Pakistan's most authentic and foremost Aviation and Aerospace magazine

PAKISTAN AIR FORCE

SECOND to NONE

July 2022

COVER STORY

Enter the DRAGON

BATTLE OF THE BRASS BANDS
MARCHING ON THE TUNES OF GLORY

LEST WE FORGET
AIRCRAFT BONEYARDS AROUND THE WORLD

KEEP EM' FLYING
A TRIBUTE TO MRF PERSONNEL

EXCLUSIVE

THE GAME CHANGER

BEYOND THE CALL OF DUTY
THE STORY OF AN INTREPID DUO

DRAGONS, FALCONS & MORE..
PAF FLYPAST 2022

MISSION JAISALMER
A SAGA OF COURAGE, GRIT & RESILIENCE

ARROWS OVER KONYA
ANATOLIAN EAGLE 2022

A DAY WITH DRAGONS

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THE FUTURE IS NOW
FLYING CARS

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from the EDITOR-IN-CHIEF

At the very onset, I am delighted to inform our worthy readers of an important milestone achieved by 'Second to None'. The magazine has been declared as a ABC (Audit Bureau of Circulation) certified publication by the Press Information Department of Ministry of Information and Broadcasting, Pakistan. A great honour for the editorial team, indeed. We are thankful to Allah Almighty and our worthy readers for making this publication a huge success in such a short span. Without your support and admiration, it would not have been possible.

This edition of Second to None has been penned down during an exceptional period of PAF history. Pakistan Air Force has always prided itself in perpetually upgrading its fleet and keeping up with the latest in technology. This was proven once more with the induction of the cutting-edge J-10C 'The Vigorous Dragon' into PAF fleet. We are proud to declare this issue as the 'J-10C edition'. In this issue, we take a deep dive into the journey that led to the procurement of this state-of-the-art weapon system. We start with how the aircraft is a 'Game Changer', in the truest sense of the term, analysing the deep impact that the aircraft will have in Pakistan's defence capability. The acquisition of this advanced aircraft is owed to the forward-thinking of Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of Air Staff Pakistan Air Force, whose vision entails equipping the PAF with the latest in aviation technology. His involvement was visible to all when he was joined by two of the newly-acquired Dragons on the Parade Day fly-past. This was the exciting start of this year's parade, with the thrills only ascending onwards. The third article 'Enter the Dragon' narrates the journey of the J-10C, from training to ferrying the aircraft to Pakistan from Chengdu. Starting from flight simulators, lectures and theory, it was a while before the Pakistani pilots were allowed to tame the Dragon. However, according to them, it was more than worth it. We close the arc of the J-10Cs with the fourth article, for which the editorial team got up close and personal with the stunning aircraft and the equally dashing aircrew of No 15 Squadron. Spending 'A Day with Dragons' was a life time experience which would be remembered for a long time to come. The experience was enthralling, as the crew walked the team through all the latest procedures and processes that have been incorporated to best utilize the J-10Cs. The tour truly felt like the start of a revolution in PAF. Another exciting feature is about the veteran Mirages of PAF. The aircraft has been defending the aerial frontiers for more than five decades now. This has only been made possible by the constant upkeep by the technical maestros of Mirage Rebuild Factory (MRF). The article explores the conditions under which the facility was erected and how far it has come over the years and also acknowledges the services rendered by the unsung heroes of MRF, whose tireless efforts keep these machines up in the air. A special report contributed by our foreign correspondent on Anatolian Eagle Exercise 2022 is also the part of the current edition.

As our tradition we dig deep into the annals of history and extract two different accounts of courage in the face of unbeatable odds. The first is the tale of a daring transport aircrew which made impossible, 'possible'. During the uncertain days of the 71 War with India, PAF had to thwart the substantially bigger IAF. It was during this time when PAF men like Flt Lt Mir Alam, Flt Lt Wajid Saleem and Flg Off Riffat Jamil stepped up. The trio was hastily given the task of bombing IAF's Jaisalmer air base. Narrated by Air Cdre Wajid Saleem (Retd), the account covers in detail how the three resourceful and relentless men accomplished the uphill task. Following the tradition of taking on missions that can only be termed as suicidal undertakings, PAF men have a way of dodging death at every turn. However, death can only be deceived enough times before it demands its toll. This was exactly what happened in the story of Sqn Ldr M S Alam Siddiqui and Sqn Ldr M Aslam Qureshi. The duo was assigned with bombing India's Jamnagar airfield. The duo accomplished the task, not once but twice, inflicting substantial damage to the enemy's attack capability. However, this was not enough for the relentless men. Keeping aside all the dangers and risks, the duo took off for the third time for what would prove to be their last sortie. This captivating story is certainly worth reading for our worthy audience.

The other pieces include a detailed analysis of the holy grail of transportation, flying cars. From Sci-fi movies to actual aviation experts, it has been predicted that flying cars are possible, it's just a matter of time. And with companies like Boeing making strides and joining hands, it seems like we're on the edge of a breakthrough.

So, as you can probably tell by now, we have curated an exciting and insightful issue for your reading pleasure.

As always, Happy Reading!

Muhammad Ali

Air Cdre Muhammad Ali, SI (M) (Retd)
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Page Photo: China Military

DEPUTY CHIEF OF TURKISH GENERAL STAFF CALLS ON AIR CHIEF

On 06 January 2022, General Selcuk Bayraktaroglu, Deputy Chief of Turkish General Staff, called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. During the meeting, both dignitaries discussed matters of professional and mutual interest.

General Selcuk Bayraktaroglu commended the professionalism of PAF and acknowledged its rising indigenous capacity in aviation industry. The Air Chief said that Pakistan and Turkey enjoy longstanding religious, cultural and historical bonds which are manifested through strong ties between both air forces. The Air Chief reiterated his resolve to further enhance the existing bilateral cooperation between the two brotherly countries.

AMBASSADOR OF THE CZECH REPUBLIC CALLS ON AIR CHIEF

On 19 January 2022, Ambassador of the Czech Republic H.E. Mr. Tomas Smetanka called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office.

The visiting dignitary lauded professionalism of PAF personnel and exceptional progress made by PAF over the years, especially through indigenization. The Air Chief highlighted the cordial relations between the two countries and reiterated his resolve to further augment the existing cooperation between the two Air Forces.

PASSING OUT PARADE HELD AT PAF AIRMEN ACADEMY

On 05 January 2022, Passing out Parade of Aero Apprentices was held at PAF Airmen Academy, Korangi Creek, Karachi. Air Marshal Zulfiqar Ahmed Qureshi, Deputy Chief of the Air Staff (Training), was the Chief Guest at the occasion. Earlier on arrival, Air Vice Marshal Zubair Hassan Khan, Air Officer Commanding, PAAK received the chief guest. A total of 1824 Aero Apprentices including trainees from allied countries and Pakistan Navy successfully completed their training.

The chief guest also awarded trophies to high achievers. Asghar Khan Trophy for the Best in Aeronautics was awarded to AFT-II Sheraz Hussain. Nur Khan Trophy for the Best in Avionics Technology was awarded to Aero Electromech Technician-II Mubashar Ul Hasan. Air Officer Commanding Trophy for the Best in General Service Training was awarded to Academy Sergeant Aircraftman Abdul Raouf Khan, whereas trophy for best foreign trainee was awarded to LAC Bandhara of Sri Lanka Air Force. Chief of the Air Staff Trophy for the over all best performance was awarded to AC Muhammad Ishtiaq.

CAS OPEN GOLF CHAMPIONSHIP CONCLUDES

On 07 February 2022, ace golfer Muhammad Shabbir won the title on the final day of 41st CAS Open Golf Championship with a gross score of 268 (20 under par), 2nd position was taken by Ansar Mehmood with the gross score of 281 (7 under par), while third position was clinched by Khalid Khan with the gross score of 284 (4 under par).

Closing ceremony of 41st CAS Open Golf Championship was held at Airmen Golf Club & Recreational Park, Korangi Creek, Karachi. Air Vice Marshal Syed Sabahat Hassan, Air Officer Commanding, Air Defence Command, PAF was the chief guest at the occasion.

29TH NATIONAL SKI CHAMPIONSHIP CONCLUDES

On 08 February 2022, Zahid Abbas of Gilgit Baltistan Scouts clinched the gold medal in slalom category on the first day of 29th National Ski Championship at PAF Ski Resort, Naltar. Silver medal was awarded to Mir Nawaz of Gilgit Baltistan Scouts and bronze medal was won by Abdul Jan belonging to Pak Army. A number of teams including PAF, Pak Army, GB Scouts, Gilgit Baltistan Winter Sports Association, Chitral, KPK, Punjab, Islamabad, Higher Education Commission Hindu Kush Snow Sports Club and Civil Aviation Authority participated with vigour and full spirit in the National Ski Championship.

AMBASSADOR OF SWITZERLAND CALLS ON AIR CHIEF

On 09 February 2022, Ambassador of Switzerland H.E Mr. Benedict de Cerjat called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office.

The visiting dignitary lauded the professionalism of PAF personnel and the exceptional progress made by PAF over the years, especially through indigenization. The Air Chief highlighted that both countries enjoy cordial relations and reiterated his resolve to further enhance the existing bilateral cooperation between the air forces of the two countries.

COMMANDER KYRGYZ AIR FORCE CALLS ON AIR CHIEF

On 08 February 2022, Colonel Kylychbek Akimovich Aidaraliev, Commander Kyrgyz Air Force called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. During the meeting, both the dignitaries discussed matters of professional and mutual interest.

Colonel Kylychbek Akimovich Aidaraliev commended the professionalism of PAF and acknowledged its rising indigenous capacity in aviation industry. The Air Chief said that Pakistan and Kyrgyz Republic enjoy longstanding religious, cultural and historical bonds which are manifested through strong ties between both air forces. The Air Chief reiterated his resolve to further enhance the existing bilateral cooperation between the two brotherly countries.

COMMANDER IRANIAN AIR FORCE CALLS ON AIR CHIEF

On 28 February 2022, Brigadier General Hamid Vahedi, Commander of the Air Force of Islamic Republic of Iran called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. A smartly turned out contingent of Pakistan Air Force presented him the guard of honour. Brigadier General Hamid Vahedi, also laid floral wreath at the Martyrs' Monument to pay homage to the PAF's martyrs.

During the meeting, both dignitaries discussed matters of professional and mutual interest. The honourable guest commended the professionalism of PAF and acknowledged its rising indigenous capacity in aviation industry. The Air Chief said that Pakistan and Islamic Republic of Iran enjoy longstanding religious, cultural and historical bonds which are manifested through strong ties between both air forces. The Air Chief reiterated his resolve to further enhance the existing bilateral cooperation between the two brotherly countries.

SAADIA KHAN SKI CUP HELD AT NALTAR

On 01 March 2022, Saadia Khan & Children Ski Cup culminated successfully at Naltar Ski Resort. A large number of ski enthusiasts and locals witnessed the thrilling and spectacular competitions. Prominent national skiers from all over the country contested for their place in the slalom and giant slalom category of races. Female skiers and young athletes demonstrated their best skills under freezing temperatures on highly steep slopes. Pakistan Air Force has developed the resort at par with the world class standards by providing all possible facilities of international calibre.

The event is named after a young skier Miss Saadia Khan who lost her precious life in a tragic car accident at age of 24 years. The tournament is being organized to provide opportunity to female players from all across the country to challenge their mental and physical toughness.

EXERCISE FALCON TALON CULMINATES

On 05 March 2022, Air Marshal Zahid Mahmood, Deputy Chief of the Air Staff (Personnel), Pakistan Air Force along with the United States Chargé d'affaires in Pakistan, Angela Aggeler witnessed the culmination phase of the bilateral exercise Falcon Talon between Pakistan Air Force and United States Air Force at an operational base of PAF. The exercise started on 26th Feb, 2022 with the deployment of USAF fighter jets at an operational base. The exercise was aimed at Interoperability in complex air operations in realistic contemporary scenarios.

Interacting with the combat crew of both the air forces, Air Marshal Zahid congratulated the participants on successful completion of the exercise. He also appreciated the air & ground crew for smooth and professional conduct of this significant exercise. He added that both the air forces have a long history of enviable cordial relations and hoped that this exercise would certainly enable both the air forces to learn from mutual experiences in addition to promoting inter-operability.

SHAH KHAN CUP CONCLUDES AT NALTAR

On 12 March 2022, Prize distribution ceremony of 16th Shah Khan Ski Cup & National Biathlon Championship-2022 was held at PAF Ski Resort, Naltar. Brigadier (Retd) Syed Kausar Hussain, Director Operations & Plans National Logistic Cell was the chief guest at the occasion. The ceremony was also attended by Air Cdre Javed Iqbal, SASO Federal Air Command and other distinguished guests.

In National Biathlon Championship Alam Maqsood of Gilgit Baltistan won gold while Khan Ishaque of Gilgit Baltistan Scouts won silver and Shah Noran of Pak Army won bronze medals.
26 national skiers from all over the country participated in the much-awaited winter sports, which are conducted each year in the magnificent Naltar ski resort under the auspices of PAF and Winter Sports Federation of Pakistan. Teams of PAF, Pak Army, GB Scouts, Islamabad and Civil Aviation Authority participated in the mega event.

Pakistan Air Force and Winter Sports Federation of Pakistan jointly arrange these events each year in a bid to promote winter sports in the country and sports tourism in snowy mountains of Gilgit Baltistan and Khyber Pakhtunkhwa.

NIGERIAN DEFENCE MINISTER & COMMANDER OF NATIONAL GUARD OF BAHRAIN VISITS AHQ

On 18 March 2022, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force met Defence Minister of Nigeria and Commander of the National Guard of Bahrain in two separate meetings today. Matters of professional and mutual interest were discussed during the meetings.

Minister for Defence of Nigeria Major General Bashir Salihi Magashi (Retd) commended the professionalism of PAF and acknowledged its developing indigenous capacity in aviation industry. Air Chief said that Pakistan and Nigeria had longstanding religious, cultural and historical bonds which were manifested through strong ties between the Air Forces of two countries.

In a separate meeting, Commander of the National Guard of Bahrain General Shaikh Mohamed Bin Isa Bin Salman Al-Khalifa also called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force. CAS said that Pakistan values its strong diplomatic, economic and defence relations with Kingdom of Bahrain.

CHIEF OF THE TURKISH GENERAL STAFF & AIR OFFICER COMMANDING 22 GROUP ROYAL AIR FORCE CALLED ON AIR CHIEF

On 24 March 2022, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force met Chief of Turkish General Staff and Air Officer Commanding 22 Group, Royal Air Force in two separate meetings today. Matters of professional and mutual interest were discussed during the meetings.

Chief of the Turkish General Staff, General Yasar Guler commended the professionalism of PAF and acknowledged its developing indigenous capacity in aviation industry. Air Chief said that Pakistan and Turkey had longstanding religious, cultural and historical bonds which were manifested through strong ties between the Air Forces of two countries.
The Air Chief reiterated his resolve to further enhance the existing bilateral cooperation between the two brotherly countries.

In a separate meeting, Air Officer Commanding 22 Group of Royal Air Force, Air Vice Marshal Richard Maddison OBE also called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force. Air Chief said that Pakistan values its strong diplomatic, economic and defence relations with United Kingdom. The visiting dignitary appreciated Pakistan's role in regional stability. He also acknowledged professionalism of Pakistan Air Force. He assured to play his role for further improvement in diplomatic and military cooperation with Pakistan at all levels. Measures to further enhance professional cooperation between the two countries were also discussed during the meetings.

GRADUATION CEREMONY HELD AT RISALPUR

On 28 March 2022, The Graduation Ceremony of 127th Combat Support, 43rd BLPC Course, 7th Log (A), 3rd AD (SSC) and 2nd Grooming Courses was held at PAF Academy, Asghar Khan. Air Marshal Zulfiquar Ahmad Qureshi, Deputy Chief of the Air Staff (Training) was the chief guest at the occasion. On his arrival at the Academy, he was received by Air Vice Marshal Qaiser Janjua, Air Officer Commanding, PAF Academy Asghar Khan.

A total of 63 cadets graduated at the occasion. The chief guest awarded branch insignias to the graduating cadets and trophies to the distinction holders. Air Marshal Asghar Khan Trophy for the overall best performance in 127th Combat Support Course was awarded to Aviation Cadet Muhammad Talha.

PASSING OUT PARADE OF 145TH PMA LONG COURSE HELD

On 30 March, 2022 Passing out parade of 145th PMA Long Course, 12th Mujahid Course, 19th Lady Cadet Course and 64th Integrated Course held at Pakistan Military Academy, Kakul. 17 Allied cadets from Kingdom of Saudi Arabia, Iraq, Jordan, Maldives, Azerbaijan and Nigeria were also among passing out cadets including international Lady Cadets.

Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of Air Staff was the chief guest on the occasion. He reviewed the parade. CAS congratulated the passing out cadets on achieving this milestone. The chief guest gave awards to distinguished cadets. The coveted Sword of Honour was awarded to Academy Senior under Officer ASUO Abdul Qahar of 145th Long Course. The President's Gold Medal to Battalion Senior Under Officer Ubaid Ur Rehman of 145th Long Course, the Overseas Gold Medal to Foreign Country Senior Under Officer Issa Enad Al Masoodi from Iraq of 145th Long Course, Commandant's Cane to Company Sports Sergeant Matee Ur Rasool of Integrated Course, Commandant's Cane to Company Junior Under Officer M Haseeb Khan of Basic Military Training Course, Commandant's Cane to Company Under Officer Faizan Khan of Basic Mujahid Course, Commandant's Cane to Company Sergeant Major Nida of Lady Cadet Course and Commandant's Overseas Medal to Friendly Country Sergeant Hauwa from Nigeria.

Major General Omer Ahmed Bokhari, Commandant Pakistan Military Academy and large number of senior serving / retired armed forces personnel, parents and relatives of passing out cadets witnessed the parade.

FIRST DEPUTY DEFENCE MINISTER OF KAZAKHSTAN CALLS ON AIR CHIEF

On 12 April 2022, Lieutenant General Khussainov Marat Rakhimovich, First Deputy Defence Minister/ Chief of General Staff of Armed Forces of Kazakhstan, called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. During the meeting, both the dignitaries discussed matters of professional and mutual interest.

Lieutenant General Khussainov Marat Rakhimovich commended the professionalism of PAF and acknowledged its rising indigenous capacity in aviation industry. The Air Chief said that Pakistan and Republic of Kazakhstan enjoy longstanding religious, cultural and historical bonds which are manifested through strong ties between both air forces. The Air Chief reiterated his resolve to further enhance the existing bilateral cooperation between the two brotherly countries.

AMBASSADOR OF JAPAN CALLS ON AIR CHIEF

On 21 April 2022, Ambassador of Japan H.E. Mr. WADA Mitsuhiro called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office.

The visiting dignitary lauded the professionalism of PAF personnel and the exceptional progress made by PAF over the years, especially through indigenization. The Air Chief highlighted that both countries enjoy cordial relations and reiterated his resolve to further enhance the existing bilateral cooperation between the air forces of the two countries.

Various matters of mutual interest and professional cooperation also came under discussion during the meeting.

PAF C-130 AIRLIFTS RELIEF GOODS FOR THE FLOOD AFFECTED AREAS OF AFGHANISTAN

On 07 May 2022, The Prime Minister of Pakistan, Mr. Mian Muhammad Shahbaz Sharif, while expressing sympathy to the people of Afghanistan affected by the recent floods, directed the National Disaster Management Authority to send relief goods air. In light of these instructions, The Air Transport fleet of PAF has been assigned the onerous responsibility to Air lift relief goods for the flood affected areas of Mazar-e-Sharif. In this regard, a PAF C-130 aircraft laden with 22000 lbs of cargo comprising food items, tents and medicines for the flood affectees of Afghanistan The second consignment will also be dispatched soon.

Relief supplies were sent by Pakistani Ambassador to Afghanistan Mansoor Ahmad Khan.

The recent floods have caused devastation in the low-lying areas of Afghanistan, badly damaging the villages and infrastructure. PAF has always responded during natural calamities in addition to safeguarding the aerial frontiers of the country.

AIR CHIEF VISITS PAF AIR WAR COLLEGE INSTITUTE

On 11 May 2022, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force visited PAF Air War College Institute, Faisal. On his arrival, he was received by Air Vice Marshal Hussain Ahmed Siddiqui, President Air War College Institute. The chief guest congratulated the AWCI team for transforming the AWCI into an institute of the highest calibre capable of meeting the contemporary challenges.

PAF Air War College Institute is the prestigious institution of Pakistan Air Force, where mid level officers of Pakistan armed forces and friendly countries are prepared for assumption of key Command and Staff appointments. The course participants are exposed to over a hundred subject matter experts including: Civil & Military Professionals, Diplomats, Scholars/ Academicians, Lawyers, Industrialists, Scientists, Economists and Media Personnel. Exclusive Interaction with foreign faculty and strategists is also ensured to provide depth and academic rigor to the course.

PAF C-130 AIRLIFTS RELIEF FOR UKRAINE

On 31 May 2022, The Prime Minister of Pakistan, Mr. Mian Muhammad Shahbaz Sharif, while expressing sympathy to support Ukrainians affected by Russian invasion of Ukraine, directed the National Disaster Management Authority to send relief goods immediately. In light of these instructions, the Air Transport fleet of PAF has been assigned the onerous responsibility to air lift relief goods for the war stricken areas of Ukraine. In this regard, a PAF C-130 aircraft carrying food items, tents and medicines for the war affectees of Ukraine landed at the airport.

Relief supplies were sent in times of of humanitarian crises and natural calamities, PAF has always responded effectively in addition to safeguarding the aerial frontiers of the country,

COMMANDER QATAR EMIRI AIR FORCE CALLS ON AIR CHIEF

On 07 June 2022, Major General (Pilot) Jassim Mohammad Ahmed Al-Mannai, Commander Qatar Emiri Air Force called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. On the arrival of Commander Qatar Emiri Air Force, a smartly turned out contingent of Pakistan Air Force presented the guard of honour. During the meeting, both air dignitaries discussed matters of professional and joint interest.

While appreciating professionalism of Pakistan Air Force, Major General (Pilot) Jassim Mohammad Ahmed Al-Mannai acknowledged PAF's rising indigenous capacity in aviation industry. The Air Chief said that Pakistan and Qatar have longstanding religious, cultural and historical bonds which were manifested through strong ties between the air forces of the two countries. The Air Chief highlighted that both the countries enjoy cordial relations and reiterated his resolve to further enhance the existing bilateral cooperation between the two brotherly countries.

The Air Chief further said, "Pakistan values its relations with Qatar, which are based on convergence on all important issues relating to regional peace, security and stability".

TURKISH AMBASSADOR CALLS ON AIR CHIEF

On 13 June 2022, Turkish Ambassador H.E. Mr. Ihsan Mustafa Yurdakul called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. During the meeting, both dignitaries discussed matters of professional and mutual interest.

While appreciating professionalism of Pakistan Air Force, Turkish Ambassador H.E. Mr. Ihsan Mustafa Yurdakul acknowledged PAF's rising indigenous capacity in aviation industry. The Air Chief said that Pakistan and Turkiye have longstanding religious, cultural and historical bonds which were manifested through strong ties between the Air Forces of two countries. The Air Chief highlighted that both the countries enjoy cordial relations and reiterated his resolve to further enhance the existing bilateral cooperation between the two brotherly countries.

The Air Chief further said, "Pakistan values its relations with Turkiye, which are based on convergence on all important issues relating to regional peace, security and stability".

AMBASSADOR OF SPAIN CALLS ON AIR CHIEF

On 20 June 2022, Ambassador of Spain H. E. Mr. Manuel Duran Gimenez-Rico called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office.

The visiting dignitary appreciated the professionalism of PAF personnel and the exceptional progress made by PAF over the years, especially through indigenization. The Air Chief highlighted that both countries enjoy cordial relations and reiterated his resolve to further enhance the existing bilateral cooperation between the air forces of the two countries.

CHIEF OF DEFENCE GENERAL STAFF ITALIAN ARMED FORCES CALLS ON AIR CHIEF

On 22 June 2022, Admiral Giuseppe CAVO DRAGONE, Chief of Defence General Staff Italian Armed Forces called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office.

The visiting dignitary appreciated sound professionalism of PAF personnel and also acknowledged the achievements made by PAF over the years, especially through indigenization. The Air Chief highlighted that both countries enjoy cordial relations and reiterated his resolve to further enhance the existing bilateral cooperation between the PAF and Italian Armed forces. Both the dignitaries agreed to further revitalize defence ties including training and indigenous production.

1ST CONVOCATION CEREMONY OF FAZAIA MEDICAL COLLEGE HELD AT AIR UNIVERSITY, ISLAMABAD

On 23 June 2022, the Convocation of 1st MBBS Batch of Fazaia Medical College, Islamabad Campus was held at Main Auditorium, Air University Islamabad. Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force was the Chief Guest at the occasion. The Chief Guest awarded Gold, Silver and Bronze Medals to the students who secured 1st, 2nd, and 3rd positions respectively in their professional examinations. Students who secured the highest marks in each subject were also awarded Gold Medals, whereas Dr Saad Azhar Malik was declared as the Best Graduate, who bagged 20 Medals in MBBS. The Air Chief congratulated the medical graduates and their parents on this significant and memorable day. He also lauded the efforts of administration and faculty of Fazaia Medical College for achieving a historic milestone.

While addressing the audience, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force appreciated the standard and quality of education being imparted at Fazaia Medical College, Islamabad.

NO 35 AIR WAR COURSE GRADUATION CEREMONY, HELD AT AIR WAR COLLEGE INSTITUTE, KARACHI

On, 29 June 2022, The Convocation & Graduation Ceremony of No 35 Air War Course was held at Air War College Institute, Karachi today. Dr Arif Alvi, President of Islamic Republic of Pakistan, was the Chief Guest at the occasion.

Addressing the graduating officers, the Chief Guest congratulated the participants on the successful completion of their course and achieving a great milestone in their career. He said that the requirements for acquisition of knowledge are changing rapidly in the present era, so acquisition of technology is the only way to gain modern education. He further added that in this Hyper-competitive world, research and work on artificial intelligence is of vital importance. He further said "We must continue to support the oppressed, regardless of their race or colour," and condemned the biasness shown by India against the Indian Muslims along with the human rights situation in IIOJK. He added that in modern warfare whether conventional or unconventional, no service could achieve success single-handedly and a joint strategic planning is required. Later on, the Chief Guest awarded certificates to the graduating officers. Top graduate trophy was awarded to Commander Waleed Arif from Pakistan Navy.

The Game CHANGER

Vigorous Dragon Joins the Fleet

"Four decades after PAF acquired the first delivery of F-16 Fighting Falcons, a momentous ceremony in March 2022, marked yet another milestone in the glorious history of the PAF. The induction of the omni-role, 4.5 Generation J-10C 'Vigorous Dragon' was another step to strengthen the aerial defence of the country. Senior Civil and Military leadership gathered at the occasion and showed their combined resolve to make the defence of the country impregnable and termed the induction of this newly inducted weapon system as a 'Game Changer' event in the history of Pakistan."

by Air Cdre Muhammad Ali, SI (M) (Retd)

The rapid evolution of air power complemented by advances in technology, required that PAF kept pace with contemporary capabilities and employment concepts. This was imperative to maintain optimum mission readiness. The PAF had been able to develop itself as a force to reckon with, through a professional, innovative and bold leadership; resilience and skills of its human resource and above all intrinsic motivation to serve Pakistan. At the ceremony, held in March this year at Karma, the PM, Services Chiefs', elected members of National Assembly and senior military and civil officials, were all part of history in the making as the PAF formally inducted its latest acquisition- the J-10C 'Vigorous Dragons'. The induction marked the dawn of a new era. The J-10C weapon system is the PAF's new pointy tip of the spear, proud flag bearer, the game changer equipped with EW suite, AESA radar, and the PL-15 missile. The 'Vigorous Dragon', as it is fondly called, would further strengthen the PAF in achieving its mission, contributing towards national security and regional stability.

The ceremony was as glamorous as it could be. Soon after the guard of honour and as the guests took their seats, a fly past of different aircraft was presented. Approaching perpendicular to the dais and flying right over it, first to come-in were the famous Sherdil, in nine-ship K-8, running-in in a "Spirit Formation." Then a single Mirage aircraft busted the arena in a high-speed low-level run-in front of the guests. Next, a 4-ship Mirage formation appeared from the left to perform a high G 'Break Manoeuvre'.

After two four-ship formations of F-16s and of JF-17s each presented linear bomb bursts, a three-ship followed by a two-ship

Title Photo: At the Helm- ACM Zaheer Ahmed Baber Sidhu, Chief of the Air Staff PAF played a decisive role in the procurement and induction of J-10C Dragons in record time of less than eight months. (Photo: CWO Iftikhar Muhammad).

Inlet: ACM Zaheer Ahmed Baber Sidhu, CAS PAF explaining the technical details of the freshly inducted J-10C aircraft to the Mr Imran Khan, Prime Minister of Pakistan. (Photo: CWO Iftikhar Muhammad).

formation of the highly anticipated J-10C aircraft flew low along the runway presenting a salute to the chief guest. The J-10C formations then fed in the landing pattern for a full-stop landing. The aircraft taxied to the venue and parked in front of the guests in a synchronized manner. After the formation switched off at main tarmac, the air and ground crews formed up in front of the aircraft. The commentators of the aerial display were Sqn Ldr Hassaan Jalal and Sqn Ldr Khadija Awan.

Quantum Leap

In their speeches, the leadership of the country articulated that the J-10C Dragon aircraft gave Pakistan a much-needed competitive advantage. In his opening remarks, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force shed light on the evolving global challenges.

security and defence," he said.

In order to safeguard against all threats, the armed forces of Pakistan continued to synergize their efforts bridging capability gaps through timely inductions programmes, ACM Zaheer Ahmed Baber further elaborated. "Considering modern parameters of warfare, induction of J-10Cs jets in the air force, is the result of one such combined effort, which merits appreciation at all levels. I must acknowledge the support that the air force received from the government of Pakistan, under the able leadership of the PM despite enormous challenges. This milestone could not have been possible without your patronage, to equip the air force with the new weapon system within a short space of eight months," he said while also

Title Photo: J-10 C 'Vigorous Dragon' is the most lethal, state-of-the-art and potent weapon system in the region today. (Photo: Lijayang Zhuhai Air Show 2021).

Centre: ACM Zaheer Ahmed Baber Sidhu, CAS PAF addressing at the occasion. (Photo: CWO Iftikhar Muhammad).

Bottom Left: Senior national and military leadership considers the induction of J-10C Dragon a Game Changer event in the history of the nation. (Photo: CWO Iftikhar Muhammad).

Bottom Right: ACM Zaheer Ahmed Baber Sidhu, CAS PAF and Mr Imran Khan, Prime Minister of Pakistan exchanging views on the impressive aerial display of the J-10C aircraft. ((Photo: CWO Iftikhar Muhammad).

Top: Political and military leadership along with the personnel of No 15 Sqn pose at the historic event. (CWO Ifikhar Muhammad).

Bottom: Air Warriors from Future - A group of No 15 Sqn pilots under the command of Wg Cdr Imtiaz Rahim lines up for a presentation ceremony for the Chief Guest. (Photo: CWO Iftikhar Muhammad).

appreciating support of the Chief of Army Staff in backing the air force in all initiatives of national importance.

In his views, the induction ceremony was testimony to the strong partnership between two friendly countries Pakistan and China, as the two sides are committed to work together in multiple domains to ensure peace in the region.

He finally complimented his team for its dedication and professionalism, and especially the No 15 Sqn, for successful induction of the new weapon system in a record time. "This induction ceremony has significant aspects. Today after a gap of four decades, PAF is inducting the J-10C next generation combat system, state of the art concept and weaponry," he said proudly.

Next to comment on the inductions was Prime Minister Imran Khan, who said that the pride was reminiscent of the wave of joy that spread 40 years ago when the F-16s were inducted to defend skies with latest aircraft. He lamented the efforts to create a security imbalance in the sub-continent. To address that challenge, the induction of J-10C was a significant addition into Pakistan's defence system. He appreciated support from China for providing the jets in a record time. He complemented the CAS, PAF for his futuristic vision that prevailed in Pakistan's armed forces. "Future warfare will be dependent on the latest technologies with focus on developing indigenous capabilities. As Pakistan sets off in the right direction, I express confidence on behalf of millions of Pakistanis, in their armed forces," Mr Imran Khan said, cautioning that after these new acquisitions, belligerent forces

Left: Pilots park the newly inducted J-10C in front of the chief guest during the induction ceremony. (Photo: CWO Iftikhar Muhammad).

Left Page Bottom: J-10C seen taxiing at PAF Base Minhas. (Photo: CWO Iftikhar. Muhammad).

Bottom Left: ACM Zaheer Ahmed Baber Sidhu, CAS PAF explaining the intricacies of J-10C aircraft to Lt Gen Faiz Hameed, Corps Commander No 11 Corps during the induction ceremony. (Photo: CWO Iftikhar Muhammad).

Bottom Right: ACM Zaheer Ahmed Baber Sidhu, CAS PAF receiving General Qamar Javed Bajwa, COAS at the venue. (Photo: CWO Iftikhar Muhammad).

threatening national security would only pick up massive losses.

"In Operation Swift Retort, Pakistan sent a message across the globe that Pakistan is capable of defending its borders. The people of Pakistan are the strength of its armed forces. Speaking on behalf of the citizens, I can safely say that the nation overcame one of the most difficult challenges during the war on terror, sending a message that Pakistan could defend its sovereignty," Imran Khan stressed, expressing greater confident in the country's defence capabilities, after seeing the new jets perform.

He expressed pride in the capabilities of the PAF to induct the J-10C jets and in taming the Dragons in a record time.

Contract Signing Jun-2021

The Dragons arrived in March this year, however, the contract to deliver these aircraft was signed back in Jun 2021. As per the contract, the Chinese agreed to provide training, ground support equipment and weaponry, including the famous PL-15 missile to the PAF. Resultantly, as we have witnessed that in less than a year, the first batch was delivered in March, 2022, reflecting PAF's need for urgent acquisition of the new capability. CAS, PAF termed the contract signing with China as a historic moment for Pakistan and for the PAF. "A Milestone achievement, a major step forward in our commitment to defend aerial frontiers of Pakistan. I appreciate and acknowledge the support of our all-weather friend and strategic partner China. Pakistan has always endeavoured for peace in South Asia without indulging in any arms race," ACM Zaheer Ahmed Baber Sidhu had said during the contracting signing ceremony with China. The ceremony was attended by senior leadership of both sides.

The Air Chief took the opportunity to share that the prime focus remained on the modernization campaign, absorbing and operationalizing new technologies along with enhancing human resource development. This, he said, was fundamental for any organization. "Being fully aware of the non-contact warfare paradigm, Pakistan strives to attain its punch through a smart induction programme of cutting edge and niche technologies,

Specifications (J-10C)

General Characteristics

Crew	1
Length	16.9 m (55 ft 5 in)
Wingspan	9.8 m (32 ft 2 in)
Height	5.7 m (18 ft 8 in)
Wing area	37 m2 (400 sq ft)
Empty weight	9,750 kg (21,495 lb
Gross weight	14,000 kg (30,865 lb)
Max takeoff weight	19,277 kg (42,499 lb)
Fuel capacity	4950 L (3860 Kg) internal.4000 L (3120 Kg) external with 3 drop tanks (2x1600L + 1x800L)
Powerplant	1 × WS-10B afterburning turbofan engines, 89.17 kN (20,050 lbf) thrust dry, 142 kN (32,000 lbf) with afterburner

Performance

Maximum speed	Mach 1.8
Stall speed	200 km/h (120 mph, 110 kn)
Combat range	1,240 or 2,600 km (770 or 1,620 mi, 670 or 1,400 nmi)
Ferry range	2,950 km (1,830 mi, 1,590 nmi)
Service ceiling	17,000 m (56,000 ft)
g limits	+9/-3
Rate of climb	300 m/s (59,000 ft/min)
Wing loading	381 kg/m2 (78 lb/sq ft)
Thrust/weight	1.05 (with Saturn AL-31FN3); 1.10 (with WS-10A)

coupled with collaboration with friendly countries and indigenization campaigns. Induction of J-10C, will endure, retention of first shot capability to PAF, and that is an important milestone for the PAF." The J-10s state-of-the-art AESA radar and other components, including the long-range PL-15 missile, would not only boost operational capabilities but also ensure desired technological edge in the evolving global environment, the Air Chief Marshal emphasized towards the end of his speech.

The Vigorous Dragon

The 4.5 Generation J-10C is a multi role fighter aircraft with extended long range first-shot Beyond Visual Range (BVR) capability. Owing to its excellent performance in all flight regimes and

altitudes, matchless manoeuvrability and advanced integrated Electronic Warfare Suite; the aircraft can take-on any contemporary aerial and ground threats with precision. Equipped with latest avionics such as modern AESA Radar and fully-fused sensor systems enabling employment of a variety of weapons, the aircraft is ideally suited for conduct of multi-domain operations.

The J-10C Vigorous Dragon, a single-engine tactical fighter built by the Chengdu Aircraft Corporation in Sichuan province. Developed in the 90s, the J-10 was similar in concept to the lightweight Belly Intake F-16 with some DNA from Canard LAVI - Israel's cancelled fighter jet. Chinese military expert Fu Qianshi, recently revealed on a program that the J-10C had become the most feared 4.5 Generation fighter in China's "Golden Helmets" free air combat test in recent years. In the last three years of the "Golden Helmets" exercise, the J-10C had repeatedly defeated the J-16 multirole fighter and the imported Su-35 air fighter, achieving a brilliant record.

The acquisition of modern, hi-tech. 4.5 generation semi-stealth J-10C 'Vigorous Dragon' into PAF fleet in record time of less than eight months shows the commitment and resolve of the present PAF leadership which has always remain the hallmark of this prestigious organization for decades. Not only its flawless induction and integration into the PAF fleet, the introduction of new maintenance concepts and revolutionary steps in bringing cultural change in handling new weapon system at the flight lines, would surely go a long way in making the PAF 'Second to None'.

Left Page Top : Like a Rocket- A PLAAF (Air Force) J-10C while showing its lethal arsenal zoom vertically, defying the laws of gravity. (Photo: China Military).

Left Page Bottom: J-10C during ferry flight from China to Pakistan. (Photo: No. 15 Sqn).

Left: Head On- A PLAAF Air Force J-10 C takes off with its rocket-pods underneath the wings. (Photo: Pavel B).

Bottom: The array of PL missiles make the dragons teeth sharp. The mission ready Dragon taxiis in front of the visiting guests of honour. (Photo: CWO Iftikhar Muhammad).

PAF FLYPAST 2022

DRAGONS,

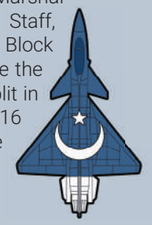
FALCONS

AND MORE...

"On 23 March, 2022, the J-10C Dragon became a household name. The Pakistan Day parade in the federal capital this year saw the grandest fly past ever, when ACM Zaheer Ahmed Baber Sidhu, Chief of the Air Staff had two Vigorous Dragons flying on his wings. The vigorous Dragons, which flew over Islamabad, are the newest acquisitions from China. Running-in at 900 knots, the two single seat multi-role J-10C, crackled over Air Chief's radio, riding the F-16, call sign Shahbaz 1, "Shahbaz 1, this is Shahbaz 2, it's an honour to fly on your wings." Although, the call sign SHAHBAZ, is dedicated only to the Air Chief, but for the first time the two J-10C pilots were assigned the call signs Shahbaz 2 and Shahbaz 3, a unique privilege for the pilots of the No 15 Sqn, which has been equipped with the J-10C fighter jets."

by Air Cdre Muhammad Ali, SI (M) (Retd)
S.Khalil

There were fewer nicer places to be this year on a sunny spring Parade Day. The trees always looked particularly fine early in the morning with the lush green grass and the parade ground speckled with spring flowers under the soundtrack of the F-16s and the thunder of the JF-17s. The Parade Day fly past this year was not just traditional, but historic as well. Opening the flypast was Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force, in the F-16 Fighting Falcon Block 52. Flying on his wings, with great aplomb, were the two new J-10C fighter aircraft. The three jets split in a linear bomb burst manoeuvre and the CAS's F-16 climbed vertically overhead the parade venue dispensing flares. It was an air to experience.



Then the guests, heads of State, ambassadors, military attaches', and families of mostly armed forces personnel, threw their gazes towards the right, to the approaching three ship formation of the fast and the furious Mirages, from the No 25 Sqn. The Mirage jet is notorious for a deep strike attack role, delivering weapons with utmost accuracy. Turning their heads to the right again, guests caught sight of one of the enemy's biggest nightmares. Approaching the venue, were the Griffins, in four state of the art F-16s of the No 9 Sqn. The nation's pride, a formation of four JF-17 Thunder of the No 26 Sqn, known as the Black Spiders, winged their way across the Parade Venue. Next, running in towards the venue was the formation of the lethal and dependable Mirage aircraft from No 27 Sqn known as 'Zarrars'. The Tigers from the No 17 Sqn chased the Mirages, close behind, flying in a diamond formation, in their ever-dependable F-7PG aircraft.

The most anticipated, the impatiently awaited, the formidable, the hunter,

the Game Changer, the Vigorous Dragon, J-10C, dazzled the audiences next. The J-10Cs participation was gratefully received. With waving flags and continuous applause, a grateful Pakistani nation paid a tribute to the airmen who have done so much to clear the skies over their sovereign land. This was the first time the J-10Cs were seen in action. These Vigorous Dragons belonged to the No 15 Sqn, carrying on the tradition of the Cobras, the squadron that has a history of astounding the nation with heroism and daring in the conflicts in 1965, 1971 and then again in 2019, during Operation Swift Retort.

"The new jets flying on Parade Day celebrations were an amazing way to promote the modern Pakistan Air Force and to inspire future generations," said a guest in the audience while talking to the team of Second to None.

Right: Air boss of the Pakistan Air Force, Air Chief Marshal Zaheer Ahmed Babar Sidhu, remains the visual symbol of the trust between the people and the air force. (Photo: CWO Iftikhar Muhammad).

Centre: Adroitness, pride and panache all packed in a single shot. (Photo: CWO Iftikhar Muhammad).

Bottom: The men who in the decisive moment give us freedom of the air: The proud members of Pak Day flypast 2022 who had the honour to fly on the wings of their leader, ACM Zaheer Ahmed Baber Sodhu, CAS PAF. (Photo: CWO Iftikhar Muhammad).

"You do not have to be an aviation enthusiast to appreciate what we saw here today. The J-10s will make headlines in the world's grandest displays," another audience member said proudly.

After the fighter complement of the Pakistan Air Force, the force multipliers rolled in. Presenting the fly past first were the three AWACS, in a formation comprising one Karakoram Eagle - III of the No 4 Sqn and two SAAB-2000 of No 3 Sqn. These aircraft are well known to be the 'Eyes and Ears' of the PAF in air.

Appearing on the horizon was a pleasing sight, a formation of "Long range maritime patrol Aircraft, P3C Orion", which belonged to No 28 Strike Squadron of Pakistan Naval Aviation.

The best was saved for the last. One of the most amazing stunts flying by the PAF pilots, who flew their aircraft closer to the edge.

A crowd's favourite, the Sherdil team returned to the parade venue taking flight in their K-8 jets. Some of their manoeuvres were basic aerobatics, others were specialized steep turns and sudden pull ups that seemed like playing laser tag in the sky. For some in the audience, the experience of watching the Sherdil turn and roll was like watching a roller coaster without rails.

Flying in next was Pakistan's indigenous, JF-17 Thunder jet. From adrenaline-rushing combat flight manoeuvres, over an awe-inspiring scenic and incredible

Top: With 'Vigorous Dragons' on wings, the CAS, PAF approaches the saluting dais. (PAF Archives).

Centre: As the two Dragons split, the CAS, PAF pulls up in a traditional salute-to-the-nation manoeuvre. (Photo: Awais Lali).

Bottom: CAS, PAF F-16 climbs vertically defying the laws of gravity. (Photo: PAF Archives).

landscape of the federal capital, the Thunder was a show stopper. The performance was hands-on high adrenaline flying experience for the Thunder pilot, but those sharp turns, rolls, and loops, made viewers sit on the edge of their seats.

"We have seen amazing flying before, but the PAF pilots make it seem unique and a once-in-a–lifetime experience every year," said a university student after the performance.

The PAF prides itself on the experience and professionalism and as one of the world's top flight safety and combat aerobatics military wing.

FLY PAST SEQUENCE

Formation	Leader	Members	Unit
Mirage	Wg Cdr Rashid Sulehri	Sqn Ldr Amyad Flt Lt Dayan	No 25 Sqn 'Eagles'
F-16	AVM Zafar Aslam	Wg Cdr Usman Niazi Sqn Ldr Waqas Rashid Sqn Ldr Umair Riaz	No 9 Sqn 'Griffins'
JF-17	Wg Cdr Zeeshan Baryar	Sqn Ldr Raheel Sqn Ldr Abdul Munim Sqn Ldr Danish	No 26 Sqn 'Black Spiders'
Mirage	Wg Cdr Ali Shahnawaz	Sqn Ldr Qazi Mujtaba Sqn Ldr Waleed Rauf Sqn Ldr Ramish Safdar	No 27 Sqn 'Zarrars'
F-7PG	Wg Cdr Kamran Yasin	Wg Cdr Zahid Jamal Sqn Ldr M Bilal Flt Lt Hafiz Juned	No 17 Sqn 'Tigers'
F-7 P	Wg Cdr Hafeez Abdullah	Wg Cdr Taimur Nawaz Flt Lt Farhan Khalid Flt Lt Rafay	'Shooters' Sqn
F-7 P	Wg Cdr Imtiaz Raheem	Sqn Ldr Zeeshan Sqn Ldr Ali Qasim	NO 15 sqn 'Cobras'

3

1: The Parade Day celebrations had everything aviation fans wanted to see. Two Mirages perform 'Zarrar' sqn seen in action over parade venue. (Photo: Awais Lali).

2: Planes of fame from the No 25 Sqn. (Photo: Awais Lali).

3: The J-10C 'Vigorous Dragons' get top billing on Parade Day over all other jets. (Photo: Awais Lali).

4: F-7 Ps of Shooter Sqn fly past the parade venue. (Photo: Awais Lali).

5: The Tigers uphold the integrity of the No 17 Sqn. (Photo: Awais Lali).

6: Black Spiders from the No 27 Sqn wing their way over the Parade ground. (Photo: Awais Lali).

7: Griffins shoot straight on Parade Day. (Photo: Awais Lali).

7

Members in the audience could feel the G force, the thrill and the rush of the fighter jet flight when the Fighting Falcon came in next, banking sharply right in front of the guests at 900 knots, and then pulling up and rolling over. "What a wild ride in one of these magnificent warbirds, the Fighting Falcon," said another audience member. Prepared for some awesome views, audiences nonetheless, held on tight as the F-16 pilot experienced the G forces and a range

Top Left: Sherdils in a death defying manoeuvre. (Photo: Awais Lali).

Left: Sherdils operate under strains of intense gravitational forces. (Photo: Awais Lali).

Top Right: A believable, engaging action film. (Photo: Awais Lali).

Top Right Inlet: The gut-wrenching drops and spins of those ferocious flights. (PAF Archives).

Right: A J-10C Dragon shocking audiences with his prowess and daredevil antics. (Photo: Awais Lali).

Right Page Inlet: Sqn Ldr Sibtain Akhtar from No 14 Sqn flew the solo aerobatic pilot of JF-17 Thunder. (Photo: PAF Archives)

Pilot zig-zags the F-16 across the sky at stomach-churning speeds. (Photo: Awais Lali).

Below Inlet: Pushing the boundaries of physics. (Photo: PAF Archives).

Bottom Left: Pak Navy Z-9C helicopter during the flypast. (Photo: Salman Falcon.pk).

Bottom Right: 'Venomous Cobras' of Pak Army Aviation. (Photo: Salman Falcon. pk).

Inlet: Cockpit view of Wg Cdr Affan Aslam's F-16 over the parade venue.

of manoeuvres. The fighter pilot made everyone dream about how badly they all wanted to fly in a jet fighter and that it was something not yet firmly ticked off from their bucket lists.

The Pakistan Air Force ranks among the best not so much because it is large, but because it is so experienced and well equipped with modern gear. The PAF maintains a high level of readiness for any challenge. Many of its pilots being some of the best trained in the world, is one major reason for their amazing success against seemingly impossible odds. With this array of men and planes, and especially after the induction of the state-of-the-art J-10C fighter aircraft, the PAF will always be well respected for its abilities and its attitude. Against enormous odds, the can-do attitude remains the same in those who serve today.

Top Left: Dare Devil SSG personnel in their signature style.

Top: Right: 'P-3C Orions' of Pak Navy.

Top Center: The dependable and reliable MI-17 of Pak Army.

Bottom Left: Pak Navy Sea King.

Bottom Right: The package of force multipliers on their way to saluting dais.

(All Photos: Salman Falcon.pk).

"It became apparent that the PAF needed a next generation aircraft and needed it fast. The ageing aircraft had to be replaced with a more potent, reliable weapon system which could counter the emerging threats, in case of any future eventuality. Luckily, keeping the challenges in mind, the PAF has taken things into a new direction by acquiring the most suitable platform of present times. Enter the Dragon. The J-10C 'Vigorous Dragon's' unique design reflects the aircraft's mission. The large delta wing area, canards and full fly-by-wire characteristics, all contribute to the J-10C's excellent manoeuvrability particularly at low speeds. Its lethal fire power and weapon-carrying capability will take PAF's operations to ever new heights."

by Air Cdre Muhammad Ali, SI (M) (Retd)
S.Khalil

Title Photo: History in the Making - Six J-10C 'Dragons' on their way to Kamra, Pakistan from Chengdu, China, as they fly over mighty Karakorum range on a beautiful sunny day. (Photo: No 15 Sqn).

Inlet: Armed-to-the-teeth in Air Superiority role, a J-10C Dragon seen in action at Chengdu, China. (Photo: Chinese Military Aviation).

Enter the DRAGON

Beginning of a New Era

Earlier in March, a new shape took to the skies over Pakistan. Six J-10Cs, bearing the tail numbers 101, 102, 103, 104, 105, and 106, entered Pakistan via PURPA (waypoint) on the north-eastern border with China. Precise and lethal equipped with canards, delta wing design, a soaring 4.5 generation omni-role, all-weather-capable jet - PAF's 'Vigorous Dragon' had arrived to safeguard the future of the country for years to come. The scenes were reminiscent of the year 1968, when six French Mirage fighters, tail numbers ranging from 101 to 106 entered Pakistani air space. Leading the formation was Wg Cdr MM Alam.

Sqn Ldr Hakimullah, Sqn Ldr Farooq F Khan, Sqn Ldr Farooq Umar, Flt Lt Arif Manzoor and Flt Lt Akhtar Rao, flew at his wings.

Fast forward to 2022. Leading the formation of Dragons was OC No 15 Sqn, Wg Cdr Imtiaz Rahim Shehzada. Wg Cdr Bilal Raza, Sqn Ldr Jibran Rashid, Sqn Ldr Hasan Anees, Sqn Ldr Zeeshan Muhammad, Sqn Ldr Ali Qasim, flew on the wings of their leader. The formation is on its way to Kamra from Chengdu.

Back at PAF Base Minhas, the air is rife with energy. A sense of excitement and pride runs through all, gathered at the occasion to welcome the Dragons. All eyes glued towards the beginning of the runway just to catch the first glance of Dragons about to appear for landing. Assembled on the tarmac of the base is the senior leadership of PAF under its honourable leader, ACM Zaheer Ahmed Baber Sidhu, the CAS PAF.

Finally, the historic moment had arrived. First Dragon bearing Serial No 101, flown by Wg Cdr Imtiaz Rahim appeared on the scene. The six J-10Cs touched down at PAF Base Minhas at Kamra. Senior air officials observing from the tarmac breathed a sigh of relief and applauded the perfect landings. As the aircraft appeared on the tarmac, a water canon salute was presented to the incoming Dragons, a tradition followed to welcome the arrival of new aircraft at a facility. Before Wg Cdr Imtiaz Rahim could disembark and line-up his crew for presentation, he found Air Chief Marshal Zaheer Ahmed Baber Sidhu, climbing the ladder, to greet him. "Does the plane live up to our expectations?" asked the smiling Air Chief.

"I'll have to admit, it is one of the best fighter jets in the world. All the work we had been doing in China over the months, improving our tactics in the way we operate the platform, I can safely say that the capability that we have brought back with us is truly phenomenal, far better than what we expected, sir," Wg Cdr Imtiaz Rahim responded.

It's a significant investment, but in defence nothing comes cheap. The J-10C is a cutting-edge platform, moving the PAF into a new ball game in terms of operational readiness, in terms of the nature of the platform the PAF was acquiring. When the Second to None team spoke with ground crews and the pilots, it was fair to say that the J-10C was a step in the right direction, something that the PAF had been working towards for a long time. It was just fantastic to see them arrive, having travelled all the way from China. It was a thing of beauty.

Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of Air Staff, Pakistan Air Force maintained that the induction of the Dragons, highlighted the fact that the investments the air force made in capabilities and in capacity was significant. "The fact that we will be flying the J-10C makes

Top: A Dragon seen in action at PAF Minhas. (Photo: CWO Iftikhar Muhammad).

Left: A Dragon pilot lights After-Burner (AB) producing more than 29000 lbs of thrust during the take-off roll. (Photo: CWO Iftikhar Muhammad).

Right: PAF's Pointed Tip of the Spear- PAF's first group of officers which got converted on the Dragons pose with the Dragons. (Photo: Chinese Military Aviation).

a statement that PAF, has significant defence capability and is willing to do its part in the world, and is willing to meet its obligations," the Air Chief said during the arrival ceremony of the jets at PAF Base Minhas, where the enthusiasm was contagious.

Taming the Dragon

To get trained on J-10Cs and later ferry the Dragons from China, a team of professionals including both pilots and ground crew, were short-listed. Wg Cdr Imtiaz Rahim Shahzada, who has flown F-16s and Mirages was given the honour of leading the contingent to China in October 2021. His team boasted skilled F-16, JF-17 and Mirage pilots, familiar with Beyond Visual Range (BVR) and had AI exposure.

Following strict covid protocols, the team travelled in three groups over a span of three weeks. Gp Capt Azkaar from Project Dragon handled logistics, overseeing departure formalities, flight cancellations due to covid, preparing backups for dropouts. Upon landing in China, on 20 October, the crews were quarantined in the city of arrival for 14 days. On the second last day of the quarantine, Wg Cdr Imtiaz Rahim, tested positive. The rest were cleared to depart to Chengdu, where they were quarantined for another two weeks. Wg Cdr Imtiaz Rahim spent, in all, 72 days in quarantine before he could join his teammates who had already started their training.

Training was focused specifically on operating the J-10C. "In Chengdu, we were basically starting to learn how to fly this technologically advanced jet, and then we went through all the different mission sets and basic skills," Wg Cdr Imtiaz Rahim said. Most of the pilot's instructions came on the ground, in the classrooms followed by pilots practicing the aircraft's most unique capabilities in an advance simulator. Language was a major barrier, which the PAF crew overcame with the help of an interpreter.

After classes, PAF pilots used to sit down to reconcile information on their own. No time to enjoy and see China. They were trained directly by the original equipment manufacturers (OEM), and by Chinese counterparts with perhaps a few more flying hours under their belts. Few days of theoretical sessions were followed by quizzes. During training it was crucial that pilots got comfortable executing J-10C's maneuvers. Hence, simulator training started in detail, learning avionics, switchology, feel of controls was extremely realistic, engine handling, response of controls - allowing to recreate emergencies and procedures in the aircraft that really simulate what it would be like to fly in a real J-10C.

Each PAF pilot had to complete prescribed number of sorties in the simulator as minimum syllabus requirement, only then they could be allowed in the new jet. Anything they could

J10-C : Armament

Guns	1× Gryazev-Shipunov GSh-23	
Hardpoints	11 in total (6× under-wing, 2× under-intake and 3× under-fuselage) with a capacity of 5600 kg of external fuel and ordnance	
Rockets	90 mm unguided Rocket Pods	
Missiles	**Air-to-Air Missiles**	**Air-to-Surface Missiles**
	PL-8 PL-10 PL-12 PL-15	KD-88 YJ-91

A Fighting Falcon F-16 from No 9 Sqn 'Griffins' escorted the Dragons as they entered the Paksitani airspace. (Photo: No 9 Sqn).

A Sight to Watch - Six J-10C 'Dragons' during ferry flight from China crossing over the mighty Karakorum range. (Photo: No 15 Sqn).

Arriving Home - A Dragon in foreground enters the tarmac as another one clears the runway in the background. (Photo: CWO Ifikhar Muhammad).

do in an aircraft they could in the simulator – max rate turns, vertical climbs weapon employment techniques etc.

"A lot of people underestimate the amount of work it takes to become a pilot, and a fighter pilot specifically. A one-hour flight, even in a simulator might mean up to several additional hours of briefing, gearing up, flight inspections, and debriefings, not to mention the hours spent studying/preparing for each mission," said Wg Cdr Bilal Raza emphasizing on the importance of training.

Finally, the day arrived when the crew had the opportunity to have the first look at the aircraft. The PAF crew were in awe of the jet when they first set their eyes on the Dragon. First thing they noticed was its huge size, the slightly different shape and Its looks as compared to weapon systems they had already flown. "It was a fantastic feeling and we were in love with the bird on first sight," Wg Cdr Bilal Raza said.

"It's one of the world's most advanced fighter aircraft and we're lucky to be a part of that programme in the PAF, and to be at the leading edge of that is real privilege and real delight," Wg Cdr Bilal Raza added, enthusiastic to feel how it would handle in the air, and wanting to experience its agility and manoeuvrability.

At Chengdu, it was the job of Chinese instructors to teach PAF pilots how to fly the J-10C from scratch. The Chinese were nervous, at first, fearing the guest crew would not be able to hack it. "This wasn't like college where we could get through with minimum passing grades. We had to attain almost 100% to qualify in each and every phase, there were no let ups. We were expected to catch on to material we were taught really quickly, the learning curve had definitely been pretty steep," Wg Cdr Imtiaz Rahim recalled. The instructors worked over time, gave up a week of Chinese New Year holidays to train PAF pilots - no compromises to achieve minimum standards.

J10-C : Bombs

Laser-Guided Bombs	LT-2
Glide Bombs	LS-6, GB3, GB2A, GB3A
Satellite-Guided Bombs	FT-1
Unguided Bombs	250 kg, 500 kg

Others:
Up to 3 external fuel drop-tanks (1× under-fuselage, 2× under-wing) for extended range and loitering time

As the first Dragon Tail No 22-101 entered the tarmac after landing, it was presented by a water cannon salute during the induction ceremony at PAF Minhas. (Photo: CWO Iftikhar).

The First Mission

After all the tedious ground work - learning about aerodynamics, aircraft systems, navigation and instrument flying, it was time to get a feel of the jet. PAF crews spent two days climbing into the cockpit, strapping up and developing equipment familiarization. Each pilot performed ground starts, after start procedures, followed by shut down, slow/medium taxi came later. some of the pilots progressed while the remaining continued on the simulator.

"Finally, we had all the gear on, and after months of preparation, it was time to go flying. Of course, a thorough briefing before flight, and supervisor checks were performed so that everything was in order in order before getting airborne." Wg Cdr Imtiaz Rahim said.

Since the PAF airmen had not flown for a long period and they needed to regain their flying currency. They jumped into K-8s to get used to the Gs, get currency and understand wind patterns and operating areas. Before stepping foot in the J-10C cockpit, student pilots needed to familiarize themselves with the gear needed to operate the J-10C, in their custom-made G suits to fit perfectly. Last but not the least, the pilots learnt to utilize

Top: A group of eleven pilots became the first ever batch to convert on to the Dragons. (Photo: Chinese Military Aviation).

Top Centre: A drone view of the Dragons lined up on tarmac showing off their extended delta wing and canards. (Photo: Chinese Military Aviation).

Bottom: Armed to the Teeth - A Dragon shows off its variety of weapons during Zhuhai Air Show. (Photo: Chinese Military Aviation).

J10-C : Avionics

- Type 1473H pulse-doppler fire control radar
- Externally mounted avionics pods:
  - K/JDC01A targeting pod
  - Type Hongguang-I infra-red search and track pod
  - CM-802AKG targeting pod for KD-88 and YJ-91
  - KG600 electronic countermeasure pod
  - Blue Sky navigation/attack pod

Top Left: Topped-up in Air Defence role, a Dragon shows-off its lethal arsenal during a training sortie at China. (Photo: China Military).

Bottom: Smooth Landings has always been the hallmark of PAF pilots. Shown in the photo is the J-10C making a full-stop landing at PAF Minhas during the Induction ceremony. (Photo: CWO Iftikhar Muhammad).

the most technologically advanced piece of equipment, their helmets. The pilot's Heads-Up Display was directly projected on the visor rather than just at the front of the cockpit. This allowed pilots to easily view key data such as altitude, air speed and direction and even select multiple targets and shoot. "Since the jet helps us so much, flying becomes second nature. That way we can focus on all the information that the plane is giving us," Wg Cdr Imtiaz Rahim elaborated.

"It's amazing to be in a 4.5 generation semi-stealth fighter, kind of tip of the spear. It's a heavily weighted aircraft, in terms of combat power, that the PAF brings to the fight," Sqn Ldr Jibran Rashid said.

One part of history was achieved when Wg Cdr Imtiaz Rahim flew the first solo sortie of the Dragon. "A lot of the challenge was trying to absorb all the information the jet is giving you, operate all the sensors and the systems at the same time and fly, the feeling was enormous," the team leader said. All the PAF pilots enjoyed basic handling, confidence building manoeuvres in advanced handling missions, in clean and tanked configuration both. This was followed by training of air combat tactics and instructor training for some of the PAF aircrew.

Top: A beautiful line up of Dragons on tarmac during the induction ceremony. (CWO Iftikhar Muhammad).

Left Top: First to enter the tarmac was J-10Cs No 101 flown by Wg Cdr Imtiaz Rahim. (Photo: CWO Iftikhar Muhammad).

Left Centre: Air Chief Marshal Zaheer Ahmed Baber Sidhu, CAS PAF meeting the officers of the first batch of J-10C. (Photo: CWO Iftikhar Muhammad).

Left Bottom: Air Chief Marshal Zaheer Ahmed Baber Sidhu, CAS PAF meeting the ground crew of No 15 Sqn. (Photo: CWO Iftikhar Muhammad).

The crews were taken aback after engaging afterburner (AB). The kick was bigger than the F-16. "There was an unbelievable amount of thrust when I opened up the after burner for the first time. The J-10C can produce 29, 000 lb thrust, which is 10,000 lbs excess thrust than the JF-17 produces and as much power as two and a half Mirages put together. A single Mirage produces 14, 000lb thrust," Sqn Ldr Jibran Rashid said. The speed increment was so fast that post take-off procedures had to be executed in rapid succession to remain with the aircraft.

Once in the air, handling the jet was not the most difficult aspect, Wg Cdr Bilal Raza said adding, "It is actually a really easy plane to fly, the aircraft comes with Voice Recognition Capability which makes your life much easy."

Nonetheless, the pilots flew at 26, 000 ft, did general steep turns, building up Gs gradually, performing straight in approach, accessed information through voice commands such as requesting fuel state, hands on throttle and stick (HOTAS) on most actions, instrument approach, close pattern, low go, and deploying drag shoot and making a full stop landing comfortably within 3, 500 to 4, 000 ft on a 7,500 ft runway.

"It was historic and emotional for Pakistanis and Chinese both when we landed safely for the first time. We were presented with bouquets," Wg Cdr Bilal Raza said.

Dragons Ferry

After six months of trials and tribulations, it was time to ferry the first batch of six J-10C Dragons, back home. From here on, life would never be the same. The crew set down to plan the ferry mission in minutest details. They needed answers to all the questions, what selecting diversionary airfields, protocols in case of emergency, what is the enroute weather like etc. Crossing over the Karakorum range was no easy job, it needed perfect and flawless planning which the crew did. Finally, came the ferry day. The aircraft were topped up with required fuel and three external tanks each were fitted to the ferry aircraft. Six Dragons under Wg Cdr Imtiaz Rahim started up and headed for the take-off point. After Burners on, six aircraft started to roll on the Chengdu runway, off to motherland. Getting airborne, the leader looked around to see if the rest of his section were with him. Climbed up to cruise height followed the planned route. "It was a proud day, proud moment for all of us. We knew that we were making history, the feeling was nostalgic. The ferry was eventless, the weather was good. As we entered the Karakorums we were amazed to see the beauty of the landscape. We flew abreast the K-2, towering 28000 feet plus the second highest peak of the world. As soon as the six J-10C jets entered Pakistani air space, an escort F-16 from No 9 Sqn 'Griffins', joined the formation of the Dragons. "Welcome back boys," the pilot of the Fighting Falcon, call sign Griffin-1 said over the radio. Bit of a homecoming for the PAF. As soon as we established radio contact with Pakistani ATC radar we were greeted enthusiastically. "Dragon-1, welcome home," replied the ground controller on radio.

The six new jets, tail numbered from 101 to 106, landed at PAF Base Minhas at Kamra, the material and logistical base of the new No 15 Sqn. The PAF crews had achieved a milestone that very few others could.

Tremendous investment had been made at Kamra, which has been a key base for many years. A fantastic new chapter in the country's military capabilities and history. What it said in many ways is that after the induction of this state-of-the-art, modern and potent weapons system, the PAF is now operating in a much stronger and more efficient manner, thanks to these Dragons.

Bottom: Dragon on Display - Owing to its remarkable features and potent capabilities, the J-10C Dragon would remain in the spotlight in PAF for times to come. (Photo: Hassan Naeem, Channeltek).

Right Page Above: PLAAF (Air Force) Multi-role, 4.5 Gen J-10C Dragon shows off its sleek design as it taxiis back from a night training sortie. (Photo: Chinese Military Aviation).

Left: Chinese WS-10 engine could produce thrust in excess of 29000

lbs during take-off and whenever needed during combat in air. Seen in photo is PLAAF (Air Force) Dragon taking-off from Chengdu, China. (Photo: Chinese Military Aviation).

Left Centre: A PLAAF (Air Force) J-10C Dragon with Rocket pods under wings taxiis back after a dusk sortie at Chengdu. (Photo: China Military).

Left Bottom: A PLAAF (Air Force) J-10C Dragon gets ready for a night sortie at Chengdu, China. (Photo: China Military).

A Day With the DRAGONS

A Salute to Dragon Operators

All Photos Air Cdre Muhammad Ali (Retd) & CWO Iftikhar Muhammad.

"The news of the induction of the latest, Beyond Visual Range (BVR) capable, stealthy, 4.5 generation J-10C 'Vigorous Dragon', into the No 15 Sqn of PAF remained the top trend in mainstream and social media platforms during the month of March this year. As the nation wanted to know more about the new weapon system of the PAF, the team of 'Second to None' decided to visit the Unit and bring out for the readers, the firsthand information from the people at the helm of affairs. Meeting the resolute, professional and highly motivated personnel of the elite No 15 Sqn left no doubt in our minds that the defence of the nation is and will remain in the safe hands of these proud guardians of skies."

by Air Cdre Muhammad Ali, SI(M) (Retd)

Today, No 15 Sqn, is the PAF's new pointy tip of the spear. It is different from other PAF sqns because of the unique aircraft it operates. Its newest acquisition, the J-10C is a powerful platform, the PAF is proud of. It doesn't need to fly treetop level, too low to be detected by enemy radar. To conceal itself, the Dragon relies on stealth technology and has advanced weapon delivery capabilities, with a refueling probe that extends its combat range. J-10C has fully integrated weapons, avionics and EW suite that make it a potent weapon system under the contemporary environment of modern warfare. The jet is configured with top class weapons, the PL15 missile and variety of standoff precision munitions, advanced radar, enabling it to detect, engage, and destroy targets at long range in air-to-air and air-to-surface domains. With multi role capabilities, the J-10C aircraft, will revolutionize PAF's operational thought, ensuring impregnable defence of the nation.

The most distinguished capability the No 15 Sqn has, is the precision and the accuracy of the fire power it

can deliver. And of course, one of its most striking features are the pilots in the squadron. This is what brought the team of 'Second to None' to the 'Home of Cobras' on a fine March morning this year. Majority of pilots and the ground crew of No 15 Sqn that greeted the 'Second to None' team were part to of the first contingent that had gone through of gruelling training of J-10C at Chengdu China.

The Aircraft

As we got settled in the office of the Officer Commanding, No 15 Sqn, it was the time for an informal chat with the men at the helm of affairs. "It's no ordinary combat aircraft. It's a supersonic high-performance super computer with wings," said the squadron's new commander, Wg Cdr Imtiaz Rahim Shahzada. The J-10C is currently the most modern weapon system of the PAF. This omni-role jet can engage targets in the air, land and on sea, armed with air-to-air missiles and various combinations of guided and un-guided bombs/ missiles. Stationed at their headquarters, their jobs are clearly defined. The Cobras can breach time and space far differently than any other air force in the region. They can escalate quickly, telling the enemy, to stop there and then, and quickly de-escalate, which is also equally important.

Wg Cdr Imtiaz Rahim is part of the small group of pilots entrusted to fly the PAF's brand new jets that can be used across all theatres of conflicts. Specialized for the delivery of pin point fire power, the J-10C is capable of things that pilots of the 50s and 60s only dreamed of. Able to withstand nine times the force of gravity and ready to strike anywhere, anytime with precision gives the J-10C a unique edge over its contemporaries. Once airborne, pilots were at the controls of a supercomputer completing thousands of operations per second, all while travelling at speeds faster than sound. The massive engine output was over 29, 000 lbs of thrust. "Kind of like being shot out of a gun, wakes you up, gets your adrenaline going," said Wg Cdr Bilal Raza of No 15 Sqn.

"Open power and it's like the plane goes through a transformer sequence," described Sqn Ldr Jibran Rashid of No 15 Sqn while talking to our team. Airborne maneuverability and visibility were excellent, as well as the payload range, the other fighter pilots of the squadron described. "Voice Recognition System available to pilot in the cockpit is also a huge plus. It helps the pilot talk to the aircraft and get the various information required like fuel state, radio channel change etc," said Wg Cdr Bilal Raza with a smile.

Introduction of low observable technology has changed the way war is waged from the air. Pilots feel they

Above: A young officer of the unit proudly displaying the newly designed patch of the sqn.

Left Above: Wg Cdr Imtiaz Rahim is the first officer commanding of J-10C equipped No 15 Sqn.

Left Centre: 'Home of Cobras'- Entrance of No 15 Sqn HQs that houses a group of young, resolute and professional fighter pilots.

Left Bottom: Cobras Legacy- Aesthetically curated history room takes the visitors down memory lane as they enter the HQ building.

Right: 'Men Who Matter the Most'- A group of ground crew wearing their newly designed outfits inspect a Dragon at the flight lines.

Right Centre: Mechanical Aircraft Tow Device (QW-15) is the new addition to the Cobras flight lines.

Right Bottom: Sqn Ldr Jibran Rashid poses with Dragon at the Cobras flight lines.

Left Page Bottom: If Looks Could Kill- Sleek and futuristic design is the hallmark of J-10C Dragon.

Left: Its All About Team Work- Wg Cdr Imtiaz Rahim along with the team of Engineering officers and ground crew.

Centre: Wg Cdr Imtiaz Rahim poses with young Dragons before proceeding to an operational training mission.

Bottom: Long lasting trust and mutual respect are some of the traits that go a long way between the pilots and ground crew. Seen in photo is a 'crew chief' helping the pilot in boarding the aircraft.

have more space to operate on their own terms - changes that are taking place to make airmen more lethal during battle. "The Dragon is a ghost in the sky, meaning that it's almost invisible to radar, which has been a nemesis to strike aircraft since long. The aircraft is taller compared with the low seated JF-17," Sqn Ldr Jibran Rashid said. The cockpit is not congested and the jet is powered by one of the best, thoroughly tested, WS-10 Chinese engines.

The squadron pilots were proud of the Dragon's survivability in a contested environment. This involves the J-10C avoiding threats using standoff weapons from longer ranges combined with updated tactics. The aircraft can send weapons to different targets with one button push whereas before it took a lot of pilot's workloads. The combination of J-10's tight turn radius and array of PL missiles allows no chance to aggressive enemy fighters.

"If an enemy jet finds itself in close quarters of J-10, its left to choose between two difficult options – out

Top Left: A J-10C shows off its sleek design as it takes off from base.

Centre: What a Sight- A No. 15 Sqn pilot heads towards J-10C for a training mission.

Bottom: Wearing the newly designed coverall and wireless super sound-proof headsets , a Marshaller directs the incoming Dragon to its parking spot.

turn the J-10 and fire weapons before it can or turn tail and run. Problem is if the enemy turns and runs, he's running into PL-15's trap," said a young officer at the sqn.

The first time the PAF pilots flew the J-10C that's when they really started to appreciate what the new weapon system can do for them. The Helmet Mounted Display (HMD), enhanced situational awareness, offering the same overlay in all directions as the Heads-Up Display (HUD), with complete weapon envelope available. "Every detail is displayed on the helmet visor with every turn of the head when looking outside the cockpit. The weapon is looking in the same direction as the pilot – look, lock, shoot," said Sqn Ldr Jibran Rashid.

It all looks graceful and beautiful but what many do not see is all the practice and repetition that goes into making it look that way. Flight operations in a new aircraft are notoriously tough, said Sqn Ldr Bilal Raza, "If you're not focused and prepared you won't last in this business very long." Fighter pilot, the words convey something in the spirit that lies in our squadrons, something young and vigorous, decisive, wanting action at once and finding its expression in the struggle going on every day in air. These young men won't just be watching a movie such as Top Gun or Iron Eagle, they'll be starring in it, in their futuristic jets that would prove to be the frontline PAF jet that would rival the most high-tech fighters of today.

Futuristic Flight Lines

During the visit, the Second to None team witnessed some new protocols being introduced at the flight lines for maintenance and handling of the newly inducted weapon system. On enquiry, we were told that ACM Zaheer Ahmed Baber Sidhu, the CAS PAF has given a new vision of 'Model Flight Line',

in line with the dictates of any modern air force. During the visit we saw the practical manifestation of that vision unfolding in its true letter and spirit. "This vision has brought about a positive cultural change, the way the flight lines would now operate. Based on modern and practical concepts of maintaining/ handling the aircraft, the ground crew would now operate more efficiently," Wg Cdr Imtiaz Rahim, OC No 15 Sqn said. The visuals at the flight lines were impressive. The ground crew that can easily be dubbed as the 'Soldiers of the Weapons' were seen on duty in their new 'Half Sleeve Coveralls'. These resilient men of No 15 Sqn in their smart and practical new gear looked more impressive as compared to their earlier turnouts. When it came to pulling the aircraft out of the pen, we were amazed to see a mechanical towing machine, formally known as 'Aircraft Tow Device' (QW-15) doing that instead of ground crew manually pulling the aircraft. We were glad to know that with the modern weapon system also comes the advanced and sophisticated maintenance protocols.

In the meanwhile, we saw a Dragon taxiing back to flight lines after completing an operational training mission. As the Dragon approached the parking bay, we once again observed something new. A smartly turned out 'Marshaller' wearing super soundproofed wireless headsets marshalled the aircraft while remaining in conversation with the pilot all the time during parking sequence. This was another modern gadget been introduced with the new weapon system that would also be adopted by other PAF sqns in due course of time.

At the flight lines we observed that Operational readiness of the Dragon was given the highest priority. There were various experts for the new aircraft, mechanical and electronic specialists seen in action everywhere. The squadron's technical groups moved into position high-tech electronic devices to keep the modern combat aircraft mission ready at all times. As soon as the pilots brought back their Dragons after routine missions, the ground crew headed by their Engineering officers immediately took the jets into shelters for inspection, performing post flight checks. Coupled with visual inspection, an electronic inspection was also carried out using the smart and sleek looking Laptops connected to aircraft.

"It's an advance weapon system far ahead of the other Chinese systems we use to operate in 70's. It is easy to operate and easy to maintain, really a pleasure to work on this beauty. The 'Wireless Testers' and 'Auto Analysis Software' make our lives very easy to detect, analyze and rectify the faults during post flight inspections," said Sqn Ldr Ejaz Ahmed, the Senior Engineering Officer of No 15 Sqn. He goes on to tell us that F-16s even does not have this capability of auto analyses which gives J-10C a remarkable edge over its contemporaries. In short, we could feel the sense of responsibility, in depth technical understanding and conscientious work, which are basic requirements in any modern maintenance unit, were all seen in their true meaning at the Dragon's flight lines.

Center: Sqn Ldr Adnan getting ready for a mission.

Bottom: A Cobra lands back after a routine operational training mission.

Right: Armed to Teeth - displaying its lethal arsenal of BVR domain, a PLAAF (Air Force) J-10C seen in action at Chengdu, China. (Photo: China Military).

Right Page Bottom: Wg Cdr Imtiaz Rahim leading the first ferry of J-10C aircraft from China.

Cobras Glorious Past

No 15 Sqn also known as the 'Cobras', have a glorious history of service to Pakistan during war and peace. As you enter the main Headquarter building of No 15 Sqn, a feel of pride grasps you right from the start. Aesthetically curated corridors depicting the proud history of the unit takes the visitors deep down the memory lane. As one side of foyer area depicts the portraits of gallant shaheeds, the other displays the battle colour awarded to the sqn during its remarkable services to the nation during wars. It has the unique distinction of first kill on 10 April, 1959, when Flt Lt Muhammad Younis, shot down an IAF Canberra over Rawalpindi, making the Eid day more special for the whole nation. Later the unit was active in the 1965 and 1971 wars achieving three more aerial kills. More recently, the squadron provided the main offensive effort during Operation Swift Retort, on 27 February, 2019 when its Mirages struck the enemy positions using stand-off weapons with pin point accuracy. Another interesting factor which got our attention was the presence of the portrait of ACM Zaheer Ahmed Baber Sidhu in the line-up of Officer Commandings in the honour board of No 15 Sqn. On further enquiry, it was revealed to us that the honourable CAS has commanded the Cobras from Dec 2003 to Jul 2005, a unique honour for the No 15 Sqn, indeed.

Top Inlet: Artist Rehan Siraj tribute to No 15 Sqn. The foreground painting depicts the newly acquired Dragon firing a BVR while the previous weapons systems flypast in the background.

Bottom: A historic photo of ferry flight of J-10C to Pakistan. (Photo: PAF Archives).

Chinese built WS-10 engine generates enormous thrust in excess of 29000 lbs for the Dragon.
(Photo: snapperscrew)

While talking to the team of Second to None towards the end of the visit, Wg Cdr Imtiaz Rahim was very proud about the new induction. He said "No 15 has a unique honour having scored the first kill for Pakistan Air Force. When the time comes, No 15 Sqn, being equipped with this aircraft will be on the forefront in defence of the country. It's a beautiful jet, highly maneuverable, highly powerful, but most of all being a 4.5 Gen jet it is unrivaled and unparalleled in the region. Its induction is a game changing event".

PAF has always been fully motivated and trained to deter any misadventure and aggression regardless of the quantum of the threat. Induction of this weapon system will enhance PAF's capability to deal with contemporary aerial warfare. We are confident that the personnel of No 15 Sqn, will ensure swift induction/ integration of the Dragons into the PAF fleet, upholding Pakistan Air Force's legacy and the PAF will continue to live up to the expectations of the nation.

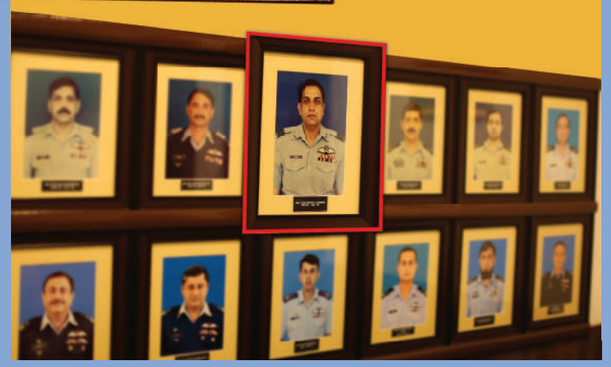
A Venomous cobra welcomes you as you enter the No 15 Sqn HQ building.

Above: Right from the Sci-fi - Specially designed helmets equipped with Helmet Mounted Display (HMD) gives an extra edge to the pilots while taming the Dragons.

Bottom: Comradeship is the hallmark of No 15 Sqn combat aircrew. Sqn pilots pose with their commander, Wg Cdr Imtiaz Rahim.

Cobra's Legacy

Ever since its inception, Cobras have produced men of valour, courage and excellence. Besides the legacy of its glorious Shuhada and Ghazis, the No 15 Sqn is also proud of the very few who have made it to the top, becoming the leader of this prestigious force. Besides ACM Abbass Khattak and ACM Rao Qamar Suleman, the present CAS, ACM Zaheer Ahmed Baber Sidhu is also a proud member of Cobras who commanded this unit from December 2003 to July 2005.



> "What does it take to strip down, overhaul and reassemble, one of the world's most dashing fighter? It takes hundreds of professionals, expertise, precision and intuition, pushing everyone to the limit. At the MRF, the major overhaul of Mirage is performed utilizing specified tools and even cleaning is a specialized job. Once the Mirage is dismantled and de-painted, the teams check the airplane structure for damage right down to the last screw. At the same time engineers perform any repairs needed on the wings, landing gears, flaps and engine. It's not like a Microsoft package off the shelf. It's like an aircraft model kit with different parts made across nine different establishments, all under the umbrella of the MRF."

by Air Cdre Muhammad Ali, SI (M) (Retd)
S. Khalil

KEEP 'EM FLYING

A Tribute to MRF Personnel


The newly-overhauled aircraft is ready to return to duty, as the MRF personnel tow it to the parking bay. (All Pics PAF Archives/MRF).

Dassault Mirage is one of the most famous fighter jets of the air forces around the world - for pursuit, attack and reconnaissance. It can fly at double the speed of sound and is renowned for high levels of reliability and versatility. In PAF, the Mirage has always been considered the backbone for decades. However, every ten years, at the very least, or after 2,000 flying hours, every Mirage has to clear its schedule for an important job - a Grand Visit (GV) or a complete overhaul. It all starts with ferrying the Mirages to the Mirage Rebuilt Factory (MRF), expert at jet maintenance and overhauling. During this time, engineers dismantle the entire fighter jet and specialists check the ejection seat, the skin and perform engine checks. All of this in nine months, at the MRF PAC Kamra, less than an hour drive from Islamabad.

How it All Started

PAF made a contract to induct Mirage aircraft in 1967. The first ferry flight of six aircraft under the leadership of legendary Air Cdre MM Alam (then a Wg Cdr) arrived from France to Pakistan on 8 Mar 1968. While the initial arrangements for F-6 overhauling had started to take shape, the need was also felt to establish a similar facility for the newly inducted Mirages. The overhaul cost of the Mirage aircraft from France was exorbitant and the process was time consuming. In 1975, the first aircraft became due for overhaul in France, at a cost of $1 million per airframe and $0.17 million for each of its engines. With overhaul dates of Mirage fleet approaching fast and the astronomical expenditures associated with overhauls from France, efforts to establish an in-country overhaul facility for the PAF Mirages were initiated in 1974, under 'Project-741'. It was subsequently shaped into the Mirage Rebuild Factory.

Humble Beginnings - DG Aero Project, Air Cdre SH. M. Saeed giving field presentation on 20 Sep, 1976. (Photo: MRF)

Wg Cdr GM Siddiqui, who was appointed as first director, MRF, Kamra, recommended a suitable site, where the F-6 facilities were already under construction. In 1975, under its first Director General, Air Cdre SM Saeed, the establishment became the first factory to start production in 1978, and accomplished complete domestic overhaul of the first Mirage jet in February, 1980. The initiative gave the PAF the added advantage of achieving a nucleus of training manpower for future undertakings. Since then, the MRF never faltered in keeping the PAF's fleet in the best possible shape. In fact, the aircraft and engine overhaul capabilities available at the MRF remained a source of reassurance, which encouraged the PAF to acquire used Mirages from all available sources in the world.

The MRF presently comprises nine wings, one each for the overhaul of aircraft, engine, components and accessories. The factory was also being readied to overhaul the F-16 engines, and to expand its manufacturing facilities to make parts for the airframes and engines of all fighters and trainers in the PAF inventory as well as those of some friendly countries.

The first package of the Australian Mirages, consisting a sizable number of aircraft, components, spares and engines, was acquired in 1990. These planes were overhauled and brought into service, adding two squadrons to the Mirage fleet of the PAF. In 2000, used Mirage IIIs were acquired from Lebanon. They were also overhauled and brought into service, enhancing the strength of the PAF's Mirage fleet. Some of the Libyan Mirage V, inducted in 2004, were made air-worthy and the remaining reduced to spares.

Top Left: Wg Cdr Sarwar Imam, DC Structure Repair Wing, MRF, points inside the fuselage of an aircraft extensively damaged after fire.

Top Right: The complexities of radar wiring inside the nose of the aircraft.

Bottom: The only Original Equipment Manufacturer (OEM) certified facility in the world to rebuild the Mirage.

Nine Months Cycle

After the aircraft has arrived at the MRF from the flying squadron, the first job is to put it in the hanger at an assigned dock. The airplanes are lifted on jacks, similar to ones you have in cars, only much bigger later, a team of engineers and technicians under the leadership of Gp Capt Najamul Hasnain, Chief Engineer at MRF, carries out the initial inspections in minutest of details. "Once we strip down the plane, we kick into the inspection mode," Najamul Hasnain said, while talking to the team of 'Second to None' that visited the facility in January this year. In nine months, the jets have to be ready for take-off and return to its squadron. Different teams work simultaneously on every part of the plane. All of them work in sync, which is why they depend on each other. Its like a well coordinated team work where every member knows its responsibilities and importance of meeting the desired timelines.

On the disassembly line, 12 Mirage jets can be docked, where they were seen in different phases of disassembly and build-up. The Mirage V PA2 from No 8 Sqn, had clocked more than 2, 000 flying hours and it was time for a mega pit stop. At Dock No 2, it had been taken apart and looked quite different than we might imagine. It was on its grandest visit, as the ground crews called it, or GV-III, its third overhaul after 32 years of service. The abbreviation 'GV' stands for a French word 'Grande Visite', that involves major inspection and overhaul of the Mirage aircraft. The entire PAF Mirage fleet has undergone two overhaul cycles of GV-I and GV-II at the MRF.

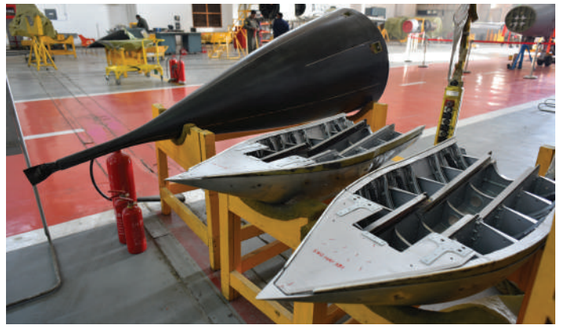
Above: Sqn Ldr Naveed from the No 50 Sqn switches off engine after a successful taxi run.

Top Left: Looks like a brand new aircraft- A freshly overhauled Mirage taxiis back after the first FCF mission.

Left Centre: At MRF, the technicians take their job very seriously.

Bottom: Wings, fins, nose, all come off on the disassembly line.

Director Projects WC GM Siddiqui conducting site survey of MRF on 15 Jan 1975



Need for GVs

The complete Mirage has been the backbone of PAF strike force since long. The nation witnessed it's capabilities, recently, in Feb 2019 during Ops Swift Retort. First of all, I want to acknowledge and pay tribute to the services rendered by our pioneering team of officers, airmen and civilians who, over decades, have worked tirelessly in keeping this weapon system up in the skies," said Air Cdre Saquib Niazi, who is the Managing Director (MD) Mirage Rebuild Factory (MRF).

Air Cdre Saquib Niazi, said that Pakistan was the only country where these versions of the Mirage had been retained in service beyond the lifespan of GV-II. The PAF needed its Mirage fleet to fly for some more time. Being the center of sustenance for the PAF Mirages, the MRF was once again entrusted with the task to find a solution. After carrying out a thorough feasibility study, in consultation with the manufacturer, the MRF devised a new inspection package by the name of GV-III. Later, two Mirage aircraft were subjected to GV-III inspection in January, 2005. As the these Mirages were undergoing GV-III, there was a change in the plan.

"With the expected phase out of the Mirage fleet in the near future, the PAF needed a maintenance package that could keep the Mirage fleet operational. A revised maintenance package named 'Mini GV' was implemented in consultation with the Original Equipment Manufacturer (OEM). It provided almost half the lease of life compared to GV-III," Air Cdre Saquib Niazi said. The senior official explained that pre-empting the inevitable shift in the phase out of the Mirage fleet, the MRF also conducted a detailed study to enhance the fleet's life beyond the year 2020. "A new concept of [illegible] the Delta-GV was introduced, which had been implemented since 2012, after consultation with the OEM," MD MRF elaborated.

Top: Gp Capt Najam explains the carefully regimented process of Mirage overhaul that are aced cleared without even a single anomaly.

Centre: Sqn Ldr Farazuddin Taimoori, Director Quality, MRF, elaborates the complexities of overhauling at the facility.

Bottom: Basking in the January sun, the newly overhauled Mirage is being prepared by the technicians for the first FCF.

1

2

3

4

1. President of Pakistan, Fazal Elahi Chouhdary Inaugurating Mirage Rebuild Factory on 14 May 1978.

2. Role out ceremony of A/C No. 101 on 20 Feb 1980.

3. Roll Out ceremony of UAE air force aircraft on 25 Sep 88.

4. Roll out Ceremony of 67-101 after GV-III on 5 Jan 2005.

Bottom: Huge Responsibility - Managing Director Mirage Rebuild Factory Air Cdre Saquib Niazi elaborates on the evolution of the MRF.

Giving a New Look

Meanwhile back in the hanger, on Dock No 2, the Mirage which we saw earlier was all dismantled. Sqn Ldr Farazuddin Taimoori, Director Quality, MRF and his team had to finish this particular aircraft in the specified time so that it can return to the unit. This also meant a whole lot of time pressure. The team had gotten to work right away.

Back at the cleaning bay, it was almost like a car wash - a little more hardcore than removing squashed insects from the windshield. Mirages are a good 50 years old. Every single scratch has to be repaired. If they find larger damages, they even replace parts. The engine is removed first and later the aircraft de-painted to expose the structure for inspection. The Chief Engineer and his team scanned every inch of the plane with utmost precision. Engine parts were sent to the Component Overhaul Facility, which was established in the early 1980s, as a mandatory requirement for supporting aircraft overhaul. The Components Overhaul Facility has continued to go through the modernization process. The setup has acquired the capability to overhaul and produce more than 10, 000 Mirage components every year. Lately, the JF-17 related testers have also been added to the facility.

Later, the wings of the aircraft are dismantled and sent to the Wing Refurbishing Facility at the MRF. Since PAF operates different variants of the Mirage – Libyan, Australian, Lebanese, single and dual seaters etc, the team faced a huge challenge of keeping the window for maintenance work and overhaul as small as possible. Everyone at MRF knows that they are the sole facility for Mirage overhaul and PAF

leadership has trust in the capabilities of the personnel. With this honour, come the challenges of procurement and thus intensive indigenization by the PAF," said Farazuddin Taimoori.

With the clock ticking, teams had also removed the outer shell and started looking for any damage. This involved undoing thousands of screws. "We are talking about very small parts here, which is why we need all the intuition and experience," said Farazuddin Taimoori.

At the Engine Wing

All materials age. In the Engine Wing, the technicians examine the fighter jet's power source, the ATAR engine.

Mechanics started screening the turbines, compressor and the afterburners, and that was no easy task. Over the period the men at MRF had gained mastery of overhauling the robust ATAR engine of Mirage. Like the airframe of the aircraft, the ATAR engine is also stripped down to individual components. All components undergo a thorough cleaning process to remove the contaminants accumulated during the flights. The cleaning process helps in identifying the defects present on the jet engine parts. The cleaned parts undergo non-destructive inspections to identify the existing defects. Specialized radiographic inspection techniques identify even the minutest cracks in the parts. The radiographic machine is equipped with a robotic arm to position the part for accurate identification of sub surface cracks.

Once all done, the newly overhauled engine is taken to Multi Engine Test Cell.

This facility is capable of test running F-100 and ATAR engines from idle to their maximum thrust in after burner settings.

As our trip down the disassembly and assembly line continued, we saw a few jets getting closer and closer to the final product, so complex than we could comprehend. On Dock 5, the Mirage III-EP came together like a giant puzzle. Ferried to the MRF last year, this aircraft was in the various stages of re-installment – being readied for rollout in specified time. Crews performed system adjustments on the aircraft. Structure, circuit and mechanical integrity checked and operated. "We can simulate the aircraft flying at 40, 000 at 700 knots," said the Squadron Leader. "This is the point where minus the engine, the plane is 100 percent ready." Another job ticked for the mega pit stop, but it was not the last.

Top: Wings moved into position for repair in the Wing Refurbishing Facility.

Left: Long arm of robot at MRF positions aircraft parts for inspections.

Bottom: A huge puzzle made up of thousands of pieces, checked for safety and repaired or replaced at the various docks, all under one roof.

Right Page Above: The aircraft in illustration, comes in for repairs when four out of its ten frames were extensively damaged after catching fire.

In the Wing Refurbishing Facility, Wg Cdr Sarwar Imam of Structure Repair Wing, MRF, and his team checked deformities in the extensions. Sometimes it could take a year to repair a wing, and was more cumbersome than fixing the fuselage. In this hangar, the crews carried out refurbishment of wings as well as the fuselage. "At the moment we are repairing the fuselage of an aircraft extensively damaged after fire. Four out of its ten frames were damaged that seemed irreparable. But we are going to make it work. This jet will be ready in a short time. Damages to the jets could be

> "MRF carried out the modification of Air to Air refueling capability of PAF's Mirage fleet indigenously.

MRF Quality Certifications

Mirage III / V overhauling certified by Dassault Aviation
Leonardo certification for Depot level maintenance of all Military variants of Agusta Westland AW-139 helicopter
Mirage Pressure Refuelling (MPR) air to air refuelling modification facility certified by Aerosud
Martin Baker certified facility for overhaul of MK-4 and OM-6 Ejection Seat for Mirage (III/V) Aircraft
Oxygen system overhauling facility recognized by Zodiac Aerospace
Hose Manufacturing Facility certified by Hydropneu Technologics
AS 9100 Rev "D"
NADCAP (National Aerospace Defence Contractor) and Pakistan National Accreditation Council accreditations for NDT and Shot Peening facilities
ISO 17025 Accreditation for Calibration Setup
SNECMA Certification for ATAR Engine Repair and Overhaul
T56 AMOF (Authorized Military Overhaul Facility) by Rolls Royce
J69 AMOF by Aero-Turbine USA
TFE-731 Engine Overhaul Certification from M/s Honeywell, USA through ITP Spain

caused by bird strikes, heavy landing, barrier engagement, and belly landing etc. "But damages caused by fires are to be rectified with precision," Wg Cdr Sarwar Imam said.

Over the years the MRF had made 22 extensively damaged Mirages fully functional. They did not seem they could ever fly again, the Wg Cdr said. He also gave the example of the damaged SAAB aircraft, which had been declared beyond repair by the original equipment manufacturer (OEM) back in 2017-18. "But it was repaired by the Refurbishment Facility, which also carries out indigenous production of parts. The aircraft is back in the squadron and is fully operational now," he said.

When, Wg Cdr Sarwar Imam and his team finished the wings, they pass it on to the next team. It really is just a big systematic process, with every single individual along the way adding their touch before passing it along to the next person along the line.

Honouring the Veterans

Meanwhile, once the engine had been installed, the aircraft has to undergo two taxi tests, before it was released for flying. The plane was also subjected to two Functional Check Flights (FCFs), in which the aircraft was pushed to the limits. This was followed by fuel checks for consumption during the flight. Mach runs were conducted at different altitudes, in which various systems were

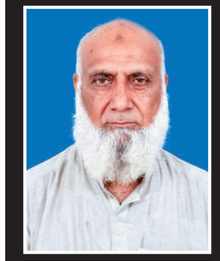
Top Left: The turbine has been checked, repaired and signed off.

Top Right: A thorough cleaning of the engine is well under progress.

Bottom Inlets: De-painting, re-painting and cleaning being carried out by the resilient MRF men.

Production Wings, MRF	
1.	Production Planning
2.	Aircraft Production
3.	Aircraft Component Overhaul
4.	Aircraft Structure Repair
5.	Engine Production
6.	Engine Accessories Overhaul
7.	Engine Repair & Fabrication
8.	Quality Control & Quality Assurance
9.	Logistic Support

Veterans Honoured



PAF Never forgets its Veterans- Hon Flt Lt Saad uddin (Retd) and Asstt Warrant Officer Karim Bahadur (Retd) have given their entire life for keeping these birds up there for more than five decades. Both of them have seen the Mirages come and go from this facility and have been the pivotal players in all the GVs. As a recognition to their long and meritorious services, MRF has recently named a 'Olive Garden' after them and has also erected a monument in their honour.

initiated to check their serviceability.

Then comes the Re-assembly phase. When the aircraft has gone through all the re-assembly phases, its time to take a ride. Outside, under the pleasant afternoon winter sun, Dock Chief, Asstt Wrt Off (AWO) Karim Bahadur, worked alongside a young team on the landing gear of a Mirage that was scheduled for a FCF mission. Recruited in December 1981, and after serving at Rafiqui, Karim Bahadur, came to MRF on March 2, 1985, where he specialized on the landing system. After retiring in 1999, as Dock Chief, PAF retained his services, given his expertise, especially to assist younger ground crews wherever they needed guidance, inspiration, and achieving precision. Karim Bahadur, is one of the oldest indispensable crew members that the PAF refused to let go of. There is an orchard of olive trees named after retired AWO Karim Bahadur, for serving the Mirage legacy for four decades, just like there is one dedicated for retired Honry Flt Lt Saaduddin, for 50 years of outstanding service. It is obvious that PAF never forgets its veterans and always honours them in a most befitting manner.

Top: A Mirage comes apart for inspection- Nine months of work, hundreds of technicians involved.

Bottom: The panaflex in the background says it all.

What's rocket science to us is mammoth and complex work carried out at the MRF.

Karim Bahadur, helped the PAF rebuild a Mirage, obtained from Australia, which was reduced to spares. "Imagine that it was just the fuselage, without the wings and fins. We collected its parts, put them all together and recovered this aircraft for the PAF. Karim Bahadur recalled he dedicated his career to rebuilding the Mirage. "The Mirage is my life," he added.

Back to where it Belongs

Right next to the aircraft at the tarmac, stood proudly, Sqn Ldr Naveed from No 50 Sqn, who had just returned after performing a second taxi test and parked his jet, right in time for the Second to None team, to learn how well the engineers had done the job. Pilots are used to the aircraft responding immediately and maintenance errors are out of the question, that's why specialists were testing the plane one last time. Climbing down from the cockpit, Sqn Ldr Naveed, performed a post flight inspection, checking for leaks, missing screws, engine condition. With a flashlight in his hands, he inspected the main hydraulic lines in the landing gear for leaks and checked for scratches" has been completely overhauled and we need to ensure there are no leakages in the hydraulic lines. There are so many people thinking, designing and producing, so when we jump into the air, we feel confident as we have full faith in our ground crew," said Sqn Ldr Naveed, who also agreed to give a joyride once the plane was ready and of course after permission from the top bosses. Major milestones cost the men hard work, concentration and sweat. It was a job very close to their hearts. If they made a mistake, it could cost someone's life. Can't afford to lose a friend or a colleague.

MRF - Achivements

Year	Vital Milestones
1974	Govt approval for establishment of MRF
1978	MRF established 1st Mirage S.N. 67-101 arrives for Overhaul
1979	Engine Bay established for ATAR 09C
1980	1st Mirage S.N. 67-101 rolls out
1988	MRF acquires100% overhaul capability of ATAR 09C 02 Mirage of UAE Airforce roll out
1990	Establishment of Fuselage Structural Repair Facility
1995	Establishment of Mirage Wing Refurbishing Facility
1997	ISO 9002 Quality Certification
2000	Initiation of Rose Upgrade
2005	3rd Overhaul (GV-III) for Mirage
2010	Mirage Air-to-Air Refueling Modification initiated
2018	4th Overhaul (GV-IV) of Mirage
2020	Air-to-Air Refueling Modification on 28 Mirages completed

- Till Date 353 Mirage A/C have been overhauled at MRF (08 A/C of UAE Airforce are also overhauled by MRF)
- Till Date 2610 ATAR09C Engines have been overhauled by MRF

MRF - A Versatile Facility

Today, the Mirage Rebuild Factory, is a dynamic setup that undertakes a variety of aircraft and engine overhauls. MRF is also responsible for structure repair of western platforms besides the other weapon systems of PAF. This also includes damage analysis and formulation of repair schemes. These capabilities were instrumental in the recovery of Saab aircraft.

MRF has pioneered aviation coatings for airborne platforms of PAF and its upgraded facility meets European aviation standards. MRF also upgraded PAF's vintage aeroplanes with modern avionics suite along with weapon integration. Air to air refueling capability in Mirage aircraft was undertaken by acquiring state of art technologies by MRF. The facility is pursuing establishment of a repair facility for 4th generation helicopters. In this regard, PAC would become an approved supplier for Leonardo helicopter division and creation of a recognized maintenance center would serve as a regional hub for all types of scheduled inspections and depot level repairs. This includes overhauling of engines of Mirage, F-16, C-130, Karakoram-8 and T-37 aircraft. Mirage is an engineering masterpiece, precisely tooled against impossible odds, a real delight to fly, however, the nine-month process is complex and full of challenges. "It's something which keeps you on the edge, always concentrated, a job that makes us feel proud," said Air Cdre Saquib Niazi, MD MRF. "That's all their hard work. Makes you proud to know that you've done a good job," he added.

Nevertheless, the men can't put their feet up yet. Further down the assembly line the wings and tail were being added to another jet. Finally, it looked like an aircraft. Means of take-off were added to another. This model was complete, and ready to be put to the ultimate tests. It's butterflies when the plane takes off for everyone involved. For the Chief Engineer and Director Quality, their next project was already waiting in the wings. These crew members were the unsung heroes of the PAF, for building the Mirage for the most demanding of tasks, and transforming it into the guardian of safety under which millions of Pakistanis slept in peace.

Top Inlets: MRF's engine overhaul facility.

Overhauling engines of not only Mirage but also American weapon systems.

Left Page Top: During the re-installation phase all teams have to be in sync or risk missing the deadline.

Left Page Inlets: A team re-installs landing gear.

Rare opportunity to explore deep inside its hidden features, the cockpit.

No 11 Sqn F-16 with Indian flag painted on it nose remained the star of the show. These markings indicated that the same aircraft shot down an IAF Su-30 during Ops Swift Retort in 2019.

A lone F-16 of No 11 Sqn sits on the tarmac with black clouds loitering in background.

(All Photos Vincent Marten unless Specified).

"Over the years, Anatolian Eagle International Exercise has gained enormous attention from air forces around the world and this year's exercise was not different. We are fortunate that our foreign correspondent has covered the exercise in all its details for our worthy readers."

by Vincent Marten

ANATOLIAN EAGLE 2022

ARROWS OVER KONYA

International exercises are held between host countries and allies to boost learning, share information and improve using accurate simulations of real-world military operations. Turkey's Anatolian Eagle is all about increasing the operational skill level of the participating pilots and defence personnel using realistic, wartime scenarios. Ever since 2001, the year that the TuAF conducted its first Anatolian Eagle exercise, many foreign air forces have participated in the exercises held at Konya Air Base. The latest iteration of this ambitious military air operation was held once again at Konya, lasting from 20 June to 1 July 2022.

The Turkish Air Force organizes an impressive number of four Anatolian Eagle exercises throughout the year. Two Anatolian Eagle exercises are exclusively for the local Turkish Air Force squadrons. The 'Anatolian Phoenix' exercise is a Search and Rescue exercise with a relatively small contingent of fighters, but the stars of the show are the participating helicopters. The International Anatolian Eagle exercise, over the years, has become a vital experience for the TuAF pilots and personal. Fifteen foreign air forces have been invited through the years and most of those forces return to the auspicious event frequently. A total of 46 Anatolian Eagle trainings have been organized, with 37,329 military personnel invited, a whopping 3055 aircraft has participated in the event, with 25,173 sorties flown over the years. This year the participating countries included Pakistan, Azerbaijan, Jordan, and the United Kingdom. A substantial number of observers also join the exercise every year. This year the observers flew in from Macedonia, Malaysia, South Africa, Bulgaria and Oman.

An Arrow from No 11 Sqn of PAF lifts off for an area fam mission on the first day of the exercise. (Photo: Paul van den Hurk).

The deployment of the fighter aircraft and cargo to Konya was initiated on 13 June and was completed on 15 June. The Pakistan F-16s from No 11 Squadron landed at Konya on the 16 June. One of the aircraft, the F-16B MLU 606, proudly donned a kill-marking in the form of a little Indian flag. This aircraft had the honour of flying during "Operation Swift Retort" and destroying an Indian SU-30MKI. Besides this victory marking, all the participating F-16s had their markings on the nose, which stated 'TopGunX4'. Top Gun is an annual squadron-level war exercise conducted by the Pakistan Air Force. No 11 Sqn 'Arrows' have won this competition four times in a row. Support for the Fighting Falcon deployment was undertaken by an IL-78 from No 10 Sqn 'Bulls' and one C-130 E from No 6 Sqn. The Azerbaijan Air Force was supposed to be participating with two Mig-29's and two SU-25's, but owing to operational circumstances, the Migs were cancelled. The support for this deployment was undertaken by the Turkish Air Force. The Royal Air Force participated only in the second week of the exercise. Four Typhoon aircraft from No 3 Sqn were forward deployed to Konya, while the remaining squadron is in Romania because of the Ukraine / Russia conflict. Another nation that sends aircraft to Anatolian Eagle regularly is Jordan. Three F-16s, one F-16AM and two F-16BM, coming from No 1 Sqn were parked at the far end of the Anatolian Eagle ramp. The long-awaited debut for the Anatolian Eagle exercise started with the participation of the Bayraktar Akinci. This Turkish-built and designed High Altitude Long Endurance (HALE) Unmanned Combat Aerial Vehicle is manufactured by the Turkish company Baykar. It was flying continuously at 15000 feet for at least 4.5 hours during one of the exercise days, an impressive flight under any circumstances.

For the first time in the history of the Anatolian Eagle exercise, the NATO surveillance and control unit DARS, Deployable Air Control Centre, was deployed to support the Turkish Air Force. DARS is linked to the Turkish control network and provided control of fighter operations, which was part of the exercise Ramstein Dust-II/2022.

On 16 June, some Mass Briefings were organized and followed by a welcome party. The day after, Familiarization or FAM flights took place. The week after, the real flying began with a morning wave (Eagle 1), followed by an afternoon wave (Eagle 2). During the first week of the exercise, the participants do not fly any CAMAO's (Combined Military Air Operations). On 22 and 23 June, as the Eagle 1 morning mission, the participants flew ASFAO's (Anti Surface Force Air Operations). The Turkish Navy also took part in the exercise, with two frigates connected to the ASFAO mission. On Friday, the end of the first week, the exercise ended with only a morning mission. During the second week of the exercise, the scope expanded and the Blue Forces flew Combined Air Operations (CAMAO) against the opposing Red Force.

Above: A Jordanian C-130 arriving at Konya for deploying the Jordanian contingent for the exercise.

Below: PAF's technical ground crew remained the backbone, ensuring safe and efficient operations during the exercise.

Above: Azerbaijan Air Force has sent their Su-25s to participate in the exercise.

Below: Jordanian Air Force F-16 getting ready for the exercise sortie.

The Red Force had to protect tactical and strategic targets, positioned in a 'Red Land', which had to be eliminated by the Blue Force. These were protected by GBAD (Ground Based Air Defence) systems like Surface to Air Missile Sites (SAM). The Red Forces used their fighter aircraft to simulate aggressor tactics. Through the exercise, the threat level was gradually increased to give the participants a more realistic training. The White Headquarters, which is the brain of the Anatolian Eagle, is where the training missions are planned and studies are carried out. The Command Control Centre (CCC) is monitoring and observing all missions in real time. They have the location, position, and flight information of all participating aircraft which are communicating with a Real Time Monitoring ACMI (Air Combat Manoeuvring Instrumentation).

The exercise airspace area was 180 NM by 215 NM. Aircraft can use this airspace up until 50,000 feet. For Maritime Operations, they reserved 140 NM by 75 NM airspace.

1: Royal Air Force participated in the exercise with their four Typhoons from No 3 Sqn.

2: Air Marshal Waqas Sulehri, Principal Staff Officer of PAF witnessing operations along with other senior officials during the exercise.

3: Arrows return from an exercise training sortie.

4: IL-78 deployed the PAF contingent all the way from Pakistan to participate in the exercise.

5: Turkish Air Force F-4E Phantoms with their colourful livery remained the centre of attraction especially for the aviation photographers.

In the second week, a DV Day is organized which gives high-ranked military personnel from several countries a chance to take a closer look at the exercise. During this day, the Turkish Air Force thrilled attendees with a demonstration of the world-famous 'Solo Turk' F-16. The last day of the exercise, 1 July, a Mass Brief was organized, followed by the re-deployments of the participating aircraft and personnel.

The Anatolian Eagle is a training centre that provides aviation joint training to Turkish and allied armed forces personnel with the most realistic live-simulation of the operational environment. A laboratory in which needs are determined and solutions are developed to solve continuously-updated scenarios and missions with modern technology. The Anatolian Eagle has been and will continue to be a very productive military exercise for the years to come.

6: An Arrow rests on the Konya tarmac after an exercise sortie.

7: A pilot of Azerbaijan Air Force getting down from his SU-25 after an exercise mission.

8: A Typhoon from No 3 Sqn of RAF taxiis for the mission.

9: TuAF ground crew secure their F-16s after an exercise mission. Jordanian F-16s seen in the background of a beautiful line-up of participating aircraft at the tarmac.

ANATOLIAN EAGLE 2022

Through The Lens

of Cees-Jan van der Ende & Tieme Festner

Marching on the Tunes of Glory

BATTLE OF THE BRASS BANDS

Top: The Army's Bagpipe Band is a highly-trained and talented group, who has mesmerized the audiences with their signature tunes all over the world.

Centre: Well - deserved - Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of Air Staff, Pakistan Air Force hands over the highly sought-after CAS Best Band Trophy to No 1 Band Unit, PAF Base Nur Khan.

Below: A perfect sum of its parts - A marching band is only as good as the skill possessed by its individual members, which means every single participant must give his best.

(All Photos: PAF Archives unless specified).

"Everybody believed that they had seen it all. For the last few days, participating bands from the three sister services had amazed the audience relentlessly. It was a musical gala that stunned the audience for days. Buglers, Trumpeters, Drummers in their specially crafted outfits played military tunes in synchronization. Every performance was better than the last, all vying for the honour of winning PAF inter-band competition 2022."

by Muhammad Khan

As the men in their traditional and unique military outfits, carrying the armoury of glittering Trumpets, Cornets, Trombones, Saxophones, Mellophones and Sousaphones entered the arena, one thing was for sure; the next three days would be full of entertainment and amusement for the audience. Everybody was seated and hush prevailed over the crowd. Then, it started. The audience waited with baited breath as one unit after another marched in. A perfectly-synchronized performance given by the seven different band units from the three sister services. A glorious barrage of melodies erupted from the performance comprising 300 experienced band members. The brethren from the three forces played flawlessly, not missing a single beat. The attendees were in awe, exhilarated for the entirety of the 14-minute performance that was signaled the commencement of Inter-Band Competition held at AHQ Islamabad. It was an experience that would stay with the audience for the rest of their lives, a perfect example of how capable and skilled the band units of PAF really are.

Inter-Band Competition 2022

This year's Inter-Band Competition was unique and was a mega event. The three-day annual 'Musical Fiesta' was part of the Diamond Jubilee celebrations of Pakistan as the nation celebrated 75 years of independence this year. The band units knew that securing the trophy would mean glory for all the band members for years to come. The event was attended by the four band units of PAF, three band units from the Army and a half unit from the Navy. The competition was held amongst the PAF band units only, the army and navy band units were participating as the guests showing the goodwill for the event.

The competition was judged by seasoned veterans from the tri-services, one from each force. The judges judged the bands in terms of their general discipline, dress and instruments inspection, performance while marching in columns and drawing different patterns. The event was also attended by student bands of Saleem Nawaz Fazaia College, PAF Base Masroor and Fazaia Inter College, PAF Base Minhas, who performed whole-heartedly with their senior counterparts. This year, the competition had a special treat for the attendees and viewers. This was the combined performance given by all the band units present, as described at the start. The exercise was made all the more impressive by the fact that the band units only had three days to practice and master it.

> "This year's winner was the No 1 Band Unit of PAF from PAF Base Nur Khan.

Top: PAF Band members playing melodious tunes for the audience.

Top: The conductor of a band is akin to a flagbearer, leading from the front and keeping it all together.

Left: Giving it their all - One of the participating PAF Bands marches out to give an enchanting performance.

Bottom: The Grand Performance - The audience had the privilege to witness the three forces come together to give a breathtaking display.

The performance received huge applause from the audience.

Three days mega event witnessed some remarkable performances by the participating band units. On one hand the breath-taking performance on the famous tune of 'Mujahido' by No 1 band unit of PAF mesmerized the audience so on other, 'Allah o Akbar' by No 2 PAF Band unit equally captivated the audience. It was a tie breaker till the very end. Smartly turned out in their traditional chequered dresses, the bagpipers from Pak Army also made a impression at the closing ceremony.

The best was kept for the finale of the event. While playing tunes of national and folk songs, all Band Units drew collectively the digit "75" surrounded by Crescent. The performance received huge applause from the audience.

Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force was the Chief Guest at the closing ceremony of the event. The Chief Guest awarded trophies and prizes to Winner Band, Best Band Master and Best individual performers. No 1 Band Unit, Nur Khan won the Inter-Band competition for the year 2022-23. The entire

Centre: Not to be left behind-Cadets from the Saleem Nawaz Fazaia College, PAF Base Masroor exhibit their marching finesse during a well-practised display.

Bottom Left: Young cubs from Fazaia Inter College, PAF Base Minhas impressed the audience with their high-spirited display.

Bottom Right: The snare and bass drums are the irreplaceable heart and soul of a marching band.

ceremony was enhanced drastically when at the end, CAS, PAF announced 1 million cash for each band unit of PAF, in addition to cash prizes they had already won. It was a befitting end to the event. The Chief Guest also appreciated performance and artistic pursuits of all the participants.

History of Brass Bands

A military band is a highly-trained group of military personnel that is charged with providing musical performances for military and official events. Although, hierarchies differ from nation to nation, the leader of the band is termed the Bandmaster or Director of Music. The line-up of the tracks played by the band usually have a patriotic or nationalistic tilt, with national anthems and national songs being the favourites. Military bands are of two types; Stationary bands and Marching bands. As is obvious, marching bands have to practice even harder to be able perform while executing all sorts of enthralling manoeuvres. Another historical classification of military bands is made on the basis of instruments. The first is field music, which includes bugles/horns, bagpipes, fifes and drums. This formation was used when the most important function was to control troops and entertainment. The second type came into being with the invention and widespread use of the keyed trumpet or the saxhorn family of brass instruments. The third classification is the mounted band, which used to accompany cavalry and, at times, artillery formations.

Marching for Pakistan

When the freedom fighters were finally able to wrest control from the colonizers and Pakistan was born, it inherited

Top: One of the skills that makes marching bands so impressive is their ability to undertake their highly-specialized movements and formations, while not missing a beat on their instruments.

Above: Bands from tri-services played various military tunes in perfect harmony.

Centre: Windpipes of Brass - It requires enormous stamina to play these difficult brass instruments while marching.

Bottom: The men of the hour-The Bandmasters of the participating bands stand proud after the competition.

brass and chamber orchestra musical equipment. Using these instruments, the RPAF band was formed on 1 February 1948 in Drigh Road, Karachi.

On 16 November, 1948, Training Flight was established within the RPAF Central Band. The first batch of inductees was trained by musicians from the band musicians of the Royal Army. After a decade, in 1959, the band was given the title PAF Central Band. The first separate Music Training Flight (MTF) was erected in Karachi in 1965. In 1973, the band was officially given its due and converted into a unit and moved to PAF Base, Kohat. After 7 years, in 1980, the unit was relocated to PAF Base Chaklala. Another development was the changing of the title of MTF to Musical Section. The entire unit was reassigned to Pre-trade Training School in Kohat. The name of Music Section was once again changed, gaining the title of School of Music.

Induction and Training

Induction into PAF band stream is through a proper procedure. The only real requirement is a passion for music and a dedication to the motherland. Once the recruits are short-listed, they are sent to Kohat and begin their training in Pre-trade Training School. Later, the trainees are sent to School of Music, a speciality military educational institution formed to train recruits in the field of martial music.

After the foundation has been laid, the trainees are issued their musical instruments. These instruments are to be maintained and honoured by the trainees for the larger part of his careers. An issued instrument will be part of trainee's life until he ascends to the level of a Band Master. Once the recruits pass out from the initial course, they are designated to band unit.

PAF now has four distinguished band units. These units are stationed in Risalpur, Nur Khan, Kohat and Korangi Creek. Each of the bands

Top: Army band unit playing their signature tunes under instructions from their bandmaster.

Centre: A Class of Their Own - The PAF Bandmasters need no uniform to be identified, their intense focus and steely gaze can be recognized in a heartbeat.

Bottom: Drummers from Pak Army unit were all in perfect sync while performing for the audience.

have their own area of expertise and are assigned duties based on area and nature of assignment. The band which resides in Korangi Creek covers ceremonies held in South Pakistan. The band posted in Risalpur usually spends its tenure in Risalpur performing on the graduation parade ceremonies. The band at Kohat Base usually performs in ceremonies located in Northern and Central Pakistan. The band in Nur Khan Base is reserved for VVIP and similarly exclusive duties, which includes the tri-services guard of honour and tri-services contingent performances. The band is usually dispatched in 2 configurations; full band (40 members) and half band (20-22 members).

PAF Band operates directly under the Admin Branch's department Directorate of Protocol and Ceremonial. The Directorate of Protocol and Ceremonial is the authority which manages the overall careers of the bands while administrative and day-to-day support is provided by the base they are stationed at.

PAF Band Events

PAF Bands are an integral part of all prestigious ceremonies in PAF. They pay tribute in all their fervour whenever a Guard of Honour is presented to the CAS and visiting dignitaries at the AHQ. Their bugles also cry in proud lament at the funerals of their distinguished brethren. The Defence Day dinner is another auspicious event where their presence is cherished by all the veterans and retired officers. Another major event for the band units is 23 March. However, the event closest to the heart of the band members is unquestionably the PAF inter-band completion. PAF Band from PAF Academy Asghar Khan also perform during the guard mounting ceremony held at Mazar-e-Quaid on 6th September every year in which a contingent of cadets from the academy take over duties as the guards at the mausoleum.

However, the most important event for the PAF bands would remain the Inter-Band Competition. The event was initiated in 2008 and the first competition was a huge success, cherished by band members and the attendees alike. Then, the event could not be curated for the next decade, for various reasons. In 2018, the tradition was once again rejuvenated by the then CAS in all its splendour. It was again held in 2019, under the patronage of Air Chief Marshal Mujahid Anwar Khan. It was all set to become a proud annual tradition. However, like everything else around the globe, the plan was interrupted by the Covid-19 pandemic. Fortunately, after the involuntary break, the event was revived immediately owing to the keen interest of Air Chief Marshal Zaheer Ahmed Baber Sidhu.

Price Winners

NO 1 Band Unit, PAF Base Nur Khan

Best Band Master: Assistant Warrant Officer Javed Nawaz (No 1 Band Unit)

Best Musician: Corporal Technician Vikram Kumar (No 3 Band Unit)

PAF Band Units have performed in several different nations and impressed thousands of spectators around the globe. The nations that have hosted PAF Band Units include Brunei, Germany, Malaysia, Libya, Turkey, Russia and China. The band gathered immense praise when it took part in the Spasskeya Tower Festival in 2015. Also known as the Military Music Festival (IMMF), the event is held in Moscow annually. The event features performances from the best military bands in the world. The PAF band unit was a part of the tri-services military band that captivated the hard-to-impress audience and earned a good name for the country.

Top: ACM Zaheer Ahmed Baber Sidhu, CAS, PAF pose with senior management of the event and participating bandmasters at the conclusion of the ceremony.

Left: Harder than it looks - It requires years of training to gain the ability to execute manoeuvres perfect to the last beat.

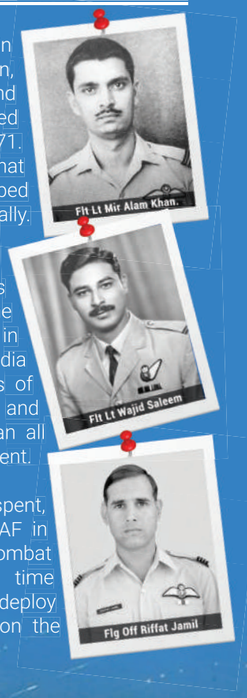
Bottom: The Grand Finale- All Band units of PAF synergized their efforts to present a memorable performance.

MISSION JAISALMER

A Saga of Courage, Grit and Resilience

"Daring aircrew of PAF's Air Transport Wing flew some unbelievable misions during both wars with the enemy. From carrying out low-level bombing raids in their improvised 'B-130' bombers to paradropping special forces across the border, these missions are part of PAF's glorious history. Narrated by the veteran himself, this is a story of one such mission of 1971 war which would definitely leave our readers spellbound."

by Air Cdre Wajid Saleem, SJ (Retd).



Mukti Bahini insurrection in erstwhile East Pakistan, fully abetted and supported by India, had reached its peak by the last quarter of 1971. Our armed forces deployed in that theatre were severely handicapped logistically as well as numerically. Despite all odds, they were holding the fort most valiantly and chivalrously. Since it was a well ingrained concept of the military, that defence of East lay in the West, an all-out war with India was all but inescapable. Clouds of war were gathering ominously and threateningly, and outbreak of an all out conflict with India was imminent.

Month of November 71 was spent, by the transport elements of PAF in providing logistic supports to combat units deploying to their war time locations. All the C130s were to deploy to the dispersal airfields as soon the hostilities broke out.

Tonnes of bombs drop on airfield as panicked IAF personnel run for their lives during C-130's historic attack on Jaisalmer. (Painting: Gp Capt Hussaini (Retd)).

A group photo of PAF transport command at PAF Base Chaklala. Sqn Ldr Wajid Saleem sitting 5th from left. (Photo: Air Cdre Wajid Saleem (Retd)).

Lists of both air and ground crews to deploy to various planned dispersal airfield had been drawn, essential aircraft spared were readied, so that no sooner ordered dispersal could go ahead swiftly and without any hiccups.

The day finally arrived, and C 130 aircraft dispersal was ordered on 3 Dec, 1971. The previously drawn-out composition of the crew sets couldn't be maintained due to various administrative and operational costraints. So, reallocation of the crews had to be resorted too.

I drew the lot with Flt Lt Mir Alam as Captain, Flg Off Riffat Jamil the co pilot myself the Navigator, plus two SNCOs as Flight Engineer and Loadmaster. And off course a complement of technicians. Orders were to deploy to Mianwali and then await further orders. Off we went and landed at Mianwali just a little before dusk.

So far, we had no inkling that war had broken out. But as we landed, we noticed four B57s, fully armed with pylon hung munitions, waiting for take-off. This was indication enough that we had jumped into the fray. Base Operations had no orders for us and we bundled off temporary quarters in Canal Rest House. Next morning, two of us the Captain and Navigator, got urgently summoned by Base Operations. We had barely arrived at the base when a light aircraft brought in our Squadron Commander Wg Cdr Yunus and Navigation Leader Sqn Ldr Rizwan Chaudhry. Quickly we went into a huddle. Our task for that night was handed over without much ceremony: Attack Jaisalmer runway at low level. Time on target 03:20: Load 25000 pounds comprising 500-pound bombs with delay fuses minimum being 30 seconds. The meeting was over before it had even started and we were left on our own to plan and carry out the task assigned. It appeared daunting and dangerous. After a few minutes, anxiety gave way to business. In hindsight, a mission that sounded like suicide, turned out to be a lottery, which only a few lucky ones win.

> "I drew the lot with FLt Mir Alam as Captain, Flg Off Riffat Jamil the Co Pilot, myself the Navigator, plus two SNCOs as Flight Engineer and Loadmaster. Orders were to deploy to Mianwali. Off we went and landed at Mianwali just a little before dusk.

To supplement counter air offensive effort, PAF had decided to commit C130 in the Heavy Bomber Role. Indian Air Force Base Jaisalmer in Rajesthan Sector, directly impacted on Pak army operations in the area, and was hence chosen as the first target for our heavy bomber B130. Planning for the mission fell in my domain, and as the Captain retreated to the rest area, I got busy with the nitty gritty of planning.

To start with, the intelligence officer was to pick up and glean as much information as possible about the target lay out, its defences and enemy radar coverage etc. Emerging picture was downright scary. Base was reportedly guarded by 200+ Shilka Radar controlled anti-aircraft guns. a variety of surface to air missiles and off course a serious threat of interception by fighters operating from Jaisalmer and Uterlai. The only factor in favour was that not much low-level radar cover was available to the Indians in that area. Conclusion was that ingress at low levels, lower the better, wasn't a cause for much worry, and the real threat to our well-being will be the airfield defences. Just visualize a huge aircraft, flying low and also slow clearly visible on a moonlit night. Highly vulnerable to say the least. Surely gives you goosebumps if nothing else. For me it was payback time. Attempting to calm my nerves, I got to work.

As I sat down to formulate the flight plan, suddenly a thought occurred to me. From the nature of the mission, the heavy terminal and on-route defences, it appeared that all

odds were stacked against us, and in all probability, it was to be a "One Way Ticket". In such a dismal scenario, why make a return flight plan? Why waste time? However, if we did get out, I would be able to rustle up a plan to get us back. A personal decision had been made To attack the primary target, Jaisalmer runway, final run in was to be 150 degree, because of the given runway alignment. Finding a suitable IP (Initial Point) from where the final bomb run was to start was the first problem. An IP was found at ideal distance and only 3 degrees off the final run. Planning backwards the construction of the remainder of the flight plan was a breeze. I preferred using American maps, and always carried the latest edition, covering all neighboring countries in my navigation bag, and on this occasion used them for planning. This was to prove a Coup d Maître, because as we learnt later B57s as well as F104s perhaps had failed to locate Jaisalmer. The reason being that our locally-printed maps had the position of Jaselmir Base wrongly marked and was in error by about 10-12 n.ms. Allah surely has his own ways.

> "Luck was not on our side that night. We had barely stabilized on course when the airborne radar, our primary low level navigation aid, decided to quit. But it was a moon lit night, and we could still manage. However, a little further ahead, the area was made impossible to transverse by impenetrable, thick fog.

Past midnight, 4/5 December, we took off at the calculated Brake Release Time to make good the given Time on Target (TOT) of 03:20 a.m. Luck was not on our side that night. We had barely stabilized on course when the Airborne Radar, our primary low level navigation aid decided to quit. But we decided to carry on. It was to be moonlit night, and we could manage navigation through visual references. As we flew a little further, a huge area was covered in heavy fog. A quick parley and we decided to press on hoping that the fog would clear up. Honestly no one wanted to miss out on the opportunity. We flew almost up to Rahim Yar Khan but there was no letup in the adverse weather condition. We were forced to abort. With heavy hearts, we returned to Mianwali, some cursing the luck, some the weather and some even the technicians who serviced the aircraft.

Next morning 05 December, greeted us with some more bad news. First, the previous night the Indian Canberra raid caused damage to one of the propellers; its spinner ruptured by shrapnel of an exploding bomb. As the aircraft was unfit for operations, we were to ferry it back on three engines for repair at Chaklala. Also, that another C130 was inbound Mianwali, and the new crew will take over our mission. No options left, we headed for the Base with our bag and baggage.

As we entered the Guard Room, we saw the damaged C130 getting airborne, flying on three engines. Now what? Operations didn't know much but simply, that the replacement crew had decided to ferry the aircraft and left us, the original crew to take the mission using replacement aeroplane. Lucky for us our flying gear has been left behind including my Nav Bag with all my treasures.

The mission to Jaisalmer was a go on night of 5/6 December. When the aircraft was in final

Top: A C-130B comes in for landing at a forward operating base during 1971 war. (Photo: PAF Archives).

Bottom Left: Flt Lt Riffat Jamil (2nd from left) along with a group of PAF aircrew at an unidentified airfield. (Photo: PAF Archives).

Bottom Right: Flt Lt Wajid Saleem (right) during training in UK. (Photo: Air Cdre Wajid Saleem)).

Top: Flt Cdt Riffat Jamil (Standing last row 2nd from right) at his graduation ceremony. (Photo: PAF Archives).

Left: Flt Lt Mir Alam sitting on the wing of the mighty Hercules as the aircraft gets rectification on one of its engines. (Photo: Air Cdre Mir Alam).

Bottom: Flt Lt Mir Alam (Standing 2nd from right) along with a foreign delegation. (Photo: PAF Archives).

Top: Sqn Ldr Mir Alam Khan (Sitting 3rd from left) along with faculty and newly graduated officers of transport stream at Transport Conversion School, Chaklala. (Photo: PAF Archives).

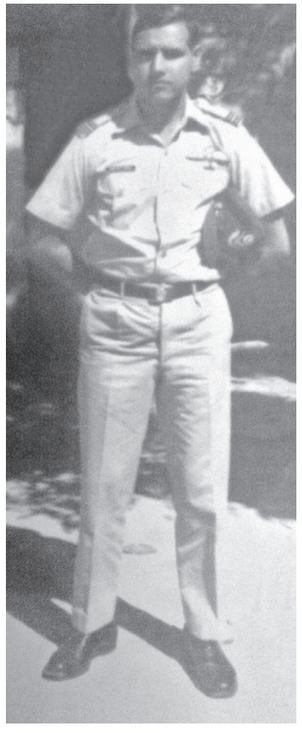
Right: Young Flt Lt Riffat Jamil poses for camera at PAF Chaklala. (Photo: PAF Archives).

Bottom: Flt Lt Mir Alam (1st from right) along with Army Liaison officer after flying a sortie in support of army troops. (Photo: PAF Archives).

stages of bomb loading and maintenance checks etc., an enemy bomber raid warning was received. A C130 sitting in the open presented a huge and easy target. Laden with thousands of pounds of live bombs, a direct hit by the enemy would have spelled disaster for the entire base. A spur of the moment decision was to immediately take-off and be clear of the installations. Loading was stopped though full bomb base had not yet gone in and 5000 pounds load was yet to be loaded. Never mind, even a 20 K bomb cargo was enough. We quickly strapped in and started the engines and taxied out. Still on the taxi way, enemy raid was overhead and ATC was asking us to switch off and evacuate. Remember shouting" Take Off. Take off" and felt the aircraft leaping forward. The captain was thinking the same but was a micro second ahead of me. We did a fast rolling take off and as the wheels lifted off the ground the bombs were already falling. A disaster averted perhaps.

> "Do we have something below or not", I yelled. Primary target couldn't be attacked. So, I located the technical area with some kind of hangers and a tarmac. I pointed it out and Captain quickly aligned with select point of impact. A drop was given, bomb load exited, and we dived down to make our getaway.

Giving a wide berth to Miawali Base we set course, for the assigned target. Our route lay along the Indus River to Rahim Yar Khan (RYK), from where ingress into India was planned along RYK- Ramgarh Axis. A clear night with moon shining brightly, navigation wasn't a problem. After penetrating Indian air space, the main worry was a pick up by the Air Defence Radars and a possible fighter interception. Safety lay in flying as low as possible. We started off at 500 feet AGL, slowly descending and at RYK we were down to 200 feet, and further descending to 100 feet AGL which was maintained for the entire duration of passage through India both inbound as outbound.



Visibility was so good that we literally followed the road to Ramgarh and from there to Mokul our IP. Navigation was easy but pilotage required great concentration because of flying so low, manually all the way. Following of roads was an advantage because of good height perception so facilitated.

Finally, time for culmination of all the effort put in: final bomb run from IP to the Target. Six minutes to TOT and all bomb pallet tie downs removed. One minutes arming pins of Bombs removed. Twelve seconds short and we started the pull up to drop height of 700 feet. As we pulled the Captain calls "Wajid. There's nothing there". As if on cue the anti-aircraft guns opened up turning the sky into spectacle of light. Some kind of rockets giving out a blue plume of fire were also noticed. Responding to the Captain's query, I yelled, 'Do we have something below or not". The runway was in sight but at 90 degrees instead of being in line. Primary target couldn't be attacked. So, I located the technical area with some kind of hangers and a tarmac. I pointed it out and Captain quickly aligned with selected point of impact. A drop was given, bomb load exited, and we dived down to make our getaway.

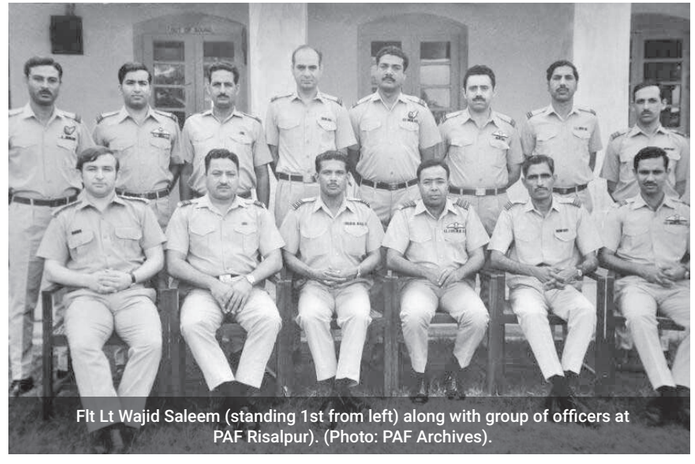
Suddenly our Load Master who could see behind through the open ramp called and said there was a MiG 21 behind us. Instinctively Captain threw in a very steep turn to break into the possible fighter on our tail. After turning 90 Degrees, Loadmaster when asked reported the MiG 21 to be still behind us. Captain rolled the wing level saying it was not a fighter? Clear of the enemy base perimeter it was time to go home. We had made it back in one piece.

Captain wanted the heading back, which I didn't have because flight plan for the return was not there. I told him to turn West. What is the heading?" he asked. My response 270 Degrees, perplexing of course. But then I put my Captain at ease by saying "Go 270. Will give you an exact heading in a while," I said. The return flight was uneventful and we recovered at Tank in wee hours of the morning on 6 Dec, 1971.

Mission success was first confirmed by another C130 returning from Jodhpur, because they had observed huge fires in the direction of Jaselmir. Later reports confirmed extensive damage to the fuel dump causing massive fires plus 200-250 casualties.

A Hercules comes-in for landing at a forward operating base during 1970 war. (Photo: PAF Archives).

Sqn Ldr Wajid Saleem along with aircrew and foreign officials at an unidentified airfield. (Photo: PAF Archives).



Flt Lt Wajid Saleem (standing 1st from left) along with group of officers at PAF Risalpur). (Photo: PAF Archives).

THE FUTURE IS *Flying Cars* NOW

A formerly steaming cup of tea lies cold and forgotten on a lumpy table, in a dark and murky corner of a café in London, 1998. A young woman in dishevelled clothes sits buried in a stack of pages, notes scribbled all over a manuscript, struggling to bring some form of genius through her ink. This woman is J.K Rowling, whose first book, Harry Potter and the Sorcerer's Stone, has set the literary world ablaze with a world of magic and fantasy. Now at her second book, with the bar set impossibly high, she struggles through her second chapter. What could possibly be magical, dreamy and relatable enough?...A flying car! That's it, that's every child's dream, every teenager's guilty fantasy, every inventor's endgame!

How did the world go from two fictional characters whizzing through the clouds in a magical flying car, to being so close to the world's first commercially available flying car, in a mere 21 years? In the words of famous fictionist and inventor Arthur Clarke: any sufficiently advanced technology is indistinguishable from magic. The anecdote that science disproves magic is false; on the contrary, technology has actualized everything previously thought of as impossible.

The courage it takes to dream big:

It takes one man's courage to turn fiction into flesh. The invention of the wheel brought the world every invention that has followed. Alan Turing's monstrosity that was the first computer, designed to crack the Nazis' enigma code, turned into computers, laptops, phones and every digital device imaginable. Enabled by these forgotten men, Bill Gates gave the world user-friendly software, Elon Musk brought innovation to Space exploration and Steve Jobs introduced Apple. Lost to the pages of history, is an inventor that enabled the world to materialize flying cars, just

"It takes one man's courage to turn fiction into flesh. The invention of the wheel brought the world every invention that has followed. Alan Turing's monstrosity that was the first computer, designed to crack the Nazis' enigma code, turned into computers, laptops, phones and every digital device imaginable. Enabled by these forgotten men, Bill Gates gave the world user-friendly software, Elon Musk brought innovation to Space exploration and Steve Jobs introduced Apple. Lost to the pages of history, is an inventor that enabled the world to materialize flying cars, just because he kept trying to colour the canvas of his own dreams."

by Talha ul Huda

because he kept trying to color the canvass of his own dreams.

Curtis Glenn: The first step on the aero car planet

In 1917, Glenn Curtis, American Aviation Mogul yet little known for his concept of the first flying car, designed the Curtiss Autoplane, recognized as the first Automobile capable of achieving flight. The Autoplane was a triplane, using the wings from a Curtiss Model L trainer, with a small fore-plane mounted on the aircraft's nose. The Autoplane's aluminum body matched that of a Model T and had three seats in an enclosed cabin, with the pilot/chauffeur sitting in the front seat and the two passenger side-by side. Using a four-blade pusher propeller, and a twin-boom tail, the plane boasted a 100 horsepower (75 kW) Curtiss OXX engine which drove the propeller via shaft and belts. The aircraft had a four-wheel undercarriage, with the front two wheels being steerable. The wings and tail could be detached for use as an automobile. Although it never achieved full flight, the fact that it hopped up in the air gave mankind the push that it needed to keep the dream alive. Curtis's futile efforts at the time, shifted the absurdity of a flying car to a possibility.

Over the 20th Century, the industrial revolution morphed into the tech renaissance, with cars becoming faster and sleeker and planes flying higher; and the amphibian of both, the flying car, quietly and gradually rose to a realistic shape.

In 1930, Waldo Waterman introduced the Arrowbile, a tailless, two-seat, single-engine, pusher configuration roadable aircraft. An Arrowbile or Aerobile was able to achieve full flight, but the design wasn't popular.

Top: Tall leap for mankind - Slovakian "AirCar" is cleared for mass production. (Photo: www.reddit.com).

Bottom: The original Curtiss Autoplane attempts to take off, circa 1910s. (Photo: www.reddit.com).

Right Page Top: Wishful thinking – will we get to book an Air-Uber soon? (Photo: oilprice.com).

Right Page Bottom: The Moller Skycar has been in development for 40 years, shining example of not giving up. (Photo: freedom-motors.com).

When George Jetson first flew across American TV screens in his flying car-like vehicle in 1962, many of us began wondering when we could buy our own Supersonic Suburbanite or Spacion Wagon. Amazingly, that day may be around the corner. After a century of unfulfilled promises, flying cars may fill the skies in the next few decades. There are still some obstacles to overcome, including receiving approval from the FAA (Since most of the development is being conducted in the US), but the cars are close to being finished.

There is no lack of engineers taking on the challenge to design a new breed of flying cars. While sleeker, more advanced cars have been developed in the last decade, no one has come close to opening up a flying car dealership. While the process might be tedious and imperfect till date, here are a few bold individuals attempting to deliver a flying car to the world.

Attempts to live the dream through history:

- Paul Moller is a shining example of human consistency and the inability to give up. He has spent more than 50 years and millions of dollars developing his Skycar. His company was later morphed into a UAV development forum called the "Aerobot". Mr Moller claims that he is now very close to developing the first mass-marketed flying car. In 1965, he demonstrated his first attempt, the XM-2, which hovered off the ground but didn't go anywhere. In 1989, Moller unveiled the M200X, which has now flown 200 flights and can go as high as 50 feet (15.24 meters). Moller's latest design, the Skycar M400, is designed to take off and land vertically, like a Harrier Jet, in small spaces. It can reach speeds of 400 mph (644 kph), but will cruise at around 350 mph (563 kph), and it has a range of 900 miles (1449 km). Gasoline, diesel, alcohol, kerosene and propane can be used to fuel the Skycar, and its fuel mileage will be comparable to that of a medium-sized car, getting 20 miles (32.2 km) to the gallon. The initial cost of a Skycar will be about $1 million, but once it begins to be mass produced that price could come down to as low as $60,000.

The four-seat Skycar is powered by eight rotary engines that are housed inside four metal housings, called nacelles, on the side of the vehicle. There are two engines in each nacelle so that if one of the engines in one of the nacelle fails, the other engine can sustain flight. The engines lift the craft with 720 horsepower, and then thrust the craft forward. The Wankel engine replaces pistons of a conventional engine with a single triangular rotor spinning inside an oval-

shaped chamber, which creates compression and expansion as the rotor turns. There are three combustion chambers in the Wankel, with a crankshaft between them.

To make the Skycar safe and available to the general public, it will be completely controlled by computers using (GPS) satellites, which Moller calls a fly-by-wire system. In case of an accident, the vehicle will release a parachute and airbags, internally and externally, to cushion the impact of the crash.

- MACRO Industries in Huntsville, Alaska is another consistent player in the game, in the process of developing a flying car that it's coined the SkyRider X2R. This aero car will be able to take off and land vertically. SkyRider incorporates the interior design of a 2-seat sports car with the mobility of a helicopter or airplane. The company has released a statement that it is also developing 5 and 7-seat models of the SkyRider, and it should fit in most two-car garages. The navigation system will be controlled almost entirely by GPS satellites and cellular services. MACRO Industries' SkyRider X2R will also use this fly-by-wire system to safely transport passengers to their desired destinations. Drivers will simply get in, turn on the power and enter the address or phone number of their destination. SkyRider will do the rest. MACRO said that the system will be almost fully automatic, but may allow some manual control. Commands will be entered just by telling the car what you want it to do.

- In 1990, Kenneth Wernicke formed Sky Technologies to develop a small-winged flying car. His Aircar has flown at 200 to 400 mph (322 to 644 kph) and driven at 65 mph (105 kph). It's also small enough to fit into an average parking space.
- Branko Sarh, a senior engineer at McDonnell Douglas Aerospace, attempted to develop a flying car, called the Sokol A400. Sarh designed a 4-passenger vehicle that would pop out telescoping wings at the push of a button. The Skycar will be operated completely by computer and guided by GPS satellites.

Consistently yours, Terrafugia

Imagine packing a few bags, get in your car and FLY anywhere from your own curb? The folks behind the start-up "Terrafugia" had hoped to make those fantasies come true by 2009 or 2010. A decade later, the Chinese company is still working tirelessly to perfect their technology, one step closer every passing day to a different world.

Top: As fascinating as it may be, public access to flying cars may be a disastrous policy challenge. (Photo: flyer.co.uk)

Bottom: The Skycar's USP is VTOL – Vertical Take Off and Landing. (Photo: www.newsweek.pl)

Right Page Top: In science fiction, vehicles with aerial mobility are always projected in the distant future. (Photo: www.hotcars.com)

Right Page Bottom: Terrafuga, a tech startup is developing a street-legal roadable aircraft – the TFX. (Photo: edition.cnn.com)

The Terrafugia team is currently working on a personal air vehicle (known as the "Transition") that pretty much looks like an SUV with retractable wings. The Transition won't be able to whisk you off on a non-stop flight to any destination, but you will be able to get as far as 500 miles in one "jump." And, amazingly, the designers hope it will do it on a single tank of premium unleaded gas. Oh, and don't worry about having to rent a car once you reach your getaway -- as hinted at in its name, the Transition gets decent mileage on the road, too! (Planned vehicle specs: In flight, the Transition will fly up to 120 miles per hour and get 30 mpg. On the highway, it will get 40 mpg and around town, it will get 30 mpg.) A full-size prototype is planned, but for now the designers are working with a one-fifth scale model in the wind tunnel and relying on computer simulations for development.

Are we prepared?

- The mass availability of flying cars is an exciting yet frightening prospect. For a number of logic-induced reasons, It would push the world into an era of dangerous fuselage-living: catastrophic number of accidents and experimental flying, counterfeit aircrafts, faulty parts, unskilled piloting, illegal commute, criminal activities, unequal distribution of resources, haywire law and order; we could go on and on. On the silver lining in this dark cloud, commercially available flying cars would also make global commute more accessible. Accidents and mishaps foretold, having the canvass of our skies painted with aero-cars would be another huge stepping stone for mankind, perhaps even as significant as the wheel or the computer. Here's to hoping that some engineer, somewhere in the world, makes a breakthrough soon and renders the world airborne.

Aircraft Boneyards Around the World

LEST WE Forget

"Several hundred veterans stood erect, old yet still proud. Every single one of them had served their time, made their nations proud. They had served in every role possible, from combat to support to logistics. Wars had been won on their shoulders; thousands relied on them to do what had to be done. They had proven their worth time and again. However, they were past their prime. They had done their time and, now, they stood in the scorching sun, waiting eagerly to be relevant again. No, this is not a tale of human soldiers or generals. This is the fate of thousands of aircraft which have lived their lives to the fullest and finally have to be retired. Though the glory is usually hoarded by men, these machines play an almost equal part in the action."

by Muhammad Khan

Aircraft boneyards are often the last resting place for aging or decommissioned aircraft. When an aircraft has lived out its use, has been damaged beyond repair or has simply become obsolete, it requires a low-cost, convenient parking solution. If they could talk, these aircraft would tell tales that would make anybody's head spin. But alas, they had to depend on their human counter-parts to preserve their legacy. They just stand there, silent, waiting for the next order of business. Eager to soar in the clouds once more yet equally content with being useful elsewhere.

These aircraft can continue to provide service in several different ways. This is where an Aircraft Boneyards come in. Please note that an Aircraft Boneyard is not necessarily an aircraft graveyard. The purpose of a well-run Aircraft Boneyard is not to discard of aircraft efficiently. It is to ensure that the aircraft are utilized in the best way possible. Aircraft boneyards also cater to aircraft that are functioning but need to be temporarily stored as they await repair or their services are needed. These usually distant facilities house hundreds of aircraft of all makes and models, from multiple air forces and travel services all around the world. Some of these aircraft stay there for decades before being scrapped. Others are kept around for a short while before being bought.

Over the years, experts have observed a trend when it comes to aviation. The airline industry operates in cycles. Initially, the first aircraft boneyards filled up after World War II, when air forces around the world discarded obsolete aircraft and converted to the superior jet aeroplanes. The process of selling or recycling the previous aircraft took years. The second influx of aircraft into boneyards happened

Title Photo: Giants in their Final Days: An aerial view of the aircraft boneyard in Tucson, Arizona.

when the classic prop airliners were discarded in favour of jet passenger aircraft in the 60s and 70s. Then, 1974, the oil crisis happened, once again landing a big chunk of active aircraft at boneyards. These planes returned to service after the oil supply stabilized, only to be sent back when the airlines were deregulated in the early 1980s. The parked airliners went back into service gradually but operations were once more interrupted by the travel shock after 1991 Gulf War. During the mid-90s, the skies were once again filled with aircraft and business was booming. Aircraft boneyards were almost empty.

However, the prosperity was ended in a single day. The 9/11 attack changed the course of history, effecting millions of lives and several nations in its wake. The aviation industry was heavily affected. Entire fleets were sent to boneyards. With perpetually looming terrorist threats, sky-high fuel costs and passengers worried about their safety, air travel suffered a substantial blow. The boneyards were once again filled. In some instances, aircraft which had just rolled off the assembly line were flown directly to a boneyard, never even accommodating a single passenger. In the last couple of decades, the economic crisis, global uncertainty, fuel shortages and several other factors have kept the boneyards full.

Aircraft boneyards are complex organizations which require skilled personnel and endless diligence. And since most personnel running them hail from aviation backgrounds, its an emotional endeavour. Let's dive deep into what exactly goes on in an aircraft boneyard.

Why deserts?

Most aircraft boneyards are stored in desert-like territories, usually far way from main cities. The aircraft are lined up in organized groups, each for different statuses and purposes. The dry, hot weather of such territories are perfect for aircraft boneyards because of multiple reasons. The dry heat, low levels of humidity and very little rain around the year ensure that the aircraft rust and deteriorate at a much slower rate than they would in normal territory. Rust and corrosion is the biggest enemy when it comes to parked aircraft. So, if the goal is to prolong an aircraft life, humidity must be kept at a low-level.

> "The dry heat, low humidity and little rain ensure that the aircraft rust and deteriorate at a slower rate than they would in normal territory. Rust and corrosion is the biggest enemy when it comes to parked aircraft.

Another benefit that such territory offers is the surface that the aircraft are parked on. The soil in such territories is hard and doesn't give in that easily. Below the top layer, under six inches of dirt, lies a clay-like layer known as the caliche. If this sub-layer is present in the soil, the preserved aircraft can be directly parked on the soil. This saves a hefty amount of costs by not having to construct concrete parking ramps or fields. It's even better if the soil is alkaline. The absence of traffic and other sources of pollution also helps greatly, proving a smog-free environment for the parked aircraft.

Another huge benefit that such territories offer is the low cost of the storage area. Airports and hangars have sky-high operative costs. This translates directly into the fee they charge for storing an aircraft. Compared to these prices, aircraft boneyards demand peanuts for storage.

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1: A Convair 240 stored in Arizona, reportedly sold to a Mexican agency but never shipped to the owner. (Phillip C.)

2: Still Glorious: An impressive group of C-5 Galaxies and several other aircraft rest after impressive careers the 309th Aerospace Maintenance and Regeneration Group's Aircraft and Missile Storage and Maintenance Facility on Davis-Monthan AFB, Arizona. (U.S. Force Photo by Staff Sgt. Perry Aston)

3: Being prepped: An aviation tech spraying the special insulated coating on a C-130 at the Davis-Monthan Air Force Base's Boneyard. (Troy Paiva).

4: A derelict fragment of US military's B-52 Stratofortress with the signature USAF stencils still visible looms against the night sky. (Troy Paiva).

5: Old Friends: A Boeing 737, 727 and MD-80 wait out their last days in the Mojave Desert, retired but not alone. (Troy Paiva).

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This, of course, does not mean that such territory doesn't come with its own set of challenges. The high-speed wind needs to be tackled. It needs to be ensured that dust cannot enter the aircraft. Aircraft are built to fly. The high-speed gusts of wind mean that all the parked aircraft need to be fastened down firmly with strong cables. The conditions are favourable for aircraft, but it is a harsh and unforgiving environment for a crew to work in. The high heat and the scorching sun takes it toll on you. It takes a special breed of people to able to do this long-term. But then again, it is a special kind of a career.

Preservation

As we've discussed before, an aircraft boneyard is not a place that aircraft necessarily go to die. It is not a huge, sprawling plain filled with aircraft carcasses. Instead, good aircraft boneyards are just a pitstop for aircraft, before they are used again in partial or full capacity once again. We shall go into detail into how exactly these preserved aircraft are used. However, lets look at how these aircraft are preserved.

> The conditions are favourable for aircraft, but it is a harsh and unforgiving environment for a crew to work in. The high heat and the scorching sun takes it toll on you. It takes a special breed of people to able to do this long-term.

It is extremely important that they retain their best-possible condition because an aircraft can last upto 50 years in a boneyard. The process has evolved over the years and varies from boneyard to boneyard. But generally, these are the steps that are followed in the leading ones across the world.

The first step is washing the aircraft thoroughly. Especially if the plane has served in corrosive or rigorous environments. For example, any airplane that has served on an aircraft carrier has to be thoroughly cleaned of any residue salt. Next comes defueling the aircraft. The crew designated to do this task can completely drain multiple aircraft in a day, depending on the size and nature of the aircraft. Larger planes with multiple engines like the hulking C-5 Galaxy can take longer than a day to completely defuel. The process is comparable to a blood transfusion. The aircraft is completely drained from the tanks and the fuel lines using high-power pumps. Then, special viscous oil is poured in, which lubricates the parts and provides a protective coating to the tank and fuel systems. Doing this prevents corrosion over the years. The aircraft is usually fired up to complete the last part. Once this is done, technicians locate and disable any volatile parts and mechanisms that may be present in the aircraft. For example, the charges that activate the ejection seats can be a nasty surprise for a crew member if they haven't been properly disposed of.

The aircraft is then handed over to the 'Spraylat Crew'. Spraylat, and other similar brands, is a paint-like latex-based substance which is permanently flexible, which is easy to remove when needed. Referencing a diagram which is usually supplied by the owner of the aircraft, the crew will coat every window, access panel, seam and opening with the substance. The insulating quality of the coating keeps the aircraft cool on the inside while protecting it from wind and other elements.

1: The remains of a commercial aircraft shot by an ingenious technique called 'light painting' by artist Troy Paiva (Photo: Troy Paiva)

2: Shot mostly at night to avoid the scalding desert heat and unwanted intruders, these pictures use the moon's natural light to create beautiful compositions. (Photo: Troy Paiva).

3: Two damaged North American F-86 jets slumber their last in the Mojave Desert in California (Photo: Troy Paiva)

4: A Second Life as a Canvas: Painted by graffiti artist Andrew Schoultz, this Lockheed L-1329 JetStar was painted in 2012 and exhibited in the Pima Air and Space Museum (Photo: airhistory.net).

5: Another masterpiece, the derelict cockpit almost feels organic and alive when seen through the artist's lens. (Photo: Troy Paiva)

6: A solitary engine from a Boeing 747 lies in the world's largest civilian aircraft boneyard, Pinal Airpark, located in Arizona. (Photo: Jarod Opperman/ Wired.com)

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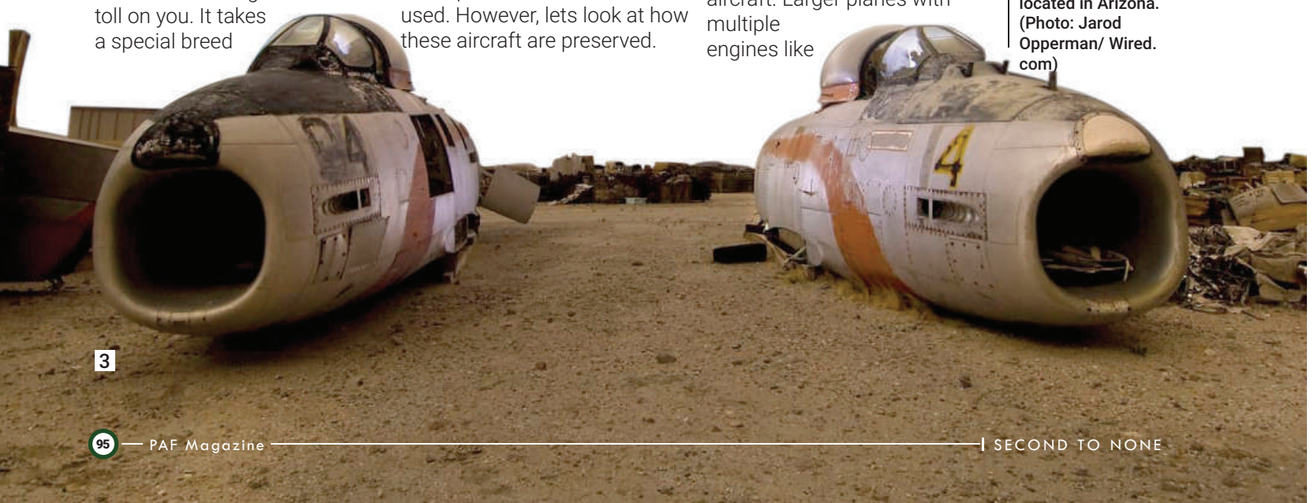

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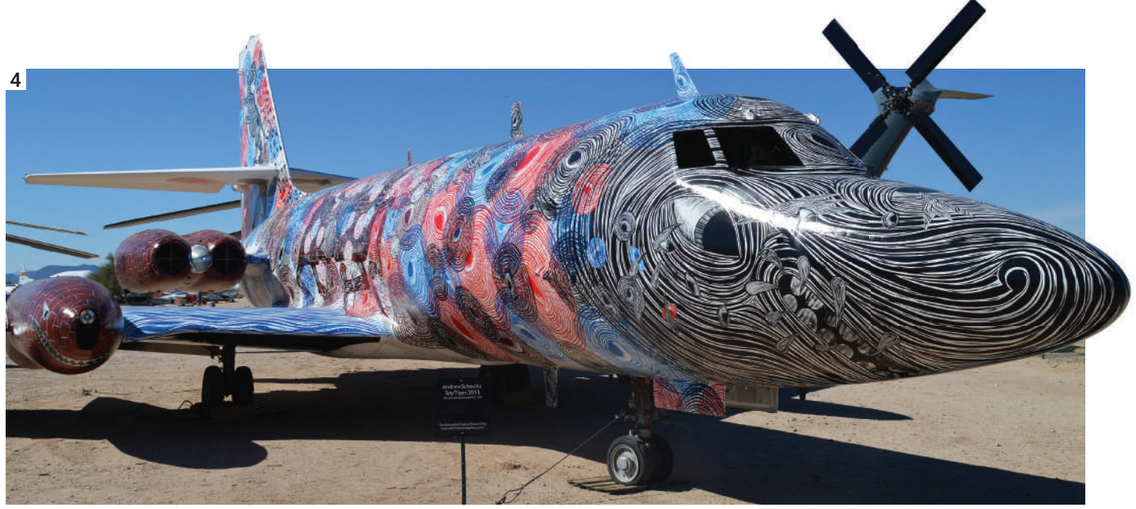

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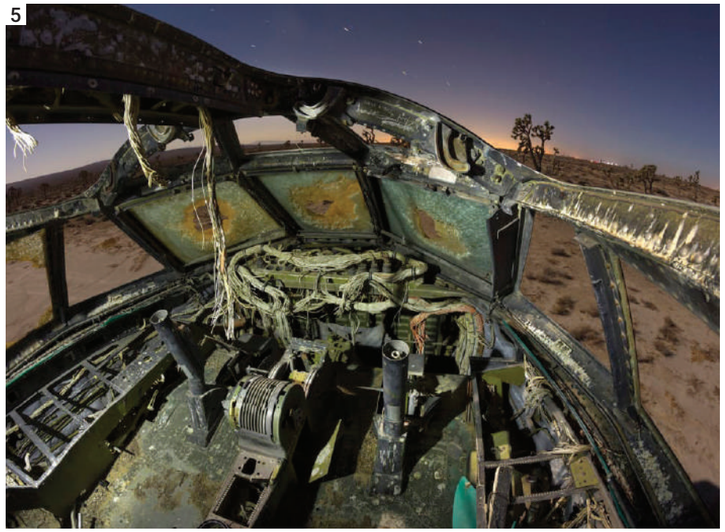

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'Sqn Ldr Alam Siddiqui's Triple Attack' - depicting final moments of the fateful mission. (Painting by Gp Capt (R) S. M. A. Hussaini).

(All pics provided by author unless stated otherwise).

The Story of an Intrepid Duo

Beyond the Call of Duty

"0330 Hrs, 7 September 1965 – Two young Squadron Leaders from No 8 Squadron of No 31 Bomber Wing at Pakistan Air Force (PAF) Station Mauripur (now Base Masroor) in Karachi, sat strapped in the tandem cockpit of their Martin B-57B Bomber No. 33-941.

Their mission was to bomb India's Jamnagar Airfield 225 nautical miles (258 miles) South-East of Karachi. In the front seat was 31-year-old pilot Sqn Ldr Mohammad Shabbir Alam Siddiqui and on the back seat was 32-year-old navigator Sqn Ldr Muhammad Aslam Qureshi. Completing final checks, they rolled for takeoff – yet again – on a high-risk strike deep into enemy territory."

by Haris Masood Zuberi

Earlier, in the morning of 6 September, eager crews of No 31 Wing, PAF had listened to Field Marshal Ayub Khan's motivating speech declaring full-scale war with India. Sqn Ldr Shabbir Alam Siddiqui's enthusiasm about finally getting a chance to test their training against the enemy in actual wartime had been remarkable. According to his Squadron Commander, Sqn Ldr Rais A Rafi (later Air Cdre), "He equipped himself with every kind of weapon - a pistol, a sten gun, and a dagger hooked up by the side (and) appeared to be a walking armoury." In his signature humorous style, he declared his resolve to take down as many of the enemy as possible – if he were to eject in enemy territory.

Anticipating orders for night strikes, the crews were advised to rest and report for briefings at 1500 Hrs. While some pilots opted to relax at home, Alam Siddiqui remained at the Wing to stay ahead of mission preparations. He only made a quick visit home to inform his family about the situation and his upcoming missions. Seeing his usual cheerful manner as he drove off in his jeep, his 21-year-old wife Shahnaz hardly assumed it would be the last time she was seeing him. Later that evening from the lawn of her home at Mauripur, she saw his B-57 formation take off among five other bombers.

Since a crucial aspect of the PAF air-war strategy had been to ensure neutralization of vital elements of the larger Indian Air Force (IAF) at the very beginning of war, Air Marshal Nur Khan launched pre-emptive air strikes. By 1630 Hrs, F-86 Sabres from No 19 Squadron from Peshawar led by Sqn Ldr Sajad 'Nosey' Haider, No 5 Squadron led by Sqn Ldr Sarfaraz A Rafiqui and No. 11 Squadron led by Sqn Ldr M M Alam from Sargodha were ready to get airborne for strikes against Pathankot, Halwara and Adampur respectively.

Meanwhile, at Mauripur – PAF's premier bomber base at Karachi – the night-intruder force of B-57 Bombers from No 8 Squadron was ordered to prepare for a surprise dusk strike against Jamnagar.

As per recent intelligence, Jamnagar airfield at the South-Western Indian town of Gujarat state was a threat for Mauripur, Karachi and adjoining areas. In preceding months, two IAF aircraft had ventured into Pakistan from the region – an Ouragan from Jamnagar was intercepted and forced-landed by PAF F-86s from Mauripur and the pilot Flt Lt R. L. Sidha detained.

At 1800 Hrs, as the crews of the 6 bombers ready for Jamnagar strikes performed R/T checks, the Station Commander Gp Capt Khaqan Abbasi stood on the tarmac waving them good luck. Sqn Ldr Alam Siddiqui – who had the knack for charming everyone with his humour – chuckled over the radio, "It had to be war for our old man to wish us luck!" Laughter echoed adding great flavour to the historic moment. At 1805 Hrs, the B-57s took off one after another. 1850 Hrs at last light was the time over target (TOT). Within minutes the bombers left Karachi behind. Shortly after contact with Badin radar, the navigators announced they were entering Indian airspace.

In order to avoid detection by radars, they flew as low as 250 feet above ground level (AGL). Clocking nearly 360 knots (415 mph) the bombers loaded with 4x1000lbs bombs, 56x2.75" rockets and 4x20mm cannons were over their target in nearly 45 minutes, now under the cover of spreading darkness.

Following the strike plan, one by one they climbed up to 8,000 feet and descended to release their loads of 4 bombs on the airfield from the height of nearly 4000 feet. Carried out with textbook precision, the mission was accomplished like clockwork. The formation quickly headed back to Mauripur, keeping very low till they had crossed the border.

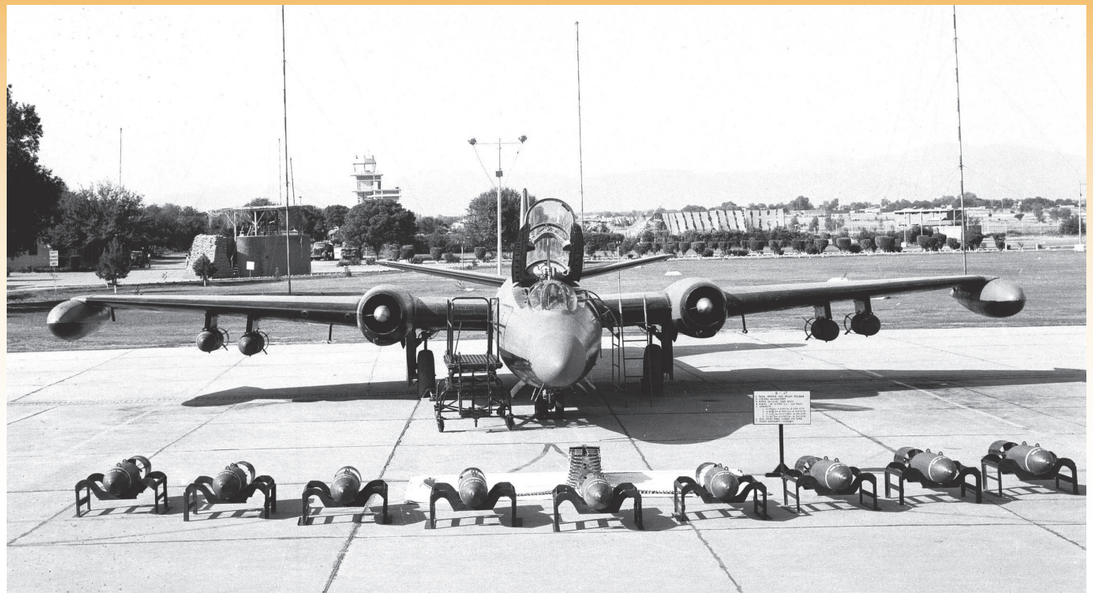
Landing at 1940 Hrs, they were greeted with cheers. All 6 B-57s were back from enemy airspace unscathed, completing the first dangerous deep-strike operation. The enemy had been stunned – element

Top: Sqn Ldr M S Alam Siddiqui PAK 3579.

Above: Sqn Ldr M Aslam Qureshi PAK 1460.

Left: A formation of B-57s approaching their target.

Below: Sqn Ldr Qureshi (Standing 1st left) and Sqn Ldr Siddiqui (Standing 9th left) along with the members of No 31 Wing, PAF few months before the '65 war at Mauripur.



of surprise was evident by absence of fighter interceptors and more surprisingly anti-aircraft artillery (AAA). This observation on the first bombing mission proved crucial for ensuing operation. It was decided to continue a 'Bombing Shuttle' over Jamnagar through the night, this time as single bombers following each other at intervals till dawn. Each crew who had flown the dusk mission was to fly a second sortie. Owing to the darkness and the enemy being on full alert conditions were much riskier.

As the aircraft fuelled and reloaded, Sqn Ldr Alam Siddiqui hopped into another B-57 aircraft (No. 33-945) with call-sign 'Zulu 753.' Among the six pilots who had just returned from the dusk mission, he was the first to head back to the target. This time with the senior navigator Sqn Ldr Aslam Qureshi, who held the appointment of the Wing Navigation Leader. He had earlier been among the crews reserved for Peshawar when the dusk strike went ahead. Since the move to Peshawar with No 7 Squadron was called off, he was keen to fly his first war mission.

They took off at 2240 Hrs and crossed the border in darkness. The expert navigator had no difficulty reaching the target head-on and on time, despite the navigation difficulties involved in low-level deep night-strikes. Once above the target, they dropped bombs at approximately 2325 Hrs. With the mission successfully completed they quickly headed back. Winning against odds once again, they landed at Mauripur at 0025 Hrs – initial moments of 7 September 1965.

All crews returning from second missions were supposed to rest till further orders. Sqn Ldr Alam Siddiqui got back to the Operations Room filled with an extraordinary energy to keep contributing to the effort. Then holding additional responsibility of the Wing Operations Officer, he had been on his feet since he reported for duty early in the morning on 6th. Throughout the day he had kept busy with arrangements. He had played his role very well on the first day of the war and now deserved to head home.

Instead, at 0300 Hrs, his Wing mates

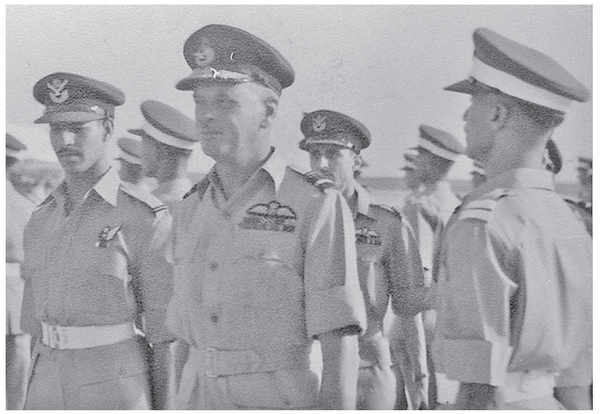
Top: A B-57 with its armament parked at PAF Base Sargodha.

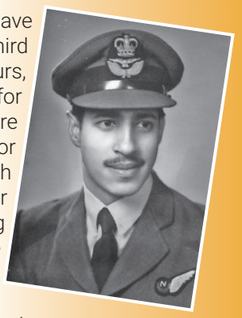
Left: Sqn Ldr Alam Siddiqui (1st from left) during his time with No 14 Sqn equipped with F-86s.

were not surprised to find him lurking around in his flight suit – ready for more action. Since his return at 0025 Hrs, he hadn't even considered going back to his anxious young wife and two infant sons. It was inconceivable for the perpetually dynamic Alam Siddiqui to leave in the midst of decisive action while some of his colleagues were still flying deep into Indian airspace. As he actively sought another chance to get airborne, fate presented him an ideal opportunity – The OC Wing, Wg Cdr Hameed Qureshi had been scheduled to take-off on his second mission at 0335 Hrs. However, since return from the earlier dusk mission, he had suffered a medical condition and seemed incapacitated. While the flight surgeon checked on him, crews were concerned for disruption of the planned sorties. Sqn Ldr Alam Siddiqui at once volunteered to go instead.

Incidentally, this sortie was scheduled last for the night. Although, he could have avoided flying for the third time within a span of 9 hours, he enthusiastically opted for this mission, fully aware there would be no break for him even the next day. With the Squadron OC in the air and the Wing OC getting medical assistance, he took initiative as a senior officer of the Wing. Instead of wasting time to brief fresh crews or ordering another pilot, while nobody stepped beyond the second mission, he chose to fly again himself. The significance of his decision to ensure this last raid was not delayed or missed turned out to be momentous – as discovered later through Indian accounts from Jamnagar.

His former OC Sqn Ldr (later AVM) Saeed A. Ansari who had also been his instructor during his Risalpur days, tried to dissuade him from volunteering to fly again. "They have not seen the target – I have just returned from there.





Top Left: Sqn Ldr Alam Siddiqui (1st from left, sitting) with No 31 Bomber Wing, PAF.

Top Right: Sqn Ldr Alam Siddiqui (standing 3rd from left) with No 31 Bomber Wing, PAF.

Above: The shaheed officers in a historic group photograph taken at AHQ in 1964.

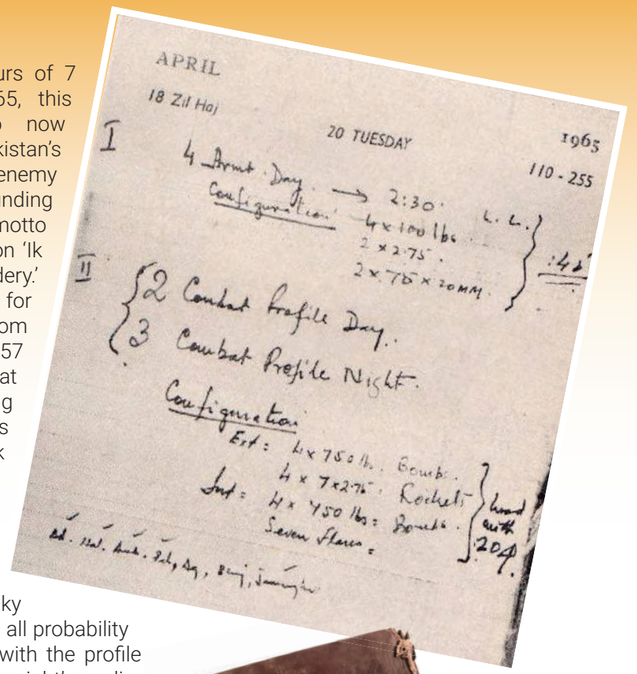
Right Center: Sqn Ldr Alam Siddiqui as a navigator before earning his pilot's wings in 1957.

Left: Plt Off Alam Siddiqui with AVM Arthur McDonald C-in-C, RPAF during a parade inspection.

I can cause more damage…" he said. Determined and decisive as he always was, Alam convinced Ansari with his typical smile and energetic handshake and drove off to the flight lines in his jeep.

Sqn Ldr Aslam Qureshi meanwhile, had been up to his own heroics. Right after landing from his first mission, he used his authority to assign himself the navigation slot on this last mission as well. While he could have avoided it on the pretext of having flown earlier or pressing responsibilities on ground, he rose to the occasion. Once settled with arrangements he had just reclined in an empty room when he was informed about Wg Cdr Hameed Quershi being unable to fly and Alam Siddiqui taking over. He quickly joined the pilot for briefings.

In the wee hours of 7 September 1965, this dauntless duo now rolled off Pakistan's soil to give the enemy yet another pounding – true to the motto of their squadron 'Ik Aur Zarb-e-Haidery.' They took off for their target from runway 27 in B-57 No. 33-941 at 0335 Hrs bearing call-sign 'Z-6.' As the bulky dark warrior-aircraft aptly signed 'Zulu' took a sharp left turn heading 130 degrees, the sky was moon-lit. In all probability keeping in line with the profile followed by the night's earlier sorties, they flew low at no more than 500ft AGL. At a speed of nearly 360 knots (415 mph) their aircraft fast approached Jamnagar. En route, they had radio contact with Sqn Ldr Rais A. Rafi who was exiting the area after his attack at 0340 Hrs. He advised them "Watch out for low clouds…use flares to light up the target." Just as he had just done moments earlier.



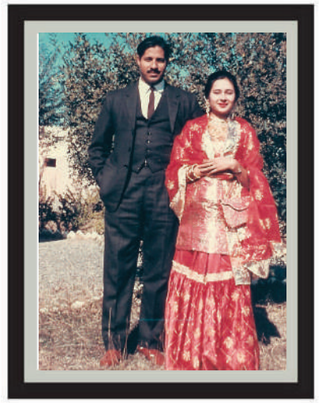
Top: A page from the diary of Sqn Ldr Aslam Qureshi circulated by IAF and Indian media.

Left: Sqn Ldr Alam Siddiqui's wallet recovered from the wreckage.

Left Below: Sqn Ldr Alam Siddiqui receiving his pilot's wings from the C-in-C, RPAF.

Right Page Above: Family photos of Sqn Ldr Alam Siddiqui and Sqn Ldr Aslam Qureshi. (Source: Family).

The aircraft reached over the target at approximately 0415 Hrs Pakistan Standard Time – almost first light, nearly some 40 minutes after take-off from Mauripur, loaded with 4x1000lbs bombs to wreak havoc on the enemy airfield. According to procedure, the crew climbed up for the dive bombing to about 5000ft or more AGL and dived to release the bombs at about 3000 feet or less – first dropping flares to light up the target during descent. Owing to Sqn Ldr Alam Siddiqui's zealous nature almost certainly going lower below the gathering clouds for precision. With the airfield below now lit up and visible they made the first bombing run and dropped 2x1000lbs bombs over the airfield. The flares were risky business – while they made the airfield below visible, they also lit-up the attacker for AAA gunners below.



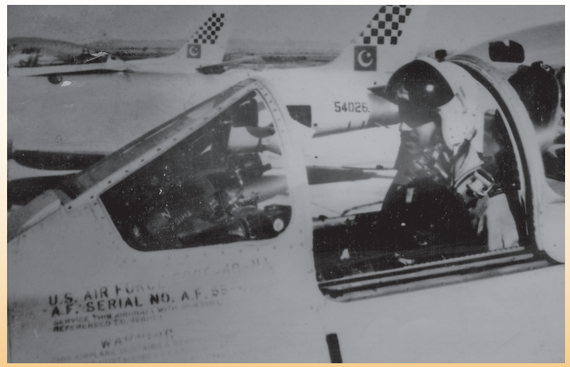
Just so happened that when the lone 'Zulu 6' suddenly showed up diving through the clouds to deliver its fury over the enemy airfield, eight Seahawk fighter aircraft of the No. 300 Indian Naval Air Squadron (INAS) were preparing for a massive strike against PAF's Badin radar installation at dawn on 7 September. The B-57 meanwhile making a quick circuit swiftly climbed and came in for another dive to release the 2 remaining 1000lbs bombs. By now the silence of the previously blacked-out airfield which had been on the receiving end of PAF's wrath since 1900 Hrs (PST) opened its furious retaliation with AAA fire. As 'Zulu 6' dived in for the second attack, it was inevitably caught in an Ack Ack (AAA) barrage.

Flying through the fierce fireworks, hurriedly to get rid of excess weight the crew jettisoned the B-57's 2 rocket launcher pods. They landed very close to the INAS Seahawks and have since been preserved by India as souvenirs of the PAF night-raid, as confirmed by Rear Admiral (Retd) Satyindra Singh in his book 'Blueprint to Blue Water - The Indian Navy 1961-1965.' Suddenly 'Zulu 6' suffered direct hits from Indian AAA below causing serious damage. The aircraft began to lose control. Already low, the now damaged bomber began losing altitude. Unable to pull through much farther, while clocking somewhere between 360 and 400 knots (415-460 mph) impact was now imminent. PAF B-57 No. 33-941 eventually hit ground and crashed in an agricultural field 10 miles East of the Jamnagar airfield – apparently martyring both the courageous officers on impact.

However, unusual absence of prompt news about the bomber and its crew officially received from India following the loss initially caused helpless bewilderment. As a result, the

Bottom Left: Left: Sqn Ldr Alam Siddiqui in a No 14 Sqn F-86 Sabre.

Bottom Right: A PAF B-57 from Mauripur leading a formation over the Arabian Sea. (Photo: PAF Archives).



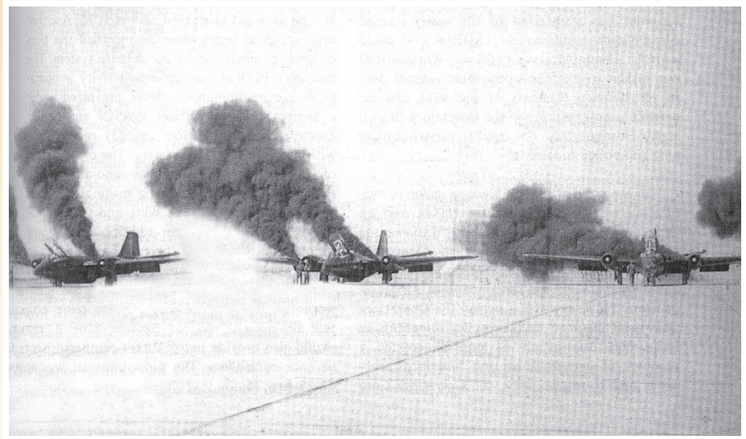
fate of this intrepid duo remained uncertain for days and eventually decades. IAF's unexpected tardiness in claiming a 'kill' caused speculations. Combined with the details on absence of Ack Ack or interceptors experienced on previous raids, the presence of low clouds, very low flight profile and possible fatigue due to the pilot flying third mission fostered assumptions about 'Z6' including the bizarre possibility of having crashed into the Arabian Sea en route.

In India however, the fate of this bomber and its crew was certain. Ack Ack had indeed claimed B-57 No. 33-941 kill which was acknowledged by the Indian authorities shortly afterwards. Indian military had retrieved a diary attributed to the crew. Images of its pages were immediately released to the media. Naturally utilizing propaganda value in the middle of war, various Indian English and Hindi newspapers had published news of the shooting down along with images of the diary pages as well as the B-57 wreckage declaring that the crash had taken place very close to Jamnagar airfield (The Statesman, Calcutta & Delhi, 13 September 1965; The Times of India, Bombay & Delhi, 14 September 1965; Indian Express, Madras, Bombay, Delhi, 14 September 1965).

When a POW exchange took place between the two nations in January 1966, India handed over a fragment of an oxygen mask attributed to the pilot along with the wallet of Sqn Ldr Alam Siddiqui, in a distressed condition but still holding its contents including family photographs. The Government of Pakistan changed the status of the lost crew from MIA to KIA, but somehow the uncertainty regarding their fate perpetuated in the absence of an official verdict. In 2005 the acclaimed book 'The India Pakistan Air War of 1965' by P. V. S. Jagan Mohan and Samir Chopra revealed accounts including that of Air Cdre K. A. Hariharan, an IAF pilot then stationed at Jamnagar, who had witnessed the last bomber's raid, the illumination by its flares and eventually its being hit by Ack Ack. Another eyewitness Sqn Ldr Kesav Chandaran narrated, "Our Station Commander Gp Capt G. H. King had filed a kill report. The crew may have attempted crash landing as the B-57 crashed towards the road to Rajkot and hit a large tree – its tail may have been hit moments after they damaged a hangar." Adding, "There was no fire on impact and a broken watch was recovered from one of the crew and kept at a museum somewhere."

In 2006, 40 years after the September 1965 war, Air Cdre Najeeb Ahmed Khan (Retd) met Mrs Shahnaz Alam. Having been very close to Sqn Ldr Alam Siddiqui Shaheed, he was touched by his dear shaheed friend's wife's anguish and sentiments for her lost husband – even four decades later. He wrote to IAF requesting information and details about the fate of the crew from the fateful mission. In a historic gesture, then IAF CAS Air Chief Marshal S. P. Tyagi carried out exclusive research and officially informed that as per records, eye witness accounts of locals, images and material attributed to the wreckage and the crew it was certain that B-57 No. 33-941 had made it right over Jamnagar Airfield – dropped two bombs and was in second circuit to drop the remaining load when it was caught up in AAA – was inevitably hit, and minutes later crashed few miles across the airfield, martyring the crew. IAF further pin-pointed the crash site at an agricultural field 10 miles east of the airfield and facilitated a visit to the location. A documentary was produced by CNN-IBN showing the location and old pictures, including one from a local daily displaying the wreckage with Indian Navy officials beside it.

While plight of the fighter squadrons from initial missions in the north brought several heroes to the forefront by the very first afternoon of the war, achievements of bombers from the same night remained relatively under-explored. No 8 Squadron persevered in silence while its crews delivered the momentous tasks of preserving the defences of the south by offering IAF enough poundings to keep it on ground. During the war, two operational missions in a night were considered the limit. Sqn Ldr Alam Siddiqui had first taken- off at 1805 Hrs and for the third time at 0335 Hrs. Flying 3 combat missions within a span of 9 hours in the same night is accepted as a record. Especially during the 1965 and 1971 wars, as far as bombing missions were concerned.



The loss of two fighters of No 5 Squadron from Sargodha created legends – Sqn Ldr Sarfaraz A. Rafiqui and his wing-man Flt Lt Yunus Hussain. Within hours they were followed by Sqn Ldrs Alam Siddiqui and Aslam Qureshi of No 8 Bomber Squadron from Mauripur. Together it was these heroes whose courage and devotion on the very first evening of the war inspired fearlessness and shaped the psyche of PAF's air-warriors facing an enemy superior in numbers.

Facts took nearly five decades to become evident. Had this last raid been called-off due to crew discrepancy, the INAS crew in Jamnagar would have caused devastation. This dauntless duo managed to annihilate the Indian assault when they ferociously descended on the enemy through the clouds just when the Seahawks were preparing for the raid. Damage to the runway and control tower left no time for them to reorganize and make it to Badin before dawn. Their sacrifice not only preserved national prestige but also contributed to the significant edge which PAF maintained through the war. As Rear Admiral (Retd) Satyindra Singh of Indian Navy puts it, 'Had the eight Seahawks at Jamnagar been allowed to bomb the 'seeing-eye' of PAF and its air defence establishment at Badin (…) on the morning of 7 September the war would have been over much earlier and (Indian) aircraft losses would have been minimized.'

In having so gallantly laid their lives, they added a golden chapter in the glorious history of PAF which is rich with such traditions of selfless devotion literally beyond the call of duty.

Top Centre: B-57 Bomber Crew strapping up for a Mission.

Top Right: A B-57 Bomber formation. (Photo: PAF Archives).

Left Page Centre: B-57 flight lines at Mauripur. (PAF Archives).

Right: B-57s starting up with the signature smoke. (PAF Archives).

Above: B-57 bomber crew climbing into the tandem cockpit. (PAF Archives).

More F-35 Fighters on Dutch Defence Shopping List

by David Donald
3 Jun 2022

Two KLu F-35As are seen during a February 2022 exercise with a pair from the UK-based 48th Fighter Wing. Having been bought by eight NATO nations to date, plus Switzerland and NATO applicant Finland, the F-35 is key to the defence of Europe. (Photo: U.S. Air Force)

Russia's invasion of Ukraine has brought the defence of Europe sharply into focus, and many NATO nations are significantly increasing their defence expenditure as a result. The Netherlands is one of them and has committed an additional €5 billion per year to the military budget, representing an increase of around 40 percent. The future spending plans are laid out in a white paper—"A Stronger Netherlands, A Safer Europe: Investing in a Robust NATO and EU"—that was introduced by defence minister Kajsa Ollongren on June 1.

For the Koninklijke Luchtmacht (KLu, royal air force) the main element is the purchase of six more Lockheed Martin F-35As, raising the total number to 52. This will permit the creation of a third full squadron to join the current 313 Squadron at Volkel and 322 Squadron at Leeuwarden. The white paper also notes that "the entire F-35 fleet will be expanded with modern long-range and precision weapons" and that the future use of unmanned fighters is being examined. Long-range engagement and suppression of enemy air defence are regarded as important aspects of future KLu operations.

The number of General Atomics MQ-9A Reapers will also be doubled to eight to increase maritime and overland intelligence, reconnaissance, surveillance (ISR) capacity. The Reapers will also be armed in the future, with that program to enter the parliamentary approval process next year.

Concept art from Lockheed Martin depicts a stand-in attack weapon fired from a jet. Lockheed, Northrop Grumman and L3Harris Technologies have each received $2 million contracts from the US Air Force to start designing a weapon that could be used to target enemy air defenses from an F-35. (Lockheed Martin)

US Air Force awards contracts to start designing F-35 weapon

by Stephen Losey
8 June

WASHINGTON — The U.S. Air Force has awarded contracts to three companies for the first phase of a new program to develop an air-to-ground stand-in attack weapon that the F-35 jet could use to destroy enemy air defences.

Lockheed Martin, Northrop Grumman and L3Harris Technologies said this week the service selected them for phase one of the SIAW program. The three-month contracts, each for $2 million, were awarded May 25, Lena Lopez, a spokeswoman for the Air Force Life Cycle Management Center's Armament Directorate, said Wednesday.

The Air Force signaled it was preparing to move forward with the SIAW in supporting documents for its proposed fiscal 2023 budget, which for the first time requested $78 million to start procuring 42 of the weapons.

The Air Force said this weapon would allow it to strike enemy targets that create an anti-access, area denial environment and can be rapidly moved. These potential targets include integrated air defences systems, ballistic missile launchers, land-attack and anti-ship cruise missile launchers, GPS jammers, and anti-satellite systems.

The stand-in weapon would have a shorter range than standoff weapons, which are designed to be fired from a distance outside the range of enemy defenses, typically by an aircraft such as a B-52.

Concept art from the Air Force Research Laboratory from 2018 showing a potential next-generation fighter concept, or F-X. Air Force Secretary Frank Kendall said June 1 that the Next Generation Air Dominance program has now entered its engineering and manufacturing development phase. (AFRL)

The Air Force's next-gen fighter has moved into a critical new phase

WASHINGTON — The Air Force's secretive and highly classified Next Generation Air Dominance fighter program has started its crucial engineering and manufacturing development phase, Secretary Frank Kendall said Wednesday.

In a discussion at the Heritage Foundation, Kendall said the Air Force began early experimental prototyping on NGAD in 2015, when he was the Pentagon's top acquisition official. This was essentially an X-plane program, he said, designed to reduce risk and develop key technologies needed for the production program.

The technology has continued to progress, he said, and the NGAD effort is now envisioned as a "family of systems" incorporating several elements, including a handful of autonomous drone aircraft accompanying the manned aircraft in formation.

It typically takes the Air Force's acquisition programs almost seven years to reach initial operating capability from the beginning of the EMD phase. Although the service has already been working on NGAD for about that long, because it just recently started work on the EMD phase, it will still be several more years before the program will reach IOC.

"The clock really didn't start in 2015; it's starting roughly now," Kendall said. "We think we'll have capability by the end of the decade."

But NGAD could also be the most expensive aircraft program in history. Kendall told lawmakers in April each piloted aircraft under the program would likely cost several hundred million dollars apiece.

The Air Force asked Congress for almost $1.7 billion for NGAD in its fiscal 2023 budget, including $133 million in research, development, testing and evaluation funding.

BAE Systems expands anti-jam receiver capabilities

by Stew Magnuson
7 June 2022

BAE Systems' DIGAR enhances the reliability of navigation, positioning and timing data in disruptive electromagnetic signals. Credit: BAE Systems.

BAE Systems has expanded its Digital GPS Anti-Jam Receiver (DIGAR) capabilities by beamforming it with Trimble receivers and its own receivers.

With the new beamforming capabilities, the level of GPS jamming protection for aircraft is increased by a million-fold, in turn allowing the pilots to execute their missions in contested environments.

The software was developed by the engineers at BAE Systems' Cedar Rapids facility, Iowa, US, to ensure its antenna electronics are compatible with industry-standard Embedded GPS Inertial Navigation System (EGI).

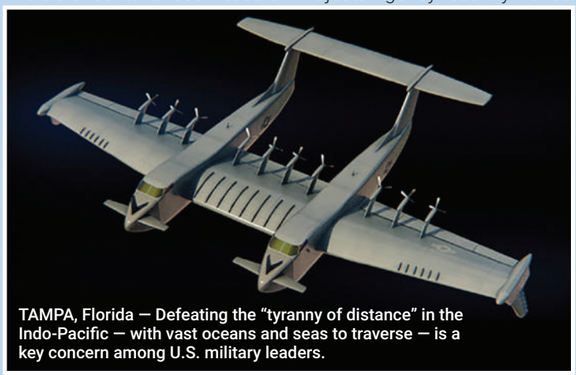
DIGAR now provides the only antenna electronics to beamform with BAE Systems' receivers, as well as Trimble GPS receivers that are embedded in aircraft EGIs.

Two Amphibious Aircraft Programs on Drawing Boards

by Stew Magnuson
6 Sep 2022

There are now two amphibious airlift programs in their early stages that might help move troops and supplies rapidly as the Defence Department continues its strategic shift to the region.

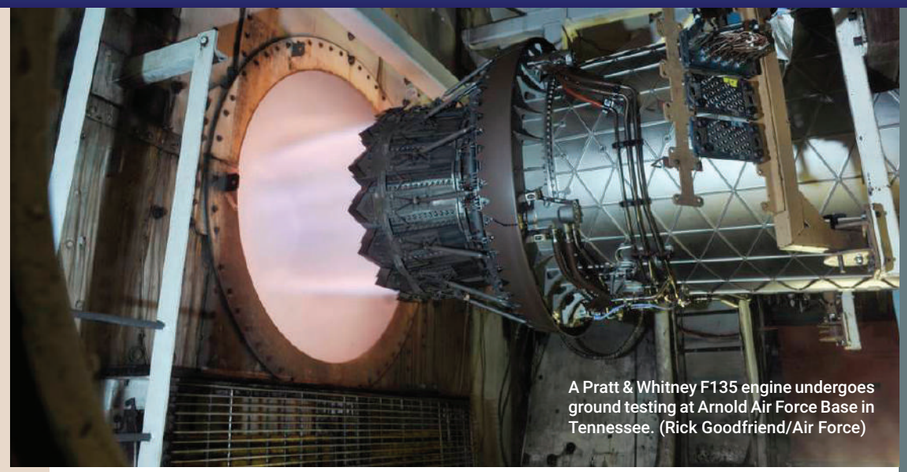
The Defense Advanced Research Projects Agency recently kicked off its Liberty Lifter project, with a goal of flying a long-range, "low-cost X-plane capable of seaborne strategic and tactical lift," the agency said in a press release.



TAMPA, Florida — Defeating the "tyranny of distance" in the Indo-Pacific — with vast oceans and seas to traverse — is a key concern among U.S. military leaders.

"The new vehicle concept seeks to expand upon existing cargo aircraft by proving revolutionary heavy air lift abilities from the sea," the agency said.

The envisioned plane will combine fast and flexible strategic lift of large, heavy loads with the ability to take off and land in water. Its structure will enable both highly controlled flight close to turbulent water surfaces and sustained flight at mid-altitudes. In addition, the plane will be built with a low-cost design and construction philosophy, the agency said.



A Pratt & Whitney F135 engine undergoes ground testing at Arnold Air Force Base in Tennessee. (Rick Goodfriend/Air Force)

Poland reveals plan to buy AW149 helos in deal potentially worth over $1B

by Tom Kington
15 June 2022

ROME — Poland plans to buy AW149 helicopters, the defense ministry said Monday, with one Italian bank estimating the order could be worth €1.1 billion (U.S. $1.15 billion) to manufacturer Leonardo.

"In the near future we will sign contracts for the supply of mine destroyers ... AW149 multi-role support helicopters, two observation satellites and tank destroyers," according to a tweet from the ministry, which cited Defence Minister Mariusz Blaszczak.

Polish news portal Defence24 reported the order will include 32 helicopters, with assembly handled in Poland by PZL-Świdnik, which is controlled by Leonardo. It also reported Poland will acquire the helicopters in three different formats: combat support; command; and reconnaissance and electronic warfare.

Pratt & Whitney wins $4.4 billion contract for F-35 engines

by Stephen Losey
16 June 2021

WASHINGTON — The Defence Department awarded Pratt & Whitney a bridge contract worth nearly $4.4 billion to provide at least 250 engines for the F-35 fighter.

The contract modification from the F-35 Joint Program Office will cover production of the 15th and 16th lots of the F135 engine used in all three variants of the F-35.

The Pentagon said Wednesday that 178 of the engines that will be produced under this contract will go to U.S. F-35s. Pratt & Whitney said the remaining engines will go to the forces of allied nations that also fly the aircraft.

If all options in the contract are exercised, Pratt & Whitney said it could cover as many as 518 engines at a total value of about $8 billion.

This deal is intended to keep F135 engines in production while Pratt & Whitney and the F-35 JPO finalize a formal production contract for lots 15 through 17, for which they reached an agreement in principle in April.

Pratt & Whitney expects to start delivering these engines this year, and continue through the end of 2025.

This A-10C Warthog unit wants to bring more 'brrrrrt' to Europe

by Rachel S. Cohen
11 June 2022

Capt. Mariah Althaus, an A-10C Thunderbolt II pilot assigned to the 104th Fighter Squadron, Maryland Air National Guard, prepares for flight at Ämari Air Base, Estonia, May 18 in support of the Defender-Europe 22. The annual U.S. Army-led large-scale, multinational joint exercise aims to build readiness and interoperability between U.S., NATO and partner militaries.
(Tech. Sgt. Enjoli Saunders/Air National Guard)

A Maryland Air National Guard unit recently sent a fleet of 10 A-10C Thunderbolt II attack planes to participate in multinational combat exercises in eastern Europe, one of its largest training delegations there in the past decade.

It's the A-10 enterprise's latest step toward a greater presence in Europe as it pivots away from decades of combat missions in U.S. Central Command.

The 104th Fighter Squadron arrived in Iceland May 5 to participate for about two weeks in the Army's "Swift Response" exercise, then joined the "Defender Europe" exercise for another two weeks.

Budget boost in hand, Germany puts more sub-hunting planes on its shopping list

by Sebastian Sprenger
4 June 2022

WASHINGTON — German lawmakers today passed a €100 billion (U.S. $107 billion) defence budget boost, initiating a major spending spree over several years that is expected to include seven new P-8 Poseidon maritime-surveillance planes in addition to five copies ordered last year.

The bill to establish a special fund for Germany's armed forces, the Bundeswehr, passed parliament by a vote of 593-80, with seven abstentions. Together with the country's regular defence budget of roughly €50 billion, the money is meant to get Berlin to spend an average of 2 percent of its gross domestic product on defence over five years — a fiscal target set for NATO members.

The vote makes good on a push announced by Chancellor Olaf Scholz in late February to boost Germany's defences following Russia's invasion of Ukraine. Defence officials have said they want to use the extra money to reverse deep cuts made to Germany's military during the post-Cold War period, when a conflict in Europe involving Russia appeared unlikely.

A Patrol Squadron 4 sailor directs a P-8 Poseidon aircraft at Naval Air Station Whidbey Island off the coast of Washington state in 2016. (U.S. Navy)

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