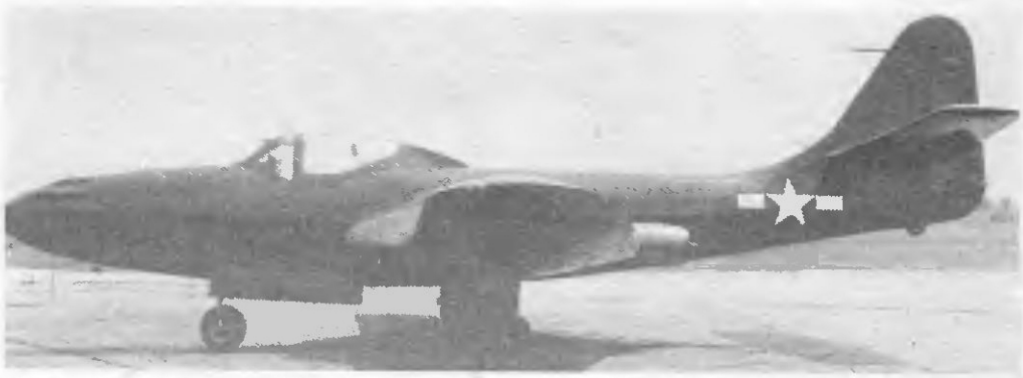
Mc DONNELL FH-1

PHANTOM

MIROSLAV BALOUS Drawing
STANISLAV SMÉKAL PART I.



Druny's XFD-1 prototype, the first XFD-1 in flight below, and XP-67 below it in a similar shot





Throughout the 1960s and 1970s, the fighter and combat power of the United States Air Force, Navy and Marine Corps was symbolized in the minds of militant Americans by the name of a single aircraft - the Phantom. The type, marked with the "full name" McDonnell Douglas F-4 Phantom II. The number II after the name, although rarely quoted in practice, indicated the continuation of the once started tradition and the existence of the first Phantom. It really was. And while it was far from becoming a symbol, its significance is still appreciated today by placing one of the surviving specimens in the exhibition of the Smithsonian's Air and Space Museum in Washington.

The first part of the name of today's mammoth aerospace concern McDonnell Douglas, the McDonnell Aircraft Corporation, founded by a certain James S. McDonnellt Jr. in the summer of 1939 in a small building at Lambert Airport in St. Louis, started in the field of aircraft production more than modestly - with two employees and no orders. Military planners noticed her in the fall of 1940 and placed an order for her to produce aircraft parts for several established companies. The entry of the United States into the war in December 194t allowed the factory to expand considerably. J. S. McDonnell managed to put together a powerful and unconventional design team, led by the imaginative Kendall Perkins. In 1941, the company won an order to develop the XP-67 fighter aircraft and the following year an order for serial licensed production of the Fairchild AT-21 Gunner training twin-engine aircraft. Meanwhile, K. Perkins and his colleagues were preparing a surprise. And the XP-67 Bat was a surprise. It was powered by two brand new Continental XI-1430 twelve-cylinder liquid engines with turbochargers, was equipped with a nose retractable landing gear and could carry six 37 mm cannons. Shocking were its shapes, more suitable for a jet aircraft. The single-seat XP-67 flew for the first time in February 1944. It didn't make a dent in the world, or rather in the enemy, but that was due to immature engines. It remained in the prototype - but it served excellently as a technological and aerodynamic exercise. At the time when Bat was still being completed, McDonnell's company had gained an exceptional position among American manufacturers. It was selected as the implementer of the first jet fighter for the decks of US Navy aircraft carriers.

To better understand the final conceptual design of the Phantom, we need to mention the development of jet propulsion units in the USA. Various organizations in the USA were interested in the reactive principle of aircraft propulsion from the 1930s, but no significant success was recorded until the outbreak of war. The official interest of military officials dates back to February 1941, when the commander of the air force, General Arnold, visited the Great Britain, where he saw the working jet engines of the designer Whittle. Upon Arnold's return, NACA formed the Durand Committee in collaboration with industry." Its purpose was to study reactive propulsion, the principles of propulsion units, their practical use and subsequent recommendations of industry to soldiers. Three large American companies, which had already been involved in water and gas turbines for industry and power plants, turbocompressors for aircraft engines and similar activities, were selected to develop aircraft jet engines. These were Allis-Chalmers, whose Allison subsidiary produced piston engines, General Electric and Westinghouse. The last of them was of fundamental importance for the creation of the Phantom aircraft.

Westinghouse Electric and Manufacturing produced practically everything related to electricity: from hand-held lamps, telephones, radio receivers (and also the first television receivers), instrumentation, locomotives and power plant equipment. He also had considerable experience with industrial gas turbine generators. On December 8, 1941, the same day the Japanese attacked Pearl Harbor, the U.S. Navy signed a contract with Westinghouse to develop auxiliary jet engines to be installed in piston fighters to increase combat and takeoff performance. The condition was a number of such engines of various sizes. At the same time, they were to be small in size and were to use common aviation gasoline as fuels (at that time, it was already known that kerosene or its mixture with paraffin and oil was a more suitable fuel for turbine units

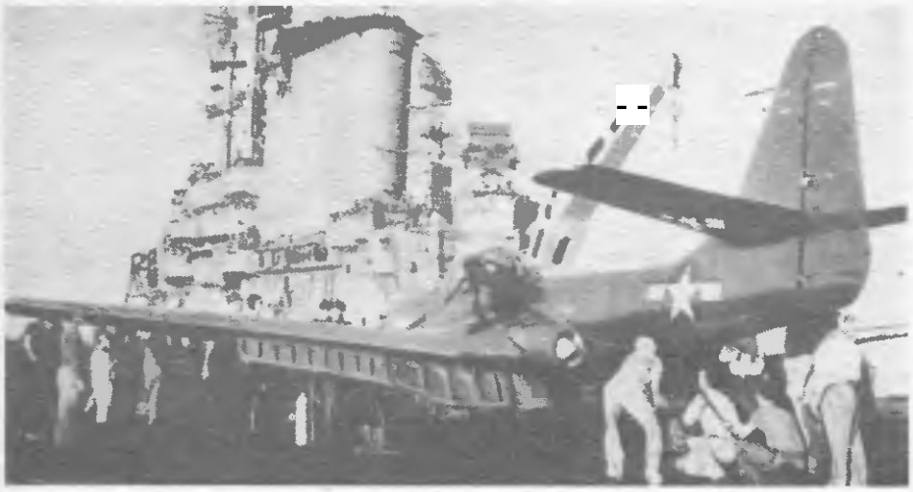
And that gasoline fuel, suitable only for starting, places higher demands on the materials used. However, the US Navy did not intend to complicate its aircraft with a dual fuel system). Westinghouse has started developing four such engines. These were marked according to their diameter in inches. The smallest Model 9.5 had a diameter of 241 mm and was supposed to give 1.24 to 1.52 kN of thrust, the largest Model 19 with a diameter of 483 mm then thrust of around 7 kN (among them were also Model 11 and 13:5). Flight specimens of the engines were tested on various naval aircraft, but in practice the combined drive was not used in the end. Later programs did create combined-propelled combat aircraft (the Navy Ryan FR-1 Fireball, Curtiss XFt5C-1 and Martin P4M-1 Mercator, as well as the Air Force Convair XP-61), but they did not use Westinghouse engines

and also had nothing to do with the creation of the Phantom. On January 7, 1943, an official preliminary order for two prototypes of the aircraft arrived in St. Louis from the Navy command with the assigned type designation XFD-1 and serial numbers 48235 and 48236. (At that time, the Naval Bureau messed up the labelling system and assigned McDonnell the same letter D that the Douglas factory had been using for a long time. It was not remedied until 1947, when it was changed to H and XFD-t became XFH-t.) When Kendall Perkins started with the first sketches of the ordered aircraft, he could choose several engine combinations to achieve the most suitable take-off weight to thrust ratio.

The number and location of engines were not specified in the aircraft assignment, only the requirement for a patrol flight at an altitude of about 5000 m in the aircraft carrier compartment and for a sufficient fuel supply was specified to a defensive fight lasting several minutes. The final size of the aircraft was determined by the amount of fuel, the weight of the pilot, four half-inch machine guns and ammunition. Kendall chose a very simple concept of a low-wing aircraft with a straight wing, a slender fuselage with a cockpit in front of the leading edge of the wing, with tail surfaces of a classic arrangement (with a horizontal one set above the stream of hot exhaust gases)

from engines) and with a bow-type chassis. With the choice of engines already so clear Sitting. Initially, it was considered With A total of six engines Model 9.5 and with a wing with an area of 17.40 m2. However, calculations showed that the weight per unit area would probably be too high for the Navy So they designed a wing with a larger area of 21.40 m2. Then the aircraft would have a total of eight engines with a diameter of 241 mm, six 0 280 mm, four by 343 mm or two by 483 mm. The multi-engine variant was tempting, at least in theory, because in cruise flight the pilot could turn off some of the engines and continue the economical flight for only the remaining ones. On the other hand, however,

Photo by Air Int and archive



Second prototype after successful landing on the aircraft carrier F. D. Roosevelt

The aircraft was very complicated, maintenance would be unbearably demanding, as well as supplying the ship with spare parts. Therefore, the variant with two engines with a diameter of 483 mm won in the end.

In May 1943, they had already finished a full-size wooden model in St. Louis. Navy representatives inspected it, the test saw tested the cabin, the weapons expert the planned installation of 12.7 mm machine guns, etc. After minor comments, such as the requirement to place the protruding engine nozzles higher and set them slightly upwards (there was concern about the effect of exhaust gases on the decks, as the US Navy had wooden flight decks on most of its aircraft carriers at the time), the project was finally approved.

In January 1944, the first drawings arrived in the workshops. The manual production of the first prototype took them until autumn. At that time, the aircraft with the military designation XFD-1 and serial number 48235 was also given the official name Phantom. This is what the painters immediately write on the dark blue painted aircraft. The next continuation now depended on Westinghouse. Its Model 19 engines, in the prototype version designated WE-19XB-B-2, were delayed and did not arrive in St. Louis until the end of the year. Before installing them in the airframe, McDonnells tested them on the brake. Instead of the expected 6.73 kN, one gave only 5.23 kN

and the other suffered from constant failures, so that its performance could not even be measured.

However, according to the program, the prototype was to have completed its first flights at that time. In order not to delay the plan any further, K. Perkins decided to have only a capable engine installed and with its thrust to start taxiing tests - instead of a second engine, it filled the ballast. The first Phantom got to taxiing in January 1945. McDonnell's test pilot Woodward Burke got the prototype into the air during one of the rapid taxiing tests. With one Phantom engine, it flew over the runway at a "height" of only a few centimeters. Nevertheless, the date of the jump, January 26, 1945, is given as the day of the first take-off. A few days later, allegedly on February 5, a real flight was made with both installed engines.

Thorough tests followed. The verification of the properties in various phases of the flight and the function of all installed systems was quite satisfactory. In fact, it was only necessary to change the deflections of the trim tabs, small things in the cabin and speed up the landing gear retraction. Even with less powerful prototype engines, the first Phantom achieved In Level 6000 m of speed 778 km/h, initial The rate of climb was 25 m/s and it flew 1200 km away. Yet before the final conclusion of the tests, the Navy ordered a series of 100 FD-1 combat aircraft from McDonnell in an official letter dated March 7, 1945. They were to be powered by a production version of the Westinghouse Model 19 engine with the new designation J-30-WE-20 and with a thrust of 7.2 kN. The well-known engine manufacturer Pratt & Whitney was also involved in the production of engines. The Model 19 built by them carried Designation J-30-P-20 In the late spring of 1945, the Navy appointed Corvette Captain W. V. Kelly as its program pilot for the Phantom trials. He was one of the few sailors to have already piloted a jet aircraft (army Bell YP-59 Airacomet). Trials continued throughout the summer, with Burke and Kelly alternating in the cockpit of the first prototype. On November 1, disaster struck - the first Phantom mysteriously crashed and Burke died. The first post-war months were quite bleak in their outlook and the loss of a single prototype was literally a blow to the company. Not only did it not have any other, but the war in the Pacific had already ended and general disarmament was expected. During the war,

Junktures The resulting military-industrial complex showed its unfortunate influence for the first time at that time. He did not let the companies he was interested in or their contracts fail. Immediately after the end of the war, the US Navy reduced the original order from one hundred to thirty FD-T machines for economic reasons, but shortly after the intervention of interested politicians it increased it again to sixty.

At the beginning of 1946, the second prototype of the Phantom was ready. It had serial number 48236 and was no different from the first. Rehearsals continued with it at the Naval Test Centre (NATC) in the Patuxent River, Maryland. In the summer, they transported the second XFD-1 aboard the largest American aircraft carrier of the time, CVB-42, USS Franklin D. Roosevelt, moored in Norfolk. She then with the Phantom on board set sail coast Virginia to the final tests of the new aircraft. On July 21, 1946, Corvette Captain J. J. Davidson (another naval pilot who had gained some "jet" experience, this time in Britain on a Gloster Meteor) sat in the cockpit and, without the help of a catapult, took off from the deck against the wind of the fast-moving Roosevelt. It needed a distance of 140 m to unstick. Around the circuit

With the landing gear and flaps extended, a successful landing followed with the first braking rope caught. On the same day, Davidson made several more take-offs and landing. The McDonnell XFD-1 Phantom thus became the first American jet aircraft to take off and land on the deck of an aircraft carrier.

At that time, McDonnells in St. Louis, Missouri, were already preparing for serial production of sixty Phantoms. The US Navy assigned serial numbers 111749 to It 1806. Some design improvements appeared in the production version: greater capacity of the fuselage tanks, the possibility of carrying an additional tank-shaped tank under the fuselage, a higher and square vertical tail, shorter ailerons that do not disturb the wing end arches, a simpler front cockpit shield, retractable braking shields in pairs on the upper and lower sides of the wing and a slightly extended nose. The first production FD-1 flew on October 28, 1946.

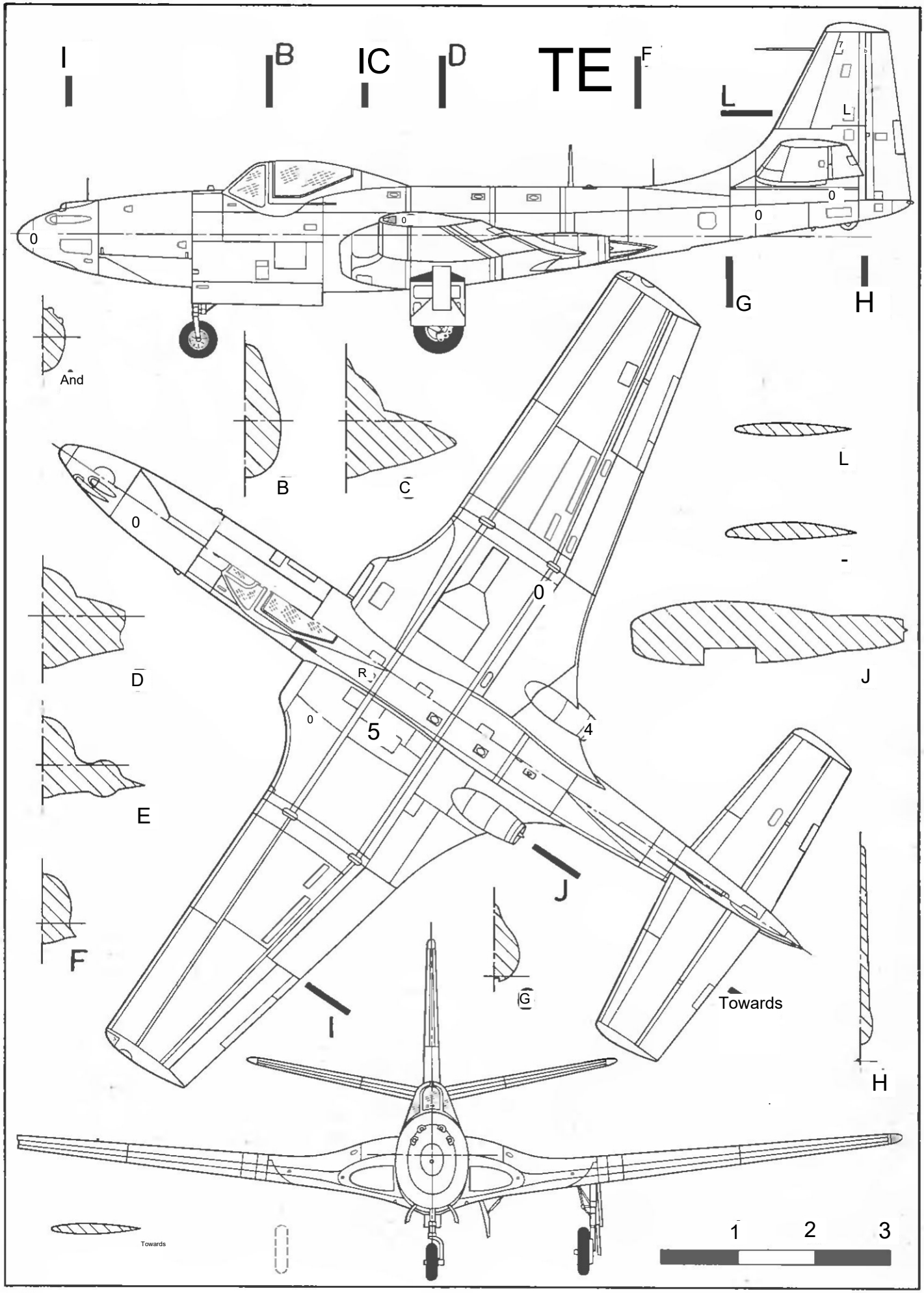
Serial FD-1 (FH-1) Phantom during a test flight



At that time, a great future was already looming in front of a new member of the military-industrial complex from St. Louis. Production facilities expanded, the number of employees increased, and with new orders came state money .

Meanwhile, at the beginning of 1947, a series of Phantoms was running and the US Navy was preparing to rearm its first fighter units with reactive technology.

Finish Next Time


I
B
IC
D
TE
F
L
L
G
H
And
B
C
L
D
J
E
F
J
G
I
H
Towards
Towards
1
2
3