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- Dutch Chinooks
- Japanese F-15J Eagles
- Night Flying at Kecskemét
- MAKS 2019
- And so much more ...

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Cover: Royal Netherlands Air Force CH-47D *Chinook* assigned to 298 Squadron © 2020 Bronco Aviation

This page: Japanese Air Self Defense Force F-15J *Eagle* assigned to 23 Hikotai © 2020 Alex van Noije



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JAPANESE F-15J EAGLES

REPORT AND IMAGES
BY JORIS VAN BOVEN
AND ALEX VAN NOYE



The Mitsubishi F-15J Eagle is an all-weather frontline combat aircraft based on the design of the McDonnell Douglas F-15 Eagle. The F-15J was manufactured under license by Japanese Mitsubishi Heavy Industries for the Japan Air Self Defense Force (JASDF). After the first F-15J Eagles were delivered to the Japan Air Self Defense Force, the aircraft quickly entered service with the first operational F-15 squadrons. In total, the Air Force of Japan received 213 F-15J/DJ Eagles. The Eagles fly at eight operational squadrons, a special aggressor unit, and a test unit. The F-15J Eagle is the premier fighter aircraft to protect the Japanese airspace. These aircraft are scattered throughout the country to respond to every possible threat 24 hours

a day, 7 days a week. Japanese fighter planes have been used more and more in scrambles in the recent years. The training of fighter pilots is an important task in every country because it provides the basis for a successful defense of the national airspace. The 23 Hikotai is responsible for this important training and educational task. With the Mitsubishi F-15J/DJ Eagle, the unit has a very powerful aircraft for this mission. One of the best-known units of the Japan Air Self Defense Force (JASDF) is the Flight Instructor Group (Hiko Kyodogun), which is also known as the Aggressor Group. The F-15J Eagles of the Aggressor Group are painted in many exotic color schemes according to the modern color schemes of the Russian Air Force

and Chinese Air Force. Photo-reconnaissance is an important task which, until recently, was performed by the specialized RF-4E Kai. Japan therefore, needs a successor for the Phantom to continue to perform photo-reconnaissance tasks. The F-15J's have been the backbone of the aerial defense in Japan for many years. The aircraft that are still flying are of different versions due to many different updates in recent decades. To keep the fleet as deployable as possible, more than a hundred Eagles will be updated.

The Choice for the F-15J Eagle

The F-15J Eagle is the primary air defense fighter in Japan, and it is the backbone of the Japanese

defense. The Japan Air Self Defense Force (JASDF) opted for the F-15 Eagle, which is being built in the United States by the McDonnell Douglas Corporation. The American version of the F-15 is referred to as the F-15C/D Eagle. The Japanese version, the F-15J/DJ Eagle, is in conformity with the United States government, built under license in Japan, and contains all Japanese specifications for such an aircraft. Most Japanese F-15J's were built under license by the Japanese company Mitsubishi Heavy Industries. The JASDF received a total of 165 F-15J aircraft and 48 F-15DJ aircraft with space for two pilots. A total of 213 aircraft were built for the JASDF of this type. Japan is the second-largest buyer of the F-15 Eagle

Maintainers performing the last chance check on three F-15DJ's of the Hiko Kyodogun (Aggressor Group) at Kumatsu AB

after the United States Air Force. Japan flies with more than 60% of the Eagles in the world that are not built for the U.S. Air Force. On March 31, 2019 (end of Japanese Tax year 2018), there were still 201 F-15J/DJ Eagles in use at the JASDF. That alone is a remarkable achievement because the F-15 has been used by the JASDF for more than 30 years. The F-15 has undergone various modifications over the years, making the planes still very formidable weapons for the JASDF. The aircraft has been the main deterrent to the Japanese air defense for more than 30 years. There is no significant difference between the JASDF and the USAF F-15J's in appearance. The main features are the JASDF roundel (Hinomaru), the color of the aircraft, and the antennas related to electronic warfare.

The choice for the F-15 Eagle was a result of the selection program of the third FX study. The budget proposal for the following year was submitted in 1974 (Showa 49) and included the third FX research costs for the successor of the Lockheed F-104J/DJ Starfighter and the oldest Mitsubishi F-4EJ Phantom IIs. The F-104J/DJ Starfighter was the most important interceptor of the Japanese Air Force at that time. The Starfighters are now very outdated and notorious in

Europe, in particular for the many accidents with that type. The F-4 Phantom II is a contemporary of the Starfighter, but it is a much heavier and more reliable aircraft. The selection work for a good successor for these aircraft started in 1975 (Showa 50). The research was limited to 13 different types. The most important candidates were: the American Grumman F-14 Tomcat, the American McDonnell Douglas F-15Eagle, the American General Dynamics F-16 Fighting Falcon, the American Northrop F-17, the French Dassault Mirage F1, the Swedish Saab J-37 Viggen, and the Tri-National Panavia Tornado IDS. For these seven models, a study team was appointed by the Defense Agency. In 1976, the F-14 Tomcat, the F-15 Eagle and the F-16 Fighting Falcon were selected as candidates to replace the F-104 Starfighter fleet and part of the F-4 Phantom fleet based on the research results. It is striking that soon, all European planes dropped out, and only all American fighters remained in the race. Only the F-17 dropped out because this type had also lost the competition to the F-16 Fighting Falcon in America.

The research team continued with the three remaining candidates. Soon, the F-16 Fighting Falcon would

also lose the competition. This type was a fighter aircraft developed for the short distance and could only be used during daytime. The requirement of the JASDF was to also be able to use aircraft at night, and therefore, only the F-14 Tomcat and the F-15 Eagle were left to choose. The F-14 and the F-15 were almost equivalent aircraft at that time. Both aircraft have a lot of power and can accelerate quickly, and they have a high G-force resistance. However, the research team noticed that the F-15 was much more agile during air combat, making this aircraft superior. The initial choice for the third FX project would, therefore, be the McDonnell Douglas F-15 Eagle if it was up to the team. At the end of 1976, it was decided to

After a period of hard work, the decision was made on 28 December 1977. With input from the FX research team and the JASDF, the Japanese government formally decided that the F-15 Eagle would become the newest JASDF fighter aircraft. The United States designated the F-15 Eagle implementation plan as the "Peace Eagle Project". As part of this plan, a licensing agreement was soon signed with Mitsubishi Heavy Industries and McDonnell Douglas for the construction of the F-15J/DJ Eagle in Japan. This license

contract was signed by all parties on 29 March 1978. The first budget released in Japan included the purchase of a first series of 23 aircraft for the JASDF. In April 1978, a production announcement was immediately issued by the Japanese government. A Japanese engineer was sent to the McDonnell Douglas plant in St. Louis, MO. Starting up the Japanese production line was not a simple process. To help the Japanese, 40 engineers from the United States were sent to Mitsubishi to share their knowledge. However, the first F-15J's for the JASDF would be supplied by the McDonnell Douglas plant. In July 1980, the first F-15J Eagle was transferred to the JASDF. The first Japanese F-15 arrived in Japan at the American airbase Okinawa Kadena AB on 1 March 1981. Since this first delivery, the F-15 has become the most important fighter plane at the JASDF. Now, more than 40 years later, the F-15J/DJ Eagle has proven that they made the right choice in the interests of Japan at that time.

The F-15J Eagle Entered Operational Service
About a month after the first F-15 pilots from the JASDF completed their training, they flew the first two Japanese F-15J Eagles from the American Kadena AB in Okinawa to the Japanese airbase Gifu on the main island of Hokkaido in Japan. These first two Eagles (02-8801 and 02-8802) have been reassembled by Mitsubishi Heavy Industries. The following eight aircraft were assembled as building kits by Mitsubishi Heavy Industries. Eventually, the remaining 155 fighter aircraft would be fully built during the licensed

postpone the decision to purchase to the next fiscal year because of the limited budget for the current year. On 10 May 1976, the "5th International Air Show" was held at Iruma AB where both the F-14 Tomcat and the F-15 Eagle would fly a demonstration. At this time, the FX selection work was almost completed and the introduction of the F-15 in Japan was almost certain. Grumman sought the last chance and brought a Tomcat from the American aircraft carrier Enterprise that was off the coast of Japan in the Pacific Ocean. The United States Navy had already received the F-14A Tomcat in operational service, and it was happy to demonstrate this in favor of the type and Grumman. Both planes gave a demonstration during the show.



F-15DJ of the Gifu AB based Hiko Kaihatsu Jikken Dan (Air Test & Development Unit)



production of domestically manufactured parts. In the first ten years, the production line was open, a hundred aircraft were delivered to make four squadrons fully operational. The National Defense Conference of 1982 approved the interim business estimate for 1981. Production was increased from 155 aircraft to 187 aircraft in 1985 and 223 aircraft in 1990. The mid-term defense force development plan reduced production to 210 combat aircraft in 1992. The production of the J-model of the F-15 Eagle finally ended on 4 November 1998 (Heisei 10). The last DJ version of the type rolled off the production line on October 8, 1999 (Heisei 11). The initial purchase price of more than 7 billion Japanese Yen was exceeded,

and the total cost of purchasing the F-15J/DJ Eagle ended at more than 10 billion Japanese Yen.

When the F-15J's entered service in Japan, they replaced the Lockheed F-104J Starfighter with the 200 series squadrons (201, 202, 203, and 204 squadron). The F-15J's also replaced a part of the F-4 Phantom II squadrons from the 300 series (303, 304, 305, and 306 squadron). The first Japanese F-15 pilots were fully trained in the United States at Luke Air Force Base. On 7 December 1981, a temporary F-15J squadron was formed at the Nyatubaru AB. On 21 December, the squadron was renamed as the 202 Hikotai, which was previously an F-104J squadron. The 202 Hikotai

then became a conversion and training unit for the F-15J pilots. The unit was mainly equipped with the two-seat training variant of the F-15J. From 24 March 1984, the second squadron started the transition from the F-104J to the F-15J Eagle. This unit was the 203 Hikotai at Chitose AB in northern Japan. Soon, the 204 Hikotai followed in 1985. This unit at Momori AB quickly phased out the Starfighter. The fourth and final Starfighter unit that converted to the Eagle was the 204 Hikotai at Chitose AB on 2 March 1987. The F-104J/DJ Starfighter left the Japanese scene completely after the conversion of the 204 Hikotai.

After the conversion of the F-104J/DJ Starfighter

units, the first F-4EJ Phantom II units had already converted to the F-15J/DJ Eagle. On 19 March 1986, the 303 Hikotai at Komatsu AB became the first Phantom unit to start the conversion from the F-4EJ Phantom to the F-15J Eagle. The next Phantom unit to switch was the 304 Hikotai which was based on Tsuiki AB on the southern island of the Japanese mainland. This unit was operational with the F-15 Eagle from 20 January 1990. The F-15J/DJ Eagle had been in service with the JASDF for more than ten years in six squadrons. At Hyakuri AB near the Japanese capital Tokyo, the 305 Hikotai started with the switch from their F-4EJ Phantom II's to the F-15J Eagle. The last operational Phantom II squadron that went through

At Komatsu AB:

- F-15J and F-15DJ (top) and F-15J of 303 Hikotai (left)
- F-15DJ (middle) and F-15J of 306 Hikotai (right)



F-15J assigned to 204 Hikotai

the conversion was the 306 Hikotai on Komatsu AB on 18 March 1997. In the end, two squadrons continued to fly with the F-4EJ Phantom II in Japan, which were the 301 Hikotai and the 302 Hikotai. The last unit to receive the F-15J was the aggressor squadron that was based on Nyatubaru AB at the time. This aggressor unit still flew with the outdated Mitsubishi F-1. Now that this unit had the F-15J, it was possible to train the operational pilots extensively in Japan with serious opponents. The 202 Hikotai that already had converted to the Eagle disbanded on 3 October 2000. Instead of this unit, there is a specialized training squadron available. This unit became 23 Hikotai on Nyatubaru AB and was given the full training task for the training of Japanese fighter pilots.

Today, the Japanese F-15J/DJ fleet still consists of the seven operational squadrons, a training unit, and an aggressor squadron. Over the last ten years, various squadrons have been relocated across Japan. On 19 January 2009, 204 Hikotai moved from Baili AB to Naha AB on Okinawa. 304 Hikotai, too, was due to leave for Naha AB, as this unit was relocated from Tsuiki AB to its new home on 31 January 2016. There was a great need to place these units on Okinawa due to an increasing Chinese threat. The current F-15 squadrons are much better distributed among the four military districts in Japan as a result of the reorganization. Each military district now has two F-15 squadrons with which the country can be systematically defended. In the north on Chitose AB, the Second Wing (2 Kokudan) is based. This unit consists of two squadrons, the 201 and 203 Hikotai. The Sixth Wing (6 Kokudan) is based on Komatsu AB in the central district. This wing consists of two operational units and an aggressor squadron, namely the 303 and 306 Hikotai and the Tactical Aviation Instruction School. At Nyatubaru AB, the Fifth Wing (5 Kokudan) is based which is made up of the 305 and 23 Hikotai in the western district. The southwestern district at Okinawa consists of the 204 and 304 Hikotai. These units are based at Naha AB and form the Ninth Wing (9 Kokudan). Finally, the Test and Evaluation Unit is based at Gifu AB.

F-15J's on Quick Reaction Alert

Over the past twelve years, Japanese fighter planes have increasingly been used for scrambles. The situation around Japan has deteriorated over the years, as non-friendly countries have increasingly invested in their military apparatus. More and more often, aircraft from countries such as China and Russia are getting closer to the national airspace of Japan. This also means that Japanese air defense is increasingly being scrambled to intercept the threat. 2016 was an absolute record year, as there have never been so many interception missions flown by the JASDF. The

Japanese fighter planes used for the defense of the airspace are spread over four major defense regions in Japan. These four defense zones are: the Northern Air Defense Force with headquarters at Misawa AB, the Central Air Defense Force coordinated from Iruma AB, the Western Air Defense Force based on Kasuga AB, and the Southwestern Air Defense Force based on Naha AB in Okinawa. These four zones all have their own wings with combat aircraft, early warning aircraft, radar installations and anti-missile batteries at their disposal to ensure the defense of Japan. Each zone has its own F-15J wing which are the most important instruments for air defense and interceptions. These four F-15J airfields are Chitose AB in the north, Komatsu AB in the central zone, Nyatubaru AB in the western zone, and Naha AB in the southwestern zone around the islands of Okinawa. At these air bases, F-15J's are on Quick Reaction Alert (QRA) every day.

Russia is implementing a drastic military modernization and revitalizing military operations. Nowadays, many modern military aircraft are flying around in the Far East region (Vladivostok). These threats consist of modern combat aircraft such as Su-30, Su-34, and Su-35. These aircraft are modern combat aircraft that are capable of achieving air dominance and can be used as tactical fighter-bombers. Many more long-distance patrol aircraft from the Russian Air Force and Navy, such as Tu-95 and Il-38, also fly into Japanese airspace. These aircraft are respectively heavy nuclear bombers and anti-submarine patrol aircraft. Russia's threat has almost doubled over the years. The amount of Russian planes above the seas around Japan has never been as high as since the end of the Cold War. Where in 2008 more than 237 Japanese fighter planes had to be scrambled, in 2012, this was already more than 248 times. In 2018, the JASDF had to alert fighter aircraft more than 343 times for a Russian threat. These threats often take place around the northern islands of the Japanese Empire. However, many flights have also been observed in the southern regions of the country. Russia's military activities in East Asia were not without risks in 2019. Two Su-34 fighter-bombers crashed in the Sea of Japan after the two aircraft were likely to collide with each other on January 18, 2019. Defying Japanese air defense by Russian aircraft is therefore a dangerous cat and mouse game for both countries.

Where Russia poses an increasing threat to Japan, this country is currently not the biggest concern for the Japanese JASDF. The Chinese threat has increased by a factor of twenty over the last ten to twelve years. The planes come from the Chinese People's Liberation Army Air Force (PLAAF) and People's Liberation Army Navy Air Force (PLANAF). China has experienced



strong economic growth in recent years, which has also made it a very strong military force. Whereas in 2008, a Japanese fighter plane had to be used for interception only 31 times, in 2010, this had already tripled to 96 times. These numbers have risen dramatically over the last ten years to more than 638 times in 2018. The Chinese threat is therefore currently more than twice as imminent as the Russian threat when expressed in the number of scrambles of the Japanese JASDF. On 1 April 2019, the PLANAF sent two Xian H-6G maritime attack bombers and also a Shaanxi Y-9JB (GX-8) aircraft for electronic warfare to Japan. These Chinese aircraft often make patrol flights through the international airspace between the Japanese islands of Okinawa and Miyako in the East China Sea. On March 30, 2019, PLAAF sent four Xian H-6K long-range bombers and a Tupolev Tu-154MD electronic intelligence aircraft and at least two combat aircraft along the same flight path. Most PLANAF and PLAAF interceptions mainly take place in the airspace around Okinawa and the East China Sea. Chinese

planes usually pass the Miyako Street during long-distance exercises, which is an important flight route for the Chinese to the Pacific Ocean.

In addition to the major Chinese and Russian threats, there are also to a much smaller extent airplanes from Taiwan that come too close, causing that Japanese combat aircraft were alerted. Over the last ten years, there have only been two years in which the JASDF had to scramble to intercept North Korean aircraft. This was in 2009 and 2013. North Korea does not have the financial means to fly far beyond its airspace. The threat from North Korea increasingly comes from rocket tests being conducted, with ballistic missiles being fired in the direction of Japan. These missiles eventually fall into the Japanese Sea but are seen by the Japanese government as a very serious threat since the missiles can contain a nuclear warhead. Due to all these increasing threats, the JASDF has been confronted with an imminent shortage of combat aircraft in recent years. The F-15J is and

remains the most important JASDF fighter plane for these air defense tasks and interceptions. Due to the increasing foreign threats, the Mitsubishi F-2 multi-role combat aircraft are also available for interception tasks. Once the first F-35A Lightning IIs are ready for full deployment, they will also be deployable for the air defense of Japan. The majority of interceptions, however, will continue to be carried out by the Eagles, since that aircraft is simply very good at this important task.

The F-15J Eagle Pilot School

Today, the 23 Hikotai is the most important training unit for all fighter pilots in Japan. The unit is based at Nyatubaru AB, and it is responsible for the training of pilots to become a fighter pilot on all types of aircraft that are active in Japan. The history of the 23 Hikotai begins in the 60s with the 202 Hikotai, which is the predecessor of the current training squadron of the JASDF. The 202 Hikotai was established on 31 March 1964, at Nyatubaru AB on the southern island of the Japanese mainland. The unit was equipped with the then ultra-modern Lockheed F-104J Starfighter. At that time, the Starfighter was the most important interceptor of the JASDF. This type was particularly suitable for rapidly intervening at great heights against enemy bombers. The Starfighter was therefore a classic interception fighter. Unlike the F-86F Sabre units, the Starfighter squadrons often remained based on an air base for very long periods. The 202 Hikotai has never changed its airbase in its existence and was therefore always based at Nyatubaru AB. When it became known that the F-15J/DJ Eagle would be the successor of the F-104J/DJ Starfighter, it was clear at a fairly early stage that the 202 Hikotai would be the first unit to take this step to the F-15J Eagle. It was a tradition that was continued because the unit was also the first operational Starfighter unit in the past. The unit was therefore involved in pilot training from the very beginning of its existence.

The 202 Hikotai became the first training unit in Japan for the training of F-15J pilots. In December 1981, the "Provisional F-15J Squadron" with one F-15J and four F-15DJ's was established to prepare the first batch of Japanese pilots to fly the F-15J. On 21 December 1982, the squadron was designated 202 Hikotai and became the F-15J OCU (Operational Conversion Unit) of the JASDF. In July 1984, they additionally took over the QRA role. The unit was initially referred to as the F-15J Mother Squadron (Haha Kantai) as they were the first to fly the F-15J. The unit mainly received the F-15DJ two-seat version of the F-15J Eagle which was solely used for the training purposes within the JASDF. Not only pilots were trained on the F-15 Eagle,

but maintenance personnel also received conversion training at this unit. This made the 202 Hikotai an overall complete training unit for everything that has to do with the F-15J.

The 202 Hikotai carried the "V" from the F-104J Starfighter era in the squadron emblem. The "V" symbolized the Fifth Wing (5 Kokudan) of the JASDF of which the unit was a part. The 202 Hikotai, as a former Starfighter unit, has adopted this tradition in the F-15J Eagle era. The Eagles were provided with the red-yellow V on the tail, just like the Starfighter at the time. However, this was of short duration, because in the Saitobaru burial mounds in the city of Saitobaru, a clay image of an ancient Japanese warrior was found. This statue was a historical find and was therefore a piece of Japanese cultural heritage. This discovery in its own region near Nyatubaru AB ensured that the F-15 got this image on the tail. The clay warrior was depicted in yellow on the tail of the 202 Hikotai F-15J's, giving the unit a unique identity from now on. The 202 Hikotai performed the combination of an operational interception squadron and that of a conversion squadron for more than 18 years. At the beginning of 2000, the situation of the training of F-15 pilots changed drastically. The Fuji T-1 and Mitsubishi T-2 were phased out in the initial pilot training. The pilots who were going to follow the training could not be trained on the new Mitsubishi F-2 because that aircraft is a totally different type than the T-2. The T-4 is not suitable for completing the full training for fighter pilots. JASDF was forced to create a unit on the F-15 that would not only perform the type conversion, but also an important part of the training for fighter pilots. The 202 Hikotai was disbanded on 3 October 2000, to make way for a new training unit.

In the new JASDF organization, the 23 Hikotai emerged and became a specific part of the Japanese pilot training. The 23 Hikotai took the place of the 202 Hikotai, and it received all the material that had become available from this unit. Now, new fighter pilots first had to complete training on the Kawasaki T-4 at Hamamatsu AB, to be followed by the full fighter pilot training on the F-15J at 23 Hikotai at Nyatubaru AB. In the new emblem of the 23 Hikotai, the red-yellow markings came in the form of arrows that symbolize the word "two three". The clay warrior was replaced by the black Japanese Misaki horse. The new 23 Hikotai trains all fighter pilots for the interception role. Because of the phasing out of the T-2, the 23 Hikotai also trained pilots to fly the Phantom II at Hyakuri AB. It was decided not to establish a separate training unit for this because the Phantom was also expected to be quickly replaced by a newer type. The pilots who



F-15J assigned to 23 Hikotai of Hiko Kyoiku Kokutai (Air Training Group) at Nyatubaru AB



- F-15J assigned to 306 Hikotai at Komatsu AB (main image)
- F-15J (left) and F-15DJ (right) assigned to 23 Hikotai of Hiko Kyoiku Kokutai (Air Training Group) at Nyutabaru AB (right)



were to fly the Mitsubishi F-2 completed the training for fighter pilots at the 23 Hikotai and then went to the conversion training at Matsushima AB. It is quite special that a training unit uses a modern type of aircraft like the F-15 for the overall air force training.

Training with Aggressor Eagles

The use of aggressors in a modern air force ensures that the operational fighter pilots can train to the maximum and continue to learn because they are repeatedly challenged. Japan has been working with Aggressors since the 1920s to make their pilots better. At the time when aviation was often still part of the army, the battle was fought to set up the aviation branch as a single independent component. This was also the case in Japan. Finally, the Flight Experiment Department was established in 1939 to

ensure that people could experiment with aircraft and, in particular, prepare pilots better for their work. However, it took until the 1980s for Japan to gain access to a real Aggressor Squadron. The idea was suggested following the United States Air Force who achieved good results with this way of training during exercises such as Red Flag in Nevada. Aggressor units spend time studying new combat techniques and developing them by testing them in real life. The role of the aggressor unit is to perform this professionally and raise the level of the entire JASDF by training operational units based on the results produced. As an instructor, a pilot not only understands tactics that differ from his own theory, but he must also act as a virtual enemy aircraft in exercises. In addition, the Aggressor Group of the JASDF cannot only simulate the enemy role. They can also use virtual weapons

from enemy countries for exercises. This makes a scenario realistic for the students during exercises.

In Japan, the Aggressor Squadron was set up by the JASDF to allow the air force pilots to experience what it is like to fight formidable opponents. The unit was set up with the introduction of the F-15J/DJ Eagle in Japan on 17 December 1981. The aim was to improve the interception skills of Japanese fighter pilots and air traffic controllers. The unit was established at Tsuiki AB in the Fukuoka Prefecture. The Aggressor Group started to fly with the Mitsubishi T-2. This type was initially chosen because the aircraft had the flight characteristics of the MiG-21. This Russian-made aircraft is used by most hostile countries around Japan. The T-2 was therefore an ideal aircraft to train against for Japanese fighter pilots. The unit moved from Tsuiki

AB to Nyatubaru AB in the Miyazaki Prefecture on 16 March 1983. The new batches of F-15 pilots were trained at this air base and it was, therefore, logical to base the Aggressor Squadron here at that time. At the end of the 1980s, the T-2 advanced trainers were regularly involved in serious accidents. The aircraft were so heavily loaded in the air combat during exercises that the aircraft sometimes collapsed in the air and fell apart. This happened despite the fact that the planes were flown by very experienced instructors. Although the T-2 has an excellent maneuverability, it was decided to replace the type for safety reasons. Until its replacement, the T-2 pilots were no longer allowed to get the most out of their aircraft. The training with the Aggressor Squadron would change drastically after the phasing out of the Mitsubishi T-2.

Two F-15DJ's of the Hiko Kyodogun (Aggressor Group) lining up for take-off at Kumatsu AB



F-15DJ's of the Hiko Kyodogun (Aggressor Group) at Kumatsu AB





In 1989, it was decided to replace the Mitsubishi T-2 with the Mitsubishi F-15J/DJ Eagle. From 1990 on, the Aggressor Squadron was equipped with F-15DJ Eagle two-seaters only as a two-pilot crew provides more safety at this kind of training. Only since the year 2000, a small number of single-seaters has been deployed at the Aggressor Squadron. In the Mitsubishi T-2 era, the color schemes of the aircraft were still kept low-profile. The planes were often painted in the colors of the Soviet fighters. The aircraft also had Russian registration numbers and markings on the aircraft. After the introduction of the F-15, the registration numbers were simply painted on the aircraft again according to the Japanese system. This is in contrast to the American aggressor units that continued to fly with Russian registrations. The F-15J's received very exotic color schemes over the years and there are not two aircraft that have the same colors. Nowadays, the colors are no longer only based on Russian aircraft, there are also Chinese color schemes on the F-15J's. From 2014, the Aggressor Squadron was merged with the newly established "Air Tactical Guidance Unit" and the "Air Self-Governing Unit". The unit is now much more than just an Aggressor Squadron because there is a whole team around it that also develops training and tactics. From this merger, the unit is therefore referred to as the Aggressor Group. On June 10, 2016, the Aggressor Group moved from Nyatubaru AB to Komatsu AB in the Japanese central military district.

To become an instructor pilot within the Aggressor Group, the pilot must be among the best of its kind in the JASDF. It is not a position that a pilot can just apply for. An aspirant for the Aggressor Group is approached by the group itself. After a pilot has been admitted to the Aggressor Group, he will retake the entire basic training of an F-15 pilot. During this process, the emphasis will not be on the proper management of the F-15 as a weapon platform. The pilot will mainly be busy putting together air combat scenarios by instructing the opponent. The pilot will mainly work on improving his own coaching skills to make trainees better at work. Within the Aggressor Group, there is a ground control team of ground staff present who instructs the aggressor on the use of the weapons. This way of working makes scenarios realistic and challenges all Japanese pilots to the maximum. The trademark of the Aggressor Group is the Cobra. This snake implies high intelligence and is killing enemies with deadly poison in a single bite. The pilot wearing a badge from the Aggressor Group warns that "if you get shot, this will be your destiny." It should be clear that only the best of the best fighter pilots in Japan are admitted to this elitist group.

Photo-reconnaissance with the Eagle
The systems with the RF-4 Phantom II were based

on a film camera. This concept has since become a remnant of the last century. The system was unable to transmit real-time images. After photographing an area or target, the film had to be returned to the home base and then developed. The reconnaissance system of the RF-4E Phantom II was criticized more than 20 years ago after the large earthquake in Hanshin-Awaji in 1995. Sixteen years later, the RF-4 was still unable to send information in real time, and it was criticized in a similar way after a major earthquake in eastern Japan. All this time, it has not been possible to find a suitable solution for the recently retired Japanese RF-4E fleet. Even aircraft from small countries with a limited budget are nowadays equipped with photo-reconnaissance pods that can send information in real-time. Japan has come a long way to make the F-15J Eagle suitable for photo-reconnaissance. In 2006, Toshiba was contracted to develop a reconnaissance version by converting existing F-15J's into RF-15J's. This version of the Eagle should then ensure that the RF-4E can be phased out. The Japanese company Toshiba received a contract to develop a draft version of the RF-15J.

At the same time, they came up with the concept of equipping the Japanese F-15J's with the Synthetic Aperture Radar (SAR) pods. Lockheed Martin announced in 2007 that it will upgrade radar capabilities for the reconnaissance version of the F-15J fleet of the Japan Air Self Defense Force. Lockheed Martin planned to equip a number of selected F-15J aircraft with advanced synthetic aperture radar pods. Lockheed Martin has been developing SAR technologies since the 1950s. Where Toshiba has the assignment to renovate the nose section of the existing F-15J for photo-reconnaissance, Lockheed Martin comes with a pod that can be mounted under the fuselage of the Eagle. Once integrated with the aircraft, the SAR radar will receive, process, and send critical targeting information in real-time. The SAR system uses a solid-state digital system to record images, a data link in the air to transmit information electronically to ground stations, and the SAR to accurately target areas at any time of the day or night in any type of weather condition. The SAR system is an active system that uses pulses of radio waves to illuminate a target and then records and processes the echo of these pulses. SAR has brought about a revolution by allowing reconnaissance through clouds, fog, and darkness and creating photo-quality images. Japan has never had such an advanced photo-reconnaissance system so far. The SAR system could, therefore, be an ideal solution for the JASDF. With this solution, the RF-4E Phantoms could be phased out in JASDF.

The development of a special RF-15 variant for Japan by converting existing F-15J models was not feasible

F-15J (top) and F-15DJ (middle, bottom) of the Hiko Kyodogun (Aggressor Group) at Komatsu AB



for the JASDF. In October 2010, the JASDF canceled the project of the RF-15J reconnaissance variant. The aircraft would have built-in optical and infrared cameras and other reconnaissance equipment. Japan continued to use its aging RF-4E reconnaissance aircraft for aerial photography at that time. Toshiba was required by contract to deliver this version of the Eagle between September and October 2010. These contracts were signed in fiscal years 2007 and 2008 for a total of 10 billion yen (about 100 million US dollars). Because of a major lack of required foreign components, Toshiba had asked the Japanese government for permission to postpone the delivery until the spring of 2012. The decision to cancel followed an announcement that Japan was considering to buy unmanned Global Hawk aircraft. A number of research reports reported that the newly developed drone of the type Global Hawk can easily be used for reconnaissance tasks. An F-15J reconnaissance type is, therefore, not necessary. However, the Global Hawk is a strategic reconnaissance aircraft. The RF-4 and a possible RF-15J are tactical reconnaissance aircraft with completely different purposes and deployment options.

Why Japan has never opted for the SAR system is a mystery. The system might have been too expensive, but that has never been indicated by the Japanese government. The US government has further developed the SAR system for deployment under the F-15 after Japan discontinued the project. The American F-15E Strike Eagle fleet is nowadays able to fly with this system for reconnaissance purposes. Between 2006 and 2010, Japan put a lot of energy into preparing the F-15J for photo-reconnaissance tasks. This has cost a large amount of money and in the end, it has yielded nothing for the JASDF. Japan was forced to continue flying with the RF-4E until the beginning of 2020. In order to be able to continue after the Phantom era, Japan ordered three Global Hawk drones from Northrop Grumman in the U.S in 2018. These unmanned aircraft will be delivered in September 2022. In addition to the drones, the first F-35A Lightning II aircraft are now being used in Japan. It seems that this aircraft will take on the primary photo-reconnaissance tasks. The F-35 has the most powerful and comprehensive integrated sensor package of any fighter aircraft in history and can perfectly perform all required reconnaissance tasks. The information collected by F-35 sensors can

easily be shared with commanders at sea, in the air or on the ground. It seems that with the arrival of the F-35A and the Global Hawk in particular, the plans for a photo-reconnaissance version of the F-15J are definitely gone.

Updating Eagles for the Future

For a drastic update of the F-15J fleet, the Japanese government needs approval from the U.S. Government. The U.S. Department of Foreign Affairs has approved the Japanese request for the upgrade package for nearly one hundred JASDF F-15J Eagles. The American ally of Japan has thus paved the way for an upgrade of the rapidly aging interceptor fleet. In a statement, the Defensive Cooperation Office for Security indicated that the US Congress had been informed of the approval. The deal with Japan falls under the US foreign military sales program. In total, the Japanese F-15J's will be updated for more than 4.5 billion dollars. With this approval, Japan can upgrade a maximum of 98 F-15J Eagles to a Japanese Super Interceptor (JSI) configuration. With the JSI update, the Eagles receive an advanced electronically scanned array (AESA) radar, new on-board and mission computers, and new equipment for electronic warfare. The aircraft will also

be provided with new ammunition. The new radar will be of the Raytheon AN/APG-82 type and it will include a multimode AESA. This version is also currently being used in the US Air Force's F-15E Strike Eagles. Japan has requested a total of 103 radars and six spare sets, 116 Honeywell Advanced Display Core Processor II mission computers, and 101 BAE Systems AN/ALQ-239 digital electronic war systems. The current package also includes anti-spoofing GPS navigation for more precise navigation and new radios for better communication. With this whole package, the Eagles must be able to stay within the JASDF for many years.

The request from Japan also consisted of a request for aircraft integration and new ammunition and test support for this. At the end of 2018, Japan has announced in its defense program that it is also considering the option to purchase Lockheed-Martin air-to-ground weapons for the F-15J fleet. It would be 158 air to surface missiles of the Joint Air to Surface Standoff Missile (JASSM) type. These weapons should be integrated with the F-15 systems with the update. The main contractor for supplying the modules of the update program will be Boeing. The main contractor for the conversion of the F-15J's will

F-15DJ assigned to 23 Hikotai of Hiko Kyoiku Kokutai (Air Training Group) at Nyutabaru AB



F-15J assigned to 306 Hikotai at Komatsu AB



be Mitsubishi Heavy Industries, with Boeing as a sub-contractor supporting the integration of the FMS and DCS elements. The JASDF currently has a total fleet of around 200 F-15J's and F-15DJ's in operational service. These are all configured for the air defense role with virtually no air-to-ground capabilities. The units fly at seven different operational squadrons throughout Japan. The Air Force also has a training squadron and an aggressor squadron. The latter squadron plays an important role in preparing the young generation of air combat pilots. The Japanese F-15J fleet was built in the 1980s by mainly Mitsubishi Heavy Industries in Japan under license. The Eagles are equipped with obsolete systems for electronic warfare and bi-directional data link. Approximately 90 F-15J's have been upgraded as part of the multi-stage improvement program in 1987. The aircraft have not been thoroughly modernized since then, and they now are outdated.

Over the years, several attempts have been made to upgrade the F-15J's, but for various tax and political reasons, Japan has never succeeded in implementing a complete upgrade program for its F-15J's. As a result, the current F-15J fleet consists of various configurations and equipment. With the most recent upgrade from 2007, only a small number of F-15J's were updated with the Link 16 system and the Joint Helmet Mounted Cueing Systems. With the LINK 16 system, the F-15J's would be able to communicate and exchange data with many other means of Japanese defense such as vehicles, ships, and other aircraft. The project was finally terminated after a significant reduction in updates following the election of a strong pacifist government in 2009. Another planned upgrade of the F-15J's, where infrared cameras and tracking systems had to be built in for a reconnaissance role, was also canceled during this period. The new update plan must ensure that the F-15J's all will have the

same standard after the update. The type is again state of the art to be used for the interests of the JASDF for the coming years. A striking detail in the request for the upgrade from the U.S. government was the lack of a LINK 16 update for all F-15J's. Also, the update to a fully digital cockpit is not planned in this upgrade. This may be added to the package later.

With the upgraded F-15J's, the JASDF hopes to be able to use these aircraft again for the defense of the country for over ten to fifteen years. With the introduction of this upgrade package that will be built into more than 98 F-15J's in the coming years, Japan will also be phasing out a part of its existing fleet. The intention is that Japan will gradually replace some of the F-15J's with the F-35A Lightning II. The entire Japanese air defense is currently in the hands of the F-15J Eagle fleet, as the Phantoms were phased out. The F-35 fleet is not yet fully operational, but will later

support the F-15 fleet in the air defense role. Japan has chosen to phase out a part of the F-15 fleet in order to purchase more F-35A Lightning II aircraft. In the meantime, the first squadron is already active in Japan. The country is also the largest foreign buyer of the Lockheed-Martin F-35 Lightning II. The intention is to have a total of 105 F-35A Lightning II's. In September 2019, the Japanese government decided to also purchase 42 F-35B STOVL's. This STOVL version of the F-35 will be deployable on board of the Japanese Izumo-class helicopter aircraft carriers. Which of the current F-15J squadrons will eventually convert to the F-35A is not yet known. However, the F-15J Eagle fleet will still be the backbone of the Japanese air defense in the coming years.

F-15J assigned to 306 Hikotai at Komatsu AB