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The French Air Force magazine

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**actualités**

The French Air Force magazine

armement

# LIBYA:

## Airmen in Operation

### HARMATTAN



# A word from the Chief of Defence Staff



**O**n 19 March 2011, French Air Force Rafales and Mirages began to loosen the noose around Benghazi.

On that 19th of March, the first day of Operation *Harmattan* was a testament to the operational abilities of our forces throughout the 226 day multinational operation.

*Harmattan*, the French component of what would become NATO Operation *Unified Protector* was an undeniable military success. The mandate given to our Forces was fully executed without any losses.

The success of this mission did not come by chance. It is a result of various factors: the strength of our political and military decision-making chain, the quality of our equipment, the coherence of our operational preparation and of course the moral strength of the men and women of the French Armed Forces.

*Harmattan* confirms the directions that have been taken for some time now that focus on the ability of our equipment and personnel to be versatile and interoperable in order to adapt quickly to a variety of situations.

We continue to use our acquired experience with diligence and determination: an armed forces model is not built based on a war model but rather as it should be, by drawing from the consequences of our missions.

*Harmattan* attests to the overall coherence of our forces' capabilities. It also confirms the operational purpose of our bases, our ports, workshops and warehouse facilities. It is also a reminder that in terms of operations, the improbable always remains possible. Who would have imagined such a mission so close to our own borders? The improbable is possible and we must be prepared and ready to face it with the audacity and ingenuity that are the trademarks of French soldiers, seamen and airmen.

Operational performance relies on the ability to adapt procedures and innovative combinations of resources. A fine example of this is the decisive operations carried out on Brega that combined combat and utility helicopters, submarines, frigates, fighter and support aircraft. These operations foreshadow the way our future missions will be carried out: in a continuing and ever more combined effort.

The French Armed Forces played a major role in this operation. France supplied the most fighter aircraft in the coalition in terms of volumes and offensive sorties. The airmobile group carried out 87% of helicopter strikes and our navy component 97% of surface-to-ground strikes. France along with the United States was the only nation capable of deploying full medical support on our aircraft carrier and LDH amphibious assault ship.

The French Air Force, together with the Navy and Army, is responsible for a wonderful chapter in the history of our operations. It demonstrated remarkable service, professionalism and an outstanding ability to adapt. This special issue of Air Actualités pays well-deserved tribute to the men and women of the French Air Force who, while working under difficult reforms, made this operational mission a success.

*Amiral Édouard Guillaud,  
Chief of Defence Staff*



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52 minutes of accounts from airmen involved in Operation *Harmattan* over Libya from March to November 2011.

Generals in armed forces staffs, pilots, aircraft engineers, intelligence officers, etc. related their impressions and experiences during the air operation. As a bonus, perspectives from journalists specialised in Defence.

This Sirpa Air produced film recounts the key moments of *Harmattan*: the beginning of the operation, the first Scalp raid, etc.



# Editorial



**A** year ago, on 19 March 2011, Operation *Harmattan* was launched in application of Resolution 1973 adopted by the United Nations Security Council. In response, the entire French Air Force prepared with remarkable efficiency on its air bases in order to carry out the various missions which it was assigned.

Within the first few hours, Air Force fighter aircraft crews, supported by aerial refuelling tanker aircraft and air surveillance aircraft, established a no-fly zone over Libya, halted the progression of tanks threatening civilian populations in the city of Benghazi and gathered intelligence information that would be essential to the pursuit of operations. By being the first to fly into Libyan airspace on 19 March 2011, the French Air Force demonstrated its ability to react quickly and our country's capability of acting fully autonomously.

From then on, from the first to the last day of operations, during the day and at night, our airmen demonstrated determination and an exemplary ability to adapt in order to meet the numerous objectives that had been set out. For more than 226 days of operations, French Air Force aircraft manned by perfectly trained crews completed more than 22,000 flying hours and 6,200 missions to give France a major role within the coalition. Throughout the entire Operation *Harmattan*, all the components of the air force worked flawlessly to ensure a high level of availability that would make our forces a decisive factor in reaching strategic objectives.

Whether working on national or foreign air bases, for more than seven months the men and women of the French Air Force displayed great skill in carrying out, supporting and redeploying our plan of action while continually adapting to the operational context in order to act fast, far and for a long time.

A year after these memorable events, this special issue of Air Actualités is a look back on the French Air Force's outstanding involvement. It also gives us a chance to take a retrospective look at just how much the contribution of our airmen was essential to the operation and the degree to which their professionalism met the expectations of the international community. Their sense of duty combined with an unfailing sense of motivation enabled them to face up to the challenge and write one of the greatest chapters in the French Air Force's history. Join us as we relive the experience in this special issue.

*Chief of Staff of the French Air Force*  
**Jean-Paul Paloméros**



## Tuesday 22 February 2011

An Airbus A340 and an Airbus A310 operated by French Air Force Squadron 3/60 "Estérel" departs for Tripoli, Libya. There they board 388 nationals, including more than 300 French citizens that are flown back to France in the night.

## Thursday 17 March 2011

The UN Security Council adopts resolution 1973 by which member states and regional organisations are authorised to, among other things, take "all measures" necessary to protect the Libyan civilian population.

## Saturday 19 March 2011

Upon order of the President of France, Nicolas Sarkozy, the Chief of Defence Staff launches Operation *Harmattan*, name of the French military operation in Libya.

# Chronology

## Sunday 20 March 2011

Preparation for sail of the Charles de Gaulle aircraft carrier with two Caracal helicopters and one Puma to be used for combat search and rescue operations. The next day, all French Air Force fighter jets are repositioned on Solenzara Air Base in Corsica. The French Air Force and Navy destroy an armoured vehicle belonging to Colonel Gaddafi forces. Starting on 23 March, French aircraft no longer operate only in the Benghazi area.



## Night of 22 to 23 March 2011

Two Rafales from Squadron 1/91 "Gaspogne" take off from Saint-Dizier and meet up in flight with two Mirage 2000 Ds from Fighter Squadron 3/3 "Ardenes" from Nancy and two Rafale Marines from Flotilla 12F from the Charles de Gaulle aircraft carrier. The six fighter planes head for Libya to carry out the first SCALP cruise missile strikes.

## Night of 24 March and Day of 25 March 2011

During the night of 24 March, a patrol of two Mirage 2000 Ds equipped with GBU 12 is deployed from Nancy Air Base for an offensive mission in the Ajdabiyah region. An artillery piece belonging to Colonel Gaddafi forces firing at the city of Ajdabiyah is hit. On 25 March, two Rafale Air and Marine patrols carry out reconnaissance missions. Four Mirage 2000 Ds, four Rafale Airs and a mixed Rafale/upgraded Super Étendard patrol carry out no-fly zone missions.

## Thursday 31 March 2011

NATO takes over command of Allied operations, working out of Italian base Poggio Renatico (roughly 40km from Bologna). The commander is General Charles Bouchard from the Canadian Air Force. The NATO led operation takes on the name *Unified Protector*. The same day, General Paloméros visits at Évreux and Orléans Air Force base transport squadrons.



## Thursday 14 April 2011

Ministers of foreign affairs of NATO countries and non-NATO countries participating in Operation *Unified Protector* meet in Berlin. Selected excerpts from the Statement on Libya include: "Today, we (...) met in Berlin to discuss the situation in Libya and our joint efforts in support of broader international community objectives with regard to Libya. The valuable contributions made by OUP partners demonstrate broad-based support for this operation. (...) We underline the need for the regime to restore water, gas, electricity (...) and to permit full, safe and unhindered humanitarian access to all the people of Libya in need of assistance. Gaddafi and his regime have lost all legitimacy through their comprehensive and repeated refusal to abide by UNSC Resolutions 1970 and 1973. (...) We reiterate our strong support for the development of a transparent political solution as the only way to bring an end to the crisis and build lasting peace in Libya."

## Tuesday 5 April 2011

French fighter jets carry out combat support and no-fly zone missions in the regions of Misratah and Brega. A military vehicle is hit. At Souda, Crete, three patrols each made up of a French Mirage 2000-5 and a Qatari Mirage 2000-5 also carry out no-fly zone missions.



## Friday 25 March 2011

The first joint mission of French and Qatari aircraft is conducted in the Libyan sky along with reconnaissance and no-fly zone missions, particularly in the Misrata, Zintan, Syrte and Ajdabiyah regions, from Souda, Crete. At the same time, two Rafale Air and Marine patrols carry out reconnaissance missions. Four Mirage 2000 Ds, four Rafale Airs and a mixed Rafale/upgraded Super Étendard patrol also carry out no-fly zone missions. Just 45 minutes off the Libyan coast, the base in Crete gives the Franco-Qatari patrols the opportunity to conduct no-fly zone missions lasting more than two hours without refuelling in flight. The same day, General Jean-Paul Paloméros, Chief of Staff of the French Air Force travels to Nancy Air Base to meet airmen taking part in Operation *Harmattan*.



## 19 and 20 April 2011

The French military contingent positioned at Souda, Crete, gains momentum with the redeployment of Mirage 2000 Ds that, until then, were stationed at Solenzara Air Base in Corsica. From 25 March 2011, four French Mirage 2000-5s had been operating out of Souda Air Base in Crete where they carried out joint no-fly zone operations with Qatari Mirage 2000-5s as part of international air operations in Libya. On 18 April, four Mirage 2000 Ds conducting no-fly zone and ground strike operations from Solenzara are redeployed to Souda. At the end of their missions they return directly to Crete. On 19 April they are joined by two other Mirage 2000 Ds. As for the six Rafales deployed to Solenzara, they move to Souda on 20 April. The redeployment improves the efficiency of French fighter planes by reducing the transit time to the zone of operations.



Daily news updates at: [www.defense.gouv.fr/air](http://www.defense.gouv.fr/air)



# Chronology

## 5 to 12 May 2011

France carries out roughly 230 sorties: 110 ground strike sorties (Rafale Air, Mirage 2000 D, Mirage 2000 N and Mirage F1 CR, Rafale Marine and upgraded Super-Étendard), 56 reconnaissance sorties (Rafale Air, Mirage F1 CR and Rafale Marine), 20 air defence sorties (Mirage F1CR from Solenzara and Mirage 2000-5 from Souda in collaboration with Qatar), 12 air traffic control sorties (E-3F and E-2C Hawkeye) and 29 refuelling sorties (C135 and Rafale Marine). On 6 May, four strategic air forces Mirage 2000 Ns are deployed to Souda Air Base in Crete.

## Saturday 14 May 2011



General Joël Rode, French representative at NATO Combined Air Operations Centre (CAOC) No. 5 in Poggio-Renatico, Italy, travels to Souda Air Base in Crete. Welcomed by Lieutenant-Colonel Emmanuel Caboche, head of the French detachment, General Rode meets armed forces taking part in Operation *Harmattan*. “My trip to Souda, Crete, consisted in determining the success of missions assigned to French pilots and to convey the confidence of authorities in the service men and women involved in Operation *Unified Protector*”, explains General Rode.

## Thursday 19 May 2011

The French contingent carries out approximately 30 sorties per day, nearly half of which are ground strike missions. These numbers correspond to more than 20% of NATO sorties and 30% of ground attack sorties. Furthermore, French air strikes help neutralise roughly thirty targets, several of which are ships, including a “Koni” frigate and patrol vessels in the ports of Tripoli and Syrte, half a dozen military vehicles, including a battle tank in Brega and Tripoli combat zones, a radar station west of Brega and approximately twenty weapons and vehicle storage buildings.



## Thursday 19 May 2011



Amiral Édouard Guillaud, Chief of Defence Staff offers NATO use of the hospital of the Charles de Gaulle aircraft carrier for forces involved in Operation *Unified Protector*. It is the first joint coalition operation. The health services of the aircraft carrier usually employ three doctors, eight nurses and a medical secretary. For Operation *Harmattan* the unit is reinforced with a surgical team of two surgeons, an anaesthetist-resuscitator, a laboratory technician, a nurse anaesthetist, an OR nurse, an X-ray technician and two general care nurses. A dental surgeon is also brought aboard. The aircraft carrier’s hospital was already used by the French carrier battle group of five ships and nearly 3,000 servicemen engaged in Operation *Harmattan*. The chief physician of the aircraft carrier prepared his team for increased responsibilities: “The carrier has already been used as a hospital for joint forces during manoeuvres,” he explains. “My teams are used to working according to NATO procedures. In this situation we’ll just have to collaborate closely with other medical teams to ensure that patients receive optimum care.”

## Wednesday 1st June 2011

NATO and its partners make the decision to extend the mission by 90 days as from 27 June. The alliance and the 17 participating countries are determined to continue operations to protect the Libyan people. Coalition fighter planes carry out 155 sorties on average per day with one third of them involving strikes.



## Thursday 12 May 2011

Amiral Édouard Guillaud, Chief of Defence Staff, travels to Souda, Crete. Welcomed by the commander of the Greek air base and by the commander of the French detachment, the chief of defence staff was able to meet service men and women deployed to the base. In the operations room, Amiral Guillaud sits in on a pilot briefing. He also meets with commanding officers of the carrier battle group and the Charles de Gaulle aircraft carrier on operational stopover at Souda. The visit gives him the opportunity to dialogue with his Qatari counterpart, General Hamad Bin Ali Al-Attyah, and discuss the close collaboration between the French and Qatari armed forces. The Chief of Defence Staff brings his support to all the service men and women engaged in Operation *Unified Protector* and receives a first-hand look at their valour and determination.



## Night of 3 to 4 June 2011

Helicopters from the French Army Light Aviation (ALAT - Aviation Légère de l’Armée de Terre) deployed from Landing Helicopter Dock (LHD) Tonnerre carry out their first combat mission in Libya. As part of NATO Operation *Unified Protector* and a mission coordinated with British helicopters, the French airmobile group with combat support from Navy ships, executes strikes on roughly twenty military ground targets. The involvement of combat helicopters comes in addition to air and naval means already used by coalition forces. They offer the possibility of increasing pressure on Gaddafi forces threatening the civilian population. LHD Tonnerre set out from Toulon on 17 May 2011. Onboard are combat and transport/utility helicopters. From the night of 3 June 2011, it is engaged in Operation *Unified Protector* in Libya. This involvement is part of United Nations Security Council Resolution 1973.



# Chronology

Sunday 10 July 2011



After completing their mission over Libya, five Rafales from Solenzara airbase in Corsica land at Sigonella, Sicily, marking the increased presence of the French detachment on the Italian air base.

Wednesday 27 July 2011

Mr. Gérard Longuet, French Minister of Defence and Veterans Affairs visits Naval Air Station Sigonella in Italy in order to meet the “air” detachment. Mr. Longuet is notably welcomed by His Excellence Mr. Jean Rochereau de la Sablière, French ambassador to Italy, and General Jean-Paul Paloméros, Chief of Staff of the French Air Force. Throughout the presentation of the detachment, the Minister of Defence is able to witness the growing momentum of the detachment after being moved to Sigonella. He also learns how air missions are carried out before meeting crews and technicians working on Rafales.

Thursday 4 August 2011

Minister of Defence and Veterans Affairs, Mr. Gérard Longuet, announces reorganisation of French military forces engaged in Operation *Harmattan*. The decision includes the withdrawal of the aircraft carrier Charles de Gaulle. However, air strike operations continue in the Libyan theatre with army combat helicopters deployed from the Navy’s Landing Helicopter Dock (LHD) Mistral and with Air Force and Navy airplanes. After being stationed off the coast of Libya since 22 March, aircraft carrier Charles de Gaulle returns to its home port in Toulon on 12 August.



Wednesday 24 August 2011

The Harfang drone completes its first operational flight after taking off from NAS Sigonella, Sicily in the middle of the night to carry out reconnaissance missions. A detachment of twenty airmen from Squadron 1/33 “Belfort” from Cognac Air Base had arrived at the Italian base on 18 August, 2011.

Monday 29 August 2011

French Minister of Foreign and European affairs, Mr. Alain Juppé, announces the reopening of the French embassy in Tripoli. A team of French special forces is deployed to ensure that Mr. Pierre Seillan, deputy to the French special envoy in Benghazi, is set up safely in Tripoli. Under the protection of special forces, Mr. Seillan arrives in Benghazi in the morning of 29 August with a team given the mission of re-establishing diplomatic relations and bringing French presence to the Libyan capital.

Saturday 3 September 2011

A Rafale patrol takes off from NAS Sigonella in Sicily (Italy) for a bombing mission over Libya during which several AASMs (Air-to-Ground Modular Weapons) are fired. The AASM is a precision-guided weapon that can integrate different types of charges. It gives the Rafale all-weather daytime or night-time multi-target firing capacity while remaining at a safe distance from opposing anti-air defences. It enables metric precision firing around a designated target while limiting the risk of collateral damage. The bombing mission is followed by reconnaissance flights also executed by the Rafale using its new generation reconnaissance pod (NG RECCE pod). The equipment can be used for day-time and night-time operations at high, medium or low altitude and can also transmit data. Five French Air Force Rafales had been deployed to NAS Sigonella, Sicily from 10 July 2011 during Operation *Harmattan*. These missions are fine examples of the aircraft’s versatility.



Friday 8 July 2011

Visiting Allied Joint Force Command Naples, NATO Secretary General Anders Fogh Rasmussen sits in on an operation briefing on the operation being conducted by the coalition in Libya. He pays tribute to the men and women of the armed forces of NATO allies and partners for their efforts, service, dedication, and professionalism: “This is a complex campaign and we are continuing to fulfil our mandate. We are doing so with great care and extraordinary precision”, he declares. During his visit, the Secretary General holds meetings with Lieutenant-General Charles Bouchard, Commander of the Operation, and his command group. The briefing provides the Secretary General with the latest efforts to ensure the arms embargo and to neutralize military equipment and command and control nodes being used to threaten or attack civilians.



Thursday 15 September 2011

Units engaged in Operation *Harmattan* participate in the security of the French president and British prime minister’s trip to Libya in addition to the protection service put in place by the office of the French President, Élysée. In the sky, fighter planes, the Harfang drone and two ATL2 maritime patrol planes protect the security bubble. The visit takes place in two phases with two parallel operations. Firstly, at the Tripoli airport, where the presidential plane lands mid-morning to give a joint press conference downtown. Five utility helicopters taking off from Landing Helicopter Dock (LHD) Tonnerre with support from two Tigres wait for the authorities with Air Force protection means and medical personnel on board. The French president, British prime minister and their delegations then fly to Benghazi in the early afternoon.



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# Chronology

2 and 3 September 2011



General Hervé Rameau, French representative at the CAOC (Combined Air Operations Centre) in Poggio Renatico, Italy for Operation *Unified Protector* travels to Souda Air Base in Crete to visit the French military detachment deployed there. The next day he meets with Colonel Pellissier, commander of the French detachment, before heading to the operations room and the Mirage 2000 D, N and F1 CR hangar.

Thursday 6 October 2011

Ministers of defence from NATO and partner countries taking part in Operation *Unified Protector* meet in Brussels to discuss the prospects for ending the mission for Libya. Ministers affirm that the time for terminating Operation *Unified Protector* is approaching but that the mission is not over yet. "It is clear that the end is in sight. Gaddafi forces are fighting for a lost cause. The threat to civilians is fading away. The recent positive developments in Libya are irreversible", the Secretary General says after the meeting. Ministers emphasize that the positive trend in Libya is irreversible but that not all of Libya's population is yet safe from attacks by Gaddafi forces. Ministers therefore reiterate their commitment to continue the mission under the United Nations mandate for as long as necessary and their determination to bring it to an end as soon as possible. They also affirm their solid commitment to continue fully resourcing the operation until completion.

Thursday 20 October 2011

The former Libyan dictator is killed near his hometown, Syrte. After 42 years, Colonel Gaddafi's rule of fear finally comes to an end. NATO Secretary General, Anders Fogh Rasmussen announces: "Libya can draw a line under a long dark chapter in its history and turn over a new page. Now the people of Libya can truly decide their own future. I call on all Libyans to put aside their differences and work together to build a brighter future. I urge the National Transitional Council to prevent any reprisals against civilians and to show restraint in dealing with defeated pro-Gaddafi forces. NATO and our partners have successfully implemented the historic mandate of the United Nations to protect the people of Libya. We will terminate our mission in coordination with the United Nations and the National Transitional Council."

Wednesday 26 October 2011



France continues to reorganise its military contingent engaged in naval and air operations in Libya with the redeployment back to France of four Mirage 2000 Ns and three Mirage 2000 Ds based in Souda. The return to France is followed by an initial reorganisation of the French contingent, starting on 22 October with the redeployment of TF 473 means, followed by two Mirage 2000 Ds and four Mirage F1 CRs on 24 October. The same day, the four Mirage 2000 Ns deployed to Souda since 6 May return to France followed by three Mirage 2000 Ds that had been at Souda since 19 April 2011. The aircraft rejoin the French military contingent on alert in France, ready to return to operations in Libya if necessary. The "fighter" detachment at Souda still includes three Mirage 2000 Ds. Approximately 4,200 French service men and women took part in operations in Libya. France remains committed with allies and partners within the framework of NATO Operation *Unified Protector* and in protecting the Libyan population with 2,400 mobilised troops working on the zone from France, Souda, Crete, Sigonella, Italy, or on alert in France.

Since 4 November 2011

Staff from the Sigonella, Sicily detachment have been working on the withdrawal of French means deployed to the base. During Operation *Unified Protector*, the use of Rafales and the Harfang drone meant that a deployable air base with 220 service men and women and 670 tonnes and 3,700 m3 of equipment and materials had to be put in place. Servicemen from the detachment working on dismantling the camp were helped by staff from the air operations support group (GAAO - groupement aérien d'appui aux opérations), from the Central Establishment for Air Force Infrastructures (ECIA - l'Établissement Central de l'Infrastructure de l'Air) and the expertise of the 25th airfield engineering regiment (25e RGA). These complex logistical operations are overseen by the joint centre for operations logistics coordination (CICLO - Centre Interarmées de Coordination de la Logistique Des Opérations) and implemented by the multimodal transport centre (CMT - Centre Multimodal des Transports). The French air detachment deployed to Souda, Crete, completed withdrawal logistical operations on 28 November 2011 with more than 80 containers loaded on a ship chartered by the French Ministry of Defence.

Monday 31 October 2011

Operation *Unified Protector* comes to an end after 7 months of service. In total, at the height the crisis, 4,200 service men and women were enlisted to enable the operation of more than 40 aircraft, 20 helicopters, a dozen battle and support ships, including aircraft carrier Charles de Gaulle and a Landing Helicopter Dock (LHD). In the air, French Air Force and Navy fighter planes deployed from aircraft carrier Charles de Gaulle, French bases and Souda, Crete and Sigonella, Sicily bases accumulated more than 27,000 flying hours and roughly 5,600 sorties during which a thousand targets were destroyed. These sorties accounted for 25% of coalition sorties, 35% of offensive missions and 20% of coalition strikes. The airmobile group (GAM - groupement aéromobile) made up of French Army Light Aviation (ALAT) helicopters carried out roughly forty air raids, destroying 600 targets. In doing so they executed 90% of coalition helicopter strikes.

Committed Resources

Power projection

- C130 Hercules
- C160 Transall
- CN 235 Casa
- Aircraft carrier Charles de Gaulle
- LHD Mistral and Tonnerre



Intelligence - Anticipation

- E-3F radar planes
- C160 Gabriel
- Mirage F1 CR
- NG Recce Pod on Rafale
- Harfang drone
- Nuclear attack submarine
- E2C Hawkeye
- Atlantique 2
- Panther



Support

- C135 FR aerial refuelling aircraft
- Caracal and Puma on Charles de Gaulle then LHDs
- Command and supply ship
- Alouette III
- Dauphin Pedro
- Fleet tanker ship



Intervention - Combat

- Rafale Air
- Mirage 2000-5
- Mirage 2000 D
- Mirage 2000 N
- Mirage F1 CR
- Mirage F1 CT
- Tigre
- Gazelle
- Rafale Marine
- Upgraded Super-Étendard
- Anti-air and air defence frigates
- La Fayette frigate
- Anti-submarine frigate
- Aviso
- High sea patrol vessel.



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## Chapter I

**Launched on 19 March 2011, within the first moments Operation Harmattan mobilised eight air bases and roughly thirty aircraft. Rafales, Mirage 2000s, C135 aerial refuelling aircraft and E-3F radar planes were the first to enter into action over Libya that day. A look back on those crucial hours.**

**S**aturday 19 March 2011. Élysée Palace, Paris, 3.30pm. Just after the summit bringing together representatives from the Arab League, the European Union, the United States and the United Nations (UN), Nicolas Sarkozy, the president of France, announces the commencement of military operations over Libya. “Together, we have agreed to ensure implementation of UN Security Council Resolution 1973”, declares the Commander-in-Chief of the French armed forces. “Our air forces will oppose any aggression by Colonel

*Gaddafi’s airplanes against the population of Benghazi. Already, our planes are preventing air attacks against the city. Already, other French planes are ready to intervene against tanks that would threaten unarmed civilians.”*

According to Nicolas Sarkozy, in the first hours Colonel Gaddafi could “still avoid the worst” by complying with the resolution

and continues that “The door to diplomacy will reopen when the aggressions stop.”

In a press release published later in the afternoon of 19 March, Gérard Longuet, French Minister of Defence and Veterans affairs, declares that the president of the French Republic is going to implement military air operations over Libya. “Committing these French military forces today will contri-

bute to protecting the civilian population from attacks carried out by Colonel Gaddafi forces by establishing a no-fly zone in Libyan air space”, states the press release.

Taking part in operations from the very first hours, the French Air Force participates alongside its allies in one of the largest missions since Operation Desert Storm in the Persian Gulf in 1991. ■

# The French Air Force on the front lines

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On the front lines

# The first 48 hours

A look back at the rise in momentum of Operation *Harmattan*, the name given to the French military counterpart of multinational air operations over Libya.

Saturday 19 March 2011

## Beginning of air operations

Upon order of the French president, the chief of defence staff (CEMA) launched Operation *Harmattan*, name of the French counterpart of the international military intervention to protect the Libyan population against attacks by Colonel Gaddafi forces.

While the multinational plan of action is being put in place and gaining in momentum, each country's military means is commanded by their national command centres. In France,

## Rafales take off and head south

the French planning and operations centre (CPCO - Centre de Planification et de Conduite des Opérations) commands forces under the authority of the CEMA in close coordination with allied countries.

In the early afternoon, France mobilises its forces to enforce a no-fly zone in the critical region of Benghazi in implementation of United Nations Security Council Resolution 1973 and particularly in coordination with its British, American and Arab League partners.

At 1pm, the first patrol of four Rafales approaches Libyan air space. They engage in no-fly zone missions in order to prevent Colonel Gaddafi aircraft from flying. Later, fighters from Dijon (Mirage 2000-5s), Nancy (Mirage 2000 Ds) and Saint-Dizier (Rafales) Air Bases take off and head south. Lieutenant-colonel Rullière, commander of Fighter Squadron 1/7 "Provence" during Operation *Harmattan* explains<sup>(1)</sup>:

*"Our mission was to enforce the no-fly zone decided upon in the night of 17-18 March 2011. The aim was to prevent pro-Gaddafi*

(1) Excerpt from the magazine "Marine et Océans" special Libya issue.



A. Jélaud/French Air Force

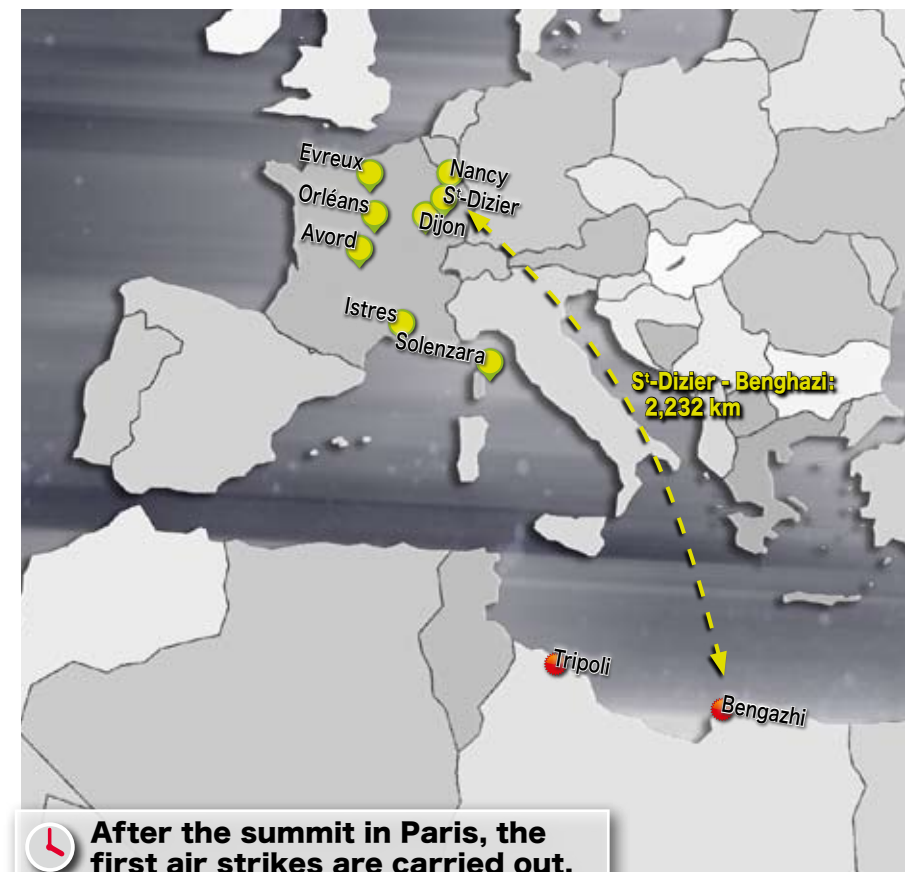


S. Dupont/French Air Force

*Reactivity, rigor and professionalism: airmen met the expectations placed before them. From the first few hours of the operation, French aircraft were operating over Libya.*



O. Bayard/French Air Force



**After the summit in Paris, the first air strikes are carried out.**

## Mobilisation

### Mobilised units:

- Fighter Squadron 1/7 "Provence" from Saint-Dizier
- Fighter Squadron 1/91 "Gascogne" from Saint-Dizier
- Fighter Squadron 1/2 "Cigognes" from Dijon
- Fighter Squadron 1/3 "Navarre" from Nancy
- Fighter Squadron 2/3 "Champagne" from Nancy
- Fighter Squadron 3/3 "Ardenne" from Nancy
- Airborne Detection and control Squadron 36 "Berry" from Avord
- Aerial Refuelling Group 2/91 "Bretagne" from Istres
- Transport Squadron 1/64 "Béarn" from Evreux
- Transport Squadron 1/61 "Touraine" from Orléans
- Airborne Electronic Combat Squadron 54 "Dunkerque".

### Committed air forces:

- In total, roughly twenty aircraft were engaged each day starting on 19 March 2011: Rafales, Mirage 2000-5s, Mirage 2000Ds, C135 aerial refuelling aircraft, E-3F radar plane, transport airplanes.

### Missions:

- Air defence to enforce the no-fly zone in the region of Benghazi and to prevent Colonel Gaddafi aircraft from flying;
- Strikes on identified military ground targets threatening the civilian population;
- Reconnaissance, air traffic control and detection, as well as aerial refuelling.



forces from using the third dimension. (...) The sky over Benghazi was empty. Our arrival dissuaded Colonel Gaddafi from using his own aircraft in the approaches to the city. However his tanks were much more present as they were supported by mobile surface to air defence systems. An SA8 tried to engage us in fire for a while, pointing its target acquisition radar at us. But our electronic combat system located it, confirming information given to us by the Awacs from Avord Air Base and we avoided its engagement range. We inspected numerous contacts not identified by the Awacs without encountering any enemy equipment. We flew over Benghazi several times at low altitude to let the population know that operations had begun and that they could maintain confidence in us. The first targeted strikes were conducted against identified military ground targets directly threatening the civilian population. The Mirage 2000-5 patrol that was to relieve us arrived a little late so we stayed in the zone for an hour more to ensure that the Cyrenaic sky was not left to Colonel Gaddafi air forces. On our way back we crossed paths with Mirage 2000Ds and Rafales with the mission of engaging tanks south of Benghazi to stop their progression towards the city."

In total, roughly twenty aircraft initially operated over the Libyan sky: eight Rafales, two Mirage 2000-5s, two Mirage 2000 Ds, C135 aerial refuelling aircraft, an E-3F radar plane. Along with these forces, two anti-aircraft and air defence frigates were positioned off the coast of Libya.

## More than 135 flying hours accumulated in one day

French Air Force aircraft took off from Avord, Nancy, Saint-Dizier, Dijon and Istres Air Force Bases. Aircraft from Évreux and Orléans were involved in logistical operations aimed at increasing the presence of air units and the carrier battle group. Transport squadrons supported all force projections. The Hercules, Transall and CN 235 were essential to the operation and carried personnel, cargo and munitions night and day to the detachments.

At the end of the day, French aircraft had already completed more than 135 flying hours (including nearly 90 hours for fighter jets) and destroyed numerous Colonel Gaddafi forces armoured vehicles.

*Page facing: portrait of General Gilles Desclaux, commander of air defence and air operations. The general was placed at the centre of the first air operations.*

## During the first hours of Harmattan, General Gilles Desclaux was charged by the chief of defence staff with overseeing air operations from the "Air" operations centre in Paris.

*How were French air operations carried out in the Libyan skies managed?*

General Gilles Desclaux – We managed all air missions carried out over Libya by the French Air Force during the commencing hours of *Harmattan* from the air defence and operation command centre (CDAOA - commandement de la défense aérienne et des opérations aériennes) in Paris. Managing on behalf of and under the direction of the chief of defence staff means proposing plans of action for daily missions. After he validated them, we had to bring those plans to life in order to inform crews of how they would get to the zone and the conditions of their mission. We basically formed a JFACC under my direction in Paris, where we came up with plans of action based on strategic directives, and in Lyon, where we scheduled and oversaw air operations. While missions were being executed over Libya, we maintained contact with crews. If necessary, we redirected their mission while transmitting instructions in real time thanks to the overall view we had of air operations in progress displayed on our control screens.

*How long did it take between designing and scheduling missions engaging our air force?*

With this crisis, like many others, we had to react very quickly in putting resources into action. One of its characteristics was that it evolved very rapidly in a small space of time. We had to adapt to the pace of the diplomatic process and anticipate the resulting decisions. The major lesson is that the French Air Force was able to adapt in real time and in particular, change the configuration of its aircraft in just a few hours in order to intervene in the Benghazi region.

*With these types of operations reactivity is one of the French Air Force's assets...*

Absolutely. Air deployment can be quick. However rapidness requires strong organisation and well-trained specialists.



## Adaptation in real time

From the very first missions carried out on Saturday 19 March, we demonstrated that we command these fast pace situations perfectly. The first day of an operation is always very complex. We didn't know ahead of time how the enemy would react. It is important to have a detailed understanding of the situation

## "The first day of an operation is always very complex"

provided by the military intelligence directorate. Using this information, meticulous analysis led to the design of missions on an almost case by case basis. To achieve the outcome desired by political decision-makers, our job was to support the Benghazi population and prevent Libyan aircraft from taking off and bombing Benghazi. We also had to prevent Colonel Gaddafi tanks and armoured vehicles from entering the city. That was the first phase of our mission.

*What missions were carried out by our aircraft?*

We carried out air defence missions to counter the Libyan air threat. Beforehand and to better assess the situation, we carried out reconnaissance missions. At the same time, we used Rafales and Mirage 2000 Ds to conduct strikes on tanks and armoured vehicles threatening the population. This had a decisive effect.

During the day on the Saturday, France was the only country to intervene in this particular objective. Then that night, American and British forces entered into action, conducting strikes on air defence systems, air bases and command and communication systems belonging to Colonel Gaddafi.

*What assessment can be drawn from the actions carried out during those critical hours?*

The French Air Force worked extremely well and this was recognised by all political and military leaders. Flight crews demonstrated remarkable know-how. In addition, the support chain (logisticians and technicians) assembled munitions and changed airplane configurations within very short timeframes in order to make them ready to execute air operations ordered by the chief of defence staff and decided upon by the president. Finally, I would also like to draw attention to the work of the CDAOA command chain that oversaw flight missions in real time via E-3Fs in order to ensure successful results. This all proves that our personnel are well prepared and trained for interventions of this type that require precision and vigilance. ■



## On the front lines

Sunday 20 March 2011

### Continuation of air operations

Following operations launched on 19 March, roughly fifteen French Air Force aircraft, including six Rafales, four Mirage 2000 Ds, C135 aerial refuelling aircraft and an E-3F radar plane carry out new reconnaissance and air defence missions in the zone of Benghazi in addition to airborne control and detection and refuelling flights. The French contingent continues to gain momentum with the arrival at the Solenzara Air Base of fighter jets returning from missions and equipment from the Charles de Gaulle aircraft carrier which left the port of Toulon to head to the Libyan coast. In two days, eleven air missions have already been carried out by aircraft taking part in military operations. ■

*Roughly twenty French Air Force aircraft are engaged from the commencement of operations on 19 March 2011.*



C. Lavenel/French Air Force

## Resolution 1973

Adopted by the United Nations Security Council, Resolution 1973 widens the scope of sanctions against Libya and opens the door to military intervention in order to protect the population. In particular:

- It sets out the creation of a no-fly zone prohibiting flights in Libyan air space, with the exception of humanitarian or evacuation flights, in order to protect the civilian population from air attacks by Colonel Gaddafi forces;
- It authorises member states to take necessary measures to protect the civilian population and enforce the no-fly zone;
- It strengthens the arms embargo by allowing inspections of ships or aircraft wishing to enter or leave Libya.



R. Nicolas-Nelson/French Air Force

# Meeting objectives on time!



A. Jélaud/French Air Force

**General Jean-Paul Paloméros, Chief of Staff of the French Air Force meets airmen engaged from the first hours of the operation.**

*“Through the skill, motivation and solidarity of each one of you, the French Air Force has been true to its reputation and met the expectations of the commander in chief of the armed forces and History. Today we are conducting complex air missions several thousand kilometres from our bases while continuing our permanent stance on security, dissuasion and the pursuit of our involvement in other theatres of operations that are just as demanding. I have seen you in action within our units, our air force bases, our facilities and our command centres. Whatever your profession, whatever your specialty, whatever your assignment location, you can be proud of the esteem in which our fellow citizens, France and the international community hold you.”*

**Colonel Michel Friedling, commander of Saint-Dizier Air Base 113**

*“The Rafale is based in Saint-Dizier. It is a versatile airplane capable of carrying out reconnaissance, air to surface strikes and air defence. On the first two days of operations, between six and ten aircraft were deployed in the Libyan skies each day. This operation involved a large number of specialties (logistics, support, technical) that participated in configuring aircraft. When you participate in such an operation it is an immense pride. You feel that you are providing the chief of defence staff with a high performance tool prepared by competent and motivated personnel.”*



J.Y. Desbordes/ECPAD



J.Y. Desbordes/ECPAD

**Commandant R., Rafale pilot with Fighter Squadron 1/7 “Provence” in Saint-Dizier**

*“At the time of the events I was away on training. I returned to the base on 18 March. All I knew was that United Nations Resolution 1973 had been adopted and I had no other information. Things happened very quickly. The next day I wasn’t set to fly but in the end, my mission was scheduled at the last minute. It lasted seven hours. It was a very long mission that involved a lot of people around me. Aerial refuelling aircraft based in Istres enabled us to get to the zone of action and brought us back to France. We were extremely reactive: four hours after receiving the targets, we were in flight. It was the result of real teamwork with preparation and planning bodies, intelligence teams giving us information and the technicians who prepared the aircraft.”*

**Capitaine R, Mirage 2000 D pilot with Squadron 3/3 “Ardennes” in Nancy**

*“I cut short a day with the family on 19 March to join my Squadron. Yesterday training missions were suspended to allow technicians to prepare the aircraft. A decisive meeting was being held in the afternoon in Paris between the European Union, the Arab League and the United States. I find out that I will be taking off at 1400 hrs for eastern Libya. Laser guided bombs are being installed under the aircraft. I inspect the aircraft with the apron technician and the armourer. They remove all the safeties. Everything is ready. Start-up, taxi, take-off. When we arrive off the Libyan coast we wait for instructions. Our orders are confirmed by radio. We are to destroy any military vehicle endangering the civilian population. We check our weapons and self-protection systems one last time before approaching the coast. I see the city of Benghazi in the distance.”*



A. Jélaud/French Air Force



# Engaged Coalition Forces

The first strikes were carried out by France. A few hours later Great Britain and the United States follow suit.

## ① Saturday 19 March

5.45pm local French time, first air strikes in Libya carried out by French fighter jets having taken off from their bases in France. At the same time, French, British and American forces are deployed at sea (command ship, aircraft carrier, submarines, destroyers, frigates, etc.)

## ③ Sunday morning

Twenty American aircraft, including three B2 stealth bombers attack Libyan ground targets for preventive purposes (mainly military air bases and their anti-air defence systems).

## ② Saturday night

American and British naval forces in the Mediterranean fire more than 120 cruise missiles against Libyan surface to air defence systems.

### Military forces deployed in the first hours

#### France

Rafale, Mirage 2000-5, Mirage 2000 D, C135 aerial refuelling aircraft, E-3F radar plane, transport aircraft.

Frigates and submarines.

#### United Kingdom

Tornado, Eurofighter, aerial refuelling aircraft, radar planes.

Frigates and submarines.

#### United States

B2, F15, F18 stealth bombers, radar planes, drones, aerial refuelling aircraft.

Command ship, aircraft carrier, destroyers, submarines.

### Numerous countries quickly inform of their intentions to participate in operations

- Canada: F18;
- Spain: F18;
- Italy: Tornado, Eurofighter;
- Denmark: F16;
- Norway: F16;
- Belgium: F16;
- Qatar: Mirage 2000-5, C17.

#### Coalition forces

- Air force bases
- Maritime forces
- Coalition strikes

Main insurgent cities

#### Libyan Forces

- Air force bases and potential targets





## The first ground strikes

**A**fter taking off from air bases 113 Saint-Dizier and 133 Nancy respectively, on 19 March 2011 a Rafale and Mirage 2000D head towards Benghazi. During the first hours of the operation, French forces neutralise numerous armoured vehicles belonging to Colonel Gaddafi forces and stop their destructive advance towards the civilian population of Benghazi.



# D+3: First Scalp raid

**Operation Harmattan has begun and a major first takes shape. Several fighter squadrons gear up to enter the history books. They will execute the first Scalp cruise missile attacks.**

In the night of 22-23 March 2011, two Rafales from Fighter Squadron 1/91 "Gascogne" took off from Air Base 113 in Saint-Dizier. Once in flight they joined two Mirage 2000 Ds from Fighter Squadron 3/3 "Ardennes" in Nancy and two Rafale Marines from Flotilla 12F that had taken off from the flight deck of the Charles de Gaulle positioned off the coast of Sicily. Accompanied by two C135 FR aerial refuelling aircraft, the six fighter jets headed for Libya. Together they made French aviation history by firing the first Scalp (système de croisière conventionnel autonome à longue portée - Long Range Standoff Cruise Missile) cruise missiles on Libyan air force base Al-Jufra.

Scalp missiles, the objects of everyone's attention. Never used before, the weapon is a cruise missile capable of reaching targets more than 250km away. Via the Hélios observation satellite, the Target, in this case the Al-Jufra air base has been studied in the finest detail and the targets of interest have been identified. Their images are even integrated into the memory of the Scalp

missiles in order that their infrared homing heads recognise the targets with precision.

In less than 24 hours, the aircraft are ready. "Last briefing, last checks around the Rafale and we're off", retells Lieutenant-colonel Gaudilliere. In heavy configuration with nearly 22 tonnes, Saint-Dizier crews quietly leave their base in the night and meet up with two 2000 Ds and two Rafale Marines. "Our coordination was optimal. We maintained radio contact and followed the general situation through link 16," explains the lieutenant-colonel. However the unthinkable occurs in flight: a technical incident prevents one of the Mirage 2000 Ds from firing its missile. The decision is made to reassign its target to the patrol leader of the Rafale Airs while continuing the mission with the Mirage.

With the unexpected mishap resolved, the moment comes for the fighters to leave the tankers. "We hardly spoke in the cockpit," recalls lieutenant-colonel Gaudilliere. "Perhaps because my pilot and I know each other very well." The first Rafale Air arrives at the release point. The pilot starts the missile's engine. "When the first Scalp was fired we were expecting to experience some dissymmetry but we ended up only feeling a slight jerk," says the lieutenant-colonel. Then a second missile is fired at the next release point. It would then take 30 minutes for the missiles to join their target. The aim is for the Scalps to arrive in quick succession with a sufficient element of surprise. For the Rafale Air patrol, the mission is not over. Equipped with MICA missiles, they switch to air defence mode to protect the other aircraft preparing to fire their Scalps.

"After firing the missiles, we immediately left the combat zone and met up with the tankers," explains the leader of the Rafale Air patrol. For "Gascogne" and "Ardennes", the mission lasted more than five hours by the time they returned to base. They would have to wait until the next day to find out the results and learn that the seven missiles fired met their targets with metric accuracy. "For crews it is a feeling of a job well done," concludes the lieutenant-colonel. During the seven months of Operation Harmattan, 15 Scalp missiles were fired in three Raids. ■

Système de Croisière À Longue Portée - Long Range (250km) Standoff Cruise Missile used for attacking hard targets. Its propulsion system and guidance system enable it to be fired at long range distances from its target. Its launch platforms include the Mirage 2000 D (2004) and Rafale (2007).

Length..... 5.10m  
Weight..... 1,280 kg  
Maximum speed..... 1,000 km/h  
Engine..... Microturbo turbojet  
Warhead..... over 300kg  
Operational range..... over 250km

SCALP

## An unprecedented armed forces mission

At Saint-Dizier, 1/91 "Gascogne" has been on alert since the beginning of Operation Harmattan. The squadron was informed of the eventual possibility of carrying out the first Scalp raid. After three days of air attacks in the Libyan skies it is no longer a question of possibility. The mission will indeed take place and files containing objectives and targets were sent to the squadrons. The work then starts for the units concerned and "personnel switches to battle mode to prepare as well as possible for the never before experienced mission within the French armed forces," explains Lieutenant-colonel Cédric Gaudilliere, commanding officer of the 1/91 and leader of the Rafale Air patrol for this first mission. At Saint-Dizier, technicians and "pétafs" (armourers) get busy. They equip the two-seater Rafales with two 2,200 litre tanks, four MICA missiles and two

*Opposite, a two-seater Rafale equipped with two 2,200 litre tanks, four MICA missiles and two Scalp missiles.*



T. Labatille/French Air Force



## Chapter II

**When the French intervention in Libya began under UN Resolution 1973, airmen at Solenzara Air Base did everything to ensure the success of the real operation.**



# Solenzara at the heart of Operation Harmattan

In less than 48 hours, Air Base 126 Solenzara was capable of accommodating twenty or so fighter jets and the personnel from several air bases (roughly 250 airmen). “Initially, the impact was absorbed by operational service units because we had to receive aircraft at the Corsican hub,” explains Colonel Éric Bometon, second in command at the

Solenzara Air Base. “We also had to room and board personnel from the squadrons and ensure that there was enough fuel for the aircraft. We also put in place an information and communications systems network.” Activity was a buzz at the Corsican hub. Fighter jets took off in successive waves to carry out strikes. To increase their efficiency, they were gradually repositioned on advanced bases at Souda (Crete) and Sigonella (Sicily). These redeployments brought French fighter jets closer to Libya to gain more time in the zones of operations. The transfer took place in two phases. Starting on 18 April 2011, Mirage 2000 Ds were redeployed to Souda and on 10 July, Rafales took off for Sigonella. Fighter jets departed from

Corsica without any break in operations through the support of military air transit unit, the support and technical supply squadron, technicians, armourers and all the airmen participating in the operation. According to Colonel Bometon: “One of the exploits of Harmattan was how the organisation of the air base proved how highly efficient they are.” ■

Corsica without any break in operations through the support of military air transit unit, the support and technical supply squadron, technicians, armourers and all the airmen participating in the operation. According to Colonel Bometon: “One of the exploits of Harmattan was how the organisation of the air base proved how highly efficient they are.” ■

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# The air base as a combat tool

General Jean-Paul Paloméros, chief of staff of the French Air Force iterated the assets of the air base, which he defines as the Air Force's combat tool.



Above, the chief of staff of the French Air Force visits airmen deployed for Harmattan at Solenzara.

Page opposite, above, aerial view of Rafales on the tarmac in Corsica.

Below, a Mirage 2000 D takes off for a mission over Libya.

“On Saturday 19 March 2011, less than two days after UN Resolution 1973 was adopted, upon order of the French president and commander-in-chief of the armed forces, our aircraft took to the Libyan sky and struck. After that, each day they raised their landing gear to carry out missions far from their country, taking off from their home base or our “advanced” air base at Solenzara. Operation *Harmattan* has demonstrated to all our strength in mobilizing our forces through our air bases.

*Harmattan* particularly highlights the continuum between training and real action, between peace time and times of crisis. It shows the ability to transpose the activities that ensure the quick reaction and adaptation of the air force, around which the very idea of the air base is built.

*Harmattan* particularly highlights the continuum between training and real action, between peace time and times of crisis. It shows the ability to transpose the activities that ensure the quick reaction and adaptation of the air force, around which the very idea of the air base is built.

Our performance over the last few weeks relies on strict training and strong fundamentals. Our air bases, where our forces are stationed and deployed, act as operational training fields that make them an essential defence and security tool for our country.

Our bases are built around an unchanging focus: their mission. Each site belonging to the French air force has one or several missions, whether they are front line combat missions or support missions. It is the perfect synergy of your missions that



## Support: an act of combat of its own

made Operation *Harmattan* a success for which we deserve to be applauded.

Your day to day missions are the foundation of our actions during combat. Through the daily uncompromising work of each one of you, regardless of your profession, on our air bases or industrial facilities, the French Air Force has undeniably proven its place on the international stage.

We operate from our air bases every day and of course this is nothing new. However current events have attested to our ability to conduct war operations from our bases while continuing our permanent position and related missions imposed by the steady pace of our other theatres of operations.

*Harmattan* also underlines what we have known for a long time: that support is inherent to sustainability and is an act of combat of its own. Thus said, I am convinced that the events that we are currently facing are also an opportunity in the consolidation of defence bases and the adaptation of our joint military structures while emphasising the fact that there is no difference between the support associated with our operational preparation and the support associated with the actual operations themselves.

I would therefore like us to gain as much experience as possible in this area in order for our military to collectively draw essential lessons from it.

Finally and perhaps above all, the main lesson I have learned from the intensity of these last three weeks of operation is

the strength of your teamwork and your motivation, especially when the stakes are critical and the timeframes short. If there is a reason why we cherish our air force bases it is surely because they are both the heart of the French Air Force and the heart of our military, professional and operational commitments.” ■





Gaining momentum at Solenzara

# Solenzara, cornerstone of the operation

A look back at the active participation of Solenzara Air Base in multinational air operations over Libya.



W. Collet/French Air Force

**B**eginning on Saturday 19 March 2011, all hands were on deck at Air Base 126 “Capitaine Preziosi” in Solenzara. Mirage F1s, Mirage 2000-5s and Mirage 2000 Ds were gradually deployed to the Corsican hub within the framework of Operation *Harmattan* being carried out over Libya. The entire base immediately reacted with professionalism. Airmen acted as any serviceman does when confronted with a real operation.

*“Some worked non-stop the first three days, barely resting at all,”* says Colonel Éric Bometon, second in command at the Solenzara Air Base. *“Those that come to mind in particular are the personnel who set up information and communication systems and those working in accommodations who organised sleeping arrangements for those arriving in the middle of the night. To give an idea, we had up to 350 additional people at the air base. The military air transit unit at the base saw a notable peak in activities. When the operation was launched, more than 200 tonnes of cargo arrived on the Saturday!”*

## Builders take the stage

As soon as air operations began under Resolution 1973, French Air Force deployment support units were placed on alert. Therefore the operations infrastructure company (CIO - compagnie d’infrastructure en opérations), the 25<sup>th</sup> airfield

*Opposite, the men of the 25<sup>th</sup> airfield engineering regiment worked hard from the beginning of Operation Harmattan. Page opposite, a Mirage F1 CR returns from a reconnaissance mission.*



O. Ravanel/French Air Force

## Working under an intense deployment pace

engineering regiment (RGA) and the central air infrastructure organisation (ECIA - l’établissement central de l’infrastructure de l’air) were mobilised from the beginning of *Harmattan*. Right from 18 March 2011, these pillars of operations infrastructure were on the scene. In anticipation, the ECIA had placed orders for infrastructure equipment ahead of time to mitigate delivery timeframes. On 19 March, Commandant D was deployed to the Solenzara Air Base. *“My mission was to determine the infrastructure needs of the Corsican hub for the operation underway. Four experts, two from the CIO and two from the 25<sup>th</sup> RGA then arrived to refine the human and material necessities in the field,”* recalls the commanding officer of the detachment. In just a few days, deployment support at the Corsican air base included fifteen people from the 25<sup>th</sup> RGA and ten from the CIO. Roughly 720 m<sup>3</sup> of infrastructure materials and equipment were transported. 315 m<sup>3</sup> of electrical equipment capable of providing power to 60 air-conditioned tents were also deployed. The two units had an overlapping

mission. One was responsible for horizontal infrastructure and the other for vertical infrastructure.

## Technicians and armourers on the job

Each day, French Air Force fighter jets took off from the air base in direction of the Libyan skies. However deploying a fighter jet does not only depend on the work of its pilot. An entire team on constant alert made it possible for the aircraft to carry out their missions in optimum conditions. Fighter jets were prepared for deployment by technicians and armourers. It took two and a half hours for technicians to carry out pre-flight inspections before aircraft were ready for take-off. At the same time, armourers worked tirelessly to assemble the various ammunitions and arm aircraft to be used on the Libyan theatre. They were organised into two teams; one in the morning and one in the afternoon. Some technicians worked the morning shift for three days and then switched to the afternoon teams. The afternoon teams were also on duty at night.



## Gaining momentum at Solenzara

### A reinforced control tower

To manage the incessant stream of missions, air traffic controllers at Solenzara Air Base were placed on round-the-clock alert. The team was even reinforced to meet operational needs. In the control tower, six controllers from Nancy and Saint-Dizier Air Bases were brought in as reinforcement for the Corsican airmen. *“Fighter jets take off from the air base every day. During the six hours that they are away, we manage the movements of transport aircraft or fighter jets replacing them,”* explains Capitaine M, air traffic control officer at Solenzara. Aircraft returned from missions in the south-eastern sector of Corsica. *“An hour before they arrived in our zone of responsibility, the aerial refuelling aircraft responsible for the patrol contacted the control tower. When they arrived in our zone of responsibility we directed them and had them land on the runway. The operation took about ten minutes,”* says Capitaine M.

When aircraft returned at night, air traffic controllers provided more comprehensive assistance. *“We had them land using the GCA (Ground Control Approach). We guided aircraft from the ground giving them instructions to help them position themselves in an ideal glide path and in the axis of the runway,”* explains one of the controllers at Air Base 126.

## Un renfort des autres bases aériennes

### Outstanding technical support

*“Aeronautical technical service units are responsible for support, logistics, implementation and monitoring of all technical equipment,”* says Lieutenant-colonel R., head of aeronautical technical services. Under his orders are the environment equipment support squadron (ESME - l’escadron de soutien des matériels d’environnement), the air information and communications systems squadron (ESICAéro - l’escadron des systèmes d’information et de communication aéronautiques), the technical support and supplies squadron (ESRT - l’escadron de soutien et de ravitaillement technique) and the logistics coordination office. The latter is the interface between the units on the base and the Air Forces Support Command (CSFA - commandement du soutien des forces aériennes) or the air defence and operation command centre (CDAOA - commandement de la défense aérienne et des opérations aériennes). *“Our units are not big enough to cater to such a large deployment of fighter aircraft,”* resumes the lieutenant-colonel. Indeed the fighter squadrons which the Corsican hub is used to receiving have few fighter aircraft. Their arrival is also planned and support units can organise themselves according to schedule. The stream

On 28 March 2011, Hugues Hendel, while commanding air forces, visited Solenzara Air Base. A look back at the actions carried out at the time and the players involved.

## Général Hendel’s impressions during his visit to Solenzara

*General Hendel, what do you think of the operations being carried out by airmen since the beginning of Operation Harmattan on 19 March 2011?*

Général Hugues Hendel – My job involves the training of forces, the return of pilots, gaining feedback and keeping up with changing doctrines and equipment. It is clear that the training of our airmen is well-adapted because they know how to come up with courses of action, optimise their experience and constantly adapt to new situations. Given the type of operations that we are likely to confront, it is important to have personnel that know how to adapt. Flexibility and the ability to adapt are the main qualities of our pilots.

*If the operation being carried out by France in Libya were to continue, how would it go over within the French Air Force?*

Everything would work out just fine since we are already working in a mindset that focuses on the long term. We’ve got weapons in stock. My concern is mainly for our young pilots. Their squadron training is suffering because priority is given to operations in Libya. Because of this, they’re working at a slightly slower pace. Despite everything though, they will benefit from the experience of the pilots who are here at Solenzara or at Saint-Dizier and Nancy and their training will resume as soon as operations are over.



French Air Force

# Focus on air forces

French air operations carried out on 28 March focused on the regions of Zintan and Misrata. An E-3F and two C135 tankers were deployed to support air defence and ground strike missions carried out from Air Base 126 in Solenzara and the Charles de Gaulle aircraft carrier with two Rafale Air patrols, one Mirage

200 D patrol and an upgraded Super-Étendard patrol. That night, a strike was made on an ammunition dump located in the region of Gharyan, south of Tripoli, by a Rafale Air patrol, two Mirage 2000 D patrols, a Rafale Marine patrol and an upgraded Super-Étendard patrol with combat support from a C135 and a Hawkeye.■

## Intelligence opens the way

On 17 March 2011, a detachment of Mirage FICRs from Fighter Squadron 2/33 “Savoie”, on a firing campaign at the Corsican air base, carried out the first reconnaissance missions off the coast of Libya. Starting on 19 March 2011, their missions took them into Libyan territory. To carry out their



C. Ambroise / French Air Force

mission, the fighter jets crossed the Mediterranean, escorted by an air defence aircraft. While working in the zone, the fighter pilots flew over their targets to photograph them. On the return flight each minute counts: *“we try to accelerate the return phase to bring fresh intelligence,”* explains Lieutenant-colonel V., head of the Mirage FICR detachment for *Harmattan*. The reconnaissance mission of the Mirage FIs continued until their withdrawal on 14 July 2011. They have been carrying out conventional assault missions out of Souda since 15 August 2011.

## Interview with Captain Ian A., British exchange officer



J.-F. D'Arenques/ECAPAD

*How did your involvement in Operation Harmattan take place?*

Captain Ian A – I’ve been integrated as a pilot in Squadron 3/3 “Ardennes” since June 2009. I had to obtain consent from England to be deployed and follow the rest of my squadron in operation *Harmattan*. My country immediately gave me the green light.

*If your country had refused to take part in operations in Libya, could your British superiors have prevented you from participating in Operation Harmattan?*

The issue wasn’t even raised since the French and British had been working together since the beginning, sharing the same ideas. Both countries therefore made huge efforts to obtain the resolution. As for me, I had thought about the issue. I personally think that it’s great that there is a British officer in a French squadron, just like the fact that there is a French officer in a British squadron. Captain F., on exchange in Great Britain, is participating alongside the British in the operation in Libya.



## Gaining momentum at Solenzara

of aircraft movements and air activities during Operation *Harmattan* were such that technical units received reinforcement from other air force bases. Three NCOs came to increase the ranks of the ESRT, which is the logistics unit particularly responsible for overseeing materials and equipment transit both by road and by air. At the same time, the ESME, which ensures the monitoring and repair of aeronautical environment equipment (ground power units, tow tractors, etc.), received personnel and equipment reinforcements to absorb the unscheduled increase in activity. “During Operation Harmattan, we worked on a round-the-clock schedule,” explains Capitaine P, ESICAéro commanding officer responsible for radio, ground to air communications, radars, sensors and navigation systems.



O. Ravanel/French Air Force

### Operations under high security

On 18 March 2011, the “Mousquetaire” cell made up of two security modules of the French Air Force paratrooper commando unit (CPA - *commando parachutiste de l'air*) No. 30 was deployed to Corsica to provide security for the base’s sensitive areas. “The *Mousquetaire* alert is armed year round by CPA No. 20 and No. 30. They can be deployed very quickly”, explains Capitaine C, commanding officer of the secu-

rity squadron at Solenzara Air Base. “These teams came to reinforce the two companies at Air Base 126 that ensure the protection of the base each day.” ■

Reinforced with French Air Force paratrooper commandos, members of the security squadron carry out security surveillance of the Corsican air base’s sensitive areas.

### The plant that makes the right stuff

From 19 March 2011 and the beginning of French intervention over Libya under Operation *Harmattan*, the aeronautical gas plant (UPGA - *l'usine de production des gaz aéronautiques*) operated at full production capacity. Located on the Solenzara Air Base, it supplies oxygen needed by pilots taking off from the Corsican air base to carry out their various missions. Above a certain altitude, humans require a supply of oxygen to breathe. Without the UPGA, which produces the precious gas, pilots would not be able to fly. Mirage 2000 D, Mirage 2000-5 and Mirage F1 crews at the advanced Solenzara base depended greatly on the plant. Only the Rafale, equipped with an onboard oxygen production system, is autonomous. The plant is used to handling variations in demand, particularly during peaks in activity during firing campaigns that are organised regularly in Corsica. The production process is complex. A stack outside the plant intakes and filters air from the environment. It is then compressed, cooled and then filtered again. When it comes out of the turbines, the oxygen is liquefied through distillation to separate it from the other components before being stored in large tanks. It must be used within 45 days after sample analysis confirming its purity. In one year, the UPGA at Solenzara produces a total of 40,000 to 50,000 litres of the precious elixir. Fighter squadron technicians then take oxygen from the storage tanks to fill the oxygen tanks placed in the aircraft.

## A word from the experts



W. Collet/French Air Force

**Colonel Éric Bometon, second in command at Air Base 126.**

“I was appointed in charge of Mirage 2000D, Mirage F1 and Rafale fighter detachments deployed to the air base. I was responsible for coordinating their activities and providing the support needed to carry out their missions. I was also the contact person for the Air Operations Centre in Poggio Renatico, Italy.”

**Chief physician L, head of the military medical centre at Solenzara.**

“It is difficult to remain in a confined space for up to seven hours where there are moments of intense activity and others that are more calm. Long flights put pressure on several parts of the body, including the neck, back and tailbone. Night flights also cause eye fatigue from persistence of vision. A massage/physiotherapist was sent to us in reinforcement in order to optimise the recuperation of crews, just like with elite athletes.”



W. Collet/French Air Force



O. Ravanel/French Air Force

**Sergent-chef M., aircraft technician at Air Force Base 133 in Nancy.**

“I am an aircraft technician in charge of Mirage 2000D repairs at Air Force Base 133 in Nancy. I am also an apron runway technician, meaning that I prepare aircraft. I get them off the ground and take over when they return from their flights. We were relieved and very happy when aircraft returned from their missions. The pilots headed out on difficult missions with a high element of risk. When we saw them return it meant that the mission had gone well. Apron technicians take care of the pilot. They place safeties back on ejection seats. They also make a technical assessment of the mission with the pilot.”

**Capitaine G., commanding officer of the technical support and supply squadron.**

“Personnel in the shipping and reception section of the unit handled thousands of square metres and hundreds of tonnes of equipment and materials during the deployment phase. During the first five days of the operation the unit carried out the equivalent to several months’ worth of work! The personnel in the unit demonstrated their motivation and teamwork. For instance, the ESRT assisted the personnel of the operations infrastructure company and military air transit unit personnel. We also provided support to armourers at the base to preposition ammunitions.”



W. Collet/French Air Force



## Armourers in action

**F**rom the beginning of Operation *Harmattan*, the number of armourers at the Solenzara Air Base ammunition dump was reinforced with “aircraft” armourers. These bomb and missile experts worked round-the-clock to recondition aircraft back from strike missions. These technicians alone are authorised to access the zone reserved for these sensitive operations. Additional ammunitions were transported from air base ammunition dumps on the mainland by truck, boat and military planes. Within the dump, airmen even worked through the night to assemble ammunitions in order to be ready for missions the next day.

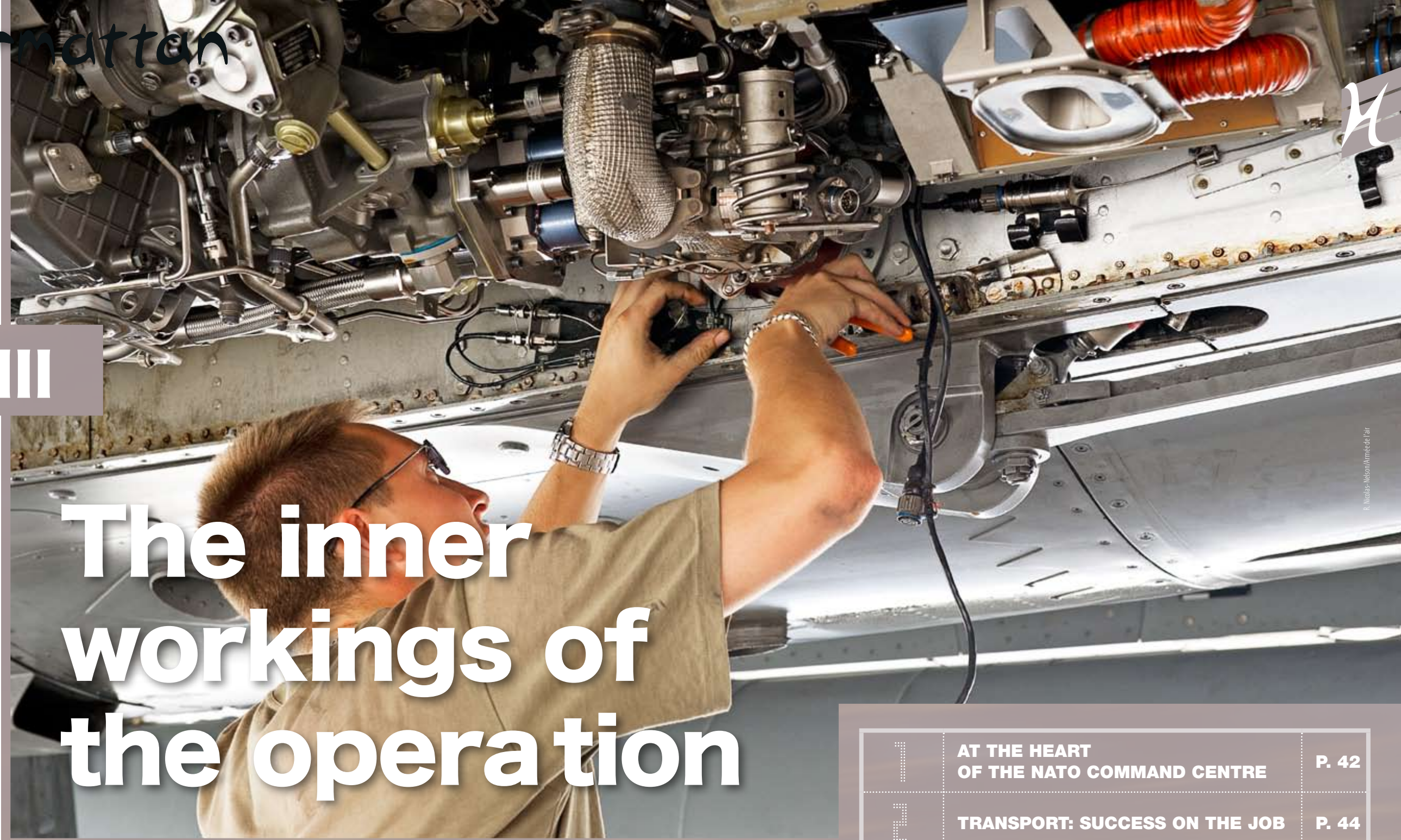




## Chapter III

**Staying strong over the long term is the challenge overcome by French airmen during Operation *Harmattan*. To do so, a true “war machine” involving the entire Air Force was set in motion.**

**R**eactivity, rigor and availability are the qualities that characterised French airmen over the seven and a half months of Operation *Harmattan* over Libya. In addition to flight crews, various NATO and Air Force bodies immediately set their work in motion like a well-oiled machine in order to carry out the operation. Very involved from the beginning, France demonstrated the know-how of its airmen within NATO bodies in Italy, wor-



# The inner workings of the operation

king in key positions as well as in the field. In order to be as close as possible to the Libyan theatre of operations, French forces were deployed to Crete and Sicily. Once there, ideal working conditions were recreated for technical personnel and crews. A substantial number of airmen participated in setting up these facilities by transpor-

ting materials and equipment, installing infrastructures and cooperating with local authorities. Mobilisation was made possible through prior tried and tested organisation. Operation *Harmattan* also put centres of excellence such as the French Air Force test and evaluation centre in Mont-de-Marsan in the spotlight. These centres

gave direction and increased the air force’s strike capability. These various interrelated and closely interconnected links in the operational chain were greatly relied on in the summer of 2011, a pivotal time during Operation *Harmattan*. In this chapter we look at the mechanisms of a resilient, quick and efficient machine. ■

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A widespread effort

# At the heart of the NATO command centre

On 31 March 2011, NATO took over command of Operation *Unified Protector* being carried out over Libya. Operations control was exercised out of Naples and the tactical element out of Poggio Renatico, Italy.



April, I arrived in Naples to act as National Senior Representative with the commander of Operation Unified Protector. I have three assistants, one from each army, and a legal adviser. They work under my orders and do not report to NATO. I am the bridge between the French military command (EMA – état-major des armées) in Paris, and the command of Operation Unified Protector in Naples. In this role I do not act only on behalf of the Air Force; I have a joint military role. We are an important source of resources for Operation Unified Protector and are therefore present at each level of the operation's decision-making process. The major manoeuvres are decided upon in Naples upon proposition of the commanding officers of the air and maritime components."

All NATO operations carried out over Libya were coordinated on an operative level by the CJTF OUP (Command Joint Task Force for the Operation *Unified Protector*) in Naples, under the command of Canadian general Charles Bouchard. He converted strategic directives developed in Mons, Belgium, into operative directives followed by maritime and air command centres for the implementation of the arms embargo and no-fly zone, and to carry out air strikes in order to protect the civilian population.

On the tactical level, maritime and land operations were carried out from Naples while the air component was based at

## An airman at the operations level

General Dominique de Longvilliers, working with the Combined Force Command for Operation *Unified Protector* in Naples.

"I took part in the first phase of operations, working out of Paris. In late March, I went to Poggio Renatico for a week in order to establish the French Participation within the CAOC 5 (Combined Air Operations Centre) right before NATO took over command. In

CAOC 5 (Combined Air Operation Centre) in Poggio Renatico (roughly 300 km from Naples) under the command of American general Ralph Jodice. "Made up mainly of the air command in Izmir, Turkey, and elements from the CAOC in Ramstein, Germany, the CFACC (Combined Force Air Component Commander) is responsible for the real-time tactical control of operations", explains General Vincent Tesnière, Deputy Commander to General Jodice. The CFACC received directives from the echelon above in Naples and proposed a plan of operations with deployed means. ■

## The operations level in Naples and the tactical level in Poggio Renatico

Above, meeting of the NATO multinational communication office in Naples.

## An airman at the tactical level

General Joël Rode, seconded to Poggio Renatico, French national representative with NATO.

"I am the National Senior Representative and person in charge of French elements put in place in Poggio Renatico for Operation Unified Protector. The "Air" detachment acts as the relay between the decisions made at the CAOC 5 (Combined Air Operations Centre) on how missions are to be carried out and the units taking part in operations from France or Crete. We put in place an important CIS detachment (Communications and Information Systems) in order to be in constant communication with French and NATO authorities. The air operations carried out from the CAOC concern aircraft taking off from their home base in France (Awacs and C135), fighter jets deployed to the field in Corsica or Crete, as well as aircraft taking off from the Charles de Gaulle, integrated into the air campaign."





A widespread effort

# Transport: success on the job

Throughout the entire duration of Operation *Harmattan*, French Air Force transport squadrons played a major part in providing support to operations.

On 23 February 2011, 335 French and 56 foreign nationals were evacuated from Libya aboard two airplanes from Transport Squadron 3/60 "Estérel" from Creil Air Force Base. In addition to the "Estérel", all air transport capacities

were used daily to deploy airmen or bring in supplies during Operation *Harmattan*. Transport squadrons act as support to all projections of forces. The Hercules, Transalls and CN 235s were essential to the operation and transported personnel,

cargo and ammunition to detachments day and night. In the first thirteen days of Operation *Harmattan*, 45 air missions enabled nearly 520 passengers and 330 tonnes of cargo to be transported, which represents more than 280 flying hours.

During the first phase of increased activity, while forces were being deployed to advanced air bases in Solenzara, then Souda, Crete, and Sigonella, Sicily, demand intensified. In addition, the day before the Charles de Gaulle set sail, the transport fleet played a crucial role by organising the transfer of several hundred seamen from Brest to Toulon. Quick reaction and efficiency to face the needs of prepositioned forces were the leitmotifs of logistics units over the seven months. At the support headquarters (CPSS - *centre de permanence et de synthèse du soutien*) located in Bordeaux, airmen worked round-the-clock to organise aircraft repairs in collaboration with the multimodal transport centre (CMT - *centre multimodal des transports*) in Villacoublay.

While visiting Évreux Air Force Base on 31 March 2011, General Jean-Paul Paloméros, chief of staff of the French Air Force paid tribute to "transporters" and their "remarkable work". He also applauded crews from the "Béarn" and "Anjou" transport squadrons for being "the cornerstones of the mission. They reacted quickly from the very first day of operations", he underlined. He also praised the crews of the "Touraine" and "Franche-Comté" transport squadrons at the controls of the Air Force's Hercules and Transall fleet. ■

Opposite, a C130 Hercules, one of the highly used aircraft throughout Operation *Harmattan*.

## A closer look at two vital jobs



just a few months, nearly 75% of airmen in the unit worked in two different operations, and in 2011, some were even deployed to all three theatres.



Within the airborne detection and control squadron (EDCA - *escadron de détection et de contrôle Aéroportés*) in Avord, E-3F radar planes were also used daily by the coalition as they are an essential link in the chain of command and control. Each day, they ensured the tactical control of operations by monitoring aircraft to protect them from air or surface to air threats and transmitting orders of engagement from authorities or sending information from the theatre to decision-makers. They also manage data link networks (L11 and L16) to ensure that equipped players can communicate. The qualified crews of the EDCA worked with the United Kingdom, the United States and NATO, each working shifts each day. Each mission lasted between 10 and 14 hours and began between midnight and 5 a.m. This represents a total of more than 2,500 flying hours, including 1,155 in command in the theatre. In one mission, EDCA crews controlled up to 24 tankers, 32 fighter patrols, 10 drones and 13 humanitarian flights.

## EATC: orchestrating operations

"The beginning of *Harmattan* was intense because we had to organise the deployment of equipment, materials and airmen in just 24 to 48 hours," explains Colonel Bernard Lannes, head of the Tasking Branch at the European Air Transport Command based in Eindhoven, in the Netherlands. "It is the pace imposed by military operations. We therefore had to put in place a much shorter loop to process requests by creating a cell with two people working round-the-clock, dedicated solely to this operation." In terms of means, the EATC did not particularly assign aircraft to Operation *Harmattan*. However in June 2011, with the aim of optimising and rationalising resources, it created a hub at the Solenzara Air Base, the converging point of all streams of cargo and passengers coming from mainland France.

During Operation *Harmattan*, the EATC tracked the transport of a total of 12,400 passengers, 3,500 tonnes of cargo and 3,850 flying hours for operations over Libya.





# A close look at deployed airmen

After the major involvement of Solenzara Air Base in the air contingent of Operation *Harmattan*, Souda (Crete) and Sigonella (Sicily) followed suit in supporting the deployment of NATO forces.

## SOUDA

**O**n 19 April 2011, the French military contingent positioned at Souda increased its activities with the end of redeployment for Mirage 2000 Ds operating until then out of Solenzara. In total, ten French aircraft were engaged in NATO Operation *Unified Protector* from Crete: four Mirage 2000-5s and six Mirage 2000 Ds. The French Air Force detachment experienced three successive phases of deployment. Following adoption of Resolution 1973 by the United Nations Security Council on 17 March 2011, four French Mirage 2000-5s and six Qatari Mirage 2000-5s were deployed to Souda Air Base. On 25 March 2011, the first joint French-Qatari missions were carried out. The second phase began on 18 April with the gradual redeployment of six Mirage 2000 Ds from Solenzara Air Base in Corsica to Souda. The transfer allowed French fighter jets to increase their “work” time over Libya. The French contingent was therefore increased to 210 people. Finally, the third stage involved the reinforcement of the French detachment with four Mirage 2000Ns to compensate the break taken by the carrier air wing during the stopover of the Charles de Gaulle aircraft

*Photo opposite, the crew of a Mirage 2000N climbing into the aircraft cabin*  
*Page opposite, a Mirage 2000-5 during taxi.*

## Increasing “work” time in the zone

carrier in Souda from 10 to 14 May 2011, after more than 50 days at sea.

In order to receive the deployed units, the operations infrastructure company (CIO - compagnie d’infrastructure en opérations), with just one week’s notice, sent a team of fourteen servicemen to Souda on 3 July 2011. Their objective was to install shade structures on the tarmac designed to protect Mirage 2000

crews and technicians from the heat before taking off for missions. Fifteen crates of materials and equipment, i.e. 78 m3 of equipment for a total of 25.75 tonnes was brought in. On 7 July, the CIO began to install the first shade structure based on a model with two metal frames and stretched canopies. With one six-metre long aircraft shelter being set up each day, ten were set up altogether. ■

## French-Qatari flights: a long tradition of cooperation

“From Souda, the Libyan coast is just a 45 minute flight away,” points out Capitaine R., pilot with Squadron 1/2 “Cigognes”. The position of the Greek base, near the zone of conflict enables Qatari aircraft operating alongside the French to carry out no-fly zone missions lasting two and a half hours without having to refuel in flight. Since the joint patrols began, fighter jets complete an average of ten sorties over three days. The job of these “sky police” is to, if necessary, intercept suspicious aircraft flying in Libyan air space. The eight French Mirage 2000-5 pilots share their experience during joint missions to give Qataris the opportunity to become more familiar with NATO procedures. During flight preparation, the French conduct the briefings: from weather forecast to the route and identified threats, these meetings take place daily. However the French are not always the patrol leader. The Qataris also sometimes take the lead. Flight crews are not the only ones to share their skills. Five French technicians work alongside Qatari teams. “They have the know-how, but lack automatic reflexes. We work with them to advise them and answer their questions,” explains weapons specialist, Sergent-chef S. A total of 220 servicemen from Qatar are in Crete.

Written by Samantha Lille – DICOD



J.-J. Chazard/DICOD



# SIGONELLA

In the early afternoon of 10 July 2011, after completing their mission over Libya, five Rafales from Solenzara Air Base (Corsica) landed at Naval Air Station Sigonella in Sicily. In addition to Souda, it became the hub from where the five Rafales would operate. It brought them closer to their zone of action to increase their time of presence in the zone.

The increased presence of the French detachment at Sigonella required significant logistical manoeuvres on the part of airmen: *"The first stage of the transfer consisted in carrying out reconnaissance of the site in Sicily,"* explains the head of logistics for the French detachment, Lieutenant-colonel M. *"A team made up of component commanding officers came to Sigonella to ensure that existing facilities correlated with operational needs."*

The deployment required meticulous planning. Air rotations began on 23 June 2011 with roughly 160 servicemen in total and more than 250 tonnes of cargo (weapons, generators, auxiliary and telecommunications means, pack-up kits, etc.) being brought in. These means were transported by tactical transport aircraft (C160 Transall and CN235 Casa), by jumbo jet (Antonov 124) and by strategic transport aircraft (A310).

In addition, substantial infrastructure means were deployed to equip the French detachment: twenty or so tent canopies, the same number of portable cabins housing, in particular, communications and information systems (CIS) hardware, four technical shelters, two "Bachmann" maintenance shel-

ters and three shade structures used to shelter aircraft. *"These logistical operations took place in constant collaboration with the local authorities,"* explains Lieutenant-Colonel M. *"We received a warm welcome. At the base we worked alongside other allied nations: Denmark, Sweden, Canada, Turkey, the United Arab Emirates, Italy and the United States."* Furthermore, as underlined by Colonel Jean-Christophe Hondermarck, head of the risk management office of the air force support command, *"the deployment of infrastructure means*

*was well-managed thanks to the quality of equipment as well as the motivation, training and strong management of personnel from the CIO. Operational capacities also greatly depended on the quality and speed of CIS set-up."* ■

Page opposite, materials and equipment transported by an Antonov 124 and C130 Hercules being unloaded.  
Below, a Caracal on the Charles de Gaulle aircraft carrier.

## Aboard French Navy carriers

**French Helicopters and paratrooper commandos were deployed from Navy carriers. Immersion into their activities.**

From the beginning of Operation *Harmattan*, two French Air Force Caracals and a Puma helicopter were taken aboard the Charles de Gaulle aircraft carrier and later the Mistral landing helicopter dock (LHD) in mid-July 2011. French Air Force helicopters carried out combat search and rescue missions (CSAR). Lieutenant-colonel Fabrice Albrecht, Caracal pilot and commanding officer of Helicopter Squadron (EH) 1/67 "Pyénées" from Cazaux Air Base explains the deployment on the aircraft carrier: *"The two Air Force Caracals and the Puma were alongside Navy Super Étendards, Rafales, Hawkeyes, Panthers and Alouette IIIs. The two armies combined forces for the operation. Our CSAR mission consisted in retrieving any crews having to eject in hostile territory. We were on constant alert and had to be ready to take off on a moment's notice to go rescue them. The carrier CSAR mission is very demanding and the unit deployed with us has to be reactive. Technicians, "intelligence" personnel, crews and commandos all have at least experience in Afghanistan and have participated in several national and international exercises."*

During *Harmattan*, nearly 60 airmen were deployed aboard the aircraft carrier or an LHD. Among them, Air Force paratrooper commandos (CPA No. 30) were deployed aboard LHD Tonnerre to carry out IMEX (Immediate Extraction) missions. Lieutenant S., deployed with the French Army light aviation battalion (ALAT – aviation légère de l'armée de terre) speaks of the three months he spent at sea. *"Among the twenty or so commandos of CPA No. 30 aboard the Tonnerre, there were a dozen of us commandos dedicated specifically to IMEX missions in collaboration with army personnel. We are all qualified for CSAR and have solid experience in extrac-*



*tion in hostile environments. The majority have already accumulated several stints in Afghanistan. Immediate extraction is a mission involving the rapid retrieval of crews from downed helicopters in hostile theatres. It must not be confused with CSAR missions which involve more complex procedures and preparation."* Commandos were therefore brought aboard an Army Puma for each mission. ■

**Ensuring that existing facilities correlate with operational needs**





# Experts in action

To last seven and a half months of operations, the French Air Force benefited from the expertise of units dedicated to equipment performance and support. Discover their work with us.



W. Collet/French Air Force

**T**he work of the French Air Force test and evaluation centre (CEAM - *centre d'expériences aériennes militaires*) in Mont-de-Marsan was crucial in giving direction and increasing the Air Force's strike capacity.

The involvement of the CEAM in the operation can be broken down into two aspects. The most visible is its day-to-day work as an expert at the service of operational servicemen. Its second mission is to integrate into deployed units to carry out the same missions as operational units. As for the personnel of the aircraft weapons evaluation centre (CEAE - *centre d'expertise de l'armement embarqué*), unit of the CEAM located at Cazaux Air Base, they conducted specific studies for French Air Force high authorities. It has numerous data on all air firing. *"To put in place new equipment and integrate new systems within the heart of Operation Harmattan, we conducted tests on configurations to determine efficient firing scenarios,"* explains Lieutenant-colonel Yann Kerneis, second in command of the CEAE. *"Our tests took into account the same altitude restrictions as the Libyan theatre. When a weapon is fired, the trajectography, which depends on the bomb body, must be well-commanded,"*

explains Lieutenant-colonel Dardard, officer in charge of weapons systems. *"Pilots are therefore provided with training on the specific aspects of the weapon."*

One of the most important implications of the CEAM pertains to the heart of air operations. *"Each fighter jet, transport airplane or combat helicopter has an auto-protection system against infrared or electromagnetic threats,"* explains

Lieutenant-colonel Christian Le Menn, officer in charge of weapons systems at the CEAM. *"These systems can be input with parameters according to the threat that they will encounter in the theatre. Personnel in the programming and electronic warfare instruction squadron (EPIGE - *escadron de programmation et d'instruction de guerre électronique*) are responsible for developing this data, referred to as libraries."* During Harmat-

*tan*, more than 60 electronic war libraries were compiled by the EPIGE for aircraft in the French Air Force, Navy and army light aviation. This tireless work required the use of classified means and special military know-how. ■

Page opposite, a Mirage 2000 D equipped with two GBU22s.

## Air manoeuvre support from air support forces

**General Jean-Marc Laurent, commanding officer of the CSFA<sup>(1)</sup> describes how air support forces created technical operational conditions for success.**

**"D**uring *Harmattan*, French air power would not have been exhibited without the exemplary work of air support forces. Placed in the heart of the action, these "soldier technicians" demonstrated a rare command of operational movements to prepare aircraft for combat and develop efficient command and intelligence tactical networks. They also enabled the quick projection of weapons systems storage structures and their operators in the Mediterranean.

These men and women proved that their work together contributed directly towards military outcomes in the theatre. What makes them a unique component of the force is that they do not simply bring support to operations; they also support air forces by providing capacity solutions adapted to strategic objectives. They therefore make it possible for the Air Force to

project its power away from its bases with complex weapons but also to be deployed to the heart of theatres, regardless of the context.

The abilities of the air support forces do not come by chance. They result from long maturation and expertise acquired through the Air Force's various operations. They rely on proven concepts of use and tools and know-how that make it possible to act in urgent situations, confront adversity, persist and regroup quickly, according to the pace of operations. They also, and

above all, rely on seasoned personnel who have been technically and militarily trained.

This operation will remain a symbol of the need of our armies for such human forces combined with weapons systems. There is no meaning in having one without the other. The sustainability and robustness of these forces must therefore not be disregarded. Fortunately, the French Air Force has cultivated the consistency of operational support, which now makes it the focal point of military strategy. ■



R. Nicolas-Nelson/French Air Force

(1) CSFA: Commandement du soutien des forces aériennes



## A widespread effort

Thursday 21 July 2011

Another air raid for the new air mobile group



The air mobile group (GAM - *groupeement aéromobile*) carried out a combat mission over Libyan territory from the Mistral landing helicopter dock (LHD). The raid was executed by seasoned helicopter pilots who already had two months in Libya under their belts and fresh crews from the GAM. Sous-lieutenant François G., flying a Gazelle during the raid, which was his first combat operation above the Libyan ground, confides “there were definite apprehensions but we were prepared as well as possible. Having our predecessors with us was reassuring because they had already worked in the zone and shown us a few landmarks. The territory we were going into wasn’t all that unknown after all. The most technically difficult aspect is the “feet wet” phase over the water.” When it came time to take off, there was obvious tension. However, a few hours later all the

helicopters landed smoothly on the deck of the Mistral after carrying out strikes on several military targets. The actions of combat helicopters from the French army light aviation (ALAT - *aviation légère de l’armée de terre*) projected from LHD Mistral then continued in Libya against pro-Gaddafi forces, under NATO command.

Friday 29 July 2011

Arrival of Mirage 2000N K3s at Souda

Two of the six Mirage 2000N K2s in Souda, Crete returned to France. They were replaced on the same day by two Mirage 2000N K3s from Istres Air Base. The two Mirage 2000N K3s carried out their first mission over Libya on 2 August 2011.



## Changes to French military forces

- At Souda, Crete, a detachment of 8 Air Force Mirage 2000Ds, 4 Mirage 2000Ns and 4 Mirage F1s, as well as an Atlantic 2 surveillance aircraft detachment from the Navy;
- At Sigonella, Italy, 5 Air Force Rafales and 1 Harfang drone.
- E-3F detection and control aircraft and C135 tankers continue to operate out of France from Avord and Istres Air Bases respectively.
- Within the Maritime Task Force, the French Navy deploys TF 473, a landing helicopter dock, two frigates, a tanker ship and a nuclear attack submarine. A third combat vessel is engaged in the NATO maritime forces.
- The landing helicopter dock takes aboard roughly twenty combat helicopters from the Army light aviation and the Air Force.

# Chronology of a decisive summer

Notably with the decision of the French Minister of Defence to reorganise engaged French military forces, Operation *Harmattan* turned a new corner in the summer of 2011.



Thursday 4 August 2011

Reorganisation of French military forces

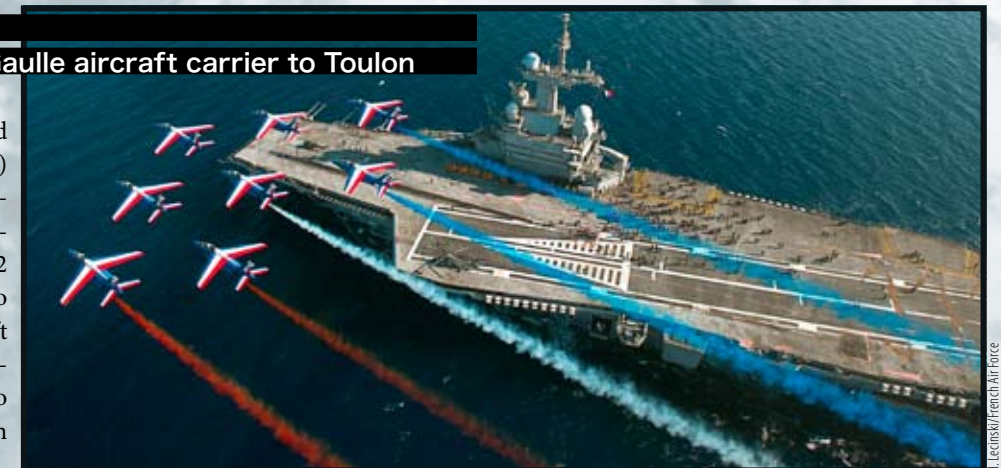
The French minister of defence, Gérard Longuet announces the withdrawal of the aircraft carrier and reorganisation of French military forces engaged in operation *Harmattan*. The decision results in the redeployment of the Charles de Gaulle aircraft carrier, among other changes. At the same time, air strike operations continue in the Libyan theatre with Army combat helicopters deployed from Navy landing helicopter dock (LHD) Mistral and with Air Force and Navy jets. Contre-amiral Phi-

lippe Coindreau, commander of the French maritime air component explains that “military action is being continued with the same level of operational intensity and military standards, particularly with offensive missions by the air mobile component, in conjunction with ground strike missions by Air Force aircraft. This justifies the switch of command headquarters to LHD Mistral to ensure the necessary continued command and coordination of operations in the Libyan theatre.”

Friday 12 August 2011

Return of the Charles de Gaulle aircraft carrier to Toulon

The *Patrouille de France* greeted the arrival of the aircraft carrier (CV) Charles de Gaulle off the coast of Toulon as it returned from Libya. Engaged in Operation *Harmattan* since 22 March 2011, the CV thus returned to its home port. Before then, the aircraft carrier had participated in Operation *Agapanthe* from October 2010 to February 2011, for a total of more than eight months of operations.





## First flight of the Harfang drone over Libya

**T**he Air Force Harfang drone conducted its first operational flight on 24 August 2011 from NAS Sigonella in Sicily, from where it took off in the middle of the night to carry out reconnaissance missions. Roughly twenty people are responsible for the maintenance and operation of the drone, which can fly for more than fifteen hours a day. Cameras mounted on the aircraft make it possible to carry out daytime and night-time missions. The information gathered by the drone's sensors is transmitted instantaneously to the control terminal. The rapid processing of images through satellite transmission and the various networks of the operation theatre is a real operational advantage. On 18 August 2011, a detachment of approximately twenty airmen from Drone Squadron 1/33 "Belfort" out of Cognac Air Base arrived at the Italian naval station. Within ten days, all the means required to put the "drones" detachment into operational service were installed. Getting ready in such a short timeframe was an exceptional logistical achievement. In one week, specialists from the operations infrastructure company (CIO - compagnie d'infrastructures en opérations) installed a "Bachmann" mobile hangar to shelter the Harfang drone and its maintenance equipment, as well as operational technical shelters for the drone remote piloting consoles. A total of 150 tonnes of equipment (i.e. 700 m3) was brought in by air from mainland France. The drone and its related means add reinforcement to resources already in place. It joined the five Air Force Rafales equipped with NG reconnaissance pods (digital reconnaissance systems).

Web

Webdocumentary: «Harfang, l'atout drone» (Harfang: the drone advantage)  
<http://www.air-actualites.com/diaporama/webdocu-drone>





## Chapter IV

**After reiterating its commitment to protecting Libyans on 1<sup>st</sup> September 2011, NATO made the decision to end Operation *Unified Protector* on 31 October 2011, a few days after the death of Gaddafi.**



# The mission goes on September and October 2011

**A**fter the liberation of Tripoli by opposition forces on 22 August 2011, the secretary general of NATO, Anders Fogh Rasmussen reaffirmed the commitment of allied forces to protect the Libyan people and the alliance's desire to see the people of Libya decide on its future freely. Therefore, on 1st September 2011, at the new Friends of Libya international conference in Paris,

the decision was made to continue NATO air strikes. "We have announced that operations will continue as long as there is a threat to civilians," declared the secretary general of NATO. French president, Nicolas Sarkozy confirmed on the same day, "We are determined to continue with NATO strikes for as long as Mr Gaddafi and his supporters represent a threat to Libya."

On 16 September, the UN Security Council adopted Resolution 2009, unanimously confirming NATO's mandate to protect Libyan civilians. French airmen therefore continued operations being carried out against the former Libyan leader on the run, Muammar Gaddafi. On 15 September, they also participated in security for the visit to Libya of the French head of state and British prime minister, David

Cameron. On 20 October, after the death of Muammar Gaddafi, the North Atlantic Council made the preliminary decision to end Operation *Unified Protector*. The decision was confirmed a few days later. On 24 October, the first French fighter jets were redeployed back to France. On 28 October 2011, the secretary general of NATO had this to say: "We have fully complied with the historic mandate of the

*United Nations to protect the people of Libya, to enforce the no-fly zone and the arms embargo. Operation Unified Protector is one of the most successful in NATO history. We launched this complex operation faster than ever before. We conducted it effectively, flexibly and precisely (...) And we are concluding it in a considered and controlled manner – because our military job is now done.*" ■



# The last months of Operation Harmattan

The mission came to an end for NATO forces after the death of Colonel Gaddafi. The first French fighter jets were redeployed back to France on 24 October 2011.

After NATO secretary general Anders Fogh Rasmussen reaffirmed the commitment of allied forces to protect the people of Libya, French airmen continued their actions from Souda Air Base, Crete, and Sigonella in Italy throughout September and October 2011. French units engaged in Operation *Harmattan* were very busy and even contributed to security, in collaboration with the protection service of Élysée, for the visit to Libya of French head of state Nicolas Sarkozy and British prime minister David Cameron. The two officials were escorted to Tripoli and Benghazi as fighter jets and the Harfang drone protected the security “bubble” surrounding the two leaders.

Missions continued for airmen when on 20 October, after the death of Muammar Gaddafi, the North Atlantic Council decided to end Operation *Unified Protector*. The decision was confirmed on 28 October, and on 31 October, at midnight local time in Libya, a NATO Awacs completed its last sortie over Libya. The next day, NATO maritime forces withdrew from Libyan waters to return to their home bases. French fighter jets and the drone stopped flying over Libya. The mission was over.

At the same time, Operation *Harmattan* went on. It continued during logistical operations to repatriate French equipment and

*Opposite and RH page, while aircraft engaged over Libya gradually returned to France, Operation Harmattan continued during logistical operations to repatriate deployed military forces.*



Camille/French Air Force



W. Coller/French Air Force

military forces still deployed in the zone. *Harmattan* was also to cover cooperative defence actions that may have been carried out with Libya in support of its transition authorities. French airmen thus withdrew successively just four days after the end of ope-

returning to Air Base 125, while Général Guillaume Gelée, head of the French Air Forces Command (CFA) was in Nancy to salute the return of two Mirage 2000 Ds. The day before in Cazaux, two Caracals from Helicopter Squadron (EH) 1/67 “Pyrénées” retur-

## “This operation comes to a successful end for the French Air Force”

rations was announced. The three Mirage 2000 Ds deployed to Souda, Crete, and the five Rafales and Harfang drone based at Sigonella, Italy, completed their NATO missions on 31 October.

Some forces had already returned to France as early as 24 October, with the return of a fighter detachment of fifteen aircraft (Mirage 2000 Ds, Mirage 2000 Ns and Mirage F1s). The four Mirage F1 CRs and two Mirage 2000 Ds landed respectively on 24 October at Mont-de-Marsan and Nancy Air Bases. On 26 October, at the base in Istres, Général Paul Fouilland, commanding officer of the Strategic Air Forces (CFAS - forces aériennes stratégiques) welcomed the crews of the four Mirage 2000 Ns

ned to Air Base 120 after seven months on Task Force 473 vessels deployed off the coast of Libya.

Finally, on 4 November, the last French fighter jets landed in France. Général Jean-Paul Paloméros travelled to Saint-Dizier Air Base for the occasion in order to welcome home Rafale crews deployed to NAS Sigonella and pay tribute to all personnel for their “professionalism and immense joint effort.” He also added that “this operation comes to a successful end for the Air Force. You were reactive. You did your job when it needed to be done. From the very first day of operations you were exemplary. You adapted and ensured the success of the mission over the long term.” ■



## A job well done by French Airmen

In early November 2011, all French fighter jets had rejoined French military forces on alert and ready to be redeployed to operations in Libya if needed. A total of more than twenty aircraft returned to their respective air force bases in Nancy, Mont-de-Marsan, Saint-Dizier and Istres. Crews and technicians were warmly welcomed home by their families and high dignitaries. Operation *Unified Protector* ended on the night of 31 October 2011 after seven months of engagement. In the sky, French Air Force and Navy fighter aircraft accumulated more than 27,000 flying hours and approximately 5,600 sorties. The latter accounted for 25% of coalition sorties, 35% of offensive missions and 20% of coalition strikes. *Harmattan* ended with logistical manoeuvres required to repatriate military equipment and forces deployed to air bases in Souda (Crete) and Sigonella (Sicily).





## Chapter V

**31 October marked the end of NATO operations in Libya. After seven months of intense missions, airmen begin the job of assessing their work. A non-exhaustive overview.**

**“L**ibya is neither the end nor the beginning of the story,” declared General Jean-Paul Paloméros, chief of staff of the French Air Force, in February 2012 during a conference on Operation Harmattan. “It will enable us to evaluate what tomorrow’s scheme of a modern air force will be as it adapts to future crises that we will have to attempt to anticipate and envision. We already know that this will be the subject of long and difficult debates in the forthcoming months and years. (...) Libya illustrates what air power can contribute in the

future; there have been examples of this in the past and history is full of lessons. It is no coincidence that over the last 20 years, since the end of the Cold War, the air component is systematically engaged on a permanent basis, as has been the case today in Afghanistan for the last 10 years, or in a more targeted way, according to the need, such as in Libya, Kosovo, Bosnia or during

the first Gulf war. 20 years of continued operations, 20 years of intense crises that have followed the Cold War.” Operation Unified Protector marked the consecration of a comprehensive international and joint military air operation for the protection of a population. Thanks to its quick reaction and reach, the air forces first adapted perfectly to the political progression of the cri-

sis and played its role as strategic leverage. Secondly, used jointly, air forces proved to be a remarkable tactical tool through their ability to be selective and control effects in order to put considerable pressure on pro-Gaddafi forces. For the French Air Force, Libya revealed the strengths and areas where efforts need to be made. Join us for a closer look. ■

# Time for evaluation and feedback



O. Ravanel/French Air Force

1

**HARMATTAN:  
REVEALED STRENGTHS**

**P. 64**

2

**HARMATTAN:  
THE NUMBERS**

**P. 72**



# Harmattan: revealed strengths

After assessment, the specialists agree on one point: Operation *Harmattan* is a demonstration of the French Air Force's consistency.



A. Jeuland/French Air Force

Above, a ternary rhythm of operations, rest, and training was put in place for crews.

Page opposite, the "Estérel" transport squadron evacuating European nationals at Tripoli airport.

The end of Operation *Unified Protector* on 31 October terminated 227 days of air operations that highly mobilised air power in general and more particularly, the Air Force. In the eyes of the experts, it was also a full-scale operational test that confirms the consistency of capacity-related decisions made several years ago (training of airmen, equipment, maintenance in operational condition, organisation of air force bases, etc.). For the Air Force, Operation *Harmattan* was a powerful indicator of the major characteristics of the institution and the air forces.

## Quick reaction to policy

On Saturday 19 March 2011, the first French Air Force strikes took place two hours after the declaration made by the French president and four hours after taking off from French Air Force bases to put a stop to the advancement of Colonel Gaddafi troops towards the city of Benghazi. One month earlier, roughly 670 French and European nationals were repatriated from Libya aboard French Air Force transport aircraft. A phase involving intelligence gathering under national command also took place from 5 to 18 March 2011 with the aim of updating Libya's order of battle and evaluating the threat. "We were present at the time and hour set by policy," declared General Jean-Paul Paloméros, chief of staff of the French Air force. "We don't have to think twice when it is time for combat and operational engagement. I don't know if Libya

(1) Extrait du magazine « Air Fan » n° 400.

will be the end of a story or the beginning of another. Recent history has taught us that we have been engaged on a regular basis in various theatres of operations and each time, the same qualities are necessary but they take on a different shape. The same reactivity that enabled us to be deployed in Afghanistan and Kosovo more than ten years ago now is essential when we need to rescue, support and evacuate our nationals."

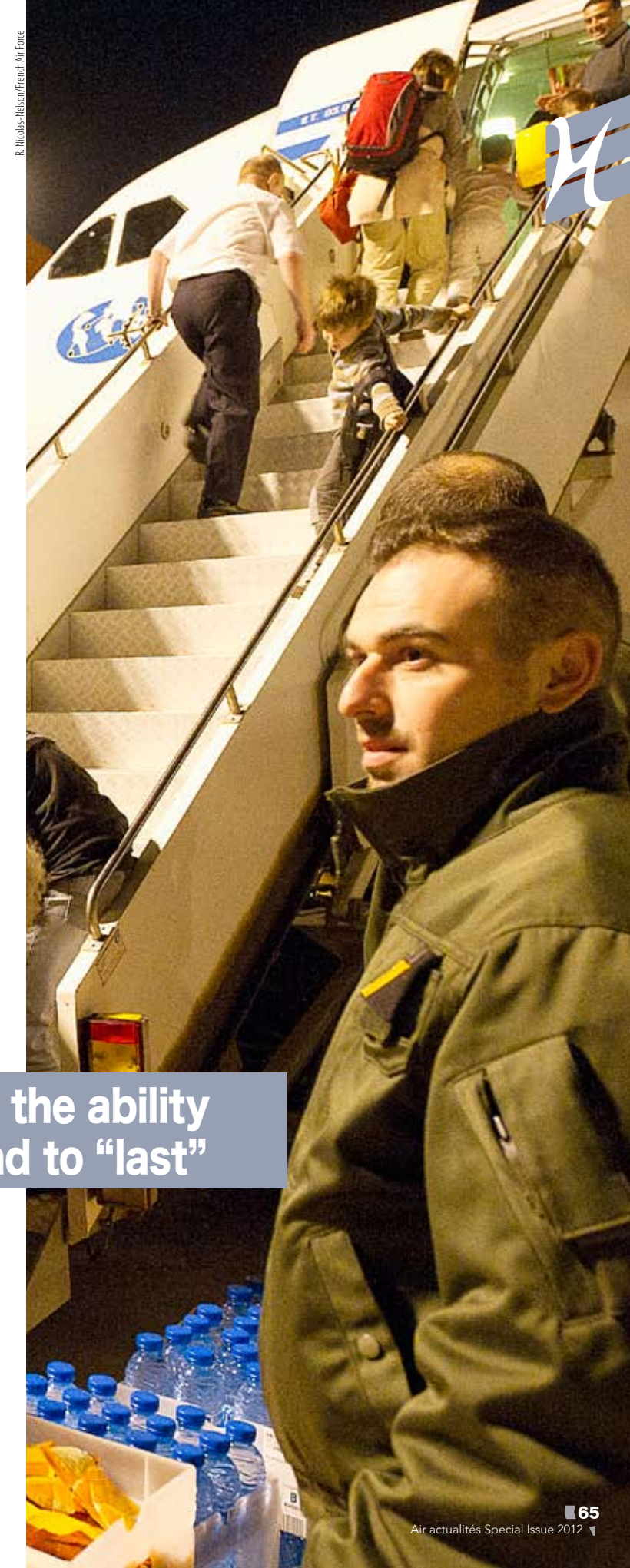
This preparation, just as for the operations, relied on consistent organisation which contributed to giving the French Air Force the ability to "be the first ones in" and to "last". The quick deployment of forces reaffirmed the role of the air base as a combat tool capable of immediately switching from peacetime to wartime activities. This concept applies to hubs located in France as well as those strategically located outside the country (N'Djamena, Djibouti, Al Dhafra, etc.). Intrinsically, the air base is designed to meet requirements related to air force reactivity and deployment flexibility. It is the quintessential factor of an organisation that combines all the functions and human and material means required to carry out operational missions all in one location. However the Air Force also gains its strength from the network of air bases in France and around the world.

## An ability to last

From the beginning, the French Air Force was prepared for several months of intense air operations. The close proximity of deployment bases favoured regular crew changes. A ternary rhythm was thus put in place, offering a time cycle that included rest, operational activity and periods of "organic regeneration" for squadrons to benefit young crews. Operations, rest, training; it is this rhythm that enabled the Air Force to keep going the distance, even though the airmen were extremely busy. The logistical support of home and support bases, as well as the entire supply chain proved to be essential. In addition, the reactivity of the new European Air Transport

## The French Air Force has the ability to be "the first one in" and to "last"

Command (EATC) in Eindhoven in contributing to the transport of material and equipment was exemplary and a decisive factor. According to General Paloméros, "when the operation began, the question was raised as to how long it would last. I gave the Air Force an objective of being able to last six months. Why six months? With respect to my previous experiences, it seemed to me to be a reasonable, manageable and necessary timeframe to settle a crisis of this nature. It ended up lasting seven and a half months. I was off by one month but the Air Force made it through despite everything. It is important to be



R. Nicolas-Nelson/French Air Force





Le Minoux / French Air Force

## An illustration of the airmen's high level of operational preparation



ready to carry action into the long term and prepare for it. It is clear that the mindset (which has already been underlined many times) and organisation of work by teams and detachments is not the same if you are involved in a short-term operation. Actually, the greatest pressure that we were up against was more from the media rather than operational pressure. However, with a bit of courage and common sense, you can confront it. You will recall that by the end of the third week, the media was talking about a stalemate. However they had forgotten that this rarely happens in combat aviation, except if we lose sight of our target, but many overlooked this”.

### Competent and trained airmen

The operations in Libya demonstrated the Air Force's high level of operational preparation. The airmen reproduced skills that had been fine-tuned through demanding daily training and seasoned experience gained in other theatres of operations, such as Afghanistan. For this reason, the qualitative relevance of the training foundation must not overshadow the need to continue the regular training of forces. Lieutenant-colonel Pierre Wencker, commanding officer of Fighter Squadron 2/3 “Champagne” explains: “In combat units, it is the young airmen that need to receive continued training and supervision. In Nancy, the majority of Mirage 2000 D crews, engaged from the first moments to the last, benefited from this experience. Numerous pilots and weapon system officers who remained in France at the beginning of the campaign were trained. Once qualified, these young officers were all sent to Souda to carry out war missions over Libya and relieve already busy crews (Mirage 2000 Ds still have a permanent detachment in Afghanistan that had to be kept in operation at the same time). It is a legacy that must be cultivated, remembered and above all, passed on.”<sup>(2)</sup>

### Consistent and complementing means

The versatility of personnel and equipment favoured the use of skills and expertise that were applied to a wide range of capacities (air transport, aerial refuelling, intelligence, strikes, combat search and rescue, etc.). The best example of this is the Rafale. In the skies over Libya it displayed the entire range of its capacities and its technological edge by carrying out all combat aviation actions in less than a week, from air superiority to reconnaissance to strikes against preplanned targets, as well as targets of opportunity (See box on page 69). Reconnaissance missions, using various Air Force resources (drone, Mirage F1 CRs, observation satellites, etc.), played a particularly important role in a conflict where the ability to

Opposite, apron technicians and pilots worked night and day.

(2) Excerpt from the magazine DSI, June 2012



W. Collet / French Air Force

## Intelligence: a key to success

### Fighter planes, observation satellites, drones, dedicated structures, etc.: French Air Force intelligence played a critical role.

During Operation *Harmattan*, gathering precise information on the order of battle of Colonel Gaddafi forces and his intentions was more than ever a major critical element. Without any friendly troops on the ground, intelligence research was essential to identifying fighters in the field. France, and specifically the Air Force, was the second largest contributor to ISR missions (Intelligence Surveillance Reconnaissance). In concrete terms, the high quality of images collected by the Rafale fitted with the new generation reconnaissance pod (NG Recce) gave complete satisfaction during the operation. However, improvements are being made concerning the best way to use the sensor's real-time transmission capabilities. On another level, the Pharos communication and information system (host portal for access to space observation intelligence) provided operators with direct satellite images, which is another important advance that offers optimum

use of upcoming technologies, such as the Pléiades and Musis satellites. In terms of electromagnetic intelligence, information was gathered by the Transall Gabriel and later by the Mirage F1CR fitted with the ASTAC pod, not to mention the Harfang drone deployed from NAS Sigonella in Italy during the last two months of the conflict. There was high demand for this French component along with drones from other coalition countries. Lieutenant-colonel Pierre Wencker explains<sup>(2)</sup>: “With the support of the drones, the efficiency of SCAR (Surveillance Combat and Reconnaissance) missions increased greatly for patrols working in the same zones of interest. The qualities of these vehicles, already used in Afghanistan, make performance (and therefore discrimination), targeting (precision), encrypted transmissions (secrecy and confidentiality) and real-time management (reactivity) possible. The fighter found an ideal addition when strikes on camouflaged and hidden targets had to be carried out.” Furthermore, in order to speed up the intelligence chain, the operations planning centre put in place the JODIC (Joint Deployed Intelligence Centre) in late June. “We processed several gigabytes of data and thousands of “image” files in order to retransmit them to planning entities and operational squadrons,” explains lieutenant-colonel Daniel Parpaillon, head of the JODIC during *Harmattan*. ■



understand the situation in the theatre and to decipher targets while lacking a ground component was fundamental. Mirage 2000-5s and Mirage 2000 Ds also fulfilled their missions to complete satisfaction by totalling more than 2,000 sorties. *“The Mirage 2000 D greatly benefited operations with its Link 16 capacity, allowing it to carry out discrete and completely secured communication with the command centre via the Awacs”,* explains General Guy Girier, deputy head of

## The importance of the Mirage 2000D and its future modernisation

plans-programmes at the Air Force command<sup>(3)</sup> *Harmattan* thus confirmed the importance of this aircraft in modern operations and its modernisation in the future. *“The reconditioning of the Mirage 2000 D fleet halfway through their service life was the result of comprehensive reflection aimed at building a more efficient combat tool through different consistent stages, while managing costs with performance results in mind in order to achieve interoperability and increased versatility”,* explains Colonel Fabrice Dougnac, head of the programming division of the Air Force planning office<sup>(3)</sup>. On a different note, the engagement of the Mirage 2000N and the Mirage F1 provided notable relief to the most solicited vectors, while the concept of visiting pilots justified its actual existence, as an intermediary in France for training young pilots and operational alert. *“Of course the success of this operation must not draw attention away from some of our armed*

*forces’ weaknesses,”* notes General Paloméros. *“They must be exposed with honesty, in the aim of consistency and in the interest of the common good.”*

### Air forces adapted to the conflict

From the first to the last day of Operation *Harmattan*, the essential characteristics of the air forces were reaffirmed. In particular, the ability to offer a wide range of options to political and military decision-makers at a well-controlled financial and human cost. *“Our command of air power enabled precise, restrained and controlled use of force through a wide range of effects from firing on targets of opportunity to conventional cruise missile strikes,”* explains General Paloméros<sup>(3)</sup>. *“Far from the massive bombing missions of the past, all strikes were carried out with precision, in strict compliance with rules of engagement and with the constant concern of preserving the population.”* From isolated firing to strategic strikes, the level of “violence” remained under control and proportional to objectives. In Operation *Harmattan*, the use of air forces made up for an imbalance in the balance of power and helped make the switch in favour of opposition troops. Therefore, with no foreign ground forces deployed, the Libyan population remained at all times the master of its own destiny. *“It should also be highlighted that this intense engage-*

(3) Excerpt from Air Fan magazine, issue No. 400

*Below, a Mirage 2000 D carrying out a mission over Libya.*



C. Amboise/French Air Force

# The Rafale demonstrates its versatility

**Operation *Harmattan* confirmed the endurance, versatility and high performance of the Rafale. Excerpt taken from the interview with General Paloméros in the 2012 March issue of the magazine “Air Fan”.**

**“H**armattan showed how precious aircraft versatility is and confirmed our desire to have renovated and versatile Mirage 2000 Ds alongside our Rafales, which, around 2020, will give us a combat aircraft fleet that is consistent on a qualitative and quantitative level in order to comply with our operational contracts. During the operation, deployed Rafales demonstrated great versatility by carrying out missions from the entire spectrum of actions in modern combat aviation: precision strikes, air defence missions, cruise missile strikes, reconnaissance missions, etc. Served by well trained crews with a great ability to adapt to a context that was particular and new to them, Air Force and Navy aircraft operated jointly to allow the forces’ methods of action or the areas of application to be changed very quickly for optimum use in such a vast theatre. Rafales carried out more than 1,600 sorties for nearly 7,000 flying hours, without ever cancelling a mission in flight for technical reasons. Availability was maintained at 95%, which is a remarkable statistic that attests to the exemplary work of our airmen in charge of aircraft maintenance and that also illustrates the operational maturity of the jet and a particularly efficient maintenance concept. Beyond this observation, throughout the entire campaign the Rafale proved just how suitable a choice it was as a combat tool. This weapons system showcased the degree of its potential within the first few hours of the operation as its versatility confirmed it as a decisive asset to the air manoeuvre. A no-fly zone over Libya had to be put in place, actions had to be taken on the ground against Gaddafi forces at the entrance to Benghazi and intelligence had to be gathered on the enemy forces, all at the same time. On 19 March 2011, from the very first patrol, these three objectives were met. In addition to creating the no-fly zone, we fired precision weapons and provided our data banks with intelligence for the next missions. Thanks to its surface to air detection and protection sys-



W. Collet/French Air Force

Web

Webdocumentary: «Rafale, un avion polyvalent» (The Rafale: a versatile aircraft)  
<http://www.air-actualites.com/diaporama/webdocu-rafale>

tems, the Rafale was able to operate without having to first destroy all Libyan anti-air installations, and particularly surface-to-air missile launchers, which from our standpoint, were the greatest threat. The range of objectives and situations required suitable action. The Rafale made constant adaptation possible and without a doubt, enabled resources to be spared. The aircraft fired an extremely wide range of ammunition, from the AASM to laser-guided bombs and Scalp cruise missiles, used for the first time in operation. It also exhibited all the qualities of the new generation reconnaissance system (NG Recce).

*Harmattan* clearly proved that we made the right choices a few years ago and that with the Rafale, we have one of the best combat aircraft in the world. However the versatility of the machine is nothing without that of the people who use it and our wide spectrum training proved to be absolutely essential in putting constant pressure on pro-Gaddafi forces day and night for seven months.” ■



ment involved a limited human imprint of the Air Force on the ground, regardless of the base of deployment, with an average of twenty people per fighter jet,” continues the General.

#### A place as an international leader

The French Air Force confirmed its place as a viable partner on the international scale. It demonstrated its interoperability with its main counterparts during the NATO-directed operations. “Just two years after joining the integrated structure of NATO, with Operation Unified Protector, France confirmed its perfect integration and driving role within the alliance,” writes General Vincent Tesnière, deputy to the general commanding air operations for Unified Protector, in the magazine “Marine et Océans”. “(...) After seven months of air operations and more than 25,000 air sorties, 9,000 of which were offensive missions, Operation Unified Protector ended in a success for which NATO and its partners can be legitimately very proud. Through the quality and availability of its personnel, the consistency and synergy of its forces, France played a major role that was unanimously appreciated by all partner countries.” France and the United Kingdom also made a critical contribution to the operation by carrying out more than half of the sorties.



© Davanel/French Air Force

## A command of air power enabling precise, restrained and controlled use of the force



A. Jeuland/French Air Force

Although there were few combined French and British missions, the desire to work in cooperation is obvious and promises an encouraging dynamic in the implementation of the Lancaster House Treaty for defence and security cooperation (signed during the summit in London on 2 November 2010). Qatar also played a decisive political role in the Libyan crisis. The confidence given by the Qatar Emiri Air Force to French airmen is the fruit of a long bilateral relationship. By contributing to the seasoned experience of Qatari pilots, the French Air Force wrote a new chapter in the history books for which the outcomes will be felt well beyond the sphere of defence. ■

Above, preparing bombs in the ammunition dump at Solenzara Air Base.

Opposite, French airmen were deployed to NATO structures, particularly in Naples.

# Lessons for the future

**The experience acquired from Operation Harmattan provides an opportunity for lessons to be drawn in the area of capacity. In the future, drones and aerial refuelling aircraft will be at the centre of all concerns.**

**A**lthough Operation Harmattan revealed many strong points, it also provided the opportunity to underline the areas where efforts need to be made and highlight the directions that need to be taken in the future, especially in the area of capacities. In addition to the renovation work being done on Mirage 2000 Ds, the main areas where progress must be made are with MALE (medium altitude, long endurance) surveillance drones and aerial refuelling aircraft.

**Drones.** Starting on 18 August 2011 and during the last two months of the conflict, France deployed a Harfang drone from NAS Sigonella in Sicily. In Libya, coalition drones were used to help make up for the lack of men on the ground to guide strikes, and to provide decision-makers overseeing air operations with reliable real-time intelligence. The Harfang drone thus enabled the coalition to monitor more than 200 targets for a range of missions: compiling target files, evaluating the risks of collateral damage, surveillance of sensitive sites, knowing the situation on the ground, etc. However, according to experts, Operation Harmattan revealed France's and even European countries in the alliance's deficiencies

in terms of drones. The majority of MALE drone missions were carried out by American *Predators*. More than a shortcoming, it is a lack of means as the Air Force only used four available Harfang drones. For the future, many specialists have underlined the need for a vehicle that is quick, with long endurance and firing capacity. “The kinetic capacity of this type of vehicle must not be a taboo, as foreign drones have demonstrated,” explains lieutenant-colonel Pierre Wencker, commanding officer of Fighter Squadron 2/3 “Champagne”, in the magazine DSI. “By associating continuity with a firing capacity with minimal collateral effects, the drone is a particularly well-adapted and efficient tool.”

**Aerial refuelling aircraft.** In many respects, aerial refuelling was the key element of Operation Harmattan and the cornerstone of the air campaign. C135 FRs of the Istres aerial refuelling group carried out between two and six flights daily for a total of 3,220 flying hours in seven months of operations. It is important to note that the United States carried out 80% of aerial refuelling missions for coalition aircraft engaged over Libya. Without them, “we would not have been able to refuel our aircraft because we lack a modern fleet”, declares General Paloméros. “Our tankers are fifty years old. It's a nice age but if they are still flying, it is because our technicians work night and day to maintain them. We absolutely must modernise this capacity in order to improve it.” A capacity shortfall in this ageing fleet would jeopardise all force projections and even our airborne dissuasion. The multi-purpose aerial refuelling and transport aircraft project (MRTT - *multi-rôles de ravitaillement en vol et de transport*), which sets out to replace the C135 FR, should see a contract awarded in March 2013, with delivery being staggered between 2017 and 2024. It is a priority more than ever before. ■



C. Ambrose/French Air Force



92%

rate of operational availability the Air Force aeronautical technical support units.

2,500

The number of flying hours for French Air Force E-3Fs, including 1,155 hours of command in the theatre.

# Harmattan: the numbers

31

OCTOBER 2011

This day marked the end of international Operation *Unified Protector* and the withdrawal of French forces.

1,000

A thousand targets destroyed by Air Force and Navy combat aircraft.

2,232 km

The number of kilometres between Saint-Dizier and Benghazi.



5,600

sorties by French Air Force and Navy combat aircraft, including 4,000 for the Air Force

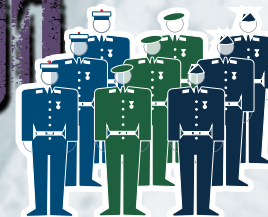
85%



The French transport fleet executed 85% of flying hours for the operation. 15% were carried out by partners of the European Air Transport Command (EATC) in Eindhoven.

4,200

Up to 4,200 service men and women from the three services were engaged.



6

The number of different types of French Air Force fighter jets engaged in the operation.



0

No material or human losses suffered by French air forces.

25



tonnes of kerosene delivered on average during each mission by crews from the aerial refuelling group, and reaching up to 40 tonnes.

391

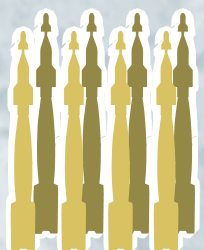
On 23 February 2011, 391 French and European nationals were evacuated from Libya aboard two French Air Force A340s. In total, more than 670 nationals were repatriated in five days.

227

Operation *Harmattan* lasted 227 days without interruption.

1,200

The number of ammunitions fired by French fighters, 830 of which were for the Air Force.





## Airmen at the heart of the operation

**B**e prepared!" The motto inspired by Robert Baden-Powell, British-serving military officer and founder of the Scout Movement, applies each day to the Air Force. It "means you are always in a state of readiness in mind and body to do your duty. (...) so that you know the right thing to do at the right moment, and are willing to do it. Be prepared in body by making yourself strong and active and able to do the right thing at the right moment, and do it." During Operation Harmattan, from the first to the last day, the men and women of the French Air Force were the keys to success. According to General Jean-Paul Paloméros, "some people may think "it seems so easy!" But when you think about it, when there is this much work, expertise, motivation and commitment round-the-clock for seven and a half months, it seems easy because everything is well-prepared by motivated men and women who are aware of their abilities and their collective strength. It is obviously the guiding principle of our way of thinking and our acquired experience. It is also what guides us towards the future."



# The recognition of a nation

**In late 2011 and the first half of 2012, a series of ceremonies honoured the involvement of French airmen in foreign operations and particularly Operation Harmattan carried out over Libya. This anthology covers the events that distinguished individuals and units.**

## Paris

**Le 11 November 2011**

The President of France decorated the pennants of Fighter Squadron 3/3 "Ardenes" (Air Force Base 133, Nancy), Helicopter Squadron 1/67 "Pyrénées" (Air Force Base 120, Cazaux) and Fighter Squadron 1/91 "Gascogne" (Air Force Base 113, Saint-Dizier) with the Cross for Military Valour with palm.



## Évreux

**Le 9 March 2012**

The French minister of defence awarded Transport Squadrons 2/64 "Anjou" and 1/64 "Béarn" with the Cross for Military Valour with bronze palm before General Paloméros presented a service citation to the air brigade of Aeronautical Technical Support Squadron 2E.064 and the Aeronautical Communication and Information Systems Tactical Group (GTSICAéro) 10.805.



## Saint-Dizier

**Le 12 December 2011**

The prime minister of France decorated Fighter Squadron 1/7 "Provence" and Drone Squadron 1/33 "Belfort" in recognition of their involvement in foreign operations in Libya and Afghanistan. The prime minister solemnly hung the Cross for Military Valour with palm on the pennants of the two Air Force flying units.

## Orléans

**Le 15 March 2012**

General Jean-Paul Paloméros, chief of staff of the French Air Force, decorated Transport Squadron 1/61 "Touraine" with the Cross for Military Valour with bronze palm. He cited as example the Aeronautical Technical Support Squadron and the Telecommunications Group for their involvement in the latest operations and individually honoured six airmen, including two non-commissioned officers of the Air Force paratrooper commando unit No. 10 (CPA No. 10) and one from CPA No. 20. A lieutenant, head of the precursor level of the telecommunications group received the commemorative medal with "Libya" pin for three secondments carried out during *Harmattan*.



## Avord

**Le 5 January 2012**

The minister of defence and veterans affairs decorated the 36th Airborne Detection and Control Squadron "Berry" (EDCA) with the Cross for Military Valour with palm and the Aeronautical Technical Support Squadron (ESTA) was cited as example.



## Dijon

**Le 3 April 2012**

The chief of staff of the French Air Force, General Jean-Paul Paloméros awarded collective decorations to the pennants of Fighter Group 1/2 "Cigognes" and Air Force paratrooper commando units No. 20 and No. 30. They received the Cross for Military Valour with palm. He then read a citation for Aeronautical Technical Support Squadron (ESTA) 2E/002 and handed out individual decorations. Sergeant B. from CPA No. 20 and Caporal-chef M. from CPA No. 30 received the Cross for Military Valour with bronze star. Major Pascal Neyrat of the ESTA received the French commemorative medal with "Libya" pin.



## Istres

**Le 12 January 2012**

General Jean-Paul Paloméros, chief of staff of the French Air Force, solemnly pinned the Cross for Military Valour with palm on the pennants of Aerial Refuelling Group (GRV) 2/91 "Bretagne" and Fighter Squadron 2/4 "La Fayette". The chief of staff then read the citation for the Specialised Technical Support Squadron responsible for the maintenance in operational condition of the C135 tankers of the GRV.



## Nancy

**Le 5 April 2012**

General Jean-Paul Paloméros, chief of staff of the French Air Force awarded Fighter Squadrons 1/3 "Navarre" and 2/3 "Champagne" with the Cross for Military Valour with palm. The Aeronautical Technical Support Squadron (ESTA) received a citation.

Individually, two pilots and two weapon system officers from Fighter Squadrons 1/3 "Navarre", 2/3 "Champagne", 3/3 "Ardenes" and Mirage 2000 D Conversion Squadron 2/7 "Argonne" received the Cross for Military Valour with silver or bronze star for their actions over Libya. Two aircraft technicians from the ESTA also received the National Defence Medal, gold echelon.

## Bordeaux

**Le 6 February 2012**

The Air Forces Support Command (CSFA) organised a ceremony presided by General Jean-Paul Paloméros, chief of staff of the French Air Force, at Air Force Base 106 at Bordeaux-Mérignac in order to pay tribute to all aircraft technicians who participated in Operation *Harmattan*. The ceremony honoured all technicians in the Air Force.



## Solenzara

**Le 3 May 2012**

General Jean-Paul Paloméros, chief of staff of the French Air Force awarded the pennants of Reconnaissance Squadron 2/33 "Savoie" and Airborne Electronics Squadron "Dunkerque" with collective decorations. They received the Cross for Military Valour with palm. Air Force Base 126 "Capitaine Preziosi" also received a citation honouring the reactivity and professionalism of its personnel during the international operation.





# Present on all fronts

## On quick reaction alert round-the-clock, 365 days a year



The purpose of the quick reaction alert concept is to protect national sovereignty in French air space and defend the country against any air threats. Eight fighter jets are located on four bases throughout France: Mont-de-Marsan, Orange, Creil and Lorient. A network of helicopters on stand-by also implementing active measures of air safety (MASA) are also part of these forces. They are on alert to identity, intercept or assist aircraft in difficulty flying over France. In 2011, military reserve fighter jets executed 664 sorties, including 116 take-offs on alert. The helicopters carried out 646 sorties, 629 of which were for surveillance of sensitive sites or regions.

## From 28 April to 2 September Baltic countries: Sky police mission

Four Mirage 2000 Cs were deployed to the Siauliai Air Base in Lithuania to ensure round-the-clock air defence of the Baltic countries. The French detachment of 105 airmen carried out more than 340 sorties, including 12 on real alert, and more than 450 flying hours.



## From 1 July 2011 to 1 January 2012 Command of NRF 17

The French Air Force took over leadership of the Air Component Command (ACC) of the 17th rotation of the NATO Response Force (NRF) for a period of six months. In this case, the command of air defence and air operations created a deployable force of approximately 1,700 people and 15 aircraft.

## Monday 18 April 2011 Ivory Coast: *Licorne* transfers full responsibility of the Abidjan International Airport

French forces of Operation Licorne handed over control of the Abidjan International Airport to the country's authorities. Since 3 April, the "Air" coordination cell had been coordinating, alongside Ivoirian air traffic controllers, the action of teams arriving as reinforcement to ensure continued air traffic services for military and civilian aircraft. Also, in the night of 2-3 April, two companies and command elements were deployed to Abidjan from forces prepositioned by French Air Force C160 Transalls and C130 Hercules. Fennecs in place in Abidjan also provided precious support to Operation Licorne.



## 2 August 2011 Rafales return to Afghanistan

Three Rafales from Fighter Squadron 1/7 "Provence" from Air Force Base 113 in Saint-Dizier landed at the Kandahar Air Base. They were sent to relieve the three Mirage F1 CRs of Fighter Squadron 2/33 "Savoie" which definitively withdrew from the theatre on 31 July. From the beginning of August, the three Rafales and three Mirage 2000 Ds deployed to Kandahar jointly carried out "fighter" missions for Operation Pamir. It was not the first time the Rafale had been deployed to Afghanistan. Two detachments had already been deployed in 2007 and in May 2009.

## 1 September 2011 Mirage 2000 Ns carry out nuclear deterrence from Istres

Fighter Squadron 3/4 "Limousin" from Istres Air Force Base gave up its place to the new name and traditions of Fighter Squadron 2/4 "La Fayette" as it was disbanded at the same time at the Luxeuil Air Force Base. Istres is the only air base with Mirage 2000 Ns carrying out the mission of nuclear deterrence.

## 3 to 14 October 2011 Épias Exercise: French-British cooperation

The French-British international exercise, Épias, is part of operational preparation of air and ground units for future deployment to Afghanistan. During the exercise, which took place in the Dijon region, French and British forces trained for Close Air Support (CAS) missions, in conditions close to those encountered by soldiers in Afghanistan. Specialists from the three Air Force paratrooper commando units, their British counterparts from the RAF Regiment and teams from the Army carried out Forward Air Controller (FAC) missions. In the air, Mirage 2000 Ds from Nancy, Rafales from Saint-Dizier, Alphajets from Dijon and British Hawks, assisted by the mobile detection and control centre carried out combined missions from Dijon Air Force Base.

## Wednesday 10 August 2011 Famine in the Horn of Africa: 22 tonnes of humanitarian goods delivered

A French Air Force Airbus A340 took off from Roissy Charles de Gaulle Airport in destination of Djibouti, carrying more than 22 tonnes of humanitarian goods. In the dozens of packages supplied by the Ministry of Foreign and European Affairs were food supplements to aid more than 18,000 malnourished children in the Horn of Africa. After roughly seven hours of flight, the Air Force crew landed at Air Force Base 188 in Djibouti, where the food was handed over to NGOs. "With military air resources, we are able to intervene quickly anywhere in the world to support French humanitarian actions," underlines airplane Captain Vincent Bertrand.





