Russian bomber
PETLAKOV Pe – 2

The construction team directed by Wladimir Michalowicz Petlakow elaborated in 1938 a project of height fighter marked as WI – 100. The machine was adapted to high flights; it had strong armament and big store of fuel. The test flight took place in December 1939. In May 1940 the tests were stopped. The assessment of outcomes after attacking Poland by Luftwaffe and analysis of German equipment make Russian command to review plans. As a consequence the project of the machine was changed and adapted as a fast bomber. Its analytical speed was similar to one – engine fighter speed. Adjusted prototype marked as PB – 100 was tested in June 1940. During tests the small effectiveness of bombing from big height was found. The way of bombing was changed from horizontal bombing to dive bombing. In the same time in a fighter an aero dynamical brakes were placed and removed turbocompressors TK3 from the engines. In the middle of 1940 the fighter passed national tests and was directed to serial production marked as Pe – 2. In a plane a machine to automatic taking out from the diving in a steep angle upwards was applied. The aero dynamical brakes didn't let to reach speed above 600 km/h. thanks to these devices the stabilisation of the final part of attack was secured, what had results in a high accuracy. First copies of Pe – 2 reached the units in the first part of 1941, replacing SB – 2, SB – 3 bis and AR – 2. The Pe – 2 was the first Russian plane on which the drive was electrified. Flaps, ailerons, aero dynamical brakes, trimmers, elevator, rudder displacements; dropping of radiator curtains, lowering and retraction of the under – carriage, drive of the bomb doors, running the bomb rack, automatics of compressors, pumps and hydraulic installation were run by 50 electric engines with power from 30W to 2kW. The fighter was well armed and the place for the crew was separated with an armour plates. In early 1942 for protection against attacks of Bf – 109F instead of 2 back kms SzKAS calibre 7, 62 mm 2nkm UBT calibre 12, 7 were built. One in an upper rotary tower (type FT) and the second in the bottom of fuselage directed by a periscope sight PP. in the same time, on a fighters was installed new armouring of pilot, navigator and shooter – radio operator's carbine. In late 1942 stronger engines WK – 105PF with power 1210KM were installed. They replaced engines M – 105 RA with power 1100 KM. Apart from these changes, other improvements were introduced like modification of the wings shape and control surface, the way of contact metal parts linked for the pin and countersunk rivet were made more carefully, air intake to the cooler were changed landing flaps were modified, air – tight sealing was installed and outside bomb release gear was eliminated. As a consequence, the maximum speed grew for 41 km/h and the length of take-off run was much shorter. The other important change was use of fuel tanks covered with caoutchouc which was self – retailing after the shoot. Moreover, the tanks as the fuel was running out were under pressure filled with neutral CO_2 gas which came from cooled and purified exhaust gas.

Technical data:

Construction: metal, fuselage with hardly arranged formers and four beams (without a longeron). The entrance to the pilot and navigator on lowered cover. The entrance for the back shooter through the trapdoor. Two sparred wing, three – sectional, (steel spare ledge). On the lover wing surface aerodynamic brakes cooperating with automatic diving, which caused the diving on the gun – sight signal and automatically took out. Controlling of flaps and trimmers with use of electrical engines.

Armour: (Pe – 2FT) permanent machine – gun UBS calibre 12,7 mm on the right side of the fuselage front run by a pilot, 1 UBT in rotary post with a pilot, 1 UBT which was shooting at

the back under the fuselage and 1 SZKAS calibre 7,62 mm moved to the posts in lateral sides of the fuselage.
Bombs 600 – 1000 kg on outward catches under the wings, in fuselage and in the back part of the engine nacelle.
Drive: (Pe – 2FT) 2 Kalikow's engines WK – 105PF, 12cylinders with doublet compressor, with power of 890 kW (1210KM).

Dimensions and performance of Pe – 2FT
Span ……17,11m
Length……..12,78m
Height ……..4, 0 m
Lifting surface……..40, 5 m^2
Complete kerb weight……..5950 kg
Use weight ……..1820kg
Maximal weight……...7770 kg
Maximal speed ……580 km/h
On height ……4000m
Flying speed ……480 km/h
Landing speed ……..170 km/h
Time – to - climb ……..7 min.
On height ……..5000 m
Ceiling ……..9000 m
Range ……1200 km

The presented model comes from 40 BAP Black sea Navy – the crew commanded by E. Stupin. Turn 1944/1945.

The model scale 1:33

GENERAL REMARKS:
Before gluing one should precise acquaint with the general plan and assembling pictures. Every picture pose a set with complete numbered parts needed to build it.
Parts marked with a star - line with a card board of about 0, 5 mm thickness.
Parts marked with 2 stars line with a cardboard of 1 mm thickness.
Parts marked with letter P glue as parts marked with a letter.
Use a"dry" method of fitting. Check twice, than glue. Gluing a fuselage pay attention to gluing symmetry. Match thickness and the length of wires. The shape make according to the templates. Unprinted places, cutting edges, scratches etc. paint with water paints (water – colour, poster paint in the right colour).

Description of building.

Assembling of a model start from building the central (bombing) segment of a fuselage made of part 6. After forming and placing the frame endings 6c in the openings of a segment, glue as it is shown on the picture. From inside glue plywood 6a and 6b. Attention!!! After bending, all fuselage plywood from 2a to 9a and 9b must be marked on unprinted side with a line as it is shown on the picture 2. Close the segment with frames 6d and 6e. In the bottom of the glued segment cut the sheating and gently during the cutting bend. Through the opening of the

frame 6e put to the inside of the segment and glue above the endings frame 6c, perpendicular to frames 6d and 6e axis. To the inside glue to the segment sheating and parts 6f. Seal the opening of the frame 6e with a part 6h as in the picture 4. Joined segments 4 and 5 glue in the frame5b. Attention!!! Before gluing on a frame from 2b to 5b make a right cuts with 1 mm gaps as it is shown on picture 3. To the segment 4 glue plywood 4a and a frame 4b. Remove unwanted material from the frame 5b by cutting it out. The place of gluing, edges and unprinted side paint with the suitable colour. The inside part of the segments plaster with parts 4c, 5c and 5g. to the inside part of the top opening edge and segments 4 and 5 sheating assembly glued in a section shape sides 5d and 5e.as it is shown on the picture 5. To the plywood 4a of the segment 4 glue a segment 3. After gluing remove unwanted material from the frame 4b and similarly as it was with the frame 5b paint. Next, the internal part of the segment plasters with parts 3c. Attention, parts 1b, 2c, 3cand 4c during plastering put forward for about half a millimetre over the edge of the lower part of the segments as in the picture 6. To the frame 4b in the marked places glue a gun sight made of parts 4d and 4e. The segment 2 made of parts2, 2a, 2b and 2c glue as the segment 3. Form and glue segment 1. Lobes of the segment from the inside strengthen with couple of glue layers or transparent varnish. Glue in the frame 1a, finished join with the segment 2. From the joined segments remove unwanted material form the frames 3b and 2b, paint and plaster with parts 1b.glue in the cockpit equipment of glued elements and parts made of A1 to A32 as shown on the picture 15. In front nasal part of the fuselage glue a machine gun unit made of parts B1 to B4. Outside the barrel will be shield by parts 1c. Gluing the barrel roll it on the wire with about 0, 4 – 0,5mm diameter. Form the segment 7, glue the plywood 7a from the inside, the area of openings and plywood 7a and the lower part. Paint the segments with a suitable colour. Glue in glazing S1, S2 and S3. Join together segments 6 and 7. Forming plaster the inside part of the segment 7 with parts 7c. Glue glazing S4 and the part 7e to the part 7d and finished assembly to in the segment as it is shown on the picture7. Glue in the cab equipment which should made of elements from C1 to C7 and A25 in the marked places. Inside glue the machine gun made of parts from D1 to D8, without the bracket D9. The ending of the ammunition belt D8 in the box opening C6. The frame 7b opening seal with the part 7f with glued to it ammunition box C6 and belt D8 part C7. Two following segments of the fuselage assembly of parts 8, 9, plywood 8a, 9a and 9b and the frame 8b as shown on the pictures 8 and 9. Marked places of sheating of the segment 9 cut and gently bend out. Above the opening to the frame 8b and sheating of the segment part 9c which is a hatch of the tail wheel. More attention should be paid during assembling the last segment of the fuselage. Glue a skeleton of the construction of parts10b – 10f. Finished assembly in the segment 9. During gluing pay attention to right crosswise position of the girders 10d with consideration for vertical axis of the fuselage. Ending plaster the structure with parts 10 and 10a. To the bended out parts of the bomb hatch to the unprinted side glue part 6g and part of tail wheel – 9d. To the frame girders10d assembly and glue parts 11a – 11e. The built skeleton of horizontal stabilizers plaster with the sheating 11. The joining place of the stabilizers with the fuselage plaster with a fairing made of part 11f as shown on the picture 11. Glue the skeleton of horizontal stabilizers with parts from 12b to 12e. Assembled structures plaster with sheating 12 and 12a. Finished stabilizers, assembly horizontally to the vertical stabilizers. Elevators assembly of parts13a – 13e and the wire I. glue part 13b with the wire to the 12a. Next, ribs 13d and 13e and girders 13c. After gluing cut out unwanted material from the girders, the whole grind with an abrasive paper, stacked on a small board. Finished structure of the elevator plaster with the sheating – 13. Similarly, glue the structure of the rudder of parts 14 – 14c and a wire II, finished plaster with the sheating – 15. Attention, gluing part 14 tightly roll it on the wire II, made according to the template. To the vertical and horizontal stabilizers assembly with wire the elevator and the rudder. Building of the wings start from gluing skeleton of slice structure made of part 16 –

16g (picture9). Finished structure grind with an abrasive paper stacked on a small board to gain uniform surface. The slice structure plaster with parts from17 to 17e. Before plastering to the sheating of the left slice to the internal side glue glazing S4. Cut out unwanted sheating from the openings, air – intakes as shown on the picture 10. Assembly slices to the fuselage. Places of joining plaster with the fairing made of part 18. Glue the navigation lights: to the left slice the red one – part 18a and to the right one the green – part 18b. Precisely cut out the part of sheating 17 which is the outward side of the under wings flap joined with part 19 by hinges glue to the slice girder 16m. Flaps made of parts 20and 20a assembly to the girder 16n. Glue an aileron structure of parts 21 – 21d and the wire III as shown on the picture 9. After gluing cut out unwanted material from the aileron girders 21d and grind it. Finished structure plaster with a sheating 22 and assembly to the girders 16r of slice structure as shown on the picture 10. Glued the aerodynamic brakes made of parts 23 – 23d as shown on the picture 21 assembly to the slices only after assembling engines. The engines building start from building a structure of parts 24 – 24j as shown on the picture 13. The finished glue in glued front unit of the engine cover made of parts 25 – 30 as shown on the picture 14. Next, glue the engine nacelle of parts 31 – 34d. Before gluing in on the frame 32b make a material cut similar to the cuts on the fuselage frame. The place of gluing and joining frames paint with a colour. The front engine units join with the nacelle with use of plywood 31a.marked places of the engine nacelle sheating cut and slightly bend out. To the bended parts of the sheating landing gear hatch glue part 35 and to the bomb hatch of nacelle glue part 36. Cut out unwanted part of the material from the frame 32b. Inside part of the nacelle plaster with parts 37, 38 and 39. To the bended places of the glued parts and to the nacelle sheating glue part 40 and 40a with glued to it units made of parts 40b and 40c. Attention: elements should be glued with printed side to the inside of nacelle. Assembly in engine sheating openings an exhaust pipe made of part 4 and opened part of the cooler made of parts 42 and 42a. Glued air – intakes made of part 43 – 43c glue the engine. The finished engines assembly to the slices of the plane. The main undercarriage consists of two fundamental units of undercarriage legs and pylons. As it s shown on the picture 19 glue a undercarriage legs unit of parts 44 – 44s and wires IV and V. glued and rolled on the wire IV undercarriage legs 44 and 44d connect with the star – pieces made of parts44b – 44d and glued arch made of parts 44e – 44k. The wheels glued of cardboard discs from templates 44l and 44m for about 10 mm thickness and grid, giving the right shape. Glued parts 44r and 44s and finished wheel mount on the wire V and assembly it to the undercarriage legs. The pylons unit make of parts 45 – 45h. Glue the pylons together to one whole according to the given template with prepared endings part made of 45, 45c and 45d. The finished units assembly in the undercarriage hatch engine nacelle together with parts45f, 45g and 45h. The tail wheel make of parts 46 – 46i and the wires VI, VII and VIII as it is shown on the picture 20. Tightly roll and glue on the wire VI part 46 and the part 46a on the wire VII. Both parts join together with a clamping ring 46b. The tail wheel grip during forming glue starting with part 46c in the order to the part 46f. In the glued grip make openings for the wires VI and Vii. Gluing, join the grip with the part 46. The glued of parts 46g and 46j tail wheel mount on the wire VIII and assembly it in the grip openings. The finished unit assembly in the tail wheel hatch. The windshields make of parts 47 – 47j and plaster it with parts from S6 to S9 as shown on the picture 12. In glued grid of the windshield 47, 47a and 47b formed according to the picture 26 glue glazing S6, S7 and S8 and to the inside glue parts 47f, 47g and 47h. Glued glazing S9 plaster with the grid 47c and part 47d. Unprinted side of the grid 47c paint with a suitable colour before plastering. In the opening of the glued windshield assembly a machine gun made of parts D1 – D9 as shown on the picture 17. During the assembling of the windshield on the fuselage of the model the endings of the ammunition belt assembly in the box A22. The finished windshield assembly above the cockpit and plaster with part 47k in accordance to the general plan of the model. To

the front part of the fuselage glue glazing made of parts 48, 48d and S10. Glued aircrew spinner with airscrew blades make of parts 49 – 49g as it is shown on the picture 22 and with a pin assembly to the engines. Ending the model building assembly an antenna made of parts 50-0 50c and the wire IX. The part of the equipment made of parts 51 – 51 b and load bomb hanging made of parts 52 – 52g as shown on the picture 23 and parts from 53 to 53h as shown on the pictures 24 and 25.

We wish nice moments at the construction of our model!!!