

INFO | Eduard

158

e-magazine FREE ■ Vol 22 ■ April 2023



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e-magazine FREE ▪ Vol 22 ▪ April 2023

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APRIL 2023

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EDITORIAL

Good evening, Dear Friends

We have completed our retail department move. As of yesterday, we have vacated the facility in Most that since June, 2019, has served as our main retail headquarters as well as the facility that served as final kit packaging. It's also the facility in which we lost a lot of the plastic for our kits when a fire broke out in December 2020. I admit to having hoped for an earlier move to a new facility after that fire. Immediately in the spring and summer of 2020, we prepared for a new-build facility, but that was ultimately quelled by the turbulent supply issues in the construction industry. In the fall of 2021, we began to negotiate the purchase of an existing facility in Sedlec, a village neighboring our main office in Obrnice, some 5km away. We were able to keep the negotiations pretty short with the owners, and the same goes for the financing talks with the bank. The talks hit a typically Czech roadblock though, when it was revealed that the access road to our new facility was bisected by a 10mwide swath of land belonging to the neighbor. Said neighbor is American, and as such, the negotiations making the access road all ours took about another 9 months. This finally happened last September. In February, all the plastic was moved to the newly renovated facility, officially known as Hall 2 and this was followed by the retail department last month. The next step is to move final kit manufacturing into the building and that is slated for June.

This was the easiest part of the whole thing. As I wrote in the March editorial, the next phase is the reconstruction of the premises for Department 012, which is kit production. That requires setting up space intended for a tool shop, a press shop, warehouses for molds and materials, as well as for the offices of designers and technologists. This will be more demanding. The installation of the required equipment will be significantly more complicated than the modification of the premises for product storage and shipping. If everything goes well, we could move production from Obrnice to Sedlec at the end of this year. It's all a little like kit development. Yeah, we can get it done in x amount of time, but then the reality of the situation inevitably kicks in. So it's probably more realistic to expect the relocation of the manufacture of kits in the first half of next year, but the entire project is expected to be complete by the end of next year. So, we actually have a relatively good supply of time, and we can still realistically believe that this move will turn out like our Zero or Nieuport 17 projects. We managed these projects in a significantly shorter time than anticipated. If everything works out, it will benefit us a lot, and you too, as our ability to release new kits at a faster pace after the move will gradually increase. In the end, however, you decide how much it will grow, because we will be guided by demand for expanded production capabilities.

One More Thing about Nuremberg

We wrote about this year's Nuremberg Toy Fair in the last issue of this newsletter, and to be honest, I didn't need to return to the exhibition until last week. I changed my opinion after reading the evaluation of the exhibition by Jindra Štěrbáček in Modelář magazine. I will not sugarcoat this mess ... I found the article extremely biased and even insulting. Its evaluation is unfair to both the organizers and the participants. I do not intend to argue with the announcement that this year's fair was a significantly smaller event for our industry than what we were used to in the pre-Covid years, but that was expected and at least we went there with a clear idea of what we were getting into. Accordingly, we made arrangements and changed our usual procedures based on our years of attending the fair. Specifically, for us and our colleagues and friends at Special Hobby, it meant joining together and sharing one booth. But it was no mini-stand, as was written in Modelář. Compared to previous years, we reduced the area of the stand by one third. In the same way, our previous stands were no opulent exhibitions; I think their size corresponded to the size and importance of our companies. We, that is, Eduard, will most likely stay with this size of stand next year, Special Hobby will probably separate from us and set up its own tables. It will be a bit of a shame, for me, living with them was pleasant and conflict-free, even if I did eat their peanuts.

The absence of a number of companies was expected, and not surprising for those who follow at least a little what is happening in the world. Asia is still struggling with the repercussions of the pandemic, air travel is currently more of a hassle than normal, discouraging many from traveling to Europe. Ukraine is defending itself against Russian aggression, so the absence of Ukrainian companies is completely understandable, and it is also clear for the Russians, they are under sanctions and their participation is unwelcome for obvious reasons. In addition, Russian companies never exhibited much in Nuremberg, I honestly only remember Zvezda. Americans aren't exactly into travel either, and frankly, in terms of the participation of different nations, two things are a mystery to me: why didn't the Poles actually come, and why did so many Australians come this year? No one has to travel further than them, they also knew what they were getting into and how limited the possibilities of contact with manufacturers would be in Nuremberg this year, and they came anyway! Hats off to them! When I add the year-over-year increase in turnover with the Australians between 2021 and 2022, it was a 71 % increase for us, so I personally consider it a definite positive point and I am slowly starting to research the process of obtaining an Australian visa. It's time to fly to Australia, even though they have poisonous spiders, snakes and all kinds of other fun stuff! I consider the opening of the toy fair to the public, and above all to children and youth, to be a positive and



revolutionary step. If I am not mistaken, this is the first time in the history of the fair that children were allowed to visit the exhibition. I'm sure that something like this would never have happened if it weren't for covid lockdowns and the changes in circumstances caused by it. If it weren't for the above-described reduction in exhibitors and the corresponding reduction in the number of visitors, the organizers would not have opened the exhibition up like that. In fact, I would bet on it. However, I wouldn't put money down on them keeping it that way when things settle down again. But I will be happy if the weekend open to the public remains a part of the fair. Among other things, it brought us a change in the perception of Exhibition Sunday. It used to be traditionally boring, nothing happened by then, we just always kind of agonizingly waited for it to finally end and we could go home. Not that we didn't want to go home this year, we wanted to, and how! But we didn't get bored. More people came on Saturday and Sunday than on the previous three days combined, maybe even more than at any other time during the entire exhibition's history. So we ended up packing our stuff in the evening, tired as hell, but with a good feeling that at least we got away with it and did a good job. And Fredy and I have to find time to go for coffee, because what we left to discuss on the traditionally boring Sunday, we didn't have time to discuss this time due to the unusually high number of visitors interested in our products.

So to sum it up, next year will be even better, if Putin doesn't completely screw up and unleash a nuclear apocalypse. I don't know how much better it will be, I rather expect the exhibitors to return gradually to normal, but it may be different. In any case, I hope Jindra actually makes it to Nuremberg next year in person and doesn't have to write a report based on what he heard from someone else. That would be awesome and much more accurate.

Kits in April

Before I start with the news, let me make one more announcement. At the end of March, we had

224 active items in the kit range. Before the fire in December 2020, there were 180 items, so now we have a significantly wider range than back then. With that, I dare to consider the renewal of the range of model kits finished. Of course, it's not the same range as in 2020, but it wouldn't be even if there was no fire. The range of kits has always been dynamically changing, and given that we've regularly released an average of six new kits every month for the past two years, some of which were brand new and some of which were rehashed older items, the current range is significantly changed. The current situation also does not mean that we will stop presenting older kits as news, kits which are currently still missing from the catalog. In April, the 48th Bf 110C returns in the form of a redesigned ProfiPACK kit, as does the 72nd scale UTIMiG-15, as a reissue of the original kit. We are also nearing the end of the packaging changeover. We have very few kits left in the old boxes in our warehouse, the vast majority of the range is in new boxes, whether they're Weekend or ProfiPACK kits. Those that we currently have in stock in their original packaging will be sold out in the next installment of the Sweep campaign in April.

So this finally brings me to the April news. In the ProfiPACK range, we are expanding the family of Trainer kits (you'll recall that this is the Czech word for "Trainer", and was the name bestowed on this line of aircraft) with the first Trainer with a retractable undercarriage, the Z-326 in M and MF versions. The kit also includes military machines, known locally as the "Three-Hundreds", consistent with their military designation C-305. In the Weekend series we have two new 48th scale items for April, the Tempest MkV Series 2 and the Focke-Wulf Fw 190A-4. The Fw 190A-4 thus returns as one of the last Focke-Wulfs that was missing. This is, among other things, because it is a rather complicated version with different combinations of armament and engine cooling exhausts. In this case, the kit is of a version with two cannons in the wing roots, and cooling flaps. One of the machines offered is a pure fighter, the remaining three are fighter-bombers, covering a choice of aircraft from the Western Front, the Eastern Front and the North African battlefield.

I saved the crown jewel of April's new releases to the end of this section, and that is the A6M2-N Rufe. I'll admit that I'm a little worried that you'll think of the Rufe as another, and even less interesting, Zero incarnation. I hope that we will convince you of the opposite, both with the kit itself and with a two-part historical-technical article by Honza Bobek with some very readable, often unknown, information about this unique float equipped fighter. The Rufe is being first released in the Limited Edition line as Dual Combo boxing, and shares only two sprues with the older Zero Model 21. One is of the canopy, the other contains small detail parts. The other four frames are new, and are Rufe-specific. We incorporated a number of features consistent with the Rufe's differences from your basic Zero, based on newly discovered findings made during the completion of the project after consulting recognized experts on the type. This is a good argument to consider for those who are on the fence over whether it is worth replacing their old Rufe kits with ours. For example, the external

reinforcement of the fuselage in the cockpit area, which look really nice on the model, are included and I strongly suspect that no kit thus far represented this feature. For those who don't feel the need for the expense of a dual combo boxing, and its associated price, please note that the classic ProfiPACK kit will be out in July.

BRASSIN

For the Rufe, we are offering a whole range of accessories in parallel with the release of the kit, based on the collection of kits for the A6M2 Model 21. Of course, we leave out the wheels, but among the accessories, there are, for example, the folding wingtips. Some publications state that the Rufe did not have these. As you will learn from the aforementioned article by Honza Bobek, the fact is that at least several dozen aircraft from the start of the production run were equipped with folding wingtips. For the Zero's main adversary early on, the F4F-3 Wildcat, we have an engine kit for the late version dash-3 in the collection of April releases, differing from the older kit for the F4F-3 Early in the engine cowl and with two versions of the face ring and some detail installations underneath, such as a reduction gear. The 48th scale sets also include a machine gun set for Anson from Airfix, two sets, a radar and exhaust, for all F-16s from Kinetic, and a Mi-24V cockpit in that Soviet turquoise finish, in addition to a few other smaller sets. This set, as was the black cockpit version for the same kit from Zvezda, is released as a combination of a 3D printed base complete with a Space 3D decal.

In 1/72 scale, this month we focused on the Bf 110E (Eduard) with three sets. These are an upgraded version of the older sets for this model. The set of wheels is cast traditionally, as is usually the case with wheels. Conversely, the nose machine gun setup is 3Dprinted. Of interest is the cockpit set, the base of which has remained cast, but the floor with the installation of the deck guns and the rear machine gun are printed. So it is a kind of hybrid, rare in the Brassin line, but for this set this combination seemed appropriate to us. In the Brassin line, you will also find several small sets for the Hurricane IIb (Revell 1/32), two kits for 35th scale armor and three new sets of the Look line.

Masks, Photoetched and Space Sets

In traditional photoetched sets, we are, among other things, releasing items for the competing Zero A6M2b from Academy, the bomb bay for the B-24D from Revell (ex-Monogram), the F4U-1D from Hobby Boss and the Mi-8MT from Zvezda, all in 1:48 scale. April also sees the long-awaited renewal of photoetched sets for our Hellcats, both the F6F-3 and F6F-5. Both of these are based on older sets, but are upgraded to current standards. Of interest will be the two Spitfire Mk.IXc 1/24 sets from Airfix, and three sets, including two for the new SdKfz 251/1 Ausf C from Academy, are for combat vehicles in 1:35. Set 36499 for this model also includes a small instrument sheet made with 3D printing technology, used for the production of our Space sets, and indicates that the trend of combining different technologies can also make its way to the photoetched range. Also being offered is one 1:350 USS Missouri set from the Hobby Boss kit, three 1:72 scale aircraft kits,

and you'll also find three new BigEd and six Space sets

Historical and Other Articles

I have already made mention of Honza Bobek's article about the Rufe fighter floatplane. It is in two parts, the second part will be published in the May newsletter. In addition to a number of lesser-known or hitherto unknown technical and historical facts, it also brings a very interesting visual component. Several unique, in some cases unpublished, photographs have been obtained from Japan courtesy of Messrs Izawa and Yoshino, thanks to the assistance of the editors of Scale Aviation magazine. I should also add that in completing the kit we used the advice and materials of Mr. Ryan Toews, who also helped Honza considerably in the preparation of his article.

Part two of Tom Cleaver's article Arrival of the Cavalry comes out this month, about the activities of VMF-223, flying Wildcats during the battles for Guadalcanal. Thus, in this issue of our magazine, you have the opportunity to see the war in the Pacific from the point of view of the two opposing sides. Article of Tomáš "Hindman" Dvořák is offering interesting insight into service of high-altitude Hind E helicopters in service of Czech and Czechoslovak Air Force. In addition to these historical notebooks, as with virtually the entire previous year, we are continuing with our look at the air war over Ukraine with the series of articles by Miro Barič. The war is entering its next phase, and I'm afraid Miro will have plenty to write about in the months to come. I have no doubt that the just delivered Slovak and Polish MiG-29s will soon be mentioned as well. Most of you will know that the majority of these machines will have hailed from the inventory of the Czechoslovak and Czech Republic Air Forces.

We also have new Boxart Stories. Richard Plos prepared a Boxart Story for the Z-326/C-305 Trainer Master, Tempest MkV Series 2 and the UTI MiG-15 kits. The first two images were created by Adam Tooby, the boxtop image of the Czechoslovak UTI MiG-15 comes from an earlier work by Kateřina Borecká. We are transformed back to the Battle of Britain era in a story describing the Bf 110C painting, as Honza Bobek takes us back to the Second World War with the author of the painting Piotr Forkasiewicz, who, as is his custom, faithfully captured the atmosphere of air combat from this period. The encounter between the Sturmoviks and the Focke-Wulf Fw 190s of JG 54 "Grünherz" is described in detail by Andrey Dikov, who also helped us with the preparation of the background for this image, created by Mark Ryš. It depicts our subject, flown by Otto Kittel, one of the most successful fighter pilots of the Luftwaffe, for whom one of his many encounters with the Sturmoviks would become fateful.

To vary the themes of this month's articles a little, we have the second part of Josef Blažek's summary on instant, epoxy and dispersion adhesives in the still new section on modelling chemistry.

And with that, I wish you a good read with this month's newsletter, and I look forward to hopefully seeing you in Prostějov and Mošon!

Happy Modelling!!

Vladimír Šulc



Photo: US Navy

Text: Jan Bobek

This photo shows one of the first completed Nakajima A6M2-N seaplanes. This is the 13th aircraft produced, with serial number 913, completed on April 23, 1942. The picture was apparently given to Japanese troops to familiarize them with the new type of seaplane, as it was later captured by the Americans and published in the enemy aircraft identification manual in 1944.

The Zero fighter became the symbol of the Japanese air power during WWII. The light and maneuverable fighter had the upper hand over Allied aircraft at early stages of the war in Pacific theatre, but gradually lost its advantage against newer opponents. During the war, other versions of the Zero came along, one of the most iconic being its floatplane version, known by the Allied codename Rufe.

During the 1920s and 1930s the Japanese aircraft industry was oriented towards the production of foreign aircraft built under licenses. However, the armed forces, especially the Navy, with regard to the specifics of the Chinese and Pacific battlefields, came up with requirements that foreign aircraft designs did not offer. Hence, Mitsubishi Heavy Industries developed the Type 96 naval fighter aircraft, better known as the A5M "Claude". The head of the design team was a young Japanese engineer, Jirō Horikoshi. Despite an engine that lacked some power, he managed to design a light and fast fighter with a fixed landing gear, which had no comparison in the world regarding maximum speed. In October 1937, Mitsubishi and Nakajima were approached to develop prototype 12-shi Carrier-based Fighter. The requirements were so extreme, and in some cases contradictory, that the two design teams investigated whether they could be less stringent. Nakajima eventually withdrew from the project, while the criteria for the prototype were even raised based on experience on the Chinese battlefield. In the end, Horikoshi's team managed to meet the technical specifications, not only thanks to the aerodynamic design and a new type of light alloy used for the aircraft's skin, but also thanks to the Nakajima Sakae 11

engine. During the flight tests, the wing surface suffered cracking during overload, and aileron control during high-speed maneuvers had also to be addressed. The new fighter had a powerful armament of two cannons and two machine guns, extremely long range (over 1,800 km) and excellent maneuverability. The new fighter reached top speed of 533 km/h at an altitude of 4,550 m. However, it lacked armor and other protective features and had a structural speed limit of 600 km/h.

Surprising Zero

The new aircraft entered service in 1940 with the 940hp engine Sakae 12 and received the official designation Rei shiki Kanjō sentōki (Type 0 carrier fighter), with the "zero" being derived from the imperial year 2600 (1940). Japanese pilots usually abbreviated it as Rei-Sen. That was also the origin of the name Zero often used by Allied pilots instead of the official code name, derived from the male name Zeke. As part of the Navy's system, the new aircraft was given the type designation A6M, where A6 meant that it was the sixth type of carrier fighter to enter service, and M stood for the Mitsubishi company name. Zero fighters, specifically the A6M2 Type 11, had been successfully deployed on the

Chinese battlefield since the summer of 1940, but their existence eluded Western intelligence because no one wanted to believe reports from China that suggested the Japanese had a world-class fighter. Further modifications to its design were made during 1941, creating the A6M2 Type 21, which included several changes, the most visible of them being folding wingtips for easier handling on the decks. With the A6M2 Type 21 modified this way, Japan entered the war against the US and other Western nations. Mitsubishi needed to produce other aircraft in addition to the Zero, so the Nakajima company began licensed production in late 1941. Total of 740 A6M2 aircraft were produced by Mitsubishi by June 1942 with additional 800 delivered by



Photo: © Izawa

Lieutenant Ri-ichirō Satō, leader of the Yokohama Kōkūtai's fighter unit. He was killed in September 1942 in a ground combat with USMC troops.

Nakajima by February 1944. The gun armament was improved and variants with magazines for up to 150 rounds could be used on the Type 21. Such a Zero may have been designated as Type 21a.

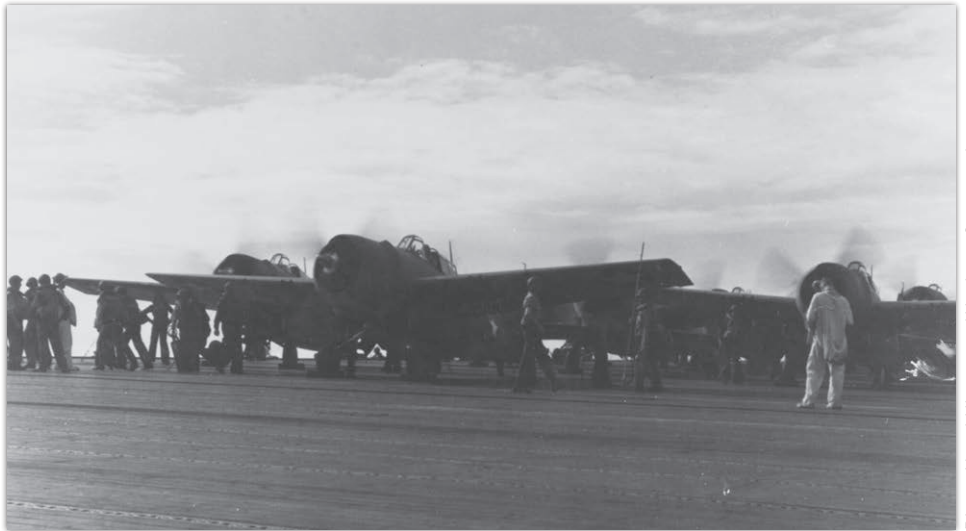
Here comes the Rufe

Floatplanes are a very old idea. Fighters of this design had already been deployed in combat during the First World War. After the war, their priority gradually declined as the performance of these seaplanes fell gradually behind that of fixed landing gear machines. The Imperial Japanese Navy returned to the idea in 1933 during preparation for a new seaplane tender. IJN came up with a specification for a machine that was to protect a coastal base during its construction and was to be capable of reaching speeds of 200 knots. Kawanishi had been preparing a study of such a seaplane since 1934. It was to operate from a tender, or launch from a catapult, and be able to counter fighter aircraft. The prototype was not built, and preparations were halted in 1936. Subsequently, the concept of a two-seat machine was considered, but even this idea was abandoned.

In the late 1930s, the US Navy prepared a plan to build 2,000 flying boats. The Japanese decided to respond to this threat. Therefore, in September 1940, the IJN commissioned Kawanishi with the specification for the 15-Shi fast interceptor seaplane. Kawanishi had already been working on a fast floatplane reconnaissance aircraft (later designated the E15K Shiun) for several months, and the Navy hoped for synergy from this decision. However, at the same time, it feared certain delays because Kawanishi's aircraft carried a number of innovative features. Therefore, the IJN decided to convert the Mitsubishi A6M2, which was currently undergoing combat test deployment in China, to a fighter seaplane. Mitsubishi was fully occupied with the production of Zeros and other types of aircraft. Therefore, the IJN turned to Nakajima, which began licensed production of A6M2 fighters at its Koizumi plant in late 1941. The company had some free design and production capacity and was therefore awarded with works on the seaplane.

Shinobu Mitsutake was appointed chief designer. His team tried to make the most of the A6M2 design. Some authors state that standard fighter seaplane was based on the A6M2 Type 11, which did not have folding wingtips. In fact, at least the first few dozen production machines had folding wingtips. On captured Rufes, this design feature is still documented on the 37th aircraft produced.

The designers added a metal central float to the fuselage. The pylon was mounted to the main wing spar and attached to the rear wing spar by a "V" shaped strut. The pylon, with incorporated the oil cooling system, was located roughly



Wildcats aboard the USS Wasp prepare for an air strike against Tulagi and adjacent islands in the early morning hours of August 7, 1942.



This picture taken from Dauntless on August 7, 1942, shows smoke rising from burning fuel supplies on Tanabogo Island, where the Rufe seaplanes were based. To the right is Gavutu Island and to the left is Gaomi Island. Florida Islands can be seen in the background.

where the Zero had the auxiliary tank attached. The absence of the auxiliary tank was replaced by tanks in the float. The stabilizing floats were mounted on separate pylons. Hatches were added to the wing's skin to allow access to the internal wing structure and pylons.

This elegant solution for mounting the central float was already used on the F1M Pete biplane and contributed to the high aerodynamic purity of Mitsutake's design. The central float and its dynamic effects on the fuselage structure during take-off, high-G maneuvers, and landing, necessitated the need to reinforce the fuselage structure in the cockpit area by additional metal sheets.

On the first few dozen machines, a system for purging the fuel tanks was installed on top of the central float. The fittings of this system,

which protruded from the float at the top, were protected by a hemispherical cover. The float was also fitted with a rudder.

The last significant change from the Zero was an increase in the vertical tail area for the stability of the machine. Testing of the prototype began on the day of the Japanese attack on Hawaii and continued intensively during early 1942. The prototype was converted from the land-based version of the Zero fighter, the A6M2 Type 11 c/n (6)69. The next nine A6M2-N aircraft were to be produced at Nakajima by conversion from Mitsubishi A6M2 Type 21 carrier fighters, which were to undergo repairs due to damage in combat. Among them were the machines c/n (5)159 and (3)312, which took part in the attack on Hawaii aboard the aircraft carrier Shōkaku. However, the converted seaplanes suffered

Photo: Naval History and Heritage Command

Photo: Naval History and Heritage Command

Photo: Naval History and Heritage Command



A close-up photo of Tanambogo Island after the attack of Wildcats shows the wreckage of two Rufe seaplanes, several beaching trolleys and a wooden seaplane ramp sloping into the water.

Photo: Naval History and Heritage Command



Photo: BUAER Newsletter

Yokohama Kōkūtai aircraft that USMC technicians took from Tulagi to NAS Alameda, USA.

Courtney Shands pictured in 1957 at the rank of Rear Admiral. As commander of VF-71, he was instrumental in the destruction of the Rufe aircraft from Yokohama Kōkūtai on Tanambogo Island on August 7, 1942.

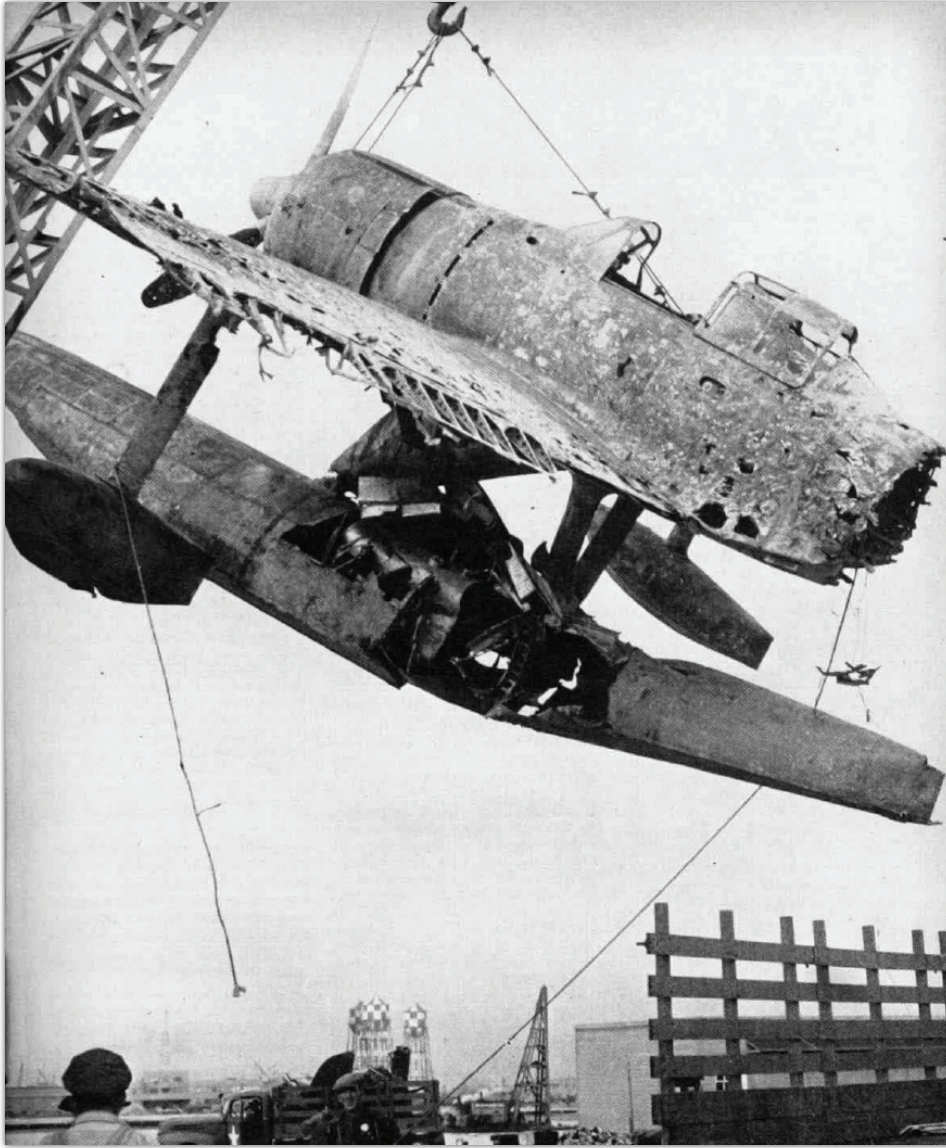


Photo: BUAER Newsletter

Fire-damaged Rufe seaplane from Yokohama Kōkūtai being transported to NAS Alameda, USA.

from corrosion. Therefore, the conversions of A6M2-N Nos. 8 and 9 were not carried out and No. 10 was instead completely manufactured as a new machine.

The floatplane fighter did not exceed comparable seaplanes in performance. It did increase in

weight due to the floats and design changes, but the Zero's landing gear and tailhook weight was missing. The machine had excellent maneuverability and stability at medium and higher altitudes and retained reasonably good flight characteristics even at lower altitudes.

Its empty weight increased by approximately 14 % over the A6M2 Type 21 and its speed was reduced to 234 knots at 5,000 meters from the original 275 knots at 4,400 meters of the Type 21. The seaplane had a range of 962 nautical miles and a maximum flight time of 6 hours.

Armament consisted, as with the A6M2, of two 20 mm cannons in the wing and two 7.7 mm machine guns in the fuselage. The aircraft could carry two 30 kg or 60 kg bombs carried under the wing. However, unlike the Zero Type 21, seaplane was not equipped with a circular directional antenna at the rear of the cockpit and did not have a headrest behind the pilot's seat.

This fighter seaplane was first designated Rei-Shiki Ichi Gata Suijō Sentōki (Type 0 Mk.1 Seaplane Fighter). In July, the aircraft was accepted by the IJN and entered service under the designation Ni-Shiki Suijō Sentōki, or Type 2 Seaplane Fighter. It bore the abbreviated designation A6M2-N. Nakajima considered preparing another fighter seaplane, which was to reach a speed of 250 knots, but eventually abandoned its preparation.

Series production began in April 1942 and ended in July 1943, as production of the Kawanishi N1K Kyōfū (Rex) fighter seaplane began a month earlier. Nakajima produced a total of 258 A6M2-N seaplanes, with the highest number of machines (24) in a single month leaving the gates of the Koizumi plant in April 1943. As soon as the Allies observed this machine in aerial encounters, they assigned it the code name Rufe.

The first pre-production and production A6M2-N seaplanes were received in the spring of 1942 by the Japanese Navy's oldest unit, the Yokosuka Kōkūtai. Its main task was research and testing of new aircraft, weapons and technical equipment. It was also involved in training and, late in the war, was deployed in combat.

With the Rufe aircraft, the unit was joined by their previous flight pilot, Lt. Ki-ichirō Nishihata, who



Photo: Naval History and Heritage Command

Seaplane tender Kimikawa Maru in Ominato Bay, Japan, pictured in April 1943. F1M Pete seaplanes are visible on the deck. This vessel delivered most of the Rufe seaplanes to the Aleutians during 1942 and 1943.

was in charge of training on these seaplanes. It would be difficult to find a more ideal officer for this task. Nishihata was a native of Fukuoka and graduated from the Etajima Naval Academy in its 59th class in November 1931. He successively held several command positions as Buntaichō. From late 1934 he served with Sasebo Kōkūtai, then commanded the seaplane carrier unit Kamikawa Maru. In late 1937 he became an instructor at Kasumigaura Kōkūtai and a year later became leader of the seaplane unit on the light cruiser Kinu. He apparently served on this ship until October 1941. Therefore, it is not surprising that his age and experience earned him the nicknames “foster parent” and “real parent” at Yokosuka Kōkūtai. His influence on the development of the A6M2-N seaplane, its acceptance into the Naval Air Force's armament, and the success of its deployment, was profound.

Nishihata attained the rank of corvette captain in November 1942 and by the end of the war was one of the commanding officers of Kōkūtai 302, armed with, among other aircraft, Raiden fighters. In September 1945 he was promoted to the rank of Commander.

Anchorage at Tulagi

The first Rufes to engage enemy in the South Pacific belonged to the fighter Buntai, which was formed in May 1942 as part of the Yokohama Kōkūtai. The commander of the entire Kōkūtai was Capt. Shigetoshi Miyazaki. He was born in 1897 in Kōchi and graduated with distinction from the Naval Academy in 1918 in its 46th class.

After training aboard the destroyer Tachikaze, he first served with the Yokosuka Kōkūtai and other aviation units, but from late 1924 he was assigned to the Japanese embassy in Paris. From June 1926 he was naval attaché to the League of Nations, and from April 1927 to May 1928 he was the Japanese plenipotentiary to the Geneva Naval Conference. After a series of command and training posts, he took command of the Yokohama Kōkūtai on 20 April 1942.

Leader (Buntaichō) of his fighter unit was Lt. Ri-ichirō Satō, who had previously served with the Yokosuka Kōkūtai. Twelve fighter seaplanes arrived to Rabaul in early June. The first patrol in the vicinity of Rabaul was performed on 5 June and five days later five Rufe pilots saw same number of B-17s from the 19th BG. However, there was no combat. During June, the seaplane pilots encountered the enemy machines several more times, but never got chance to shoot at them.

In early July, they moved to Tulagi Island off Guadalcanal and encountered enemy aircraft almost daily. The naval base for the Rufes became the nearby islet of Tanambogo, while the Mavis seaplanes moored at the islet of Gavutu. The garrison commander on these islands was Capt. Miyazaki. All marine and engineer units, as Japanese and Korean civilian personnel were under his command. But only a small portion of the 1,500 or so men he commanded were trained for ground combat.

The first victory was claimed on July 10 in a battle with two Liberators of the 435th BS. One of the Liberators was damaged, but the

gunners reported that one of the floatplanes broke away from the fight with a smoking engine. The crew also managed to photograph one Rufe. A week later, B-17s from the same unit killed P01c Hori who remained missing after the fight. Aboard the Flying Fortress were US Marine Corps officers who managed to take valuable photographs of the northern coast of Guadalcanal and the Tulagi area, despite being forced to retreat by other Rufe seaplanes.

The same fate befell the Sea1c Matsui in combat with a B-17 of 11th Bombardment Group (Heavy) on July 23. Seven bombers of this unit encountered twelve Rufe seaplanes during 1 August, and the Japanese, with no losses of their own, severely damaged three of them. The 11th BG board gunners, however, reported two kills.

B-17s raided Tulagi also on August 4, 1942. Seven Rufes attacked the heavies over their target. The gunners of the 26th BS, 11th BG claimed one seaplane as downed, but one Rufe collided with a B-17E commanded by 1st Lt. Rush E. McDonald. All of his crew and the Japanese pilot Sea1c Kobayashi perished.

During the Allied landing on Guadalcanal in the morning hours of August 7, Wildcats and Dauntless bombers from USS Wasp attacked the anchorage at Tulagi and surrounding islands, destroying all seven H6K Mavis flying boats and six Rufes in water and two on the island. One Rufe later apparently escaped and joined two colleagues at Shortland Island off Bougainville. Under Miyazaki's leadership, Yokohama Kōkūtai personnel at Tulagi, Gavutu, and Tanambogo,



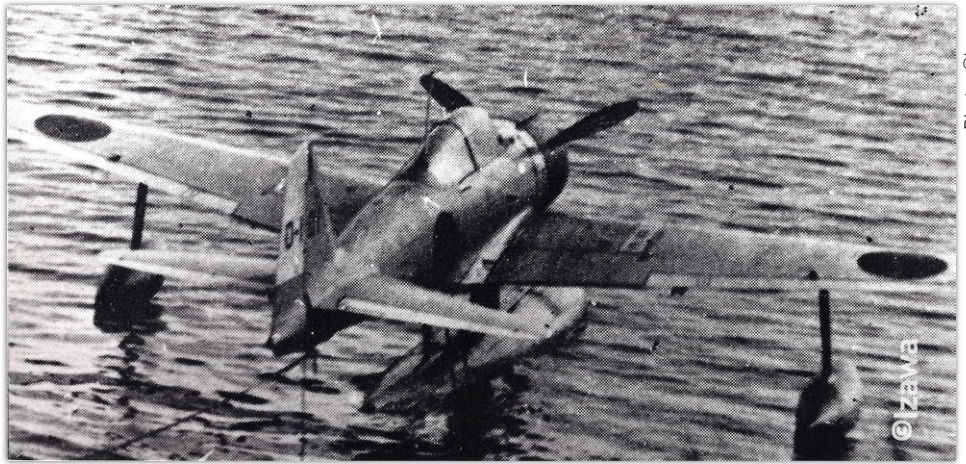
The first aircraft shot down by Rufe pilots in the Aleutians was a B-17B (c/n 38-215) “Old Seventy”. She is pictured in this photo from Alaska back when she was also used as a cargo machine.

along with other units, engaged in ground combat. Miyazaki's last radio message was, "Enemy troop strength is overwhelming. We will defend to the last man. Pray for our success." Improvising under harsh conditions, the defenders under Miyazaki's command performed superbly. In the first landing on August 7, they inflicted 10% casualties on the American troops, and the defenses on some islands persisted until noon on August 9.

Five Rufe pilots were killed on Tanambogo Island on August 8 in action against U.S. Marines. They succeeded in setting fire to a Stuart tank of 1st Company, 3rd Battalion, 2nd Marines. Of the three tankers, two were killed and one was wounded. Forty-two defenders were killed, including the executive officer of the Yokohama Kōkūtai, Lt. Cdr. Saburō Katsuta, who was last seen on the tank's turret.

Lt. Satō escaped to Halavo Island with about forty men and was killed with thirteen of them in a battle with members of the 2nd Marines on September 19. Only one of his pilots was captured, it was Warrant Officer Yomichio Hirahashi.

Patrol flights continued from Shortland for several days in late August under the command of Ensign Kofuji, but on September 2, 1942, the Yokohama Kōkūtai fighter unit was disbanded and the personnel and remaining Rufe seaplanes were taken over by the Kamikawa Maru.



Seaplane A6M2-N from Tōkō Kōkūtai moored off the shore in the Aleutians. Note the lighter colouring of the control surfaces. It is possible that some sort of waterproofing is stuck to the top of the wing to cover the edges of the cannon hatches.

Commanding officer of Yokohama Kōkūtai Capt. Miyazaki was formally in command of the unit until October 1, 1942, when he was posthumously promoted to Rear Admiral. According to the testimony of one of Japanese prisoners, Miyazaki committed suicide by explosive in a dugout on August 8. One of his former colleagues in the Geneva Naval Conference negotiations, Rear Admiral William Ward Smith, commanded Cruiser Division 9 at the time with the cruisers USS Indianapolis and USS Louisville during the Battle of the Aleutians.

Aleutians and Kurils

The first unit to engage the enemy with Rufes was Tōkō Kōkūtai. Formed in late 1940, it was deployed at the start of the war in the Pacific during the conquest of the Philippines and the Dutch East Indies. In June 1942, with six H6K Mavis flying boats, this unit was deployed in the capture of Attu and Kiska Islands in the Aleutians. Protection for the invasion force was provided by floatplanes from the seaplane tenders Kamikawa Maru and Kimikawa Maru. The command soon recognized that to fight the Americans in the Aleutian area, fighter



In this photo taken in August 1942, some of the fighter pilots of the 5th Kōkūtai are posing at the Kiska base. Rear row from the left: Sea2c Hachirō Narita, next to him stands the most successful fighter pilot in the Aleutian area, PO2c Gi-ichi Sasaki, PO2c Saishi Okawa and the last airman is probably leader of fighter unit Kushichirō Yamada. Front row from the left: Sea2c Minoru Minazawa and Sea2c Yoshio Suzuki. Sasaki and Okawa were killed during raids against Amchitka. The Rufe R-106 has a partially visible convex cowling located on top of the main float. An E16A Jake seaplane can be seen in the background.



Photo: Naval History and Heritage Command

A picture taken on November 7, 1942, shows several damaged Rufe seaplanes in Holz Bay, Attu Island.

seaplanes needed to be deployed to protect the anchorages and bases under construction, as float-type observation aircraft were not ideal for this purpose. Moreover, both tenders got tasks in another part of the Pacific.

In early June a Rufe fighter unit was formed in Yokosuka under the command of Lt. Kushichirō Yamada. Six machines were transported to Kiska by seaplane tender Chiyoda, and the unit was integrated into Tōkō Kōkūtai. The planes were usually moored to buoys in shallow water and transported ashore for maintenance using bamboo structures. They usually patrolled in pairs and sometimes engaged with enemy aircraft several times a day. Very soon they started using 30kg bombs against heavy bombers. During anti-submarine patrols they probably used 60kg bombs. The weather in the area was often inclement with fog and low cloud. Therefore, even the four-engined aircraft often

operated at relatively low altitude. Yamada's pilots first encountered enemy on July 7 and 8, 1942, during a Liberator raid on Kiska. First victory was achieved ten days later, one B-24 and one B-17 were claimed, but Americans lost only one Flying Fortress of the 28th Composite Bombardment Group. It was an old B-17B c/n 38-215 "Old Seventy" from the 36th BS, with seasoned veteran Major Jack Marks at the controls. The machine exploded at 2,000 feet in a dogfight with Rufe pilots near Rat Island. However, there is another version saying that the damaged bomber crashed into a mountain range.

In early August, Yamada's fighter unit was detached from the Tōkō Kōkūtai and became the 5th Kōkūtai, whose number of aircraft was expanded to twelve fighter seaplanes. During August it was also reinforced with observation floatplanes.

The fighters of the 5th Kōkūtai scored their first victory on August 7, 1942. The warships under the command of Rear Adm. W. W. "Poco" Smith sailed from Kodiak to Kiska to shell the Japanese positions. The fog made combat activity considerably more difficult for both belligerents. In addition to the heavy cruisers USS Indianapolis and USS Louisville, the light cruisers USS Honolulu, USS St. Louis and USS Nashville and four destroyers were also part of the fleet.

Despite the fog in the area, the Americans managed to open fire at 19:55, simultaneously sending six SOC Seagull observation aircraft over the target.

The Japanese came into contact with the observation planes several times but had little chance to attack them successfully in the bad weather. The first to fire was Lt. Yamada with his wingman and they claimed a Seagull shot



Photo: Fold3

This photograph is one of the images that fell into the hands of the Allied forces after the landing on the Aleutians. It probably dates from late 1942 and early 1943 and shows the airmen of Kōkūtai 452.

down. Later, Yamada got into a fight with the observation planes again, and with a P20c Gi-ichi Sasaki, they scored two victories.

The Americans lost one Seagull and three were damaged. The crew of the downed Seagull apparently survived, but interestingly, the machine (Bu. No. 9945) belonged to the air unit of the battleship USS Indiana, which was not part of the fleet.

The crews of H6K Mavis attempted to blindly bomb the American vessels through low cloud cover, and one of the Rufe pilots attacked the destroyer USS Case in very adverse weather conditions. He was driven off by defensive fire from 5-inch and 20mm guns. Japanese gunners from shore batteries also attempted to engage the US ships, as the Rufes' pilots dropped phosphorus bombs over them, presumably to identify enemy's position.

American troops landed on Adak Island on August 30 and built with incredible speed an airfield in the following weeks. For the Japanese on Attu and Kiska, this worsened the prospects of completing their own airfield.

An unequal battle occurred on September 15, 1942, when the submarine base at Kiska was attacked by fourteen heavy bombers from the 28th CBG, accompanied by fourteen Lightnings and the same number of Airacobras from XI. Fighter Command. This formation was engaged by four Rufe pilots, two of whom were killed.

P20c Gi-ichi Sasaki scored four victories over fighter aircraft in this engagement and claimed one as probably destroyed, but his machine turned over on landing. At the end of the day only one Rufe remained operational. In late September, the Kimikawa Maru arrived at the island, bringing six Rufes and two observation aircraft. In the following week the unit faced significant odds on several occasions including P-40s of No. 111 Sqn RCAF, and on October 4 was completely without fighter seaplanes. American and Canadian fighters often strafed the anti-aircraft gunner positions to reduce the risk to low-flying bombers that arrived over the target only minutes later.

At the beginning of November, the 5th Kōkūtai was redesignated Kōkūtai 452. In same period additional aircraft were supplied, but these were destroyed in the following days during a storm and in a strafing attack by Lightnings and Marauders. In late December, Kimikawa Maru again brought in new Rufe seaplanes. On the last day of 1942, Japanese fighters managed to shoot down a B-25 of 28th CBG, a P-38 of 343rd FG and destroyed a Catalina that was forced to land.

The Kōkūtai 452 was still operating in extremely difficult conditions. Planes were anchored in Arctic temperatures at the seashore or in shallow water, their only protection being a tarpaulin stretched across the forward half

of the fuselage. Yet unit's technicians managed to keep most of the seaplanes operational. Primarily they operated from Kiska Island, and spare planes were offloaded on Attu, where there was less danger from Allied aircraft.

On January 24, 1943, a patrol of two Rufes discovered five cargo ships with escort cruisers, which were securing the landing on the island of Amchitka. Rufes attacked with 60kg bombs and continued their strafings in late January and during February. Their main target was the airfield, which the Americans were building on the island with their usual incredible speed. American air defenses managed to shoot down several of the Rufes. Sasaki, who became the only Rufe fighter ace in the area, did not return from one of these dangerous missions.

It occurred on the evening of February 18, 1942, the day after the first Curtiss P-40s from the 18th Fighter Squadron arrived at the newly completed airfield, which was named Fox Field because of its short runway. The Rufe pair was led by Warrant Officer Kunitsugu Nakamachi and P20c Sasaki flew as his wingman. In the air, however, two quadruplets of Curtiss planes were waiting for them. The Japanese pair was attacked by the first flight, led by Major Clayton J. Larson. Hundreds of soldiers from the surrounding hills watched in amazement as the battle took place off the west coast of the island.

Nakamachi, still over the water, dropped his bombs and turned northwest back toward his own base, but he had little chance against the fast Curtiss planes that attacked from above. He was hit by Larson and his wingman 1st Lt. Beary. The burning Rufe crashed into the sea.

A determined Sasaki gave up the raid on the airfield just off the coast and also tried to break through to the northwest. American fighters made repeated runs on Sasaki. The experienced Japanese pilot combined tight 360-degree turns and steep descents. He even fired twice at Larson without result. His fight against the odds was like this over 35 miles stretch. However, Sasaki was eventually hit and crashed into the sea about 5 miles west of the northwestern tip of Amchitka. The victory was scored by Lt. Stone.

The last aerial engagement of Rufe seaplanes in the Aleutians occurred on March 17, 1943.

In ten hours, the Americans made a total of five raids on Kiska from the Adak and Amchitka bases. They deployed 13 B-24s, 16 B-25s, 32 P-38s, and eight P-40s. The Japanese could only send seven Rufe fighters against them. Among them was Kiyomi Katsuki, who made

a name for himself in the South Pacific as a Pete biplane pilot and later became a fighter ace. The formation faced ten Lightnings and claimed two victories, but the Americans recorded no losses.

This seaplane fighter unit, which changed designation three times during its operations, had shot down fifteen aircraft certainly and five probably since the summer of 1942. In less than eight months of its combat deployment, it operated against the enemy over sixty days, in many cases conducting multiple actions in a single day. It lost twelve fighter seaplanes and ten pilots in aerial combat. Its remaining 23 machines were written off in the Aleutians due to defects and weather conditions.

At the end of March 1943, the remaining airmen of Kōkūtai 452 were evacuated by submarine to Japan. In May the unit was reorganized and received new Pete, Jake and Rufe seaplanes. Its fighter unit was commanded by Lt.(jg) Shunshi Araki. From July his unit was based on Lake Bettobu on the Kuril island of Shumshu, 11 km southwest of Kamchatka.

Their opponents were again the Liberator crews. Rufes engaged them for first time on July 19.

In addition to the Rufe seaplanes, the sporadic fighting involved IJN observation aircraft as well as Army aviators with Ki-43 Oscars from the 54th Hikō Sentai.

The Kōkūtai 452 fighters achieved their last victories on September 12 in a battle with a formation of eight B-24s and twelve B-25s. They reported two B-24s shot down and one probable. However, Japanese Army fighters also joined the fight and the Americans suffered heavy losses. In addition to the two Liberators, they lost seven Mitchells and some crews made emergency landings in Soviet territory.

In early October 1943, the fighter Buntai of Kōkūtai 452 was disbanded and the unit continued to serve with reconnaissance aircraft in the Kuril Islands until the summer of 1944.

The original commander of this unit, Kushichirō Yamada, later served as the Hikōtaichō of Kōkūtai 302 at Atsugi Base and committed suicide on August 15, 1945. Araki ended his service in the same fighter unit as Yamada, and he too did not live to see the end of the war.

To be continued...



Pilots of the 11th Fighter Squadron at Umnak Air Force Base, Alaska, pose for a photographer while playing cards. They were among the opponents of the Rufe seaplanes. The unit's commander was John S. Chennault, the eldest son of Claire Lee Chennault, who led the legendary volunteer Flying Tigers in China. The P-40E's nose shows that the apple didn't fall far from the tree.

Shots of the wrecks of Rufe seaplanes after landing on Attu and Kiska islands in mid-1943. The hangar images were taken at the base on Attu.



Photo: US Navy



Photo: US Navy



Photo: Alaska State Library



Photo: US Navy



Photo: US Navy



Photo: US Navy

Colors and markings

Text: Jan Bobek

Rufes had a grey paint coating on all surfaces, which was sprayed over a reddish-brown base paint. To prevent corrosion, the interior surfaces of the flap area were also painted aluminium instead of the Aotake paint that was common on A6M Zero fighters.

Due to the change in the name of the aircraft, the fuselage identification stencil changed in July or August 1942. It occurred between approximately the 30th and 50th Rufe produced. From October 1942, the manufacturer stopped putting the date of manufacture on the stencil.

At the end of August 1942, Nakajima introduced a yellow identification stripe on the leading edge of the wing on A6M2-N aircraft, and at the same time introduced a white outline of Hinomaru on the fuselage.

In February 1943, naval fighter units were instructed to spray the aircraft with dark

green on the upper surfaces. Ground personnel usually made use of paint that was available for maintenance on aircraft of other categories that already had green paint. In the case of the seaplane units, these were the Aichi, Mitsubishi and Kawanishi aircraft. The shades of their camouflage paint varied slightly depending on the paint supplier. The use of war booty paints, for example in Rabaul, or the use of paint designed for warships cannot be ruled out. When this paint was applied, the white outline of fuselage Hinomaru was often thinned or completely repainted. However, some aircraft were left in grey paint on all surfaces and are documented from as late as 1944.

In the final months of production, the new A6M2-N aircraft received a standard coat of D1 dark green paint on the upper surfaces, a shade specific to the Nakajima paint supplier. This change

was accompanied by the introduction of white outline on the Hinomaru on upper surfaces. With combat units this white part was often thinned or completely repainted, which could also be done on the fuselage Hinomaru.

The coloring of the transport cart is often given as black, but this does not match contemporary photographs. More likely is the dark grey-blue color used for naval vehicles and technical equipment. The dark blue color used by the Imperial Navy, for example for workshop equipment, cannot be ruled out either. The construction of the cart was composite, with the vertical stabilizing parts and the parts on which the float was mounted being made of wood. The whole cart was painted in one color, but in service the paint naturally showed signs of wear and tear, the grey paint from the main float sometimes had worn off and remained on parts of the cart.

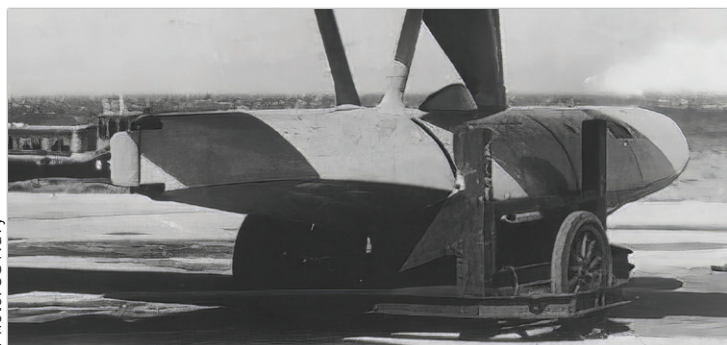


Photo: US Navy

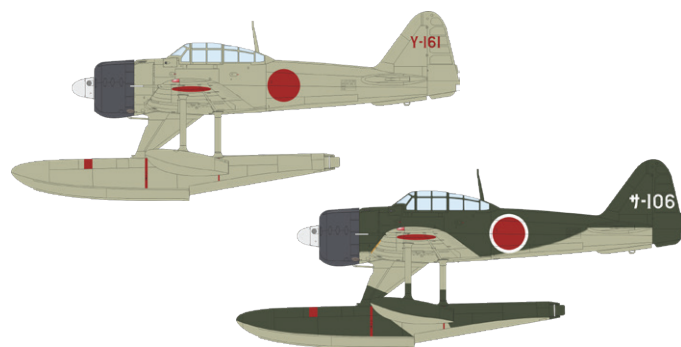


Photo: ©Izawa

Unpublished photograph of Rufe NI-119 with a group of Kōkūtai 802 NCOs taken in early 1943 at Shortland Base. This is an aircraft that was finished with grey paint on all surfaces and the unit level received a coat of dark green paint on the upper surfaces. The rectangular field of grey paint on the fuselage is clearly visible, which the mechanics have retained for the machine's production stencil.



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THE CAVALRY ARRIVES

VMF-223 at Guadalcanal

part 2

Text: Thomas McKelvey Cleaver

We left the pilots and mechanics of VMF-223 in the first part of this article as they began to familiarize themselves with Henderson Airfield and the situation on Guadalcanal. The latter certainly did not make them so happy, but it did compromise their combat determination.

It was fortunate the Japanese were initially as nearly hamstrung as the Americans. The Imperial Navy's 25th Air Flotilla (5th Air Attack Force), based at Rabaul, had been reinforced only days before the Allied incursion into the Solomons as part of a general build-up preparatory to occupying Guadalcanal and supporting a further Japanese drive into the New Hebrides. On August 9, Vice Admiral Nishizō Tsukahara activated the Eleventh Air Fleet at Rabaul and assumed control

of regional air operations. The one-armed senior aviator, who had lost his arm to a spinning propeller, advocated a policy of strong reprisals against the Americans. However, since his bomber force had taken severe losses during the first two days of aerial combat, the admiral was restricted to planning harassment and reconnaissance missions to the island. The Americans were fortunate that Guadalcanal and the Japanese airfields at Rabaul were separated by more than

Photo up: Aerial view of the runway of Henderson Airfield on August 22, 1942, two days after VMF-223 arrived on the island. The buildings to the south of the runway were intended as workshops and the roofs were made of 7/8-inch-thick steel.

600 miles of the Solomon and Coral Seas. Though the Zero was the longest-legged operational fighter in the world, the 1,300 mile round trip between Rabaul and Guadalcanal taxed even its capabilities to the limit, while the twin-engine Betty had fuel for only 15 minutes over the target. The range limitations of the Zero and the Betty meant missions had to be flown by the most direct route, with no margin for feints or for speeding up the throttled-back engines of the fuel-conserving fighters



The commanding officer of VMF-223, Maj. John Smith after returning from Guadalcanal at NAS Anacostia.

and bombers. Additionally, the weather in the South Pacific meant they flew from their bases after the morning cloud buildups had dissipated, which meant adherence to a predictable timetable. The route took them from Rabaul to Buka, off northwestern Bougainville, down to Buin, overlooking the Shortland Islands, then straight through New Georgia Sound, soon to be known as "The Slot."

Before the war, the Australian Navy had recruited Australians living in the

Mason's warning and the arrival of the bombers over Guadalcanal. This schedule allowed the Marines to count upon several quiet hours after dawn and before dusk for getting work done, with at least two hours during mid-day in which to find cover and take aim. The Japanese arrived punctually between 1200-1300 hours, depending on the weather enroute. Weather in this equatorial region was marginally predictable and subject to rapid change without prior notice.

The Wildcats needed every minute of warning they could get, since it took around 45 minutes for the airplanes to get to 20,000 feet.

Solomons to remain behind if the Japanese appeared and operate a radio warning system when they spotted Japanese naval or air forces. Coastwatcher Jack Read, whose station in the hills of Bougainville overlooked Buka, was generally first to send the word of an impending air strike. Paul Mason, near Buin, was next. There was invariably two hours between

A combat schedule developed since the Japanese could only fly a large formation of bombers from Rabaul in daylight. Weather allowing, the bombers and their escorting fighters would take off from their air bases at Rabaul by 0800 hours, though delays were caused by early morning build-ups of weather over the Solomon Sea that could delay

departure until as late as 1000 hours. As the Japanese formation flew down The Slot, the aircraft were spotted by the Australian coastwatchers on the various islands, who radioed their sightings to Cactus Control at Henderson Field. By the time they passed Munda, the defenders on Guadalcanal would man their fighters and take off. The Wildcats needed every minute of warning they could get, since it took around 45 minutes for the airplanes to get to 20,000 feet. The enemy formation would finally arrive between 1100-1300 hours. Given the variability of weather, there were a few times where the clouds over The Slot prevented the coastwatchers from spotting the oncoming Japanese in time to give sufficient warning.

The Japanese Are Intent on Taking Guadalcanal Back

Much of the battle noise that had kept Lieutenant Trowbridge awake that first night on the island came from the fight along what the Marines thought was the Tenaru River but was actually a lagoon. The Ichiki Battalion – the first Japanese troops to arrive on the island as part of Yamamoto's plans to drive the Americans into the sea – were engaged by well-dug-in defenses as they advanced on Henderson Field. Dawn on August 21 found the surviving Japanese holding their position. First Battalion, First Marines, moved inland around the lagoon and enveloped the enemy.

As the enemy troops tried to escape down the beach, they were strafed by newly-arrived VMF-223 Wildcats. All resistance ended by 1700 hours. When some wounded Japanese opened fire on the Marines, they went through the battlefield and shot every enemy soldier they came across whether dead or alive, except for 15 taken prisoner. Thirty Japanese survivors escaped to tell the tale to their comrades at Taivu Point. Food, equipment, weapons, and ammunition were taken from the 871 dead. That evening, Colonel Ichiki buried his unit's colors, drew a ceremonial dagger, and disemboweled himself in the soft sand beside Lengo Channel.

The Marines Meet the Enemy

At mid-day, Admiral Fletcher's carriers gave cover so that two transports could slip into Sealark Channel and unload supplies. MAG-23's senior mechanics were a welcome addition when they came ashore from the destroyer that had brought them up from Efate. Coastwatcher Jack Read radioed a warning that a strike force was on the

way down the Slot. Lieutenant Hugh MacKenzie, the coastwatch liaison officer at Lunga, patched into the Marine communications net, known as Texas Switch, and for the first time was able to pass the news to American aviators who could rise to the challenge. Captain Smith's four-plane division responded to the call.

They were over Savo Island at 1207 hours, climbing through 14,000 feet, when they spotted six Zeros five hundred feet higher and on a reciprocal heading. Smith opened fire head-on at the leading Zero as the two aircraft roared toward one other. The Japanese pilot flinched first. He pulled up, exposing his belly to Smith's six .50-caliber machine guns, and then fell away smoking as Smith was engaged by a pair of Zeros that had latched onto his tail. Smith quickly discovered the Wildcat was heavy enough to disengage by diving away if there was sufficient altitude. His wingman, Sergeant John Lindsey, was hit in the fight but managed to make a dead-stick wheels-up landing at Henderson Field, with his Wildcat becoming the squadron's first loss, while Smith became the first pilot claim a Zero shot down. In a second fight later that afternoon, Lieutenant Trowbridge claimed two more, though the Japanese recorded all planes returned. Over the next two days, the Marines claimed two more Zeros and proved they could stay in the same air with their more-experienced opponents.

The First Big Battle

Over the next four days, what would become the Battle of the Eastern Solomons began to shape up as the two navies sought to find each other.

Despite the loss of the heart of the Imperial Navy's carrier strike force with the sinking of Akagi, Kaga, Soryū and Hiryū at Midway, their remaining carrier fleet was still formidable when compared with the carriers the U.S. Navy could bring to action. The First Carrier Division now formed the heart of Japanese naval aviation, composed of the fleet carriers Shōkaku and Zuikaku and the light carrier Zuihō. The light carriers Jun'yō, Hiyō and Ryūjō of the Second Carrier Division were a worthy second line.

At 0600 hours on August 24, Admiral Nagumo's Kidō Butai turned southeast, into the wind, and Shōkaku and Zuikaku launched the first search patrols of the day. Admiral Kondo's Advance Force, 120 miles southeast, also turned to remain in position to guard Nagumo's eastern flank. Starting at 0615 hours, the two carriers



Aces from Guadalcanal. From left: Maj. John L. Smith, Lt. Kenneth Fraizer, Maj. John Dobbin and Maj. Robert Galer. The first two from VMF-223 the second from VMF-224, the unit which reinforced the fighters at Guadalcanal on August 30.

Photo: via author

launched 19 Kates on searches out to a distance of 250 miles. No one really expected to locate the Americans, since the Japanese carriers had sailed out of range during the night.

The Reinforcement Force transports were scheduled to arrive off Guadalcanal the night of August 24. If the 5th Air Attack Force's Bettys could not knock out Henderson, carrier aircraft would have to be committed. Since Admiral Yamamoto

launched as soon as she and her escorts were within range.

Because there was as yet no operational radar as yet at Henderson, and since coastwatcher sightings had proven to be less than completely reliable due to the vagaries of weather in the region, Air Group 23 Executive Officer Lt. Colonel Charlie Fike had begun launching one or two divisions of Wildcats at "Tōjō Time," 1100-1500 hours, when it was most likely

When the "Condition One" flag went up in response, their pilots scrambled to man all the available Wildcats, followed by a further scramble down the main runway. While they were supposed to take off in order of divisions and sections behind the flight leader, in practice everyone rushed to get airborne to gain the altitude advantage over the incoming bombers. Because of performance differences between the individual planes, the system of elements and divisions broke down, and everyone joined up on whomever was closest.

had stipulated that the Shōkaku and Zuikaku air groups were not to attack land targets so long as Task Force 61 remained a threat, the only force available for an attack on the airfield was the small Ryūjō Air Group, with its nine B5N Kates and 24 Zeros. Since the scheduled 5th Air Attack Force mission against Henderson was scrubbed because of bad weather, use of Ryūjō's small force on August 24 became inevitable. The strike would be

that an incoming strike might appear. Thus, when the small Ryūjō attack force arrived at 1415 hours, a division of Wildcats led by Marion Carl was waiting at 20,000 feet, with another 12 Wildcats and P-400s from the newly-arrived 67th Fighter Squadron on alert at the field. Carl's wingman was Tech Sergeant Johnny Lindley, with 2nd Lieutenant Fred Gutt flying section leader with VMF-212's Marine Gunner Tex Hamilton on his wing.

Photo: Cpl. L. M. Ashman, USMC via NHHC



The wreckage of a Wildcat after one of the Japanese raids on Henderson Field.



Capt. Joe Foss (left) became the most successful ace of the Southern Solomons campaign and the first American aviator to match Eddie Rickenbacker's World War I score of 26 victories.

Photo: via autor

The Ryūjō force approached Guadalcanal from the direction of Florida and Malaita islands at 10,000 feet. Lieutenant Murakami led the six Kates along with the six escorts led by Warrant Officer Shigemi in one formation, while the formation of nine "attack" Zeros led by Ryūjō's Hikōtaichō (air group commander) Lieutenant Nōtomi, flew about 1,600 feet to the right of the bombers.

Carl spotted the force over Tulagi. As he wheeled his four Wildcats into position, he radioed a warning to Henderson Field. When the "Condition One" flag went up in response, the pilots scrambled to man all the available Wildcats, followed by a further scramble down the main runway. While they were supposed to take off in order of divisions and sections behind the flight leader, in practice everyone rushed to get airborne to gain the altitude advantage over the incoming bombers. Because of performance differences between the individual planes, the system of elements and divisions broke down, and everyone joined up on whomever was closest. Leading the dash was Captain Rivers Morrell, VMF-223's executive officer.

At 1423 hours, Carl peeled off and led the way as the four Wildcats dived on the Ryūjō force. Carl lined up on six airplanes in the larger formation that turned out to be Shigemi's six escort Zeros. Firing from overhead and diving through the formation with Technical Sergeant Lindley glued to his wing, Carl was certain he had set one of the "bombers" on fire for his first victory over Guadalcanal and second of the war. Close behind, Hamilton and Gutt fired at the same formation. While Hamilton was drawn into a protracted dogfight with three of the "escort" Zeros, Gutt was able to shoot one of the Kates and dive through the formation behind Carl and Lindley, who became separated as they zoomed to regain altitude for a second attack.

The Kates came directly over the beach and lined up on the four 90mm antiaircraft guns of Battery E, 3d Defense Battalion. At 1428 hours the guns opened fire while the Kates released their 36 60-kilogram bombs in a group drop at 1430 hours. A "Betty" was claimed by the overexcited gunners, who actually hit nothing. The Kate's drop was equally ineffective, with no damage inflicted even though the bombs detonated on either side of the guns.

Nōtomi's attack formation had more success. The three shotai formations attacked from three directions just as the bombs were dropped, strafing the runway with impunity. Nōtomi's threesome caught

up with a Wildcat that had just lifted off and shot it up. Wounded in the head and shoulder, the pilot managed to keep the airplane airborne long enough to ditch reasonably well off Florida, where he was rescued by islanders and returned to Tulagi the next day.

67th Fighter Squadron skipper Captain Dale Brannon and his wingman, 2nd Lieutenant Deltis Fincher, dashed for their Airacobras when they saw the Condition One flag go up. Both remembered they could hear the drone of the enemy overhead by the time they were in their cockpits and starting up. As they raced in echelon along the runway, they could hear the explosions of the bombs over the roar of their engines. Just as they lifted off and retracted their gear, a Zero swooped in front of them. They turned into one another and let fly with everything: eight .30-caliber machine guns, four .50-caliber machine guns, and two 20mm cannon, disintegrating the Zero. They flew through the debris as they clawed for altitude but were attacked in turn by the shotai leader and wingman of the fighter they had just destroyed. The enemy fighters made one

pass and disappeared. Both P-400s were hit by 7.7mm bullets, but Brannon and Fincher were undeterred. Unfortunately, as Brannon later recalled, "When we got up to Guadalcanal, one of the first things that we found out was that the British had put a high-pressure oxygen system in our airplanes. The Marines had oxygen, but it was low pressure. I remember we managed to get all the way up to 16,000 feet on our first fight. We were really woozy. And of course, the Zeros were way up above us."

Three Wildcats took on the retiring attack Zeros at low altitude over Lengo Channel. VMF-212's 2nd Lieutenant Bob McLeod got good hits on one that he claimed destroyed. In fact, the pilot – Lieutenant Nōtomi's wingman – was able to nurse his stricken fighter back over Guadalcanal, where he crash-landed, was found by Japanese troops, and was eventually evacuated off the island. In return, VMF-223's 2nd Lieutenant Elwood Bailey was shot down. Last seen in his parachute, descending toward the water near Tulagi, he never made it home.

Lieutenant Murakami's Kates executed

a wide formation turn to the north after they dropped their bombs, in an attempt to retire from the area. At 1433 hours, Marion Carl executed what observers called "the most beautiful overhead pass," downing a Kate on the formation's left side. Lindley and Gutt also fired on the Kates. As they did so, reinforcement began arriving. Captain Morrell, flying what was probably the best Wildcat on the island, was in the lead followed by five second lieutenants. All six attacked the five surviving Kates and five escort Zeros from below. As they did so, two attack Zeros arrived to help ward off the attackers. 2nd Lieutenantt Ken Frazier destroyed a Kate on the right side of the formation on his first pass while Carl shot a Zero off Lindley's tail; however, he did not destroy it, as credited. Gutt was shot up and wounded in the left arm and left leg by another Zero, but made it back to Henderson Field. Lieutenants Rex Jeans and Red Taylor teamed up to disable a Kate, but Taylor – one of the six VMF-212 reinforcements – was immediately shot down and killed by a Zero. Last of all, VMF-212's 2nd Lieutenant John King fired on a Kate that blew up. After



Many Wildcats were destroyed not only in combat but also on the ground. Either as a result of enemy attacks or in crashes during take-off and landing. These aircraft then became a source of spare parts.

Photo: via autor



Photo: via autor

Capt. Jimmy Flatley led VF-10 to Guadalcanal after the USS Enterprise was severely damaged in the Battle of Santa Cruz.

King's victory, the Wildcats withdrew. Altogether, the Marines claimed 20 confirmed victories: 12 Kates, a non-existent "Betty," and seven Zeros. However, the Japanese lost only four Kates, including the one that crash-landed, and three Zeros, including the one Brannon and Fincher had blown up. Marion Carl was credited with four victories, including the phantom Betty, and was immediately recognized as the first Marine Corps ace. In fact, he was actually two kills shy, but would make up the difference two days later. The Marines had won the first big air battle. There would be many more.

The End For VMF-223

By October 2, the surviving fliers of VMF-223 were exhausted from near-daily battles and the terrible living conditions on Guadalcanal. That day, the enemy returned with another fighter sweep; the skies were clearer and the coastwatchers radioed their warning in time for the Wildcats to get off the field and grab sufficient altitude. to meet the 27 Zeros in a hard-fought

fighter-versus-fighter battle. Leading six VMF-223 F4Fs, Marion Carl scored what would turn out to be his last victory, bringing his score to 16.5 before his guns jammed. His wingman Ken Frazier was able to shoot down two before the others turned on him and shot up his Wildcat badly enough that he was forced to bail out. His score of 12 put him in third-place in VMF-223's "ace race," behind Smith and Carl. Newly arrived VMF-121 pilot 1st Lieutenant Floyd Lynch dropped one enemy fighter, but the top score of the day went to "Coach" Bauer, whose four victories made him an ace in only two sorties. This time, Japanese records confirmed the nine Zeros claimed by the Marines was accurate.

VMF-223's exhausted fliers took off for what turned out to be their last mission from Henderson Field on October 10. Squadron leader John Smith led seven Wildcats to escort SBDs and TBFs to New Georgia where more enemy ships had been spotted. Halfway there Smith happened to look back and saw 15 Rufe and Pete

floatplanes closing on his formation. He called a warning and reversed course; the other six followed. Spotting the oncoming Americans, the enemy formation turned to flee, but the Wildcats caught up and shot down six Petes and three Rufes. Smith's Rufe was his final victory, giving him a total of 19 to make him the leading Marine ace to that point in the war.

October 12, 1942, saw the survivors of VMF-223 climb aboard an R4D headed for Espiritu Santo. Over their nine-week tour, the squadron claimed 110 victories, including 47 Zeros and 47 Bettys. John L. Smith was credited with ten Bettys while Marion Carl claimed eight, to give both pilots more Japanese bombers in their scores than any other Marine pilots during the war. Nineteen pilots had landed at Henderson Field on August 20; ten paid the ultimate price.

Adapted from "The Cactus Air Force: Air War Over Guadalcanal," by Eric Hammel and Thomas McKelvey Cleaver; Osprey Publishing (2022).

THE HIGH-ALTITUDE HINDS



**CZECH AND CZECHOSLOVAK
HINDS E FROM TECHNICAL
PERSPECTIVE**

Tomáš „Hindman“ Dvořák

The original type designation of Hind E was Mi-24V, where the letter V means “vysotnyi” which translates as “high-altitude”. This corresponds to engines' higher power available at higher level. This allowed not only a higher ceiling but, most importantly, the ability to hover at higher height above sea level, both with or without the ground effect.

The Hind's E predecessor, the Hind D, was continually developed and many of the features of the Hind E were already adopted. The only differences distinguishing the two at first sight at every stage of development are the ATGM used and the location of the APU intake. The Hind E used more advanced and beam-targeted supersonic 9M114 Shturm missiles instead of wire-controlled subsonic 9M17P Falanga ones. The guiding system appearance also differed in the shape of the antenna cover on the port side below the nose and different doors and other details on the sighting/aiming system on the starboard side. Also, while the Hind D has the intake for APU on the starboard side of the fuselage ridge just opposed to the APU's exhaust on the port side, the Hind E is feeding the air to APU through the whole tail beam via the triangle-shaped opening in the low part of the vertical stabilizer on the starboard. All the other features, including more powerful TV3-117V engines, “wet” pylons, shape of the main as well as tail rotor blades and other features can be seen not only on the Hind E, but also on late Hind D choppers, depending on the state of the development. But Czechoslovakia did not use these late Hind Ds.

Series variations

Early series of Hind E (numbers from 0701 to 0710 in Czechoslovakia) were equipped with older type of the Friend-Foe identification system SRO-2 Chrom. It was recognizable by the “three fingers” antennae on the top of the WSO's cockpit canopy windshield frame and on the bottom of the tail fin. The gun camera S-13 was mounted on the port side on the front of the joint section of the wing and the vertical pylon. This corresponded to the Hind D, but the early Hinds E lacked the small, bulged antenna of the warning system S3M Sirena (it was also absent on the rear of the outer pods). Instead, the Czechoslovak Hinds E used the more advanced passive system L-006 Beryozka (birch) installed in the bulky oval covers on both sides of the front fuselage between front and rear cockpit. These were quite popular among pilots as they were used as handy shelves for the map cases or helmets prior to or after the flight. Behind and under the port Beryozka antenna, there was a fixed

landing light FFP-7 added. On the trailing edge of the tail, two small bulges of the warning system antennae were added. These were monitoring the rear area. The early Hinds E also kept the frame in the wheel bay separating the port and starboard compartments.

The early Hind D were additionally equipped with the flare dispensers ASO-2V. These were fixed to the rear of the tail by the metal belts encircling the tail. The early Hinds E had the dispensers screwed directly into the frame of the tail. As the Hind E was developed the later series (Nos 0786 through 0790 and 0812 through 0816 in Czechoslovakia) had the gun camera removed from the port side wing and a new type (SS-45) installed in the rear pilot-in-command cockpit in the case on the right side of the gunsight. The above-mentioned frame in the main wheel bay was removed, which was greeted by technicians as it made easier the access to the serviced components in the bay.

The choppers with tail numbers 0832 through 0839 presented another step in the development of the Hinds E supplied to Czechoslovakia: The covers of the

L-006 system were moved behind the rear cockpit and raised out of reach from the ground. The three-fingers SRO-2 antennae were changed for the trapezoidal antennae of new system 62-01 Parol. As a third visible change, the flare dispensers were moved from the tail to the rear of the center section of the fuselage behind and above the wing. Also, their number was increased from four to six (three on each side). They firstly had covers, but as their removal and fixing during maintenance was rather complicated, the covers were gone on later series of Hind E.

The last Hinds E supplied to Czechoslovakia were choppers with the numbers 0927, 0928 and 0929. They sported minor changes on the instrument panel in the rear cockpit, but otherwise were the same as the previous ones. Two of these were lost in fatal air crashes and seven airmen were killed.

After several technical inspections and overhauls, most of the oldest Hinds E in the inventory of the Czech army were discarded and Nos. 0702, 0710, 0788, 0790, 0815, 0835 and 0839 were sold to AAL company from United Arab Emirates. After some non-specified overhaul, they were sold – probably to Libya or Sudan.

First modernization

After the political changes in 1989, first upgrades to the Czechoslovak Hinds E were made. Due to the rising number of participations on Western airshows,



The first batch of Hinds E sported the gun camera placed in the intersection of the end of the wing and the end pylon like on the Hind D but the small bumpy antenna of the warning S3M Sirena system is missing.

Photo: author



Photo: Petr Soukup

The chopper number 0836 demonstrates the form of the final supply during the existence of the socialist Czechoslovakia. On the frame of the windshield of the WSO's cockpit there is the trapezoidal antenna of the 62-01 Parol system and the bulky covers of the L-006 Beryozka system are already moved behind the rear cockpit.

equipment had to be added to ensure at least very basic "westernization". The GPS system, digital feet-calibrated altimeter and western-standard transponder were added. The GPS antenna was mounted on the frame of the windshield of the WSO's cockpit and the white fin-shaped antennae of the APX-100 transponder were placed behind the front wheel bay and on the top of the tail boom.

Stealth Hind

The Hind E No. 0837 was selected for the trials of the special surface finish. Rubber panels covered nearly the whole fuselage with intention to delete the radar frequency and so make the helicopter less visible on the radar screens. The new surface was also painted with an experimental camo scheme. The paint was to degrade the visibility of the helicopter through the night vision goggles. None of the measures proved efficient, the only effect, apart of the smooth surface (the riveting was hidden under the rubber panels), was the added weight which unbalanced the weight distribution of the chopper.

The weapons

Apart of the above-mentioned ATGMs

Shturm replacing the much slower Falanga, Hind E had a much wider variety of weapons. There were unguided rocket blocks B8V20 of 80 mm caliber, gun pods GUV either with 30 mm grenade launcher 9-A-669 or with one 12,7 mm 9-A-624 four-barrel Gatling gun plus two 7,62 mm ones of the same system. Another option were cannon pods containing two-barrel UPK-23/250 cannon of 23 mm caliber, mine containers KMGU-2 or rocket launchers RM-122. More to it, up to four external fuel tanks, each of 450 liters of volume, could be fitted to the inner and outer racks. The Shturm missiles could be fitted not only to the end pylons, but also to the outer racks through special adapters, increasing the maximum number of ATGMs to eight.

Prior to the political changes at the end of 1989, one set of the exhaust gas cooling system (EVU) was supplied, but it was never used. This system was eventually tested by the Czech army in 2002 with a new set of the same type previously supplied.

The "new" generation

As a part of the debts payments by Russian Federation to Czech Republic, 17 new Hinds E were supplied to the Czech army between 2003 and 2006.

Seven of them kept the older designation Mi-24V, while ten others were designated Mi-35, which was the export designation of basically the same aircraft. But some minor differences existed.

The first batch consisted of seven choppers numbered 7353 through 7358 plus 0981. They were all powered by the new engines TV3-117VMA and the flare dispensers were fitted differently to the fuselage. The cockpits were painted in black instead of the turquoise color used previously. This change was done with aim to allow use of the night vision goggles (NVG). Unfortunately, the illumination was not NVG compatible, so the effort was useless.

As there was no GPS system installed, these choppers were in fact the same as those supplied in the eighties, including the Cyrillic stenciling in the cockpits. What was missing was the system Friend-Foe, so these machines had neither the antennae of the SRO-2 Chrom, nor the 62-01 Parol. But early into use, these new choppers were fitted with APX-100 transponders and a little bit later also with LUN 3520 radio of Czech origin. The T-shaped black antenna was fitted on the tail slightly to the right side. In the WSO cockpit, the control panel was



Photo: author

The control panel of the new radio LUN 3520 allowing continuous change of the frequency replaced the Doppler navigation system DISS and the navigational data were instead supplied by the GPS system.



Photo: author

Control panel of the infrared-guided missile countermeasure system L-166V-11E „Isanka“ was located next to the right front weaponry panel in the WSO's cockpit.

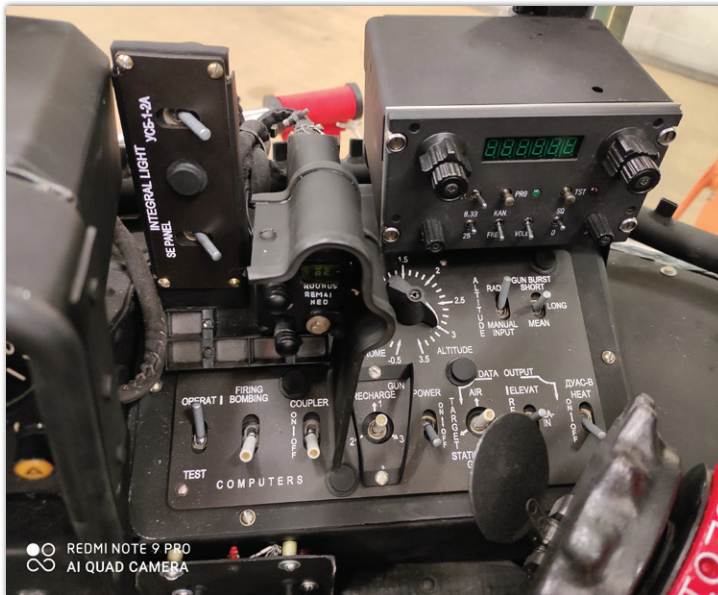


Photo: author

Control panel of the LUN 3520 radio was fitted over the left front weaponry panel in the cockpit of WSO.



Photo: author

Left side of the WSO's cockpit already in black color with English stenciling and the conversion table from feet to meters. Necessary, as the altimeters were calibrated in meters.



Photo: author

The cargo compartment with two black cases for the NVG system accessory.



Photo: author

The proof the chopper number 3365 was originally (or was intended to be) Hind F...

mounted on the left front panel while in the rear cockpit of the pilot-in-command it replaced the now obsolete Doppler navigation system DISS.

Next supplied were three Hinds E now designated Mi-35 as mentioned previously. These were Nos. 7360, 3361 and 3362. These choppers were already NVG compatible, the cockpit stenciling was in English. In the cargo compartment, there are two black cases hanged on the starboard side to store the NVG cabling. These choppers were equipped with the GPS antenna fitted to the tube of the DUAS system. To be honest, the solution developed by the LOK (Aviation Repair Shops in Kbely; Kbely being part of Prague) looked much better ...

As a new transponder KT-76C was installed, its antenna was placed on the bottom of cover of the Shturm guiding system. This placement was rather unhappy, as the antenna was quite vulnerable when the towing shaft was to be fitted. Due to that, it was moved to the

former position behind the front wheel bay like in the case of APX-100. As the KT-76C did not need the second antenna, there was none on the tail boom.

Last seven

The very last of the Hinds E supplied either to Czechoslovakia or to Czech Republic (Slovakia only received the former Czechoslovak Hinds D and E in the process of dividing the assets of Czechoslovakia and did not buy any new Hinds) were seven examples with numbers from 3365 to 3371. They were in the same configuration as the three previously supplied and underwent the same changes regarding the transponders and radio installations. Later, four of them (3367, 3368, 3370 and 3371) got the KT-76C transponders replaced by APX-119. It was visible by minor change of the position of the antenna behind the front wheel bay (from centerline slightly to the starboard side) and the second antenna was added again on the top of the tail boom. At the

end of the Hinds E service in Czech army, the short-wave radio Jadro was deleted and with it also its wire antennae between the rear fuselage and horizontal stabilizers.

Of the 17 newly supplied Hinds E, 11 went through general overhaul in the LOM (Aviation Repair Shop Malešice; Malešice being part of Prague) company. They got the same colors (so-called NATO standard, as described in Czech army) as they were supplied from Russia in compliance with Czech requirements, but as the colors were not sprayed with the use of templates, the borders of the color shades are diffuse. The twelfth Hind E planned for the general overhaul did not make it, as it was lost in an accident (engine failure while conducting the hover check).

Why just the Hinds E?

There might be a question why the Czech Republic opted for the already obsolete Hind E during negotiations with the



A nice view on the rear cockpit illuminated for the use with the NVG.

Russian side and did not ask for the much more advanced Hind J or its derivatives. There was for sure the aspect of the price, as the Hind J would have been more expensive and so less of them would have been supplied. But the main reason was (according to some sources) that the army did not want to enter a new type into its inventory due to logistic reasons. And more to it, there was a quite ambitious plan for upgrades, which was to be shared by the V4 states (Czech Republic, Slovakia, Poland and Hungary). But the plan collapsed and in effect it marked the beginning of the end of the Hinds E in the Czech army. Although a tough attack and transport helicopter, it had only the essential avionics to be allowed to fly in the modern airspace of the 21st century and would be sentenced to doom in the modern battlefield, as it lacks all the modern Defensive Avionics Systems as well as target and data acquisition systems.

In fact, the request for Hinds E supply was quite a surprise for Russians because this version was already out of production for several years. But they finally fulfilled the request, although rather peculiarly. The airframes of the Hinds E supplied were not newly manufactured, which is clearly supported by the fact the serial numbers were the continuation of the line of the Hinds F supplied to Niger. The 3365 Hind E, i.e., Mi-24V, even had a Mi-35P machine data-plate. According to the author's own experience, that he got during his 2001 stay in the Rostov factory, where the Hinds are produced, it was a common practice for a Hind E to enter the general overhaul to leave it as an Hind F.

In the foreign services

Apart of the older Hinds E sold to AAL, Czech Republic donated six of these helicopters to Afghan government. In the Afghan National Army, they got new numbers 113 (originally 0836), 114 (0703), 115 (0816), 116 (0834), 117 (0838) and 118 (0812). During the general overhaul prior to being sent to Afghanistan they received the more powerful TV3-117VMA engines, while all the GPS and identification equipment was removed. VHF and UHF radios were installed and the T-shaped white antennae were placed on the top of the tail boom (for the AT-160 COM1) and on its bottom (AT-160 COM2). Probably the most visible change was the installation of the long tubular antenna of the HF radio 10-389. It ran alongside the whole tail boom on the starboard side. There were also several other minor upgrades and changes. These choppers served in Afghanistan very reliably from the end of November 2008 until their dischargement in 2016.



Detail of the GPS antenna fitting developed in LOK.

Photo: author



Antennae of the APX-100 transponder were fitted behind the front wheel bay and on the top of the tail boom.

Photo: author

The air war over Ukraine

A year of bloodshed

Text: Miro Barič

Photo: Ukrainian armed forces, social media and other public sources



The first UH-60 Black Hawk of the Ukrainian GRU military intelligence.

Even though the Russian aggression against Ukraine started in the Crimea and Donbas in February 2014, and their terrorist activities even sooner, in February this year we commemorated the first anniversary of the Russian attack on the whole Ukrainian territory. It is the largest conflict in Europe since 1945.

This part of our series will be a summary of the events in the past 12 months. In the end, as usual, we focus on the events taking place between February 1 to March 1 and relevant to the air war.

February 2022

For several months the Russian troops were gathering near the Ukrainian borders and the American intelligence services warned it was not an exercise but preparation for the invasion. The government in Kremlin repeatedly stated that it was not going to attack Ukraine, on the contrary the troops would be withdrawn after the exercise was completed. None of it was true. On Thursday, February 24, 2022, early morning the massive bombing of the targets all over the entire Ukraine started and the Russian troops attacked in four directions – to Kiev, Kharkov, Donbas and Kherson from Crimea. The most important target was Kiev. Putin's army wanted to capture the capital and consequently the whole country in a couple of days. The paratroopers from the helicopters were tasked

to capture the airport Hostomel near Kiev so that the reinforcements and heavy equipment could be moved there by the transportation airplanes. The Russians however failed to capture Kiev and kill or capture Ukrainian president Volodymyr Zelensky. He refused the American offer to evacuate saying: "I need ammo not a ride!"

March 2022

The Russian advance on Kiev and Kharkov was stalled and was very slow in Donbas. The Russians made a rapid advance in the south only. The local Ukrainian command there failed miserably in organizing the defenses, a criminal deed in fact. In a couple of days, Kherson, north-west of Crimea and Melitopol, north-east of Crimea, were captured. Mariupol was surrounded but the advance from Kherson to Mykolaiv and Odessa was halted by Ukrainians. The key moment was the Russian defeat at Voznesensk. At Kiev the Russians tried to break through with a convoy many kilometers long. The Ukrainian troops however (and Russian logistical mistakes) stopped the convoy and significant parts

of it were destroyed. Without supplies the Russians had to start a retreat.

April 2022

In the beginning of month, the Russians had to withdraw from the areas north of Kiev. After they left a lot of evidence was found about the massacre of civilians in the town of Bucha and other cities. After its retreat from Kiev, the Russian army started to focus on Donbas where heaviest fighting has taken place since. Even though Russians withdrew from certain areas, they continued to shell the Ukrainian cities with missiles. Step by step the military aid for Ukraine started. In the beginning of April Slovakia was among the first countries to offer aid by delivering S-300 AA system. In the middle of April, in the Black Sea, the cruiser Moscow, a flagship of the Russian Black Sea Fleet was sunk having been hit by two Ukrainian missiles.

May 2022

The Ukrainians started heavy shelling and bombing of the Snake Island located near the coast and border with Romania. The island controls the shipping routes to Odessa. The Russians captured it during the first day of war. In the middle of May, the defenders of the steelworks Azovstal in Mariupol were ordered to cease the resistance. By May 20 all of them surrendered. Even though these days is considered taboo, during this month the Ukrainians received their first aircraft

deliveries – 21 decommissioned Mig-29 fighters for the spare parts and 14 Su-25 combat aircraft. The deliveries were made through the mediating parties.

June 2022

In their advance in Donbas the Russians took advantage especially of their overwhelmingly superior artillery. Therefore, the Ukrainians started to receive the new 155 mm howitzers from the Allies and above all HIMARS rocket launchers which are crucial for destroying the Russian ammunition dumpsters, bridges and command posts. In June the Czech Mi-24 and Slovak Mi-17 helicopters arrived in Ukraine. In the end of the month, after another series of successful Ukrainian attacks, the Russian troops had to flee from the Snake Island. On the other side, after a long-lasting effort the Russians managed to capture the city of Severodonetsk in the Luhansk area.

July 2022

The front line practically stalled. In the beginning of month, the Russians captured Lysychansk but did not advance any further. The fiercest battles were fought for the town of Bakhmut and have been going on until the present time. The Ukrainians started to successfully deploy HIMARS rocket launchers to destroy the Russian ammunition and fuel dumpsters. The Russians retaliated by bombing the civilian targets.

August 2022

The Ukrainians received the anti-radar HARM missiles and started to use them successfully to blind the Russian AA defense. During this month the large-scale attacks were launched against the Russian military airports on the occupied Crimea. On August 29 the long-awaited Ukrainian counterattack was launched in the Kherson area.

September 2022

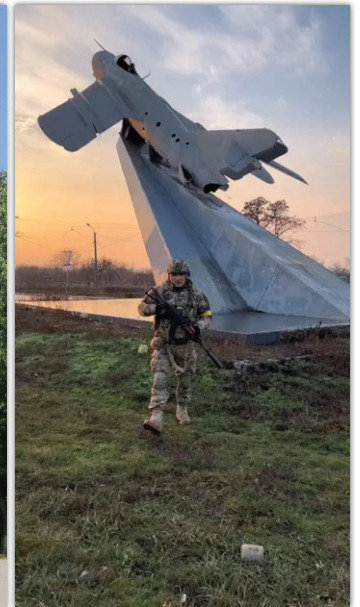
While the Russians focused on the defense of the Kherson area the Ukrainian troops launched a surprise attack on the other side of the front line. In a couple of days, they liberated Balakliya, Kupyansk and Izyum and by the end of the month Lyman and practically the whole Kharkov area. Putin reacted by declaring partial mobilization even though only in March he promised that there would not be any. The hastily organized referendums about the annexation to Russia took place on the occupied territories. The Russians started to use the Iranian kamikaze drones to bomb the Ukrainian cities.

October 2022

The counterattack towards Kherson continued. On October 6, in the wee hours, the explosion took place on the Kerch bridge connecting the occupied Crimea with Russia, one road lane was destroyed, and the railway section was seriously damaged. On October 29 in Sevastopol the attack of the remote-controlled boats against the Russian warships at anchor took place. The Russians launched the bombing campaign against the Ukrainian energy infrastructure.



The memorial with the MiG-17 aircraft in Bakhmut underwent renovation shortly before the war.



A Ukrainian soldier takes a picture in front of the memorial in Bakhmut during the fighting.



Belarusian volunteers from the Kastus Kalinoŭski regiment in Bakhmut.



The MiG-17 at the memorial was eventually destroyed like most of the town of Bakhmut.

November 2022

On November 11, the Ukrainian troops liberated Kherson. It has been only 42 days since Putin declared the city will be Russian forever. At Bakhmut the fighting in the muddy trenches, reminiscent of WWI, continued. The Russian bombing of the civilian infrastructure continued as well. As a reaction to it, the West started to supply Ukraine with the modern AA defense systems.

December 2022

The muddy terrain did not allow any significant movements at the frontline. The Ukrainians, using the drones, attacked the airports from where the Russian strategic bombers took off. The USA promised Ukraine the delivery of the Patriot AA defense system and later were joined by Germany and Netherlands as well.

January 2023

The New Year started with the largest massacre of the Russian soldiers when the building where hundreds of them stayed for celebrations, including

the stored ammunition, was hit by HIMARS missiles. There was an ammunition dumpster in that building as well. After several months, the Russians achieved the breakthrough at Bakhmut. They took advantage of the poorly planned Ukrainian troops rotation and captured the town of Soledar north of Bakhmut. Germany and USA promised Ukraine Marder and Bradley AFVs.

February 2023

The Russians continued with the push they initiated immediately after the New Year. They tried to attack along the whole frontline, from Kupyansk and Kremnina at the junction of the Kharkov and Luhansk areas through Bakhmut and Avdiivka in Donetsk up to Vuhledar. The pressure at places was enormous accompanied by large losses, but the advance was minimal. According to some reports, in two months since the beginning of the year the Russians captured only 85 square kilometers of territory. Each square kilometer of the Ukrainian territory gained cost them 250 soldiers killed ... Especially at Vuhledar, where they stubbornly

attacked across the large, widely open terrain, the Russians suffered big losses – they lost more than hundred tanks and armored vehicles and the whole Marine brigade.

Russian losses

Several aircraft and helicopters were reported shot down on both sides, but these claims could not be verified. Same as during the previous months, many of these destroyed aircraft could be only documented later when the wrecks were discovered, and the new images surfaced. The destruction of the Russian Mi-35M helicopter (other sources stated Mi-24VM) was confirmed however as it had to perform emergency landing on February 9 near the frontline at Tokarivka in the Kharkov area, barely 3 kilometers from the Russian border. Immediately after landing it was destroyed by the artillery fire from the 14th Independent Mechanized Brigade of the Ukrainian Armed Forces. This was recorded on video by a drone and later photographs appeared showing a helicopter wreck lying on the side. On Monday, February 13, the Russian Sukhoi



Russia launched at least six balloons with corner radar reflectors into Ukraine on February 15. At least one of them was shot down by Ukrainian air defense forces.



A Russian Mi-35M had to make an emergency landing near Tokarivka in the Kharkiv region on February 9 and was subsequently destroyed by Ukrainian artillery.



Su-25 with designation RF-95143 and fuselage number "yellow 37" photographed in February 2022 in Belarus and destroyed a year later in Belgorod Oblast.



UAW SURVEY

Su-24M of the Ukrainian Air Force. The yellow coloring of the lower surfaces is to prevent firing from their own ranks.



Damaged Ukrainian Mi-8MSB-V in digital camouflage during ground transport.



Shots of the wreckage of a Ukrainian Mi-8 helicopter from the deck of another chopper of this type.



Sequence of shots of a Ukrainian Tu-143 drone launching from an SPU-143 wheeled launcher.

Su-24M, carrying registration RF-93799 and bort number "blue 45", was hit above Bakhmut by the portable missiles. Its crew members belonged to the so-called Wagner mercenary group. Despite the number thirteen in the date, the aviators were lucky and managed to land the burning aircraft at their home base. On February 23, the pilot of the Su-25SM carrying registration RF-95143 and bort number "yellow 37", was not so lucky. On his return from the combat mission, he crashed near the village of Orekhovo in the district of Valyuki in Belgorod area. The cause of the crash was supposed to be a mechanical failure. The pilot from the 266th Squadron of the Attack Aviation did not survive.

Ukrainian losses

During the reported period, loss of one Ukrainian

aircraft was confirmed. On February 13 near Pishchanka in Vinnytsa area, while intercepting the Iranian-made drones Shahed-136, a Mig-29 was destroyed. Its pilot, Lieutenant Dmytro Shklyarevskyi saved himself on the ejection seat but suffered injuries and had to be hospitalized. From the hospital the pilot wrote that he had survived by a miracle and an operation was awaiting him. On the same day, the information appeared in the Ukrainian media that after four months long recovery Major Vadym Voroshylov from 204th Brigade of the Tactical Aviation returned to the duty. We wrote about him in the previous parts of this series. On October 12 he shot down five Shahed-136 drones and the debris from the last one hit his Mig-29 and he also had to eject. Hanging on the parachute he took a selfie of his bloodied face – in this way he wanted to check his wounds.

Also, the images of the Ukrainian Mi-8, hit under unknown circumstances in the previous period, appeared. First, on February 13, an image of the Mi-8MSB-V sporting digital camouflage and bort number "yellow 88", was published. The fuselage of the damaged helicopter was filmed during its ground transportation. Immediately next day, on February 14, the video of another Mi-8MSB-V wreck carrying digital camouflage, appeared. The wreck, lying in the snow-covered countryside, was filmed from the board of another Mi-8. No further details are known at this time.

Equipment deliveries

On February 21, the Ukrainian military intelligence service GRU published the photograph of the first Black Hawk helicopter in its service. Based on the coloration it was determined that it was

most likely the former US Army UH-60A serial number 80-23439 which later received the civilian registration N60FW and was modernized by Ace Aeronautics company from Alabama. After a long diplomatic pressure, Germany, USA and the Great Britain committed to deliveries of the modern tanks Leopard 2, Abrams and Challenger 2. Other countries joined the effort to deliver Leopard tanks, Poland in the first place. Training of the Ukrainian tank crews began in Germany, Poland and Great Britain and during our reporting period the first Leopard 2A4 tanks arrived in Ukraine from Poland. After this delivery the discussion started about deliveries of fighters and long-range missiles. We will talk about this next time.

Russian improvisations

While the stream of the modern armor is coming to Ukraine increasing variety of the emergency modifications appear on the Russian side. In a year of fighting Russians lost more than 1700 tanks, 2100 AFVs and further 1000 armored personnel carriers and other armored vehicles. Moreover, these are all the losses documented on the Onyx server by photographs and videos, the actual losses will be even higher. The high losses lead to the deployment of the artillery tractor MT-LB, originating in the 1950s, in the role of an AFV. It had not been intended for the first line employment therefore it features weak armor (maximum 10 mm on the hull) and light armament (one 7.62 mm machine gun). To increase the firepower of these vehicles the Russians started to install the naval AA cannons on them, which were removed from the old warships rusting in the ports. Part of the modifications are 2M-7 turrets carrying 14.5 mm caliber twin machine guns which in 1950s had been installed on the small torpedo and patrol boats.

The 2M-3 turrets carrying the 25 mm caliber twin cannons promise better firepower. This weapon was produced during 1953–1984 in the Soviet Union and was installed on patrol ships, minelayers or landing crafts. Only the Soviet Navy used 25 mm caliber 110-PM cannons. Their rate of fire was up to 300 rounds per minute, horizontal range 2.5 km and vertical range 1.7 km. However, their installation on



Russian MT-LB with 2M-7 naval turrets with two 14.5 mm caliber machine guns.



MT-LB with barbette and 2M-3 turret with a pair of 25 mm caliber guns, which the Russians removed from the old ships.



MT-LB is bizarre. They are welded on the ceiling of the rear part of the hull including the whole ship barrette, instead of cutting the opening in the hull and putting the barrette inside. This doubled the vehicle's height. Originally these turrets were designed for the AA warfare, but they cannot meet the current requirements. They only feature manual aiming which is sufficient for the slow flying targets. It is supposed then that these vehicles are assigned to ground warfare, to provide supporting fire for the infantry. Due to their height, however, they present an easy target for the opponent.

Drone attacks

In addition to their effort to break through the Ukrainian defense on the front line the Russians continued with shelling of the civilian infrastructure in the Ukrainian cities. During the large-scale attack on February 10, they launched 71 cruising missiles out of which 61 were shot down by the Ukrainian AA fire. 20 Shahed-136 drones were destroyed as well. However, the rockets that penetrated the defense hit and damaged four power stations. In addition to the missiles and drones the Russians started to launch the balloons. They carry the radar reflectors which deflect the radar microwaves back to its antenna. This causes a strong disturbance on the

radar screen. The goal is to disable the Ukrainian AA defense. Not only the Ukrainians waste the precious rockets on the useless balloon, but the chances are that the actual missiles will break through as the anti-weapon will be confused by multiple targets. The Ukrainians also retaliated by the drone attacks. During February 27 and 28 the whole series of incidents took place deep in the Russian territory. Ukrainians do not officially claim them but the whole situation looks like testing the capabilities of the variety of UAVs before the large-scale attack. There were different types of drones used on different targets. The Russians official statement is that all these drones were shot down and no damages were sustained which is not quite true in the case of Tuapse on the Black Sea coast. On Tuesday, February 28 the Rosneft oil refinery was damaged by the drone explosion. A smaller fire broke out. The Russians were lucky as the explosion and fire took place away of the main oil tanks.

At the same time the attack of at least 15 drones was launched on the targets in Crimea, at least two hit Belgorod in the Russian territory. The old Tu-141 Strizh jet reconnaissance drone, full of explosives, crashed in the Krasnodar southern outskirts. One drone crashed right next to the gas compressor station in Kolomen area which is only 100 km

south of Moscow! No surprise the the Russians started to build the AA defense around Moscow and even the Pancir AA systems appeared on the roofs of several houses in the Russian capital. However, the most daring attack against the Russian targets took place at the end of February in Belarus. On February 26, at the Machulishchy base near Minsk two explosions damaged Beriev A-50U AWACS aircraft. The Russian AF has been operating out of this base since the beginning of war and besides A-50U Mig-31s are flown out of there. The attack was supposedly conducted by the Belorussian resistance who consequently fled the country. According to their claims they damaged the radome and the hump containing the satellite communication located behind the pilot's cockpit. They used two commercial drones each carrying 200 grams of explosives. At least the hump damaged behind the cockpit was recorded on video and later confirmed by satellite images. Destroying the electronics effectively disabled A-50U from performing its missions even though the flight capabilities were not impaired by such small charges. A couple of days later the aircraft was flown in for repairs. The question is how fast the Russians can fix it. Only seven A-50U were built in 10 years, between 2011 and 2021.



Satellite shot of Maxar after the attack. Damage to the hump on the fuselage and the antenna dish are discernible.



A satellite image of an A-50U at Belarus' Machulishchy airport was taken by Planet Labs PBC shortly before the attack.



Russian Defense Ministry photo of an A-50U before the drone attack.



A drone also crashed near Kolomen, just 100 km from Moscow, on February 28.



Footage of the attacking drone. It landed on a hump with antennas on the back of the aircraft and exploded there.



Wreckage of a Tu-141 Strizh drone that landed on the outskirts of Krasnodar on February 28.



Drones also landed on Belgorod on February 27.



Refinery in Tuapse damaged by drone strike on February 28.



Happy crab

Text: Richard Plos

Illustration: Adam Tooby



When the first prototype Z-326, serial number 301 with the OK-90 matriculation (later changed to OK-LHA), took off at 9.20 a.m on August 12, 1957, it marked a further extension of the Z-26 series production. It was to end with the Z-226 version, but persistent interest abroad eventually exacted not only the resumption of production, but also a fairly significant modernization of the entire design. The Z-326 with its retractable undercarriage and new cockpit canopy moved further away from the original design of a wooden wing and tailplane underpowered aircraft with a four-cylinder engine. In the form of the Z-326 Trener Master, it was an all-metal, six-cylinder aircraft with the aforementioned retractable landing gear, which, like the Z-226T, was also very good in aerobatics (though not as good, being heavier) and could also be used for basic training of both civilian and military pilots, as well as for flying for fun or towing gliders.

The Czechoslovak People's Army ordered ten C-305s, a slightly modified military version of the civilian version, after good experience with the previous C-5, C-105 and C-205 versions. These aircraft, delivered in 1960, sported several minor changes. They had small signal lights on the undercarriage leg covers, illumination of the cockpit and flares dispenser with a small control panel in the cockpit. The undercarriage lights were not there to illuminate the surface during taxi, but to signal the undercarriage is down. As the C-305s had all the instruments needed

for night flying, future military pilots did so. A young pilot often had a full plate during his first night solos, even with such an easy-to-control aircraft the Trener was. So, the risk of forgetting to deploy the landing gear and subsequently bellying the aircraft was high. Two small lights therefore signaled to the observer on the ground the landing gear of the aircraft was down. In case no lights were visible a flare was fired to "wake up" the pilot, who either still had time to get the wheels down or he had not and then retracted the flaps, gave the full throttle and went for another try.

C-305s were also used for training Indonesian pilots in Czechoslovakia then nearly all of them were gradually handed over to Svazarm (organization for cooperation between civilian sector and army) from 1970. The aircraft with number 0610 was among the last to be handed over. This was done in September 1972 and the aircraft was assigned to the Kladno Aero Club and obtained the OK-OTE registration. It was one of the C-305s that were delivered to the army in simple aluminum overpaint instead of the more attractive green-blue metallic supplemented with blue and white stripes on the fuselage. And in this form the former 0610 began its civilian career. Not long afterwards, a cartoon of a cheerful crab was painted on the left side of the engine cowling. The painting was inspired by the well-known author of animal-themed cartoons, Pavel Kantorek. In addition, the front of the engine cover was painted blue while the

wing tips and the upper part of the vertical stabilizer were painted red. A little later, the undercarriage covers got black paint with two stripes (presumably white). Later still, as part of the overhaul, OK-OTE received a red paint job in standard Z-226, but it can't be said to have helped its appearance... In the end, however, it got the attractive metallic military coloring mentioned above. It was done in the Zbraslav Aero Club in 2008 after the aircraft was repaired from a previous accident. Today it is in the possession of the Military Historical Institute, unfortunately in a non-airworthy condition.

In 1972, however, it was still in good shape, albeit with one limitation: "OK-OTE was classified in Normal category and thus was not allowed to fly aerobatics. It was due to the collision with another C-305 in which it suffered major fuselage damage during its military career. Before it was modified for towing of gliders, we used it only for training day and night and for navigation flights," recalls Jasoň Kučera, a long-time member of the Kladno Aero Club.

On the boxart of kit No. 82183, made by Adam Tooby, an unspecified aeroclub member from Kladno is flying with OK-OTE over the beautiful landscape of the Křivoklát Protected Landscape Area. Apparently before the OK-OTE got the towing equipment, and also before the landscape below became the PLA Křivoklát...

Like dogs on chains

Text: Jan Bobek

Illustration: Piotr Forkasiewicz



The Battle of Britain is one of a long list of legendary milestones that defined World War Two, though it's the only one that played out exclusively in the air. Between August 8 and October 31, 1940, the Luftwaffe paid for the Battle of Britain with the loss of 221 Bf 110s, either destroyed outright or heavily damaged. Approximately four hundred of their airmen were either killed in action, captured, or seriously injured. German airmen including Bf 110 and bomber crews claimed 2,169 victories.

The RAF experienced Bf 110 crews created a defensive circle (Abwehrkreis), but this was not always a strictly defensive manoeuvre. Bf 110 airmen often used it as a decoy to attract the attention of the enemy and allow their bomber colleagues to escape.

However, if a Bf 110 crew had the freedom to choose the tactical situation, the advantages of their aircraft could be used with great success against Spitfires and Hurricanes, such as concentrated firepower, long range, better initial acceleration in a dive, better rate of climb and a higher operational altitude.

But when Bf 110 crews were forced to provide direct escort to the bombers, they could get into trouble because of the lower speed of bombers. If they wished to retain their speed advantage, the German fighters were forced to manoeuvre around the bomber formation. In a way, they were like dogs on a chain. This was the situation that RAF fighters observed when defending against the air raid of September 3, 1940, re-created in artwork

by Piotr Forkasiewicz. The Luftwaffe sent 73 bombers escorted by nearly 500 fighters to the targets near London. The bombers were divided into several groups. A formation of thirty Do 17s from II./KG 2 hit the North Weald airfield, escorted by Bf 110s from I./ZG 2 and III./ZG 26 and Bf 109s from JG 26.

On departure, the Germans got into a dogfight with Hurricanes from No. 17 Sqn RAF and Czechoslovak No. 310 Sq as well as Spitfires from No. 19, 54 and 222 Sqn RAF. A total of five Bf 110s from I./ZG 2 went down. Off the English coast, I./ZG 26 joined the defence. One Bf 110 was lost by I./ZG 26 another one by II./ZG 26 (plus one damaged) and two had to be written off by III./ZG 26.

Al Deere of No. 54 Sqn RAF was trying to get into a firing position behind one Bf 110 of ZG 26 when his target was unexpectedly attacked by Colin Gray in a vertical dive. To Deere's surprise and considerable displeasure, the enemy aircraft burst into flames under the fire of his colleague. He had to admit, however, that Gray had performed an incredible feat of marksmanship. But to boost the artillery men's morale the victory was eventually credited to the AA unit, to the chagrin of all the airmen.

The Germans lost only one Dornier 17. The Bf 110s crews scored some 20 victories and, according to British records, can be credited with about nine RAF fighters shot down and seven damaged. Five RAF pilots were killed and six suffered injuries. Although the Bf 110 were chained to the bombers like dogs, they

could bite to death. The machine "3U+GT", which is depicted in Piotr's artwork, belonged to 9./ZG 26 that emerged successfully from the battle. Two Spitfires were claimed by Ofhr. Luger, one Spitfire and one Hurricane were claimed by Lt. Sidow while Lt. Grisslich and Ofw. Hott each shot down a Spitfire. The crew of the badly damaged "3U+GT" made an emergency landing at Wissant without injury, but their machine had to be written off.

How successful was the Bf 110 in the role of fighter in the Battle of Britain? There are well documented victories and losses of Spitfire, Hurricane and Bf 109 units, giving their kill/loss ratios as 1.7, 1.2 and 1.5 respectively. The Bf 110 units are a bit enigmatic due to missing detailed records about their victories. Only 216 aerial victories are documented in detail between August 8 and October 31, 1940. However, this figure is based on records of only three Zerstörergruppen, while details of four others are completely missing!

However, from the data of the higher Luftwaffe command, it is known that during the abovementioned period, Bf 110 and bomber crews claimed almost 600 victories. If we accept the estimate that 75 % of this figure was achieved by Bf 110 airmen, then we get an unexpected champion of the Battle of Britain. The kill/loss ratio for the Bf 110 would be 2! Despite this achievement, the battle ended with the first German failure since the beginning of the war.

Green Hearts Umbrella

Text: Andrey Dikov
Illustration: Marek Ryś



On February 11, 1943, with the help of Soviet aviation units, the Soviet 55th Army of Leningrad Front continued its offensive as a part of the "Polar Star" operation against German Army Group Nord. So the fighters of JG 54 created an "umbrella" over the German ground units to prevent raids by groups of Soviet ground attack aircraft. The following description covers only one hour of fighting over the front.

One of the Shturmovik groups consisted of four Il-2s of 57. ShAP KBF led by St. Lt. V. Soldatov escorted by Kpt. A. Baturin's five I-153s 71. IAP KBF approached the frontline around 11:35 and was reportedly intercepted by more than 10 Fw 190 and Bf 109 fighters. Soviet biplanes were tied in air combat and set up a defensive circle, but despite all the combat instructions demanding Il-2 leaders to keep with their fighter escort, the Shturmovik group continued its way along the route Popovka-Nikolskoye seeking for targets. As a result, all were lost.

They were attacked by several 2./JG 54 Fw 190s. Apparently the Shturmoviks, most of which were one-seaters without gunners, decided to split and try to reach Soviet lines in two pairs. Those two who turned right were attacked by Oblt. H. Götz (claims at 11:33 and 11:40) and Fw. H-J. Kroshinski (11:35), while the left pair was shot down by Lt. A. Mack (11:38) and Fw. Otto Kittel (11:42). It is supposed the first aircraft downed was a wingman's one-seater with board number 41 piloted by young Sgt. Pavel Myakinkiy. The others were one-

seaters No. 33 and No. 39 of deputy squadron commander Soldatov (credited with some 15 combat sorties) and Stn. A. Litvinov (2 sorties) and two-seater No. 35.

As it was discovered after the war, Myakinkiy managed to survive the crash-landing and made his way to the frontline. In the forest he met another Soviet pilot with a broken leg. By night they plodded to Pustyn'ka railway station and Pavel tried to find a rest in the house of locals. Unfortunately, the house he knocked to was occupied by German station guards and he was killed by a hand-grenade in the following skirmish. His wounded friend was found in a haystack nearby and beaten to death with rifle butts. Locals found Pavel's documents as well as pilot's wife letter addressed to "Mikhail" and buried the aviators. Then JG 54 attacked another group of four Il-2s of 57. ShAP KBF led by ML. Lt. P. Morozov escorted by three Yak-7s, one Yak-1 of Maj. G. Romanov and four I-16 of Lt. A. Lomakin of 21. IAP KBF. The Shturmoviks arrived on the battle scene at 11:45 and had time to make their first strafing attack against targets in Nikolskoye. On their second run they were reportedly attacked by two Fw 190s and eight Bf 109s coming from the side and at first glance Soviet pilots thought those were also Soviet aircraft. But they were obviously 1./JG 54's Fw 190s of Lt. H. Adameit and Uffz. R. Raupach accompanied by 4./JG 54's Bf 109s. The Yaks were involved in battle with the Bf 109s resulting in two apparently unsubstantiated claims, while Germans claimed "LaGG-3". Yaks

later joined the surviving Il-2 group north of Neva river, without losses and escorted them safely to Grazhdanka airfield. Before that the Fw 190s had managed to make several attacks, damaging two Shturmoviks and claiming three.

A Group of two Il-2s of 943. ShAP led by Maj. Mikhail Vasilyev escorted by two Yak-1s of 14. GIAP and two P-40s of 196. IAP led by St. Lt. A. Slipchenko had failed to fulfil its task and returned to base. Behind the enemy lines near Zakhozhye the wingman rammed his leader and Vasilyev went missing. Most probably, this is the unknown pilot with a broken leg killed together with Myakinkiy. On the way back home the Shturmovik fighter escort was attacked at 11:50 by lone Messerschmitt without result.

As result of the day the Luftwaffe fighters claimed 19 Soviet aircraft shot down on Leningrad front, including 8 Il-2, 4 P-40, a P-39, 4 LaGG-3, one MiG-3 and one La-5. Two Fw 190 and one Bf 109 were shot down by fighters, one Ju 87 and one Bf 110 by ground fire. On the other hand, Soviet 13th Air Army and subordinated navy units lost 4 Il-2, 1 La-5, 1 P-40 and 1 MiG-3 shot down in air combats, one more MiG-3 made a forced landing on airfield and 2 Il-2 were damaged. One Il-2 was lost due to aerial collision and another one shot by Flak. Meanwhile the Soviet pilots claimed 16 German aircraft shot down, including 6 Fw 190, 5 Bf 109, 4 Ju 87, a Ju 88 plus a Ju 87 and one Bf 109 claimed by AA units.

Fatal mistake

Text: Richard Plos
Illustration: Adam Tooby



At the end of the war, the Me 262 jets pushed the boundary of flight performance above the level of all fighters of the time. Yet they were not invincible. In addition to the faulty deployment and the technical problems, surprise or disadvantageous position at the enemy encounter often dealt them a fatal blow. But the biggest trouble was the landing approach, during which the Schwalbe was most vulnerable. In any case, shooting down a jet was something special for any Allied fighter and by the end of the war, a good number of them had this valuable scalp to their credit.

One of the former pilots of the Me 262, Hubert Lange, said that the most dangerous opponent in his opinion was the Hawker Tempest. "It was extremely fast at low altitudes, very agile and heavily armed," the German pilot recalled. Some Me 262s fell victim to a tactic known in No. 135 Wing as the "Rat Scramble". In this scenario the scramble Tempests stood at the runway of the B-80 Volkel Air Base waiting for the notice about Me 262 in the air. Then they took off immediately, but the pilots made no attempt to engage the German jets. They instead headed straight for Rheine-Hopsten airfield where the Me 262 and Ar 234 were based. The aim was to attack the jets during their approach to land, when they were flying slowly with flaps deployed, so they were unable to accelerate. The German response to this tactic was a strong air defense system with more than 500

Anti-Aircraft batteries including over 150 four-barrel 20mm Flakvierling batteries specifically protecting the landing approach area. After seven Tempests were lost to flak fire at Hopsten within a week, the Rat Scramble tactic was abandoned.

On November 3, 1944, however, W/Cdr John B. Wray, commander of No. 122 Wing, was not in the air to hunt rats. He was up for an "air test" with his personal Tempest coded JBW. At the same time, he was going to try out the new anti-glare goggles. At 18,000 ft (5,500 m), he saw two Me 262s about 2,000 ft (700 m) below. They were not at their top speed, but spotting him, they turned tail. Wray dived on the nearest one and opened fire at 300 yards. Several 20 mm shells hit their target, which flipped onto its back and dived vertically into the cloud. Wray claimed it as a "probable" but was only credited with a "damaged". But as post-war records revealed, this Schwalbe did not actually survive his attack.

More than a month later, on December 17, Wray took off again from Volkel Base and was steered by No. 83 Group Control Center to Weert, where several jets had been spotted. Shortly after he turned his Tempest at an altitude of just 2,500 ft (760 m) to the south, he saw a pair of Me 262s crossing his path, flying westwards. He began to pursue the leader of the pair while his wingman focused on the other Schwalbe. Although both were on full throttle, using maximum power of their Napier Sabre engines, the

Me 262s were pulling away from them, gently descending. Neither of the men in the cockpits of the Tempests could have done anything about it had it not been for a surprising reversal. For some reason, the pilot of the leading Schwalbe decided to turn left and continued until he was heading east. This put him directly in front of Wray's guns.

It was perhaps only at that moment that the German pilot realized what a mistake he had made and began to maneuver wildly at low level. This was his second mistake, because instead of using full power to increase the distance between himself and the dangerous Tempest, he thus continued to lose his speed advantage and probably also lost sight of his surroundings, he subsequently hit a building with the wing and only a few seconds later crashed into the waters of the nearby Rhine. The moment just before the fatal collision with the building was captured by Adam Tooby on his boxart. We may never know why the pilot of the Me 262 made the unfortunate maneuver that put him in a very awkward position. He may not have known about the Tempest pair before. In any case, he was one of the twelve confirmed Me 262s lost in combat with the Tempests, sixteen more being acknowledged as damaged by the Allied pilots of these mighty fighters.

The Breakpoint

Text: Richard Plos

Illustration: Kateřina Borecká



"Canopy, oxygen, KAP, ARK, SRO, battery, gyro, landing gear ..." The instructor listens to the pre-flight check by the student pilot in the front cockpit. A few seconds later, the student moves the thrust lever forward, revs the RD-45 engine to 11,560 rpm, releases the brakes and heads out for his examination flight. Unless he screws up, he's in for his desired first solo flight ... "Watch the heading," comes the instructor's calm voice over the headset as the nose lifts. "He's really got a good memory," flashes through the student's mind as the main gear wheels leave the concrete runway. He screwed up one of his first take offs as he got a little bit off the heading of the runway and immediately got a telling off from the instructor. So far today, though, it's looking good. He's raising the landing gear, retracts flaps and takes the engine revs down to 10,800 rpm. An eye on the exhaust gas temperature: 680°C. That's good. Feeling like everything's going like clockwork, he sets course towards the training zone...

The year 1951 marked a major breakpoint for the Czechoslovak Air Force. After a period in which a handful of pilots had become familiar with the S-92, i.e., the Me 262, or with the early designs of Soviet jets as the Yak-17 and Yak-23, the wheels of first MiG-15s touched the runway of Mladá airbase in May. The qualitative leap from the madcap and unreliable propeller-driven Avia S-199s to the best jet available at the time was enormous. Moreover, Czechoslovakia

was the first country to obtain the rights to license production of the MiG-15. A licensing agreement was signed on April 17, 1951. The first ten MiG-15s were however assembled from parts shipped from the USSR, and the first of these took to the air on November 6, 1951. As early as May, however, the Air Force took delivery of six single-seat MiG-15s which flew in directly from the USSR. In July, they were supplemented by four two-seaters UTI MiG-15s, delivered in crates. All these aircraft were intended for the No. 5 Fighter Squadron based at Mladá airbase. It was the only unit in Czechoslovakia to use the S-92/CS-92 (Me 262) and S-101 (Yak-23) jets. This unit was transformed into the Air Force Jet Training Center (PVSL) on June 1, 1951 and Lt. Col. Jaroslav Týkal, later Czechoslovak Air Force commander, led it for the first two months.

The Center first task was to retrain the personnel of the entire 3 Air Division, which command was subsequently taken over by Lt. Col. Týkal. Since then, the UTI MiG-15s were in constant use and their need grew as the number of pilots of this type was increasing. However, the Czechoslovakian production started only in 1954, until then the aircraft used for training and conversions were delivered directly from the USSR. A total of 3,454 MiG-15s rolled off the Czechoslovak production lines, and the UTI trainer was by far the most numerous of the variants produced. By 1961, 2013 of them had been produced, most of them were exported. Only

155 were destined for the Czechoslovak Air Force, where they ended their service on April 1, 1983, with the 4th Squadron, of 1 Fighter Air Regiment based in České Budějovice. At that time, the unit's inventory included two UTI MiG-15s, Nos. 2311 and 2470.

The aircraft No. 2463 depicted in the painting by Kateřina Borecká, started its service in 1957 at 15 Fighter Air Regiment based in Žatec. In 1970 it underwent repairs at the Kbely Aviation Maintenance Center (LOK) and was assigned to 6 Fighter-Bomber air Regiment in Přerov. Its service ended with 30 Fighter-Bomber air Regiment in Hradec Králové at the beginning of 1983.

... A hand on the throttle pulled it back to speed down to below 400 km/h, the maximum for flaps and landing gear deployment. But there was still time for it. First, he had to obtain clearance to enter the airfield traffic pattern, then to adjust the altitude and lower the speed even more. "Slow down descending," comes the instructor's voice in the headset, but more just for saying something at last, as there wasn't a single comment from the back cockpit during the whole time of maneuvering in the training zone. On the final approach, everything looked fine and after the landing gear wheels touched the runway smoothly, he knew, he'd done it. "Are you afraid?" the instructor snapped at him, barely out of the cockpit. "N... no, Captain," the student pilot replied in surprise. "Okay, so scat and prepare yourself for solo flight!"



PART 2

ADHESIVES

Text: Josef Blažek

Instant, Epoxy and Dispersion Adhesives

To continue our discussion on modelling chemistry and tips for beginners (and maybe advanced modellers will find out something new, too), we will look at more types of adhesives that are commonly used in the hobby.

We will then focus on cyanoacrylate (CA) glues, their accessories, epoxy adhesives and dispersive type glues. We will discuss their differences and their composition, how they work, and their properties that make them suitable for different situations. We'll demonstrate specific glue types, with products from Bolt due to their wide range of products and popularity among modellers. However, the characteristics we will be discussing are applicable to products from other manufacturers as well.

CYANOACRYLATE GLUES

These are also known as instant glue and often shortened to CA, and as the name implies, these are rapid curing systems that harden on contact with the bonding surfaces. Practical applications of these types of adhesives are far and wide, to include such materials as plastics, glass, metal, fabric, paper and wood. Bonded materials can be dissimilar. They can easily be obtained from hardware and hobby stores

and pretty much any place that caters to the handyman. To begin, we'll discuss the principle on which these glues work. They are based on an unstable compound, which in this case is ethyl cyanoacrylate. The compound reacts with water (or moisture in the air) to quickly harden. To get a little more technical, the chemical reaction with water leads to reactive sites at the end of the molecular chains. These reactive sites then connect to each other under the influence of the ongoing reaction, which leads to the formation of a dense network of interconnected molecules. This process is actually visible to the naked eye. If there is a sufficient quantity of the glue applied, the gradual hardening can be observed until the adhesives has hardened as a whole. On the contrary, if we spread a small amount of glue, the whole process of gradual solidification is extremely dynamic, which is caused by the rapid penetration of moisture from the air (that is, water) into the glue. This penetration of moisture into the glue fundamentally affects the speed of setting, which, from a modeler's

perspective, explains why open containers of glue gradually set (moisture penetrates the glue after initial opening and consequent initiation of the reaction).

STORAGE AND SHELF LIFE OF CA GLUES

There are a lot of myths in the modelling community about how to store and how not to store instant glues in order to extend their life. Unopened adhesives have an extended shelf life due to the protective gas filling, but this does not mean that their shelf life is infinite. In general, higher storage temperature, higher exposure to UV radiation (light) and higher humidity always have negative effects on the overall life of cyanoacrylate adhesives. To give a specific example illustrating the idea of the dynamics of the shortening of the shelf life, when storing instant glues at an ambient temperature of about 30 degrees Celsius, the shelf life will be shortened by some 60 to



JOSEF BLAŽEK

Vítěz mezinárodních IPMS soutěží v kategorii Master a několikanásobný mistr ČR. Autor článků v mezinárodních časopisech s celosvětovým dosahem (Military Illustrated Modeller, Cocardes International, ModellFan, Modelář). Spoluautor modelářského startupu Plastic Invasion.

Foto: autor

70%, which is a relevant decrease of the overall usability of the product. It follows that the ideal storage environment is dry, cool and dark. You have a refrigerator or a freezer, as does every household, and this is ideal for storing CA. To the contrary, these recommendations do not apply after opening the glue container and exposing the contents to the local environment. Storing opened adhesives in the refrigerator or freezer in order to extend their life is a pure myth. The aforementioned locations provide high levels of moisture, relatively speaking, which within the conditions of the way the glues work, impact the shelf life of the material negatively. On opening, the container with the glue loses its protective gas layer, and the moisture can now directly activate the chemical reaction of the adhesive. One way to combat this might be to store the containers in plastic Tupperware with sealable lids that will restrict the amount of moisture getting to the glue, and combine this with storage in a cool, dry dark place. But in the case of storing the container in a sealable containers, it is necessary to consider the unavoidable rise in the glues temperature to that of the local environment. The shelf life of the glue can be extended, but the gradual thickening of the liquid is unstoppable. With this in mind, it makes sense that the size of the package and quantity of glue that it contains, are a factor corresponding to shelf life. The modeller should acquire bottles of CA that they can use in the course of a couple of months after first opening it. It is also important to store the glue away from other materials, especially those that act as activators. The glues are generally compatible with one another, so that if one bottle of CA becomes thick, it can be thinned with thinner stuff to achieve a compromised viscosity that is acceptable to the user.

After opening the adhesive, its lifespan in the above-mentioned storage in the freezer or refrigerator will be quite variable, depending on the quality of the seal and exposure to moisture. However, if after opening, the glue is stored in a typical modelling room at a temperature between 18 and 20 degrees Celsius and always closed tight after use, a shelf life of about three months can be expected.

CYANOACRYLATE GLUE VAPORS

After the application of cyanoacrylate adhesives and their subsequent hardening, effects of the inevitable vapors can often be seen, which resemble frost. Such evaporation has negative effects when it is released into difficult to reach places on the model, such as the inner parts of the canopy, especially when they are displayed closed. Why does this phenomenon arise and can it be eliminated or reduced? During the hardening of the glue, the natural and gradual evaporation of ethyl cyanoacrylate and its reaction with humidity occur. These vapors thus harden as a result of

Storage Medium	Temperature	Resulting Shelf Life
Freezer	-18 °C	2 Years
Fridge	4 °C	1 Year
Indoors	18–20 °C	6 months

the reaction, which results in the formation of micro particles of hardened instant glue. A larger amount of these hardened micro particles settle in the vicinity of the applied glue and the frosting effect becomes obvious. There are some options to minimize or optically eliminate this phenomenon. It is easiest to use only a small amount of glue to minimize the fumes. Another option is the use of special alkoxyacrylates, which have a reduced evaporation rate. In general, it is good to avoid closing the area where we apply the CA adhesives early, so that there is room for evaporation. When drying, it is a good idea to rotate the parts resulting with the glue at the top, to allow vapors to escape into space and prevent them from spreading over the surface of the model, which would happen when they are turned over and the fumes have access to them as they escape. Since the release of vapors can occur even after some time, the entire glued joint can be sealed against vapor release by applying an overcoat, which ensures coverage of the release adhesive even after it has hardened and thus minimizes negative effects on the model. Despite all our efforts, however, a situation may arise when unwanted vapor escape occurs and we are forced to remove these negative consequences of CA use. In most cases, it is sufficient to clean the affected areas with a dry brush or cotton swab (on clear parts). Alternatively, you can use the thinner embedded in the surface, which, however, must not dilute the base color of the given parts.

BASIC TIPS FOR CYANOACRYLATE GLUES AND THEIR USE ACCORDING TO COMPOSITION AND VISCOSITY

A large number of cyanoacrylate adhesives from various manufacturers are available on the market today. As was mentioned at the beginning of today's chemistry class, for the sake of clarity between the basic types, we will focus on Bolt brand products. At the same time, the described properties and use can be freely applied to various products of other manufacturers with the same or similar consistency and composition.

BOLT! CA BOLT THIN

The classic representative among cyanoacrylate adhesives are the thin variety, which are the most accessible type of CA in terms of their consistency. Their use is very universal and they represent the ideal 'entry' type for working with instant



glues. They can be applied in the usual way, i.e. by applying them to one or both glued parts, which are then pressed together. Alternatively, the procedure where the parts are pressed together and the glue is applied along the joint can also be used. Here, however, it is necessary to maintain a gap between the parts to provide the glue someplace to wick into. The minimum size of such a gap depends on the viscosity of the thin instant glue, but in general it needs to be at least around 0.03 mm, which in modelling practice is quite small. Thin instant adhesives are especially suitable for gluing non-porous materials, and wood and paper should generally be avoided, where the glue will quickly soak into the material, causing insufficient amounts of CA in the joint its subsequent instability and fragility. The reaction time of thin second glues is generally very short and varies between 1-3 seconds, which restricts the possibility moving and manipulating glued parts.

CA HOT BOLT ULTRA THIN

The follow-up type to thin instant adhesives is the so-called 'super fast' adhesives with an accelerated reaction time. Their application differs from regular thin glues in that it becomes impossible to apply them to the abutting surfaces of the parts and then pressing them together, because during the necessary handling, the glue reacts with the surrounding environment and hardens virtually immediately. So, super fast instant glues need to be used by applying drops at points



of contact of the target components, which can be used to advantage, for example, in the joints between main parts of the model. Complete curing of the applied glue is generally within one second of application. Thanks to the speed of curing, the disadvantage of using the adhesive in porous materials is eliminated, since the adhesive sets up faster, before it is absorbed into the surface and thus remains in the glued joint, which ensures the required strength of the joint. For the sake of completeness, it is good to mention that the presented representative of super fast instant glues is not interchangeable with other types of cyanoacrylate glues.



CA BOLT MEDIUM

Secondary adhesives of medium viscosity are very versatile in their use. This type of glue is suitable for most materials (even porous ones) and can be used for most common situations encountered when assembling plastic models and their accessory, dissimilar items. Their application is possible in one of two ways, as in the case of thin instant adhesives. They can be applied to one or both bonding surfaces, which are then pressed together. The reaction time is longer compared to thin glues and varies between 5 and 15 seconds. This extended curing interval gives us the possibility of subsequent manipulation and correction of part positions. This can be used to great advantage when gluing more complex or larger units, where it may be necessary to achieve optimal alignment. The second typical method of application is the drip method, which, however, due to the thicker consistency of the glue compared to thin glues, requires a gap of increased size to a minimum of 0.1 mm. However, its viscosity is of a universal consistency that can be mixed with both thin and thick types of instant glues.

CA BOLT THICK

Thick cyanoacrylate adhesives (often described as gel types) are characterized by having the highest viscosity of the discussed basic types of CA adhesives. This property allows them to



be used effectively in the case of gluing porous materials and at the same time the possibility of joining glued surfaces with a greater clearance of up to 0.5 mm. When gluing parts with greater clearance, the curing time of the glue is significantly extended and can be sped up using accelerators, which will be discussed in the next part of this article. Thick CA adhesives are best applied in the classic way, where they are applied to one or both mating surfaces, and then the components are pressed together. As already indicated, the total reaction time is significantly longer, which carries with it the added bonus of manipulation time and fine adjustments. The use of thick instant adhesives is very suitable for small parts, when after applying the glue to point(s) of contact, time is allowed for a clean and precise connection. Due to their composition, this class of adhesive is normally mixable with thinner types (medium and thin adhesives). A longer curing time is associated with the negative impact stemming from a greater amount of fumes visible emanating from the area of glue application. These vapors, which we have already described, can be produced for a long time with this type of glue, and it is advisable to take this manifestation into account during future assembly steps, especially with regard to clear parts of the model.



CA BLACK BOLT

It's been a few years since the modelling world was hit by the phenomenon of the so-called 'black instant glues', which sand very well. In most cases, it is not an admixture of a special miracle ingredient or black pigment, but the addition of rubber (if its presence is desired) to the glue. This special type of cyanoacrylate adhesives stands out, in addition to its visibility on most common surfaces, due to its elasticity. It is therefore

particularly suitable for flexible materials, which are very rare in plastic modelling. Examples of such materials include the aforementioned rubber parts, softened and foamed plastics or composite materials, and several others. In general, these are joints where it is claimed that the flexibility of the glued materials and the durability of the glued joint under stress are maintained. Such connections are not typical for static plastic modelling and the use of such special glues is not generally of any great advantage to plastic modellers.

SPECIALIZED ACCESSORY ITEMS FOR CA ADHESIVES

Since the mere application of cyanoacrylate adhesives and subsequent gluing is often not enough for the ideal desired results, there are special accessories for working with instant adhesives. The basic products are accelerators and, conversely, debonders of already hardened glue. The following takes a closer look at these.

BOLT UP Accelerator



Accelerators are used for instant or very fast curing of CA adhesives, even in thick layers. They have a thin consistency and their application is via a swab, wire tip, dispersal sprayer or a brush. The reaction speed on contact with the glue is almost immediate, which is appreciated when there is a need to quickly cure a large amount of glue between parts with visible clearance or when the glued surfaces are compressed under ambient stress. Immediate bonding of the contact surfaces between the parts is achieved, and the need to further manually press the parts together becomes no longer necessary. When choosing an activator, it is good to pay attention to the suitability of its use on plastic parts.

BOLT OFF Debonder

In modelling practice, it is almost impossible to always achieve gluing of parts without unwanted and visible traces of glue around the application. Furthermore, incorrect positioning of the parts can lead to a need to separate the attached parts

and start over. All these cases can be solved with the help of cyanoacrylate adhesive removers. Simply applying this liquid to the glued joint will, over a few dozen seconds, help to separate wrongly adhered parts, but it is always better to take an active approach to cleaning and ungluing parts and removing the glue using a debonder. Probably the most suitable tool for cleaning parts from cyanoacrylate glue is the use of cotton swabs dipped in the remover. Traces of the glue

are removed by gently rubbing the area with a moistened swab until we are satisfied with the appearance of the fixed area. Since the glue dissolves under the cotton swab and clogs the cotton tip, depending on the extent and amount of glue to be removed, it is advisable to use several applications with clean swabs, as required. For areas that are difficult to access or areas with a broken surface, it is appropriate to use fine brushes, that have been relegated specifically for this purpose after serving out their usefulness as paint applicators. Inexpensive brushes from art supply stores or hobby shops will suffice for these needs. When choosing a cyanoacrylate adhesive remover, or debonder, it is good to check to make sure that the type doesn't etch the plastic of the model, as some will.

EPOXY TYPE ADHESIVES

Epoxy glues, which consist of two components, are also included among the glues that are commonly found in plastic modelling. The principle and application of this class of adhesive is very simple. After mixing both components in the specified ratio, usually one to one, a chemical reaction occurs, the observable start of which begins after a few dozen seconds. Subsequently, the mixed components harden very quickly. Epoxy glues are especially suitable for hard materials, which underlines the suitability of their use in plastic modelling. Their biggest advantage is that after curing, they do not leave visible traces in the form of fume production in their local vicinity, as in the case of instant glues, and are thus a big help when gluing larger models, especially if they are made of a polyurethane or laminate. Such types of models cannot be glued with solvent type glues, which we detailed in the first part of this article, and epoxy two-part glues are a suitable alternative for gluing together large surfaces and eliminating the shortcomings of cyanoacrylate glues. Another good use of these types of adhesives is joint reinforcement along invisible join lines, allowing any required thinning of plastic parts in preparation for the installation

of aftermarket accessory sets. A general shortcoming is their apparent softness compared to hard cyanoacrylate joints, and therefore they are sanded poorly. Currently, there are already special two-component epoxy adhesives with additional additives on the market that can minimize these shortcomings.

DISPERSION TYPE ADHESIVES

As in the previous cases, we will explain what dispersion adhesives are and what they are suitable for in plastic modelling. A common mistake in the definition of dispersion adhesives is that they are a solution consisting of a polymer in water. In fact, it is a mixture of polymer with water, whereby the aforementioned polymer is not dissolved, but only perfectly dispersed in the resulting emulsion. Dispersion adhesives have a milky white color that gradually fades to clear as it hardens. The white color is therefore not caused by any pigment, but by small polymer particles that scatter light and create that 'milky effect'. Many dispersion adhesives can be diluted as needed with water (non-waterproof dispersion adhesives such as those produced by Herkules) and thus create a liquid that can be embedded into porous surfaces to attach individual details. A typical example is the simulation of natural surfaces in the creation of dioramas. The opposite is the case of dispersion water-resistant adhesives, which have a substantially higher dry matter content of the polymer and are therefore not as thin as adhesives that can be diluted with water. Dilution of these adhesives is only possible to a small amount, to some 5% and always only with distilled cold water; otherwise precipitates will form. At the same time, if we let such diluted glue stand, the water will begin to separate. A higher dry matter content of the polymer then means a higher strength of the joints, and the adhesives thus have up to 3 times greater strength (as in the case of, for example, Herkules vs. PERFECT G Express). Another difference compared to glues with a lower dry matter content is their hardness and the possibility of sanding the hardened glue. If we use glues with a lower content of polymer solids, when trying to sand, the glue starts to chew up because it is soft. On the other hand, dispersion adhesives with a higher proportion of polymer solids are significantly harder after curing and can be sanded. Here, however, it is important to note that it is better to use coarser/sharper sandpapers and to minimize friction, because high friction creates a higher temperature, which causes the glue to soften after setting, despite its high percentage of polymer solids (i.e. D3/D4-based glue).

PERFECT G Express glue

An example of dispersion PVAC glues is Bolt Perfect G Express. The specific properties of this glue make it suitable for porous materials such as wood or paper, and it is therefore useful mainly for



the needs of creating dioramas or for attaching accessories to models of combat equipment. The benefit of this type of glue is mainly the shortened curing time compared to classic dispersion glues (for example Herkules, Tamiya Craft Bond, etc.), which enables accelerated creation and thus saves invested time. Specifically, the complete drying time is between 5-15 minutes, depending on the amount of glue and the extent of the glued joint. As with other dispersions, the glue is white in its liquid state and clear after curing. The high dry matter polymer content of the in this type of glue means above all the ability of the glued joint to be stronger. Such a property is suitable for the use of gluing clear parts on aircraft models. The glue is thus a good compromise for those who are afraid of damaging clear parts when gluing them with solvent glues or, on the other hand, are afraid of the fumes that are released from cyanoacrylate glues. Gluing with a dispersion adhesive is not as strong as compared to the mentioned types of adhesives, but if we choose a suitable dispersion adhesive with a higher polymer dry matter content, we will also achieve good bond strength.

SUMMARY

In the first two parts of our series focusing on modelling chemistry and tips for beginners and advanced modellers alike, we presented the basic, readily available and commonly used types of glues that can be used for plastic modelling. All the mentioned types described in the first and second parts of our series have their strengths and weaknesses, and the use of all the mentioned types of glues gives the plastic modeller the ability to deal with constructing all conceivable assemblies from various materials that they might come up against. In the next part, we will focus on tools and aids suitable for applying and working with the types of glue presented thus far.

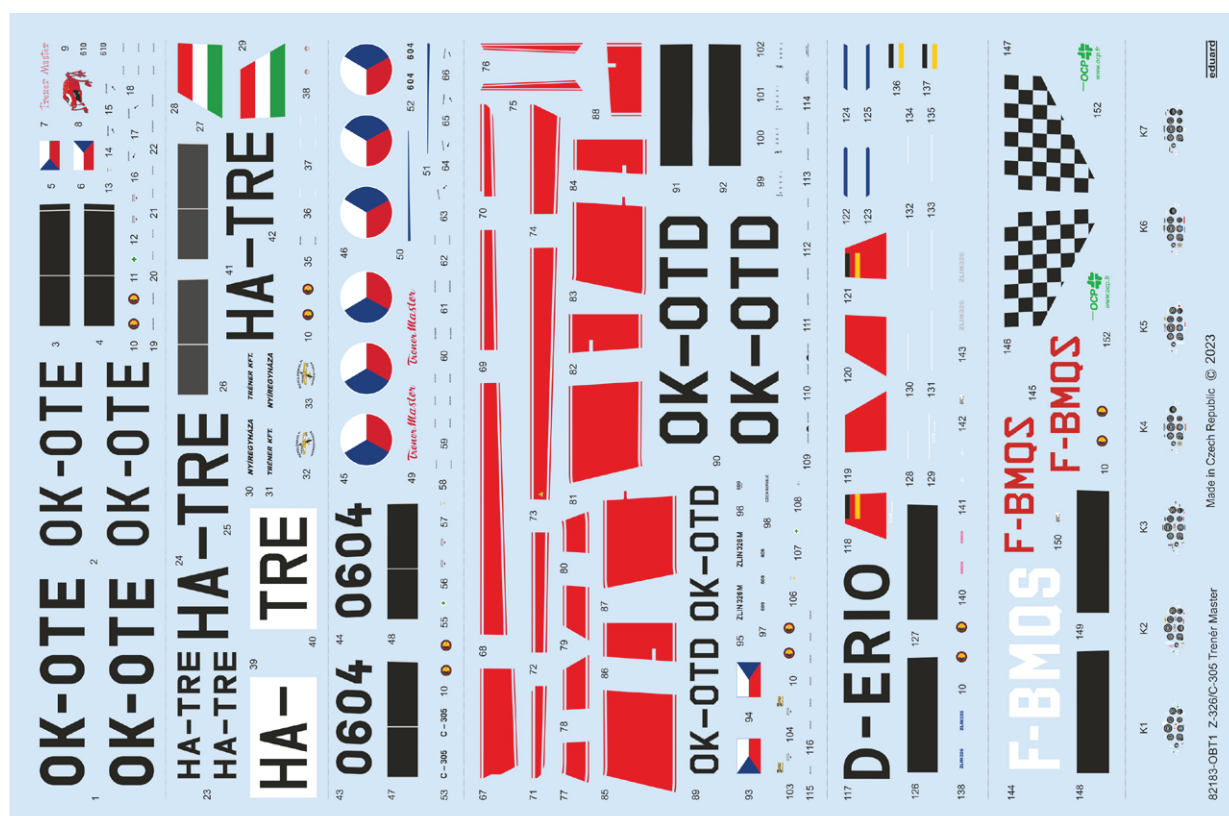
Z-326/C-305 Trenér Master

1/48

#82183

ProfiPACK edition kit of Czechoslovak single engine two-seat trainer and aerobatic aircraft Zlín Z-326 Trenér Master including C-305, Z-326M and Z-326MF versions in 1/48 scale. Kit presents markings selection including Czechoslovak, Czech and foreign users.

- plastic parts: Eduard
- marking options: 6
- decals: Eduard
- PE parts: yes, pre-painted
- painting mask: yes
- resin parts: no

[Product page](#)


■ Z-326, No. 610, Kladno Aero Club, Kladno Airfield, Czechoslovakia, 1975



This aircraft served as C-305 in the military aeroclub of Czechoslovak People's Army for basic training of student pilots. During this service an unspecified collision (on the ground) with other aircraft occurred according to some sources, resulting in fuselage damage. The aircraft was repaired but lost its aerobatic category classification and was overhanded to the civilian

Kladno Aero Club at the end of September 1972. Prior to conversion to the tug version, it was used for training and navigation flights. The aircraft retained the overall silver livery as it was used in army, but the nose was adorned with blue color, while wingtips and top of the vertical stabilizer were painted red. More to it, the cartoon of the smiling crab was painted on

the port side of the nose with unusually stylized Trenér Master inscription above it. The painting was based on a cartoon by Pavel Kantorek, Czechoslovak professor of physical science at Ryerson University, Toronto. He was author of many humorous cartoons with animals starring in the main role.

■ Z-326MF, No. 918, Repülőiskola Nyíregyháza, Nyíregyháza Airport, Hungaria, 2020



Hungaria is one of the countries, where the Trenér family is very popular. There were 12 of Z-326 Trenér Masters delivered directly from the factory in 1961 and 1962, but this one is not one of them. This aircraft was sold to Gabon (Air service Libreville) in December 1966 with registration

mark TR-LMX and later was delivered to France, where it was flying under registration F-BSTA as Z-326. The conversion to MF version was done in Hungary and the aircraft sported non-standard right engine cover – the one used on Z-326 powered by Walter Minor 6-III engine, i.e.,

with four wide louvers. This was later changed for the standard cover for the M-137 engine. Today, the University of Nyíregyháza is the owner of the aircraft and uses it along other ones for pilot training of its students.

■ C-305, No. 604, Czechoslovak People's Army, Czechoslovakia, 1965

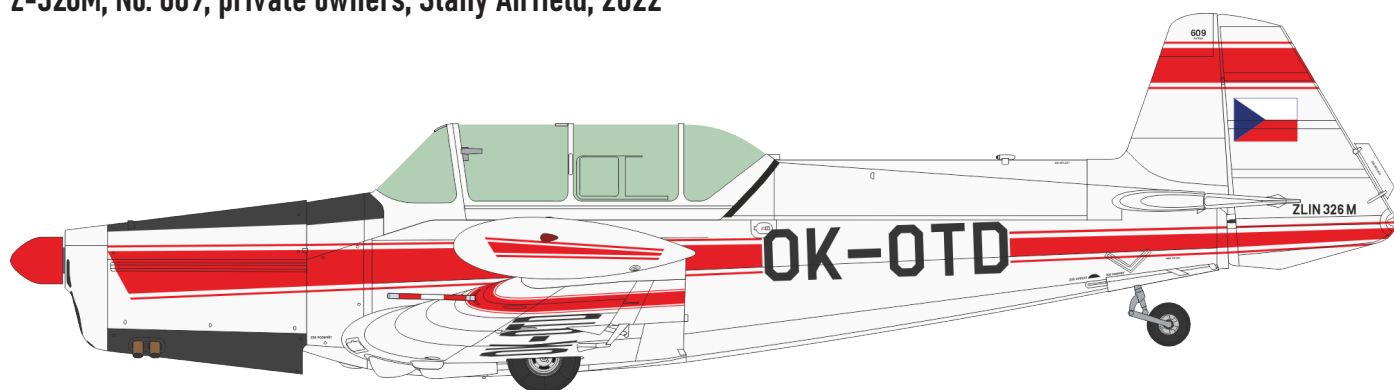


Czechoslovak People's Army obtained ten Z-326 in military version C-305. These aircraft varied only slightly from the civilian ones, as they were equipped with small indication lights on the undercarriage leg covers and with the signal rockets dispenser under the belly with corresponding control panel in the cockpit. These

served for basic pilot training in Military Aero Clubs, where young beginners were starting their career of military pilots prior to enlisting. Some aircraft were flying in simple silver livery, other obtained attractive three-tone coloring with metallic light blue-green as a basic one. This aircraft was handed over to civilian Aero Clubs

representative (Svazarm organization) on May 8, 1968 and was assigned to Vrchlabí Aero Club consequently. Later it was transferred to Olomouc Aero Club and finally to nearby Prostějov Aero Club, where it is flying with OK-OTA registration today.

■ Z-326M, No. 609, private owners, Slaný Airfield, 2022

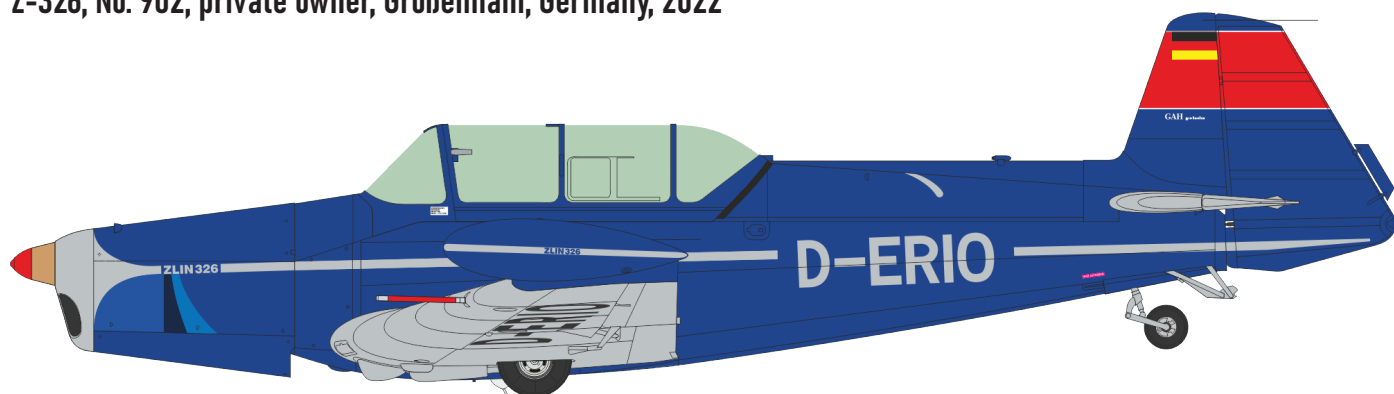


This is one of the still flying aircraft produced as C-305 for the Czechoslovak People's Army. It was handed over to the civilian Svazarm organization on May 26, 1972 and was given the OK-OTD registration. It served in the Aero Clubs of Točná, Kladno and briefly also Jičín, where it reached

its time between overhauls and was grounded. During the process of the assets allocation of the then Aero Club of the Czechoslovak Federation Republic, this aircraft was assigned to the Aero Club Polička. There it underwent overhaul, making it airworthy again, and also the

conversion to the Z-326M version. The Aero Club then used it primarily for towing of sailplanes. In 2006, however, it was sold to a private owner who operated it at the Líně airport. Subsequently, it was sold to a pair of private owners who keep flying this Trenér Master from Slaný airport.

■ Z-326, No. 902, private owner, Großenhain, Germany, 2022

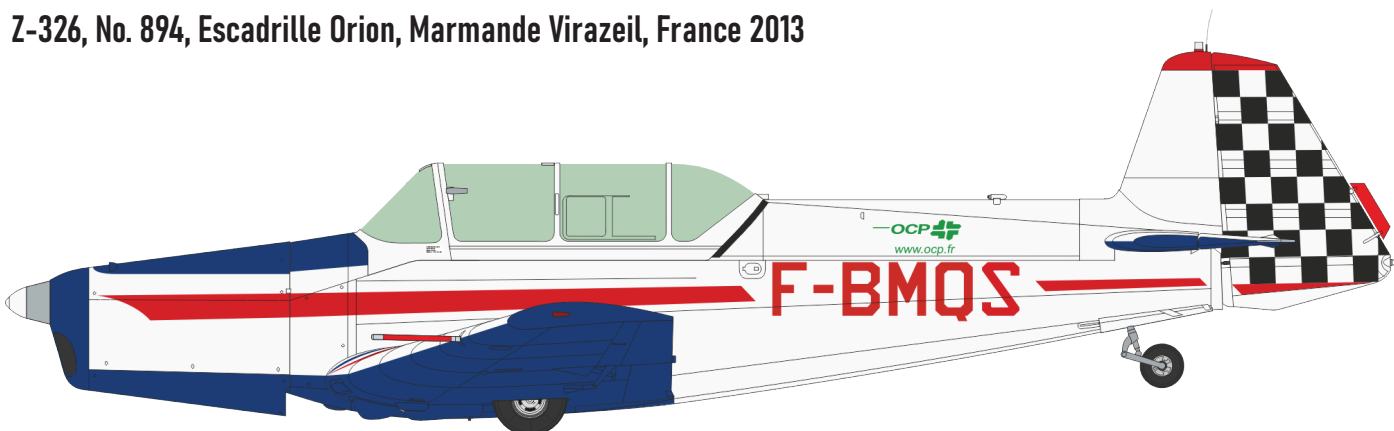


In 1963 the management of the Moravan Otrokovice company officially ended the production of the Z 26 series aircraft. So, this Z-326 serial number 902 was manufactured as the "last" of all Trenérs and was factory stored until 1965. However, the customer demand was strong, so after two years, serial production was running again. In June

1965, the No. 902 aircraft left Czechoslovakia for France with registration F-BMQX. One of its first bases was Villefranche Airport. After completing its flight school career, it was stored and later sold to Switzerland. Since 1992 it was in the possession of Groupement Avion Historique in Lausanne. At that time, but also shortly after

being sold to Germany, it bore the registration HB-TCB. In this form, it also briefly appeared during maintenance in the Czech Republic. It was registered as D-ERIO after 2015 and remains privately held.

■ Z-326, No. 894, Escadrille Orion, Marmande Virazeil, France 2013



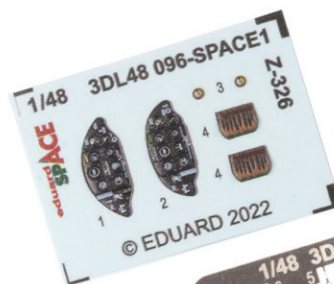
After manufactured in 1963, this Z-326 was factory stored until June 25, 1965, when it was handed over to a French customer. It served in

the flying school in Challes and later was in the inventory of Association Pour La Sauvegarde Des Avions Anciens. It is a part of another group of

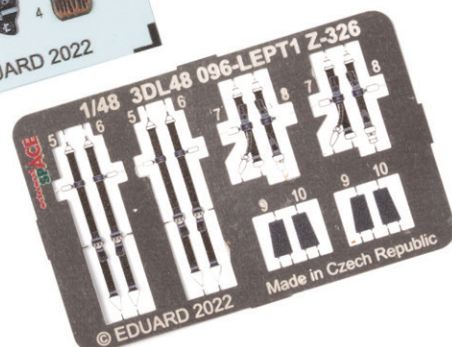
enthusiasts today, Escadrille Orion, based at the Marmande Virazeil airfield.

Recommended: for Z-326/C-305 1/48

644186	Z-326 LööK (Brassin)
644197	Z-326 LööKplus (Brassin)
648729	Z-326/526 wheels (Brassin)
3DL48096	Z-326 SPACE (3D Decal Set)
D48097	Z-126/226/326/526 cockpit placards (Decal Set)
EX912	Z-326 TFace (Mask)

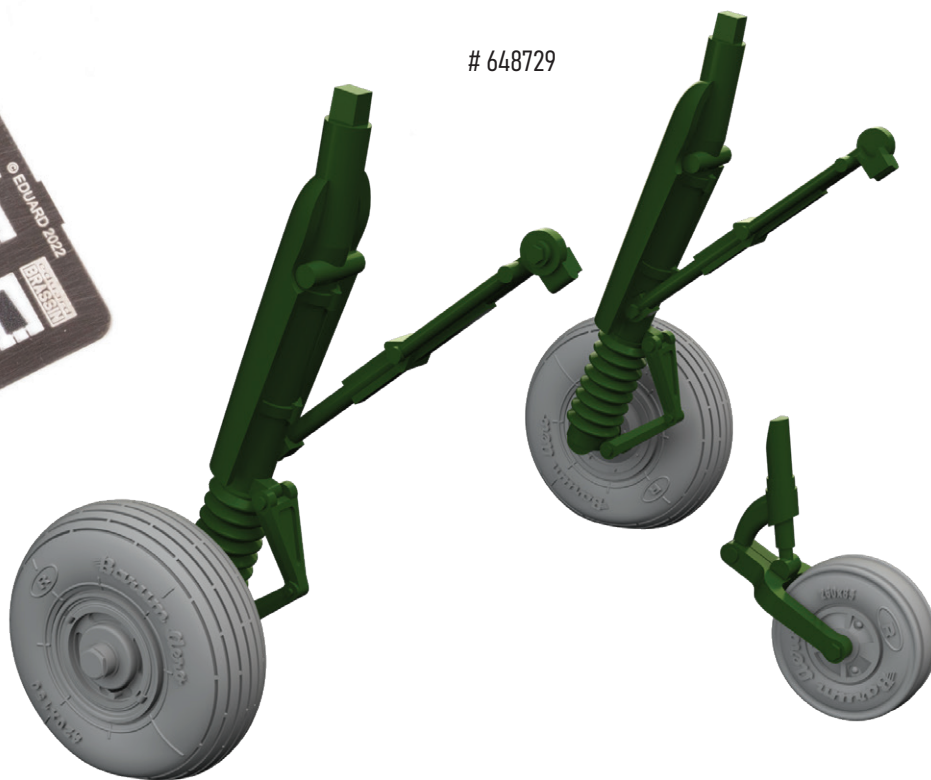
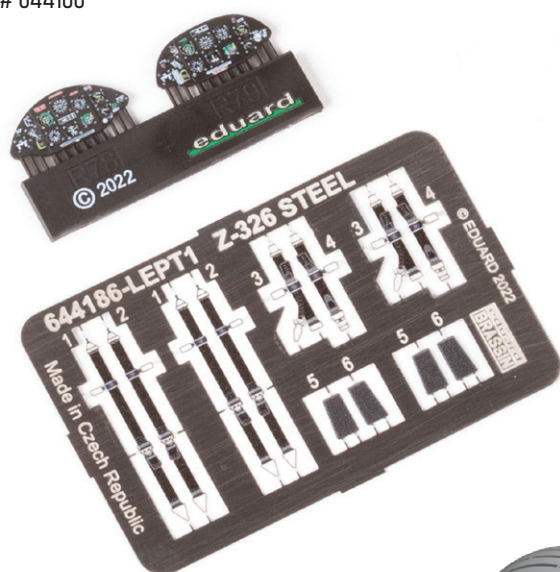


3DL48096



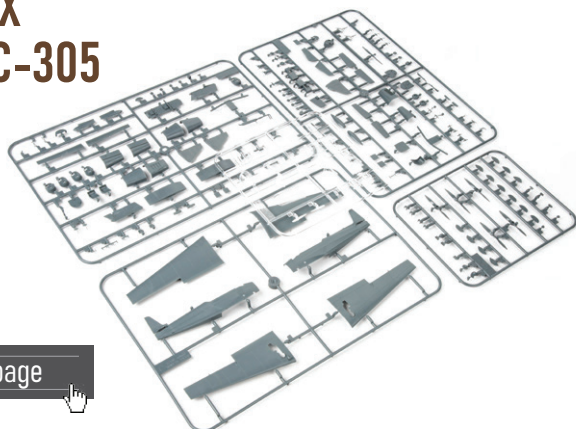
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OVERTREES

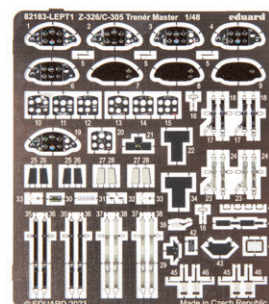
#82183X
Z-326/C-305
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OVERLEPT

#82183-LEPT
Z-326/C-305 PE-Set
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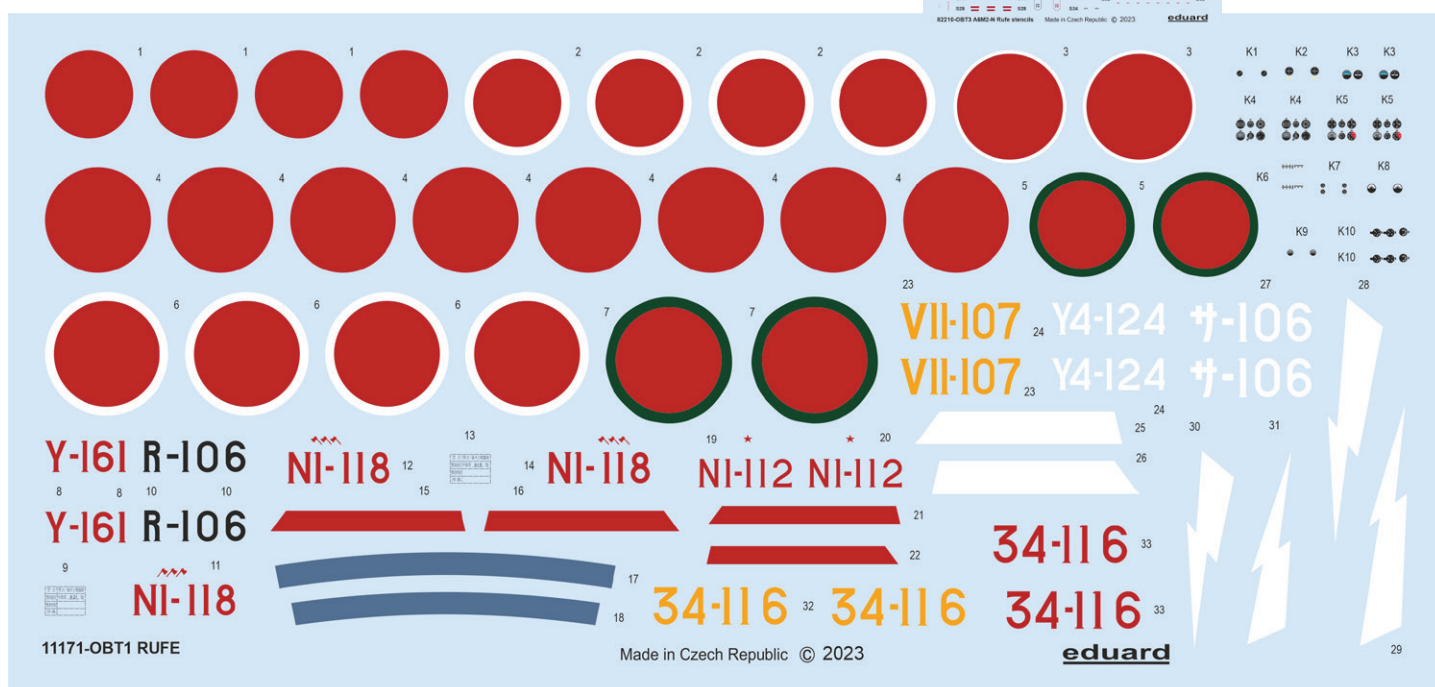
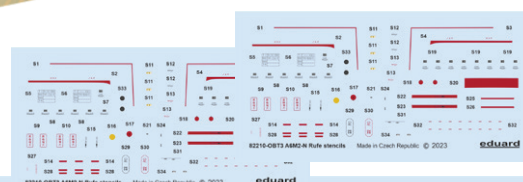
RUFE DUAL COMBO

1/48

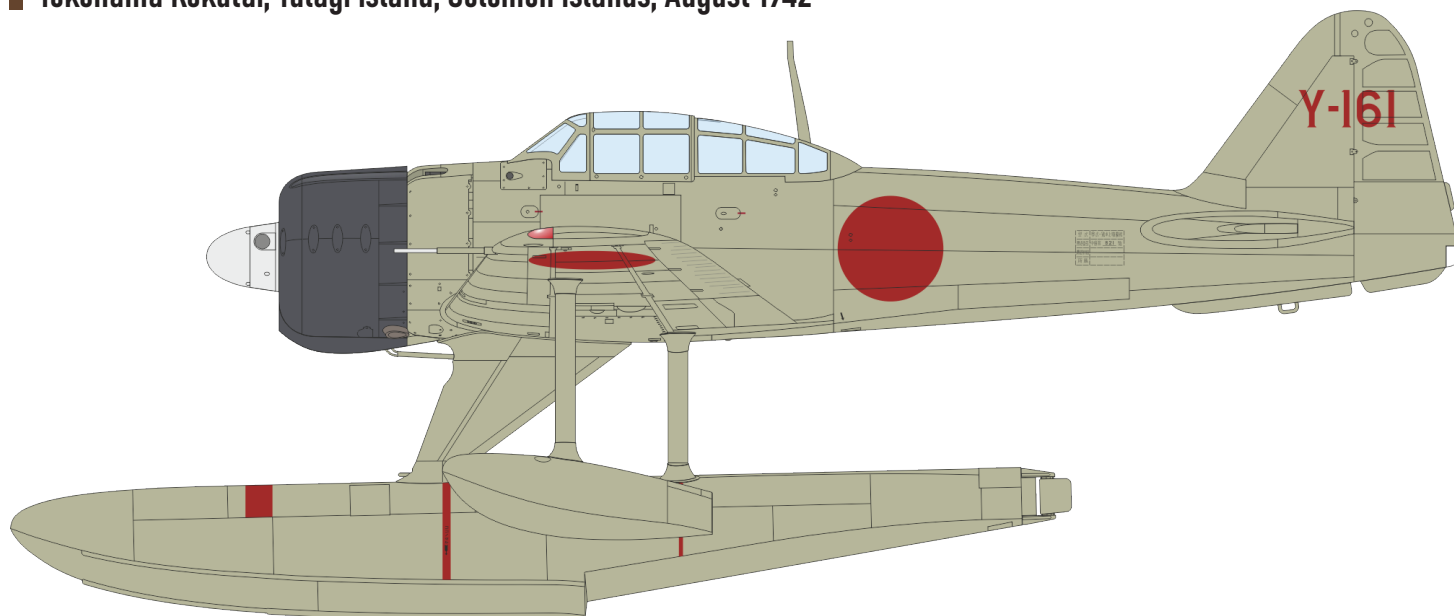
#11171

Limited edition kit of Japanese interceptor/fighter bomber floatplane A6M2-N (Allied code name Rufe) in 1/48 scale. Kit presents Rufe serving in Imperial Japanese Navy Air Service during World War II.

- plastic parts: Eduard
- marking options: 8
- decals: Eduard
- PE parts: yes, pre-painted
- painting mask: yes
- resin parts: no

[Product page](#)


Yokohama Kōkūtai, Tulagi Island, Solomon Islands, August 1942

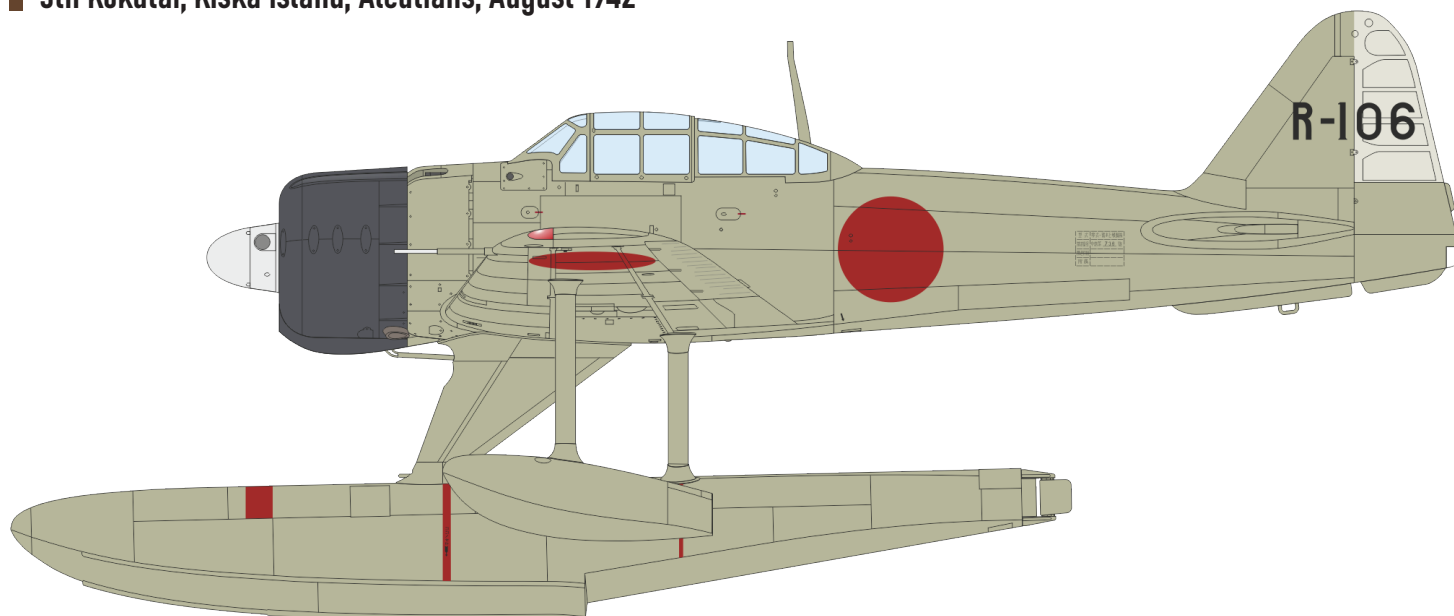


This plane is early production Rufe with purge system cover on the top of the main float and with folding wingtips. The commander of the fighter unit, which was part of the Yokohama Kōkūtai, was Lt. Ri-ichirō Satō. He was born in Sendai, Miyagi Prefecture and graduated from Etajima Naval Academy in 1938 in its 66th class. He was promoted to Lieutenant junior grade in November

1940 and received rank of Lieutenant when he was assigned to the Yokohama Kōkūtai in May 1942. From early July his unit was based on Tulagi Island off Guadalcanal. Their adversaries were American Flying Fortress bombers and Liberators. His unit claimed five victories. Satō, in cooperation with other pilots, claimed one certain and one probable victory over a B-17. After the

Allied invasion of Guadalcanal on August 7, 1942, most of the Yokohama Kōkūtai pilots were killed in ground combat, including Satō. USMC technicians found on Tulagi Island ten Rufe wrecks and took two, including the Y-161, to the U.S. Naval Air Station Alameda for research.

5th Kōkūtai, Kiska island, Aleutians, August 1942

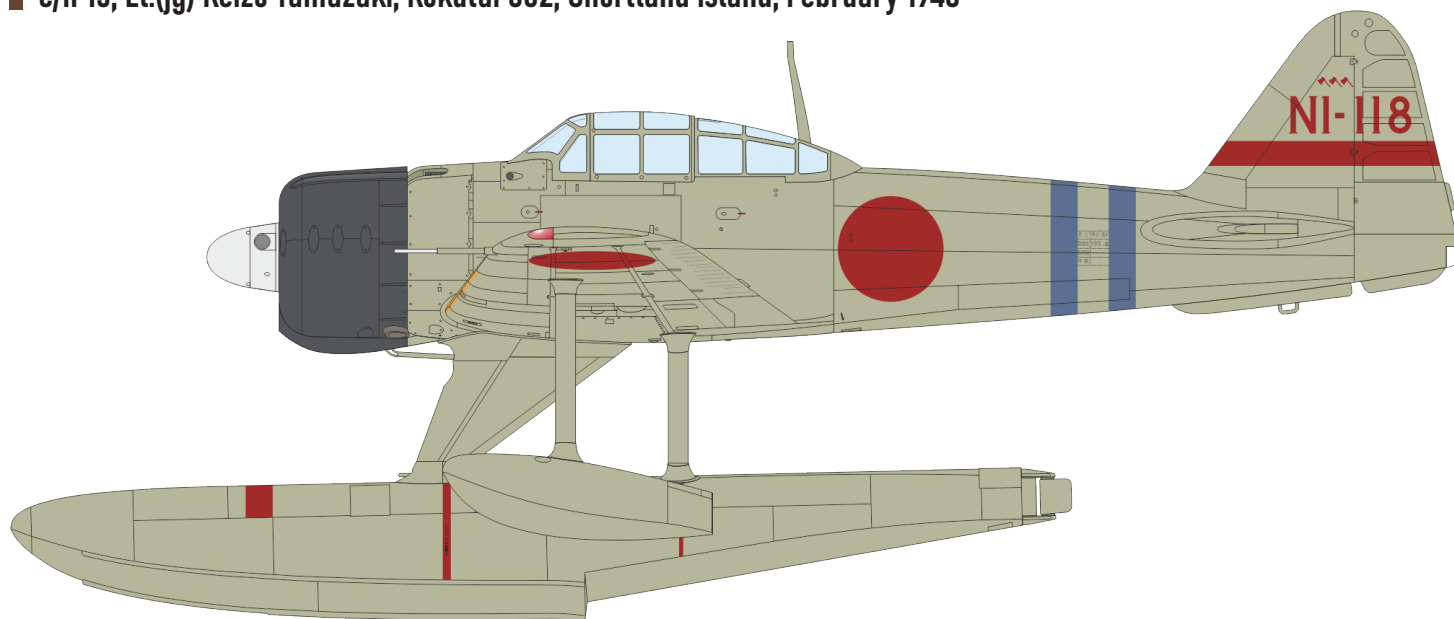


This plane is early production Rufe with purge system cover on the top of the main float and with folding wingtips. Rudder and probably other canvas-covered control surfaces had lighter color shade. The aircraft of this fighter unit successively bore at least four different markings on their tail surfaces, depending on how this unit was designated and subordinated to different

commands. Its most successful fighter pilot was the CPO Gi-ichi Sasaki. He came from Miyagi Prefecture and joined the Navy in 1937. Sasaki became a pilot of two-seat float planes and participated in combat in China. He took part in the conquest of the Philippines and the Dutch East Indies on board of the Mizuho seaplane tender. After its sinking, he was assigned to the Tōkō

Kōkūtai in the Aleutians, which was eventually renamed the 5th Kōkūtai and then to Kōkūtai 452. He achieved a total of four individual victories – five shared and one aircraft credited shared as probably destroyed. He was killed on February 19, 1943, over Amchitka Island in a dogfight with a Curtiss P-40 pilot.

■ c/n 15, Lt.(jg) Keizō Yamazaki, Kōkūtai 802, Shortland Island, February 1943

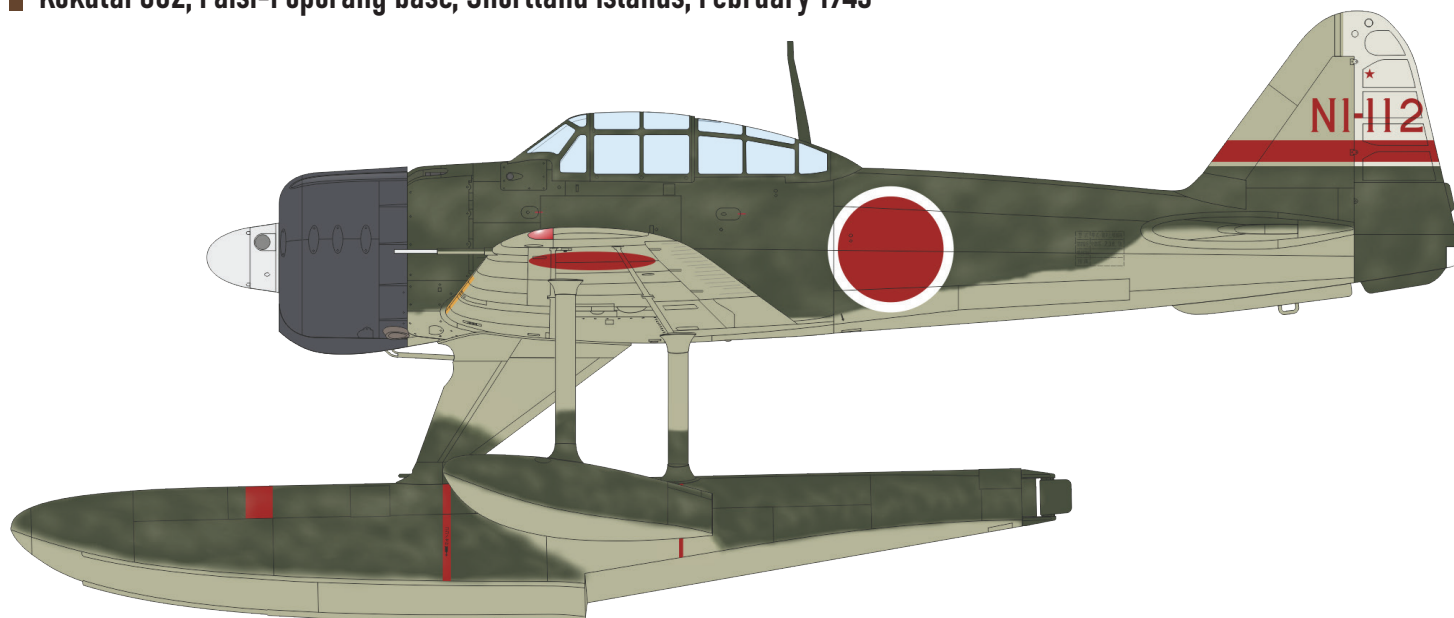


This is the fifth A6M2-N produced and is one of the few Rufes converted from the A6M2 Type 21 carrier fighter. This plane had purge system cover on the top of the main float and folding wingtips. It was one of two Yokohama Kōkūtai seaplanes that were based in Shortland during August 7, 1942, when the rest of the unit was destroyed on Tulagi Island. Rufe was then taken over by the air unit of the Kamikawa Maru, and in October 1942 it was taken over by 14th Kōkūtai (Kōkūtai

802). It is possible that the two bands on the fuselage were in fact grey, obscuring the original white markings of the Kamikawa Maru. In March 1943, this machine was transferred to Marshall Islands. The tail surfaces are marked with victories achieved by several pilots, including Lt.(jg) Keizō Yamazaki, who achieved a probable kill of P-38 of the 339th FS on February 13 during the defense of Shortland. Yamazaki was born in Odawara, Kanagawa Prefecture. He graduated

from the Etajima Naval Academy in its 68th class in 1940 and completed his flight training in June 1942. After his unit was integrated into Kōkūtai 902, he was promoted to the rank of Lieutenant in November 1943. In February 1944, he became commander of Kōkūtai 256's fighter unit equipped with Zeros based in Shanghai. During the fall of 1944 he led his unit in Taiwan during air battles against U.S. Navy aviators.

■ Kōkūtai 802, Faisi-Poporang base, Shortland Islands, February 1943

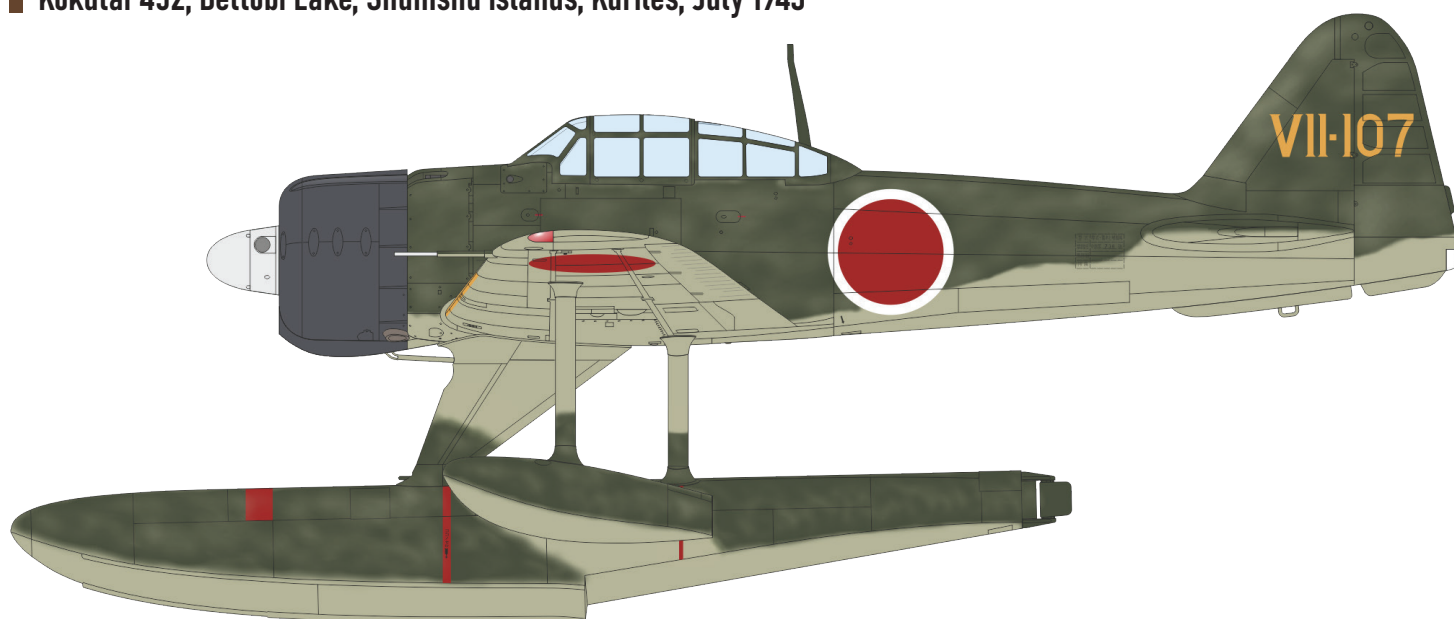


This aircraft was among the new ones that Kōkūtai 802 took over in Japan during December 1942. The top of the main float did not have purge system cover. At the unit level, the aircraft received a dark green paint, but the upper part

of tail surfaces was left in original color. The aircraft probably had a late production stencil on the fuselage. The rudder sported a victory mark and there was also a horizontal red stripe on the vertical tail surfaces, which was probably

the unit's identifying marking. It is likely that the aircraft took part in the aerial combat on February 13 and 14 in the defense of the Shortland Islands and Buin, in which the American units suffered fairly significant losses.

■ Kōkūtai 452, Bettobi Lake, Shumshu Islands, Kuriles, July 1943

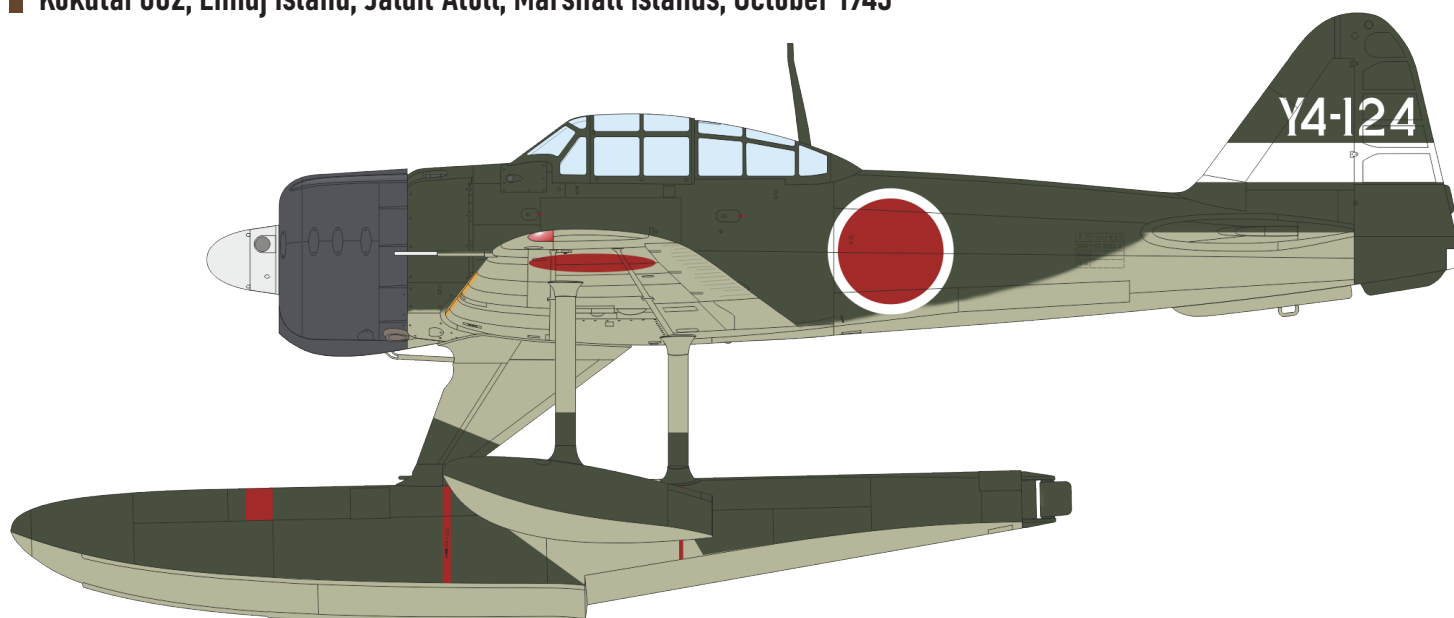


This aircraft was taken over by Kōkūtai 452 in Japan after evacuation from Aleutians. The top of the main float did not have purge system cover. At the unit level, the aircraft received a coat of dark green paint. The aircraft probably had a late production stencil on the fuselage. Among the successful pilots of this unit was Warrant Officer Kiyomi Katsuki. He served on the seaplane tender Chitose at the start of the Pacific War as a F1M

biplane pilot. In January 1942, he claimed shared destruction of Dutch PBV flying boat. In the Solomon Islands area, he shot down a Dauntless on October 3 and during the following day, while defending his own ship, he rammed a B-17 of the 72nd BS. The entire crew of Capt. David C. Everitt was killed, but Katsuki and his observer survived. Katsuki received a written commendation from the unit commander. He achieved two more

victories during the same day. After retraining to A6M2-N, he was assigned to Kōkūtai 452 and claimed B-25 and B-24. With N1K Rex at Kōkūtai 934 he shot down a B-24 in January 1944. He achieved two more victories as Zero pilot with Kōkūtai 381 over Balikpapan and Singapore. At the end of the war, he served with Kōkūtai 352 in Japan.

■ Kōkūtai 802, Emidj Island, Jaluit Atoll, Marshall Islands, October 1943

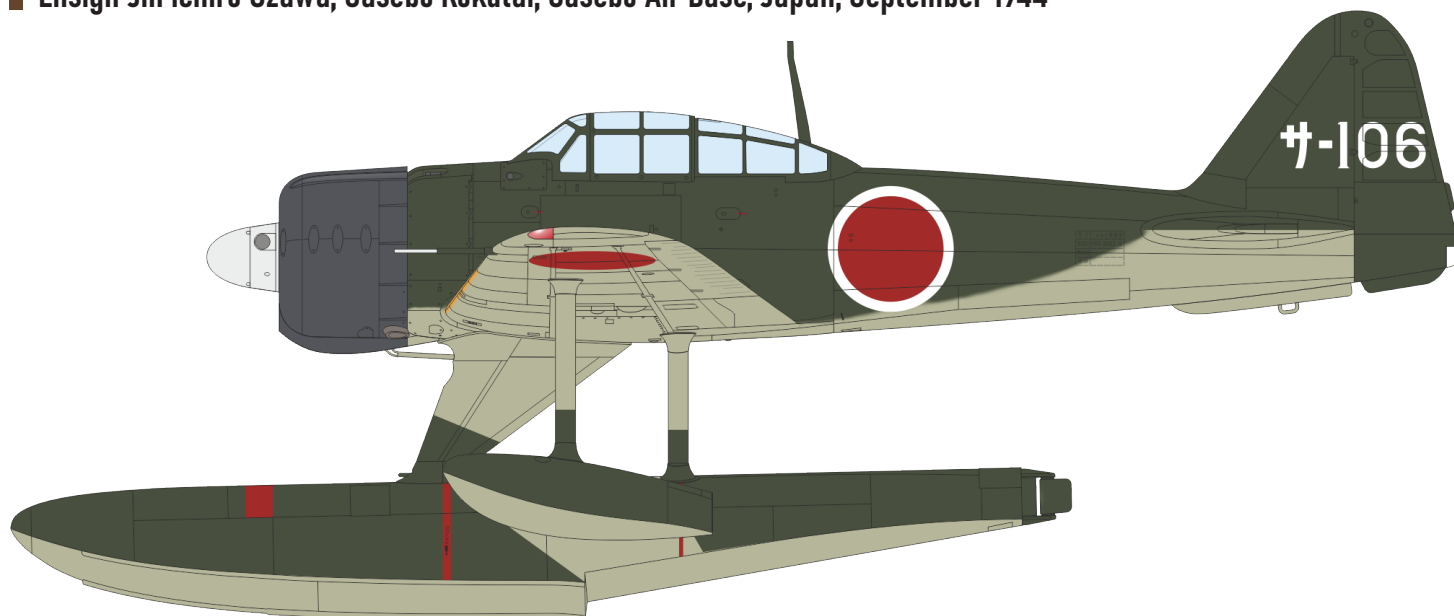


This late production aircraft was finished in a factory applied dark green paint. After relocation to the Marshall Islands area in March 1943, Kōkūtai 802 under the command of Lt.(jg) Yamazaki was primarily engaged in anti-submarine patrols and the pursuit of four-engine bombers. Long-range

reconnaissance was carried out by another part of this unit, which was armed with H8K Emily flying boats. In September 1943, the designation of its aircraft was changed to Y4 in connection with the transition to the subordination of the 22nd Kōkū Sentai (Air Flotilla). The identification

markings on the tail surfaces of Rufe seaplanes changed from red to white during service in the Marshall Islands. In October, fighter unit of Kōkūtai 802 was integrated into Kōkūtai 902, and in November, the fighter unit clashed with US Navy aircraft during a raid on Truk.

■ Ensign Jin'ichirō Ozawa, Sasebo Kōkūtai, Sasebo Air Base, Japan, September 1944

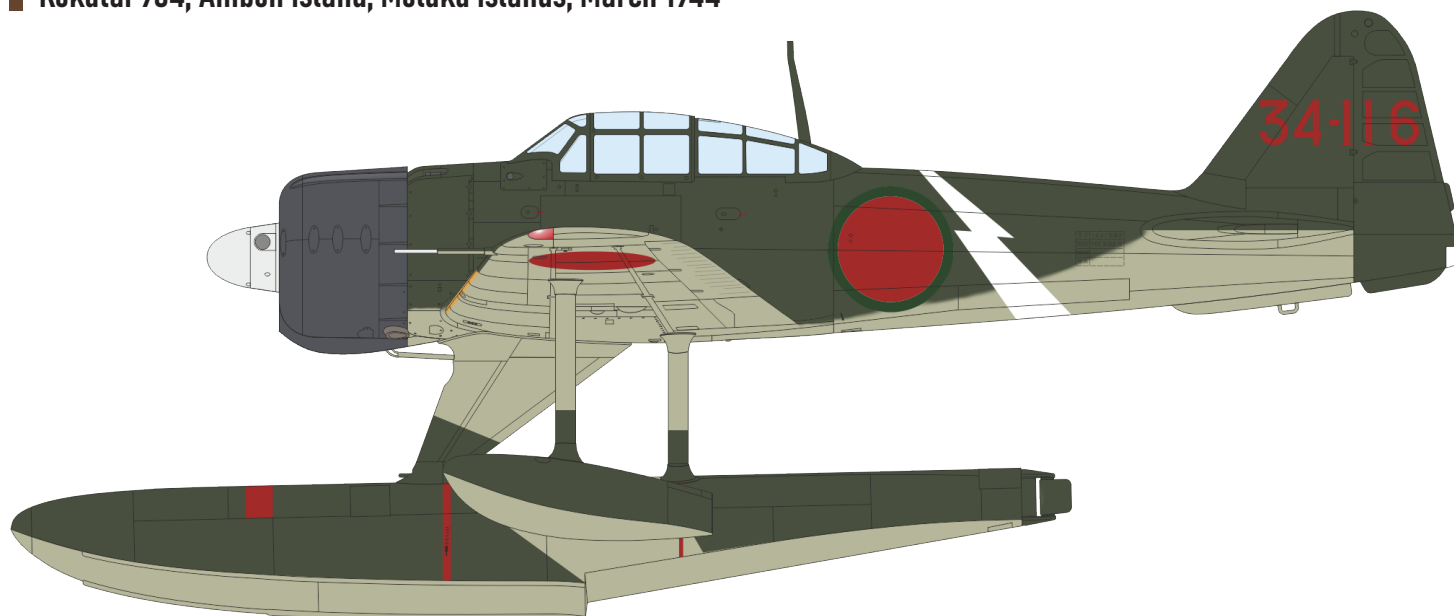


This late production aircraft was finished in a factory applied dark green paint. After participating in the defense of Chichijima in July 1944, Sasebo Kōkūtai continued seaplane pilot training in Japan. The Sa-106 was flown by Ensign Ozawa. He joined the Navy in 1943 after graduating from high school and received his flight training at Tsuchiura Kōkūtai. On October

30, 1944, while practicing a fighter dogfight between two Rufe seaplanes, Ozawa had to bail out from his aircraft when the elevator control cable broke. He almost did not survive the bailing out. At the end of the year, the Sasebo Kōkūtai's fighter Buntai was transferred to land-based fighter unit. During the fighting over Okinawa on June 22, 1945, Ozawa achieved one victory against

a formation of more than thirty American aircraft. He was then reassigned to Kōkūtai 723 with C6N Myrt reconnaissance planes and was to conduct a Kamikaze mission on that type of aircraft. After the war he pursued electrical engineering and took part on the first microwave intercity transmission in Japan.

■ Kōkūtai 934, Ambon island, Moluku Islands, March 1944



This late production aircraft was finished in a factory applied dark green paint. At the unit level the white outline of Hinomaru was repainted to reduce the visibility of the machine. In early 1944 the Kōkūtai 934 was equipped with E13A Jake and F1M Pete observation aircraft and also with Rufe and N1K Rex fighter seaplanes. Their frequent opponents were the Beaufighter crews of No. 31 Sqn. RAAF. One of the Kōkūtai 934 pilots,

P02c Hidenori Matsunaga, scored approximately ten Beaufighters as shared victories. In March 1944 he was transferred to Kōkūtai 381 flying Zeros. In some publications, the Rufe with a lightning bolt was considered to be Matsunaga's mount. He was photographed with Rufe (unknown tail code) with similar marking together with another pilot. Design of the lightning bolt varied, and its color was most likely white. The identity

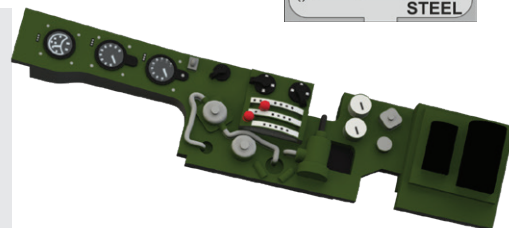
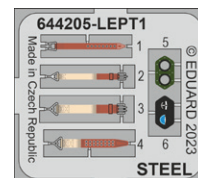
of the pilots to whom belonged the seaplanes with lightning is unknown. It could have been a formation leader's machine, or possibly the aircraft of a fighter squadron unit commander Lt.(jg) Toshiharu Ikeda, who scored a victory over a Spitfire with a Rufe. Ikeda later became commander of Hikōtai 603 and was killed on June 23, 1944, at Saipan.

Recommended: for RUFE 1/48

- 644205 A6M2-N Rufe LööK (Brassin)
- 648845 A6M2-N Rufe seat PRINT (Brassin)
- 648846 A6M2-N Rufe exhaust PRINT (Brassin)
- 648847 A6M2-N Rufe cannon barrels & cockpit guns PRINT (Brassin)
- 648848 A6M2-N Rufe folding wingtips PRINT (Brassin)
- 648849 A6M2-N Rufe gun bays PRINT (Brassin)
- 3DL48114 A6M2-N Rufe SPACE (3D Decal Set)
- EX934 A6M2-N Rufe TFace (Mask)
- 648850 A6M2-N Rufe cockpit PRINT 1/48 Eduard - release 05/2023
- 648851 A6M2-N Rufe landing flaps PRINT 1/48 Eduard - release 05/2023
- 648852 A6M2-N Rufe engine complete PRINT 1/48 Eduard - release 05/2023



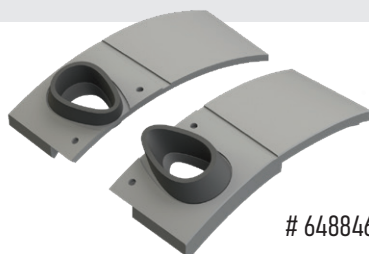
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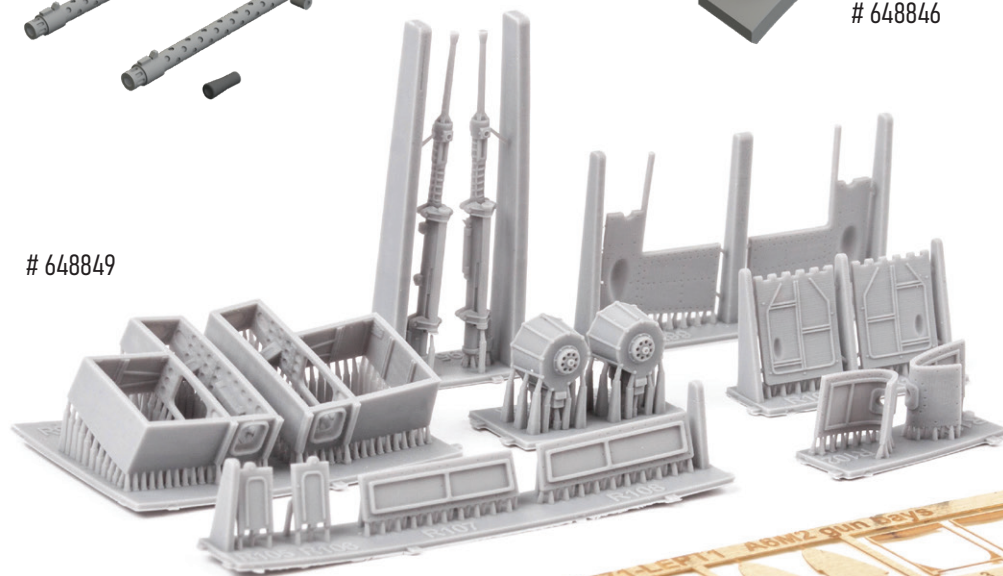
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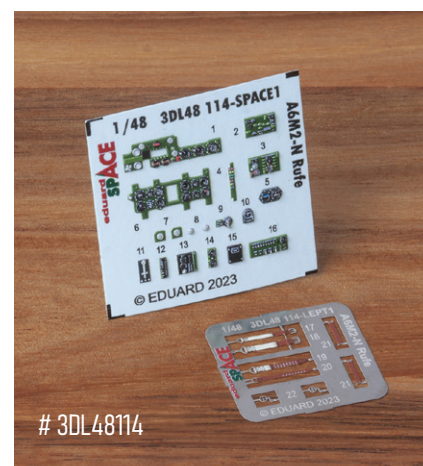
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648846



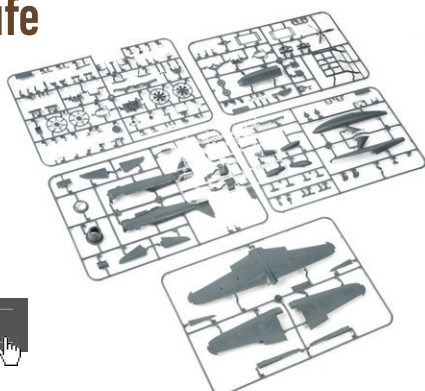
648849



3DL48114

OVERTREES

#82219X
A6M2-N Rufe
1/48

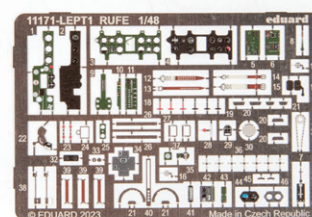


Product page

OVERLEPT

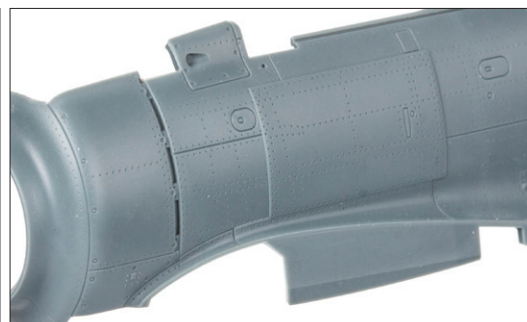
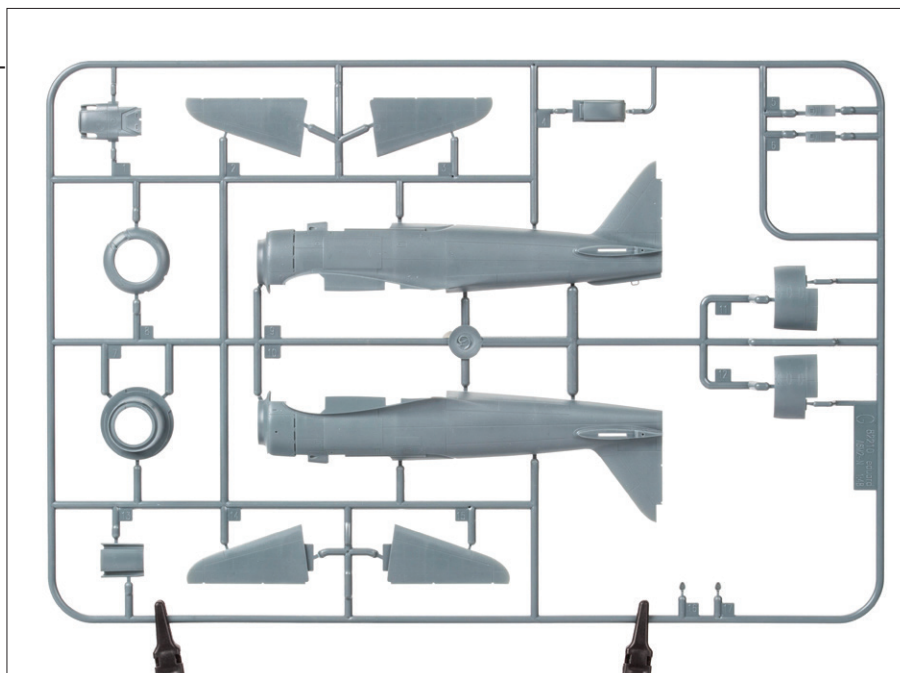
#11171-LEPT
RUFE PE-Set
1/48

Product page

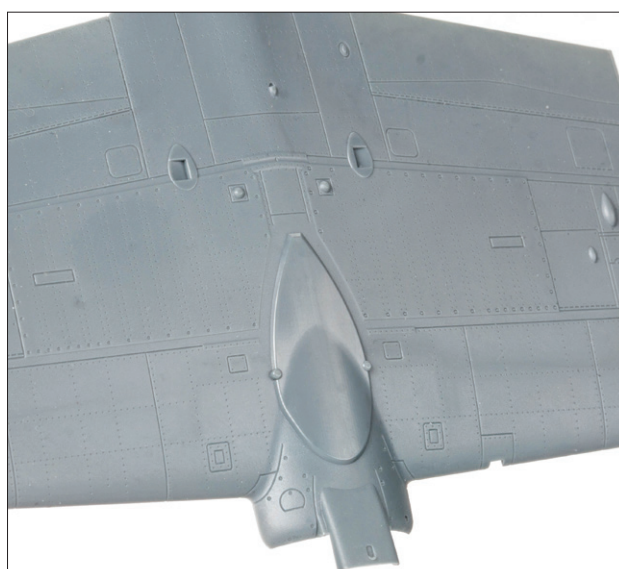
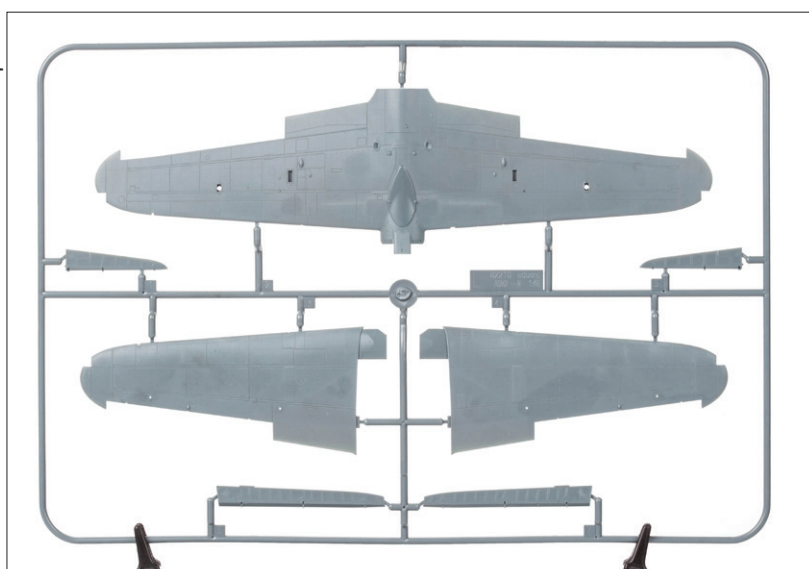


RUFE - new sprues in detail

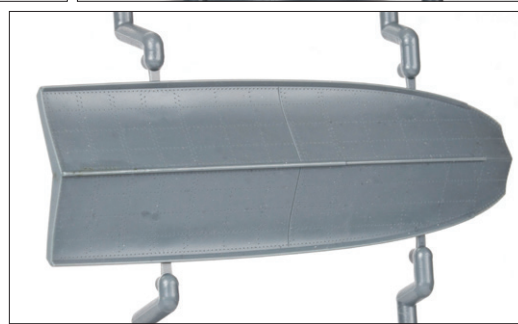
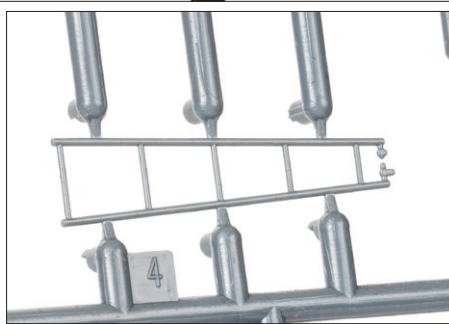
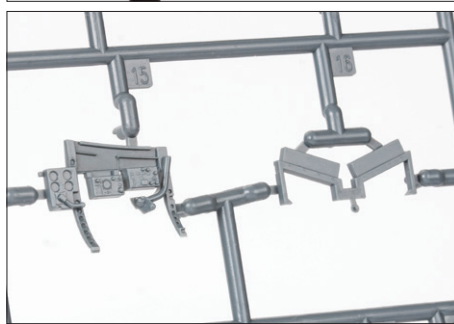
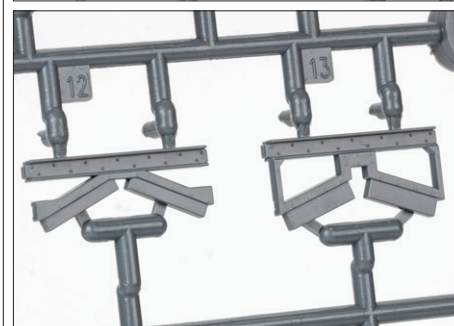
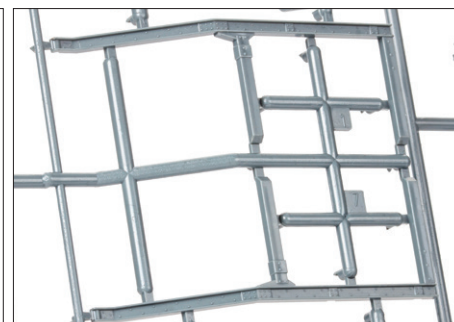
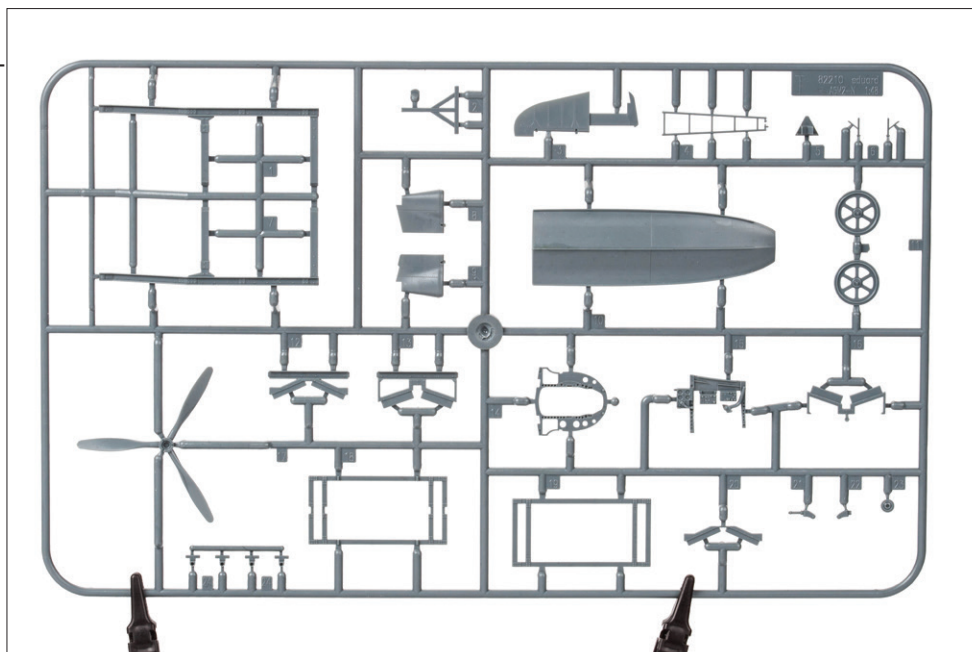
Sprue G



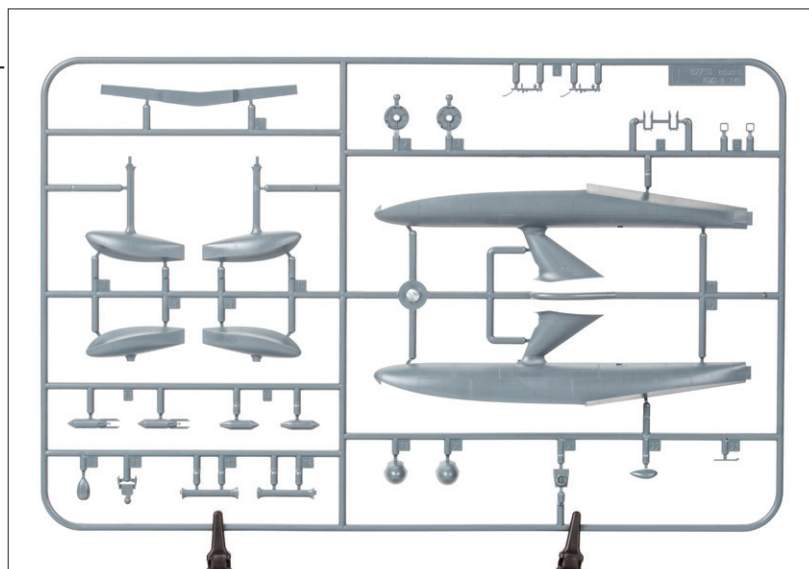
Sprue L



Sprue T

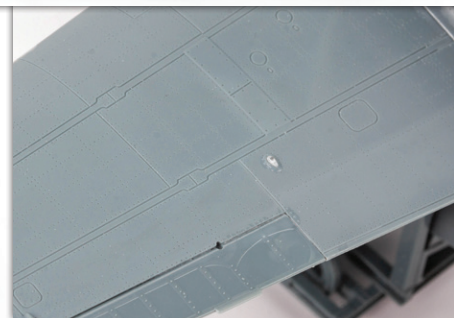
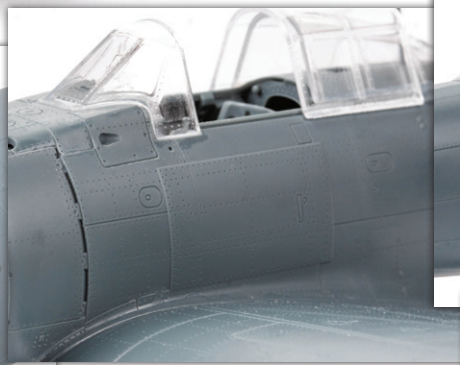


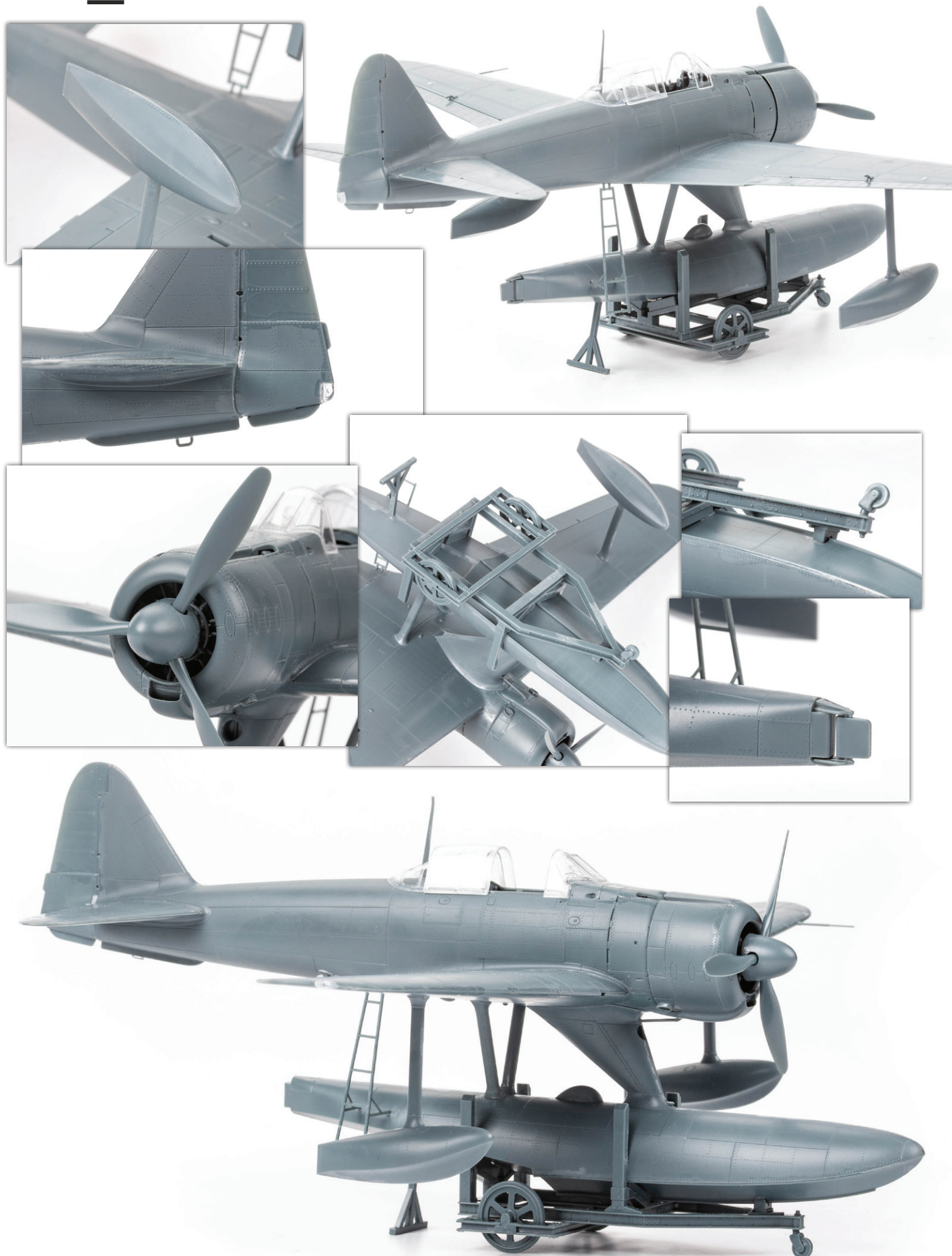
Sprue U



RUFE - test build

built by **Jakub Nademlejnský**





Rufe

1/48 Eduard



built by **Jan Kotas**

11171

Kōkūtai 452, Bettobi Lake, Shumshu Islands, Kuriles, July 1943



This aircraft was taken over by Kōkūtai 452 in Japan after evacuation from Aleutians. The top of the main float did not have purge system cover. At the unit level, the aircraft received a coat of dark green paint. The aircraft probably had a late production stencil on the fuselage. Among the successful pilots of this unit was Warrant Officer Kiyomi Katsuki. He served on the seaplane tender Chitose at the start of the Pacific War as a FIM biplane pilot. In January 1942, he claimed shared destruction of Dutch PBV flying boat. In the Solomon Islands area, he shot down a Dauntless on October 3 and during the following day, while defending his

own ship, he rammed a B-17 of the 72nd BS. The entire crew of Capt. David C. Everitt was killed, but Katsuki and his observer survived. Katsuki received a written commendation from the unit commander. He achieved two more victories during the same day. After retraining to A6M2-N, he was assigned to Kōkūtai 452 and claimed B-25 and B-24. With NIK Rex at Kōkūtai 934 he shot down a B-24 in January 1944. He achieved two more victories as Zero pilot with Kōkūtai 381 over Balikpapan and Singapore. At the end of the war, he served with Kōkūtai 352 in Japan.



[Product page](#)

Bf 110C

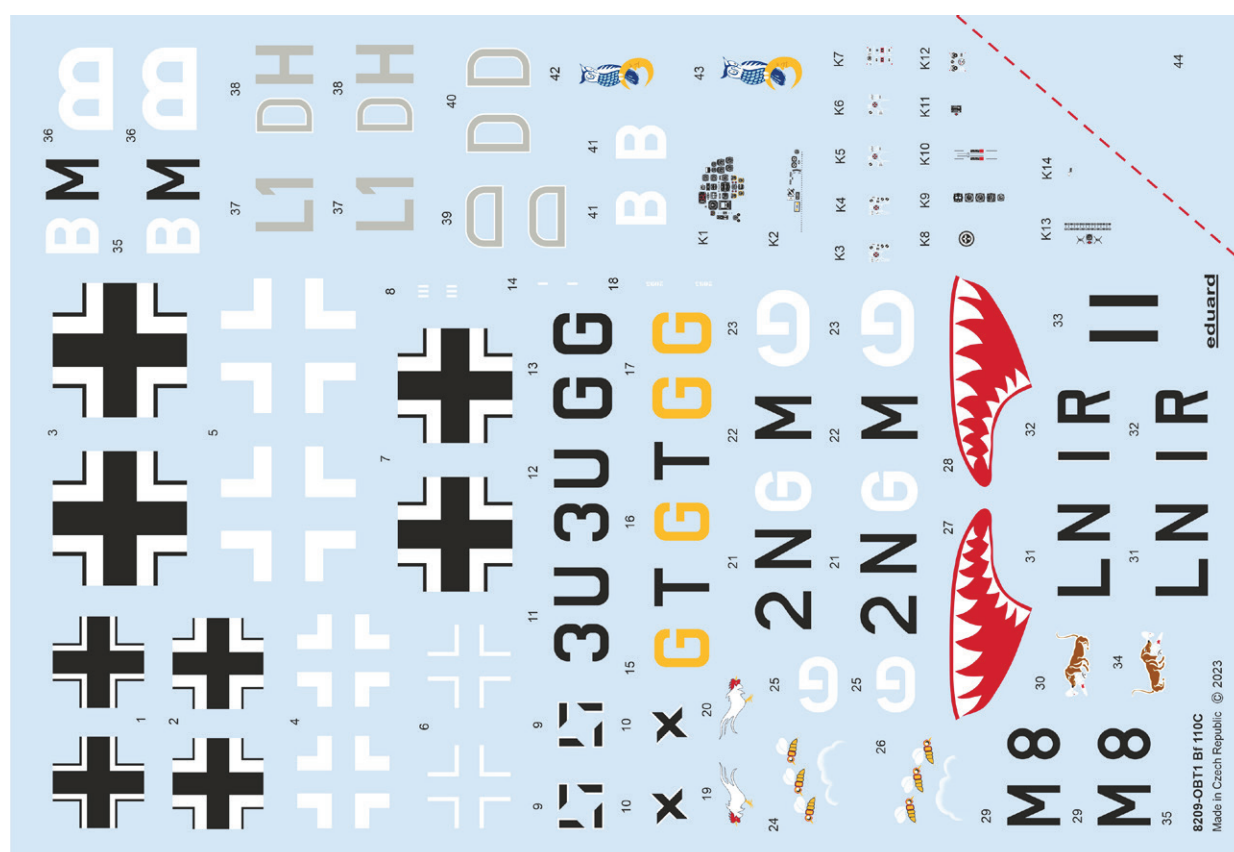
1/48

#8209

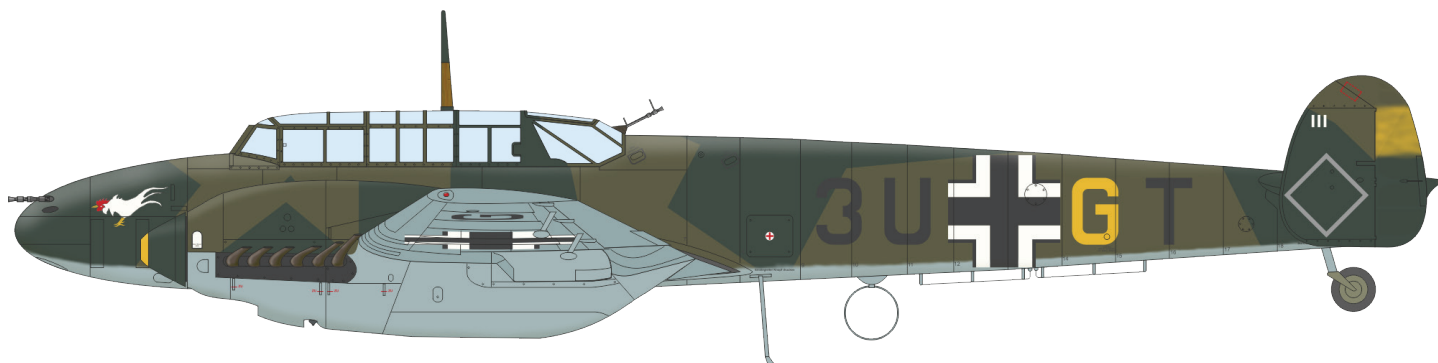
ProfiPACK edition kit of German WWII twin-engine heavy fighter aircraft Messerschmitt Bf 110C in 1/48 scale.

This version was used as a day and night fighter.

- plastic parts: Eduard
- marking options: 5
- decals: Eduard
- PE parts: yes, pre-painted
- painting mask: yes
- resin parts: no

[Product page](#)


Bf 110C-2, WNr. 3578, 9./ZG 26, Barly, France, August 1940



In the beginning of the war this Zerstörergruppe was equipped with Messerschmitts Bf 110D. III./ZG 26 converted to 110s in the beginning of 1940 under the command of Hptm. Johannes Schalk. Before the war, this aviator commander the Austrian Jagdgruppe 1 and he was also one of the first Bf 110 pilots decorated with Knight's Cross. On September 3, 1940, Ofw. Hott behind the

controls of this One-Ten, participated with the whole III./ZG 26 in escorting Do 17 from II./KG 2 on their raid to the North Weald airfield. While defending the bombers, his aircraft was damaged and Ofw. Hott crash-landed it at Wissant, France. The damage was assessed as being at eighty percent. This aircraft was camouflaged in RLM 70, 71 and 65 colors. There is a 9./ZG 26

insignia painted on the both sides of the nose – a white cock at the fighting stance. The aircraft's individual letter, repeated on the wingtip, is painted in the Staffel color i.e. yellow. There are three white bars painted on the vertical tail surfaces marking the enemy aircraft shot down.

Bf 110C-4, WNr. 2095, 4./ZG 1, Trier-Euren, Germany, June 1940

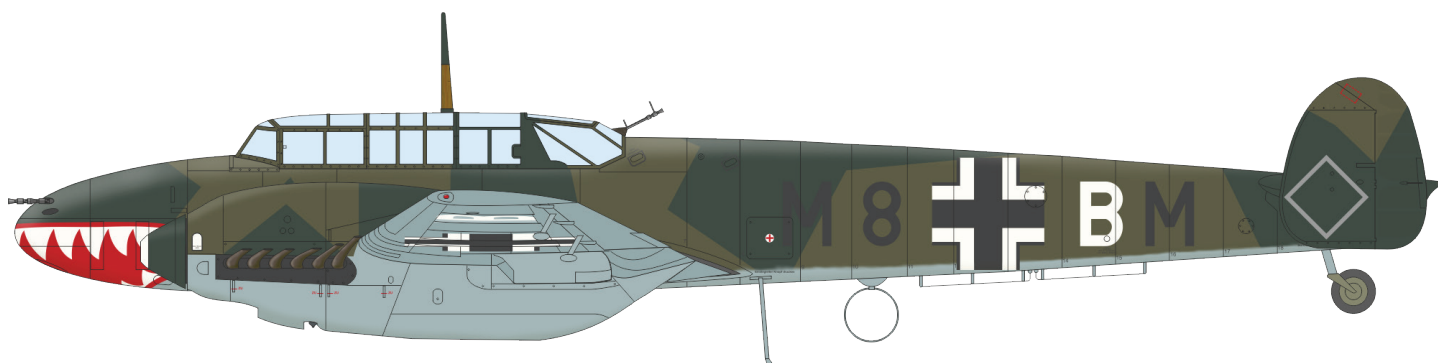


II./ZG 1 was established on May 15, 1939, based on I. Gruppe JG 54 and equipped with the single-seat Bf 109D and Bf 109E. The conversion to the Bf 110C two-seat heavy fighters took place in March 1940 in the Northern Germany. After the transfer

to the western border, in the preparation for the attack on the Netherlands, Belgium and France, the unit was incorporated into the Luftflotte 2 under which command it flew combat missions until the surrender of France. Then the II./ZG 76

was renamed as III. Gruppe Zerstörergeschwader 76. The unit's insignia in the form of three wasps painted on the aircraft nose, was retained even after the unit's transfer.

Bf 110C-2, WNr. 3257, Hptm. Heinz Wagner/Stfw. Adolf Schmidt, CO of 4./ZG 76, Abbeville, France, August 1940

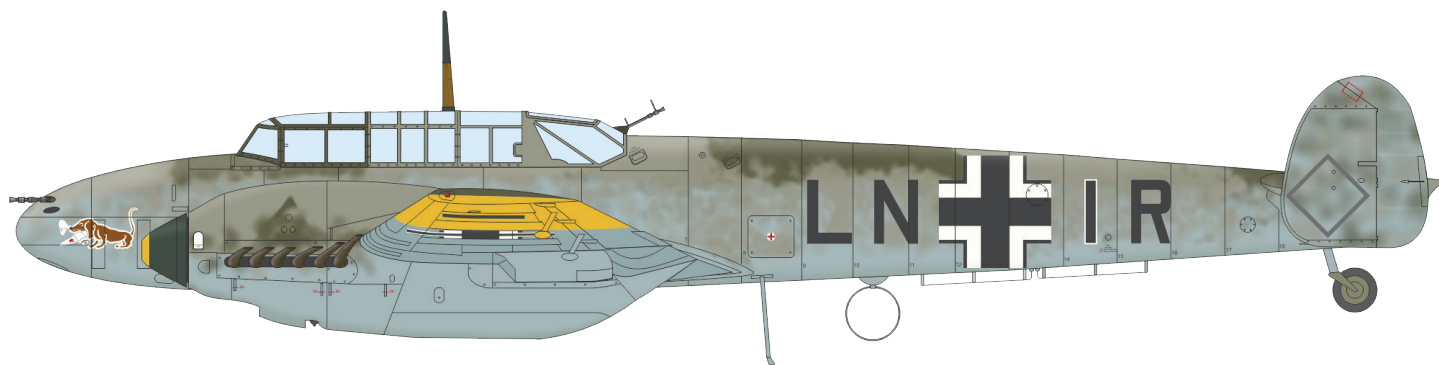


II. Gruppe Zerstörergeschwader 76 was established on May 1, 1939, by renaming I./ZG 144. It was equipped with single-seat Messerschmitt Bf 109D which in February and March they traded for Bf 110. Flying One-Tens the unit took part in the attack on the Netherlands, Belgium and France and after France surrendered the

unit was transferred to Abbeville airfield on the French coast from where it started to fly bomber escorts to the targets in the Great Britain. The last flight of the Messerschmitt Bf 110C-2 marked M8+BM and crewed by Hptm. Heinz Wagner and radio operator Stfw. Adolf Schmidt, was a bomber escort to the Luton airfield with the adjacent

industrial area which took place on August 30, 1940. The plane was most probably shot down by P/O William McKnight (flying as a wingman to S/Ldr Bader) at the altitude of 1,000 feet. It crashed on Enfield Sewage Farm, Wharf Road, Ponders End near the large reservoir and the crew was killed.

■ Bf 110C-2, WNr. 3026, Lt. K. Koch, 1.(Z)/JG 77, Kirkenes, Norway, October 1941

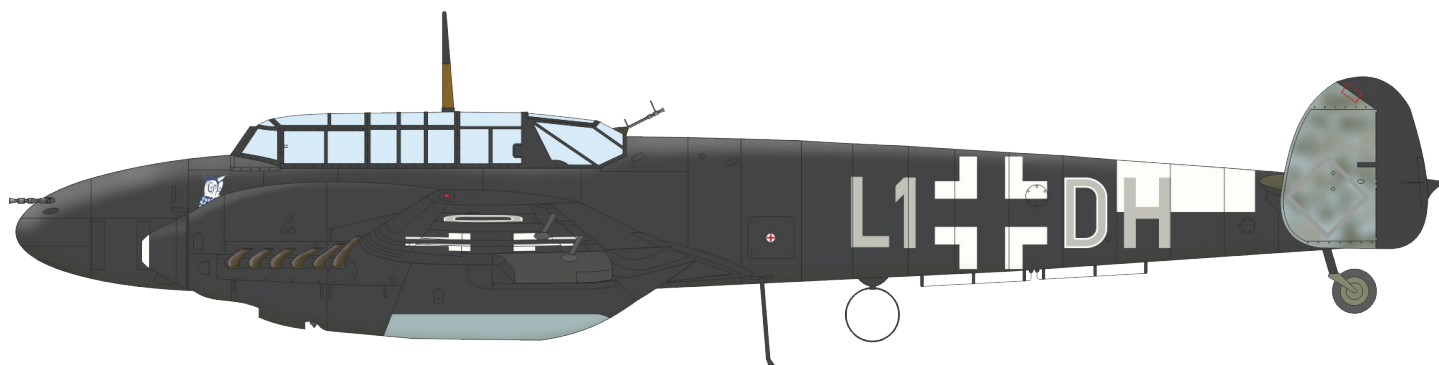


Zerstörerstaffel of the newly established I./JG 77, equipped with the aircraft and personnel from III./ZG 76, was formed in May 1941. The reason were the preparations for the attack against the Soviet Union. The unit was transferred to the Hoybuktmoen airfield near Kirkenes. The mission of the Bf 110 crews were the attacks against

the railroad connecting the important port of Murmansk with the rest of the Soviet Union. The unit was equipped with Bf 110C, D and probably several Bf 110E aircraft. In January 1941 the unit was renamed to 6.(Z)/JG 5. The camouflage of this aircraft was probably sprayed with RLM 71 and 02 on the upper surfaces, side and lower surfaces

were camouflaged in RLM 65. The factory markings were over sprayed with RLM 02 and the mottling was sprayed in the same color. The unit insignia, a dachshund biting the Soviet airplane, was painted on the aircraft's nose.

■ Bf 110C, 1./NJG 3, Benghazi, Libya, May 1941



I. Gruppe Nachtjagdgeschwader 1 was formed by renaming V./LG 1 and its mission was the night interception of the British middle and heavy bombers flying raids against the German cities and industrial centers. Between February and October 1941, the 1. Staffel was temporarily relocated to the south, first in Sicily and Greece followed by the North Africa, Benghazi and

Derna airfields. The unit flew missions with its Messerschmitts Bf 110C and D against the British bombers attacking the German and Italian troops. During the unit's operations on the southern front the fighters were camouflaged in black color. The white band on the fuselage tail, marking the aircraft flying on the southern front, was painted only partially, on the fuselage spine. 1./NJG 3

insignia, an owl sitting on the Moon, was painted on both sides of the fuselage. During its service in the south, the featured airplane had its vertical tail surfaces and complete horizontal tail surfaces replaced due to the damage. The replacement parts retained their original camouflage.

Recommended: for Bf 110C 1/48

644076	Bf 110C LööK (Brassin)
648085	MG 15 gun (2 pcs) (Brassin)
648602	Bf 110C/D radio equipment (Brassin)
648607	Bf 110C/D/E exhaust stacks (Brassin)
EX752	Bf 110C TFace (Mask)

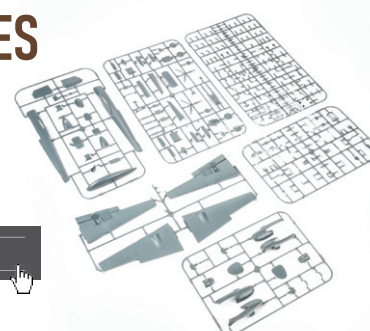
648085



OVERLEPT #8209-LEPT Bf 110C 1/48

[Product page](#)


OVERTREES #8201X Bf 110C 1/48

[Product page](#)


Fw 190A-4 w/ engine flaps & 2-gun wings

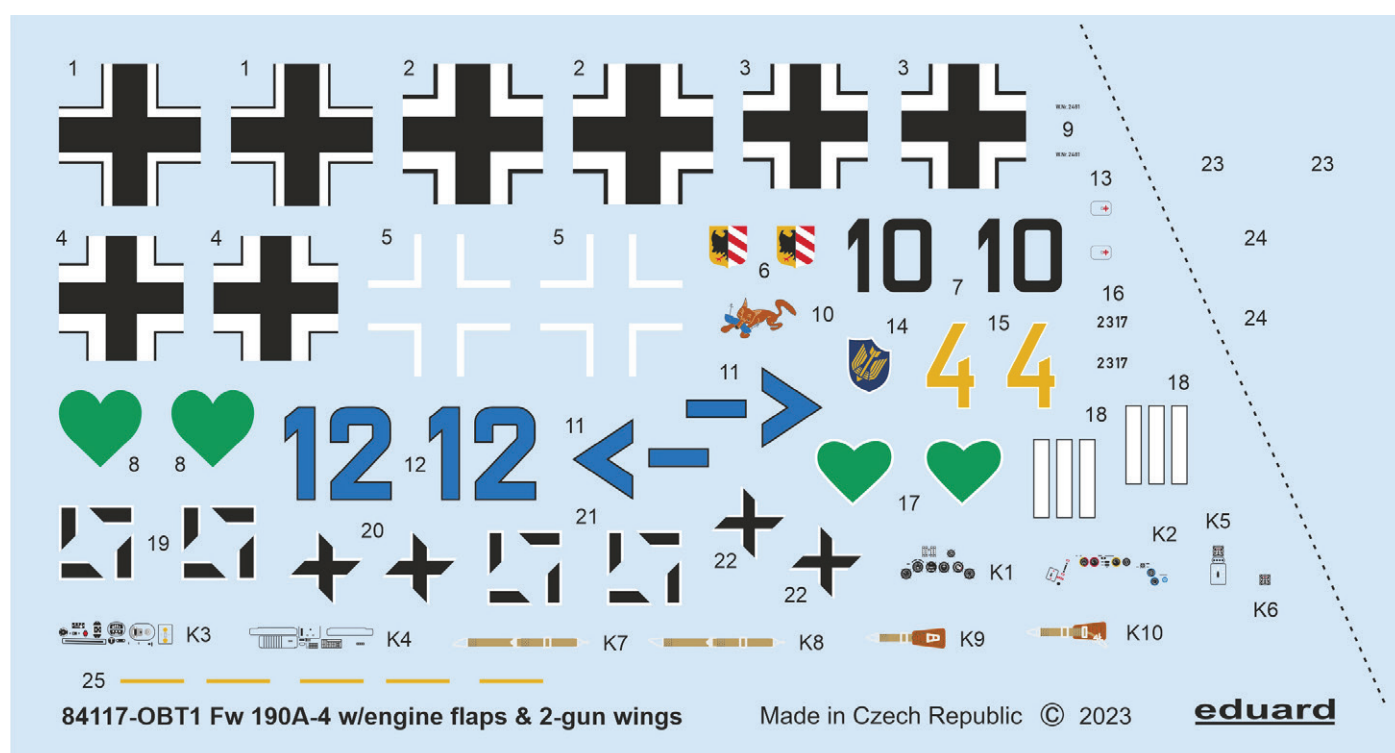
1/48

#84117

Weekend edition kit of German WWII fighter aircraft Fw 190A-4 in 1/48 scale. This version of the Fw 190A-4 was equipped with flaps on the engine cooling outlets. The wing was equipped with two cannons in the wing root.

- plastic parts: Eduard
- marking options: 4
- decals: Eduard
- PE parts: no
- painting mask: no
- resin parts: no

[Product page](#)



■ WNr. 0142481, Fw. Otto Kittel, 2./JG 54, Krasnogvardeysk, Soviet Union, February 1943

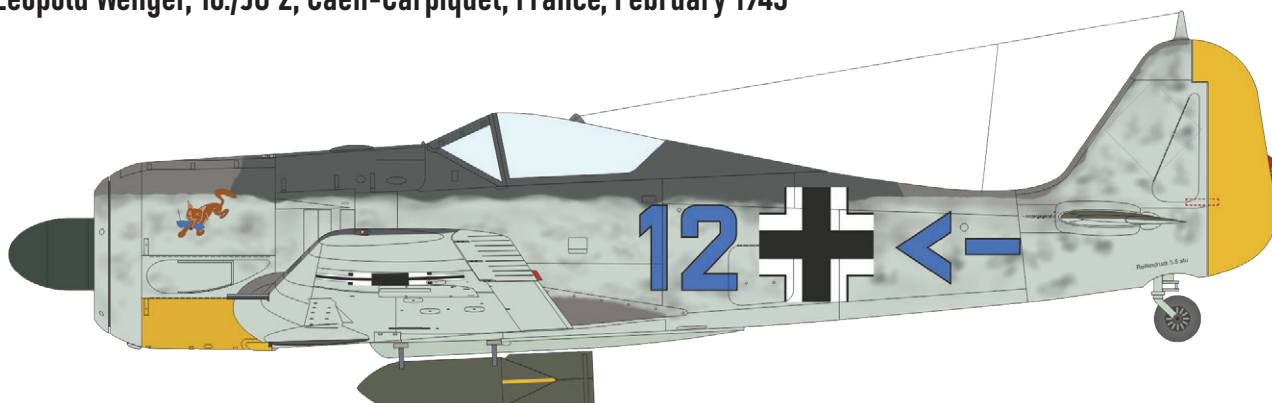


Otto Kittel was born on February 21, 1917, to German parents in Korunov (German: Kronsdorf, since 1945 Krasov) near Krnov in Austria-Hungary. After the declaration of the Czechoslovakia, the Krnov region became part of it, but after the Munich Agreement it was one of the territories that Czechoslovakia had to cede to Germany under pressure from the Great Powers. The inhabitants claiming German nationality

subsequently became German citizens. Kittel was apprenticed as a car mechanic in Mladá Boleslav and joined the Luftwaffe in 1939. He completed his first combat deployment during the fighting in Yugoslavia in the ranks of JG 54, which was deployed in East Prussia to support Army Group North in the advance on Leningrad during the attack on the USSR. On June 24, 1941, Otto Kittel scored his first two aerial victories, and on

September 14, 1943, he achieved his 100th kill. However, he did not survive the war. His aircraft went down in flames near Dzhūkste, Latvia, after a dogfight with a formation of 14 Il-2s. However, it is not clear when this occurred, it is stated to be either 14 or 16 February 1945. During World War II, he shot down 267 enemy aircraft, all on the Eastern Front, ranking him 4th in the list of Luftwaffe aces.

■ Lt. Leopold Wenger, 10./JG 2, Caen-Carpiquet, France, February 1943

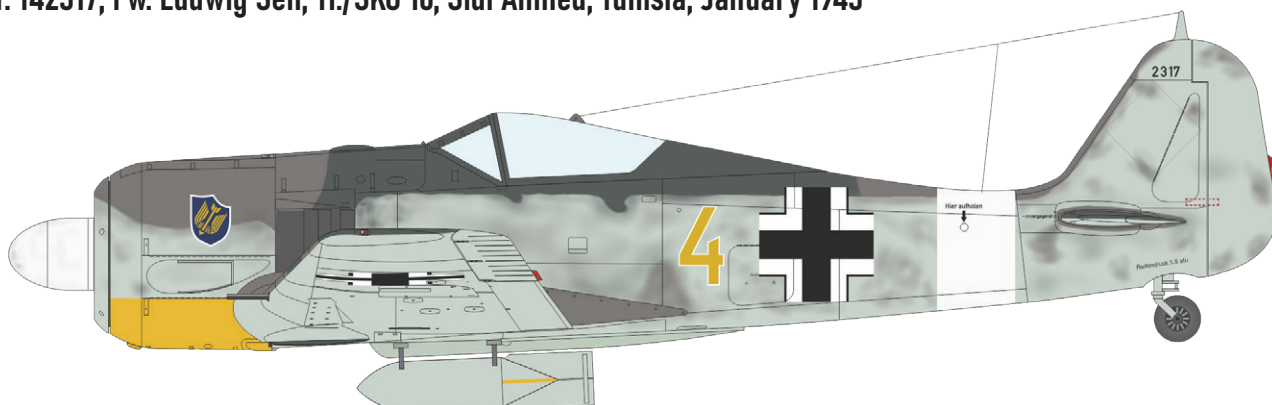


At the end of 1941, the Luftwaffe considered a resumption of the bombing of Great Britain and coastal shipping. It was ordered that every fighter unit taking part in operations against Great Britain would include one Staffel for the purposes of the so-called "hit and run" bombing missions.

This role was taken up by 10.(Jabo) Staffel within JG 2. Under the command of Oblt. Frank Liesendahl, the unit sank twenty ships for a total of 630,000 BRT of shipping in four months. Wenger's aircraft carried the standard day camouflage scheme of Luftwaffe fighters consisting of RLM 74/75/76.

The fox biting a ship in two was the insignia of 10.(Jabo) Staffel. One of the pilots of this unit was Leopold Wenger, born on November 19, 1921 in Graz. He was killed on April 10, 1945, when he was shot down over Vienna.

■ WNr. 142317, Fw. Ludwig Seif, 11./SKG 10, Sidi Ahmed, Tunisia, January 1943

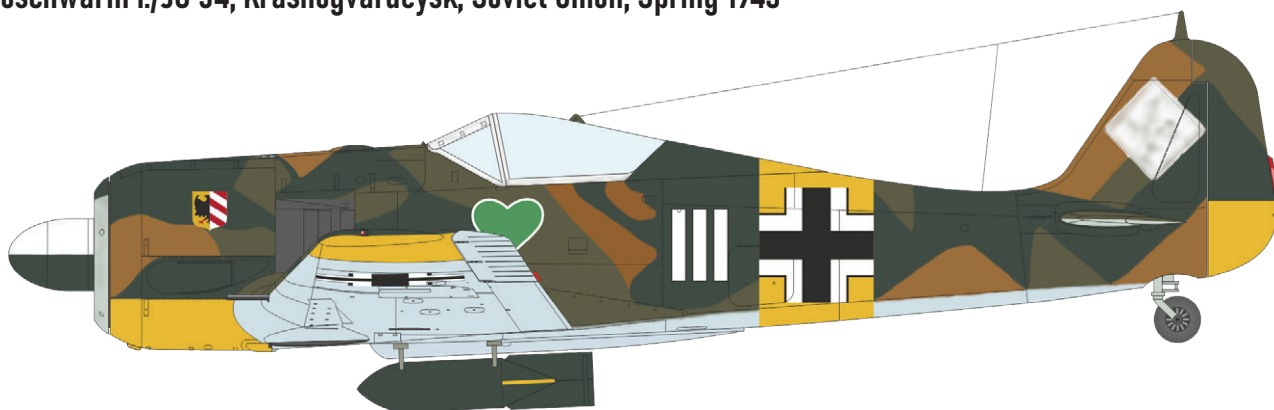


An order dated November 30, 1942 redesignated III./ZG 2 as III./SKG 10, but the unit maintained its combat assignment for ground support, bombing and destroying of enemy ground assets including airfields and ports in Tunisia. III./SKG 10 operated in the area until April 30,

1943, when they handed over their remaining four aircraft to II./SchLG. 2, the unit they shared a base with. During combat operations, pilots of III./SKG 10 destroyed hundreds of Allied tanks and other ground equipment, shot down thirteen aircraft and sank or damaged twelve ships. The

aircraft flown by Feldwebel Seif was camouflaged in RLM 74/75/76. The white fuselage band was applied to aircraft operating in the MTO. The port side of the engine cowl sported the III./SKG 10 unit marking, a yellow winged arrow on a blue shield.

Jaboschwarm I./JG 54, Krasnogvardeysk, Soviet Union, Spring 1943



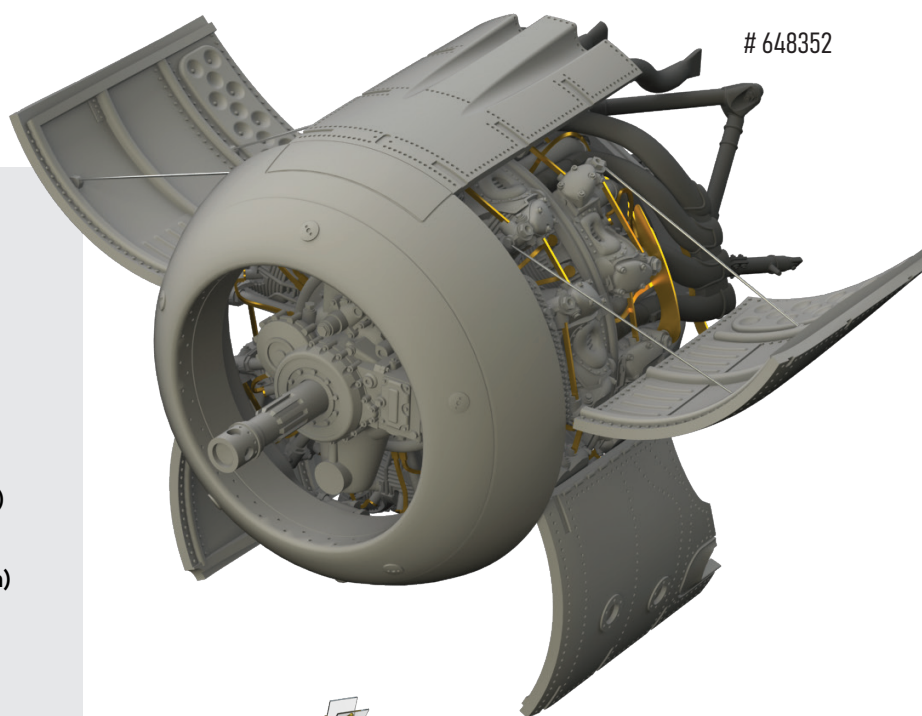
JG 54 received its first Fw 190A-4s in early February 1943, with white camouflage on the upper surfaces and RLM 65 on the bottom. On February 19, 1943, JG 54 scored its 4,000th aerial victory, achieved by an Fw. Otto Kittel. After the

winter period, the upper surfaces of the aircraft were painted black RLM 70, dark green RLM 71 and brown. As was customary with JG 54 in a variety of camouflage fields. The winter white paint remained on some of the less worn areas.

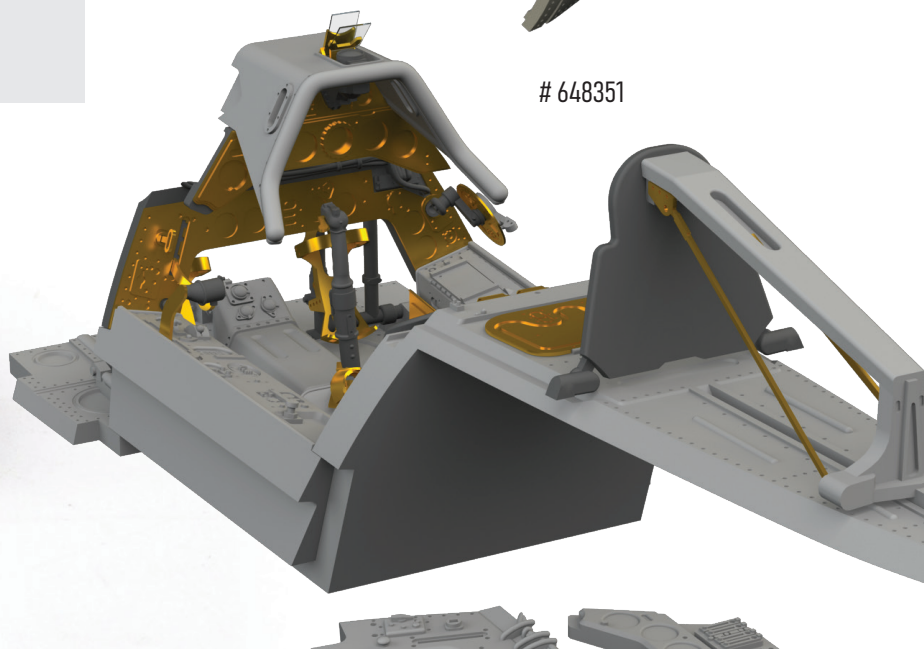
The Roman numeral III marked aircraft is an example of such a state and the color scheme is partly a mere reconstruction based on the better documented aircraft of JG 54. Roman numerals were used to mark staff aircraft in this period.

Recommended: for Fw 190A-4 1/48

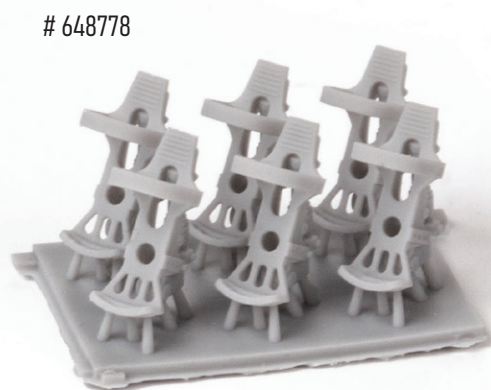
- 48936 Fw 190A-4 landing flaps (PE-Set)
- FE863 Fw 190A seatbelts STEEL (PE-Set)
- 648351 Fw 190A-4 cockpit (Brassin)
- 648352 Fw 190A-4 engine (Brassin)
- 648354 Fw 190A-4 fuselage guns (Brassin)
- 648356 Fw 190A wingroot gun bays (Brassin)
- 648366 Fw 190A propeller (Brassin)
- 648371 Fw 190A control surfaces early (Brassin)
- 648381 Fw 190A exhaust stacks (Brassin)
- 648778 Luftwaffe rudder pedals PRINT (Brassin)
- SIN64837 Fw 190A-4 advanced (Brassin)
- SIN64839 Fw 190A-4 essential (Brassin)
- D48038 Fw 190A-4 national insignia (Decal Set)
- EX587 Fw 190A TFace (Mask)



648352



648351

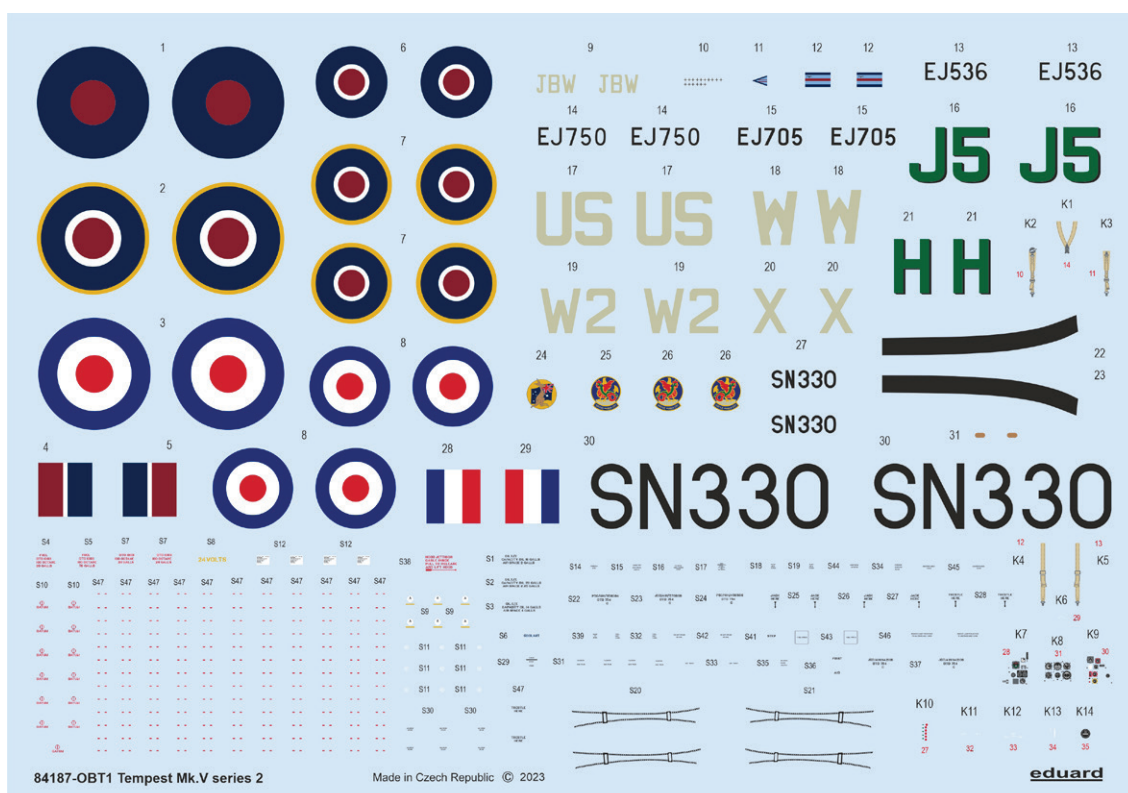


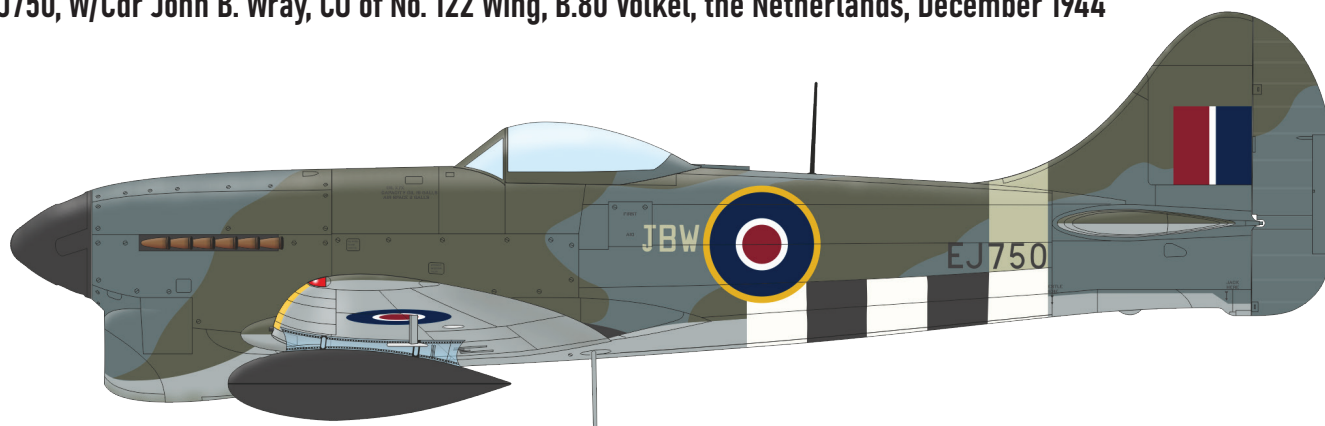
648778

1/48

Weekend edition kit of British WWII fighter aircraft Tempest Mk.V in 1/48 scale. The kit offers the aircraft manufactured within Series 2 and serving in the RAF during and after the end of World War II.

- plastic parts: Eduard
- marking options: 4
- decals: Eduard
- PE parts: no
- painting mask: no
- resin parts: no

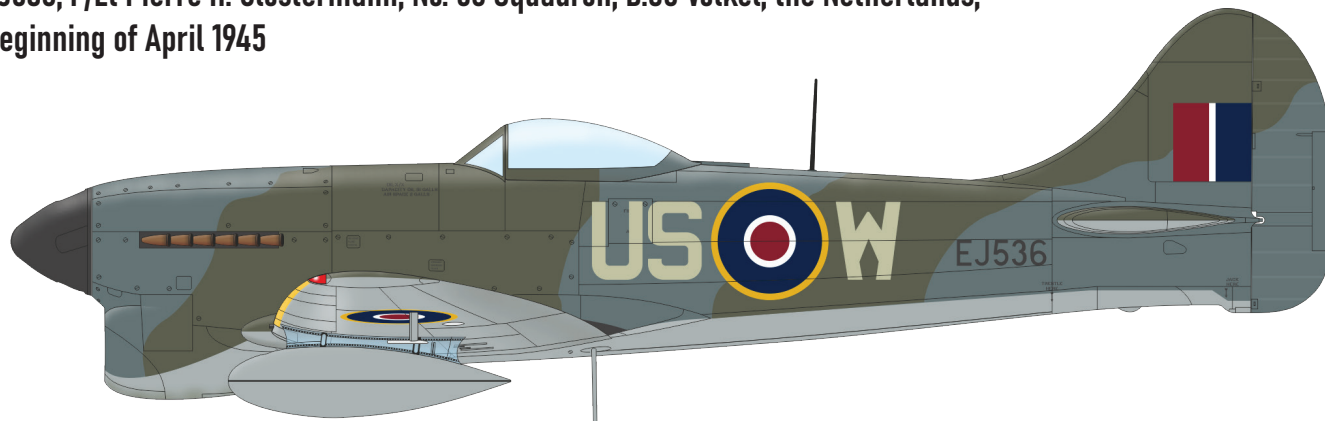


EJ750, W/Cdr John B. Wray, CO of No. 122 Wing, B.80 Volkel, the Netherlands, December 1944

W/Cdr John Wray was an experienced fighter-bomber pilot who flew Beaufighters, Whirlwinds, Hurricanes and Typhoons and after the No. 122 Wing's commander W/Cdr R. P. Beamont was shot down he assumed his position. Wray's Tempest EJ750 was marked with the first letters of his full name, i.e. JBW, and flying it on November

3 he claimed a Me 262 damaged. After the war however this "damaged" aircraft turned out to have been destroyed. On December 17, 1944, Wray claimed another Me 262 jet kill. Its pilot, Lt. Wolfgang Lübke from II./KG 51 hit a building by the left wingtip and crashed into the nearby river Rhine during the low altitude dogfight. In January

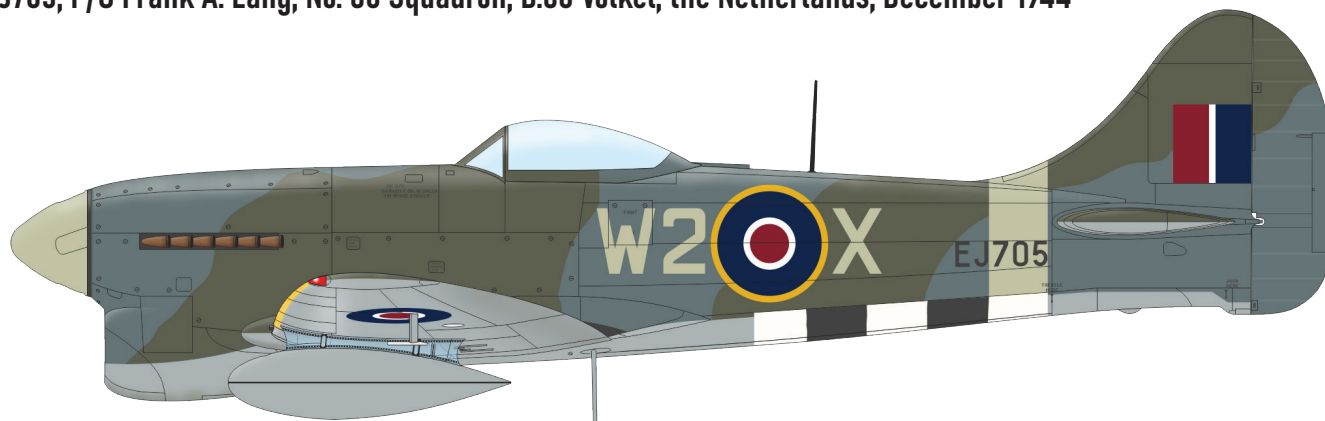
1945, W/Cdr Wray finished his tour of duty as a No. 122 Wing commander and the Tempest EJ750 was re-marked with SA-B code letters indicating that it belonged to No. 486 (RNZAF) Squadron. On February 8 it was lost during the anti-shipping attack when the pilot F/Lt Miller made an emergency landing in the occupied territory.

EJ536, F/Lt Pierre H. Clostermann, No. 56 Squadron, B.80 Volkel, the Netherlands, beginning of April 1945

The well-known French pilot, F/Lt Pierre Henri Clostermann, flew with No. 56 Squadron from March 18 until April 5, 1945. His usual mount was initially a Tempest serial number EJ708 marked US-W, in the end of March it was replaced by a Tempest serial number EJ536 and on the

fuselage it again carried the US-W code letters. On April 5, 1945, while at its controls, he damaged two Fw 190D-9s and destroyed four Ju 88Gs on the ground. On the starboard side under the windshield Clostermann had painted 16 crosses, symbols of his current air combat successes

(in total 12 confirmed kills and four probables). He finished his combat career flying with No. 3 Squadron with the total score of 14 confirmed kills, four probables and nine enemy aircraft destroyed on the ground.

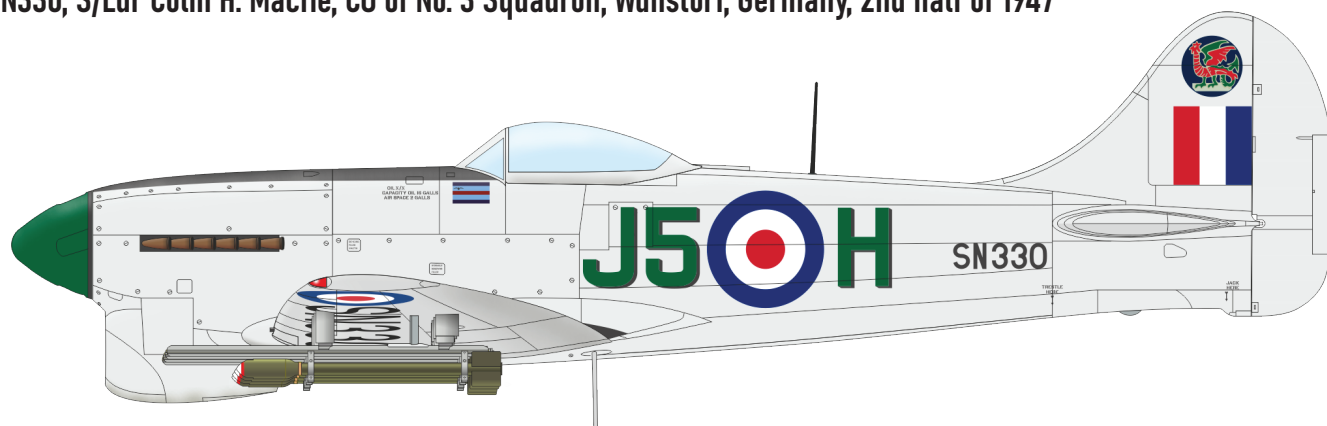
EJ705, P/O Frank A. Lang, No. 80 Squadron, B.80 Volkel, the Netherlands, December 1944

Right before D-day, the No. 80 Squadron, operating Spitfires Mk.IX, was incorporated into the Great Britain air defenses. In August it was re-equipped with the new Hawker Tempests Mk.V. In the end of September, the unit was transferred to the Continent as a part of the 2nd TAF. Tempest

serial number EJ705 was most frequently flown by an Australian pilot P/O Frank Lang. On the starboard side under the windshield his Tempest carried the nose art in the form of a kangaroo holding the Australian flag. Flying this aircraft on January 22, 1945, he destroyed two gliders and in

cooperation with other pilots from his unit shot down a Bf 109. Flying EJ705, other pilots from No. 80 Squadron destroyed two Bf 109 and one Fw 190. EJ705 finished its wartime career on March 11, 1945, when it was seriously damaged by an in-flight engine fire.

■ SN330, S/Ldr Colin H. Macfie, CO of No. 3 Squadron, Wunstorf, Germany, 2nd half of 1947



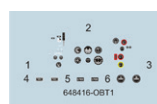
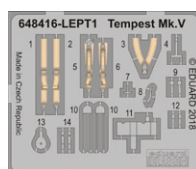
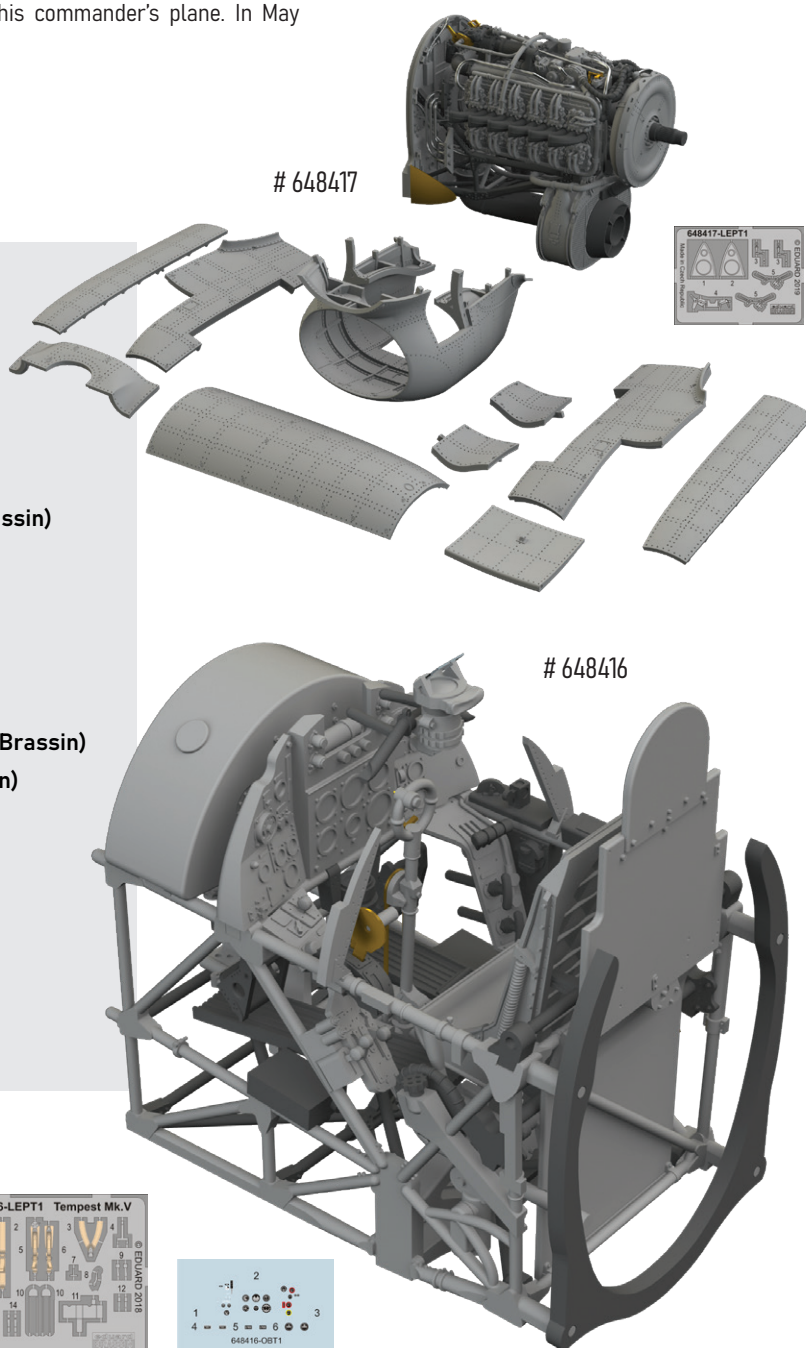
Tempest serial number SN330 missed the wartime service. In November 1945 it was dispatched to Germany and in January 1946 assigned to the No. 80 Squadron. During the following month it was damaged and returned to the Great Britain for repairs at Hawker company. After the

repairs were completed, it was delivered to the No. 3 Squadron sporting the overall coat of the aluminum paint and new, type D cockades. J5-H code letters were painted in the unit's traditional green color. S/Ldr Colin Hamilton Macafie chose this aircraft as his commander's plane. In May

1948 the Tempests were replaced by Vampires F.1 and SN330 was returned to the Great Britain for storage. In November 1950 it was sent for the scrap metal.

Recommended: for Tempest Mk.V Series 2 1/48

- 48976 Tempest Mk.V upgrade set (PE-Set)
- 48977 Tempest Mk.V landing flaps (PE-Set)
- FE943 Tempest Mk.V seatbelts STEEL (PE-Set)
- FE1079 Tempest Mk.V series 2 Weekend (PE-Set)
- BIG49212 Tempest Mk.V (PE-Set)
- 644006 Tempest Mk.V LööK (Brassin)
- 644039 Tempest Mk.V w/ late wheels LööKplus (Brassin)
- 648416 Tempest Mk.V cockpit (Brassin)
- 648417 Tempest Mk.V engine (Brassin)
- 648418 Tempest Mk.V exhaust stacks (Brassin)
- 648419 Tempest Mk.V gun bays (Brassin)
- 648421 Tempest Mk.V wheels late (Brassin)
- 648446 Tempest Mk.V undercarriage legs BRONZE (Brassin)
- 648450 RP-3 60lb rockets for Tempest Mk.V (Brassin)
- 648499 Tempest Mk.V intake ring (Brassin)
- 648500 Tempest Mk.V dust filter w/ eyelid (Brassin)
- SIN64858 Tempest Mk.V ADVANCED (Brassin)
- 3DL48023 Tempest Mk.V SPACE (3D Decal Set)
- D48030 Tempest Mk.V stencils (Decal Set)
- EX628 Tempest Mk.V TFace (Mask)
- EX695 Tempest Mk.V (Mask)



KULTURNÍ DŮM KOPŘIVNICE

KOPŘIVNICE



6. KVĚTNA 9-16.30 h

KULTURNÍ DŮM KOPŘIVNICE

25. ročník mezinárodní výstavy a soutěže

Mezinárodní soutěž plastikových a papírových modelů ve vyhlášených kategoriích

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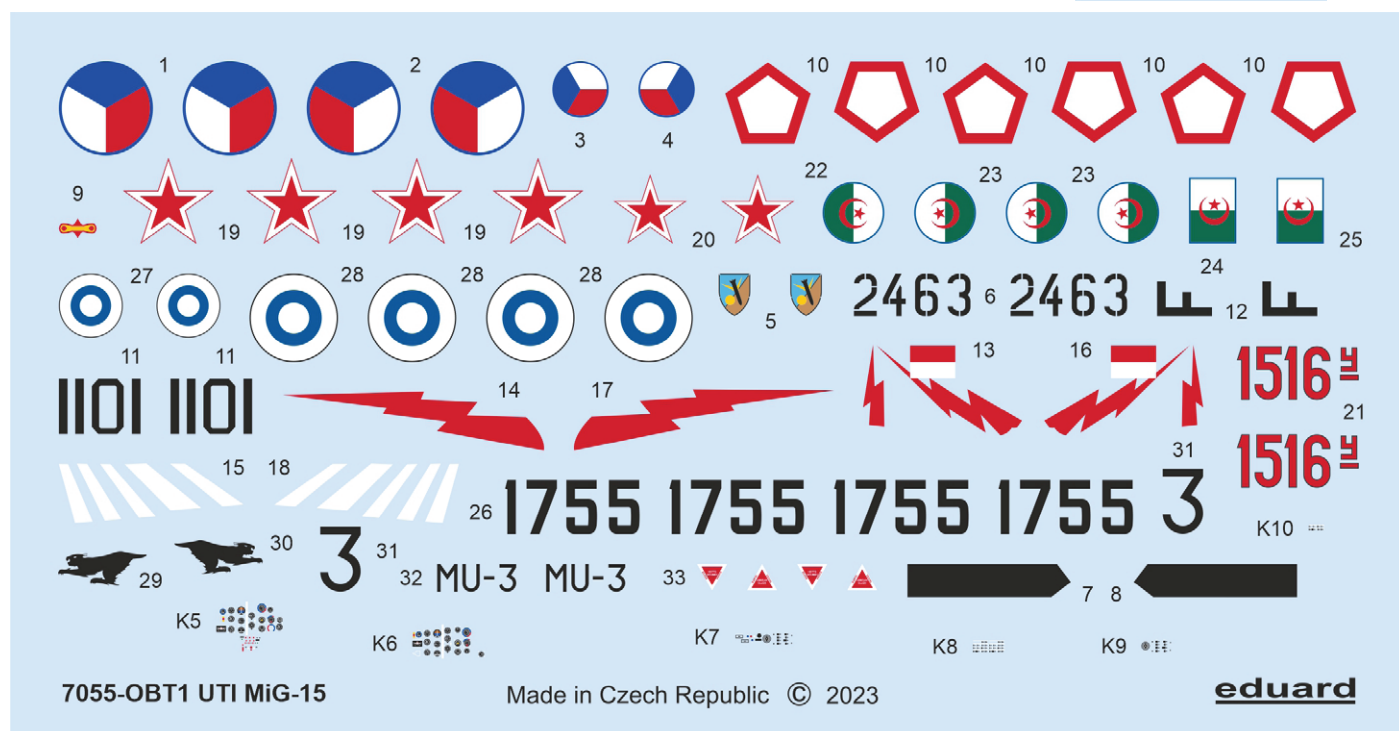
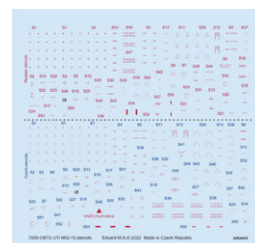
UTI MiG-15 1/72

Re-release

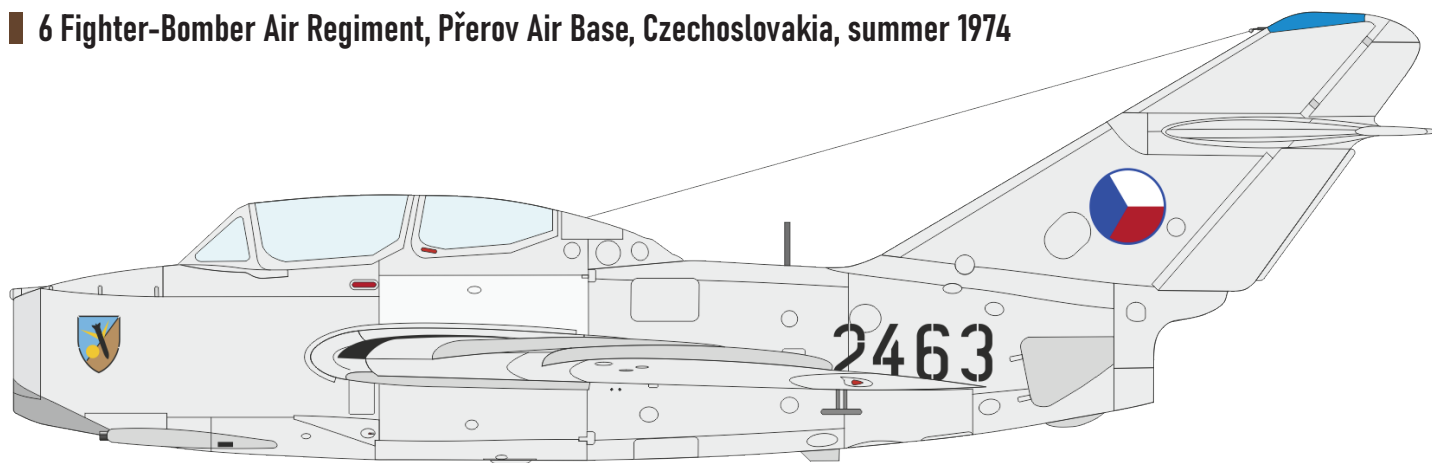
#7055

ProfiPACK edition kit of Soviet two-seat jet trainer aircraft UTI MiG-15 in 1/72 scale.

- plastic parts: Eduard
- marking options: 5
- decals: Eduard
- PE parts: yes, pre-painted
- painting mask: yes
- resin parts: no

[Product page](#)


6 Fighter-Bomber Air Regiment, Přerov Air Base, Czechoslovakia, summer 1974

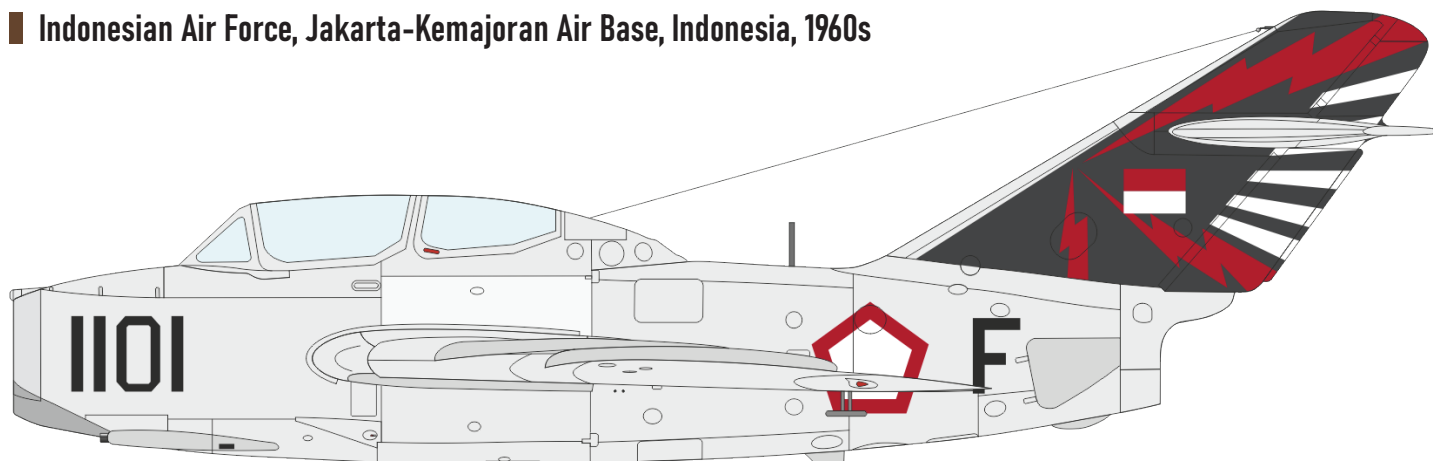


The unit emblem on the nose hints the aircraft belonged to 6. sbolp (6 Fighter-Bomber Air Regiment), but it is unclear which squadron flew

it. It might be the Squadron 2, and thus the top of the fin and the dot in the unit crest were blue. Aircraft flown by the Squadron 1 had these parts

colored in red while the Squadron 3 yellow.

Indonesian Air Force, Jakarta-Kemajoran Air Base, Indonesia, 1960s

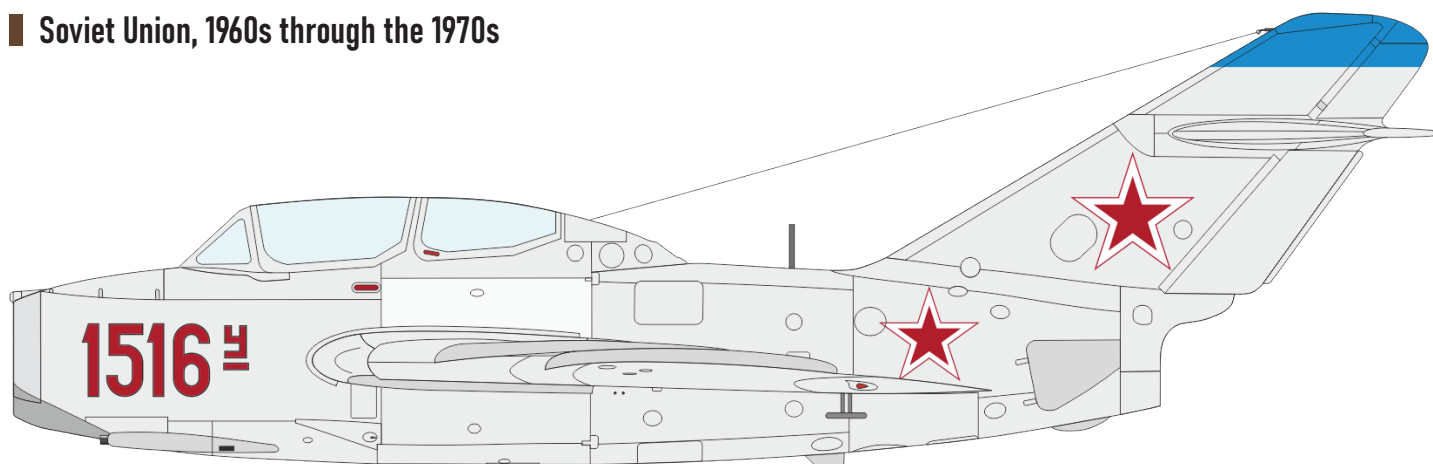


A total of fifteen Czechoslovak-built UTI MiG-15s was delivered to Indonesia during the late fifties.

All were taken out of inventory in 1973 when the T-33A Shooting Stars replaced them. The colorful

tail appeared on Indonesian MiG-17s and MiG-21s as well.

Soviet Union, 1960s through the 1970s

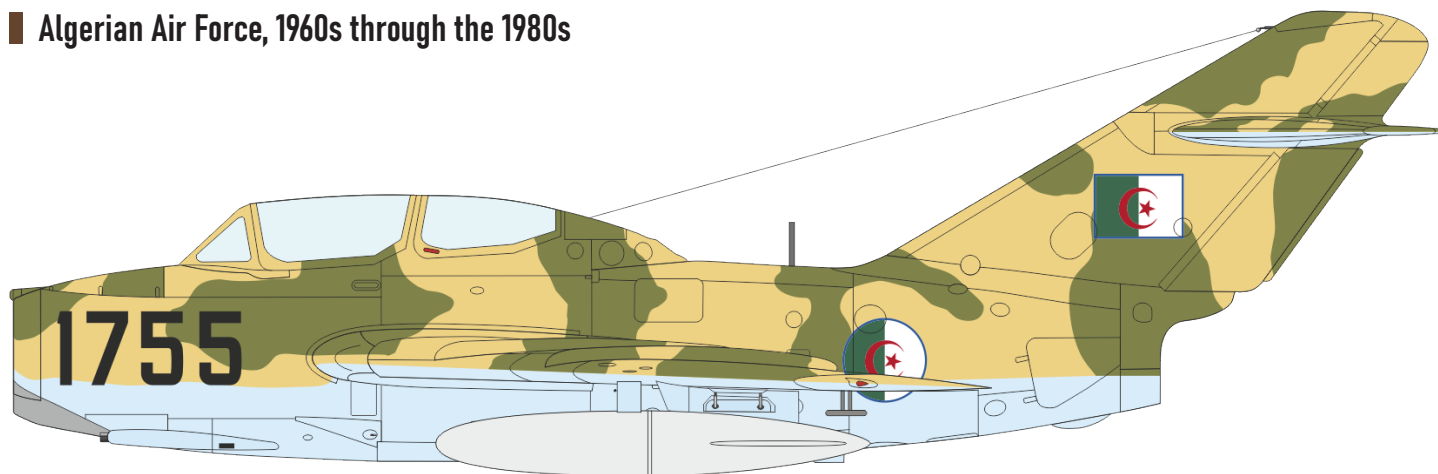


Many Soviet two-seater UTI MiG-15s wore the underlined letter "U" in Cyrillic along with the

fuselage number. It was the abbreviation of the term "uchobnyi", meaning "training". Black

walkways are not visible in the photo of this aircraft.

Algerian Air Force, 1960s through the 1980s

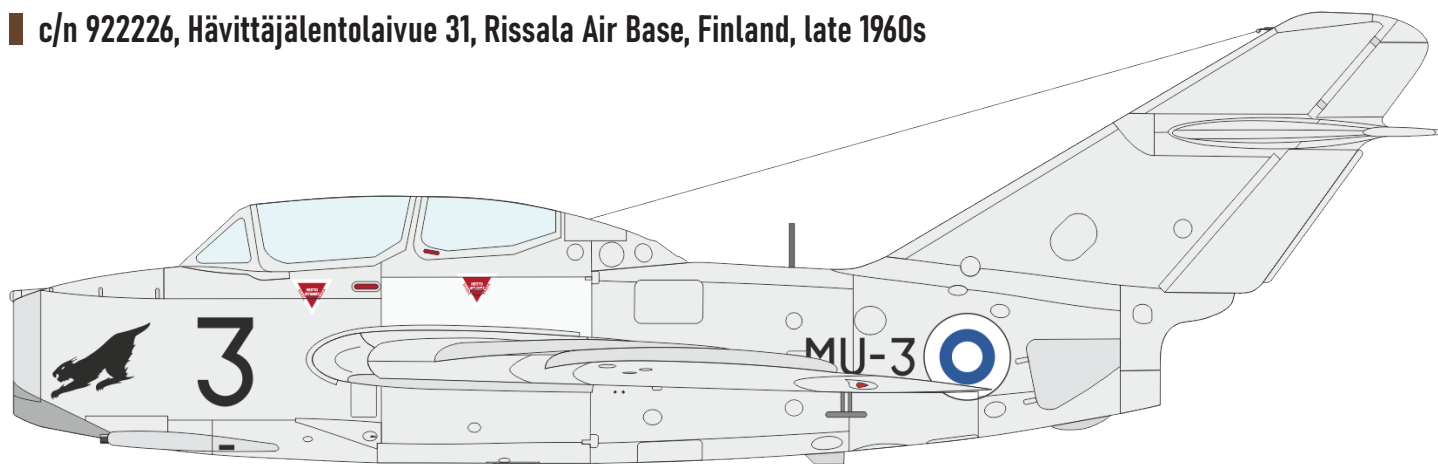


The Algerian Air Force obtained its first examples of the MiG-15 in the mid-sixties. Twenty of them were still in service in 1984. The presence of the

national insignia on the upper starboard and lower port wings is unclear. Current Algerian aircraft repeat the fuselage codes in these

locations.

c/n 922226, Hävittäjälentolaivue 31, Rissala Air Base, Finland, late 1960s



This aircraft was sold to Finland on November 10, 1962. It crashed on November 27, 1970 and was written off. During the fall of 1969, it escorted

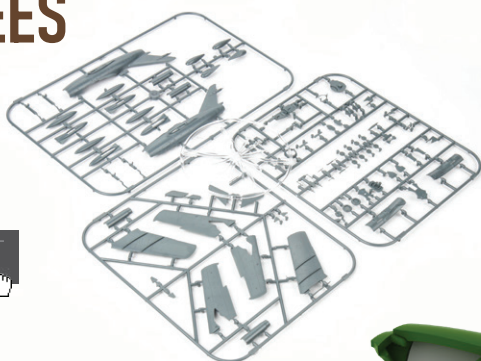
Czechoslovak IL-18 with president Ludvík Svoboda on board during his visit to Finland. The lynx silhouette places this aircraft with

Hävittäjälentolaivue 31 (Fighter Squadron 31).

OVERTREES

#7055X
UTI MiG-15
1/72

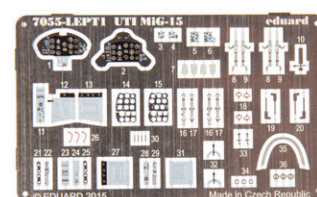
[Product page](#)



OVERLEPT

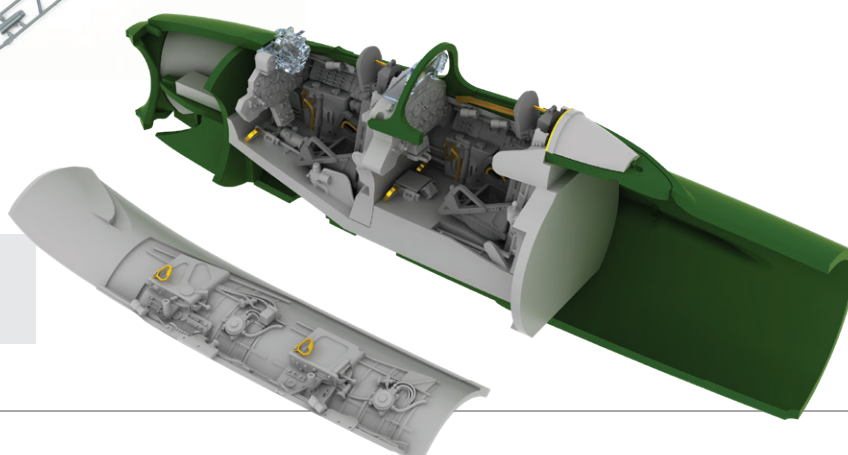
#7055-LEPT
UTI MiG-15 PE-Set
1/72

[Product page](#)



Recommended: for UTI MiG-15 1/72

672077 UTI MiG-15 cockpit (Brassin)
3DL72014 UTI MiG-15 SPACE (3D Decal)

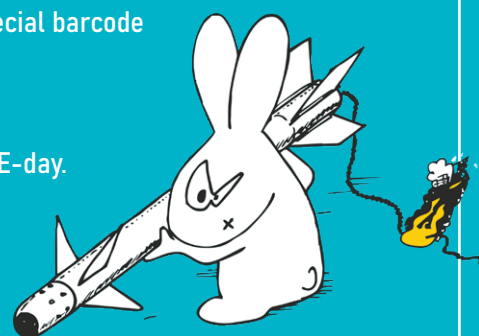


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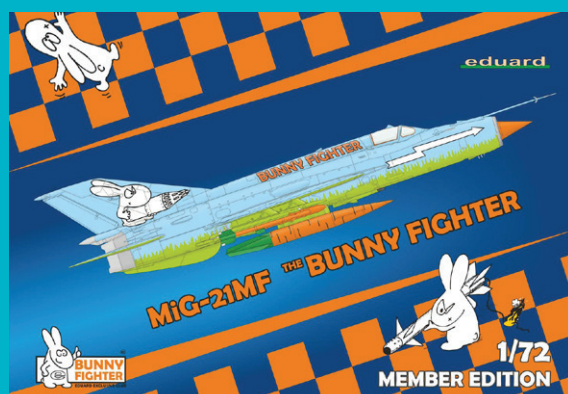


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Activation products:

MiG-21MF + T-shirt 1/72

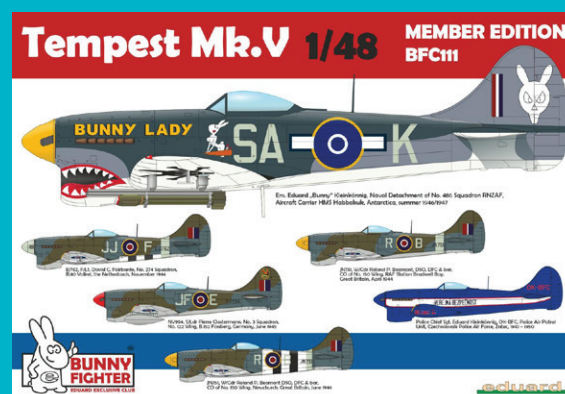


BOX CONTENT:

Plastic parts, Marking options 4, Decal Set, PE parts, Mask, Brassin parts (undercarriage wheels, cockpit, exhaust nozzle, FOD).



Tempest Mk. V + T-shirt 1/48



BOX CONTENT:

Plastic parts, Marking options 6, Decal Set, PE parts, Mask, Brassin parts (two different types of wheels, landing flaps, dust filter with eyelid, intake ring and RP-3 60lb rockets), 3D decals for main and sidewalk instrument and control panels with photo-etched details and seat belts.

632188

Hurricane Mk.II exhaust rounded PRINT

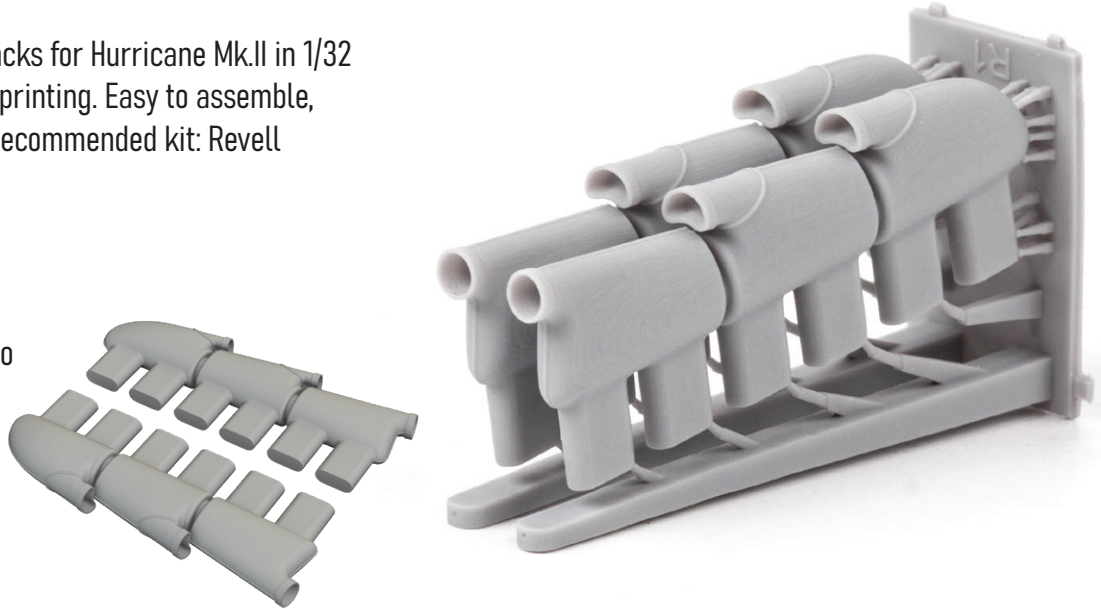
eduard
BRASSIN
Print

1/32 Revell

Brassin set - exhaust stacks for Hurricane Mk.II in 1/32 scale. Made by direct 3D printing. Easy to assemble, replaces plastic parts. Recommended kit: Revell

Set contains:

- 3D print: 2 parts
- decals: no
- photo-etched details: no
- painting mask: no

[Product page](#)

632189

Hurricane Mk.II exhaust fishtail PRINT

eduard
BRASSIN
Print

1/32 Revell

Brassin set - exhaust stacks for Hurricane Mk.II in 1/32 scale. Made by direct 3D printing. Easy to assemble, replaces plastic parts. Recommended kit: Revell

Set contains:

- 3D print: 2 parts
- decals: no
- photo-etched details: no
- painting mask: no

[Product page](#)

632190

Hurricane Mk.II wheels

1/32 Revell

Brassin set - the undercarriage wheels for Hurricane Mk.II in 1/32 scale. The set consists of the main wheels and a tail wheel. Easy to assemble, replaces plastic parts. Recommended kit: Revell

Set contains:

- resin: 3 parts
- 3D print: 2 parts
- decals: no
- photo-etched details: no
- painting mask: yes

Product page



634032

Bf 109G-4 LööKplus

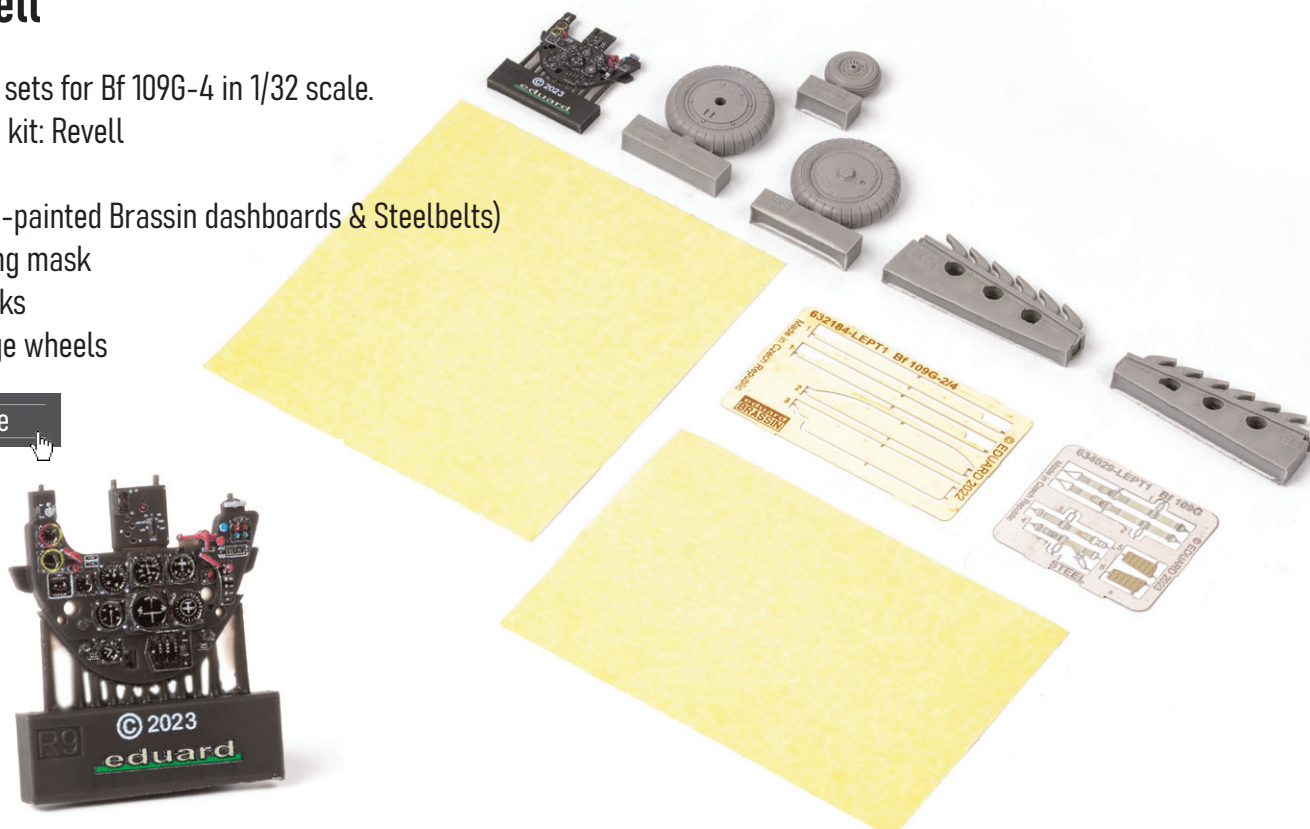
Löökt

1/32 Revell

Collection of 4 sets for Bf 109G-4 in 1/32 scale. Recommended kit: Revell

- LööK set (pre-painted Brassin dashboards & Steelbelts)
- TFace painting mask
- exhaust stacks
- undercarriage wheels

Product page



635024

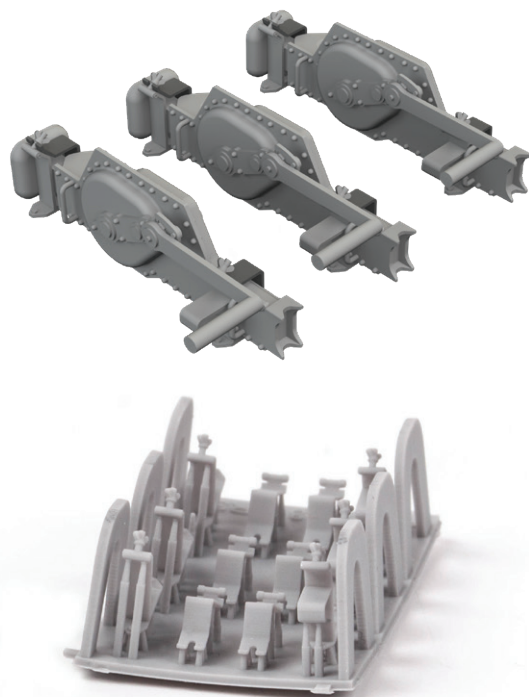
WWII German 10 ton jacks PRINT

1/35

Brassin set - 10ton jacks for German WWII AFV in 1/35 scale. The set consists of 3 jacks. Made by direct 3D printing.

Set contains:

- 3D print: 15 parts
- decals: no
- photo-etched details: no
- painting mask: no

[Product page](#)


635026

WWII German wire cutters PRINT

1/35

Brassin set - wire cutters for German WWII AFV in 1/35 scale. The set consists of 5 wire cutters. Made by direct 3D printing.

Set contains:

- 3D print: 5 parts
- decals: no
- photo-etched details: yes
- painting mask: no

[Product page](#)




644204

Anson Mk.I LööKplus

1/48 Airfix

Collection of 4 sets for Anson Mk.I in 1/48 scale.
Recommended kit: Airfix

- LööK set (pre-painted Brassin dashboards & Steelbelts)
- TFace painting mask
- radiators
- undercarriage wheels

Product page



LööK



644205

A6M2-N Rufe LööK

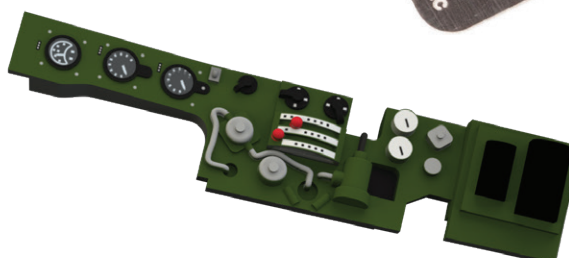
1/48 Eduard

LööK set - Brassin pre-painted dashboard and STEEL seatbelts for A6M2-N Rufe in 1/48 scale. Easy to assemble, replaces plastic parts. Recommended kit: Eduard

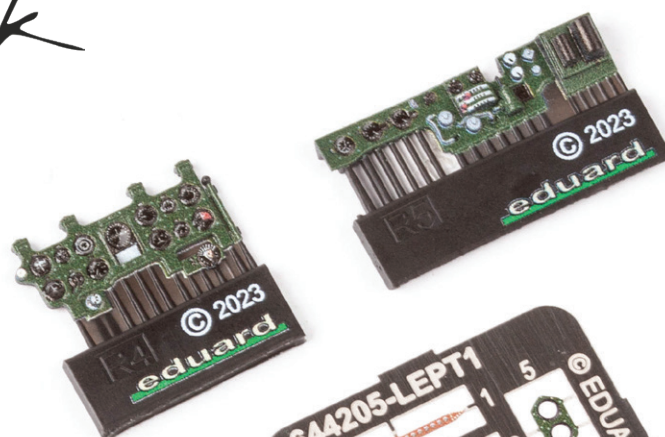
Set contains:

- resin: 2 parts
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

Product page



LööK



644206

B-25J LööK*LööK***1/48 HKM**

LööK set - Brassin pre-painted dashboard and STEEL seatbelts for B-25J in 1/48 scale. Easy to assemble, replaces plastic parts. Recommended kit: HKM

Set contains:

- resin: 3 parts
- 3D print: 2 parts
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

[Product page](#)


644207

F-16C Block 25 LööK*LööK***1/48 Kinetic**

LööK set - Brassin pre-painted dashboard and STEEL seatbelts for F-16C Block 25 in 1/48 scale. Easy to assemble, replaces plastic parts. Recommended kit: Kinetic

Set contains:

- resin: 2 parts
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

[Product page](#)


648826

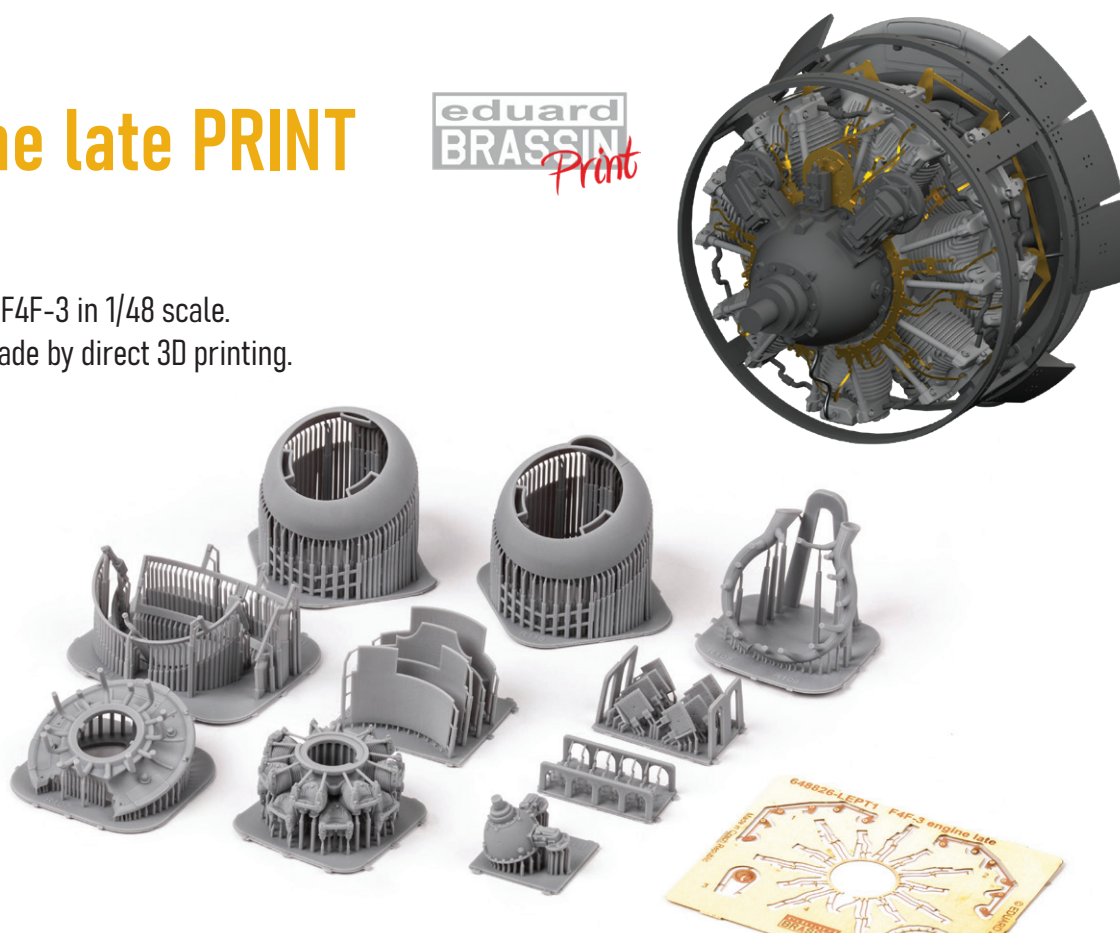
F4F-3 engine late PRINT

1/48 Eduard

Brassin set - the engine for F4F-3 in 1/48 scale.
 The cowling are included. Made by direct 3D printing.
 Recommended kit: Eduard

Set contains:

- 3D print: 36 parts
- decals: no
- photo-etched details: yes
- painting mask: no

[Product page](#)

648842

A-1H seat

1/48 Tamiya

Brassin set - the seat for A-1J in 1/48 scale. Seatbelts are printed together with the seat. Easy to assemble, replaces plastic parts. Recommended kit: Tamiya

Set contains:

- resin: 1 part
- decals: no
- photo-etched details: no
- painting mask: no

[Product page](#)


648844

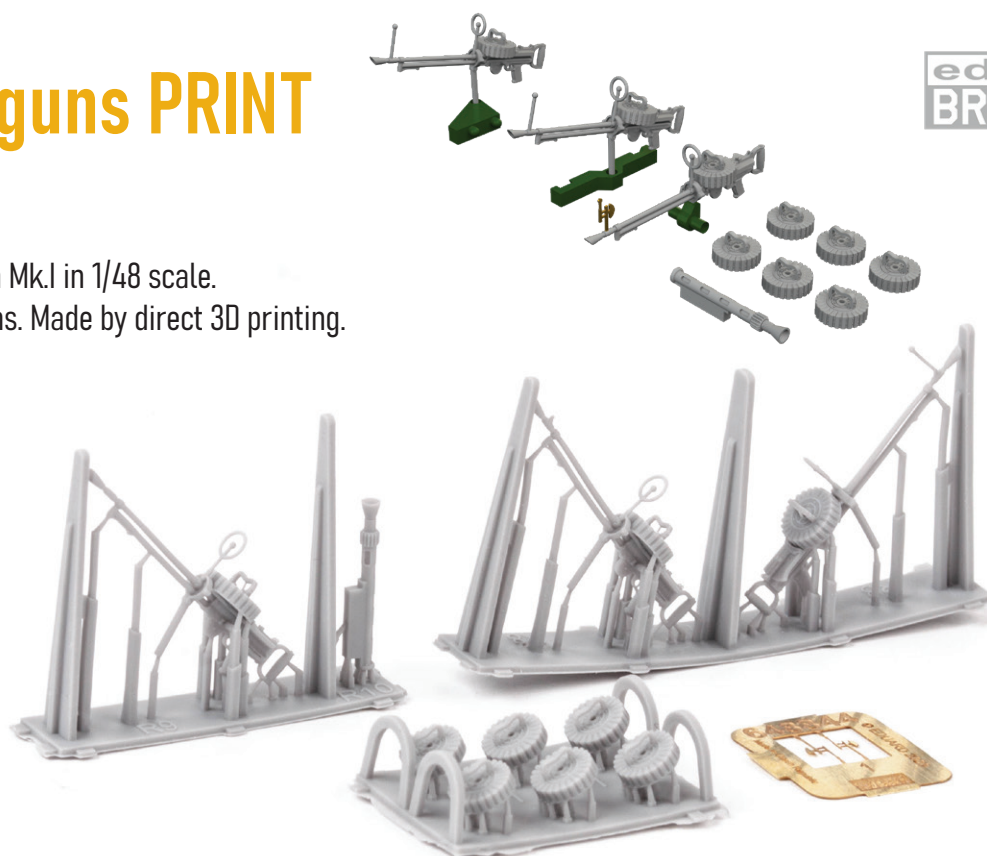
Anson Mk.I guns PRINT

1/48 Airfix

Brassin set - guns for Anson Mk.I in 1/48 scale.
The set consists of the 4 guns. Made by direct 3D printing.
Recommended kit: Airfix

Set contains:

- 3D print: 10 parts
- decals: no
- photo-etched details: yes
- painting mask: no

[Product page](#)


648845

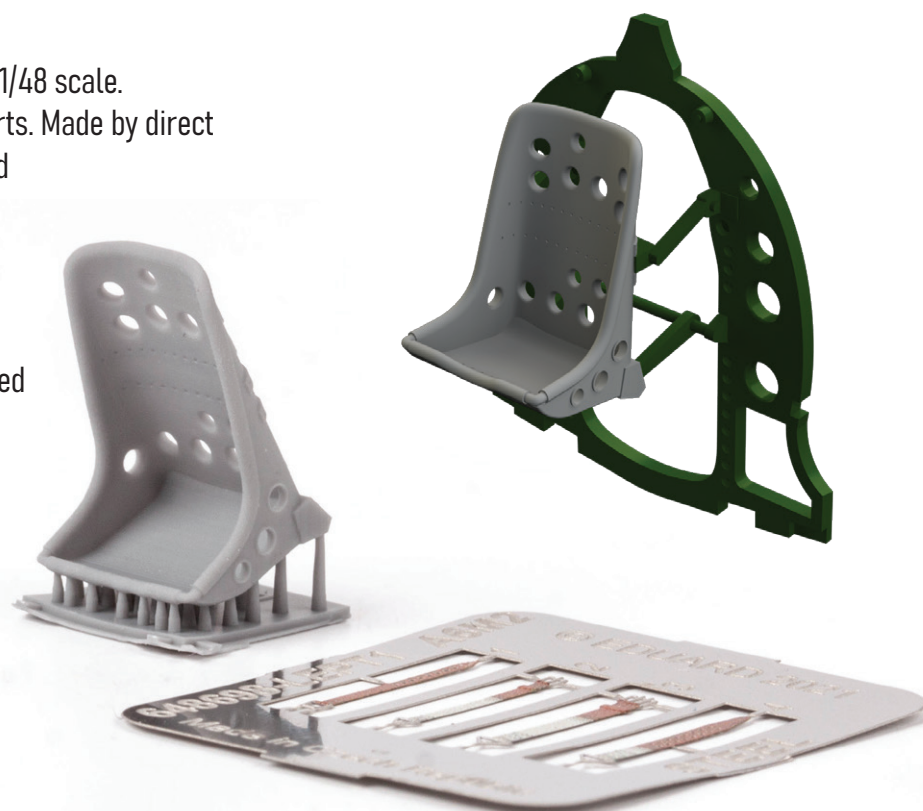
A6M2-N Rufe seat PRINT

1/48 Eduard

Brassin set - seat for A6M2-N Rufe in 1/48 scale.
Easy to assemble, replaces plastic parts. Made by direct 3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 1 part
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

[Product page](#)


648846

A6M2-N Rufe exhaust PRINT

1/48 Eduard

Brassin set - exhaust pipes for A6M2-N Rufe in 1/48 scale. Easy to assemble, replaces plastic parts. Made by direct 3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 4 parts
- decals: no
- photo-etched details: no
- painting mask: no

[Product page](#)

eduard
BRASSIN
Print
648847

A6M2-N Rufe cannon barrels & cockpit guns PRINT

1/48 Eduard

Brassin set - gun barrels for A6M2-N Rufe in 1/48 scale. Easy to assemble, replaces plastic parts. Made by direct 3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 4 parts
- decals: no
- photo-etched details: yes
- painting mask: no

[Product page](#)

eduard
BRASSIN
Print

648848

A6M2-N Rufe folding wingtips PRINT



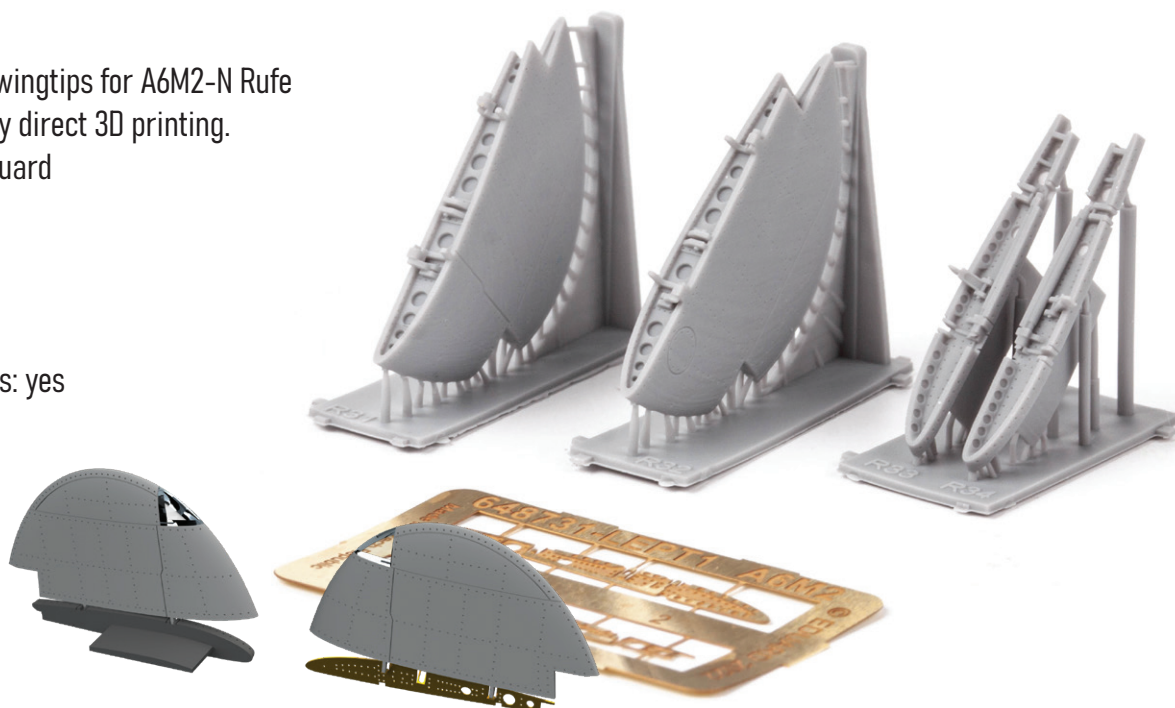
1/48 Eduard

Brassin set - folding wingtips for A6M2-N Rufe in 1/48 scale. Made by direct 3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 4 parts
- decals: no
- photo-etched details: yes
- painting mask: no

[Product page](#)



648849

A6M2-N Rufe gun bays PRINT

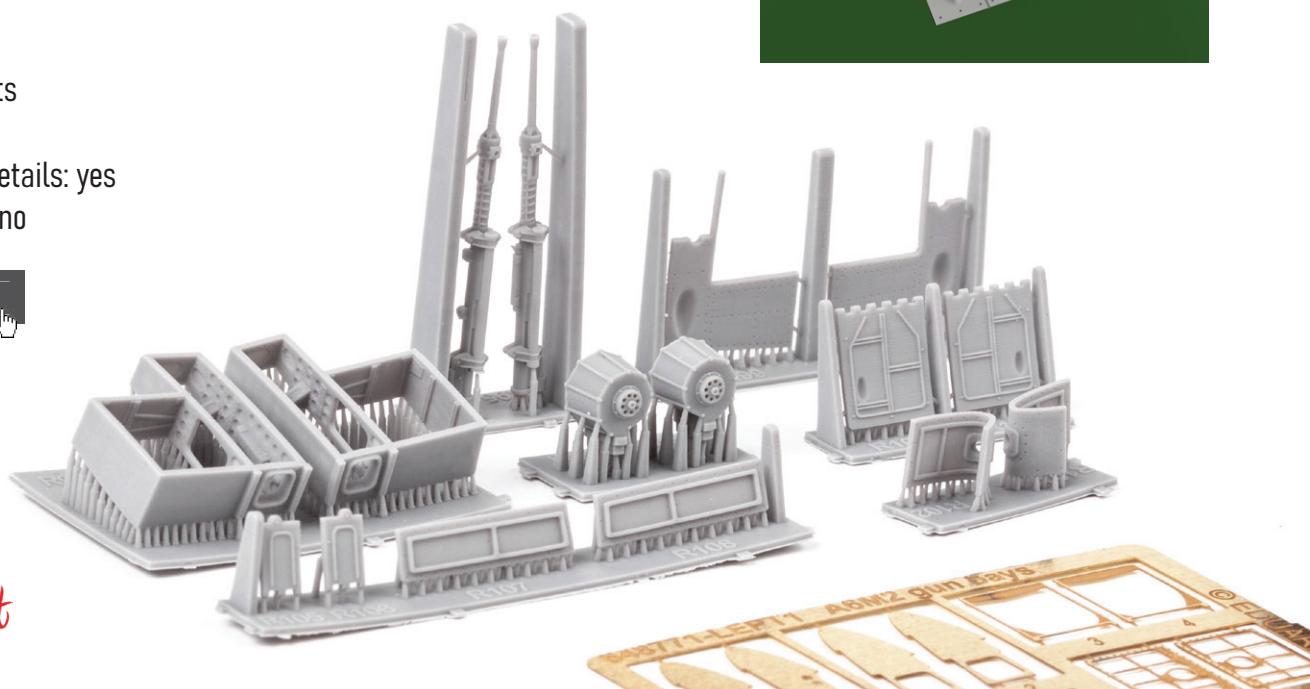
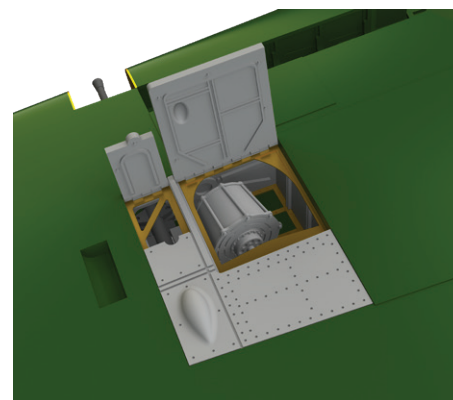
1/48 Eduard

Brassin set - gun bays for A6M2-N Rufe in 1/48 scale. Made by direct 3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 16 parts
- decals: no
- photo-etched details: yes
- painting mask: no

[Product page](#)




648854

F-16 exhaust nozzle P&W F100 PRINT

eduard
BRASSIN
Print

1/48 Kinetic

Brassin set - exhaust nozzle for P&W F100 powered F-16 in 1/48 scale. Made by direct 3D printing.
Recommended kit: Kinetic

Set contains:

- 3D print: 4 parts
- decals: no
- photo-etched details: no
- painting mask: no

[Product page](#)



648855

F-16 radar early PRINT

eduard
BRASSIN
Print

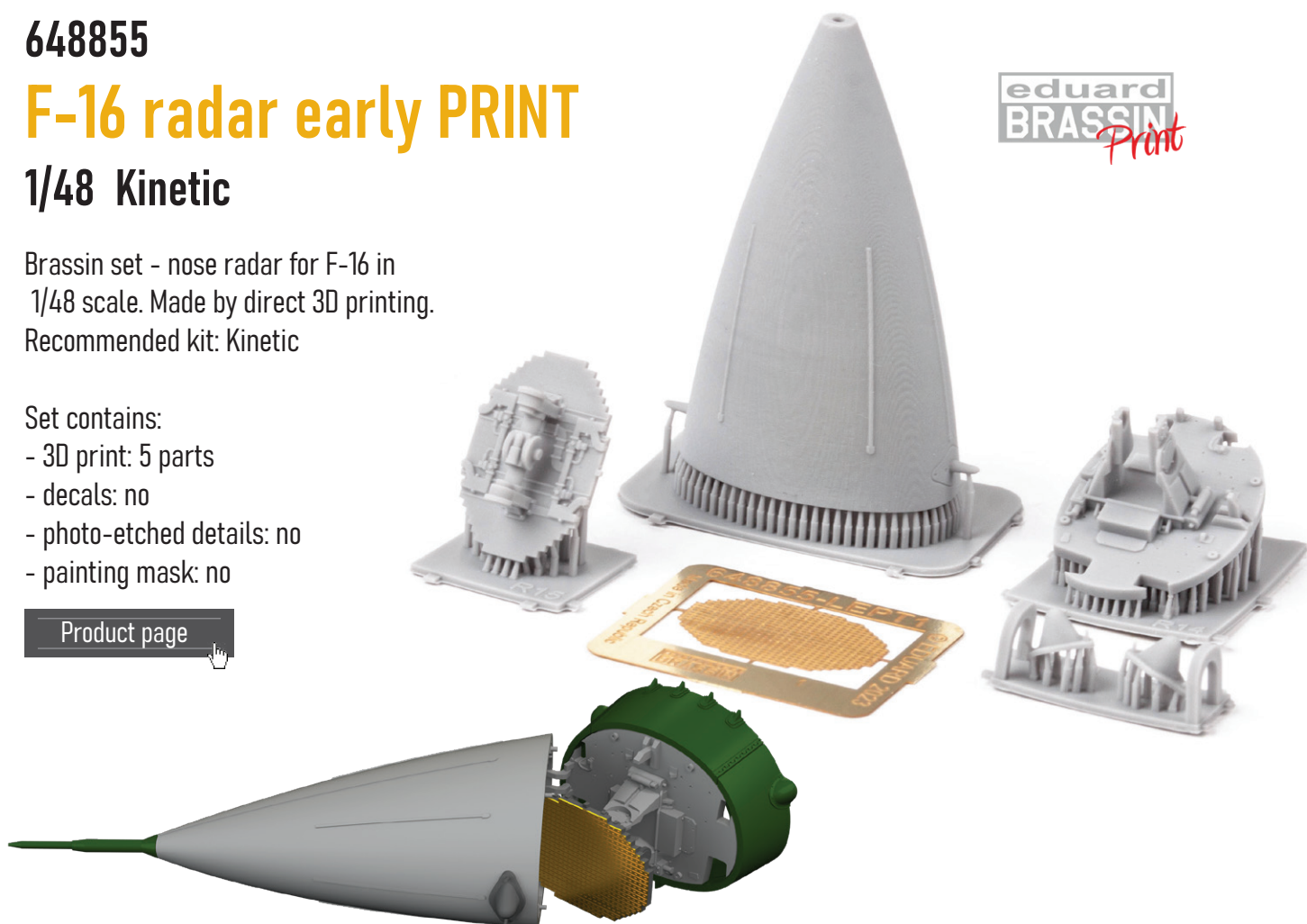
1/48 Kinetic

Brassin set - nose radar for F-16 in 1/48 scale. Made by direct 3D printing.
Recommended kit: Kinetic

Set contains:

- 3D print: 5 parts
- decals: no
- photo-etched details: no
- painting mask: no

[Product page](#)



648857

Mi-24V cockpit turquoise PRINT & SPACE

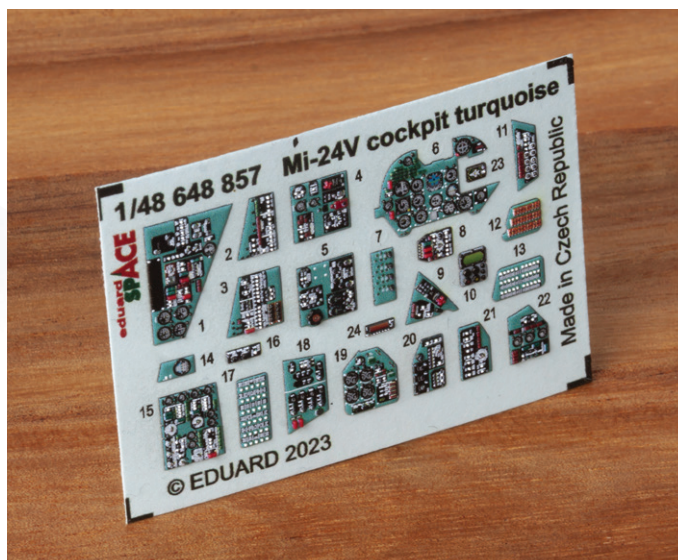
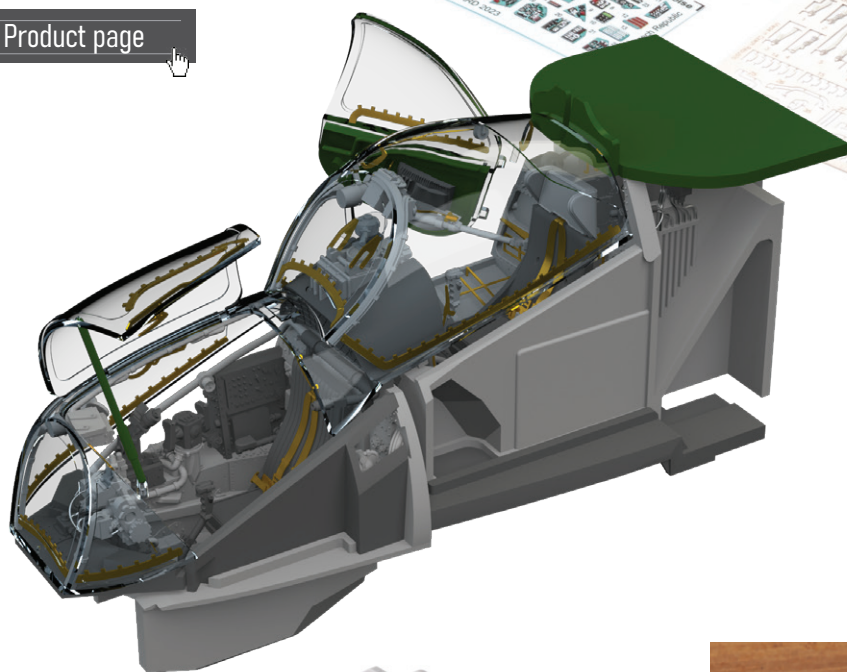
eduard
BRASSIN
Print

1/48 Eduard/Zvezda

Brassin set - turquoise-painted cockpit for Mi-24V
in 1/48 scale. Made by direct 3D printing.
Recommended kit: Eduard / Zvezda

Set contains:

- 3D print: 10 parts
- resin: 46 parts
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no
- SPACE 3D decals: yes

[Product page](#)


672311

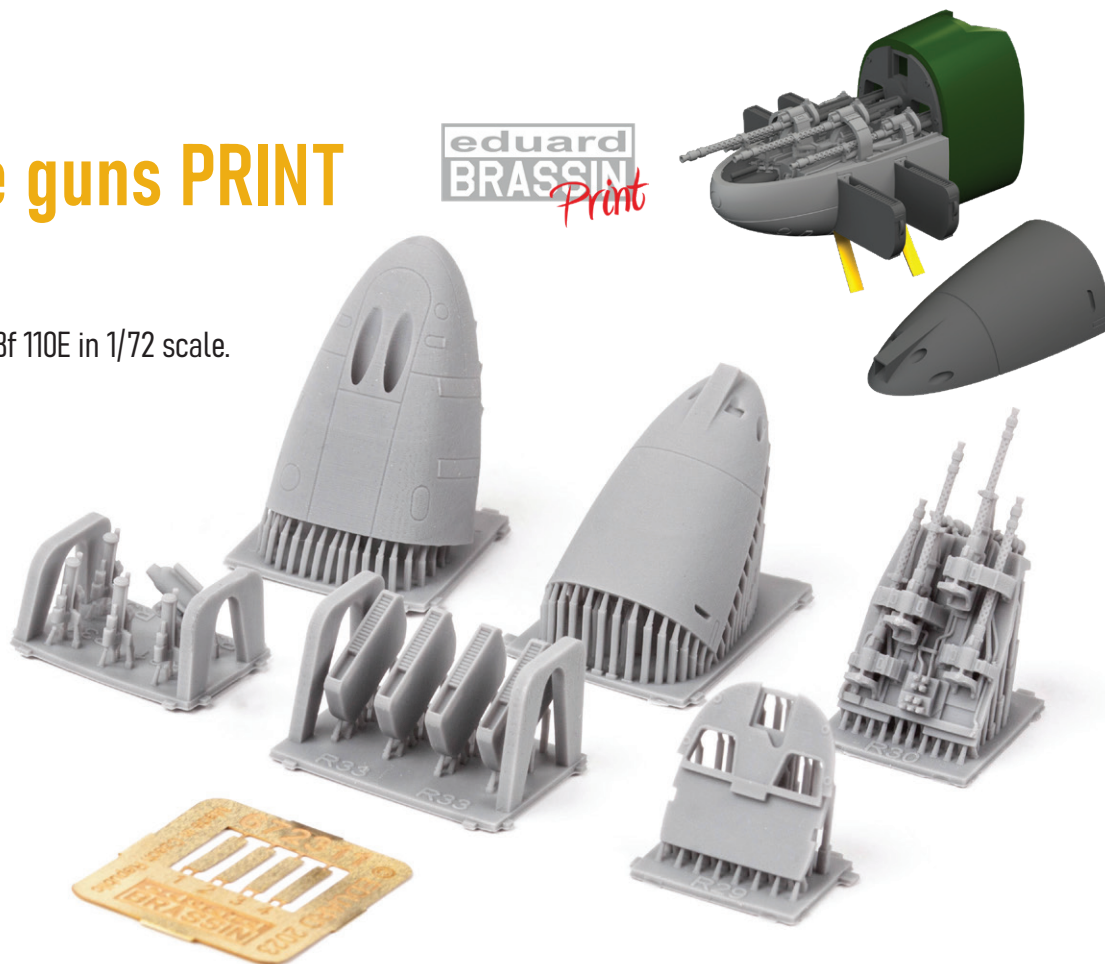
Bf 110E nose guns PRINT

1/72 Eduard

Brassin set - nose guns for Bf 110E in 1/72 scale.
 Made by direct 3D printing.
 Recommended kit: Eduard

Set contains:

- 3D print: 13 parts
- decals: no
- photo-etched details: yes
- painting mask: no

[Product page](#)

672312

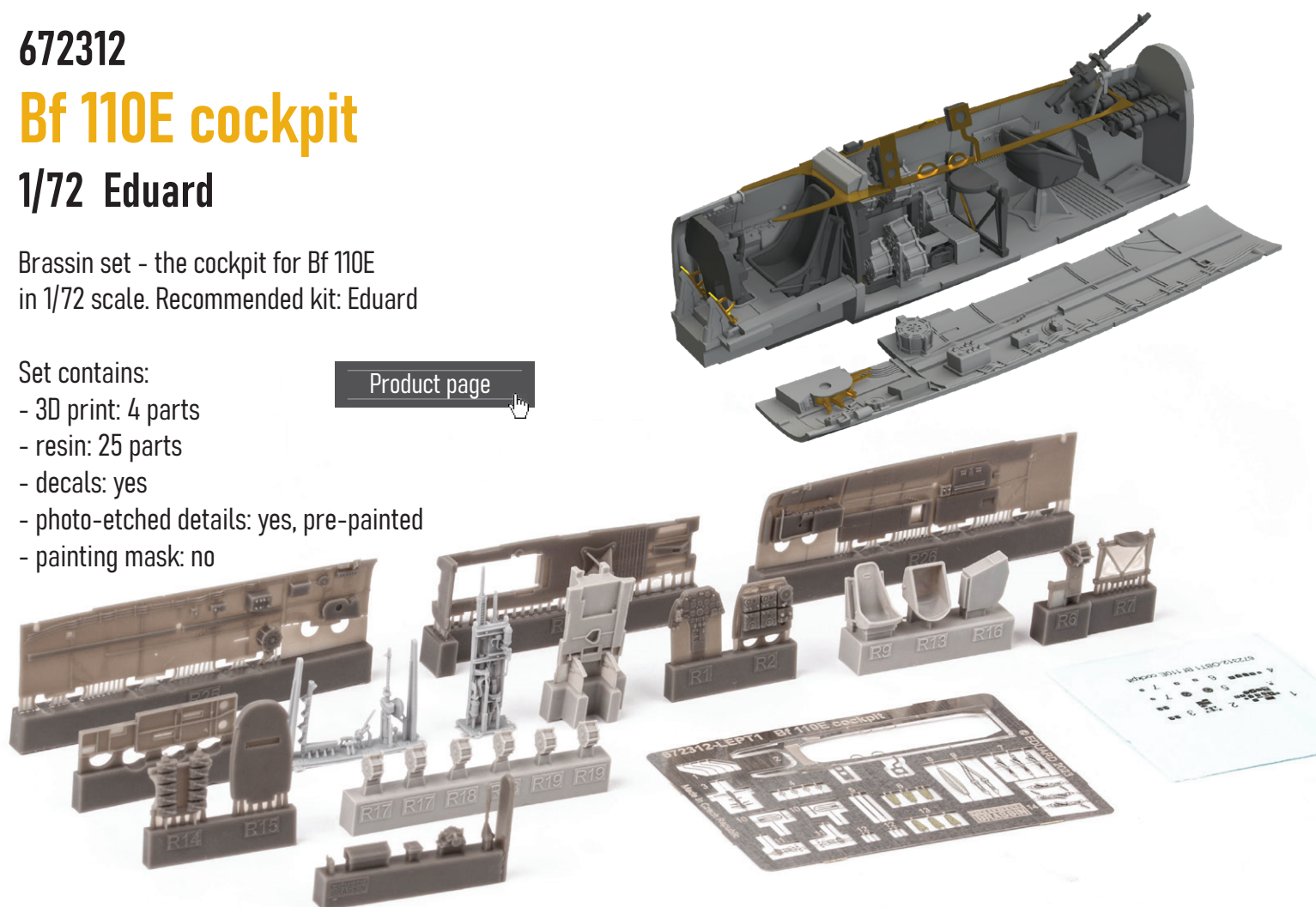
Bf 110E cockpit

1/72 Eduard

Brassin set - the cockpit for Bf 110E
 in 1/72 scale. Recommended kit: Eduard

Set contains:

- 3D print: 4 parts
- resin: 25 parts
- decals: yes
- photo-etched details: yes, pre-painted
- painting mask: no

[Product page](#)


674003

P-39Q LööKplus

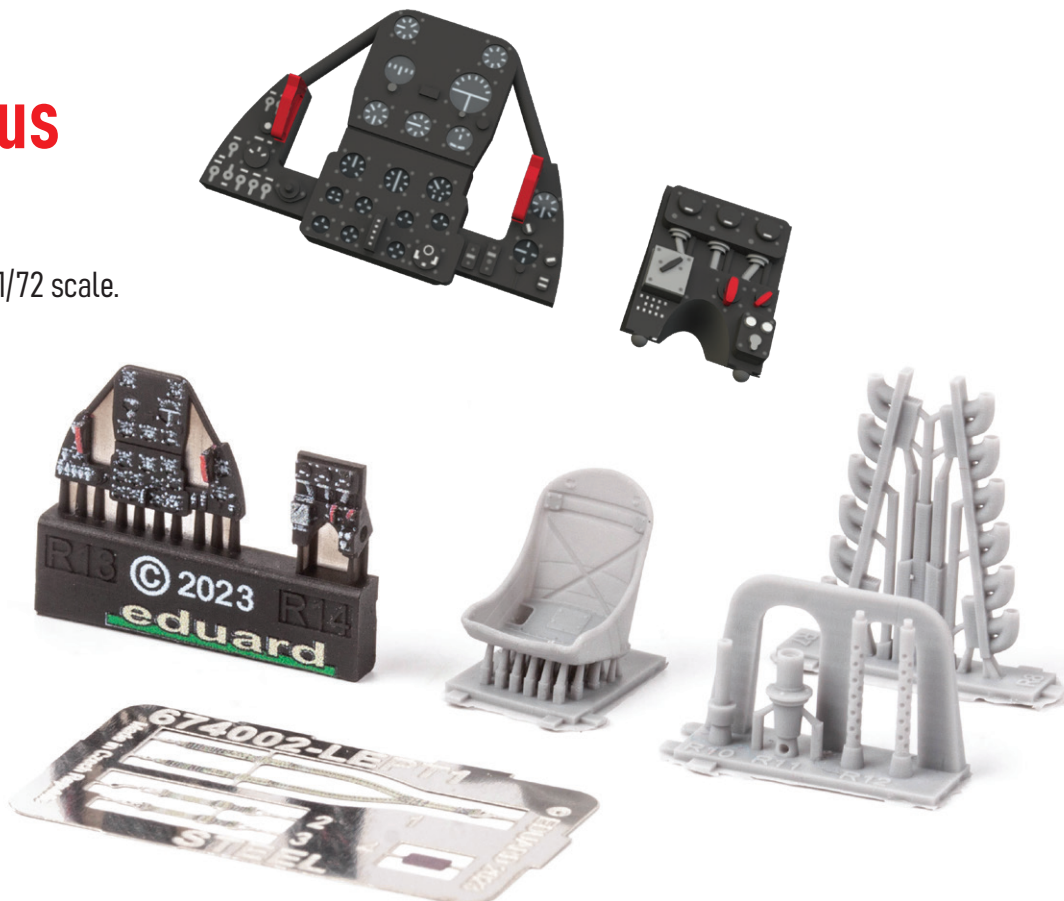
1/72 Arma Hobby

Collection of 4 sets for P-39Q in 1/72 scale.

Recommended kit: Arma Hobby

- LööK set (pre-painted Brassin dashboards & Steelbelts),
- seat
- exhaust stacks
- gun barrells

[Product page](#)



672310

Bf 110E wheels

1/72 Eduard

Brassin set - the undercarriage wheels for Bf 110E in 1/72 scale. The set consists of the main wheels and a tail wheel. Easy to assemble, replaces plastic parts.

Recommended kit: Eduard

Set contains:

- resin: 3 parts
- decals: no
- photo-etched details: no
- painting mask: yes

[Product page](#)


SIN63216

Tornado IDS armament

1/32 Italeri

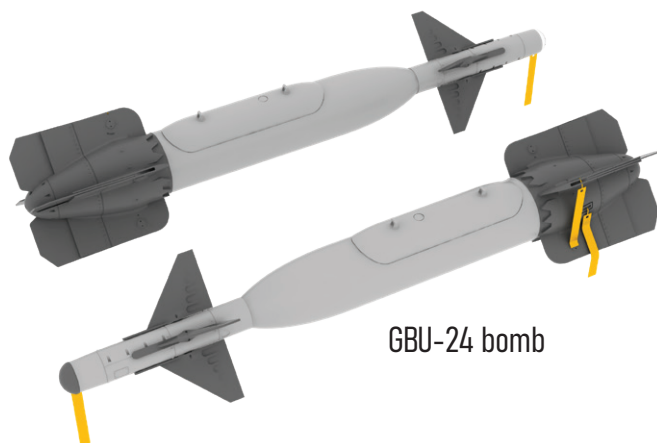
Collection of 6 sets for Tornado IDS in 1/32 scale.

Recommended kit: Italeri

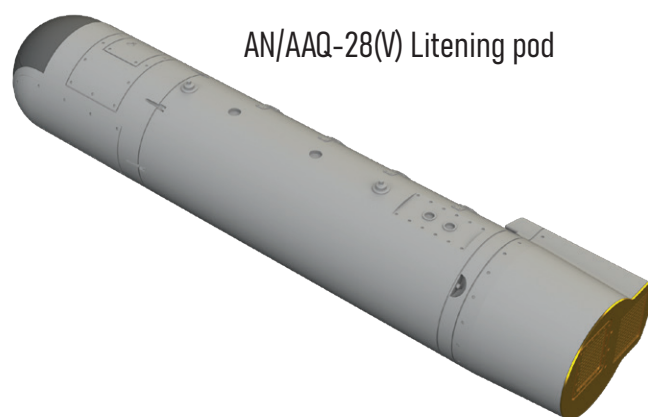
- AIM-9M/L Sidewinder
- AGM-88 HARM
- BOZ-107 pod (2 sets)
- AN/AAQ-28(V) Litening pod
- GBU-24 bomb

All sets included in this BIG SIN are available separately, but with every BIG SIN set you save up to 30%.

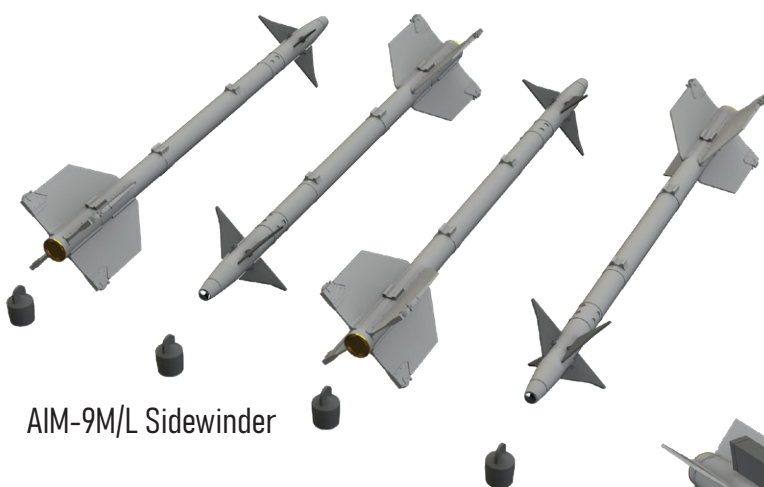
Product page



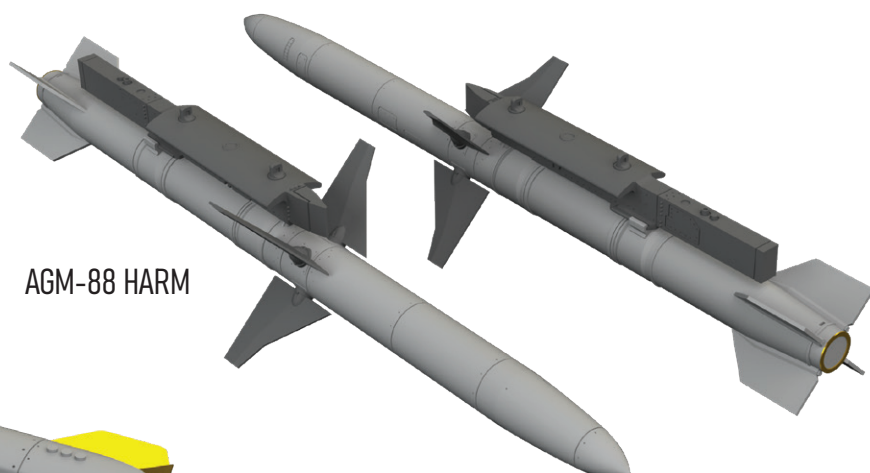
GBU-24 bomb



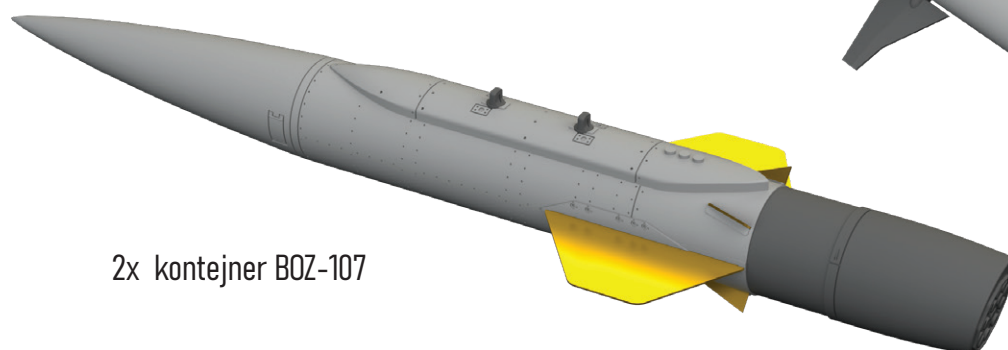
AN/AAQ-28(V) Litening pod



AIM-9M/L Sidewinder



AGM-88 HARM



2x kontejner BOZ-107

SIN648102

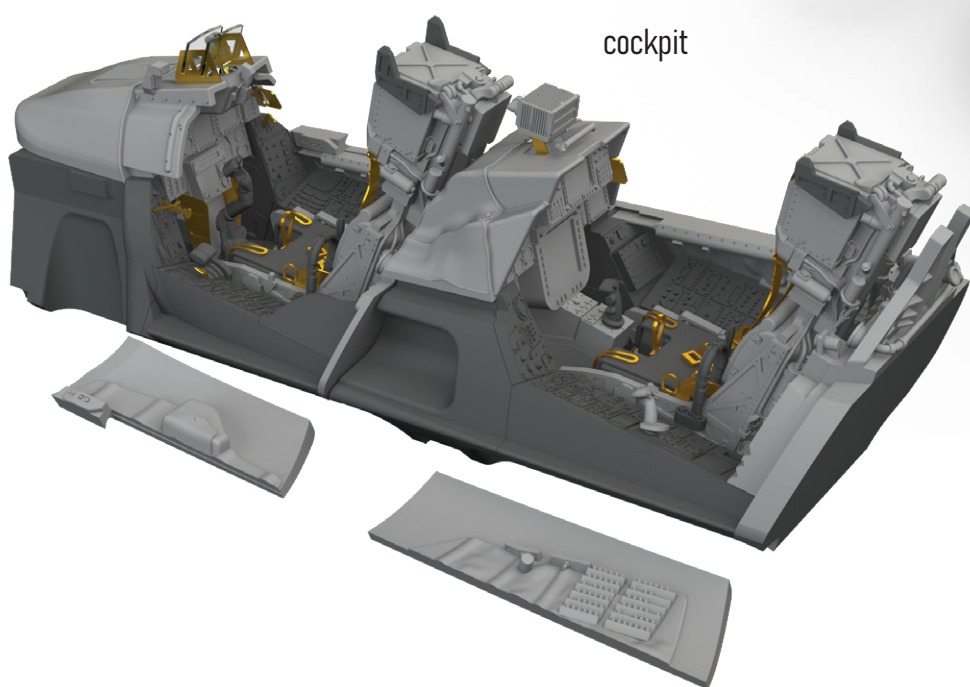
F-14D**1/48 Tamiya**

Collection of 4 sets for F-14D in 1/48 scale.

Recommended kit: Tamiya

- undercarriage wheels
- cockpit
- exhaust nozzles
- Remove Before Flight tags SPACE

All sets included in this BIG SIN are available separately, but with every BIG SIN set you save up to 30%.

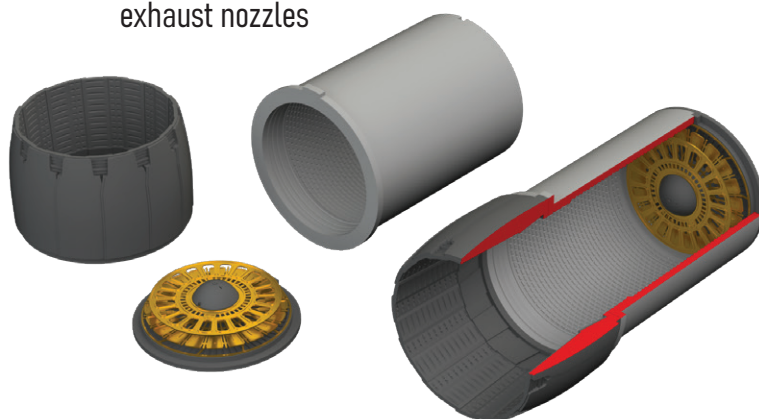
[Product page](#)


cockpit

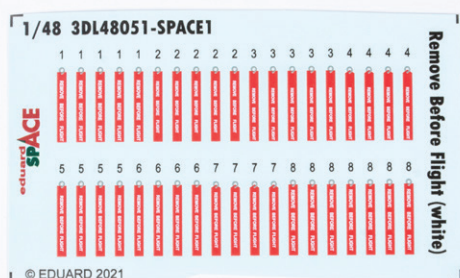


wheels

exhaust nozzles



RBF

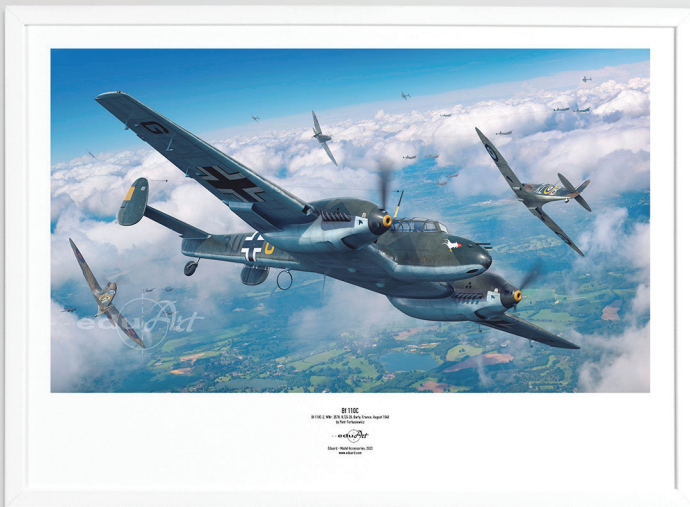


SPACE

ARTWORK PRINTS



8136-ART



8209-ART

UV stable printing
on white
vinyl 160g/m2.

Packed in hard
envelope.



82183-ART



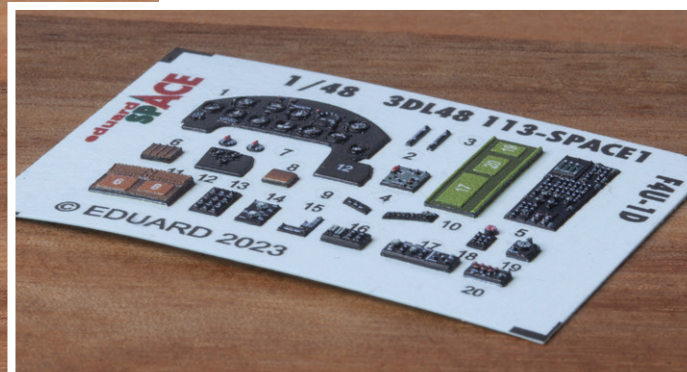
84187-ART

www.eduard.com only

3DL48113 **F4U-1D SPACE** 1/48 Hobby Boss

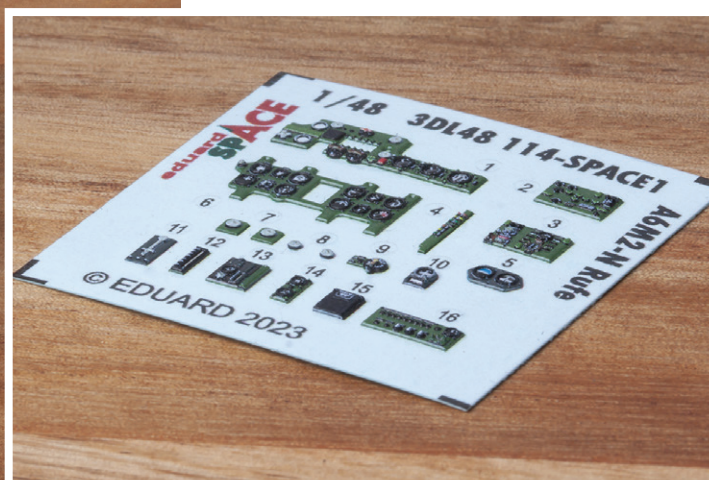
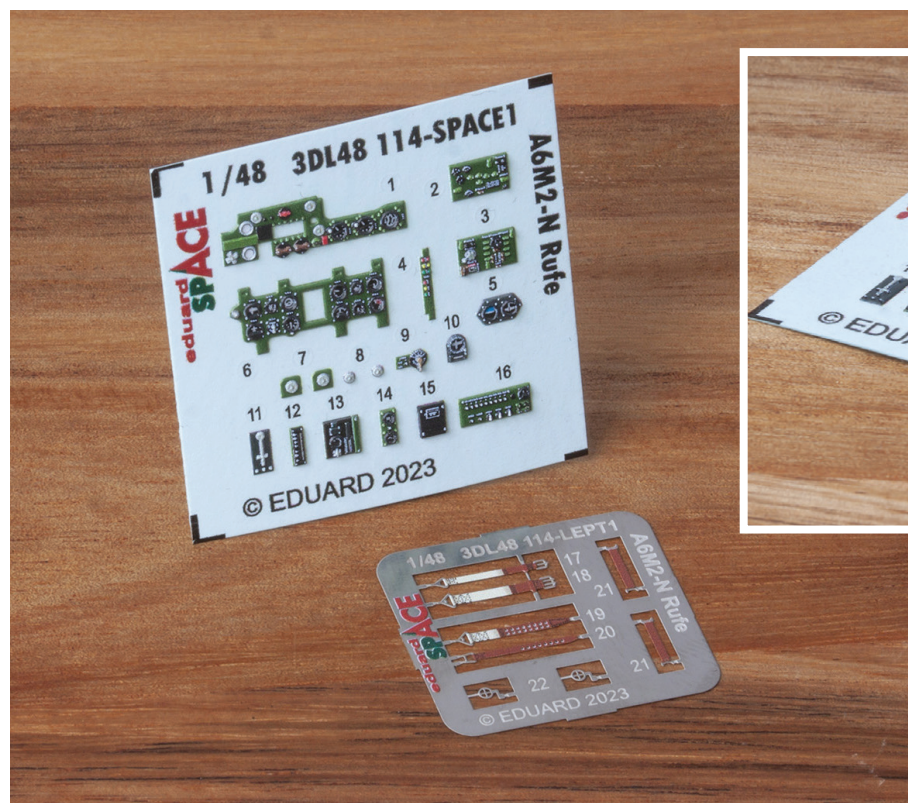
*EASY
APPLICATION*

[Product page](#)

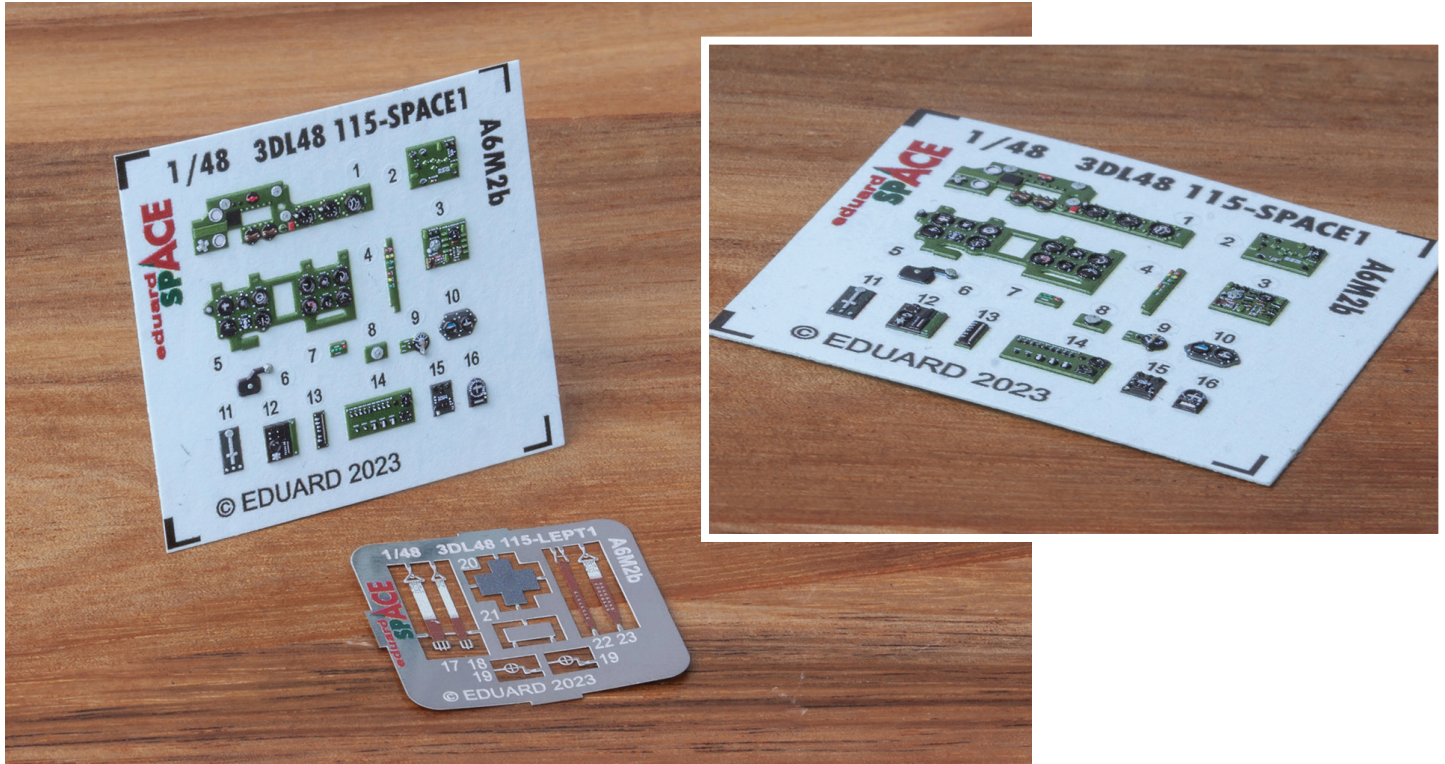


3DL48114 **A6M2-N Rufe SPACE** 1/48 Eduard

[Product page](#)

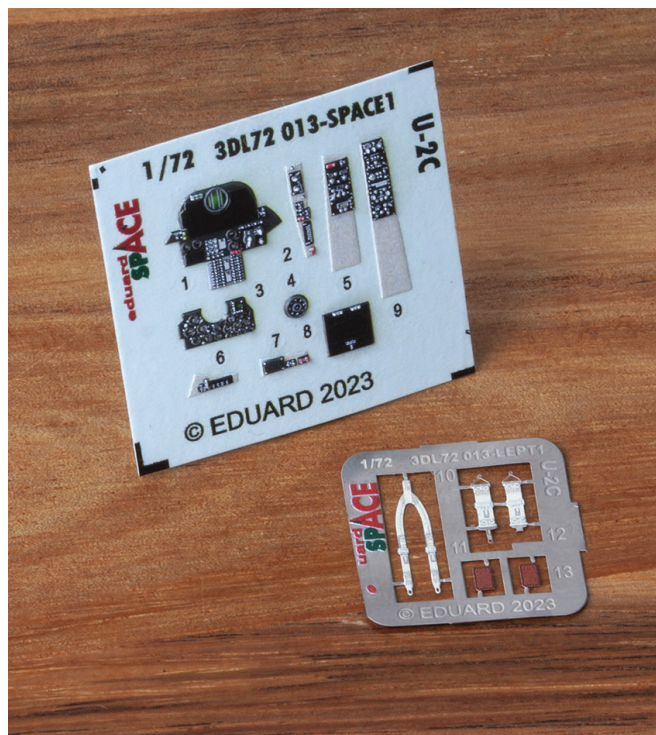


3DL48115 **A6M2b SPACE** 1/48 Academy

[Product page](#)


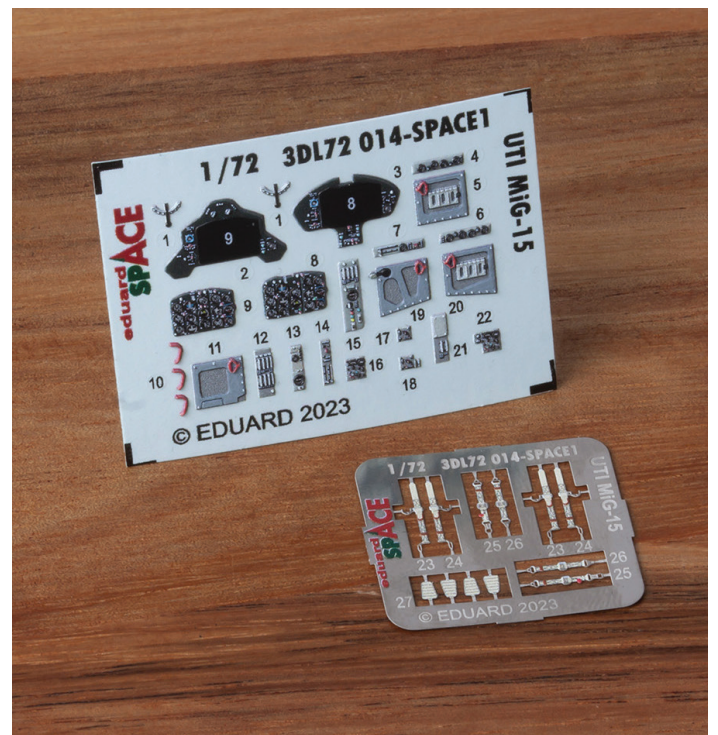
3DL72013 **U-2C SPACE**

1/72 Hobby Boss

[Product page](#)


3DL72014 **UTI MIG-15 SPACE**

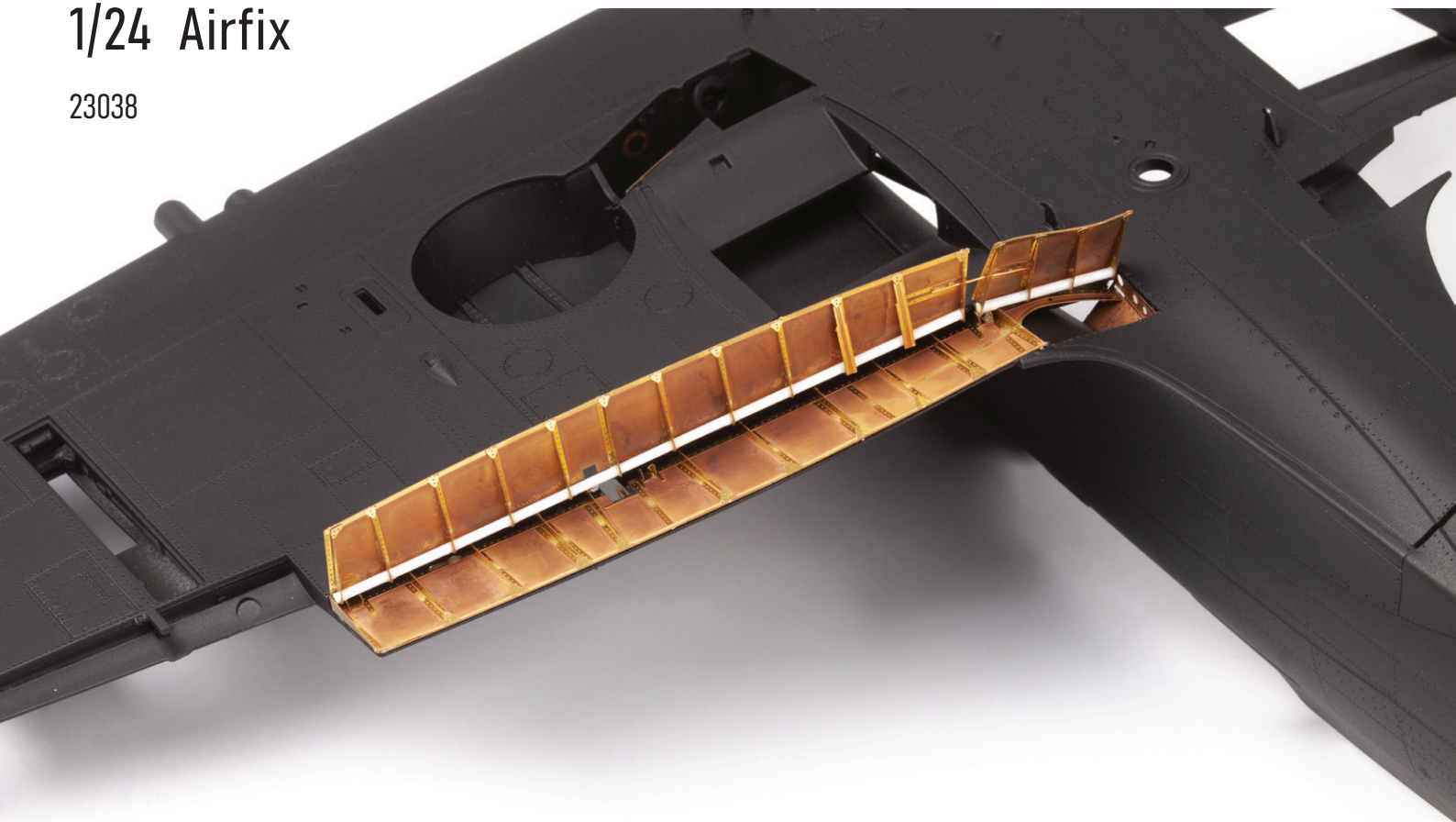
1/72 Eduard

[Product page](#)


Spitfire Mk.IXc landing flaps

1/24 Airfix

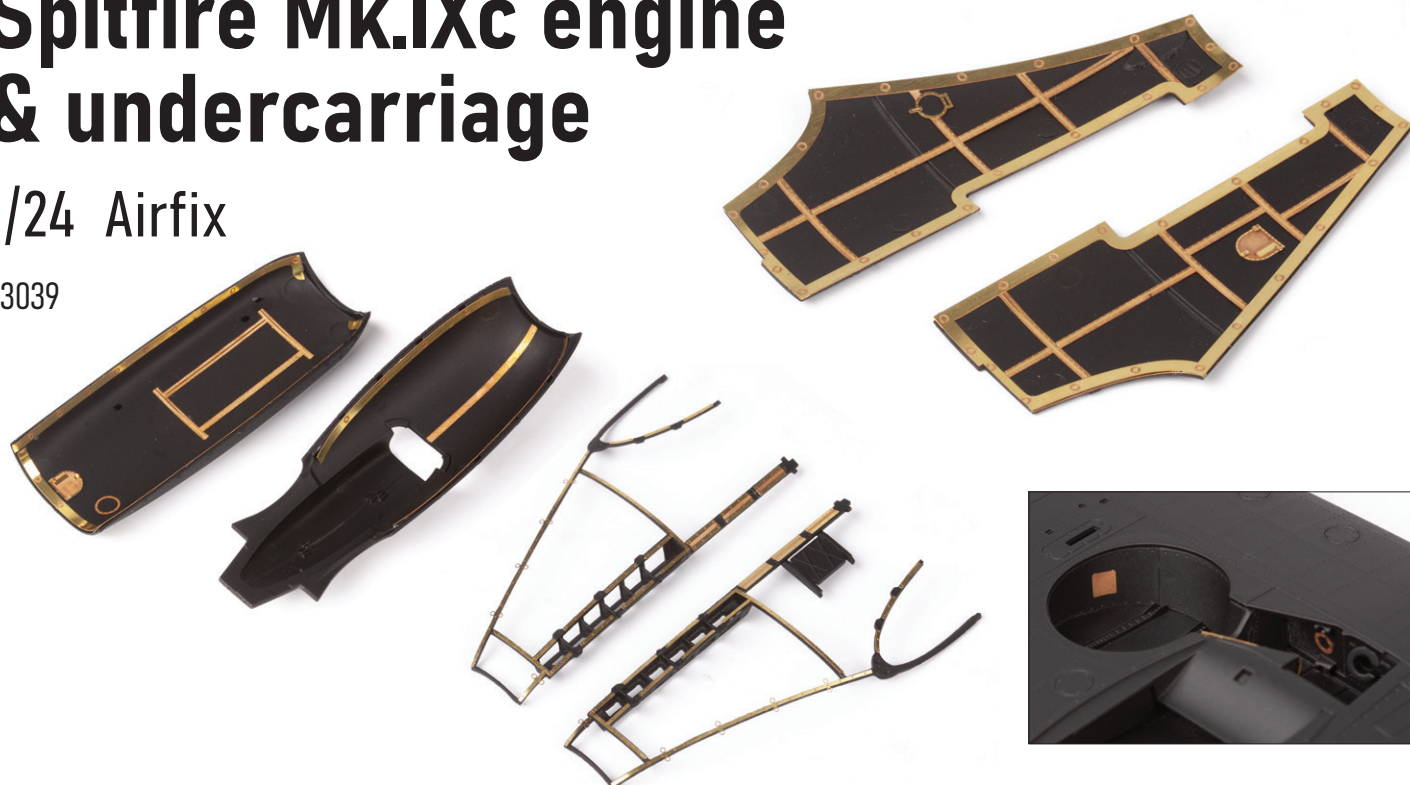
23038



Spitfire Mk.IXc engine & undercarriage

1/24 Airfix

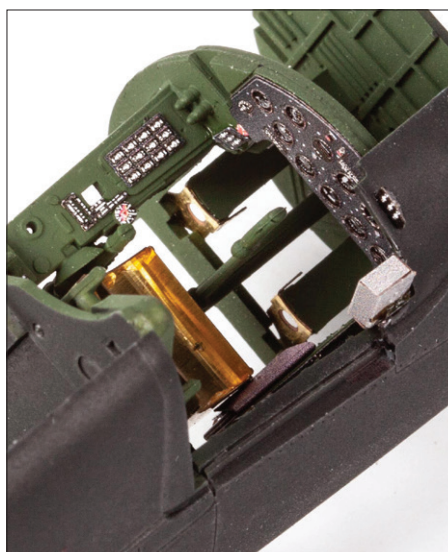
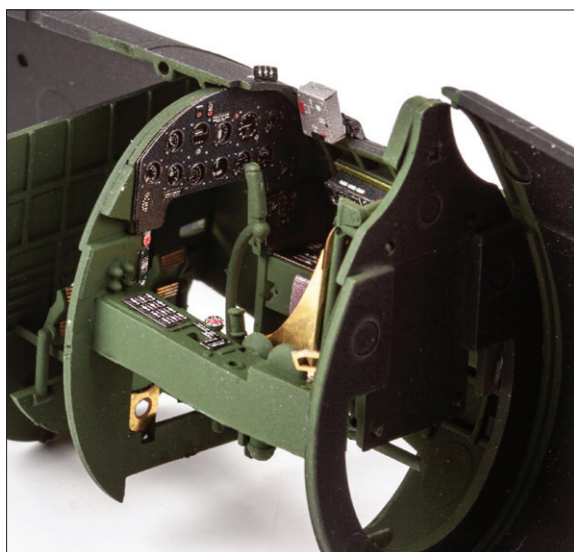
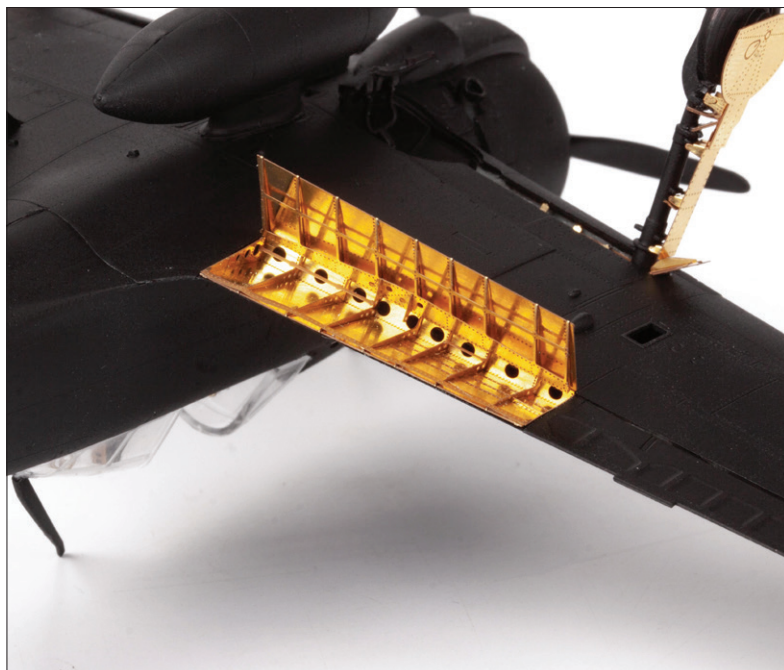
23039



A6M2b landing flaps

1/48 Academy

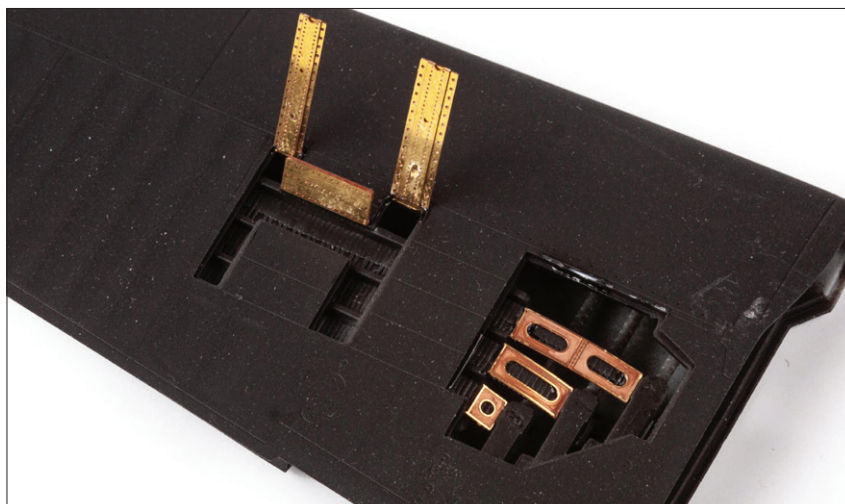
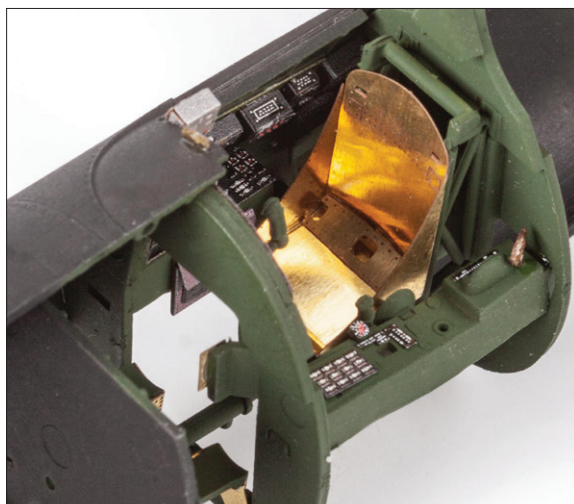
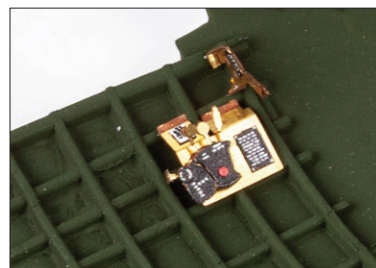
481105



F4U-1D

1/48 Hobby Boss

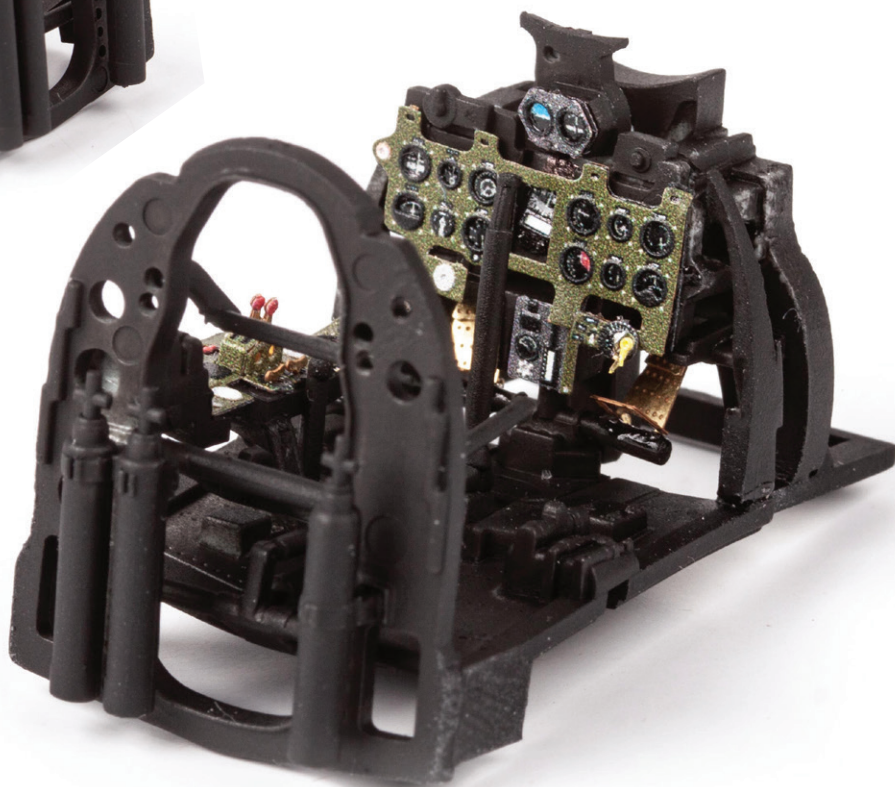
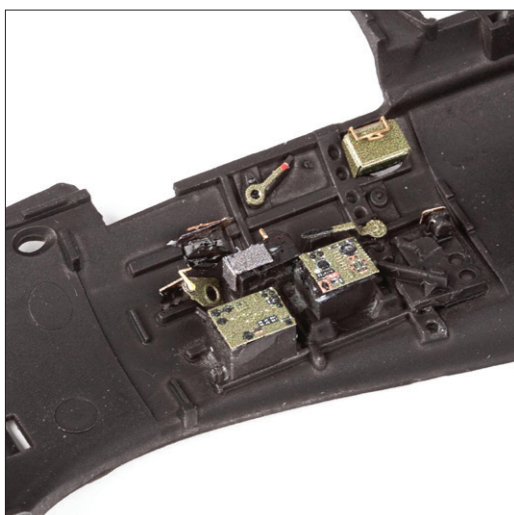
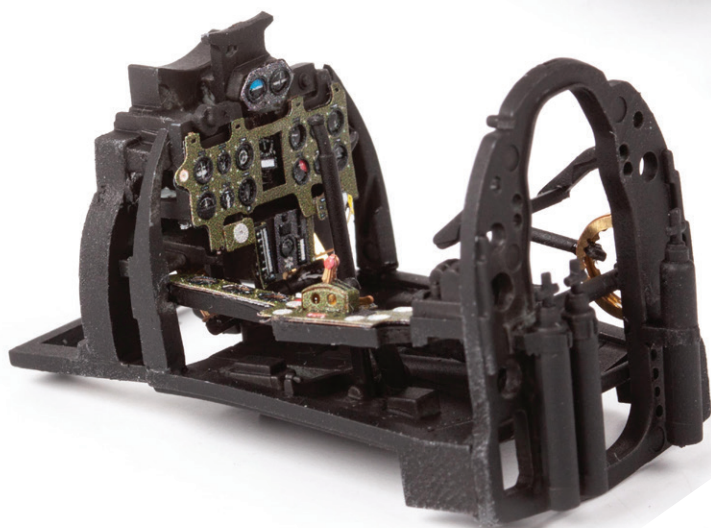
491342

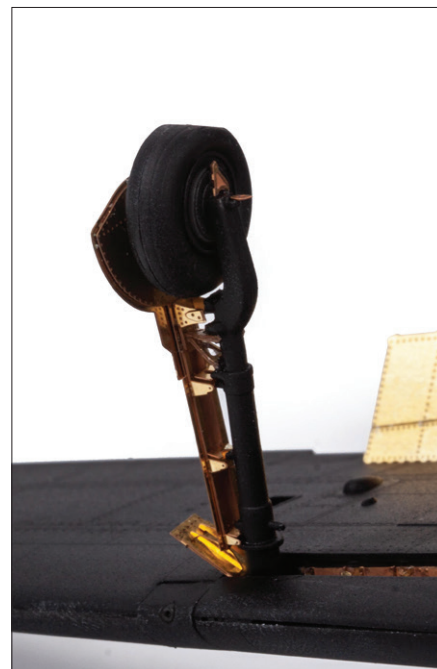


A6M2b

1/48 Academy

491344





Mi-8MT

1/48 Zvezda

491340

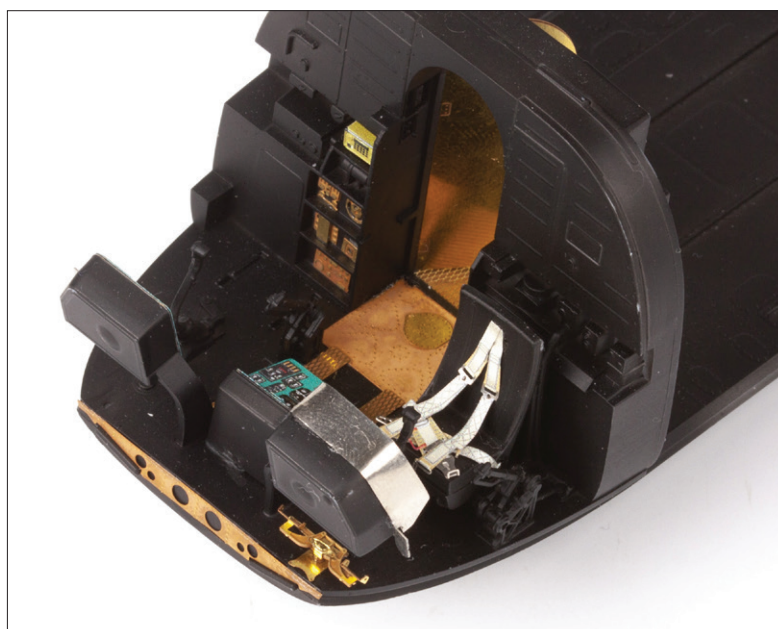
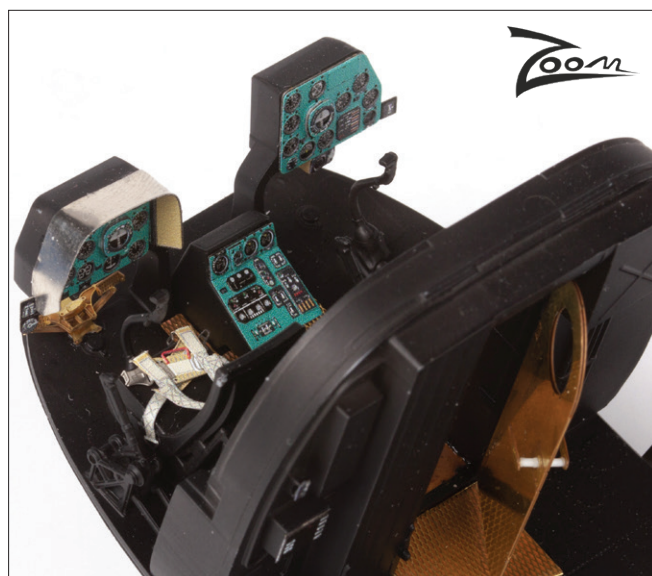


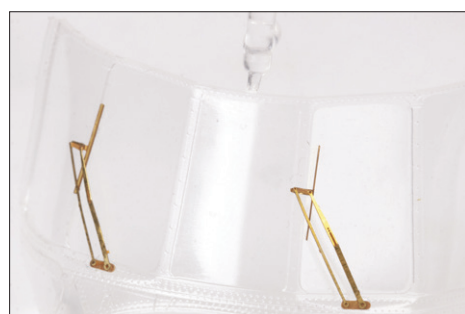
Mi-8MT
seatbelts STEEL

FE1341

Mi-8MT

FE1340

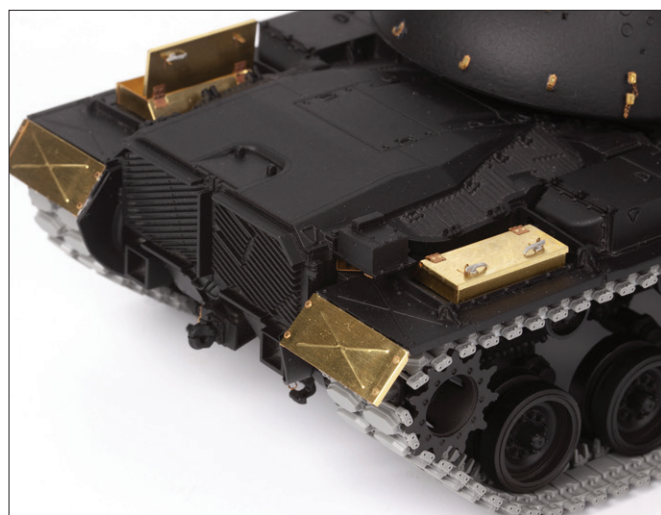




M48A5

1/35 Takom

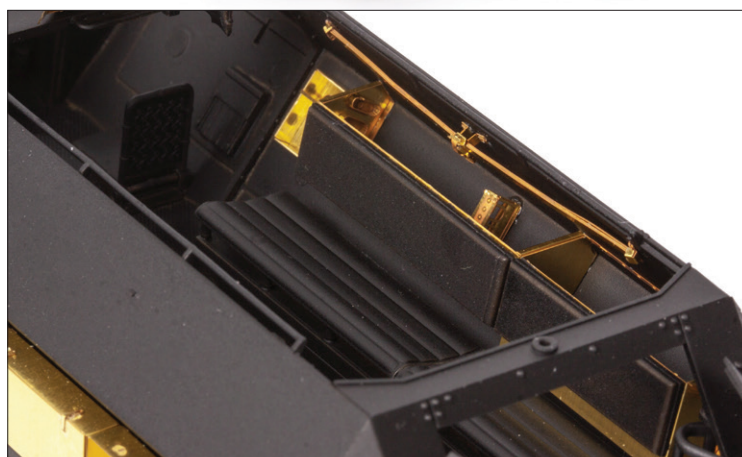
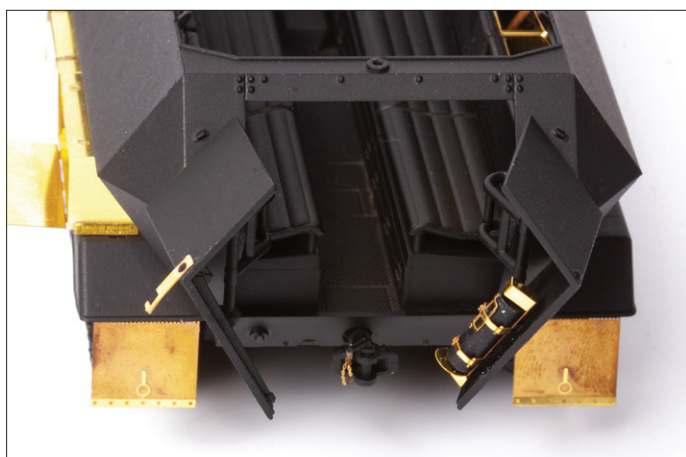
36498



Sd.Kfz. 251/1 Ausf.C

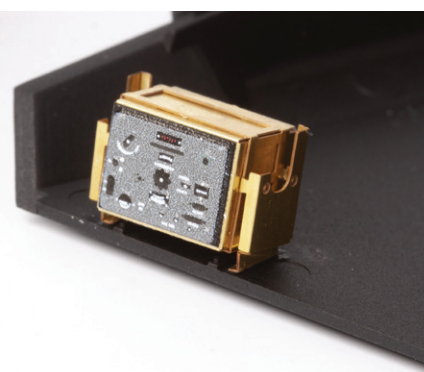
1/35 Academy

36499



eduard
SPACE

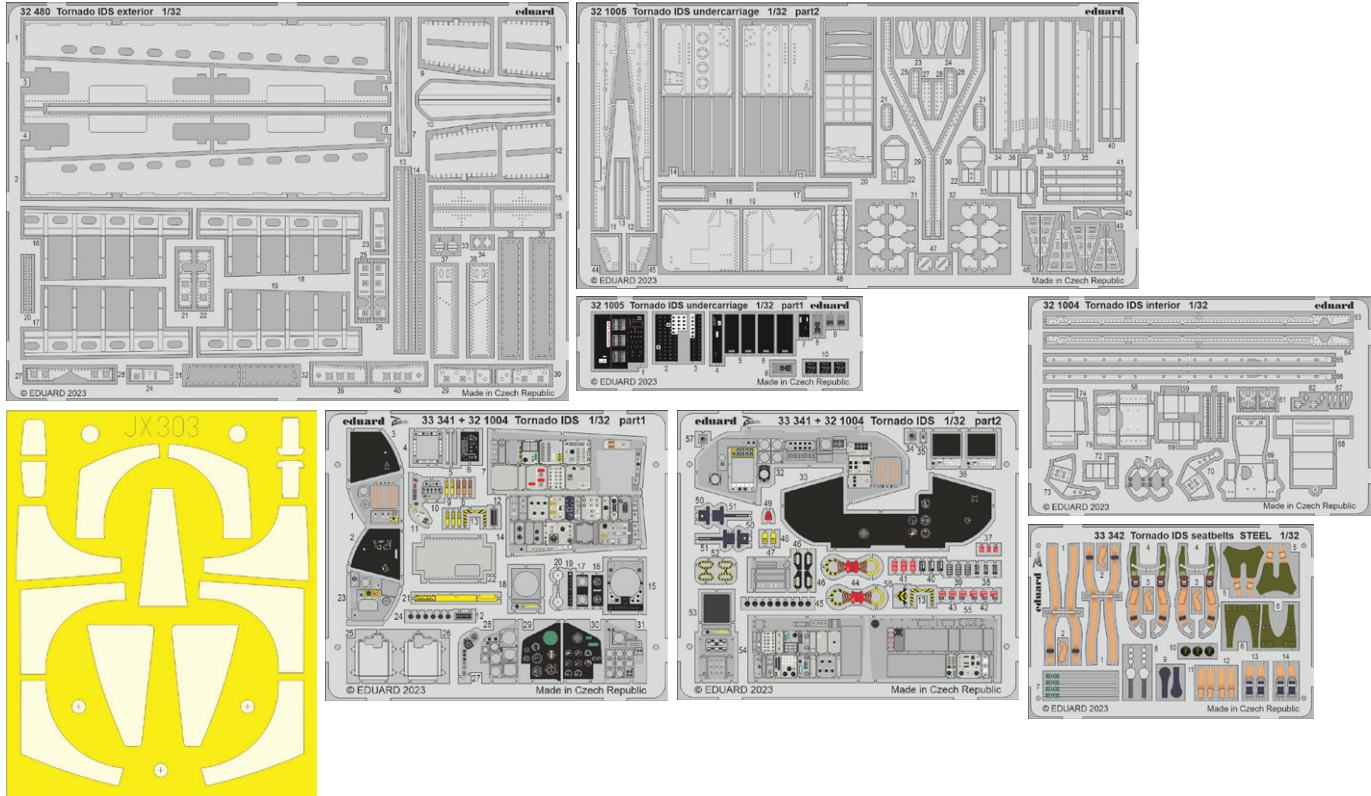
3D Eduard SPACE
included.



BIG33150 Tornado IDS 1/32 Italeri

Product page

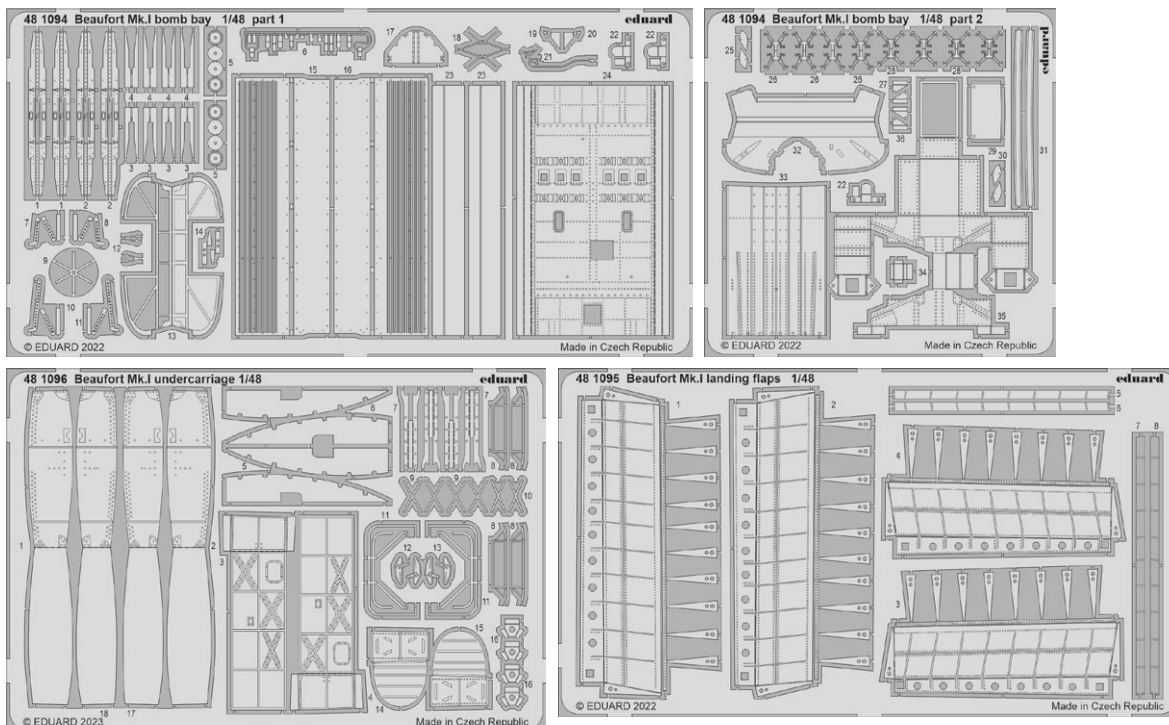
- 32480 Tornado IDS exterior 1/32
- 321004 Tornado IDS interior 1/32
- 321005 Tornado IDS undercarriage 1/32
- 33342 Tornado IDS seatbelts STEEL 1/32
- JX303 Tornado IDS 1/32



BIG49361 Beaufort Mk.I PART II 1/48 ICM

Product page

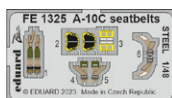
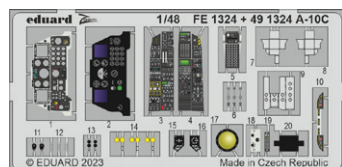
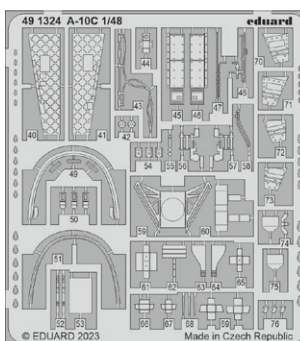
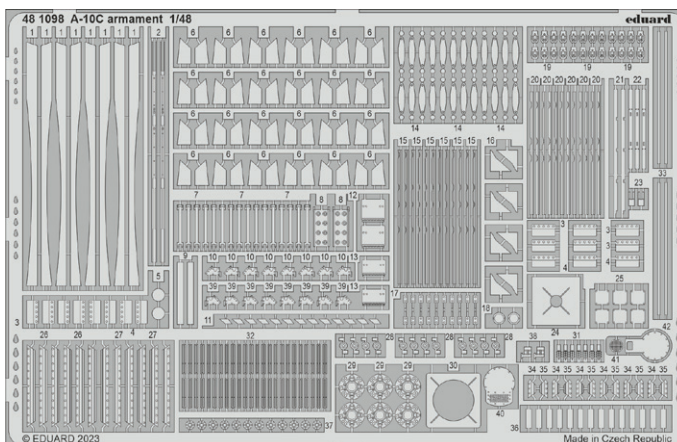
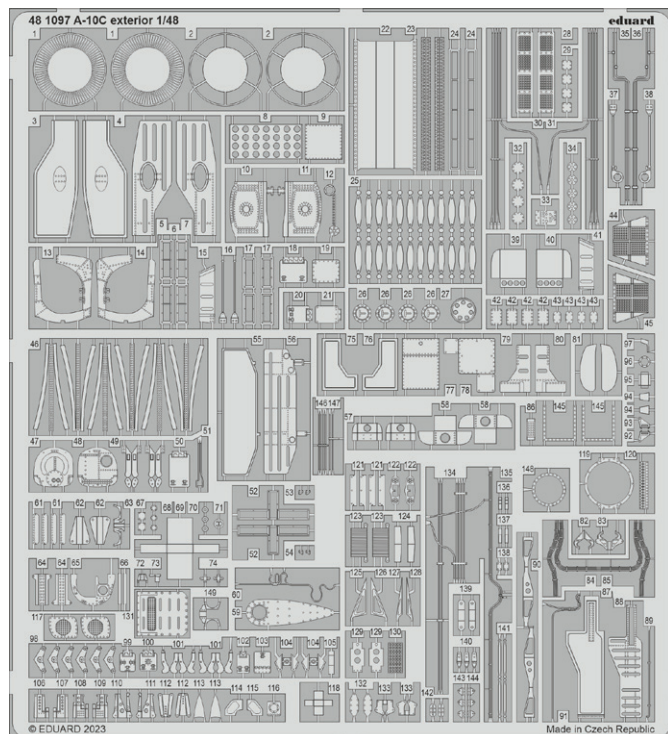
- 481094 Beaufort Mk.I bomb bay 1/48
- 481095 Beaufort Mk.I landing flaps 1/48
- 481096 Beaufort Mk.I undercarriage 1/48



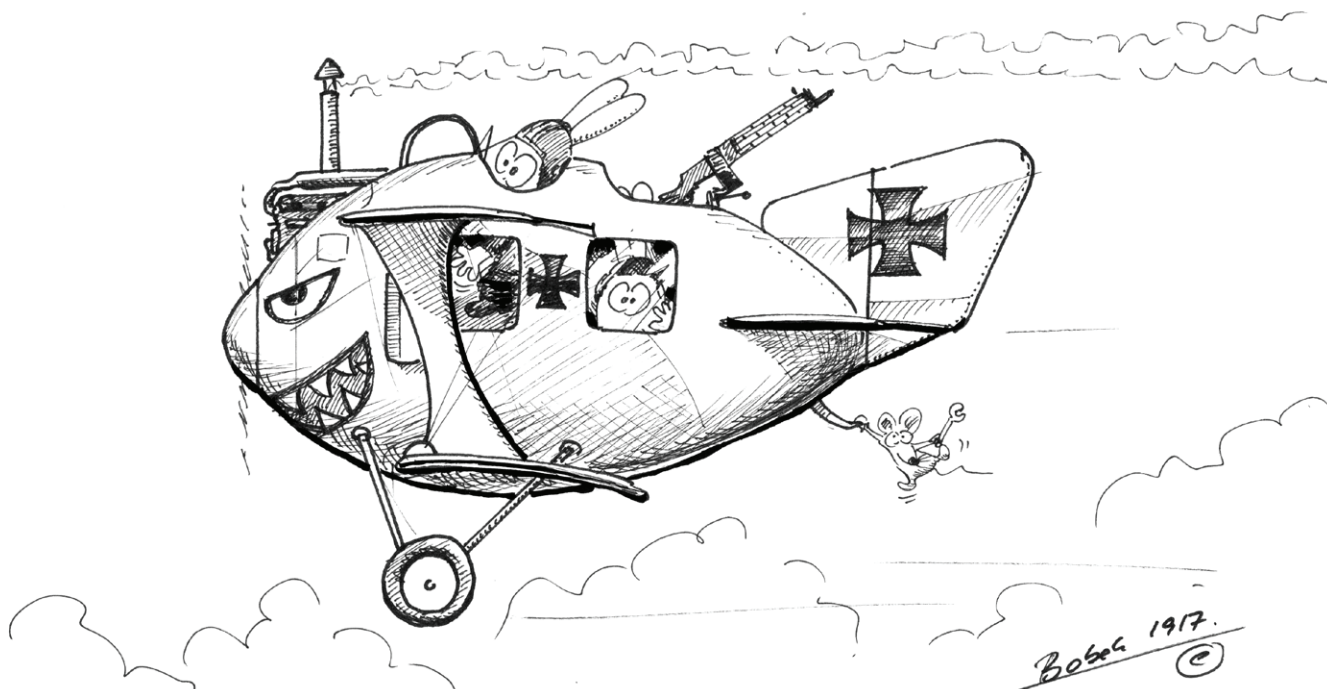
BIG49362 A-10C 1/48 Hobby Boss

Product page

481097 A-10C exterior 1/48
481098 A-10C armament 1/48
491324 A-10C 1/48
FE1325 A-10C seatbelts STEEL 1/48
EX915 A-10C 1/48



E-Bunny wishes you a Happy Easter!



EX934 A6M2-N Rufe TFace

1/48 Eduard

EX935 F4U-1D

1/48 Hobby Boss

EX936 F4U-1D TFace

1/48 Hobby Boss

EX937 A6M2b TFace

1/48 Academy

EX938 Mosquito B Mk.IV / PR

Mk.IV TFace

1/48 Tamiya

EX939 Fw 190A-4

1/48 Eduard

CX645 UTI MiG-15

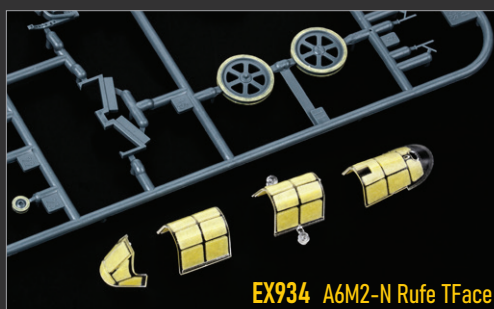
1/72 Eduard

CX646 U-2C

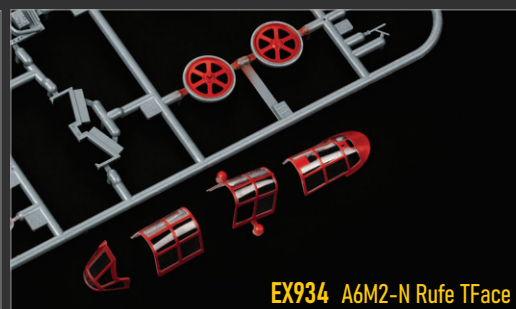
1/72 Hobby Boss

CX647 F-14B

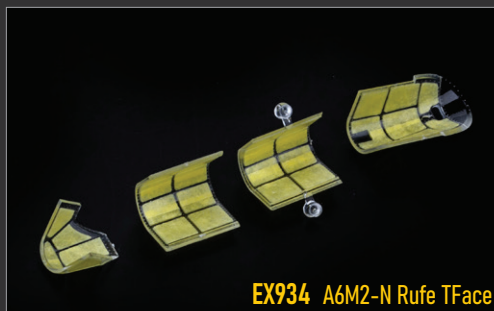
1/72 Academy



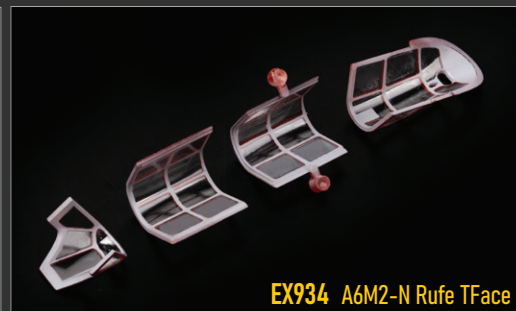
EX934 A6M2-N Rufe TFace



EX934 A6M2-N Rufe TFace



EX934 A6M2-N Rufe TFace



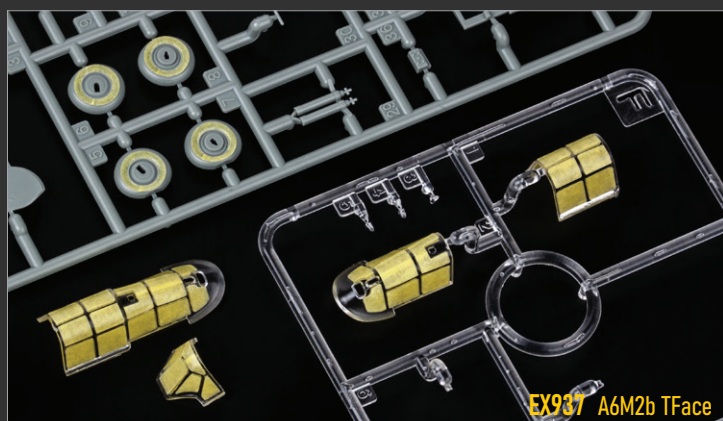
EX934 A6M2-N Rufe TFace



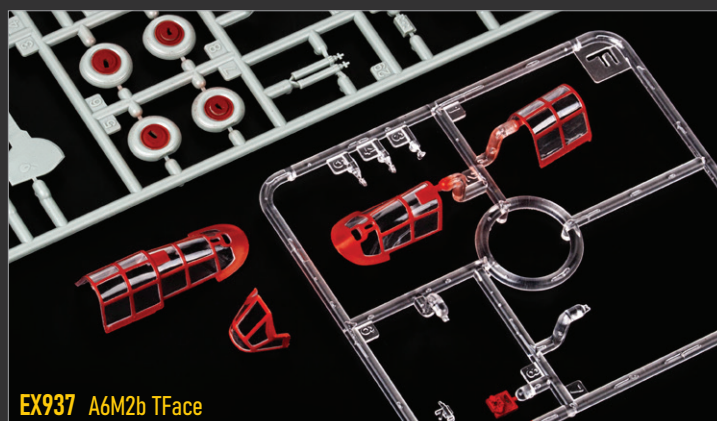
EX935 F4U-1D
EX936 F4U-1D TFace



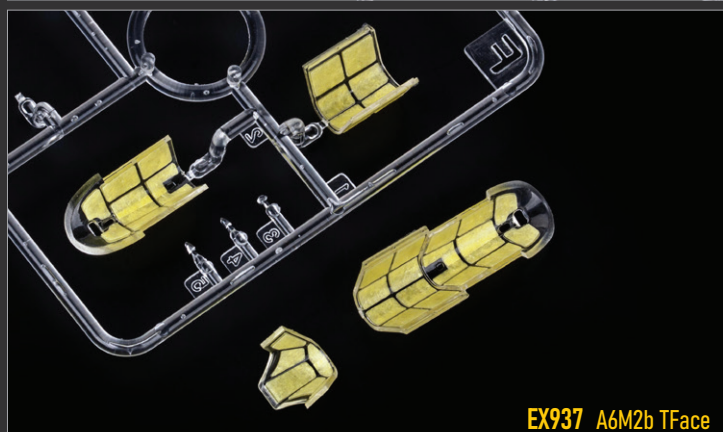
EX936 F4U-1D TFace



EX937 A6M2b TFace



EX937 A6M2b TFace



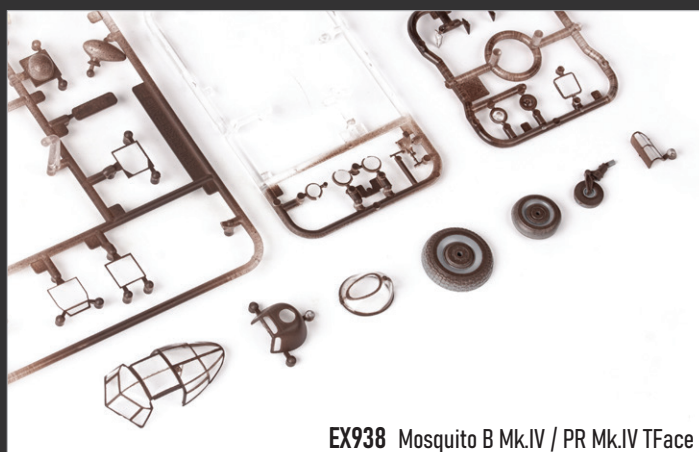
EX937 A6M2b TFace



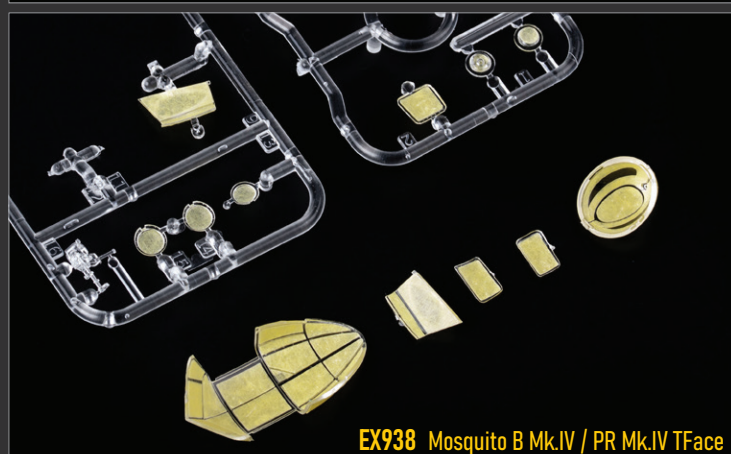
EX937 A6M2b TFace



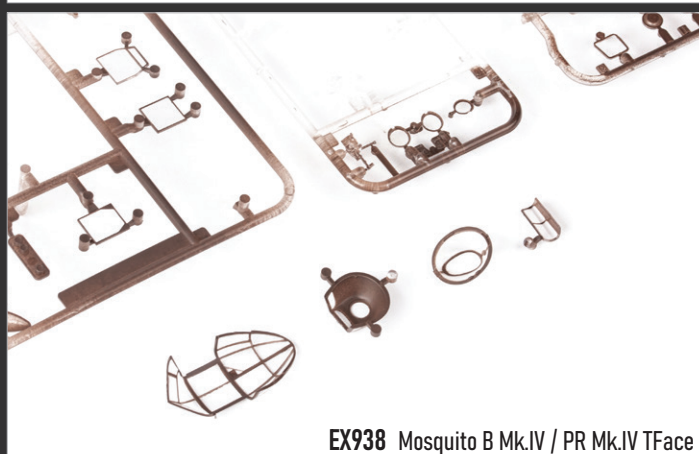
EX938 Mosquito B Mk.IV / PR Mk.IV TFace



EX938 Mosquito B Mk.IV / PR Mk.IV TFace



EX938 Mosquito B Mk.IV / PR Mk.IV TFace



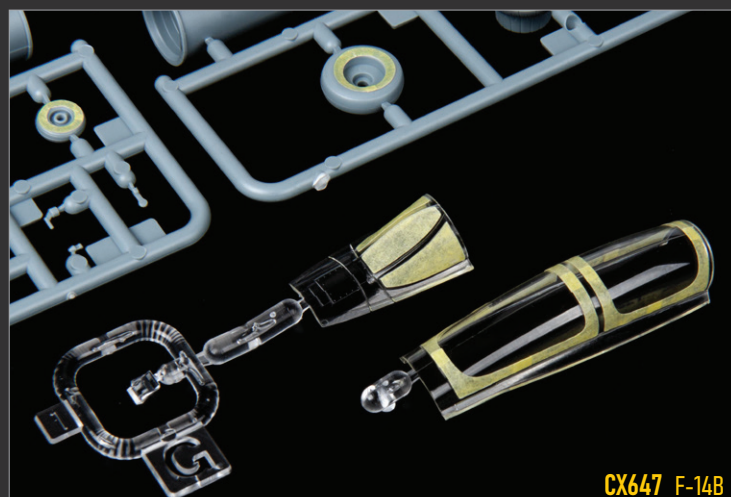
EX938 Mosquito B Mk.IV / PR Mk.IV TFace



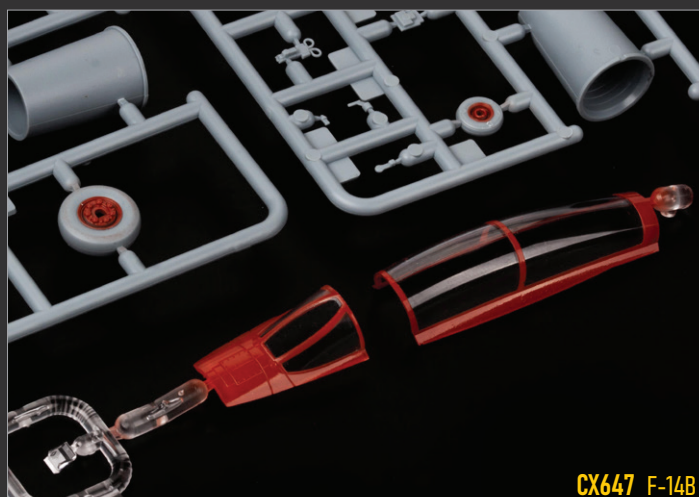
CX646 U-2C



CX646 U-2C



CX647 F-14B



CX647 F-14B

KITS

82183	Z-326/C-305 Trenér Master	1/48	ProfiPACK
8209	Bf 110C	1/48	ProfiPACK
11171	RUFE DUAL COMBO	1/48	Limited
84117	Fw 190A-4 engine flaps and 2gun wings	1/48	Weekend
84187	Tempest Mk.V Series 2	1/48	Weekend
7055	UTI MiG-15 reedice	1/72	ProfiPACK

PE-SETS

53292	USS Missouri BB-63	1/350	Hobby Boss
23038	Spitfire Mk.IXc landing flaps	1/24	Airfix
23039	Spitfire Mk.IXc engine & undercarriage	1/24	Airfix
36498	M48A5	1/35	Takom
36499	Sd.Kfz. 251/1 Ausf.C	1/35	Academy
36500	Sd.Kfz. 251/1 Ausf.C side stowage bins	1/35	Academy
481104	B-24D bomb bay	1/48	Revell
481105	A6M2b landing flaps	1/48	Academy
491340	Mi-8MT	1/48	Zvezda
491342	F4U-1D	1/48	Hobby Boss
491344	A6M2b	1/48	Academy
491346	F6F-3	1/48	Eduard
491347	F6F-5	1/48	Eduard
72730	F-14B exterior	1/72	Academy
73799	U-2C	1/72	Hobby Boss
73800	F-14B	1/72	Academy

ZOOMS

FE1340	Mi-8MT	1/48	Zvezda
FE1341	Mi-8MT seatbelts STEEL	1/48	Zvezda
FE1342	F4U-1D	1/48	Hobby Boss
FE1343	F4U-1D seatbelts STEEL	1/48	Hobby Boss
FE1344	A6M2b	1/48	Academy
FE1345	A6M2b seatbelts STEEL	1/48	Academy
FE1346	Fw 190A-4 Weekend	1/48	Eduard
SS800	F-14B	1/72	Academy

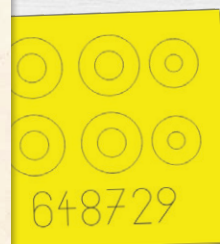
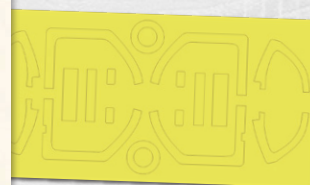
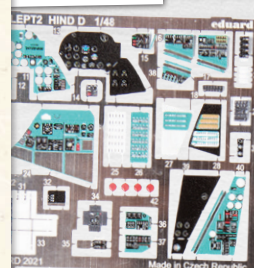
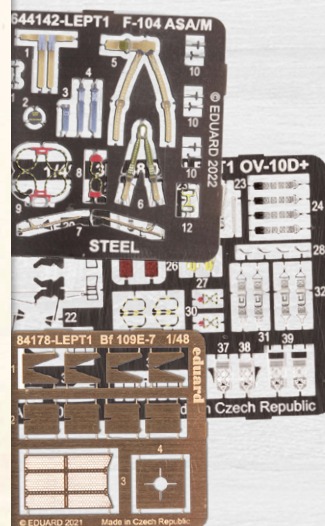
MASKS

EX934	A6M2-N Rufe TFace	1/48	Eduard
EX935	F4U-1D	1/48	Hobby Boss
EX936	F4U-1D TFace	1/48	Hobby Boss
EX937	A6M2b TFace	1/48	Academy
EX938	Mosquito B Mk.IV / PR Mk.IV TFace	1/48	Tamiya
EX939	Fw 190A-4	1/48	Eduard
CX645	UTI MiG-15	1/72	Eduard
CX646	U-2C	1/72	Hobby Boss
CX647	F-14B	1/72	Academy

LIMITED

ProfiPACK
edition

WEEKEND
edition



BIG ED

BIG33150	Tornado IDS	1/32	Italeri
BIG49361	Beaufort Mk.I PART II	1/48	ICM
BIG49362	A-10C	1/48	Hobby Boss

BRASSIN

644205	A6M2-N Rufe LööK	1/48	Eduard
644206	B-25J LööK	1/48	HKM
644207	F-16C Block 25 LööK	1/48	Kinetic
635024	WWII German 10 ton jacks PRINT	1/35	
635026	WWII German wire cutters PRINT	1/35	
632188	Hurricane Mk.II exhaust rounded PRINT	1/32	Revell
632189	Hurricane Mk.II exhaust fishtail PRINT	1/32	Revell
632190	Hurricane Mk.II wheels	1/32	Revell
648826	F4F-3 engine late PRINT	1/48	Eduard
648842	A-1H seat PRINT	1/48	Tamiya
648844	Anson Mk.I guns PRINT	1/48	Airfix
648845	A6M2-N Rufe seat PRINT	1/48	Eduard
648846	A6M2-N Rufe exhaust PRINT	1/48	Eduard
648847	A6M2-N Rufe cannon barrels & cockpit guns	1/48	Eduard
648848	A6M2-N Rufe folding wingtips PRINT	1/48	Eduard
648849	A6M2-N Rufe gun bays PRINT	1/48	Eduard
648854	F-16 exhaust nozzle P&W F100 PRINT	1/48	Kinetic
648855	F-16 radar early PRINT	1/48	Kinetic
648857	Mi-24V cockpit turquoise PRINT & SPACE	1/48	Eduard/Zvezda
672310	Bf 110E wheels	1/72	Eduard
672311	Bf 110E nose guns PRINT	1/72	Eduard
672312	Bf 110E cockpit	1/72	Eduard

LööKPLUS

634032	Bf 109G-4 LööKplus	1/32	Revell
644204	Anson Mk.I LööKplus	1/48	Airfix
674003	P-39Q LööKplus	1/72	Arma Hobby

BIG SIN

SIN63216	Tornado IDS armament	1/32	Italeri
SIN648102	F-14D	1/48	Tamiya

SPACE

3DL48113	F4U-1D SPACE	1/48	Hobby Boss
3DL48114	A6M2-N Rufe SPACE	1/48	Eduard
3DL48115	A6M2b SPACE	1/48	Academy
3DL72013	U-2C SPACE	1/72	Hobby Boss
3DL72014	UTI MiG-15 SPACE	1/72	Eduard

BIG-ED

eduard
BRASSINeduard
BRASSIN
Print

LööK

LööK+

BIG
SINeduard
SPACE

WEATHERING COLORS

YAKUMO

These Yakumo Colors—Mr. Weathering Color and Mr. Weathering Paste-based weathering colors—were supervised by the world-famous modeler, Mr. Mig Jimenez. The mud and dirt colors are made with pigments that have been collected from all over the world.



WWII WESTERN FRONT

CAT.NO.: WY01

WY01 is a weathering paint set for German vehicles in the WWII Western Front. Thin each color with the separately-sold **Mr. Weathering Colour Thinner** (WCT101/102); or **MIG015 thinner** (YAKUMO thinner).

From a modeler's perspective, Europe was the setting of many of the most interesting battles of the war, including Normandy, the Battle of the Bulge, Hungary, the Warsaw Uprising and the fall of Berlin. On these fronts the Germans used several standardized camouflage patterns, but each was always based on green and brown camouflage colours over a dark yellow base (C039 dark yellow, C041 red-brown and C070 dark green). Dust in summer and dry mud were the most common effects seen in German vehicles. In addition to the two products used to represent these effects, the perfect wash tone is also included, and another for streaked dirt stains. For the most complete finish, combine with SET D-BASICS.

[Product page](#)

MIG
001

DARK WASH

Apply the wash with a fine brush to details, in panel lines, and around hatches to enhance contrast and volume. Remove the excess with a clean brush moistened with YAKUMO thinner. Let it dry 24 hours.

MIG
003

DRY MUD

You can apply the mud with a thick brush to the underside of the vehicle, the tracks, and the suspension. You can also apply splashed earth effect with the mud product by the flicking a thick brush loaded with product using a toothpick. This will create mud splatter effects. Make a few tests on an old model or a piece of paper before trying it on the model. Let it dry 24 hours.

MIG
002

DARK STREAKING GRIME

Stroke well. Draw vertical lines on vertical or sloped surfaces with irregular shapes and different intensity, then blend with a flat brush and YAKUMO thinner to soften. Let it dry 24 hours.

MIG
004

EUROPE DUST

Pigment colour to simulate dust effects, particularly on the horizontal areas and around surface details. Apply the pigment dry with a brush and then moisten the surface with thinner. Once dry, it can be moistened again and touched up to achieve the desired effect.

MIG
002





WWII EASTERN FRONT

CAT.NO.: WY02

WY02 is a weathering paint set for winter camouflaged vehicles in WWII Eastern Front. Thin each color with the separately-sold **Mr. Weathering Colour Thinner** (WCT101/102); or **MIG015 thinner** (YAKUMO thinner).

The Germans camouflaged their vehicles in the harsh Russian winters with white paint to blend it with the snowy landscape. A white vehicle needs a very special treatment of aging and dirt to be realistic and credible. This special set for German winter vehicles includes the necessary products to achieve a realistic appearance in a winter environment such as the battles of Moscow, Stalingrad, or the siege of Leningrad. This set is specially designed for white camouflage applied on German panzer grey colour (Panzer Grey - C040 German Grey, C513 „Dunkelgrau“, C514 „Grau“ etc). For the most complete finish, combine with SET D-BASICS.

[Product page](#)

- | | | | | | |
|------------|--|--|------------|--|--|
| MIG
005 | | WINTER WASH
see MIG 001 for description | MIG
006 | | WINTER STREAKING GRIME
see MIG 002 for description |
| MIG
007 | | MIG-007 - FRESH DARK MUD
see MIG 003 for description | MIG
008 | | MIG-008 - DRY EARTH
see MIG 004 for description |



WWII AFRIKA KORPS

CAT.NO.: WY03

WY03 is a weathering paint set for model vehicles in the WWII Afrika Korps. It can add realistic sand stains from the harsh weather conditions of Africa to your scale model. Thin each color with the separately-sold **Mr. Weathering Colour Thinner** (WCT101/102); or **MIG015 thinner** (YAKUMO thinner).

The landscapes of Tunisia or Libya were very harsh and hostile environments for the vehicles of the German Afrika Korps (DAK). The scorching sun and heat faded the colours quickly while the dust was ubiquitous. The Germans over painted their grey vehicles with various shades of sand colour (i.e. C039 Dark Yellow) to make them less visible on the open desert plains. The product included in this set allow you to apply washes, dirt effect, and large accumulations of dust to give your model realistic look. For more complete finish, combine with SET D-BASICS.

[Product page](#)

- | | | | | | |
|------------|--|--|------------|--|--|
| MIG
009 | | SAND FILTER
Apply the filter over the entire surface of model uniformly for a transparent and subtle effect, without letting the product accumulate in recesses and panel lines. Allow the filter to dry for 24 hours. | MIG
010 | | DESERT WASH
Apply the wash with a fine brush to details, in panel lines, and around hatches to enhance contrast and volume. Remove the excess with a clean brush moistened with YAKUMO thinner. Let it dry 24 hours. |
| MIG
011 | | GRAY STREAKING GRIME
see MIG 003 for description | MIG
012 | | MIG-008 - DRY EARTH
see MIG 004 for description |



BASICS

CAT.NO.: WY04

WY04 is a weathering paint set that can be used on various military models including tanks. This set of paints can replicate basic oil stains, chipped paint, and rust. Thin each color with the separately-sold **Mr. Weathering Colour Thinner** (WCT101/102); or **MIG015 thinner** (YAKUMO thinner).

Most German military vehicles showed certain universal weathering effects, no matter the setting or time of the year. Tanks or half-tracks usually showed chipped paint, rust effects, or large areas of fuel stains soaked into caked dust or dirt over top. These are the weathering effects that bring more life and realism to the model, and that is the reason why you must pay special attention when adding them. This universal set will allow you to create extremely realistic effects on your models, no matter the location or time of the year in which they are set. The colours and effects are accurate for the cold Russian winter, the Normandy campaign or the barren landscapes of the North Africa. Always use this set in combination with one of the YAKUMO sets for military vehicles in a specific setting.

[Product page](#)

MIG 013 FUEL & OIL

Apply this product to the sides of model in the shape of vertical lines, or add small drops over a surface treated with MIG014 pigment. This effect can be diluted with YAKUMO thinner to create a softer and more natural effect. Use this effect sparingly and apply the effect in scale. Let it dry 12 hours.

MIG 015 CHIPPING

The perfect colour to represent chipped paint effects on your models, as long as the surface you are depicting was made out of iron or steel in the real vehicle. Use a brush with a fine tip to paint the chips on the zones most exposed to wear and tear. You can also apply the chipping with a piece of sponge or packing foam. Let it dry 10 minutes. Can be cleaned with water.

MIG 014 EARTH & GRIME

A pigment tone to simulate accumulated dirt, or to create a base onto which you can apply fuel stains. Apply the pigment dry with a brush to the designed areas. It can also be used to emphasize shadows or dirt effect on nooks and crannies.

MIG 016 MIG-008 - DRY EARTH

Eventually all vehicles rust in specific areas due to rain, snow and dew. Apply the product in small quantities around small details such as screw heads, brackets or other fixtures, as well as on vertical or sloped surfaces in the form of faded lines. Use the effect sparingly and apply the effect in scale.



HKPM Prostějov pořádá

Výstavu plastikových modelů a bodovací soutěž

ČASOVÝ HARMONOGRAM:

7:45 - 9:00 - Přejímka modelů do soutěže

9:00 - 15:30 - Vstup pro veřejnost

Cca 15:45 - Vyhlášení výsledků

Vstupné je dobrovolné

**1.4.
2023**

Odkaz na elektronickou registraci: <https://prostejov.ipmscz.eu/>



eduard
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31. 3. - 4. 4. 2023
SLEVA 15% (20% pro BFC)
na WWW.EDUARD.CZ
PLATBY za předobjednávky pouze PŘEDEM

VELIKONOČNÍ Prostějov

Národní Dům, Vojáčkovo nám. 1 Prostějov

Sponzoři:

MN-MODELÁŘ

**special
HOBBY**

**KOVOZÁVODY
PROSTĚJOV**

eduard

AMK MINERVA PROSTĚJOV



ZLIN Z-326

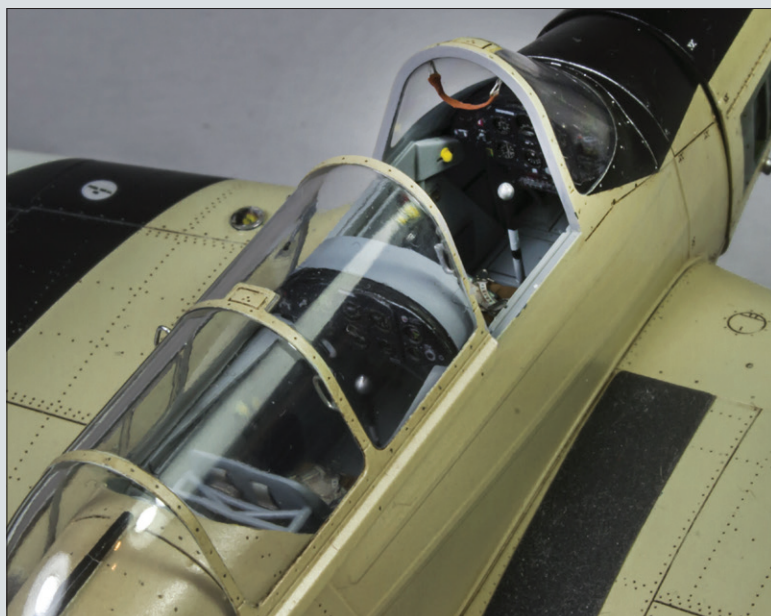
built by Mattia Pancotti

1/48



11167

Z-326, No. 908, private owner, Reykjavik, Iceland, 2020





This Z-326 became the first ever aerobatic aircraft in Iceland. It set off from Czechoslovakia to the island country on July 14, 1966, first by rail, then by ship. It has changed several owners in Iceland. Today, it is owned by Helgi Rafnsson. Among the pilots who put their hands on the controls of this aircraft is also one of Icelandic most famous pilots, Magnus Norðdahl. The former airline commercial pilot and DC-4 captain was born in 1928 and

even after his 80th birthday he was still performing great aerobatics with TF-ABC including the famous "Lomcovac" on various occasions. The aircraft got an unusual livery in Iceland. The painting overlays all the stencilling; it was not restored. The number 168 on the vertical fin does not correspond to the serial number, as usual with other Treners.

[Product page](#)



F-35A

1/48

Tamiya

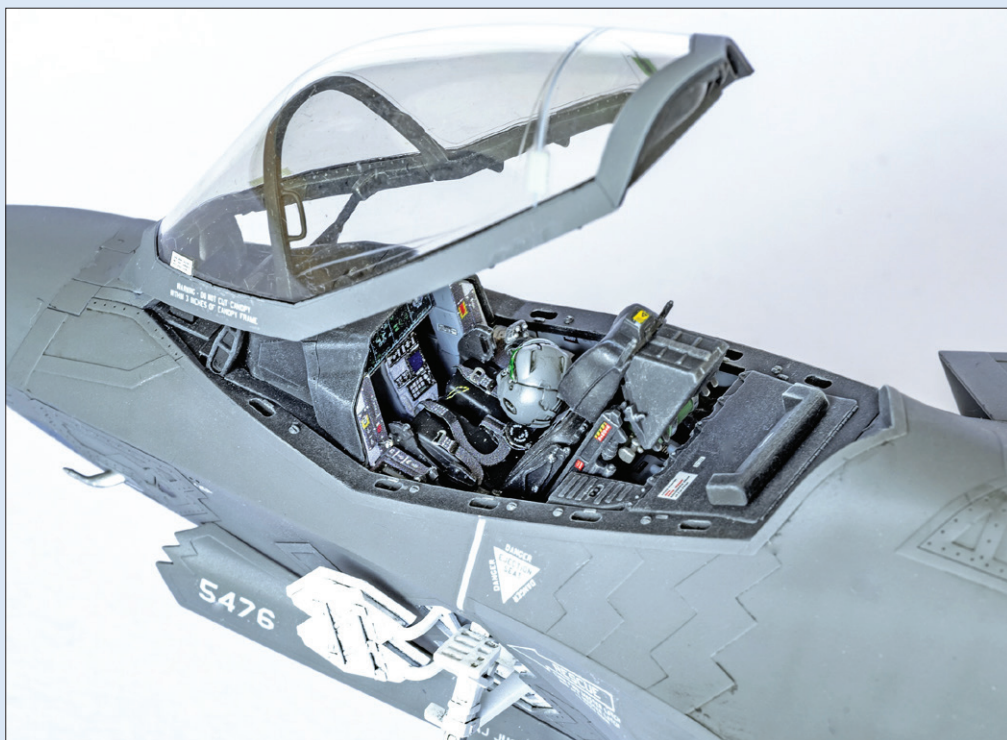
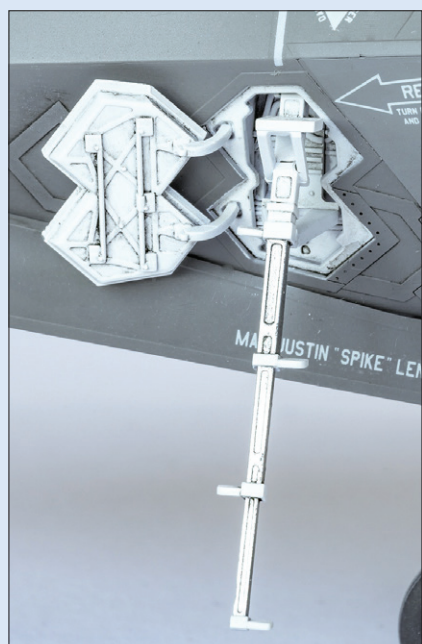


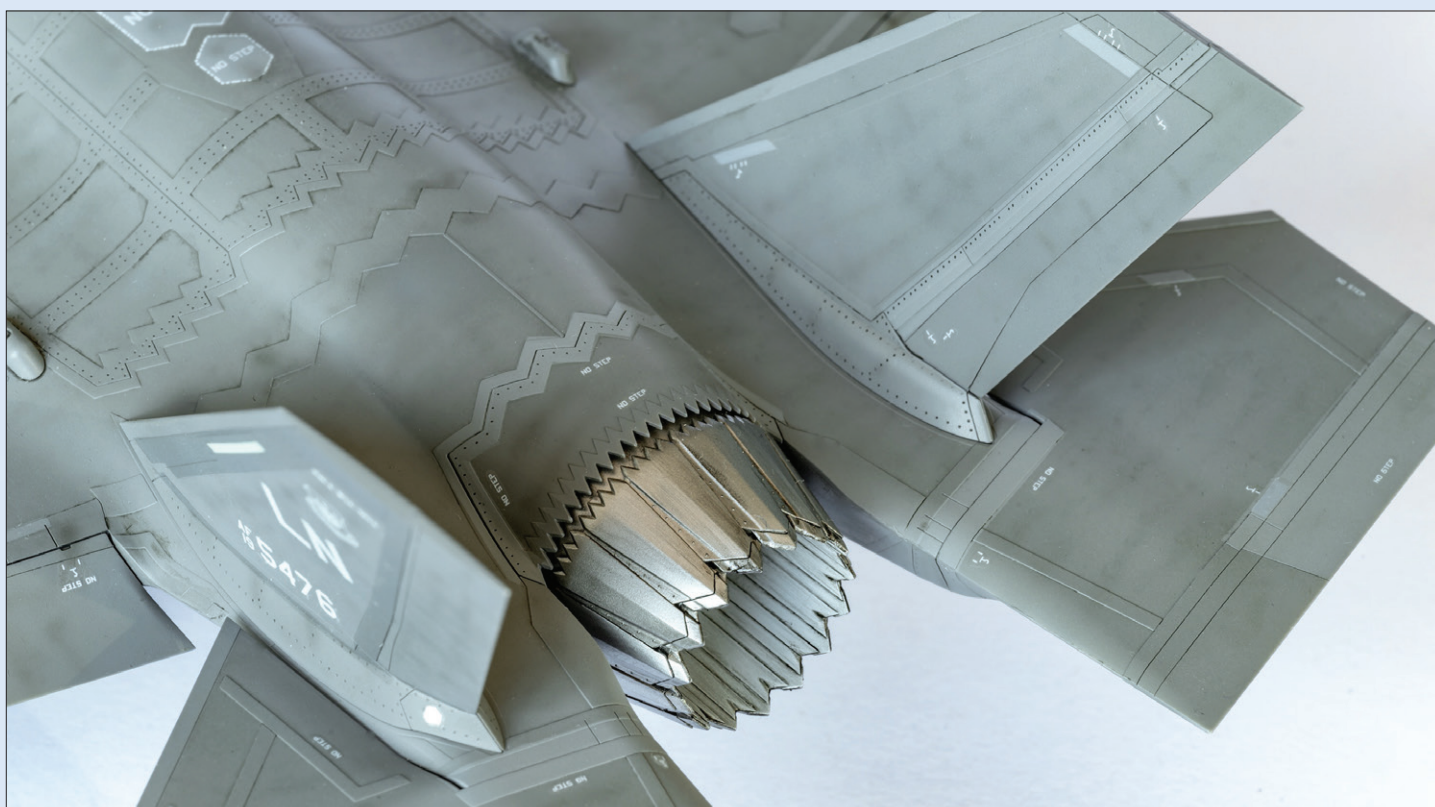
ACCESSORIES USED:

FE1332 F-35A (PE-Set)

FE1333 F-35A seatbelts STEEL (PE-Set)

built by Matthias Becker





Spitfire Mk. IXc early 1/48 Eduard

8282

built by Martin Prosser

EN354, 1st Lt. Leonard V. Helton, 52nd FG, 4th FS, La Sebala Airfield, Tunisia, June, 1943



Bf 109G-6, MT-423, ylikersantti (Staff Sergeant) Hemmo Leino, 1/HLeLv 34, Kymi, Finland, June 1944

Bf 109G-2

1/48 Eduard



built by **Didier Waelkens**



Fw 190A-2

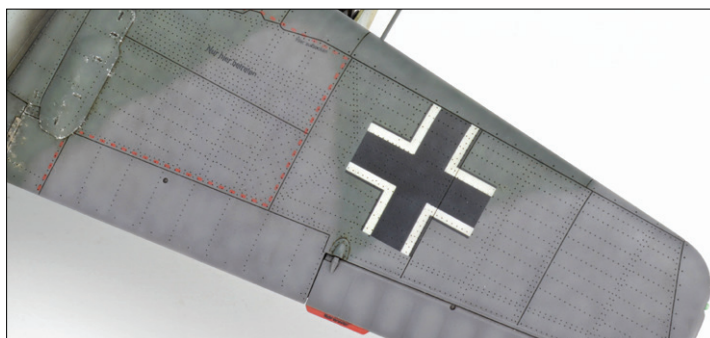
1/48



#82146

KAMO D

built by Jan Baranec

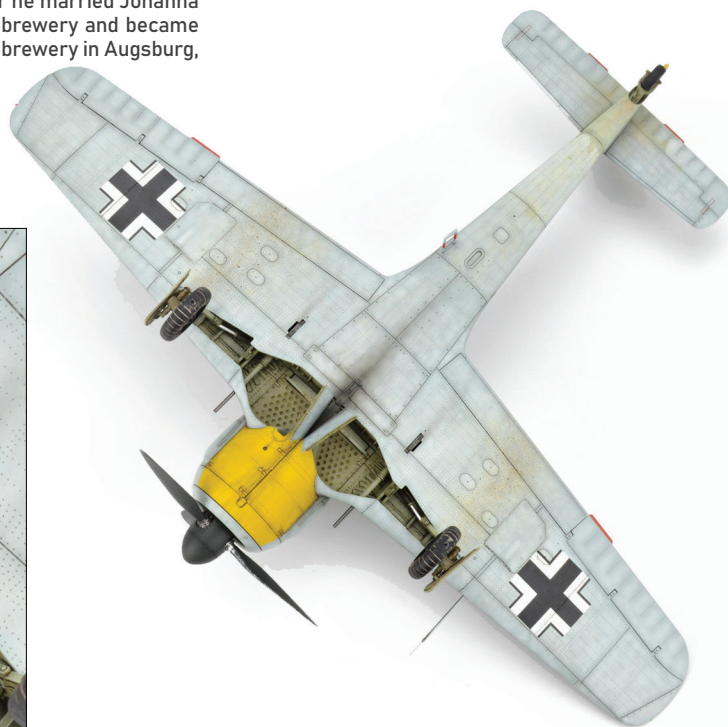
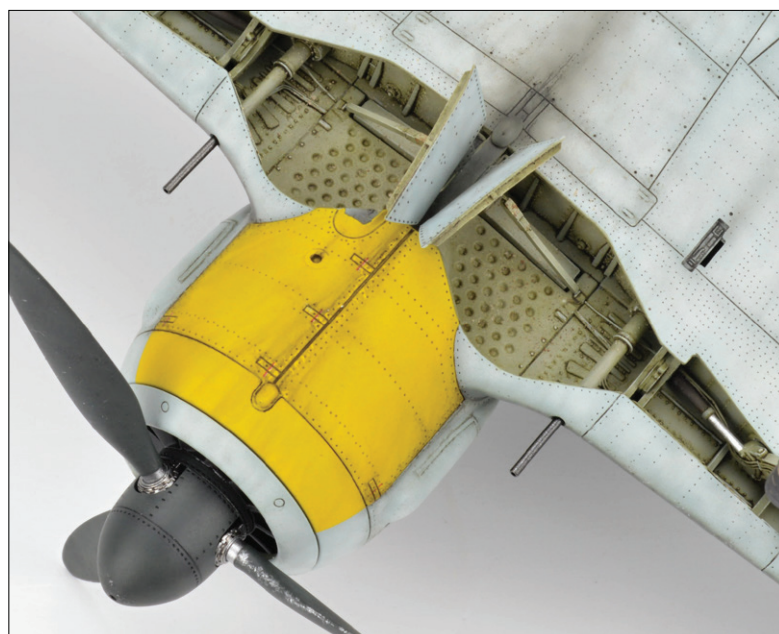


W. Nr. 0125310, Hptm. Josef Priller, CO of III./JG 26, Wevelghem, Belgium, June 1942

Josef "Pips" Priller was born on July 27th, 1915 in Ingolstadt, Bavaria. In 1935, he joined Wehrmacht, and as soon as one year later, in October 1936, he started to attend the fighter pilot training. He managed his first shot down as a commander of 6. Staffel JG 51 when he downed a Spitfire above Dunkerque on May 28th, 1940. In November 1940, he was appointed a commander of the 1./JG 26. On December 6th, 1941, he became commander of III./JG 26, from January 11th, 1943 he lead the whole Jagdgeschwader 26. His total number of shot downs kept growing. On December 20th,

1941, his successes were rewarded – Priller was decorated with Knights Cross of the Iron Cross with Oak Leaves and Swords. On January 28th, 1945, he was appointed a post of an Inspekteur der Jagdflieger Ost, where he remained till the end of WWII. Priller's total score of shot downs was 101 enemy aircraft. All of the shot downs happened in the Western Front. After war he married Johanna Riegele, the proprietor of a brewery and became general manager of Riegele brewery in Augsburg,

Germany. He died of heart attack on May 20th, 1961. The aircraft flown by Josef Priller in June 1942, in the standard camouflage scheme for Luftwaffe fighters, had a yellow rudder and bottom portion of the engine cowl. It also carried the marking for the CO of the III. Gruppe. The tail carried 73 kill markings, his tally to June 1st, 1942.



BIG ED (May)

BIG49363 Anson Mk.I 1/48 Airfix
 BIG49364 F-16C Block 25 1/48 Kinetic
 BIG49365 F-16C Block 42 till 2005 1/48 Kinetic
 BIG49366 F-16C Block 42 from 2006 1/48 Kinetic

BRASSIN (May)

634033 Hurricane Mk.IIb LööK 1/32 Revell
 634034 Spitfire Mk.IXc LööK 1/24 Airfix
 644211 F-16A MLU LööK 1/48 Kinetic
 644212 F-16C Block 42 till 2005 LööK 1/48 Kinetic
 644213 F-16C Block 42 from 2006 LööK 1/48 Kinetic
 624003 Spitfire Mk.IX exhaust fishtail PRINT 1/24 Airfix
 632191 Luftwaffe rudder pedals PRINT 1/32 Revell
 635027 WWII German towing cable eyes PRINT 1/35
 635028 WWII German trench binoculars PRINT 1/35
 648827 F4F-3A engine PRINT 1/48 Eduard
 648850 A6M2-N Rufe cockpit PRINT 1/48 Eduard
 648851 A6M2-N Rufe landing flaps PRINT 1/48 Eduard
 648852 A6M2-N Rufe engine complete PRINT 1/48 Eduard
 648853 F4F-4 gun bays PRINT 1/48 Eduard
 648856 F-16 radar late PRINT 1/48 Kinetic
 648858 F-35A ejection seat PRINT 1/48 Tamiya
 648860 F-35A exhaust nozzle PRINT 1/48 Tamiya
 648861 Lewis 97-cartridges ammo magazines PRINT 1/48

LööKPlus (May)

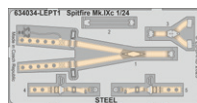
644208 A6M2-N Rufe LööKplus 1/48 Eduard
 644209 Mosquito B Mk.IV LööKplus 1/48 Tamiya
 644210 F-16C Block 25 LööKplus 1/48 Kinetic

BIGSIN (May)

SIN648103 F4F-4 ESSENTIAL 1/48 Eduard
 SIN648104 F-16 armament w/ laser guided bombs 1/48 Kinetic

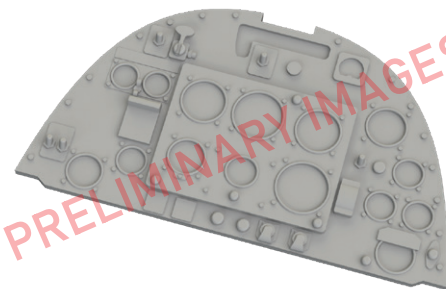
634034**Spitfire Mk.IXc LööK****1/24 Airfix**

LööK set - Brassin pre-painted dashboard and STEEL seatbelts for Spitfire Mk.IXc in 1/24 scale. Easy to assemble, replaces plastic parts. Recommended kit: Airfix



Set contains:

- resin: 1 part
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

**644211****F-16A MLU LööK****1/48 Kinetic**

LööK set - Brassin pre-painted dashboard and STEEL seatbelts for F-16A MLU in 1/48 scale. Easy to assemble, replaces plastic parts. Recommended kit: Kinetic

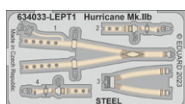
LööK

Set contains:

- resin: 3 parts
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

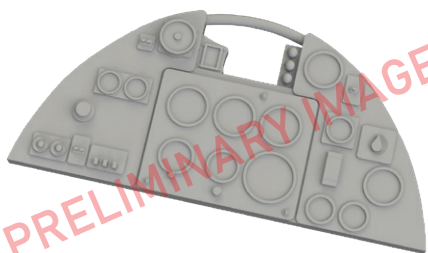
**634033****Hurricane Mk.IIb LööK****1/32 Revell**

LööK set - Brassin pre-painted dashboard and STEEL seatbelts for Hurricane Mk.II in 1/32 scale. Easy to assemble, replaces plastic parts. Recommended kit: Revell



Set contains:

- resin: 1 part
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

*LööK***644212****F-16C Block 42 till 2005 LööK****1/48 Kinetic**

LööK set - Brassin pre-painted dashboard and STEEL seatbelts for F-16C Block 42 in 1/48 scale. Easy to assemble, replaces plastic parts. Recommended kit: Kinetic

Set contains:

- resin: 3 parts
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

*LööK*

644213

F-16C Block 42 from 2006 LööK**1/48 Kinetic**

LööK set - Brassin pre-painted dashboard and STEEL seatbelts for F-16C Block 42 in 1/48 scale. Easy to assemble, replaces plastic parts. Recommended kit: Kinetic

Set contains:

- resin: 3 parts
- decals: no
- photo-etched details: yes, pre-painted
- painting mask: no

LööK

624003

Spitfire Mk.IX exhaust fishtail PRINT**1/24 Airfix**

Brassin set - exhaust stacks for Spitfire Mk.IXc in 1/24 scale. Made by direct 3D printing. Easy to assemble, replaces plastic parts. Recommended kit: Airfix

Set contains:

- 3D print: 12 parts
- decals: no
- photo-etched details: no
- painting mask: no

eduard
BRASSIN*Print*

632191

Luftwaffe rudder pedals PRINT**1/32**

Brassin set - rudder pedals for German WWII aircraft in 1/32 scale. The set consists of 3 pairs of pedals. Made by direct 3D printing. Easy to assemble, replaces plastic parts.

Set contains:

- 3D print: 6 parts
- decals: no
- photo-etched details: no
- painting mask: no

eduard
BRASSIN*Print*

635027

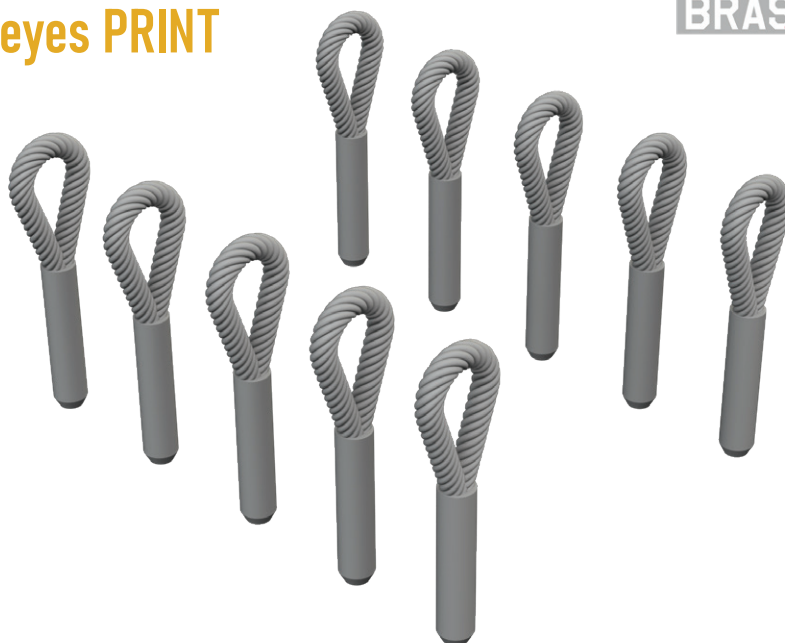
WWII German towing cable eyes PRINT

1/35

Brassin set - towing cable eyes for German WWII AFV in 1/35 scale. The set consists of 10 eyes. Made by direct 3D printing.

Set contains:

- 3D print: 10 parts
- decals: no
- photo-etched details: no
- painting mask: no



eduard
BRASSIN
Print

635028

WWII German trench binoculars PRINT

1/35

Brassin set - German WWII trench binoculars in 1/35 scale. The set consists of 5 binoculars. Made by direct 3D printing.

Set contains:

- 3D print: 5 parts
- decals: no
- photo-etched details: no
- painting mask: no



eduard
BRASSIN
Print

648827

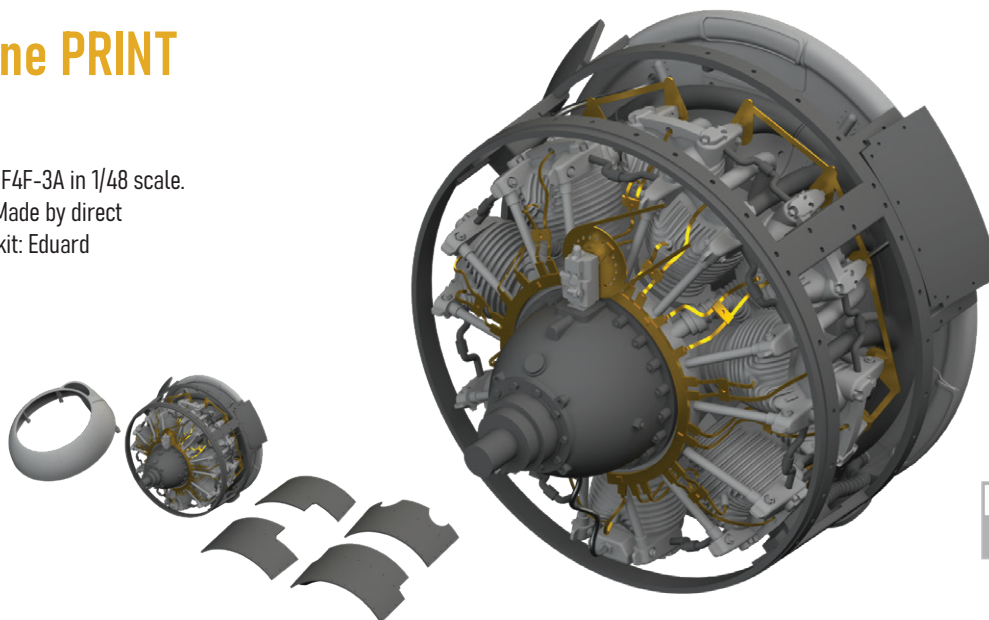
F4F-3A engine PRINT

1/48 Eduard

Brassin set - the engine for F4F-3A in 1/48 scale. The cowlings are included. Made by direct 3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 29 parts
- decals: no
- photo-etched details: yes
- painting mask: no



eduard
BRASSIN
Print

648850

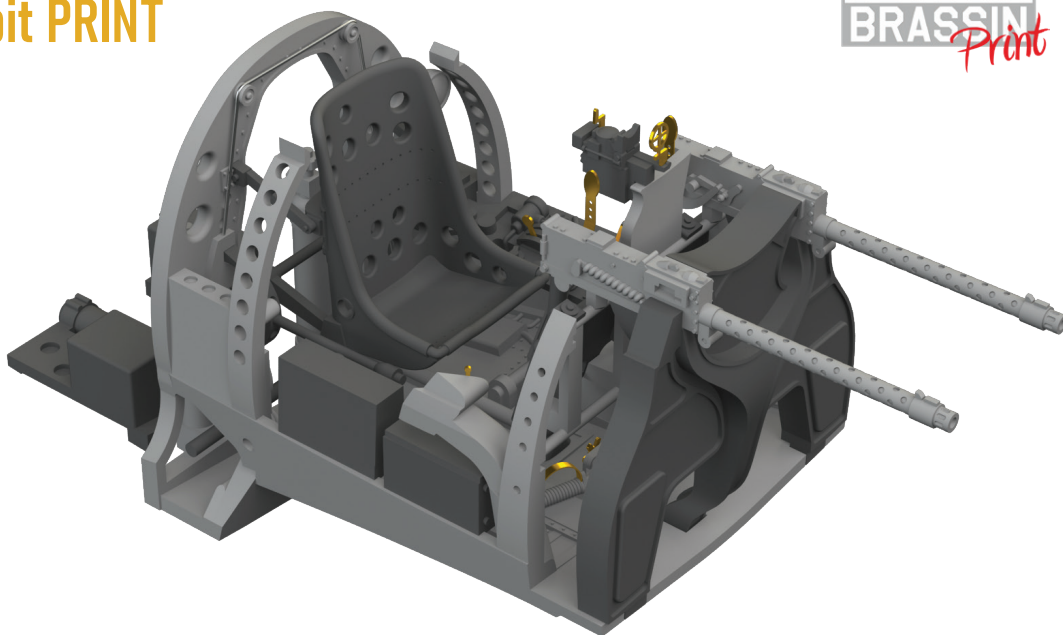
A6M2-N Rufe cockpit PRINT

1/48 Eduard

Brassin set - cockpit for A6M2-N
in 1/48 scale. Made by direct 3D printing.
Recommended kit: Eduard

Set contains:

- 3D print: 28 parts
- decals: yes
- photo-etched details: yes, pre-painted
- painting mask: no
- SPACE 3D decals: no


eduard
BRASSIN
Print

648851

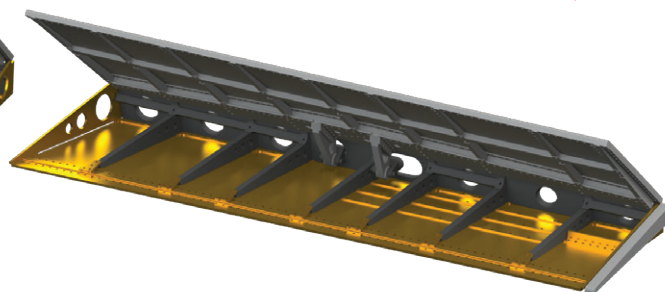
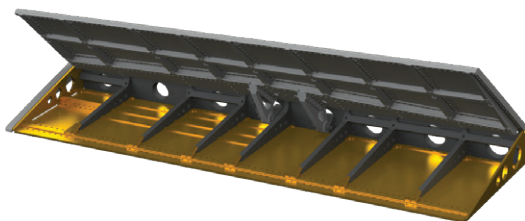
A6M2-N Rufe landing flaps PRINT

1/48 Eduard

Brassin set - landing flaps for A6M2-N Rufe in 1/48 scale.
Made by direct 3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 6 parts
- decals: no
- photo-etched details: yes
- painting mask: no


eduard
BRASSIN
Print

648852

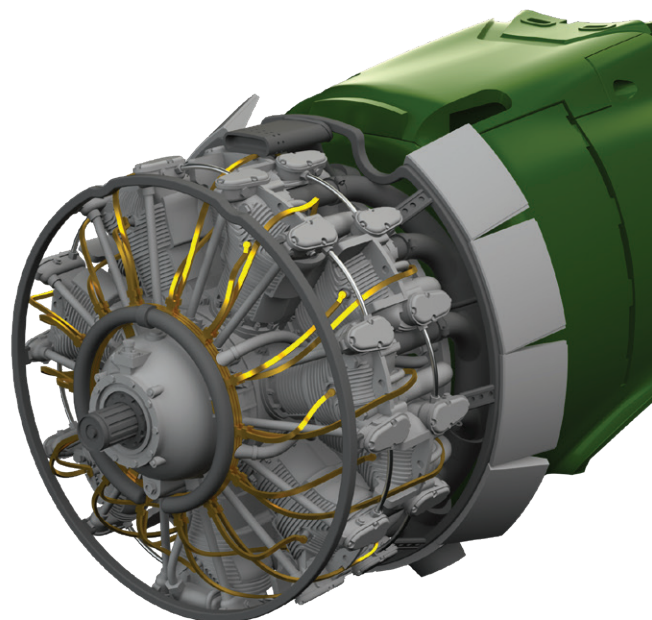
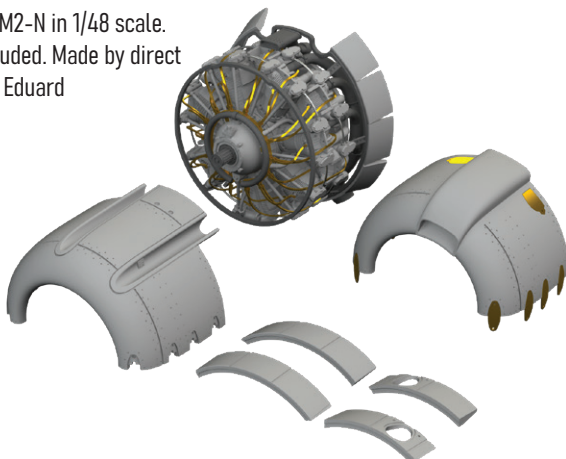
A6M2-N Rufe engine complete PRINT

1/48 Eduard

Brassin set - the engine for A6M2-N in 1/48 scale.
The separate cowlings are included. Made by direct
3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 24 parts
- decals: no
- photo-etched details: yes
- painting mask: no


eduard
BRASSIN
Print

648853

F4F-4 gun bays PRINT**1/48 Eduard**

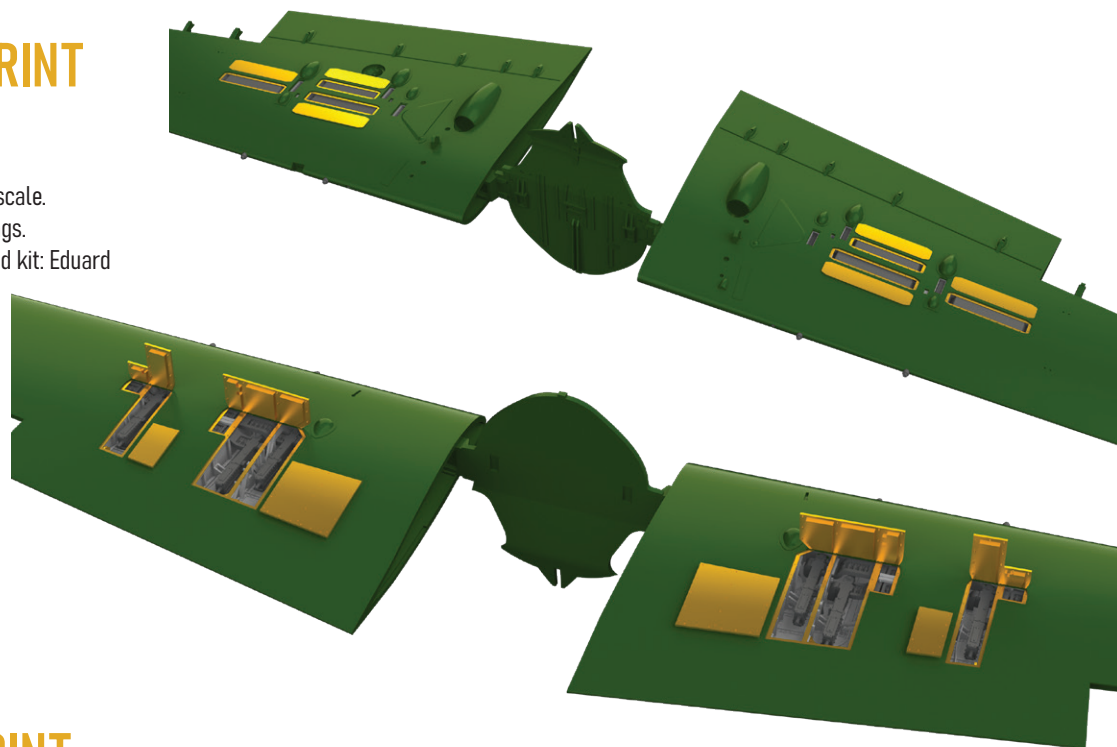
Brassin set - gun bays for F4F-4 in 1/48 scale.

The Set consists of gun bays for both wings.

Made by direct 3D printing. Recommended kit: Eduard

Set contains:

- 3D print: 26 parts
- decals: no
- photo-etched details: yes
- painting mask: no



648856

F-16 radar late PRINT**1/48 Kinetic**

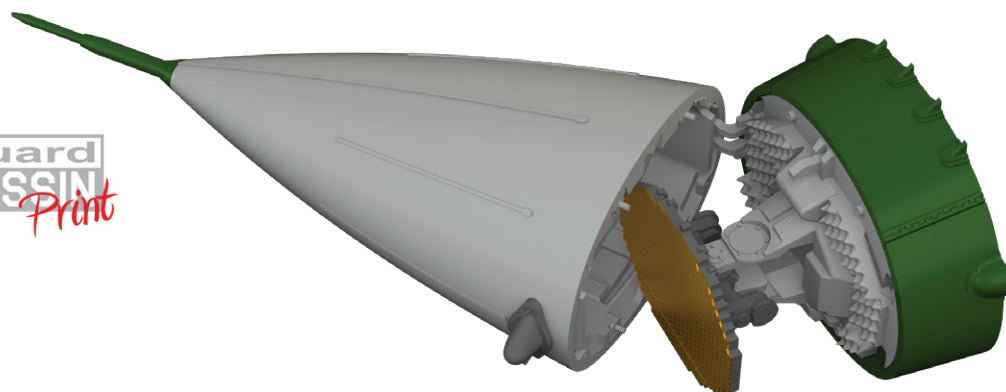
Brassin set - nose radar for F-16 in 1/48 scale.

Made by direct 3D printing.

Recommended kit: Kinetic

Set contains:

- 3D print: 5 parts
- decals: no
- photo-etched details: yes
- painting mask: no



648858

F-35A ejection seat PRINT**1/48 Tamiya**

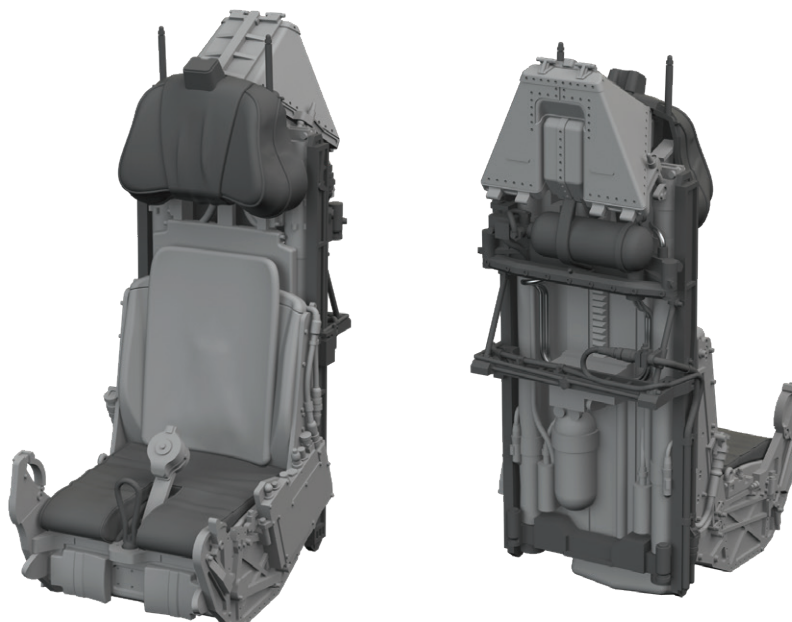
Brassin set - ejection seat for F-35A in 1/48 scale.

Easy to assemble, replaces plastic parts.

Made by direct 3D printing. Recommended kit: Tamiya

Set contains:

- 3D print: 9 parts
- decals: yes
- photo-etched details: yes, pre-painted
- painting mask: no



648860

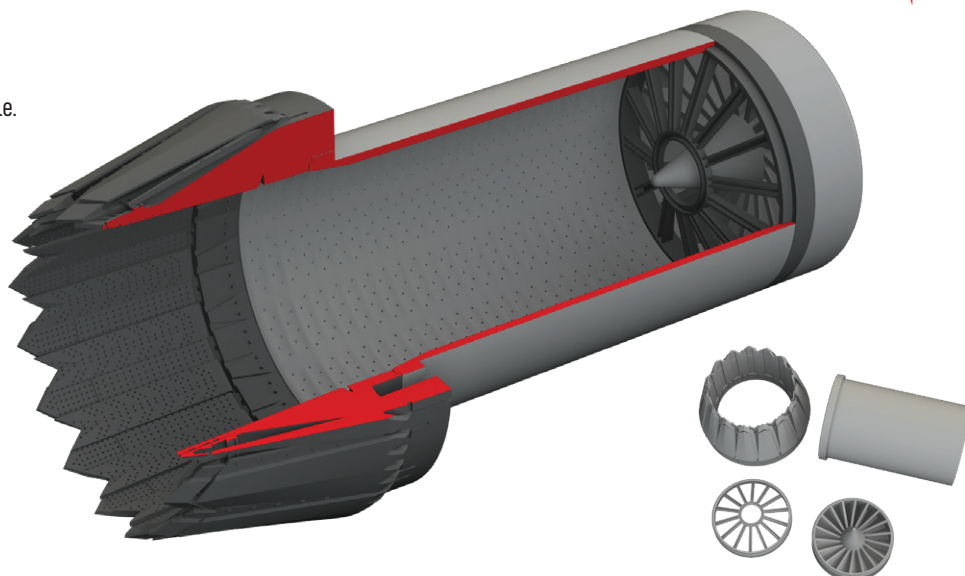
F-35A exhaust nozzle PRINT

1/48 Tamiya

Brassin set - exhaust nozzle for F-35A in 1/48 scale.
Made by direct 3D printing. Easy to assemble,
replaces plastic parts. Recommended kit: Tamiya

Set contains:

- 3D print: 4 parts
- decals: no
- photo-etched details: no
- painting mask: no

eduard
BRASSIN
Print

648861

Lewis 97-cartridges ammo magazines PRINT

1/48

Brassin set - ammunition magazines for Lewis guns in 1/48 scale. The set consists of 12 magazines.
Made by direct 3D printing.

Set contains:

- 3D print: 12 parts
- decals: no
- photo-etched details: no
- painting mask: no

eduard
BRASSIN
Print

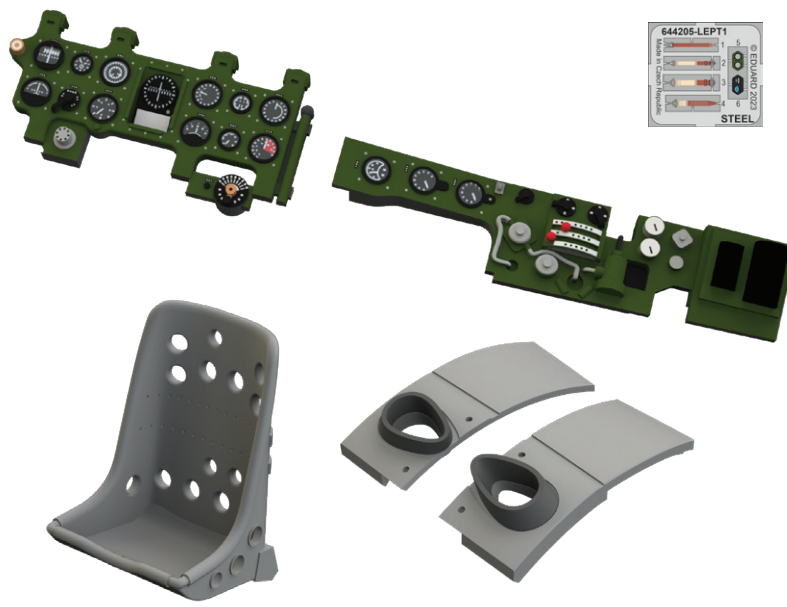
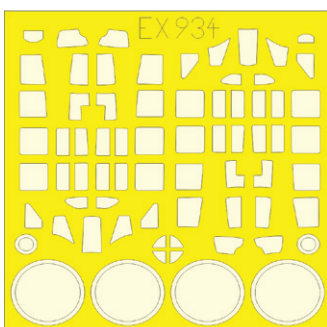
644208

A6M2-N Rufe LööKplus

1/48 Eduard

Collection of 4 sets for A6M2-N Rufel in 1/48 scale.
Recommended kit: Eduard

- LööK set (pre-painted Brassin dashboards & Steelbelts)
- TFace painting mask
- exhaust pipes
- seat

644205-LEPT1
© EDUARD 2023
STEEL*LööKt*

644209

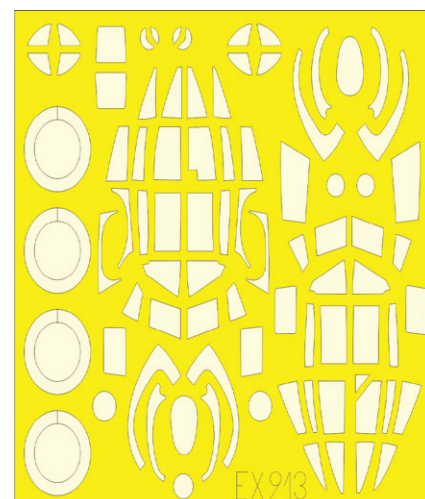
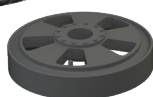
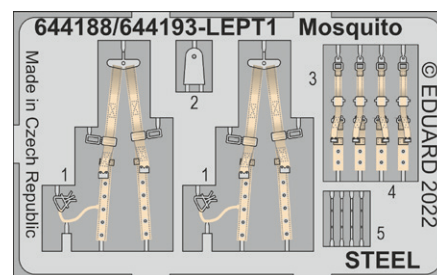
Mosquito B Mk.IV LööKplus

1/48 Tamiya

Collection of 3 sets for Mosquito B Mk.IV in 1/48 scale.

Recommended kit: Tamiya

- LööK set (pre-painted Brassin dashboards & Steelbelts)
- TFace painting mask
- undercarriage wheels

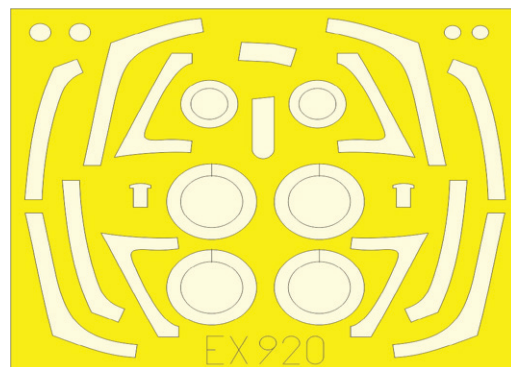
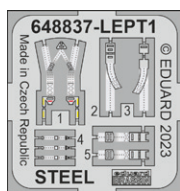
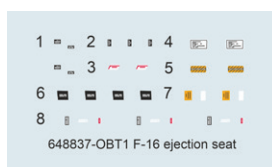
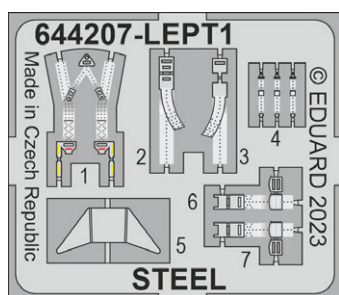
644210

F-16C Block 25 LööKplus**1/48 Kinetic**

Collection of 4 sets for F-16C Block 25 in 1/48 scale.

Recommended kit: Kinetic

- LööK set (pre-painted Brassin dashboards & Steelbelts)
- TFace painting mask
- undercarriage wheels
- ejection seat

LööK+

SIN648103

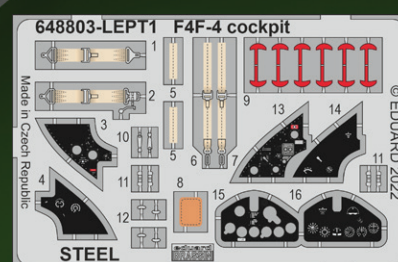
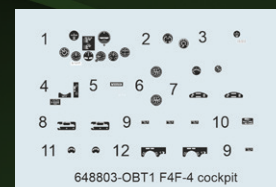
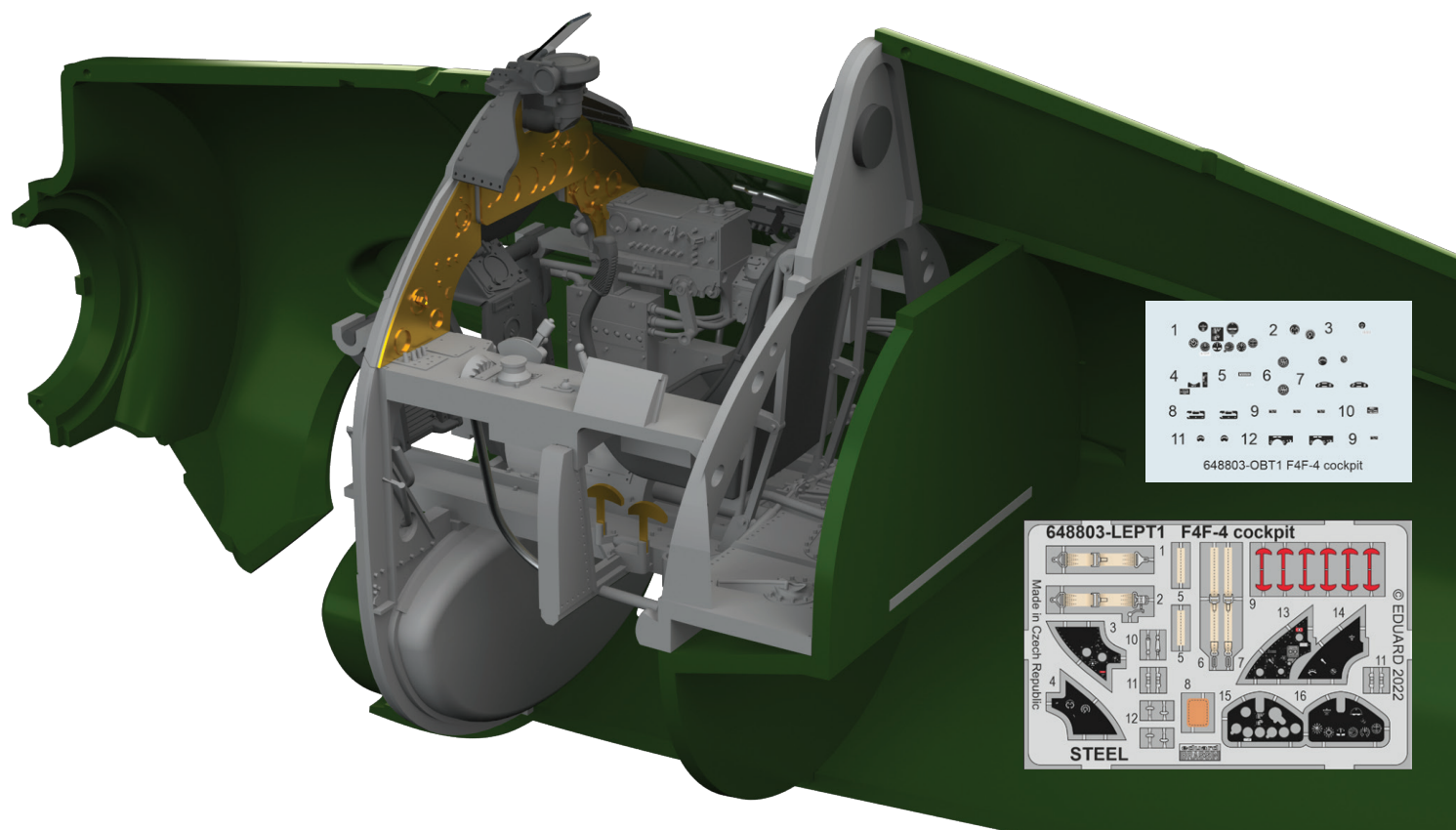
F4F-4 ESSENTIAL

1/48 Eduard

Collection of 4 sets for F4F-4 in 1/48 scale.
Recommended kit: Eduard

- cockpit
- undercarriage legs BRONZE
- undercarriage wheels
- exhaust pipes

All sets included in this BIG SIN are available separately,
but with every BIG SIN set you save up to 30%.



SIN48104

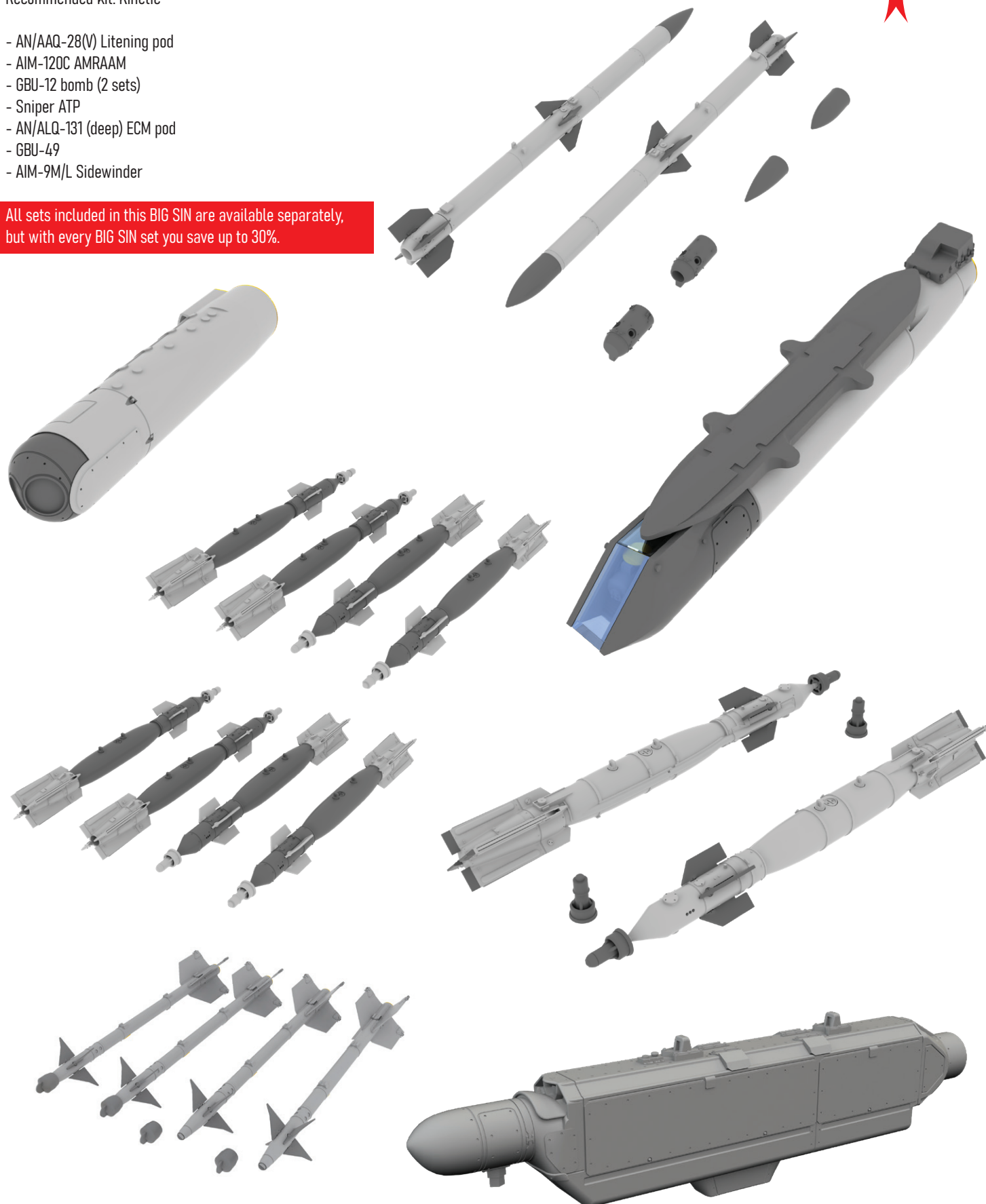
F-16 armament w/ laser guided bombs

1/48 Kinetic

Collection of 8 sets for F-16 in 1/48 scale.
Recommended kit: Kinetic

- AN/AAQ-28(V) Litening pod
- AIM-120C AMRAAM
- GBU-12 bomb (2 sets)
- Sniper ATP
- AN/ALQ-131 (deep) ECM pod
- GBU-49
- AIM-9M/L Sidewinder

All sets included in this BIG SIN are available separately,
but with every BIG SIN set you save up to 30%.



PE-SETS

53293	USS Missouri BB-63 part 2	1/350	Hobby Boss
32482	CH-54A exterior	1/35	ICM
321007	P-40B	1/32	Great Wall Hobby
321008	CH-54A	1/35	ICM
481106	PV-1 exterior	1/48	Academy
481107	PV-1 bomb bay	1/48	Academy
481108	PV-1 undercarriage	1/48	Academy
481109	A6M2-N Rufe landing flaps	1/48	Eduard
481110	Mi-17 cargo floor	1/48	AMK
491348	PV-1	1/48	Academy
491350	F-86D	1/48	Revell
491352	Mi-17	1/48	AMK
491353	Mi-17 cargo seatbelts	1/48	AMK

ZOOMS

33345	P-40B	1/32	Great Wall Hobby
33346	P-40B seatbelts STEEL	1/32	Great Wall Hobby
33347	CH-54A	1/35	ICM
33348	CH-54A seatbelts STEEL	1/35	ICM
FE1348	PV-1	1/48	Academy
FE1349	PV-1 seatbelts STEEL	1/48	Academy
FE1350	F-86D	1/48	Revell
FE1351	F-86D seatbelts STEEL	1/48	Revell
FE1352	Mi-17	1/48	AMK
FE1353	Mi-17 seatbelts STEEL	1/48	AMK
SS801	MiG-21MF interceptor WEEKEND	1/72	Eduard

MASKS

JX307	CH-54A	1/35	ICM
JX308	CH-54A TFace	1/35	ICM
EX940	F-86D	1/48	Revell
EX941	F-86D TFace	1/48	Revell
EX942	Mi-17	1/48	AMK
EX943	Mi-17 TFace	1/48	AMK
EX944	PV-1	1/48	Academy
EX945	PV-1 TFace	1/48	Academy
EX946	Do 335A TFace	1/48	Tamiya

SPACE

3DL32014	P-40B SPACE	1/32	Great Wall Hobby
3DL32015	CH-54A SPACE	1/35	ICM
3DL48116	F-86D SPACE	1/48	Revell
3DL48117	Bf 110C SPACE	1/48	Eduard
3DL48118	P-400 SPACE	1/48	Eduard
3DL48119	Mi-17 SPACE	1/48	AMK
3DL72015	Spitfire Mk.IXc SPACE	1/72	Eduard
3DL72016	B-25J SPACE	1/72	Hasegawa

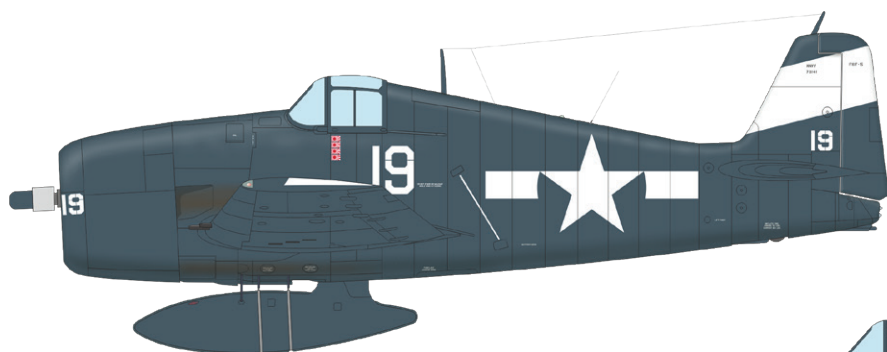
DECAL

D48112	Angel of Mercy	1/48	HKM
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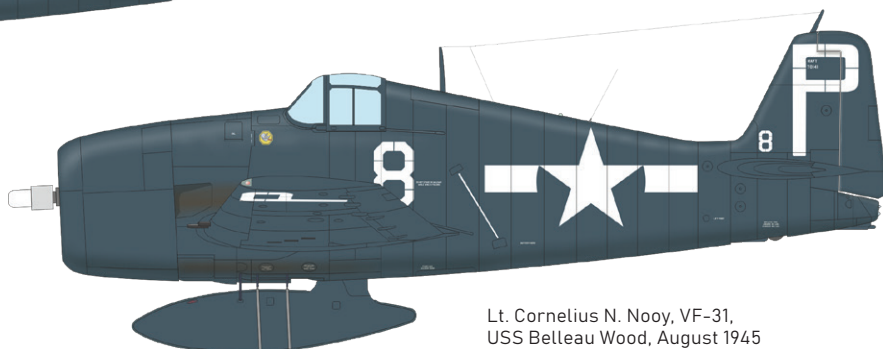
F6F-5 Hellcat #8229

ProfiPACK
edition

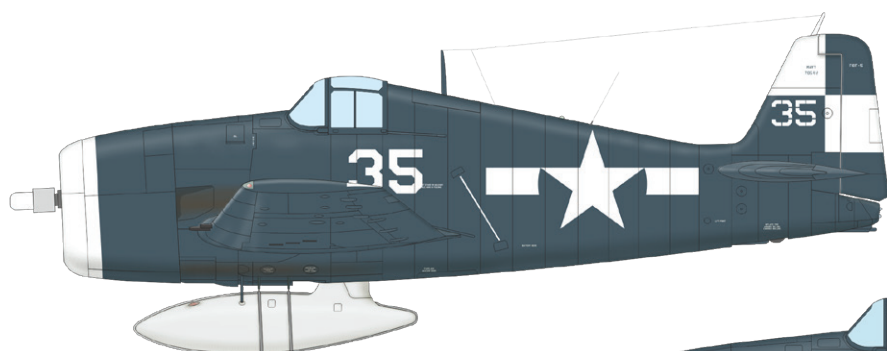
1/48



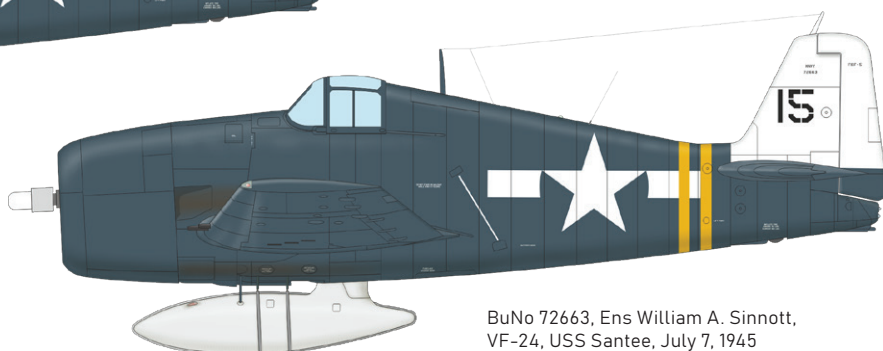
Lt. Eugene A. Valencia, VF-9, USS Lexington, February 1945



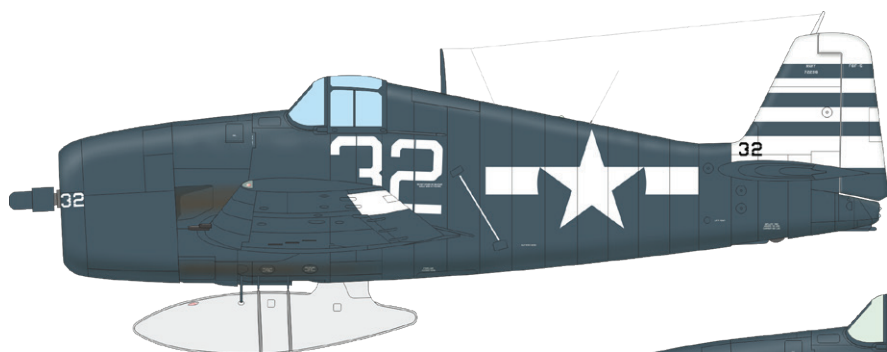
Lt. Cornelius N. Nooy, VF-31, USS Belleau Wood, August 1945



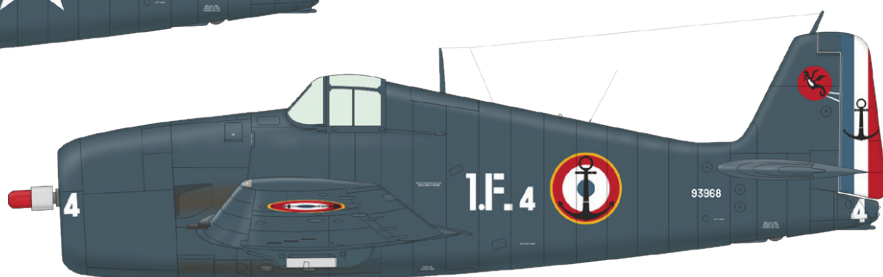
BuNo 70597, Lt James L. Pearce, VF-17, USS Hornet, March 21, 1945



BuNo 72663, Ens William A. Sinnott, VF-24, USS Santee, July 7, 1945



BuNo 72296 Lt Louis A. Menard, jr., VBF-12, USS Randolph, February 17, 1945



Flottille 1F, PA Arromanche, French Indochina, 1951

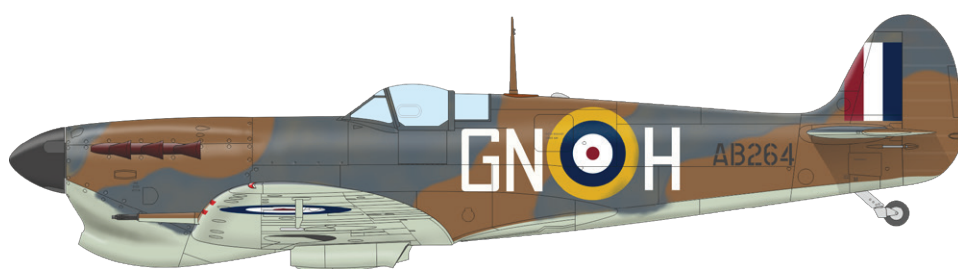
SPITFIRE STORY: Malta

#11172

1/48

Dual Combo

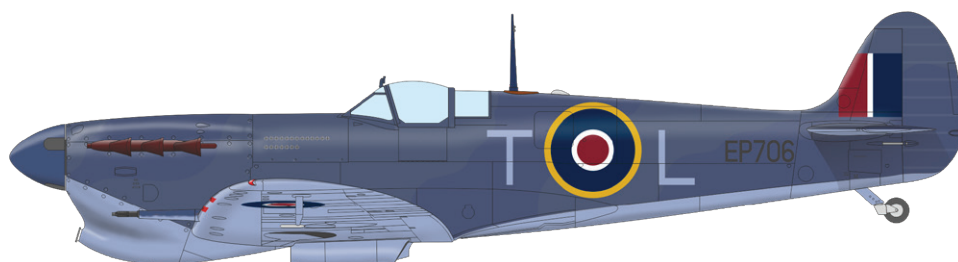
LIMITED



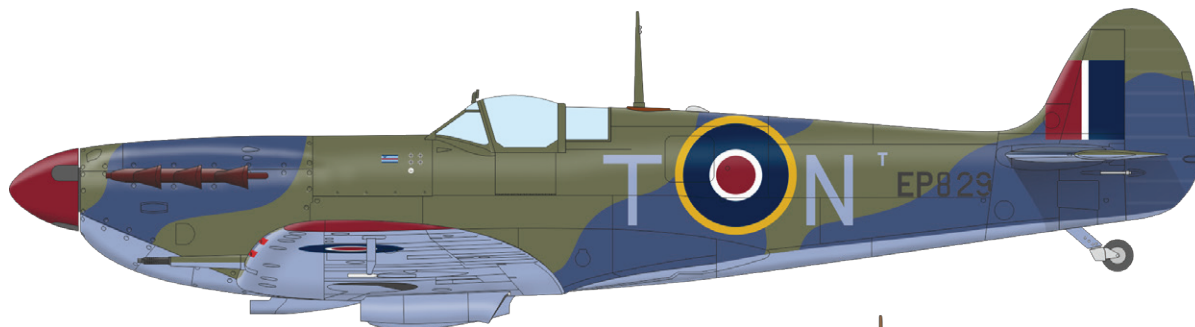
Spitfire Vb Trop, AB264, F/O Robert W. McNair,
No. 249 Squadron, RAF Ta Kali, Malta,
March 1942



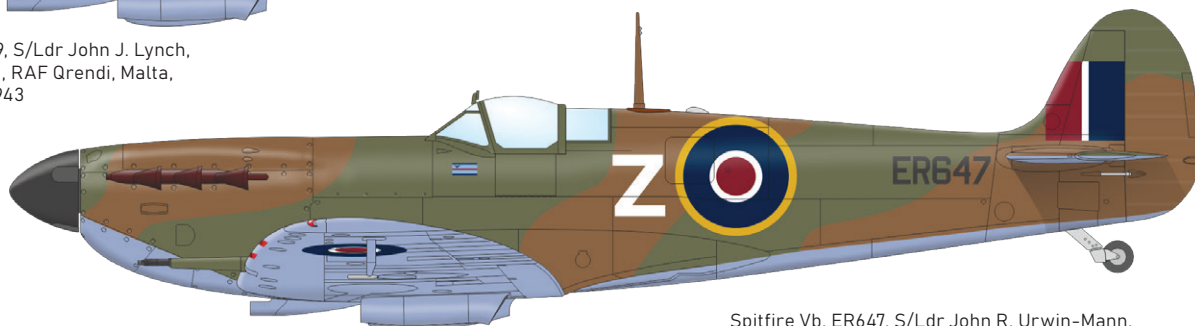
Spitfire Vb Trop, EPI22, Sgt. Claude Weaver III,
No. 185 Squadron, RAF Ta Kali, Malta,
July 1942



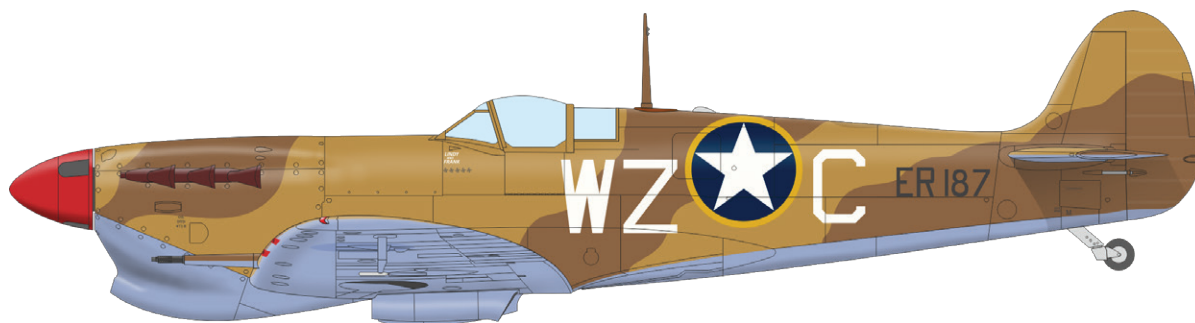
Spitfire Vb Trop, EP706, P/O George F. Beurling,
No. 249 Squadron, RAF Ta Kali, Malta,
August - October 1942



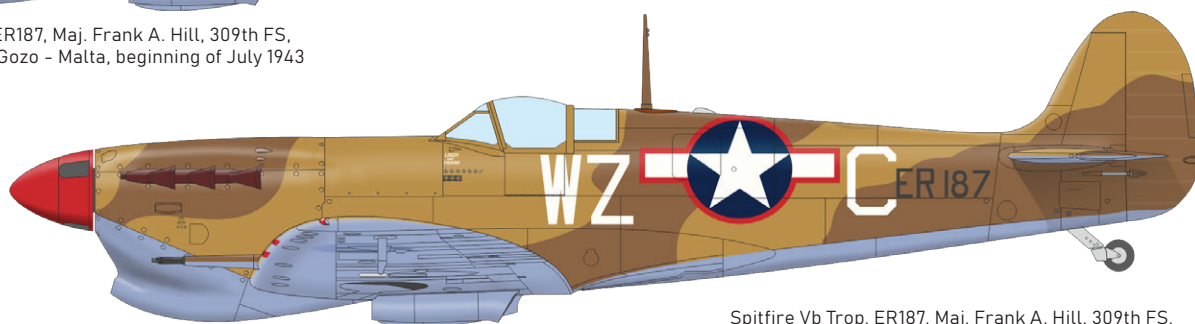
Spitfire Vb, EP829, S/Ldr John J. Lynch,
No. 249 Squadron, RAF Qrendi, Malta,
February - May 1943



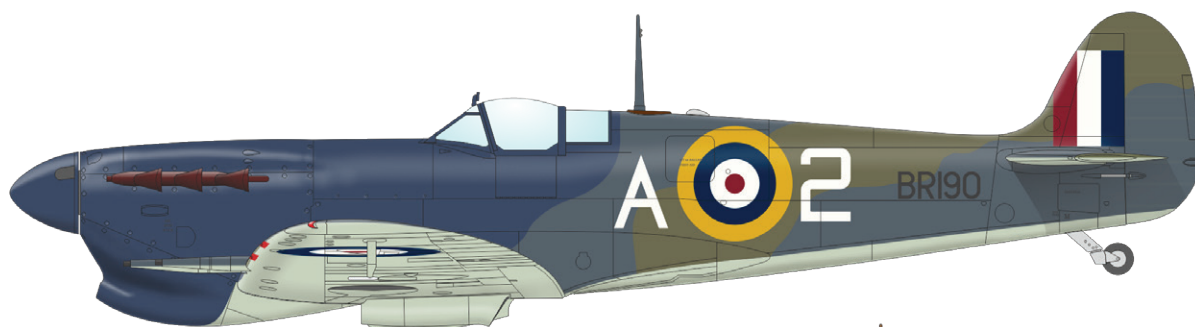
Spitfire Vb, ER647, S/Ldr John R. Urwin-Mann,
No. 126 Squadron, RAF Luqa, Malta, spring 1943



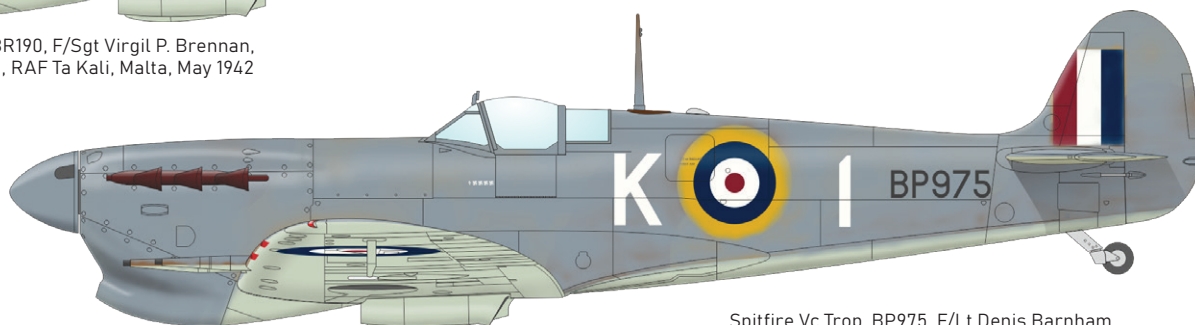
Spitfire Vb Trop, ER187, Maj. Frank A. Hill, 309th FS,
31st FG, Xewkija, Gozo - Malta, beginning of July 1943



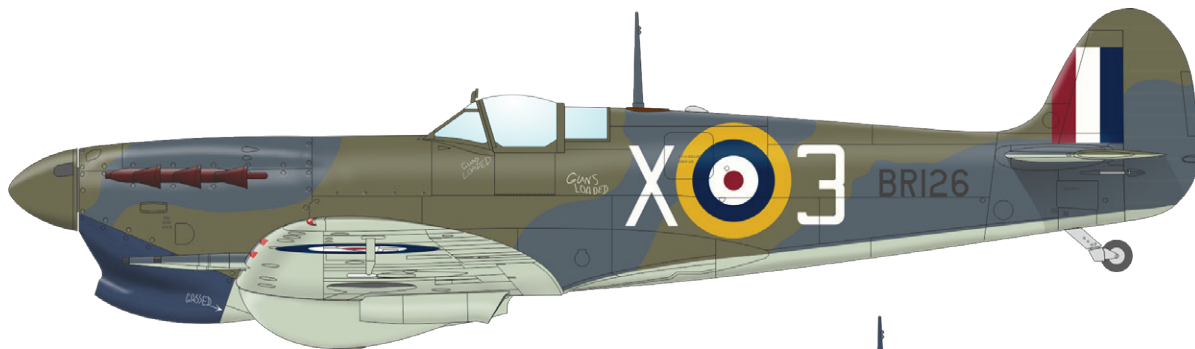
Spitfire Vb Trop, ER187, Maj. Frank A. Hill, 309th FS,
31st FG, Xewkija, Gozo - Malta, beginning of July 1943



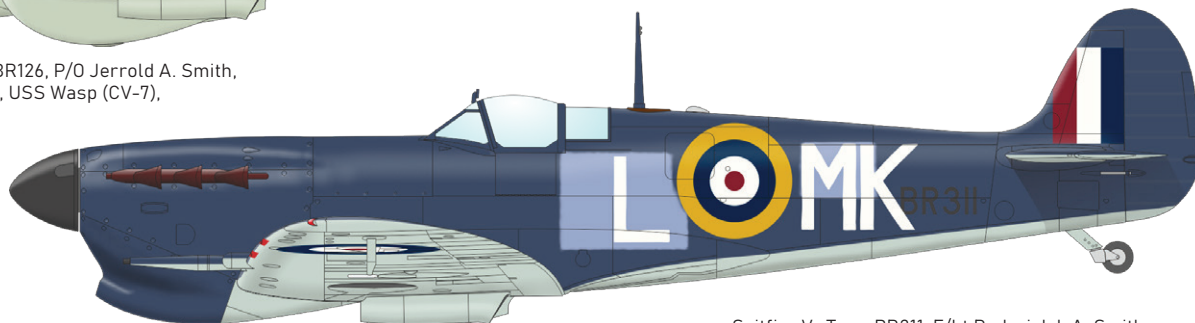
Spitfire Vc Trop, BR190, F/Sgt Virgil P. Brennan,
No. 249 Squadron, RAF Ta Kali, Malta, May 1942



Spitfire Vc Trop, BP975, F/Lt Denis Barnham,
No. 601 Squadron, RAF Luqa, Malta, April - May 1942



Spitfire Vc Trop, BR126, P/O Jerrold A. Smith,
No. 126 Squadron, USS Wasp (CV-7),
May 1942



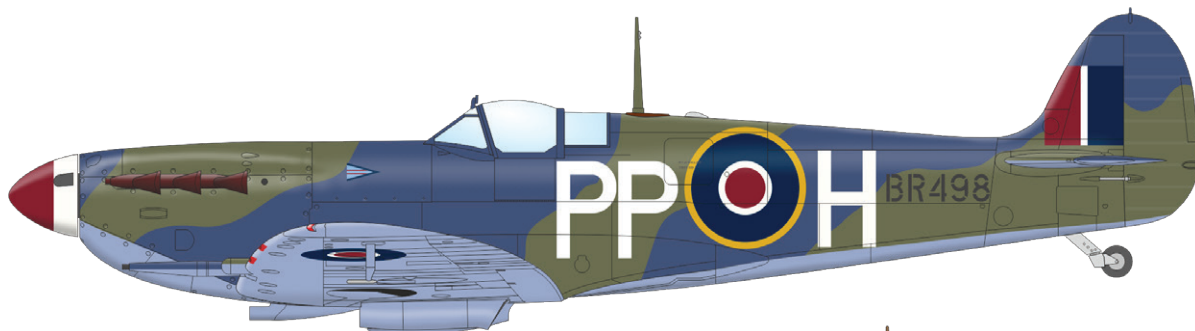
Spitfire Vc Trop, BR311, F/Lt Roderick I. A. Smith,
No. 126 Squadron, RAF Luqa, Malta, October 1942



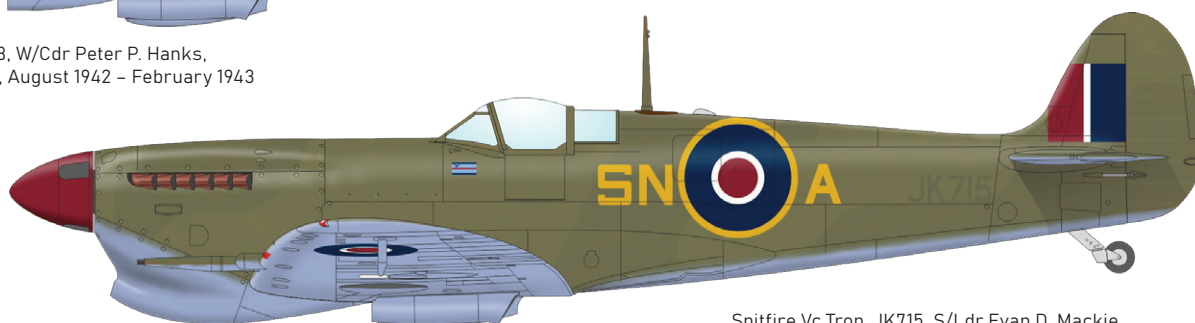
Spitfire Vc Trop, BR321, F/Lt John A. Plagis,
No. 185 Squadron, RAF Hal Far, Malta, June 1942



Spitfire Vc Trop, BR387, P/O John W. Yarra,
No. 185 Squadron, RAF Hal Far, Malta, June 1942



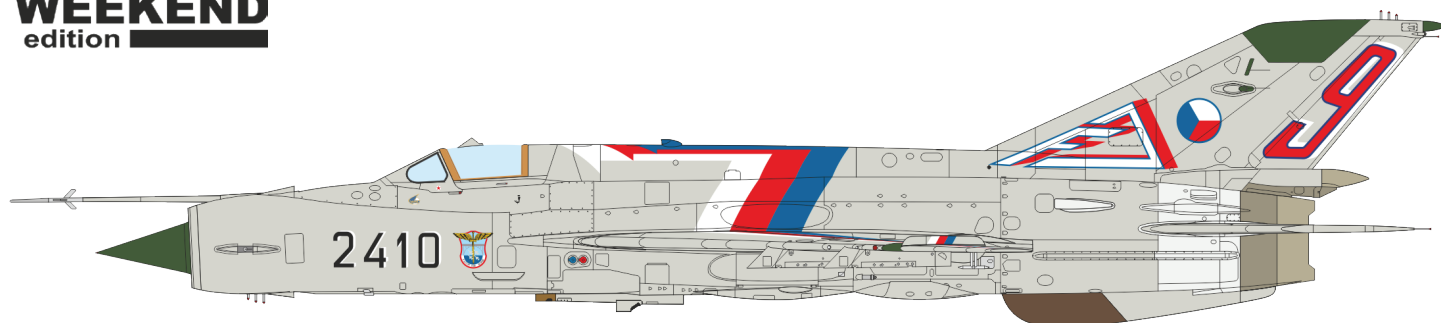
Spitfire Vc, BR498, W/Cdr Peter P. Hanks,
Luqa Wing, Malta, August 1942 – February 1943



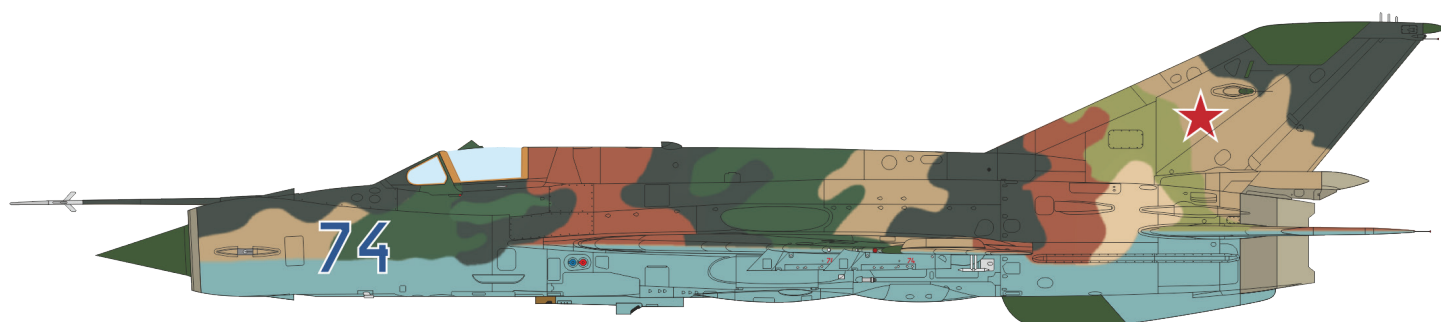
Spitfire Vc Trop, JK715, S/Ldr Evan D. Mackie,
No. 243 Squadron, RAF Hal Far, Malta, June – July 1943

MiG-21MF Interceptor #7469

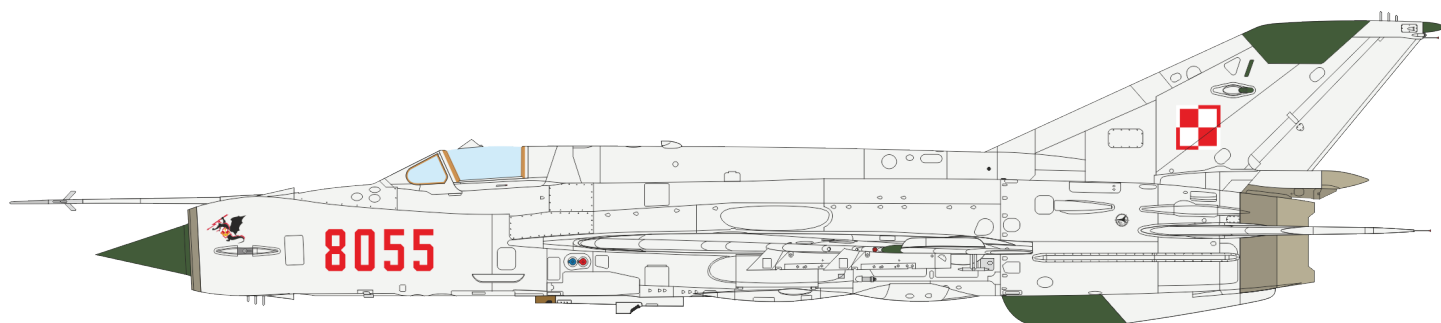
1/72

WEEKEND
 edition


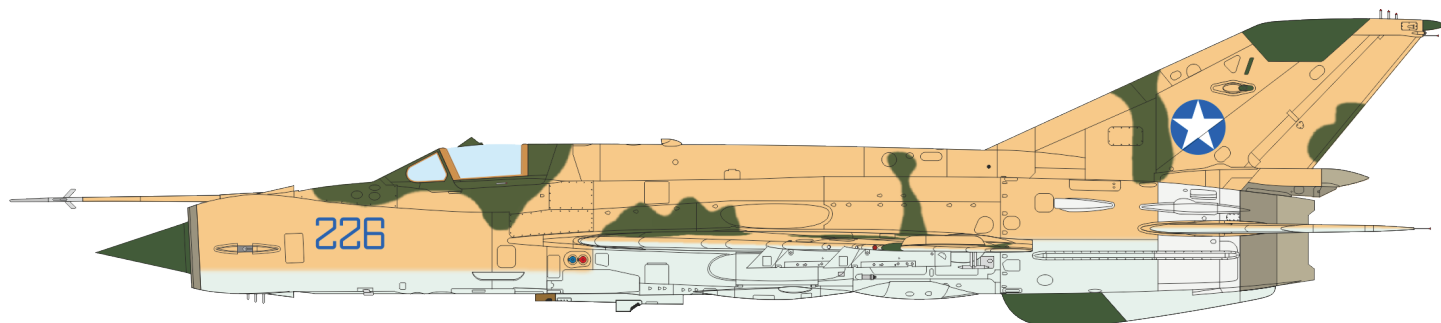
1st Squadron, 9th Fighter Bomber Air Regiment,
 Bechyně, Czech Republic, September 1993



116. CBP (116th Combat Training Center),
 Privolzhsky, Soviet Union, May 1990



10. Pułk Lotnictwa Myśliwskiego, Airport Łask,
 Poland, 1986 - 1993

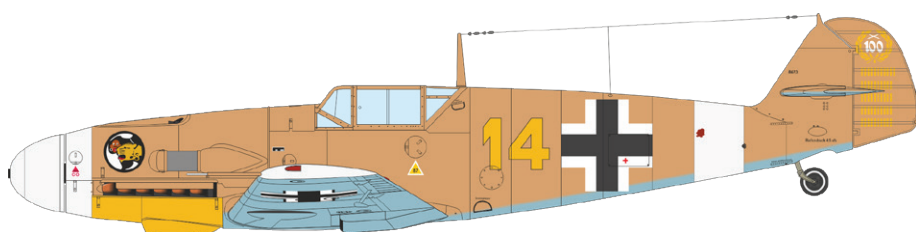


Mogadishu Airport, Somali Air Force, Somalia, 1991

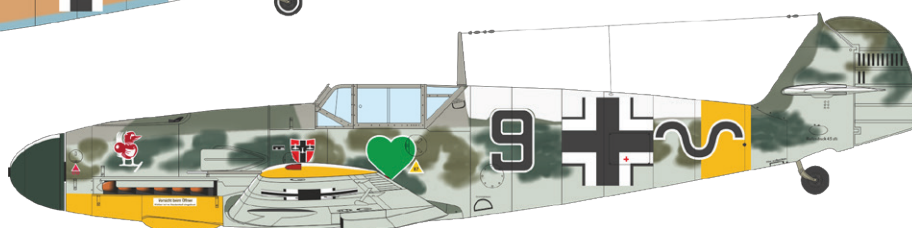
Bf 109F-4

#84188

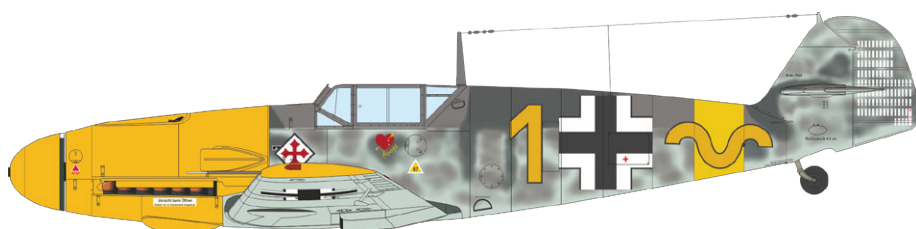
1/48



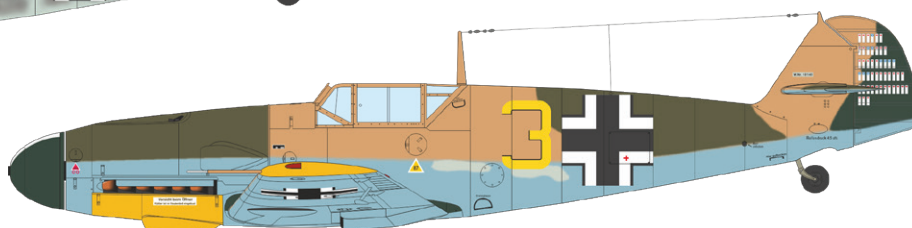
Bf 109F-4/Trop, WNr. 8673,
Hptm. Hans-Joachim Marseille,
CO of 3./JG 27, Quotaifiya, Egypt,
September 1942



Bf 109F-4, Lt. Hans-Joachim Heyer,
8./JG 54, Siverskaya, Soviet Union,
April 1942



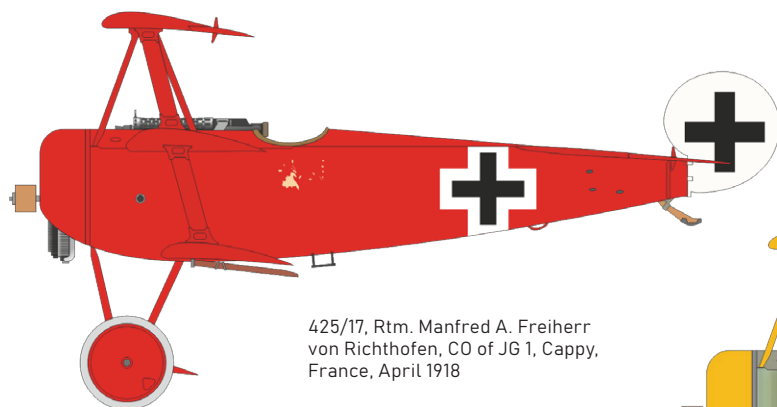
Bf 109F-4/Z, WNr. 7420, Lt. Hermann A. Graf,
CO of 9./JG 52, Kharkov-Rogan, Soviet Union,
May 1942



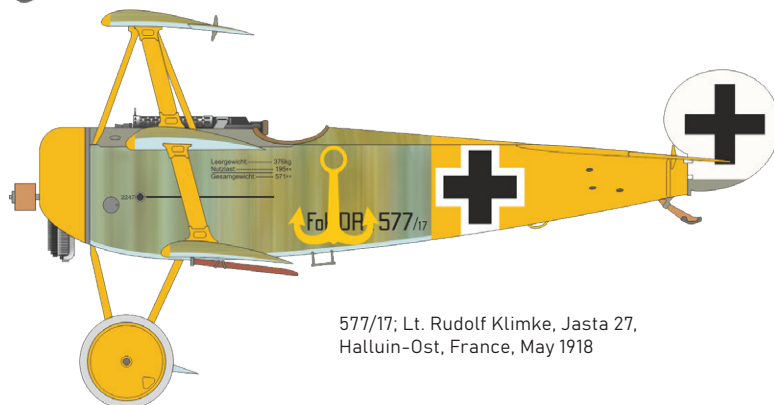
Bf 109F-4/Trop, WNr. 10145, Fw. Rudolf Müller,
6./JG 5, Petsamo, Finland, June 1942

Fokker Dr.I #8162

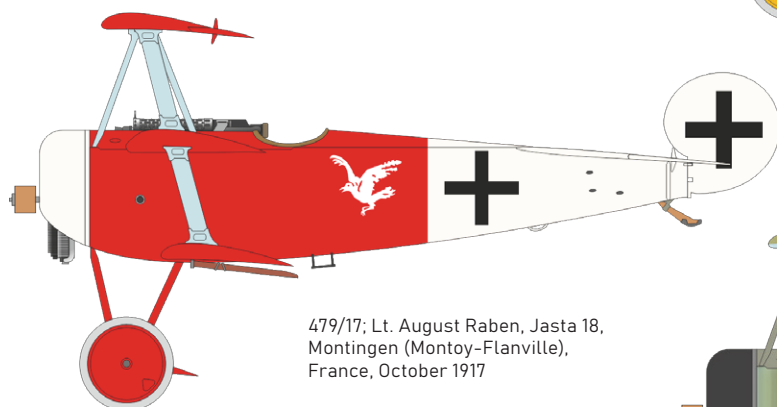
ProfiPACK 1/48
edition



425/17; Rtm. Manfred A. Freiherr von Richthofen, CO of JG 1, Cappy, France, April 1918



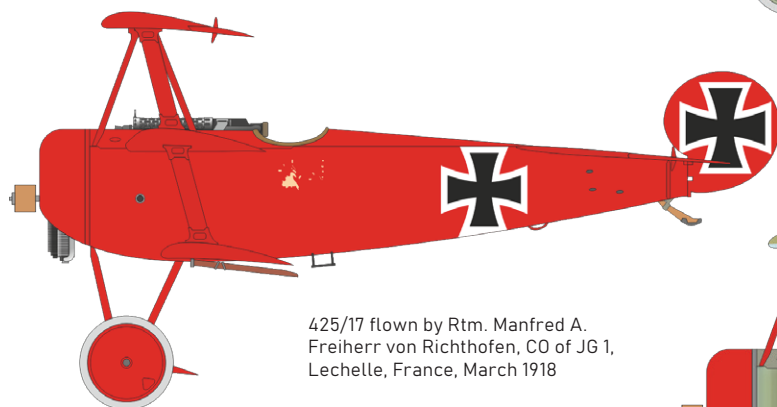
577/17; Lt. Rudolf Klimke, Jasta 27, Halluin-Ost, France, May 1918



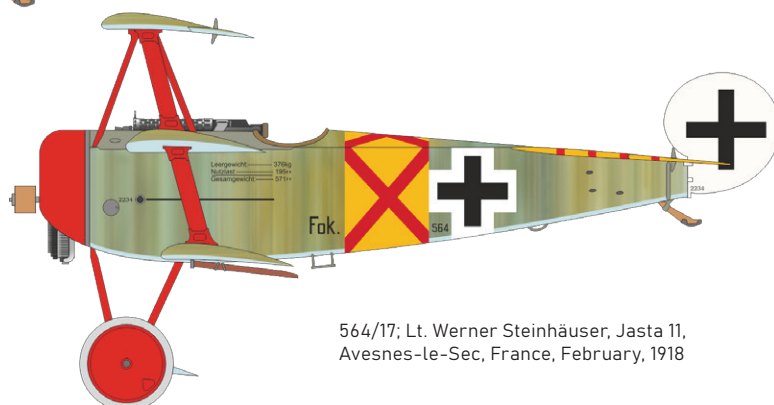
479/17; Lt. August Raben, Jasta 18, Montingen (Montoy-Flanville), France, October 1917



213/17; Lt. Friedrich P. Kempf, Jasta 2, Bavichove, Belgium, February 1918



425/17 flown by Rtm. Manfred A. Freiherr von Richthofen, CO of JG 1, Lechelle, France, March 1918

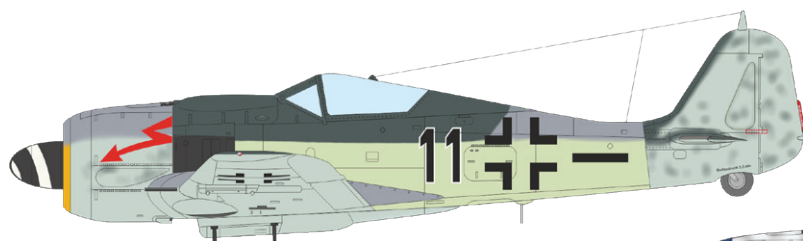


564/17; Lt. Werner Steinhäuser, Jasta 11, Avesnes-le-Sec, France, February, 1918

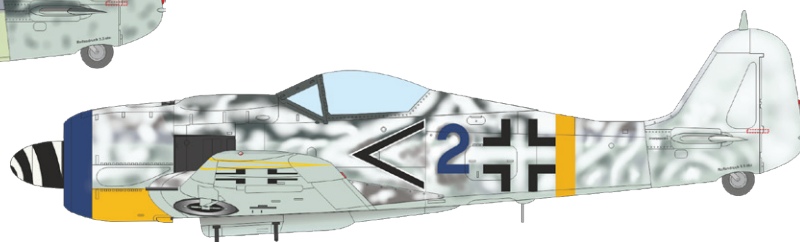
Fw 190F-8

Re-release #70119

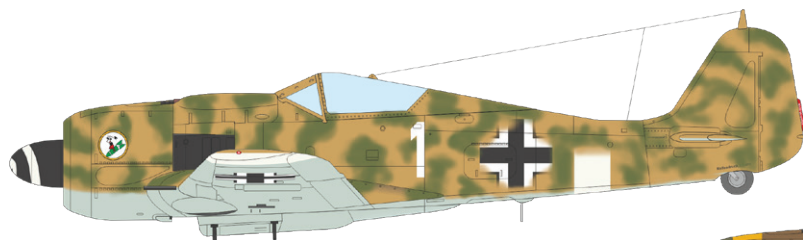
1/72



5./SG 77, Cottbus, Germany, early March 1945



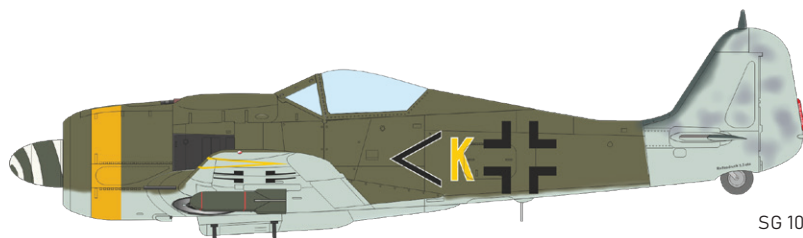
SG 2, Hungary, Winter 1944/1945



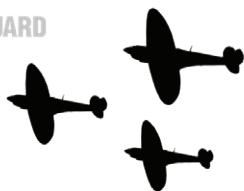
1./SG 4, Piacenza, Italy 1944



WNR. 584592, SG 2 or SG 10, Neubiberg, Germany, May 1945



SG 10, České Budějovice, Protectorate of Bohemia and Moravia, May 1945



THE MOVING

Do You like moving? I absolutely hate it! I had to move three times in the last five years and will be moving again this year. And more to it, I got a "bonus" due to work obligations - moving our warehouse! Just so as not to get out of practice ... With colleagues we moved the sales department from the Rico facility (yes, that's the infamous facility where a million of sprues were burned in the fire) to our own facility in Sedlec. And to be honest, I actually enjoyed it! It is not bad to get up out of your chair sometimes and change sitting at the office for a few days of physical work, getting your hands dirty too. Within four days we moved almost the entire department, the truck turned around ten times in total, and the shelves with most of the goods were soon standing in the newly renovated hall. It is about the same size as our former premises in Rico (about 1,400 m²) and the whole new premises offer a total usable area of about 5,500 m².

The event went smoothly, with virtually no complications, and we were able to resume sales and shipment of goods on schedule. Thanks to this we were also able to prepare the goods in time for the first major modelling event this year, which we attended with our travelling sales stand. Yes, it was the December PanthersCup. And even though I had to move all the boxes to and from the event again, I thoroughly enjoyed this event as well. Indeed,

PanthersCup is one of the meetings that is worth a visit every year. And I really appreciate the work of the Panthers club who organize the contest, more so there are not so many such big events in the Czech Republic this year.

The reasons for termination of these events are clear. The overwhelming organizational complexity with all the necessary steps, like premises arrangement, people needed to run the event, appropriate refreshments, prizes for the competition and all the other issues which need to be tackled like registrations, side events and many other things, all require a lot of effort. Although if the enthusiasm of the organizers is usually not lacking at the beginning of such projects, it usually fades with time. If we add to this the usually very demanding Czech modeller,, who as a visitor, with his typical perfectionist attitude, looks for the slightest mistake in order to reveal it on discussion forums or social networks, we cannot be surprised that some exhibitions and competitions are ending. Moreover, youngsters' interest in our hobby isn't increasing, so we can only hope for a miracle that everything will turn for the best. So, let's at least think twice, when publicly evaluating these events, that they cost someone a lot of effort and that we should be happy there are still some people with the enthusiasm to organize them.

I hope that the Panthers will again organize their event next year and that this competition will not disappear like other big ones, for instance ModellBrno, Nymburk Kitsaloon or Pilsenkit. This year, as if by chance, the date of PanthersCup clashed with the Euro Model Expo in Lingen, which we participated in the previous two years, and also with the exhibition in Bytom, Poland, which is certainly also worth a visit.

In a week we are going to Prostějov and then, in April, to Mosonmagyaróvár. But where to go later this year? If you are organizing a plastic modelling event on a larger scale and you would like to have our stand at the event, write me an [email](#), maybe we could come. And we don't mind going abroad. In the second half of the year, we have just a trip across the pond to IPMS in San Marcos, then our E-day off course, and the Slovakian "combo" of events in Bratislava and Nitra, which was by the way a pleasant surprise in our schedule of events last year.

All in all, I would love to move our stand for modelling events and so I hope that this year we will find other great places like Nitra and we will have reasons to expand our schedule again. For now, sadly we are rather reducing it ...

Jakub Nademlejnský



Stánek na výstavě v Nitre 2022



Prázdné regály po přestěhování v areálu v Sedleci



Plné regály po přestěhování v areálu v Sedleci



Výstavní prodejní tým Eduard



Plný stánek na výstavě PanthersCup 2023