

Wright Brothers' 1908

PROPOSAL FOR A HEAVIER-THAN-AIR FLYING MACHINE

Proposal Management looks back on this legendary procurement and the proposal which helped launch a new industry for a forward-looking world.

By Jayme A. Sokolow, Ph.D. and R. Dennis Green

The miracle of flight and the U.S. government's interest in supporting it were brought together in 1907 with the issuance of a two-page procurement notice. This solicitation for a heavier-than-air flying machine soon led to a War Department contract with Wilbur and Orville Wright, one of the most significant contracts ever signed by a federal agency.

The story behind this procurement grows more amazing in its retelling. In some ways, it shows us how far proposal development has come. In other ways, it reminds us how little government procurements and proposals have changed.

Similarities to contemporary procurement would include a cautious and conservative government agency, the need for behind-the-scenes encouragement of government officials (pre-bid), and an early mandate for competitive bidding, even when few if any legitimate competitors were known



Wilbur & Orville Wright

to exist. They also include a specification with some aggressive and technically challenging requirements, a clarification cycle, and—when the Wright brothers were underbid—multiple awards.

There were also significant differences to contemporary procurements. The Wright brothers' proposal is refreshingly brief (two pages). There is no fluff. Its content is focused on engineering requirements and the bidder's careful compliance with each one. Moreover, the government made its selection and sent the award notice in just one week.

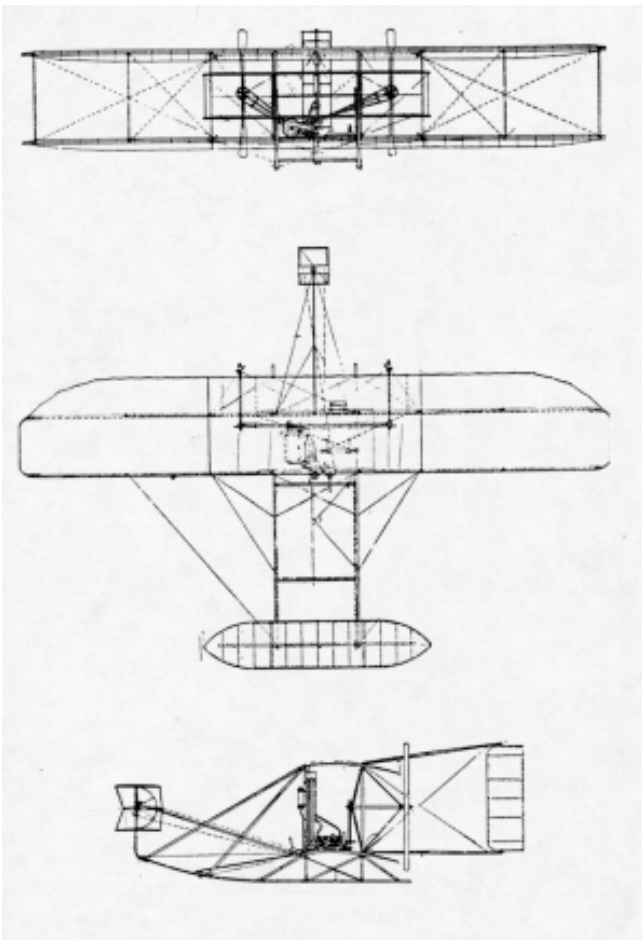
**“They have done it!
Damned if they ain't flew.”**

The Wright brothers' work on a flying machine actually began many years prior to the War Department's procurement notice. After many experiments with kites, gliders, and engines, on a cold and clear December 17, 1903, Wilbur and Orville Wright made aviation history when Orville flew a machine-operated airplane about 120 feet in 12 seconds over the smooth sands of Kitty Hawk, North Carolina. Later that day, Wilbur beat his brother's record when he flew the same plane almost 852 feet in 59 seconds. “They have done it! Damned if they ain't flew,” marveled one astonished eyewitness.

Despite its importance, the Wright brothers' accomplishment was at first not appreciated by the government. The Wright brothers lived in Dayton, Ohio where they ran a modest printing and bicycle business. Although they had different personalities, the brothers had two important traits in common—mechanical ability and a keen analytical

intelligence. They were problem solvers who enjoyed engineering challenges.

Wilbur wrote the *Smithsonian* for information on aeronautics in 1899, and in just four years he and his brother had built three gliders and then their famous airplane. Although the U.S. government was very interested in gliders and airplanes as military weapons, it was reluctant to support the Wright brothers. Almost four years after *Kitty Hawk*, however, they were writing their first government proposal to build and test an airplane for the War Department.



DRAWINGS ACCOMPANIED THE WRIGHT BROTHERS PROPOSAL—Though we are unable to identify the specific drawings which accompanied the Wright Brothers' proposal, they probably resembled those of this 1905 machine which are found in The Papers of Wilbur and Orville Wright. We know that the 1905 machine was taken to Kitty Hawk, North Carolina, and altered so that the operator and one passenger could sit upright on the lower wing surface. It was tested there in May 1908.

By 1905, the Wright brothers had made hundreds of successful flights to the amazement of newspaper reporters and curious onlookers. But when they contacted the War Department about their airplane, the replies were not encouraging. One memorandum from the Recorder of the Board of Ordnance and Fortification, in fact, set a standard that has rarely been equaled in contracting language. "The Board," the letter intoned, "does not care to formulate any requirements for the performance of a flying machine or to take further action until a machine is produced which by actual operation is shown to be able to produce horizontal flight and to carry an operator." When the Wright brothers wrote letters to the French and British governments, they also received unenthusiastic responses.

In 1907, the Wright brothers' prospects brightened when the American Aero Club and Lieutenant Frank P. Lahm intervened on their behalf. The American Aero Club met with President Theodore Roosevelt and asked him to have the War Department purchase the Wright brothers' airplane. Meanwhile, Lahm, a balloon enthusiast assigned to the Aeronautical Division of the Army Signal Corps, also lobbied the War Department. He had met the Wright brothers in Dayton and was convinced that their airplane would make military balloon flights obsolete.

In June of 1907, Lahm wrote a letter to the Chief Signal Officer and urged the Board of Ordnance and Fortification to buy the Wright Flyer. The Board agreed but told him that it could not pay more than \$10,000 unless Congress appropriated more funds. In December, the Board interviewed Wilbur, who said that he and his brother did not want to be paid by the government until they produced a successful airplane. The Board was so impressed with his presentation that it decided to buy an airplane for \$25,000 using unspent funds from the Spanish-American War, which had ended nine years earlier. First, however, the Board would solicit competitive proposals from all interested bidders.

REQUEST FOR PROPOSALS

On December 23, 1907, the Aeronautical Division issued Signal Corps Specification No. 486, "Advertisement and Specification for a Heavier-Than-Air Flying Machine." As shown in the accompanying copy of the specification, the War Department wanted to purchase an airplane that could be assembled within an hour. "It should be sufficiently simple in its construction and operation to permit an intelligent man to become proficient in its use within a reasonable length of time." The airplane had to carry two people weighing a total of 350 pounds at a minimum speed of 40 miles per hour for at least 125 miles. It also had to land safely on a field even if the propulsion system failed.

SIGNAL CORPS SPECIFICATION, NO. 486.

ADVERTISEMENT AND SPECIFICATION FOR A HEAVIER-THAN-AIR FLYING MACHINE.

TO THE PUBLIC:

Sealed proposals, in duplicate, will be received at this office until 12 o'clock noon on February 1, 1908, on behalf of the Board of Ordnance and Fortification for furnishing the Signal Corps with a heavier-than-air flying machine. All proposals received will be turned over to the Board of Ordnance and Fortification at its first meeting after February 1 for its official action.

Persons wishing to submit proposals under this specification can obtain the necessary forms and envelopes by application to the Chief Signal Officer, United States Army, War Department, Washington, D. C. The United States reserves the right to reject any and all proposals.

Unless the bidders are also the manufacturers of the flying machine they must state the name and place of the maker.

Preliminary.—This specification covers the construction of a flying machine supported entirely by the dynamic reaction of the atmosphere and having no gas bag.

Acceptance.—The flying machine will be accepted only after a successful trial flight, during which it will comply with all requirements of this specification. No payments on account will be made until after the trial flight and acceptance.

Inspection.—The Government reserves the right to inspect any and all processes of manufacture.

GENERAL REQUIREMENTS.

The general dimensions of the flying machine will be determined by the manufacturer, subject to the following conditions:

1. Bidders must submit with their proposals the following:
 - (a) Drawings to scale showing the general dimensions and shape of the flying machine which they propose to build under this specification.
 - (b) Statement of the speed for which it is designed.
 - (c) Statement of the total surface area of the supporting planes.
 - (d) Statement of the total weight.
 - (e) Description of the engine which will be used for motive power.
 - (f) The material of which the frame, planes, and propellers will be constructed. Plans received will not be shown to other bidders.
2. It is desirable that the flying machine should be designed so that it may be quickly and easily assembled and taken apart and packed for transportation in army wagons. It should be capable of being assembled and put in operating condition in about one hour.
3. The flying machine must be designed to carry two persons having a combined weight of about 350 pounds, also sufficient fuel for a flight of 125 miles.
4. The flying machine should be designed to have a speed of at least forty miles per hour in still air, but bidders must submit quotations in their proposals for cost depending upon the speed attained during the trial flight, according to the following scale:

40 miles per hour, 100 per cent.
39 miles per hour, 90 per cent.
38 miles per hour, 80 per cent.
37 miles per hour, 70 per cent.
36 miles per hour, 60 per cent.
Less than 36 miles per hour rejected.
41 miles per hour, 110 per cent.
42 miles per hour, 120 per cent.
43 miles per hour, 130 per cent.
44 miles per hour, 140 per cent.
5. The speed accomplished during the trial flight will be determined by taking an average of the time over a measured course of more than five miles, against and with the wind. The time will be taken by a flying start, passing the starting point at full speed at both ends of the course. This test subject to such additional details as the Chief Signal Officer of the Army may prescribe at the time.
6. Before acceptance a trial endurance flight will be required of at least one hour during which time the flying machine must remain continuously in the air without landing. It shall return to the starting point and land without any damage that would prevent it immediately starting upon another flight. During this trial flight of one hour it must be steered in all directions without difficulty and at all times under perfect control and equilibrium.
7. Three trials will be allowed for speed as provided for in paragraphs 4 and 5. Three trials for endurance as provided for in paragraph 6, and both tests must be completed within a period of thirty days from the date of delivery. The expense of the tests to be borne by the manufacturer. The place of delivery to the Government and trial flights will be at Fort Myer, Virginia.

8. It should be so designed as to ascend in any country which may be encountered in field service. The starting device must be simple and transportable. It should also land in a field without requiring a specially prepared spot and without damaging its structure.

9. It should be provided with some device to permit of a safe descent in case of an accident to the propelling machinery.

10. It should be sufficiently simple in its construction and operation to permit an intelligent man to become proficient in its use within a reasonable length of time.

11. Bidders must furnish evidence that the Government of the United States has the lawful right to use all patented devices or appurtenances which may be a part of the flying machine, and that the manufacturers of the flying machine are authorized to convey the same to the Government. This refers to the unrestricted right to use the flying machine sold to the Government, but does not contemplate the exclusive purchase or patent rights for the flying machine.

12. Bidders will be required to furnish with their proposal a certified check amounting to ten per cent. of the price stated for the 40-mile speed. Upon making the award for this flying machine these certified checks will be returned to the bidders, and the successful bidder will be required to furnish a bond, according to Army Regulations, of the amount equal to the price stated for the 40-mile speed.

13. The price quoted in proposals must be understood to include the instruction of two men in the handling and operation of this flying machine. No extra charge for this service will be allowed.

14. Bidders must state the time which will be required for delivery after receipt of order.

JAMES ALLEN,

Brigadier General, Chief Signal Officer of the Army.

SIGNAL OFFICE,

WASHINGTON, D. C., December 28, 1907.

ADVERTISEMENT AND SPECIFICATION FOR A HEAVIER-THAN-AIR FLYING MACHINE — Issued December 23, 1907, this two-page request for competitive proposals was criticized by the American Magazine of Aeronautics as asking for the impossible. The magazine predicted that no one would bid.

WILBUR WRIGHT
ORVILLE WRIGHT

CABLE ADDRESS
WRIGHTS, DAYTON

WRIGHT BROTHERS
1127 W. THIRD STREET
DAYTON, OHIO

January 27, 1908.

General James Allen,
Chief Signal Officer of the Army,
Washington, D. C.

Dear Sir:

We herewith inclose a bid for furnishing the Signal Corps with a heavier-than-air flying machine, in accordance with Specification No. 496, of December 29, 1907, together with a certified check for two thousand, five hundred dollars (\$2,500.00).

The machine we propose to deliver is designed to weigh between 1,100 and 1,250 lbs. with two men on board, and for a speed of forty miles an hour. It will have an area of 600 square feet in the supporting planes; and will be propelled by a four-cycle, water cooled gasoline motor. The frames of the planes will be constructed of spruce and ash covered with cotton maulin; the propellers, of spruce and linen.

We have made the date of delivery of the machine 200 days, in order to provide sufficient time for increasing the speed of the machine now under construction, in case Requirement No. 5 is to be interpreted literally. If, however, Requirement No. 5 is interpreted to mean an average of the speeds, with and against the wind over a measured course, which is the correct method to give an average corresponding to a flight made in still air, as specified in Requirement No. 4, we would be

WRIGHT BROTHERS' PROPOSAL— This two-page Wright Brothers' proposal was accompanied by drawings, a photograph of their 1905 machine, and a method for computing the speed of a flying machine in the wind. The proposal references a certified check for \$2,500— ten percent of the price being quoted for the machine if performing at the specified 40-mile speed. The Wright Brothers' original carbon copy of this proposal is held by The Library of Congress, Manuscript Division, in Washington, D.C.

WILBUR WRIGHT
ORVILLE WRIGHT

CABLE ADDRESS
WRIGHTS, DAYTON

WRIGHT BROTHERS
1127 W. THIRD STREET
DAYTON, OHIO

General Allen--2,

able to make delivery at a much earlier date.

We inclose a photograph of our machine of 1905, which was similar to the one we now propose to furnish. We would request that this, as well as the drawings, be kept confidential.

Very respectfully,

If the airplane flew less than 36 miles per hour, the government would not purchase it. For each mile the airplane flew under 40 miles per hour, the government would deduct 10 percent from the contract. But if the airplane could fly between 41 and 44 miles per hour, the contractor would receive a 10 percent bonus for each mile. To encourage only serious proposals, all applicants had to deposit 10 percent of their total project budget with the Aeronautical Division. Deposits would be forfeited if airplanes failed to meet Specification No. 486.

“I hardly think that the perfect flying machine will appear in such sudden fashion.”

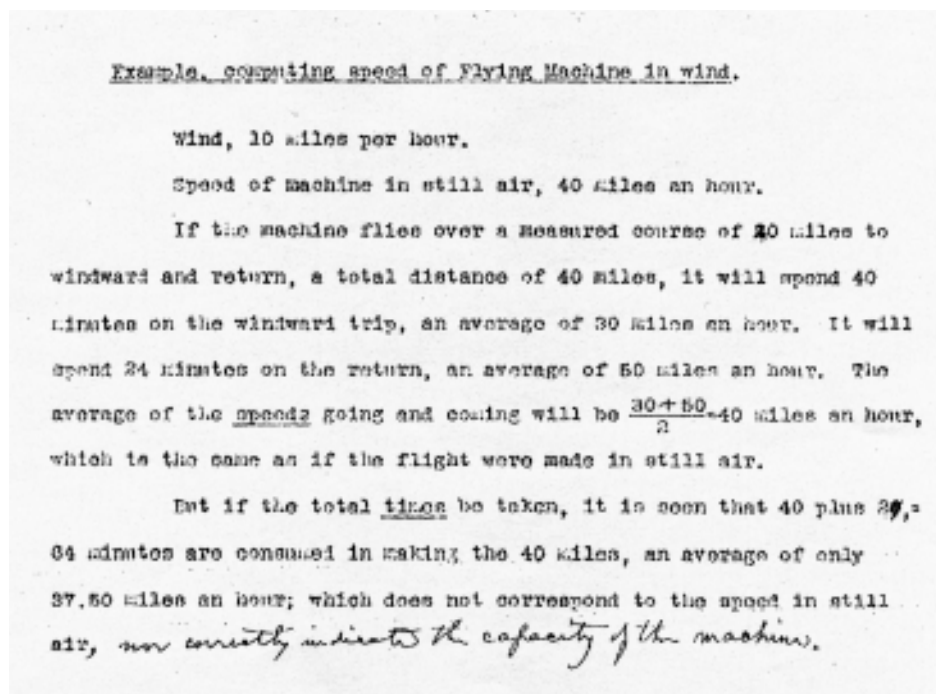
Although the Wright brothers had already demonstrated that heavier-than-air flight was possible, the experts were as skeptical about the procurement as the War Department had once been about airplanes. The American Magazine of Aeronautics believed that “there is not a known flying-machine in the world which could fulfill these requirements,” and the former editor of Aeronautical Annuals was equally dismissive. “I hardly think,” he wrote, “that the perfect flying machine will appear in such sudden fashion.” Many newspapers were equally dismissive.

FORTY-ONE BIDS

As with modern-day government procurements, the proposal preparation period included correspondence to clarify the bid. Topics for clarification included the manner for keeping certain design features confidential, the extent of a bondsman's liability (in the event of successful but incomplete performance), and the selection of Ft. Myer, Virginia as the location for delivery and trials.

By the February 1, 1908 deadline, the Army Signal Corps received 41 proposals ranging from a low of \$850 to an astronomical \$1 million. Some bids were patently absurd. One federal prisoner offered to build an airplane in exchange for his release while another applicant submitted his design on wrapping paper. Only three proposals were accompanied by certified checks.

One legitimate bidder was J.F. Scott of Chicago, who quickly dropped out of the competition. A second was Augustus M. Herring of New York City, who failed to construct an airplane despite receiving two generous extensions on his contract. The third bid came from the Wright brothers. Their two-page proposal was accompanied by drawings, a photograph of their 1905 machine, and a method for computing the speed of a flying machine in the wind. They promised to build an airplane to the War Department's specifications in 200 days for \$25,000.



PROPOSAL ADDENDUM—The Wright brothers recognized the need to clarify how speed would be measured from the ground if the machine were flying in wind.

Form 106

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INCORPORATED
24,000 OFFICES IN AMERICA. CABLE SERVICE TO ALL THE WORLD.

This Company TRANSMITS and DELIVERS messages only on conditions limiting its liability, which have been assented to by the sender of the following message. Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages, beyond the amount of tolls paid thereon, nor in any case where the claim is not presented in writing within sixty days after the message is filed with the Company for transmission.
This is an UNREPEATED MESSAGE, and is delivered by request of the sender, under the conditions named above.
ROBERT C. CLOWRY, President and General Manager.

RECEIVED at Patterson Building, 28 South Jefferson St., Dayton, Ohio.
TELEPHONES: BELL 3303, 3304; HOME 2003, 2043.

140 C LD VN 33 Paid Govt
Washington DC feb 8th 1908
Wright Brothers
Dayton, O.

Your Proposal for Heavier than air flying Machine opened in this office on feb first is accepted formal order will be placed with you in a few days.

Allen. 645 P

ALWAYS OPEN. MONEY TRANSFERRED BY TELEGRAPH. CABLE OFFICE.

NOTICE OF AWARD—The Wright Brothers received formal notice that their proposal had been accepted via Western Union telegram after just one week.

It did not take long for awards to be issued. A Western Union telegram dated February 8, 1908, advised the Wright brothers that their proposal had been accepted. Copies of a contract were issued for signature just three days later.

STELLAR PERFORMANCE EARNS BONUS FEE

On August 20, 1908, Orville Wright delivered his airplane to Ft. Myer, a military installation adjacent to Arlington National Cemetery. With the help of a contract extension the Wright brothers tested and modified their Army Flyer for the War Department.

In September, Orville set a new airplane endurance record with Lieutenant Lahm as his passenger. By July of 1909, Orville and Lahm set yet another endurance record of one hour, 12 minutes, and 40 seconds. On July 27, Orville and another passenger flew the Army Flyer over 40 miles per hour at an altitude of 400 feet. During this test run, 7,000 spectators, including President William Howard Taft,

watched the graceful airplane fly between Ft. Myer past the present site of the Masonic Memorial to George Washington's estate in Alexandria, Virginia.

According to the Associated Press, "as if drawn by invisible power, it rose higher and higher, reached the end of the field, turned at a right angle and came about, facing the madly-cheering multitude. Hats and handkerchiefs were waving, automobile horns were tooting, some overwrought spectators even wept as the great white creature turned again southward at the starting tower." When Orville landed, a "wild demonstration. . .welcomed the triumphant aviator."

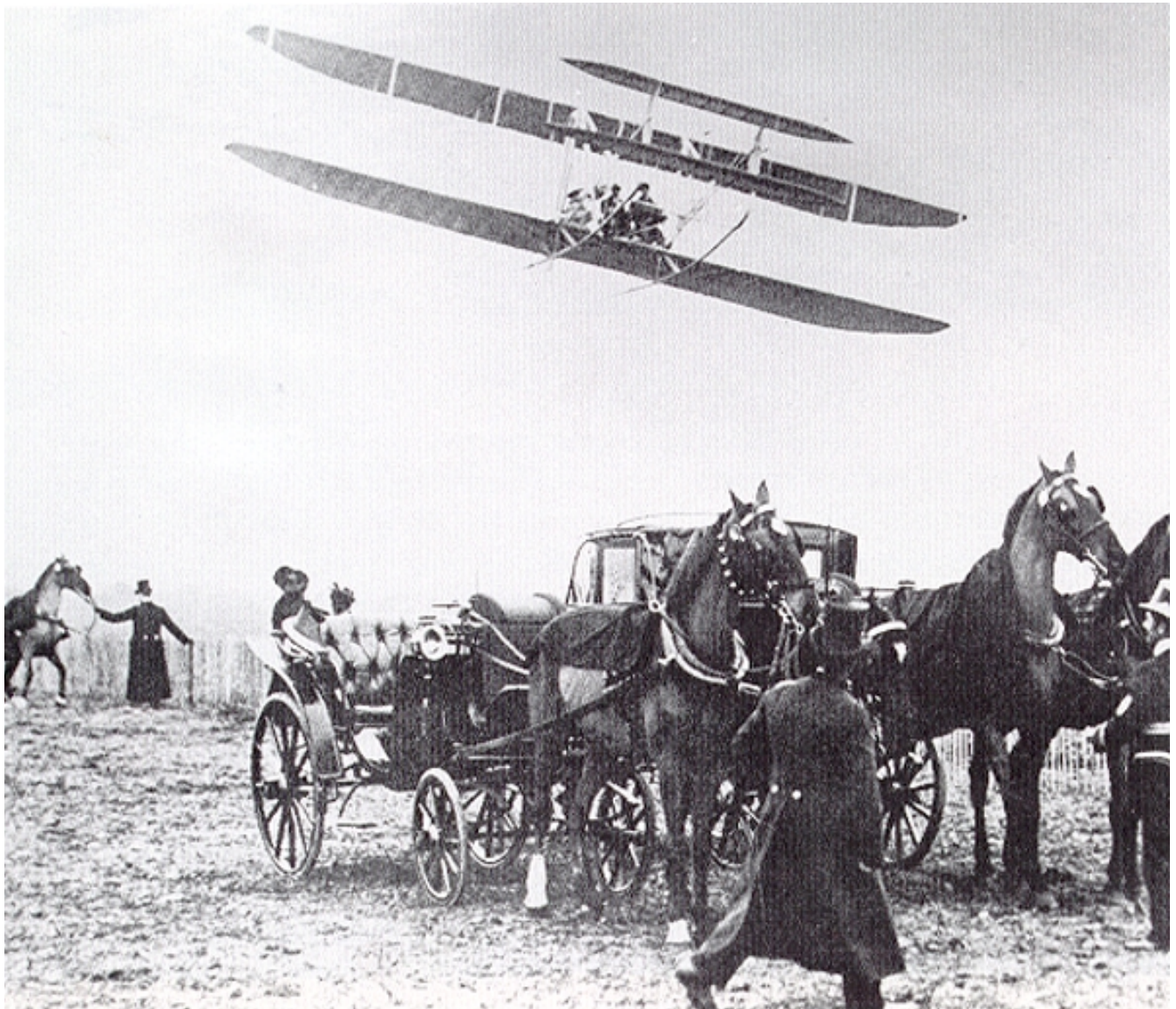
"as if drawn by invisible power.."

By October 1909, the airplane was staying aloft for more than three hours at an official speed of 42.583 miles per hour. With a 10 percent per mile bonus, the War Department paid \$30,000 for the Army Flyer. The Wright

brothers had finally demonstrated that their airplane could benefit the War Department.

That same year, Orville and Wilbur created the Wright Company to manufacture airplanes with a capital stock issue of one million dollars and financial titans such as Augustus Belmont and Cornelius Vanderbilt on its board of directors. In 1912, Wilbur died of typhoid fever but Orville kept working on airplanes until his death in 1948. By then, airplanes could go faster than the speed of sound.

The 1908 War Department agreement with the Wright brothers is one of the most important contracts ever signed by the U.S. government. Although other inventors quickly introduced monoplane wings, a front propeller, a closed body, single stick control, and wheels, another Wright brothers' contract deliverable — the Wright Model B 1911 — is still the basic model for airplanes today. APMP



The public demonstrations of the Wright Flyer in 1908 sent shock waves across the United States and Europe.

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NOTE: *Proposal Management* wishes to thank the following individuals for their assistance in locating copies of the referenced specification and proposal documents:

- Dawne Dewey, Special Collections and Archives, Wright State University Libraries, Dayton, Ohio
- Leonard Bruno, Manuscript Division, Library of Congress, Washington, D.C.

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