FLY MAG
SCANDINAVIAN AVIATION MAGAZINE

THE MAGAZINE

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EXERCISE ANAKONDA 2016

Anakonda is the largest annual exercise of Poland's armed forces, and after recent turmoil in Eastern Ukraine, its significance is more important than ever.

DANISH FIGHTING FALCONS

Report about the sole jet fighter in the Royal Danish Air Force through the past 30 years.

WONSAN AIR FESTIVAL

The very first air show organized in the DPRK took place in September at Kalma international airport.

SPANISH ISLAND HOPPERS

Spanish Army helicopters flies over the beaches, mountains and volcanic landscapes of Lanzarote.

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This issue features reports from excerise Anakonda and NATO Tiger Meet, various European airshows, and the first ever airshow in North Korea - the Wonsan Air Festival, as well as an in depeth article about the Royal Danish Air Force's jet fighter through the past 30 years; F-16 Fighting Falcon.

We hope you enjoy the magazine - Happy reading.

THE MAGAZINE

For more info about FLYMAG, please visit: www.flymag.dk / www.facebook.com/flymag.dk
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ARMY 2016

TEXT & PHOTOS - IVAN VOUKADINOV

Between September 6-11, the second edition of the International Military and Technical Forum Army 2016 was held at the famous Kubinka airbase in Russia. Ivan Voukadinov reports from Kubinka.

A Su-34 departs from Kubinka during Army 2016

Photo by Ivan Voukadinov

Army 2016

Between September 6-11, the second edition of the International Military and Technical Forum Army 2016 was held at the famous Kubinka airbase in Russia. During the six days, daily demonstrations and exhibitions were shown at three different places: Kubinka airbase, Alabino shooting range, and the Patriot Park. About 100 aircraft were shown in flight or on static displays as well as a wide variety of ground equipment from a total of 818 exhibitors from 9 countries.

The ARMY forum began last year, during its first edition also held at Kubinka airbase. The goal of the forum is to showcase the latest Russian military hardware and technologies while also promoting their sale and export to potential customers. Currently it is the largest military exhibition in Russia.

On Tuesday, 6 September the forum opened with a VIP day attended by various high ranking members of the Russian government, defense companies, and other foreign dignitaries. The following two days were “business days” which were not open to the general public but allowed for deals and contracts for various military equipment to be signed outside of public view.

The last three days (the weekend of September 9 to 11) were open to the public who were able to travel freely between all three places.

The Patriot Park hosted the main exhibition area and displays of ground equipment which included armored vehicles, tanks, surface to air systems, UAVs and more. Meanwhile, the nearby Alabino shooting range was the place to see the various dynamic displays.

These were split up into three “clusters”: water cluster, land cluster and air cluster. The land and water displays included impressive live firing demonstrations from vehicles including T-72, T-80, BM-21 Grad, and rocket launchers.

Demonstrations

The air cluster included a simulated water drop from an Il-76MD and single ship aerial demonstrations of the Su-30SM, Su-35, Su-34, MiG-29 and Yak-130. The Sukhois came from Lipetsk airbase and the MiG-29SMT was one of the newly delivered examples at Astrakhan.

These were followed by the three main demonstration groups of the Russian Air Force – Strizhi flying six MiG-29s, Sokoli Rossii flying four Su-30SMs and the Russian Knights flying four Su-27s.

The Sokoli Rossii team were flying brand new Su-30SMs just recently delivered to the 31st IAP at Millerovo and borrowed for the event. Additionally, this was one of the last public appearances of the Russian Knights flying the Su-27. The team will transition to the Su-30SM in the following months.

Kubinka airbase

More demonstrations were made by Mi-26, Mi-28, Mi-8MTV-5, Mi-35M, Ka-52 and ANSAT-U helicopters with the Mi-35M and Ka-52 shooting unguided rockets at mock targets. On most of the days the three different “clusters” displayed at least twice each day.

Finally, Kubinka airbase hosted an impressive static display of most major types currently in service with the Russian air force and Russian naval air force. At least 40 aircraft and helicopters were displayed on the territory of the base.

Some of the more interesting static displays included a Tu-160 from Engels airbase, Tu-22M3 from Shaikovka, Tu-95MS from Ryazan, A-50U from Ivanovo, newly delivered MiG-29KUB and Su-30SM of the Navy, Su-30SM from the test center at Akhtoobinsk, Su-24MR from the recently reactivated Shatalovo airbase, Su-34 and Su-35 from Lipetsk, MiG-29SMT from Astrakhan, Tu-134UBL from Tambov, and a large amount of helicopters of all types in service.

An interesting static display was also a FORPOST unmanned aerial vehicle, which is a licensed copy of the Israeli IAI Searcher. In addition, all aircraft which displayed over Alabino staged out of Kubinka, and the three demonstration groups made additional demonstrations over Kubinka as well as Alabino.

After landing all aircraft taxied very close to the spectators. On the last day of the show, some of these static displays began to leave for their home bases which offered the additional opportunity to see them in the air as they left. Despite this, a majority of the public was either at Alabino or Patriot Park and a much smaller fraction attended Kubinka.

The ARMY forum is shaping up to be an annual event with the next one tentatively scheduled for next summer.

ANAKONDA 2016

TEXT - BARTOSZ BERA & KRZYSZTOF ZIELINSKI
PHOTOS - BARTOSZ BERA

Anakonda is the largest annual exercise of Poland's armed forces and after recent turmoil in Eastern Ukraine, its significance is more important than ever. Bartosz Bera and Krzysztof Zielinski reports from the exercise.

A Polish Air Force Mil Mi-17 flies in formation with a Polish Navy SH-2G, along the Polish coast. Photo by Bartosz Bera

Anakonda 2016

Anakonda is the largest annual exercise of Poland's armed forces and after recent turmoil in Eastern Ukraine, its significance is more important than ever. Poland's NATO partners considered it to be a great opportunity to present the strength of the Alliance and the readiness to fight against so called "green men", (which is how troops fighting against Ukraine's army, that seemed to not belong to any country, were called) – scenario of this year's exercise assumed hybrid war where "Red" forces took over Baltic states and Northern Poland.

From multiple aspects, this year's exercise was the largest for quite a long time – it took place from 7th to 17th of June 2016 across multiple locations within Poland. The total number of participating troops reached 31,000 (including 12,000 from Polish units belonging to General Command of the Polish Armed Forces).

Concurrently, purely-NATO led exercises, organized by different departments, were being conducted – those being Baltops, Saber Strike and Swift Response – and while they were being performed over Poland they were becoming part of Anakonda. The airborne part of the exercise was mostly based on Polish and American forces and in many aspects was extraordinarily impressive.

Air inauguration of Anakonda 2016 was part of Swift Response 2016 that essentially required mass transport of equipment and paratroopers from different NATO countries, to drop zones located in Northern Poland. Main airborne operations took place near Torun and included 30 transport aircraft from Poland, USA and Great Britain. Main strike force here was the American 82nd Airborne Division, currently in the GRF (Global Response Force) role – supported by the Polish 6th Airborne Brigade and British 16th Brigade.

Troops and equipment (105mm cannons and HMMWVs vehicles for example) were delivered to the drop zone as JFE (Joint Forcible Entry) by C-17 Globemasters that were loaded in Pope Army Airfield. More than 9hr long flights were executed by crews from McChord, Charleston, Elmendorf and Hickam Air Force Bases supported by KC-135R and KC-10 tankers and for Polish and British troops it was their longest ever flight to the drop zone.

Operations over Syria

This transatlantic fleet was joined by Polish C-130 and C-295Ms from the 3rd Transport Air Wing and British C-130J from RAF 30 squadron with 6th and 16th Brigade paratroopers on board.

Concurrently, seven C-130Js from the 86th Airlift Wing from Ramstein AFB dropped over the 21st Tactical Air Base in Swidwin several hundred paratroopers from the 173rd Brigade supported by Italians from Folgore Brigade – these units played key role in main airborne scenario of Anakonda exercise.

Combat aircraft were operating from three different locations – the first of them was the 32nd Tactical Air Base in Lask – where local F-16s were joined by several planes from the 31st Tactical Air Base in Poznan-Krzesiny, the 31st USAF FW and 138th ANG FW. Americans show up in Lask on a regular basis for Av-Dets (Aviation Detachments – rotational USAF presence in the 32nd and 33rd Base functioning since 2013, typically lasting couple of weeks each). The second location was the 22nd Tactical Air Base in Malbork where local MiG 29s were joined by six more from the 23rd Base and two from the Bulgarian 3rd Air Base.

Poland has recently increased military cooperation with Bulgaria, which resulted in an agreement for RD-33 engine overhauls in Polish workshops and promise of performing upgrades of Bulgarian MiGs in a similar manner as Polish ones were upgraded – Bulgarian pilots had the opportunity to familiarize themselves with that during Polish AF visits in Graf-Ignatievo base back in September 2015.

Frontline Aircraft

The third location was Swidwin – that was not only a theatre for paratrooper combat exercises but an actively operating airfield as well – for Polish Su-22s. During Anakonda, fast jets performed mainly Close Air Support missions for ground based troops in Drawsko, Wicko Morskie and the Wedrzyn ranges. Whilst F-16s during Baltops performed Offensive Counter Air and Defensive Counter Air Missions, together with previously mentioned USAF units, Eurofighters from JG 73 from Laage and Swedish JAS 39 Gripens from F17 wing in Kallinge. (One of them provided air cover for amphibious landings at the Wicko Morskie range).

The mission that was an absolute “cherry on top” though, was an escort of B-52H bombers, operating over the Baltic Sea out of RAF Fairford. (One of the three bombers deployed there from the23rd Bomber Wing from Minot AFB in North Dakota) – These escorts formed up creating epic pictures and circulated quickly all over the world. All participating aircraft were supported by four KC-135Rs from the 100th ARW – which for the time of exercise were deployed to Powidz.

Su-22s – beside the earlier mentioned CAS missions, also performed flights to meet the needs of the air defense units training in the Wicko Pomorskie range, launched (from 5000m) aerial target missiles SRCP-WR (a modified RS-2US missile, previously equipped on MiG-21 from a surplus left from the Fishbed retirement). Slightly non-typical, a task for a single Fitter was a “show of force” that was performed during the “Kaper” part of the exercise.

This scenario included the hijacking of a passenger vessel by terrorists (in this role – small Polish Navy ship KTr-852), failure of the negotiations and recovery of the ship by force. The Su-22’s role was a low-level, high-speed pass which was supposed to distract “hijackers” making any entry by the GROM special forces unit operators, (that were approaching the ship by both RIB boats and Mi-17 helicopters), possible.

A US Army AH-64 Apache during exercise Anakonda 2016

Photos by Bartosz Bera

New kid on the block: The Air Tractor

The most impressive airborne part of Anakonda 2016 was definitely the helicopter one – despite only Polish and American crews participating in it. A large part of it was driven by aircraft from the 12th Combat Aviation Brigade, of which almost 60 arrived in Poland. Task Force Griffin – which was how the combined Polish-American unit was named – operated from two airfields.

The main one was the 12th Unmanned Aircraft Base in Miroslawiec that hosted 14 AH-64Ds (1 battalion, 3rd Aviation Regiment), 6 CH-47F Chinooks (1 battalion, 214th Aviation Regiment), 3 UH-60M Black Hawks (1-214 GSAB), 6 Mi-24 Hinds (56th Air Base), 2 W-3PLs (56th Air Base) and 4 Mi-2s (56th Air Base) – additionally, there were some more choppers operating outside Task Force Griffin – chemical Mi-2Ch, medical Mi-17AE (Airborne Medevac Unit also built a field hospital inside the base) and electronic reconnaissance helicopter “Procjon”. Rest of the Task Force Griffin aircraft was based in the 56th Base, Inowroclaw – those included 32 UH-60M from 1-214.

Everything was commanded by American officer Col. Ryan K. Welch. Crews started the exercise with joint training flights – Mi-24 and W-3PLP Gluszec flew together with AH-64Ds. Mi-24 crews were very impressed with the Apache’s capabilities – amount of available power allowing them to achieve immediate firing position, perform the attack and then leave to hide as well as with the simplicity of the start-up procedure of the helicopter.

First joint exercise task, for executing which command delegated a pair of AH-64Ds and a pair of W-3PLs, was providing cover for amphibious Wisla river crossing (30 German and British amphibious M3 vehicles), north of the previous day’s mass drop location.

The almost three hour long mission took two days of prior planning and usage of FARP (Forward Arming and Refueling Point) located in Inowroclaw. In this case, slight difficulty came from the Polish helicopters inability to perform refueling with engines on (HOT refueling) – which extended their time spent at FARP.

UAV capabilities

Time spent around the crossing area was around an hour with the break for refueling – after that, helicopters departed to Miroslawiec. During subsequent days, crews were preparing for the main task of the exercise – which was a mass “air assault” – its scenario consisted of transferring troops from the 173rd Brigade from an airfield in Swidwin (which was “repossessed” from enemy troops immediately after the drop) to the Wedrzyn range where they were supposed to perform an assault on specific objects located in an urban zone.

35 of Task Force Griffin helicopters performed the transfer and were additionally supported by Mi-17s from the Polish 25th Air Cavalry Brigade.

Transport forces were protected by a pair of Mi-24s and a pair of AH-64Ds and the transfer operation was divided into three separate waves – second and third waves were performed during night and included less choppers than first one. All aircraft were relocated to Swidwin and the Mi-24s were equipped with additional PTB-450 fuel tanks which allowed them to avoid visiting FARP.


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Quick Reaction Force

For safety reasons, flights were performed at higher altitudes than normal war zone operation tactics would suggest and with anti-collision lights on – since all aircraft were technically operating in a civil airspace. Helicopters providing protection for the transfer were operating on the edges of the entire formation and after landing were hovering in the predetermined tactical cover locations.

Entirety of this enormous (largest in recent years) exercise went without any problems and its epilogue ended being – as planned in the whole scenario – counter-strike of the enemy forces around dawn that was fought off by Mi-24s and Apaches called by JTAC from the 173rd Brigade.

This was followed by Anakonda's only live fire exercise – Mi-24s crews were firing at their targets located by the Drawsko Pomorskie range using UPK-23-250 pods – which was jointly performed together with artillery and missile units and Polish F-16s as well.

Attack helicopter

The last part combined operations during DV Day, during which Apaches and Mi-24s executed CAS missions for special forces units fast roping off the the 7th Special Operation Squadron (7 Eskadra Dzialan Specjalnych -7 EDS) Mi-17 decks.

The 7th EDS crews were also operating from the Miroslawiec airfield but remained outside Task Force Griffin structure, functioning within special operations team that included operators from Poland, USA, Hungary, Croatia and Macedonia (7th EDS was the only airborne unit in that team, due to regular daily duties where the unit is fully dedicated to special operations).

The squadron performed mostly night missions using night vision goggles – and those typically required penetrating enemy zones while remaining undetected by their radars and deliver (infil) or extract (exfil) groups of special force operators.

In most of these missions, troop deliveries and extractions were performed using full landings (most of the Mi-17s that the 7th EDS uses have doors on both sides with the rear gate removed). However, in several cases, fast rope was in use.

Command and Control

The squadron's crews were also prepared to perform CAS missions using weaponry their helicopters were equipped with. Shooters were using PK machine guns or M134D Gatlings. Additionally, during Anakonda, their helicopters were carrying external weapons configurations that aren't typically seen on Polish Mi-17s – four standard UB-32 pods with unguided S-5 missiles and two – very effective and favored by pilots but known mostly from Mi-24s – UPK-23-250 pods with GzZ-23 guns.

Slightly different during the 7th EDS mission was the task during the "Kaper" episode which required safe delivery of the Hostage Rescue team to the deck of the hijacked ship. Perfect timing was key here, since the strike team had to be delivered to the deck at the exact time the groups on RIB boats approached it.

Tall masts of the ship created additional difficulty but the 7th EDS crews practice such approaches literally daily and it was a cup of tea for them. After delivery, all the helicopters remained in tight formation near the ship to provide sniper support – if required. It is worth adding that additional external support was provided by a Polish Navy SH-2G Kaman helicopter crew from the 43rd Naval Aviation Base and also included an on-board sniper.

The Anakonda exercise, without doubt, delivered substantial political and military benefits. On a tactical level it allowed cooperation between the participating units (for example between 12 CAB and 56th Air Base) – that most certainly will provide opportunities for further joint projects (that gen. Miroslaw Rozanski – Chief Commander of General Command of the Polish Armed Forces – is of the opinion that exercises with allies brings added value for Polish armed forces). From a strategical point of view, the exercise provided a very clear message to Eastern NATO countries that in case of any threat, the alliance has means to provide help and support of substantial force.

Special thanks for the General Command of Polish Armed Forces, pplk Szczepan Gluszczak, crews and airmen of the 56th Air Base, 7th Special Operation Squadron and commander and personnel of the 12th Unmanned Aircraft Base in Miroslawiec

ISLAND HOPPERS

TEXT - DIRK JAN DE RIDDER & MENSO VAN WESTRHENEN
PHOTOS - DIRK JAN DE RIDDER

While thousands of British, Dutch and German tourists celebrated their holiday on the beaches of Lanzarote, they saw formations of five Spanish Army helicopters fly over the island's beaches, mountains and volcanic landscapes multiple times a day. For pilots and maintenance crew of BHELMA VI their week at Lanzarote was far from a holiday.

Two Spanish Air Force SA 300L Puma's flies in formation above the dessert dunes.

Photo by Dirk Jan de Ridder

Famara 2016

While thousands of British, Dutch and German tourists celebrated their holiday on the beaches of Lanzarote, they saw formations of five Spanish Army helicopters fly over the island's beaches, mountains and volcanic landscapes multiple times a day. For pilots and maintenance crew of BHELMA VI their week at Lanzarote was far from a holiday. It was their busiest week of the year. Dirk Jan de Ridder and Menso van Westrhenen were there to report.

BHELMA VI (Batallón de Helicopters de Maniobra VI – Tactical Helicopter Battalion VI) sent two AS332 Super Pumas and three AB212s to participate in exercise Famara 2016 between 5 and 10 June. Nearly all of its pilots as well as many technicians and other personnel attended the battalion's annual exercise. Every day three five-ship sorties were flown, comprising a morning, afternoon and night sortie.

The main objective of exercise Famara 2016 was to train the planning, management and execution of tactical missions while operating out of a deployed base on a fictional island infiltrated by insurgents.

Every sortie was lead by another pilot and critically evaluated by battalion commander lieutenant colonel Alberto Quero Tomás Fernández de Tejada.

He explains: *"What I try to do in this exercise mainly is to train my officers to follow standard procedures so that all the preparations and all the procedures can be performed easier. For the next six months we have a reduced company of helicopters available for national requirements. This week is an evaluation to certify them for that mission. I am mainly evaluating the preparation and the briefing of the missions. My major, the chief of operations, evaluates the flying part of the exercise."*

Both day and night

The biggest sortie of the whole exercise comprised an air assault mission that lasted from sunrise until after sunset on Wednesday. Airmobile forces and their equipment were transported from the island of Fuerteventura to Lanzarote, both on board the helicopters and using external sling loads.

By mid-day everything had been transferred and the first group of pilots returned to base. Late afternoon the second group took over, bringing all personnel and material back to Fuerteventura. Their final hop was during sunset and they returned to base switching to night vision goggles during the flight.

BHELMA VI, the Spanish Army's smallest helicopter battalion, is equipped with three AS332 Super Puma and five AB212 Twin Hueys and based at the island of Tenerife. Until the beginning of this year it was also the last main operator of the UH-1H in the Spanish Army, but the type was withdrawn from use after over 30 years and 20.000 flying hours with the unit.

Operating multiple helicopter types creates many challenges, as lieutenant colonel Quero explains: *"Having two helicopters types is really a problem. Six months ago we even had three helicopters. The UH-1 has a single engine and in Spain it wasn't certified to fly over the sea with passengers. Here in the Canary Islands most flights include some part of the flight over the water, so it was not really useful, but we loved that helicopter because many of us learned to fly with it.*

We are now in a slow but determined transformation process towards the Super Puma, which in the end will enable us to count on just one helicopter model, similar to other helicopter units in the Spanish Army. This transformation depends on the arrival of the NH90 which is going slowly, so I am afraid we will have both helicopter models for some more years. The AB212s can fly for at least five more years."

All types of helicopters

“I am trying to qualify pilots on just one helicopter, but that is not entirely possible. I don’t have enough pilots to separate them perfectly between the AB212 and the Super Puma. It happens, but it is not common for pilots to fly both helicopters during the same period.

They fly the Super Puma and if I need them to fly the AB212 they will fly that helicopter for a while. For pilots with a lower amount of flying hours it is quite dangerous to change between the two helicopters. They will fly just one helicopter, even though some of them may be qualified in both. I have flown some hours in both and, even for me it is difficult to switch.”

BHELMA VI is the only Spanish Army helicopter battalion that does not form part anymore of Fuerzas Aeromóviles del Ejército de Tierra (FAMET, Spanish Army Aviation). Operating under direct command of Mando de Canarias (Canary Islands command) since 2010, BHELMA VI’s main mission is to support the military command of the Canary Islands, be ready to deploy abroad on peace keeping missions, integrate in large force operations and help the civilian population in case of emergencies.

Lieutenant colonel Quero: *“The command structure makes us different, but we work a lot with other FAMET units. Not as much as other FAMET units, but that is not because of the organisation. It is because of the distance. It is not easy to send our helicopters to the peninsula to cooperate in big exercises, but our pilots cooperate in every big FAMET exercise.*

Next month we will have some Chinooks from Madrid participating in an exercise here with us. I am also planning to have a seminar of attack helicopter operations. Preparing to work together is challenging. In our current exercise we simulate a patrol of attack and heavy transport helicopters. My officers must be conscious that we will never operate abroad without attack helicopters and normally not without transport helicopters either. We have to be ready to plan and execute operations all together.”

BHELMA

The Spanish Army has three tactical helicopter battalions, two of which are based in mainland Spain. BHELMA III in Logroño (northern Spain) used to operate the Cougar and is starting to convert to the NH90. BHELMA IV in Seville still operates both Cougars and Super Pumas. BHELMA VI has always been the 'lesser-equipped' battalion operating older and lighter helicopter types.

In 2010 a pair of Super Pumas arrived, significantly improving the unit's capability of airlifting personnel and cargo between the islands. The original plan was for all three tactical transport battalions to be equipped with the NH90. Due to budget cuts and cost overruns, the NH90 order was cut in half and only BHELMA III will operate the helicopter. BHELMA IV will become a Cougar battalion with its Super Pumas to be transferred to BHELMA VI at Tenerife.

The arrival of more Super Pumas and the eventual retirement of the AB212 will enable the battalion to prepare for operations abroad like the other two tactical helicopter battalions. Until now BHELMA VI has only carried out peacekeeping missions in Bosnia and Herzegovina (in 2004 and 2005) and Lebanon (from 2008 to 2009). Its pilots, board operators and maintenance personnel have also deployed to other locations as part of other battalions. The final FAMET deployment to Afghanistan in 2013 was largely composed of BHELMA VI personnel.

Lieutenant colonel Quero concludes: *"BHELMA VI is not a very popular unit. We have a system asking personnel where they want to go. If there is a post where the army needs someone and if no-one wants to go, someone has to go. This is a very nice place and a very nice unit. For people with families and children on the peninsula it is not an easy decision to move the whole family, but when they come, they don't normally want to go back to the peninsula anymore."*

DANISH FIGHTHING FALCONS

TEXT - SØREN AUGUSTESEN
PHOTOS - SØREN AUGUSTESEN, JOHN KRISTENSEN & SØREN NIELSEN

Søren Augustesens reports on the sole jet fighter in the Royal Danish Air Force through the past 30 years, the history, the current status and the future.

RDAF F-16s often carries Day-Glo coloured Sidewinders. These are used to differentiate between friend and foe during mock air-to-air combat.

Photo by Søren Augustesen

Danish Falcons

In the early 1970s the Royal Danish Air Force (RDAF) started looking for a replacement for the three types of fighter aircraft then in service. The new fighter would have to replace the Lockheed F-104G Starfighter, the North American F-100D/F Super Sabre and the SAAB F-35 Draken. Under consideration were alternative fighters, the General Dynamics (now Lockheed Martin) F-16 Fighting Falcon, the SAAB JAS-37 Viggen and the Dassault Mirage F-1.

By the end of the competition, the F-16 Fighting Falcon was selected and in 1975 Denmark joined Belgium, Holland and Norway in an order for a total of 348 airframes from the United States. Of these, Denmark initially ordered 58 F-16s, consisting of 48 F-16As and 10 F-16Bs all build by SABCA in Belgium.

The first F-16B, serial number ET-204, was delivered to the RDAF on the January 18, 1980. Following the initial order of 58 airframes, a further eight F-16As and four F-16B were ordered in 1984. These were built by Fokker in Holland and delivered in 1988-89. In 1994, a further three F-16As were purchased and more were added in 1997 (three more A models and one B model). These last seven aircraft were all ex-USAF airframes.

This last purchase brought the total up to 77 airframes made up of 62 A models and 15 B models.

Of the 77 airframes delivered, 39 were delivered as Block-10 aircraft with the remaining 38 airframes delivered as Block-15. As of June 2016, the RDAF have 44 F-16s left in service, comprised of three F-16AM Block-10, three F-16BM Block-10, 29 F-16AM Block-15 and eight F-16BM Block-15. The forty-fourth F-16 is ET-210, F-16BM Block-10, which flies in the USA for the F-35 Lighting II test program.

Since the first delivery in 1980, the RDAF F-16s have been through various update programs, bringing new features and capabilities to the fleet, as well as extending their service life.

Upgrades

The largest of these that the RDAF F-16s have been through is the Mid Life Upgrade (MLU) program which the RDAF joined from its onset in 1989 when the initial planning stages started. In total, the RDAF upgraded 48 F-16As and 13 F-16Bs. All RDAF F-16s were modified at the main F-16 depot at Aalborg Air Base in the northern part of Jutland.

Most of the RDAF F-16 remaining in service has been upgraded to the MLU 6.5 tape standard; except for the seven remaining Block-10 airframes, which have only been upgraded to MLU 4.3 tape. Because they are only Block-10, they do not have the strengthened nose wheel construction and they are unable to carry a targeting pod as well as not being able to fire the AIM-120 AMRAAM air-to-air missile. These airframes are only used for training and as Quick Reaction Alert (QRA) aircraft but not for international missions.

In 1986, many other European users of the F-16 upgraded the Pratt & Whitney F100 PW200 engines to a modernised version namely, the PW-100-220E. However the Danish government decided not to join this engine upgrade. With the drawn out selection process for the F-16 replacement, it soon became clear that the original engines would not be able to see the F-16s through to their out-of-service date.

This meant that the RDAF in 2013 purchased 50 used F100 PW220E engines and these are currently being fitted to the RDAF F-16 fleet to keep the aircraft flying until their planned out-of-service date in 2024. Commanding officer of 730 Squadron, pilot name 'STI' said about the upgraded engines *"The main advantages of the new -220E engines are more rapid thrust during take off, which means the aircraft gets airborne quicker, leaving more runway in case of an emergency. The engine also performs better in the air, which improves its effectiveness during air-to-air combat"*.

With the F-16 replacement not expected to reach Full Operational Capability (FOC) until 2027, the RDAF F-16s are currently going through a structural life enhancement program, which aims at keeping the F-16s flying until at least 2024.

F-16 squadrons

The RDAF currently have two F-16 squadrons, 727 Squadron and 730 Squadron. No F-16s are assigned to either squadron. All F-16s are pooled together at the Aircraft Maintenance Squadron and jets are assigned to each fighter squadron on an “as needed” basic.

Denmark is part of the European Participating Air Forces, and both squadrons are assigned to the European Expeditionary Air Wing. In the last almost 20 years, RDAF F-16 has participated in numerous international missions and both squadrons now have a core of very experienced pilots, many of whom have more than 1000 hours in the F-16.

The main day-to-day mission of the Danish F-16s is the 24-hour Quick Reaction Alert (QRA) maintained at FW Skrydstrup. 24 hours a day, seven days a week, 365 days a year, two F-16s are kept on QRA readiness, with two more as immediate backup. The four aircraft are kept in a specially constructed building close to the crew building. The aircrafts are fully fuelled, checked out and can be airborne within minutes of the alarm sounding.

The aircraft are armed with two AIM-9L Siderwinders, a centreline fuel tank and a full drum of 20mm ammo for the gun. Two pilots and two ground crews are on 12.5 hours standby in a building close to the QRA shelters. In addition to the two main jets and the two backup jets, 2-3 airframes are on standby, in case one of the four jets has a malfunction that can’t be fixed.

This is done to avoid situations where one of the four primary aircraft breaks down Friday afternoon, leaving one of the QRA jets without a spare airframe for the weekend. These standby jets are also armed and can be ready for flight at short notice.

Apart from keeping the 24-hour QRA, the two F-16 squadrons have to keep the pilots current and well trained. This means that on a normal day two missions are flown, one in the morning and one in the afternoon, usually consisting of eight aircraft per mission. In times when aircrafts are deployed on international missions, or on exercises, the number of airframes per mission is reduced.

A RDAF pilot signs off for the aircraft before a night training mission.

Photo by Søren Augustesen

International operations

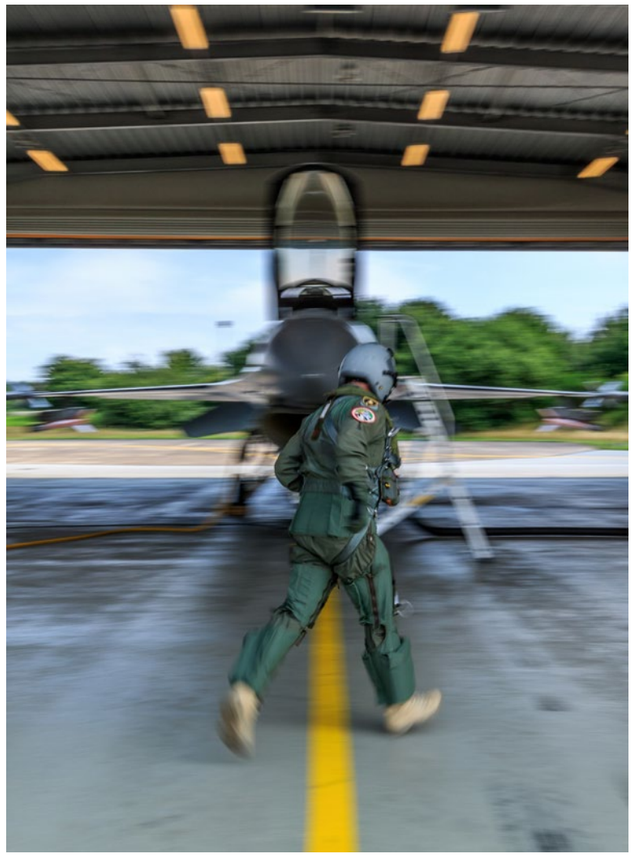
The first time RDAF F-16s or any type of RDAF fighter aircraft, participated in combat operations was during Operation Allied Force, the NATO led missions against Serbian positions in Kosovo. On October 13, 1998, six F-16s from Eskadrille 730 (730 Fighter Squadron) departed Fighter Wing (FW) Skrydstrup, along with a total of 115 support personnel and headed for Grazzanise Air Base in Italy. In April 1999, a further three F-16s were send to Grazzanise where they operated until June 2000.

After this initial overseas operation, the RDAF F-16 has been very active internationally. The next time RDAF F-16s participated in a combat operation was during the US-led “Operation Enduring Freedom” over Afghanistan. From October 1, 2002 until October 1, 2003 six RDAF F-16s operated out of Manas Air Base in Kyrgyzstan. During the deployment the six F-16s flew a total of 743 missions over Afghanistan, totalling about 4350 flight hours. During these missions several laser-guided bombs were dropped.

After the Baltic countries joined NATO in April 2004, NATO set up the Baltic Air Policing mission to provide air policing over the three nations as they lacked the assets to do so themselves. RDAF F-16s have been deployed to the Baltic region four times (2004, 2009, 2013 and 2014), flying out of either Šiauliai Air Base in Lithuania or Ämari air base in Estonia.

In September 2006, the USAF stopped deploying fighter units to Keflavik Air Base, which left Iceland with no means to patrol their own airspace. Following several intrusions of Icelandic air space by Russian aircraft, NATO air policing over Iceland was started in May 2008. The RDAF have been deployed to Keflavik Air Base on three occasions, in 2009, 2010 and 2015.

While on station in Keflavik in March 2009, RDAF F-16 were also flying the Baltic Air Policing mission from Šiauliai Air Base in Lithuania, which meant that the RDAF were carrying out air policing over five different nations simultaneously.



Operation Odyssey Dawn

On March 19, 2011 the Danish government, backed up by UN resolution 1973, decided to send a total of six F-16 and 120 personnel to the Naval Air Station Sigonella on Sicily to help with the US led Operation Odyssey Dawn, the fight again Colonel Gadhafi's forces. The Danish F-16s undertook their first operational mission on March 20 and during the twelve days Operation Odyssey Dawn lasted, the Danish F-16s flew 41 missions and dropped 102 bombs.

On April 1, the US-led Operation Odyssey Dawn ended and was replaced by the NATO led Operation Unified Protector. During both operations the RDAF F-16s flew 600 missions and dropped 923 bombs. The Danish F-16s flew their last mission on the evening of October 31; this was also the last NATO mission with fighter jets. During Operation Unified Protector NATO aircraft flew 26435 single sorties, of which the Danish F-16s flew approximately 1300.

More recently, in October 2014, four RDAF F-16s, plus three spares, deployed to Ahmed Al Jaber Air Base in Kuwait to assist the US-led international coalition in the fight against the Islamic terror organisation ISIL in Iraq. The F-16's, along with around 140 personal, were deployed to Ahmed Al Jaber Air Base until October 2015, when they returned to their home base at Fighter Wing Skrydstrup. During this time, the Danish F-16s flew 547 missions over Iraq and dropped 503 bombs.

A RDAF F-16 breaks off from the tanker in style!

Photo by Søren Nielsen

Fight against ISIL

On May 4, 2016 the Danish Parliament decided that RDAF F-16s should return to the Middle East to again help in the fight against ISIL, this time flying over both Iraq and Syria as part of the Inherent Resolve campaign. Like the previous deployment, four F-16s were sent with three airframes in reserve. On June 15, 2016 eight RDAF F-16s took off from their home base and headed towards Incirlik Air Base in Turkey.

On the way, they made a scheduled fuel stop at Gioia Del Colle in Italy. From there, seven aircraft continued to Incirlik Air Base, while the eighth one returned to FW Skrydstrup. It is expected that the F-16s will be deployed for six months. From Incirlik the Danish F-16s will fly missions over both Syria and Iraq in the fight against ISIL.

On June 17 two Danish F-16s flew the first combat mission from Incirlik AB over both Syria and Iraq but no bombs were dropped during this first sortie. As of October 5, the RDAF F-16s have flown 166 missions, during which 231 precision weapons have been dropped on various targets.

Arctic Falcons

For many years the RDAF have flown patrols over Greenland using a combination of CL-604 Challenger and C-130J-30 Hercules aircraft from 721 squadron. In 2015 the decision was made to test out the F-16 and its sensor suite over Greenland and to gain knowledge about operating fighter aircraft over the arctic.

RDAF F-16s have previously made fuel stops at Kangerlussuaq (Sønder Strømfjord) while deploying to the United States, but this would be the first time missions would actually be flown over Greenland.

On August 5, 2015 three F-16s took off from FW Skrydstrup and headed towards Kangerlussuaq. Along with them were also a CL-604 Challenger aircraft and a C-130J-30 carrying spare parts and ground crews.

To help deal with the long distances when flying over Greenland, the RDAF borrowed two sets of 600-gallon drop tanks from the Portuguese Air Force. The 600-gallon drop tanks were used by the two primary jets, while the third, a backup jet, flew to Greenland with the normal 370-gallon drop tanks.

Greenland

During their mission to Greenland, the two primary jets landed at Thule AFB, the first ever landing there by an F-16, almost 40 years after the last single seat fighter landed at the base. Having successfully completed a number of sorties over large parts of Greenland, the three F-16s returned to Denmark on August 7, 2015.

Future Fighter

The search for an F-16 replacement technically started in 1997 when Denmark joined the Joint Strike Fighter (JSF) program as a Level 3 partner. In August 2005 the competition to replace the F-16 started in earnest, when the Danish Department of Defence requested information from Lockheed (Joint Strike Fighter), EADS (Eurofighter), SAAB (JAS-39 Gripen) and Dassault (Rafale) but the latter refused to enter into the selection process as they felt that the Joint Strike Fighter had already been chosen.

In December 2007, EADS pulled the Eurofighter out of the competition as they felt that Lockheed were receiving an unfair advantage, however they re-entered the fray in March 2013. In May of 2008, Boeing made a last minute entry into the selection process with the F/A-18 E/F Super Hornet.

Postponed decision

In March of 2009 the decision for the new fighter was postponed for the first time until late 2009. In October 2009, the decision was postponed for a second time, this time until 2010. Yet again, in March 2010 the selection process was put on hold for up to four years as new analysis showed that the RDAF F-16s could fly for four years longer than first assumed.

The decision process was re-started in March 2013 and on April 10, 2014, the Danish Ministry of Defence sent out “Request for Binding Information” (RBI) to the four manufacturers in the competition. On July 21, 2014 the ministry received the RBI back from Lockheed, Boeing and EADS. SAAB decided to pull out of the competition at this point.

On the May 26, 2015 the then Defence minister announced that the discussions about the new fighter would start in the Parliament on June 18, but the next day the then Prime Minister called for a general election on that date and the decision were postponed yet again.

F-35 Lightning II

On May 12, 2016 the Danish government announced that it had chosen the Lockheed F-35 Lightning II as its preferred replacement for the F-16 in RDAF service.

On June 9, the leading Danish government party, along with other parties in the Danish Parliament, reached an agreement to purchase a total of 27 F-35's at an estimated cost of $3 billion. The 27 airframes will replace the current F-16 fleet of approximately 44 airframes. Of the 27 F-35s, five will remain in the USA at Luke Air Force Base where they will be used to train future Danish F-35 pilots and ground crews.

Commanding officer of 730 Squadron, 'STI' had this reaction to the selection of the F-35; *"Generally the pilots are pleased with the decision. There is a feeling that it was the correct choice. It is important that we have chosen the same type as two of our European Participating Air Forces (Norway and The Nederland's) partners have chosen." He added, "It is expected that all the teething problems will be solved before the RDAF receives their first aircraft."*

The decision to purchase 27 F-35s has subsequently been met with criticism and scepticism from aviation experts, both nationally and internationally. In their reasoning for replacing 44 F-16s with just 27 F-35s, the Danish government is, amongst other things, expecting to be able to fly a minimum of 250 hours per airframe per year, compared with the 165 flight hours that the F-16s fly now.

Standardization

In years when the F-35s are deployed on international missions, the government expects to be able to fly 290 hours per airframe. The 250 hours in a "normal" year, is in stark contrast to the 167.7 flight hours per year that the Norwegian government is expecting for their F-35 fleet and no other F-35 user in the world is expecting to be able to fly 250 hours per year.

Experts have called the numbers used by the Danish government to justify purchasing 27 F-35 unrealistic and naïve.

When the decision to purchase just 27 airframes was announced, the Danish Prime Minister Lars Løkke Rasmussen said:
"*The government has concluded that it is necessary to have 27 new F-35s to replace the F-16s.*

This is neither a build-up nor disarmament. It is a completely neutral extension of the Danish fighter capacity."

Afterwards, several experts pointed out that, whilst the capability of the Danish fighter force remains that same, the capacity will be severely impaired. Having only 22 airframes available in Denmark, will make it very unlikely that the RDAF will be able to participate in international operations while at the same time participating in either the Baltic Air Policing or the air policing over Iceland, something which the F-16 fleet has done before.

A RDAF F-16 breaks away during a training mission in the northern part of Denmark

Photo by Søren Nielsen

Challenge by Boeing

Following the recommendation by the Danish government, Boeing officially challenged the selection, claiming that the estimates of cost per airframe were made using flawed data. In the official government report, it was concluded that 28 F-35s would be purchased at a total cost of $2.33 billion or $83 million per aircraft.

The report also concluded that a total of 38 F/A-18 Super Hornets would be needed to accomplish the same mission over a thirty year period and the total price for these jets were calculated at $4.65 billion or $122 million apiece.

Boeing challenged the price information given in the report, saying that when calculating the cost of the Super Hornet, the cost of sustainment and training for the first five years was included in the upfront procurement cost, but that this was not done for the F-35. It is also noteworthy that the F-35 unit cost cited in the report differs significantly from Pentagon's own estimate of $99 million. The complaints were however refuted by the Danish government.

In mid-September, Boeing took the first step towards a legal challenge against the Danish Ministry of Defence (MoD) recommendation of the F-35, by submitting a "request for insight", which would require the MoD to hand over all the information used to evaluate the three fighters in the competition.

It is especially the economical criteria of the evaluation, and the high cost of the Super Hornet used, that Boeing is going to focus on. They will also be looking into the other three criteria's, strategic, industrial and military aspects.

Boeing says that they are concerned that the evaluation was not as fair and transparent as leading Danish politicians have claimed, and they want it "reviewed to the fullest extent allowed under Danish law" according to vice president and general manager of Boeing's global strike division Debbie Rub.

Boeing is also concerned that the high cost used and the poor evaluation of the Super Hornet given by the Danish MoD, will have a negative effect on other potential Super Hornet customers, namely Canada and Finland.

Poor evaluation

It is unlikely that the legal actions taken by Boeing will make the Danish government cancel the F-35 order, but if Boeing can prove that the prices used by the Danish MoD were exaggerated, it will make them stand better in future fighter competitions non the less.

It is not only the high number of flying hours and comparatively low unit costs used in the selection process which have raised concerns. The Danish government have also calculated using radical changes in the pilots working conditions. These changes included rising the weekly working hours from 37 hours, which is the standard Danish working week, to 48 hours.

They will also open up for the possibility of a 2-to-1 deployment vs. home time, meaning that pilots can be deployed for twice as long as they get to stay home before being deployed again. Also, the service time for pilots might be increased from 8.5 years to 17 years to cut down on the need to train new pilots. It remains to be seen how the pilots work union will react if these changes are implemented.

The current plan put forward by the Danish government is for the first four F-35s to be handed over to the RDAF in 2021, followed by another six in 2022 and the remainder between 2023 and 2026. According to the Danish Defence Ministry, the Danish government reserves the right to buy fewer than 27 airframes if the initial deliveries are delayed or fail to meet the price criteria set once a contract has been negotiated.

The possibility of buying additional airframes in the future is also still on the table. The F-16 fleet is to be phased out from 2020 to 2024. This is expected to leave a gap of two years, from 2022 to 2024 where the RDAF will be unable to participate in international fighter operations as the full operational capability for the F-35 is expected in 2027. It remains to be seen if the planned time schedule is achievable.

The author would like to thank 730 squadron for their help with making this article possible – Vis Superne.

WONSAN AIR FESTIVAL 2016

TEXT & PHOTOS - PATRICK ROEGIES & JURGEN VAN TOOR

The very first air show organized in the DPRK took place in September 2016 at Kalma international airport located in the Wonsan Kumgangsan region. Patrick Roegies & Jurgen Van Toor reports from North Korea.

A two ship of Su-25K's fighter bomber passing by during their demonstration flight at the Wonsan Air Festival 2016.
Photo by Patrick Roegies

Wonsan Air Festival 2016

The Democratic People's Republic of Korea (DPRK) is one of the most isolated nations in the world and from an aviation point of view not much is known concerning the aircraft within the operational inventory of their Air Force.

Until recently there were no air shows in the Democratic People's Republic of Korea (DPRK). Military exercises could only be attended by DPRK leaders and officials on invitation of the government.

The very first air show organized in the DPRK took place in September 2016 at Kalma international airport located in the Wonsan Kumgangsan region.

Organised by Juche Travel services in cooperation with the Korean International Travel Company foreign aviation enthusiast organizations like 4Aviation were enabled to attend to the event.

The Kalma airport has received a facelift over the past few years and is reconstructed into an international airport with constructions completed in 2015.

The infrastructure of the airfield is also modernized and the city of Wonsan now hosts a brand new youth hostel an open air theatre and a restricted town square with the purpose of promoting tourism in this region.

Civil participants

The Air Festival event was organized with the purpose to promote the spirit of international peace and friendship through a joint passion towards aviation. Patrick Roegies and Jurgen van Toor report.

A wide variety of participants took part in the air show. The Wonsan air club, Air Koryo and the DPRK Air Force were the main contributors of the air displays supplemented with remote controlled model aircraft and sky diving performances of the Pyongyang Air Club.

During the Saturday Air Koryo supplied flying displays of the Ilyushin Il-18, Ilyushin Il-62, Ilyushin Il-76, Tupolev Tu-134, Tupolev Tu-154 and Antonov An-26 aircraft and on the Sunday pleasure flights could be made in each individual type.

Furthermore there were air displays of two unmarked aircraft of which one was an Alpi P-400 and the other one was a PAL P-750XL which is probably assigned to the Air Force.

Military participants

The main contributor of the flying displays however was the DPRK Air Force. This was the first time that the DPRK Air Force presented itself to an international audience and several aircraft types were presented.

Serial number 555 is one of the izdelye 9.12B aircraft originally delivered in the first batch of MiG-29's, built in the 36th batch by Mikoyan OKB under construction number 25755.

Photo by Patrick Roegies

Formation of KPAAF

The Korean People's Army Air Force (KPAAF) originated shortly after the war on 20 August 1947. The Air Force received a separate status in 1948 and adapted mainly Soviet tactics and doctrine.

With their primary appointed mission, the air defence of the homeland, the required assets and resources were organized. As a secondary mission the Air Force was appointed the role to provide tactical air support for the army and naval forces.

The Air Force was soon equipped, with the help from their Soviet allies, who supplied Polikarpov Po-2s and Yakovlev Yak-18s. Since most of the airfields were situated in the south the Air Force was mainly concentrated in the south.

The Korean pilots were sent to the Soviet Union and China to receive their pilot training. Soon national aviation schools were opened and joint Soviet – Korean regiments were formed. The first units were equipped with the Li-2 transporters, which made regular flights to the Soviet Union and China.

New aircraft were received soon after the construction of the aviation schools were completed and the domestic training program was up and running. Ilyushin Il-10, Lavoshkin La-9, and Yakovlev Yak-9 fighter aircraft were received and formed the backbone of the KPAAF for the remaining decade.

With the outbreak of the Korean war in June 1950 the KPAAF performed most missions during night time. For these missions the Yak-18's and Po-2's were modified with bomb racks operating in support of the Army.

Since the air-to-air capabilities were minimal since the aircraft in the operational inventory of the KPAAF all dated from the second world war, meant the aircraft which were deployed by the United Nations were superior, and the KPAAF was forced to flee into China operating from Chinese air fields.

The first MiG's

During the conflict the KPAAF received the factory new Mikoyan – Gurevich MiG-15 which were operated by Soviet pilots, evened the score in air to air capabilities. During the Korean war period the forward fuselages of most of the MiG-15 aircraft were painted in bright red for quick identification purposes.

In the course of 1952 these bright red markings were removed and the aircraft were pained in various different new camouflage schemes. By the time the armistice agreement was signed on 27 July 1953, the Air Force had the disposal of approximately several hundreds of MiG-15 Fagot B's and MiG-15 Midgets which were left behind by the Soviet Regiments that operated the aircraft while being deployed in North Korea.

The existing air fields that were severely damaged during the conflict were abandoned and new air fields were constructed in the Democratic People's Republic of Korea using underground aircraft hangars, repair facilities, ammunition, fuel stores, and even air defence missiles underground or in hardened shelters, in some occasions constructed in the surrounding mountains.

The fighter variants of the MiG-15 remained in active service until the late fifties and early sixties by the newer Mikoyan – Gurevich MiG-17 fighters when the aircraft were gradually replaced, while the trainer variant, the MiG-15UTI remained in active service until well in the eighties.

At the start of the sixties the KPAAF received their initial batch of twenty-four Soviet built Ilyushin Il-28 bomber aircraft. When the delivery was completed of the first batch, Chinese license built versions of the Il-28 the Harbin H-5 were acquired.

These aircraft were appointed a wide variety of tasks which resulted in different configurations of the H-5 enabling them to fulfil the bomber, reconnaissance and conversion trainer role. According to estimations a total of eighty-two Il-28 and H-5 aircraft were delivered to the KPAAF.

MiG-21bis appointed bort number 42 red was one of the aircraft, which were delivered from Kazakhstan.

Photos by Patrick Roegies

MiG-21 and Su-7 era

In 1961, a treaty of mutual assistance and military cooperation was signed between The DPRK and The Soviet Union. In accordance with this treaty, between 1961 and 1962, Mikoyan – Gurevich MiG-19's were delivered and the first MiG-21 variants were received from the Soviet Union.

An initial batch of factory new MiG-21F-13's were received in 1963, including a number of MiG-21 trainers. Another acquisition of a MiG-21 subtype took place in 1968 when the Air Force took delivery of factory new MiG-21PFM's.

In the seventies the supersonic fighter bomber made its appearance within the inventory of the KPAAF with the delivery of the Sukhoi Su-7. The KPAAF took delivery of 25 Su-7BMK's and Su-7UMK's. These aircraft were in service appointed to a single yet unknown Regiment with two subordinating squadrons and remained in active service until the mid-nineties.

Also in the seventies an estimated total of 60 let L-39 aircraft were delivered to the KPAAF fulfilling the trainer role.

From China the Q-5 Fantan ground attack aircraft were received to supplement the fighter bomber fleet. According to several unconfirmed sources the total estimated amount of aircraft received varies between 40 and 150 aircraft.

During the seventies and eighties additional Chinese built aircraft were introduced within the operational inventory of the air force as well supplementing the mainly Soviet built fleet. The Air Force took delivery of Chinese built Shenyang F-6 and Chengdu F-7 aircraft.

During that same decade they also received the Sukhoi Su-7, Sukhoi Su-25, the Mikoyan – Gurevich MiG-23 and Mikoyan – Gurevich MiG-29 from the Soviets.

The Mikoyan – Gurevich MiG-23 was introduced in the inventory of the KPAAF in September 1984 when the Air Force took delivery of eight MiG-23ML aircraft and two MiG-23UB trainers. Additional deliveries took place and comprised a total of forty MiG-23ML's and ten MiG-23UB's.

The early eighties

The estimated total of 60 Floggers were operated by the 56th Regiment based at Oksan Air Base and he 57th Regiment based at Onchon Air Base.

Another subtype of the MiG-21 was integrated in the KPAAF inventory was the MiG-21MF, which were acquired second hand from the Soviet Air Force, and initial deliveries took place from 1985 forward.

In 1985 the DPRK also received an unconfirmed number of Hughes MD500 Helicopters by circumventing the export control and UN weapons embargo. Although the configuration of these helicopters was according to civilian versions the KPAAF has modified these helicopters for military purposes.

Six of these helicopters were noted during the Wonsan Air Festival 2016 in full military markings. Also the rotary capabilities were increased and comprised approximately 275 helicopters by the end of the eighties, mainly consisting of Mil Mi-2, Mil Mi-4, Mil Mi-8 and a handful of Mil Mi-26 helicopters.

The first batch of twelve Sukhoi Su-25K Frogfoot aircraft and two Sukhoi Su-25UB training aircraft were ferried by pilots of Soviet Union Regiments and have been delivered in late 1987 to the DPRK Air Force. These aircraft formed the first squadron of a regiment based at Sonchon located approximately 80 kilometres from Pyonyang.

The aircraft delivered were all within the construction number range of the "early 10th series" with their construction numbers ending with the following number range 10xxx.

An Air Koryo Tupolev Tu-154 landing after it's display during the show Saturday.
Photo by Patrick Roegies

The late eighties

A second batch of Su-25K and Su-25UBK aircraft were delivered in the spring of 1988 and were assigned to the second squadron within the regiment and a third identical squadron received their Su-25K's in two batches, with the first batch delivered in the summer and the second batch in the autumn of 1988. According to estimations the DPRK Air Force received approximately 36 Su-25K's and 4 Su-25UB's

The bort numbers used to be blue and the aircraft were painted in a two tone green and brown camouflage scheme. Their current camouflage scheme is a two tone grey scheme and the aircraft are appointed red bort numbers.

The first MiG-29 aircraft were received between 1988 and 1989 and according to unconfirmed sources the KPAAF received aircraft to equip one or two squadrons of MiG-29's. Reports concerning actual deliveries vary from seventeen to forty-five.

Actual deliveries took place in 1988 acquired from the Soviet Union and delivered by Mikoyan OKB. The delivery comprised thirteen izdelye 9.12B MiG-29 Fulcrum A and one izdelye 9.51 MiG-29UB Fulcrum B aircraft. The delivery of this initial batch took place until 1992 when the last aircraft was delivered. These aircraft were all constructed in Russia by Mikoyan OKB possibly in the 36th batch with construction number built up 257xx range.

Since North Korea was the second Asian country to acquire the MiG-29 they were the sole country to purchase a manufacturing license of the MiG-29 and it was the sole country to actually receive the the izdelye 9-13B MiG-29 Fulcrum C version.

A follow up contract in the early nineties comprised the delivery of these ten izdelye 9.13B MiG-29 Fulcrum C to be assembled by the seventh machine industry bureau located at Panghyon which was a serious first attempt to start a domestic aircraft industry. This endeavour proved to be too ambitious for the DPRK and progress remained far behind schedule.

Major delays

Due to major delays in the assembly process and complications in payment terms for the aircraft, which was taken place in goods, the Russian government decided to abandon the program and up to that point only three aircraft were assembled completely. With the cease of deliveries of components the DPRK ceased the pursue of the plans for a MiG-29 fleet comprising forty aircraft. As a consequence the remaining delivered sub-assemblies of the izdelye 9.13B aircraft were never completed and probably cannibalized to keep the operational fleet active by using the spare parts.

The MiG-29 aircraft acquired in the first batch were appointed with a three-digit 5xx serial number. Aircraft have been noted in the 540 and 550 serial range. The three izdelye 9.13B aircraft received deviating serial numbers. Serial number 415 was noted in the past and should be a reference to the birthday of the supreme leader Kim Il-Sung Il who was born on 15 April 1912. The second known serial number 820 refers to the formation of the Air Force, which took place on 20 August 1948. The serial number of the third one remains unknown.

With the cease of the Soviet Union and a visit to the DPRK of Boris Yeltsin further deliveries of aircraft and spare parts were ceased, since further deliveries were banned according to the United Nations arms embargo enforced on Russia. By the end of the nineties a new formal request was submitted by the DPRK to Russia for the delivery of spare parts which, eventually resulted in actual deliveries of spare parts enabling the KPAAF to maintain its operational Fulcrum inventory until well in the new century.

The Fulcrums were appointed to the 55th Kumsong Guards Air Regiment subordinated to the 1st Combat Division at Sunchon Air Base comprising two squadrons. The current operational strength of the Regiment is estimated at fifteen aircraft of which at least five are still in an active condition operating on a rotation basis.

The last known delivery of aircraft took place in the nineties. An additional intended forty, second hand MiG-21bis aircraft were acquired from Kazakhstan in the late nineties.

Current situation

Since this delivery was in conflict with the weapons embargo as enforced by the United Nations deliveries were ceased when one shipment consisting of six aircraft was intercepted at Baku Azerbaijan only thirty were actually delivered. According to estimations a total of 400 MiG-21's were received and an estimated total of 100-150 aircraft are believed to be operational currently.

Fighter and fighter-bomber Regiments

Although the MiG-29 is the most modern fighter within the KPAAF the MiG-21 is still the backbone of the Air Force. In the early 1nineties the operational strength of the KPAAF comprised a total of an estimated 1620 aircraft and 70.000 personnel.

The KPAAF is unable to purchase new aircraft given the still active United Nations arms embargo against the country, meaning their previous conventional aircraft suppliers are unable to supply the KPAAF with newer aircraft. The last attempt to purchase the Chinese built JH-7 aircraft failed since the request for purchase was turned down by China.

Besides the purchase of new aircraft the acquisition of required spare parts has ceased as well leading to direct problems with the existing aircraft within the inventory mainly consisting of Su-25, MiG-21 and MiG-29 supplemented by the remaining Shenyang F-6 and Shenyang F-7 aircraft. The limited spare parts that could be acquired were probably supplied by the friendly states Cuba and Iran.

The same problem occurs with the remaining training, transport and rotary aircraft within the operational inventory of the KPAAF. In order to save fuel and spare the engines and other critical parts MiG-29 pilots are flying the MiG-21.

Approximately fifty Harbin H-5 aircraft, the Chinese license built version of the Il-28 in the configurations of bomber, reconnaissance and conversion trainer versions are believed to be operational. These aircraft assigned to two active Regiments are probably undertaking none-operational missions such as target-towing in addition to more offensive tasks.

Training Regiments

Training aircraft still date from the sixties and does not reflect the requirement to train future pilots preparing them for supersonic flying. Pilot training is mainly performed using the Nanching CJ-6 as the primary trainer before the future pilots continue their fighter training in the remaining two-seat MiG-15UTI supplemented by a small number of Aero L-39C Albatrosses. Helicopter training is provided using the Mil Mi-2 helicopters. Like much of the Democratic People's Republic of Korea Air Force, the effectiveness of the training syllabus is debatable.

Transport Regiments

The KPAAF uses the Soviet designed Antonov An-2 and Chinese license built Y-5 as their main transport aircraft and has received the aircraft in large numbers. According to estimations a total of two-hundred-seventy An-2 and Y-5 aircraft were received. Additionally the KPAAF has the disposal over approximately ten Antonov An-24 transport aircraft and modest fleet of semi-military Ilyushin Il-76 transport aircraft. A small number of Soviet-era like the Tu-134, and the Tu-154 transports in service are painted in the livery Air Koryo to facilitate VIP flights overseas.

Helicopter Regiments

The KPAAF currently still operated the Mi-2, Mi-4 and a small number of Mi-8 helicopters supplemented by the MD500 helicopters for special operation tasks. In recent obeservations a batch of four Mi-26's have been noted as well. It remains unclear how many of the estimated 275 acquired helicopters are still in active service. There are reports of Mil Mi-24 Hind within the operational inventory of the KPAAF but no actual proof of this has been provided.

Order of Battle

The actual order of battle is complicated since a unit can have multiple designations since the centralized command appoints a unit with a name during peace-time, alert-time and war-time status. In all three status the unit can have another designation, divided in an air unit, regiment/ battalion and an heroic name designation.

The air commands appear to have the primary responsibility for integrated air defense and are organized with a semi-automated warning and interception systems to control the surface to air missiles, interceptor aircraft, and air defense artillery units. The territory of North Korea is divided in Three major districts and has assigned its own Air Combat Command.

The First Air Combat Command is situated in the northwest, probably headquartered at Kaechon, is responsible for the west coast to the border with China, including Pyongyang.

The headquarters of the Second Air Combat Command is situated at Toksan and is responsible for the northeast and extends up the east coast to the Soviet border.

The headquarters of the Third Air Combat Command is situated at Hwangju in the south and is responsible for the border with South Korea and the southernmost areas along the east and west coasts.

From 1996 onwards the North Korean Army Air Force had six air divisions at it's disposal under the direct control of the National Air Command. Of these six air divisions three were appointed fighter aircraft, two had transportation aircraft appointed, and one air division consisted of fighter training aircraft.

Currently North Korea operates from approximately seventy air bases, including jet and non-jet capable bases and emergency landing strips. Although not all 70 air bases have active regiments based the bases are kept in an operational status. Besides these airbases the Air Force has appointed a number of highway strips which can be used in case of emergencies during future conflicts. The majority of tactical aircraft are concentrated at air bases around Pyongyang and in the southern provinces.

In total 3 MiG-21bis aircraft were present at the Wonsan Air Festival 2016, here's Red 53 in the air.

Photo by Patrick Roegies

Basic flying training

The North Korean Air Force has the capabilities to put almost all of the military aircraft within their inventory in hardened shelters with some of them located underground or inside mountain caves

With the aging fleet the KPAAF has a limited capability in performing their appointed tasks the defense of the North Korean air space, providing tactical support to the army and naval forces and conduction air operations against South Korea. With the restricted use of assets due to fuel and spare part shortages might affect the annual amount of hours performed by pilots in the KPAAF.

Aircraft industries

Since serious attempts in the past to start a domestic aircraft had failed, the aircraft industry in North Korea is limited. With the assembly of the MiG-29 the basis for a national aircraft manufacturer seemed viable, but for yet unknown reasons this development was not further pursued, possibly due to lacking technological means and know how.

The aircraft industry within the DPRK is limited to constructing the required spare parts for the aircraft in their existing operational inventory.

With the weapon embargo being enforced by the United Nations and the lack of a domestic aircraft industry the DPRK was forced to find other means to find alternatives to replace their aging fleet of aircraft with the oldest models dating from the sixties.

United Nations weapons embargo

The first delivery of aircraft to the DPRK took place in 1985 comprising the delivery of an estimated total of United States manufactured civilian version of eighty-seven MD5000 Hughes helicopters which were indirectly acquired by means of an illegal transaction.

The two Californian brothers Semler made false statements in shippers declarations to the united States Customs Service in 1984 stating that the helicopters were intended for delivery to Germany when in fact the helicopters were to be delivered to North Korea.

Jets from Kazakhstan

In 1996 the DPRK intended to purchase 133 surplus MiG-21 aircraft from the Kazakhstan Air Defense Force. The company operating under the auspices of the Kazakh Ministry of Defense ”Kazvoyentekhimpex” drafted a contract with a total value of 28 Million USD. When these plans became known to the United States State Department the Kazakh government was contacted and resulted in the withdrawal of the contract.

The DPRK government however did not abandon the plan to acquire these aircraft and in early 1997 and a formal request was submitted to Kazakhstani Defense Minister M. Altynbayev by the Sierra Leone ambassador to Moscow informing the delivery of the 133 Mig-21bis aircraft intended for Sierra Leone. Later that year a similar request followed submitted by Peru

After several failed attempts another way was found to deliver the MiG-21bis aircraft to North Korea but failed with deliveries well underway. The delivery of an intended six MiG-21bis aircraft including spare parts was intercepted in Baku, Azerbaijan in March 1999 on board of a Russian transport aircraft which was officially listed as a sugar transport to the DPRK and raised a serious international scandal.

On 14 October 1998 a contract was signed between the DPRK and Czech based company Agroplast comprising the delivery of 40 MiG-21bis aircraft were to be delivered to Agroplast and were to be passed on to North Korea. The aircraft were to be purchased from the Kazakhstan owned Uralsk Metallist Plant which derived the aircraft earmarked as surplus by the Kazakstan Air Defense Force. This resulted in November 1999 to the companies directly involved with this contract.

During investigations it became clear that the transaction was taking place against the official government policy of Kazakhstan and deputy prime minister and minister of foreign affairs K. Tokayev promised to actively cooperate in the investigation of the follow up of this sale. As a result the Kazakhstan government finally admitted that the MiG aircraft were sold to the DPRK and that five previous shipments comprising a total of 30 MiG-21bis aircraft had already successfully taken place before the shipment was intercepted in 1999.

Modernization programs

Since the most recent aircraft, which are still in the operational inventory of the Korean Air Force, were acquired from 1960 until 1990, modernization programs are likely to be conducted on the operational aircraft.

The aircraft presented at the Wonsan Air Festival 2016 were all provided with a new camouflage scheme and looked like they were subjected to an extensive modernization program only recently. Details concerning modernizations remain unclear but unconfirmed sources state that aircraft might have been refurbished by using Belarusian and Cuban resources. If these modernization programs took place in North Korea or abroad remains unclear as well.

Conclusion

Although lots of information remains unknown concerning the KPAAF and the quest for information is difficult the threshold to a more open environment seems to have started with the organization of the Wonsan Open Air Festival. During the closing ceremony of the festival the officials announced there would be a new Air Festival organized in 2017 also open to be visited by foreigners.

THE 2016 NATO TIGER MEET

TEXT - SPENCER WILMOT
PHOTOS - SPENCER WILMOT & SØREN NIELSEN

Base Aerea de Zaragoza, Spain, home of the Spanish Air Force's 15th Wing (Ejercito del Aire - Ala 15), played host this year to the eagerly awaited NATO Tiger Meet (NTM). Spencer Wilmot reports from Zaragoza.

A Zaragoza based tiger Hornets powers off for yet another NTM mission, during NTM 16. Photo by Søren Nielsen

NATO Tiger Meet ‘16

Base Aerea de Zaragoza, Spain, home of the Spanish Air Force’s 15th Wing (Ejercito del Aire - Ala 15), played host this year to the eagerly awaited NATO Tiger Meet (NTM).

Eagerly awaited, indeed. It was promised to be a special occasion, a huge event. And for the most part, it was! In the 55 years history of the NTM, no other Meet had been this big.

Luckily, for photographers and spotters alike, the ‘event’ was spread over two days. Friday seeing the Tiger Meet proper, supported by 1500-1600 tiger crazed photographers, whilst the Saturday was a base Open House. This saw 40,000(!) spectators pass the gates on a typically hot Spanish May day. The crowds were enormous but then, so were the number of aircraft. Over the entire 2 weeks numbers were reported to be around one hundred aircraft.

Zaragoza is by no means a small base! Helped out by the US Navy in its infancy, the massive Southern ramp meant there was a lot of walking involved. That is, if you didn’t want to set up and find a spot for the day by the runway!

Initially, photographers on the Friday could do just that. Although the promise of a full day ending in the evening had been a pulling factor for most, the sad truth was the day wouldn’t quite go as planned.

The evening end to the day turned out to be, in fact, mid afternoon. It meant the great light most people had ideas about was denied, cutting the day short by some 4 hours. And even though it was great access by the side of the runway, there was no getting away from the fact that it meant shooting into the Sun for the most part.

Moving on to why the majority of spotters actually went then; the tiger schemed jets! And boy, there were plenty! Of the decorated aircraft the one that clearly attracted most was the French Navy (4F) E-2C Hawkeye. A reason in its own right to travel to the inner reaches of Spain, for most. Yet sadly, of the two E-2C present, it was the tiger that went u/s, (obviously!)

The roaring tiger schemes!

A huge shame but the French didn’t stop there, however. (When have they?!) They supplied 4 Mirage 2000D of ECE 01/30 (BA 118), one of which was painted up in a stunning White Tiger and draped Spanish flag scheme. Absolutely gorgeous!

6 Rafale M of (11F) Landiviseau were also present from the French Navy, one adorned with a red seahorse and tiger stripe scheme. Delightful. Again, no one does it as good as the French!

Hellenic F-16C/D and Turkish F-16C/D also were a welcome addition to this year’s Meet. Over the 2 day event, the Hellenic special actually underwent an overnight transformation (Friday night), seeing the national fin markings be replaced by an orange design to match the conformal and wing tanks! Very neat. And appreciated by most, no doubt.

The Czechs sent in their special *Alien Tiger* Mi-24 Hind that was clearly an outstanding piece of flying art. Words don’t do it justice, at all. In the right light not much could touch it that weekend. A visual masterpiece! No wonder it was rewarded with *Best Looking Tiger Aircraft*.

Obviously a Tiger Meet wouldn’t be anything without the Belgians and Swiss and they turned up with several Fighting Falcons and Hornets respectively. The BAF’s special orange tiger (31 smd) F-16 was certainly a match for the TuAF (192 Filo) Falcon, (remember Konya?!) Both of them resplendent in orange, white and black tiger stripes.

A Korean Air Cargo 747 takes off in Zaragoza, while the French Marine Rafales is waiting for their turn to taxi out.

Photo by Spencer Wilmot

A bad day turns good

After witnessing the morning's mass launch, photographers were free to wander the limited number of stalls and get some lunch in anticipation of the early afternoon recovery, later on.

Beer was flowing, and let's be honest, helped the Spanish ham go down!

Rumours were flying freely as to what and how and how long we could stay on base, but at the end of the day photographers were given quite a nice location at the side of the arriving taxiway. It meant being able to chose a spot along a 500m section of concrete, scattered with shubbery and trees, thankfully, for some shade.

Plan your shoot well and you could've walked a few metres toward the runway and get the jets recovering, quickly returning to your initial spot to get them taxiing - and showboating - back to the pan.

Most returned with a break over the field, for landing. Common practice and a good indication to get your gear ready. Whilst security were kind enough to give us some leeway, with regards to how close to the action we could get, it was obvious there was a limit to operational boundaries. And rightly so.

So, a hot and busy first day. Many types and many tigers. After the initial disappointment had sunk in, regarding time on base, the day played out very well. Of course, it wasn't every body's idea of perfection. But we here at FLYMAG do our best to make the best out of whatever opportunity we're given. And to be fair, it could've been a lot, lot worse.

Next year's NTM could prove to be a spectacular event in its own right; the French are hosting it at Landiviseau!

THE STARS OF THE SHOWS

TEXT - SØREN NIELSEN
PHOTOS - SØREN NIELSEN & SPENCER WILMOT

A short photo report from various European airshows, where we showcase the "Stars" of the different shows.

The star of the show the Royal Danish Air Force open house show at FSN Skrydstrup, the Ukrainian Su-27 Flanker powers to the sky!

Photo by Søren Nielsen

The stars of the shows

The stars of the shows is a new feature in FLYMAG, where different of FLYMAG reporters visit various airshows around Europe during the summer. We then pick the different airplanes we think is the stars of the shows, and showcase them to you in this photo report.

Instead of doing an in depth report of the different shows, then we'll rather showcase the pictures from the shows.

We have selected to showcase from the following airshows:

Royal International Air Tattoo

- RAF Fairford

Swedish Air Force 90 years anniversary

- Malmens flygplats

Royal Danish Air Force open house

- FSN Skrydstrup

Royal International Air Tattoo

The annual air tattoo at RAF Fairford is usually one of the biggest airshows in the world, and the list only gets more interesting, when it's the year of the bi-annual trade show at Farnborough the following week. This year wasn't an exception, with participating planes such as:

- RAAF KC-30A
- Canadian CP-140 Aurora
- Airbus Defence & Space and Luftwaffe A400M
- FAF with the Mirage 2000N of Ramex Delta
- Greek Phantom
- JASDF KC-767J
- Royal New Zealand Air Force B757
- Pakistan Air Force C-130
- USAF F-22A, F-35A, CV-22
- USMC F-35B, KC-130
- USN F/A-18F

To choose the stars of this show is impossible, and we'll let the pictures do the talking.

The all metalic SAAB formation.
Photo by Spencer Wilmot

Swedish Air Force 90 years anniversary

The Swedes have had a tradition for many years, and continue to have, to keep their old airplanes air worthy, and show case them at the airshows, and the airshow at Malmens flygplats wasn't an exception.

The stars of the show here must be, amongst others the old SAAB planes:

- Tunnan

- Draken

- Viggen

As well as a tactical demonstration of the home team, Helikopterflottiljen (Helicopter squadron) and their HKP 16 (UH-60 Blackhawk) and HKP 15 (AgustaWestland AW109) helicopters.

Royal Danish Air Force - Open house

Usually it's the home team that blows the crowd away during their open house, but the list this year was really impressive, with foreign F-16 demos from HAF, and BAF, USAF B-52 flyby, the Draken of Swedish Air Force Historic Flight, Polish MiG-29, and the Czech alien hind.

Although everything was impressive, it wasn't these displays that took spotlight of the show. The highlight was undoubtedly the Ukrainian delegation, consisting of a Il-78 and two Su-27, with one Su-27 in the flying, and the rest on static.

THE NEXT ISSUE OF FLYMAG MAGAZINE

The next issue of FLYMAG will be published in the begining of 2017.
You'll amonst others be able to read about the Royal Norwegian Air Force F-16 squadrons at Ørland Air Base, which is turning into F-35 super base in the coming years, as well as the U.S. Army in Europe, and their Apaches.

WANT TO CONTRIBUTE?

The editorial of FLYMAG is always open to receive content, if you want to contribute.
Send your material to info@flymag.dk to get in touch with us.

When you send pictures, remember to have them in 3:2 or 2:3 ratio, or we might end cropping them, or not using them. It's of great importance that you have taken the pictures your self, and that we receive them in a high resolution,without watermarks.

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