

Direction Finding Old and New¹

By C. K. Wildman

There are few people today, even in aviation, who realize that not many years ago the pigeon basket was just as much standard equipment in an airplane as the radio is today.

In fact, before a pilot was allowed to fly very far from home he had to be "checked out" on pigeons. In the Navy, pilots were required to master a little black book called Instructions Covering Pigeon Communication. In the Army the fliers had to study a similar instruction book called The Pigeoner. On the final examination one question required that a careful distinction be drawn between "primary" and "secondary" feathers. Accurate sketches had to be submitted with the paper.

Many pilots from both branches of the service found that the information contained in these courses of instruction was of vital value. In 1921 one of our naval aviators was forced down at sea and tells in these words of the experience.

It was the Monday following the Army-Navy game, and Tom, Andy, and I took off in an IIS-2, a single engine pusher flying boat, on "Navigation No. 1," the standard navigation problem we all had to fly. It required us to fly three legs of a triangular course, the apex being a point well out of sight of land in the Gulf of Mexico. We had radio, which at best was not too reliable, and the wind driven generator was useless if we were forced down on the water. Three of these problems had to be flown, each pilot functioning as pilot, navigator, and radio operator in succession. I was the navigator on this flight, while Tom was the pilot and Andy acted as radio operator and flight mechanic. The pigeons, always three of them, were stowed aboard and were in my custody as navigator. At each "fix" on the flight a radio report was to be sent, and at the same time a pigeon launched with the confirmation, "just in case." To us this had always seemed more of a game than a real safety aid, and sketching pigeon wings and studying the care and feeding of the birds comprised a part of the ground-school syllabus which made staying awake on hot Pensacola afternoons more difficult.

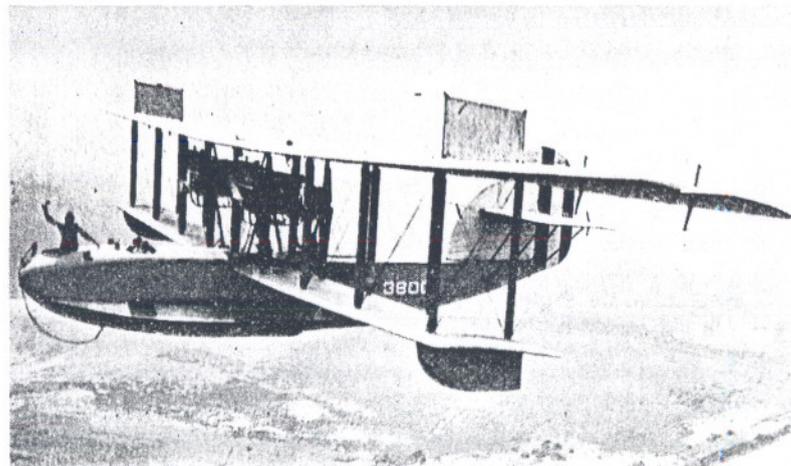
The first leg of the flight was along the coast, to get the force and direction of the wind at our cruising altitude, and we proceeded to Bon Secour. At Dauphin Island we took departure and headed for point "B" of our problem, which to a landlubber would appear exactly the same as any other point on the 5,000 odd square miles of ocean that one can see from a flying boat at 1,000 feet altitude. Point "B," however, seemed of no importance when the engine stopped and we assumed the gliding angle of the well-known brick, characteristic of the IIS-2 flying boat, and I realized that "X" was now the spot where the plane would be found—I hoped. Andy was removing his gloves to operate the transmitter to send an "S O S" when he had to brace himself for a beautiful stall landing that Tom made in a moderate sea. Looking at Tom's face from my cockpit in the bow brought to mind some of the caustic remarks we had

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made about how the pigeons looked when Tom made a flipper turn over Santa Rosa Island. Well, here was an unscheduled launching of the pigeons, and right at that time I felt slightly resentful that our pigeon studies had been so brief. Tom and Andy found a rocker arm cover was broken, and I wrote out a message with that information and our dead reckoned position and time of landing.

The old adage about "the watched pot never boils" wasn't in it with the apparent stopping of the clock while we waited for those pigeons to get help. Two hours and a half later an F-5-L twin-engined patrol plane landed off our starboard bow. Yes, sir, pigeons have their points.

Some naval officers have felt that the "homing" instinct of the pigeon is not unlike the "homing" characteristics of the radio direction finder. In other words, they have conducted experiments which they feel show that there is a definite relationship between the phenomenon of radio and the "homing" done by birds. So far these experiments have not developed any positive data, but the results of one series of flights is very interesting and is significant.



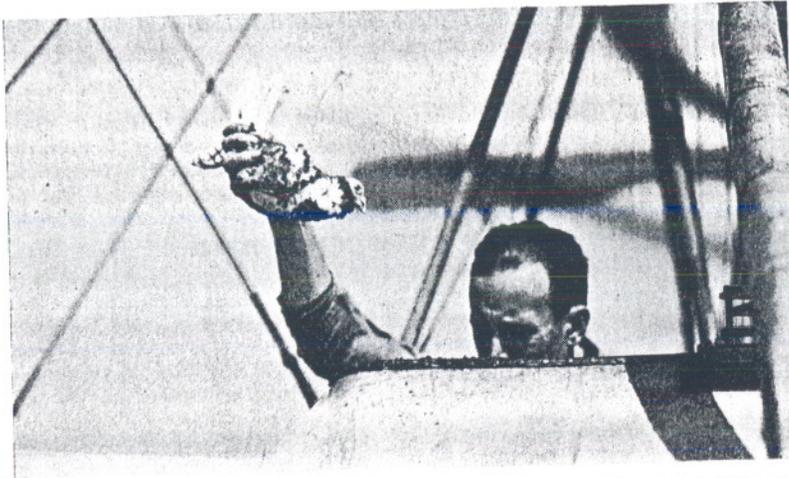
Launching a homing pigeon. The navigator is preparing to throw the bird clear of the maze of struts and wires of this F-5-L flying boat.

Officers and men at Lakehurst took several birds to the Ocean Gate, N. J., radio transmitting station. Groups of five pigeons were released while the station was transmitting. A few minutes later the station was turned off and another group released. This procedure was repeated a number of times.

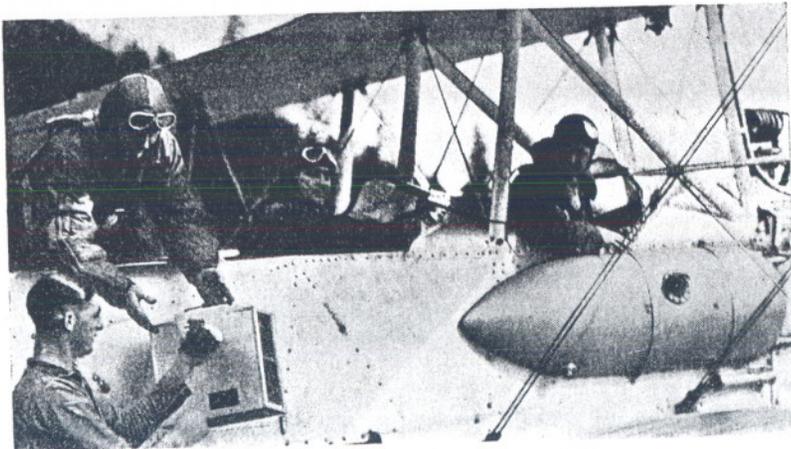
According to an official Navy Department report: "The pigeons released when the station was not transmitting circled in the conventional manner and within 5 minutes had departed for Lakehurst. The pigeons released when the station was transmitting, on each occasion circled in an erratic and confused fashion very close to the station for 15 to 20 minutes before heading for Lakehurst." The average flying time back to Lakehurst for all the pigeons released when the station

was not transmitting was 19 minutes, while the average flying time for birds released when the station was transmitting was 47 minutes.

Thus the real facts concerning the relationship between what we call "pigeon instinct" and radio direction finding is not yet entirely clear. But it can be said at this time that there is proof that there is



A navigator of an HIS-2 pusher flying boat demonstrates the proper way to hold a pigeon prior to release. The bird's wings are held immobile to prevent injury when the pigeon is thrown down into the air stream.



In the early twenties the pigeon basket was just as much standard equipment in the Navy as the airplane's instrument panel. Here a Navy quartermaster hands a well-stocked pigeon box to the navigator prior to take-off. Both the pilot and the observer watch carefully to be sure that the birds are placed on board.

something basic about the pigeon which is related to radio waves. Today competent scientists are exploring this relationship. In the future we may learn even more lessons about flying from these first commercial aviators.

Intimate Observations of Marconi

As Related by Some of His Friends and Associates

Wireless was first introduced to America by the late Marchese Guglielmo Marconi, Senatore of Italy, President of the Royal Academy of Italy and of the Italian National Council of Research—intimate friend of rulers, church dignitaries, executives, and engineers in all countries. Only a few, however, have been privileged to know the intensely human Marconi and of his association with his fellowmen and fellow workers.

Mr. Marconi visited America with a set of instruments in 1899 to report the international yacht races. His eagerness to get his apparatus set up was balked by formalities of the customs office, and after he had climbed up and down the steep steps of the customhouse a half dozen times, he said with a weary smile, "When does the next boat leave for Liverpool? This is too much of a rush for me." But eventually he got his trunks released, and the races were reported with great success.

Marconi was his own operator, and while sending a message with the letter "J" he had to look up the telegraphic characters on a card. "Why wasn't he named Robert," he said with a chuckle, "instead of John?" After the races a group of reporters and yachtsmen met on the transmitting yacht *Ponce*, and spent an hour or two with Signore Marconi, where he sat at the piano and played, running the range between popular songs and light opera, voted by all as "a prince of a good fellow."

Marconi was a hard worker, and required long hours and patient attention to duty from his subordinates. But he so fired them with zeal reflected from his own tireless efforts that they were an especially loyal group. In 1912 a group of American Marconi engineers was sent to England to study the huge Marconi transmitters there, preparatory to installing duplicates in our American high-power stations. Day after day Marconi would come to the station with mysterious packages under his arm—sometimes a new form of spark gap, or a jigger for receiving which would then be tried out in practice. One cold, rainy night, Marconi came in quite unexpectedly, having walked several miles from the railway station, but carrying the usual package. Everyone eagerly watched while he unwrapped—not a condenser nor a new magnetic detector, but a dozen phonograph records. "I thought you young men from the States might be rather lonely out here," he said, "So I have brought you some gramophone records." So saying, he placed the first record on the machine, and the homesick Americans heard the strains of *Everybody's Doing It Now*.