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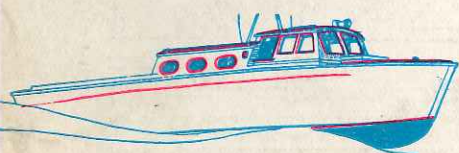
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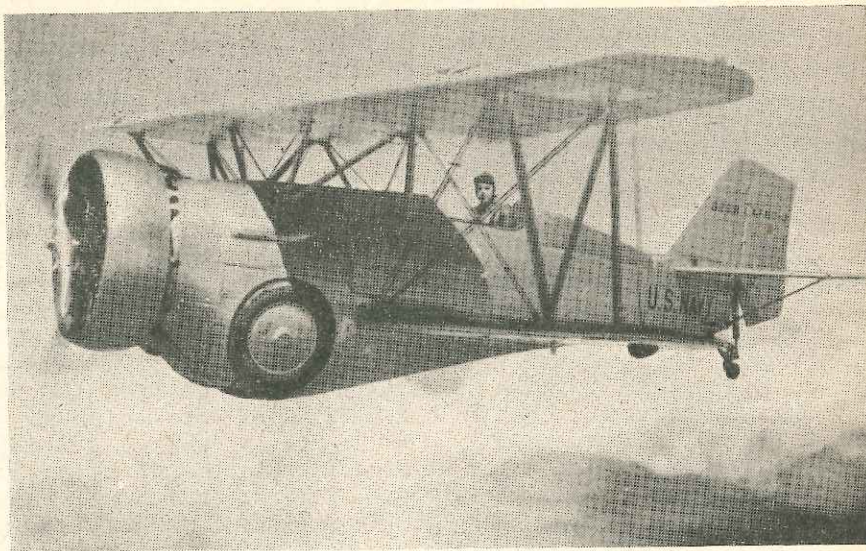


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GAMBLING WITH DEATH

Testing war machines is a man's job. We have described British methods in a previous article; this is how they do it in the United States

By
ALFRED CELLIER



Courtesy U.S. Navy.

Curtiss BF2C Bomber-fighter with 700 h.p. Wright "Cyclone" engine mentioned below.

STOPPING to admire some new type of aircraft, it is seldom that one gives any thought to the course of things which made that particular design possible. From the drawing boards of the designers to the time it goes to the aerodrome for its trial, it is an unaccepted product. At the aerodrome the human element steps in and, from then until it is passed upon, its fate is in the hands of the test pilot.

No glory or medals are pinned upon those unknown airmen who strive to make the new machine fulfil all the expectations that have previously been worked out on paper. Many times failure occurs and the test pilot is killed. When this happens things are usually hushed up so that the new machine does not receive a bad name and that further tests may be carried out until it is perfected.

Formerly, in America, when a new machine was constructed and offered to the services, it was put through all the tests by service pilots who then determined its merits in relation to the others on trial. As this method resulted in many of the test pilots being killed, it was then decided to require such tests to be carried out by the company pilots before any machine would be considered. This naturally resulted in a great deal more care being taken by the particular firms in order to put over their products and, consequently, the life of the test pilot was considerably lengthened.

Yet, being a test pilot is not such a bed of roses as might be expected. The possibilities of passing out during a steep dive or being knocked out by flying fragments of a propeller or wing, or trapped inside the fuselage through some structural failure, still makes it a hazardous occupation. But it is all in the day's work.

Recently, it might have been noticed in the news items that the American Army Air Corps had ordered 110 Northrop attack ships, costing £379,280. Probably little thought was given it by the reader, but behind it lies a story of that unheralded hero, the test pilot.

Such an order is well worth going after by any manufacturer, and Northrop, with his all-metal, low-wing

monoplane, had a machine whose high speed was around 280 miles an hour. It was untried for military work, but several commercial versions had proved themselves exceptionally well. Only one little matter stood in the way and that was to put it through the required military tests which called for an acceleration of 10 gravity. This, of course, is far in excess of what any airplane would be called upon to perform in its actual service.

While scientists often claimed that men could only stand an acceleration of 8 gravity and live, the test pilots have done better and actually have put their machines into the greater acceleration. The Northrop in question was powered with a Pratt and Whitney double-banked engine of 750 h.p. The test had to be a success and Northrop knew the man to do it. For the job he chose Vance Breese, a designer who has had years of experience flying mail, and barnstorming in the old days.

When everything was ready for the tests, Breese was taped from head to foot in order to help his body stand the terrific strain of the dive. He took off equipped with a parachute, giving him some safety in the event of the wings coming off. Climbing to 20,000 feet, Breese pointed the nose down and began a full power dive, always watching his instruments. The air-speed indicator needle gradually crept to 200, 300 and 400 miles an hour. Still faster, and at 425 miles an hour the instrument suddenly broke to pieces as he pulled the machine out of its steep dive at four thousand feet above the ground. The trial was a complete success and the order that followed was a nice one.

But what of the test pilot, what did he get out of it? That is the surprising part of the story. Can you imagine anyone getting the fabulous sum of £400,000 an hour? Well Vance Breese did. For the part he was called upon to take in the tests, it is reported that Breese received £3,000 for the sixteen thousand foot dive he made. Figuring on the basis of two shillings a foot for the fifteen seconds involved, it totals at the rate of £6,400 a minute, or nearly £400,000 an hour. Yet some people

talk of a depression! Nevertheless, Breese well earned his money and there are many who would not have undertaken it for double the sum.

Not all companies hire outside test pilots to demonstrate their new machines, as they generally have one or two on their payroll. Yet in a particular case the Curtiss Company felt that it was too much to ask of a test pilot working for them, who had already made seven dives, and they went outside for a pilot to finish the tests on a new machine. This ship was a bomber-fighter known as the BF2C, with a 700 h.p. engine. It has a retractable landing gear that folds into the side of the fuselage, and the Navy had already tried a former model, this being the second modification.

Before it would be acceptable to the service several more dives of various sorts were required, the last two to be done at the naval proving ground at Dahlgren. Formerly such tests were conducted at the naval experimental station at Anacostia, Washington, D.C., but so many airplanes went to pieces in the course of the tests that these activities were transferred to a safer place. Dahlgren, thirty miles away, was surrounded by open country and little danger existed there should an accident occur.

The acceptance tests of this machine were undertaken by James Collins, another unsung hero. That they were successful may be attributed to the fact that the machine is now a standard carrier type. The Navy had called for a terminal velocity dive of 9 gravity and Collins put the machine into an acceleration of $9\frac{1}{2}$ gravity in a ten-thousand-foot dive.

During the terrific physical strain of such tests many men have fainted. One well-known navy Commander recommends that test pilots during such dives yell at the top of their voices. This, he claims, gives a tenseness to the muscles of the abdomen and the neck and preserves sight and consciousness.

Years before, when little was known of the relation of the human element to such exceptional strains, an army pilot, through a faulty accelerometer, accidentally received too much gravity while testing a new machine at Wright Field. The effect of his steep dive and pull out broke blood vessels in his brain and ruptured his intestines. He was confined to the hospital for a year and really never did recover from his experiences.

Just two years ago, at Wright Field, Captain Hugh M. Elmdorf, with Captain Frank O'D. Hunter, both noted pursuit pilots, went aloft in a new two-seater low-wing fighter. Putting the machine through its final tests, everything worked beautifully as each manoeuvre was passed upon. On the last and final test, a steep power dive, from which if it passed it would go into production, something went wrong. With the earth hurtling upwards at a tremendous rate, the machine refused to respond to its controls. Captain Elmdorf, in a second, gave the signal to his companion to jump, and he crashed with the machine to the ground. Captain Hunter bailed out at just two hundred feet. The high speed of the plane immediately opened his parachute, and he landed in safety. With later modifications, this particular type was again tested and passed into service, where it is now a standard model.

Thus the test pilot plays an unseen part in the little drama of the drawing boards. The accelerometer is not usual equipment on aeroplanes but is a portable instrument very necessary for test purposes. Looking

something like an air-speed indicator, it tells in terms of G., or gravity, the force of pull-out from a dive. For instance, a man weighing 150 pounds is pulled into his seat with a force equal to his own weight. So in sharply pulling out of a ten thousand foot dive hard enough to push the gravity reading to ten would be to pull the pilot into his seat with a force equal to ten times his weight, or fifteen hundred pounds holding him down. No wonder man has lost consciousness in such parts.

The stress also put on a new aeroplane is considerable, and only the expert designing and engineering of the present have made such recent tests possible. Construction of the aeroplane has progressed by leaps and bounds and a great deal of the credit must go to the men who test them.

As this article was being written, the author's attention fell on a news item—James Collins, mentioned herein, made his last flight. Deciding that it would be his final trip and then he would be able to live the more leisurely life of an aviation writer, with his wife and two children, Collins told newspaper men, "I'm getting \$15,000 for a series of power dives and I may as well take the easy money."

The new fighting ship was a Grumman, and Collins took it skyward into the heavens. When reaching ten thousand feet he pointed its nose straight down in the most gruelling test an aeroplane and pilot can undergo. Screaming earthwards at more than 400 miles an hour, he straightened out with a snap which he knew from experience would leave him momentarily unconscious. Suddenly the engine and propeller tore loose from his machine and it spun the rest of the way to the ground, carrying Collins with it.

The test, undertaken shortly before dusk, was the tenth and last dive, and was witnessed by navy inspectors, who claimed Collins had been killed outright. Two civilians, though, who were the first to reach the wreckage, said that Collins asked them to pull him out and then said: "Never mind wiping my face. I'm done."

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