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- Dutch Chinooks
- Japanese F-15J Eagles
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- And so much more ...

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Content

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

THE AVIATION MAGAZINE

by www.TheAviationMagazine.com e-mail: editor@TheAviationMagazine.com

THE AVIATION MAGAZINE is published six times a year by a team of volunteers interested in aviation. We are devoted to cover a wide range of aviation events ranging from air shows, air base visits, military exercises, civilian spotting, and pilot and veteran interviews -- accentuated with exceptional photography. THE AVIATION MAGAZINE is a leader in the e-magazine format since 2009, bringing exclusive and fascinating reports to our global aviation enthusiasts digitally.

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The people behind THE AVIATION MAGAZINE

Publisher & Editor

Ralf Peter Walter
editor@TheAviationMagazine.com

Core Team
Ralf Peter Walter
Wolfgang Jarisch
Peter Thivessen

Occasional Conributors
Igor Bozinovski
Kris Christiaens
Joe Cilberti
Carlo Cuit and Paul Kievit
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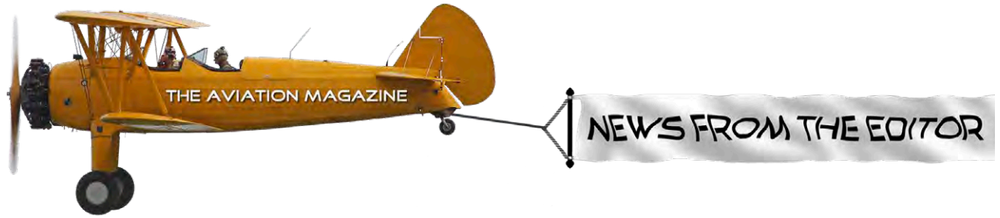

All over the world, COVID-19 continues to severely restrict our daily lives. An end to the pandemic is currently not in sight. Press events, exercises, photo calls, anniversary celebrations, open days, and the like are still reduced to an absolute minimum or will not take place at all for the foreseeable future. Of course, this also has an influence on our magazine. As a result, in this issue and the next one, we will be reporting mainly on events of the past year. Additionally, we are going to publish our magazine every three months instead of every other month until the situation improves. Whenever we have enough reports, we will of course go back to the two-month cycle.

Dear reader, if you have a report with photographs that you would love to share with other aviation enthusiasts, please feel free to contact us at editor@TheAviationMagazine.com and we can have a chat to see if it fits within the scope of one of our next magazines.

With this in mind, I wish you all much pleasure in reading this new issue. Download your free copy of the 70th issue of THE AVIATION MAGAZINE **here**!

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I wish you all the best and stay healthy.

Ralf Peter WALTER
Publisher & Editor

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DUTCH CHINOOKS

REPORT AND IMAGES BY
CARLO KUIT & PAUL KIEVIT

The 16 April 2020 marked the 75th anniversary of 298 Squadron which is currently operating a force of ten CH-47D *Chinooks* and is awaiting the delivery of twenty CH-47F MY II CAAS *Chinooks* (US Army Multi Year II program, Common Avionics Architecture System) as replacement. Due to the COVID-19 crisis, the planned 75th anniversary is postponed to a later moment. Especially this COVID-19 and the introduction of the new *Chinook* fleet is on top of the mind of Lt Col. Niels van den Berg, the current commander of 298 squadron. Niels transitioned from 300 Squadron during 2011, and he is the 298 Squadron commander since September 2018. "My main focus is to have stability in the squadron. We worked very hard over the last seven years implementing new procedures, quality assurance and improve operations which has shown to be successful. There is no need to change." Niels continues: "The big challenge for the squadron is implementing the new CH-47F fleet and remain open for business to support international missions. The moment we have both the new CH-47F and legacy CH-47Ds in use with the squadron will be a turning point in potentially briefly impacting availability for operations. We expect, under the current COVID-19 situation, to be completed with the conversion by 2022." The first new CH-47F's are expected to arrive in The Netherlands in December 2020. As Boeing Philadelphia has been identified as critical infrastructure, the impact by COVID-19 has been minimal. The total number of new CH-47F MYII CAAS *Chinooks* within the Royal Netherlands Air Force will be twenty. Fifteen will be assigned to 298 Squadron at Gilze-Rijen Air Base while five remain with 302 Squadron at Fort Hood in the United States.

COVID-19 crisis impact

"After the announcement by Dutch Prime Minister Mark Rutte on 16 March, in which the intelligent lockdown was announced in the Netherlands, we took a week and a half to rethink how we as squadron would move forward", said Niels. "We decided to focus on crew checks, flight currencies and certification flights to safeguard our basic skillset and readiness status as we are not able to set up complex exercises with our sister squadrons (300 and 301 Squadron) and the 11 Air Mobile Brigade. We have about half of the squadron working from home and rotate personnel every other couple of days to avoid risks of virus infection. Luckily, 2019 has been a very good year for us in terms of training and flight hours. Therefore, we can absorb a bit before we are being negatively impacted", Niels adds. The Helicopter Weapons Instructor Course (HWIC), which was taking place at that moment in Germany, was cancelled mid-March. "Currently, we only allow four persons for planning and the execution of flights. Therefore, we work in solitude as squadron."

Defense Helicopter Command (DHC)

The Heavy Rotary Squadron is one of four flying squadrons that are part of the Defense Helicopter Command (DHC). Since the establishment of the DHC in July 2008, 298 Squadron transferred to Gilze-Rijen Air Base from Soesterberg Air Base. The purpose of

Low flying area GLV5 - Across the Netherlands multiple low flying areas exist in which Helicopter Crews can train with brown out landings, slingery exercises. GLV-5 is located close to Gilze-Rijen Air Base. Chinook 'D-662' is seen here exercising brown outs. The Helicopter has as nickname 'Lady Liberty'. The reason for this nickname is that she has flown low over Manhattan and the Statue of Liberty years ago.

the DHC is to integrate all of the helicopter units of the Royal Netherlands Air Force (AH-64Ds, AS532U2s, CH-47D/Fs, and NH90s) under one Central Command structure across two airbases and to save costs. Only the NH-90 fleet of 860 Squadron is based at Naval Air Station De Kooy in the northern part of The Netherlands. The other three units reside at Gilze-Rijen Air Base.

History of the 298 Squadron

The squadron has its heritage dating back to 16 April 1945 when the squadron was operating at Gilze-Rijen Air Base as 'No. 6 Dutch Auster Squadron' with six Auster's. Soon after the end of World War II, the squadron was transferred to the Dutch West Indies. On 1 March 1950, 298 AOP (Air Observation Post) was established. Over the years, '298' has flown various types of aircraft and helicopters. The Auster's were replaced by L-18C *Piper Cubs* and L-21B *Super Cubs* to support the role of artillery spotters. The first helicopter arrived in 1955 (H-23B *Raven*). The Alouette II followed in 1959 for Search and Rescue (SAR) missions. These were replaced by Alouette IIIs from 1964 onwards. Twelve Bölkow Bo-105C helicopters were also part of the 298 Squadron from 1975 to 1979.

From September 2018 Niels van den Berg is the Commander of 298 squadron. He started with the Squadron during 2011 when he transferred from sister squadron 300, operating the AS532 'Cougar'. One of the most important tasks the Commander has is the introduction of the new CH-47F MYII CAAS.

Purchase of new CH-47D's

Early 1993, the Dutch government signed an agreement with the Canadian government to acquire seven Boeing CH-147 C-models that were in use by the Canadian Armed Forces between 1974 and 1991. In December 1993, a contract was signed with Boeing for the purchase of thirteen modern CH-47D *Chinooks* with a digital Honeywell Avionics Control and Management System (ACMS) cockpit and improved T55-L-714 engines. Seven being remanufactured ex-Canadian C-models and six brand new with a "one-piece machined" airframe structure as a novelty. Boeing delivered the remanufactured CH-47D *Chinooks* to the Royal Netherlands Air Force (RNLAF) in 1995-1996, marking the 25th anniversary of operations with the *Chinook* fleet this year. The six new CH-47D's were delivered between 1998 and 1999.

Currently, ten of the originally thirteen CH-47D's are still in service. Two *Chinooks* were lost in accidents in 2005 during operations in Afghanistan and the oldest CH-47D (D-661) was withdrawn from service in late 2019. Captain Roël Boezen "Booze", 298 squadron liaison officer, adds "The accidents in Afghanistan made us realize we had to further improve and hone the training and capabilities of our crews. Both lost helicopters suffered from a hazardous mountainous and brownout landing during reduced visibility operations where wind and loss of engine power due to the thin air conditions had an impact on the performance of the *Chinook*. Circumstances we do not encounter when operating in The Netherlands. As a result, a new training program has been implemented consisting of 'High Blaze' exercises for dedicated mountain flying, and 'Hot Blaze' to allow crews to practice operations in a hot, high and dusty environment." Captain Boezen continues: "One of the most challenging conditions to fly in are in snow in which you can easily lose your reference orientation. Therefore, we have cold weather operations in snowy conditions in the Nordics trained during 'Cold Blaze'. Last but not least, the fourth training is 'TAC Blaze' with a focus on tactical maneuvers and electronic warfare."

New CH-47F's

To cater for the loss of the two CH-47D's and for the additional demand for Heavy Rotary Capacity, the Dutch Ministry of Defense signed a new contract with manufacturer Boeing in 2007 for the delivery of six CH-47F's. The CH-47F's were equipped with updated ACMS cockpits (Block 6 with partly color displays), improved self-protection kits, CHASE (*Chinook* Aircraft Survivability Equipment). The main purpose of the CH-47F fleet was to serve as a platform for Special Forces Operations. The configuration included Fast Rope Capabilities, new attachment points for onboard

The Defense Helicopter Command (DHC) and MAOT (Mobile Air Operations Team) always work closely together in the transportation of under sling loads, FBO operations. Twice a year a big exercise is held in a training area called Ederheide (GLV4/Eder Heath).

Annual Market Garden commemoration Ginkel Heath/Dropzone Y
Since 1960 each year the British Airborne Landings on the Ginkel Heath is commemorated by veterans, local community and the government. International paradropping are taking place with over 1,000 paratroopers each year. To support the event as of 2017 the Defense Helicopter Command (DHC) has been joining to showcase their capabilities to the audience.

Captain Roël Boezen “Booze” is the 298 squadron's Liaison Officer. In Dezember 2018 he was awarded the "Vliegerkruis". The Airman's Cross (in Dutch called Vliegerkruis) is an important military decoration created in 1941. The cross is meant for those Dutch military, who displayed during one or more flights in an aircraft, initiative, courage and perseverance against the enemy or during hostile actions. The Airman's Cross is the fifth-highest military decoration still being awarded for bravery. On 23 September, 2009, the *Chinook* crew, including then co-pilot 1st LT Roël Boezen, transported a Joint Terminal Attack Controller Team (JTAC) to a valley close to Tagaw. As the helicopter landing site was confined a so-called ridge landing was made. Unexpectedly, the crew was asked to arrest a fleeing suspect. It has been the first time a helicopter crew member received the Vliegerkruis.

weapons, a long-distance communication radio, and a Forward-Looking Infrared System (FLIR) under the nose. With the latter system, the pilot has good situational awareness of the surroundings under very poor visibility conditions. The 'F' had GPS navigation connected to a radar altimeter. Initially, 298 Squadron had three CH-47F's (D-890/891/892). To complement 302 Squadron in Ford Hood, CH-47F 'D-891' was transferred to the US in 2015. The remaining two F's have been shipped back to Boeing in March 2019 in support of the current Renew Program. Two of the CH-47F's (D-894/895) assigned to 302 Squadron were ferried to Boeing in April 2020, with the last two (D-891/893) to follow early June 2020. In anticipation of the arrival of the new CH-47F fleet, 300 hours base maintenance inspections are diminishing for the existing CH-47D fleet but will continue until the Initial Operation Capability (IOC) of the new CH-47F fleet is reached. It is currently uncertain what the future will bring for the remaining CH-47D's. Two are foreseen to be used as instructional airframes and one is planned to be delivered to the National Military Museum (NMM) at Soesterberg.

The new CH-47 MY II CAAS *Chinook*

Between 2010 and 2015, The Netherlands prepared for the replacement of the ageing eleven D-models as well as the expansion of the *Chinook* fleet with three helicopters. After extensive deliberations, the standard US Army MYII CAAS configuration was considered to be the most efficient choice for a successor. The Netherlands was able to utilize options in the existing MYII production contract between the US Army and Boeing. For that, the Letter of Offer and Acceptance (LOA) with the US Army for fourteen new CH-47F MYII CAAS Chinooks was signed on 12 November 2015. On 14 April 2016, the US Department of Defense awarded Boeing a contract to build twelve CH-47F's followed by an additional order on 28 April 2017 for the remaining two new CH-47F's. In order to prevent a "mixed fleet" of CAAS and ACMS *Chinooks*, which would have been costly during the sustainment of the fleet, it was then decided to renew and modernize the six ACMS F-models. On 14 December 2017, The Netherlands and Boeing signed the Direct Commercial Sales contract for the Renew Program, converting the six ACMS F-models into the exact same configuration as the fourteen new *Chinooks*.

Operating the standard MYII CAAS *Chinook* will allow for further optimization of operations, training and maintenance. "We have had a lot of contact with the US Army and the Australian MOD being existing operators, to understand potential challenges we might encounter when fielding the new *Chinooks*. When we deliver them to the RNLAF (Royal Netherlands Air Force), we want to make sure that there are no obstacles and that they will be able to operate and sustain the helicopters during the first three years. This period will allow the RNLAF to become self-supporting when it comes to in-service support", said Colonel Koen van Gogh, senior project manager Defense Material Organization (DMO) who is responsible for the Replacement and Modernization Program *Chinook*.

"About 2,500 parts of the legacy CH-47F's will be

CH-47D *Chinook* and AH-64DN *Apache* at the annual Market Garden commemoration, Ginkel Heath/ Dropzone Y

Three CH-47D *Chinooks* approaching the landing zone at the Ederheide (GLV4/Eder Heath) training area

reused. These parts will be overhauled (zero hours status) before being installed on brand-new MYII CAAS airframes. This option turned out to be more efficient and affordable than modifying the legacy CH-47F fleet. The first idea was to just replace the ACMS cockpit of the legacy Fs by a MYII CAAS Cockpit. We

Lt. Colonel Wil van Rijn, System Integrator (left) and Colonel Koen van Gogh (right) doing a walkaround of an CH-47D.
Photo by Phil Nijhuis, Mediacentrum Defensie (MCD)

concluded the risk was too big in terms of certification and costs", stated Colonel van Gogh. "The legacy CH-47F's are now sent to 'Summit Aviation' who are tasked by Boeing under the Renew contract to remove the usable parts from the helicopters and have them delivered into the overhaul process." Summit Aviation is an Industry Leader in Aircraft Maintenance, Repair, Avionics upgrades, Mission System Integration, Modifications, and Aircraft sales.
The new CH-47F MY II CAAS *Chinook* comes with the short nose, which differs from the current 'F' version in appearance. Meaning there is no room for the current weather radar. Also, the FLIR system under the nose will not be implemented. Another striking difference is the Woodland Desert Sage Color Scheme instead of the current grey scheme.
"Although the main goal was to stay common with the US Army, Dutch operating intent and national legislation led to the addition of some unique modifications. Fortunately, there is no need to integrate these into CAAS, so commonality will not be affected." The additional Dutch requirements include Crashworthy Crew Seats with ballistic protection, leading to modified MFCU's (MultiFunctional Control Units), a LH Removable escape Hatch, a Hook Load Measuring System, an Ice Detection System, a Pitot Heater Failure Indicator, FRIES (Fast Rope Ingress and Egress System), including external hardpoints, and a minor change to the electrical system, all which can be implemented during the production. A Fall Protection System to protect maintainers, and an Emergency Locator Transmitter are implemented by 'SES-I' (Science and Engineering Services) in Huntsville, Alabama as 'Post Production Modifications'. "We choose for 'SES-I' because they did similar work for the US Army and to make sure we do not interfere with the work performed on the Boeing production line", Colonel van Gogh explains.
On 20 March 2020, the first Royal Netherlands Air Force CH-47F's performed their maiden flight during

- CH-47D - The crew of the CH-47D consists of a pilot, co-pilot and two loadmasters (right)
- During March 2019 the first two CH-47Fs (procured in 2008) left for Boeing Philadelphia to be rebuilt to MYII CAAS standard. Airframes involved were D-890 and D-892 which were on strength with 298 squadron. After rebuilt to MY II CAAS the airframes will remain with 302 squadron in the US (below)

acceptance at Boeing Philadelphia (registration D-472 and D-473). These two helicopters left Boeing Ridley Park to be ferried to Huntsville in Alabama on 5 May 2020 for validation and verification by the US Army and the Post Production Modifications by 'SES-I'. "These two helicopters are planned to be the first CH-47s to be sent to The Netherlands by December 2020. After arrival in the Port of Antwerp, Belgium, the helicopters will be transported to Woensdrecht Air Base in The Netherlands where they will be prepared to be transferred to 298 Squadron with an expected arrival at Gilze-Rijen around mid-January 2021. These two CH-47F's will have all our additional requirements implemented, and they will have the Digital Automated Flight Control System (DAFCS) 3.3 software and CAAS 9.4 installed" Colonel van Gogh stated He continues: "In order to support a tight

conversion schedule of our flight crew to the MYII CAAS *Chinook*, we decided that the next six CH-47F's coming from the production line will not undergo the Post Modification until a later date. These six Chinooks will go to Fort Hood, TX (USA) directly to be used for conversion training. The next batch of CH-47F's will be delivered after the Post Modification. The earlier unmodified CH-47s will then be rotating through 'SES-I' to complete the process of modification as well. Between January and February 2021, we have planned the arrival of another two CH-47s to the Netherlands. These will be airframes built with retrofitted parts of the legacy CH-47Fs", the Colonel concludes.
To support the transition and difference training, a Transportable Flight Proficiency Simulator (TFPS) has been procured from NAVAIR (Naval Air Systems) Manned Flight Simulator Enterprise Team which is based at NAS Patuxent River (US). "The procurement of a TFPS, stationed at Gilze-Rijen, will be more efficient for the Squadron as there will no longer be a need to train in the simulator of the Royal Air Force at RAF Benson Air Base", Koen van Gogh continues. "The TFPS has already arrived at Gilze-Rijen Air Base and we are awaiting a team from NAVAIR to do the final acceptance testing of the Simulator. The TFPS will need to be ready before the first group of instructor pilots is scheduled to receive their conversion training at Fort Hood, since the TFPS will be used for the crew's Ground School/ Academics training at Gilze-Rijen Air Base before they head to Ft. Hood for the flight training. Each Aviator will undergo a three-week training on the Simulator before attending a three-week course with 302 Squadron in the US and participating in an American Falcon exercise, held four times a year. Upon return to the Netherlands, the aviators will be fully qualified pilots on the MYII CAAS *Chinook*."
Lt Colonel van den Berg adds: "We had planned to send a so-called Class 0 to Fort Hood in the US during the June-July 2020 period for the Instructor Course on the MY II CAAS variant. As we have five flights with five crews, we have fifty pilots and fifty loadmasters to train, resulting in five training classes at Fort Hood. This transition training is planned to be executed over an eighteen-month period. We will have a team from the US Army to support the conversion, a so-called NETT Team (New Equipment Training Team), both locally at Gilze-Rijen as in Ft. Hood. Expectation is to achieve Full Operational Capability (FOC) status by mid-2022 with the Initial Operational Capability (IOC) by October 2021."

Missions of the past

'Nihil Nobis Nimium' or 'Nothing is too much' is the motto of the 298 Squadron. The squadron has been involved in many missions and oversea deployments since it has been operating with the CH-47D/F. Kosovo (KFOR, 1999), Allied Harbor in Albania and a year later, for UNMEE (United Nations Mission in Ethiopia and Eritrea). From January 2001 to May 2004, the Royal Netherlands Air Force detachments contributed to NATO's Stabilization Force (SFOR) in Bosnia. From July 2003 to November 2005, they served in Iraq. The detachment provided transport for the Stabilization Force in Iraq (SFIR) for the Dutch military personnel from the Security Forces. From May 2005 to June 2006,

CH-47D participating in the 2019 Market Garden commemoration at Ginkel Heath / Dropzone Y

three *Chinooks* were deployed for the Dutch Special Forces deployment for Operation Enduring Freedom (OEF). Two *Chinooks* were lost due to accidents in 2005 during these operations. As of 2007 to October 2010, 298 Squadron was regularly active from Kandahar Airfield in Afghanistan in support of NATO Operation ISAF (International Security Assistance Force). And lastly, from April 2014 to April 2017, three *Chinooks* participated in the 'Minusma' Mission. This UN Mission was designed to restore Peace and Stability in Mali.

Training in the US

"The initial training for new crews is conducted at Fort Rucker Air Base (US) as part of the *Chinook* Aircraft Qualification Course. After completing the course, new crews are continuing their training with the Squadron at Gilze-Rijen Air Base", 2ndLT 'Frank' explains. "We were planned to travel to Fort Hood to have a ten-week training period with 302 Squadron as part of the Mission Qualification Training (MQT)." This squadron provides Joint Air Assault Training for helicopter crews of the Defense Helicopter Command

2LT 'Frank' is one of the student pilots who was planned to be training with 302 squadron in the US until the breakout of covid-19. Currently 'Frank' is trained by instructor pilots within 298 squadron in order to continue the education.

(DHC) and ground units of 11 Airmobile Brigade. This will take place four times a year with the 'American Falcon' exercise to conclude the training. In addition, Pilots and Load-Masters follow the Initial Mission Qualification Training twice a year. The squadron is staffed with personnel from the Royal Netherlands Air Force, Army, and the US Army." Frank continues: "Our group consists of a mixture of a CH-47 loadmaster, pilot, but also AH-64 pilots. Just before we would travel, it became clear that we would not go to the US. Due to the COVID-19 situation, the original schedule will require revision as currently 302 Squadron stood down with no training activities. We are now being trained within the Squadron here in The Netherlands. This means we all have to be flexible to cater for the further education as training is conducted alongside daily operations." Captain Booze details further: "The Defense Helicopter Command is a more complex organization to cater for this ad-hoc additional training. Luckily, we managed to be flexible and had a fast resolution in place. The focus for training is now on tactical exercises, navigational skills, and planning of flights. In order to provide best possible training, we need to have instructor pilots and ground forces to act as enemy forces. As we cannot fully focus on the MQT training, the duration will be longer than the ten-week period at Fort Hood."

Firefighting

The Netherlands have been confronted with the largest wildfires in 40 years in the southern part of the Netherlands, Deurnsche Peel and Herkenbosch, during the third week of April 2020. Starting off with one supporting Chinook, it resulted in a combined FBO (Fire Bucket Operations) effort of four *Chinooks*, an AS 532 Cougar, Mobile Air Operations Teams (MAOT) and the local fire brigades. "In case we are asked to support firefighting operations, the tasking order is provided by NASOC (National Air and Space Operations Center) to the staff of DHC", Niels adds. "The week before the fires started, we already had been asked to have one helicopter on standby." Christiaan Velthausz, on-scene commander and part of the fire department states: "Under normal circumstances, the Ministry of Defense generally supplies helicopter capacity within 24 hours of the request. Although in practice, this is a lot faster, usually about three to four hours. In the event of an increased risk of wildfires, FBO and therefore, the helicopters can be put at 2 hours' notice to move. During the firefighting, we had on average five to ten MAOT personnel to support the FBO operations. The main lessons learned have been to work on a large-scale basis for a long period in a complex setting" according to Sergeant-Major Rob van Mierlo, commander MAOT. "From 1 April 2020 onwards, MAOT has a team on standby. Continuously ready to set off within 2 hours."

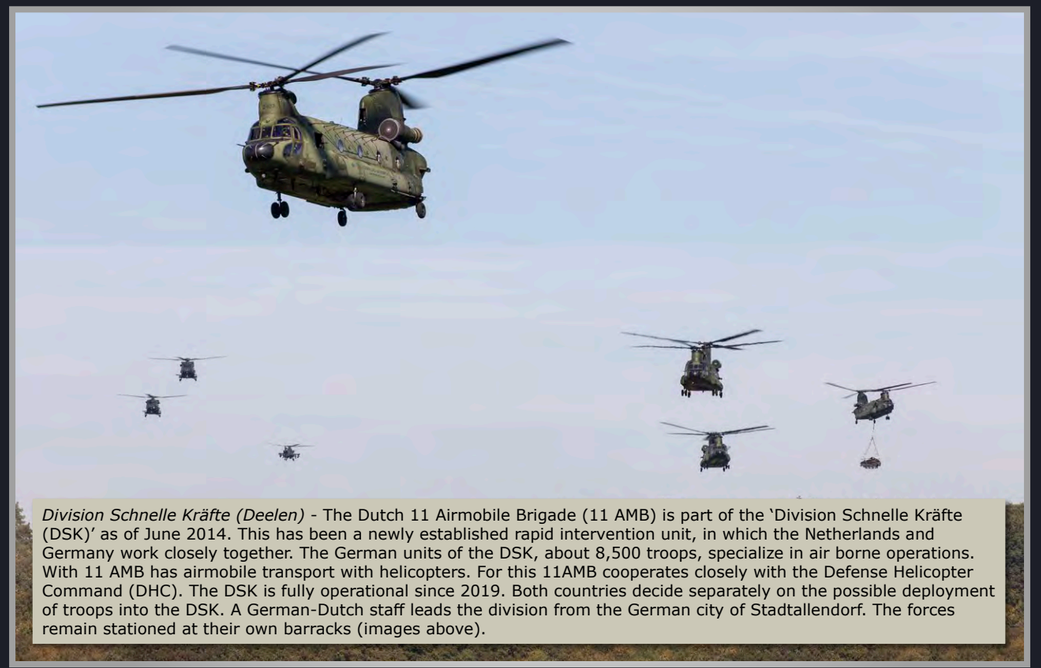
"In the event of very large or difficult-to-fight fires, the (civil) Heli-Team Fire Team with helicopters and the MAOT of DHC form the so-called 'Fire Bucket Operations (FBO) Team'. This team works together with the local fire brigade on site. About 10 years ago, the Defense Organization requested a single point of contact for firefighting operations; that became the Heli-Team Fire Brigade", Christiaan Velthausz, the on-scene commander, says.

"We have a total of ten Bambi Buckets which can hold in theory 10,000 liters of water. During FBO operations, we only drop 8,000 liters each time. This is to prevent engine over-torque as we demand all power available with full fuel load. Loading less water helps to significantly reduce the risk of having to abort the mission and return to base due to engine over-torque", Captain Boezen adds. One of the loadmasters, who was involved in the firefighting explains: "We had an observer of the fire department joining our flights, who had a map showing coordinates where to drop the water. My task was to inform the pilots of the coordinates on where to drop water. After each drop, we received direct feedback by local observers on the ground whether our drop was successful. This worked out perfectly." Over a five-day period, more than 3,2MIO liters of water were dropped during 540 individual drops.

In preparation of the firefighting season 298 squadron trained in the period February-April 2020. The third week of April saw the start of the largest nature fires in the last 40 years in The Netherlands. Four CH-47s and an AS532 have been involved a full week dropping 3.2 MIO liters of water in 540 drops. The AS532 can carry 2500L of water in a Bambi Bucket where the CH-47D takes 8000L of water. To support the crews a dedicated firefighter observer joined the flights in order to guide the water drops.

On Gilze-Rijen AB there are several spots CH-47 crews use to practise landing in difficult. 'Slopes North' has a more complex setting with a concrete ridgeline allowing for so-called 'Ridge Landings'

CH-47D preparing to land in the low flying area GLV5 close to its home base Gilze-Rijen



Division Schnelle Kräfte (Deelen) - The Dutch 11 Airmobile Brigade (11 AMB) is part of the 'Division Schnelle Kräfte (DSK)' as of June 2014. This has been a newly established rapid intervention unit, in which the Netherlands and Germany work closely together. The German units of the DSK, about 8,500 troops, specialize in air borne operations. With 11 AMB has airmobile transport with helicopters. For this 11AMB cooperates closely with the Defense Helicopter Command (DHC). The DSK is fully operational since 2019. Both countries decide separately on the possible deployment of troops into the DSK. A German-Dutch staff leads the division from the German city of Stadtallendorf. The forces remain stationed at their own barracks (images above).

During early October 2019 a Chinook transported a mockup of a Bf-109 from Gilze-Rijen Airbase to a close-by location called ‘De Kiek’. This location was utilized by the German Luftwaffe during World War 2 as a decoy airfield in order to confuse Allied Bombers who targeted Gilze-Rijen.

Cooperation DHC and Special Operations Forces - The CH-47 fleet is equipped and available to support Dutch Special Forces like the Commando Force (KCT/ Korps Commando Troepen) and MARNS (Dutch Marines) where needed. To train and hone procedures regular exercises take place. These mostly take place on undisclosed locations across The Netherlands. In April 2018 Commando’s and MARNS trained in embarkation of a ship supported by a CH-47D and an AS532 ‘Cougar’. Till 2014 the 298 Squadron had a dedicated flight to support Special Operations, no. 5 flight.

Stroe training area, 11 Airmobile Supply Company (Bevocie) exercise - 11 Airmobile Supply Company (Bevocie) is part of the Airmobile Brigade and specializes in moving and supplying units by air. During the exercise held in June 2018, the Chinook moved vehicles, personnel and various supplies. The helicopter transported the cargo inside, but also externally to so-called "slings" under the aircraft. This supply operation is called Combat Battle Train (CBT). After deployment of the Airmobile Brigade, restocking normally takes place after one to two days. If this is not possible by land, this is done by air. The CBT team flies in advance to an area where so-called Pathfinders establish a secure "Drop Off Zone". Once done, the 11th Bevocie moves in

CH-47F *Chinook* exercising sling-load operations in the Ederheide (GLV4/Eder Heath) training area

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REPORT BY RALF PETER WALTER AND PHOTOGRAPHY AS STATED

At the beginning of May 2020, the Taktisches Luftwaffengeschwader 31 "Boelcke" (TaktLwG 31 "B") of the German Air Force presented two of its EF2000 Eurofighter in striking special color schemes: aircraft 31+49 with the "Tranche 4 / Project Quadriga" markings and 30+96 with the "Sword of Boelcke" markings.

Eurofighter "Tranche 4 / Project Quadriga"

Originally, it was planned that 31+49 Quadriga has its public debut at the Internationale Luft- und Raumfahrtausstellung (ILA) in Berlin, Germany. The ILA was canceled due to COVID-19 and the first public appearance of 31+49 was on 6 May at Nörvenich AB, home to TaktLwG 31 "B". However, the German Air Force goes on with the Project Quadriga, the technological modernization of the EF2000 Eurofighter. The Luftwaffe will replace old, Tranche 1 Eurofighters with the latest, Tranche 4 Eurofighters. Tranche 4 is the Eurofighter consortium's designation of this version to distinguish them from early Tranche 3 aircraft while Germany officially refers to them as Tranche 3, too. An upgrade of Tranche 1 aircraft to Tranche 4 level is considered too expensive so it was decided to buy brand new Tranche 4 Eurofighters. One key feature of this aircraft will be an E-Scan Mk 1 active electronically scanned array (AESA) radar including a Multichannel Receiver and updated software. Germany plans to buy a total of 38 Tranche 4 Eurofighters (7 twin-seater, 26 single-seater plus five single-seater optional) to enter service between 2023 and 2025.

This stunning color scheme addresses several key topics of today's and the future Luftwaffe: The gray-green binary code stands for a modern, digital Luftwaffe. The blue-shaded polygon pattern applied to fuselage, wing, and the vertical tail is based on the corporate design of the Bundeswehr. The artistically reinterpreted painting of the Quadriga – an antique two-wheeled chariot drawn by four horses – and the lettering "Tranche 4" on the vertical tail symbolizes the Luftwaffe's "Project Quadriga".

Roll-out of Eurofighter 31+49 in its new "Tranche 4 / Project Quadriga" livery. *Peter Thivessen*

Eurofighter "Sword of Boelcke"

As 2021 is the sixtieth anniversary of the TaktLwG 31 "B" being awarded the name "Boelcke" after the famous WW I fighter pilot Oswald Boelcke with 40 victories, the TaktLwG 31 "B" applied the "Sword of Boelcke" markings to its EF2000 Eurofighter 30+96.
The painting of the fuselage, wings, and the vertical tail is dominated by a multitude of lightnings. These stand for energy, dynamics, and speed – three attributes the Eurofighter combines. On top of the fuselage is the well-known Boelcke sword, and the wings from the squadron crest are also found on the Eurofighter's wings. The left side of the vertical tail shows the squadron crest in white. On the right side, the Eurofighter's three roles within the TaktLwG 31 "B" are graphically displayed: air-to-air in the year 2004, multi-role (by adding air-to-ground capability) in 2017, and tactical air reconnaissance in 2019. Silhouettes of the four different types of fighter aircraft, Republic F-84F Thunderstreak, Lockheed F-104G Starfighter, Panavia Tornado IDS, and Eurofighter EF2000 which the TaktLwG 31 "B" operated until today are shown on the underside of the wing.

For the "special painting" of the Eurofighters, foil was used instead of paint. The benefit of foil is that it is lighter and material-friendly, and it easier and faster to remove than paint.

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 perfoming 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 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.

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

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 Nyutabaru 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

F-15J (top) and F-15DJ (middle, bottom) 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 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

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'swith 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

NIGHT FLYING AT KECSKEMÉT

REPORT AND PHOTOGRAPHY BY ISTVÁN KELECSÉNYI

In 2020, the unfolding COVID-19 epidemic reversed the lives of almost the entire country. Emergency scenarios, epidemiological procedures, and new protocols have come into effect almost everywhere. Despite the epidemic situation, training flights and missions were continued at the Szentgyörgyi Dezső Air Base in Kecskemét, in strict compliance with health regulations, and aircraft were also used for the repatriation of medical and Hungarian citizens.

The reduction in the intensity of the epidemic made it possible for JAS-39 *Gripen* aircraft pilots to receive night training flights again this year, albeit slightly later than usual, from 8 to 11 June 2020. Night training flights are important, as the pilots' proficiency must be maintained. Whether in peacetime QRA (Quick reaction Alert) or in the event of a war emergency, he must be able to perform the various procedures must at night outside of daylight hours. For the technical staff, the tasks to be performed under electric light are the same, but they still operate under different lighting conditions.

After the modernization and reconstruction of the Kecskemét Air Base, the aprons were given electric lighting, so technicians can work on the aircraft in much better light conditions than before. Although the flashlight is needed, the systems, parts, and equipment to be inspected are much more visible.

The commander of the Kecskemét Air Base allowed the admission of a limited number of photographers (journalists and spotters) for the flights. The limited number of staff was justified on the one hand by the epidemiological regulations and on the other hand, by the safety supervision of the participants. Due to the large number of applicants, the army of photographers was divided into two parts. On Tuesday and Wednesday, it was possible to take photographs of the technical maintenance of *Gripens*, the activities of pilots, taxiing on taxiways, and take-offs and landings. It was also possible to photograph the AN-24 medium transport, A319 passenger, and Falcon7x VIP transport aircraft of the "Camel" transport squadron.

These *Gripens* are ready to go, waiting for their taxi-clearance

The training flights lasted from about 5 pm to midnight. The noise exposure of the population was higher than average these days. Nevertheless, Kecskemét is proud of its flying sons, the base, and they accept the flight operation, which also includes a few days of less rest and sleep time per year.
Preparation for the training flight starts during daylight.

The first take-offs are at sunset. During the training, two to four JAS-39 *Gripen,* including usually a two-seater, flew in three waves. On Tuesday, the Falcon7x VIP transport aircraft was also flown in the evening and at night. On Wednesday an Airbus A319 passenger transport aircraft flew in from Afghanistan, bringing home some troops of the Hungarian contingent which supports NATO's anti-terrorist operations in Afghanistan.

Night flights are necessary for the performance of military tasks every year and also contribute to the security of civil aviation in peaceful conditions, under Hungarian and NATO air defense tasks.

We thank the Commander of the Air Base and the staff of the Communications Department for making this report possible.

Pre- and post-flight activies at the flightline

JAS-39C single-seater leaving the flightline for take-off


HUNAF
59°TFW
44
TWY
F2 TWY
C2

Falcon7x VIP transport aircraft

Airbus A319 transport aircraft

Antonov An-24 transport aircraft

JAS-39D *Gripen* two-seater returning at sunset from its training mission

HELICOPTER WEAPON INSTRUCTOR COURSE

REPORT AND PHOTOGRAPHY BY DANNY REIJNEN

From January 2020 until April 2020, the Helicopter Weapon Instructor Course (HWIC) should have taken place in the Netherlands and Germany. Every 1.5 years, the Netherlands Defense Helicopter Command (DHC) organizes this course under the leadership of 299 Squadron's TACTES department.

Royal Netherlands Airforce (RNLAF) helicopter crews receive training with the 299 Squadron, based at Gilze-Rijen AB, the Netherlands. In addition to flight training, this course includes

- SERE training – **S**urvival skills, **E**vasion planning, **R**esistance to exploitation & political indoctrination, **E**scape planning.
- FARP operations – **F**orward **A**rming and **R**efueling **P**oint outside the helicopter unit's originally designed Area of Operations used to hot-refuel and re-arm helicopters. A FARP is a temporary facility deployed as far forward, or widely dispersed, as tactically feasible. Using FARPs requires proper training. The crew needs to be familiar with procedures such as approaching, landing at and departing from a FARP, hot-refueling, using different refueling systems, working with untrained ground personnel, and re-arming with various types of ammunition.
- Leadership training – being an active leader in every scenario when having passengers on board of the helicopter.
- Driving training – being able to handle and drive the different vehicles that may be transported with the helicopter.

For the flight training, normally, the helicopters of the 298, 300 and 301 squadron are used. The 299 Squadron provides tactical training and ensures the combat readiness of the various helicopter crews. After 17 weeks, this course should deliver weapon instructors to the Defense Helicopter Command making them tactical specialists.

The HWIC 2020 is a special edition compared to previous courses. This year, it is set up with international participants. The class consists of 11 Dutch students (eight pilots and three load masters)

RNLAF AH-64D *Apache* assigned to 301 Squadron on the ramp at Fritzlar, ready for a night mission

Formation-take-off of the different types of helicopters taking part in the course; clockwise from left: NH90 TTH, CH-47D, AH-64D, Tiger UHT, and AS532 (main image). The same formation, without the AS532 (right).

spread over three helicopter types (AH64D Apache, CH47D Chinook, AS-532 Cougar) and 11 German students (eight pilots and three load masters) spread over two helicopter types (NH-90, Tiger).

The course is split into three modules: HWIC TAC, HWIC STRIKE and HWIC SOF. Between the flight weeks of these modules, theory is provided by internal and external instructors and specialists from the Netherlands Aerospace Centre (NLR).

The course started on 6 January, 2020. Unfortunately, due to the outbreak of the COVID-19 virus, the Dutch Ministry of Defense cancelled the course after module TAC. The remaining modules STRIKE and SOF are postponed until further notice. Graduation day for the new Weapon Instructors, originally planned for 29 April, 2020, is also postponed until the remaining two modules are completed.

Leader of the HWIC, module TAC and squadron commander of the 298 squadron, Lieutenant-Colonel Niels van den Berg emphasizes:

"The HWIC is the TOPGUN training for Helicopter crews. The Helicopter Weapon Instructor Course (HWIC) is one of the toughest courses in military helicopter flying. It is the helicopter version of the more famous FWIT (Fighter Weapons Instructor Training)."

Niels completed the course in 2008 as a Chinook pilot and flies missions as an instructor during HWIC TAC.

RNLAF CH-47D *Chinook* from 298 Squadron is just about to take-off for a night mission

RNLAF AS532 *Cougar* from 300 Sqn and CH-47D *Chinook* from 298 Sqn just took-off for a new mission

▲ RNLAF CH-47D *Chinook*
▼ German Army NH90 TTH

Module TAC

Main focus of this module is practicing and instructing evasive manoeuvers in small and large formations. Military helicopter crews must be able to perform missions under any enemy threat. These threats consist of ground based air defense assets like:

- Flycatcher mobile radar
- Infrared-guided man portable air-defence systems)
- Small arms (AK-47, Heavy Machine Gun, etc.)

or airborne defense assets like:

- Fighters (EF-2000)
- Slow movers (PC-9)

Prior to flying their missions, the students are theoretically trained in recognizing enemy threats and how to defeat them. These enemy threats are simulated during the HWIC TAC period. Students must be able to defeat these threats and to teach new pilots how to evade and defeat them. HWIC TAC took place in Germany, with the participating helicopters flying from Fritzlar Air Base. Fritzlar AB is the home of Kampfhubschrauberregiment 36 (KHR36), equipped with the Tiger UHT attack helicopter.

Captain Michael, student at HWIC 2020 states:

"In order to be part of the HWIC training, you have to be section lead at least, meaning you have to be able to be in charge of three helicopters. After the HWIC, I will be a qualified Weapon Instructor, which means I will be able to execute evaluations during tactical training and exercises. I am a tactical expert and I will be able to advise commanders on a tactical level. The biggest challenge for me is planning a mission we normally do not do: Air Combat Maneuver against fixed wing aircraft, with formations larger than you normally operate with. It's the first time we fly these missions together with the Germans. It needs a lot of adaption because they fly other helicopters, have other routines regarding flying, and they are working with other systems. But still, we learn a lot from each other. Working together with other assets, Air Combat Maneuver and working on your own skills in giving instruction and tactical performance, are the reasons that this exercise is a great added value for me."

Modul STRIKE

The strike exercise is a well-known exercise within DHC, in which the helicopters of the DHC are executing the exercises on the Bergen-Hohne range. Part of the HWIC is learning to shoot dynamically in larger formations, and of course, being able to transfer this knowledge to new and young pilots. STRIKE also consists of a theoretical and a practical module. During the theory, the various weapons of the DHC and those of the German helicopters are discussed. Pilots also get used to the available self-defense mechanisms and how they are used.

Major Bas, head of TACTES, explaining his part in HWIC

"In the past, there was a need to educate people who were involved in educating others in tactics. It wasn't core business back then but it used to be done next to the normal flying activities. Because of this need of people who could educate and train others, the Helicopter Weapon Instructor Course started in 2005. Why I wanted to be head of TACTES? Well, I was interested in this job to train people and with my experiences, 4 years of training and educating people in Ft. Hood, operating in warzones and being a weapon, flight – and JTAC instructor, I had the necessary experiences to get the job."

Modul SOF

The Special Operations Forces (SOF) module focuses on working with ground troops and Special Forces. The Special Forces use different planning and implementation methods other than conventional units. The students are challenged by complex missions and various enemy threats. Because of these, students are expected to think more outside the box and complete the mission with unconventional solutions. Furthermore, students are educated on Dutch and German special operations after which they go into practice.

RNLAF AH-64D *Apache of 301* Sqn and a German Army NH90 TTH of THR 30 over Germany

German Army NH90 TTH and RNLAF CH-47D *Chinook* followed by a German Army Tiger UHT departing Fritzlar airfield

Participants HWIC 2020

AH-64D	301 Sqn	RNLAF
CH-47D	298 Sqn	RNLAF
AS-532	300 Sqn	RNLAF
Tiger UHT	KHR36	German Army
NH-90 TTH	THR30	German Army

Tiger UHT of the Kampfhubschrauberregiment 36 of the German Army (Heeresflieger)

MAKS

INTERNATIONAL AVIATION AND SPACE SALON

REPORT AND IMAGES BY KRIS CHRISTIAENS

Beriev Be-200 air tanker demonstarting the drop of red and blue fire retardant. This is usually a gel. Since it can stick to a vertical surface or vegetation a gel is much more effective than pure water. Also the gel can keep the water for an hour or even longer, depending on the ambient temperature, wind and humidity. The fire retardant is mostly dropped at the edge of a fire and not into the fire to prevent or slow down its further spread.

The MAKS international airshow and commercial, civil and military aviation business expo is held biennially at Zhukovsky International Airport, 36 km southeast of central Moscow. The purpose of this event is to demonstrate leading Russian technologies and to open up the Russian aerospace industry to the international market. Some prototypes of aircraft and combat systems, and experimental units that for one reason or another cannot be shown abroad, are demonstrated exclusively at MAKS. This makes MAKS a very popular event among aviation enthusiasts and aviation photographers from all over the world. This event lasts for six days, three of which are open to the general public. The Gromov Flight Research Institute, which is one of Russia's most important aviation research institutes, is also located at the Zhukovsky International Airport. During the Cold war, this airfield was also used as a backup landing site for the Russian spaceplane Buran and was the Soviet Union's equivalent to the US Edwards Air Force Base. That is why there are many rare and old aircraft on this part of the airfield. In 1993, MAKS was held for the first time and over the years, it became one of the largest aviation events in the world.

During the 2019 edition of MAKS, more than 578,000 people visited this important event. The biggest highlight of MAKS 2019 was undoubtedly the official presentation of the Sukhoi Su-57 to professionals and the general public. This new single-seat, twin-engine, stealth fighter jet was shown for the first time at an airshow during MAKS 2019. To demonstrate its maneuverability and its power, the Russian Air Force performed a dog fight with four of these fifth-generation fighter jets. This aircraft has a short take-off and landing capability and is designed for a wide range of combat missions against air, ground, and maritime targets in all weather, day or night, and in a severe jamming environment. Other highlights during this edition of MAKS were impressive demos of the Sukhoi Su-35, MiG-29 M2, and Yakovlev Yak-130 fighter jets. Two Sukhoi Su-30SM fighter jets of the Russian Navy showed the dramatic and demanding Cobra maneuver to demonstrate the aircraft's pitch control authority and the pilot's skills. Since MAKS is also a trade fair for civil aircraft, numerous new passenger aircraft were also demonstrated such as the Airbus A350-900, the Sukhoi Superjet 100, the Piaggio P.180 Avanti and the Irkut MC-21. The most impressive demonstration during MAKS 2019 was the water drop maneuver of the Be-200 multipurpose amphibious aircraft designed by the Beriev Aircraft Company. This aircraft is designed for firefighting and has a capacity of 12,000 liters of water. During the public days of MAKS 2019, the general public was also treated to beautiful demonstrations of Russian aerobatic teams such as the Russian Knights with

their eight Sukhoi Su-30Sm jets and the Swifts with their six MiG-29/29UB jets.

In addition to the air show, there were also a lot of beautiful and rare aircraft at MAKS on the static part of this event. One of the biggest surprises at MAKS 2019 was the appearance of the extremely rare Sukhoi Su-47 Berkut. Only one Su-47 *Berkut* was ever built and it first flew in September 1997. This experimental supersonic jet fighter served as a technology demonstrator prototype for several advanced technologies, later used in the 4.5 generation fighter jets. Another rare and impressive aircraft at the static part of MAKS 2019 was the Myasishchev VM-T *Atlant* strategic-airlift airplane. Only two Atlants were ever built. Its main task was to ferry Energia rocket boosters from their development plant to the Baikonur Cosmodrome. On several occasions, the Soviet space shuttle *Buran* was piggybacked to the Cosmodrome as well. Besides rare and experimental aircraft, people could also see some impressive Russian bombers such as the Tupolev Tu-160 *Blackjack*, the Tupolev Tu-22M *Backfire*, and the Tupolev Tu-95 *Bear*'. Also present at the static part of MAKS 2019 were two aircraft of the Roscosmos State Corporation for Space Activities. Roscosmos is a state corporation responsible for the wide range and types of space flights and cosmonautics programs for the Russian Federation. The aircraft of Roscosmos at MAKS 2019 were an Aero L-39C *Albatros* and an Ilyushin IL-76MDK that are used to train cosmonauts.

СУХОЙ

SUCKHOI Su-30SM

СУХОЙ
SUKHOI Su-57


РОССИЯ

MiG-35D

Mil Mi-38T (left) and Mil Mi-17V-5 (right)

Mil Mi-28NM

The Mil Mi-8AMTSh-VA is a special version for operations in the Arctic

The Mil Mi-26 is one the world's largest helicopters

Mil Mi-8AMTSh

Su-30SM of the aerobatic team "Russian Knights"

MiG-29 of the aerobatic team "Swifts"

MiG-29 of the aerobatic team "Strischi"

One of only two Myasishchev VM-T *Atlant* built to carry rocket boosters and the Soviet space shuttles of the Buran program.

The Sukhoi Su-47 is an experimental supersonic fighter jet with a forward-swept wing design

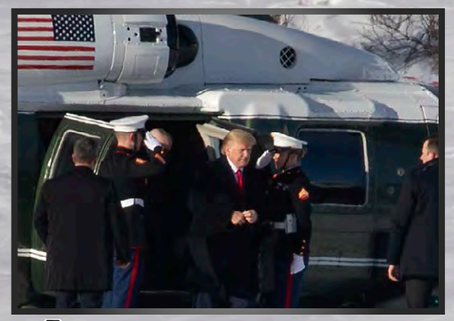
WEF 2020

World Economic Forum
21 -24 January 2020
Heliport Davos-Stilli
Switzerland

PHOTOREPORT BY RALF PETER WALTER

This *Cougar* is especially equipped with comfortable seats, noise reduced cabin, carpet covered floos and air condition so that the guests feel comfortable on board.

The Swiss Air Force AS532UL *Cougars* and AS332M *Super Pumas* provide VIP transport between Davos and Zürich Int'l Airport and Dübendorf AB.



U.S. President Donald Trump arrives in Davos on 21 January with MARINE ONE, a Sikorsky VH-60N *White Hawk*

MARINE ONE is accompanied by a second VH-60N *White Hawk* (below) and two Sikorsky UH-60L *Black Hawks* (left). The Swiss Air Force joins the four U.S. helicopters on their flight from Zürich Int'l Airport to Davos with three AS332M-1 *Super Pumas*.

The VH-60N *White Hawk* (right) is an executive transport helicopter derived from both the U.S. Army's UH-60 *Black Hawk* and the U.S. Navy's SH-60 *Seahawk*. The *White Hawk* is flown by Marine Helicopter Squadron One (HMX-1) which supports the executive transport mission for the President of the United States of America. VH-60N incorporates day/night/all-weather operations, TCAS, self-contained navigation, GPS, and CSFIR sensors, and carries no weapons. Communications include extensive communication capability with communications station operator, and EMP hardening.

Swiss Air Force AS332M-1 *Super Puma (▲) and AS532*UL *Cougar* (▼)

Swiss Air Force EC635P1 (▲▼)

German Chancellor Angela Merkel flew with this AS332L-1 *Super Puma* of the Federal Police (Bundespolizei) to Davos

AMERICA STRONG

PHOTOS BY U.S. AIR FORCE & U.S. NAVY

"We are truly excited to take to the skies with our Navy counterparts for a nation-wide tribute to the men and women keeping our communities safe. We hope to give Americans a touching display of American resolve that honors those serving on the frontline of our fight with COVID-19."

U.S. Air Force Lt. Col. John Caldwell
Thunderbird 1

"We are incredibly honored to have the opportunity to salute those working on the frontline of the COVID-19 response, we are in awe of your strength and resilience. Thank you to all of those in essential industries keeping our nation moving forward. We will get through this. We are all in this together."

U.S. Navy Cmdr. Brian Kesselring,
Blue Angels commanding officer

HOUSTON
TEXAS

NEW YORK CITY
NEW YORK


USAF
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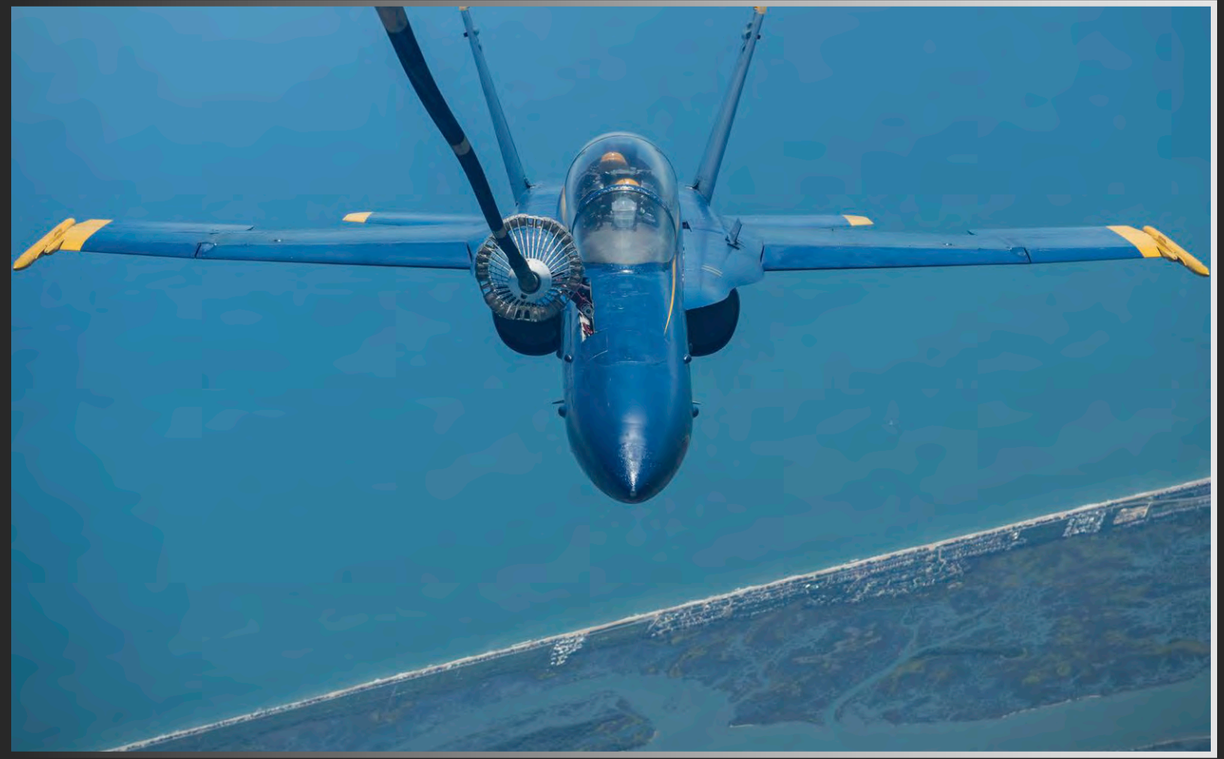

SAN ANTONIO
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AIRCRAFT OF THE 419 SQN OVER THE YEARS

REPORT BY LÁSZLÓ NYÁRY & RALF PETER WALTER,
ART BY LÁSZLÓ NYÁRY, PHOTOGRAPHY AS STATED

Avro Lancaster Mk X with 419 Squadron markings flying over Cold Lake during the Lake Land 2009 air show. *CF photo*

1941 TO 1945

The Royal Canadian Air Force (RCAF) 419 Bomb Squadron was established on 15 December 1941 at RAF Mildenhall, England, as part of No. 3 Group, Bomber Command.

The name Moose, which is used in the squadron's emblem and motto, is derived from the nickname of the first commanding officer of the squadron, Wing Commander "Moose" Fulton. As a Royal Air Force pilot Fulton flew twenty major operations in three months. In September 1940 he was awarded the Distinguished Flying Cross. As the first Commanding Officer of the newly established RCAF 419 Bomb Squadron, he received the Air Force Cross in January 1942, and on 4 August 1942, he was posthumously awarded the Distinguished Service Order. He flew the twin-engined Wellington bomber X3488 VR-H. His final mission was on the night of 28 July 1942. On the way home from an air raid at the German city of Hamburg he was attacked by enemy night fighters, suffering substantial damage. The last message received from his plane was "… attacked night fighters … wounded … five hundred feet going in…." The Wellington was last seen crossing the French border over the Channel. On 4 August 1942, he was reported as "missing in action" and in April 1943 listed as "killed in action".

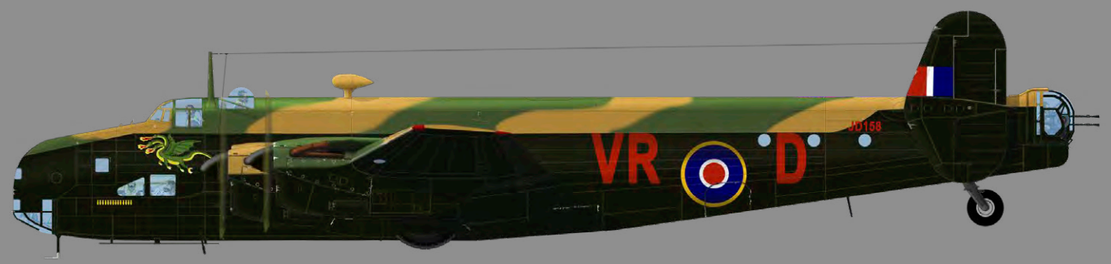
The 419 Bomb Squadron was the third RCAF bomber unit to be formed in England. Most of the airmen were Canadian, but there were also some British, Americans, and even Australians who flew with the 419. The ground crews were mostly from the Royal Air Force. In January 1942, they began to fly night-missions over Germany with the Vickers Wellington Mk III. In August 1942 they moved north to RAF Leeming as part of the new 6 Group, Bomber Command. In

The all-Canadian crew of 419 Squadron Vickers Wellington Mk 1C bomber ("H" for Harry) gather for a photograph on their Royal Canadian Air Force base in England on 9 Feb 1942. *DND Archives Photo, PL-7096*

Vickers Wellington Mk III of Wing Commander "Moose" Fulton

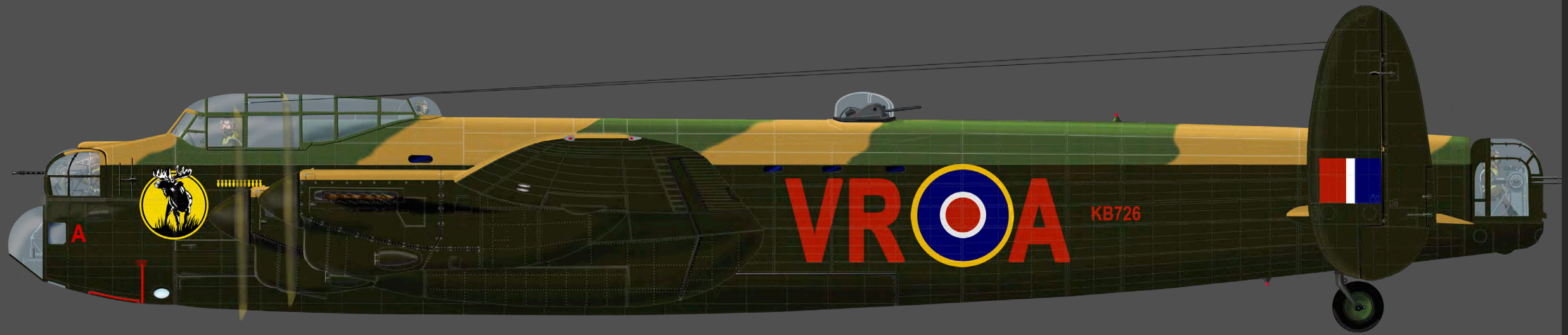
Handley Page Halifax Mark II Series "Special" bombers

"Special" referres to the "Z" nose fairing and the removal of dorsal gun turret, increasing the speed by 16 mph.



Halifax JD158 VR-D "Dragon" of the 419 "Moose" Squadron based at RAF Middleton St. George in 1943. The Dragon was shut down on the attack on Peenemünde on 17/18 August 1943, all crew members were lost in the Baltic Sea near Stralsund-Gross Zicker.

Halifax BB323 VR-R "Mermaid" of the 419 "Moose" Squadron based at RAF Middleton St. George in 1943. The Mermaid was shot down by a Luftwaffe night fighter over Venlo, Holland on 14 July 1943. The tail gunner was killed but the rest of the crew survived as POWs.



This Canadian Lancaster, built in Malton, Ontario, serving with 419 "Moose" Squadron based at RAF Middleton St. George, UK, was shot down on their 13th operation over Cambray, France on 13 June, 1944 by a Luftwaffe Junkers Ju 88 night fighter. Mid-upper gunner Andrew Mynarski tried to save one of the crew, died when he bailed out with his parachute in flames shortly after landing. For his heroic actions, he was awarded the Victoria Cross, the highest award for bravery in the face of the enemy that can be awarded to British and Commonwealth forces.

November the 419 Squadron was re-equipped with the Handley Page Halifax Mk II. Many of these were the Halifax B.Mk II Series 1 (Special), also known as the "Z" nose configuration having the front turret as well as the dorsal turret removed which increased the speed as much as 16 mph over the other MK IIs. The squadron flew the Halifax for the next 18 months on the night offensive against Germany, not just performing bombing raids but also mine laying in the Channel and the Baltic Sea.
In April 1944 the squadron began the transition to the Avro Lancaster Mk X which was produced in Canada and flown across the Atlantic. The squadron remained continuously on the offensive until 25 April 1945, when it flew its last sortie. The squadron caused severe damage to the enemy from Peenemünde - the area was highly involved in the development and production of the V-1 buzz bomb and V-2 rocket - to other major cities such as Berlin, Hanover, Mannheim, Mannheim, Nuremberg, and even Milan in northern Italy.

The average crew survival rate was between two and three months or about 20 missions flown. Between January 1943 and March 1944, involved in over 200 missions, the 419 Bomb Squadron lost 59 aircraft. At the end of March 1944, they suffered the worst loss of thirteen aircraft in a single mission. Before the D-Day invasion in June 1944, the 419 Bomb Squadron was very active: bombing an aircraft factory at Meulan Les Mureaux, bombing successfully rail-yards at Trappes, Le Mans, Amiens, Laon, Aulnoye, Courtrai and Vaires-sur-Marne, also mine-laying operations in the Gironde Estuary, Brest, Lorient, St Nazaire, Terchelling Islands, Helgoland, and the Kieler Bucht.

As a result of its wartime record, 419 Bomb Squadron became one of the most decorated units during the war. From January 1942 to the end of the war over roughly three-and-a-quarter years it logged 400 operational missions, it flew 4,325 sorties with the loss of 618 Aircrew and 129 aircraft, 197 Prisoners of War with 25 evading their capture and two escaping from prison. Several of them were awarded the Distinguished Flying Cross, Distinguished Flying Medal, The French Croix de Guerre, and one of them, Pilot Officer Andrew Charles Mynarski, the Victoria Cross.

419 Moose Squadron returned back home to Canada in June 1945 and was disbanded at Yarmouth Airport in Yarmouth, Nova Scotia, on 5 September 1945.

The 419 Squadron's motto is "MOOSA ASWAYITA" that is in Cree and means "Beware of the moose". The moose is a fierce fighter indigenous to Canada and represents the Squadron's nickname: "The Moose Squadron".

1954 TO 1962

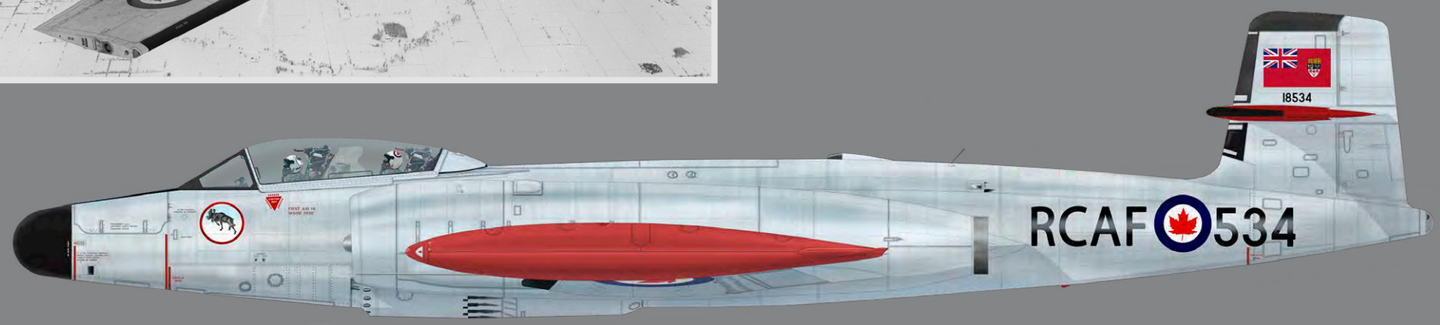
On 15 March 1954, the squadron was re-established as 419 All-Weather Fighter Squadron and shortly thereafter, moved to Germany as Canada's contribution to NATO during the Cold War. Under the command of the 1 Canadian Air Group, the squadron was based at Baden-Söllingen and operated the Avro Canada CF-100 Canuck. While flying in Canada, the CF-100 retained the natural metal finish. However, for Germany, this was changed to a British-style disruptive camouflage scheme with dark sea gray and green on the top and light sea gray on the bottom. On 31 December, 1962 the squadron was again disbanded.

DND photo

RCAF photo

British Aeropace photo

The Avro Canada CF-100 *Canucks* in Germany had a comouflage livery



Avro Canada CF-100 *Canuck* in natural metal finish over Canada. *RCAF photos*

1975 TO 1995

On 2 May 1975, the "Moose" squadron stood up again as 419 Tactical Fighter Training Squadron (419 TFTS) at CFB Cold Lake, Alberta. Equipped with about 23 CF-5Ds and 14 CF-5As, the squadron became the operational training squadron for the CF-5 (CF-116) Freedom Fighter, subsequentially changing its role to that of lead-in-fighter training and adversary training for the CF-18 (CF-188) Hornet. Three of the CF-5As could temporarily be equipped with three Vinten 70 mm cameras, mounted in the aircraft's nose. When fitted with the camera-nose, the designation of the aircraft changed to CF-5A (R). The background for this was that there were some instructors in the squadron who wanted to maintain their aerial reconnaissance qualification. On the withdrawal of the CF-5 from service within der Royal Canadian Air Force in 1995, the 419 TFTS was again disbanded on 25 June 1995.

Photos these pages © Gerhard Lang

Special livery on the occasion of the 70th anniversary of the Royal Canadian Air Force

SINCE 2000

On 23 July 2000, 419 Tactical Fighter Training Squadron (419 TFTS) was reactivated again. The squadron is tasked to conduct the Phase IV of the NATO Flying Training in Canada (NFTC) program at CFB Cold Lake, Alberta. Established in 2000, the NFTC program is a cooperative approach to training military pilots based on a strategic alliance between the Government of Canada and industry, with CAE Inc. being the prime contractor for the industry. Originally, it was planned to end in 2021. However, in January 2017, it was extended until at least 2023. Countries sending candidates to NFTC currently are Canada, Denmark, Italy, Singapore, and the Royal Air Force. This program prepares future fighter pilots for training on CF-18 class aircraft and includes Air-to-Air and Air-to-Ground combat operational procedures. Since 2000, a number of other countries have signed on to the program and interest continues to increase. The 419 TFTS operates the BAE Systems Hawk CT-155 (Hawk Mk.115).

NATO Flying Training in Canada

The pilot training consists of four phases:

- *Phase I: Selection of the candidates for the NFTC and elementary flying training. This phase is a responsibility of the nation that sends students to NFTC.*
- *Phase II: Basic flying training and decision whether the student will continue with transports, helicopter or jet training.*
- *Phase III:* Advanced jet flying training. The successful completion of Phase III leads to Canadian Air Force Wings for the student pilot
- *Phase IV:* This final phase comprises tactical and fighter lead-in training.

After having successfully completed all four phases, the new pilot is ready for conversion to the type of fighter aircraft his or her respective air force is operating. This is usually done by the individual nation's operational conversion unit.

Photo © RCAF

CT-155 Hawk aircraft, from 419 Squadron Cold Lake, fly in formation with the B-25 Mitchell Bomber of Canadian Warplane Heritage Museum over Lake Ontario, Ontario. The aircraft were part of the Heritage Flight organized by the Canadian Warplane Heritage Museum of Hamilton and 419 Squadron, 4 Wing Cold Lake, Alberta (above).

All photos these pages © RCAF

On the occasion of its 75th anniversary in 2016 one of the squadron's CT-155 Hawk was painted with a special livery, reflecting the color scheme applied to the Lancaster bomber the squadron flew in WW II. The aircraft is dedicated in memoriam of Wing Commander John "Moose" Fulton, the first commander of the 419 Squadron. He and his crew did not return home from a mission over Germany on on 2 August 1945.

YEARS

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