

THE AVIATION MAGAZINE

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Volume 10, Issue 2



- ✈ Azerbaijan Air Force
- ✈ Exercise CRUZEX 2018, Brazil
- ✈ Aviation Roundup, USA
- ✈ Ukrainian Air Power
- ✈ And so much more ...

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Cover: AF-1C *Skyhawk* of the Brazilian Navy, participating for the first time at CRUZEX, © 2018 Peter Thivessen

This page: Two MiG pilots of the Azerbaijani Air Force discussing their last mission, © 2018 Bronco Aviation



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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, pilot and veteran interviews all 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

Contributing team members

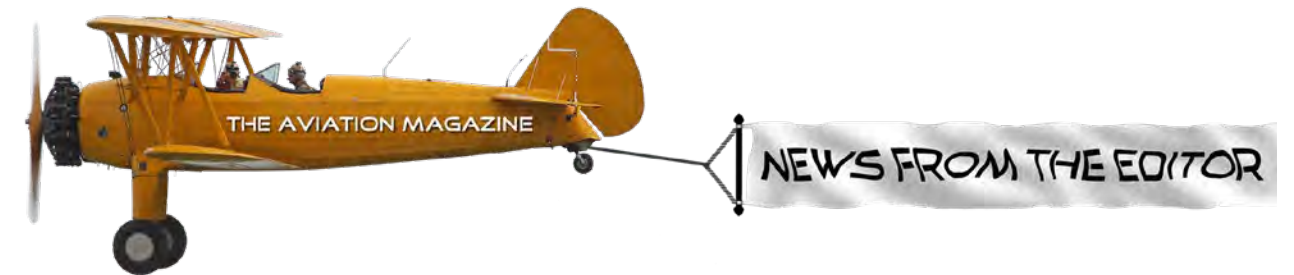
Geoffrey Arnwine
Joe Cilberti
Wolfgang Jarisch
Peter Thivessen
Jeroen Oude Wolbers

Occasional contributors

Carlo Cuit and Paul Kievit
Paco Jover
Mathias Leischner
Udo Leischner
Felix Mayer
Tommaso Munforti
Jason Phelan
Anthony F. Seychell

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Welcome to this year's second issue. More than 100 pages bring you exciting photographs and information on events on three continents: America, Europe and Asia. Rare pictures of the Air Power of the Republic of Azerbaijan and the Ukraine, extensive coverage of the Brazilian exercise CRUZEX and the NATO Days in the Czech Republic make this another great issue.

What's up in the next issue? One of the focal points of the next issue will be on events in Spain such as visits to the air bases Talavera la Real (F-5 *Tiger II*) and Moron (Eurofighter) and the 75th anniversary of Spain's Air Force Academy Air show. Again in the Ukraine, this time we will show you some of the aircraft that are on display at the State Aviation Museum in Kiev. The photo-report on the helicopter traffic at Davos, Switzerland during the World Economic Forum kicks off the 2019 season.

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Ralf Peter WALTER
Editor & Publisher

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AZERBAIJANI AIR FORCE

AZƏRBAYCAN HƏRBI HAVA QÜVVƏLƏRİ

Article and Photography by
Carlo Cuit and Paul Kievit



MiG-29s are from dawn till dusk on six minutes alert at Tagiyev Air Base.

This year marks the 100th Anniversary of both the Azerbaijani Air Force (Azərbaycan Hərbi Hava Qüvvələri) and the Azerbaijan Democratic Republic. The Azerbaijan Armed Forces that include Air Force was established on the 26th of June 1918. In April 1920 Azerbaijan came under control of the Union of Soviet Socialist Republic (USSR). This included its armed forces until 1991.

Azerbaijan is known as 'The Land of Flames' and regained its independence after the breakup of the Soviet Union in 1991. The Azerbaijan Armed Forces were re-established on the 9th of October 1992. Today the Azerbaijan Air and Air Defense Forces are the largest in the Caucasus region with the Air Force having about 8.000 personnel of a total of almost

70.000 personnel in the total Armed Forces.

The main Fighter base of the Azerbaijan Air Force is Tagiyev (also known as Nasosnaya) Air Base. It is a former Russian Air Base which is undergoing a lot of modernization at this time. Tagiyev houses the sole squadron of MiG-29C's and MiG-29UB's which have been in service since 2007. The airbase is located north-west of the Capital Baku, near the town of Sumqayit. Before operations started here with the MiG-29's, the unit was operating a mixture of MiG-25PD/PU/RB's which were withdrawn from use in 2006. The resident Su-24 fleet was withdrawn during 2010 with three derelict airframes remaining on base. The specialized Repair Factory for the MiG-25, part of Tagiyev Airbase, has seen aircraft from Iraq, Libya,

and Algeria for maintenance well into the last decade. Nowadays only the Air Force MiG-29s are undergoing repairs at the plant not being a commercial factory for foreign countries anymore. Recently Tagiyev Air Base has undergone an extensive upgrade to both the HQ facilities and the runway. With support of the United States, new runway lightings have been installed. Also the ILS/DME and VOR capable to support operations is installed with this support.

"The sole MiG-29 unit has no specific designation or name within our Air Force, we are just known as the Fulcrum unit" according to Base Commander Col. Rustamov Zaur. "We have the MiG-29s in service since 2007 when they were procured from Ukraine and were overhauled in the Ukraine before delivery". In

total about 17 MiG-29s are believed to be in service, fifteen MiG-29Cs and two MiG-29UBs of which three are currently undergoing a 3.000 hour check at the Lviv Repair Plant in Ukraine. Approximately twenty-six pilots are on strength with the unit. "We fly approximately 60 hours a year, our way of counting flight hours is a bit different as we only note down actual time in the air without mission preparation, taxiing and landing" according the Lt. Col. Ibrahim Haziyeve, the MiG-29 Squadron Commander.

"Student pilots who are in their third year at the Air Force Academy in Baku start with flight training, approximately 10 to 20 hours at Baku Kala Air Base with the Mi-17-1V. After graduation, selected MiG-29 pilots will join the Air Force Training School which is

located at Kurdamir Air Base for fixed wing training. The Training School is sharing facilities with the small Su-25 "Frogfoot" fleet. Student pilots have to be trained and fly around 150 hours on the L-39" according to Lt Col. Ibrahim Haziyeu. When the training is finalized at Kurdamir, new pilots (rank of captain) will either join the local Su-25 unit or join the MiG-29 unit at Tagiyev. "New graduated pilots will complete a forty-five day Academic Training as preparation on their first Fulcrum flight" explains Lt. Col. Haziyeu. "After this forty-five days, there will be some additional training and a test to check capabilities. When we are satisfied, the new pilots will have around 10 to 15 hours on the MiG-29 simulator which we acquired s o m e years ago. Presently there are two simulators available, one for MiG-29 pilots and one for Su-25 pilots training. All MiG and Sukhoi pilots are required to have a number of simulator hours a

year. "It is a bit depending on availability how many hours can be logged by any one pilot on the simulator" according to the head of the Simulator Centre, Major Rustam Cafarov.

In parallel with the simulator training about ten to twenty sorties, depending on student needs, are flown on the MiG-29UB before the new MiG pilot will have his first solo flight on the Fulcrum" concludes the Lieutenant Colonel. The solo flight is just basic flying. An additional three to four months, up to a year, is required to become a fully operational pilot with the squadron. Training for night flying and ground missions will take an

additional two years of training. Currently conversion and operational training is conducted within the MiG-29 unit. "It puts a lot of pressure on the squadron to have training in parallel of operational missions" according to one of the Instructor pilots.

This situation will change in the near future with opening a new dedicated Air Force Training School.

"Air Defense and Ground Support are the most important tasks for our unit" continues the Base Commander. "We mostly train for Air Interception and have each day up to three MiG-29s on scramble alert. As an example in 2016 we had sixteen actual scrambles, mostly in the conflict region. We have the MiG-29 airborne within six minutes when required.

We can also work together with the Su-25s, we are then tasked as Combat Air Patrol. As most of the training exercises are held within the Air Force, international cooperation has become more important over the

last few years" concludes Commander Col. Rustamov. Turkey and Azerbaijan have a strong cooperation dating back to 1992 when an agreement was signed on military education. Ever since both countries have been closely cooperating in both Defense and Security. The Azerbaijan and Turkish Armed Forces have regular exercises. Most known is the annual exercise "TurAz Şahini" (TurAZ) in which Azerbaijan MiG-29s, Su-25s and Mi-17-1s are practicing with Turkish Air Force units operating out of Konya Air Base in Central Turkey. The latest edition took place during September 2017 at Tagiyev in Azerbaijan.

The TurAz exercise helps to improve interoperability and exchange of experience between the Azerbaijan and the Turkish Air Forces. Through years of joint exercises with Turkey, Azerbaijan has been updating its combat readiness tactics as well as adapting its airbases to standards, such as landing-departure methods and instrument landing systems (ILS). Azerbaijan pilots are mainly trained at the Azerbaijan High Military Aviation School. Some also attend courses at the Air Force Academy in Turkey and have had initial flight training at Cigli Air Base. "The ultimate goal is to prepare and join the international exercise "Anatolian Eagle" which is held yearly in Turkey (latest edition 2016)" Col. Rustamov explains. Currently two MiG-29 pilots are training with the Pakistani Air Force to



MiG-29UB taxiing to the runway for takeoff

gain experience with the JF-17 fighter. "First results are that the JF-17 is comparable to our MiG-29C and therefore we are reviewing what the next steps will be to acquire a new fighter aircraft" adds the Base Commander.

The largest contingent of aviation assets is located at Kala (Qala) Air Base, which has undergone some reconstructions with a new large hangar area for maintenance and storage of helicopters. This new facility was officially opened in March 2018 as part of further modernizations within the Azerbaijan Air Force. The majority of the helicopter force consists of a number of 'Hind' variants: Mi-24V/ P, Mi-35M and Mi-24G 'Super Hinds'. The fleet of Mi-17-1V 'Hip-H' doubles, as light attack and assault platforms next to the more common tasks of troop transport. For this purpose the Mi-17-1Vs can be

equipped with a variety of weapon systems: the 'Lahat' (Skybow) an W77i light weight laser homing missile which is highly effective against a variety of target types, including ground targets, ships and helicopters at ranges up to 8 km. The 'Lahat' can hit static or moving targets, including moving helicopters with pinpoint accuracy. It is built by IAI, Israel and in use with the Azerbaijan Air Force for two years and was supported by Elbit during its introduction. Azerbaijan has been the first export customer for this system. It is solely used by the Mi-17-1s unlike the 'Baryer' system which can be interchanged between the Mi-17-1 and Mi-24V fleet. Simultaneously with the introduction of the 'Lahat' the long range missile system 'Spike' ER has been introduced within the Azerbaijan Armed Forces, the weapon



- The MiGs can be armed with a combination of 2 × R-27 R/ER/T/ET/P (AA-10), 4 × R-60 AAMs (AA-8), 4 × R-73 AAMs (AA-11), unguided S-5, S-8, S-24 rockets and up to six 1,100lbs bombs. above)
- Lt.Col. Ibrahim Haziyeu, commander of the MiG-29 squadron, is discussing flight operations with some of his pilots. (inset)

system can also be used on the Mi-17-1.

Recently, in March 2018, a fifth squadron (Special Operations) became operational with the Bell-412 helicopters. A total of three of this type were acquired in 2016 from Canada, sources stated. "In January 2018 a number of pilots was trained over a two-month period in a "train-the-trainer" concept. Besides the three Bell-412s also a Bell-401 and MD-530 were acquired, all sporting black colors. Both types are currently not operational as pilots have not been trained yet" according to Major Zaur Agayev, one of the pilots of the Special Operations Squadron. Major Agayev graduated from the Turkish Air Force Academy and will be one of the instructor pilots within the fifth squadron. Currently one pilot is already in Pakistan to become an Instructor Pilot for the Bell-412.

The Mi-24V fleet was upgraded in the second quarter of 2003. Currently about nine Mi-24Vs are operational with Second squadron, an additional nine were upgraded in 2013 to Mi-24G 'Super Hind' standard (Gecə) which stands for "night". The upgrade program was based on cooperation between the South African Company "Advanced Technologies and Engineering" (ATE) with Ukrainian companies "Aviakon" and "Luch" design bureau from Kiev. The Azerbaijani Mi-24G is largely based on the ATE's Super Hind Mk4. The core avionics kits are similar to the Mk4 version. The equipment kit (based on the Denel Rooivalk) comprises of an ATE's developed mission computer, navigation system, NVG rangefinder as well as the Kentron Cumulus Argos 550 gyro stabilized multisensor targeting and surveillance system integration, TV and IR sensors and a laser rangefinder. Most striking differences are the redesigned nose and cockpit which contributes to weight reduction and improved sight from the cockpit. The mission equipment is lighter in weight and offers NVG capabilities. Cockpit equipment includes two multirole 6x8 inch flight control and data displays, and a Doppler GPS system.

The Denel's compact gyro stabilized multisensor surveillance and targeting system provides night/all-weather flight capabilities. The 'Baryer' V-ATGM missile system developed by Luch design bureau and besides the Mi-24G also the Mi-24V is capable firing this missile. The Azerbaijan Air Force was the first export customer of the 'Baryer'. Further the weapon package of the Super Hind includes GI-2 'Vector' chin mounted dual feed automatic canon which can be aimed using the FLIR/TV sight, the helmet mounted sight or the head up display (HUD). The upgrade still allows using the S-8 58 mm unguided rockets. The nine Mi-24Gs have been in service between

2014 and early 2017. The fleet is currently awaiting maintenance which has been planned for on the short term. Back in 2014 Paramount Group signed a joint venture agreement with Azerbaijan's AirTechServices Corporation to form Paramount Aerospace Azerbaijan which offers manufacturing capabilities for the modernization and enhancement of helicopters and fixed wing aircraft. The joint venture is expected to lead the maintenance on the Mi-24G fleet.

The main stay of the 'Hind' fleet consists of the Mi-35M of which twenty-four were supposed to be acquired in 2010. Deliveries were completed by January 2014. During the reporters visit in May 2018 Mi-35s were noted at Kala Air Base. The Mi-35's are equipped with night vision goggles, a turret-mounted IRTV-445MGH infrared TV thermal imaging system and new countermeasures equipment. The weapons package comprises of 9K114 'Shturm'-V (AT-6 'Spiral') anti-tank missiles, 80 mm S-8 and 240 mm S-24 unguided rockets, as well as either a single 12.7 mm 9-A-629 machine gun or two 7.62 mm 9-A-622 machine guns/one 30 mm 9-A-800 grenade launcher. In addition, they can operate with 50 kg (110 lb.) to 500 kg (1,100 lb.) bombs.

The Mi-35M has a number of improvements compared to the legacy Mi-24V. The main rotor system is of the Mi-28 and has an X-shape tail rotor. The main rotor's fiberglass blades have a new aerodynamic profile. The Mi-35M also has upgraded turboshaft engines. Stub wings were shortened in order to further reduce weight. The Mi-35M is fitted with upgraded avionics and an improved sensor package, including a night vision system. New compared to the Mi-24V are an electro-optical rangefinder/targeting systems with thermal imaging guidance channel, satellite positioning and navigation system, electronic multifunction displays, onboard computer and new generation jam-proof communications equipment. The Mi-35M can deliver different weapons; eight 'Ataka-V' or 'Shturm-V' anti-tank missiles and 'Igla'-V air-to-air missiles, unguided rockets (S8) or bombs. The nose turret is fitted with a GSh-231 23 mm twin-barrel cannon. The landing gear of the Mi-35M is no longer retractable. This reduced overall weight. As one of the Mi-24 pilots stated "The Mi-35 is like a bear, heavy so we try to keep the material light we carry with us". Round the clock two Mi-24V/Mi-35Ms are on QRA and can be airborne in 8 minutes from initial alert.

Kala Base Commander concludes "Our focus is now to have two Mi-17-1's compatible with the NATO Operational Capabilities Concept (OCC). We hope to join a NATO initiated exercise in 2019 in order to have the opportunity to gain experience, see what we are worth and share our knowledge".



Su-25 "Frogfoot" (above) and Su-25U "Frogfoot" (below) from the Kurdamir Air Base





As of 14 May 2018 preparations started for the Centennial Parade to be held over Baku City 26 June 2018. A total of 43 helicopters took to the sky to perform mass formation exercises during the Authors visit to Qala.



For QRA duties this Mi-35M is fully armed and ready to go in eight minutes from scramble alert; this Mi-35M is carrying the 'Baryer' system which fires RV-2 anti-tank missiles up to a range of 7500 metres.



The Mi-24P fleet consists of only two (#102, #105) airframes which are a legacy left behind by the Russians. They are sporting a black color scheme and are part of 2 squadron.



This Mi-35M '503' is sporting a non-standard camouflage and serial presentation. Three (501, 502 and 503) were seen at Quala in May 2018.

Line up of Mi-24Vs which are part of 2-CI Eskadrilya / 2 squadron 'Griffins'.



Mi-24P and Mi-17-1-V (above) and two Mi-17-1-V (below)





Two Mi-17-1-V waiting for takeoff clearance

Interview Lt. General Tahirov, Deputy Minister of Defense - Commander of the Air Force



Lieutenant General Tahirov Ramiz Firudin oglu was born in Vladikavkaz in the USSR on 16 April 1966. He graduated from the Military Lyceum Jamshid Nakchivanski in 1983, from the Kiev Higher Anti-Aircraft and Rocket Engineering School in 1988 and from the Academy of Public Administration under the President of the Republic of Azerbaijan in 2006 with honors. From 1988

to 1992 he served in the Armed Forces of the USSR at the Academy of Air Defence of Land Forces. In 1992-2002, he served in the Armed Forces of the Republic of Azerbaijan. In 2002-2013, he worked as Deputy Assistant to the President of the Republic of Azerbaijan for defence issues. Lt. General Tahirov was engaged in combat operations for the sovereignty and territorial integrity of the Republic of Azerbaijan. He has been awarded with the Medal "For Motherland, the Medal for Distinguished Military Service, Medal for Distinguished Service for Homeland and the Medal for Distinguished Military Service. Since May 2014 Lt General Tahirov has been appointed as Deputy Minister of Defense and Commander of the Air Force.

Q: General Tahirov can you share information on new developments within the Air Force?

A: "We are in the middle of a number of changes to our Air Force. We are planning to have a new Air Base operational within 1-2 years from now at Dallar airbase specifically for the Air Force Training School. We concluded that training of students within a combat unit is time consuming. For the upgrade work to Dallar Airbase we have both INDRA Company and Thales competing for the work and hope to take a decision soon. Scope of work includes runway, building and the training center itself. It is part of the overall goal to have the Air Force operating on a higher level of professionalism and develop one single training curriculum for student pilots. To achieve this goal we have support from both Turkey and Pakistan who both have extensive experience operating a dedicated Air Force Training School. Also new technologies require us to change procedures and execution of missions".

Q: What are the plans with the current fleet of aircraft and will new aircraft be acquired?

A: In order to support the plans we have with our Air Force Training School, we have acquired ten Super Mushak trainer aircraft from Pakistan. These will be delivered by July 2018 and will first operate out of

Kurdamir where the AF Training School is established before transferring to Dallar Airbase in the near future. To support the introduction of the new trainer we have instructors being trained in Pakistan. It is planned student pilots will start training in their second year on the Air Force Academy. We are also interested in the Hürkuş B turbo prop trainer aircraft which is being developed by Turkish Aviation Industries (TAI) currently. To replace the ageing L-39 we have been presented the M-346 platform by Leonardo company. We have not taken any decision yet on procurement of the type as there is a significant technological gap from a 5th generation trainer aircraft back to the MiG-29 or Su-25 which are platforms from the 1970s. As we have not taken any decision on the future of the MiG-29 or procurement of a JF-17 type aircraft we will have to wait to procure the M-346. To compare the capabilities of the M-346 we also have had flight tests with the Yak-130 and concluded the M-346 would be the best platform for us.

We have an agreement with the Paramount Group to service these helicopters. We are waiting for service engineers to join the maintenance team at Kala (Qala) to start activities.

We have also shown our interest in the TAI T-129 ATAK helicopter. However timelines for procurement are not known, currently the Turkish Armed Forces is fulfilling their own requirements before they will start producing the ATAK for foreign countries. The idea is the ATAK will both replace existing airframes and be added to existing squadrons at Kala.

Q: Can you elaborate on cooperation in the region?

A: We have very extensive relations with Turkey as of the early 1990s. Besides we have what we call a 'Triangle' between Azerbaijan, Georgia and Turkey. We meet regularly to discuss mutual topics; however we have no combined exercises with Georgia.

Q: Lessons learned cooperation with Turkey?

A: With our cooperation with Turkey we have been able to learn and share experiences in military operations which are vital to further expand our knowledge and improve our professionalism. We have instituted mutual exercises of which TurAz is the most important to us. Late September 2017 the Turkish Air Force visited our country for two weeks. The ultimate goal we have is to join an international exercise like 'Anatolian Eagle'.



During March 2018 a fifth squadron (Special Operations) became operational with the AB-412. A total of three of this type were acquired in 2016. In January 2018 three pilots and a mechanic from the Pakistani Armed Forces trained a number of Azeri pilots over a two month period in a train-the-trainer concept.

The MD530 is currently not operational awaiting pilots to be trained on the type. The helicopter is on strength of the newly formed 5th squadron (special operations).



For search and rescue duties three Ka-27s are on strength which are under control of the Air Force, part of 4 squadron, a mixed squadron. The Kamovs were left behind by the Russians when the vacated Qala Airbase in the early 1990s and are currently operated by the Azeri Army on behalf of the Navy.

NEUBURG AIRBASE

ARTICLE AND PHOTOGRAPHY BY MATHIAS LEISCHNER



Last Call "Ghost Tiger"

On September 27th 2018, a small but excellent photo call was held for members of the Bavarian Tigers Supporter Club. This event marked the last opportunity to see the Eurofighter 31+00 in the "Ghost Tiger" livery as the Jet was scheduled for maintenance, which unfortunately, includes the removal of

the paint job (actually it was a sticker job). The Bavarian Tigers are embedded in the Taktisches Luftwaffengeschwader 74 (TaktLwG 74 - Tactical Wing 74) in Neuburg an der Donau. In March 18, 2013, the "Tiger Spirit" was taken over from the then disbanding 321 Squadron of the Jagdbombergeschwader 32 at Lechfeld AB during a ceremony. Interestingly enough, the Bavarian Tigers are not attached

to a squadron but to the Wing, which means both its squadrons 741 and 742 are involved. Beginning with the visit of three Eurofighters at the Tiger Meet 2013 at MAS Orland, Norway (as a visiting "observer" unit) the Bavarian Tigers have regularly taken part in the NATO Tiger Meet exercises and are a full member since 2014. Since then, special paint jobs have been a regular sight with the Ghost Tiger

having been the latest one but, according to the opinion of many, also the most spectacular one. During the Tiger Meet 2018 at Poznan, Poland, the Bavarian Tigers not only won the Tiger Games (proving the spirit is truly in them) but also the Trophy for the best-painted Tiger Aircraft.

We can only hope that the next Tiger from Neuburg will also be a winner!





Equipped with a live IRIS-T air-to-air missile this QRA Eurofighter is cleared for take-off on runway 27 after being scrambled less than 10 minutes ago

The TaktLwG 74

JG 74 (Jagdgeschwader 74 - Fighter Wing 74) was officially taken into service on the 1st of May 1961 (after the unit operated unofficially as JG 75 for a short period of time), flying the F-86K Sabre in the all weather interceptor role. From 1964 to 1974, the JG 74 flew the legendary F-104G Starfighter in its short service life as an interceptor. The F-104G was followed by the mighty F-4F Phantom II from September 26th, 1974.

In 2006 the first Eurofighters were delivered to JG 74. For a period of about two years the wing operated the Eurofighter alongside the F-4F Phantom and bid farewell to the latter on the 12th of June 2008. On the 1st of October 2013, JG 74 was renamed to Taktisches Luftwaffen-Geschwader 74 (TaktLwG 74) and became a multi-role wing but keeping its job as quick reaction alert (QRA) unit for the southern part of Germany. From November 22nd 1973 until 11th of March

2005, the wing held the traditions of Werner Mölders, a former Ace from the Luftwaffe in WW II. Due to his service in the Legion Condor during the Spanish Civil War and the likelihood of being involved to war crimes against Spanish civilians (he was giving fighter cover to bombers on their way to Spanish cities), the name JG 74 Mölders was dropped again. Today TaktLwG 74 is responsible for defending the southern part of Germany. The wing has two

Eurofighters on 24/7 Quick Reaction Alert (QRA). When scrambled, the aircraft, carrying live weapons, are airborne within less than 15 minutes. The wing is also regularly involved in the air policing for the Baltic States as well as taking part in national and international exercises. A very special Thanks to the staff of the Bavarian Tigers!!!



This QRA Eurofighter returns home to base



Unarmed Eurofighter taxiing to its shelter after returning from a training mission



Two Eurofighters at the "Last Chance"

CRUZEX 2018

ARTICLE AND PHOTOGRAPHY BY WOLFGANG JARISCH AND PETER THIVESSEN



F-5EM *Tiger II*, Brazilian Air Force



E-99 | Embraer EMB-145-RS, Brazilian AF (both images)

© 2018 Wolfgang Jarisch
© 2018 Peter Thivessen

Simulated War – Real Training

The 8th edition of the multinational exercise CRUZEX (Cruzeiro do Sul Exercise = Exercise Southern Cross), organized by the Brazilian Air Force, took place from 18th to 30th November 2018. Main base for this major exercise was Natal, which is located in the federal state Rio Grande do Norte. Exercise director was Brigadier Luiz Guilherme Silvera de Medeiros. It was the largest operational exercise conducted by the Brazilian Air Force. Air Arms from Chile, Peru, Uruguay,

Canada, France, the United States as well as the host nation Brazil brought together around 100 aircraft and 2000 military personnel to Natal air base. Observers were sent from Bolivia, India, Sweden, United Kingdom and Venezuela and Portugal brought Special Forces, while Germany and France lectured on the use of the Air Forces in UN missions. The goal of this largest exercise in South America was to simulate missions in modern warfare environments and to promote the exchange of experiences among participants. The

unconventional warfare scenario (known as UW scenario) was the main difference to CRUZEX's previous seven editions. "CRUZEX enables the exchange of operational capabilities. In addition to strengthening inter-country relationship, the exercise enables also to combine the knowledge of other nations with experiences in common action scenarios", said CRUZEX Director Brigadier Luiz Guilherme Silvera de Medeiros. Another positive side effect was that the Brazilian Army and Navy were strongly involved in the exercise thus coming closer to the requirements of the air forces and

having the chance to work in an international environment. The biggest surprise came from the Brazilian Navy (Marinha de Brasil), which brought two single seat AF-1A Skyhawks and a sole twin-seat AF-1C Skyhawk to CRUZEX 2018. The Brazilian Navy participated in the exercise for the first time. The host Nation brought a large variety of aircraft to Natal, in total around 70 aircraft. The F-5EM/FMTiger II variants for example, which are the most advanced Tiger II variants. AEL System began to



Twin-seat AF-1C *Skyhawk* (main image) an single-seat AF-1A *Skyhawk* (inset) of the Brazilian Navy

upgrade 43 single-seat F-5E and six two-seat F-5F Tigers in 2005. They have a new radar; a new data link connection and a new helmet mounted display was added. The upgrade also includes chaff/flare launchers, a new radar warning receiver and new wiring for the use of Rafael's Sky Shield electronic warfare pod. Also involved from the FAB there were A-29 Super Tucanos, AMX RA-1s and A-1Ms, C-130s and KC-130s, three AEW platforms from

type E-99 and R-99 as well as C-105s, a C-767 and a SC-105. Some H-36 helicopters also participated in the exercise for CSAR missions. A KC-135R from the US-Air Force (22nd Air Refueling Wing from McConnell Air Base) and a KC-135E from the Chilean Air Force (Grupo de Aviación No 10) supplemented the tanker fleet, while Canada and the French Air Force supported the freighter fleet with two C-130J (Canada) and

a sole C-235 (France). The French transporter is usually based at Aérienne 367 at Cayenne-Rochambeau, a French AF facility in French Guiana. The availability of combat aircraft during the exercise remained high. Fighter jets from the host nation were supported by four F-16 Vipers from the US Air Force, four from the Chilean Air Force, and four Mirage 2000 D from the Peruvian Air Force. The Peruvian Air Force sent four and

the Uruguayan Air Force three Dragonflies to the exercise. The A-37Bs are still capable of executing CRUZEX missions, but due the lacking radar, a laser-guided weapon or target designation pod the A-37Bs are very limited in action according to NATO standards. The coalition operated in a fictitious scenario under the lead of the UN and the commanders' challenge was to coordinate and strengthen the efficiency



- F-16C, U.S. ANG Texas (main image and inset left)
- F-16AM, Chilean Air Force (inset middle and right)

of the various elements within a combined air operation (COMAO). The aircraft were active in an area of around 64,000 km² of Northern Brazil. Thus, the support of Tankers to refuel the fighters and Transporters, which brought paratroopers, equipment and JTAC's (Joint Terminal Attack Controllers) to the exercise area, was absolutely necessary to fulfill the requirements of the exercise in this huge area.

A typical CRUZEX mission day began with the take-off of the tankers and the AEW platforms to provide strategic support. The next aircraft in the sky were transport aircraft, depending on the specification of the mission. Then came a large group of attack aircraft, which flew CAS and strike missions. The Red Air Forces were led by the F-5EM/FM plus a rotating squadron of the US or Chilean F-16s or the Peruvian Mirage 2000s. COMAO aircraft were

equipped with striking targeting pods. They came into the theatre after the blue air established air superiority. Combat rescue missions in a fictional hostile area were flown with H-36 Caracals after the strikers had secured the area. The R-99 and E-99 platforms provided a complete picture of the conflict scenario for both parties in real time. It was an exercise with a long and perfect preparation phase, well done by the host nation.

In addition, the perfect daily planning on base made these multilateral exercises a huge success for all participants. The authors want to give big compliments to the Brazilian Air Force Press Office for the fantastic support during the accreditation process and to the whole team on base for the daily support, which created a very family atmosphere. A special thanks to Col. Mendonça for the briefings.



Single-seat A-1M | AMX (main image and inset left) and two-seat A-1MB | AMX (inset right) of the Brazilian Air Force

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F-5FM, Brazilian Air Force ▼



▲ Mirage 2000DP, Peruvian Air Force





C-98, Brazilian Air Force ▼

▲ C-95BM *Bandeirante*, Brazilian Air Force



▲ C-97 *Brasília*, Brazilian Air Force

▼ C-99A, Brazilian Air Force





- R-99 AEW&C, Brazilian Air Force (main image and inset top)
- H-36 *Caracal*, Brazilian Air Force (inset left)



- CC-130J *Hercules*, Royal Canadian Air Force (top left)
- C-130M *Hercules*, Brazilian Air Force (middle left)
- KC-130M *Hercules*, Brazilian Air Force (bottom left)
- SC-105A *Amazonas*, Brazilian Air Force (top right)
- CN-235, French Air Force (bottom right)
- C-105A, Brazilian Air Force (main image)



- KC-135R, U.S. Air Force (inset left)
- KC-135E, Chilena Air Force (inset right)
- C-767, Brazilian Air Force (main image)



- A-29B *Super Tucano*, Brazilian Air Force, with Brite Star II EO/IR sensor ball mounted under the forward fuselage (inset top)
- A-29B *Super Tucano*, Brazilian Air Force (inset left)
- Two A-37B *Dragonfly* of the Peruvian AF and an A29B *Super Tucano* of the Brazilian AF returning to the base after their mission is completed (main image)



- A-37B *Dragonfly* of the Peruvian AF (left side and main image)
- A-37B *Dragonfly* of the Uruguayan Air Force (right side)

AVIATION ROUNDUP MINDEN - TAHOE AIRPORT

ARTICLE AND PHOTOGRAPHY BY GEOFFREY ARNWINE





COMMEMORATIVE
AIR FORCE



Grumman F8F Bearcat (left)
and
Grumman F6F Hellcat (right)

For the second straight year the Aviation Roundup Airshow was held at Minden-Tahoe Airport on October 13-14. Headlining the show this year for the very first time was the United States Navy Blue Angels as well as a variety of other performers.

Gates opened at 10:30 am both days with flying activities starting at 1:00 pm. There were multiple static displays and other exhibits for the crowd to visit prior to the aerial events.

The show started with the opening ceremonies featuring the National Anthem as well as a

parachute jump from the U.S. Army Black Daggers aboard a CH-47D Chinook helicopter. After the anthem, a variety of civilian performers took to the sky including Gene Soucy in his Grumman Showcat biplane, Jim Peitz in his Beechcraft F33C Bonanza, Bill Stein in his specially painted Extra 300, and the Red Bull Air Force which featured Kirby Chambliss in his Edge 540, Aaron Fitzgerald in his BO-105 helicopter, and a skydive team.

There was a nice variety of warbirds that performed for the spectators during the event. Those included

Gregory "Wired" Colyer in his T-33 Shooting Star trainer jet known as "Ace Maker II," Gene McNeely in his Race 60 T-6 Texan WWII trainer, and the Commemorative Air Force SoCal Wing with their F6F Hellcat and F8F Bearcat. In addition to those performers, rides were offered to people in the crowd in a P-51 Mustang and B-25 Mitchell.

Concluding the airshow was the United States Navy Blue Angels making their first ever appearance in Carson Valley. The team, lead by Capt. Eric Doyle, performed various maneuvers that pilots of the

Navy and Marine Corps are trained to do including formation flights, tight turns, and solo passes. After their aerial performance, the pilots visited the crowd line to meet fans and sign autographs.

After the aerial portion of the show was complete, spectators were able to visit the different ground displays before gates closed at 5:00 pm. Special thanks to the city of Minden, volunteers, organizers, performers, sponsors, and spectators for making the 2018 Aviation Roundup a success!



Lockheed T-33 *Shooting Star*



Grumman F6F *Hellcat*



North American P-51D *Mustang*



Grumman F8F *Bearcat*



- North American B-25J *Mitchell* (above)
- Zivko Edge 530 (right)



- Showcat, based on agricultural aircraft Grumman G-164A Ag Cat (left)
- Zivko Edge 530 (above)
- CH-47F *Chinook* (main image)



NATO DAYS



Article and photography by
Peter Thivessen and Wolfgang Jarisch



Formation of a Finnish Air Force
F/A-18C *Hornet* and a Royal Danish
Air Force F-16AM *Fighting Falcon*

The biggest security show in Europe, the NATO Days, took place at Ostrava Leoš Janáček Airport /Mošnovonce, Czech Republic in combination with the Czech Air Force Days.

The NATO Days began their tradition in 2001. The annual show was held from 15th – 16th September 2018. The motto of the event was: "Our security cannot be taken for granted and there is no prosperity without security". Therefore, the aim of the event is to present the wide spectrum of resources and capabilities of the Czech Republic and its allies in the field of security provision for the general public.

At this year's edition, the 100th anniversary of the founding of

Czechoslovakia was celebrated. In 1993, Czechoslovakia split into two sovereign states, the Czech Republic and Slovakia. Anyway, it was a reason to celebrate. The combination of both events attracted more than 220.000 visitors. This event is always worth a visit. More than 40 dynamic displays took place and a wide range of aircraft, helicopters, tanks, trucks and ground

equipment were shown in the static display. On the showground, the visitors could also see a small area with historic equipment from WW II, and the history of the Skoda brand was shown in a small exhibition, provided by the Silesian Museum. This year's special partner nation was the United States of America. The US Air Force brought the big stuff to Ostrava. The visitors could have a close view on a B-52H Stratofortress, a C-17 "Globemaster" and a KC-135R "Stratotanker". From the US Army Europe were two AH-64D Apaches in the static display. Sadly, the US Air Force had no aircraft in the flying display. Still, the organizers had prepared some surprises for the visitors. Croatia sent the "Wings of Storm" to Ostrava for the first time and the Swedish Air Force Historic Flight sent the Saab J32 "Lansen" for the first time, which could be seen in a unique formation in the sky over Ostrava. The formation was led by the J32 and on its wingtips the Saab SK 35 "Draken" and the twin seater AJS 37 "Viggen". What an impressive formation! Both aircraft also performed solo displays. Later on, the formation was seen in a five ship formation with an F-18 "Hornet" from the Finish Air Force and the F-16 "Fighting Falcon" from the Danish Air Force. This formation was called "The Nordic Flypast", a formation what we will not see again very soon. Another national display team was brought by the Polish Air Force, the White-Red-Sparks team with its aging TS-11 "Iskra". Further attractions in the sky over Ostrava were some well-known solo jet displays, like the French Rafale Demo Team or the F-16 Tiger Demo Teams from Poland, Denmark and Belgium. The Finish F-18 Hornet and the Spanish and British Eurofighter

JAS-39 *Gripen* of the Czech Air Force with "Tiger tail" (main image) and special tail to commemorate 100 years of Czechoslovakia (inset)

© 2018 Wolfgang Jarisch



supplied enough sound for the visitors during their performance. The host nation delivered an amazing solo display with its Gripen, piloted by Ivo Kardoš. He won the award for best flying display this year at the NATO Days and Czech Air Force Days 2018.

The Czech Air Force Flight Training Centre brought a brand-new Enstrom 480B-6 and a Mil Mi-2 for the flying display. Six Enstrom were ordered by the Czech Air Force as replacement for the aging Mil MI-2 that CLV (Flight Training Centre) has been using for training Czech Air Force pilots since 2004. The first Enstrom was handed over on 16 July 2018.

The two ship formation Mil Mi -171 and the Mil Mi-24/35 from the Czech Air Force performed another spectacular display and a solo W-3A Sokol also showed its capabilities.

The Slovak government sent a Fokker 100 and an Airbus ACJ 319 to Ostrava. They came in a two-ship formation for a low level pass; then they climbed up in the sky for a break. Another surprise for the visitors arrived from the Slovak Air Force.

A two-ship formation of Mig-29 showed the agility of the legendary "Fulcrum". It was a big surprise because all other MiG-29, MiG21 and Su-22 in Europe are grounded due to several accidents in Poland and Romania. All of these aircraft use the same ejection seat.

Historical flypast commemorating 100 years of Czechoslovakia

In this extraordinary passage, accompanied by Smetana's symphonic poem "Vltava", 16 types of aircraft that have been serving in the Czechoslovak and Czech Air Force over the last hundred years were presented. The historical flypast began with the Second World War aircraft Jak-3, followed by other famous aircraft and helicopters including the contemporary ones.

The following aircraft took part in the flypast: Airbus A-319, JAS-39 Gripen, L-159 ALCA, Mi-24/35, Mi-171Š, C-295 CASA, L-410 Turbolet, L-39 Albatros, Zlin Z-43, Zlin Z-142, Jak-3, L-29 Delfín, Spitfire Mk. XVI, Harvard Mk. II

At the end of both public days, there were some historical aircraft in the flying display. The show ended with a flypast of the OV-10 "Bronco". This aircraft performed a symbolic airdrop. Not parachutists but an endless number of poppy flowers made of cardboard were dropped off the aircraft and colored the sky in a wonderful sea of red blossoms.

Summing up, the NATO Days and the Czech Air Force Days are always worth a visit. A huge showground with interesting static and dynamic

displays and each year different kinds of Aircraft and ground equipment make it a benchmark event in Europe. Additionally, the perfect traffic planning on arrival and departure must be highlighted. Plenty of food and toilets for the well-being of the visitors are provided. A big compliment to the organizers!

The authors have to say thank you to Andrea Čerovská for the great support in 2018.

See you in 2019!



- Finnish Air Force F/A-18C *Hornet* deploying flares (main image)
- MiG-29AS (inset top) and MiG-29 UBS (inset above) of the Slovakian Air Force



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- C-17A Globemaster III of the U.S. Air Force (top)
- C-130H Hercules of the Belgian Air Force (above)
- L-410FG of the Czech Air Force (right)
- B-52H Stratofortress of the U.S. Air Force (main image)

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- C-27J Spartan of the Romanian AF (left)
- C-27J Spartan of the Lithuanian AF (above)
- KC-135R Stratotanker of the U.S. ANG (top)



- C295M of the Czech Air Force (above)
- CN-235M-200 of the French Air Force (right)
- C295M of the Polish Air Force (main image)



- C295M of the Spanish Air Force (above)
 - C295M of the Finnish Air Force (left)
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Swedish Air Force Historic Flight

- Saa J 32 *Lansen* (far left and above top)
- Saab Sk 37 *Viggen* (left middle and above middle)
- Saab J 35J *Draken* (left and above)

Images above and main image © 2018 Wolfgang Jarisch
Images left © 2018 Peter Thivessen





- F-16 Block 52CF of the Polish Air Force (left top)
- F-16AM of the Royal Netherlands Air Force (far left)
- F-16 Block 32CF of the U.S. Air National Guard (left)
- F-16AM of the Royal Danish Air Force (main image)



- EF2000 *Typhoon* of the Spanish Air Force (left)
 - EF2000 *Typhoon* of the Royal Air Force (right)
 - Rafale of the French Air Force (top right)
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Mi-24V *Hind* of the Czech Air Force

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- 1 | Mi-2, Czech Flight Training Ctr
- 2 | Enstrom 480B-G, Czech Air Force
- 3 | Mi-17M, Slovakian Air Force
- 5 | AS365N3+, Lithuanian Air Force
- 6 | Sea King Mk41, German Navy
- 7 | Mi-24D, Czech Air Force
- Main Picture | W-3A, Czech Air Force



- PC-9, Bugarian AF (top)
- L-39ZA, Lithuanian AF (above left)
- L-39C, Lithuanian Air Force (left)
- L-39C, Czech Air Force (above right)
- L-339ZA, Czech Air Force (above right)



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Spitfire Mk.VXIe



AT-6C Texan



MiG-15



L-29 Delfin



Yak-3



OV-10B Bronco



- Airbus A319 CJ (left inset) and Fokker 100 (right inset) of the Slovak Government Flight Service
 - Airbus A319 CJ with two JAS-39 *Gripen* of the Czech Air Force (main image)
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UKRAINIAN AIR POWER

ARTICLE AND PHOTOGRAPHY BY ANTHONY F. SEYCHELL



The Ukrainian Armed Forces

The military of Ukraine consists of several arms, notably amongst which are the Ukrainian Ground Forces, the Ukrainian Navy, the Ukrainian Air Force and the Ukrainian Airmobile Forces. Additionally, there is a main reserve component of Armed Forces of Ukraine which is the National Guard of Ukraine. The three main arms of the Ukrainian Armed Forces operate air assets, the most significant being that of the Ukrainian Air Force.

The modern Ukrainian Armed Forces were formed after the break-up of the USSR in 1991. They inherited all Soviet assets that were based in the Ukrainian Soviet Socialist Republic. These assets were considerable, consisting of no less than one rocket army, four air force armies, an air defence army, three regular armies, two tank armies, one army corps and the Black Sea Fleet. The assets of the Soviet Strategic Deterrence Forces (nuclear weapons and intercontinental missiles) were handed over to Russian Republic as successor state of the USSR. The Ukrainian Air Force inherited 19 Tu-160s, eight of which were returned to Russia in 1999 as exchange for debt relief. The remainder were scrapped under the Nunn-Lugar Cooperative Threat Reduction agreement although one Tu-160 was retained and is now displayed at the Museum

of
Long
Range
Aviation in Poltava.

The Ukrainian Air Force (Повітряні Сили України, Povitryani Syly Ukrayiny)

Ukraine became independent from the USSR on 24 August 1991 and the Ukrainian Air Force was established soon afterwards. Independence led to the transfer of all bases and the Soviet Air Forces aircraft that had been based on Ukrainian soil. Amongst these aircraft, there were also Soviet aircraft recently withdrawn from East Germany. It is estimated that around 1500 aircraft were transferred to the Ukraine Air Force. In the

inventory of the newly established Ukrainian Air Force there were MiG-23s, MiG-25s, MiG-27s, MiG-29s, Su-15s, Su-17s, Su-24s, Su-25s and Su-27s together with a number of L-39s, transport aircraft and even Tu-22 long range bombers. Over the years, the number of diverse types and also operational aircraft was significantly reduced.

Chuhuiv Air Base

The author, in August 2018, had the opportunity to visit Chuhuiv (Chuguyev) Air Base which houses the 203rd Training Aviation Brigade operating the Aero L-39. There are also a number of AN-26s and Mil-8s based here.

Ukrainian Air Force Mi-2MSB - combat variant of the Mi-2 with new engines and upgraded avionics - at Chuhuiv air base



Mi-8 MT at Chuhuiv AB ▼

▲ An-26 at Chuhuiv AB



▲ L-39C at Chuhuiv AB

▼ An-26 at Chuhuiv AB



The Ukrainian Ground Forces (Сухопутні Війська ЗСУ Sukhoputni Viys'ka)

The Ukrainian Ground Forces, like the Ukrainina Air Force, were formed from Soviet Ground Forces formations, units, and establishments that were on ukranian soil when the Soviet Union was dissolved. The Ground Forces have an Army Aviation element as part of their order of battle.

The Army Aviation is tasked to provide reconnaissance, tactical fire support and air transport for the Ukrainian Ground Forces. As of 2017, the Ukrainian army aviation has four Army Aviation brigades, based in Kherson, Novyi Kalyniv, Brody and Poltava. The 57th Aviation Base in Brody is also the main maintenance while Army Aviation Military Training Center is at Poltava. The aircraft inventory consists of Mi-2s, Mi-8 (various variants), Mi-9 and Mi-24 (various variants). Ukraine has initiated a number of modernisation programmes which address, amongst other things, the air assets of both the Air Force and the Army Aviation.

Ukraine, since the dissolution of the USSR, has participated in a number of peace-keeping missions in Africa. Elements of the Army Aviation, made up from Mi-8s and Mi-24s, had been deployed in the Democratic Republic of Congo, Liberia, Sudan, South Sudan, Ivory Coast and Mali. A number of these helicopters are still in white "United Nations" livery with UN-numbers.



Mi-2 and Mi-8MTV at Poltava air base



Poltava

Poltava Air Base is located approximately 8 km (5.0 mi) northwest of the town of Poltava. It was operational during the World War II, first as a Luftwaffe base, then by the Soviet Air Force. For a time, this base was used as a heavy bomber staging field by the US Army Air Force. For this purpose, Poltava was designated as USAAF Station 559 and was declared operational by the USAAF in May 1944. Soviet-American cooperation did not last long and the last operational mission from USAAF Station 559 was in September 1944, although USAAF personnel were on base until June 1945.

After the Great Patriotic War, the airfield was rebuilt and was used by Soviet Air Defence Forces. Later, it became a heavy bomber base and Poltava was the "home" of the 13th Guards Dnepropetrovsko-Budapeshtskaya of Suvorov Heavy Bomber Aviation Division of Soviet Long Range Aviation until the dissolution of the USSR in 1991. Up to around 2006, it was still used by the Ukrainian Air Force as a heavy bomber base, but the withdrawal of the Tu-22 from Ukrainian service meant that there was no further need for the base, and it was closed since the air force no longer operated a long-range and medium-range bomber force. Eventually, the base was transferred to the Army Aviation and it is now its Military Training Center.



Mi-24 (above and right) and Mi-2 (left) of the Ukraine Army Aviation at its Poltava air base



Mi-24 of the Ukraine Army Aviation at Kherson air base

Kherson

Ukraine Army Aviation base Kherson (Chornobaikva), in southern Ukraine, is the home of the 11th Army Aviation Regiment, operating a mix of Mi-8s/Mi-17s and Mi-24s. Nowadays, a significant part of the base is used for civil flights and is called Kherson International Airport.

During the base visit in August 2018, it was noted that there were various airframes still painted white and with UN codes. A recently delivered Mi-2 MSB was also on the base, resplendent in its new camouflage. The Mil 2 MSB is a modernised variant of the Mi-2, being equipped with new engines

that are more powerful, consume less fuel and are actually lighter than the previous ones. The new AI-450M engines provide better performance, especially at high temperatures and altitudes while the engine lifetime is also significantly longer. Besides the new engines, the helicopter has upgraded avionics.

Acknowledgements

The author wishes to acknowledge the support and assistance of the Ukrainian authorities and the personnel of the Ukrainian Air Force and the Ukrainian Army Aviation who made possible the base visits and this report.



▼ This Mi-8MTV of the Ukraine Army Aviation at Kherson air base supported humanitarian aid missions of the UNO

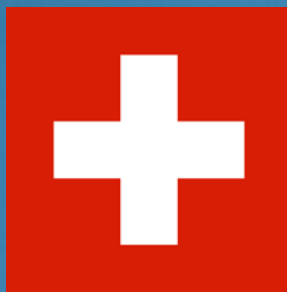
▲ Mi-8MTV of the Ukraine Army Aviation at Kherson air base



▲ Mi-8MTV of the Ukraine Army Aviation at Kherson air base

▼ Mi-2MSB, combat variant of the Mi-2 of the Ukraine Army Aviation at Kherson air base





MEIRINGEN AIR BASE

Report by Ralf Peter Walter



Today the Swiss Air Force has three major jet bases: Emmen AB, Payerne AB and Meiringen AB. Meiringen AB is located in central Switzerland. It is home to the Fliegerstaffel 11, flying the F/A-18C/D and to a pair of F-5E *Tiger II* aircraft, equipped to deploy a towed target for air-to-air shooting. These two F-5s are wearing the red and white color scheme of the *Patrouille Suisse*, the official Swiss Air Force jet display team. This makes the aircraft highly visible and thus provides some extra safety for the pilot during the shooting training.

At the day of the base visit, the F/A-18s flew ten training missions. The J-5011 with its "Tiger tail" needed special attention after landing due to hot brakes at the main landing gear. The jet

was parked clear of any building at the far end of the apron and firemen used fans to cool down the brakes.

During the day several aircraft other than *Hornets* and *Tigers* could be seen at Meiringen:

- The Swiss Air Force's only de Havilland Canada DHC-6-300 *Twin Otter* used for cartography purposes
- An EC635 P2+ from nearby Alpnach AB
- An AS532 UL Cougar Mk.1 helicopter, also from Alpnach AB
- A Pilatus PC-7 (NC)

The Aviation Magazine thanks the Flugplatzkommando for making this report possible.

F-5 Tiger II towing a target for F/A-18 *Hornet* air-to-air shooting training





As a tradition the Fliegerstaffel 11 (11th Squadron) gives its F/A-18C with the serial J-5011 a "Tiger tail".

After landing the aircraft needed its main gear brakes to be cooled down by two fans (image right)







- Pilatus PC-7 (inset above)
- AS532 UL Cougar Mk.1 (right)



- deHavilland Canada DHC-6-300 *Twin Otter* (inset above)
- EC635 P2+ (main image)

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