

**MIRAGES
AT WAR**

**REMEMBERING
THE DELTA
WARRIORS**



**AEGEAN
KNIGHTS**

**EXCLUSIVE REPORT ON
INIOCHOS
EXERCISE-2022**



PAKISTAN AIR FORCE

SECOND to NONE

Spring, 2023

DRAGONS WEAR CAMO

GSTAR-2022

**SEMINAR
REPORT**



NASTP

**SPEARHEADING PAF'S
VISION OF NATION BUILDING**



BAHRAIN AIRSHOW 2022

**THUNDER OVER
BAHRAIN**



THE HIMALAYAN BATTLE LINES (PART -I)

BEYOND THE 1962 INDO-CHINESE BORDER CONFLICT

HELP FROM ABOVE

PAF'S FLOOD RELIEF OPERATIONS-2022

MAKING HISTORY

A FEAT TO REMEMBER AND CHERISH

GAME OF KINGS

REPORT ON CAS POLO CUP-2022

A VETERAN PAR EXCELLENCE

A TRIBUTE TO SQN LDR
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EDITORIAL TEAM

This issue of Second to None has been curated with an eye on the promising future and a humble glance on our proud past. We begin with an account of the International Defence Exhibition and Seminar, IDEAS, which is the most prestigious and largest defence show of Pakistan. PAF, being a regular participant, has always curated one of the most-visited exhibitions of the show. This year was no different, as PAF's National Aerospace Science and Technology Park (NASTP) bagged the prize of being the 'Most Decorated Stall' of the event. Another event that created substantial buzz in the defence circles was GSTAR-2022, an event organized by Centre for Aerospace & Security Studies (CASS). This year's theme was 'Evolving Global Order: Challenges and Opportunities' and the event featured in-depth discourses on international and regional security landscape. Another proud albeit very different event organized by PAF was the Chief of the Air Staff Challenge Cup Polo Tournament 2022, which started from 28 November. The PAF Sports Control

Committee collaborated with the Islamabad Polo Club to organize the thrilling event which featured incessant action owing to the best polo players from all over Pakistan.

The scope of PAF's events and participation is not and never has been constrained to national level. PAF aircraft and its dashing personnel has impressed people from all over the globe. A recent example of such an endeavour is the participation of PAF's best in the Bahrain Air Show 2022. The JF-17s' momentous performance amazed and thrilled, as it always does. However, this air show marked the proud and historic moment when PAF successfully carried out its first Air-to-Air Refuelling of JF-17 through its IL-78 during an international ferry flight. An impressive feat, to say the least. When talking of international exercises, another such event that attracted attention was Iniochos Air Exercise. Our foreign correspondent has comprehensively covered the same for our worthy readers. Air Exercises and similar events are important and a significant part of an air force's undertaking. However, it is imperative for an air force to respond to the call of the nation whenever situations may arise. The recent horrific floods are a prime example. Working alongside other

sister services and various other organizations, PAF worked day and night to ensure that it did all it could for those affected by the horrendous floods.

During the wars with our belligerent neighbour, the first aircraft that comes to mind are the Fury and the F-86. There is another. The persevering Harvard which would be known in the history of PAF as a veteran which trained scores of budding cadets during its service with PAF. Another aircraft that played a key role during 1971 war was the Mirage. Thrown into the foray shortly after being inducted, the sturdy aircraft proved its worth, holding its own against an air force almost five times in size. Of course, the Mirage would be nothing without its air and ground crew, which were equally capable. Talking of capability, one cannot help remember the impressive events of the 'Red-letter Day'. It was on that day PAF attained the historic feat by pulling-up a 16-aircraft formation loop, which the PAF men executed perfectly in front of a huge, awe-struck audience in 1958.

PAF men have a common attribute. The ability of keeping their head down and working tirelessly, not caring about reward or recognition. This was also the case with the life of SqN Ldr Ghani Akbar, SJ. The perfect example of a life led with purpose; the ace pilot has several achievements to his name which are adequately covered in our feature. Another fascinating piece in the issue is regarding the evolution of RADAR technology. From big concrete dishes to artificial elephant-like 'ears', individuals from over the globe invented interesting contraptions to give a few minutes of warning against approaching enemy aircraft.

We hope this issue is as interesting as the topics and lives up to the expectations of our worthy readers.

Happy reading!



Muhammad Ali

Air Cdre Muhammad Ali, SI (M) (Retd)
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A tribute to a war veteran who achieved outstanding feat during both the wars against the enemy.

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PAF C-130 AIRCRAFT BRINGS BACK BODIES OF SHUHADA OF BALOCHISTAN HELICOPTER CRASH

On 03 August 2022, C-130 aircraft of Pakistan Air Force carrying dead bodies of Commander XII Corps, Lieutenant General Sarfraz Ali Shaheed and Commander Engineers XII Corps, Brigadier Muhammad Khalid Shaheed arrived at PAF Base, Nur Khan. The officers had embraced martyrdom in a tragic accident on 01 August, 2022 alongwith four other military officials during flood relief activities.



Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force, expressed deep sorrow and empathy over the loss of precious lives in the crash. In his condolence message, the Air Chief said, "May Allah bestow the departed souls higher ranks in the Heaven and grant patience to the bereaved families".

Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force, expressed deep sorrow and empathy over the loss of precious lives in the crash. In his condolence message, the Air Chief said, "May Allah bestow the departed souls higher ranks in the Heaven and grant patience to the bereaved families".

COMMANDER DEFENCE FORCES OF HUNGARY CALLS ON AIR CHIEF

On 04 August 2022, Lieutenant General Romulusz Ruszin-Szendi, Commander Defence Forces of Hungary 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 enjoyed cordial relations and reiterated his resolve to further enhance the existing bilateral cooperation between the PAF and Hungarian Air Force. Both the dignitaries agreed to further revitalize defence ties including training and indigenous production. Various matters of professional interest and regional security also came under discussion during the meeting.



COMMANDER IRAQI NAVY CALLS ON AIR CHIEF

On 10 August 2022, Lieutenant General Ahmed Jasim Maarij Abdullah Al Zayid, Commander Iraqi Navy 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, Lieutenant General Ahmed Jasim Maarij Abdullah Al Zayid acknowledged PAF's rising indigenous capacity in aviation industry. The Air Chief said that Pakistan and Iraq had longstanding religious, cultural and historical bonds which were manifested through strong military ties between the two countries.



U.S. AMBASSADOR CALLS ON AIR CHIEF

On 16 August 2022, U.S. Ambassador to Pakistan H.E. Mr. Donald Blome called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. During the meeting, matters of regional security situation, enhanced bilateral and defence cooperation were discussed.



The visiting dignitary lauded the professionalism of PAF personnel and the exceptional progress made by PAF over the years, especially through indigenization. He also appreciated Pakistan's efforts in promoting regional peace and vowed to enhance cooperation in various fields. The Air Chief highlighted that both the countries enjoyed cordial relations and reiterated his resolve to further enhance the existing bilateral cooperation between the two strategic partners. CAS further said, "Pakistan values its strong diplomatic, economic and defence relations with United States of America which are based on convergence on all important issues relating to regional peace, security and stability".

Both sides agreed to further optimize military to military ties particularly in training and operational domains.

GRADUATION CEREMONY OF NO 56 COMBAT COMMANDERS' COURSE HELD



On 24 August 2022, The graduation ceremony of No 56 Combat Commanders' Course was held at Airpower Centre of Excellence (ACE). Air Marshal Hamid Rashid Randhawa, HI(M), Deputy Chief of the Air Staff (Administration), Pakistan Air Force was the chief guest on the occasion.

While addressing the course participants, the chief guest said that ACE had polished their professional skills and enhanced their tactical awareness. He stressed that officers must continue to strive for excellence in their upcoming assignments as core professionals. He further said that success in future wars depended on timely addressing new trends in warfare, enhancing contemporary technologies and integrating future capabilities. The chief guest also expressed his satisfaction on implementation of emerging warfare concepts in the elite institution of PAF. He awarded certificates and trophies to the graduating officers who underwent a strenuous and professionally demanding course.

Chief of the Air Staff Trophy for overall best performance amongst combat pilots was awarded to Squadron Leader Osama Sharif Ghani while Air Officer Commanding Air Defence Trophy for overall best performance amongst combat controllers was awarded to Squadron Leader Muhammad Ayaz.

The ceremony was attended by Air Officers and field commanders of Pakistan Air Force.

PSF COMBAXX INTERNATIONAL SQUASH TOURNAMENT 2022 CONCLUDES AT MUSHAF SQUASH COMPLEX

On 28 August 2022, Pakistan Squash Federation (PSF) in collaboration with Pakistan Air Force organized PSF Combaxx International Squash Tournament for Men at Mushaf Squash Complex, Islamabad between 24-28 August, 2022. The event had a prize money of USD 12000. 24 squash players from Egypt, Malaysia, Iran and Pakistan participated in the mega event.



Air Marshal Zulfikar Ahmed Qureshi, HI(M), Deputy Chief of the Air Staff (Training), Pakistan Air Force, graced the closing ceremony as Chief Guest and awarded trophies & prize money to the finalists. While lauding the PSF efforts for providing international-standard training and coaching facilities to the players, the chief guest reiterated that the PAF and the PSF would continue to sponsor talented young players besides making concerted efforts to help the country regain its glory in world squash.

PAF OBSERVES 7th SEPTEMBER AS MARTYRS' DAY

Pakistan Air Force observed 7th September as Martyrs' Day at all the country. The day started with special prayers and Quran Khawani for the Shuhada of 1965 & 1971 Wars and those who sacrificed their lives in action since the creation of Pakistan.

Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force was the chief guest during a Martyrs' Day Ceremony held at Air Headquarters, Islamabad. Addressing on the occasion, the Air Chief said that PAF had proud history of sacrifice, valour and professionalism. Brave sons of the soil had always responded to nation's call and marked glories with their blood during 1948, 1965 & 1971 Wars, Ops Sentinel and Operation Swift Retort. Pakistan Air Force had evolved due to great legacy of forefathers and the airforce was striving for the advancement in space, electronic warfare, cyber, niche technologies and indigenous defence capability to ensure sovereignty and territorial integrity". Air Chief had appreciated the efforts of PAF personnel for relief and rescue operations during the recent floods. He further expressed solidarity with Kashmiri brothers and sisters in their indigenous and just struggle for self-

determination. To pay homage to the martyrs, the Air Chief laid floral wreath at the Martyrs' Monument and offered "Fateha". Principal Staff Officers, Officers, Airmen and PAF civilians attended the ceremony.

Earlier in the day, a wreath laying ceremony was also held at the grave of Pilot Officer Rashid Minhas Shaheed, (Nishan-i-Haider) at Karachi. Air Vice Marshal Zaeem Afzal, Air Officer Commanding Southern Air Command, offered 'Fateha' and laid floral wreath at the grave of the Shaheed on behalf of Chief of the Air Staff, Pakistan Air Force.



CHIEF EXECUTIVE OFFICER TRANSFORMATION MANAGEMENT OFFICE MINISTRY OF DEFENCE, KINGDOM OF SAUDI ARABIA CALLS ON AIR CHIEF

On 07 September 2022, H.E Dr Samir AbdulAziz Al Tubayyab, Chief Executive Officer, Transformation Management Office, Ministry of Defence, Kingdom of Saudi Arabia called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. During the meeting, matters of regional security situation, enhanced bilateral and defence cooperation were discussed.



Dr Samir AbdulAziz Al Tubayyab commended the professionalism of PAF and acknowledged its rising indigenous capacity in aviation industry. The visiting dignitary also appreciated Pakistan's efforts in promoting regional peace.

CAS said that Pakistan and Saudi Arabia enjoyed longstanding religious, cultural and historical bonds manifested through strong ties between both the countries. The Air Chief further highlighted that the advancement in space, electronic warfare, cyber, niche technologies coupled with artificial intelligence had profoundly affected the traditional environment of national security and Pakistan Air Force focused in acquisition and development of these technologies.

Both sides agreed to further optimize military to military ties particularly in training and operational domains.

CHINESE AMBASSADOR CALLS ON AIR CHIEF

On 09 September 2022, Ambassador of the People's Republic of China, H.E. Mr Nong Rong, called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. Several key areas of mutual interest along with regional developments were discussed.



Chief of the Air Staff shared broad contours of PAF's modernization drive to achieve operational capability in the contemporary warfare in air, space and cyber space domains as per the PAF's operational construct. The Air Chief also highlighted that both the countries enjoyed unprecedented strategic partnership and reiterated his resolve to further enhance the existing bilateral ties in military to military cooperation and training domains between PAF and PLAAF. CAS further said, "Pakistan values its strong diplomatic, economic, defence relationship and time-tested friendship with China which are based on convergence on all important issues relating to regional peace, security and stability".

The visiting dignitary praised the professionalism of PAF personnel and the exceptional progress made by PAF over the years, especially through indigenization. He appreciated Pakistan's efforts in promoting regional peace. Both leaders vowed to further consolidate cooperation in various fields including emerging technologies and mutual cooperation in military industry. The honourable Ambassador also offered heartfelt condolences to the people of Pakistan over the loss of life and devastation caused by floods in Pakistan.

C-17 AIRCRAFT CARRYING FOOD & SHELTER RELIEF GOODS FROM USA LANDS AT NUR KHAN AIR BASE

On 09 September 2022, US C-17 aircraft arrived at PAF Base, Nur Khan carrying humanitarian aid for the flood affectees in Pakistan. The aircraft was received by high ranking officials of Pakistan Air Force. The United States operated several sorties comprising of life saving humanitarian supplies through an air bridge to Pakistan to provide support to the flood affectees. The humanitarian relief support by the US is aimed at providing succour to the sufferings of flood victims and help Pakistan during a testing time.



AIR CHIEF INSPECTS PAF OPERATIONAL AIR BASE



On 17 September 2022, in order to carry out operational evaluation of PAF installations, newly constructed infrastructure, equipment and support units, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force visited operational base Skardu in the Northern Sector.

Addressing the personnel, the Air Chief said that, "This enhancement of the infrastructure and capability would augment PAF's operational flexibility and enable generation of prudent response in the complex operational environment in the sector. PAF was now better poised for added sustenance and innovative application of air power in the North. Besides maintaining the highest professional standards, circumstances demanded operational readiness to respond to any external/internal security challenge. The advancement in space, electronic warfare, cyber, niche technologies coupled with artificial intelligence had profoundly affected the traditional environment of national security. In order to provide safe and secure environment against all threats, the armed forces of Pakistan would continue to synergize their efforts by bridging the capability gaps through timely induction programs. PAF in synergy with its sister services was ever ready to counter any threat to the sovereignty of the sacred motherland. Pakistan Air Force would never be intimidated by stockpiling of weapons by the enemy."

The Air Chief was briefed on the role and task of the various units with a focus on operational and administrative tasks and various projects of infrastructure development being carried out at the base. Later, he visited various installations where he interacted with the officers and airmen. Interacting with the air and ground crew, the Air Chief lauded the level of motivation and thorough professionalism of PAF personnel.

Earlier on his arrival at the base, the Air Chief was received by Principal Staff Officers and base key staff.

AIR CHIEF OVERSEES OPERATIONAL EXERCISE OF PAKISTAN AIR FORCE

On 28 September 2022, Pakistan Air Force conducted an operational Air Defence exercise focusing at fostering synergy while considering future warfare challenges. The aim of the exercise was to practice counter air operations in order to validate contemporary employment concepts. The exercise was focused on integration of PAF and Pak Army air defence assets while training PAF operational crew to develop, practice and validate tactics against envisaged threats.



Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force oversaw the operational PAF Air Defence exercise. While monitoring the conduct of exercise from Command Operations Center, the CAS assessed integration and synergistic employment of offensive and defensive forces in synergy with Army Air Defence in order to validate contemporary employment concepts under near-realistic threat scenarios. PAF operational assets including fighter aircraft, air defence elements, force multipliers and Battle Management Centers were also integrated in the exercise.

GRADUATION CEREMONY HELD AT PAF ACADEMY, ASGHAR KHAN

On 29 September 2022, The Graduation Ceremony of 146th GD(P), 92nd Engg, 102nd Air Defence, 92nd & 94th Royal Saudi Air Force Engg Cadets' Courses were held at PAF Academy Asghar Khan, Risalpur today. General Nadeem Raza, Chairman Joint Chiefs of Staff Committee was the Chief Guest on the occasion. On arrival at the Academy, the Chief Guest was received by Air Vice Marshal Muhammad Qaisar Janjua, Air Officer Commanding, PAF Academy Asghar Khan.



A total of 115 Aviation Cadets, 10 Gentleman Cadets and 22 Royal Saudi Air Force Cadets graduated at the passing out parade ceremony. The Chief Guest awarded branch insignias to the graduating cadets and Trophies to the Distinction Holders. Chairman Joint Chiefs of Staff Committee Trophy for the best performance in General Service Training was awarded to Aviation Cadet Academy Under Officer Sabeeh ud Din, whereas Chief of the Air Staff Trophy for best performance in Engineering discipline was awarded to Aviation Cadet Squadron Under Officer Mohammad Saqib Sher. Chief of the Air Staff Best Pilot Trophy for outstanding performance in Flying Training was awarded to Aviation Cadet Ahsen Ali Khattak. Best Allied Cadet Trophy for 92nd Royal Saudi Air Force Cadets' Course was won by Royal Saudi Air Force Cadet Fahad Mobarak Al Johani whereas, Best Allied Cadet Trophy for 94th Royal Saudi Air Force Cadets' Course was awarded to Royal Saudi Air Force Cadet Waleed Khalid Abdullah Al Turki. Sword of Honour for overall best performance in College of Aeronautical Engineering was won by Aviation Cadet Squadron Under Officer Mohammad Saqib Sher, whereas Sword of Honour for overall best performance in College of Flying Training was awarded to Aviation Cadet Mohammad Saad Bangash.

STUDENTS OF PAF SCHOOLS & COLLEGES CONTRIBUTE IN FLOOD RELIEF ACTIVITIES

On 11 October 2022, Recent monsoon rainfall and the super floods demanded great efforts and support for saving humanity, working shoulder to shoulder with the Pakistan Air Force personnel. Students of PAF schools and colleges made indigenous efforts to bring cheers amongst the distressed children of flood affected areas.

The PAF students came together to raise funds on their own to buy treats which included chocolates, sweets and stationery items for the brothers and sisters in these testing times. More than 17000 packets comprising sweet treats were distributed in the flood affected areas which brought back the lost smiles on the faces of suffering children.



The activity reflected PAF's resolve of being the first responder to the nation's call wherein PAF had always stepped forward for conduct of relief activities to alleviate the sufferings of those affected by natural disasters.

DEPUTY DEFENCE MINISTER, IRAQ CALLS ON AIR CHIEF

On 17 October 2022, Secretary General Jabbar Thejel Mutlag, Deputy Defence Minister, Iraq called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. During the meeting, several key areas of mutual interest, enhanced bilateral relations and defence cooperation were discussed.

Secretary General Jabbar Thejel Mutlag, Deputy Defence Minister, Iraq commended the professionalism of PAF and appreciated Pakistan's efforts in promoting regional peace.

Chief of the Air Staff said that Pakistan and Iraq enjoyed longstanding religious, cultural and historical bonds manifested through strong ties between both the countries. The Air Chief further highlighted that the advancement in space, electronic warfare, cyber and niche technologies coupled with artificial intelligence had profoundly affected the traditional environment of national security. Pakistan Air Force was fully focused in acquisition and development of these technologies through smart inductions and human resource development for cost effective operations.

Both the dignitaries also agreed to further optimize the existing ties between both the air forces particularly in training and operational domains.



DIRECTOR JOINT CHIEFS OF STAFF OF THE SAUDI ARMED FORCES CALLS ON AIR CHIEF



On 17 October 2022, a Saudi Armed Forces delegation led by Major General Hamed Bin Rafei Al Amri, Director Joint Chiefs of Staff of the Saudi Armed Forces, called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office today. During the meeting, matters of regional security situation, enhanced bilateral and defence cooperation were discussed.

Major General Hamed Bin Rafei Al Amri expressed his grief over the devastation caused by floods in Pakistan and offered sincere condolence to the families of the victims. He praised efforts of PAF personnel for their support to civil administration in

relief activities and rehabilitation process of the flood affectees. The dignitary also acknowledged the rising indigenous condolences of PAF in aviation industry and agreed to further optimize the existing ties between both the air forces particularly in training and operational domains.

Chief of the Air Staff shared broad contours of PAF's modernization drive to achieve operational capability in the contemporary warfare in air, space and cyber space domains as per the PAF's operational construct and said that Pakistan Air Force was fully focused in acquisition and development of these technologies. The Air Chief said that Pakistan and Kingdom of Saudi Arabia enjoyed longstanding religious, cultural and historical bonds which are manifested through strong ties between both the countries. CAS thanked the visiting dignitary for the unflinching support extended by Kingdom of Saudi Arabia and reiterated that assistance from our global partners shall be vital for rescue and rehabilitation of the flood victims in Pakistan.

PRESIDENT OF THE ISLAMIC REPUBLIC OF PAKISTAN VISITS AIR HEADQUARTERS

On 19 October 2022, the inaugural ceremony of a two-day flagship international seminar titled 'Global Strategic Threat and Response' (GSTAR) arranged by Centre for Aerospace & Security Studies (CASS) was held at Air Headquarters, Islamabad. Dr Arif Alvi, President Islamic Republic of Pakistan was the chief guest at the occasion. On his arrival at Air Headquarters, Islamabad he was received by Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force.



President Dr. Arif Alvi in his inaugural speech appreciated the PAF's key initiatives directed towards maximising the field of knowledge into its operations. The President appreciated the CASS administration for the conduct of a thought provoking seminar on the contemporary strategic issues. The President said, "The complex dynamics of the world politics has exponentially changed the traditional balance of power and security environment which demands befitting response through national cohesion. The present era marked the creation of new centres of power created by technology and wealth. There is a need to construct a new order on the basis of equality of humans, respect for human security, harnessing of new technology and a commitment to peace."

CAS-SERENA HOTELS INTERNATIONAL MEN & SERENA HOTELS-COMBAXX SPORTS INTERNATIONAL WOMEN SQUASH CHAMPIONSHIP-2022 CONCLUDES AT MUSHAF SQUASH COMPLEX

On 23 October 2022, Pakistan Squash Federation (PSF) in collaboration with Pakistan Air Force, Serena Hotels and Combaxx Sports, organized Chief of the Air Staff Serena Hotels- International Men & Serena Hotels- Combaxx Sports International Women Squash Championship at Mushaf Squash Complex, Islamabad Islamabad. Held between 19-23 October 2022, as many as 48 players from 16 countries including Germany, Spain, Egypt, Singapore, Austria, Malaysia, Serbia, USA, Brazil, Hungary, England, Qatar, Czech Republic, Iran, Kuwait & Pakistan participated in men and women mega events.



Air Marshal Muhammad Zahid Mahmood, Vice Chief of the Air Staff, Pakistan Air Force graced the closing ceremony as chief guest and awarded trophies and prize money to the finalists.

The women's final was played between World No 72 Ms Fayrouz Aboelkheir from Egypt and World No 82 Ms Malak Khafagy also from Egypt. Fayrouz Aboelkheir defeated Malak Khafagy with a game score of 6-11, 12-10, 4-11, 11-6, 12-10 in 37 minutes.

AIR CHIEF INAUGURATES AIR BOSS OPERATIONS ROOM & AIR BATTLE MANAGEMENT SCHOOL AT AIR POWER CENTRE OF EXCELLENCE

Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force inaugurated newly established Air Boss Operations Room and Air Battle Management School at Air Power Center of Excellence on 20 January, 2023.

While addressing on the occasion, the Air Chief said, "Pakistan Air Force has realigned its operations with special focus upon high-quality combat training and prompt induction of modern weapon systems. He further added that Pakistan Air Force has prepared itself for the challenges of the 21st century and is fully capable of thwarting any potential threat".



AIR CHIEF INSPECTS OPERATIONAL AIR BASE OF PAKISTAN AIR FORCE

Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force inspected PAF Base Rafiqui to carry out operational evaluation of the PAF installations, equipment and support units on 11 January, 2023.



The Air Chief expressed his satisfaction as regards to the overall combat readiness of the base. He also lauded the exceptional response of base personnel during the rescue and rehabilitation of flood victims in the aftermath of recent floods in the country.

GERMAN AMBASSADOR CALLS ON AIR CHIEF



On 03 November 2022, Ambassador of the Federal Republic of Germany, H.E. Mr. Alfred Grannas, called on Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force in his office. Several key areas of mutual interest along with regional developments were discussed.

Chief of the Air Staff shared broad contours of PAF's modernization plan of smart acquisitions from allied countries, upgradation of infrastructure and revamping of training. The Air Chief also highlighted that both the

countries enjoy unprecedented strategic partnership and reiterated his resolve to further enhance the existing bilateral ties in the military to military cooperation. CAS further said, "Pakistan values its strong diplomatic, economic and defence relationship with Germany which is based on convergence on all important issues relating to regional peace, security and stability".

The visiting dignitary offered heartfelt condolences to the people of Pakistan over the loss of life amidst devastation caused by floods and appreciated the efforts put in by Pakistan Air Force for relief and rehabilitation of the flood victims. The honourable Ambassador praised the professionalism of PAF personnel and the exceptional progress made by Pakistan Air Force over the years, especially through indigenization. He also appreciated Pakistan's continuous efforts for regional stability and pledged to play his role for further improvement in diplomatic cooperation with Pakistan at all levels.

Both sides agreed to further consolidate existing military-to-military ties particularly in training and operational domains.

NASTP SPEARHEADING PAF'S VISION OF NATION BUILDING

“National Aerospace Science and Technology Park under the visionary leadership of ACM Zaheer Ahmed Baber Sidhu, CAS PAF is proudly spearheading PAF's vision of nation building as envisaged by the father of the nation. The author brings out an in-depth account about the vision, mission and dynamics of this unique organization for us to be proud of.”

by Air Cdre Liaquatullah Khan Niazi

Right: AVM Abbas Ahmed Ghumman briefing ACM Zaheer Ahmed Baber Sidhu, CAS PAF during IDEAS-2022. (All Photos: PAF Archives unless specified).

Right Center: ACM Zaheer Ahmed Baber Sidhu, CAS PAF had a busy day while meeting foreign dignitaries during IDEAS-2022.

Title Photo: A futuristic looking Stall of NASTP remained the center of attraction for the general public during IDEAS-2022. (All photos PAF archives unless specified).



munitions manufacturing, simulators and AR / VR Systems etc.

(b) AEDs are located in North, specializing in ground handling equipment, special vehicles, radar MRO / upgrades, C-130 Mods / Upgrades, and multi-domain support including Robotics, EODs and MRO of Payloads.

(c) R&D Units undertake design, research and development in the fields of EW, EO/IR, ISR and Drone Systems.

Initially, most of PAF aircraft and systems were sent to their countries of origin for major overhauls and repairs, that resulted in loss of operational time in Beyond Country Repair (BCR), loss of foreign exchange and host of allied logistics and technical challenges. PAF

leadership therefore, envisaged huge challenges in MRO of several types of fighter aircraft and Pakistan Aeronautical Complex (PAC) was established in 1973. PAC has evolved over last five decades from an MRO facility, setup for F-6 Aircraft, called F-6 Rebuild Factory (F6RF) in Kamra, into a huge complex of four factories over 2500 acres of land with 16000 skilled work force and more than 100000 population. Currently, PAC has the capacity to undertake MRO of all kinds of military and selected commercial aircraft, engines, radar and payloads as well as production of UAVs, trainer and fighter aircraft with flagship SMK and JF-17 Thunder.

The same activity also continued to synergize PAF organic R&D capability and PAF constituted its major R&D setup called

Inlets (Below): Pride of Pakistan, JF-17 Thunder and PAC Kamra's most successful product, the Super Mushshak remained the center of attraction for foreign and local dignitaries alike during IDEAS-2022.

The 11th Edition of International Defence Exhibition and Seminar, IDEAS 2022 was held from 15th – 18th November, 2022 at Karachi Expo Centre. The mega event was significantly commemorated through enhanced participation of Pakistan Armed Forces, national and international defence industry, OEMs, entrepreneurs, and high level national and international defence delegations. The new features were aimed to make IDEAS an effective platform for defence Buyers and Sellers. Pakistan Air Force is the air warfare branch of the Pakistan Armed Forces which is tasked with providing, in synergy with other services, the most efficient, assured and cost-effective aerial Defence of Pakistan. Furthermore, Pakistan Air Force provides air logistic support capability and strategic air transport to the Pakistan Army, Pakistan Navy and various government departments on requirement basis. Pakistan Air Force also actively contributes in nation building efforts and thus poised on the threshold of tomorrow, PAF remains, “Second to None”; fully abreast with the indispensable mechanisms to live by its standards in the coming millennium and beyond. PAF has been operating various types of aircraft since national independence including British, American, French and Chinese origin. While on one hand these aircraft and weapon systems have been providing the PAF with much needed war fighting capability, there have also been serious obsolescence and interoperability challenges apart from restrictions, embargos and export controls.

In order to mitigate these challenges, PAF leadership has been responding proactively by establishing MRO Depots as well as several R&D centers for core capabilities in data automation, sensor fusion, systems and weapons integration etc across Pakistan.

(a) AEDs are located in South with 75 – 100 years of excellence in Aerospace, Engines, Avionics, Aerostructure, MRO, Systems integration, testing, qualification,



Aviation Research, Innovation and Development (AvRID) as well as certification agency called PAF Air Worthiness Certification Authority (PACA).

Given establishment of the Projects Branch (now headed by three-star Air Marshal), AvRID, PACA and COEs of PAF Depots and Organic R&D Setups (NCW Tech, 606 Wing, Special Task Group, CoCS, CRDC etc), current PAF leadership has envisioned to establish National Aerospace Science and Technology Parks (NASTP) across Pakistan to nurture much needed Triple Helix Model. NASTP will provide eco-system of essential elements required to nurture design, research, development and innovation in the aviation, space and cyber domains, needed by the PAF to have supremacy in future warfare. Chief of the Air Staff PAF, Air Chief Marshal Zaheer Ahmed Baber Sidhu has provided overall vision and mission statement of the Project:-

NASTP Vision

Become one of the best Aerospace, Cyber & Computing Clusters in the world and transform national landscape with design, R&D and innovation centers for emerging and disruptive technologies.

NASTP Mission

Foster collaborative research, development and innovation in the fields of Aviation, Space, Cyber & Computing to ensure social, economic, technological and scientific benefits for Pakistan and our valuable partners.

NASTPs will be established at selected regional locations and shall have comprehensive set of elements of the overall eco-system of Project based on specific location, market analysis, presence of key industry, institutions, PAF Air Engineering Depots, private companies and engineering centers. Regional NASTPs shall aim to build mini-clusters around themselves comprising local industry, institutions, technology incubation centers and IT Parks etc.

NASTP Unveiling at GSTAR 2022


Global Strategic Threat and Response (GSTAR) is a biennial international forum initiated by CASS. This event brings national leadership, reputable international and Pakistani experts from think tanks, academia, defence services, intellectuals, and OEMs together at one platform. GSTAR 2022 was held on 19-20 October 2022. His Excellency President of Islamic Republic of Pakistan Dr Arif Alvi was the chief guest at the inaugural session on 19 October, 2022.

This day now holds a significant spot in the technological, economic and defence landscape of Pakistan, as worthy CAS declared the inception of National Aerospace Science & Technology Park (NASTP) at the GSTAR forum in the presence of national leadership, local industry and international audience. This unveiling garnered an immense interest and initiated a national-level dialogue on the far-reaching effects on the knowledge economy of Pakistan.

Overview of NASTP Alpha Rawalpindi


NASTP Alpha has following key elements:-

NASTP STALL DECLARED WINNER AT IDEAS-2022



The 11th Edition of International Defence Exhibition and Seminar, IDEAS-2022, concluded at Karachi Expo Center. PAF's stall of National Aerospace Science and Technology Park (NASTP) won the prize of being the Most Decorated Stall of the event which portrays the hard work and commitment of the entire PAF team. NASTP kept gathering admiration from the visitors and foreign dignitaries throughout the 4 days show of IDEAS-2022. The NASTP project, which as per CAS vision and his own initiative has materialized in record time, is aimed at establishment of Industry-Academia linkage to provide an eco system of essential elements required to nurture design, research, development and innovation in aviation, space and cyber domains.

Around 285 foreign defence delegations from 64 countries participated in IDEAS-2022 which is reflective of the huge significance of the exhibition. The success of NASTP at IDEAS-2022 is the beginning of the wonders which the project is all set to perform in years to come. The mega event provided an opportunity to Pakistan Air Force to showcase indigenous projects in front of the audience from around the globe and will encourage foreign defence collaborations.




(a) NASTP Technology Divisions in Aircraft, Space, Radar, EW, EO/IR, Cyber, Computing, Advanced Airborne Comm Systems & Technologies, C2 Systems and Software Development

(b) NASTP Training Division with two flagship projects NASTP Aviation Academy and NASTP Instt of Technologies & Systems

(c) National Incubation Center for Aerospace Technologies (NICAT)

(d) Training and Incubation Center for Cyber & IT called Siber Koze with Turkish Collaboration

(e) PAF Air Worthiness Certification Authority (PACA)

(f) Center for Artificial Intelligence & Computing (CENTAIC)

(g) National Center for Cyber Security (NCCS)

(h) Certification Center with SISCO and HUAWEI Labs

(j) Hardware Certification Center ACAST

(k) Alpha Techno Square (ATS) for private companies and Daftarkhwan for Co-Working Spaces

(l) Amenities including but not limited to Banks, ATMs, Cafeteria, FMS, Day Care, Business Centers, Conference Rooms

Benefits, Advantages & Incentives of NASTP for the Private Sector

NASTP will thus provide following benefits to Academia and Industry:-

(a) Quality Human Resource.



Top Left: Free Fall jumps remained the hallmark of the air show held for general public during IDEAS-2022.

Top Right: ACM Zaheer Ahmed Baber Sidhu, Chief of the Air Staff Pakistan Air Force visiting stalls of PAF pavillion in the 11th edition of international Defence Exhibition.

Right: A day was kept by PAF for the aerial display for the general public during IDEAS-2022. Seen in illustration is a PAF Mirage showing its delta wings during the flying display.=



(b) Linkages with national and international companies.

(c) Prototyping, Manufacturing, Product Certification, Testing and Qualification Services.

(d) Quality Training Courses as per the latest requirements of the industry.

(e) Technology Incubation.

(f) Consultancy services from all of the aforesaid NASTP Divisions.

(g) Expos for products and services.

(h) Access to databases of companies, services, manufacturing and software houses.

(j) Data, Cloud Computing and HPC Services.

(k) Incentives for R&Ds.

(l) Startups Support – Trainings, Venture Capital, Endowments.

(m) Scholarships & Job creation.

(n) STZ benefits such as exemption on customs duties and taxation.

Evolving Global Order: Challenges and Opportunities

19-20 October 2022

CASS
CENTRE for AEROSPACE & SECURITY STUDIES

GSTAR 2022 SEMINAR REPORT

EVOLVING GLOBAL ORDER: CHALLENGES AND RESPONSIBILITIES

“Momentous developments are taking place across all domains which are deeply affecting the global, regional, & national security environment. Moreover, rapidly emerging technologies and their diverse military applications are making the international and regional security landscape far more complex, volatile, and delicate. This necessitates an intellectual initiative at the global level to comprehensively map and review such developments, analyze their implications, and explore viable policy options to mutually chart a way forward to help build a more stable world and regional order. It is in this context that the GSTAR-2022 with the theme of 'Evolving Global Order: Challenges and Opportunities' was organized by Centre for Aerospace & Security Studies (CASS) at Air Headquarters, Islamabad.”

by Editorial Team

Two-day flagship International Seminar titled 'Global Strategic Threat and Response (GSTAR)' from 19-20 October, 2022 under the core theme 'Evolving Global Order: Challenges and Opportunities' was organized by Centre for Aerospace & Security Studies (CASS) at Air Headquarters, Islamabad. The biennial event GSTAR is a unique international forum, initiated by CASS to review the most significant global strategic trends and challenges.

The seminar featured international scholars and practitioners from Canada, China, Germany, Latvia, New Zealand, United States and United Kingdom. In addition to the inaugural and closing plenaries, the seminar had four thematic sessions on International Security Environment: Emerging Challenges & Opportunities, Geo-economics: Driver of the Asian Century, Emerging Technologies and Future Warfare, Aerospace Security: Determinants and Future Prospects.



Air Chief Marshal Zaheer Ahmed Baber Sidhu, CAS PAF presenting a souvenir to President of Pakistan, Dr Arif Alvi.



Evolving Global Order: Challenges and Opportunities

19-20 October 2022



Above: ACM Zaheer Ahmed Baber Sidhu, CAS PAF addressing at GSTAR-2022.

Left: President of Pakistan, Mr Arif Alvi addressing at GSTAR-2022.

The seminar highlighted the significance of technological advancement, global strategic threats and response management in the wake of future aerial warfare.

During the inaugural ceremony, Dr Arif Alvi, President Islamic Republic of Pakistan was the chief guest. On his arrival at Air Headquarters, Islamabad he was received by Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force.

President Dr. Arif Alvi in his inaugural address appreciated the PAF's key initiatives directed towards maximising the field of knowledge into its operations.

The President appreciated the CASS administration for the conduct of a thought provoking seminar on the contemporary strategic issues. The President said, "The complex dynamics of the world politics has exponentially changed the traditional balance of power and security environment which demands befitting response through national cohesion. The present era marked the creation of new centres of power created by technology and wealth, therefore, there is a need to construct a new order on the basis of equality of humans, respect for human security, harnessing of new technology and a commitment to peace."

Earlier CAS in his welcome address said, that the growing rivalry between major powers had resulted in weakening of international institutions and emergence of traditional and non-traditional security issues. In the context of new technologies, he highlighted the dangerous consequences of selective sharing and its effect on regional stability. The Air Chief emphasised on the need for international consensus to address the challenges of these technologies. He reiterated the resolve of the PAF to contribute towards securing the national interests of the country. In this regard, he informed about significant initiatives being planned in various domains including operations, capability enhancement, organization and training, to make PAF a cutting-edge force.

The Air Chief also announced the formal launch of the National Aerospace Science and Technology Park (NASTP) aimed at giving impetus to the process of indigenization and

technology drive in the country. The first park of its kind would be inaugurated this year while two others would follow in near future.

Later, President Dr. Arif Alvi met Air Chief in his office. The President was briefed on the operational readiness and PAF's unflinching resolve to ward off any external threat to national security. CAS highlighted PAF's comprehensive plan for growth of in-country capabilities in the well-established as well as emerging disruptive technologies in Aerospace, Cyber, IT and Artificial Intelligence domains.

While acknowledging the critical role of PAF in the defence of motherland, the President underlined the importance of air force in contemporary geo-political milieu. He lauded PAF's efforts and contributions beyond call of duty by assisting the government of Pakistan in responding to natural calamities. He expressed highest level of confidence in the visionary PAF leadership and stated that PAF's

Human Resource, technical, operational and industrial domains were well poised to achieve excellence which had always been a hallmark of Pakistan Air Force.

SESSION 1

Speakers of Working Session I on 'International Security Environment: Emerging Challenges & Opportunities' included Ambassador Robin L. Raphel, Senior Advisor, Center for Strategic and International Studies, USA; Dr Yan Xuetong, Dean, Institute of International Relations, Tsinghua University, China; and Ambassador Riaz Mohammad Khan, Former Foreign Secretary, Government of Pakistan. The session was moderated by Ambassador Jalil Abbas Jilani, Advisor Foreign Affairs at CASS. According to Ambassador Robin Raphel, strategic competition with China

required a major allocation of diplomatic, strategic and economic resources; and stressed that the US Indo-Pacific Strategy would provide an opportunity for stable balance of power in the region. On the other hand, Dr Yan Xuetong argued that China-US competition was going to get worse in the next decade. He warned that deglobalisation in the future could create both traditional and non-traditional challenges for nations around the globe. He also highlighted that data technology had changed the concept of warfare in the world. 'It is, unfortunately, being used in disinformation campaigns creating challenges for developed and developing nations', he said. Discussing 'US-China Rivalry: Options for Pakistan', Ambassador Riaz Mohammad Khan agreed that China was focusing on its

Below: ACM Tahir Rafiq Butt, Ex CAS PAF along with participants to GSTAR-2022.

Bottom: President of Pakistan, Mr Arif Alvi and ACM Zaheer Ahmed Baber Sidhu, CAS PAF along with the participants of GSTAR-2022.



Evolving Global Order: Challenges and Opportunities

19-20 October 2022

linkages in the Asia-Pacific in cooperative terms; and countries would have to adjust to different dimensions of US-China rivalry.

SESSION II

Dr Moeed W. Yusuf, Former National Security Advisor, Government of Pakistan was the keynote speaker for the second session 'Goeconomics: Driver of the Asian Century', while other speakers included Dr Una Aleksandra Bērziņa-Čerenkova, Head China Studies Centre, Riga Stradins University, Latvia; Dr Karl J. Moore, Associate Professor, McGill University, Canada; and Dr Wang Wen, Executive Dean, Chongyang Institute for Financial Studies, China. Dr Usman W. Chohan, Director, Economic Affairs and National Development, CASS, moderated the proceedings. In his keynote address, Dr Moeed W. Yusuf emphasised the need

for Pakistan to keep economic security at the core of its security matrix, which he said required a focus on geoeconomics, without overlooking geostrategy. To that end, he said, Pakistan must aim to develop regional connectivity and seek development partnerships rather than aid partnerships. He cautioned that the world was moving towards 'economic nationalism' marked by increasing restrictions, sanctions and coercive measures. Countries, he argued would need to be highly competitive to be successful in such an environment. Speaking from Canada, Dr Karl Moore highlighted that while there were echoes of the past in modern-day globalisation, the two were vastly different. However, China throughout ancient, medieval, and even modern times, had remained the only country that had always played a central

role. In his view, the fragility of globalisation was leading to more focus on regionalisation. according to Dr Una Aleksandra Bērziņa-Čerenkova, geoeconomics was a welcome lens in a debate saturated with security discourse. She agreed that US-China competition had expanded and noted that China's ambitions were just as strong as the US. 'We have been under the impression that economic interdependence can deter. There is some truth to it. But when ambitions and strategies trump these arguments, it is not a deterrent', she said. Dr Bērziņa-Čerenkova stressed that middle and small country agency among big rivalry was paramount for stability. Speaking on peaceful regional connectivity and prosperity, Dr Wang Wen from China stressed that 40 years of peace had delivered an era of prosperity

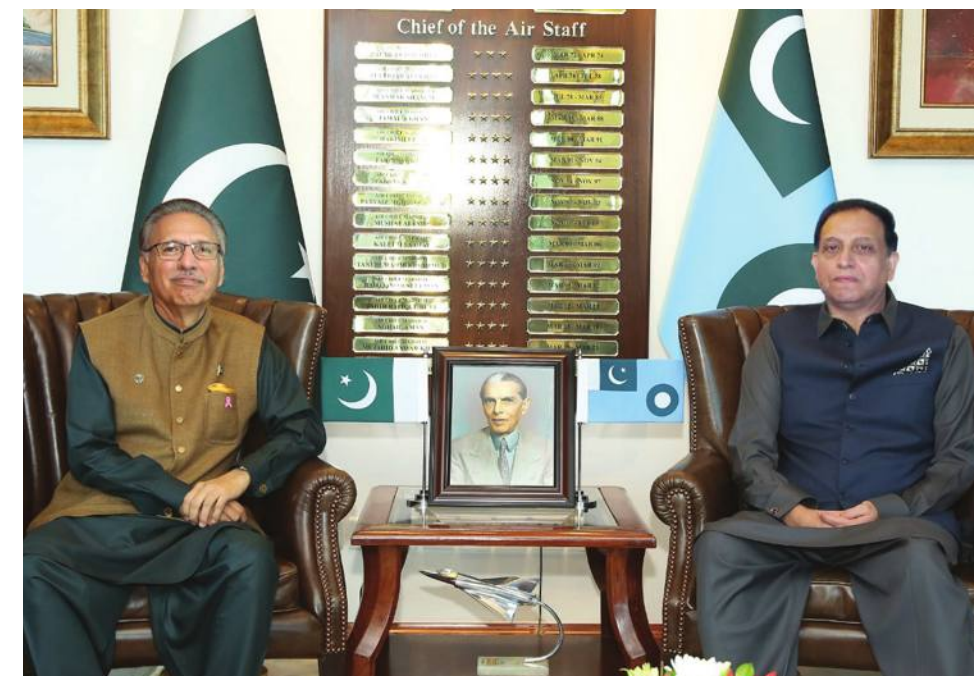
Above: Air Marshal M. Ashfaq Arain moderating the 3rd session of the seminar.

Bottom: ACM Zaheer Ahmed Baber Sidhu, CAS PAF addressing at the inaugural session of GSTAR-2022.

in East Asia. This, he said, had been possible despite a diverse cultural, religious, and political environment. He emphasised on the continuity of policies and focus on integrated regional connectivity for prosperity in the Asia-Pacific region.

SESSION III

In working session III on 'Emerging Technologies and Future Warfare', Lieutenant General Khalid A. Kidwai, NI, HI (M) (Retd), Advisor National Command Authority & Former Director General, Strategic Plans Division, Government of Pakistan was the keynote speaker, while other distinguished speakers included Senior Colonel Yang Jun (Retd), Senior Research Fellow, China Institute for International Strategic Studies (CIISS), China; Dr George Malcom Moore, Scientist-in-Residence & Adjunct Professor, James Martin Center for Non-proliferation Studies, Middlebury Institute of International Studies, USA; and Ms Marina Favaro, Senior Research Fellow, Institute for Peace Research & Security Policy, University of Hamburg, Germany. Air Marshal M. Ashfaq Arain, HI (M), SBT (Retd), Advisor Chief of the Air Staff on CASS Affairs and Director Emerging Technologies, CASS, moderated the proceedings. In his keynote address, Lt General, Kidwai (Retd) emphasised the fact that emergence of new technologies was not a new phenomenon but a constant historical fact which was likely to continue in the future as well. A spectacular technology, when inducted in a weapon system, tends to affect stability for a while but soon a counter technology or antidote is developed which acts to restore the stability. In the context of South Asia, Lt. General Kidwai said that the West in its bid to strengthen India as a counterweight to China has been violating international rules and norms by arming and



selectively sharing technologies with it which has put strategic stability in the region under stress. India, on the other hand, he said, has always been careful to follow its interests rather than completely playing to one side. Lt. General Kidwai at the end reiterated that Pakistan like always would respond to restore stability in the region. Senior Colonel Yang Jun from China discussed how future warfare could only be won by grasping the laws and characteristics of modern warfare, jumping out of the box of traditional thinking and stereotypes and taking into consideration systems, data and algorithms, exploring new operation concepts, designing new approaches to victory, strengthening the integration of warfighting & technological development and that of research and operations, and drawing on others' strengths to make up for one's own shortcomings. In his presentation, Dr George Moore from the US discussed how the current and future proliferation of drones and Lethal Autonomous Weapon Systems had changed both military and civil security, including the impact of AI and removal of the human element from lethal decision-making. He

opined that the potential use of drones, particularly Uncrewed Aerial Vehicles would lower the threshold for conflict given the ongoing issues raised by UAV operations in Ukraine. 'There are no conventions or agreements governing use of drones. This area could gain prominence after the Ukraine war,' he concluded. Ms Marina Favaro from Germany defined emerging technologies as those scientific discoveries and technological applications that had not yet reached maturity or were not widely in use, but were anticipated to have major - perhaps disruptive - effect on international peace and security. She cautioned that great power competition would be the main driver behind future research and development in the US, Russia, and China. 'A possible China-Russia alliance could confront the US with serious military-technological challenges', she concluded. The two-day international conference was attended by diplomats, senior military officers, and heads of various think tanks, scholars, journalists and students.

Above: President of Pakistan, Mr Arif Alvi and ACM Zaheer Ahmed Baber Sidhu, CAS PAF, during a meeting at AHQ Islamabad.



THUNDER OVER BAHRAIN

PAF participates in Bahrain Air Show-2022

“The JF-17s Thundery performance at the recent Bahrain Air Show-2022 was not the only news which made it to the headlines of prominent media outlets during last month. PAF's first ever air-to-air refuelling event of JF-17 during an international ferry flight was a much bigger news story, attracting the attention of global audience. The author brings out a historical account of the star-studded air show where JF-17 Thunder was in the spotlight.”

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



The morning of 5 November, 2022 saw something unique happening in the clear blue skies of western Pakistan. A PAF IL-78 air-to-air refueller lurking around in the specified area waiting for the three JF-17 Thunders to join up. Soon the three-ship formation of Thunders appeared from behind the giant tanker and the wait was over. Without any difficulty, the first pair of Thunders got itself hooked-up to the tanker through the giant looking basket, the drogue. Within minutes the activity was over and Thunders broke off for the final destination, Bahrain. It was the red-letter day for PAF which would be remembered in the history as the day when for the first time, any aerial platform of PAF carried out live air-to-air refueling during an international ferry mission. A historic and proud day for the PAF, indeed.

The three-ship Thunder formation headed to the capital of Bahrain, Manama where the red-carpet reception awaited them. The honor of participation in Bahrain Air Show, this year, went to the elite No 2 Sqn of PAF who are known by their unique and proud callsign, “The Minhasians”. The call sign is a tribute to Plt Off Rashid Minhas (Shaheed), who is the only recipient of Nishan-e-Haider (the highest gallantry award of the country) of PAF. No 2 sqn carries the proud legacy of young Rashid Minhas whose name is synonymous with gallantry for the Pakistani nation. Wg Cdr Mudassir Riaz along with his under-command pilots including Sqn Ldr Sibatain Akhtar, Sqn Ldr Fahad and Sqn Ldr Hassan from No 2 Sqn were selected to perform at the air show. A contingent comprising technicians,



Inlets: ACM Zaheer Ahmed Baber Sidhu, CAS PAF met with various senior military and civil dignitaries during his visit to Bahrain Air Show-2022. (All Photos PAF Archives unless specified).

Bottom: Three JF-17s from No 2 Sqn of PAF flew from Pakistan to Bahrain to participate in Bahrain Air Show-2022. Seen in illustration is a JF-17 getting ready for aerial display during the Air Show.

marketing and sales production team under the leadership of Air Cdre Arsalan from PAC Kamra also attended the air show. Aesthetically curated and well-designed PAF chalet was also erected at the air show to display various indigenously manufactured aviation products of Pakistan Aeronautical Complex.



As per plan, three JF-17 Thunders of No 2 Sqn ferried from Karachi to Manama, Bahrain on the 5th November, 2022. The sixth edition of the Bahrain International Airshow (BIAS) 2022 kicked off at the Sakhir Air Base on 9th and continued till 11 of November. The opening ceremony of the airshow was a spectacular event. It was Officially opened by HRH Prince Salman bin Hamad Al Khalifa, Prime Minister of Bahrain who is also the Deputy Supreme Commander of the Defence Forces of Bahrain. Besides large number of foreign dignitaries, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force was also in attendance at the opening ceremony of Bahrain Air Show. While interacting with the Pakistan Air Force contingent, the Air Chief lauded PAF personnel's performance in the air show and said that their participation in the event was a matter of pride for the nation and appreciated their efforts for bringing laurels to the country. He also praised the PAF team for putting up a nice show at the mega event. Later on, he visited various stalls and met several high-ranking officials.

On the first day, the afternoon skies over Sakhir Air Base echoed with the roar of the variety of aircraft which included all types of fighter and commercial airplanes vying to impress the public. Gulf Air 787, RBAF, Pakistan's Pride JF-17 Thunder, Fursan Al Emarat, UAE Mirage 2000, RSAF Typhoon, USAF F-16 demo team, Global Stars, Red Arrows, DHL B767-300 Flypast, UAE F16, Saudi Hawks and P-8 all participated on the first day to make it a memorable event.

A huge applause continued as the Pakistan's indigenous state-of-the-art JF-17 Thunder took off for its breathtaking performance. Piloted by Sqn Ldr Sibtain Akhtar,



Above: Wg Cdr Mudassir Riaz performing last minute checks as his alert ground crew looks on.



Left Inlets: Wg Cdr Mudassir Riaz signs the post flight documents after a thundery performance at the airshow. A PAF ground crew guiding the incoming JF-17 to its parking spot.



Pakistan Air Force performed air-to-air Refuelling during the deployment of JF-17 Thunder aircraft at Bahrain International Air Show, BIAS 2022. Although PAF has been successfully conducting such activities inland during operational missions and exercises, however, the capability was further consolidated by conducting air-to-air refuelling on international waters through PAF's own tanker aircraft during a long-haul ferry mission for the first time.

History in the Making: Bahrain Air Show will go down in the history of PAF as an event which marked the beginning of the new era. It was during this event PAF's JF-17s for the first time in the history carried out air-to-air refueling from PAF's IL-78 tanker during an international ferry mission to Bahrain. The collage of pictures depicts the same historical moment for our worthy readers.





the performance of JF-17 Thunder remained the highlight of the inaugural day of the show. Landing gears still down, the roaring Thunder pulled up vertically showing off its enormous engine thrust. High 'G' turns, half Cuban 8s, inverted flight, barrel rolls, high alpha pass, muscle climb and signature thunder roll were some of the maneuvers that enthralled the cheering crowds. Classic vertical roll was the finale of the entire sequence which lasted for around three minutes. On subsequent days, Wg Cdr



Above: Wg Cdr Mudassir Riaz and Wg Cdr Sibtain Akhtar were the two display pilots who performed during the Bahrain Air Show-2022. Seen in illustration is Wg Cdr Sibtain Akhtar getting ready for the display flight.

Bottom Left: One JF-17 Thunder with all its lethal arsenal was put on static display which remained the star of Bahrain Air Show-2022.

Bottom: Air Cdre Arsalan of PAC Kamra along with dignitaries pose in front of the pride of Pakistan, JF-17 Thunder.



Mudassir Riaz and Sibtain Akhtar performed in tandem for the general public.

One JF-17 Thunder, along with variety of weapons that could be carried on the aircraft, was also put on the static display at the air show for the general public. At the display venue, PAF personnel briefed the eager crowd about the combat aircraft's operational capabilities and sophisticated weaponry. The spectators were ecstatic to see the pride of Pakistan at the show as majority of them saw the much-talked-about aircraft for the first time.

The participation of JF-17 Thunder aircraft in the air show has proved to be an excellent opportunity to showcase its cutting-edge capabilities. It has also given an opportunity to the potential buyers to assess the fighter jet's immense potential in the international market.



Top Insets: JF-17 Thunder participated for consecutive three days during the Airshow. Its thundery performance amused the large number of aviation enthusiasts during the Bahrain Air Show-2022.

Bottom: Nose to Nose: JF-17 Thunder waits for its turn to perform as UAE Mirage taxis back after landing.



GAME OF Kings

Report on CAS Polo Cup-2022
by S.Khalil



Air Chief Marshal Zaheer Ahmed Baber Sidhu, CAS PAF awarding trophy to the winning team. (All pics PAF archives unless specified)

PAF White defeated PAF Blue and bagged the winner's trophy in an exciting final of the 31st Chief of the Air Staff Challenge Cup Polo Tournament with 5-1/2 to 5 goals.

It was a remarkably blue-sky day at the Islamabad Polo Club, which is the home of contemporary polo in the capital city. On 6 December 2022, players tested their dexterity on the game's principles and from the lofty positions and at high speeds, whacked the polo ball sending it soaring down the field. Spectators were drawn to the vibrantly green and immaculately groomed field, keen to indulge in the rich traditions shared both on and off the polo ground.

Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force was the chief guest on the occasion. The Air Chief Marshal Zaheer Ahmed Baber Sidhu gave away prizes to the players and awarded CAS Challenge Polo Cup Trophy to the winning team. The Air Chief congratulated the winners and appreciated the club management for the successful conduct





of the event. CAS also emphasized upon the significance of sports for the improvement of psychomotor skills and physical health of the youth.

PAF Sports Control Committee in collaboration with Islamabad Polo Club management organized the 31st Chief of the Air Staff Challenge Cup Polo Tournament-2022, which commenced from 28 November, 2022. With all the domestic stars of the game in action in the incomparable setting of Islamabad Polo Club stunning grounds, situated in the heart of the capital, the tournament drew in polo aficionados from all over Pakistan.

Six polo teams namely PAF Blue, PAF White, Asean, ASC Rizvi, ASC Ahmed Khan and ASC Vaulters participated in the mega event. Diplomats, high ranking civil and military officials along with polo enthusiasts witnessed the final match. PAF regularly contributed to nation building efforts by organizing such tournaments. The event was widely appreciated both at domestic and international levels which was a manifestation of the PAF's commitment to promote sports in the country.

HISTORY

Polo is perhaps the oldest team sport, related to the inspirational relationship between humans and horses. This bond and the unique blending of athletic talents between horse and rider has helped polo to evolve.

Veteran polo player Wg Cdr Fahad Aziz said that although the precise origin of Polo was obscure and undocumented, there was ample evidence of the game's regal place in the history of Asia. No one knows where or when stick first met the ball but it seemed likely that as the use of light cavalry spread so did the rugged game on the horse back. He explained that as mounted armies swept back and forth across this part of the world, polo was adopted as the most noble of pastimes by the kings and emperors, Shahs and Sultans, Khans



and Caliphs of the ancient Persian, Arab, Mongols and Chinese. "It was for this reason it became known across the lands as 'The Game of Kings,'" the Wg Cdr explained who is also captain of the team PAF White.

Polo continues, as it has done for so long. The feeling of many of its players were epitomized by a famous verse inscribed on a stone at a polo ground in Gilgit,

"LET OTHERS PLAY AT OTHER THINGS, THE KING OF GAMES IS STILL THE GAME OF KINGS".

In Pakistan, the Pakistan Polo Association (PPA), formed in 1947, is the governing body, to promote and organize polo locally. The renowned

polo tournament in the country took place annually on the Shandur Pass at 11,000 feet elevation, the highest polo ground in the world where a Chitral vs Gilgit tournament was held every June. The rules of the game here dated back 800 years to those created by a descendent of Genghis Khan himself.

In 1982, PAF Polo Club was formed, on the request of Air Marshal Rahim Khan to then Air Chief Marshal Anwar Shamim. Air Marshal Sharbat Ali Changezi became the first president of PAF Polo Club while Flight Lieutenant Khalid Kamal Tampton, the first PAF Polo Club Secretary. In 1986, Pakistan Air Force Polo Team was formally included into PPA and was granted formal membership.

Over the years, due to continuous efforts of Air Marshal Sharbat Ali Changezi Air Chief Marshal Pervaiz Mehdi Qureshi, Air Chief Marshal Mujahid Anwar Khan, Air Marshal Amer Masood, and tremendous support of air staff today, PAF Polo Club was well organized and established facility for all PAF personnel.

Subsequently, PAF had produced polo players explicitly. Air Marshal Amer Masood, Air Commodore Haider Ali Shah, Air Commodore Nausher, Air Commodore Kazmi, Wg Cdr Fahd Aziz, Squadron Leader Hamayun, Squadron Leader Haider and Sqn Leader Hamza, were few names known for their horsemanship, professionalism and dedication amongst the Pakistan polo community.



All Photos: A collage of illustrations of the final match.

Bottom: Air Chief Marshal Zaheer Ahmed Baber Sidhu, CAS PAF along with the officials and the members of winning team at the closing ceremony of the tournament.





HELP FROM

ABOVE

PAF'S FLOOD RELIEF OPERATIONS-2022

“Like unprecedented devastation carried out by floods in 2010, this year’s destruction caused by the deluge was no different. According to survey carried out by World bank, the economic loss to the country is in tune of USD 15.2 billion, besides thousands of lives lost during the calamity. However, PAF rose to the occasion as expected and played a key role in carrying out flood relief operations alongside other sister services.”

by Gp Capt Muhammad Bahroni



When the founder of Pakistan, Quaid-e-Azam Muhammad Ali Jinnah, visited Pakistan Air Force School in Risalpur on 13th April, 1948, he articulated these historic sentences: “There is no doubt that any country without a strong Air Force is at the mercy of any aggressor. Pakistan must build up her Air Force as quickly as possible. It must be an efficient Air Force Second to None and must take its right place with the army and the navy in securing Pakistan’s defence.” Since the Father of the Nation was well aware of the significance of an Air Force for the defence of the country, he wanted Pakistan to build a robust Air Force capable of competing with a power many times its size. This is the result of the Quaid’s illustrious vision that today Pakistan Air Force is counted amongst the world’s best Air Forces.



Since military organizations are well-suited to nation-building tasks owing to their immaculate training and discipline, the purpose of maintaining regular armed forces by any country is to not only to ensure national security but these institutions are often the first responders during natural calamities and disasters in addition to playing their critical role in nation building efforts. Ever since the inception of Pakistan, PAF has been actively involved in nation-building efforts; may it be the relief operations in the aftermath of natural calamities like floods, earthquakes, draughts or may it be contribution in sports, education, healthcare and establishing industry-academia linkage as per the Air Staff vision.



The torrential monsoon rains of 2022 triggered the most severe flooding in Pakistan’s recent history, washing away villages and leaving millions in dire need of lifesaving support, and at increased risk of waterborne diseases, drowning and malnutrition. Hundreds of thousands of homes were washed away while many public health facilities, water systems and schools were destroyed or damaged. The



damage was almost unimaginable, hundreds of precious lives were lost. Likewise, floods destroyed thousands of houses and many low-lying villages were washed away. Flood water ruined all the standing crops too. The loss of lives, property, livestock and crops resulted in a catastrophe that is unprecedented in the history of Pakistan. All this situation brought a new series of challenges for the immediate rescue, relief and rehabilitation of the flood victims. As the floodwaters started to recede, the crisis transformed into an acute child survival crisis. Frail, hungry, children fighting a losing battle against severe acute malnutrition, diarrhea, malaria, dengue fever, typhoid, acute respiratory infections, and painful skin conditions were in dire need of support. Pakistan Air Force being the first responder to the call of the nation exhibited the fullest vigilance in helping the fellow country men in the hour of need.

Following the catastrophic destruction caused by floods, Air Chief Marshal Zaheer Ahmed Baber Sidhu, Chief of the Air Staff, Pakistan Air Force issued the directives to establish the organizational setup for the swift assistance of the needy people. PAF took the lead and served the finest in performing all the assigned duties. For this purpose, all the operational and non-operational Air Bases of PAF were tasked to extend all out support to the flood victims during the testing times.

The directives of PAF's leadership were very clear; *No stone to be left unturned to provide Rescue, Relief and Rehabilitation to the flood victims.* Following the directives and keeping the tradition of serving the nation during natural calamities, Pakistan Air Force personnel came to the succor of the flood affected families of Naltar valley, KPK, South Punjab, Baluchistan and Sindh. Relief camps and field hospitals were immediately established in the flood affected areas with centralized command and control at Air Headquarters, Islamabad. Additionally, PAF Help Desk was established at Disaster Relief Cell for provisioning of relief and rescue related information. On the directives of the Air Chief, PAF Flood Relief Fund was also established which was judiciously utilized for rehabilitation of the flood victims. National ISR and Integrated Air Operations Centre (NIIAOC) was established at Air Headquarters, Islamabad worked round the clock to coordinate rescue and relief efforts in synchronization with all stakeholders. The centre also provided all out support to civil administration in the rehabilitation process.

At the field level, free medical facilities and medicines were provided to the affected populace round the clock in the field hospitals established by Pakistan Air Force. PAF Medical Lab collection points extended prompt sampling and diagnosis of the water-borne diseases amongst flood victims

NIIAOC LEADS HADR OPERATIONS IN PAKISTAN



Over the period, natural calamities and disasters are on the increase owing to global warming and various other climate change phenomena. More specifically, our region and especially our country are the most effected ones in the present times. Pakistan in last 15 years or so has seen horrendous calamities like earthquake in 2005, super floods in 2010/ 2011 and most recent floods this year. This required a comprehensive national response to deal with such calamities and in response NDMA (National Disaster and Management Authority) was established to address all such issues. The major stakeholders in the new set-up remained the three-armed forces owing to their enormous capabilities, provision of unique assets and expertise. Historically, out of the three services, PAF had always played an important role while carrying out such humanitarian efforts owing its unique characteristics of reach, speed and ubiquity. Most recently, keeping in view this factor, the present Chief of the Air Staff, Air Chief Marshal Zaheer Ahmed Baber Sidhu decided to utilize these capabilities to their optimum and gave a new vision of carrying out these operations with more synergy and effectiveness. As per his vision, the newly established set-up with a name of NIIAOC (National ISR & integrated Air Operations Centre) at AHQ was integrated with the national disaster management system. Over the period this new set-up became the nerve Centre for carrying out all sorts of humanitarian efforts under the umbrella of HADR (Humanitarian Assistance and Disaster Relief) operations. The new set-up proved to be a welcome addition in the national disaster management as its efficacy and operational capabilities were put to test while carrying out HADR operations during this year's horrendous floods. Under the instructions of Chief of the Air Staff all PAF assets were made available for the search & rescue, relief and rehabilitation efforts of the affected people. During this year's HADR operations, the NIIAOC played a pivotal role in leading these national humanitarian effort as they had real time picture available at its Command & Control Centre. This real time and updated picture helped the senior management of the PAF to take informed decisions thus paving way for effective HADR operations. During one of his visits to NIIAOC at AHQ, the honorable President of Pakistan, Dr Arif Alvi highly commended the unflinching efforts of men in blue during these crises.





A total of 54 flood relief centres and 03 central aviation hubs were established all across the country.

Pakistan Air Force Women Association (PAFWA) under the dynamic leadership of President PAFWA, Begum Air Chief Marshal Zaheer Ahmed Baber Sidhu joined by ladies of PAF Regional Air Commands, Chairpersons PAFWA at bases, PAC Kamra, PAF Academies and PAF Training Institutes established PAFWA Relief Camps at all the bases of Pakistan Air Force to collect donations and clothing items for those in need. Cash donations, clothing items, blankets and essential medical supplies were despatched in flood relief camps established by PAF throughout the country for further distribution amongst the needy. The vision of President PAFWA, active participation of the ladywives and overall generous spirit of PAF women community resulted in collection of Rs 32.516 Million in cash and 245,000 clothing items which were provided to ease the sufferings of the flood affectees.

As the flood water started to recede, maximum efforts were diverted towards the rehabilitation process of the flood affected populace and thus Pakistan Air Force distributed 02 months ration amongst the flood affectees enabling them to be self sufficient until the rehabilitation work was completed in flood hit zones. PAF personnel took unprecedented initiatives for the well being and timely provisioning of basic necessities of food, shelter, drinking water and medical assistance to the flood victims during the rehabilitation phase as well. While the situation of national level floods demanded great efforts and

following which they were provided with free medical care at PAF field hospitals and medical camps. On the other hand, Emergency Response Teams of Pakistan Air Force extended all out support to the civil administration to provide the much needed medical, shelter and food facilities to ease the pain of the flood victims. The Emergency Response Teams also evacuated several families to safe areas. Relief goods were flown to the areas, by PAF transport and helicopter fleet, which had been cut off by land routes and thus Pakistan Air Force established an air bridge to provide the much needed food and medical supplies. Despite the inclement weather the highly skilled PAF aircrew continued the relief operation to provide humanitarian assistance to the flood affectees. The relief operation by PAF aircrew was truly a practical manifestation of Pakistan Air Force's resolve to extend all out support to fellow countrymen in the hour of need.

Approximately 33 million people got directly affected during the floods. Starting from June that continued till mid of September, heavy rains and floods claimed thousands of precious lives. The task of rehabilitation for PAF was huge. The foremost was of provisioning of food and shelter to the homeless people. PAF began to set up the tent cities and chose the suburbs of main cities for making these temporary colonies for the flood affectees. PAF while remaining cognizant of the situation established relief centres at various locations throughout the country with centralized command and control at Air Headquarters, Islamabad.



support for saving humanity, working shoulder to shoulder with Pakistan Air Force personnel, students of PAF Schools & Colleges too made indigenous efforts to bring cheers amongst the distressed children of flood affected areas. The PAF students came together to raise funds on their own to buy treats which included chocolates, sweets and stationary items for the brothers and sisters during the testing times. More than 20,000 packets comprising sweet treats were distributed in the flood affected areas which brought back the smiles on the faces of suffering children.

Owing to the floods one third of Pakistan went underwater. Food which is the first survival source got totally unavailable in the areas inundated in water. With passage of each passing day the situation continued to get worsen. Following the directives of PAF's leadership, provisioning of food & drinking water was ensured in the flood affected areas and 4,847.02 tons of ration, 330510 litres of fresh/mineral water, 7529 tents and 1,284,486 food packs were distributed in various flood affected districts. Additionally, 21 tent cities were established where 19807 personnel have been accommodated. Pakistan Air Force also established the second largest tent city about 150 KM away from Karachi in collaboration with the Turkish relief agency AFAD. The family sized tent city comprised of 500 make-shift houses which have been improvised to shelter homes keeping the upcoming weather conditions in winter. PAF Emergency Response Teams were deployed in 30 districts which rescued 1521 stranded people till date. Additionally, PAF's Air Mobility Command carried out 108 sorties of C-130 and 158 helicopter sorties to distribute ration all across the country. 46 Medical camps were established by PAF in which advanced and tertiary care was provided to 93,115 patients.

In the aftermath of the horrible floods, Pakistan Air Force personnel led from the front to come to the succor of the fellow countrymen. PAF has definitely appeared in lead to rebuild Pakistan. The natural calamity can be damaging but the determination to restructure is greater. The entire Rescue, Relief and Rehabilitation operation by Pakistan Air Force personnel, wives and students of Fazaia Schools & Colleges is reflective of PAF's resolve of being the first responder to the nation's call wherein PAF has always stepped forward for the conduct of relief activities to alleviate the sufferings of those affected by disasters and natural calamities. Every single individual of PAF reiterates the pledge and resolve to defend sovereignty and territorial integrity of the country, while continuing to play their role in Nation building efforts thereby truly earning the title of being the Sentinels in Sky.



Aegean Knights



Exclusive Report on Iniochos Exercise-2022

“The largest aerial exercise held in the Mediterranean area is by far the Iniochos exercise. The Elliniko Polemiki Aeroporia (Hellenic Air Force) has organized and developed this exercise with the military personnel of the Air Tactics Centre in Andravida. Through the years, several nations have been invited to participate in the exercise. Given the high level of HAF personnel and the capability to involve a variety of weapon systems within one of the largest exercise area's in Europe, the Iniochos exercise intends to become one of the competitive exercises in Europe and the Mediterranean region. The endeavour strives to provide participants with a high level of training and an experience jam-packed with learning.”

by Vincent Martens



Title Photo: A Spanish Air Force EF-18M seen during take-off. the Spanish aircraft were deployed to Greece, they were supported by air-to-air refueling by an Italian KC-767A.

Left: A F-4E Phantom getting airborne, fully-loaded with three fueltanks and a targetting designation pod.

Right Bottom: A Royal Air Force Eurofighter Typhoon taxiing back to its shelter area. Owing to several operations outside the UK, squadron markings have been removed.

The Iniochos exercise was held for the first time in the late 1980's as a small-scale tactical exercise. It was designed as a practical training program for aviation personnel, covering planning and execution of Combined Air Operations (CAMAQ) in a realistic environment, in order to test and evaluate operational plans and tactics. Over the years, the exercise proved to be a success and the Greece Air Force made the decision to organize this as an annual event.

The Hellenic Fighter Weapons School (FWS), which is responsible for the execution and conduction of the exercise was deployed

to Larissa AB. On this base, the air force established the National Centre for Air Operations, which had all the necessary facilities to cater to the extensive demands of such an endeavour. The FWS also formed the 'White Cell' during the Iniochos exercises. The White Cell was responsible for the coordination and planning of operations. The participating aircraft were also deployed to Larissa and flew their missions from this airbase. In 2005, the exercise was decentralized again and, at the time, aircraft flew from their own home-bases to partake in the missions. Meanwhile, the coordination and planning of the operations by the White Cell now took place at the Air Tactics



The duration of the exercise is based on 15 calendar days, but the exercise is actually divided into four phases:

- Phase 1: Exercise preparation
- Phase 2: Force Deployment
- Phase 3: Execution Phase
- Phase 4: Force Redeployment.





Centre (ATC) and Fighter Weapons School facilities at Andravida Air Force Base. In November 2013 the air force once again decided to develop the exercise into a single base model and this was tested in 2014. The objective was to create a more realistic and demanding environment. In 2015, the air force decided to launch the exercise as an INVITEX (Invitation Exercise). For the first time, foreign countries were invited to be a part of the exercise and the Israeli Air Force and USAFE Special Forces became the first foreign participants. Since then, it has brought hundreds of participants together in on-site planning, briefing and debriefing. Participants are exposed to multiple-threat environments and have to develop multi-faceted plans to tackle each scenario effectively. The exceptional flying environment, the Egean Sea, does not have any restrictions. Because of the participation of the Greece Army, Navy and Special Forces different threat levels were implemented into the exercise through the years. More foreign countries have found the way to Andravida and the exercise is expanding rapidly.

The FWS still has the responsibility to oversee the missions, from scenario planning up to the debrief. To make

certain that the missions covered the full spectrum of missions flown currently by the HAF. Some of the missions flown are for instance;

- Air Operations versus Integrated Air Defence Systems
- Reconnaissance missions
- Combat Search and Rescue missions
- Time Sensitive Target Missions
- Dynamic Targeting / Strike Coordination and Reconnaissance / Close Air Support
- High Value Airborne Asset / Protect - Attack
- Slow Mover Protection
- Offensive Counter Air / Airfield Attack
- Air interdiction on special targets (bridges, power stations, vehicles)
- Anti-Surface Warfare

The prevalent scenario of the exercise is the escalation of local crises into a full scale international conflict. Naval and army forces provide the full scale threat and target array. During the exercise, the operation makes use of the majority of the Athens FIR. The Accurate Shot / Event Assessment is also an important part of the scenario. This is achieved with the use of on-board and off-board tracking data, sensors and specialized debriefing

software. All these devices are used to reconstruct the missions, under the experience of Fighter Weapons School instructors who oversee the debriefing process.

The expected outputs of the exercise include developing inter-operability and standardization between HAF units and allied nations Air Forces, developing integration of tactics, techniques and procedures during air, land and air-sea operations, the use of legacy and modern assets integrated into a modern battlefield and preparing aircrews for any potential future battlefields. The mission commanders who plan the CAMAOs during the exercise are rotated daily. They plan, arrange and organize the available weapon systems, with the help of the other participating air forces. During the operational days, two missions are undertaken; one in the morning (take off time 10.00 hours local) and the second mission starts around 14.30 hours. The mission commanders also plan evening missions.

Participants in the morning missions fly mostly above the Aegean Sea, and the afternoon participants fly above the mountainous areas. On some days, local missions are flown before

Top: Coming back from an afternoon mission, four F-4E Phantom aircraft enter the airfield for a low approach with clearly visible smoking engines.

Right: All the French Mirage aircraft were stationed at Nancy AB. Two of them can be seen flying here with, full after burner.

Center: During the exercise, time is of the essence. A F-4E during take-off for a local test flight.

Bottom: In 2021, the UAE Air Force participated with four F-16s. One of them can be seen coming back from an early evening mission.



The Italian Air Force brought fifth-generation F-35 to Iniochos. One of them comes in for a landing, wearing the 100 years anniversary marking of 13 Gruppo on its tail.

the actual Iniochos flight. These flights are planned to take not more than an hour, since the pilots have to be back at Andravida before the Iniochos morning mission. The exercise includes air refuelling aircraft, mostly one KC-135 from the USAF and occasionally also a KC-707 from the Israeli Air Force on standby.

For the first time in the history of the exercise, 3rd, 4th and 5th generation aircraft flew missions together during the 2019 edition. The participation of the Italian Air Force that year was of great importance for the exercise and the other participants. Six F-35s from the 32 Stormo and six Tornados from the 6th Wing were sent to Andravida. The Tornados were divided into three Tornado Interdiction Strike (IDS) aircraft and Tornado Electronic Combat Reconnaissance (ECR) aircraft. All this with about 200 pilots, navigators, technical and logistic personnel. The main objective for the ITAF was the integration between the F-35 and 3rd and 4th generation aircraft. Crews of the 6th Wing and 32nd Stormo operated in complex and high-stake training scenarios. Pilots flew Composite Air Operations training flights that included Suppression / Destruction of Enemy Air



Defence (SEAD and DEAD), Close Air Support (CAS), Defensive Counter Air and Offensive Counter Air (DCA /OCA). The Air to Surface Integration (ATOSI) between the three different generations of fighter aircraft was of great technical and educational importance. The F-35s flew side-by-side with the Tornado ECR from 155 Gruppo during Iniochos. This is relevant owing to the fact that the Lightning II is expected to replace the ECR Tornado in the future. The Tornado ECRs were flying SEAD and DEAD missions, while the Hellenic Land and Sea forces acted as enemy threats. To make these missions more realistic and challenging the Tornados flew with the CATM-88B captive air training missile. As part of large strike packages, the F-35 also carried out joint missions with the F-4E of the Hellenic Air Force. The Lightning II was equipped with both the MADL (Multifunction Advanced Data Link) and Link 16 that allows the aircraft to communicate with the other generation aircraft. Another exceptional fact was that aircraft from two fighter squadrons at Araxos Air Base (335/336 Mira F-16C/D) flew missions from their own airfield, while participating during Iniochos. Pilots from Araxos went to Andravida for briefing

During the exercise, several call-signs are used by the participating Greece aircraft. The following callsigns are known:

117 Mira F-4: Toxo	330 Mira F-16 : Keravnos
338 Mira F-4: Aris	337 Mira F-16 : Ghost
332 Mira Mirage 2000: Geraki	335 Mira F-16 : Tiger
343 Mira F-16 : Star	331 Mira Mirage 2000: Theseas
341 Mira F-16 : Arrow	347 Mira F-16: Perseas
340 Mira F-16 : Alepou	
336 Mira F-16 : Olympus	

and debriefing because of the physical environment.

During the Covid-19 epidemic, Iniochos exercise could not be organized. But in 2021, Greece Air Force organized a 'healthy' exercise at Andravida. The organizers ensured enough space for the participating countries to operate in a safe environment. To achieve this, the Greece Air Force decided that all the local squadrons flying with the F-16C/D Block 52s would be relocated to Araxos Air Base, which is north of Andravida. Only one Block52 F-16C was at one point at Andravida because of the 'Elephant walk' exercise. A first-time participant was the Canadian Armed Force with experienced JTAC (Joint Terminal Attack Controller) teams. These teams are qualified service members who direct the action of a combat aircraft engaging in close air support and other offensive air operations. During the exercise, the JTAC teams were positioned into 'hostile' territory by the Cypriot National Guard using the AW 139 helicopter. Besides the Special Forces mission, the AW 139 also took part in the Combat Search and Rescue (CSAR) exercise.

The Greece Ministry of Defence announced that the air force was going to receive the Dassault Rafale as a new fighter. Six second-hand Rafales were delivered in July 2021, while the new aircraft will be delivered in 2022 and in early 2023. A total of eighteen aircraft are ordered which will replace the Mirage 2000BGM/EGM. It did not come as a surprise that the year after the first deliveries were completed, the French Air Force participated in the Iniochos exercise. During the exercise, the French participated with air force and navy Rafales. It was perfect opportunity to display the capabilities of the Rafale to the Hellenic Air Force and other parties. Substantial interest was shown in the Rafale's SPECTRA-EW suite (Self Protection Equipment to Counter Threats



Left: Page Above: The American Air Force squadrons stationed in Europe are regular participants of the exercise. Two F-15E Strike Eagle squadrons from RAF Lakenheath, UK, were deployed to Andravida for the exercise.

Left Page Bottom: Fine line-up of participating Israeli Air Force Fighting Falcons. In 2019, a total of twelve F-16s were deployed to Andravida.

1: A Block 52 F-16D from 343 Mira of Greece Air Force, one of the three fighter squadrons based at Souda AB.

2: An Mirage 2000-9EAD from the UAE Air Force during take-off from Andravida for a morning mission.

3: An F-16D from 109 squadron just before touch down. This squadron was moved further north in Israel, and was re-established at Ramat David AB.

Bottom: An French Air Force RafaleC taxiing back towards the shelter area.

for Rafale Aircraft). This system is developed by Thales and MBDA and all the aircraft that are built or upgraded as F3-R standard will have this capability.

A regular customer of the Iniochos exercise is the Israeli Air Force. During the last years several squadrons were deployed and different assets were used. What is gained by the IDF and why do they keep returning to Andravida? A Deployment Commander of the Israeli Air Force explained, "A formation of Blue aircraft fly low on their way to strike an airfield belonging to the enemy, the Red forces. The threat is challenging and the complex mission requires tight cooperation between aircrews from different countries. We act as Blue and Red forces at the same time. Each side is unaware of the plans from the others. Every day, each division takes a whole day to come up with the best possible plan, and the results are then examined in the debrief. The threats and mountainous topography requires that we plan our mission as precisely as possible and try to avoid encountering hostile forces. During the exercise, we chose to focus on low altitude flight and airstrikes on hostile areas. The setup and the area prepared for the exercise cannot normally be achieved in Israel. Besides the air operations, the training and cooperation with international militaries is very beneficial, as well. From maintenance crews and planning on the ground up to mutual flight, we strive prove our position as a significant and powerful air force". One of the IDF squadrons which participated in

the exercise was the 117th squadron at that time flying the F-16C. A pilot of the 117th who participated in the exercise reveals, "The terrain is unfamiliar, the threats are different to what we are used to and we have to face great uncertainty. A large amount of aircraft in the air makes for a mess in the airspace, and communicating in English makes everything more difficult. This makes everything feel like a sort of Tower of Babylon, where we have squadrons from many nations utilizing various aircraft with each flight formation focusing on a different mission and utilizing different munitions".

Such a large fighter jet deployment would not be possible without IDF Technical Department and the deployed soldiers who handled the field and aircraft maintenance. Explained by the commander of the Technical Department, "The main challenge in maintenance is doing it far from home,

when we don't have all our tools with us and our logistical support is limited. All we have is what we brought with us and we have to use that in order to succeed in our mission and help the aircraft take off safely. At all times, the Technical Department service members have to maintain the aircraft. The goal is to establish high-quality training for the aircrew members. Naturally, we are very curious regarding the ways other air forces maintain their aircraft, which are identical to ours. We participated in professional discourse with the US Air Force and learned about their maintenance ideology, as well as the organizational structure of their technical department".

The participating units are divided into Blue and Red forces, usually flying both from Andravida. Araxos could also be used as mentioned earlier like during the epidemic. The Blue forces can fly multiple smaller and bigger waves per day, but not every squadron



Left: F-16C from the 117 squadron of the IDF during an unusual take-off.

Left Bottom: Greek F-16s resting on the tarmac after another hectic day. The aircraft are from 347 and 341 Mira.

Centre Left: Every and all Greece Air Force fighter squadron display their capabilities during the exercise.

Centre Right: A F-16C/D on the taxi-track, about to take off. This particular F-16C is wearing the anti-radiation Half Glass 5 paint.

Bottom Right: A F-4 Phantom along the taxi-track, going towards a shelter while a Spanish F-18 lands in the backdrop.

will participate in every mission. The Red forces mainly operate in air-to-air role, but the Hellenic Army and Navy with ground-based air defence systems and ground-based radar stations support the Red Forces. In the 2022 edition of the exercise, more than 1100 fighter sorties were flown during the 11 days of the exercise. If you include the air refueling, early warning, transport and helicopter missions, the total would be around 2500. The USAF also flew standalone missions, utilizing the Hellenic Air Force ranges. To give the exercise an even more realistic environment, during the Iniochos 2022, the Hellenic Navy also ran some exercises with all types of submarines and warships.

Because of covering the broadest spectrum of air operations and the participation of maritime assets, the countries that wish to take part are

growing. Nations that participated already, with assets or as observers, are Israel, United States, Italy, Spain, France, Cyprus, United Arab Emirates, Canada, Germany, United Kingdom, Jordan, Kazakhstan, Egypt, Austria, Slovenia and Romania. As a result of the growing participation, the Greece Air Force is looking for more space and accommodation. When one of the F-4 squadrons at Andravida was disbanded in 2017, the space and buildings were immediately used for the exercise. Also a taxi track that was out of use for some years was restored and became operational again. Regarding new participants, indications are that Egypt and Saudi Arabia want to participate next year. The Iniochos exercise has grown and expanded through the years. It is quickly becoming or is already the main medium-scale air exercise in Europe and the nearby Middle East countries, a no small feat.





Meet the
HARVARD

“ What all planes won the wars against our belligerent neighbour? A list like that might feature airplanes from the Furs to the F-86s etc. There was, however, another candidate, an unlikely one for sure. Considering its importance of providing a steady flow of well-trained pilots, its impact could not be understated. Every nation that evolved in aviation from the 1940s onwards had some sort of help from the under-appreciated Harvard. Also known as the T-6, it could easily take the punishment of training. In combat operations, it gained a reputation of resilience and reliability. ”

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

In cities across Pakistan, vintage PAF aircraft rest quietly in museums and public places. They stand as important symbols of PAF history. School children and tourists admire them, take their pictures and leave them behind closed doors at the end of the day. Standing next to a nearly 70 years old Harvard at the PAF Academy Asghar Khan at Risalpur, one wonders if over the years its contributions have become a faded memory for some. To many members of the younger generation, just another aircraft in history. Little do they know that this slow but rugged trainer ravaged the enemy ground targets during the conflicts against India, and in the process, earning a place in the hearts of its pilots. It deserves better understanding and commemoration. In this aircraft our predecessors, with their blood and sweat, boldly wrote major chapters of PAF history. We must never forget their story and the legacy of their

experience that the price of freedom is eternal vigilance and readiness.

The Harvard had gained a stellar reputation with its crews who complimented its flight characteristics, stability in the air and ease of handling. It was good-looking and some pilots confessed it was also probably the most challenging plane they had flown. The minute you show complacency; it would eat your lunch. Used in light bombing roles in more than one instance, the Harvard was used by the PAF to provide close air support in Pak-India wars and perform reconnaissance missions. It was flexible enough to go full Texan, allowing installation of machine guns and rockets. Harvard will always have a special place in the hearts of veterans. Sqn Ldr Ghani Akbar called it a pilot maker of 18, 19, and 20 year olds into fighting machines. They honed proficiency in the T-6, before transitioning to advanced war birds. Today they help keep the history alive of

this truly classic aircraft as they share stories that leave listeners sitting on the edge of their seats.

Harvard during Kashmir War

During early days after independence, the only access to the Northern areas of Pakistan like Gilgit and Skardu was through an unreliable 'kutchra' mule track which remained blocked for most of the year due to snow falls and heavy landslides. The concrete airstrips were not developed in Northern areas and only unprepared surfaces were available for air transport operations. This is where the Harvards were called upon for the help. During road blockades, these work horses were tasked to transport personnel and equipment to and from Skardu/ Gilgit to Peshawar or Chaklala. The most memorable of such mission was flown on 14 April 1948. These were the times when the locals of Northern areas with support from Pak Army had launched a war of liberation during Kashmir

operations. On this historic day, under instructions of Wg Cdr Asghar Khan (the then commandant of RPAF School, Risalpur), Flt Lt Khyber Khan transported the first heavy mortar to the liberation forces participating in Kashmir war. In this improvised mission, the rear seat of the Harvard was removed to carry the mortar, however, its barrel remained protruding out of the cockpit, making the flight of the aircraft all the more challenging. Instructor pilot, Flt Lt Khyber Khan took up the challenge and carried out the historic mission with perfection. After landing, the transported mortar was carried to Skardu on a Bactrian camel. Later it was revealed that the transported mortar played a key role in the capture of Skardu, the enemy's last strong hold.

Harvard during 1965 War

When the war started against India in 1965, the PAF held back nothing, throwing in every single asset with the slightest

Title Photo: For more than three decades, Harvard remained the backbone of RPAF and later PAF's flying training at Risalpur, training hundreds of budding pilots who later proved their mettle in wars with the enemy. Shown in the painting is a Harvard 2B of Advance Flying School at Risalpur during early years. (Photo Painting: Gp Capt Hussaini (Retd)).

Inlet: The veteran has been immortalized at its last resting place, the PAF Museum Karachi. (All pics PAF archives unless stated).





destructive power needed to wreak havoc on the enemy. Coming in on a fast dive, Harvards could inflict their firepower on the ground targets and make good its escape before enemy fighters had a chance to intercept, making panicked infantry men running for their lives.

During the war, seven Harvards were earmarked for the first night's mission. Since the Harvards operated from Raisalpur, the air staff directed to use PAF Base Chaklala at Rawalpindi, as their refuelling station and final jumping board for operations. From Chaklala, each sortie was planned for about three hours and ten minutes. Pilots stretched the Harvard to the limits of its fuel endurance.

On 6 September, all seven Harvards topped up at Chaklala for a search, to locate and engage enemy troop concentrations and movements on the Amritsar-Jullundur Road. Four aircraft were to prowl along the road to Jullundur, while the rest would scout other stretches. Taking off from Chaklala after dark, the Harvards set out on their individual missions at intervals. Flying over the hills, pilots descended to roughly 500 feet after crossing Chenab River. They risked themselves being shot down by friend and foe alike, as they flew within the reach of even the small arms fire.

Flt Lt M Younus, who flew four such missions, portrayed in one of his debriefs, the devil-may-care in which they were undertaken. "My first mission on the Amritsar-Pathankot sector on the night of 6 September. Flying at about 300 to 400 feet above ground level (AGL), I headed for Lahore and noticed en route that Mangla dam area was lit like a Christmas tree. Next, I saw an almost continuous mosaic of flashes and tracers in the battle areas southwards

aply spirit was

from Jhelum and this got the adrenaline going. My canopy was open against the humid head wind of September and I was even able to pick up the odour of burnt cordite hanging in the air. I noticed some light arms fire coming up near Dhariwal. I fired off some rounds of my two guns, which generated a small explosion in the target area – probably a fuel truck. At the end of my leg, I let go my rockets at a small bridge but I doubt that they connected."

1: Instructor pilots along with Commandant Center, Sitting with Harvard in the background at the Flying Training Wing at Raisalpur during 70s.

2: From Left to Right: Flt Cds Sattar Alvi, Sikandar, Inamul Haq, Najeeb during the 60s at Raisalpur. Air Cdre Sattar Alvi later rose to international fame when he shot down an Israeli aircraft during Arab-Israel war and earned S.J.

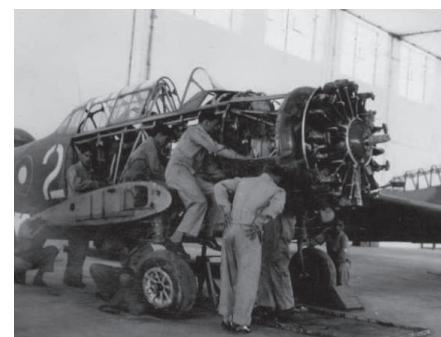
3: A group of instructor pilots (sitting) along with freshly graduated officers (standing) at Raisalpur. Flt Lt Azeem Daupota (later ret'd as Air Marshal) sitting on the extreme left.

Bottom: A Harvard T-6G during its routine training mission over River Kabul during early 70s.

On that first night, pilots harassed an enemy convoy along the Batala-Chhina Road, dodging the enemy ack-ack, escaping without any damage. There was a warmer welcome from enemy ack-ack on the Harvards, ten miles northeast of Amritsar, but again no one was hit. On the Gurdaspur-Amritsar and Amritsar-Pathankot roads, PAF pilots located more Indian troop concentrations, attacking them on the road bridge over the canal of Deena Nagar. Such attacks in themselves could not do any serious damage, but they were to prove successful in deterring enemy road and rail movements on the Amritsar-Pathankot Road.

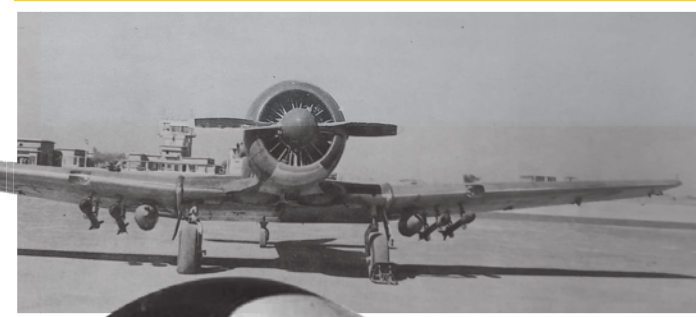
On completion of their mission, and as they reached Chaklala, the airfield came under attack by enemy fighters.

As five aircraft had already returned to Raisalpur via Chaklala, two Harvards were rerouted to Sargodha, dangerously low on fuel. Worst, light ack-ack opened up over Rawalpindi to deter the invading Indian Canberras. Groping their way around in the dark, the two Harvards were fortunate to reach safety, one at Sargodha, the other at Raisalpur, to which the pilots had decided to divert.



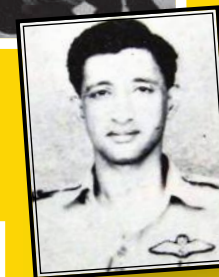
Above: Seen in the photo are the instructor pilots of Raisalpur whose flying skills, courage and never ending endurance played a key role during 1965 war.

Below: Carrying 400 rounds of .303 and four 60-lbs rockets, the Harvards remained a nuisance for the enemy during the two wars.



A young Flight Cadet poses with his Harvard during flying training at Raisalpur.

Left Inlets: Ground crew at Raisalpur and maintenance crew at PAF Drigh Road (later PAF Faisal) played a key role in keeping this vintage aircraft up for flying during challenging times.



Flt Lt M Younus



Flt Lt Israr Ahmed



Harvard during 1971 War

Once again during 1971 War, the instructor pilots at Risalpur were called upon to replicate the heroics of 1965 war. Several night flying sorties were carried out by these dare-devil instructor pilots. However, one important sortie needs a special mention. On the night of 5 Dec 1971, when the war was hardly 24 hours old, Flt Lt Israr Ahmed (instructor pilot of Harvard at Risalpur) was tasked to fly a vital interdiction mission in Chamb-Akhnur area where the two armies were fighting a stiff battle. Pak Army needed close support and convoy interdiction missions at regular intervals. On that day, Flt Lt Israr Ahmed took off in pitch-dark night and landed at Chaklala for refuelling. With fuel tanks fully topped up, Flt Lt Israr took off for the daring mission. Flying low, he reached the area with pinpoint accuracy. As he pulled-up for the first attack on the convoy, the enemy ack-ack gave him a hot reception. Undaunted he



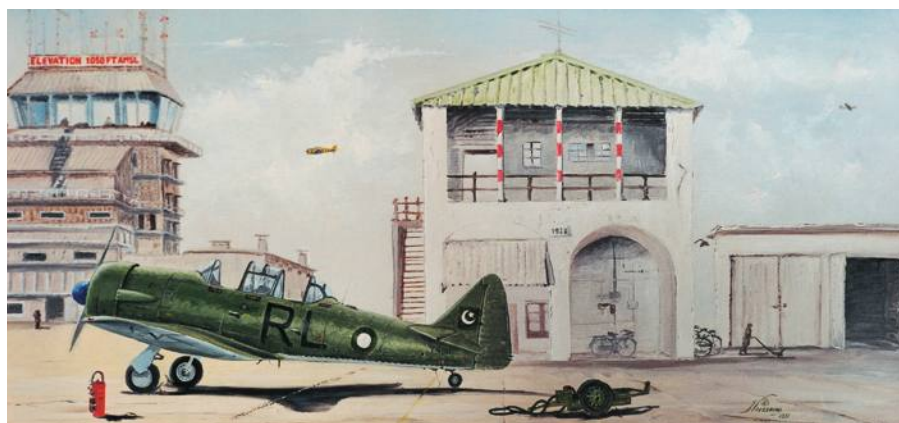
pressed on and attacked the target. As he pulled-up for exit, his T-6 G Harvard was hit by the enemy ground fire and a shell fractured his right arm. Profusely bleeding, he flew the aircraft with determination. Kissing the curvature of the earth, he exited the battle area and later climbed to higher level, and headed home. He flew the aircraft meticulously and landed back safely at base. The great heroics done by resilient Israr not only saved the valuable aircraft but also became the symbol of pride for all the flying instructors of Risalpur. Flt Lt Israr valour earned him Sitar-

e-Jurat during 1965, first ever for an instructor pilot and that too on a vintage Harvard aircraft.

The Training

The Harvard was the most significant training aircraft and those privileged to fly one testified that there wasn't anyone who did not love the Harvard. As an advanced trainer, the T-6 was a lot of students' first introduction to more complex aircraft systems, remembering the propeller nomenclature, and learning landing gear speeds etc. There was something mystical about flying an airplane designed to fly like a fighter. The T-6 was an airplane that had to be mastered before a military pilot could solo a really fire breathing war bird. "It was a much more responsive airplane than a pilot expected. Flying a Harvard was the closest most pilots came to flying a mustang or a hurricane," Sqn Ldr Ghani Akbar (Retd), SJ of 1965 war, said.

The veteran described the classical airplane, a pre-WWII design, highly manoeuvrable that could do all sorts



Left Page Top: On 14 April 1948, Harvard flown by Flt Lt Khyber Khan delivered a mortar to Gilgit which played a decisive role in the capture of Skardu Fort during liberation of Northern areas. (Painting: Gp Capt Hussaini (Retd)).

Left Page Center: A Lone Harvard at Risalpur.

Left Page Bottom: Shown in the painting, is a Harvard along side with its starting battery cart during early days at Risalpur. (Painting: Gp Capt Hussaini (Retd)).

Right Page 1: A historic photo of the members of 1st GD (P) course at Risalpur. Flt Cadet Mahmood Ahmed (later ret'd as Gp Capt) was the only survivor of this first unfortunate course, rest all fatally crashed in flying sorties at various locations.

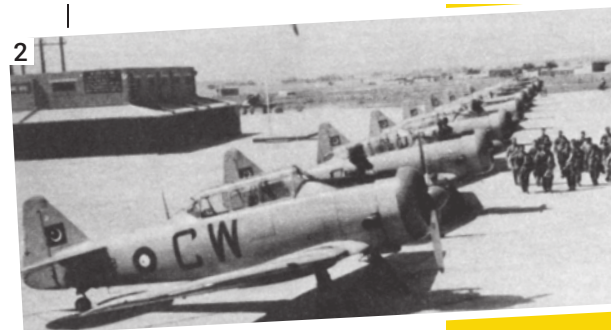
2: A group of Flt Cadets pass in front of the line-up of Harvards at Risalpur.

3. Flt Cdt Ghani Akbar getting ready for a training mission.

4: Instructor pilot Flt Lt Ghani Akbar pose to the camera during his instructional career at Risalpur. Sqn Ldr Ghani Akbar earned SJ during 1965

5. Flt Lt Ghani Akbar along with his student pilot at Risalpur.

Right: Instructor pilot imparting flying training to a cadet during a typical circuit and landing mission at Risalpur.



of aerobatics. Even though the T-6 was the best trainer of the time, it was not easy to fly. "One could see the real worth of the person in a Harvard aircraft and many did not make it. As wonderful as it was to fly, a pilot's biggest test was to land this tail dragger. The trick to land safely was the three-pointer landing, with all three wheels contacting the ground at the same time while holding the attitude to prevent the tail from swinging. Landing on front two gears was risky at 55 knots. Many pilots got suspended," Sqn Ldr Ghani Akbar (Retd) said, who also later became an instructor on the Harvard aircraft.

Nothing was startling about the performance of a Harvard, and the thrill of flying this machine visceral, like flying into battle. In February 1960, Ghani Akbar was into his second solo, when, surprisingly the engine packed

up. "When it did not start, I focused on forced landing. Found a strip near a field for a belly landing. Farmers in the field didn't scatter until touch down. They thought it was just a routine practice approach which the student pilots used to carry out every day. The plane was flying again after two days," he said quipping.

AVM Hamid Khawaja (Retd), an instructor on Harvard in 1974, who trained pilots going on to the fighters, is also one of the many admirers of the Harvard. "It was a very powerful aircraft, you just ram the throttle and the aircraft would respond instantaneously," said AVM Hamid Khawaja (Retd), a 1,000

hours Texan pilot without a single incident of swing. "You can do any type of aerobatics on the Harvard, be it a slow roll or a roll of the top. The aircraft always responded well thanks to its herculean engine power," said AVM Hamid Khawaja (Retd).

Although he described the T-6 as reliable and one that would easily recover from a spin, the aircraft could not be taken for granted. "Out of all the various flying phases of training, doing instrument flying on Harvards was much challenging especially if you



were a student. It hardly had any reliable instruments, the gyros were highly unreliable and would topple after mere 30 degrees of turn," the veteran said, who nonetheless preferred Harvard for almost any kind of aerobatics. "Taxi was another difficult task on Harvard, being the instructor sitting in the rear seat you could not see anything in front to remain on yellow line. You have to rely on the student during taxi and that was a tricky part. You never taxi straight in a Harvard, you move the aircraft in zig-zag to clear the area on all sides to avoid obstacles or other aircraft," added AVM Hamid Khawaja (Retd).

Harvard- Over the Years

At the time of partition, the RPAF received a mix of 20 Harvard 2Bs and 2Cs. With such few aircraft, the PAF made further purchases of T-6s from the USA and Canada. On 6 September 1947, instructor pilots Sqn Ldrs Khyber Khan, SA Aziz and Flt Lts Rahim Khan and Zafar Chaudhry and two cadet pilots, flew the first contingent of training aircraft into Pakistan. These were the six Harvard 2Bs from Ambala. During landing a cadet scraped a wing tip on the runway. It was Risalpur's first minor accident. Next day, the aircraft were painted in the new PAF markings, which swept an excitement through Risalpur.

By October 1947, the high command had established three small training units at Risalpur. Four Tiger Moths made up the elementary flying training squadron. The advanced flying training squadron consisted of four Harvard 2Bs and a flight of two Harvard 2Cs for squadron training. The total of two flights seemed meagre today but, at that time, it was equal to almost half of all the other aircraft possessed by the RPAF.

As Indian threats grew along Pakistan's borders, flying training was placed on a war footing. The duration of the course was halved from 18 to nine months. The RPAF



Left Inlets: 33-ship formation of Harvards spell out RPAF on 26 February 1955 during an air display witnessed by Defence Minister Ayub Khan at Lahore.



Bottom: Hugging the ground barely feet above, a Harvard presents a low fly-past at Jamrud range near Peshawar. (Photo: PAF Archives). Bottom: A Harvard resting at the entrance of Cadets living at PAF Academy Asghar Khan reminds its viewers of its glorious past.

acquired 14 Tiger Moths, and 30 Harvards T-6Gs were bought from the USA, but took over a year to be delivered. The first batch was not inducted until March 49. These T-6Gs were better at controls, especially with a tailwheel locking mechanism, significantly reducing swinging on landing, which had plagued Risalpur. By 1960, the RPAF replaced the oldest Harvards, with another ten from the USA.

The Harvard 2Bs and 2Cs remained in service until they were withdrawn in August 1962, after providing 15 years of invaluable training right from Risalpur's embryonic stage to serving as a vital communication link to Gilgit during the 1948, Kashmir operations. Nonetheless, until 1975, the T-6Gs provided excellent basic flying training to a majority of PAF pilots. During the 1965 war, instructors from the Flying Instructors' School (FIS) at Risalpur, armed these piston engine trainers, with two .303 Browning machine guns and four rockets each, to harass forward Indian positions in moonlit nights.

Showing the Flag

The first ever military parade in Pakistan was held on 16 August, 1947. PAF's participation was limited to a fly past by four Tempest aircraft. Two years later, fly pasts were different.

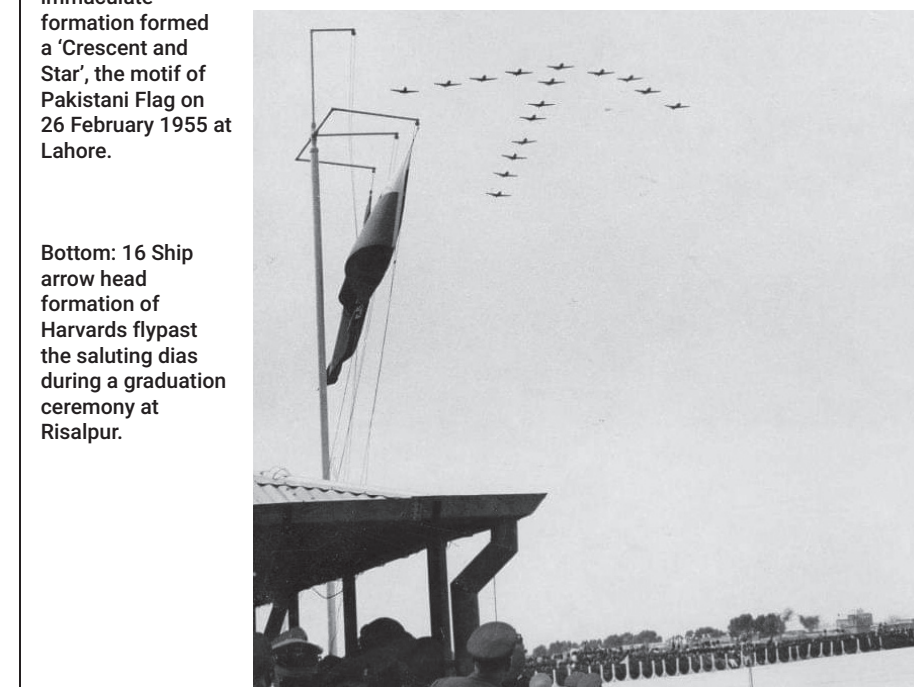


Flt Lt MA Rabbani (who later ret'd as Gp Capt), was tasked to fly a contingent of Harvards from Risalpur to Masroor for participation in Independence Day celebrations. Odds were stacked up against such an operation. Ground crew endeavoured to make 21 Harvards fit and fly worthy, including the one declassified to be cannibalized. The unpredictable monsoon weather made flying risky. Nonetheless, on 9 August, 1949, 21 Harvards from Risalpur, formed five sets of diamonds of four planes each and set course for Multan. It was the first time that Risalpur saw so many Harvard planes together in the sky. "It must have been a sight to watch," remembered Gp Capt MA Rabbani in his book "My Years in Blue Uniform". Two hours later, bad weather forced the formation to abort the mission and return to Risalpur. After refuelling, the 21 aircraft took off from home base and headed to Multan again. At Multan they were to be refuelled, take-off and make a pit stop at Hyderabad, to top up again and carry on to their final destination. Sometime into the journey, team leader Flt Lt MA Rabbani was forced to return to Risalpur after his plane developed technical faults. He joined his team in Multan around dusk.

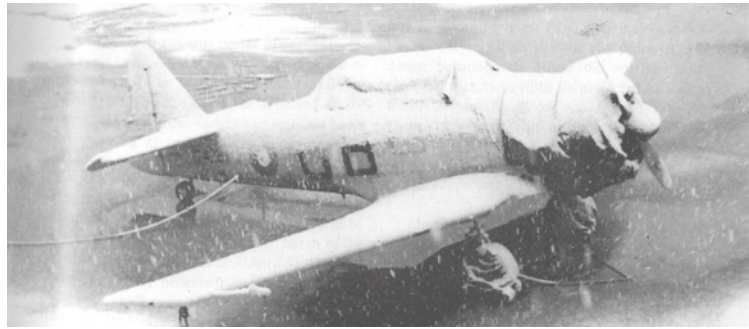
Before continuing, Flt Lt MA Rabbani was directed to refuel at Hyderabad, against his repeated requests to make refuelling arrangements at Nawabshah instead. "I knew that persistent monsoon would have made the grassy landing strip at Hyderabad muddy and slushy," he recalled. Soon after the 21 Harvards had taken to the sky for Hyderabad the next morning, MA Rabbani ran into engine trouble again and was forced to land on an abandoned air strip at Sukkar. It took 45 minutes before his 'fitter' could fix the plane and get airborne. Short on fuel, MA Rabbani could not have made it to Hyderabad hence decided to land at a partly submerged runway at Nawabshah, only to learn to his horror that the contingent had not arrived at Hyderabad for refuelling. He was petrified with the thought



Top Inlets: 27 Harvard in an immaculate formation formed a 'Crescent and Star', the motif of Pakistani Flag on 26 February 1955 at Lahore.



Bottom: 16 Ship arrow head formation of Harvards flypast the saluting dias during a graduation ceremony at Risalpur.



of 20 Harvards, critically low on fuel, hovering over a slushy air strip of Hyderabad. "Panic overwhelmed some of the pilots, who broke away from the formation in search of a landing strip in case of emergency. One Polish instructor in a Harvard 2C, with longer range, made straight to Mauripur. Sqn Ldr Eric Hall (Staff officer at Masroor) brought the rest of the formation to Bholari (a small airstrip near Hyderabad), with their fuel tanks almost dry," MA Rabbani wrote in his book.

Flt Lt Rabbani took off again and headed towards the dreaded scene of a possible disaster of 20 Harvards. Flying low above Hyderabad, he could see the muddy landing strip but no Harvards. "As I climbed up and wide out of Hyderabad circuit, I noticed a landing strip and the missing 'nineteen' parked neatly in line. I heaved a sigh of relief to join my colleagues for a second time in two days. I led the refuelled Harvards to Mauripur, a one hour run from Bholari," he added.

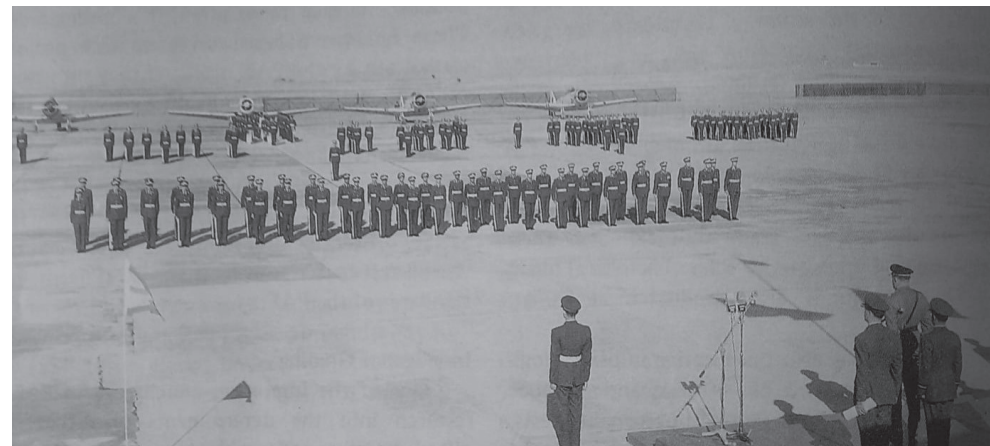
The next morning, AVM Atcherley, known for his dominating personality, blasted MA Rabbani off his feet for indiscipline, using vocabulary that would blush anyone. Despite his efforts to explain, AVM Atcherley wouldn't have it. "After this dressing down, I managed to retain my senses

and the fly past rehearsal went well. We finally made it to Pakistan's first proper Independence Day fly past. It was our moment in the sun. The Harvards were a special attraction, staying in sight longer than the speedier Furies and Tempests."

"Pretty good performance by your boys, good show," AVM Atcherley told Flt Lt MA Rabbani when they ran into each other at a reception later that evening. It was a red-letter day for the RPAF too, setting a trend for some remarkable fly-pasts and air displays that the service became famous for.

A year later, in March 1950, Flt Lt MA Rabbani, led his last formation of Harvards for Shahinshah of Iran, during his visit to Risalpu.

It was in Lahore, on 26 February, 1955, when 33 Harvards in immaculate formation spelled the letters 'RPAF' over a parade. Later



The Aircraft

Designated as T-6 Texan, was first inducted in 1939. This aircraft was similar to and eventually replaced the BC-1A basic combat trainer. The BC-1 eventually came to be known as Harvard 1. A naval version SNJ-1, flew extensively in the US navy. The USA built numerous improved versions of the T-6 advanced trainers. Their sub-types varied mainly in matters of equipment. The British Harvard versions of the T-6 carried no armament and were fitted with British instruments, radio and other equipment.

From July 1940 onwards, more than 15,000 Texan T-6s had been built. The Harvards came to represent 26 percent of all trainers built in the USA. In 1946 and 1947, large numbers of surplus T-6 trainers were reconditioned by North America. As many as 33 countries, including China and Pakistan, acquired them. The RPAF continued to operate its Harvards for almost 30 years, eventually phasing them out in 1975.



in the display, 27 Harvards formed a crescent and star, the motif on the Pakistani flag.

Not All Pilots had Nine Lives

Today the men and women who proudly wear the uniform remember the airmen and the events of 50 years ago. They salute those who battled bravely in defence of our nation. Returning from time warp and mourning inwardly, AVM Hamid Khawaja (Retd) remembers comrades and friends who crashed in the Harvard. "A pilot crashed after one of the wings blew away during flight, two instructors died after the plane stalled, one student pilot rammed into the propeller of a started-up Harvard and was chopped off and another pilot crashed after getting disoriented," he remembers with a heavy heart.

Amongst the saddest accidents was the first fatal air crash at Gilgit on 14 February, 1948, when air force friends lost one of their comrades, the young Plt Off Asif Khan. A three-ship formation of Harvard aircraft led by legendary PAF pilot FS Hussain with Flg Off Lanky Ahmed on right wing and Plt Off Asif Khan on the left, took off from Peshawar for Gilgit on that sad day. Plt Off Asif Khan, who was one of Air Marshal Asghar Khan's brothers, was known for daredevil aerobatics – flying so low over Kabul River that the tips of the propeller

almost touched the water. Interestingly, Plt Off Asif Khan was supposed to bring back his elder brother, legendary and famous Maj Aslam Khan (the officer played a key role in liberation of Northern Areas in 1948 and was later awarded with gallantry medals) in the back seat of his Harvard. Sadly that never happened.

Before landing at Gilgit, young Plt Off Asif Khan decided to perform some aerobatics to impress his brother and other dignitaries watching him over at the airport. While performing such dare devil maneuver, Plt Off Asif Khan performed a slow roll over the town, close to the ground from which the aircraft never recovered. The young pilot officer and the airman sitting in the back seat did not make it.

A Tribute

Today various nonprofit organizations in the USA and Canada have restored and fly the sturdy two-seater that helped train thousands of pilots during World War II and the Korean War. Most veterans, including Ghani Akbar, wished that the PAF followed the tradition, to preserve that portion of history. There is a really significant historical connection with the plane. It was the most recognized trainer, that robust engine and the iconic snarl it made, and wings modified for better stall characteristics. Inside,

pilots were greeted to clean selection of instruments and easy access to all the controls - switchology laid out ergonomically, incredibly important in trainer aircraft. Flying a tailwheel, made pilots better in almost every quantifiable way.

The Harvard may not have looked like much compared to those much popular warbirds, yet its service and design ensured that pilots were given the exact training they needed before heading into combat. In doing so it might have contributed more as an aircraft than quite a number of other machines. Unlike many of its contemporaries, the Harvard continued in silence past the three wars with India, providing one generation of pilots after another with the fundamentals of flying training, even after jets were introduced.

Today, we find two in the PAF museum Karachi, to educate, inspire and honour the men who maintained and trained in this historic airplane. And when you see it, instead of just walking by, as we do so many times when we see a shinier warbird next to it, take a minute, and have a look at it, it deserves it...

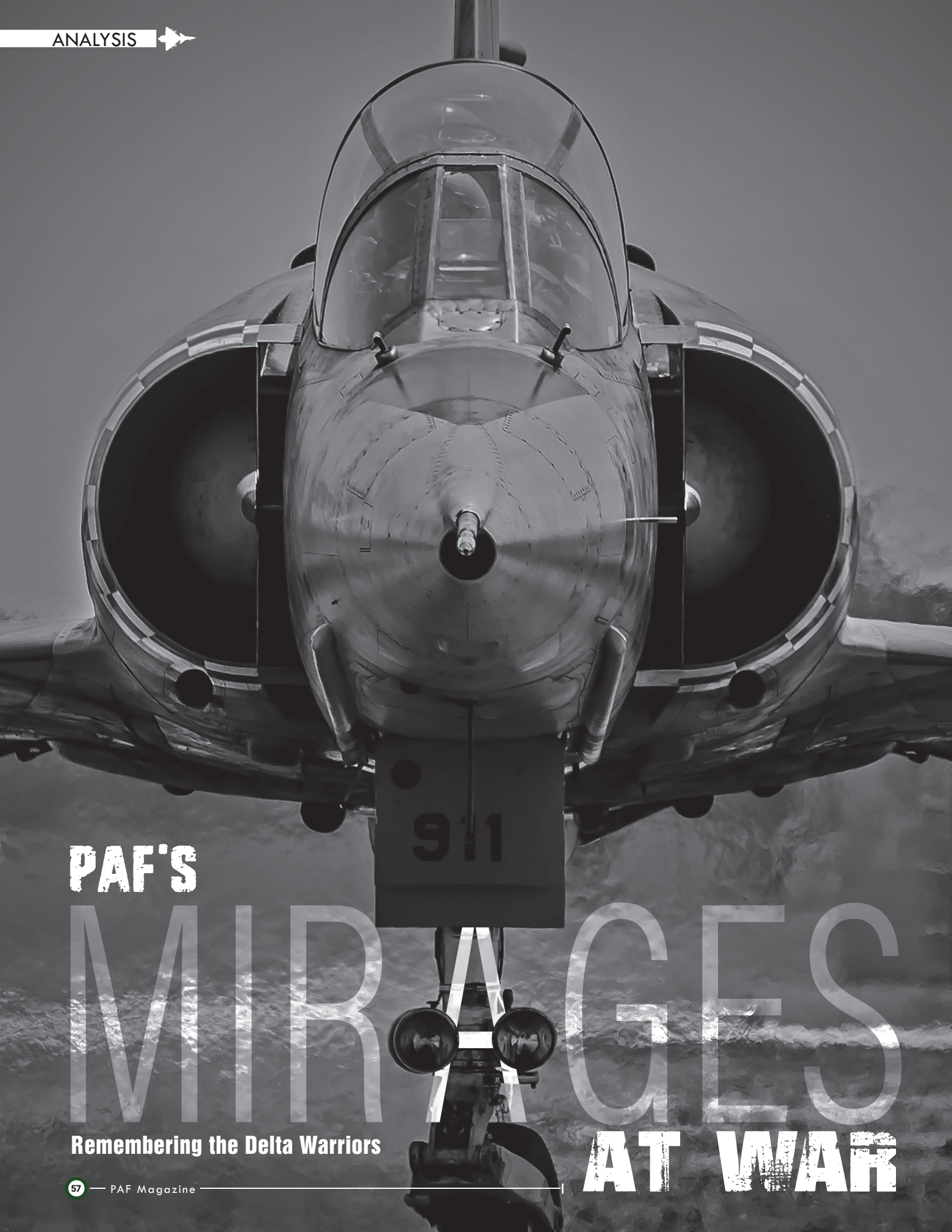
Left Page Top: Wearing the cape of slush and snow, a Harvard stood against all odds during its tenure with RPAF College at Risalpur.

Left Page Center: Harvard crashes plagued the training at Risalpur during early years after Independence. Seen in photo is a Harvard which made a crash landing after its landing gears failed to extend. The aircraft was flown by Flt Lt Mir Alam Khan who later received SJ during 1971 war. (Photo: Air Cdre Mir Alam Khan (Retd)).

An impressive line-up of Harvards used to be a regular site during graduation parades at Risalpur.

Bottom: A Harvard rests in the display area at PAF Museum Karachi attracting scores of aviation enthusiasts ever day. (Photo: PAF Museum).





PAF'S

MIRAGES

Remembering the Delta Warriors

AT WAR

“Few years into operations after induction into PAF fleet in 1967, the Mirages were put to real test in the all-out war with arch rivals, India. However, the amazing aircraft and its equally amazing air/ ground crew proved equal to the task in defending the country against an enemy more than five times in size. IAF tried their best to achieve a kill against this speed monster but failed, and in turn lost three of its aircraft when pitched against PAF Mirage in various aerial combats.”

by Air Cdre Kaiser Tufail (Retd)

At the outbreak of the 1971 Indo-Pak War, Mirage IIIEs were the newest and most advanced combat aircraft in the PAF inventory. Besides performing a wide variety of missions, they could generate a higher daily sortie rate compared to the aging F-86s, F-104s and B-57s. They could navigate accurately to relatively deeper targets, and after the attack, egress at high speed. They could carry out straight line, hit-and-run intercepts against raiders as adeptly as the F-104s, though the radar performance of both fighters was suspect against low-flying targets in ground clutter. Coupled with marginal performance of the five-odd low level AR-1 air defence radars which were interspersed with yawning gaps, the Mirages' intercept capability was of consequence during day only; at night-time, it was a chance in a million, as it were. Surface attack weaponry of the Mirage was not yet commensurate with the more capable platform that it was. PAF relied on the old vintage Mk-117 (750-lbs) high explosive bombs delivered from critical dive angles. Specialist anti-runway weapons had not been marketed by the French as yet. Air-to-air weapons included first generation AIM-9B Sidewinder heat-seeking missiles, whose two-degree wide field of view allowed only dead line astern attacks against backgrounds free of extraneous heat sources. Employment of the semi-active radar-guided Matra R-530 missile was found to be impractical in combat situations due to its stringent launch parameters and very short

range, particularly at low level, where most of the interceptions were expected. It never saw operational use other than, what amounted to virtual jettisoning in one combat situation. High expectations from these modern Mirages were also tempered by the stark reality of having just one squadron to fulfil the myriad tasks. 23 Mirages – one aircraft had been lost earlier in a flying accident – were a meagre 8% of the 276 combat aircraft available at the outbreak of war. How the PAF would dovetail its much vaunted front-line element into the military's overall strategic reckoning had to be carefully articulated in its concept of air operations.

Strategic Compulsion

Cognizant of the improbability of successfully holding its eastern wing against a determined Indian onslaught and a vigorous

insurgency, Pakistani military planners came to be grounded in the conviction that 'defence of the East lies in the West'. In practical terms, this aphorism meant that Pakistan would launch a major offensive into India from the western wing at the outset of any conflict. By threatening vital Indian assets in Kashmir and the Punjab, the Pakistan Army planners hoped to draw Indian forces away from the east, and gain enough time for outside powers to restrain an unmistakably rampant India. Additionally, any territory seized in the west could be offered as a sop to the countrymen for losses in East Pakistan. PAF's concept of operations gave over-riding priority to supporting the Army's proposed offensive. Air cover was sought to be established over the Army's deep thrust till such time that it had dug in and established its own defences.



Title Photo: Sleek, Versatile, Lethal and Agile are some of the character traits of the Mirage aircraft which would always make it a Pilots' aircraft.

Bottom: A PAF Mirage dropping bombs during an exercise at Thal range.

It was also felt necessary to attack 4-5 Indian airfields that directly threatened the offensive once it was underway. To prevent timely arrival of logistic reinforcements, PAF was to interdict supplies directly serving the Indian forces; this meant attacking rail yards and other supply nodes soon after start of the offensive. Until the army's offensive was launched, limited close air support during holding operations was to be provided. Tactical recce was to be conducted regularly to determine the changing disposition of enemy formations. Finally, PAF was to maintain pressure on the IAF with sustained disruptive strikes against some of its forward and rear bases, to accrue a measure of psychological ascendancy in the conduct of air operations. From PAF's standpoint, it was easy to see that the modern Mirages were the weapon of choice for operations during the critical land battle planned for the western theatre. Yet, far from singling out these vital assets for the critical stage of the war only, it was boldly decided to employ them to the hilt in all phases. The bulk of No 5 Squadron was deployed at its parent Base, Sargodha, under command of Wg Cdr Hakimullah, formerly an old hand on the F-104s. A detachment of six aircraft, led by Sqn Ldr Farooq F Khan, was moved to the deeper located satellite Base of Mianwali to provide redundancy in the night intercept role, and also as a



back-up strike element for the all-important land offensive. Mirages were thus poised to be at the forefront of PAF's 'coup de main'.

Softening Up

Contrary to the general perception, PAF's dusk strikes of 3 December against some of the forward Indian airfields were not pre-emptory at all, as the Indian invasion of East Pakistan had already taken place in earnest, on 21 November. While these strikes were, of course, aimed at cratering runways and destroying radars, they also had an intrinsic 'provocative' element which the PAF planned to cleverly exploit through its well-prepared air defences, when IAF retaliated the following morning. Mirages got a small share of 8 airfield strike sorties in the

opening round of the counter-air operations campaign that also included 24 airfield strikes by F-86s and 4 radar strikes by F-104s. Wg Cdr Hakimullah led a flight of 4 Mirages to Amritsar, while his flight commander, Sqn Ldr Aftab Alam, led another flight of 4 Mirages to Pathankot. Heading east into fast-fading light, Wg Cdr Hakimullah was able to take a cue from Amritsar runway lights, which were inexplicably glimmering when it should have been a complete black-out. His formation pulled up for a dive attack to deliver two 750-lb bombs each. Except for No 4, whose bombs did not release due to some malfunction, the rest were able to put in the attacks in the beginning of the runway. Sqn Ldr Aftab Alam's formation did not have the good fortune of catching Pathankot with its lights on, and could not execute a proper attack in the evening haze and low light. The bombs fell in the general vicinity of the airfield. Given the very short distance from the border, IAF was unable to scramble interceptors from the ground, so standing patrols should have been a sensible option. With no

1: A PAF Mirage shows off its lethal arsenal during static display at PAF Base Sargodha.

2: A PAF Mirage firing an air-to-air weapon during an exercise.

3: Flt Lt Naeem Atta pose with Mirage.

4: Seated L-R: F/L Shafique Haider, S/L Farooq Umar, W/C Hakimullah (Officer Commanding), S/L Farooq Feroze, F/L Khalid Iqbal. Standing L-R: F/L Safdar Mahmood, F/L Najib Akhter, F/L Salimuddin, F/L Farooq Habib, F/L Sarfaraz, F/L Saeed Anwar, F/O Hasnat Ahmad.

5: Sqn Ldr Hakeemullah Khan (later retired as ACM) and Flt Lt Farooq Omer being interviewed by BBC during 1971 war.

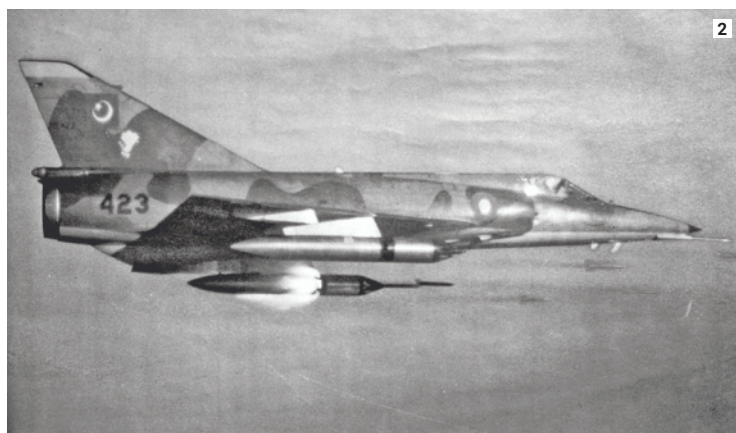
6: Flt Lt Safdar Mahmood was also among the PAF pilots who was credited with an IAF kill during 1971 war.

7: Flt Lt Saleemuddin pose with his Mirage during 1971 war.



interceptors, all raiding aircraft came back unscathed. The disruptive raids were continued into the night by the B-57s. The missed strike at Pathankot was repeated by Sqn Ldr Aftab Alam's formation the next afternoon. This time, all the bombs found their mark on the runway and taxi track. As they were exiting after delivering the attack, Nos 3 and 4 found a Gnat closing in behind them, with guns blazing. Thanks to their swift Mirages, they were easily

able to get out of harm's way. Mirages continued with the airfield strikes, flying for five more days. A mission each was flown on 5, 6, 8, 9 and 10 December. Awantipura airfield was added to the usual list of Amritsar and Pathankot. Wg Cdr Hakimullah, along with attached senior squadron pilots, Sqn Ldr Rao Akhtar and Sqn Ldr Arif Manzoor alternated as mission leaders for these subsequent strikes. With the threat of enemy interceptors increasing, it was decided to add a pair of escorts during the airfield strikes. Altogether, 38 strike



A beautiful view of PAF Mirage fleet on the tarmac of PAF Base Sargodha.



Gp Capt Hussaini, aviation artist of PAF, has very precisely depicted the various encounters which the Mirage had during 1971 war.



sorties (including 8 escorts) were flown by Mirages against three forward airfields. This was almost one-fourth of the total daytime counter-air effort of 158 sorties flown by the PAF. As stated earlier, these airfield strikes were largely disruptive in nature and served the purpose of softening up, before the actual neutralisation that was to come later with

the army's offensive. Seen in that context, they do not seem measly in quantum, though where they fell short was in the 'punch'. There is no reason to doubt the IAF assessment of the effects as "negligible/slight damage." The runways were never out of operation for more than a few hours. The damage could have been longer lasting if special runway penetrating

ordnance had been used, as the Israeli Air Force had done in 1967. Non-availability of such weapons led the PAF to resort to conventional iron bombs which would bounce off the runway and explode above the surface, causing more blast and less breach. Also, delivery from shallow dive angles to avoid exposure to Anti Aircraft Artillery (AAA) made the bombs skip off the surface even farther. The disruptive raids seem well worth the effort, however, considering that operational and maintenance activity on IAF forward bases was hampered, and no PAF aircraft was lost while conducting these very dangerous missions. On a few occasions when enemy interceptors managed to get behind an odd Mirage, the latter was able to outpace them, much like Dassault had imagined in his desert vision of a mirage whereby, "enemy pilots should see it but never catch up with it!"

Defending the Skies

Despite a biggish nose which housed a sizeable antenna promising long range pick-up at higher altitudes, the Cyrano II radar of the Mirage lacked the ability to distinguish low flying targets against ground clutter. This drawback rendered the Mirage completely dependent on ground-controlled interception at low level, much like its spares-stricken counterpart, the F-104. PAF's five low level ground radars could cover just 7% of the eastern border of West Pakistan and were, therefore, deployed at the main bases and a few vulnerable approaches only. Air defence was, thus, largely a function of Combat Air Patrols (CAPs) being able to respond to chance pick-up of low flying targets by ground radars. Once vectored on to its target by ground control, the Mirage could accelerate fast enough to chase an intruder for whom there was little hope of escape. The test of the Mirage's capabilities as an interceptor came on the night of 4 December, when Flt Lt Naeem Atta was scrambled from Mianwali. The ground controller, Flt Lt Khalid Kashmiri, vectored Atta on to an intruder heading west, towards Mianwali. The controller was

able to position the Mirage three miles astern of the low flying target, but even with a nearly full moon, there was no prospect of visual contact at that distance. As the Salt Range loomed ahead, the target

started climbing to avoid the hilly terrain. Fortuitously for Atta, this meant that the target was also easing out of ground clutter and there was a good probability that it would be 'painted' by the Cyrano radar. Unknown to Atta, his radar had been in standby mode, as he had not been careful in selecting his switches in a hurry. On the radar controller's reminder, Atta rechecked the selection to transmit mode, and was soon able to report a blip on his radar scope at an optimum IR-missile shooting distance of one-and-a-half mile, dead tail-on. Following radar lock-on, the missile's seeker head swung to the heat source, and a growl in Atta's earphones confirmed a launch-ready condition; the intruder's fate was sealed. Moments after launching the AIM-9B Sidewinder, Atta saw a huge fireball silhouetting an aircraft in the night sky. Next morning, the wreckage of a Canberra (IF 916) was confirmed at the village of Nara located at the western edge of the Salt Range, not too far from Khushab town.

The aircrew, including the pilot Flt Lt Lloyd Sason and navigator Flt Lt Ram Advani, belonging to the Agra-based Jet Bomber Conversion Unit, were killed on impact. [1]

Not far from Mianwali is Sakesar, a small PAF Base perched on the picturesque Salt Range at an elevation of 5,000 feet. The Base housed a high-powered FPS-20 radar as well as the vital Sector Operations Centre – North. At mid-day on 5 December, the IAF had made an attempt at attacking the radar, which cost it dearly, as two Hunters were shot down by a patrolling pair of F-6s. Later that afternoon, a lone intrepid Hunter was able to sneak in for a successful rocketing attack. After the attack a clean getaway for a singleton, right under the noses of patrolling interceptors, was an improbable prospect. As expected, the Hunter was intercepted by two Mirages scrambled from Mianwali. The pair was



Above: The Back Bone-PAF ground crew remained the unsung heroes, turning around the aircraft for back to back missions in a record time during 1971 war.

led by Flt Lt Safdar Mahmood, with Flg Off Sohail Hameed as his wingman. Diving down from the hills, the Hunter had built up speed, but not enough to elude the far swifter Mirages. With the help of instructions from the ground controller Flt Lt Shaukat Jamil, Safdar was able to catch up and settle behind the Hunter, a couple of well-placed bursts of the 30-mm cannon got the Hunter smoking. As Safdar held off while watching his

Bottom: If Looks could Kill-An absolute beauty captured by lens at PAF Base Sargodha during its early years of service with PAF.



PAF KILLS - 1971 INDO-PAK WAR

Date	Victor	Weapon	Vanouished	Air Craft	Area
04-Dec	F/L Naeem Atta	AIM-9B	F/L L M Sason F/L R M Advani (N)	Canberra	Jabbi, Chakwal
06-Dec	F/L Safdar Mahmood	Guns	S/L J M Mistry	Hunter	Katha Saghral
06-Dec	F/L Salimuddin	AIM-9B	F/L V K Wahi	Su-7	Samba

COMBAT MISSION-1971 AIR WAR

Aircraft	AIR DEF (GENERAL)		AIR DEF (FEBA)		OFFENSIVE COUNTER AIR		TAC AIR SUPP (AR/BAI/CAS)		AIR INTERDICTION	PHOTO RECCE ²	MAR AIR SUPP
	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY / NIGHT	DAY / NIGHT	DAY / NIGHT
Mirage IIIE/R	208	96	8	38	139	4	36				

quarry in its last throes, Sohail picked up the smouldering aircraft and let off a Sidewinder missile to finish it off. Just before the aircraft impacted the ground, the pilot ejected but it was too late. Sqn Ldr Jal Mistry of No 20 Squadron was found fatally injured. The wreckage of the Hunter (A 1014) was strewn near the small town of Kattha Saghral.

Chamb was one of the few sectors where Pak Army had made significant advances and the Indian XV Corps desperately sought destruction of heavy guns that had been reported in the area. On 6 December, a pair of Su-7s from Adampur-based No 101 Sqn was tasked to locate and destroy the guns. The Su-7s sought out what appeared like hutments concealing the artillery pieces and were rocketing the place. Flt Lt Salimuddin Awan and his wingman Flt Lt Riazuddin Shaikh, who were patrolling in their Mirages over Gujranwala-Sheikhupura area, were vectored by ground radar onto the two Su-7s. Salimuddin, who was carrying a R-530 radar-guided missile along with two Sidewinders, decided to get rid of the bulky weapon by just blindly firing it off, so as to



Left: PAF pilots exchanging views during a post flight debrief at PAF Base Sargodha.

Right: A PAF Mirage taxis out for a routine operational training mission at PAF Base Sargodha.

Bottom: Gp Capt Hussaini's depiction of Sqn Ldr Hakimullah's interdiction mission at Mukrian Railyard during 1971 war.



lighten up for the chase. Spotting the Mirages, the Su-7s jettisoned their drop tanks and rocket pods, and started exiting east. With the Su-7s doing full speed, a long chase ensued till Riazuddin found himself close enough to fire a missile, but it went straight into the ground. Salimuddin then moved in, and on hearing the lock-on growl, pressed the missile launch button, not once but twice, to be sure. Two Sidewinder missiles shot off from the rails, and moments later, Riazuddin called out that

one of the Su-7s had been hit. Salimuddin instantly switched to the other Su-7 and fired his 30-mm cannon. Just then, Salimuddin noted the outlines of Madhopur Headworks near Pathankot, which was not surprising, as they had been chasing the Su-7s for several minutes inside enemy territory, along the Jammu-Kathua Road. Recollecting themselves, the Mirages turned back and recovered at Sargodha with precariously low fuel. Monitoring of VHF radio confirmed a

message transmitted to Adampur that an Su-7 had been "fired at ... the pilot ejected". It was later learnt that the wingman, Flt Lt Vijay Wahi had succumbed to his ejection injuries. The leader, Sqn Ldr Ashok Shinde, was lucky to bring back his Su-7 which had been damaged by bullet hits. High-speed pursuit was a forte of the Mirage, a lesson learnt by the IAF the hard way, and one time too late.

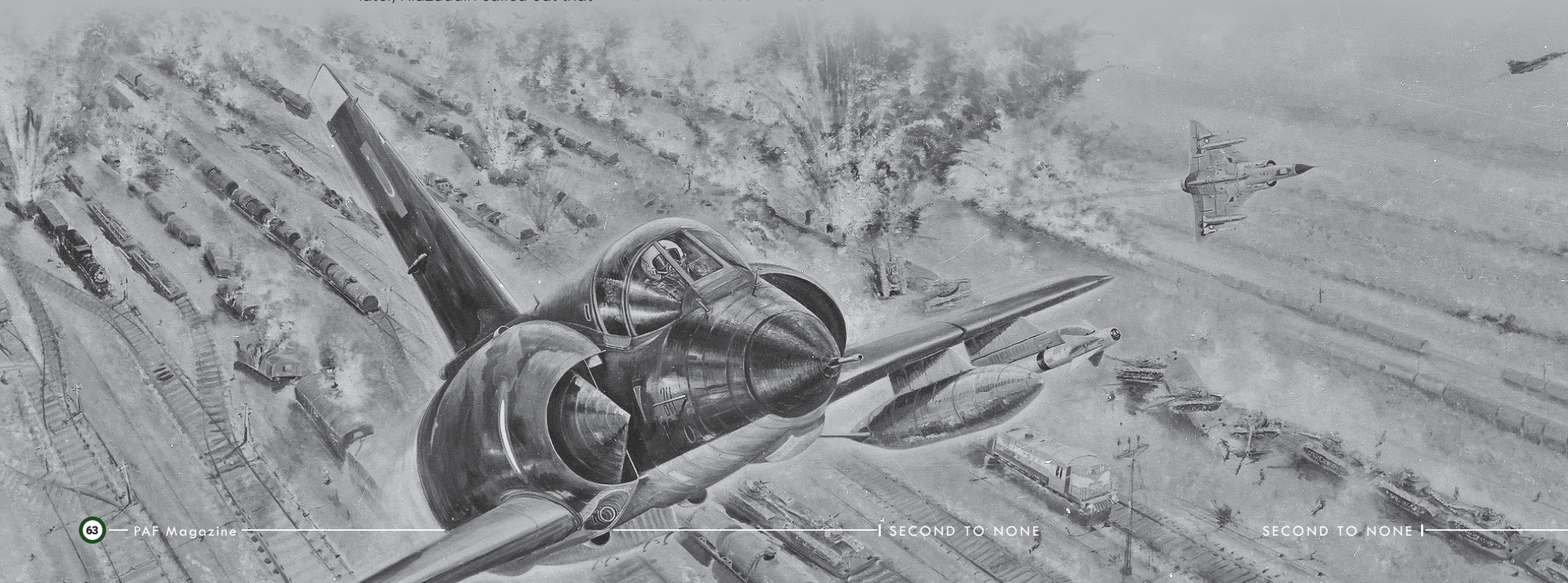
Mirages flew a total of 317 air defence sorties (221 during day, 96 at night) which was 18% of the overall air defence effort. [2] With three IAF aircraft shot down, the Mirage kill rate, based on the total air defence

sorties flown, came to be 0.95%. This compares quite favourably with kill rates of other PAF fighters which performed air defence missions:- F-86F: 1.2%, F-86E: 1.1% and F-6: 0.74%.

Scouting the Troops

PAF had three Mirage IIIRs, which were equipped with five OMER Type 31 optical cameras mounted in the nose. With a Doppler navigation radar available, getting to a destination was fairly easy. Magnesium flares provided enough illumination at night to confer a round-the-clock tactical reconnaissance capability. The number of aircraft was, however, on the low side and did not sufficiently cater for unserviceabilities. A month prior to the outbreak of all-out war, the PAF had started to fly cross-border photo recce sorties, some of which were in the vital Chamb Sector, where the Pak Army's 23 Division had planned a secondary 'diversionary' offensive. With the disposition of forces well-known, the attack resulted in significant advances that threatened India's overland links to Kashmir, besides depriving Indian forces from establishing a launch pad for offensive operations towards the vital lines of communication passing through nearby Gujrat. Early in the war, another important breakthrough came in the Suleimanki-Fazilka Sector, where 105 Independent Infantry Brigade (IV Corps) was able to surprise the Indian 'Foxtrot' Force, and made a firm foothold in the area of Pak II Corps' planned main offensive. While

the Indian forces desperately carried out repeated counter attacks, PAF Mirages conducted regular photo recce missions in Ferozepur area to update the ground commanders about Indian reinforcement efforts aimed at vacating the incursion. In the event, a badly demoralised and confused Foxtrot Force could not make any headway and the Pakistani brigade was able to safeguard the vital Suleimanki Headworks, which was only a mile from the border. In preparation for the main offensive, PAF Mirages fervently conducted photo recce missions along Ferozepur-Kot Kapura, Ferozepur-Fazilka and Fazilka-Muktasar railway networks, as well as in general areas of Ferozepur and Sri Ganganagar, for the latest disposition of forces. An important mission involved recce of crossing points over Gang Canal for a careful scrutiny of obstacles across the waterway that could possibly impede the movement of II Corps. The main offensive could, however, not materialise as explained later, and most of the photo recce effort was rendered worthless. Two pilots who played a sterling role in the photo recce operations were the squadron's 'slide rule wizards', Sqn Ldr Farooq Umar and Flt Lt Najib Akhtar. Of the 30 photo recce sorties (besides 15 escorts) flown by No 5 Squadron before and during the war, 22 were considered successful. [3] Although most of the singleton recce Mirages were escorted by another Mirage, yet some of the missions had to be aborted due to intense enemy air activity. In Shakargarh Sector, a



few night recce missions were attempted with partial success. In one such mission on the night of 11 December, an IAF MiG-21 scrambled to intercept a Mirage flown by Sqn Ldr Farooq Umar, ended up shooting down one of its own MiG-21s flown by Flt Lt A B Dhavle, which was patrolling in the vicinity. Four-odd Bomb Damage Assessment missions were also flown following the initial strikes on runways. These helped in better planning of subsequent airfield strike missions.

Interdiction of Supplies

One of the hugely successful missions of the war was an attack on Mukerian Railway Station. On 15 December, Wg Cdr Hakimullah was tasked to lead a four-ship mission to attack Bhangala Railway Station on Jalandhar-Pathankot railway line. After pulling up for the attack, he was dismayed to discover that there was no rolling stock in sight, but he decided to try his luck further south along the railway line. Having flown a mere 30 seconds, he overflew Mukerian Railway Station which was bustling with trains. Peeling off into the attack pattern, the four Mirages set themselves for single-pass dive attacks with two 750-lb bombs each. According to Hakimullah's estimate, there were at least 100 freight bogies latched to different trains berthed adjacent to each other. The Mirages released their bombs one by one, though No 4, who had hung ordnance, pulled



off dry. The impact of the bombs on fuel and ammunition laden trains was so furious that the blasts shook the aircraft; No 2's drop tanks sheared off with the shock wave but he was able to fly back without any further damage. The Mirages had so far been striking at shallow targets, but with the time for the main offensive running out, it was decided to use them more audaciously. It was ironic that one of the most significant interdiction missions was also the one and only flown by Mirages, before the curtain fell two days later.

Drop Scene

Pakistan Army's plan in the west called for the beginning of offensive operations five or six days after an Indian attack in the east. These, however,

were meant to be secondary operations, essentially distractions, designed to fix the enemy and to divert his attention away from the intended site of the main attack by II Corps. With one armoured and two infantry divisions, II Corps was to strike into India from the Bahawalnagar area approximately three days after the secondary attacks. II Corps was to drive east to cross the international border, before turning to the northeast to push for Bhatinda and wishfully, beyond. It was expected that most of India's armoured reserves would have become embroiled in Pakistan's defences in the Shakargarh salient during this three-day interval between the secondary attacks and the main effort. After much prodding by the Army's field formation commanders as well as the PAF C-in-C, the vacillating GHQ reluctantly issued orders for II Corps to shift to its forward assembly areas on 14 December; elements of 1 Armoured Division began to move the following day. By this time, however, the other major component of II Corps ie, 33 Division, had already been detached to reinforce the beleaguered I Corps in the north and 18 Division in

Above: All Set to Fly - A PAF Mirage at No 5 Sqn flight line waiting for mission.

Bottom Left: Defending the Aerial Frontiers: A PAF Mirage over Himalayas.

Right Page Bottom: A CCS Mirage parked at PAF Base Sargodha.

the south, where things were not going well for the Pakistan Army. As a consequence, II Corps was deprived of almost one third of its striking power before the offensive had even begun. On the evening of 16 December, however, new instructions arrived from GHQ, "freezing all movements" until further notice. Following capitulation of forces in the Eastern Wing, Pakistan accepted a cease fire on 17 December. Mirages – which were expected to reduce the IAF's weight of attack by neutralising 4-5 IAF airfields once the main offensive was underway – could, thus, not be utilised for the critical task that had been meticulously planned for months.

Report Card

During the 14-day war, Mirages flew a total of 390 sorties which was 13% of PAF's overall war effort of 2,955 sorties. [5] For a relatively new and modern weapon system, the Mirage achieved a modest aircraft Utilisation

Rate of 1.6 sorties per aircraft per day during the war. [4] While it fell short of the planned 2.2 daily sorties, it reflected a cautious conduct of the war whereby the PAF was held back, so that everything could be thrown in during the army's main offensive which, in the event, never came through. Wg Cdr Hakimullah, who very ably commanded the Mirage squadron during the war, and also led several dangerous missions in enemy territory, was awarded the Sitara-i-Jurat (Star of Valour). That coveted award also went to Sqn Ldr Farooq Umar, the senior flight commander of the squadron, who had flown many useful photo recce missions in enemy areas infested with patrolling fighters. The three pilots who shot down IAF aircraft were content with having joined the elite club of fighter pilots with aerial kills. A month after the war, the PAF was able to line up 22 Mirages for all to see on the tarmac at Sargodha, while the 23rd Mirage was

under maintenance in a hangar.[6] The impressive sight belied claims of any losses that had been incurred by the Mirage fleet during the war.

References:

- [1] The Canberra's 'Orange Putter' tail warning radar (an active device) was prone to picking up ground clutter, and was usually turned off by the pilots at lower altitudes. It is likely that Sasoon had also turned it off, to avoid false alarms that would have been triggered over the hilly terrain.
- [2] Official PAF Records.
- [3] Ibid.
- [4] Ibid.
- [5] Utilisation Rate is based on an average aircraft serviceability of 75%. The Mirage-III wartime UR is calculated thus: UR = 395 sorties ÷ 17 aircraft ÷ 14 days = 1.6.
- [6] A picture of the lined-up Mirages appeared in Air Enthusiast, May 1972 issue.



MAKING HISTORY

A Feat to Remember and Cherish

“2 Feb 1958 would always be remembered as the red-letter day in the history of Pakistan Air Force. It was on this day that young and fledgling Pakistan Air Force stunned the entire world by pulling up a 16-aircraft formation loop at PAF Base Mauripur (now Masroor), Karachi.”

by ACM Jamal A. Khan (Retd)

In another story for the Sabre Jet Classics, I made a mention of the “Falcons,” for ten years the F-86F formation aerobatic team of the Pakistan Air Force (PAF). The Falcons were originally just four Sabres in 1956 but over the next two years, the team grew their number to seven and then to nine for all maneuvers including barrel rolls. I had already had the pleasure of flying as No. 2, 4 and 6 and I flew the loop as Falcon 6 – slot to the leader’s right wingman. In December 1957, our air force chief asked

Title Photo: Another view of 16 sabre aircraft getting ready for the final pull up over PAF Base Masroor.

Right: 16 Sabre aircraft in close formation pulling up for a world record. (All photos PAF Archives)

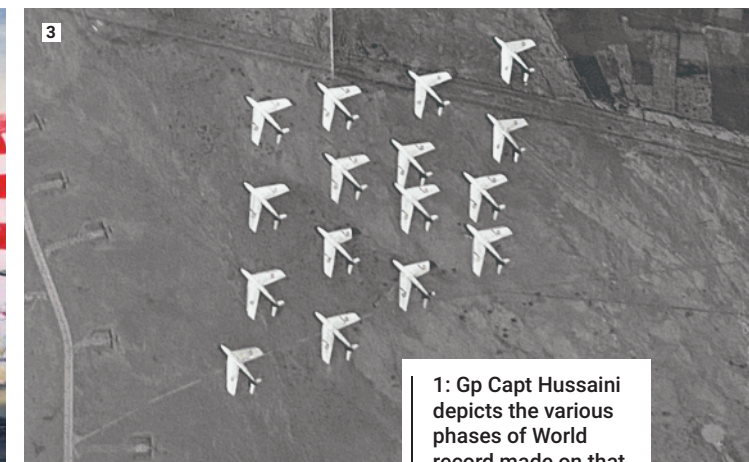


the Falcons leader, Wing Commander (Lieutenant Colonel) “Mitty” Masud, if he could expand his team to a really impressive number for an air display that was planned to welcome the King of Afghanistan on February 2. That gave Mitty little less than four weeks of flying days, but he said yes. The air chief approved his plan for flying a 16-Sabre loop as the show opener in the grand firepower and aerobatic air display for the monarch’s state visit; the loop would be followed by the full sequence of aeros by the core seven, when the other nine would break off. Mitty felt that he had the advantage of an already existing and well-practised team of seven around which he could expand the formation to fly the centerpiece maneuver – with a little bit of luck. Mitty happened to be a popular but hard task master and was pretty sure he could call in the luck factor by his leadership. Our special guest on the occasion,

King Zahir Shah of Afghanistan, was a kindly and air-minded gentleman and a great unifier of his tribally structured country. Sadly, he was overthrown in a palace coup by his cousin in 1973 and immediately exiled, setting up events that soon installed a Soviet puppet government in Kabul and eventually triggered Moscow’s 1979 Christmas invasion of his country. The U.S.-Pakistan-aided Afghan resistance eventually secured the most stunning and world-changing victory of the Cold War. But the unfilled vacuum after the defeated Red Army’s ouster in 1988 also triggered a genocidal civil war, religious extremism and warlordism. A faction of former freedom fighters (Taliban) then burst upon the scene and ruled with widespread excesses in the name of religion while a horrified Pakistan appealed for moderation. Along with their U.S. and NATO allies, Pakistan and Afghanistan are today fighting a

complex and hard counterinsurgency war that began with the 9/11 outrage on American soil but is actually embroiled in the competing interests and conflicting objectives of 8-10 regional and major powers. Now back to the air show for King Zahir Shah.

For the Falcons, another advantage was that all four newly equipped F-86 squadrons were temporarily stationed at one air base near Karachi, the same at which the air display was to be held. This made it easier to pick pilots and there were virtually no logistic problems. All our Sabres had been recently delivered (complete with their ‘new cockpit’ smells) and the 95% in-commission rate for the 16+4 Falcons Sabres gave us the confidence to drop the (already knotty) idea of having a “master” reserve pilot. However, two additional planes were started up near each F-86 cluster to hop into if



1: Gp Capt Hussaini depicts the various phases of World record made on that day through his paint and brush.

2: Wg Cdr Mitti Masood briefing Flt Lt Anwar Hameed minutes before departure for the historic mission. (Gp Capt Hussaini painting).

3: An aerial shot of 16 Sabre aircraft taken from top by the photo ship aircraft.

4: Archive photo of Wg Cdr Mitti Masood.

5: 16-ship setting up for the loop over PAF Masroor.

6: Archive photo of Flt Lt Jamal A Khan with F-104 aircraft.

needed by any of the team pilots having trouble with his Sabre. We started engines fifteen minutes before taxi time.

All sixteen aircrew were experienced fighter pilots but for half of them the F-86 was their first jet fighter. Their ranks and numbers ranged between Wing Commander/Lieutenant Colonel (1), Squadron Leader/Major (5) and Flight Lieutenant/Captain (10).

After a week of cluster practices in four to six F-86s by the newly inducted pilots in separate pieces of sky and after disciplining the original core of seven into rock-steady flying that could induce maximum stability within the larger formation, the

sixteen flew together for the first time with just two weeks remaining for the air show date. The experience was awesome for some of the pilots, especially those who had never flown formation aerobatic maneuvers with other planes surrounding them in all directions. The wingmen at the right and left wingtips of the large diamond of sixteen had (besides enjoying the best view, and possibly because of it) to concentrate the most for keeping well tucked in. And to power the bigger arc he was required to fly behind all his team mates, Falcon 16, the rear-most slotman of the diamond, had routinely to use 98-99% rpm to the leader's 91%. The Group Commander of our F-86 wing, himself a highly admired

ultra-low level aerobatic pilot, frequently accompanied us in an RT-33, taking pictures with the nose camera for the debriefings and to provide us with some very useful tips and occasional growls.

An interesting problem arose when, during one of the practice loops, a 120-gallon tank departed one of the Sabres. Spewing fuel, it rolled along the

slat of the owner F-86 and then was thankfully seen to disappear in a trajectory away from the formation. The subject pilot could easily control the asymmetry through the remainder of the loop and the pilot flying his wing did not have the time even to bounce around a little because it all happened so fast. Although our sortie times would thenceforth be cut down a lot, Mitty decided we would fly even the work-up sorties in the clean configuration till show day. Mitty's briefings were characteristically crisp and very executive. We had a few exciting near misses with birds, so it was an SOP for him before each practice to scan and choose an area with the lowest bird strike potential, but he ordered us not to worry about or look for birds (a normally ingrained habit) because he was responsible for preventing bird strikes on the entire formation. While covering emergency procedures, he had briefed us early that except for the extremity wingmen, the best emergency break-away SOP for every Falcon during maneuvers should be easing forward on the stick to get clear as the first step, regardless of the airplane attitude or altitude. After a fruitless crewroom debate to find a better alternative to this separation policy, one of the pilots asked Mitty the next morning what maneuver he should

perform if the formation happened to be still headed down out of a loop. "One," shot back Mitty, "Push on the stick to separate. Two, orientate. Three, use good judgment," as he turned with barely a withering pause to other matters.

After the 50-plane firepower and aerobatic display before 20,000 spectators was over, King Zahir Shah insisted on meeting the air show pilots in visible and happy acknowledgement of the honor accorded to him by Pakistan. I too shook hands with the king at the formal lunch. I did not know then that I would meet him again thirty years later in Rome (but more regularly and discreetly), where he lived in exile under the protection of the Italian government, and I served as my country's ambassador. The King returned a frail 87 to Kabul in 2002, still fervently beseeching his people to shun religious intolerance and to return to peace and stability. He died in 2007 and many Afghans told me they were convinced that their country's misfortunes began with his exile.

The correspondent of London's Flight International magazine who attended the air show later wrote in an illustrated article that the PAF's 16-aircraft loop was a first but many

of us felt instinctively that the honor would be short-lived. Sure enough, Britain's RAF set out immediately to better our record and its 111 Squadron's Black Arrows did so with twenty-two Hunters within the year.

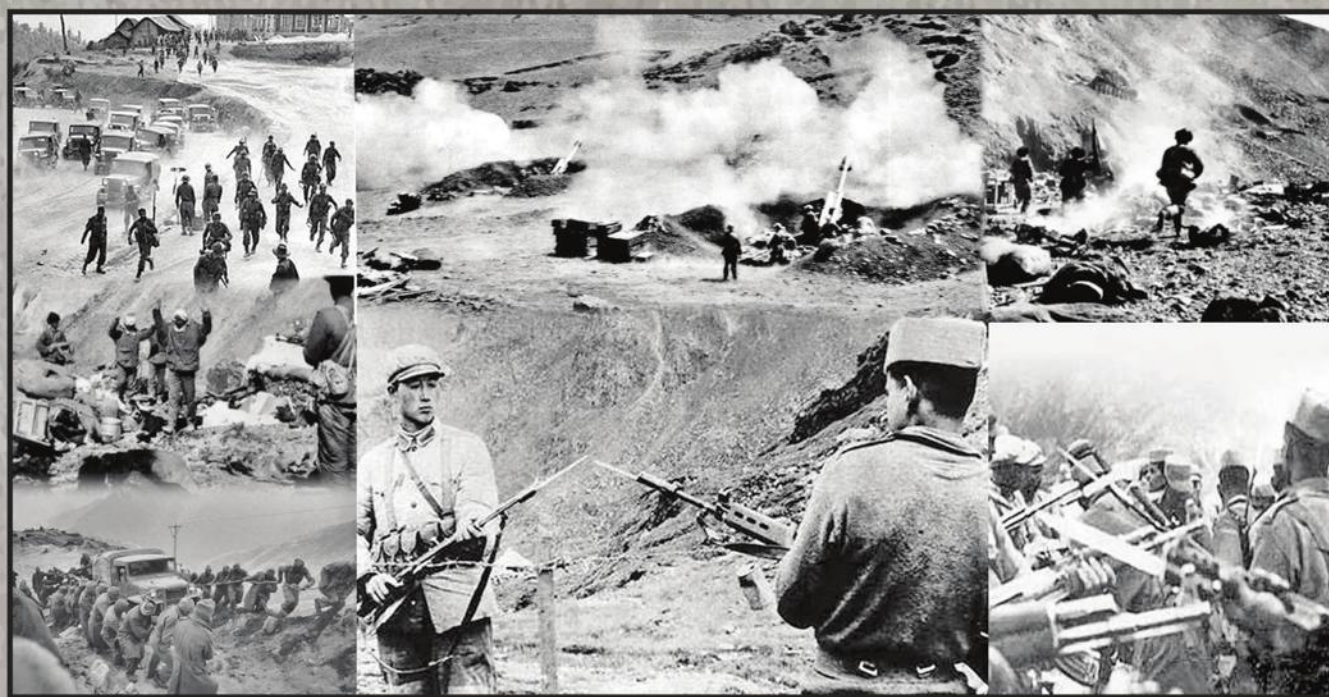
The pilots of the core Falcons' team continued to fly in their periodic air shows in combinations of four-to-nine Sabres in the years that followed while their other loop colleagues returned to their squadrons. Later many of them were to fly the much-loved F-86 in two wars, in which they achieved a dominating cumulative kill ratio of 1:5.6 in air combat. Sadly, the last of the PAF's Sabres had to be retired by 1979. In 1982, Pakistan purchased through a commercial contract its first F-16As and Bs, arguably the only fighters that could rightly be called the Sabre's true incarnation in compactness, agility and sheer pleasure of piloting. The fleet has recently grown to include some F-16Cs and Ds as well, and the PAF pilots are flying them in a highly unconventional and intensely challenging counterinsurgency environment in alliance with the United States and its other NATO partners.

THE HIMALAYAN BATTLE LINES

BEYOND THE 1962 INDO-CHINESE BORDER CONFLICT

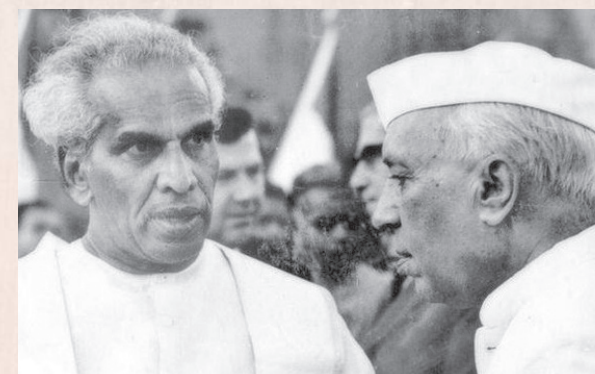
BACKGROUND AND FUTURE OF ONE OF
THE LEAST STUDIED WAR OF THE REGION: 1947 - 2022

PART 1



“The 1962 Indo-China War is a frozen conflict. This mid-20th Century border war continues to define the contours of the 21st century regional security and stability atmosphere. While the conflict is concerning India and China, it is nevertheless the background which continues to exert major and secondary effects on regional and global players.”

by Air Cdre M Suleman Aziz (Retd)



Above: Late Prime Minister Jawaharlal Nehru with then Defense Minister Krishna Menon, during the 1962 Indo-China War. (Photo: Quora.com).

For many years after independence in 1947, the street slogan in India was that, “Hindus and Chinese are brothers”. Later, there was the 5-point agenda, the Panj Sheel, forwarded by the Indian leadership regarding peaceful coexistence and maintenance of cordial relations with China². However, in the winter of 1962, following strained diplomatic and military relations, India and China went to war in the contested Himalayan region over border demarcation issues. The seeds of this conflict were laid long before i.e. during the British colonial rule when various borders of India were demarcated under a different set of conditions. While there is a long history of contentious pre-partition demarcations³, this particular conflict pertains to two distinct areas in the northern mountainous regions where

India shares a border with China and other smaller states. Located on arid lands with extreme weather conditions, the area of concern spans over a length of 4000 Kilometers at an average altitude of 14,000 feet Above Mean Sea Level.

Historically, the British-Indian government had previously made several attempts to resolve these issues. However, in the Indian pre-partition era i.e. prior to 1947, the geostrategic situation of the late 19th to early 20th Century had a different context. The primary concern at that time was that the jewel of the British crown - India - an important provider of imperial wealth, commodities and military manpower was to be safeguarded from the north by a growing threat of possible Russian expansion⁴. Creation of buffer zones was thus one

of the prime factors in British demarcations and boundary settlements. At some places, tradition and understanding was given precedence over exactness⁵. Decades later, these incomplete or dual interpretable demarcations were to haunt the area's native inhabitants.

After independence in the post WW 2 era; the context of boundary demarcations quickly transformed for India and then China as she transformed into the Peoples Republic of China or PRC in 1949. Consequently, each claimed rights to their traditional sovereign territorial lands. In part, misunderstandings and misinterpretations followed by political mishandling of the situation caused these two⁶ countries, who once enjoyed cordial relations and were in constant diplomatic communication, to finally draw battle lines and go to war. Clausewitz thus wrote more than

Bottom: A Bren Gun Section on Guard. The Jawan in the foreground is carrying a bulky .303 Lee Enfield Rifle. They are keeping a watch in the cold and mountainous terrain of Chushul, Ladakh. (Photo: BR Galleries).





Left: President Eisenhower received by Prime Minister Nehru at Parliament House, before the President addressed a joint session of Indian Parliament. (Photo: flickr.com).

Below: The soldiers were ill equipped, not trained for the high altitude, fatigued and confused due to the confusing orders being issued by senior generals. (Photo: Indian directories).

Bottom: File photo of Indian soldiers patrolling in Aksai Chin during the India-China War in January 1962. (Photo: scmp.com).



100 years ago, 'it is clear that war is not a mere act of policy but a true political instrument, a continuation of political activity by other means'. What exactly happened from 1947 to 1962 is not just another war story from the books of military history. It laid down the context of the future security matrix for the South Asian region and beyond! Today, this region has the most rapidly rising economic and military powers of the 21st Century and is home to more than 2.5 billion people. While this conflict concerns two protagonists, as a consequence, few major and secondary effects are generated on other regional and global players. These continue to be a factor in the 21st Century – and for the foreseeable future.

As of today, the 1962 Indo-China war stands as a frozen conflict⁸. What can be drawn from the 1962 Indo-Chinese war in terms of regional stability? The answer to this question is not simple as it is a live and evolving situation. This simmering has not faded either. In fact, in 2020, there were renewed tensions in the same region. Due to the continuing applicability of its causes, it would be necessary to briefly narrate history of the problem, conditions leading up to the conflict and its outcome. This article will analyze the problem in its entirety following the single case study methodology. Then evaluate its

impact on future relations between the two opponents in particular and other 'concerned' regional countries, with some applicable interpretations for Pakistan. While undertaking this analysis, it would be evident that from 1962 onwards, the two nations i.e. India and China, view each other with caution. There are momentary periods of border conflicts and rising tensions in an irregular sinusoidal sequence⁹. Furthermore, Indian drives to pose herself as a strong supporter of US policies in the US pivot-to-Asia-strategy adds to the impediments of resolving any issues. Indian aspirations can now



be seen as it is a member of the Quadrilateral Security Dialogue or the 'Quad' involving USA, Japan and Australia. Although considered as a loose alliance focusing on security and economic interests, the four navies participated in their first joint exercise in over a decade in August, 2021, off the Guam islands in the Pacific under Exercise Malabar-21¹⁰. Whereas, Exercise Malabar-22 was conducted for over 5 days near Yokosuka, Japan in November and witnessed live weapon firings, anti-air and ASW drills besides other tactical and interoperability procedures of the four navies.

Consequently, the main structure of external security for the two protagonists, at least in the South Asian region and specifically in the context of the Indian defence policy has clearly been transformed. It would be clear as to why continued development of Indian military potential¹¹, including its nuclear, space and guided missile programs¹² and efforts to acquire aerospace force and blue water naval capabilities¹³ clearly link with her foreign policy. These in turn are also related in ways to the strained Indian relations with Pakistan, her other conflicting interests with China and her desire to attain regional power status. Hence, the Indian politico-military psyche, despite the bollywood projection and other soft image initiatives, is set at a threshold defined by the strong requirement to retain overall balance with a rising China¹⁴.

However, in this article, due to the vastness of the subject, multiple linked issues like details of the Indian rivalry with Pakistan and other Chinese disputes in the South or East China Sea's would be briefly mentioned, only to provide an overview of the wider canvas of the future context of South Asian geostrategic concerns. Today, beyond the dawn of the 21st Century and hyper-connectivity of the globalized world, opportunities have revitalized intentions of China and India to sustain high economic growth. Even as there is realization that economic cooperation would be mutually beneficial, there is an additional factor i.e. competition for attaining or retaining strategic leadership - at least in the South Asian region.

Until the 2020 Galwan area border conflict¹⁵, both India and China could have been considered on the path of improving diplomatic and economic relations. After, the 2020 incident, the factor of 'keeping an eye on each other' with transient periods of tensions clearly continues to exist till date. Needless to emphasize, another military conflict between these two nuclear powers, could easily translate to adverse global and regional effects. Subsequently highlighted arguments explain their relations and reasons. As a final point, we will also briefly mention the consequent impact of 1962 Indo-Chinese war on global strategic bloc re-alignments in light of the on-going Russia-Ukraine conflict and the readjustments that would affect global stability in the 21st Century. In conclusion, we would synthesize the

main factors considered and attempt to rationally answer whether there is possibility of re-emerging tensions or improved relations between the India and China.

Historical Perspective of the Problem

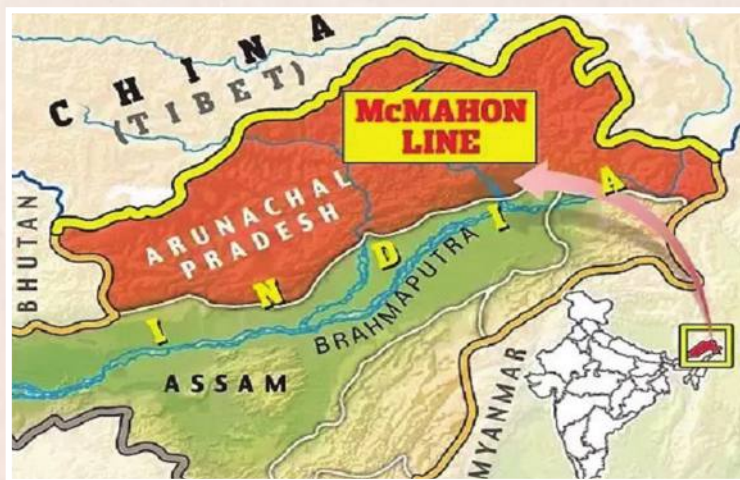
The border war of 1962 with the ensuing rivalry and strategic competition between India and China is not limited to one incident. While the 1962 border war is the main event, there are a series of short skirmishes before and much later. As in many other cases, China is usually considered and portrayed as the aggressor - the Asian tiger that initiated this conflict as well.¹⁶ China is considered as the perpetrator as it must have supposedly initiated the conflict as a part of its traditional and ancient Chinese grand strategy to secure its near abroad or peripheral regions. However, Neville Maxwell, (India's China War, Worcester and London, 1970) amongst others, in his epic work, 'India's China War' has carried out in depth research and traces the background of this conflict. As the conflict stands unresolved till date, a short lesson in the context of geographical orientation is also necessary.

To this day, the conflict involves two separate areas on the approximately 4000 Kilometers northern border of India with China. First is the North Eastern Frontier Agency or NEFA, a former province of India. Now called Arunachal Pradesh and it borders with Bhutan (see map above). The northern boundary of this area is the disputed at the infamous McMahon Line.¹⁷ This line was used by the British to demarcate and separate China's current autonomous Tibet region. This line was drawn after a formal treaty with the then independent Tibetan government in 1914 through another Simla agreement.¹⁸

The line was contested after independence and an independent Indian survey after 1947 did find some inconsistencies. However, Maxwell and others have gone into great length to explain the problem in its interpretation by the Indians¹⁹. This was primarily



One of several pictures of a humiliating defeat of the Indian soldiers at the hands of the soldiers of China's People's Liberation Army (PLA) released by China in 2021 (Photo: twitter.com)



had conquered this area. However, these were evicted by the Chinese counterstroke and pushed back further down till present day Ladakh in India. The two fighting forces finally disengaged and a non-interference treaty was signed in 1842. Each force i.e. the Chinese and the Sikh regiments had a reason to disengage. The Chinese were involved in their first Opium war while British India was getting destabilized as it drew near the Anglo-Sikh tensions before the first war of independence or the mutiny of 1857.

Left: The map shows the disputed boundary at the infamous McMahon Line.

Center: An Indian sentry and a Chinese sentry casually engaging each other on the Chinese side of the ancient Nathu La border crossing between India and China. (Photo: livemint.com).

Bottom: Indian soldiers take their position in the underbrush in the The Battle of Sikkim, which took place in 1967. (Photo: aneelanike.com).

Right Page: Prime Minister Lal Bahadur Shastri visits the Lahore sector on October 18, 1965. (Photo: rediff.com).

due to the traditional Indian comprehension and folklore that the summits of the Himalayan range separate India and China rather than other demarcated boundaries. While there are other minor inconsistencies in the actual border pillars marked in the pre-partition era by the British Army, these issues strongly came to limelight when India started publishing her own maps of this region in 1954. The actual McMahon line therefore exists South of Indian interpretations. The other contentious point for the Chinese till this date is the town of Tawang, located north of Assam, under Indian control and remains as one of the potential flash points of the future²⁰.

The second disputed area is more than 1000 Km to the west of NEFA and is called Aksai Chin²¹ and few adjoining areas.

Both China and India lay claim to this land (it is under China now). Once again, Maxwell along with other sources explain at length, problems of Indian interpretations. In essence, the issue here goes further back to the 1840s when independent Sikh regiments i.e. of Indian princely states

To the Chinese therefore Aksai Chin was their land - as always²². In this case, the McDonald – McCartney line i.e. the 1865 British expedition to survey and demarcate this area from China was acceptable to the Chinese. India realized this only after Tibet was annexed by China in 1950 and a road was being subsequently built by them through this area from 1956-67.

The 1962 Border War

At the core of this event, it was not the demarcation or rejection of



these lines that led to this war. The real problem lay in the handling of the situation from the Indian side. In that, history records Indian domestic political bickering and an extreme hard line stance adopted by the Indian government under Indian PM Nehru²³. Initially after 1947, there were steadily growing relations between India and China. India was the 16th Country to recognize China and was a mediator and facilitator from the Chinese side in the resolution of the Korean conflict of the 1950s²⁴. However, as the years passed and when problems of border demarcations came to light, there was no clear perusal of diplomatic claims or strategy to peacefully resolve the issue. The exception, quite like today, was the media fire and parliamentary rhetoric in India. Clarifications were not directly sought despite Chinese non-recognition of Indian maps printed in 1954²⁵ (which are since then taken as reference, specifically by the western countries).

Diplomatic miscommunication or inadequate communication or a combination of both soon led to a short skirmish in 1959 between Indian border patrols that were found beyond their territory in NEFA i.e. beyond the McMahon line while confronting Chinese frontier guards. Another skirmish occurred two months later in Aksai Chin²⁶. In response, the Chinese strengthened their positions north of NEFA and initiated diplomatic efforts while consolidating their positions in Aksai Chin. However, the initial Chinese military re-deployments went largely unnoticed by India. After the first skirmishes, Indian domestic portrayal of the situation was understandably of Chinese aggression. In the post Korean war era and height of the cold war, this view was obviously and very largely accepted by the west – as it would be today – in support of a democratic India rather than a communist China²⁷. Strangely, while diplomatic communications continued, the skirmishes soon went into the background due to other domestic commitments in both

countries. When the topic did revive, it arose strongly in Indian parliamentary debates. Domestic political blame-game with finger pointing and mud slinging between political opponents was responsible for the uproar and subsequent actions. Hence the Indian government of the time under PM Nehru came up with a plan to resolve the issue - once and for all!

What followed subsequently actually aggravated the situation. In that, India adopted an aggressive stance that was subtly called its 'forward policy'²⁸. This was to militarily evict the aggressors from perceived Indian claimed territory with no further discussions unless there was a complete and unconditional Chinese withdrawal. The stance in itself was the perfect ingredient for a military conflict. Therefore, despite repeated Chinese requests, visits by PM Chou En Lai²⁹ and numerous other diplomatic efforts, the Indian stance grew harder. Peace initiatives by other countries like Sri Lanka were also fruitless. The Indian Military at first did not support a conflict with China. Nevertheless, contrary to the facts and against the strategic appreciation by the Indian army, the Indian political leadership domestically portrayed India to be militarily in a stronger position and with better overall preparations. Moreover, it was the assessment of the political leadership; which was largely uncontested by the Indian army's hierarchy; that China would not militarily respond to aggressive Indian patrols. This in

essence was a critically incorrect military and strategic assessment that caused neither the government nor military leadership to adequately prepare for a Chinese response. This posture was also obviously converse to the Indian army field commanders' views from the Himalayas³⁰. Consequently, as the media and public debates on military skirmishes grew intense, soon it was a matter of internal drive i.e. by the Indian population – driven largely by the political opponents of the ruling Indian leadership – to militarily evict the Chinese³¹. Therefore, during October - November 1962, Indian army forward patrols on encountering and engaging Chinese frontier guards initiated the spark for the border conflict³². After a brief lull in the fighting, what followed next was the systematic defeat of an ill prepared but numerically equivalent strength of Indian troops³³. By the time the Indian political leadership and military hierarchy did accept the real ground situation and began emergency deployments with logistic moves, it was too little too late³⁴. Despite all efforts, the conflict concluded with a humiliating defeat for India. As often, strategic miscommunication, operational misinformation and incorrect strategic appreciations do cause such results.

After achieving their objectives in Aksai Chin (Pinyin in Chinese language) and NEFA or Arunchal Pardesh areas, the Chinese ground forces unilaterally



declared ceasefire and withdrew mostly to their pre-war positions. The war had lasted for about a month i.e. from 20 October to 20 November, 1962. Upon termination of operations, the Chinese leadership simultaneously exhorted the Indians to diplomatically resolve the issue while returning all Indian captured weapons and ammunition – something analogous to a Kung Fu movie wherein the lead character retreats but only after teaching a life long lesson! Interestingly, there was no use of airpower by either side other than pre-war logistics drops and reconnaissance flights with the Indians continuously fearing repercussions of Chinese air force retaliation. There was no role for either navy in this war either and no assets were ever deployed. While there were numerous political and military errors at the strategic and operational levels, this was a scar on the Indian political leadership, military hierarchy and the public that was not to go away easily. In spirit, what the Chinese had adopted was a strategy that was militarily applied on them previously by the Russians³⁵.

Through the years after 1962, no progress on any of the issues could ever be made specifically until the death of PM Nehru in 1964. Moreover, it was only later when public pressure into answers following tensions with Pakistan that the Indian government initiated an inquiry and began to look into the real reasons of the conflict and its outcome³⁶. The official results of the war in terms of casualties were published by India in 1965 with approximately 5000-7000 Indian soldiers killed in action, depending upon the source, and many more casualties. The Chinese casualties were approximately one-tenth of these. Diplomatic

relations between China and India actually never revived until 15 years later³⁷. Between these years, there were a series of events and two more near engagements. Recently i.e. as of 2020, there has been another serious incident that highlights the reality of the issue. Nevertheless, other than these military centric events, there have been a series of political, diplomatic and economic aspects of this conflict that are essential to contemplate.

Indo-China Diplomatic and Economic Relations: Post 1962.

Barring occasional statements to denounce each other, there were no diplomatic relations between the two states until the end of 1970s. During this time period, the Indian stance remained unchanged from the legacy of Nehru and the Chinese retained their stance for diplomatically resolving the issue while maintaining forces at the pre-1962 war positions – a stance not followed in totality by India³⁸. However, after the Indian elections of 1977, Indira Gandhi's political party (daughter of Nehru) lost power. Consequently, power was transferred to a new leadership and political party in India – and a new thought process. Thus, efforts for reviving diplomatic relations were reinitiated by the end of 1978 when the Indian Minister for External Affairs visited China³⁹. The build-up of relations was painfully slow as there were various tensions and military events in parallel (explained later) that would stall the process. Nonetheless, through the 1980s, there were reciprocal visits by the Chinese. Diplomacy prevailed throughout and thwarted military buildups in the north of India during the mid 1980s.

Nevertheless, after the end of the Cold War, the context of



relations between the two started to change. The 1990s again witnessed reciprocal visits between the heads of the two states and border dispute resolution mechanisms were put in place. Occasional reminders by Indian leadership that China remains its prime enemy continued, such as after the Indian nuclear tests of 1998. The development of Indian long range ballistic missiles to reach major Chinese cities and other military capability enhancement measures are also in the same context. These developments involving Billions of US \$ in an otherwise third world country clearly indicate that despite steady improvements in relations at diplomatic level, the 1962 conflict has played a major role in promoting instability in the region. Moreover, relatively recent Indian initiatives to remain enthusiastically involved with the US against China for e.g. starting from the US pivot-to-Asia strategy bear witness to the same. Continuous range enhancements in Indian Ballistic Missiles⁴⁰ and possible lease of six Tu-160 'white swan' strategic bombers from Russia along with other strategic

Top: Border troops from the two nations converse casually on the Indo-China border. (Photo: businesstoday)

Top Center: A scene from the deadly 2020 border clash between the Chinese and Indian troops in Galwan Valley. (Photo: scmp.com).

Right Page Above: People's Liberation Army Navy marines stand at attention following demonstration of brigade's capabilities, seen parallel to a marching formation of the Indian Army. (Photo: intpolicydigest.org)



capability enhancements are in the same context⁴¹. Nonetheless, economic interests did drive another parallel set of actions between the two. By the end of the 1990s and early 2000s, globalization and 21st century international system of free markets, commerce and trade diversities were in the prime interest of both states. Both were and remain rising economies. Therefore, to reduce tensions, the 2000s marked further improvements in diplomatic relations⁴². Although tensions did not totally cease, mutual visits by high level delegations and heads of states continued. By now, it was evident that track-2 diplomacy and Confidence Building Measures (CBMs) needed to go beyond cultural visits and were to be accompanied with inter-state trade to improve relations. Thus by 2004, the Indo-China trade had crossed US \$ 10 Billion mark with steady increase.⁴³ Occasional political disputes for example on China's membership in the South Asian Association of Regional Cooperation (SAARC) and China's opposition to Indian permanent membership to UNSC⁴⁴ and NSG⁴⁵ membership continue. However, alongside these mutual diplomatic, political and economic measures to improve relations, there is a gray shade to this relationship that needs to be taken into perspective to acquire a 360 degrees view of their mutual relations.

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Doing it the **CRUDE** Way

WHEN HEARING WAS BELIEVING

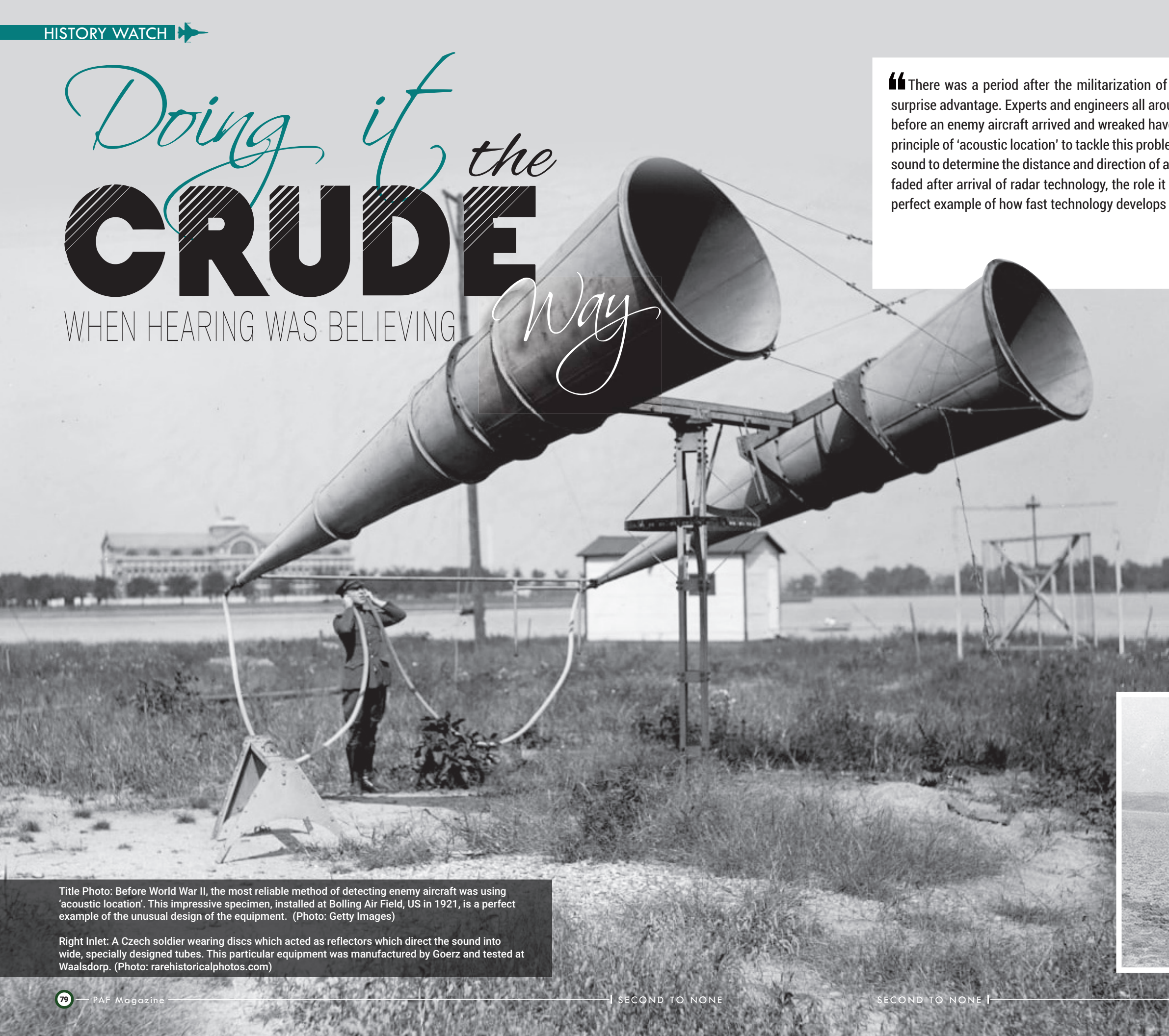
“There was a period after the militarization of aircraft when approaching aeroplanes and bombers had a huge surprise advantage. Experts and engineers all around the world scampered to come up with a method to alert forces before an enemy aircraft arrived and wreaked havoc. Almost at the same time, different nations started utilizing the principle of ‘acoustic location’ to tackle this problem. This concept used different methods and equipment to amplify sound to determine the distance and direction of approaching military aircraft. Although, the technology prematurely faded after arrival of radar technology, the role it played in base defence and the diverse array of technology is the perfect example of how fast technology develops in war-like scenarios.”

by Muhammad Khan

Before the advent of the radar, the most common early warning systems were based on acoustic location principles. At the heart of it, the process of acoustic location can be summed up as the use of sound to estimate the distance and direction of the sound’s source. This phenomenon had been observed long before it was put to military use. The first instance its commercial use was in 1879. The device was named ‘Professor Mayer’s Topophone and it was invented by Alfred Mayer, a Professor of Physics at the Stevens Institute of Technology in New Jersey, US. Made popular by appearing in the pages of a magazine called Scientific American, it was a curiously designed machine with surprisingly well-designed construction. It was a bit advanced for its time and couldn’t find traction within military circles, given the fact that military aircraft wouldn’t be invented for another three decades.

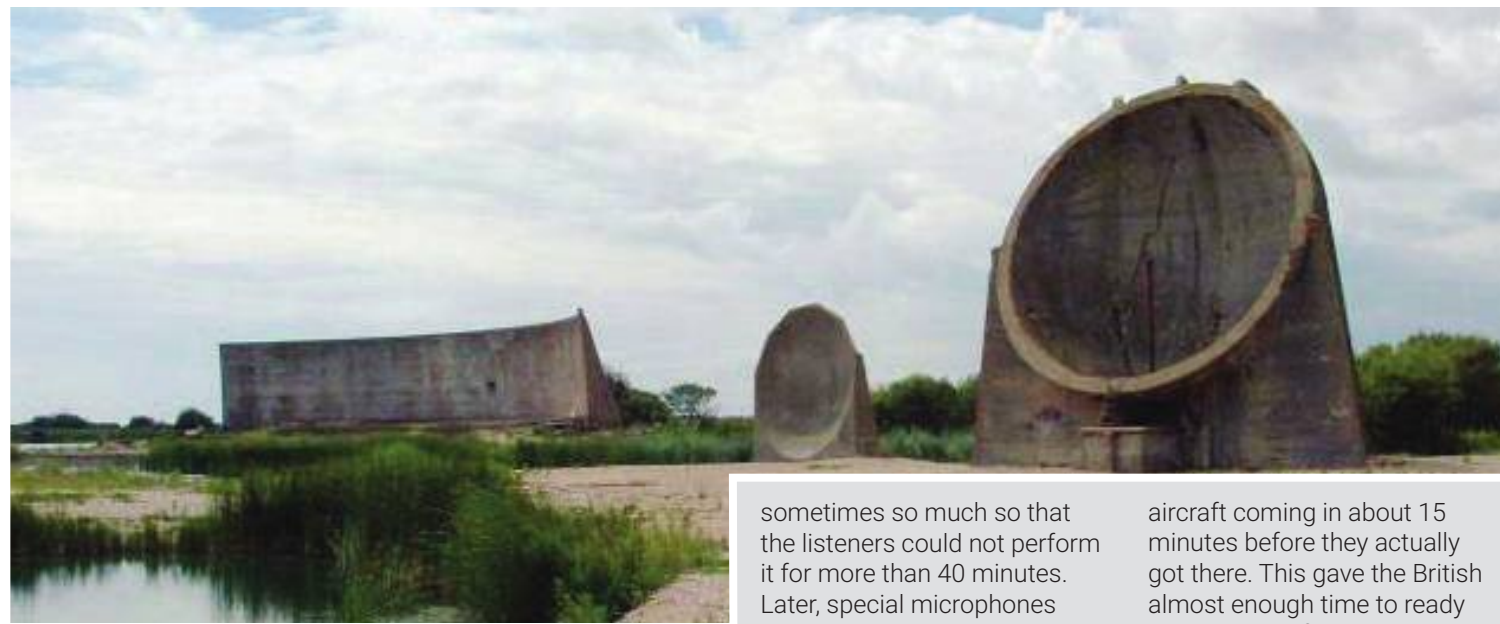
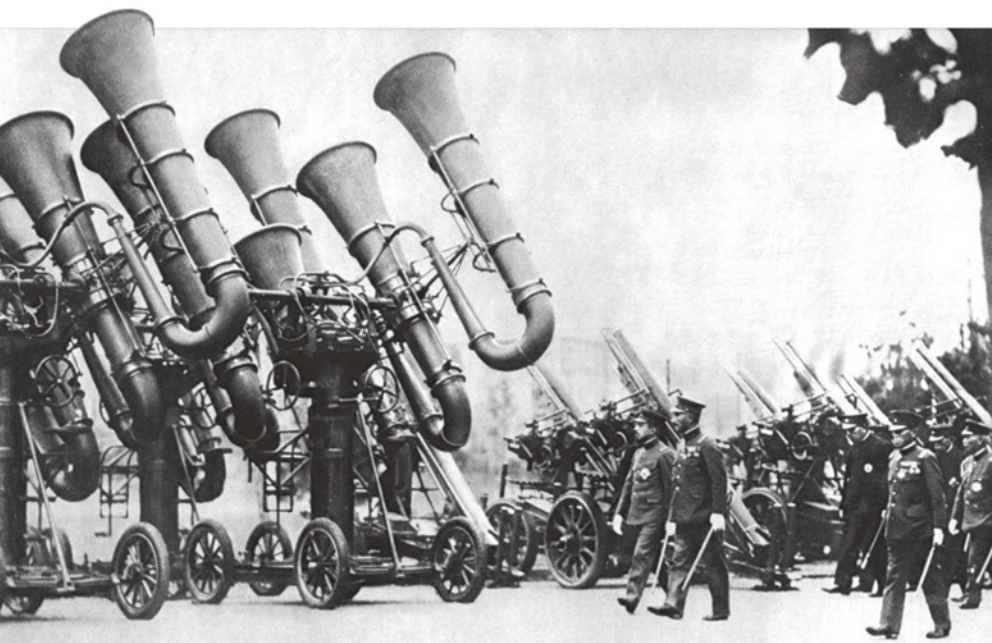
Even after the invention of the aircraft and its militarization in 1911, it was not until the substantial threats of aerial bombing emerged that military minds realized the importance of early warning systems. Some way had to be devised to detect warplanes from a significant distance. Acoustic location was the most obvious choice at the time.

More than one person claims the first use of the technology. A notable instance was of Alfred Rawlinson, a commander of the Royal Naval Volunteer Reserve. Rawlinson commanded a



Title Photo: Before World War II, the most reliable method of detecting enemy aircraft was using ‘acoustic location’. This impressive specimen, installed at Bolling Air Field, US in 1921, is a perfect example of the unusual design of the equipment. (Photo: Getty Images)

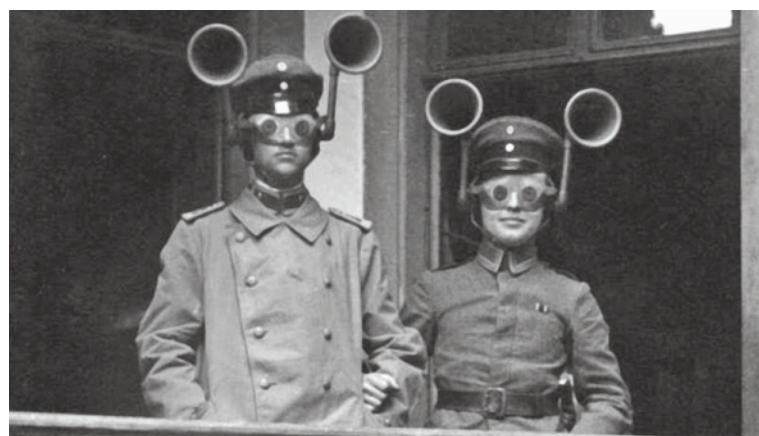
Right Inlet: A Czech soldier wearing discs which acted as reflectors which direct the sound into wide, specially designed tubes. This particular equipment was manufactured by Goerz and tested at Waalsdorp. (Photo: rarehistoricalphotos.com)



mobile anti-aircraft battery on the east coast of England in 1916. A problem persistent to the crew was the overcast sky in the area. Clouds would hinder their vision, making it hard to see the approaching Zeppelins. Rawlinson, in an epiphany of improvisation, decided to construct a device which could potentially help them determine the location of the incoming aircraft even if they did not have a visual on it. The device was a pair of gramophone horns fixed on a rotating pipe. From each of the horns, a tube was connected which was then used to hear any incoming sounds. It was essentially a bloated, amplified stethoscope. This equipment gave successful results, giving mostly accurate fixes on approaching aircraft, even though they weren't visible through the clouds. Although no planes were shot down using these equipment, Rawlinson claimed to have forced one of the Zeppelins to jettison its bombs at one point.

Sound Mirrors:

Another pioneer of location determination using acoustics was Dr. William Sansome Tucker of Britain. Dr. Tucker used the same principles of acoustic location but his application



Left Above: Three Japanese acoustic locators, colloquially known as "war tubas", mounted on four-wheel carriages, being inspected by Emperor Hirohito. (Photo: Mashable.com)

Left Center: An officer and a soldier from an unidentified German Feldartillerie regiment test a contraption which combine enhanced acoustic and optical locating, to get the best of the two method. (Photo: rarehistorical.com)

Left: A Dutch soldier tests out a device aptly named 'The Personal Parabola'. (Photo: hearinglossjournal.com)

was different. He came up with the idea of 'sound mirrors' in 1915. Sound mirrors were large, concave discs made of concrete. The concept was similar to the modern TV receiver, replacing radio waves with sound waves and was the cutting-edge innovation in military research on sound and its wartime uses. They worked by using the curved design to amplify sounds and noise by capturing the sound of any incoming aircraft from the European mainland. This technique was amplified by using a human listener with advanced stethoscopes. After the receiver was calibrated for optimum reception, the captured noise would be matched with the data received from the other receivers. The comparison would, then, be used to calculate



speed, flight path and height. The most effective range for the mirrors was from 8 to 24 miles. The operator/listener stationed at the acoustic mirror was given special training so he distinguish between different sounds and noises. It was a difficult task,

sometimes so much so that the listeners could not perform it for more than 40 minutes. Later, special microphones were designed by Dr. Sansome which were placed at the focus point of every sound mirror. This made the structures much more effective.

The mirrors ranged from 20ft to 200 ft, most of which are still intact and can even be visited today. From 1915 to 1935, the British army built several acoustic mirrors around its coastal areas. These mirrors proved to be useful and warned the forces of approaching war planes by the distant sound of their engines. The system could detect the engine sounds of the German bombers from almost 15 miles away. This meant that the British forces could detect

aircraft coming in about 15 minutes before they actually got there. This gave the British almost enough time to ready their artillery, if they were vigilant.

The mirrors are sturdy structures and still stand today at various locations throughout Britain. The best specimens, however, are the ones constructed on the Dungeness peninsula and at Hythe in Kent. In the Dungeness peninsula, there are 3 acoustic mirrors which stand till today. The biggest of them is a 70 metres long curved wall, with a height of about 5 metres. Sound mirrors were eventually rendered obsolete by the advent of the radar but Dr. William Sansome had given us the

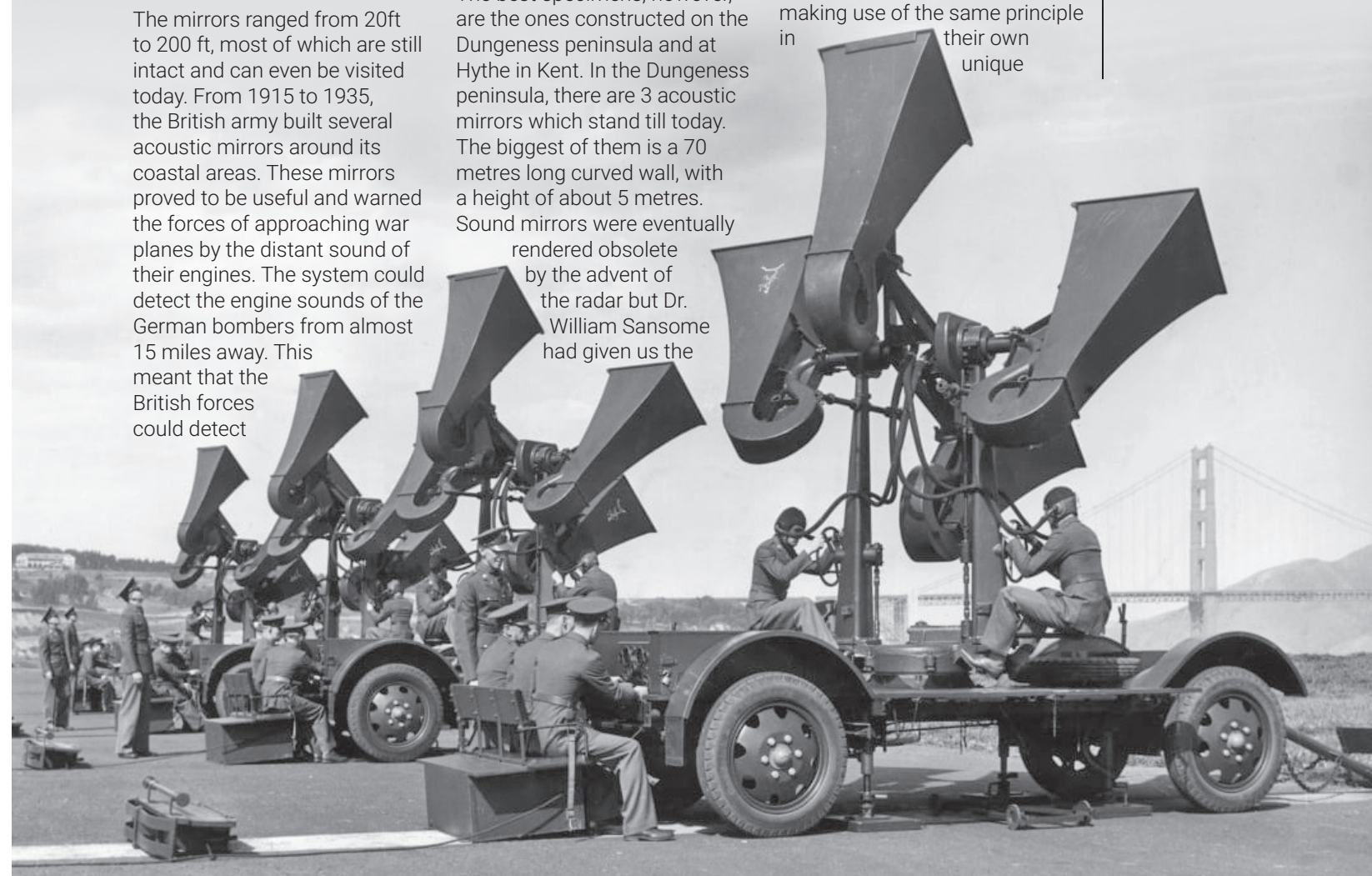
mechanism to use connected systems to accurately pinpoint the location of an aircraft. This mechanism made substantial contributions to the technology that followed.

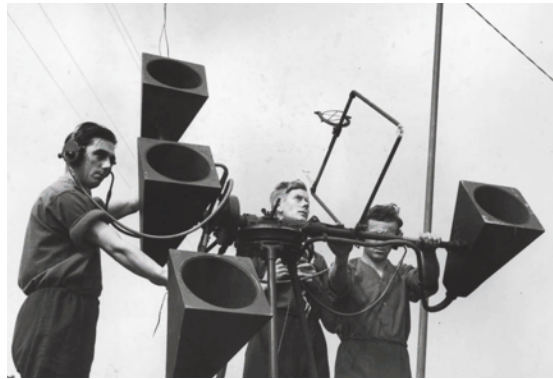
The addition of sound mics designed by Dr. Sansome also gave rise to another way to use acoustic location. Listening Wells were deep shafts or holes, which were effective in picking up sound waves that other designs couldn't. Listening Wells, although effective, were very rudimentary in use. The operators had to spend hours on end, constricted in a hole deep underground. These wells were only constructed in Romney Marsh in England.

This wasn't the only use of acoustic location at the time. Several other militaries were making use of the same principle in their own unique

Left: The three iconic acoustic mirrors at RAF Denge, which still stand to this day. Each different design had its own benefits and pitfalls. (Photo: en.wikipedia.org)

Bottom: Military experts sit and interpret the reading from 4-tube sound detectors being operated by soldiers. The detectors are parked near San Francisco, California, in 1944. (Photo: Getty Images)

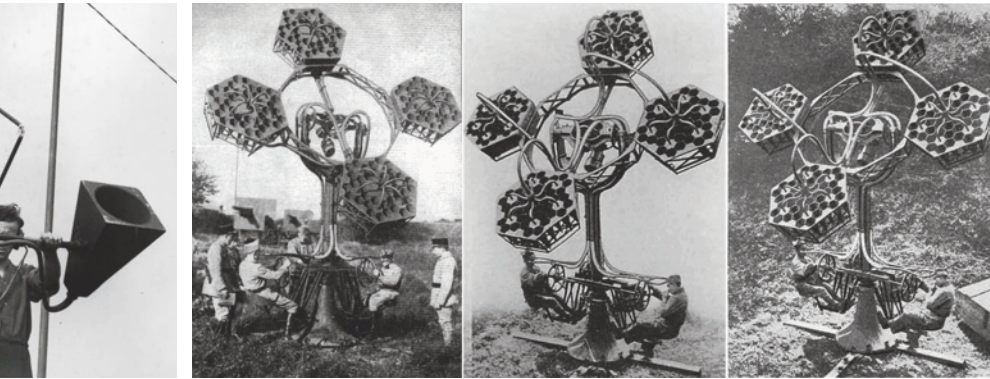




fashions. Although, radar technology was on the horizon, these machines had to fill the gaps till they were widely available.

In the late 1930s, Hitler's forces were on the rise once again. It was obvious that to build a formidable military defence, the Nazis would need fool-proof anti-aircraft measures. The British had made significant advancement on the radar technology but the Germans were not far behind. They did, however, have advanced acoustic location technology, the prime example of which was the 'Das Ringtrichterrichtungshoerer', which can be translated to 'ring-horn acoustic direction detector'. This technology was successfully used to assist searchlight operators locate night bombers.

The Americans used the technology adequately, as well.



They used different versions of acoustic locators. A good specimen was a substantially large, fixed 2-horn listening device installed at Bolling Field in Washington, D.C. The devices eventually became less cumbersome and mobile but they were rendered obsolete soon afterwards. An important part that acoustic locators played in American military history was detecting the first Japanese aircraft coming in to attack the American-occupied island of Corregidor in 1941.

The Mechanism:

The acoustic locators were designed on the design of the human ear. Pinna is the outer ear, the part that we normally see. The pinna is specifically designed to capture sound and amplify them. These augmented sound waves then enter the inner ear, where sensitive organs process them. If you cup your hand over your outer ear, you



Top Left: A British military sound locator in use at an airfield in southern England, in 1930. On the left is a searchlight that was used in conjunction with the locator. (Photo: Getty Images)

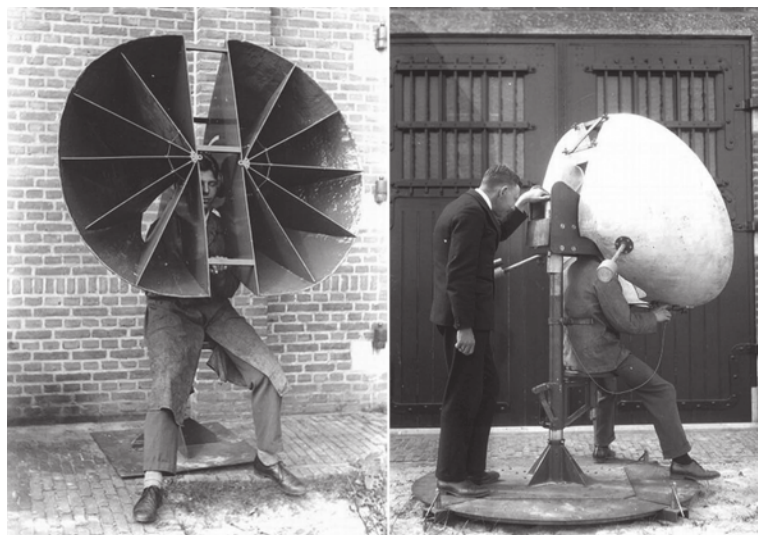
Top Right: This wild-looking contraption was designed by French Nobel prize winner Jean-Baptiste Perrin, a World War I officer. It was called the Perrin acoustic locator and used 36 small hexagonal horns to locate sound. (Photo: douglas-self.com)

will instantly feel the difference in that ear. Your ear will capture sound waves more effectively. Acoustic location works on the same principle, enhancing the outer ear by giving it a major boost in ability. They usually consisted of large horns or microphones connected to the operators' ears using tubing, much like a very large stethoscope. Most acoustic location devices use this principle, in their own unique way. The trumpet or tuba shaped designs, which looked like warped versions of their musical counter-parts, consisted of several horns to capture sound waves from afar. The horns were usually arranged in horizontal and vertical configurations. The

Left Centre: The impressive 'Ringtrichterrichtungshoerer', operated by a crew of 3 men. Mainly used in World War II, to aim searchlights at night targets, presumably because it was cheaper than a radar set. (Photo: douglas-self.com)

Bottom Left: An antecedent of the Dutch personal horn. This design no doubt had more capacity, thanks to its greater area. It swivelled on the post behind the operator. (Photo: douglas-self.com)

Right Page Above: Trained Japanese soldiers demonstrate the use of a "war tuba.", under the supervision of a superior. (Photo: Mashable.com)



horizontal horns could pinpoint the incoming aircraft's bearing and the vertical horns were used to estimate the height of the aircraft, using triangulation. If the device was moveable, the operator would tilt and move the device until he received the loudest sound waves.

In the case of sound mirrors, the mirrors were usually immovable discs of concrete standing at larger heights. The disc would catch sound from afar, being faced the direction that it was, and it would be amplified by the microphone installed in front of it. Sound mirrors had a much farther range than the sound trumpets or horns but required extensive construction. They could easily detect an aircraft from 10 to 15 miles away. This meant that if a combat aircraft was travelling around 60 mph, it gave the troops 15 minutes warning before it reached their destination.

It is said that the Germans figured out the fact that their enemies were using acoustic location devices to counter their aircraft. They came up with an idea to counter this. Aircraft engines are usually run synchronized to reduce vibration. The Germans ran the engines of their bombers unsynchronized in the hope that it might make the aircraft harder to detect.

The next step after microphones, in 1939, were systems that stopped relying on sound completely and interpreted the noise in terms visual

symbols which were displayed on a cathode ray tube screen. This device was developed by Alan Blumlein.

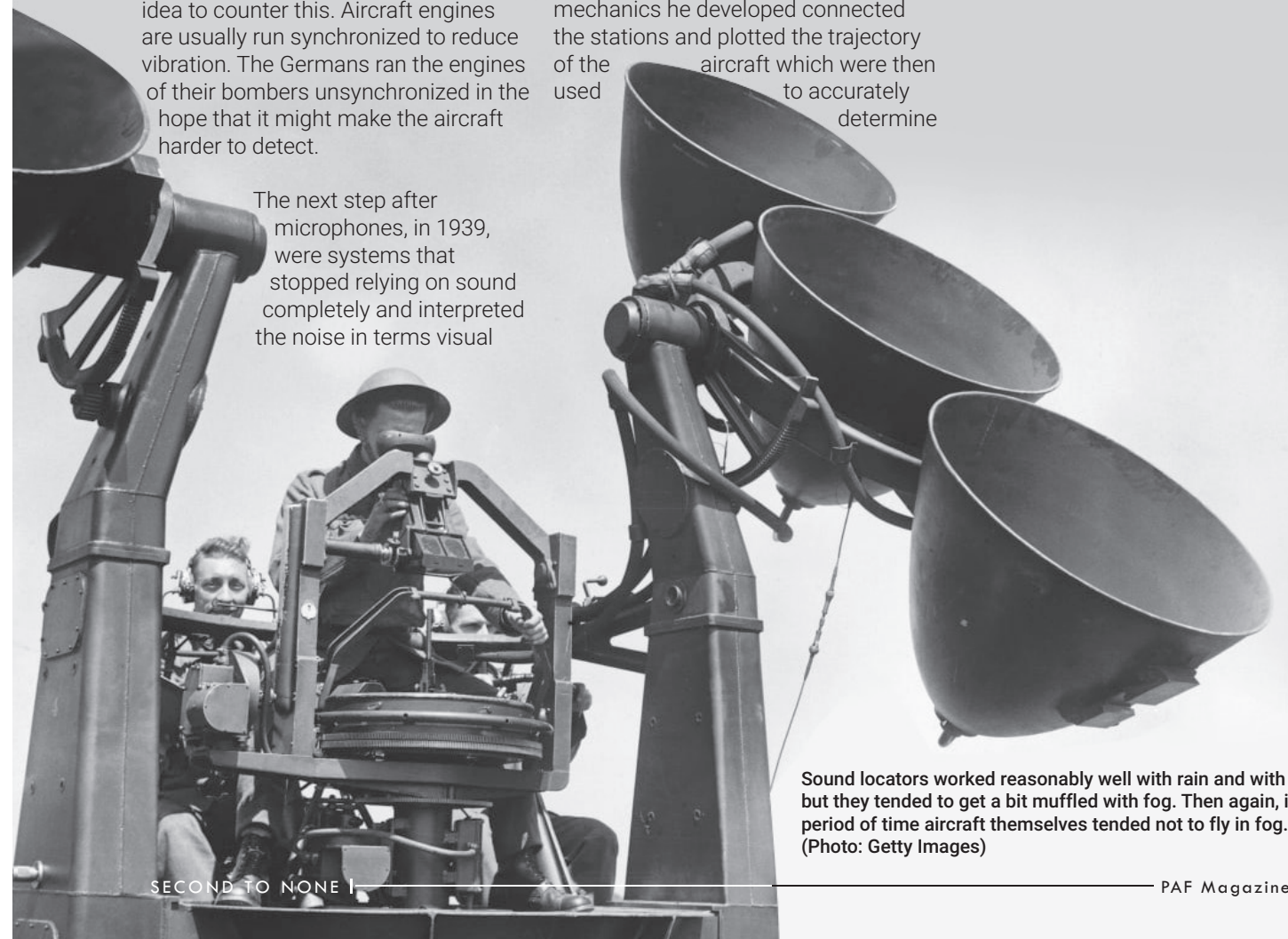
The demise of acoustic location:

Acoustic location devices were elementary anti-aircraft measures to start with, providing only a weak defence. As technology progressed, the increasing speeds of aircraft meant that the warning time given by the device was significantly lessened, which meant that the operators had almost no time to act before the aircraft arrived. The last nail in the coffin for acoustic locators was the advent of radar technology. Although, the devices kept on being used by multiple militaries, it was just a matter of radar technology being available.

However, it is pertinent to say that the research and application of acoustic location had far-reaching benefits. The acoustic mirror programme, the brainchild of Dr. William Sansome Tucker, had provided England the mechanics to use interconnected stations to accurately locate the exact position of an adversary in the sky. The mechanics he developed connected the stations and plotted the trajectory of the aircraft which were then used to accurately determine



the position of the aircraft. This research was then handed over to the early radar team and it made a substantial difference in their efforts which eventually culminated to the invention of the radar.



Sound locators worked reasonably well with rain and with cloud, but they tended to get a bit muffled with fog. Then again, in that period of time aircraft themselves tended not to fly in fog. (Photo: Getty Images)

EL NIÑO & LA NIÑA

EFFECTS ON REGION AND PAKISTAN

“El Niño and La Nina events last nine to twelve months, but at times can extend for years. However, on average, El Nino and La Nina events occur every two to seven years. The combined effect of both El Nino and La Nina generate weather changes all across the globe also known as “El-Nino Southern Oscillation (ENSO). The author explores its effects on global weather changes with a special focus on its devastating impacts on Sub-Continent.”

by Zuhaib Anwar

The terms El Nino and La Nina refer to Pacific Ocean weather phenomenon that oscillates temperature back and forth from warm temperature to cooler and vice versa. El-Nino refers to warming of the central and eastern tropical Pacific, whereas La Nina is the reverse phenomenon, where the trade winds pick up speed and warm water in the eastern Pacific moves towards western side of the Pacific. El Niño and La Nina events last nine to twelve months, but at times can extend for years. However, on average, El Nino and La Nina events occur every two to seven years. The combined effect of both El Nino and La Nina generate weather changes all across the globe also known as “El-Nino Southern Oscillation (ENSO)”. The

interaction of ocean currents and atmosphere results in the formation of a “feedback loop” which intensifies little changes in the condition of the sea into an ENSO event. ENSO is established when there is complete bonding of ocean and atmosphere. In short, the most important driver of ENSO is temperature variation.

The ENSO cycle is completed in three different phases: neutral phase, El Nino phase and La Nina phase.

Neutral Phase of ENSO
In the neutral phase, the trade winds blow from eastern Pacific Ocean to the western Pacific carrying warm surface water and moist air with it. The central Pacific remains relatively cool as warm water is pushed by

the trade winds westwards. In the neutral phase, the process of atmospheric convection occurs where the warm air over the west Pacific rises into the atmosphere that causes the formation of cumulonimbus clouds, carrying rain. After it rains, the dry air moves east and descends over the cooler eastern Pacific. The process of air rising over the west Pacific and falling over the east Pacific and westward air movement over the ocean surface is known as Walker Circulation.

El-Nino Phase
During the El Nino phase, trade winds are weak or may reverse. In this phase, trade winds are not powerful enough to push the ocean currents westwards. The warm surface water shifts to central and eastern Pacific

Ocean, resultantly the western Pacific Ocean becomes cooler than normal. The process of atmospheric convection discussed in the neutral phase migrates from the west to central and eastern tropical Pacific Ocean resulting in increased rainfall in parts of the eastern Pacific and western American continent, whereas Australia and Asia receive relatively less rain fall.

La Nina Phase

La Nina phase, although it appears similar to the Neutral Phase, differs in intensity and effects. Trade winds are strong in this phase as compared to pre-El Nino phase. The strong trade winds blow from the east Pacific Ocean towards the west, intensifying the Walker Circulation process and greater atmospheric convection over this region. “Sea surface temperature (SST)” over central and eastern tropical Pacific Ocean becomes cooler than normal, causing the thermocline to raise and move closer to the surface i.e. cold water of deep ocean water rises to the surface. During La Nina event, atmospheric convection over western Pacific increases because of the stronger winds that provide moisture, thus, intensifying Walker Circulation.

Currently, the world is experiencing drastic climate change and when combined with the phenomenon of ENSO, rapid and fluctuating changes in the oceanic atmosphere becomes more damaging. Therefore, policy makers and disaster managers need to pay proper attention to the impact of both climate change and ENSO. It is vital to keep track of the changes in weather patterns, develop long-term forecasts that could make regions susceptible to the consequences resulting from the slightest deviations in rainfall and temperature as compared to what has normally been a regular pattern.

ENSO in South Asia

“El Niño Southern Oscillation” (ENSO) has probably added to the worst human calamities on the planet in the shape of dry spells and floods. In terms of economic impact, around 10 to 20 percent deviation in world GDP growth and consumer price indices occurs due to ENSO.

The South Asian Monsoon phenomenon identified that the Indian Monsoon Rainfall (IMR) has a significant effect on South Asian countries, including Pakistan, Bangladesh, Nepal, India and Sri Lanka and it has been influenced by ENSO. ENSO phasing strongly affects the inter-annual and inter-decadal variability of seasonal rainfall over the subcontinent. It has been observed that ENSO adversely affects the South Asian Indian summer monsoon and the

“South Asian countries are largely agrarian societies, therefore, the fate of these countries is dependent upon summer monsoon rainfall and any disruption in monsoon pattern can cause grave consequences.”

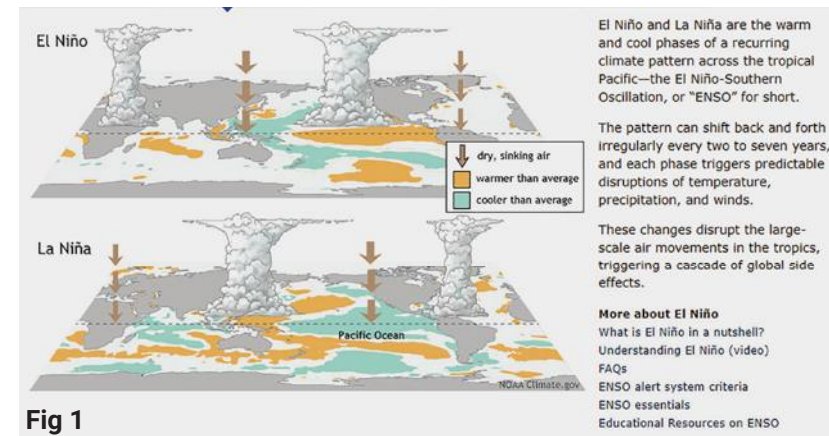
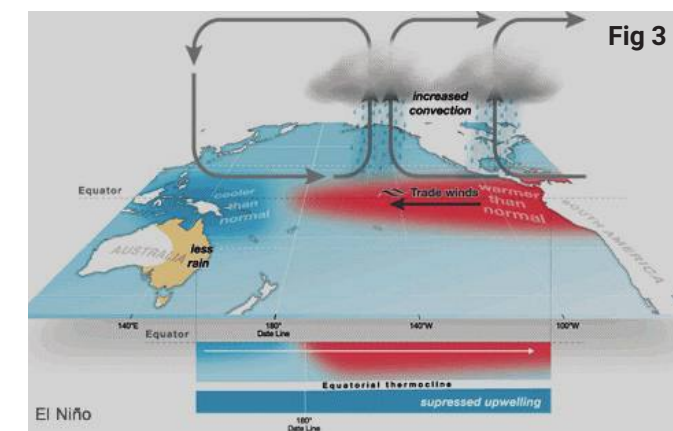
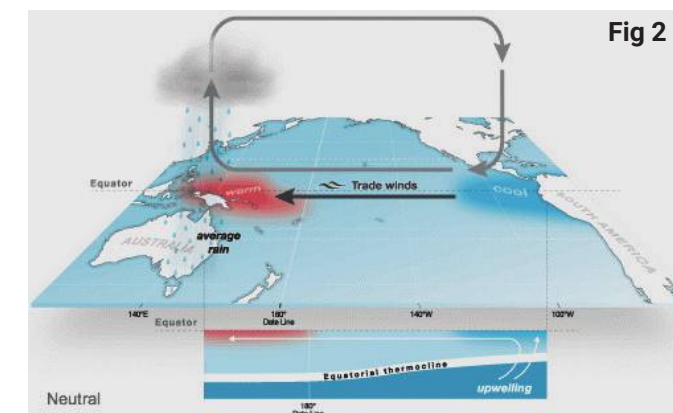


Fig 1

subcontinent receives relatively less rainfall during ENSO monsoon years.

The raising unpredictability regarding beginning and time period of monsoon exercises an enormous impact on agriculture, water resources, economics, ecosystems, and human security across South Asia. South Asian countries are largely agrarian societies, therefore, the fate of these countries is dependent upon summer monsoon rainfall and any disruption in monsoon pattern can cause grave consequences. The “Intergovernmental Panel on Climate Change” has stated that “with the passage of time drought-hit areas might grow consistently, and heavy precipitation events would likely rise in intensity as a manifestation of impacts of climate change on fresh aquatic systems”. It is important to investigate how increasing temperature impacts monsoon patterns.



ENSO in Pakistan Direction of Winds

Monsoon enters Pakistan from two different sides. First, the south eastern wind that travels from the Bay of Bengal that enters Pakistan travelling through India along the foot hills of the Himalayas. Jhelum, Lahore, Rawalpindi and Sialkot districts receive the first rains of monsoon in Pakistan. These areas are included in the "northern monsoon belt" - the main monsoon occurring areas in the country. Second pathway is through Arabian Sea where the moist rain carrying south western winds enter Pakistan. The south eastern region of Pakistan receives rainfall from these wind currents. Long-term studies for analyzing trends related to monsoon in Pakistan are quite limited, requiring greater attention. Analysis of the geographic zones of Pakistan highlights the decreasing monsoon precipitation trends after the 1970s.

El-Nino

In 1998, an El Nino event was recorded in Pakistan as a result of which the country witnessed heavy snowfall on its mountains followed by four years of drought in lower Punjab, Khyber Pakhtunkhwa and Balochistan. Another milder event of El Nino was traced in 2009 that resulted in droughts followed by the devastating floods of 2010.

Similarly, this year scientists stated that El Nino Southern Oscillation (Enso) was again in La Nina phase, as it was during 2009 and 2010. During that time, the phenomenon caused higher than average rainfall in South Asia. Dr Liz Stephens, an associate professor of the "Climate Risks and Resilience" at the University of Reading, UK, who is part of a global flood forecasting system says, that "La Nina is behaving very strongly in some metrics and is a significant factor for enhancing monsoonal rains in the South Asian region". This year floods are partly to be blamed on the human induced climate change and partly on the fact that La Nina has continue for the third consecutive years.

The statement becomes really interesting when we see it with the strange phenomenon that La Nina has continued for a three consecutive years. This phenomenon is known as 'triple dip' La Nina (lasting three consecutive years) and it has happened only twice since 1950 making this one the third ever in last 72 years. Some climate experts predict that human induced climate change would intensify the impact of La Nina and also make it a more frequent phenomenon as compared to yesteryears.

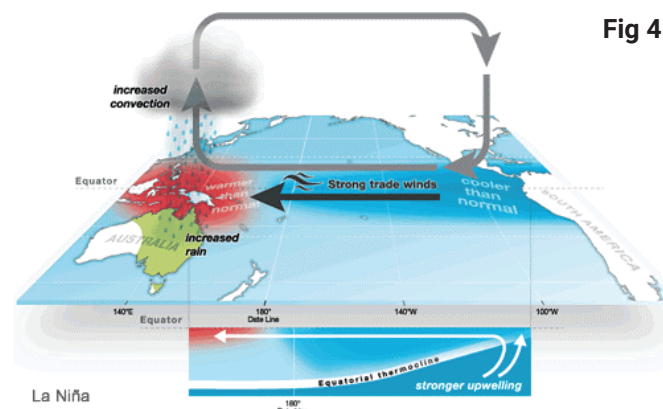


Fig 4

Tracing the Roots of ENSO

Pakistan is among the top ten countries of the world most vulnerable to climate change. Pakistan is sensitive to both change in precipitation and temperature. As per the latest seasonal forecast, Pakistan is expected to experience an extended winter season in 2021. According to the forecast, most parts in Pakistan would be subject to low temperature till mid-March due to La Nina effects. These changes, in turn, could increase forest, water resources and agriculture sector vulnerabilities in the country. The adverse impacts of El Nino and La Nina will include:

1. Changes in Summer Monsoon Rainfall

The summer monsoon in Pakistan is adversely impacted by ENSO event. Due to the low intensity of cyclogenesis over the Bay of Bengal during ENSO, the monsoon system is weak and it dissipates before reaching Pakistan, thus, the country receives less than normal monsoon rainfall during ENSO monsoon years. Whereas, La Nina, causes higher than normal rainfall due to strong cyclogenesis activity in the Bay of Bengal as sea surface temperature rises. As discussed earlier, the drought of 2009 and the subsequent devastating floods of 2010 in Pakistan happened due to El Nino event in 2009. However, this time, a rare climatic phenomenon of triple-dip La Niño led to unprecedented floods in Pakistan.

2. Increasing Natural Disasters

As discussed above, during El Nino, Pakistan receives less than normal rainfall, which can lead to scarcity of water creating drought-like conditions in a country where there is already shortage of water. The negative impact of ENSO can be highlighted in terms of enhanced de-glaciations, changing rainfall trends leading to surface runoff, landslides, soil erosion, biodiversity loss and avalanches, etc.

3. Lower Crop Yield

According to the Food and Agriculture Organization, the La Nina may affect the

quality and yield of wheat crops, especially in the rain-fed areas of Pakistan. La Nina could hamper the production of the country's staple food (wheat) for the year 2021 and 2022. Moreover, limited snowfall during winter in northern Pakistan could decrease the irrigation supplies for the season of spring during which water is naturally obtained from snow melt. Given the current scenario of rising wheat flour prices, further price hike is expected if production falls short due to lack of proper irrigation, thereby adding to the misery of people due to further inflation in the prices of basic commodities.

4. Decrease in Water Resources

During El Nino year, Pakistan receives less than normal rainfall which also depletes its water reserves. To meet the water demand of farmers to irrigate their fields, dam water is used during less than normal rainfall years. Moreover, the two large water reservoirs i.e. Tarbela and Mangla are used for electricity generation, therefore, when there is less rainfall, water reserves of Pakistan deplete as these reservoirs do not receive enough water. Whereas, on the other hand, during La Nina, Pakistan receives more the normal rainfall, but, the country's water storage capacity is limited as no



major water reservoir has been constructed since the completion of Tarbela Dam in 1976 and the excess water goes into the Arabian Sea without being stored for future use.

Recommendations

Pakistan is among the countries that is enormously affected by ENSO. Therefore, the Meteorological Department of Pakistan should have state-of-the-art facilities that can be used to better monitor and predict weather patterns. Further, ENSO also adversely affects our economy which is largely dependent upon agricultural produce. Therefore, to mitigate

the adverse effects of ENSO and to adapt to changing weather phenomenon, forecasting and broadcasting ENSO-related information for the agriculture department/farmers could help in the better selection of crops and better yield. This will not only avert crops destruction, but may also lead to additional production. Secondly, construction of big water reservoirs is a matter of survival for Pakistan. Pakistan loses large quantities of water during the monsoon season, which can otherwise be used during low rainfall or drought times. Furthermore, infrastructure and agricultural damage can be prevented by constructing dams. In Pakistan, due to the declining surface and underground water resources, we cannot afford drought-like situation due to ENSO which can be averted through the construction of dams.

Lastly, most countries include ENSO as a variable while formulating their short/ long- term economic policies, hence, Pakistan's policy makers should also consider including ENSO as an effecting factor while formulating economic, agriculture and developmental policies.

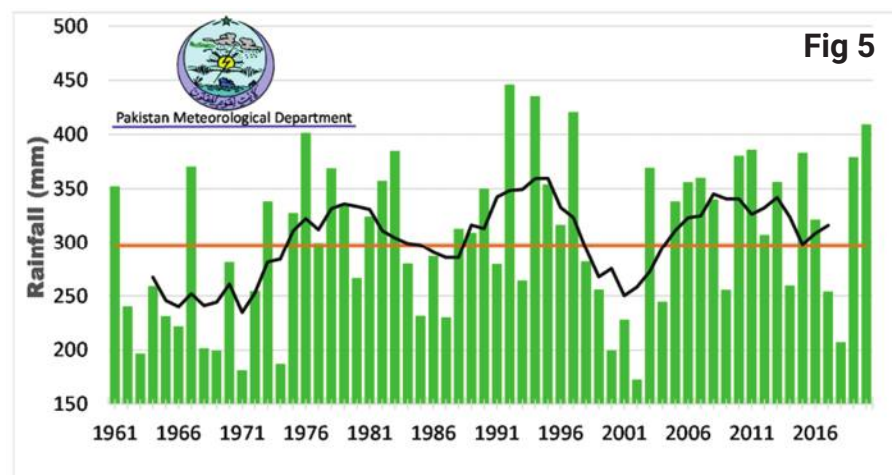
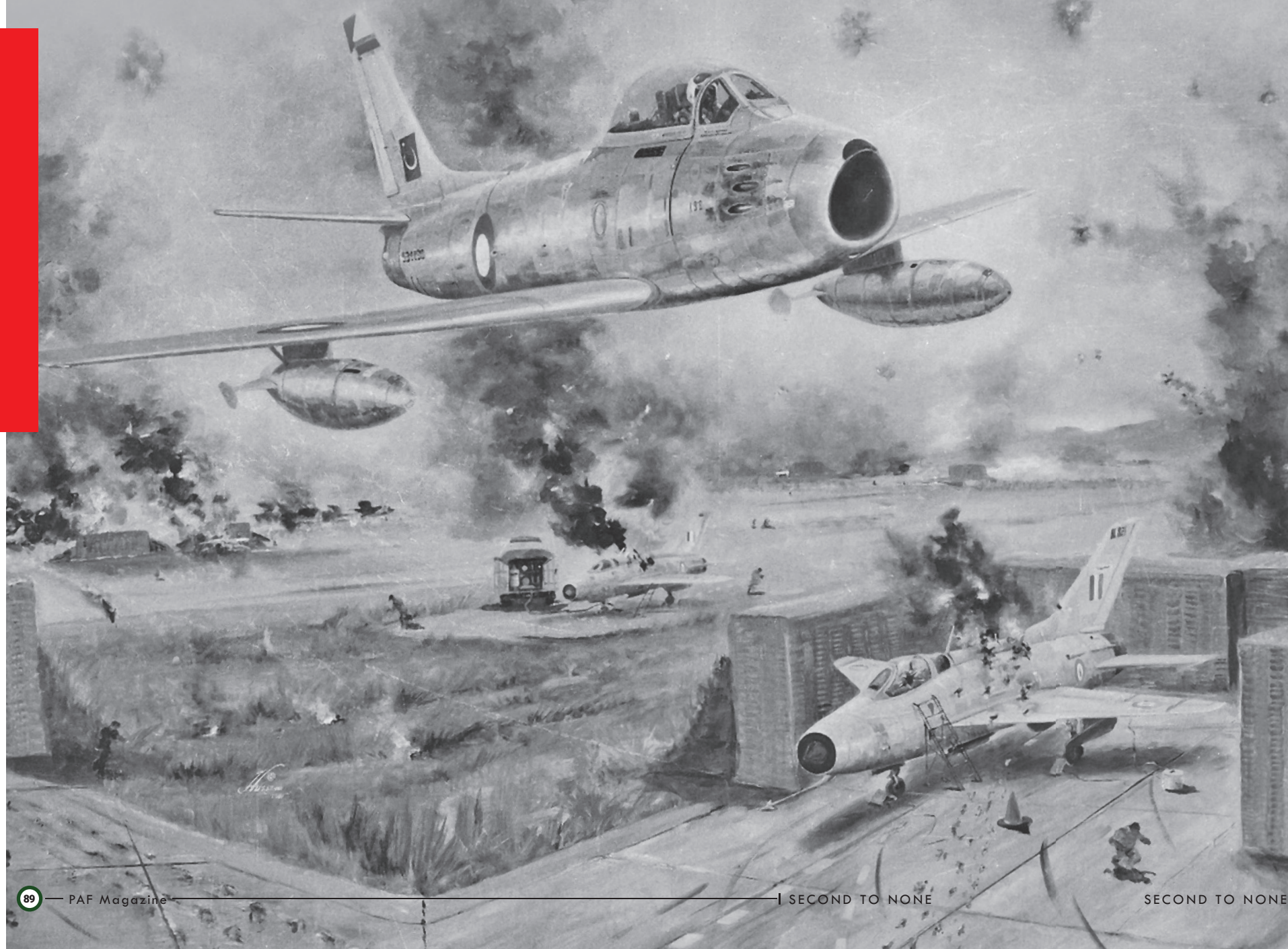


Fig 5



A VETERAN PAR EXCELLENCE

A Tribute to Sqn Ldr Ghani Akbar, **SJ (Retd)**



Title Page: Gp Capt Hussaini's painting depicts the historical moment of PAF's classic attack on Pathankot airfield during 1965 war.

Right: Sqn Ldr Ghani Akbar pose with his faithful and trusted, Sabre. (All Pics PAF Archives unless specified).

Below: Straight from a Hollywood WWII classic, young Ghani Akbar dons fighter pilot's attire.



“Every fighter pilot remembers being deployed into combat, and how special that moment was. All his life, Ghani Akbar, wanted to be a flier. Being a fighter pilot was not just a job. It was an attitude, a mentality. There was a sense of accomplishment at doing the missions that he flew, and he did it right and did it well. He joined the air force with a sense of purpose, to represent his nation incredibly well and we could see that in the character of his service and in the character of his performance.”

by S.Khalil

No strike mission has caused as much feeling as the attack on Pathankot. It may not have been the longest mission in the 1965 war but one of the costliest in material for the Indians. Those who took part have never forgotten it. And hind sight cannot change what was considered the best experience of the time. This piece of history should not just fade away into the shadows. The story of this mission comes tumbling out with nerves relaxed and stomach stretched over coffee with Pathankot veteran, Sqn Ldr Ghani Akbar, SJ (Retd).

Born in 1939, in district Peshawar, Ghani Akbar, completed Metric in 1956. It was his dream to join the air force. In January 1961, he graduated as pilot officer and was assigned to fighter leader school (FLS), where Sqn Ldr Sajad Haider was his instructor. Ghani Akbar, gave credit to Sajad

Haider, for his first exceptional strafing run, to his first accurate rocket hit, and every vital lesson in combat flying that followed.

Posted to 11 Sqn Sargodha, in 1961, Sqn Ldr MG Tawab, was his first squadron commander. From then on, he flew under exceptional fighter pilots, his squadron commanders, Anwar Shamim and MM Alam. Before long, in 1964, Ghani Akbar became instructor at the FIS. When war was imminent in 1965, he reported to No 19 Sqn, where Syed Sajad Haider, was his Sqn Commander again.

“Our Sqn Cdr received a phone call from the AHQ and informed us that the day has come for which we were waiting and planning for so long,” Sqn Ldr Ghani Akbar (Retd) said. In the days that followed, hops across the border were like trips to the corner grocery store, they could do it in their sleep.

PAF pilots would go on prowls. Ease down on the deck, see what they could find, give tree top flying a new definition. Railroad tracks, kicking over trains, destroying targets of opportunity such as production plants, water supplies, and other critical installations that would render the enemy





unable to make arrangements for necessary war supplies and unable to sustain its forces enough to maintain support for the war – stop the enemy cold.

“On 6 September, we got a mission for Jassar, near Narowal, Punjab, where Indians were pounding our troops with artillery shells. Enroute to Jassar, the Leader got a call to abandon the mission and head towards Wagah border,” Ghani Akbar recalled. The six jets, led by Sqn Ldr Sajad Haider, No 2 Flg Off Arshad Ch, No 3 Flt Lt M Akbar, No 4 Tahir Kheli, No 5, ..., and then a young Flt Lt Ghani Akbar flying at No 6, set course to Lahore, and descended over Shalimar. “We followed tracks, and destroyed tanks, guns, and artillery posts - the Indian attack was repulsed,” he said. The formation returned to Sargodha to refuel and then to home base Peshawar.

For something much bigger was in the making

As soon as the formation landed at Peshawar, attack orders were



transmitted to destroy Pathankot. Sqn Ldr Sajad Haider would lead the show. There was a briefing, informal, short, to the point, enemy money handed over to all, instructions to get back alive. Sajad Haider laid down a synchronized plan of battle. He didn't have to draw it for them. They had been doing this every day, twice thrice a day even.

The Sqn Ldr selected the team of eight attack aircraft and two more for combat air patrol (CAP). Sajad Haider led, and his No2 Flg Off Arshad Ch, No 3 M Akhbar, No 4 Tahir Kheli, No 5 Flg Off and No 6 Abbas Khattak, No 7 Mazhar, No 8 Flt Lt Ghani Akbar, and for the CAP mission, Wg Cdr Tawab and Flt Lt Arshad Sami, would fly No 9 and No 10. Ten F-86 jets lined up nose to tail for the take-off, surged into the air and formed quickly, climbing to altitude they would need before they went over India. Emphasis on timing to the split second. The leader made the decisions, made the decisions, the rest followed at his wing, he turned, they turned, he climbed, they climbed, up into a world that belonged to them. Getting close.

Pathankot airfield, right on the nose, spread out like a diagram, flying in two formations of 4s, the F-86 dropped down on the airfield for rocket attack run, concentrating on definite objectives, blasting away the runway,



bunkers, bombers and fighters, it was the same enemy. Flames everywhere.

“Everything was ablaze, when I caught sight of one more target on the ground, a Mystere, when pulling up. I decided to make a second pass for attack,” Ghani Akbar said.

“Exit,” shouted the leader Sajad Haider and so did Wg Cdr Tawab. But it was war, and one could not always stick to standard operating procedures (SOPs). Ghani Akbar peeled off as the rest of the formation continued. Every nerve and muscle now focused on the new target. Hell on earth ensued as Ghani Akbar opened fire again and there were flames. Got it burning nicely and made an exit.

It was a special daylight delivery service that PAF ran. Skeletal frames left with nothing else, room sized craters, besides the lingering effects that have lasted till date, ringing the ears, post traumatic stress disorders. Indian's caught in the crosshairs could do



nothing but run or duck in cover. Words cannot describe the energy released by the bombs, knocking the wind out of India, followed by the most putrid tasting ammonia dust that swept through the Pathankot airfield. The campaign's defining moment is cited as the single most destructive act of war of the 1965 and 1971 air campaigns put together.

All the aircraft had climbed back to rally point, fuel gauges now close to empty, and as planned, the formation headed home to Peshawar except Ghani Akbar..

The jets had enough fuel for a single pass, not two. Ghani Akbar was now praying to God. Realizing he would not have enough gas to return to Peshawar, Ghani Akbar decided to go to Sargodha instead. “It had gotten dark, the runway was not visible and fuel was depleting fast,” Ghani Akbar said. Never before had he prayed to God like he did that day, “Allah help me, I will gain nothing if I crash.” And just then he saw the airstrip at Sargodha and landed. “In the middle of the runway I flamed out,” he quipped.

Time for another crack at the Huns
Pathankot, or what was left of

Pathankot, was the fulfillment of a promise. But this was not one and done raid. Roused by the success, the brass that ran the war, had decided to weaken the entire Indian might. The PAF were quick to exploit the new tactics the very next evening. Pathankot airfield was the critical target of the Indian war machine. If the PAF could dismantle it, India's capabilities would be strongly hindered, said Ghani Akbar. Flt Lt Muhammad Akbar, No 2 Flt Lt Ghani Akbar, No 3 Sqn Ldr Sajad Haider, flew 500 ft, in their F-86s, equipped with fuel tanks, rockets, guns, bombs, and cameras. In the distance, the pilots could see a glow of fire. “It was like a red carpet,” Ghani Akbar said. The formation was forced to turn back by heavy Indian ack ack fire.

After the war ended the air force kept Ghani Akbar flying. Sunday was like Monday and Monday was like every other day, a working day, the sound of airplane engines waking up crews at dawn, getting ready for training missions.

In 1971, another chapter in the poisonous relationship between Pakistan and India opened. The two countries

had gone to the brink again. The tactical importance of this bombing run was as significant as the psychological impact proved immense. PAF air power fulfilled its deadly potential during the bombing offensive over Bathinda. Yet this epic of PAF heroism has been relegated to folklore. There are no commemorations of the carnage that six PAF pilots caused.

The year is 1971. Pakistan and India are at war for the third time. Radars track every aircraft aloft. It does not take long for six yellow blips to stick out from the herd. Filling the headphones of Flt Lt Ejaz, patrolling the Eastern border, are coordinates of the intruders and new mission directives to intercept them. His wartime mistake could have marred an iconic campaign of the Pakistan-India 1971 war.

This story leaps out of black and white on a frosty Sargodha morning. It is a rare insight and first hand account of a red hot mission. PAF high command had concluded that aerial bombing of Bathinda railway junction would hinder Indian offence at Sahiwal. It came with significant risks, with the possibility of being captured or destroyed. Huge responsibility fell on six “lucky” young pilots.

Pathankot war veteran, Sqn Ldr Ghani Akbar, is assigned this special duty. He is to pick top six pilots and indiscriminately bomb Bathinda railway junction, in broad daylight. “Flying into Indian airspace was taking a huge risk. It was a suicide mission,” recalled Sdn Ldr Ghani Akbar.

For this job he selected Flying Officer Abraham, as his No 2, Flt Lt Bhatti, his No 3, and Flt Lt Khudadad Khan “KD”, as his No 4. Sdn Ldr Aftab Raja, No 5, and Flg Off Aurakzai, No 6, will fly combat air patrol (CAP) above and provide air cover

1: Flt Lt Ghani Akbar (Standing 1st from left) along with fellow officers at PAF Masroor.

2: Flt Lt Ghani Akbar (sitting first from right) along with the team of Pathankot strike members.

3: Flt Lt Ghani Akbar receiving the coveted Sitara-e-Jurat from President of Pakistan, Field Marshal Ayub Khan.

4: Young Ghani Akbar in a light mood along with his fellow fighter pilots during 1965 war.

5: Gp Capt Hussaini's canvas depicts the PAF's strike on Wagah on the morning of 6 September, 1965.

while Ghani Akbar and his wingmen gave the enemy a sharp taste of aerial warfare.

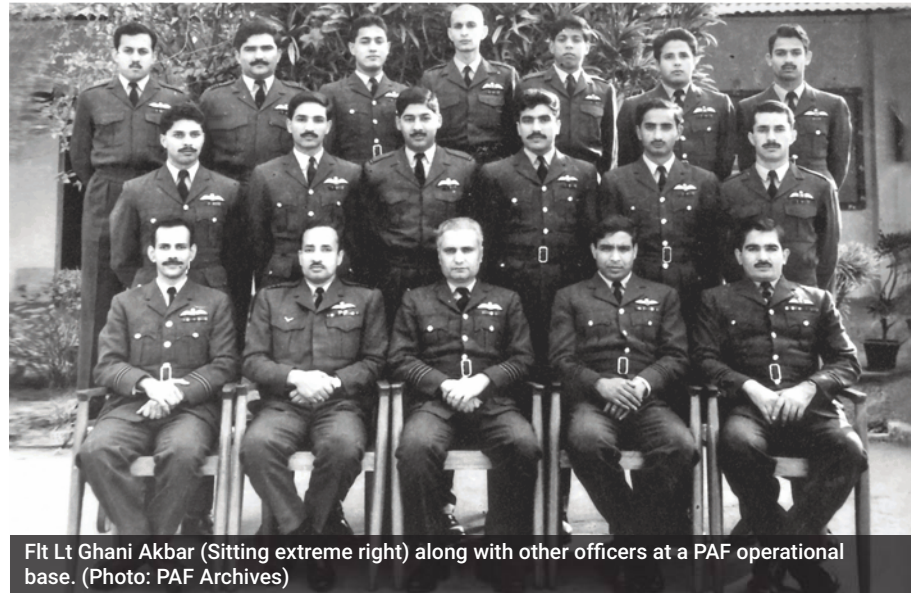
This group had jumped across the border several times each day for strike missions in their venerable F-86s in the 1965 war with India, picking off tanks, convoys and military logistics. Despite the excitement, they were nervous. "This mission was different. Our appetites were spoiled. As their leader I tried to show confidence in the mission and tried eating. It felt like chewing on wood. We were all so tense," Ghani Akbar said. They had no clue how the Indians would jump them when they crossed the border. Ack-Ack and SAMs were all ready and keeping an eye for intruders in the sky.

Base commander, whispers time on target (TOT) - 4:05 pm. The group goes into a deep huddle for last minute specific planning. Jeeps carry pilots to the planes. The six pilots ride out to six F-86s. No one knows what lies ahead. Time for start-engine nears. Minutes later all six are airborne. Sqn Ldr Ghani Akbar flies ahead, and the other five get into position before he makes a half turn. Now the whole group sets course in battle formation and zooms towards the Indian air space.

Bathinda railway junction is a flat place, of warehouses, depots and factories and all those other ingredients that nestle on the backs of postcards. In 1971 it bristled with armament and supplies. This formidable stronghold of ordinance put Bathinda high on the list of PAF bombs. But it was savagely defended by the Barnala radar to the east, and two air bases to its north and south.

"It was very precise targeting, on precise location to destroy and stop logistic support to India's war machines against Sahiwal. We were told that the army would roll in and do the rest. That was the mission," Ghani Akbar said.

The six ship formation fly deck level. That's less than a hundred feet above ground - closing in like a shark sensing blood in the water. "We were so low, we could see enemy trenches where Indian soldiers were cooking their meals.



Flt Lt Ghani Akbar (Sitting extreme right) along with other officers at a PAF operational base. (Photo: PAF Archives)

Throttles are pretty much kept forward. No 5 and No 6 climb to high positions above the formation of the bombers. The four-ship commenced their slashing attack. Munitions are dropped and smoke from the first explosion covers the terminal. "It was hammer, hammer, hammer all the way," Ghani Akbar said. There goes what used to be the biggest railway crossing in Asia.

The four planes scored some direct hits on strong points along the junction - warehouses, railway intersections destroyed and the enemy's fighting spirit weakened, all in less than three and a half minutes. Their training had served them well. Pilots maneuver their jets at body crushing G force speeds to fly clear of danger. Weaving above the bombers as top cover, dismayed No 5 and No 6, see no Indian jets coming for them. The two winged friends join the four-ship and head home. Throttles blasted forward.

Welcome is the sight of the Pakistan India border. But the battle has not ended. The speed of combat was so fast that radars at home mistook the returning jets for intruding Indian planes looking for revenge. As pilots switch to the radar channel, Flt Lt Ejaz has the "intruders" in sight and decided to intercept them. But he hesitates before following through the mission and decides to rely on his battlefield judgment. He establishes radio contact to confirm if the target is hostile. "Red Leader, waggle wings," he orders. The

opportunity to abort presents itself. Had Ghani Akbar failed to oblige, he would have been shot out of the sky by his own course mate. Flt Lt Ejaz, cusses at the ground controls with chilling news that the so called intruders are actually friendlies. The pilots land in an evening they will never forget. Ghani Akbar was proud of the job they had done and thankful that all six returned home safe. It was a day for records.

"It would've given us more thrill if we could see it," said Ghani Akbar. They did not know how good they were until India bemoaned over the radio of the destruction PAF pilots left behind. Fast forward many years. While waiting for a connecting flight at the Amsterdam airport, he made acquaintances with a family from Bathinda. They didn't have memories from that day, they had scars. The Sikh woman sketched a grim image of the bombing raid that made you think of a graveyard of supplies and ordinance. "It was a horrible day, the PAF pilots kept attacking the area for minutes and we could hear loud bangs," the eyewitness told Ghani Akbar as she reminisced.

"I was glad that years after this attack some eyewitness confirmed what we achieved that day. It was a sigh of relief," Ghani Akbar quipped.



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Japan, UK, Italy to develop next-generation fighter jet

by Tokyo (AFP)
09/12/2022



Japan, Britain and Italy said Friday they will jointly develop a next-generation fighter jet in a project that holds scope for future cooperation with allies including the United States.

The new jet, to be ready by 2035, is expected to merge the nations' current research into cutting-edge air combat technology, from stealth capacity to high-tech sensors.

In a joint statement, the three countries said the "ambitious endeavour" would "accelerate our advanced military capability and technological advantage" at a time when "threats and aggression are increasing" worldwide.

Their announcement was accompanied by a set of images showing an artist's impression of the sleek new jets flying past Mount Fuji and over London and Rome.

They did not give a cost estimate, but the three countries are already pouring billions of dollars into high-tech fighter jet development, efforts that will come together under the joint project, called the Global Combat Air Programme.

"We share (an) ambition for this aircraft to be the centrepiece of a wider combat air system that will function across multiple domains," the statement said.

That includes "future interoperability with the United States, with NATO and with our partners" in Europe, Asia and worldwide, it explained.

The US Department of Defence said it supported the project in a separate joint statement with Japan's defence ministry.



South Korean President Yoon Suk-yeok (L) listens to a briefing about the third prototype of South Korea's homegrown fighter jet, the KF-21 Boramae, during a visit to Korea Aerospace Industries (KAI) in Sacheon, South Korea, Nov. 24, 2022. (EPA Photo)

Turkish firm to aid in mass production of S. Korea's fighter jet

by Daily Sabah with Reuters
12/06/2022

Turkish technology company SDT Space and Defense Technologies Inc. will continue to contribute to South Korea's domestically developed fighter jet during the mass production process after already providing a simulation link system to the project during the prototype stage.

The company's general manager, Ömer Korkut, told Anadolu Agency (AA) that the firm made one of its most important exports by providing the in-arm simulation data link system for South Korea's fifth generation fighter jet, the KF-21, and stated that they delivered 19 air units and a ground station during the prototype phase of the project. Korkut stated that they recently received another ground station order that they will deliver in April 2023.

For their next project, the company is working as the subcontractor of the LIG Nex1, Korkut said, noting that the decision to include the company in the project during the mass production process was recently revealed and it is very good news.

He said they expect 120 more product orders from 2024.

"It is important for us to be able to provide subsystems for a fifth-generation combat aircraft, as well as to a country that develops technology such as South Korea," he said.

A Leonardo spokesperson told Shephard the company's M-346 jet training system continues to move ahead and that the new Smart Chair is capable of 'reproducing a possible cockpit for a sixth-generation fighter, in which the only physical elements are the stick and the throttle'.

Everything else appears in a virtual and augmented reality, the spokesperson said. 'The pilot interacts with an interface in which conventional screens and buttons disappear, only to reappear in an immersive reality projected directly into the helmet,' he added.

The system allows for advanced pilot training for multi-domain scenarios. Leonardo claims the Smart Chair can emulate human-machine interfaces of the latest and even next-generation frontline aircraft. The system has built-in AI, eye tracking and a virtual instructor.

'Commands are given by simply moving the eyes – thanks to sophisticated tracking algorithms – or pressing virtual

buttons and interacting with virtual touchscreen displays,' the Leonardo representative said.

'This system has a simple, intuitive layout, reducing the pilot's workload to make it easier to handle the mission and direct all the components of the FCAS [Future Combat Air System], beginning with the adjuncts/wingmen that will accompany the sixth-generation fighter.'

All these components are transferred to a Prototyping Pilot Station based on a powered mock-up of the M-346 jet trainer.

Shephard Defence Analyst Giovanni Rasio said according to an Italian Air Force pilot: 'Although the M-346 was developed with fourth-generation aircraft training requirements in mind, it can serve as an excellent platform for fifth- and sixth-generation aircraft training.'



Leonardo has created an advanced environment based on a combination of physical systems and immersive synthetic reality. (Photo: Leonardo)

Leonardo explores 6th-generation combat aircraft simulation at I/ITSEC 2022

by Norbert Neumann in London
12/08/2022



Egypt, South Korea agreement on Golden Eagle aircraft

by Darek Liam
12 / 08 / 2022

Egypt's Arab Organization for Industrialization (AOI) has entered a cooperation agreement with Korean Aerospace Industries (KAI) to localize the manufacturing technology of T-50/FA-50 Golden Eagle advanced trainer jet and light combat aircraft.

The Egyptian Air force (EAF) is in the market for a new trainer aircraft to replace its aging fleet and to train its student pilots for the newly delivered Rafale fighter jet, and incoming Sukhoi Su-35 fighter jet. If acquired, the aircraft will replace Egypt's ageing Alpha Jet and K-8 jet trainers with 100 new jets, of which 70 will be manufactured locally.

Prior to the agreement signing, South Korean aerobatic display team "the Black Eagles" flew the Golden Eagle jets alongside Egypt's "Silver Stars" over the Giza pyramids during an Air Show in August. At the time, KAI was offering Egypt the Transfer of Technology (ToT) and joint production of FA-50/T-50 Golden Eagle advanced trainer jets.

Also, India's Hindustan Aeronautics Limited offered its Light Combat Aircraft-Lead-In Fighter-Trainer, based on the Tejas. Other competitors include the Leonardo M-346, Irkut Yak-130, and Aero Vodochody L-39NG.

US Air Force Completes Key Testing Of Hypersonic Missile On B-52H Bomber

by Ashish Dangwal
12/06/ 2022

The US Air Force's 2nd Bomb Wing is based at Barksdale Air Force Base in northwestern Louisiana. The service said the Air-Launched Rapid Response Weapon, or ARRW, is anticipated to be prepared for deployment as early as the fall of 2023.

The Lockheed Martin AGM-183A ARRW is a long-range hypersonic missile developed for the United States Air Force. The missile is projected to boost the USAF's hypersonic strike capability at stand-off ranges, allowing it to attack heavily defended, high-value targets.

A group of airmen carried out the test activity from the 2nd Maintenance Group, 307th Aircraft Maintenance Squadron, along with the ARRW and B-52H Stratofortress Systems Programs Office staff.

As part of this trial-and-error testing process, the Air Force personnel devised a standard procedure for loading and unloading the weapon system onto the B-52H Stratofortress bomber aircraft.



The US Air Force has validated the loading procedures for its first air-launched hypersonic weapon with the B-52H aircraft at the Barksdale Air Force Base (AFB) in Louisiana, US.



RAAF F-35A Lightning II and RSAF F-15SG Strike Eagle aircraft fly over Singapore.

First trip to Singapore for fighter jets

by Flight Lieutenant Bronwyn Marchant
12 / 06 / 2022

The Royal Australian Air Force's F-35A Lightning II made its debut in Singapore, visiting Paya Lebar Air Base late last month.

Personnel from 75 Squadron trained alongside their Republic of Singapore Air Force (RSAF) counterparts in the air and on

the ground, further enhancing the bilateral relationship while integrating 4th- and 5th-generation fighter aircraft.

Commanding Officer of 75 Squadron Wing Commander Martin Parker said continuing to integrate the F-35A with regional partners was an important part of Air Force's preparedness.

"Air Force's relationship with the RSAF is strong and underpinned by regular exercise engagements and close professional relationships at all levels," Wing Commander Parker said.

"The F-35A's debut visit to Singapore enables our aviators to continue to develop these close relationships and our air force's interoperability.

"We had the opportunity to fly the F-35A alongside the RSAF's F-15SG Strike Eagles and F-16 Fighting Falcons during the dissimilar air combat training, building mutual understanding and teaching us how to better operate together in the region.

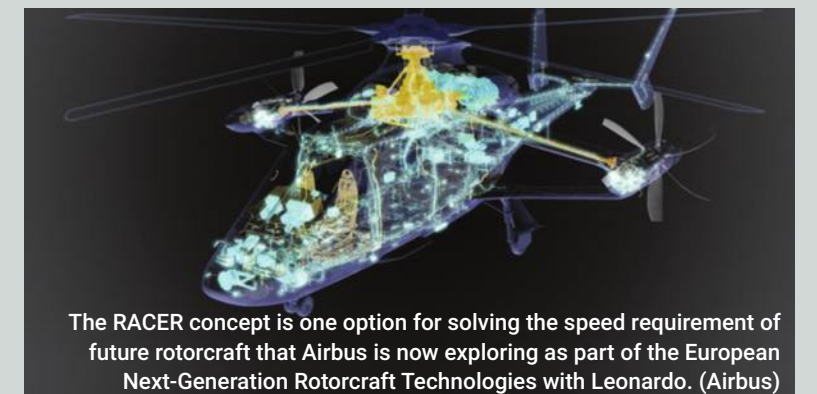
Europe formally launches ENGRT next-gen rotorcraft effort

by Gareth Jennings
15 / 12 / 2022

The European Union has formally launched the European Next-Generation Rotorcraft Technologies (ENGRT) programme to develop the technologies for vertical take-off and landing (VTOL) aircraft for the post-2035 timeframe.

Speaking to Janes and other defence media in Madrid, Matthieu Louvot, executive vice-president, Airbus Helicopters Programmes, said the project first announced earlier in 2022 was launched on 1 December.

"We are at a crucial point for the European Next-Generation Rotorcraft Technologies programme. The programme is now signed, and the companies are now working on it. Airbus Helicopters is co-ordinating the consortium, and Leonardo is very much involved in that together with us," Louvot said during the annual Airbus Trade Media Briefing (TMB) on 12 December.



The RACER concept is one option for solving the speed requirement of future rotorcraft that Airbus is now exploring as part of the European Next-Generation Rotorcraft Technologies with Leonardo. (Airbus)

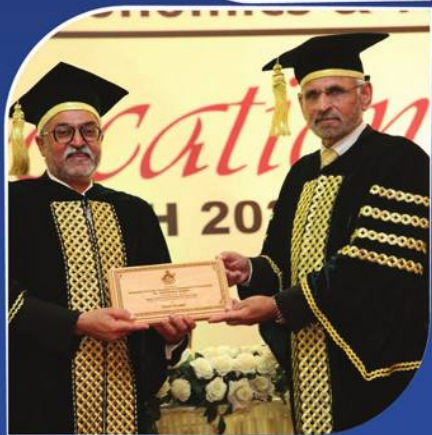


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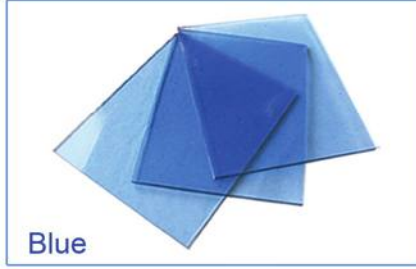


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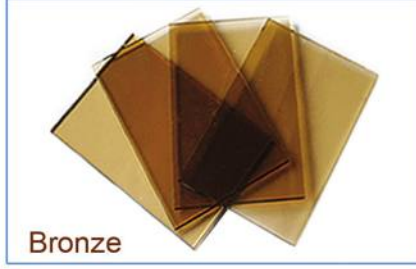
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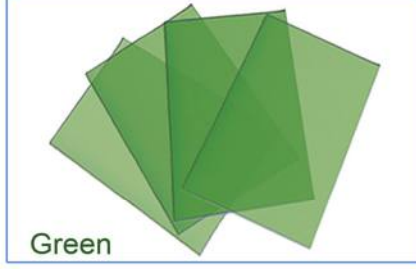
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(PHOTO: AWAIS LALI)



(PHOTO: AWAIS LALI)

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