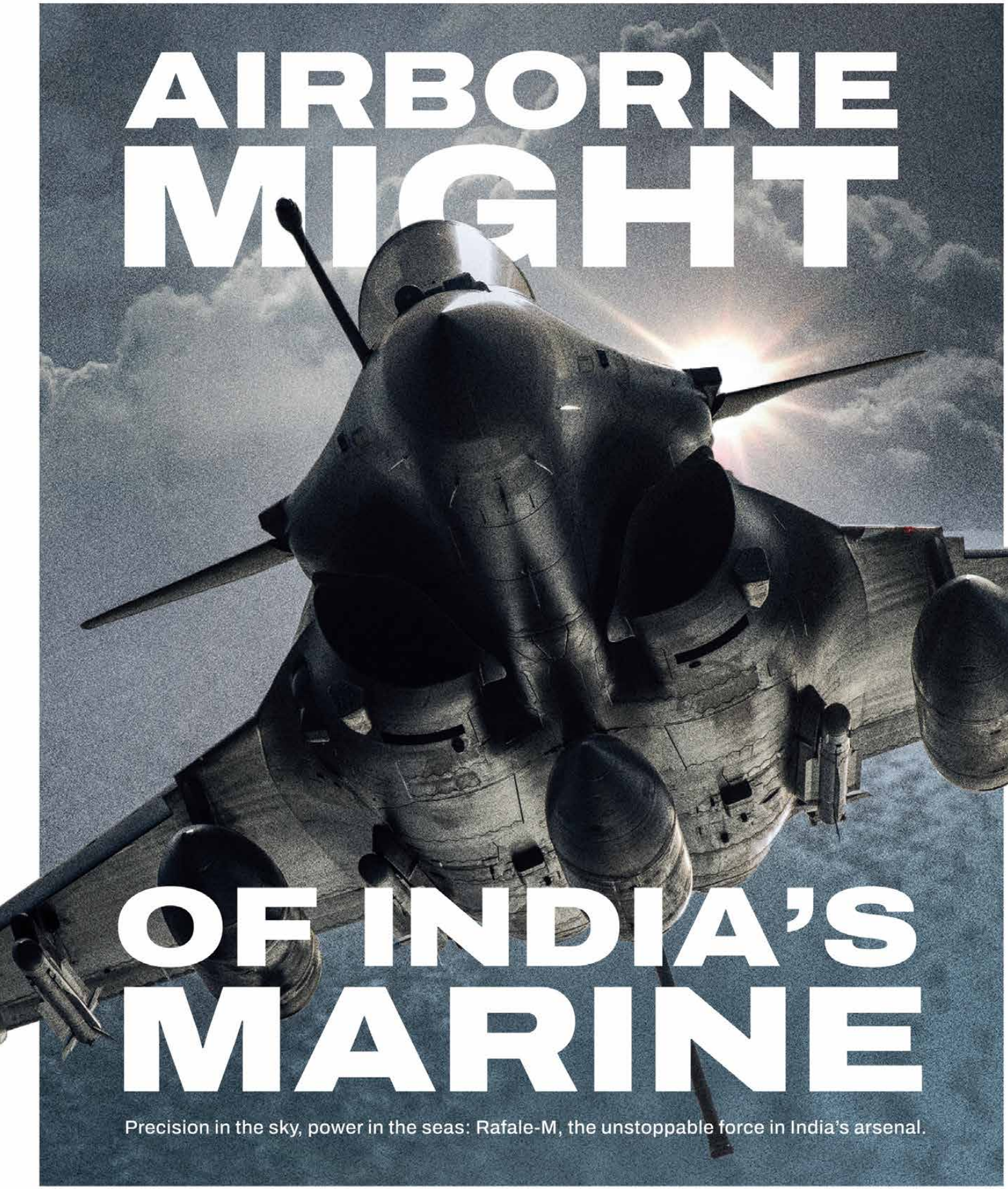
VAYU

Aerospace & Defence Review

VI/2025

The History Issue



OVER 70 YEARS. 6 AIRCRAFT TYPES. 1 NATION

TOOFANI | MYSTERE IV | ALIZE | JAGUAR | MIRAGE 2000 | RAFALE

RAFALE
DASSAULT AVIATION / SAFRAN / THALES

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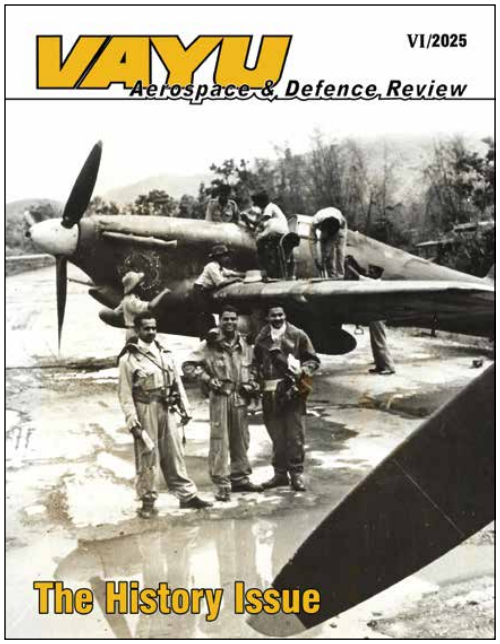

Cover : No. 6 Squadron Hurricane II B during WW–II days. Photographer unknown.

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Lt Gen Kamal Davar says...

.... A new anti–India axis rising in the east

Never before in recent history has the world witnessed so much churning as in the last four years. The scenario around India too is no exception with unexpected developments taking place both in India's west and east.

For India, a credible threat from the eastern flank, namely from once a very friendly neighbour, Bangladesh, is gaining in intensity. Since the ouster of its pro–India Prime Minister, Sheikh Hasina in August 2024, the political environment in Bangladesh is rapidly becoming highly radicalised, with killings of its minority Hindu population becoming rampant and anti–India sentiment rising.

That Pakistan and to some extent, China, are both deeply involved is apparent since the last one year with high level reciprocal visits to Dhaka by Pakistani ISI and senior Army officers. That China is speedily expanding its footprint in Bangladesh, especially in areas of trade and connectivity is also very obvious.

The recent visit by a highly fundamentalist Muslim ideologue of Indian origin, currently settled in Malaysia, Zakir Naik to Dhaka conveys ominous tidings for India. Since Shaikh Hasina's replacement by their Army by Nobel Peace Laureate, Muhammad Yunus, the otherwise secular nation is indulging in endless measures with its anti–India acts. It thus appears that an anti–India axis is firmly taking shape between China, Pakistan and Bangladesh.

Such anti–India strategies will have a bearing on India's restive Northeastern states which now prompts India to take additional security measures in these states and along the international border with Bangladesh from where illegal migrations, smuggling of cattle and drugs etc is an age old practice. Importantly, India must redouble its security measures in its highly vulnerable Siliguri Corridor, which is the only land link between India's Northeast and India's hinterland and borders Bangladesh.

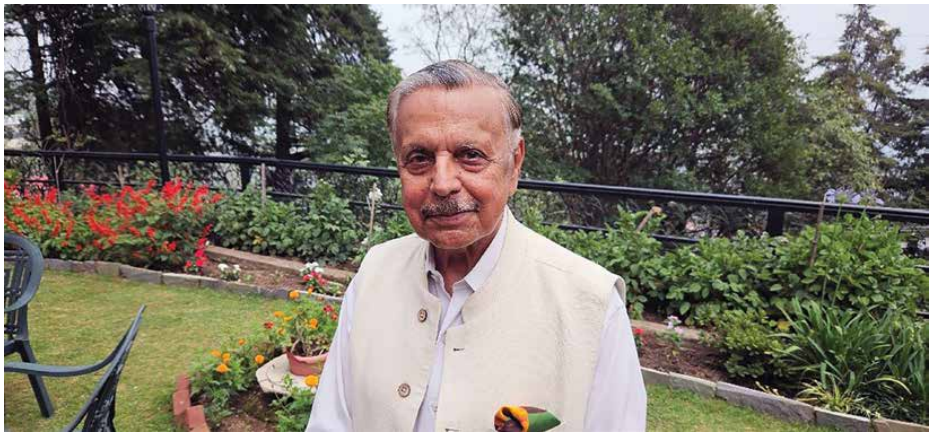
Reliable media reports have suggested that Yunus had the temerity to present his visitors with a map of a Greater Bangladesh which included some parts of India's Northeast and West Bengal. Such ludicrous acts need to be strongly condemned by the Indian government and Bangladesh warned to desist from such acts or be prepared to face reprisals. An idea also troubling the minds of some analysts is that somewhere our "strategic partner", the United States too is involved in these anti–India activities to keep a growing India in check.

Bangladesh appears to traverse the wrong path by its anti–India stance and is ignoring geo–political realities and all that India has done for it to ensure its independence from their genocide inflicting West Pakistani brethren in the late 60s and 70s. Bangladesh, by ignoring its geography and its post 1971 relations with India, is displaying uncalled for recklessness for which it will suffer in the years ahead unless it gets back to cooperation with India.

Their Yunus led interim government is distinctly leaning towards China, as Beijing, in the short term, offers quick cash, connectivity projects and military hardware without bothering about the recipient nation's human rights or corruption oriented track record. However, in the long run, the recipient nation gets sucked into a debt trap. Bangladesh should learn from the Sri Lankan experience of Hambantota being financed by China, and even Pakistan's financial problems with its Chinese mentors regarding the Gwadar port.

Bangladesh should look at its friendly neighbour India's track record in coming to its aid frequently whenever that impoverished nation has faced crises. It needs to adopt a strategy of "calibrated equidistance" from China, US and Pakistan, while restoring its multifaceted links with India. We also must endeavour to solve our water sharing problems especially of the Teesta river with Bangladesh.

New Delhi will have to take suitable measures to influence Dhaka not to fall into any trap being set for it by any nation. Meanwhile, additional security measures to thwart Chinese or Pakistani mischief on India's east will have to be taken with alacrity.



The writer, a retired lieutenant–general, was the first head of India's Defence Intelligence Agency, is a long–time Pakistan watcher and has been involved in Track–2 diplomacy.

OPINION

Admiral Arun Prakash says....

.....The perils of polarisation for India's defence forces

Summoning hundreds of America's top military leaders from their posts worldwide, US President Donald Trump and secretary of war Pete Hegseth, harangued them in what is being interpreted as an attempt to enforce ideological alignment among the military's command structure, with a blunt ultimatum that officers who disagree should resign. While such developments in far–off America should not be of concern to us, this sudden and significant departure from long standing norms in a fellow democracy and its bearing on civil–military relations calls for reflection.

India's armed forces have, so far, had an excellent record of non–involvement in any kind of activity that can be described as politically motivated. A serviceman is free to cast his vote as he wishes, but any expression of political views or public signs of political affiliation has remained taboo. Thus, no politics, no religious discrimination and no caste, gender or ethnic bias was considered the Indian military's gold standard credo, and an attribute that has distinguished it from many other national institutions, which have forfeited the public's faith and confidence.

Of late however, the secular and non–discriminatory ethos of the military appears to be under stress. While the Indian Army has inherited a tradition of accommodating and respecting diverse religious ceremonials, especially those linked to the faith of its troops, now, there appears to be a steady push towards public display of a politically motivated religious cultural identity. Senior military leaders are increasingly visible at places of worship or pilgrimage and are seen participating in religious ceremonies. This is unexceptionable, since every individual is free to pray at the temples of his gods and observe the rituals of his faith. However, military ethos and propriety have traditionally required that religious worship remains a private and personal activity, undertaken when off duty, and without involving service facilities or personnel.

What military veterans find jarring is that such appearances are duly photographed and publicised in the media, and that officers are often seen in uniform on such occasions, in the company of political functionaries. Thus, the time honoured regulations barring the display of religious marks, signs and symbols while wearing the uniform are frequently being violated. This is accompanied by increasing references to mythological and religious themes — often painstakingly contrived — in public briefings and utterances and also while assigning code–names to military operations and institutional symbols. All in the name of a "long overdue process of de–colonisation".

Such tendencies lend themselves to an interpretation that the armed forces are either initiating the process or allowing themselves to be progressively pushed into alignment with a specific religious–cultural agenda. This would not only be violative of the oath of allegiance that every serviceman swears to our secular Constitution, but would also send a message of alienation and exclusion to the personnel of diverse faiths, who continue to serve in uniform in significant numbers.

Of more serious concern should be the distinct possibility that these acts, rather than being signs of soldierly piousness, are indicative of eagerness to please the political establishment. In a region full of militaries with political aspirations, the Indian armed forces have, fortunately, remained completely untainted by political stain or ambition so far. Any signs of straying from this path of rectitude should be a cause of worry to the political establishment because it could undermine India's national security.

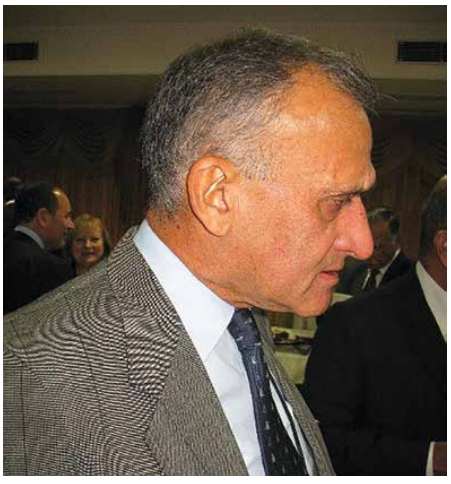
India's tradition of an apolitical military is something which we must firmly adhere to for reasons critical no only to the nation's security but also its core interests.

First, if the military were to align with a specific political party, its leadership's decision making could be compromised. Second, governments are bound to change, sooner or later. Therefore, military officers who ingratiate themselves with one political party could be purged when its opponents come to power, resulting in organisational turmoil. Third, political or religious polarisation would create deep fissures within the officer corps to start with, and eventually infect the rank and file. Last, the military commands respect from the public for its non–partisan approach, but if the people begin to perceive it as another rent–seeking organisation, swayed by politics or religion, that respect will vanish.

In earlier times, a prime cause of concern for soldiers used to be the indifference of the Indian politician towards national security issues, manifested in the consistent failure of parliamentarians to take up defence related issues. Against this backdrop, the September 2016 cross border raids on Pakistani terrorist camps constituted a salutary paradigm shift. This was confirmed by the February 2019 air–strike on Balakot and now Operation Sindoor, launched as retribution for a cross border terrorist attack. These actions marked a welcome departure from the long standing policy of "strategic restraint" and called Pakistan's nuclear bluff. Insofar as they marked the end of political indifference towards national security, these developments have, rightly, received a warm welcome.

However, this newfound political interest in security issues has also brought with it some complexities. Not only have politicians started taking credit for ordering military operations — which is their prerogative — but also for their successful execution. When done for political advantage, this prompts rival parties to retaliate by questioning the government's claims. In such a crossfire, the military leadership, unfortunately, finds itself on the horns of a dilemma. If they do not defend themselves, their credibility is cast in doubt, and if they do, they risk accusations of political partisanship.

Finally, we must remember that the defining characteristic that elevates India's military above its regional peers is its unwavering allegiance to the Constitution. This sets it apart from China's People's Liberation Army, which swears loyalty to the Communist Party, and Pakistan's military, which claims to be "defenders of Islam". Allowing political or religious polarisation to seep into our armed forces would severely erode morale, cohesion, and combat efficiency, with grave consequences for the nation's security. Therefore, insulating our military from such contagion is an issue that demands deep and urgent reflection by both our political and military leadership.



In the photo above is Admiral (Retd) Arun Prakash

Interview with Air Chief Marshal AP Singh Chief of the Air Staff, Indian Air Force

***VAYU**: The Indian Air Force is short of Airborne Early Warning & Control Aircraft (AWACS) systems. What are the current plans to fill the gap? Can you share updates regarding the ongoing indigenous AWACS (Netra Mk II) development involving ex Air India A320/21 and the status of the AEWC Netra Mk.1A?*

Airborne Early Warning and Control (AEW&C) systems are a vital component of modern air power, and the Indian Air Force recognises the need to strengthen this capability in adequate numbers. To bridge the gap, we are pursuing multiple projects that will substantially enhance our airborne surveillance and command network in the coming years.

The AEW&C Mk.IA programme, based on the Embraer–145 platform, is being developed by the Centre for Airborne Systems (CABS) under the aegis of DRDO. Six such aircraft are planned for induction, each equipped with significantly upgraded radar ranges and advanced Mission System Avionics. These improvements will greatly enhance our ability to detect, track and manage air operations across a wide battlespace.

In parallel, the AEW&C Mk.II programme represents a major leap forward in indigenous capability. For this, six pre–owned Airbus A321 aircraft have been transferred from Air India to the IAF. The design and development are being spearheaded by CABS, DRDO, under the 'Make in India' initiative. The Mk.II system will feature next generation sensors, advanced electronic warfare suites, and extended endurance, offering far superior performance compared to earlier variants. Development of the mission systems is progressing well at DRDO, while contracts for structural modifications are being finalised with AIESL and ADS, Spain.

Additionally, the IAF is also progressing plans to induct state–of–the–art Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) aircraft. These platforms, incorporating indigenous sensor technologies, will further enhance our situational awareness and provide critical capabilities for joint operations. Collectively, these initiatives reflect our commitment towards building a robust, networked, and self–reliant airborne surveillance architecture for the future.

AEW&C Netra Mk.1 and Su–30MKI (Photo: Phil Camp)

***VAYU**: On capability enablers, what are IAF's plans on refuellers? We have been tracking this saga for 2 decades.*

The Indian Air Force has made notable headway in strengthening its force multiplying capabilities, particularly in the area of air–to–air refuelling. A contract has already been concluded for the wet lease of a Flight Refuelling Aircraft (FRA), which will be jointly utilised by the IAF and the Indian Navy for training purposes. We expect this aircraft to become operational within this year, significantly enhancing our training and operational readiness.

In parallel, the IAF is also processing a case for the procurement of six additional FRAs to meet long term operational requirements. The responses to our Request for Proposal (RFP) are presently under evaluation. Combat enablers such as flight refuelling aircraft and AEW&C

platforms are essential for extending reach, persistence, and operational flexibility, and therefore remain very high on our modernisation and capability development priorities.

***VAYU**: Also, for over 2 decades now we have been tracking the MMRCA/MRFA programme: could you give us its status please?*

Defence procurements, particularly those involving major platforms like fighter aircraft, are complex and process driven endeavours. Such acquisitions have long term strategic, industrial and financial implications. With self–reliance as a key national imperative, these processes now carry additional dimensions to ensure that capability enhancement aligns with indigenous development.

At present, the Indian Air Force has initiated a case for the procurement of Multi Role Fighter Aircraft (MRFA), which is being progressed in accordance with the provisions of DAP–2020. The emphasis is on inducting a contemporary fighter platform within an optimal timeframe to enhance operational capability, while simultaneously maximising transfer of technology, local manufacturing, and integration of indigenously developed weapons and systems. While strengthening squadron strength and augmenting combat capability remain enduring priorities, I would like to highlight that the IAF today stands fully prepared and operationally ready to meet all contingencies. You will agree that our achievements in Operation Sindoor amply demonstrated this fact.

***VAYU**: After the success of Exercise Tarang Shakti, will the IAF have more on the same lines every year?*

Exercise Tarang Shakti–24 was indeed a resounding success for the Indian Air Force. It showcased our seamless interoperability, tactical acumen and high standards of professionalism while also highlighting India's growing stature as a credible and responsible air power.

The exercise not only demonstrated our operational prowess on the global stage but also significantly reinforced our defence and diplomatic engagements with participating nations. In many ways, Tarang Shakti–24 set new benchmarks in military diplomacy. The participating nations were extremely happy with the flying environment and conduct of the exercise.

Building on the momentum it has generated, the IAF intends to make Exercise Tarang Shakti a biennial event, with the next edition planned for Sep–Oct 2026. By institutionalising it as a regular feature in our exercise calendar, we aim to further deepen our engagement with like–minded air forces, enhance mutual understanding and interoperability, and contribute to regional as well as global stability. We look forward to the next edition being even more impactful and inclusive.

At Exercise Tarang Shakti (Photo by Mayyank Kaul)

***VAYU**: Could you share some updates on the Su–30MKI upgrade plans?*

The global security environment increasingly recognises air power as a primary and decisive instrument of statecraft. As India navigates a complex regional and global landscape, the nation relies on us to provide timely and effective responses to emerging threats. It is our solemn responsibility to ensure that the IAF remains a credible, capable and formidable force, always ready to meet the nation's expectations. Achieving this requires a phased and deliberate enhancement of our operational capabilities, supported by indigenous development and the integration of cutting edge technology.

The upgrade of our Su–30MKI fleet is a key component of this strategy. In collaboration with Hindustan Aeronautics Limited (HAL), we are undertaking a comprehensive modernisation programme that underscores our commitment to indigenisation. The upgraded fleet will incorporate contemporary, indigenously sourced systems, including electronic warfare suites, airborne radar, navigation and mission control systems, communication systems, cockpit displays, weapons and weapon control systems. This modernisation will not only significantly enhance the combat potential of the Su–30MKI but also strengthen India's indigenous defence ecosystem, ensuring that our frontline fighter fleet remains at the cutting edge of operational capability.

IAF Su–30MKI (Photos by Mayyank Kaul)

DRDO tests Agni–Prime from rail based launcher

DRDO, in collaboration with the Strategic Forces Command (SFC), carried out the successful launch of Intermediate Range Agni–Prime missile from a rail based mobile launcher system, under a full operational scenario on 24 September 2025. This next generation missile is designed to cover a range up to 2000 km and is equipped with various advanced features.

DAC clears proposals worth Rs 79,000 crore

The Defence Acquisition Council approved various proposals of the Services amounting to a total of about Rs 79,000 crore on 23 October 2025. For the Indian Army, Acceptance of Necessity (AoN) was accorded for the procurement of Nag Missile System (Tracked) Mk–II (NAMIS), Ground Based Mobile ELINT System (GBMES) and High Mobility Vehicles (HMVs) with Material Handling Crane. For the Indian Navy, AoN was granted for the procurement of Landing Platform Docks (LPD), 30mm Naval Surface Gun (NSG), Advanced Light Weight Torpedoes (ALWT), Electro Optical Infra–Red Search and Track System and Smart Ammunition for 76mm Super Rapid Gun Mount.

For the Indian Air Force, AoN was accorded for Collaborative Long Range Target Saturation/Destruction System (CLRTS/DS) and other proposals. The CLRTS/DS has the capability of autonomous take–off, landing, navigating, detecting and delivering payload in the mission area.

BEL receives many orders

Bharat Electronics Limited (BEL) has secured orders that include EW system upgrade, defence network upgrade, tank sub systems, TR modules, communication equipment, EVM, spares, services, tank subsystems and overhauling, communication equipment, combat management system, ship data network, laser dazzler, jammers, upgrades, spares, services, etc.

BrahMos flagged off from UP Defence Corridor

Raksha Mantri Rajnath Singh and Uttar Pradesh Chief Minister Yogi Adityanath, on 18 October 2025, jointly flagged off the first batch of BrahMos missiles manufactured at the BrahMos Integration and Testing Facility Centre in Lucknow.

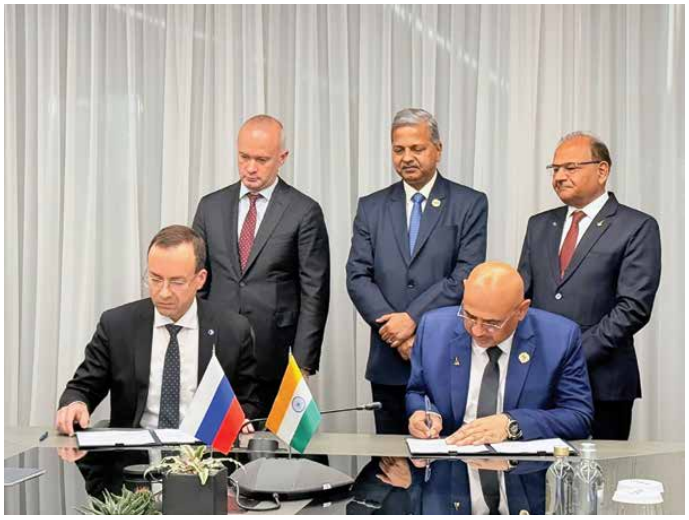
HAL's HTT–40 series production flies

The first Hindustan Turbo Trainer–40 (HTT–40) Series Production aircraft, TH 4001, which will train the next generation air warriors, took to the skies at the HAL facility in Bengaluru on 24 October 2025. HTT–40 Basic Trainer Aircraft is a fully aerobatic, tandem seat,

turboprop aircraft built to provide basic flight training, aerobatics, instrument flying and night flying.

HAL and UAC MoU for production of SJ–100

Hindustan Aeronautics Limited (HAL) and Public Joint Stock Company United Aircraft Corporation (PJSC–UAC) Russia signed an MoU for production of civil commuter aircraft SJ–100 in Moscow, Russia on 27 October 2025. SJ–100 is a twin engine, narrowbody aircraft. As on date, more than 200 aircraft have been produced and are being operated by more than 16 commercial airline operators. SJ–100 "will be the game changer for short–haul connectivity under the UDAN Scheme in India". Under this arrangement, HAL will have the rights to manufacture SJ–100 aircraft for domestic customers.



President Droupadi Murmu's Rafale sortie

Post the 40 minute sortie on 29 October 2025 at Ambala, the President stated, "The sortie on Rafale is an unforgettable experience for me. This first flight on the potent Rafale aircraft has instilled in me a renewed sense of pride in the nation's defence capabilities. I congratulate the Indian Air Force and the entire team of Air Force Station, Ambala for organising this sortie successfully". Previously, she had taken a sortie in a Sukhoi–30MKI in 2023.

Advanced Night Sight for IA's 7.62 x 51mm rifles

The Ministry of Defence signed a contract agreement worth Rs. 659.47 crore for procurement of night sight (Image Intensifier) for 7.62 x 51mm Assault Rifle along with accessories for the Indian Army with the consortium of MKU Ltd (Lead Member) and Medbit Technologies Pvt Ltd on 15 October 2025. The night sight will enable soldiers to fully exploit the longer effective range of the SIG 716 assault rifle.

HQ IDS's 25th Raising Day

Headquarters Integrated Defence Staff (HQ IDS) celebrated its Raising Day, marking the commencement of twenty fifth year of service since its establishment on 1 October 2001. Conceived as a permanent institution for promoting jointness and integration in the Armed Forces, HQ IDS has emerged as the fulcrum of tri–service synergy vanguard for new domains like cyber and space, a key enabler in shaping India's integrated military preparedness.

Framework for US–India defence partnership

Raksha Mantri Rajnath Singh met with US Secretary of War Mr Pete Hegseth on the sidelines of 12th ASEAN

Defence Ministers' Meeting – Plus (ADMM–Plus) in Kuala Lumpur, Malaysia on 31 October 2025. The meeting was constructive and the delegation–level talks were followed by a one–to–one meeting. US Secretary of War Pete Hegseth stated, "I want to express gratitude to Minister Singh for the partnership we have with India. It's one of those consequential US–India relationships in the world. Our strategic alignment is built on shared interests, on mutual trust and commitment to a secure and prosperous Indo–Pacific Region. This 10 year US–India Defence Framework is ambitious. It's a significant step for our two militaries, a roadmap for deeper and even more meaningful collaboration ahead. It underscores America's long term commitment for our shared security and our strong partnership."

Fourth F404–IN20 delivered to HAL

GE Aerospace handed over the fourth F404–IN20 engine against the order of 2021 to HAL on 30 September 2025.

Nag Mk.II tested from 'Light Tank'

CVRDE/DRDO achieved a major milestone in the development of Light Tank (designed and developed by DRDO and manufactured by Larson & Toubro Ltd) by demonstrating the anti–tank guided missile (Nag Mk.II) firing capability. All performance objectives, including the range, maneuverability for top attack mode and accuracy, were achieved.

Airbus, TASL H125 FAL in Karnataka

India's first helicopter Final Assembly Line from the private sector, to be established by Tata Advanced Systems Limited (TASL) to build the Airbus H125 helicopters, will be located in Vemagal in Karnataka. The move promises to unlock the full potential of the rotorcraft market in South Asia. The delivery of the first 'Made in India' H125 is expected in early 2027. The helicopter will be available for exports in the South Asian region as well.

TASL inaugurates facility in Morocco

Tata Advanced Systems Limited, on 23 September 2025, unveiled a new, state–of–the–art manufacturing facility in Berrechid, Casablanca region for the Wheeled Armoured Platform 8x8 (WhAP 8x8). The facility was inaugurated by Mr. Rajnath Singh, Defence Minister of India and Mr Abdeltif Loudyi, Minister Delegate to the Head of Government in charge of the Administration National Defence, Morocco. Spread over 20,000 sqm, it is Morocco's largest defence manufacturing facility.

TASL in partnership with Safran inaugurates facility for LEAP

Tata Advanced Systems Limited in partnership with Safran Aircraft Engines inaugurated their manufacturing

facility at the Tata Centre of Excellence for Aero Engines in Adibatla, Hyderabad. The facility will produce complex rotating parts for the CFM LEAP engine, including cutting edge machining and special processes under one roof. The inauguration ceremony marks a significant milestone in the strategic collaboration announced in January 2024, when both companies signed a long–term agreement for the production of rotating parts for the LEAP engine, developed by CFM International, a 50–50 joint venture between GE Aerospace and Safran Aircraft Engines.

MoD contracts HAL for 97 LCA Mk.1A's

Ministry of Defence (MoD) signed a contract with Hindustan Aeronautics Limited (HAL) for procurement of 97 Light Combat Aircraft (LCA) Mk.1A, including 68 fighters and 29 twin seaters, along with associated equipment, for Indian Air Force, at a cost of over Rs. 62,370 crore (excluding taxes), on 25 September 2025. The delivery of these aircraft would commence during 2027–28 and be completed over a period of six years.

The aircraft will have an indigenous content of over 64%, with 67 additional items incorporated, over and above the previous LCA Mk.1A contract signed in January 2021. The integration of advanced indigenously developed systems such as the Uttam Active Electronically Scanned Array (AESA) Radar, Swayam Raksha Kavach, and control surface actuators will further strengthen the Aatmanirbharta initiatives.

The project is being supported by a robust vendor base of nearly 105 Indian companies directly engaged in the manufacture of detailed components. The production is expected to generate close to 11,750 direct and indirect jobs per year for the duration of six years, giving a major boost to the domestic aerospace ecosystem.

L&T partnership with BEL for AMCA

Larsen & Toubro (L&T) has formed a strategic partnership with Bharat Electronics Limited (BEL) to support the Advanced Medium Combat Aircraft (AMCA) programme of the Indian Air Force.

The consortium will participate in the Expression of Interest notice issued by Government of India's (GoI) Aeronautical Development Agency, by way of submitting a response in the coming weeks.

L&T–BEL's AMCA alliance onboards DTL

The consortium of L&T and Bharat Electronics Ltd (BEL), which is pursuing India's 5th Generation Fighter Aircraft (AMCA), announced the onboarding of Dynamatic Technologies Ltd (DTL), as an exclusive partner for the programme. "This collaboration will combine DTL's global expertise in complex aerostructures and sub–systems manufacture for leading aerospace original equipment manufacturers, with L&T's engineering excellence and BEL's electronics expertise. This synergy brings unique strength to AMCA's development and boosts domestic capabilities in advanced aerospace manufacturing".

L&T and GA–ASI in partnership for MALE RPAS

L&T and the US headquartered General Atomics Aeronautical Systems, Inc. (GA–ASI) have entered into a strategic partnership to manufacture Medium Altitude Long Endurance (MALE) Remotely Piloted Aircraft Systems (RPAS) in India, for the Indian Armed Forces. Under this partnership, L&T will participate in the upcoming 87 MALE RPAS programme of the Ministry of Defence, where L&T will be the prime bidder and GA–ASI the technology partner.

Indian Navy contract with Coratia Technologies

Odisha based Coratia Technologies has signed a contract worth INR 66 crore (approx USD 7.5 million) with the Indian Navy for the supply and maintenance of its indigenously developed Underwater Remotely Operated Vehicles (UWROVs. Coratia Technologies has developed underwater robots, Jalasimha and Jaladuta, as well as Navya (ASV), enabling sonar based mapping and real time data analytics powered by AI and ML, serving a dual use purpose for both the defence and civil sectors.

(L) Debendra Pradhan with Minister of Defence Mr. Rajnath Singh at iDEX

Naval Group and MDL extend MoU

On 16 October 2025, Naval Group France and Mazagon Dock Shipbuilders Limited (MDL) signed an extension of their existing Memorandum of Understanding (MoU) to further strengthen cooperation for the joint export of submarines to a mutually friendly country.

The extension underscores the shared vision of both the firm's "to jointly explore and develop opportunities for exporting India–built latest generation of Scorpene class submarines to international partners".

Zen Technologies FAC simulator for naval training

Zen Technologies, through its subsidiary Applied Research International (ARI) Simulation, has announced the launch of its advanced Fast Attack Craft (FAC) Simulator training solution designed to prepare naval operators and combat crews for the complexities of modern maritime warfare.

Zen Technologies contract for anti–drone systems

Zen Technologies Limited announced that it has received a significant order worth approximately Rs. 37 crores from the Ministry of Defence for the supply of state–of–the– art anti–drone systems with hard kill capabilities. The order represents "a strategic milestone in Zen Technologies' ongoing partnership with India's defence establishment and underscores the company's leadership position in the Counter–Unmanned Aerial Systems (C–UAS) domain".

MS Tech in contract from AAI

MS Tech Ltd announced that the Airports Authority of India (AAI) had placed an order for multiple THREATSCAN

Desktop Explosives Trace Detectors (ETD's). This award follows multiple previous contracts where MS Tech already deployed a large volume of ETD's, including at Chennai International Airport, Goa International Airport, Kolkata International Airport and many others.

Strategic partnership with the UK

A new £350 million deal with India will support hundreds of jobs in Northern Ireland and supply India, a key strategic partner, with air defence missiles and launchers. The contract is set to deliver UK manufactured Lightweight Multirole Missiles (LMM) built in Belfast to the Indian Army, delivering on the Government's Plan for Change in another significant boost for the UK defence industry.

Rolls–Royce ambitions to make India a home market

Tufan Erginbilgic, Chief Executive Officer of Rolls–Royce, was in India as part of the industry delegation for the UK Prime Minister Sir Keir Starmer's first official visit since the signing of the India–UK Comprehensive Economic and Trade Agreement. Rolls–Royce's "unique portfolio of capabilities across civil aviation, defence and energy will enable it to grow its presence and partnerships in India and continue to power, protect and connect India for decades to come. Rolls–Royce's expertise aligns with India's ambitions for self–reliance in defence, for energy independence, and for growth in connectivity including through the creation of world class AI infrastructure".

Rolls–Royce CEO Tufan Erginbilgic (R) with UK PM Sir Keir Starmer in Mumbai.

Rolls–Royce partnership with Bharat Forge

Rolls–Royce has signed an agreement with Bharat Forge Ltd to manufacture and supply fan blades for Rolls–Royce's Pearl 700 and Pearl 10X engine. The agreement marks a significant milestone in Rolls–Royce's commitment towards building in–country capabilities and strategic local partnerships and builds on its commitment to double its supply chain sourcing from India by 2030.

DRDO's MCPS tested at 32,000 feet altitude

Military Combat Parachute System (MCPS), indigenously developed by DRDO, has successfully undergone a combat freefall jump from an altitude of 32,000 feet. The jump was executed by the test jumpers of the Indian Air Force showcasing the efficiency, reliability

and advanced design of the indigenous system. This achievement makes the MCPS the only parachute system currently in operational use by the Indian Armed Forces capable of deployment above 25,000 feet.

Indian Army rolls out overhauled VT–72B with ADSL

The Indian Army rolled out its first overhauled Armoured Recovery Vehicle (ARV) VT–72B from the 512 Army Base Workshop (ABW), Pune, on 17 September 2025. Airbornics Defence & Space Private Limited (ADSL), a subsidiary of JCBL Group, served as the project's sole industry partner, marking a significant milestone in industry–defence collaboration. As a part of the project, ADSL was responsible for overhauling the Utility Portion of the ARV VT–72B, which included dismantling the vehicle, replacing critical components, and repairing or substituting Major Unit Assemblies (MUAs).

IA MoU with JCBL for repair hub at Leh

The Fire & Fury Corps of the Indian Army on 16 October 2025 signed a Memorandum of Understanding (MoU) with Airbornics Defence & Space Pvt Ltd (ADSL), part of JCBL Group, for establishing a New Generation Vehicle (NGV) Repair Hub and Warehouse inside 14 Corps Zonal Workshop, Leh.

The initiative aims at boosting the Army's logistics readiness by setting up a dedicated OEM warehouse cum repair facility for new generation vehicles, inside the workshop premises of the Indian Army.

Indian Army inducts WZT–3 ARVs refurbished by JCBL

The Kharga Corps of the Indian Army has inducted three Armoured Recovery Vehicles (ARVs) WZT–3, refurbished by Airbonics Defence & Space Pvt Ltd (ADSL), a subsidiary of the JCBL Group. The refurbishment was carried out under the Other Capital Procurement Procedure of the Western Command for the Black Arrow Brigade.

Advanced night vision factory in Nimmaluru, AP

Marking another step towards Aatmanirbharta in defence, Prime Minister Narendra Modi dedicated to the nation an Advanced Night Vision factory in Nimmaluru, Andhra Pradesh on 16 October 2025. The facility is among the multiple development projects worth around Rs 13,430 crore which the Prime Minister laid the foundation stone for, inaugurated and dedicated to the nation in Kurnool.

IIT Madras, Zuppa and IAF MoU

Zuppa Geo Navigation Technologies, IIT Madras, and the 8 Base Repair Depot (8 BRD) of the Indian Air Force have signed a Memorandum of Understanding (MoU) to jointly undertake in–house Research & Development (iR&D) in defence technologies. This collaboration marks an important milestone in strengthening self–reliance (Atmanirbhar Bharat) in the defence sector by bringing together complementary strengths from industry, academia and the Armed Forces.

Rossell Techsys assemblies for T–7A Red Hawk

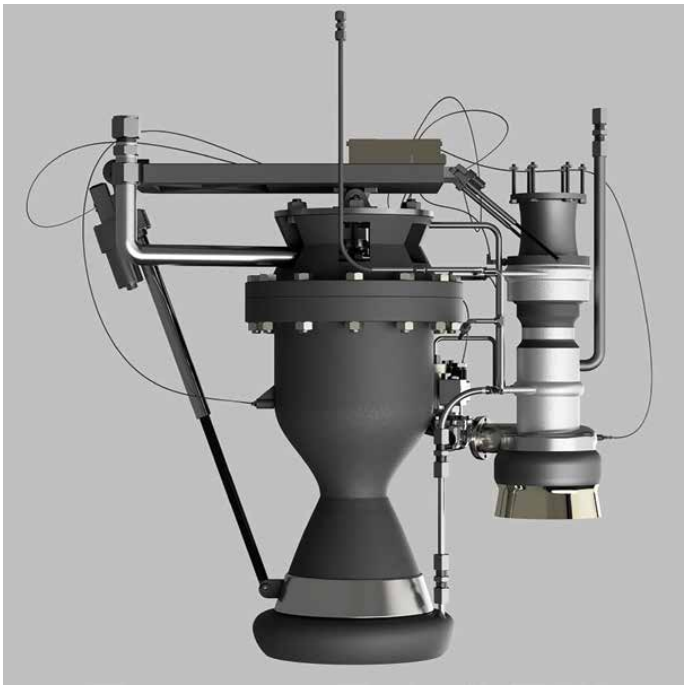
Rossell Techsys Limited has signed a long term Indefinite Delivery, Indefinite Quantity (IDIQ) contract with Boeing for manufacturing electrical panel assemblies for the T–7A Red Hawk, Boeing's advanced pilot training system. Under the agreement, Rossell Techsys can produce up to 1,200 shipsets through 2033.

SQuAD Forging rolls out 25,000th aircraft wheel

Aequs' forging joint venture, SQuAD Forging India Private Limited, engaged in making precision forged components for the aerospace industry, rolled out the 25,000th aircraft wheel manufactured at its plant recently. Significantly, SQuAD, which has been manufacturing aircraft wheels since 2018, took five years to make the first 10,000 wheels in August 2023. The unit achieved the major milestone of 25,000th wheel in just two years since then.

Thrustworks Dynetics in strategic funding

Thrustworks Dynetics is an IIT–Bombay incubated propulsion company that is developing India's first Integrated Rocket Facility and has already built India's first mobile rocket engine test bed. The company has just raised INR 7 crore in its latest round led by Jamwant Ventures, co–led by Piper Serica and SINE–IIT Bombay participating.



Zuppa and Divide By Zero tie–up

Zuppa, India's leading deep–tech company specialising in drone technology and advanced sensor systems, and Divide By Zero Technologies (DBZ), India's industrial 3D printer manufacturer, announced a strategic collaboration to develop mobile rapid fabrication units – deployable containerised systems capable of 3D printing and assembling drones directly at the frontlines. This initiative represents a breakthrough in defence manufacturing agility, enabling on–site drone fabrication, repair, and mission–specific customisation within hours – reducing reliance on centralised production and logistics chains.

Zuppa and QuBeats in collaboration

Zuppa Geo Navigation Technologies Pvt Ltd announced a strategic partnership with QuBeats (a registered trademark of Nostradamus Technologies Private Limited) through a Memorandum of Understanding to co–develop and deliver next generation quantum assured navigation solutions for Zuppa's unmanned aerial systems.

Paras Defence's in order from MoD

Paras Anti–Drone Technologies Pvt Ltd, a subsidiary of Paras Defence and Space Technologies Ltd, received a major domestic order worth approximately Rs. 46.19 crore from the Ministry of Defence, for supplying advanced anti–drone systems such as drone jammers for the Armed Forces. The order is expected to be executed by March 2026.

Marine Robotics EyeROV order from Indian Navy

EyeROV, India's underwater robotics startup, has announced the signing of a landmark Rs. 47 Cr contract

with the Indian Navy for advanced Underwater Remotely Operated Vehicles (UWROVs). The deal strengthens India's naval capability with field tested indigenously built technology.

Jyoti Global Plast launches surveillance drone

Jyoti Global Plast Limited has announced its entry into the drone technology space. The company is building on its expertise in advanced materials and high precision manufacturing to drive this new venture. The new surveillance drones are equipped with day–and–night flying capability powered by dual (day + thermal) cameras, an Android based ground control system and a vibration damping pod with a quick release anti–vibration claw.

Big Bang Boom Solutions gets IN contract

Big Bang Boom Solutions has announced signing of its landmark sixth iDexcontract, after successful completion and closure of its first three iDex projects. On 28 June 2025, the company signed a contract with the Indian Navy under iDEX DISC–13 to develop a multi–spectral camouflage cloak, a roll–on roll–off system designed to protect assets on the ground from enemy radar using niche nanotechnology and meta materials.

Avantel sets up facility in Hyderabad

Avantel Limited, a player in satellite communications and defence electronics, inaugurated its second facility in Hyderabad to expand its capabilities in developing aerospace and defence technologies. Spread over 76,000 sq. ft., the new facility will focus on the design, development and manufacturing of Software Defined Radios (SDRs), radar systems and satellite integration.

GE Aerospace's Pune facility celebrates 10 years

GE Aerospace's Pune manufacturing facility celebrated ten years of operations, marking a milestone in the company's four decade history in the Indian aviation industry. Over the past decade, Pune has emerged as a hub for producing commercial jet engine components and a centre for advanced manufacturing skill development, training over 5,000 production associates through its apprentice and other programmes.

BonV Aero BVLOS drone mission

BonV Aero, a homegrown leader in transport class heavy lift UAV (Unmanned Aerial Vehicle) technology, has become the first Indian company to successfully conduct

a beyond visual line of sight (BVLOS) flight over 60 kilometres while carrying a 20 kilogramme payload. The UAV mission was completed in 75 minutes at an average speed of 48 km/h, showcasing the operational maturity of BonV Aero's proprietary propulsion and energy systems, designed specifically for high endurance, high payload applications.

Delivery of DSC A20 (Yard 325)

DSC A20, the first indigenously designed and constructed Diving Support Craft was delivered by Titagarh Rail Systems Ltd (TRSL), Kolkata to the Indian Navy on 16 September 2025 at Kolkata. The contract for building 5 Diving Support Craft (DSC) was signed between MoD and Titagarh Rail Systems Limited (TRSL), Kolkata on 12 February 2021.

ICGS Adamya commissioned

Indian Coast Guard Ship Adamya, the first ship of the eight in series Adamya class Fast Patrol Vessels (FPVs), was commissioned at Paradip Port on 19 September 2025. This 51 meters FPV has been designed and built indigenously by Goa Shipyard Limited; the ship displaces 320 tons and is propelled by two 3000 KW diesel engine to attain a maximum speed of 28 knots. She has an endurance of 1500 nm at economical speed.

Indian Navy commissions 'Androth', 2nd ASW–SWC

The Indian Navy commissioned its second Anti–Submarine Warfare Shallow Water Craft (ASW–SWC), Androth, at Naval Dockyard, Visakhapatnam on 6 October 2025. Built by Garden Reach Shipbuilders and Engineers (GRSE) Ltd, Kolkata, it has over 80% indigenous components.

Delivery of 'Mahe' ASW SWC by CSL, Kochi

'Mahe', the first of eight Anti–Submarine Warfare Shallow Water Crafts (ASW SWC) being built by Cochin Shipyard Limited (CSL), Kochi, was delivered to Indian Navy on 23 October 2025. It is equipped for underwater surveillance, low intensity maritime operations (LIMO), anti–submarine warfare (ASW) operations in coastal waters and has advanced mine laying capability. At approximately 78 metres, with a displacement of around 1,100 tons, the ship packs a punch in underwater warfare, with torpedoes, multifunctional anti–submarine rockets, and advanced radars and sonars.

Commissioning of ICGS Akshar

Indian Coast Guard (ICG) Ship Akshar, the second ship of the eight in series Adamya class Fast Patrol Vessels

(FPVs), was commissioned at Karaikal on 4 October 2025. This 51 meters FPV has been designed and built indigenously by Goa Shipyard Limited. The ship displaces 320 tons and is propelled by two 3000 KW diesel engine to attain a maximum speed of 27 knots. She has an endurance of 1500 nm at economical speed.

Indian Navy commissions static firing facility 'Trinetra'

A state–of–the–art Static Firing Facility 'Trinetra', for testing of Naval Weapon Systems was inaugurated by Vice Admiral Rajesh Pendharkar, Flag Officer Commanding–in–Chief, Eastern Naval Command, on 8 October 2025 at Naval Station Bheemunipatnam, near Visakhapatnam. The Static Firing Facility will enable scientific assessment of the combat worthiness of naval weapon systems by capturing and recording key performance parameters of missiles, rockets and related systems.

Launch of sixth ASW SWC BY 528 (Magdala)

BY 528 (Magdala), the sixth vessel in the series of eight Anti–Submarine Warfare Shallow Water Crafts (ASW SWC), was launched on 18 October 2025 at Cochin Shipyard Limited (CSL), Kochi. ASW SWCs will augment underwater domain awareness, anti–submarine warfare and mine laying capabilities. Propelled by three diesel engine powered waterjets, these ships are equipped with sensors such as a hull mounted sonar and low frequency variable depth sonar (LFVDS), and firepower provided by torpedoes, anti–submarine rockets, NSG–30 gun and 12.7 mm SRCG.

Indian Navy commissions 'Ikshak'

The Indian Navy enhanced its hydrographic survey capabilities with the commissioning of Ikshak, the third vessel of the Survey Vessel (Large) or SVL class and the first to be based at the Southern Naval Command. Built by Garden Reach Shipbuilders and Engineers (GRSE) Ltd, Kolkata, Ikshak stands as a "shining example of India's growing self–reliance in shipbuilding". The vessel has over 80% indigenous content.

ICG launches 2 FPVs: ICGS Ajit and ICGS Aparajit

The Indian Coast Guard (ICG) marked a significant milestone in strengthening India's maritime security with the launch of two advanced Fast Patrol Vessels (FPVs) ICG Ship Ajit and ICGS Aparajit at Goa Shipyard Limited (GSL) on 24 October 2025. These vessels are the seventh and eighth in a series of eight indigenously built FPVs being constructed by GSL for the ICG.

Indian Coast Guard marks key milestones

The keel laying of second Fast Patrol Vessel (FPV), Plate Cutting of fifth FPV under the 14 FPV Project, and girder laying ceremonies for the second and third indigenously built Air Cushion Vehicles (ACVs) of the Indian Coast Guard (ICG) were held on 30 October 2025 at Mazagon Dock Shipbuilders Limited (MDL), Mumbai, and Chowgule's Rassaim Yard, Goa, respectively.

Indian Navy's GSAT–7R satellite launched

Indian Space Research Organisation (ISRO) launched Indian Navy's GSAT–7R (CMS–03) communication satellite on 2 November 2025. This is the most advanced communication satellite thus far for the Indian Navy. This satellite is India's heaviest communication satellite till date, weighing approximately 4,400 kg, and includes many indigenous state–of–the–art components developed specifically to meet the Indian Navy's operational

requirements. This satellite will significantly enhance connectivity with high–capacity bandwidth, enabling seamless and secure communication links between ships, aircraft, submarines and Maritime Operations Centres of the Indian Navy.

IndiGo for 30 more A350–900s

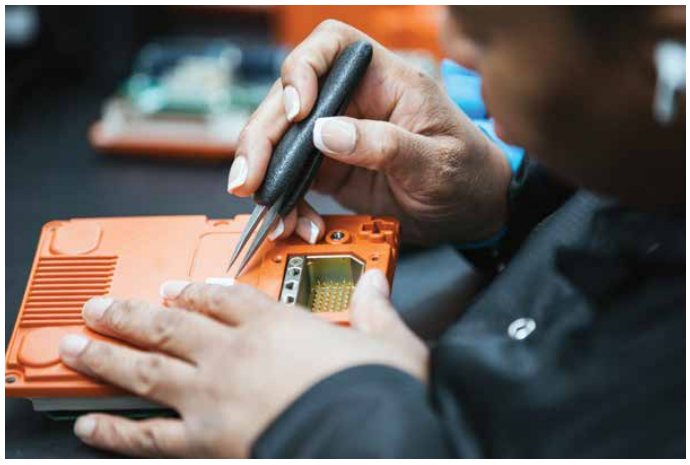
IndiGo has finalised a commitment for 30 Airbus A350 aircraft, converting a Memorandum of Understanding signed in June into a firm order. This brings the airline's total A350 orders to 60 aircraft. The expanded order marks a strategic shift for IndiGo as it prepares to enter the long–haul international market, leveraging "the A350's long range and efficiency to support its global ambitions".

Thales signs two strategic contracts with IndiGo

Thales and IndiGo have signed a strategic maintenance contract for the airline's current fleet of 430 Airbus A320 aircraft and future order of over 800 A32X aircraft. As part of this 11 year contract, Thales will provide IndiGo with repair services for avionics components, coupled with Thales's Avionics–By–The–Hour (ABTH) programme. Repairs will be managed at Thales's new avionics MRO facility in Gurugram, India, located near the Delhi airport. IndiGo has also extended a 5 year contract with AvioBook, a Thales company, for AvioBook Flight —the only Electronic Flight Bag solution currently authorised for paperless operations by the Directorate General of Civil Aviation (DGCA).

Acron Aviation's new MRO centre in India

Acron Aviation announced the launch of its new Maintenance, Repair and Overhaul (MRO) centre in Bangalore. The new facility offers regional operators faster turnaround times and localised support, reducing dependence on overseas repair channels. The centre has launched with repair and test capability for the SRVIVR25, a critical onboard safety system, and will expand over the next three years to include recorders, TCAS and advanced display systems.



Acron Aviation supplies 2 Airbus A320neo FFS

Acron Aviation "is proud to announce its role in supporting the newly inaugurated training centre formed through the landmark joint venture between Air India and Airbus". Acron Aviation supplied two Airbus A320neo Full Flight Simulators (FFS) to the Airbus India Training Centre, which was inaugurated on 30 September in Gurugram, Haryana, India. Acron Aviation will also supply two additional A320 FFS to this facility by 2026.

APPOINTMENTS

Air Marshal Hardeep Bains is Air Officer–in–Charge Personnel, IAF

Air Marshal Hardeep Bains took over as Air Officer–in–Charge Personnel on 1 October 2025. Air Marshal Hardeep Bains was commissioned in the fighter stream of the Flying Branch of the Indian Air Force on 19 December 1987. He is a cat 'A' qualified flying instructor with over 5000 hours of accident free flying. In a career spanning over 38 years, the Air Marshal, an alumnus of National War College, South Africa and National Defence College, Israel has held various key field and staff appointments. Prior to his present appointment, he was the Commandant of National Defence College, New Delhi. In recognition for his meritorious services, he was awarded with Vishisht Seva Medal in 2012, and the Ati Vishisht Seva Medal in 2015 by the President of India.

Vice Admiral B Sivakumar assumes charge as the Chief of Materiel

Vice Admiral B Sivakumar assumed charge as the 40th Chief of Materiel on 1 November 2025. He is an alumnus of 70th Course, NDA and was commissioned as an Electrical Officer into the Indian Navy on 1 July 1987. The Flag Officer holds Master's Degrees in Electrical Engineering from IIT Chennai, is a post graduate in Higher Defence Management from Osmania University, MPhil from Madras University and is an alumnus of National Defence College. During his service of over 38 years, the Flag Officer has held various key appointments in the Naval Headquarters, HQ ATVP, Naval Dockyards and Command Headquarters. He has served onboard frontline warships, Indian Naval Ships Ranjit, Kirpan and Akshay and has commanded the premier Electrical Training Base, INS Valsura.

Vice Admiral Sameer Saxena is FOC–in–C SNC

Vice Admiral Sameer Saxena assumed charge as the Flag Officer Commanding–in–Chief, Southern Naval Command on 31 October 2025. VAdm Sameer Saxena was commissioned into the Indian Navy on 1 July 1989 and is a specialist in Navigation & Direction. He is an alumnus of the National Defence Academy, Khadakwasla, Defence Services Staff College, Wellington, and the Naval War College Newport, USA.

The Flag Officer has held several key operational, staff and training appointments. As a non–specialist officer, he served onboard Indian Naval Ships: Ajay, Sukanya and Akshay. As a specialist, he served on the Direction team onboard the aircraft carrier, INS Viraat and subsequently as the Navigating Officer of Indian Naval Ships Kuthar, Godavari and Delhi. He has been the Executive Officer of INS Mumbai.

Vice Admiral Gurcharan Singh assumes charge as Chief of Personnel

Vice Admiral Gurcharan Singh assumed charge as the Chief of Personnel of the Indian Navy, on 1 November 2025. An alumnus of the National Defence Academy (Khadakwasla), he was commissioned into the Indian Navy on 1 July 1990. The Flag Officer has held several appointments, both afloat and ashore. As a specialist in Gunnery and Missiles, he has served onboard Indian Naval Ships Ranjit and Prahar. He has the distinction of being part of the commissioning crew of three indigenously constructed warships, viz, INS Brahmaputra as the Gunnery Officer, INS Shivalik as the Executive Officer, and INS Kochi as the Commanding Officer. He has also commanded INS Vidyut and INS Khukri.

India to host IFR 2026, Milan 2026 and IONS Conclave of Chiefs

India will host three major international maritime events in February 2026 at Visakhapatnam, namely, the International Fleet Review (IFR) 2026, Exercise MILAN 2026 and Indian Ocean Naval Symposium (IONS) Conclave of Chiefs, scheduled to be conducted from 15 to 25 February 2026. This marks India's maiden conduct of these major maritime events simultaneously.

MAHASAGAR extends India's SAGAR (Security and Growth for All in the Region) philosophy from the Indian Ocean to across regions, emphasising sustainability, resilience and collective responsibility of the maritime commons. The February 2026 convergence is a major operational manifestation of this vision, demonstrating India's commitment to being a 'Preferred Security Partner' for all friends and partners.

Invitations have been extended to navies from across the globe to participate in this historic gathering at Visakhapatnam, India's eastern maritime gateway and home to the Eastern Naval Command. The event will reflect India's commitment to free, open and inclusive seas, anchored in strategic frameworks including MAHASAGAR, the Act East Policy, IONS and the Indo–Pacific Oceans Initiative (IPOI).

The event will feature a Presidential Fleet Review at Sea by the President of India, showcasing indigenous platforms including INS Vikrant (India's first domestically built aircraft carrier), Visakhapatnam–class destroyers, Nilgiri class stealth frigates and Arnala class anti–submarine warfare corvettes—reflecting India's transformation into a 'Builder's Navy'. The Indian Navy ships would be joined by a diverse congregation of ships from friendly foreign countries, the Indian Coast Guard and the Merchant Marines.

Exercise MILAN's Sea and Harbour Phases will focus on interoperability, maritime domain awareness, anti–submarine warfare, air defence and search–and–rescue operations. The International City Parade will feature contingents from participating navies, Indian Army and Indian Air Force marching through Visakhapatnam's iconic beachfront, the RK Beach, showcasing maritime diplomacy directly to citizens.

An International Maritime Seminar will gather maritime strategists, defence officials, academics and industry leaders to discuss contemporary issues including maritime collaboration, technology and humanitarian support. The IONS Conclave of Chiefs, during which the Indian Navy would assume Chairmanship for the second time (2025–2027), will bring together Naval Chiefs from 25 members, 9 observers and specially invited nations to deliberate on maritime security, HADR and information sharing.

India's IFR tradition began with the 2001 Mumbai edition hosting 20 foreign navies and reached greater heights with the 2016 Visakhapatnam IFR welcoming navies from around the world. Exercise MILAN, launched in 1995 with four navies at Port Blair, has evolved into a premier multilateral exercise with partner navies across the globe participating in 2024. India's forthcoming IONS Chairmanship and the MAHASAGAR vision reinforce its role as a convenor of regional maritime security cooperation.

Visakhapatnam's proven infrastructure, strategic location and maritime museums make it an ideal host. Coordinated preparations by the Indian Navy along with the Ministry of Defence, the Ministry of Home Affairs, the Ministry of External Affairs, the Ministry of Tourism, the Ministry of Culture at national level and the Government of Andhra Pradesh, local administration at the state level would ensure seamless execution of this landmark convergence. Significant economic benefits for the region are anticipated through hospitality, tourism and service sector activities during the event.

This convergence transforms naval tradition into strategic cooperation, turning this grand spectacle into "meaningful diplomacy and operational synergy. It would strengthen India's position as a responsible maritime power committed to mutual advancement, holistic security and growth across regions".

3rd production line of LCA Mk.1A & 2nd production line of HTT–40 at HAL Nashik inaugurated

Raksha Mantri Rajnath Singh inaugurated the third production line of Light Combat Aircraft (LCA) Tejas Mk.1A and the second production line of Hindustan Turbo Trainer–40 (HTT–40) at the Nashik facility of Hindustan Aeronautics Limited (HAL) on 17 October 2025. He also flagged–off the first LCA Mk.1A produced at the facility.

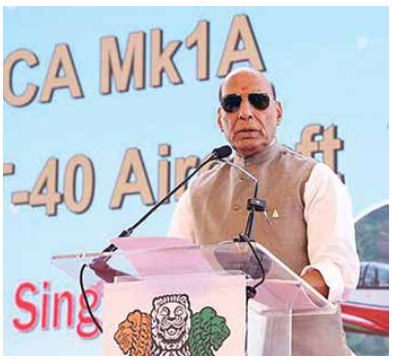
CMD, HAL Dr DK Sunil termed the successful operationalisation of the LCA Mk.1A and HTT–40 production from Nashik as a testament to HAL's capacity for expansion. "HAL's Nashik Division's capacity to produce indigenous advanced fighters in addition to Su–30MKI has added momentum to our production efforts to meet delivery timelines. It has also resulted in the creation of around 1,000 jobs and the development of over 40 industry partners in and around Nashik, aligning with the Government's goal of forging an effective Public–Private Partnership," he added.

HAL Chief Test Pilot (fixed wing) Group Capt KK Venugopal (Retd) piloted the Tejas Mk.1A sortie, which was followed by exhilarating aerial displays by Su–30MKI and HTT–40. The Tejas Mk.1A also received a water cannon salute. HAL has operationalised the third LCA Mk.1A production line in a record time of two years, fully equipping it with more than 30 structure assembly jigs for all major modules of the aircraft, including centre fuselage, front fuselage, rear fuselage, wings and air intake. The line operates fully and can produce eight aircraft per annum. With the inauguration of the line, HAL will achieve a total production capacity of 24 aircraft per year.

HAL has established the second HTT–40 production line at Nashik. The assembly complex houses structure assembly shops for manufacturing fuselages, wings and control surfaces.

HAL Nashik Division was established in 1964 for the license manufacture of MiG–21 fighter aircraft. The division has produced more than 900 aircraft and overhauled more than 1,900 military aircraft–from MiG–21 and MiG–27 to Su–30 MKI. With its extensive design, manufacturing, and integration capabilities, the division has successfully equipped the Su–30 MKI with additional indigenous armament, including the integration of BrahMos missiles.

It is a state–of–the–art facility that comprises a full gamut of aircraft manufacturing, overhaul and design capabilities. The division has a legacy of providing full lifecycle support for its manufactured aircraft. Currently, the division is providing comprehensive overhaul and repair support for Su–30 MKI aircraft.



Dassault, Rafale and India

Dassault Aviation expands its Engineering Centre in Pune

In line with the achievements already made to fulfil its commitments under the 'Make in India' policy, Dassault Aviation extended its presence in India by inaugurating the new premises of Dassault Aircraft Services India – Engineering Centre in Pune, Maharashtra, on 4 November 2025.

The expansion of the Engineering Centre, which will double its capacity to accommodate more than 150 engineers, demonstrates "Dassault Aviation's determination to develop cutting edge technological capabilities and foster local expertise for the benefit of its internal operations as well as those of its Indian and global supply chains. It also illustrates its commitment to meeting the offset obligations set out in the Rafale contract with the Indian Air Force".

Created in 2018 in Pune, DASI–EC is an operational and mature structure that oversees Dassault Aviation's engineering activities in India, in both the civil and military sectors capitalising on a core set of skills based on the company's Indian partners. From design to production and support, the entire aircraft life cycle falls within its scope of activity, all as part of an extended design office approach. By strengthening resources and developing local expertise, the aim is to support the transfer of Rafale and Falcon production to India, which is experiencing considerable growth with the signing of several major agreements with leading Indian partners in recent months.

With this new sized engineering centre, "Dassault Aviation intends to participate in promoting the 'Make in India for the world' and 'Aatmanirbhar Bharat' policies for India's self–sufficiency in aeronautics, and to contribute to positioning India as a leading hub for technological innovation and industrial excellence".

Exercise Garuda 25: IAF Su–30MKIs and FASF Rafales

The Indian Air Force (IAF) participated in the 8th edition of the bilateral air exercise 'Garuda 25' with the French Air and Space Force (FASF) at Mont–de–Marsan, France, from 16–27 November 2025. The IAF contingent arrived in France on 10 November 2025 and participated with Su–30MKI fighters. The airlift support was provided by the C–17 Globemaster III, for the induction and de–induction phases of the exercise, while the IL–78 air–to–air refuelling tankers were utilised for extending the range and endurance of the participating fighters.

During the exercise, the IAF's Su–30MKI aircraft operated alongside the French multirole fighters including Rafales in complex simulated air combat scenarios, focusing on air–to–air combat, air defence and joint strike operations. This exercise aimed to refine tactics and procedures in a realistic operational environment, enabling mutual learning and fostering interoperability between the IAF and the FASF. Exercise Garuda 25 also provided an opportunity for professional interaction, exchange of operational knowledge and sharing of best practices between the two Air Forces.

(All photos: IAF/FASF)

Safran in India: A success story

Safran has been present in India for nearly 70 years and today has 2,600 employees in 18 sites, all working in production, design or services in the aviation, space and defence industries.

Notable is the Safran–HAL, a joint venture between Safran and Hindustan Aeronautics Limited (HAL) in Bengaluru producing the unit manufacturing components for CM56 and LEAP engines for CFM International (a 50/50 joint venture between Safran Aircraft Engines and GE). The Group is also one of the leading suppliers of wheels and carbon brakes for the commercial Airbus A320 and Boeing 787 Dreamliner aircraft used in India. Inaugurated in October 2016 in Goa by M. Manohar Parrikar, the then Indian Defence Minister, Helicopter Engines MRO Pvt. Limited (HE–MRO) is a joint–venture between Safran and HAL which supports local and international operators, including the Indian Armed Forces.

Safran is one of the main contributors to the 62 Rafales acquired by India. The first fighter aircraft was delivered in October 2019. Safran Group companies produce a large proportion of the systems and equipment, for instance the aircraft's M88 engine, the power transmission system, the landing gear, the wheels and carbon brakes, the ring laser gyro inertial navigation system, the gyroscopes for the fly–by–wire system, the auxiliary power unit (APU) and all the wiring systems. Safran is in addition managing the project for the Hammer modular air–to–ground weapon (AASM). It is also the primary supplier of inertial navigation systems for Indian combat aircraft.

Sigma 95N navigation systems are used in the LCA Tejas, MiG–27, MiG–29, Jaguar and Hawk fighter planes. Over 500 fighter aircraft used by the Indian Air Force and Navy are equipped with inertial navigation systems produced by Safran.

The Group is the leading supplier of turbine engines for the helicopters used by the Indian Armed Forces, with more than 1,400+ helicopter engines in service. The Shakti/Ardiden 1H1 engine, certified in 2009, is one of the key components in the partnership between the two countries. Co–developed by Safran and HAL, the engine is currently under construction in Bengaluru, badged as Shakti, using components manufactured mainly in India. It was initially selected for the Dhruv helicopter produced by HAL, which is now in service. It is also being used in the Light Combat Helicopter (LCH). To date, 350+ Shaktis have been made. More recently, the Ardiden 1U engine, derived from the Ardiden 1H1, designed specifically for single turbine helicopters, was selected for the Light

Utility Helicopter (LUH), a new and innovative single–turbine multi–function helicopter weighing three tonnes. The first technical flight of the Ardiden 1U in the LUH took place in September 2016 in Bengaluru, and met all its performance objectives. It was certified by Indian Directorate General of Civil Aviation (DGCA) in 2021.

On 19 June 2025 Safran Aircraft Engines signed an agreement with Hindustan Aeronautics Limited for the industrialisation and production of rotating parts for LEAP engines. This agreement supports the government's "Make in India" policy and follows the memorandum of understanding signed by Safran Aircraft Engines and HAL in October 2023 to develop industrial cooperation in LEAP engine parts manufacturing, as well as the contract signed by both partners to produce forged parts. Safran Aircraft Engines is thus continuing to expand its footprint in India and is extending the scope of its cooperation with HAL through the production of Inconel parts.

The objective is to support the strong growth of the Indian aerospace market and ensure the ramp–up of LEAP engines powering single aisle civil aircraft. To this end, Safran Aircraft Engines is developing a complete aerospace ecosystem based on the creation of new facilities in India and closer cooperation with its major Indian partners such as HAL.

Safran Aircraft Engines is thus boosting its capabilities and presence in India, where it already operates five production sites in Hyderabad, Bengaluru and Goa. A sixth site dedicated to maintenance, repair, and overhaul (MRO) of LEAP engines will open in Hyderabad soon. In 2022, Safran and HAL also set up the Safran HAL Aircraft Engines joint venture in Bengaluru, specialising in manufacturing components for the LEAP engine as well as the M88 engine.

India is CFM's third largest market in terms of the number of engines in service, with 75% of the Indian commercial fleet equipped with CFM engines. Today, of the 500 aircraft operated by Indian airlines with CFM engines, over 370 are LEAP powered, and over 2,000 engines on order are for Indian airlines.

In more news, at Aero India 2025 trade show in Bengaluru (India), Safran Aircraft Engines and Titan Engineering and Automation Limited (TEAL), a major player in the Indian aerospace industry based in Bengaluru, signed a contract for the production of parts for the LEAP engine's low pressure turbine. This first partnership between the two companies leverages TEAL's technological expertise and will enhance production capabilities for the LEAP in India. Production of the first parts will start in 2026.

In more Safran engine developments at the company, at the Paris Air Show 2025, Safran unveiled the M88 T–REX, an evolution of its M88 engine. Compatible with future standards of the Dassault Aviation Rafale, this engine will build on the proven reliability and performance of the M88, while taking it to new limits with a thrust increase to 9 metric tons with afterburner. To achieve this level of performance, the M88 T–REX will incorporate significant, targeted upgrades. The improved low pressure compressor will allow greater airflow intake. The high pressure turbine will incorporate new materials and next generation cooling circuits and the nozzle will benefit from optimised aerodynamics. With these enhancements, the M88 T–REX will retain the key advantages of the current M88 in terms of size, modularity, fuel efficiency and cost of ownership, while delivering 20% more thrust. Maintainability and fleet management will also be simplified thanks to compatibility between the modules of the M88 T–REX and those of the current M88. Safran is currently conducting risk reduction studies ahead of the engine's development. Qualification of the M88 T–REX is aligned with the planned entry into service of the Rafale F5 standard.

Embraer inaugurates India office at New Delhi

Embraer, a leading aerospace company, on 17 October 2025, inaugurated its new India office of its fully owned Indian subsidiary at WorldMark 4, Aerocity, New Delhi. The milestone event was graced by Brazil's Vice President Geraldo Alckmin, Brazil's Minister of Defence Jose Mucio, India's Minister of Civil Aviation Kinjarapu Rammohan Naidu and the Ambassador of Brazil to India Kenneth Felix Haczynski da Nobrega. The opening of the office marks a significant deepening of Embraer's long standing commitment to India and sets the stage for an expanded role across all its business units — commercial aviation, defence, business aviation, services and support, and urban air mobility (UAM).

The new office will serve as the central hub for Embraer's operations in India, as it builds capacity to capitalise on opportunities within the country's ever–evolving aerospace and defence industry. This includes growing its teams across corporate functions and specialised units focused on procurement, supply chain and engineering. Embraer's strategic investment reflects its long term vision to strengthen its presence in India, and to collaborate closely with the local industry to support the country's mission of an Atmanirbhar Bharat and its Make in India initiatives.

Embraer's history in India dates back 20 years, when the first E–Jets began operations in 2005, opening new frontiers in regional connectivity. The inauguration of the new corporate office represents a renewed and expanded commitment to the country. Today, nearly 50 Embraer aircraft across 11 different types operate in India, serving the Indian Air Force, other government agencies, business jet operators and a commercial airline – Star Air.

Francisco Gomes Neto, President & CEO of Embraer, stated, "The opening of our New Delhi corporate office marks a bold new chapter for Embraer in India – a market central to our global vision. This office spans across all our business units and will strengthen collaboration with partners, customers, and suppliers. We are committed to bringing world class technology and innovation to support India's aerospace growth, advance self–reliance, and help realise its ambition of becoming a global aviation hub."

Speaking at the office inauguration event, Bosco da Costa Junior, President & CEO of Embraer Defense & Security stated, "Our office inauguration here in New Delhi reflects our ambition for further growth in the country. Our aircraft have earned a reputation for performance and reliability, and we are confident that our multi–mission medium transport aircraft, the C–390 Millennium, is perfectly suited to bring additional capabilities to the Indian Air Force."

The inauguration also underscores the strengthening of relations between India and Brazil, with Embraer's expansion in the region reflecting a shared commitment to deeper collaboration and mutual growth. Embraer's increased presence will enable greater engagement with

Indian stakeholders, customers and the broader aerospace supply chain.

Embraer's activities in India span multiple sectors. In defence, the ERJ145 platform forms the basis of the Indian Air Force's 'Netra' AEW&C aircraft, and the Legacy 600 aircraft is used for the transportation of government officials and VIPs by the Indian Air Force (IAF) and Border Security Force (BSF). Furthermore, Embraer is positioning the C–390 Millennium as the best solution for the Indian Air Force's Medium Transport Aircraft (MTA) programme.

In commercial aviation, the E–Jets family continues to unlock 'blue ocean' opportunities in tier–two and tier–three cities, enhancing regional connectivity and supporting India's ambitions to become a leading global aviation hub. Star Air is an all–Embraer operator of E175 and ERJ 145 aircraft and is growing its operations across India.

Eve Air Mobility, backed by Embraer, is actively expanding into India through strategic partnerships aimed at advancing urban air mobility. This includes working with JetSetGo to explore the deployment of its Urban Air Traffic Management software, Vector, that helps address congestion and supports sustainable travel. Separately, Eve partnered with Hunch Mobility to study the launch electric commuter flights in Bangalore that would establish the city as the region's first hub for urban air mobility using eVTOLs.

The C–390 Millennium is the most modern military transport aircraft in its class and can carry more payload (26 tons) compared to other medium–sized military transport aircraft and flies faster (470 knots) and farther. It can perform a wide range of missions including cargo and troop transport, airdrops, medical evacuation, search and rescue, firefighting, and humanitarian operations. It can operate from temporary or unpaved runways. The aircraft can also be configured for air–to–air refuelling, both as a tanker and as a receiver. The current fleet, in operation, has demonstrated a mission completion rate of more than 99%, highlighting exceptional productivity in its category.

Already selected by air forces in Brazil, Portugal, Hungary, the Netherlands, Austria, South Korea, Czech Republic, Sweden, Slovakia, Lithuania and an undisclosed customer, the C–390 Millennium has the capability, versatility and performance to serve India's strategic needs.

Text courtesy: Embraer

Embraer and Mahindra Group in alliance to introduce C–390 Millennium in India

In a bold step towards India's Atmanirbhar Bharat vision, Embraer Defense & Security and Mahindra Group, have signed a landmark Strategic Cooperation Agreement (SCA) to advance the C–390 Millennium solution for the Indian Air Force's Medium Transport Aircraft (MTA) programme. This agreement was inked alongside the inauguration of Embraer's national office in Aerocity, New Delhi.

The agreement builds upon the Memorandum of Understanding signed in February 2024 at the Embassy of Brazil in New Delhi, deepening the scope of cooperation to include joint marketing, industrialisation and developing India as a hub for the C–390 Millennium. Since the signing, the C–390 Millennium aircraft has further increased its operator base globally.

Embraer and Mahindra Group will work closely with stakeholders in the country and engage with India's military and aerospace ecosystem to identify opportunities for local manufacturing, assembly facilities, supply chain and MRO activities. The long term ambition is to position India as a manufacturing and support hub for the C–390 Millennium aircraft, serving both domestic and regional requirements.

This partnership unites Brazil's aerospace innovation with India's manufacturing prowess and contributes to the strengthening of ties between the two nations while positioning India as a potential hub for the C–390 Millennium aircraft in the region.

Speaking at the signing ceremony, Bosco da Costa Junior, President & CEO of Embraer Defense & Security stated, "The agreement is a significant milestone in our relationship with Mahindra Group. India's aerospace industry is dynamic and world class, and together we aim to deliver the most advanced and reliable military transport solution to the Indian Air Force. This partnership is more than an aerospace deal – it reflects our commitment to 'Atmanirbhar Bharat' and the growing friendship between Brazil and India."

Vinod Sahay, Member of Group Executive Board, Mahindra Group stated, "The C–390 Millennium is unmatched in capability, efficiency and versatility. By deepening our collaboration with Embraer, together we will ensure that the C–390 Millenium for the IAF's MTA campaign will not only contribute to India's security and aspirations but also supports the 'Make in India' philosophy and further self–reliance."

INS Trikand at Alexandria, Egypt

Indian Naval stealth frigate INS Trikand called at Alexandria, Egypt, on 1 September 2025 during her deployment to the Mediterranean Sea. The ship participated in Exercise Bright Star 2025, hosted by Egypt from 1 to 10 September 2025, which saw participation by contingents from the Indian Army and the Indian Air Force.

INS Kadmatt at Papua New Guinea

INS Kadmatt, an indigenously designed and built anti–submarine warfare corvette, was accorded the honour of conducting and leading the mobile Fleet Review on 4 September 2025, as part of Papua New Guinea's 50th Independence Day celebrations.

Exercise Zapad 2025 in Russia

An Indian Armed Forces contingent comprising 65 personnel departed for the Mulino Training Ground, Nizhniy, Russia, to participate in the multilateral joint military exercise Zapad 2025, which was conducted from 10 to 16 September 2025. The contingent comprised 57 Indian Army personnel along with 7 personnel from the Indian Air Force and 1 from the Indian Navy. The Indian Army contingent was led by a battalion of the Kumaon Regiment along with troops from other arms and services.

1TS departs Port Louis and La Reunion

The ships of the Indian Navy's First Training Squadron (1TS) — INS Tir, ICGS Sarathi and INS Shardul departed La Reunion and Port Louis respectively on 11 September 2025, reinforcing maritime cooperation and regional security in the Indian Ocean Region (IOR). At La Reunion, bilateral engagements between the Indian Navy and the French Navy focused on professional exchanges and training interactions. INS Tir and ICGS Sarathi participated in a PASSEX with the Floreal class frigate FS Le Malin, which included coordinated manoeuvres, communication drills and navigation exercises.

INS Trikand at Salamis Bay, Greece

Indian Naval Ship Trikand, stealth frigate of the Indian Navy, called at Salamis Bay, Greece on 13 September 2025

during her ongoing deployment to the Mediterranean Sea. During the visit, INS Trikand participated in the maiden bilateral maritime exercise between India and Greece.

INS Nistar at Singapore for Pacific Reach 2025

Indian Navy's latest indigenously designed and constructed Diving Support Vessel (DSV), INS Nistar made its maiden port call at Changi, Singapore on 14 September 2025. The ship functioning under the Command and Control of the Flag Officer Commanding Eastern Fleet participated in the multinational Exercise Pacific Reach 2025 (XPR 25).

INS Kadmatt in Suva, Fiji

Indian Naval Ship Kadmatt arrived in Suva, Fiji on 15 September 2025, for a goodwill visit as part of her three month deployment. The port call "reflects the deep rooted historical, cultural and people–to–people ties between India and Fiji, while reaffirming India's commitment to strengthen maritime cooperation and bilateral relations with friendly foreign countries".

Indian Navy and Hellenic Navy exercises

The maiden edition of the bilateral maritime exercise between the Indian Navy and the Hellenic Navy concluded on 18 September 2025 in the Mediterranean Sea, marking an important milestone in the growing defence cooperation between India and Greece. The exercise was conducted in two phases – a harbour phase held from 13 to 17 September 2025 at Salamis Naval Base, followed by the sea phase on 17 and 18 September 2025.

INS Trikand visits Limassol, Cyprus

Indian Naval Ship Trikand called at Limassol, Cyprus on 21 September 2025 during her ongoing deployment to the Mediterranean Sea. Activities during the port call included professional interactions, yoga and a cultural exchange onboard.

Exercise Pacific Reach (XPR–25)

The Indian Navy's Submarine Rescue Unit (East), embarked on INS Nistar, showcased precision and professionalism at XPR–25, hosted by the Republic of Singapore Navy (RSN). Over three successive days, the

unit achieved three successful matings with international submarines, demonstrating the full spectrum of intervention and rescue operations and establishing India's position in the global submarine rescue arena.

INS Sutlej at Port Louis, Mauritius

INS Sutlej, a specialised hydrographic survey vessel of the Indian Navy arrived at Port Louis to undertake 18th Joint Hydrographic Survey at Mauritius on 29 September 2025. This mission was conducted under the framework of long standing bilateral MoU on hydrography signed during the 14th Joint Committee Meeting on hydrography held earlier this year. The current survey mission will cover an extensive area of approx 35,000 square nautical miles.

ICGS visit to South Africa

Indian Coast Guard Ship Sachet, an Offshore Patrol Vessel (OPV), made its maiden port call at Cape Town, South Africa, on 2 October 2025 as part of its ongoing overseas deployment. The Commanding Officer of ICGS Sachet, accompanied by the Defence Adviser, called on Rear Admiral Handsome T Matsane, Flag Officer Fleet, at Simon's Town.

INS Trikand visits Taranto, Italy

Indian Navy's stealth frigate INS Trikand, called at Taranto, Italy, on 28 September 2025 during her ongoing operational deployment to the Mediterranean Sea. During the visit, the ship's crew engaged in professional exchanges and cross–deck visits. These interactions "focused on sharing best practices and enhancing mutual interoperability between the two navies".

INS Sahyadri visits Kemaman, Malaysia

Indian Navy's indigenous stealth frigate INS Sahyadri made a port call at Kemaman port in Malaysia, on 2 October 2025, as part of the Eastern Fleet Operational Deployment to the South China Sea and Indo–Pacific. The ship was accorded a warm welcome by the Royal Malaysian Navy, celebrating "enduring cultural ties and shared maritime traditions between the two nations".

ICG and NATPOLREX/ NOSDCP

The Indian Coast Guard (ICG) conducted the 10th edition of the National Level Pollution Response Exercise (NATPOLREX–X) in conjunction with the 27th National Oil Spill Disaster Contingency Plan (NOSDCP) and Preparedness Meeting from 5–6 October 2025, off the coast of Chennai, Tamil Nadu. The two day event saw active participation from central ministries, coastal state governments, major ports, oil handling agencies and maritime organisations. It also hosted over 100 national delegates and more than 40 foreign observers from 32 countries, highlighting its growing international relevance in the domain of marine pollution response.

UK Carrier Strike Group and Exercise Konkan

On 5 October 2025, the United Kingdom's Carrier Strike Group (CSG), led by HMS Prince of Wales aircraft carrier commenced Exercise Konkan with the Indian Navy in the Western Indian Ocean. Exercise Konkan is aimed at

increasing combined maritime and air capabilities between the UK and Indian navies on the high seas. Whilst the Exercise has been biennial since 2004, it marks the first time in history that a British and Indian Carrier Strike Group conducted a maritime exercise together.

The UK CSG, currently on an eight month deployment known as Operation Highmast, linked up with the Indian Navy's Carrier Strike Group, led by INS Vikrant to begin 4 days of complex maritime exercises that also involved submarines and various aircraft from both the forces. Following the completion of the exercise, CSG ships visited ports in Mumbai and Goa to celebrate enhanced military interactions with India and showcase the best of British trade and industry and highlight the strong 'living bridge' of people and culture between the UK and India. On completion of the port visit, the UK CSG participated in an aerial defence exercise with the Indian Air Force, allowing both the forces to test their tactics and share best practices.

UK Carrier Strike Group and IAF

On 14 October 25, IAF Sukhoi–30MKIs, Jaguars, AWACS & AEW&C aircraft joined Royal Navy F–35Bs from HMS Prince of Wales for a joint exercise over the Indian Ocean Region. The training strengthened interoperability, mutual trust and collective commitment to regional stability.

ICGS Sachet visit to Maputo, Mozambique

Indian Coast Guard (ICG) Ship, Sachet an Offshore Patrol Vessel (OPV) made a port call at Maputo, Mozambique on 11 October 2025, as part of its ongoing overseas deployment to Africa, symbolising the ICG's operational reach and commitment to strengthening maritime cooperation with friendly foreign countries.

India–Korea navy bilateral exercise

Indian Naval Ship Sahyadri, as part of ongoing operational deployment to the South China Sea and Indo–Pacific made a port call at Busan Naval Harbour,

South Korea, on 13 October 2025 to participate in the maiden Indian Navy–Republic of Korea Navy (RoKN) bilateral exercise. Indigenously designed, constructed and commissioned in 2012, INS Sahyadri is the third ship of the Shivalik class guided missile stealth frigates.

Indian Army at AUSTRAHIND 2025

An Indian Army contingent comprising 120 personnel departed for Irwin Barracks, Perth, Australia, to participate in the fourth edition of the India–Australia joint military Exercise AUSTRAHIND 2025 that was conducted from 13 to 26 October 2025. The Indian Army contingent was led by a Battalion of Gorkha Rifles along with troops from other arms and services. The annual Exercise AUSTRAHIND 2025 is aimed at enhancing military cooperation, improving interoperability and providing a platform for participating armies to exchange tactics, techniques and procedures in the domains of sub conventional warfare in urban/semi urban terrain.

'Samudra Shakti' 2025 with Indonesian Navy

The Indian Navy hosted the fifth edition of the Indo–Indonesian Joint Bilateral Maritime Exercise Samudra Shakti 2025 at Visakhapatnam from 14–17 October 2025. The participating units included INS Kavaratti, an Anti–Submarine Warfare Corvette of Eastern Fleet under the aegis of Eastern Naval Command (ENC) and the Indonesian Navy Ship KRI John Lie, a Corvette (with an integral helicopter), which arrived at Visakhapatnam to a warm welcome by the ENC.

Indian Army exercises

Multi Domain Operations: Fire and Fury Corps demonstrated net centric, integrated employment of formations and units in High Altitude Areas of Ladakh. Seamless integration of reconnaissance, surveillance assets and weapon platforms across multiple domains was showcased with precision and professionalism in October 2025. Drone operations, air insertion and manoeuvre of mechanised forces exemplified multi domain ops in action.

Indian Army Rudra Brigade

Lt Gen Hitesh Bhalla, GOC, Fire and Fury Corps reviewed operational readiness of Rudra Brigade in the High Altitude Areas in October 2025. GOC appreciated the effective integration of all arms within evolving organisational structure and monitored tactics, techniques and procedures to enhance operational preparedness and response capabilities.

Indian Army Rising Star Corps

GOC Rising Star Corps reviewed operational preparedness of mechanised and infantry formations and validated employment of force multipliers. He commended troops for their professionalism and high levels of mission readiness.

Japan–India JAIMEX 2025

Indian Naval Ship (INS) Sahyadri participated in the Sea phase of JAIMEX–25 (Japan India Maritime Exercise) from 16 to 18 October 2025 and made a port call at Yokosuka, Japan for the Harbour phase. Prior to arriving at Yokosuka, INS Sahyadri and JMSDF ships Asahi, Oumi and submarine Jinryu participated in the sea phase of JAIMEX–25. The sea phase included advanced anti–submarine warfare and missile defence drills, enhancing interoperability by undertaking flying operations and underway replenishment.

IAF in Spain for Ocean Sky 2025

The Indian Air Force participated in the multinational air combat exercise Ocean Sky 2025 hosted by the Spanish Air Force at Gando Air Base, Spain, from 20–31 October 2025. The exercise “aims to foster mutual learning, enhance interoperability, sharpen air combat skills, and strengthen defence cooperation with friendly nations”.

Indian Navy conducts Tri–Services exercise with IA and IAF

Tri–Services Exercise (TSE–2025) "Trishul", conducted by the Indian Navy as the lead service jointly with the Indian Army and Indian Air Force, commenced in early November 2025. Headquarters Western Naval Command, in close coordination with the three Services, conducted the exercise which featured large scale operations across the creek and desert sectors of Rajasthan and Gujarat, alongside comprehensive maritime operations including amphibious operations in the North Arabian Sea.

Covering the Gujarat coast and the northern Arabian Sea – Army Southern Command, Western Naval Command, and the South Western Air Command were the principal formations participating in the exercise – Indian Coast Guard, Border Security Force, and other central agencies also participated in large numbers, further reinforcing inter–agency coordination and integrated operations.

The exercise aimed to achieve validation and synchronisation of operational procedures across the three Services, enabling joint effect based operations in multi–domain environment. Key objectives included enhancing interoperability of platforms and infrastructure, strengthening the integration of networks across Services, and advancing jointness in operations across multiple domains.

A major focus of the exercise was to enhance synergy between all forces and validate multi–domain integrated operations in a large and complex operational environment, involving large scale deployment of Indian Navy warships, Indian Air Force fighter and support aircraft, as well as amphibious operations involving amphibious component of Indian Army and Indian Navy including the Landing Platform Dock INS Jalashwa and Landing Craft Utility vessels (LCUs). The exercise also validated joint Intelligence, Surveillance and Reconnaissance (ISR), Electronic Warfare (EW) and Cyber Warfare plans. The exercise included Indian Navy carrier operations conducted jointly with shore based assets of the Indian Air Force.

Additionally, it focussed on the refinement of procedures and techniques tailored to address emerging threats and the evolving character of contemporary and future warfare. "TSE–2025 Trishul underscores the collective resolve of the Indian Armed Forces to operate in a fully integrated manner, thereby enhancing joint operational readiness and national security preparedness".

Exercise Malabar 2025 at Guam

Indian Naval Ship (INS) Sahyadri was at Guam in the Northern Pacific for participation in the multilateral Exercise Malabar–2025. Indigenously designed and constructed, INS Sahyadri is a guided missile stealth frigate. The ship is a shining example of the 'Aatmanirbhar Bharat' vision and has participated in several bilateral and multilateral exercises, as well as operational deployments.

The Harbour Phase of Exercise Malabar–2025 featured operational planning and discussions, alignment on communication protocols, familiarisation visits between participating nations, and sports fixtures. Following the harbour phase, all participating units proceeded for the Sea Phase, wherein ships and aircraft took part in naval drills, focusing on joint fleet operations, anti–submarine warfare, gunnery serials and flying operations.

INS Savitri at Port Louis, Mauritius

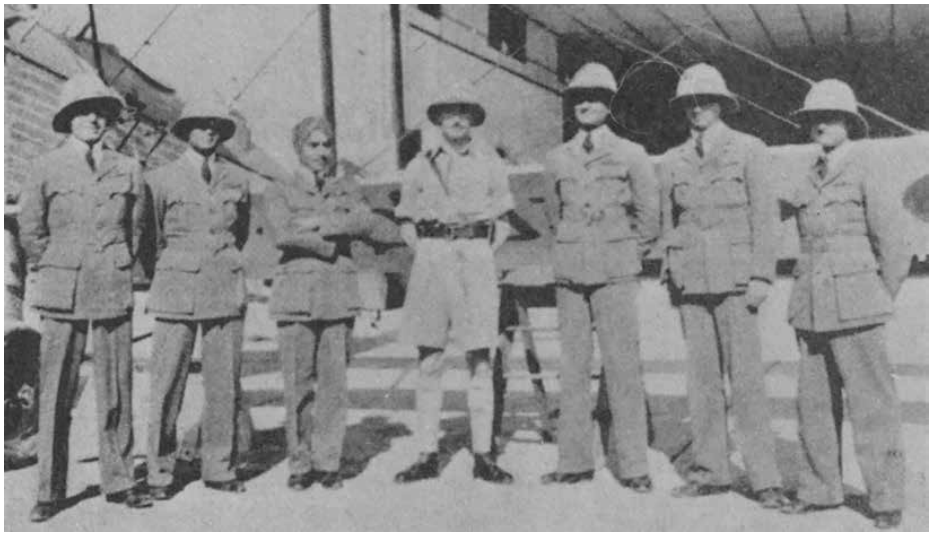
Indian Naval Ship (INS) Savitri, an Offshore Patrol Vessel (OPV) of the Eastern Fleet, arrived at Port Louis, Mauritius as part of a Long Range Operational Deployment to the South West Indian Ocean Region. The ship received a warm and cordial welcome from the National Coast Guard of Mauritius. INS Savitri undertook crucial joint Exclusive Economic Zone (EEZ) surveillance activities alongside the Mauritius National Coast Guard (NCG) ships and aircraft. The joint surveillance was aimed at ensuring security across the maritime zones of Mauritius while simultaneously enhancing interoperability and coordination between the Indian Navy and the Mauritius NCG.

PIONEERS OF THE AIR FORCE

Airmen of the infant IAF loading bombs on a Wapiti army co–operation aircraft at Miranshah, 1937.

The first of the IAF's "Few" were few indeed but their pioneering spirit and professional approach laid the firm foundation of a service that was to grow through the baptism of many fires into one of the world's foremost air arms. The pioneers were a small band of officers and airmen, young men from all parts of India, most of them just out of colleges or from technical institutions. The very first six Cadets selected were A. Singh, B. Singh, Sarkar, S. Mukerjee, A.B. Awan and Tandon, who were sent for training to the RAF Flying College, Cranwell, England, in 1930. After successfully completing training, they returned to India with their wings in 1933 and were posted to the lone Flight ("A") of the lone Squadron (No.1) of the infant IAF at Drigh Road, Karachi. Also trained at Cranwell subsequently were A.M. Engineer, K.K. Majumdar, Narendra, Henry Runganathan, H.E. Khan, R.H.D. Singh, Mehar Singh, Prithipal Singh and Arjan Singh.

The airmen were, however, trained at the RAF Depot, Drigh Road, Karachi, in batches of 20 to 24 individuals. Training of the first batch started in November 1931, and "Hawai Sepoys" Harjinder Singh (later, Air Vice Marshal), Ram Singh (later, Group Captain), U.K. Nair (later, Group Captain), R.P. Sharma, Pritam Singh and K.L. Mitra were some of the graduates from technical institutions who joined the I.A.F. in the very first batch. They were basically trained by Warrant Officer Newing (who later became a Group Captain), Warrant Officer Harper, Flt. Sgt. Hill (Technical Instructor) and Flt. Sgt. Tilbury (Drill and P.T. Instructor), all from the Royal Air Force. The airmen's training started in a most discouraging and unfriendly atmosphere, since the Raj was only reluctantly disposed towards its progress. Barring a few officers and airmen of the RAF, who were keenly interested to see the Indian Air Force grow, a great number of their colleagues unfortunately were not kindly disposed towards the IAF, its officers and men. For the Indian airmen this was not the only handicap. The rigidity of Army discipline which was enforced on them, their rank structures viz., Hawai Sepoy, Hawai Naik and so on, the new environment and the equally



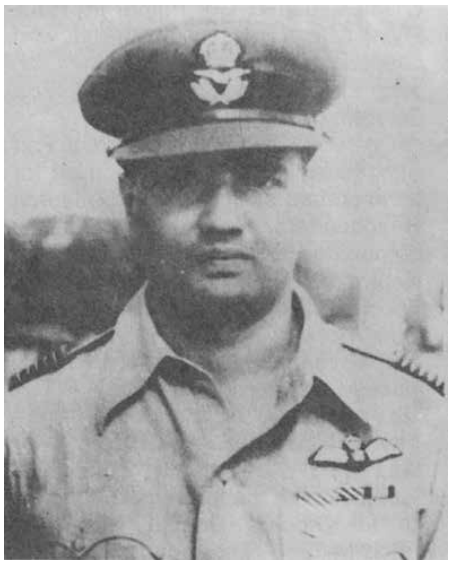
The start of it all! "A" Flight, No.1 Squadron IAF at Drigh Road in 1935. L to R. P/O Engineer, F/O Sircar, P/O Daljit Singh, Army Liaison Officer, F/O Awan, P/O Majumdar and P/O Narendra.

new occupations, limited emoluments and the inadequate facilities were some of the other factors these young pioneers had to contend with. They had no yardstick, no traditions, they had to start from scratch and many who could not withstand these handicaps or who suffered from false vanity, religious bias or misconceived notions about the dignity of labour, found it difficult to carry on and quit the Service. Some others, however, had an indominable will and patience and, with singleness or purpose, stuck it out and served the IAF to see it develop into an effective force.

"A" Flight of the Indian Air Force on being formed at Drigh Road, was equipped with 4 Westland Wapitis. The Commanding Officer of the unit was Flt. Lt. C.A. Bouchier, an RAF officer with a few other British officers and airmen seconded to the Squadron for purposes of flying training and maintenance of aircraft. The training of "A" Flight carried on satisfactorily for some time until two great tragedies befell the infant IAF. They were the terrible air accidents of Plt. Offrs, A. Singh and B. Singh, near Pad Idan, where both of them, nephew and uncle respectively, met with a fatal crash, and that of PIt. Off. Sarkar at Karachi when 29 Baluchees were killed on the ground. Although these mishaps were a temporary setback to the normal growth of the IAF, they, however, did not deter the Indian airmen's determination to forge ahead.

As the training progressed, the RAF officers and other ranks were gradually replaced by Indians.

On 1st April, 1936, "A" Flight was ordered to move to Peshawar where it carried out further training, establishing not only high standards in flying but also in terms of the maintenance of aircraft and a smart turnout on the parade ground. The Flight's activities matched those of the RAF Flights in station. The operational preparedness of the IAF was first put to test when "A" Flight moved to Miranshah to participate in the Waziristan Operations against hostile Waziris and Afridis, in the tribal territory on the North–West Frontier of undivided India early in 1937. In the event, "A" Flight carried out far more flying hours in a month with their 4 aircraft as compared to the RAF units. The Flight got a good name and proved that the IAF was competent to take on the responsibility of guarding the frontiers. The Indian Officers and men worked hard and with great zeal to earn this reputation. It must be mentioned here that there were certain RAF personnel whose contribution to the success of the Flight was as great as many. It was this early association of one Flt. Sgt. J.A. Hicky with the IAF, which prompted the powers–that–be to re–appoint him with the IAF on 11 April 1953, after a lapse of 18 years—this time as Group Capt. and Director of Technical Services at Air Headquarters, in which capacity he worked till 31st March 1954. Later on, he was appointed as the Director of Technical Development and Production (Air), this appointment lasting till 10th April 1956, the last Royal Air Force officer to serve with the IAF.



Wg. Cdr. K.K. "Jumbo" Majumdar, D.F.C. and Bar whose exploits in Burma against the Japanese in 1942 and later in Europe against the Germans categorised him as one of the great fliers of the Second World War.

Within a year of its formation, "B" Flight had made much progress in its training and it was decided to send a detachment from Karachi to Bangalore for Army Co–operation exercises. The detachment moved to Bangalore in November 1938 in three parties, viz., advance party by rail, air party, and rear party by rail. On arrival at Bangalore railway station, the advance party was met by a British Colonel whose first question to the Officer i/c Party was "Have you brought your aeroplanes with you?" On being informed that the aircraft were being flown by Indian pilots from Karachi to Bangalore, the Colonel expressed some disbelief. This was the longest distance flight that the IAF had undertaken since its inception. The exercises went off very well and many lessons were learnt by both arms. The Army highly appreciated the co–operation of the IAF, the excellent manner in which the exercises were conducted, as did the Colonel who was not only enlightened but was certainly the wiser.

As "A" and "B" Flights had achieved high standards of efficiency, both were moved to R.A.F. Station, Ambala to

Air Commodore Mehar Singh, M.V.C., D.S.O. was commanding No. 6 Squadron in Burma at the time this photograph was taken. His Squadron had done record operational flying and was known as "Eyes of the 14th Army" in the Arakan Campaign. He was a brave and outstanding flier.

Gilgit - 1933 60B sqdn.
Photo: DW Warne. Westland Wapiti.

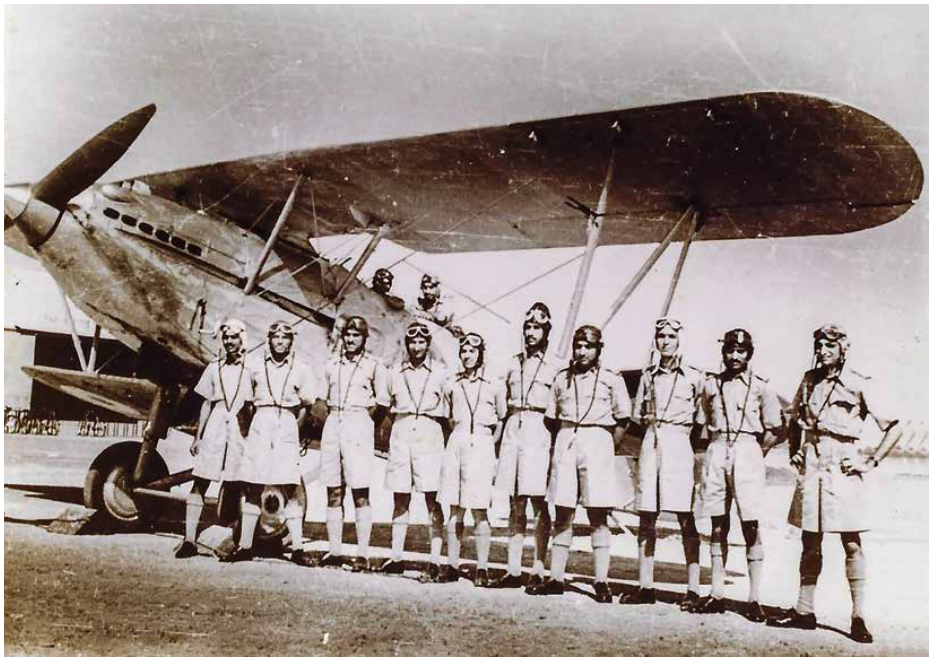
form the first Squadron of the IAF and a third Flight ("C") was soon formed to make up the full complement of the formation. "C" Flight shortly moved to Miranshah under the command of Flt. Lt. Majumdar, popularly known as 'Jumbo', to take part in the Waziristan operations of 1938. "C" Flight did a marvellous job, setting up flying records and establishing high standards of operational readiness, owing its excellent performance and success to the espirit de corps of the officers and men. Besides its flight commander, Flt. Lt. Majumdar, mention must be made of the then Fg. Offr. Mehar Singh, affectionately called "Mehar Baba". Both these were aviators of an extremely high order and officers of extraordinary calibre.

On the cessation of operations, "C" Flight was assigned the responsibility of dropping leaflets in tribal areas, warning hostile tribesmen that operations had ceased and demanding their cooperation in being at peace with the administration. "Mehar Baba" was on this peace mission, flying a number of sorties to drop leaflets. During one such sortie he and his Air Gunner, Gulam Ali, failed to return to base. The Flight Commander ordered an extensive search, "Jumbo" himself carrying out the search till late in the evening but there was no sign of the missing aircraft. The Army was also alerted, but there was no news of 'Mehar Baba'. "Jumbo" was in a state of great agitation as he had immense regard and affection for 'Mehar Baba'. It was only the next day that news trickled through Army sources that 'Mehar Baba' had crash–landed on a hill and that both he and Gulam Ali were safe at Datta Khel Fort. How they crash–landed and the many odds, such as the injuries sustained, avoiding hostile tribesmen and the none–too–friendly 'Maliks' whose help they had to seek to get to the Fort, is a story in itself! After its attachment of four months at Miranshah, "C" Flight returned to Ambala.

Air Marshal S. Mukerjee, who became Chief of the Air Staff, IAF was one of the first batch of six cadets who were sent to RAF Flying College, Cranwell for training in 1930.

3rd September 1939 was a memorable date in the early history of the Indian Air Force, as it was on that day that the command of No. 1 Squadron was handed over by Sqn. Ldr. Smith, RAF to Sqn. Ldr. S. Mukerjee, the first Indian to be entrusted such responsibility. The Squadron was now truly "Indianised". Subroto Mukerjee had many 'firsts'. He was in the first batch of Indian Cadets trained at the RAF Flying College, Cranwell and subsequently commissioned to the I.A.F. He was the first Indian to be appointed as Flight Commander and, later, Squadron Commander. He was the first Indian Station Commander of RAF Station, Kohat; later he was to be the first Indian officer to hold the Air ranks of Air Commodore, Air Vice Marshal and ultimately Air Marshal and the Chief of Air Staff of the IAF.

Wg. Cdr. Horsley, the then Station Commander at RAF Station, Ambala, had a 'soft spot' for the IAF and worked tirelessly for its cause. To avoid any discrimination between Indian and RAF airmen, he recommended that the rank structures of the Indian airmen should correspond to that of the RAF, i.e. LACs, CPLs, SGTs, etc., instead of Hawai Sepoy, Hawai Naik,



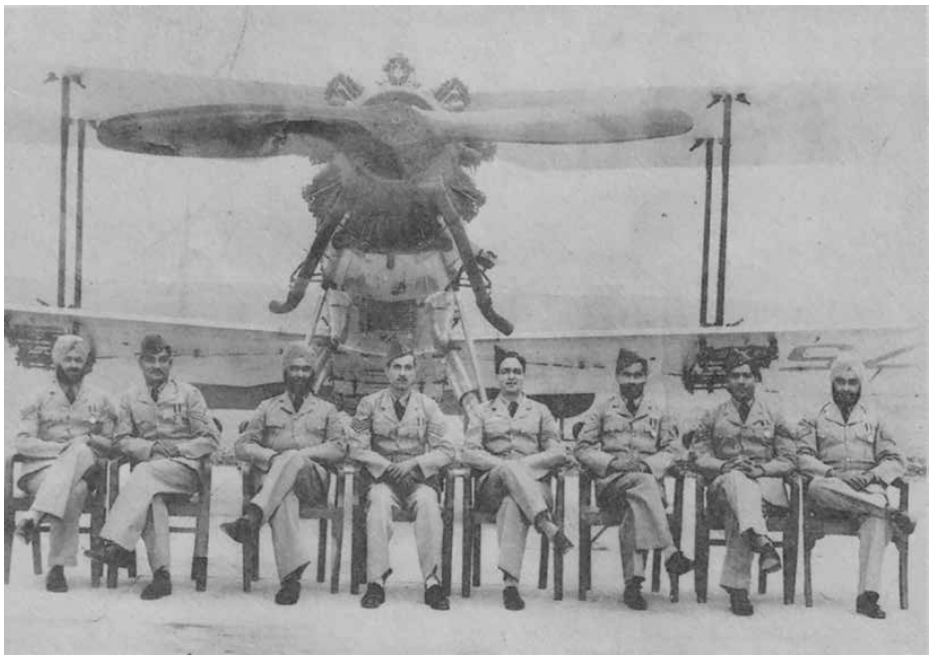
Hawai Havildar, and so on and this recommendation was accepted by the Government. Horsley was keenly interested in the early "Indianisation" of the IAF and in fact, his interest extended much beyond. When Netaji Subhas Chandra Bose, then the President of the Indian National Congress, was on a whirlwind tour of India in November 1940, landed at Ambala airfield in a chartered aircraft, Horsley was the first person to receive him.

"C" Flight commanded by Flt. Lt. K.K. Majumdar and comprising 4 Wapitis soon moved to Fort Sandeman, a small town situated about 175 miles NNE of Quetta, in Baluchistan. Permanent technical and domestic accomodation was available but the airstrip was, of murram surface and there was no proper runway. The Flight moved to Fort Sandeman to meet certain operational requirements of the Army and this job was well performed, record flying being carried out. The three men responsible for this were Flt. Lt. Majumdar, Fg. Offr. 'Mehar Baba' and Flt. Sgt. Harjinder Singh, NCO i/c Flight. Harjinder was a man of dynamic personality, initiative, drive and resourcefulness, a 'go–getter' who firmly believed in achieving the end. The IAF meant the world to him and he passionately worked for its cause. He retired as an Air Vice Marshal, AOC–in–C Maintenance Command, in 1963. Flying Officer Surjit Singh Majithia, who later became Deputy Defence Minister, also distinguished himself at Fort Sandeman, during this period.

On completion of his tenure at Fort Sandeman, 'Jumbo' was recalled for an important assignment at Squadron Headquarters. He handed over the command of the Flight to Flt. Lt. Narendra. 'Jumbo' was appointed as Special Officer on Duty reporting to Wg. Cdr. Horsley, Station Commander, Ambala, and detailed to visit the newly raised Coastal Flights of the IAF. This was carried out most effectively and a special Board of RAF Officers which was held subsequently, considered 'Jumbo' to be the foremost among the Indian Officers. 'Jumbo' was quiet, good–natured and unassuming. He possessed a keen intellect and was fond of reading and discussing, not only professional subjects, but almost any subject under the sun. He possessed all the essential ingredients of an intellectual, a professional and a leader, inspiring great faith in his officers and men.

Flt. Lt. Narendra, the new Flight Commander at Fort Sandeman, was a very soft–spoken, kind and a extremely intelligent officer, with special aptitude for administrative work. He was keenly interested in human psychology of which he had vast knowledge. Although a small figure, Narendra had a big and generous heart. His contribution to the consolidation of the I.A.F. in subsequent years was considerable.

After about four months stay at Fort Sandeman, Flt. Lt. Narendra returned to Headquarters at Ambala, and Flt. Lt. Henry Runganadhan was appointed as Flight Commander. Henry was a 'happy–go–lucky' person who had little value for money. His father, Sir Samuel Runganadhan, was the then High Commissioner for India in the U.K. Henry was a good pilot



Senior NCOS of the IAF's "C" Flight, in front of a Wapiti at Miranshah.

and an expert Parade Commander, his word of command being such as to put every expert or professional Parade Commander to shame. He was a dare–devil flier and also generous at heart. Once, at midnight, he visited the domestic camp. He got hold of Flt. Sgt. Ram Singh, the then NCO i/c Flight, and other airmen and had the canteen opened to buy some beer. The last bottle of beer was soon exhausted and everyone was merry. But that was not all. The Flight Commander suddenly decided that arrangements should be made for night–flying. While the aircraft were being wheeled out of the hangar, he sent a message to the Officers' Mess for his officers Burhao–un–Din, Arjan Singh and B.K. Dass to come to the airfield. As the surprised officers arrived on the tarmac, Henry asked them to get into the aircraft. Since they were all in their pyjamas and had just been woken up, all three said "nothing doing" to the Flight Commander. This did not find much favour with Flt. Lt. Runganadhan, who ordered his own aircraft started, shouting for LAC Narayanan (Retiring as Wing Commander) his Air Gunner, to hop in. He then took off without any night flying facilities, not even flares, let alone a beacon. After about half an hour's flying, he landed and thank God, very safely too! Getting out of the cockpit he went straight to his officers and said, "you thought I could not fly and that I would kill myself. I am sorry for having allayed all your fears!" Henry was a courageous flier and an officer of very high quality. Although drink was his weakness, he never let it get the better of him.

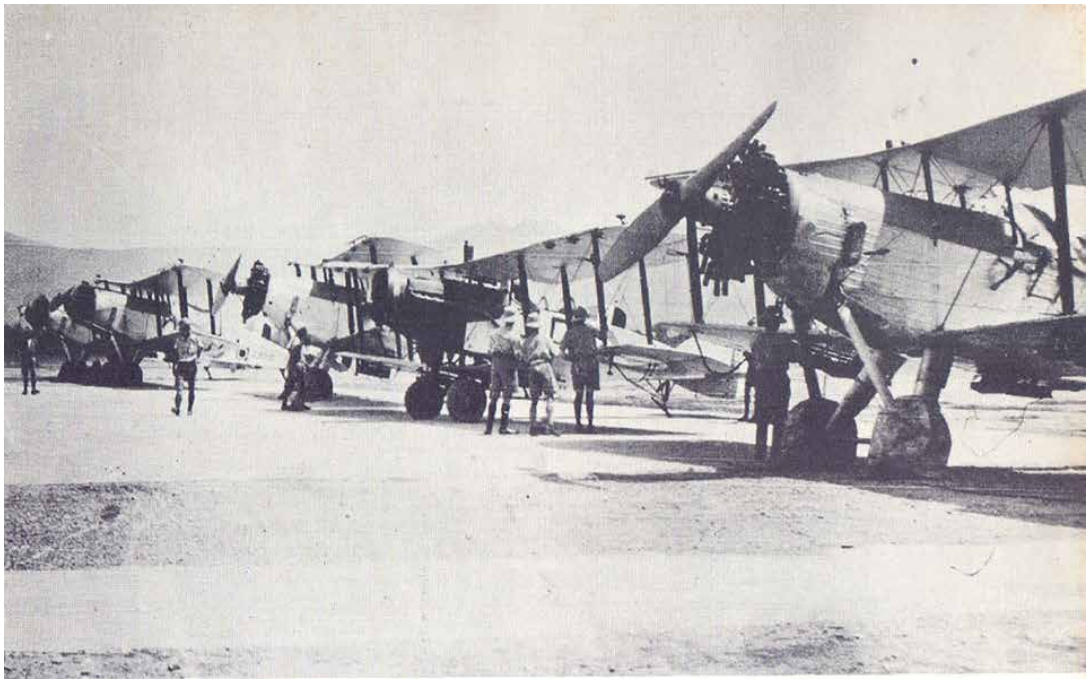
Officers and airmen of 'C' Flight, No.1 Squadron, IAF detached to Fort Sandeman, Baluchistan.

"B" Flight was once visited by the auditors. Then Flying Officer, Henry Runganadhan was detailed to take the auditors round the Flight and let them examine all the books. This was the first occasion on which Henry had come across an auditor. The Chief among them, an elderly gentleman, when going through Form 700—Aircraft Serviceability Form—got stuck. Henry asked if he could help the auditor. The auditor said that he was satisfied with the entry about an "IAF aircraft—Lost Bearing, force–landed at Pad Idam Landing Ground—refuelled." He added that he did not mind about the force–landing part so much, or for that matter, even refuelling of the aircraft—consumption of oil and fuel—but what he did not particularly like was the "Loss of Bearing" to the State. He emphasised that the "Loss of Bearing" was a public loss and must be made good by the pilot who was flying the aircraft, Henry tried his best to make the auditor understand the implication of the term "Lost Bearing". The auditor, however, refused to be satisfied with Henry's explanations. The auditor's attitude had exhausted Henry's patience. Henry turned to the auditor whose upper jaw was abnormally high and teeth discoloured, may be owing to lack of cleaning or chewing of betel, or perhaps both, and said to him, "you know, if I were a dentist what would I have done?" "No" came the reply from the auditor. "I would have pulled out all your teeth without charging a penny", said Henry. The auditor waived the objection.

It was unfortunate that just when given Command of No.1 Squadron, after its re–equipment with Hurricanes and while on his way from Karachi to Kajamalai, Trichinapoly, Henry should be killed in the crash of a Hudson in which he was travelling as a passenger. On having been given command of No.1, Henry had told Squadron Leader D.A.R. Nanda (Retired as Air Vice Marshal), then commanding No. 3 IAF Squadron of his pride at "this singular honour of being the first Indian Commander of a Hurricane Squadron". Alas! this Command was not to be for long.

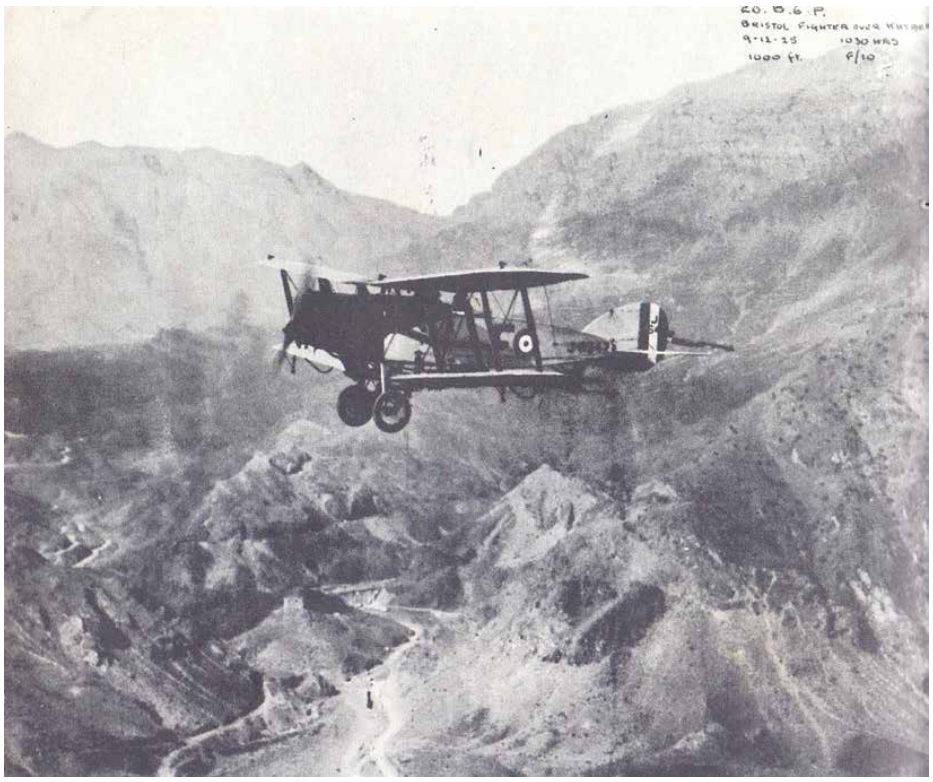
On being selected to undergo the Staff College Course at Quetta in June 1941, Squadron Leader S. Mukerjee relinquished command of No.1 Squadron at Peshawar, and handed over to Sqn. Ldr. K.K. Majumdar. The Squadron was re–equipped with Lysanders which were presented by the Governor of Bombay at a splendid ceremony at Peshawar. The squadron prepared to move to Burma in early 1942 and W.O. Harjinder Singh, the senior–most IAF SNCO, moved with the Squadron. In Burma, No.1 Squadron operated from Toungoo, Lashio, Mingaladon and other airfields and did creditable work in operations against the Japanese during its brief stay there. 'Jumbo' was awarded the D.F.C. On return to India in February 1942, the Squadron was located at Secunderabad.

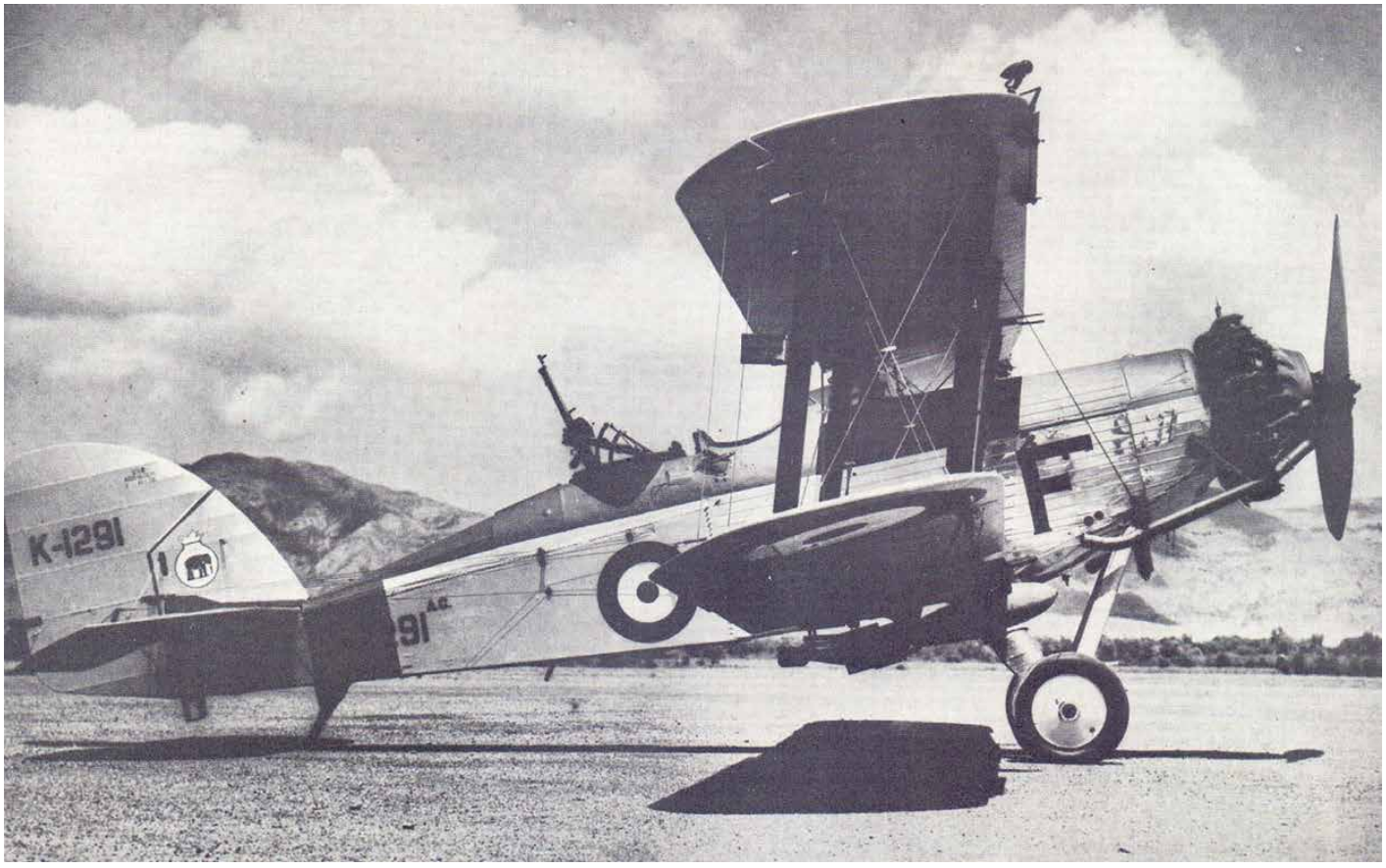
Since the airmen had done a great job, it was decided by Air Headquarters to consider suitable individuals from among them, for commissioning in the General Duties and the Ground Duty Branches. A Board of Officers



appointed at Air Headquarters, with Sqn. Ldr. Crystal, an RAF Officer, appointed as President and Sqn. Ldr. Majumdar, DFC, and Flt. Lt. Roop Chand, as members. A number of airmen were interviewed by the Board. Sgt. Bedi EO/Asst. (retired as Sqn. Ldr.) was one among them. Sqn. Ldr. Crystal asked Bedi some questions which he answered to the best of his ability. 'Jumbo' declined to ask him any, since the said that he knew enough of Sgt. Bedi. Roop Chand's turn came. He asked Bedi, who had also been to the Burma Front with No. 1 Squadron, as the NCO i/c Equipment Section, as to how he evacuated the equipment when the Squadron was ordered to return to India. Bedi promptly replied, "It is very simple. Sir, you were there on the spot at the time. You should, therefore, know how the equipment was evacuated from Burma". Bedi was selected for commissioning. After commissioning, Bedi went to Burma again. The operations were on and everyone was busy. Bedi's main Equipment Section was a couple of miles away from the Flight Stores and his work entailed frequent daily visits. One day, one of the Flight Commanders complained to Bedi about the non–supply of a certain item at the Flight and requested for Bedi's personal attention in the matter and an on–the–spot visit to the Flight. Bedi had been particularly busy that day and had visited the Flight a couple of times already so he turned to the Flight Commander to say that he was doing his maximum to help the Flights and if they were still not happy, he was helpless. He wanted the Flight Commander to realise that "with half the–Bedi here and half–the–Bedi there, what can the poor Bedi do?" From that time onwards people started alluding him as "Half–the–Bedi" instead of the (full) Bedi. It was typical of Bedi that whenever he saw any unfamiliar face come to his section to draw some stores, without ascertaining the requirements, his answer normally would be "Haven't got it". But whenever you were in a tight corner, he would certainly come to your rescue by producing the item, somehow, from somewhere!

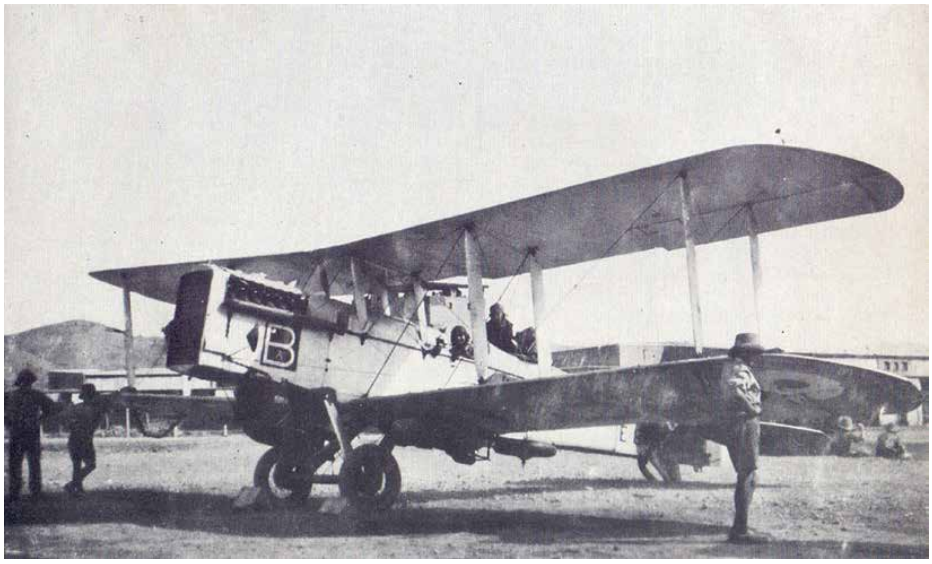
1942 was the year of great expansion for the IAF. Three more Squadrons, Nos. 2, 3 and 4 were also formed in quick succession, two on Lysanders and one on Audaxes, while six Coastal Flights had already been functioning for guarding the three thousand mile long coastline of India. The Command of No.2 Squadron was given to Sqn. Ldr. Aspy" Engineer DFC (Later Air Marshal and Chief of Air Staff). Engineer with his love for flying, took to his profession when he was in his 'teens', at 17 claiming the Aga Khan Trophy for

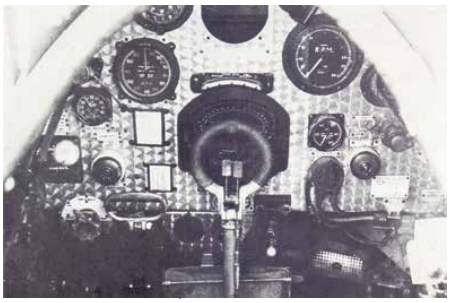




being the first Indian to have flown between England and India (in a Tiger Moth). He did very well at Cranwell and was awarded the DFC for an act of gallantry in the Waziristan operations. A great administrator and a strict disciplinarian, he was responsible for a great deal of consolidation in the IAF.

On further availability of man–power and aircraft, three additional Squadrons were formed by the end of the year. Wapitis, Hawks and Andaxes were replaced by Lysanders, Dominies, Blenheims, Hurricanes and Vultee Vengeances. An India Command was established under Air Vice Marshal Thomas. The IAF was made responsible for the air defence of the country, enabling the RAF Squadrons to be deployed outside India. The tempo of expansion and requipment continued through 1943





and by early 1944, the IAF had 9 Hurricane Squadrons. In recognition of the valuable contribution of the IAF in the War, His Majesty's Government conferred the title of "Royal" to the IAF. By early 1945, the Royal Indian Air Force was functioning no longer as a band of enthusiastic individuals but as an integrated fighting force. Its main task of Army co–operation in terms of tactical reconnaissance, close support and ground attack was greatly effective and its officers and men held in much esteem. The very purpose for which the IAF had been formed was now being well served.

Air Commodore
Amrit Saigal (Retd.)

1ST DSO OF THE IAF

The late Air Commodore Mehar Singh, then a Squadron Leader commanding No. 6 Squadron (Hurricane II B's) RIAF was the first Indian of the RIAF to be awarded a DSO in World War II.

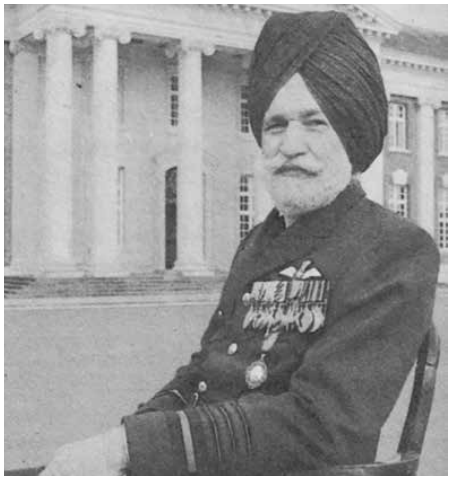
Sqdn. Ldr. Mehar Singh, popularly known as 'Mehar Baba' had led his young, and for the most part inexperienced, pilots with steadfast devotion, tremendous nerve and great skill throughout the Arakan campaign as the Fighter Reconnaisance Squadron for XIV Army Corps. In December 1943 the Squadron had flown 350 hours carrying out numerous tasks such as providing cover to allied troops and keeping in touch with isolated pockets, always flying at tree level to avoid superior Japanese aircraft in the area. By February the Sqdn. had amassed 1350 flying hours. Its most notable effort was put up during the fierce two day battle at Buthidaung in March 1944. The laurels of victory were rightly shared by No. 6 Sqdn. with the XIV Corps. At the time No. 6 Squadron used to be airborne everyday at dawn to carry out three sorties a day setting up an absolute record monthly sorties per pilot throughout the Burma front.

Finally, to wind up the season of record–setting, "Mehar Baba" carried out a most daring rescue of one of his pilots, somewhat in cowboy fashion, under the very nose of the Japanese. The pilot ran out of fuel on a reconnaisance flight in Arakan behind enemy lines. With adroit skill he somehow managed to put down his Hurricane in a small paddy field without damaging it badly, but he was only half a mile from the Japanese forces. Having marked his position, his companions flew back to Cox's Bazar to report to Mehar Singh. The rugged and dauntless Squadron Commander lost no time in putting a remarkable plan into operation. He ordered the lashing of some fuel cans on the rear seat of a Tiger Moth, jumped into the cockpit and instructed the Squadron's Hurricanes to provide him cover, making a bee line for the stranded Hurricanes which was sitting at the mercy of the Japanese.

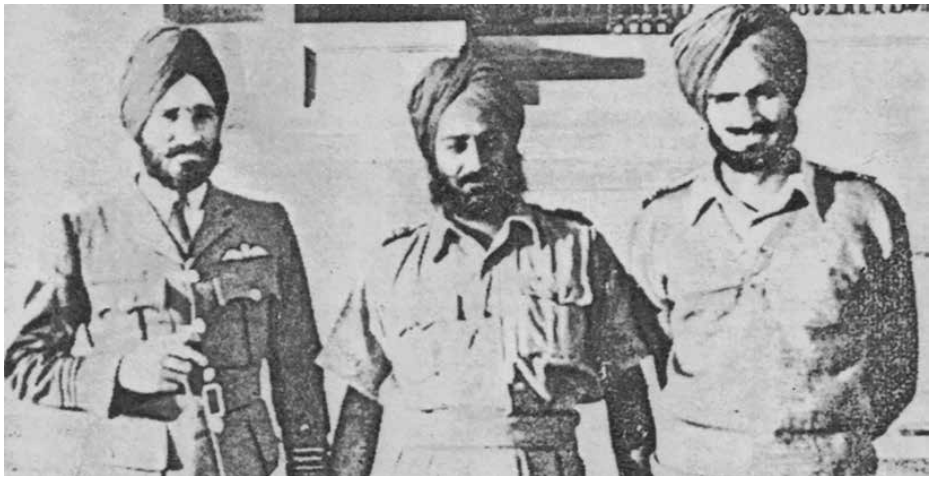
Circling round the tiny field he landed alongside while the Hurricanes wheeled overhead, covering the field. Mehar Singh quickly examined the damage a largish hole in the starboard wing, caused by a tree while landing and three of the airscrew blades that had been chopped off by 3 to 5 inches. This did not deter him and after a quick survey of the total five hundred yards of rough field available to him, he filled petrol in the Hurricane, ordered the young pilot to fly off in the Tiger Moth and return to base. Soon Mehar Singh was roaring bumping over the paddy field. By a deft manipulation of controls, backed by his sheer strength and resolve, he succeeded in lifting the Hurricane over the bund at the end of the field. With the Moth following, the whole cortege flew triumphantly to their base.

A little later a flash signal came through with congratulations from the HQs, saying that Air Marshal Sir John Baldwin was on the way to the base to personally award the first DSO to Sqdn. Ldr. Mehar Singh. The Sqdn. was paraded and the Air Marshal pinned the coveted red and blue ribbon on Mehar Baba's shirt.

ACM Arjan Singh At RAF Cranwell



Air Chief Marshal Arjan Singh, DFC, in his IAF winter ceremonial uniform, at the RAF College, Cranwell in November 1989.



Some Squadron Commanders of the RIAF in Delhi during the Second World War (left to right) Arjan Singh, Mehar Singh, Prithipal Singh, commanding Nos. 1, 6, and 3 Squadrons respectively.

Air Chief Marshal Arjan Singh DFC, Former Chief of Air Staff, Indian Air Force, took the salute at the Royal Air Force College graduation parade at Cranwell on 28 September 1989. The retired Air Chief Marshal was in Britain at the invitation of the British Defence Secretary and the RAF Chief of Air Staff.

The distinguished, 71–year old fighter pilot and diplomat, wearing his winter ceremonial IAF uniform, reviewed the parade, accompanied by Air Vice Marshal Robert Wood, Commandant of the RAF College Cranwell. In his address to the 70 graduate officers and specialist entrants passing out at the parade, Air Chief Marshal Arjan Singh spoke warmly of his links with the RAF College, from where he had earned his "wings", exactly 50 years back, in 1939.

During the Second World War, Arjan Singh commanded No.1 Squadron flying the Hurricane IIB in the Burma campaign. It was his armed reconnaissance sortie that discovered the renewed Japanese offensive and Arjan led the entire squadron in attacking the enemy troops at dusk on that fateful day.

Awarded the distinguished Flying Cross, Arjan went on to become a Group Captain in the Royal Indian Air Force and was commanding the Air Force Station at Ambala when the country (and armed forces) were partitioned in 1947. Many of his old colleagues, including Asghar Khan were to become chiefs of the new Pakistan Air Force.

As Chief of the Indian Air Force during the 1965 operations, Arjan Singh was awarded the Padma Vibhushan and promoted to the rank of Air Chief Marshal, the first IAF officer to have "four stars". After retirement, the Air Chief Marshal was appointed as India's High Commissioner to Kenya and Ambasador to Switzerland.

The RIAF's prime aircraft was the Hurricane IIB fighter–bomber, in action during the Burma campaign. An artist's, depiction of an Indian Air Force Hurricane attack on Japanese positions in the Arakan.

NO. 1 SQUADRON IAF IN WORLD WAR TWO

The blitzkreig war in Europe had pushed Britain and its Allies to the wall and things were very grim during the last months of 1940. On 1 April 1941, the Indian Air Force's No. 2 Squadron was formed and No.1 Squadron parted with many of its most experienced pilots and men to help get it airborne. No. 1 Squadron carried out operations in the Tochi valley through till August 1941 when it was decided to exchange the Squadron's Harts with Lysander army co–operation high–wing monoplanes. Twelve Lysanders had been purchased for the Indian Air Force from funds subscribed by the citizens of Bombay and these were allotted to No.1 Squadron at Drigh Road. Conversion training was completed efficiently and swiftly and in September, No.1 Squadron flew north to Peshawar with their new aircraft. On 7 November, Sir Roger Lumley, the Governor of Bombay, formally presented the Lysanders.

Hurricane IIB of No. 1 Squadron at Imphal, 1944 [note Tiger's head painted below cockpit].

[Hereafter, No.1 Squadron and the city of Bombay were to retain a special relationship].

On 7 December 1941, the Japanese fleet attacked the U.S. bases in Hawaii and launched a general offensive in S.E. Asia.

The World War had come to the East. Burma was in imminent danger of invasion and all available forces were mobilised to meet the threat.

During the first Burma campaign: Lysander army co–operation aircraft with ground crew (note bomb racks improvised on wheel spats).

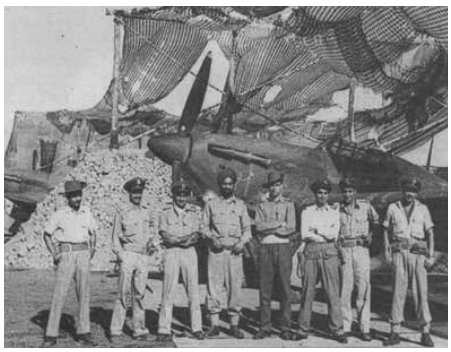
The First Burma Campaign

No.1 Squadron, led by Sqn. Ldr. 'Jumbo' Majumdar started its move to the east, reaching Toungoo in Burma on 1st February 1942, and prepared to face the mighty Japanese forces with their handful of Lysanders, along with those of No. 28 Squadron, RAF. On the very first night itself, the Japanese air force raided Toungoo and Jumbo decided to reciprocate the very next day. Although meant only for tactical reconnaissance, No. 1 Squadron's personnel fixed pairs of 250 lb bombs on the Lysander wheel spats and No. 1 Squadron launched raids against the Japanese airfields at Mae–Haugsuan, Cheingmai and Chiangrai in Siam, missions flown at low level without escort and evoking great praise from

Sqn. Ldr. Arjan Singh DFC (later Air Chief Marshal), commanding No.1 Squadron during the Second Burma Campaign.

the American Volunteer Group (AVG) and New Zealander pilots.

On 5 February 1942, No. 1 Squadron was moved to Mingaladon, just outside Rangoon and the next day, Jumbo led Nos. 1 and 28 Squadrons on a combined raid against Japanese – held dockyards and the railway junction at Moulmein. The ground troops were heartened by the display of Lysanders in flight echelon formation, staggering along with their bomb loads and direct hits were scored on the targets, the dockyard erupting in flames which could be seen from 60 miles away. The Lysanders flew back at almost ground level over the Martaban and General Wavell, the Commander–in–Chief, sent a personal signal congratulating Majumdar and the two Squadrons.



Hurricanes of No. 1 Squadron under improvised camouflage nets in Assam, 1944.

Mingaladon was frequently raided by the Japanese air force, the American Volunteer Group P–40s quick off the ground to engage the raiders and many furious dog fights were witnessed. At night, the allied fighters were dispersed to a number of satellite airstrips, two nicknamed Johnny Walker and John Haig after the famous brands of Scotch whisky! On 18 February, the RAF and AVG tore into 40 Japanese bombers and shot down 12 of them.

From Mingaladon, No.1 Squadron essentially carried out tactical and photo reconnaissance and operated important staff communication flights. During the second week of February, the Squadron was split, as the Chinese 5th Army in northern Burma urgently needed reconnaissance aircraft for army co–operation.

Sqn. Ldr. Majumdar and Flt. Lt. Prithipal Singh took several pilots and Lysanders north to Lashio, Flt. Lt. Prasad remained at Mingaladon with his flight while Flt. Lt. Raza went to Toungoo with his flight to carry out tactical recce. Thereafter, the various detachments were cut off from each other as the Japanese advanced and as communications steadily worsened, pilots and air gunners often improvised maintenance on their own. At Mingaladon, Flt. Lt. Prasad and his flight were busy bombing in the Pegu area and along the Siam border. The main body of No.1 Squadron kept the Japanese airstrip near Ywathit in Siam under check and to convince the doubting Chinese of the imminent danger, Sqn. Ldr. Majumdar had to once actually do a "touch and go" with his Lysander on the enemy airstrip!

Throughout the second half of February, Flt. Lt. Raza operated his sole Lysander from Toungoo, which was raided every day by the Japanese. Raza carried out daily recce of all approaches from the Sittang river along the Siam borders.

The Japanese hit Toungoo with ten bombers on 27 February, escorted by nine fighters but the next evening, Raza hit back at the Japanese airfield at Mehongson, strafing the enemy aircraft at dispersal and bombing the wireless cabin. On the 1st March, Raza flew the last Lysander out to Lashio, with Sgt. Cabinetmaker (the technician) driving away a steam

Flg. Offr. A.R. Pandit, (later Air Marshal), with DFC awarded for his part with No. 1 Squadron 1944–45.

engine loaded with refugees, the last one out of Toungoo before the Japanese occupation.

At Lashio, on 7 March, Flt. Lts. Raza and Rajinder Singh flew RAF pilots in their Lysanders to Mingaladon to recover two abandoned Hurricanes and all four aircraft then flew back to Magwe. For five days (7–11 March) the last six Lysanders of No.1 Squadron carried out continuous patrol as they retreated from Burma. On 12 March, the Lysanders were handed over to the Burmese Communication Flight and No.1 Squadron's pilots flew back to India in a USAAF Flying Fortress.

For his exceptional courage, leadership and fighting spirit, Sqn. Ldr. K. K. Majumder was awarded the DFC, the first Indian to be so honoured, while WHO Harjinder Singh was awarded the MBE for his imaginative improvisation and keeping the Squadron at high serviceability in almost impossible conditions.

Hurricanes Received

After withdrawal from Burma, No. 1 Squadron re–assembled at Secundrabad, once more under command of Sqn. Ldr. S. Mukerjee, and then moved to Trichinopoly in May. In June, 14 pilots and 45 NCOs proceeded to No. 151 Operational Training Unit at Risalpur for conversion to the

Hurricane IIB fighter, collecting their alloted aircraft at the Drigh Road Depot and then, under brief command of Sqn. Ldr. Henry Runganadhan, went back to Trichinopoly. In October 1942, the Squadron's crest was officially approved, being a full Tiger profile enclosed in two concentric circles, officially approved, with the motto "Ittehad men shakti hai", later modified to "Ekta men shakti" (or "In unity there is strength"). Henry was succeeded by Sqn. Ldr. S.N. Goyal and the Squadron changed its location several times in the next year, being moved to Bairagarh then Chhara, and back to Risalpur. In May, a detachment went to Miranshah for bombing trials and then the Tigers moved to Kohat where command was assumed by Sqn. Ldr. Arjan Singh on 3rd September 1943. During the next few months, No. 1 Squadron detachments moved to Miranshah and carried out army co–operation exercises at Adampur, in the Punjab.

In early December 1943, Field Marshal Sir Claude Auchinleck visited the RAF Station at Kohat and inspected No.1 Squadron. Sqn. Ldr. Arjan Singh advocated the intense desire of No.1 Squadron to go back into battle. This was supported by the RAF Station Commander. Within a week of this request, No.1 Squadron (now with Hurricane IIBs) was ordered to move immediately to Imphal on the Manipur front where massive buildups were taking place on both sides of the Assam–Burma border. The next year was to be breathless with action and epoch marking in the already great history of the Tiger Squadron.

Back To War–And Glory

No.1 Squadron reached Imphal (Main) on 3 February 1944 and were to remain in action for a record period of 14 months, taking vital part in the fateful seige of Imphal followed by the trans–Chindwin and trans–Irrawaddy offenses. Once again, No.1 Squadron IAF shared the base with their old collegues–in–arms No.28 Squadron RAF, both being Tactical Reconnaissance Units (Tac/R), co–operating closely with the Army.

The Tigers under Sqn. Ldr. Arjan Singh commenced operational flying immediately, with sector reconnaissances flown on the 5th February, carrying out offensive, tactical and photographic reconnaissances to observe Japanese movements on the Chindwin, beyond Tiddim, and as far east as the Myitkyina–Mandalay railway, much valuable information being obtained by the Squadron.

The Japanese offensive against Imphal started on 8 March, attempting to cut off the 17th Indian Division as it retreated. No.1 Squadron's task was to locate the position of the retreating troops day to day and to keep the tracks leading from the Tiddim road under observation for Japanese movements. Fighting in the thick jungle–hills was confused. On 29 March, during a late evening reconnaissance flown by the C.O., Japanese troops were seen clambering down the hills. Landing back at Imphal Main to refuel, the entire Squadron was led back by Arjan Singh into the area before sunset and the Hurricanes hammered the enemy with machine guns and bombs, decimating the Japanese advance battalion, with 14 officers and 217 men killed and wounded.

During March, the Squadron had flown 366 sorties and no Japanese fighters were encountered yet but April 1944 was to be a crucial month when the siege of Imphal tightened and the Japanese came so close that the Imphal airfields were within range of enemy artillery fire. Maximum air effort was put in by No.1 Squadron, flying 412 sorties in April, tactical reconnaissance mostly over the Tiddim road, Palel–Tamu Sittaung road, Imphal–Kohima road and the Ukhrul road. The Tigers strafed bashas, mechanical transport, gun positions and troops. In turn, Japanese Kawasaki Ki48 and Mitsubishi Ki21 bombers raided Imphal on 15 April, damaging two of No.1 Squadron's Hurricanes.

During May 1944, the weather deteriorated with early monsoon rains which curtailed flying yet No.1 Squadron flew 372 sorties, including 32 by night, that month, which also had the loss of a long range reconnaissance Hurricane to prowling Japanese Nakajima Ki 43 ("Oscar") fighters. No.1 Squadron's aircraft ranged over almost the entire battlefield, carrying out continuous tactical reconnaissance as in the area north–east of Imphal the Japanese were being gradually pushed back.

June 1944 was an even more trying month, the runways waterlogged while rain storms made flying hazardous. No. 28 Squadron RAF had been pulled out of Imphal, leaving No. 1 Squadron IAF solely responsible for tactical reconnaissance in the area, flying 327 sorties that month. The Tiger's Hurricane IIBs (with machine guns) were replaced by Hurricane IICs (with cannon), for greater effect in ground attack missions. The seige of Imphal was broken by the month–end and the Squadron was tasked to keep harrassing the retreating Japanese, mainly in the Ukhrul area and south of Imphal. Reconnaissance was carried out over the roads and tracks from Palel to Sittaung on the Chindwin, from Tamu to Kamjong, from Htinzin to Yazagyo, the Chindwin river and so on, a total of 307 sorties being flown in July.

During the ensuing battle for Central Burma, the British–Indian forces mounted relentless pressure on the retreating Japanese beyond the Chindwin and No.1 Squadron, as part of the 221 Group, operated from forward bases covering a front of some 200 miles to the limits of their

Armed, fuelled and ready to go: Hurricanes of No. 1 Squadron at Imphal.

endurance and range. In August, No.1 Squadron flew 354 sorties, with targets of opportunity being attacked, but deteriorating weather in September reduced sorties to 292, but these were longer in duration, the Hurricanes fitted with extra fuel tanks. On 17 September, the Tigers attacked bunkers on a hill feature in the Yazagyo area and Taukkyan airfield south–west of Kalemyo. And so into October, with the Squadron flying a record 439 operational missions totalling 780 hours, the Tigers operating to as far as the Mandalay–Myitkyina railway. The value of No.1 Squadron's tactical reconnaissance was gratefully acknowledged by XXXIII Corps, the Squadron commended "for the skill and speed with which air photographs have been produced and dropped on forward troops".

"One" Are Second To None

The Japanese continued to fall back and in November, No.1 Squadron were discovering their lines of retreat. With an average strength of 17 pilots, the Tigers flew 524 operational sorties, totaling just over 1000 flying hours, a most remarkable effort! On the night of 3 November, Sqn. Ldr. Arjan Singh had carried out a vital low level tac–recce of the bridge at Hpaungzeik, enabling the allies to move across and No.1 Squadron received a notable appreciation of its efforts from GOC 20th Indian Division who presented them with a Japanese sword of honour captured in the battle of Imphal in recognition of "assistance readily and courageously given by its pilots and ground crews". Reinforced by their old collegues from No.28 Squadron RAF, the Tigers flew 335 sorties for the XIV Army in December 1944, which saw beginning of the trans–Chindwin offensive.

In January 1945, now under command of Sqn. Ldr. Raja Ram, and given the task of tac/recce for IV Corps which had been secretly moved to the south for the advance towards the Irrawaddy and the strategic airfield and communication centre of Meiktila, No.1 Squadron moved from Imphal to an airstrip at Kan, north of Gangaw and the Tigers entered a new phase of intensive activity. The Irrawaddy was crossed on 14 February 1945 and the Squadron covered the deception movements southwards, up to Sale, Mondaing and Tanaunggyin, north of the Myingan Meiktila road. A detachment of No.1 Squadron was moved to Sinthe, north of Pyinchaung, to cover the Irrawaddy crossing and in two days, the detachment flew 60 sorties. As the offensive made progress, the Squadron also extended the area of its activity but intense Japanese ack ack fire claimed four aircraft damaged and one shot down in February 1945.

Meiktila fell in March and fierce Japanese counter attacks were held with the aid of fighter–bombers. No.1 Squadron was constantly in the air and flew 618 hours in March 1945, inspite of the fact that nine aircraft had been damaged by a sneak Japanese air raid on the airfield early in the month. By the month–end, No.1 Squadron started to shephard No.7 Squadron into the Sinthe area, the "Battle Axes" tasked to relieve the veteran 'tigers" as the Japanese retreated further.

This brought to a close a fantastic operational tour of 14 months in the course of which No.1 Squadron flew 4813 operational sorties totalling 7220 hours. The value and reliability of the Squadron's vital work was recognised time and again and in his farewell message, the AOC 221 Group said "the reliability of their Tac/R and photographic work has remained at a high level throughout and ground crews have set a record of serviceability of aircraft which is second to none in any Air Force in the World". No.1 Squadron's Hurricanes were kept at a 99% serviceability, the highest in the 3rd Tactical Air Force. The Squadron Commander had been awarded an immediate DFC in the field, Lord Louis Mountbatten pinning the coveted medal personally on Sqn. Ldr. Arjan Singh and on completion of its operational tour, another 6 DFCs were awarded to No. 1 Squadron, plus innumerable other awards including that to the SEO, Flt. Lt. Ram Singh.

No.1 Squadron of the now Royal Indian Air Force returned to India and were posted back to Kohat in April–May 1945 from were they had set out for war in late 1943.

At Imphal, May 1944 : (left to right) Flg Offr. Rao, Flt. Lt. Herbert P. Gnanolivu (the M.O.) and Flt. Lt. Raja Ram, with 'Banzo', No.1 Squadron's mascot.

The First Jets In Asia

In January 1949, No. 7 Squadron moved to Palam (Delhi), a dream city for the battle weary pilots and airmen who had lived in tents in the sub–zero temperatures of winter–time Srinagar. The Squadron had acquitted itself brilliantly and with honour during its six years of existence, virtually all of which were at war. The only regret was that the pilots had not got the opportunity to tangle in true air–to–air combat. Both during the Second World War and the J&K Operations, the Squadron's forte remained tactical–reconnaissance and close air support to the Army plus ground attack. Of course, every fighter pilot dreams of the classical aerial engagement, but in this respect No. 7 Squadron would have to wait for another 16 years when the two nations would go to war, over Kashmir again.

Flying was limited by the lack of spares and attrition during the 15–months of operations in J&K and this kept most Tempests on ground. Additional Tempests had been ordered from the U.K., and in March 1949, Sqn. Ldr. Masillamani and Flg. Offr. Lalkoke were sent to England to ferry Tempests back to India, but both had force–landing incidents on the ferry flight.

No. 7 Squadron was in for a pleasant surprise when it was selected to be associated with the first jet fighters to be received by India's air arm; nay, the first jet fighters with any air force of Asia. In June 1949, a flight was established by Air HQ as the "Aircraft Testing Unit" (ATU) with the aim of inducting Vampires into IAF service, becoming the first formation outside the West to operate jet aeroplanes.

The de Havilland Vampire jet fighter was just too late to see service during World War II but was an epoch–marking aircraft, with a speed well in excess of 500 mph over a wide range of altitudes, was highly manoeuverable, a pleasant aircraft to fly and easy to handle. In fact the Vampire initiated some 25 Air Forces throughout the World into the jet age. Initially christened the Spider Crab, the outstanding design feature of the aircraft was its twin boom layout which was selected in order to keep the jet pipe as short as possible and so minimise the inevitable thrust power losses.

The Vampire was built around an egg–shaped nacelle, which embodied the engine mounting, the wing–root air intakes and wing attachments. The monocoque nacelle was, strangely, built of wood and consisted of balsa sandwiched between two thin plywood skins, the two half–shells being joined together along the top and bottom. The wing was of all–metal construction, with split flaps, outboard of which were the air–brakes. Unlike propeller driven fighters of the piston–engine era, the Vampire's pilot had an excellent field of view. The main landing gear, too, was made unusually short in the absence of a propeller and retracted outward into the wings while the nose leg retracted rearwards into the nacelle. The lack of any ergonomy whatsoever in the cockpit provided for an "airbrake–lever", much like a "flap lever" in current multi–engine aircraft, on the left console. This was the first IAF aircraft to sport airbrakes, another "fancy" new–gadget for the pilots to boast of, having been used to the massive torque of the four–bladed propeller on the Tempest till then. Perhaps most significant of all was the tricycle type undercarriage providing for simple and easy landings. From a pilot's point of view, the lack of any swing every time one opened or closed throttle (a significant problem on the Tempests and Spitfires) was heavenly. The sheer speed available at a touch of the finger tips was exhilarating. The Vampire was armed with four 20 mm Hispano cannon in the nose and could carry eight 3" rockets or 1000 lbs of bombs under each wing.

The first Vampires were quickly superceded by improved versions, with more powerful engines and the F. Mk.III also had increased internal fuel capacity. Three such models were diverted to the RIAF from RAF stocks to facilitate trials in tropical conditions and prepare for large–scale induction of the jet fighter into Indian service. The export version of the Vampire Mk.5 was designated the FB Mk.52 and was a ground–attack, fighter–bomber variant with a re–stressed wing of shorter span, with a re–designed longer–stroke landing gear, could carry 2000 lb of bombs or rockets underwing and had outstanding manoeuverability. The Vampire FB 52 which supplanted all piston–engined fighters of the IAF, was powered by a de Havilland Goblin 2 centrifugal–flow turbojet rated at 3100 lb thrust.

The very first Vampire of the Indian Air Force (HB544) in flight over north India.

HISTORY

The first Vampires for the RIAF were three Mk.IIIs, (HB 544, 545, 546) diverted from the RAF and flown to India in the first week of November 1948 by a Mr. Jameson of de Havilland's and two RAF pilots. For maintenance support and training came three de Havilland ground engineers (Vantirer, King and James Hamilton). The Aircraft Testing Unit (ATU) was established on 1 November, 1948 at Kanpur, with hand picked flying and maintenance personnel, in order to convert to jet fighting and establish standard operating procedures for the Royal Indian Air Force which was to eventually be entirely reequipped with this epoch–marking new combat aircraft.

The Commanding Officer was Sqn. Ldr. C.D. Subia ("Boss") who had been Flight Commander with No. 10 RIAF Squadron flying Tempest IIs in Kashmir, assuming charge of the ATU on 2 November 1948. Subia was 26 years old, "tall dark and handsome" and still a bachelor (according to the pen pictures in the Unit's Diary). The Flight Commander was Ft. Lt. M.P.O. "Micky" Blake, joining the ATU from No. 8 Squadron where he was the Adjutant. From No. 7 Squadron itself came Flg. Offr. George Verghese "Flagstaff" Kuriyan, taking over as Adjutant of the ATU, and rumour had it that he had flown over the Zoji La so often that "they" charged him house rent there now! Also from No. 7 was the fourth pilot, Flt. Offr. G.D. "Nobby" Clarke, who was one of the first pilots to go into action in Kashmir. Also known as the 'bugle–boy', he had flown the maximum number of operational sorties in Kashmir.

The ATU's Medical Officer was Flt. Lt. M. Mukerjee, from No.8 Squadron in Kashmir and Engineering Officer was Flt. Offr. Gian Singh, formerly with No.4 Squadron, also on Tempests and with them during the Police Action in Hyderabad. Gian Singh's right hand man (afternoon, his left hand man!) was Flt. Sgt. Man Mohan Singh, from the No.1 EFTS Jodhpur, and Corporal Dass was the Discipline NCO. Finally, there was Sandy, the bull terrier mascot of the ATU!

By the end of January 1949, the jet conversion training was completed at Kanpur, without any serious mishap, the only scare being when Flt. Offr. Kuriyan lost his Vampire's hood at the top of a loop.

On 21 February, 1949, the first of the grand tours began, a long range training flight across peninsular India from Kanpur towards South India. Wg. Cdr. Moolgavkar, till recently O.C. No. 1 (Operational) Wing in J&K was overall in–charge of the tour, whose essential object was to give the RIAF experience in high speed cross country flying, operations and maintenance of Vampires from unfamiliar airfields and to test fly Vampires at high altitudes and at varying climatic and temperature conditions in the country (In doing so, they would also show the jet fighter off in Western and Southern India). Wg. Cdr. Moolgavkar immediately converted to jet flying in the first Vampire (HO 544). A Dakota of No. 12 Squadron with 12 airmen and support equipment, took off from Poona at 0845 hours, followed by the Boss and Kuriyan at 1030 hrs, taking them 2:30 hours to reach Poona's Lohegaon airfield. The other two Vampires arrived in the late afternoon

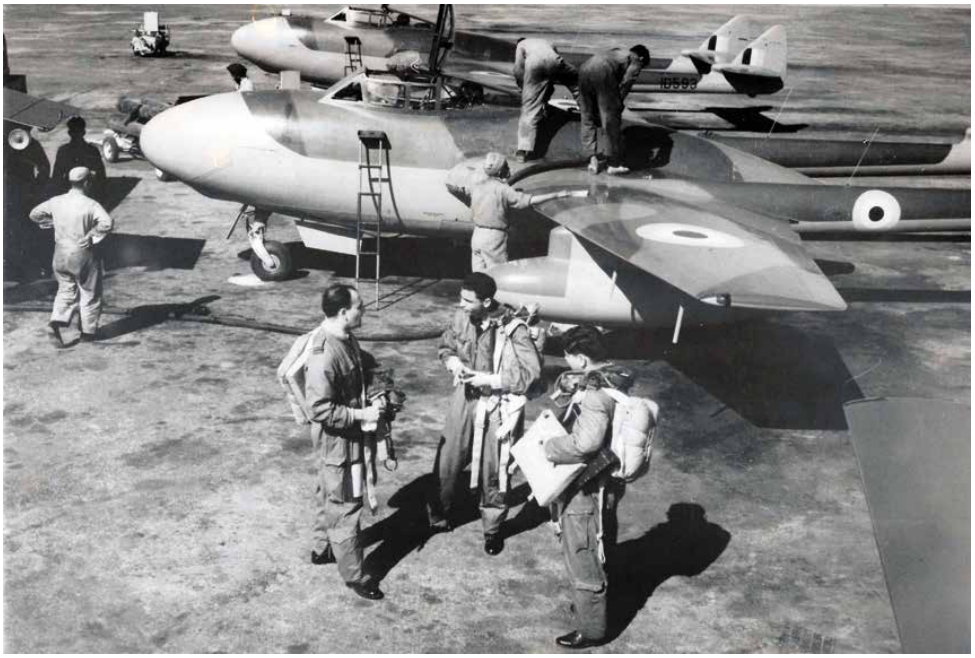
and the Vampires were first presented and flight demonstrated to the Indian public at Poona on 23 February, 1949.

Beginning at 1700 hours, thousands of spectators witnessed the three Vampires which were put through their paces by Subia, Blake and Clarke, flying formation first in Vic, then echelon starboard followed by line abreast and lastly by line astern. The Vampires then climbed to 8000 feet and did a loop in line astern formation, but it was dicey and, as the diary records, "Nobby and Micky almost shook hands in the air .... the crowd applauded this manoeuvre but we nearly had St. Peter clapping us on the back"! The demonstration ended with a high speed run by Subia and a zoom climb and the crowds went wild with excitement. After landing, the pilots were mobbed, mostly by girls. As the newspapers reported it, "Vampire Vamped!", with photographs of the pilots surrounded by pretty girls hunting for autographs!

The Vampires were flown to Bombay's Santa Cruz airport the next day, led by Wg. Cdr. Moolgavkar. "By now we were all used to cameras clicking around us and when Bombay's pressmen surrounded us, we behaved

as if it was an every day occurrence", the Diary records nonchalantly! No. 2 ED at Cotton Green were the hosts and even as Gian Singh and his erks got the Vampires into flying shape, the rest went to town! 27 February was another "Circus day", the Governor of Bombay being amongst the 10,000 – odd spectators who witnessed formation aerobatics by the Vampires. Rumours had it at this stage that both Moolgavkar and Subia had received offers to star in movies then planned by various Bombay Studios, such was the hero worshipping in this film city, India's Hollywood!

The flying circus troupe (three Vampires plus Dakota) flew on to Bangalore on 28 February, reaching the Hindustan Aircraft Factory from Bombay in just 105 minutes,



as an awestruck newspaper reported. After "going to town" for a couple of days, the 'circus' performed on 3 March at the HAL aerodrome in front of over 5000 people and once again the 'aces' were highly applauded.

On 4 March, the three Vampires took off for Madras at 1130 hours landing at Meenambakam for more photographs and receptions. 'Liberty runs' were flown in the Dakota to and from the IAF Station at Tambaram where all personnel were staying. Flt. Lt. Situ Mullick, the AF Public Relations Officer, had arranged for an interview on All India Radio, Madras where amidst stage fright and broadcast jitters, the ATU Circus performed well enough! Subia's birthday bash was celebrated in Madras, with generous Scotch followed by a Chinese dinner, Mullick insisting on ordering the food in Japanese!

The last of the 'Circus Shows' was held at Meenambakam on 7 March, the half hour flying witnessed by over 5000, Wg. Cdr. Moolgavkar giving the commentary as always and the Vampires landing to great ovation. As the South Indian press proudly added, "all the three pilots hail from South India."

Back on the road home, the Vampires (and Dakota) flew to Poona on 8 March, but adverse weather in Kanpur delayed arrival at the home base till the afternoon of 9 March where the officers had a stag party for the Dakota crew and the de Havilland representatives who were returning to England. "So ended a very successful tour".

Routine set in thereafter, the ATU being involved with Station affairs at RIAF Kanpur, including cooperation both on the sports field and in the air with No.5 Heavy Bomber/ General Reconnaissance Squadron which had just been formed with refurbished B24 Liberators.

On 22 March, the ATU received a signal from AHQ, New Delhi: "From Wg. Cdr. Moolgavkar to Sqn. Ldr. Subia. Air Vice Marshal Mukerjee wishes me to convey his congratulations to all ranks under your command for successfully completing Operation Flash. Please add my personal congratulations also. The behaviour, discipline and the sense of duty of your officers and airmen were exemplary throughout the tour. Wish you the best of luck in the future".

In preparation for the 16th Anniversary of the Air Force on 1st April 1949, formation flying was practised with a Vampire (Micky as "Red 1") Tempest (Nobby as "Red 2") and Spitfire XVIII, (Flt. Lt. Ramachandra the ARD Test pilot as "Red 3"), a ceremonial parade being followed by the flypast at low level by B–24s and the mixed formation of fighters.

Line up of HAL–built Vampire FB52s at Bangalore.

In the course of the month, the three Vampires were strenuously flown, in battle formation, practising cross–overs and turn abouts at height (upto 30,000 feet) as also quarter–attacks while the single Harvard was flown for practice force–landings in the low flying area. On the ground the new canteen was inaugurated ("a grand success") dance nights attended at the Lido's Club ("on the look–out for popsies"), and hockey was played against the Provincial Armed Constabularly, plus swimming, squash and cricket at the Cawnpore Club. Sundays and holidays were usually spent on their faithful "charps" (Charpoys!"). The Adjutant's red MG sports car did high speed forays for weekends to Lucknow. These, indeed, were halcyon days.

The ATU "converted" some senior IAF officers to jet flying, including Gp. Capt. Arjan Singh, Ranjan Dutt and P.C.Lal, the later getting airborne in Vampire (HB 544) on 4 May 1949.

The ATU was moved from Kanpur to Delhi's Palam airport on 26 May 1949, all three Vampires having completed 100 hrs inspection and test flown satisfactorily. The Vampires flew into Palam at 0830 and taxied to their new "hangout", Delhi greeting the ATU with a dust storm in the evening, the men and heavy baggage arriving by train. The ATU shared the new base with Tempests of Nos. 7 and 10 Squadrons, Devons and Dakotas of the Comm. Sqdn and Spitfire XIXs of 101 PRU. A favourite pastime (after flying) was to lounge at the terminal building and oogle at deplaning or departing passengers, Palam being a "busy" civil airline airport as well.

By mid–June 1949, rumours on the ATU amalgamating with No.7 Squadron were getting stronger but the unit was "not at all thrilled by the prospect". Nevertheless by Air H.Q. directive, the ATU officially became part of No. 7 Squadron on 1 July 1949, based at Palam. Sqn. Ldr. C.D. Subia taking over command from Sqn. Ldr. Masillamani on 22 July. No. 7 Squadron now had two flights, "A" with Vampires (Red) and "B" with Tempests (Black).

Under Gp. Capt. Jaswant Singh, the Station commander, 12 aircraft formation flying was practised for the country's second Independence Day flypast over the Red Fort, formations of Vampires, Tempests, Spitfires and B–24s making a spectacular show.

No.7 was assigned air defence of the Capital as its prime task and the Squadron flew continuously, for instance 16 sorties on 21 September, six Tempests in formation at dusk, cross–country flights over the Nainital hills and Doon valley, but one aircraft on landing (HA 550) went into wet grass and nosed–over. On 12 October, a nine aircraft formation flypast was led by the Boss, the Vampires of Red Section leading Tempests of Yellow and Blue Sections, tight formations which led to the belief that No. 7 was heading for formation aerobatics (shape of things to come!). No. 7 trained hard on fighter interception exercises under GCI control. On the ground, the Squadron won the inter unit Cricket tournament, and deserved it fully.

On 23 November, the Wing put up a grand flying display in honour of the visiting RAF Chief, Air Chief Marshal Slessor with fifteen Tempests and two Vampires, No. 7 providing the latter and five of the former. For this effort, the Squadron "bowed in earnest homage to Sardar Gian Singhjee and Flt. Sgt. Prakash for their magnificient efforts in providing the majority of aircraft for the Station Show".

No. 7 also carried out air–to–ground firing at the ranges, both with Tempests and Vampires.

Command of the 'Fighting Seven' was handed over by Sqn. Ldr. Subia to Sqn. Ldr. B.S. Dogra on 16 December 1949 and with that the news was confirmed to that No. 7 would re–convert onto Spitfires, this time the Mk.XVIIIs. This curious decision was taken firstly because the Vampires were yet to arrive in quantity and secondly, serviceability of the Tempests was getting low, with Hawker Aircraft unable to meet demand. From the 20th December, pilots of No. 7 started familiarisation flights in the Spitfires of No.101 PR Unit during the last week of the year which also happened to be the last week of the decade of the forties. On the 30 December, "the starting cartridges were fired dead at 1000 hours and the nine veteran Tempests sprang into life with that familiar resounding thump that has always been pleasing music to the ears".

Ten minutes later, led by Sqn. Ldr. Dogra, the nine Tempests took off from Palam and headed towards Kanpur. "It was with a sad heart that we said goodbye to the brave warriors ... we shall always remember these as our comrades and warriors in arms". Four Spitfire XVIIIs were then flown from Kanpur to Palam the same evening, the rest of the pilots coming back in a Devon.

Extract from "The Battle Axes": No. 7 Squadron, IAF, 1942–92.

HISTORY

1971 Operations: Some Lessons and Other Musings

By Lieutenant General Kamal Davar (Retd)

Lt Gen Niazi signing the Instrument of Surrender under the gaze of Lt Gen Aurora. Standing immediately behind from L to R: Vice Admiral Krishnan, Air Marshal Dewan, Lt Gen Sagat Singh, Maj Gen JFR Jacob (with Flt Lt Krishnamurthy peering over his shoulder). Veteran newscaster, Surojit Sen of All India Radio, is seen holding a microphone on the right. (Photo: commons.wikimedia)

Abstract

On 16 December 1971, with the fall of Dacca, the 1971 war came to an end. One of the shortest wars in history led to the creation of what is now the eighth most populous country in the world, after the largest surrender of troops after World War II to date. This article takes a strategic view of the events leading to, during, and after the war and brings out lessons of that war which should be kept in mind today and in the future.

Introduction

As India and her Armed Forces celebrate the 50th anniversary of the nation's glorious victory in the 1971 operations against Pakistan which led to the birth of a new nation — Bangladesh — it is also an opportune time to introspect regarding our military preparedness for the impending future. That India, under the indomitable political leadership of Prime Minister Indira Gandhi combined with the uncommon professionalism, matchless valour and dogged determination of its men in uniform and its enlightened military leadership won for India, perhaps, its finest victory ever in its long history, cannot be debated. As India, rightfully and joyously, relives those rare moments, the current challenges confronting the nation and those likely to emerge in the foreseeable future necessitate deliberate analyses for India's security and well–being. It is not always that history displays a

propensity for repeating itself but inadequacies in military preparedness, rather not addressing and synergising various constituents of Comprehensive National Power (CNP), can lead to serious consequences for any nation.

Fathoming Strategic Geo–political Situation

Though national interests and objectives are normally of a semi–permanent nature which may not undergo major changes frequently, a careful watch by a nation of the prevalent strategic geo–political realities must always be borne in mind especially as obtaining in nations inimical to one's interest. The changing geo–political dynamics in undivided Pakistan in 1970–71 and the resultant fratricidal conflict thereafter between its two wings was a classic example of changing ground realities. No country in the world, including India or even the US, could imagine a sudden deterioration which would lead to the dismemberment of a country so speedily. As is commonly known, there was always simmering discontent in Pakistan's eastern wing vis–à–vis its western wing owing West Pakistani Punjabi and Pathan officers and the traditional arrogance displayed by them towards their dark–skinned Bengali fellow citizens. Additionally, the bulk of Pakistani investments and expenditure was unfairly reserved for their western provinces at the cost of the East Pakistan province which had a larger population (about 65 million) than in West Pakistan (around 58 million) (1). Imposition of Urdu on the Bengali populace in East Pakistan, an indifferent response by the central government to natural calamities in its eastern wing and clear–cut favouritism by the Centre towards its western based citizens were all contributory factors towards serious differences aggravating between the two wings of Pakistan.

(Photo: Commons)

The final nail in the coffin was the Pakistan Government disregarding the results of the Pak general elections. Held in December 1970, they gave an overall majority in the nation to East Pakistan's charismatic leader Sheikh Mujibur Rehman's party, the nationalist Awami League (AL) over Zulfiqar Ali Bhutto's Pakistan People's Party. Bhutto and many other political leaders in West Pakistan refused to accept the results which would have made Mujibur Rehman Pakistan's prime minister. Bhutto even forced Pakistan's dictator, Gen Yahya Khan, to not accept these results. Consequently, major political and violent disturbances commenced in East Pakistan prompting Yahya Khan to dispatch additional Pakistan Army troops to its now turbulent eastern wing. Yahya Khan even replaced in East Pakistan the well–respected Corps Commander, Lt Gen Sahibzada Yakub Khan, by the notorious 'Butcher of Balochistan', Lt Gen Tikka Khan.

Realising that West Pakistani politicians will not allow him to be sworn in as Pakistan's prime minister despite his electoral win, Sheikh Mujibur Rehman called for a "full struggle" in East Pakistan on 7 March 1971. The same evening, Gen Tikka Khan launched Operation Searchlight in which hundreds of thousands of innocent Bengalis were slaughtered and lakhs of Bengali women were raped. This genocide on hapless Bengalis forced the hugely suffering East Pakistanis to finally make up their mind to secede from their parent nation. Meanwhile, nearly a million of Bengali refugees crossed over to India over the next few months to escape from the monstrous atrocities of the Pakistani army in East Pakistan. India made many attempts to bring to the notice of an uncaring world about the carnage of Pakistanis on their fellow citizens. PM Indira Gandhi herself visited many European capitals and thence paid an official visit to Washington. She brought to the notice of the US administration the atrocities heaped by its protégé Pakistan on its innocent Bengali citizenry. However, Mrs Gandhi's entreaties fell on an insensitive, then US President Richard Nixon's, deaf ears. India, by then had made up its mind to fully support the beleaguered Bengalis in East Pakistan including militarily.

The rest is history. By early 1971, India had commenced its preparations for a military offensive into East Pakistan in the coming months. By this time, India had fully comprehended the changing geo–political realities of the region, something which the Americans had failed to do so notwithstanding their long–term mentorship of errant Pakistan. The lesson to be imbibed as regards the geo–political and internal churnings from this period is that a careful watch must be ensured by the nation's foreign policy and security establishments including its intelligence agencies and appropriate prophylactic and counter measures put into place well in time. Gazing back 50 years from now clearly reveals that the Americans do display, time and again, a propensity of misreading or calculatedly ignoring geopolitical realities in the nations of interest to them. Their intervention in Iraq in 2003, the shoddy exit from Afghanistan in August 2021 and mollycoddling terror sponsoring states like Pakistan for decades are suitable examples of the US failings, among others, in comprehending geo–political truths.

(Photo: newindianexpress.com)

HISTORY

Synergy between Political and Military Leadership

Desired levels of synergy between various organs of the state especially its political and military leadership is sine qua non for success in the achievement of national objectives. Though military leadership takes its final instructions from the elected government before prosecuting military operations against the enemy, yet the many complexities of macro–level decisions can only be made after thorough and frank analyses between the top echelons of the government and its military professionals. They must have faith in each other and by a consensual approach arrive at sound decisions in larger national interest. As is well known, PM Indira Gandhi, conscious of the fact that the nation was overburdened by nearly a million refugees, desired that the Indian Armed Forces should commence their offensive into East Pakistan as early as possible and latest by mid–1971 so that the refugees could be sent back to their own country. These refugees would become not only a financial drain on India, but later, a major security problem as Hindu Bengalis would have preferred to stay back in India. However, she deferred to then Army Chief Gen Sam Manekshaw's advice that the Army's operations could greatly be hampered by the onset of monsoons in East Pakistan and thus it was advisable to postpone our operations to the coming winters. In addition, a few more months for the Armed Forces would also enable them to replenish their depleting stocks of arms, ammunition and equipment including from abroad. Furthermore, the Indian Army and the R&AW could train and equip the Mukti Bahini (East Pakistani freedom fighters and Bengali deserters from the Pak Army) better, and in greater numbers, for carrying out hit and run operations against the Pakistan Army in East Pakistan. By all standards, the Mukti Bahini imbued with the spirit of freedom, proved to be effective and of great assistance to India before and during the war.

(Photo: dnaindia.com)

The synergy between the government and its armed forces was indeed a fine example of civil–military cooperation in the supreme interest of the nation. It must be mentioned here that Mrs Indira Gandhi, apart from her own political acumen, also had wise politicians in her Cabinet like Defence Minister Jagjivan Ram, Minister for External Affairs Swaran Singh, Special Adviser DP Dhar and efficient bureaucrats like PN Haksar, TN Kaul among others. The Indian government's handling of the East Pakistan crisis was a splendid example of a 'whole of government approach' which needs emulation by Indian governments in the future whenever the nation faces formidable challenges.

Proactive Foreign Policy

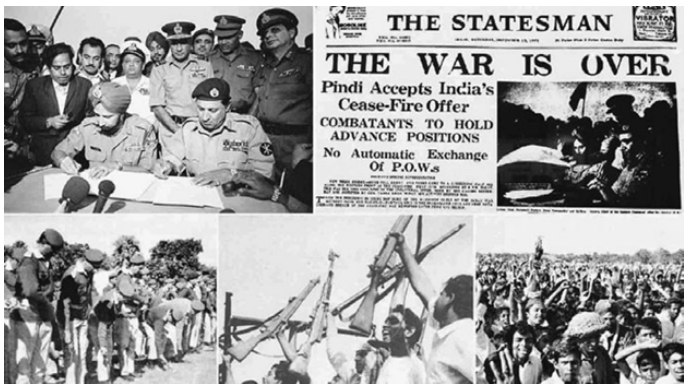
Despite the world in full knowledge of Pakistan unleashing monumental genocide in its eastern wing, the UN and hardly any nation, under the influence of US, came to the fore to condemn Pakistan. However, notwithstanding US President Richard Nixon's intransigence and, equally, his wily Secretary of State Henry Kissinger's machinations towards India, PM Indira Gandhi ensured that India remains in the driving seat as regards sensitivity towards the hapless East Pakistanis. She sent top Opposition leaders like Atal Behari Vajpayee, Jayaprakash Narain, Jyoti Basu, among others, to various countries to explain India's case and acquaint the global community as regards Pakistan's grave atrocities on its own people. India, in addition to being largely proactive in its foreign policy, also executed a masterstroke by signing the Soviet–India Defence Treaty in Oct 1971 which would enable much needed defence cooperation with the then second super–power of the world. Despite warming of relations between India and the Soviet Union, it is a matter of gratification that India all throughout maintained its strategic autonomy orientation during this period and even later. As regards Pakistan, despite its close relations with China and the US, it had misread both nations intent in coming out openly to support Pakistan militarily. China made some noises by movement of a few troops in the northern sector whilst the US did threaten India by moving some assets of its Seventh Fleet into the Bay of Bengal — more to dissuade India than commit them operationally. The US bluster had failed to intimidate PM Indira Gandhi's resolve.

Flexibility and Contingency Planning in Military Strategy

Despite India's efforts and the advice to Pakistan of some powers, to arrive at a political settlement with its eastern wing, having failed, by August 1971 it was clear that India was left with no alternative but to go to war. Overall, the Indian Army had a clear quantitative edge over Pakistani forces in East Pakistan (to be referred as the Eastern theatre) and a rather small edge in the Western theatre. However, both the Indian Air Force (IAF) and the Indian Navy (IN) had a reasonable qualitative and quantitative advantage over their Pakistani counterparts. The Indian Armed Forces after the 1965 war and in the period preceding the 1971 operations had built up their arsenals to satisfactory levels. Overall, India's military planners synthesised a joint strategy to achieve their military objectives by undertaking a swift offensive in the Eastern theatre, offensive defence in the Western theatre and totally defensive along the Northern borders opposite China. It was, in reality, fighting a two–front war though less challenging as the threat India now faces with collusive military cooperation between China and Pakistan. In the Eastern Theatre, though an offensive was to be launched, the military objectives were not as ambitious as it turned out later — it was primarily to assist the Mukti Bahini in liberating some portions of East Pakistan territory, establish their own government and hasten the return of the refugees back to their own country. In the Western Theatre, the Indian Armed forces were to carry out limited

offensives and ensure no territory in J&K, Punjab and Rajasthan was lost.

Along the Northern borders it was limited to preventing China from attacking/capturing Indian Territory. As operations unfolded subsequently, India managed to achieve its mission objectives in its overall military strategy in all the three theatres. In the Eastern theatre where Dacca was not the objective initially, the rapid three–pronged military offensive by our Armed Forces into East Pakistan achieved spectacular gains and ultimately Dacca became the terminal objective. Dacca subsequently fell into Indian hands and overall operations were halted by India on 16 December 1971 in both the theatres. Flexibility and contingency planning in military strategy are essential attributes as amply displayed during these operations.



(Photo: unitingearth.com)

Dissuasion, Compellence and Deterrence in National Strategy

Dissuasion, Compellence and Deterrence are a nation's subsets of its overall military strategy, be it for war–avoidance or strategic coercion before operations are physically launched. Understanding the nuances of these principles during the 1971 operations and extrapolating them now to our current challenges will be a useful exercise. It is pertinent to note that with the march of time and advent of additional technologies and increase in the domains of warfare, these subsets also do undergo change. Space capabilities, hypersonic weapons, cyber threats, artificial intelligence and indeed hybrid or Grey Zone warfare play an important transformational role in the complexities of these doctrines. Briefly, dissuasion is influencing an adversary to stop/alter a course without use of force. Deterrence is the prevention of action by the adversary owing to the possibility of a credible threat of unacceptable counteraction and/or belief that the cost of action by the adversary far outweighs the perceived benefits. Additionally, the threat of force (deterrence by denial) but not the actual use of force (deterrence by punishment) against an adversary is conveyed successfully to maintain the status–quo. Compellence, on the other hand, may involve the actual use of force to change the adversary's behaviour. During the Bangladesh operations, these principles were all in play nearly a year before the actual conduct of the offensive into Pakistan by India. With Pakistan not listening to India's entreaties to stop its genocide on its Bengali population, gradually Deterrence by Denial graduated into Deterrence by Punishment! However, Pakistan's strategy of defending its Eastern theatre (separated by 1600 kms) by threatening India with a limited offensive in the Western theatre, though theoretically sound, did not successfully materialise for Pakistan. Its launching a pre–emptive air strike on 3 December 1971 on some Indian airfields gave India the opportunity to retaliate in full measure and commence its Offensive–Defence operations in the Western theatre! Fast forwarding to the current times and Pakistan's traditional perfidious behaviour towards India, it will be worthwhile for the Indian security establishment to draw up various contingency plans incorporating compellence as its cardinal vector to keep Pakistan's mischief in check. As regards China, India needs to step up its politico–diplomatic cum military responses in a synergetic endeavour to convince the Chinese of the futility of its current designs, for the India of today is far better militarily prepared than in 1962. Effective dissuasion as a first step towards the Chinese should be thus exercised with all the emphasis at our command – the Indian Army's determination and steadfastness in Eastern Ladakh since the last year or so may dissuade the overly hegemonistic Chinese to an extent.

(Photo: edtimes.in)

Operational Art and Centre of Gravity

In the 1971 War, the Indian Armed Forces exhibited a high degree of competence in the desired application of the Operational Art and identification of the centre of gravity in the prosecution of military operations. Though there are diverse interpretations of these terms among the world militaries, American Field Manual 100.5 (Operations) 1996 defines Operational Art as "the skillful employment of military forces to attain strategic and/or operational objectives within a theatre through the design, organisation, integration, and conduct of theatre strategies". (2) It further expounds that "The essence of operational art lies in being able to mass effects against the enemy's main source of power—his centre of gravity" (3) and thereafter develop a campaign plan to achieve decisive success. In the 1971 operations, as stated above, the Indian Armed Forces had correctly identified Dacca as the centre of gravity of our operations and our military objectives were modified accordingly. It is worth remembering that in today's context it is not only a ground objective which should be identified as the centre of gravity of an enemy nation but there could also be many other significant features like a major water supply source, its population, trade dependencies, food producing areas,

nuclear infrastructure, power generation centres etc. the loss or destruction of which will be calamitous for a nation.

Intelligence: A Force Multiplier

The truism is that the availability of credible and timely intelligence for a nation's statecraft and military planning is unquestionable. However, the significant aspect of intelligence acquisition prior to and during the 1971 operations was not of the desired standards. There were thus avoidable gaps in Indian military planning and execution during actual operations. By the end of 1970/ early 1971, there was distinct resentment among Bengali origin soldiers of the Pakistan Army and some diplomats in Pakistan owing to continual and increasing West Pakistani arrogance, and later, atrocities being committed on the hapless East Pakistani population. The latter, as the weeks went by, had more or less made up their mind of severing all ties from the parent nation. Indian intelligence agencies could have made far better use of this dissent among the Bengali population for gathering vital inside information. Matters, of course, improved when India commenced in right earnest, the training, equipping and employment of the Mukti Bahini. Disgruntled elements in a nation are always vulnerable to enemy nations and intelligence agencies thus must remain ever watchful — this simple fact applies to India also. Details of Pakistan's military support from the USA (despite an official American embargo/sanction on them after their violation of human rights in East Pakistan) and from China were hardly known to India prior to the 1971 operations.

In addition, there was inadequate information/ surveillance on Pakistan Army's reinforcements moving to East Pakistan via Sri Lanka. In the Western Theatre, there was inadequate hard intelligence on major Pak build–up opposite the Chhamb–Jaurian sector and in the Longewala area which could have indicated Pak Army's likely offensive designs in advance. In addition, concrete information was missing as regards Pakistan Army deployments in the Ravi–Chenab corridor or regarding Pakistan Army created terrain obstacles in this sector, which was of interest for Indian Army's plans in this area. The Pakistan Air Force (PAF) pre–emptive strike on our airfields on 3 November 1971 evening took the Indian Air Force (IAF) by surprise, though, fortunately, hardly any IAF assets were destroyed/damaged. Even today the requisite availability of hard intelligence remains unquestionable, and measures must be regularly taken to re–energise the intelligence edifice of the nation by according it adequate resources to sharpen its diverse capabilities.

A PT 76 tank of 45 Cavalry in action in Bangladesh in the 1971 war. (Photo: indianexpress.com)

The Verdict of Democracy and Internal Social Cohesion

Apart from many strategic and military lessons thrown up by the 1971 War, a few brutal political truths also are more than apparent. Firstly, from electoral verdicts, whichever political dispensation is successful, the result must be respected by the entire nation. More importantly, governments in multi–cultural, multilingual, and multi–religious nations must accord respect to all its people otherwise not maintaining internal social cohesion can prove fatal to a nation's unity. The break–up of Pakistan is a telling example for all nations which are diverse in their characteristics. Translating Military Victories into Political Gains a splendid and incomparable military victory as India achieved in 1971 should have resulted into some major political gains for India.

With over 93,000 Pakistani prisoners of war having surrendered to the Indian Army, we could have extracted some concessions from the Pakistanis at the Simla Summit in March 1972. Attempts were reportedly made by India which included the return of our prisoners from them, converting the Cease Fire Line (CFL) to an international border (as was the Indian stance those days) and to make them drop all references to J&K. However, it appears that the Pakistani premier ZA Bhutto did manage to outwit the Indian leadership gathered in Simla by his tales of woe and helplessness. However, in Simla (now called Shimla) the CFL was converted to a Line of Control (LoC) and Pakistan also agreed to settle all disputes with India in a peaceful manner. It also agreed to making J&K a bilateral issue not to be raised in international forums. That Pakistan has reneged on the Simla Agreement many times is also a fact of recent history!

Conclusion

It is always militarily prudent to carry out in–depth analyses of military campaigns conducted by the Armed forces — whatever been their result. Their lessons, off course, must be then adapted to the current environment incorporating contemporary geo–political realities, challenges from new domains of warfare and the latest breakthroughs in technologies. The 1971 India–Pakistan War remains unique and incomparable in the annals of warfare where in a matter of a mere 13 days, India and the Mukhti Bahini created a new nation. Much can be learnt by all militaries in the world regards the nuances of this magnificent and matchless victory. India will do well to salute all the architects of this historic event, political and military leaders and the soldiers, sailors and airmen from both India and Bangladesh.

Endnotes

1. Parvez Tahir, When East overtakes West, The Express Tribune, Sep 22, 2017. https://tribune.com.pk/story/1512636/ east–overtakes–west

2. US Department of the Army, FM 100(5) Operations 1993. https://www.bits.de/NRANEU/others/amd–us–archive/fm100– 5%2893%29.pdf

3. Ibid. This article first appeared in and courtesy: Journal of the United Service Institution of India, Vol. CLI, No. 626, October– December 2021.

Testing Times

A Test Pilot Looks Back

India has long had the distinction of training its own experimental test pilots (and engineers), the only country outside the West to do so. Perspective planning by some of India's senior Air Commanders in the 1950s resulted in the first three IAF fighter pilots being trained as TPs in England, some later went to France and just a few, to the United States. From the early 1970s, the IAF has trained its own ETPs at the Aircraft & Systems Testing Establishment (ASTE), in Bangalore as reviewed in this exclusive article by one of India's pioneer Test Pilots, Gp. Capt. Kapil Bhargava.

The Indian aircraft industry began in December 1940 with the birth of Hindustan Aircraft Limited (HAL). During World War II, HAL did great work overhauling aircraft and assembling some. It became the first certified repair base for Douglas Dakotas in Asia. It also overhauled PBY Catalinas, the amphibian aircraft. One may not believe it today, but the Catalinas used to land in Bellendur Tank south of the present Bangalore Airport. The aircraft taxied in the water to the northern edge of the lake and then rolled up to cement pads on land. One can still make out some of these pads, even though the area has been neglected and the lake is dying fast. It may even become a runway if current ideas of airport expansion take shape.

The first important flight testing job started soon after WW II ended. When the Americans withdrew from India after the surrender of Japan, they left behind many war surplus aircraft, including B–24 Liberator bombers abandoned at Kanpur. The Americans had made sure that they were only scrap metal—or so they thought. Bulldozers were driven into the planes and sand poured into turning engines to ruin them. With careful cannibalisation, HAL work parties however repaired many aircraft. These were just about airworthy and gradually nursed back

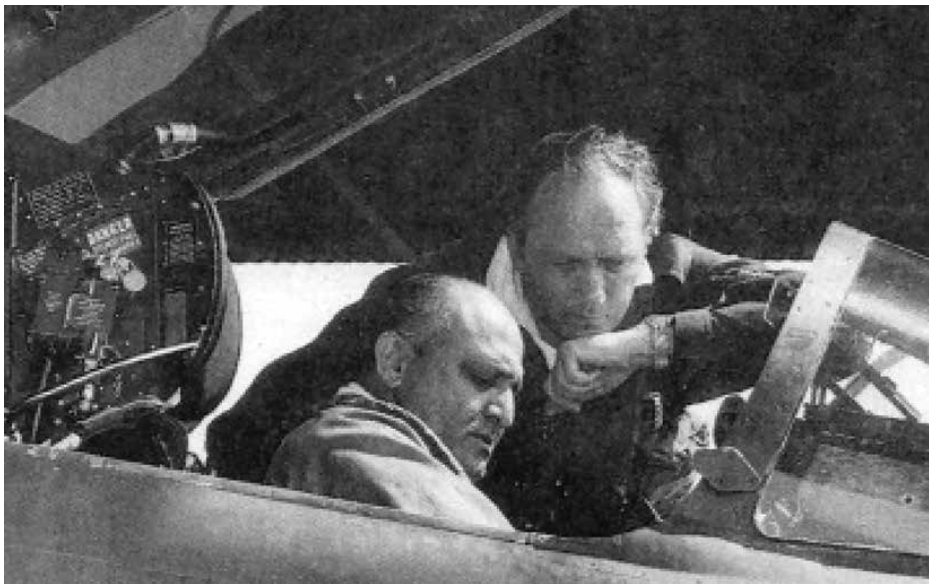
Of great historical interest is this photograph of the prototype HF–24 Marut at Bangalore in 1964: seen are some of India's pioneer test pilots, Suranjan Das, Inder Chopra and P.K. Dey.

to Bangalore by Captain Munshi who was then the Chief Test Pilot (CTP) of HAL. His work and courage have not been recognised enough. After their overhaul and satisfactory performance during flight testing, the B–24s were delivered to the Indian Air Force, whose two bomber squadrons (Nos 5 and 6) were equipped with Liberators and maintained for many years. The last of these aircraft in a flying condition was presented to a UK museum and ferried there by Wg Cdr IM Chopra (Chopie) when he was CTP with HAL.

The IAF had an increasing need for flight testing. An Aircraft Testing Unit (ATU) was raised in 1948 to test and accept Vampire aircraft, the first jets to come to India. In the absence of

Group Captain Suranjan Das.

Inder M. Chopra (Chopie)–after the first flight of Basant HA 31.



C.V. "Chandu" Gole strapping into a Jaguar.

any qualified test pilots, the unit was led by Wg Cdr H Moolgavkar, with Sqn Ldr D Subia, Flt Lt MPO Blake, and Fg Offs V Kurian and GD Clarke as members. The unit displayed the aircraft around the country. I saw their aerobatics demonstration at Bangalore in March 1949. Mickey Blake's bull terrier Sandy used to accompany the team in a Harvard, and kept civilian visitors away from the aircraft most effectively and only uniformed personnel could pass him. The ATU was number plated for a long while.

The year 1949 was important in the history of aircraft development and flight testing. In that year, Dr. VM Ghatage started design work on the Hindustan Trainer–2 (HT–2). The IAF felt the need for test pilots of its own and sent two Flt Lts to the Empire Test Pilots School (ETPS) in the UK, Roshan Lal Suri and Suranjan Das. HAL management realised that, in order to fully develop the HT–2, it needed qualified test pilots. Suranjan Das was posted to HAL as a deputy to Captain Munshi. As the aircraft neared completion, Captain Munshi was upset at being side–lined in the first indigenous aircraft project. One day in August 1952, when he was doing taxying trials on the HT–2, he got airborne and flew for about 45 minutes. After he landed, he pronounced the aircraft as fit for the IAF. Dr. Ghatage asked him if he had spun the aircraft. Captain Munshi confirmed that the aircraft had given him no trouble in spins. He left HAL soon afterwards.

For meeting service requirements, full–scale spin trials were planned. Suranjan Das demanded that a spin parachute be installed as that was what he had learnt at the ETPS. He was told that this was not necessary as the aircraft had already been spun by Captain Munshi. Suranjan Das then negotiated his briefing. He said that he would do two turns of spin and then take standard recovery action. If the aircraft did not recover after four turns, he would bail out. That is exactly what he did, south–west of Yelahanka village. During the subsegment debriefing, Dr Ghatage suggested that Das had bailed out only to prove his point and that was perhaps the only known occasion when Suranjan Das lost his temper. It took many flight trials to clear spinning on the HT–2. Even till the end of its service, spinning it remained somewhat critical. Full down elevator was usually needed to recover, if the instructor at the back was heavy, with a lighter cadet in front–which was a natural result of their age differences.

Test pilots after completing the ETPS, were often attached to aircraft factories in the UK, and provided free testing services to establishments and companies, while in turn they gained experience in flight development and production testing. Chopie, PK (Babi) Dey, CV (Chandu) Gole were all attached to Hawker at Dunsfold. On the earliest such attachment in 1952, Bhupinder Singh did test flying at Royal Aircraft Establishment at Farnborough. He had a reputation for being fun–loving and was an exceptionally able pilot. Once when he was in a Vampire over a total cloud cover, his engine flamed out. Most people would have bailed out. Bhupinder Singh decided not to, and to everyone's amazement did a controlled descent through cloud (QGH) ending in a safe deadstick landing.

After my graduation, I first went to Short Brothers in Belfast to test RAF's Canberra B.8s but later moved

What do TPs do after they retire? More flight testing. Photo of Ajit Lamba and Pinaki amphibian.

to Hunting Percival in Luton. One day when the CTP and I were at lunch in the Luton Flying Club, an attractive cream–coloured aircraft landed on the grass airfield and taxied close to the club. The pilot joined us for a sandwich. I was introduced to him as a test pilot helping out Hunting Percival. I told the aircraft owner that he had a good looking personal transport. After a few minutes, he casually asked me what license I was flying on. I explained that I had a British Private Pilot's License. He pulled out a bunch of keys from his pocket and invited me to fly his aircraft. I went out, unlocked the Saab Safir, flew it for fifteen minutes and returned his keys with thanks. The aircraft had manual undercarriage retraction, helped with bungees.

When the IAF decided to go in for Gnats, Sqn Ldr S. Das was sent from India and attached with Folland at Chilbolton. On completion of his ETPS course, Flt Lt A Sudhakaran (Sword of Honour winner, he had received colours for the IAF from the President when still a Plt Offr) was also sent to Folland in Jan 1957, but after pointing out serious deficiencies in the aircraft, the Chief Test Pilot of Folland, Ted Tennant asked for his withdrawal. Flying Officer Babi Dey was then moved from Hawker to Chilbolton. During his tenure at Folland, Suranjan Das became the first Indian to demonstrate an aircraft at the Farnborough Air Show. Once while practicing for it, he was doing a roll close to the ground. He suddenly felt a restriction in the aileron control. His first reaction was to start talking on the radio. He asked the ATC to ensure that his comments were recorded just in case he could not recover. He said that these comments could help prevent a recurrence of the problem. Remarkable coolness! After the HT–2, HAL designed the Pushpak, Krishak, Basant and HJT–16 Kiran Mks I & II. As the CTP of HAL, I did the maiden flight of the Pushpak in September 1958. The Krishak was first flown by Roshan Suri and was later developed into a successful Air OP aircraft for the Indian Army. Ripu Daman Sahni flew the first Basant, an agricultural aircraft, which was extremely underpowered.

After a new engine was used and some fuselage changes made, Chopie did the maiden flight of the Basant Mk II, and later of HPT–32. Kiran MK II with a de–rated Orpheus engine had many troubles from its very first flight. MW (popularly called Chuchu–for his very loud voice) Tilak had engine flameouts many times in flight, and even compressor blades failure due to vibration. He is now settled in Australia and maintains an active interest in flying.

Even after three decades, HAL—made aircraft continue to be the backbone of flying training in India, Pushpaks for the Clubs and Kirans for the IAF. HPT–32s have replaced HT–2s and should serve on for many years.

In 1954–55, India was approached by both Willi Messerschmitt and Kurt Tank, who were offering to develop fighter aircraft in India. We chose Prof. Kurt Tank as the more able designer for a multi–role aircraft. He came to India with a seventeen–man team which soon dwindled to thirteen. His aircraft was HAL's 24th design study and was thus named Hindustan Fighter–24 (HF–24). Tank had great faith in gliders and decided to make a full scale plywood flying model of the aircraft. Wg Cdr Roshan Lal

Seated (L to R) Sqn Ldr K Badrinarayan, Sqn Ldr KT Sudhir, Wg Cdr PK Dey, Air Cmde CV Gole, Sqn Ldr J Thomas, Sqn Ldr HK Khanna, Flt Lt Srinivasan.
Standing (L to R) Flt Lt SN Garg, Sqn Ldr S Inamdar, Flt Lt MK Pant, Flt Lt PK Yadav, Flt Lt P Ajit.

Brijesh Jayal in the cockpit of a Jaguar.

Indian Test Pilots (Fixed – And Rotary – Wing) Trained To Date :	
Establishment	**Graduates**
ETPS, U.K	31
EPNER, France	15
USN TPS	3
USAF TPS	2
EFTS (ASTE)	104
	155

Suri as the senior most Indian test pilot came and took over as CTP of HAL, in time for the project. With Flt Lt. Kunhiraman as copilot, I air–towed the HF–24 glider to 17,500 ft. Roshan Suri then released the tow cable and came whistling down at 3,800 ft per minute.

The rate of descent increased even further with flaps, undercarriage and air brakes out. He carried out a flawless landing and followed it with 82 more. This was his finest hour. I did the last three flights of the glider but on its 86th flight damaged it by landing with the nose wheel retracted. Unfortunately, Roshan Suri did not adequately plan the first take off on the HF–24, and aborted it with undercarriage up. Wg Cdr Suranjan Das replaced him and carried out the successful maiden and subsequent flights on the aircraft. Babi Dey and Chopie helped him in developing the aircraft.

In 1959 ATU was revived and redesignated as the Aircraft & Armament Testing Unit (A&ATU), with Sqn Ldr Bhupinder Singh in command. The Unit was tasked to put the Gnat, still an unproven aircraft, through an intensive phase of flying. A special operational handling flight was raised under Sqn Ldr MSD Wollen and attached to the A&ATU. Three months into the job revealed serious flaws in many systems of the Gnat.

The fleet was virtually grounded for six months for modifications. Flt Lt A Sudhakaran was the first Indian test pilot to be killed during a test flight. He took off from Kanpur to test cabin conditioning of the Gnat at low altitude in mid–summer. Two minutes after take off his engine cut due to fuel starvation. The air pressure for fuel transfer had failed and the collector tank which was rather small (250 lbs capacity) had dried up. He attempted to force land the extensively instrumented aircraft. As he approached the ground, he saw that he would plough into a village fair. He turned the aircraft away and ejected. Unfortunately he did not have today's zero–zero ejection seat. Sudhakaran was an outstanding officer with an impressive personality. The staff at ETPS had rated him as a natural born exceptional flier. His loss was felt by all those who knew him.

The Gnat light fighter had many problems inherent in its design. Its flight control system was excessively sensitive. The stick to tail gear ratio had to be reduced from 4:1 down to 10:1 to desensitise it with a cam. Even after this change, there was a tendency for pilots to induce oscillations when flying low at a high IAS and during formation flying. It was virtually impossible not to bob up and down in formation above 420 knots with drop tanks, and at aft cg at low altitude. Wingmen next to the leader had trouble enough, those further out could never really settle down. Another job on the Gnat was to clear gun firing in all flight conditions. This was critical at high altitudes (above 30,000 ft) when the engine used to cut due to the ingress of hot gases from front guns. An engine RPM dipping system was developed. To everyone's surprise this worked extremely well. Sqn Ldr Jagat M Lowe died in a Gnat at the end of its final production test flight and control problems were suspected. Many pilots were killed while flying Gnats in service. Eventually the Ajeet derivative of the Gnat as developed by HAL was decidedly safer.

During a visit to Egypt, Dr Zakir Hussain, then Vice President of India, was shown around their most ambitious aircraft project, the HA–300. This was a light single seat delta shaped fighter aircraft, designed by Willi Messerschmitt, of Me–109 and Me–262, fame. The Egyptian Air Force Chief, M. Sidky Mahmoud asked Dr Zakir Hussain for India's help on the project. The request was extrapolated by accompanying staff and Indian journalists to mean a "collaboration project". Back in India, the press really went to town, wrote learned editorials about the emergence of a third military block of the non–aligned, and its impact on the global balance of power.

The truth was that the Egyptians wanted only the loan of test pilots and some help in developing the E–300 engine intended to power the aircraft. Sidky Mahmoud visited HAL in early 1963. He wanted Suranjan Das and Babi Dey to be loaned to Egypt. Wg Cdr

Das turned down the request as they were busy with HF–24 development. Eventually, I found myself in Egypt in June 1963. I first flew the HA–300 on its maiden flight on 7th March 1964 at Helwan, south of Cairo. One HF–24 Mk1BX was gifted to Egypt, flown by Chopie to develop the E–300 engine to power the HA–300.

A very important task came to A&ATU with the handing over of the HF–24 to the IAF in 1965. Many test pilots worked very hard to make the aircraft ready for squadron service. Wg Cdr P Ashoka remembers the aircraft with affection. He is the first, and probably the last, test pilot to continue professional test flying till superannuation at the age of 58 years. Gp Capt Das as the CTP of HAL was the driving force for follow–up versions of the HF–24.

He did the maiden flight of the HF–24 Mk1R with reheated Orpheus engines on it. Unfortunately, his aircraft crashed in January 1970 when on takeoff, the canopy opened and probably the right engine lost power. His tragic death also killed the project. Suranjan Das is today commemorated by a road in Bangalore connecting HAL's main Complex to the Engine Division. HAL instituted a trophy in his name for the best test pilot trainee graduating in India each year.

The graduation dinner is also named after him. Sqn Ldr JK Mohlah was killed in a Marut during a test flight at HAL, probably because of a run away tail trimmer. The aircraft also claimed the life of Sqn Ldr AK Sapre who was working on it to clear four gun firing in time for the Bangladesh War of 1971.

It was my privilege to convert A&ATU to the Aircraft & Systems Testing Establishment (ASTE) in September 1972. The change was necessary for starting training of Flight Inspectors and preparing pilots and engineers for training abroad in flight test disciplines. This training was later followed by courses for Production Test Pilots and in 1976 the first full Experimental Test Pilot training was started. Test pilots have also been trained in France and USA—Gp Captain BS Chhoker an alumnus and a graduate rotary wing test pilot from EPNER has the distinction of flying India's first helicopter on its maiden flight, the ALH. One of ASTE's eminent graduates, Rakesh Sharma became India's first and only cosmonaut, and has been nominated for the maiden flight of the LCA. More than 40 ASTE–trained Flight Test Engineers and Flight Test Instrumentation Engineers are to help in development of ALH and LCA. Training of rotary wing experimental test pilots has been added to the Experimental Flight Test School (EFTS). The present Commandant of ASTE is its own graduate. EFTS is now on the world map and students from abroad have attended test pilot courses in India.

There is often an unstated feeling that test flying is "dangerous". This is true for those who do not take adequate care and do not plan for foreseeable contingencies. A brave test pilot is one with a very high guts–to–brains ratio. In all the years since 1949, only nine test pilots have lost their lives while engaged in test flying. Eight others were killed, mostly while giving demonstrations close to the ground. Low altitude displays are not everyone's cup of tea. For these, no specialised training is available anywhere in India at present. Perhaps there is need to separate these two different and safety–wise contrary jobs.

Only the finest pilots can become test pilots. This is amply proved by the fact that eight test pilots reached the rank of Air Marshal in the IAF. Two of them are still in service, being Air Marshals S Krishnaswamy and Philip Rajkumar, who are engaged in vital jobs. One test pilot became Chairman HAL (Chopie) and another rose to be the Chief of the Naval Staff (Admiral RH Tahiliani).

Air Marshal Prithi Singh has over 100 different types of aircraft in his log book. Air Marshal Brijesh Jayal is now an eminent author, with a cautionary novel to his credit. Air Marshals Chandu Gole, RD Sahni, PK Dey, PM Ramachandran, Air Vice Marshal Ajit Singh Lamba and Wg Cdr KK Saini have all left their mark. Theirs is a very good tradition to follow. The job of test flying is one of the most challenging and satisfying professions available to a flyer. The rewards are unmatched.

If you have any doubts, come and talk to me.

Article by Gp Capt Kapil Bhargava VM (Retd)

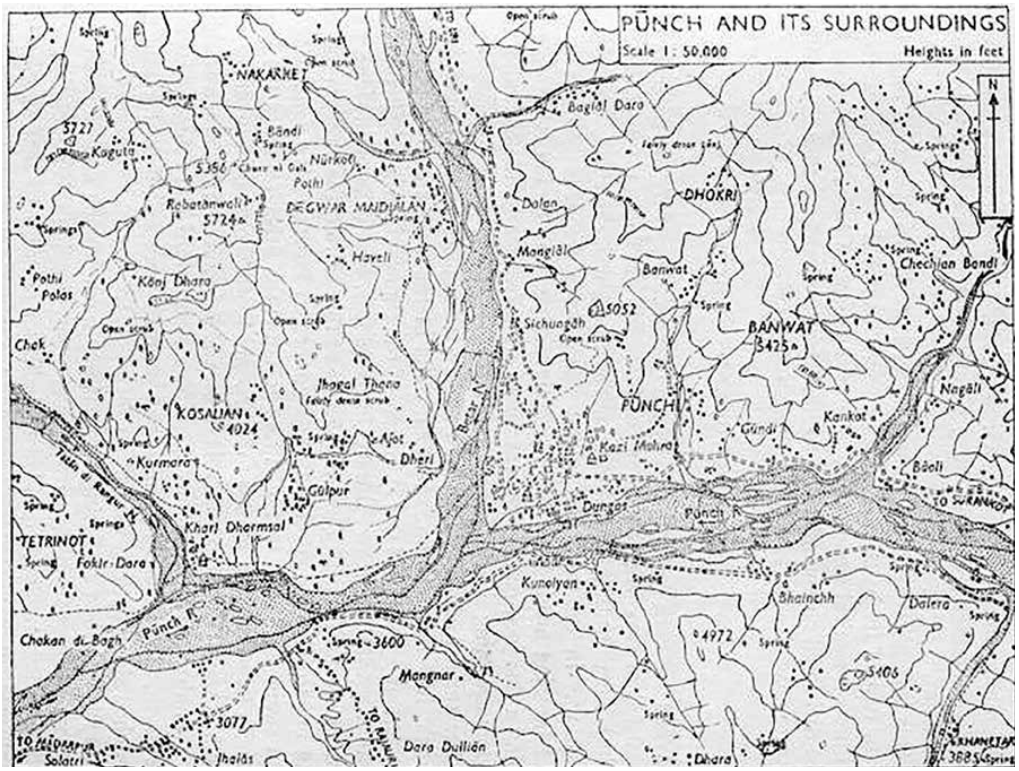
The author, Gp Capt Kapil Bhargava (Retd) in the cockpit of the HA–300 at the handing over of the restored HA–300 to the Deutsches Museum.

HISTORY

Historical Series On The IAF

Operation Poonching

It should have been a Mosquito light bomber squadron. Formed on 1 December, 1945 as a Spitfire squadron at Kohat, No. 12 Sqn of the Royal Indian Air Force converted to the Airspeed Oxford in Bhopal but within months was to become the first transport squadron of the RIAF. It drew its pilots from the existing fighter squadrons, most of them having flown Spitfires, Hurricanes and Harvards. An Air Marshal recalls, "We were given our training on the twin–engined Oxford and we were to go on to the Mosquito. But the Mosquito was an aircraft which had a fuselage made of plywood! Well, not quite basic plywood, but something like that. Amazingly, Mosquitos gave great service in Europe but here, in the tropics, they fell apart! Moisture and heat!"



From: The History of Indian Artillery.

With the induction of the Mosquito being shelved, but with the pilots already having done part of the twin–engined training, it was decided that a Dakota squadron would be formed instead. From Bhopal, the Squadron was shifted to Mauripur, Karachi, an existing RAF airfield which is a major PAF base today. Recalls Air Marshal LS Grewal, at that time a Flying Officer with No. 12 Sqn, "Training on the Dakotas began, but that was still underway when partition (of the country) came about. Just half a dozen pilots were fully operational while most of us were only trained for daytime flying. The squadron was on the move to Chaklala and Risalpur, some of us were still at Karachi, when a few days before partition, it was decided that the Dakota squadron would move to Agra. We had six aircraft and half a dozen reasonably trained pilots who each had about 30–40 hours on the Dak, while people like me had just 15–20 hours, all of which was by day". It was Shivdev Singh (now a retired Air Marshal) who was commanding this 'hotchpotch of a squadron' in late August 1947.

Initial days at Srinagar Airfield – a civilian bus embarks troops as a civilian Dakota in the background gets ready to take on civilian refugees for the return flight.

Within the next two months, the situation in J&K became alarming. While Maharaja Hari Singh dilly–dallied and Kashmir's fate seemed to hang fire, plans for annexing the state by Pakistan were beginning to take shape. In an interview published in the "Defence Journal" (Karachi, June–July 1985) with Maj. Gen Mohammad Akbar Khan (code named "General Tariq"), who was the commander of the raider forces, he goes on record to say, 'A few week after partition, I was asked by Mian lftikharuddin on behalf of Liaquat Ali Khan (Prime Minister of Pakistan) to prepare plan for action in Kashmir.'

On the 24th October 1947, a tribal lashkar attacked Muzaffarabad and successfully captured it. The next day they advanced and captured Uri. On the 26th, they occupied Baramula and Maharaja Hari Singh fled from Srinagar to Jammu where he finally acceeded the State

IAF C–47 Dakota at Poonch airstrip, flying in troops and flying out refugees.

to India. Says Air Marshal Grewal, "When Pakistan used the raiders as an excuse to attack, the situation developed very fast. On the 26th afternoon, we were asked to move to Delhi. We had four Dakotas with us and at the briefing in Air Headquarters, there being no Group at that time, we were told that the situation was critical, and we were to fly one of the Army units ...1st Sikh... with one company to Srinagar airfield."

The airlift began early morning on 27 October and the first troops to land at Srinagar were the Sikhs, who were built up to two companies by nightfall. The landing was unapposed as "Tariq's Raiders" held temselves up at Baramula indulging in an orgy of rape and plunder. It is interesting to read about General Tariq's version of what happened, "It was a part of their (tribal lashkars) agreement with Major Khurshid Anwar of the Muslim League National Guards, who was their leader, that they would loot only non–Muslims." He adds, "In September 1947, when the Prime Minister launched the movement of the Kashmir struggle, Khurshid Anwar was appointed commander of the Northern Sector. Khurshid Anwar then went to Peshawar and with the apparent help of Khan Qayyum Khan raised the lashkar which assembled at Abottabad and with which he entered Muzzaffarabad on the 24th of October 1947—reached Baramula where he delayed the lashkar for two days for some unknown reason."

Air Marshal Grewal adds, "The situation was so bad that we were instructed to fly low over the airfield first and see what was happening before attempting to land. Luckily, the raiders were still at Baramula enjoying themselves and hadn't arrived". The total number of Dakotas available on 27 October were listed in an Operational Order issued to 1 Sikh. Flight A from Willingdon, due to take off at 0500 hrs, included 6 civil Dakotas (to transport a company of 1 Sikh). Simultaneously, Flight B from Palam would also leave at 0500 hrs, comprising 3 RIAF Dakotas (ferrying the battalion's Tac HQ). Flight C from Palam was scheduled for 1100 hrs comprising 8 Dakotas (Patiala Mountain Battery) while Flight D also from Palam would follow at 1300 hrs comprising 11 Dakotas (second company of 1 Sikh). The civil Dakotas were to carry 15 men plus 500 lbs while the RIAF Dakotas had a capacity of 17 men along with the additional 500 lbs. 'Men' included personal arms, equipment and bedrolls.

The gloves were off once the first few Dakotas touched down at Srinagar airfield. No. 12 Squadron RIAF along with the hastily commandeered civil Dakotas, were to fly a series of shuttles between Delhi and Srinagar, airlifting the entire 161 Infantry Brigade within the next five days. Flying Officer (later Wing Commander) Desmond Pushong records a typical day in his log book: On October 30, flying a Dakota III, (VP 901), along with a crew comprising Flying Officers Gill and Roy and Warrant Officer Biswas, they took off from Palam to refuel at Amritsar prior to landing at Srinagar, a total flying time of 3 hours and 10 minutes. Says Pushong, "The civil Dakotas were slightly faster than ours because their engines were fitted with 'needle' props and the fuselages were highly polished being in natural metal. Our aircraft sported dull camouflage paint

that slowed us down a bit". The same aircraft and crew returned to Ambala at night, via Srinagar, in 2 hours and 15 minutes.

1 Sikh was commanded by Lt. Col Dewan Ranjit Rai, who decided to push his battalion right up to Baramula rather than deploy around the Srinagar airfield itself. This gallant officer was killed the next day, but his action was the first of many to check the advance of the tribal lashkars. The situation on the ground was desperate and as Air Marshal Grewal further recalls, "On the second or third day, we started using our fighter aircraft. They operated out of Ambala, strafing on the Baramula–Srinagar road, trying to stop those people from coming in. There was one bridge at Shalateng... we called it the black bridge... and the raiders in fact, had came up to that point. Our intention was to get the Spitfires to operate from Srinagar, so one of the Dakotas went to Ambala to pick up the technicians and basic equipment, ammunition etc. That aircraft was obviously overloaded, our knowledge of the Dakotas performance being so little in those days. Flt Lt CJ Mendoza was the Captain. He never got to Srinagar and we never knew what happened to his Dakota at that stage. They possibly missed the Banihal Valley, turned right and crashed into a hill near the Sheshnag Lake. This aircraft was located some 8 months later."

A series of 'lucky' coincidences continued to aid the Indians. First, there had been the raider's self imposed two–day delay at Baramula, followed by the unopposed landings at Srinagar and then Lt Col Rai's decision to move 1 Sikh up to Baramula. The battle fought at Shalateng on 7 November was to prove decisive in that the raider column was completely routed by 161 Brigade aided by RIAF Tempests and a troop of armoured cars from 7th Cavalry. With the raiders falling over each other to get out of the way of the now advancing Indian brigade, first Baramula and then Uri were liberated. Also, the successful Shalateng Battle ensured that Srinagar itself would never again be directly threatened throughout the year–long fighting that was to follow and that attention could now be focussed onto the area outside the Jhelum Valley where Kotli was reporting exhaustion of ammunition, Jhangar was beseiged, Naushera threatened, Rajouri captured and Poonch flooded by a steam of refugees while Kashmir state troops evacuated Rawalkot.

The emphasis shifted completely to the Jammu Province and Poonch in particular by the second week of November. Meanwhile, according to General "Tariq": "We overwhelmed the garrison at Bagh and took control of the tehsil. We sent a lashkar to surround and isolate Poonch from Srinagar. We captured Kotli, Mirpur, Bed Pattan and the whole area both sides of the road between Jammu and Poonch..."

On 12 November, Mehar Chand Mahajan, the former Prime Minister of J&K, had appealed to the defence Minister of India, Sardar Baldev Singh, to come to the rescue of Jammu Province. Another day was to pass before the recapture of Uri and only then could the diversion of troops and aircraft from the Valley be made possible. However by then, the fate of Mirpur had been sealed.

On 14 November, the Defence Committee of the Cabinet (DCC) met and in its appreciation of the situation, decided to evacuate the beleaguered garrisons close to the Jammu–Poonch–Uri road. Gen. Roy Bucher was confident that the Indian Army would be able to achieve these limited tasks along with the securing of the Jhelum Valley, but nothing beyond that. A study of the map of Kashmir and Pakistan clearly showed that, with the complicity of the Pakistan government, the tribal lashkars could motor right upto the Poonch border. In addition, at least forty serving soldiers who lived in Poonch had deserted to Pakistan with their arms and there were 2000 other soldiers known to be serving in the Pakistan Army who were recruited from that area. There was every possibility of mass desertion on their part to join the raiders concentrating opposite Poonch.

Mountain guns of the 4th (Hazara) Mountain Battery (F.F.) being loaded in Dakota (VP–903) of No. 12 Squadron.

There were other problems as well in the valley. Gen Tariq had let the raiders fight like regular troops which in turn provided the Indian Army and the RIAF a triangle tangible which was soundly thrashed. However, in mountainous terrain, the tribesman was certainly going to play his own guerilla game of infiltration, eschewing open country. The tribesman was far more dangerous, and that much more difficult to deal with, along the long and vulnerable line of communication from Pathankot to Jhangar. In addition, the overall military situation in India was also creating it own problems. Although it seemed improbable, at that time, that the Pakistan government had the stomach for an all–out war with India, intelligence gathered from various sources indicated the possibility

Supplies being loaded from an ubiquitous '1500 Wt.' truck into an equally ubiquitous Dakota, to be airlifted to Poonch.

of raids into East Punjab from Bahawalpur and parts of Rajasthan as well as Kathiawar from Sind, by hordes of tribesmen ostensibly acting independently and out of the Pakistan government's control. Finally, there was the major problem of Hyderabad (Deccan). The situation was fast deteriorating and it was clear that a show of military strength in that region was inevitable to subdue the Nizam's ambitions.

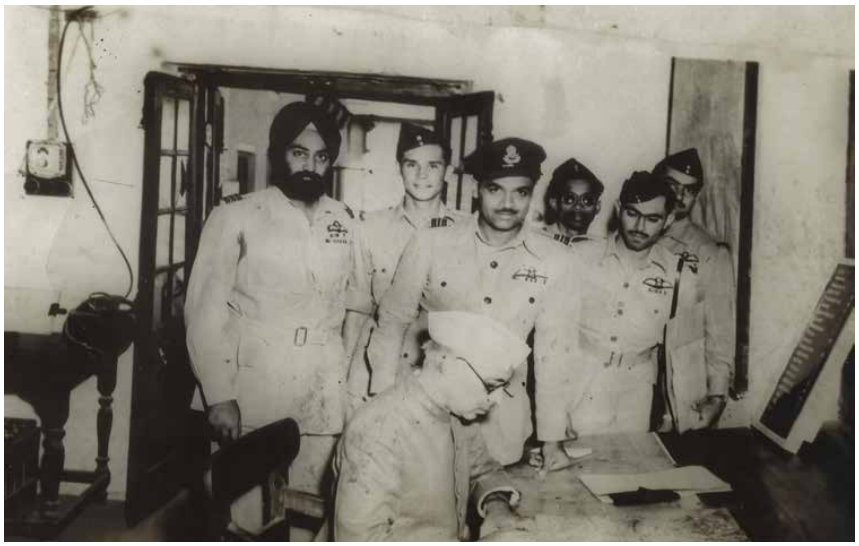
On November 16, Maj. Gen Kalwant Singh, GOC J&K Div ordered the immediate relief of Naushera, Jhangar, Kotli, Mirper and Poonch. The Poonch link–up plan meant that the thrust of 161 Bde from Srinagar would be diverted from Uri to Poonch over the Haji Pir pass while 50 Para Bde was to fight its way from te south along the Jammu–Akhnur–Beri Pattan–Naushera–Jhangar–Kotli–Mirpur axis. Gen Roy Bucher, the C–in–C, considered the plan to far exceed the Army's resources and was thus "dangerous, fool–hardy and risky" while Brig. Paranjape of 50 Para Bde also voiced his reservations.

The 'Poonch link–up' plan proved itself to be too ambitious. The advance got bogged down in the south while the Uri column was delayed, eventually starting on the 20th November. Its rearguard was badly mauled near milestone 7 where 24 lorries were ambushed. An ironical misfortune awaited the main body of troops. The State troops, seeing the lights of the approaching convoy, burnt down the wooden bridge over the Betar Nulla at Kahuta, leaving 1 (Para) Kumaon to make its own way to Poonch and becoming part of the garrison under command of Brig Pritam Singh. 161 Bde made its tedious way back to Uri where it was to fight off many attacks in the months to come.

The Dakotas of No. 12 Squadron RIAF were ordered to concentrate at Jammu. On November 16, Pushong along with Fg Offrs Singh, Roy and WO Ghosh dropped supplies over Kotli. Entries in the log book for November 17 record two successive fights Jammu–Amritsar–Jammu before yet another supply drop over Kotli followed by Mirpur. A bullet fired by a rifle hit WO Ghosh in the arm over Mirpur, says Pushong. "He got hit and when we landed back at Jammu I took him to the doctor, but the next day he flew a sortie with me to Srinagar followed by a supply drop mission over Poonch where a big problem had developed. This is a small place... a satellite state within J&K where a lot of refugees had congregated from across the border. Anyway, later that day we were back at Agra and Ghosh was taken care of."

Recollects Air Marshal Grewal, "We did move our troops into Poonch but soon after they were totally cut off as Pakistan had completely surrounded the valley from all sides and the only way in was by air. There was no airfield as such though there was a small level place available where horses used to be exercised. On one side there was the river, with a steep drop of a hundred odd–feet, while on the other there was a hut. The total length of the field was some 600 yards. Landing an aircraft there under any circumstances would have been very difficult but at that time we had an extremely capable leader.... Air Cmde Mehar Singh. But for him, I think that the operations would have been quite impossible for the Air Force."

No.12 Sqn RIAF had by then come under the operational command of No. 1 operational Group with its headquarters at Jammu. 'Baba' Mehar Singh, a man larger than life, setting an example in almost everything he did,



No. 12 Squadron aircrew room: Pandit Nehru, Air Commodore Mehar Singh, Sqn.Ldr. Pushong.

commanded the loyalty of the pilots in a manner that few man could ever hope for. On the other hand, another man was getting about the task of preparing the ground for the Dakotas to fly in. Brig. Pritam Singh was 'a tough guy', and one who was to display remarkable courage and determination in the days to come. To facilitate a regular flow of supplies, not only for the Poonch Brigade but also for the 10,000 locals and 35,000 refugees, Brig Pritam Singh organised hundreds of refugees to construct an improvised airstrip.

Pritam Singh and Mehar Singh were symbolic of the determination and courage of the two armed forces which had to coordinate to save Poonch. Prime Minister Nehru had declared that Poonch would be saved "at all costs". Kotli had already been relieved by Indian troops advancing from the south, but the advance was also temporarily halted at that stage. Around Poonch, the Indian pickets were well sited to meet the threat of the raiders from all sides. Based at Jammu, RIAF Tempest fighter–bombers and Harvards attacked enemy positions. On 4 December, Tempests subjected enemy positions northeast and north–west of Poonch to 20 mm cannon fire and again on 7 December enemy positions in the immediate vicinity of Poonch were subjected to rocket attack and straffing. On 8 December a Dakota successfully dropped supplies and an improvised aircraft bombed enemy targets north of Poonch while on 9 December supplies of ammunition were dropped. Recalls Air Marshal Grewal, "At night the raiders used to move their convoys around freely because during the day Tempests would harry them repeatedly, inflicting heavy losses. Mehar Singh then had this bright idea... why not load a bomb into the cargo compartment of a Dakota aircraft and roll it out of the door. So we began to do just that, live–fusing in the aircraft with a torch and rolling it out the bomb could land anywhere within the radius of half a mile, but it created a big bang... and the man on the ground did not know where it was going to land either."

It took the refugees, toiling under hostile mortar fire, six days to complete the Poonch landing strip, with fighters providing cover overhead. According to Desmond Pushong's log book, he first flew into Poonch, from Jammu, in a Harvard with Flying Officer Choudhry on 10 December. Says he, "I went to take a look and familarise myself with the terrain. Two days later, Mehar Singh landed the Harvard there also and followed that with a Dakota landing.

At Jammu, he told us that it was a difficult task but it could be done. All of us were very keen to get going and I landed there for the first time on 12 December Pushong's crew consisted of Fg Offrs Menon, Roy and WO Nanu, flying the Dakota III (VP 903). It was soon to become a familiar aircraft for the Poonch garrison. Yet another Dakota was hit while air dropping ammunition but managed to land safely at Poonch."

On December 13, VP 903 landed at Poonch on three occasions during the day. But it was premature for the Indians to celebrate. The raiders moved up field guns and by the evening had the airfield bracketed by mortars and field artillery. Recalls Wg Cdr Pushong, "After having got there in the first place, there was now this new crisis. I was at the bar in the mess when Mehar Singh walked in and he called Grewal and me aside. He asked the two of us if we were willing to fly there again with these howitzers and land at Poonch at night without any lights. I said we could try. His only brief to us was that if we found ourselves overshooting the runway, we were to retract our under carriage! Anyway, Grewal said we would get the guns there but he joked that the squadron might be minus two Dakotas. Mehar Singh just looked at us and said that was acceptable."

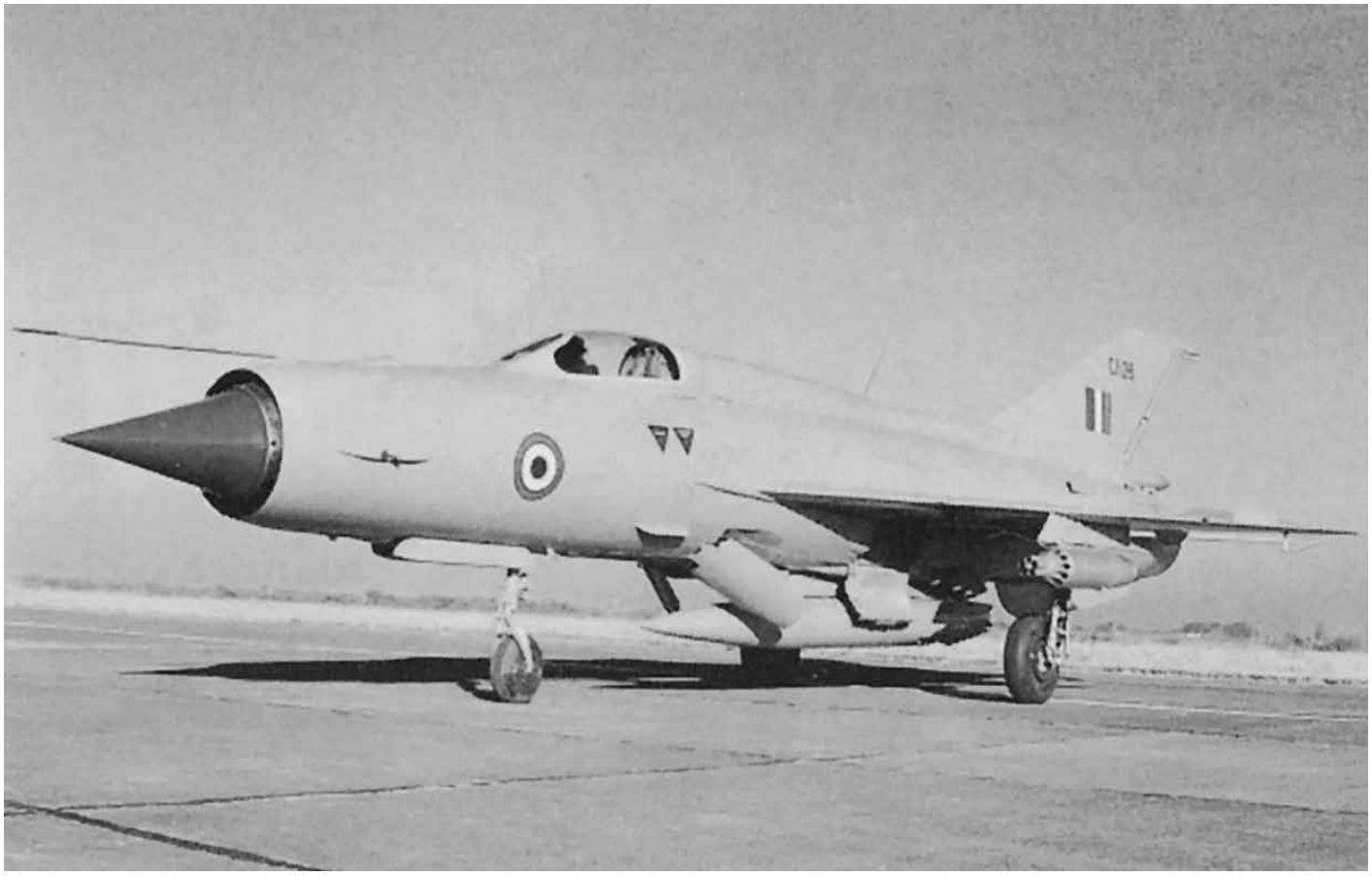
The 3.7 inch howitzers were from the Right section of the 4th (Hazara) Mountain Battery (F.F.). After loading, the two Dakotas took off on a bright moonlit night. Mehar Singh was hoping that the enemy gunners would have covered them and would be asleep. Air Marshal Grewal takes up the story, "I was to land first but our Pushong never listened to any briefing and he just cut me out and landed first. So I had to do a holding circuit behind the hills and wait." On the ground the first Dakota had barely come to a halt when a Kumaoni officer hauled himself aboard. Pushong grabbed his khukri and they slashed the ropes with which the gun were tied, the waiting troops manhandling the guns onto the airstrip.

Within minutes. VP 903 was airborne again. "There was no breeze and as the airstrip was a Kutcha place, a dust was hanging over it after Pushong took off. I couldn't wait too long and as a result I think it was the most stupid landing I ever did. I got to the threshold and cut the engines, but I couldn't see. I was just hanging there, hoping the aircraft would touch down. Minutes later, we had cut the second gun loose and were off again... I was just getting off the ground when the enemy firing started." But now the besieged Poonch garrison had got its own howitzers.

Article by Kunal Verma

Air Marshal Philip Rajkumar writes on…..

….The MiG–21 upgrade saga and the step–by–step manner in which the IAF got its definitive MiG–21 bison



MiG–21FL (Type 77)

The earliest mark of the MiG–21 (NATO Code Fishbed) to enter the IAF's inventory in 1963 was the MiG–21F–13, also referred to as the Type 74. It could carry 2 x K–13 Infra Red (IR) homing air–to–air missiles (NATO code Atoll) and had a single 37 mm NR–37 cannon and a gyro gun sight with radar ranging. The role of the aircraft was primarily air defence.

This was followed in 1965 by the MiG–21PF (Type 76) which was the first version to be equipped with an Airborne Interception (AI) radar, the R1L. The MiG–21FL (Type 77), made its appearance in 1966 and was equipped with the R2L AI radar. These two versions did not have a gun and could only carry 2 x K–13 missiles. The small number of Type 74s and Type 76s were phased out by 1968.

As war clouds gathered over the sub–continent in March 1971, a podded gun carried at the ventral station was supplied by the Soviet Union, but only a PKI fixed gun sight was available for aiming. Trials were then carried out with the Gyro Gun Sight GGS Mk 4 by the Tactics and Combat Development and Training Squadron (now the Tactics and Combat Development Establishment) at Jamnagar in mid–1971 but the modification was not pursued because the sight had to be installed inverted to fit in the available space. The December 1971 Indo–Pak war convinced the operations directorate at Air Headquarters that the MiG–21 fleet had to have a gun with a predictor gyro sight and a request was made to the Soviets for a gun–armed version of the MiG–21.

The MiG–21 M arrives

In 1973 the Soviet Union offered an improved version of the MiG–21, the MiG–21M, which in the IAF was known as the Type 96. This version had an AI radar (the RP–21M) and a twin barreled GsH–23 internally mounted cannon which could fire 3000 x 23 mm rounds per minute and had a gyro gun sight as well. In addition, this was equipped with an improved ejection seat (the KM–1) which had ground level ejection capability. The Soviets offered this version with a new engine, the R–13–300, which had somewhat more thrust than the earlier R–11F2S–300

engine which powered the Type 77 fleet. The airframe could accommodate the R–11 engine as well, but the R–13 engine had a second stage afterburner which cut in at Mach 1.6 to improve supersonic acceleration. However, a large saddle tank spoilt the beautiful area ruling of the Type 77 airframe and the Type 96 could not match the supersonic performance of the Type 77. The Type 96 however, had a gun, a radar warning receiver, could carry 2 x 490 litre drop tanks under the wing, an 800 litre drop tank at the ventral station and was therefore a more versatile platform.

As license manufacture of the MiG–21M was contemplated, the IAF had to quickly decide on choice of the engine. In February 1973, two MiG–21 M aircraft, one fitted with an R–13 engine was designated MiG–21MF (C–1533) and the other fitted with the earlier R–11 engine, remained the MiG–21M (C–1531), both positioned at ASTE at Kanpur. Sqn Ldr S Krishnaswamy (later CAS) and I carried out a comparative evaluation of performance of the two aircraft with the two different engines between 22 February and 4 March 1973.

The evaluation consisted of 24 operational profiles flown at low, medium and high altitude. Acceleration times to various Mach numbers, up to Mach 2.05 and time to climb to 19 km were compared. On 4 March 1973, I wore pressure clothing and flew two static climb sorties to 19 km on the two aircraft one immediately after the other. The visibility was barely 1.5 km at Kanpur because of dust haze and the radar surveillance by the radar unit at Memora, near Lucknow was not very good. I had to go out about 180 km in a south easterly direction, accelerate to Mach 1.85 in the turn on to reciprocal heading and then climb to 19 km. On each occasion, I reached 19 km with the 450 litres low fuel level warning light glowing in the cockpit while I was at a distance of 100 km from base. The prevailing poor visibility, pressure clothing which restricted outside view from the cockpit, the absence of navigation aids other than the radio compass and the low fuel state called for careful handling of the situation. I had to throttle back to idle below 15 km altitude, descend at 500 km/hr IAS, arrive overhead base with just 300 litres which gave me three to four minutes to execute the circuit and landing. It was satisfying to complete the static climbs. The R–13 engine did give the MF version a small but noticeable edge in performance over the M version at low and medium altitude. Since the R–11 was already being manufactured at HAL, Koraput Air Headquarters decided to drop the R–13 on techno–economic considerations.

MiG–21M (Type 96)

The Soviets did not give up efforts to convince Air Headquarters to produce the R–13 instead of the R–11 at Koraput and offered an improved version of the R–13, the R–13 F for evaluation by IAF test pilots. In April 1975, Air Headquarters sent a team of three officers, Wg Cdr PM 'Ramu' Ramachandran (later VCAS), Sqn Ldr BR Madhav Rao, an AE(M) officer who had vast experience of working on the MiG–21 and myself to Krasnodar, near the Black Sea to carry out the evaluation. The R–13 F engine was identical to the R–13 except that it had the provision for an emergency reheat mode which could be engaged when required by turning on a switch which was just ahead of the throttle. At Krasnodar we were not allowed to exceed 1000 km/hr IAS in the local flying area. Ramu and I could not find any difference in performance in the sub sonic regime. When we discussed our findings with the Soviets, they turned around and said that the main advantage could only be seen while accelerating to limiting IAS at low level or while accelerating through the transonic regime at medium altitude. When asked to be allowed to go supersonic at Krasnodar, they refused, saying that the area where they carried out supersonic flights, foreigners were not allowed to fly! We returned to Air Headquarters and categorically stated in our report that it was not worth going in for the R–13 F.

Our rejection of the R–13F engine had a very beneficial effect because when the CAS, Air Chief Marshal OP Mehra, visited the Soviet Union a little later, his team was shown the definitive MiG–21bis, fitted with the R–25 engine. The R–25 was a much superior engine to various engines fitted in MiG–21s so far in IAF service and the MiG–21bis entered service in 1976, being more capable than the M version because it had a superior AI radar, the Almaz, and a better engine. Both the airframe and engine were to be manufactured under license later by HAL.

In 1983 Air Marshal LM Katre was appointed Chairman of HAL. He set about trying to revive the moribund design bureau of the company. He ordered the HPT–32 to be re–engined with a turbo–prop, the Hindustan Turbo Trainer–34 (HTT–34). I had an opportunity to fly some sorties on this very lively aircraft, which had impressive performance, spun exactly like the HPT–32 and would have made an ideal trainer for the basic flying stage in the IAF. Had this aircraft development been pursued we would not now have had to go to the world market to look

MiG–21UM (Type 69)

for an HPT–32 replacement. The Ajeet trainer project was given the go ahead and a MiG–21bis modernisation project was launched at HAL, Nasik. Air Marshal LM Katre was a visionary Chairman and HAL had an opportunity to dramatically transform itself under his leadership but regrettably, his tenure at HAL (and later as CAS) was all too short.

Dr Kota Harinarayana who was the Chief Resident Engineer (CRE) at Nasik joined HAL and was made chief designer of the Nasik Design Bureau. One MiG–21bis airframe (C–2270) was modified with the following modifications:

- The leading edge of the wing was fitted with a vortex plate. This was no more than a steel plate with a rounded contour to fit the leading edge with a metal plate about six centimeters in length which protruded from the bottom of the leading edge into the airstream. This device was a modification developed by the National Aerospace Laboratories (NAL) after extensive wind tunnel work at Bangalore and meant to energise the airflow over the wings at high angles of attack thereby improving turn performance.
- The normal two position wing flap was replaced by a blow back flap which extended in stages as the speed reduced. It retracted fully at about 700km/hr IAS. This device was also meant to improve manoeuvere performance at low speeds.
- An enlarged saddle tank which increased fuel capacity by 200 litres was fitted. This modification certainly made the dorsal spine behind the cockpit look fat and ugly!
- Some Soviet era avionics like the radio, radio compass, radio altimeter were replaced by Western avionics. To make use of the savings in weight a small rubberised fuel tank containing 120 litres of fuel was fitted in the area behind cockpit pressure bulkhead.

After initial flights at Nasik, the aircraft was positioned at ASTE in early 1985 for a thorough evaluation. I was the Chief Test Pilot at ASTE at that time and the evaluation was done by pilots in the Flight Test Squadron. I flew only one sortie on 14 June 1985 to look at the problem areas pointed out by the evaluation pilots. The vortex plate did improve subsonic turn rates by about 8–10 % which was good for a passive, low cost device. Supersonic acceleration, however, deteriorated due to the fat saddle tank and the combat flap did not significantly improve manoeuvere performance. Air Headquarters rejected this attempt at modernisation but this was, however, a good learning experience for the Nasik design bureau.

MiG–21bis (Type 75)

One of the principal drawback of various marks of the MiG–21s in IAF service was the absence of a navigation and attack system. Navigating at low level with only a stop watch, compass and map required a lot of training and practice to attain and retain proficiency. Weapons could be delivered accurately in a dive only by adhering to rigid entry and release conditions which did not allow for any tactical flexibility in the attack. Lay down attacks with retarded weapons were equally difficult because the target would disappear below the nose well before the release point. The final release had to be done by counting down a time delay after the target had disappeared! This method was not very accurate and so by 1986 the IAF had started serious search for a suitable navigation and attack system for its MiG–21 fleet.

Evaluation in Egypt

In 1987, Marconi Elliot of the UK informed Air Headquarters that they had fitted a nav/attack system in MiG–21Ms of the Egyptian Air Force (EAF). The system consisted of a Head Up Display (HUD), a display processor which also did weapon aiming computations and a air data computer which accepted inputs from the aircraft's pitot static system and twin gyro platform to perform navigation calculations. A colour video camera which recorded HUD symbology to act as a useful mission debrief tool and a keyboard fitted just below the HUD which was the input device, completed the system. Apart from the HUD, keyboard and camera which were fitted in the cockpit the rest of the system was neatly packaged in nose compartment of the aircraft.

IAF team in front of 'Monument to Aviation' at Krasnodar Air Base, USSR, in April 1975: Sqn. Ldr. BR Madhav Rao is 3rd from left, Wg. Cdr. P.M. Ramachandran is 5th from left Sqn. Ldr. P. Rajkumar is 7th from left.

Thanks to good relations existing between the UK, India and Egypt, the company offered to arrange for a no cost – no commitment evaluation of their system fitted in an EAF aircraft. The EAF wanted their aircraft to be insured and the insurance company in turn wanted to know the qualifications and experience on type of the pilot who would perform the evaluation. Air Headquarters detailed me to do the evaluation and the insurance company accepted my competence to do the job as I had flown over 2000 hours on various marks of the MiG–21 by that time!

As I was not in regular flying touch with the MiG–21M, I requested Air Headquarters to attach me to an operational squadron for a short while to get my hand

back and practice weapon delivery. I flew seven armament sorties with No. 29 Squadron at Jamnagar between 4 August 1987 and 7 August 1987. I really enjoyed myself firing rockets and guns and dropping practice bombs over Sarmat range after a long break!

The evaluation was conducted at the Al Mansoura air base in the Nile delta, north of Cairo between 24 August 1987 and 29 August 1987. I was first briefed on the system characteristics by Marconi Elliot representatives and the EAF Research and Development department personnel. I familiarised myself with the system in a system simulator on the ground and was first given a sector recce sortie in a MiG trainer by Colonel Ibrahim of the EAF. The early morning haze over the delta was dense and visibility was barely a couple of kilometers. When we reached Port Said and started flying westwards towards Alexandria over the Mediterranean Sea, the visibility improved considerably. Colonel Ibrahim said he would send a chase aircraft when I flew solo and I agreed because the triangular cross country way points were small towns in the delta and it would have been easy to miss them in the haze.

In all I flew four sorties (tail nos 8354 and 8324) to assess navigation performance and did dummy dives over the airfield to prepare for the weapon delivery sorties. Unfortunately, the EAF got cold feet at this stage and did not authorise me for weapon delivery saying that the Wadi Natrun range in the desert west of Cairo was "not available". One or two sorties of weapon delivery would not have enabled me to collect any statistically significant data and EAF statistics would have had to be used in any assessment. In my view the lack of live firing did not affect the evaluation.

During MiG–21 Upgrade talks in Moscow, December 1993: at the Mikoyan Design Bureau. In front of bust of Artem Mikoyan, famed founder of the MiG Design Bureau are (left to right) Flt. Lt. Chatterjee, (unknown), Wg.Cdr. Sethi, Gp Capt. H. Masand, RA Beliyakov, Head of Design Bureau, Air Cmde Philip Rajkumar, Manucharov Rawal, Dy GM, HAL, Nasik.

After having flown the inertial nav/attack system in the Darin Jaguars, I thought this system on offer was primitive. It may have been state of the art some years earlier but it was clearly out of date. I did, however, find flying the MiG–21 with a HUD a pleasure and the video recorder debriefing tool of immense value. Air Headquarters now gave up its search for a nav/attack system for the time being.

The need for comprehensive upgrade

When AOC, AF Station Gorakhpur in 1989, I was sent on a short course on Systems Analyses at Metcalfe House in old Delhi. I found this course very informative and useful because it taught one how to develop quantitative criteria to aid decision making. In 1991 when I was Commandant ASTE I was asked by Air Headquarters to carry out a study on operational effectiveness between Soviet–origin and Western aircraft. Amongst other things this study clearly brought out the need to upgrade as many systems in an aircraft as possible if its effectiveness was to be improved. To meaningfully upgrade the MiG–21 fleet, a number of improvements had to be made in one go particularly pertaining to its primary sensor, the AI radar, and then navigation, weapons, weapon aiming and airframe life extension which was required for reasonable exploitation of the upgraded fleet.

The Soviet Union had passed into history at the end of 1991 and now the Russian Federation offered an upgrade package for the MiG–21bis fleet in 1992. At about the same time, India established diplomatic relations with Israel and defence ties with that country started to develop at a rapid pace. Israel Aircraft Industries (IAI) offered an upgrade of the MiG–21, which they had developed for the Romanian Air Force. In May 1993, I was sent to Tel Aviv to evaluate this proposal. The first topic I raised with the IAI engineers was about airframe life extension. When asked whether they had the structural data of the MiG–21bis airframe to carry out the life extension they replied in the negative and said they expected the IAF to provide

MiG–21bison

In pristine shape: the MiG–21bis

the data. I then flew a sortie in a Lavi test bed aircraft to evaluate the Elta 2032 radar which was being offered for the upgrade. Unfortunately the radar failed after only 10 minutes of flight and I was not able to evaluate it. When I submitted my report to Air Headquarters stating these two important factors, the Israeli proposal was rejected.

In July 1993 I was posted to Air Headquarters as Director Air Staff Requirements and the MiG–21 fleet upgrade problem dropped into my lap. The Mikoyan design bureau had offered a very attractive upgrade package at reasonable cost. The package consisted of new radar called the Kopyo, Beyond Visual Range (BVR) missile carrying capability, latest Close Combat Missiles, an Inertial Nav/Attack System (INAS), Counter Measures Dispensing System (CMDS) and some EW capability. In December 1993, I led a team of IAF, HAL and DRDO officers for a first round of talks on the upgrade proposal with the Mikoyan design bureau and had the pleasure of interacting with Mr Beliakov who was Chief Designer of the bureau.

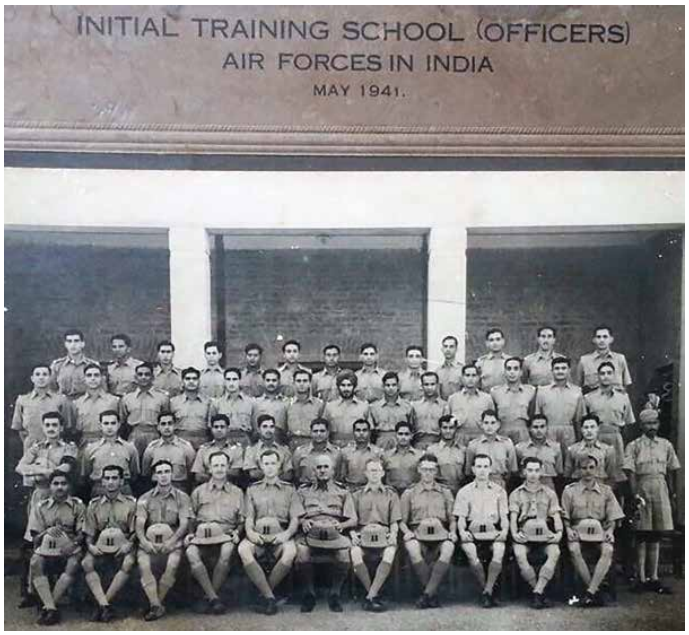
I had a group photograph taken of the team and him standing near the bust of Artem Mikoyan, the famous designer who had founded the design bureau. The Indian team visited several other plants where other systems on offer were being manufactured. Of particular interest was the team's visit to the Vympel missile design bureau at Tushino and the Sokol plant at Nizhny Novogorod (old name Gorkhy) dedicated to the manufacture of MiG designs. This was the plant where upgradation of the first two airframes would be carried out. We spent two weeks in the freezing cold of Moscow but returned to Delhi convinced that the Russian package was the manner to go. In July 1994, I led another team for the second round of talks and we were able to finalise the technical specifications of the upgrade. Commercial negotiations followed and the contract was signed sometime in 1996. The IAF positioned a team of test pilots and technical officers at the Sokol plant at Nizhny to oversee the upgrade programme. Wing Commander N Harish was the first IAF test pilot to fly the upgraded MiG–21bis now called the Bison (son of Bis!) in 2000. MiG–21 Bison squadrons are now in operational service and so the long and tortuous upgrade saga of the MiG–21 recorded its final chapter.

Air Marshal Philip Rajkumar

HISTORY

My IAF Training Days 1941

By Air Marshal AR Pandit PVSM AVSM DFC



No. 8 Pilots Course – Pandit standing 6th from right, last but one row.

At the end of every year, it is customary to take stock of achievements and failures gone by. A yearly balance sheet is a relatively simple matter but how does one go about it when a period of over 3 decades has to be covered?

There are some who meticulously maintain a diary, for them it is a straightforward process. I do not belong to that class, so I have to rely entirely on my memory. But believe you me when the dam bursts open, the memories start rolling down and are so crystal clear that every little detail is projected on the screen of your mind.

A young man in June 1940, at Indore, still at large, groping in the dark for that ray of kindly light to lead his way. Having decided wisely or otherwise not to pursue his college studies only to come up eventually in the queue, to join the "Baboos". Having decided to do some vocational training instead and completing short courses in Radio Communication and Electrical Engineering, the young man found himself at a loose end. All avenues appeared closed due to the War which was only a few months old. All avenues? No, not all, for there was a demand for young men to join the Defence Forces. So, this young man decided to take the plunge and that young man was me.

At that time my father was an honorary Lt Col in the Holkar army. Although a civilian officer he was required to wear a uniform. I remember having stared at that starched khaki uniform many a times and wondered if I would be lucky to find myself in one some time. Because of my father's rank and position I did enjoy some privileges. One of them being the use of the Cavalry horses for riding. I went regularly every evening for riding. I always dressed myself in riding breeches and made sure that the Rajput turban which I tied was at the cockiest angle possible. I had also arranged with my riding master, the timings, in such a manner, that I would always pass the Girl's High School when the girls were coming out of their school gate. What a terrific delight I took when the girls tried to get away from the path we came trotting by. Major General Carpendale was the C–in–C of the Holkar Army and always appreciated my riding whenever he happened to be around. As a matter of fact, he was the one to goad me into applying for a commission in the Indian Army. He got my application forwarded to the Army HQ at Simla. I also applied for commission in the Air Force.

By July there was no news from the Army HQ or the Air Force. What was I to do? My father advised me to fill forms at the college, which was just opening after the summer vacation. I too thought that it was better to do that than sitting idle. So I joined The Indore Christian College and started attending classes. Then came the telegram from the Director General of Civil Aviation to appear before an interview board at Bombay. This was for pilot's training. The Civil Aviation Dept. was training pilots for eventual entry into the Air Force. A team consisting of about 5 members were going all over the country, interviewing young men and selecting them for pilot's training at the various flying clubs. As soon as the call was received, there was strong opposition from all my relatives, friends and well–wishers. Going to war was bad enough but going for military flying was worse than committing suicide, they said. My father was the only person who left the decision to me. So I pacified the old ladies of the family by saying that I was only going for an interview. With their blessings (I might not even be selected) if I was, the choice of proceeding for training would also be with me so why start mourning about it from now?

For the first time in my life, I travelled alone by train to Bombay. I stayed in a lodge opposite the Dadar railway station. The interview was in the Fort area. The interview board was known as the Ginwala Committee after the name of its President. One of the members of the board was Flt Lt S Mukerjee of the Air Force. Not having appeared before any selection boards earlier, I should have been but was somehow not at all scared. This may have been more due to my ignorance than anything else. Or perhaps I could not care whether I was selected or not, making me frank and fearless. I was also not quite used to conversing in English. However, I must have fared well because I was asked to go for the medical examination immediately after the interview.

Oh, yes! I must narrate an incident here. The President

asked Flt Lt Mukerjee if he wanted to ask any questions. Mukerjee thought for a time and then shot out, "Are you related to the Pandits in Bombay?" Equally fast I shot back "No, Sir". In retrospect, I think I need not have been that fast in replying because I was to find out later that Mukerjee was then courting a pretty lady named Sharada Pandit in Bombay. Not that my affirmative replying would have made any difference because as the later events proved, I was selected in spite of that.

Civil Aviation Scheme No. 2 entailed the selection of about 100 young men for flying training. I was told that there were nearly 4000 to 5000 applications. On selection, the candidates were to get all the training, boarding and lodging free and get a stipend of 100 rupees a month. When I heard that there were so many applicants, I was very pessimistic about the outcome.

The interview was in August and time was getting on. In my own mind, I was more than sure that I could forget about it. The old ladies and other elderly people in and around the family were very happy that the whole episode turned out to be just one of those happenings, like a dream to be forgotten. I also did not really think very much and started catching up with my studies. I used to burn the midnight oil day after day. I filled in the Final Examination form to be written in March '41. A friend or two now and again teased me about wanting to be a pilot but that did not upset me. Out of 5000, only 100 were to have been selected. Where did I stand a chance? Then came a printed reply from the Army Headquarters, Simla, that my application for the King's commission in the Indian Army had been registered but since I was underage I would be called up only after attaining the age of 20.

Air Force Selection and Karachi Flying Club

And then the day dawned! I do not remember the date but it was in the first week of December 1940. One fine afternoon there was a telegram asking me to report within 8 days at the Karachi Aero Club for flying training. Eight days to prepare, pack, travel and report at Karachi. How could I do it? Clothes were to be stitched, not even knowing what sort of clothes were required by a pilot under flying training, route of the journey to be found out, tickets to be purchased. Could he travel all the distance by himself having travelled only once alone to Bombay? And of course, was he to go or not? The response from the expected quarters was of course wailing and crying and wet dissuasions but I made up my mind for myself. My father appreciated it and never once opposed it. He said that the decision was mine and he hoped that I should never have any occasion to regret it. One mad rush once the decision was made, and on schedule, I was on my way. I had never seen tears in my father's eyes before. He was reported to be a stern and stonehearted man but bidding me goodbye, he was different and that unexpected show of emotion endeared him to me. I can now imagine what must have been passing through his mind. "Am I doing right in allowing my son to go? God forbid if something were to happen to him. What would all these people say? They were bound to blame me for knowingly sending my son to certain death. At the same time was it right for a parent to come in his son's way when he had selected his path? Then again, he was a mere slip of a boy, what did he understand about worldly things? But you were old enough to weigh all the factors. Should you have not dissuaded him? Poor boy! Had his mother been alive, she would have never let him go". The train started off, the tearful friends and relations started fading away in the distance, but the chain of thoughts continued to unwind for hours thereafter.

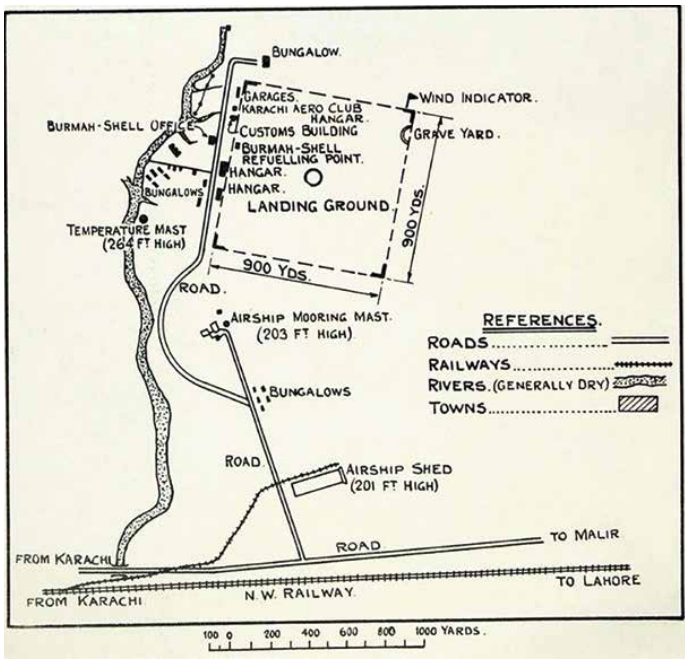
A young, uncertain and slightly lost boy was stepping off at the Karachi station from a train after having travelled for 3 days and 3 nights. It certainly was not a comfortable feeling to arrive at a strange place when dusk was just settling in. Thousands of miles away from home, no friendly or familiar face to look up to. A co–passenger, Gohel, got off at Drigh Road station and wanted me to do the same. He had told me that he was also attending the same training but I was told repeatedly not to trust strangers, so I decided to carry on to the Karachi Main Station. I had also written to a friend and a classmate of mine at Indore who was studying in the Karachi Engineering College. I lost some time looking for him and then panic started gripping me. A small steel trunk and tiny bedding were all I had and I kept on lugging it up and down the platform. When the crowd had thinned out, I decided to go to the nearest hotel for the night. After asking the station staff I was directed to one about a furlong away. The place was filthy. The people were so different and talked Hindi but in a different way that it almost sounded like a foreign language. I was so dog tired that I just did not want to do anything. I sat down in the armchair ignoring the bed which was anything but inviting. "Why have I landed myself in this situation? Would it not be wiser to catch the next train back?" Until the last minute, my grandmother was imploring me not to go. Her old shrivelled face in tears. I could see her so clearly. "You know when your mother died, I had promised her that I would look after you, your brother and sister. What would her old soul be saying? Please do not go. If you have to go, then wait for a few months. I am not going to last for more than a few months. Then you can do whatever pleases you." The face of my father with tears at only the corners of his eyes appeared before me in an enlarged projection form. How much anxiety and anguish have I caused him? Those friends of mine who were not quite sure whether they should have admired me for this foolhardy undertaking or sympathised with me as if I was forcibly being snatched away from them by some cruel fate. They stood there with either an expressionless face or grinning stupidly. While all this panorama was passing through my mind, the smells of onions and garlic being fried in preparation for a pulao or a curry continued to blow into my dark room. I guess I must have been put up in that spare room on top of a cook–house which no one would otherwise take. I knew not what time it was nor did I care. Like in a trance I sat and dreamt on.

I thought of the recent past few months. I had just returned from Bombay after completing Diploma courses in Radio Communications and Electrical Engineering. I had passed with honours The City and Guilds London examination in the 2 subjects also. How proudly I displayed those beautifully printed certificates without realising at that time that they were not worth the paper they were printed on; at least not at that particular time. I had dreams

of starting a workshop, which as time went by, would become a thriving one. How different I was and how proud I felt that while my classmates continued their routine college studies, I had already obtained technical qualifications which would set me off much before them on to a profession and a career. I went boasting about it and started acquiring a superiority complex. I made enquiries about obtaining the electrical and electronic test equipment and tools from various local firms. After all, I must have all those before I start off the repair shop. They directed me to Bombay, Calcutta and Madras offices. Alas! There were no replies from these places and the wind was being taken out of my sails. There was a danger that my hovering in the air was to bring me down to earth with a jolt. Then I learnt that with the war going on in Europe all imports had been stopped so I could forget about setting up anything. What a disappointment! I thought that the world had come to an end. I started hiding from my friends, shunning their company. This is when my father suggested that I resume my college studies. He has always been a tower of strength. My daydreaming puts me to sleep. I wake up with a start. I look around and find myself in a dingy hotel room. I then realise that I am in Karachi and it is already morning. I did not waste any time leaving my night abode, hoping never to set eyes on it again.

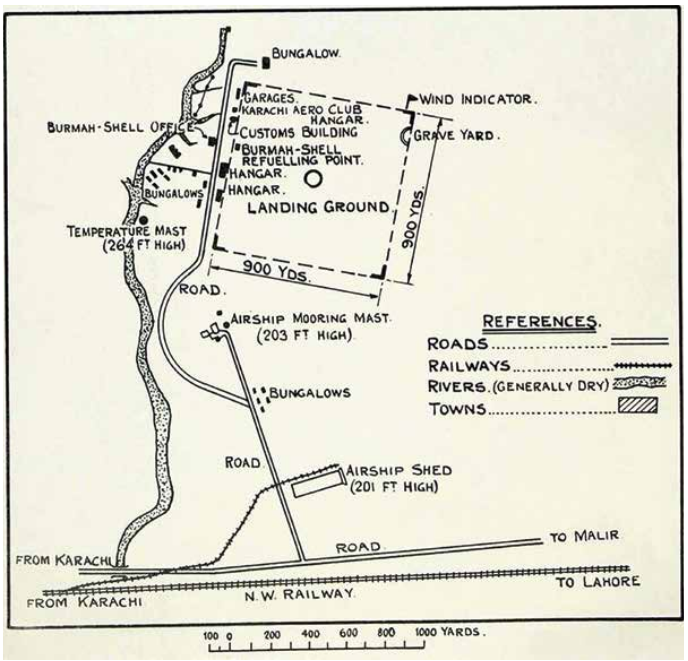
There was not a soul in sight. I saw a huge metal shed which I came to know later, was built as a hangar for the R101 airship which never arrived from Europe. In the distance was also a tall tower, as tall as the Qutub Minar. This was also built for mooring the airship R101.

Drigh Road – The R101 Airship Hangar and R101 Mooring Tower in the background. Karachi Flying Club was beyond the tower.

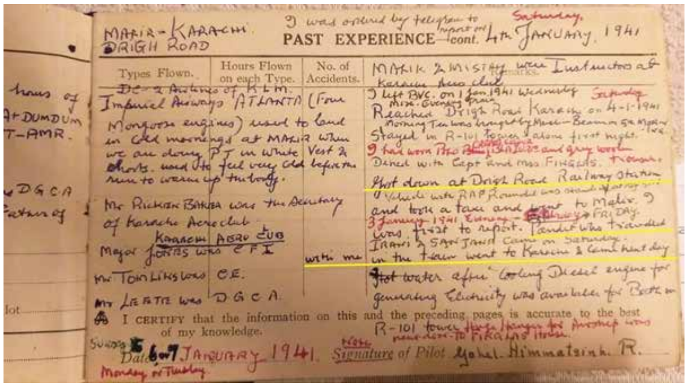


Map of Karachi and Drigh Road Airfield.

I hired a "gaddi" (horse drawn buggy) to take me to Karachi Aero Club and was told by the gaddi–wallah that it was 10 miles away. I did not believe him but agreed to pay him the demanded 10 rupees. It is a long way to the Karachi Aero Club and I wondered if I was really being taken for a ride by the bearded "gaddi" driver. After a seemingly never ending ride I was left by the driver at the gate of the Aero Club, on a main road, all alone.



I picked up my trunk in one hand and the bedding in the other, and jumping the gate, which was closed and locked for some reason, I started walking. After 15 to 20 minutes of walking, I came to a house and enquired about the whereabouts of the aero club. On being told that I was to report there for flying training, I was directed to go to the mooring tower about half a mile further on. The first person I met on reaching the tower was Gohel who took charge of me straightaway and took me to his room.


MAKIR-KARACHI
DRIGH ROAD
I was ordered by telephone to report on Saturday, 4th JANUARY 1941
PAST EXPERIENCE—cont.

Types Flown.	Hours Flown on each Type.	No. of Accidents.	Remarks.
~~DC-2~~ Airliners of K.L.M. Imperial Airways ATLANTA (Four Mongoose engines) used to land in cold mornings at MAKIR when we are doing PT in White Vest & shorts. used to feel very cold before the run to warm up the body.			MALIK & MISTRY were Instructors at Karachi Aero club
Mr Richard Baker was the Secretary of Karachi Aero club			I left BVC. on 1 Jan 1941 Wednesday ... Reached Drigh Road Karachi on 4-1-1941 Saturday. Stayed in R-101 tower alone first night. Dined with Capt and Mrs FINGLAS.
KARACHI AERO CLUB Major JONES was CFI		with me	Got down at Drigh Road Railway Station and took a taxi and went to Malir. I ... 3 January 1941 ... FRIDAY. was first to report. Pandit who travelled with me in the train went to Karachi & came next day. Irani & Sanjana came on Saturday.
Mr TOMLINS was CE.			Hot water after cooling Diesel engine for generating Electricity was available for Bath ...
Mr LEATE was DGCA.			R-101 tower. Huge Hangar for Airship was near-close to FINGLAS House.

I CERTIFY that the information on this and the preceding pages is accurate to the best of my knowledge.

Date 6 or 7 JANUARY 1941. Signature of Pilot Gohel. Himmatsinh. R.

Entry from HSR Gohel's logbook about meeting Pandit (yellow underline) (Courtesy: Gita Gohel Rathore).

There were 3 or 4 rooms at the base of the mooring tower where we were to be accommodated. I met the others. Amongst them were Hussain, Hasim Ali Khan, Irani, Latif, Choudhari, Hanif, Chadha and of course Himmat Singh Gohel. We were all to be put under the care of Captain Finglas who was on the administrative staff of the club. We were also to have our meals with him. He met us in the evening and told us what all was required of us.

Cadets at Karachi Aero Club 1941 – L to R: Pandit, Hussain, Hafiz, U/I, Gohel, Sanjana, Latif, Irani, HA Khan (Photo Courtesy: Gita Gohel Rathore).

That evening Gohel and myself climbed up to the top of the mooring tower as the lift had long been unserviceable. The Drigh Road airport where the aero club was located presented a beautiful sight from that elevated vantage point. In the distance, we could also make out the outlines of the city or what we thought to be Karachi. That night we walked to Capt Finglas' home for our first meal. Being a strict vegetarian, I had practically nothing to eat and envied Gohel and others who were relishing the non–veg delicacies on the menu. Capt Finglas also introduced us to the Western table manners, laying of the table with the correct placements of the cutlery and the crockery and their uses for different types of dishes. I felt that it was impossible for me to ever learn all that. On all such occasions, in future also, I always felt that I shall never get used to these strange manners of behaviour and then started feeling homesick every time that happened. We had no conveyance so walked back to the "tower" on the first night.

Our routine at Karachi started very early in the morning when it was still dark. We did our PT just outside in the open. One thing that I remember was that no tea was served in the morning and there was no hot water provided for bath. After PT we had a cold shower, got ready for breakfast at Finglas' and then off to the aero club. Two main personalities we met were, Major Jones, the chief flying instructor and Mr. Tomlin, the Chief Engineer. Major Jones gave us an idea of what all we were required to do while under training there. Tomlin introduced us to the four–stroke engine and the aerofoil. I also touched an aircraft with my hands for the first time in my life and what a proud moment when I got into the open cockpit of the Gypsy Moth trainer aircraft! We were to be trained on the Gypsy Moth and the Tiger Moth aircraft. We had two other flying instructors. They were both Indians. Mr. Mistry and Mr. Malik. I was assigned to Mr. Malik. Anyway, that day there were no flying instructions as we were still to be given our flying clothing. After lunch we went to buy our flying equipment. We bought a leather helmet and earphones (only tubes as there was no radio set in the trainer aircraft), flying goggles and a flying log book to maintain a record of flying.

For a few days we had lectures on The Theory of Flight, Aero–engines, Airframes, Meteorology and Navigation before we had our first flight. The flight lasted only 15 mins. But I felt so enthralled and was so busy observing the countryside that I do not think I paid any attention to what my instructor was saying. When I was asked to hold the flying controls, I mechanically did so but my attention was all focused outside the cockpit rather than on flying the aircraft until I realised that the instructor had already landed and we were bumping towards the aero club building. I know that the instructor must have concluded that I was more interested in taking a joy ride than learning to fly!

Our first introduction to what is known in the Air Force jargon as "Line Shooting" must have been after our first familiarisation flight. All of us must have had a similar experience as mine but everyone was starting to tell tales of how he flew the aircraft and had no difficulty whatsoever in handling the flight controls. Each of us had now done about 4 or 5 flights when we were visited by two Royal Air Force flying instructors, Flt Lts Middleton and Bishop. They flew with us and with our instructors for 2 or 3 days. After their departure, we could make out that they were unhappy with our progress and blamed the flying instructors for it. Within a week we got instructions to proceed to different flying clubs in India. Some of us were sent to Bengal Flying Club at Dumdum (Calcutta). We were booked via Lahore and Delhi and travelled at Government expense by Intermediate class on the railways. We were also given Rs. 10 each for travelling expenses. It was early Jan 1941.

Onward to Bengal Flying Club

On arrival, we found our way from Howrah station to the Flying club. We were shocked to see that we were to live in tents. We had our daily meals at the club. There were 2 or 3 other tents and the batch which had come before us also lived there. There were 3 or 4 instructors at the Bengal Flying Club – all Indians. Mr. Chitamber was the Chief Flying Instructor. Mr. Montes and Mr. Gosh were the other two. Then sometime later Mr. Rhodes, a tea planter

instructor also joined. They were all jolly persons and used to get together often with their wives in the evenings at the Flying Club bar. I particularly remember one person, Mr. Dhargalkar who used to be Maharaja of Dharbhanga's personal pilot and often came to the club with Sri Chitamber. We were all goodie goodie boys and were not allowed to make use of the bar.

Raja Gohel was a little more experienced than Abbas Hussain and myself in worldly affairs. One day we pooled up enough money to buy a bottle of beer. I still clearly remember how the 3 of us hid behind our tent and consumed the contents of the bottle without being caught by any of the instructors. What an exalted feeling of achievement we all felt then! Our flying instructions continued in the mornings. My instructor was Monte. A short man who was kind, unlike my previous instructor, Mr. Malik at Karachi. He took great interest in our training. His calm and sympathetic attitude made us learn fast. He was a polished flier and whenever he demonstrated an exercise, his flying which was very smooth, impressed me very much. I did my solo after 7.30 hours of dual instructions. In February, boys from the previous batch were sent to the Initial Training Wing at Walton, Lahore for Air Force training. We were also told that we would be following soon. In March I did my flying tests for pilot's "A" license. All 3 of us gained our flying licenses after successful completion of the ground examination, which was conducted in Theory of Flight, Air Navigation and Indian Aircraft Rules. We were also required to undergo tests in performing a figure of "8" over the airfield without going outside the limit of the aerodrome and also spot landing on the airfield circle after a "Glide Approach".

We had hardly any social life. On Sundays we used to sit in the club verandah watching the members of the club flying the aircraft as we had a holiday on Sundays. In the afternoon we went by bus to Sham bazaar and Chorangee for window shopping. Oh yes, in Calcutta for the first time in our lives we became the proud possessors of a suit each, which we got stitched. Grey Panama suiting selected after a lot of thinking! It cost us Rs. 45/– each. Apart from the occasional shopping sprees, we went for regular evening walks. Of course, the early morning PT and ground lectures were routine features. In March we had a visit by Flt Lt Bishop and flew with him. On his being satisfied with our flight progress, we were ordered to proceed to Lahore for 6 weeks General Service Training in the Air Force.

ITW Walton

We were received at Lahore station by Air Force personnel and taken to the I.T.W (Initial Training Wing) at Walton. We were accommodated in the hostel of a school or a college. The headmaster of the school had been put in uniform and was our officer commanding in the rank of Wing Commander. Wg Cdr Hogg was an old fatherly person. Apart from him, there were other instructors of whom I remember Flt Lt Stockwell—the Professor, Sqn Ldr Geddes, the chief ground instructor and Sgt Symes the P.T. instructor. They were all very strict with us and while at Walton we hardly had any time to breathe because our daily schedule used to be so tight.

Here, we got up at 6 AM, got ready for PT while it was still dark. PT lasted for about 45 mins commencing with a run. We then rushed back for a bath and put on the uniform, which was issued to us in the first week of our arrival. Breakfast commenced at 0800 and had to be finished to attend classes at 8.45. We formed ourselves into sections and marched to our classrooms. Sometimes the routine started with a drill and sometimes with classes.

We were not allowed to go to Lahore until we passed our saluting test. This took some doing because perfection was difficult to achieve particularly in the eyes of Sgt. Symes, our PT and drill instructor. We were all Flt Cdts, just below the officer status but above the non–commissioned officer status, so Sgt. Symes always addressed us as "Sirs", but invariably followed by the choicest and pungent sarcasm. For example, one day on parade Hafeez had not had his weekly haircut so Sgt. Symes stood behind him and asked, "Ain't I hurting you, sir?" For a while Hafeez did not know whether he was being addressed, then when he realised it he did not guess what Sgt. Symes meant. Hafeez said, "No, sergeant". "Well sir, I shall because I am standing on your hair." That was his way of indicating that Hafeez had not had his Tommy–cut. Somehow there was never any love lost between Hafeez and Sgt. Symes. Sometimes he used to say to Hafeez, "For God's sake don't walk like Frankenstein, Sir." Or better still, "Did you gentlemen sirs see the pregnant frog walking by?" (pointing at Hafeez).

Stockwell taught us Maths, English, current affairs and Air Force history. He was a typical school master and I am sure did not believe in the old saying "spare the rod and spoil the child." Geddes was more polished and taught us Air Force Organisation, Theory of Flight and other service subjects. The lectures lasted till 1300 hrs when we marched back to the mess for lunch. A few of us were expected to give short talks on the subjects allotted to us on the spot for 3 to 5 mins each before we moved to the dining room area. The meal was a sit–down one and lasted till about 1430 hrs. We did our homework between 1500 and 1600 hrs after which we were expected to go for games. We played hockey, football or handball.

Some days we went swimming. I knew just little swimming and was scared of water. Sgt. Symes got after me when he saw that I stuck to the shallow end. "Sir, would you please jump from the diving board?" There was no question of not obeying so I went up to the board and hesitated there until I got a shout from below. Sgt. Symes was in the water and said, "I am not here to drown unwanted kittens." I closed my eyes, said a quick prayer and plunged down. I was pulled out of the pool with water streaming out of my nose and mouth. After that, I always jumped from the board without being asked by Sgt. Symes to do it.

Games got over by 1800 hrs and we rushed back for a shower to get ready for dinner. All present had to go and wish the senior most officer present, a good evening. No one was allowed to sit. There was a seating plan and we were to enter in pairs according to the seating plan with seniors entering last. There was a President who sat at the head of the table and a "Mr. Vice" at the other end. Invariably we got detailed as "Mr. Vice" in turn while the President was always one of the instructors. The meal proceeded in perfect silence. Table manners such as "No one to start until everyone is served. And the President starts eating."

The waiters never started clearing the table until the last man had finished eating. After the dessert the table was cleared of cutlery and crockery except the glasses to drink the toast, which was done on special dining–in nights only. Two decanters of sherry and wine, like Madeira, were placed before the president and Mr. Vice. Both of them removed the stoppers and placed them on the table. The bottles were passed clockwise around the table. Only the right hand was to be used. After you filled your glass the decanter was not to be lifted but slid along the table to the person on your left. Waiters were to clean the hall before the President was to hit the gavel, stood up and said, "The King". Mr. Vice stood up and said, "Gentlemen, The King." All of us stood up and raised our glasses and said, "The King" and drank the toast after which we all sat down. The cigars and cigarettes used to then be passed around and after the President lit his cigar, it was taken as a signal by others to light up their own. If a President was a non–smoker, then he announced, "Gentlemen, you may smoke." Except on special dining–in nights when the President made a speech, we adjourned to the anteroom where coffee used to be served. The President was always the first to get up from the table and Mr. Vice, the last. On adjourning to the anteroom we had a debate on some point of common interest. By 2030 we said "Goodnight" and departed to our rooms. The lights were put off at 2200 hrs. We did our preparation or homework for the next day during the period 2100 to 2200 hrs. Invariably we dropped dead after this strenuous day's schedule.

Our course at the I.T.W. was given the title "No. 8 Pilot's Course". You will recollect that our batch consisted of about 100 but at the I.T.W. we were approx 60 to 65 which meant that nearly 40 boys were suspended at the Flying Club stage. All courses before us were commissioned as Acting Pilot Officers, as soon as they reported to the I.T.W. but from our course, to our great disappointment, the Govt. decided to start the Cadet Officers Scheme. This meant that we were not commissioned. When some of us started demurring, we were told that we would be commissioned as soon as we finished our Elementary Flying training. Anyway we had no choice. There were about 10 dropouts at this stage also.

The rest of us were divided into two groups at the end of 6 weeks of training at Walton, Lahore. One group was sent to No. 1 Elementary Flying Training School at Begumpet (Hyderabad). The other group went to No. 2 Elementary Flying Training School at Jodhpur. We saw very little of Lahore because as stated earlier, we were allowed to go to town only after we passed the saluting test. This took nearly 3 weeks so we managed to go to Lahore only twice or thrice. We were provided with a service transport for this purpose and had to get back to the camp by a certain time. During these visits, we patronised the standard restaurant in the Mall. It was a very popular spot those days. We did no shopping as we never had enough money for that purpose. On completion of our training, we were interviewed by our commandant, Wg Cdr Hogg, who met us individually. By the time my turn came, I was sweating profusely because some of the people who came out of the Wingco's office were almost in tears. Someone then whispered that they must have been told that their training was being discontinued. I was very apprehensive because none of us had been given any idea during our stay there as to how we were faring. Anyway, I walked in a trance into the Commandant's office and was happy to hear that I had done well and was to proceed to No. 2 EFTS at Jodhpur for further training. I quickly saluted, turned about and marched out before the old man had time to change his mind!

No. 2 EFTS Jodhpur

Our journey by train to Jodhpur was very eventful as far as I was concerned. We were 4 of us in the compartment. Since it was terribly hot, we had asked for a block of ice to be put in the compartment. It was about 2/3 o'clock, when the bearer was putting aerated bottles in the ice container, one of them burst. A piece of glass hit me just below my chin and I started bleeding profusely. There was a big commotion. My companion pulled the chain and stopped the train. One or two of them tried to apply pressure on my throat to stop the bleeding and almost strangled me in the process. Someone rushed to the guard to find that the First Aid Kit was so ancient that the injection needles in it were rusted beyond recognition. Then the whole train was searched for a doctor but unfortunately, none could be traced or no one came forward to render assistance. The next station was informed by the guard of the train on emergency telephone and requested for a doctor. By the time the next station had been reached the bleeding had more or less stopped and the quack who was available there put a bandage on the wound. Jodhpur was also informed by telegram to meet the train on arrival with an ambulance. I was meanwhile given a pill which must have been a kind of a sedative because I slept until the next morning when we reached Jodhpur. Pilot Officer Milneday, the Adjutant met us and I was whisked off to the hospital. The doctor put a couple of stitches on the cut and conveyed the good news that the shrapnel had missed my windpipe by 1/16th of an inch and that I was lucky otherwise it would have meant certain death. I thanked God for this.

Fortunately, my wound healed up very fast and did not affect my training at all. First week or so was spent in equipping ourselves with flying clothing. Then ground lectures to prepare us for flying. We had about 10 instructors, all from the Royal Air Force. Sqn Ldr Bonnar was the Commanding Officer. There were also 3 civilian Indian flying instructors. Mr. Parekh, Mr. Mehta and Mr. Rhodes who had come from Bengal Flying Club.

I was assigned to Mr. Manubhai U Parekh along with Gohel and one more Flt Cdt. Our drill and PT instructor as well as the maths teacher were also civilians belonging to Jodhpur. We were accommodated in the Annexe and tents put up temporarily behind the hotel building. Incidentally, the hotel was out of bounds for us trainees. We were issued with bicycles to move around the place. It was the month of May 1941 and Jodhpur was terribly hot. We commenced our flying training in the last week of May. Manubhai Parekh was a charming and affectionate man on the ground but he was just the opposite in the air – a real terror. He would shout at you at the slightest mistake saying there was no room for error. There were times when I used to be in tears in the cockpit. I remember two occasions when I just left the controls after a very violent dual instructional sortie which Mr. Parekh decided to give me.

On the ground we all always exchanged notes and I was told by one of the boys of the previous course that he had actually been hit by Manubhai on the hand with a joystick when he failed to satisfy him. However, as soon as he came out of the aircraft, he used to be all sympathy, affection and so fatherly that one forgot all the shouting in the air. My flying training continued despite Manubhai's show of temper in the air and I was sent solo after 6/7 hrs of dual flying. The day I went solo I was the happiest person because until that day I was convinced that Mr. Parekh was going to ensure that I was thrown out of training at this stage. We kept on flying throughout the summer.

At No.2 EFTS Jodhpur – Pandit standing 3rd from left last row. Maharaja of Jodhpur seated centre.

On the ground I was more than happy with my progress and I was also considered above average in PT and all other games. I was appointed the captain of my group. In Jodhpur as compared with Lahore we had enough time to enjoy ourselves. We often went for camel rides, picnics and sightseeing. The Maharaja was very pro–Air Force and held an honorary rank in the RIAF. He and his brother Raja Ajit Singh used to invite us trainees for dinners and other outings. I vividly remember His Highness' dinner at his Sardar Samand countryside palace. We were entertained to swimming and dancing. We also saw a tiger consuming a buffalo tied to a tree. This was a special treat to be seen through the binoculars. The poor animal used to be tied down to a pole about a mile or so from the palace. Floodlights were focused on the spot. As soon as the wailing of the animal stopped, it was assumed that the tiger had killed the animal and the lights were switched on. All the visitors were then treated to the sight of the tiger consuming his meal. The swimming pool was beautifully lit by underwater coloured lights and we had a glorious swim. Raja Ajit Singh invited us in batches to his Bal Samand House and we were treated to some exquisite dances. There was also an excellent zoo at Bal Samand stocked with well fed tigers, leopards and other wild animals. Just next to the airfield the Maharaja had started constructing a new palace on a hillock and we were not allowed to fly over it or the town itself. Jodhpur fort was worth a visit.

Those days Jodhpur airfield was surrounded by wide stretches of wild bushes which abounded in deer, chitals and buck. Our instructors used to go low flying with us and chase herds of deer. It presented a fantastic picture as hundreds of these animals chased by low flying aircraft ran for their lives. Some of the instructors also indulged in shooting from a low flying aircraft, landing in the field, picking up their shikar and bringing it back triumphantly to enjoy a venison dinner. The instructors were friendly with a number of Rao Rajas who lived near about the aerodrome. I remember one day when I was flying with an RAF instructor, he kept circling a house nearby at terrace level until someone came out and waved a white piece of cloth. Later I learnt that this was done for the benefit of a beautiful lady who resided there! Near the State House was also the famous Polo ground of Rao Raja Hanit Singh. Whenever we could we would cycle down to the ground and watch the game of polo which used to be played, if I remember correctly every Thursday. Rao Raja Hanit Singh and his sons were considered world–class polo players. Most of us youngsters were busy with our flying and groundwork but there were a few who were more enterprising and made friends with some local socialites and also formed some romantic and sentimental attachments in Jodhpur.

Our training in Jodhpur was to last for 3 to 4 months. Some of us could not go solo and were taken off flying training. However, they were sent for Observers training. I remember two of my very good friends Madhu Akut and Kailash Chand were sent for this to Ambala. We had a prince in our batch. Raja Saheb of Jawhar. He and I became good friends. Unfortunately, he did not do too well as a flier but was presented with the pilot's wings at the end of his training at Jodhpur.

We were still Flt Cdts and hoped that we would get our commissions as soon as we finished our training at Jodhpur. By 1941 we had more or less finished our flying and then the final tests started. This was yet another hurdle to cross and we again became tense and apprehensive as the exam date approached. A number of boys had already been suspended from flying training earlier. Twice I too was punished for bad flying. The punishment used to be running around the perimeter of the aerodrome with your parachute on your back.

Then dawned the day when Manubhai took me up and said that this was the trip to prepare me for the final test which was invariably with the OC and Chief instructor, Sqn Ldr Bonnar. I must have really flown well that day or Manubhai was being especially kind but there were no scenes created in the air. After this, I went solo to polish off some of the weaknesses pointed out in my aerobatics. For example, I used to be good in rolls and roll of the top of the loop to the left but slightly weak on the right. So I kept on practising one roll after the other to the right. Then Sqn Ldr Bonnar took me up for the final test. We did everything that was taught to us – steep turns, instrument flying, aerobatics and forced landings, ending with a perfect 3 point landing. I was flying with confidence and although the chief instructor did not utter anything during the flight, I could feel that he was more than satisfied. When we stopped in the dispersal he merely said, "good, please send the next man." I got down, saluted him and walked triumphantly back to Manubhai who was waiting near the flight office and asked, "How did

it go?" I did not want to commit myself, so I said, "I think it was all right, sir." He was not satisfied but did not press the point.

However, the next day Manubhai invited Gohel and myself to his house for tea. We were introduced to his wife and also met his children. He was very happy and told us that both of us had done well and he was proud of us. On our request, he also gave us each a snap of himself. On the reverse side of the snap given to me was written, "To my dopey but stubborn Pandit." Later I came to know that in my assessment by Sqn Ldr Bonnar I had been given an "above average" remark. Sqn Ldr Bonnar asked me to fly with him one day when the instructors were doing the formation. All our instructors would get together now and again to put up a 10 or 12 aircraft formation to show us how it could be done. I was, therefore, particularly happy that the leader of the formation, Sqn Ldr. Bonnar asked me to fly with him in his aircraft. That turned out to be my last flight out of Jodhpur. We were ordered to report to Service Flying Training School, Ambala. That was the first week of September 1941.

Capt Manu Parekh (centre with wings).

1 SFTS Ambala

On arrival at Ambala, we were hoping to be commissioned as promised but there was no sign of it. Oh yes! Our batch which had been divided between Begumpet and Jodhpur from I.T.W. was reunited at Ambala, but of course, there were a number of faces conspicuous by their absence. These were colleagues who were suspended from flying training. Some of them were at Ambala doing their Observers training as Navigators. Out of the 120 odd who were selected to undergo flying training at the civil clubs we were now only 25 left in the 8th Pilots Course. God only knows how many of us will remain to earn the flying wings and ultimately start our flying careers! We all eagerly waited for a week to be told that commissions would be given only on completion of our training in Ambala. This was a bit too much for us to digest and we spewed it out by putting up a joint representation to the authorities saying how promises were broken by them and that we should now be commissioned, or we had no choice but to go home. The authorities must have taken a serious note of this because we were told that as soon as we finished the first half of our course, we would be awarded wings and commissions; the date of commission being the date we commenced our training at Ambala.

The chief flying instructor at the Advanced Stage was Sqn Ldr Middleton and at the Applied Stage was Sqn Ldr Powley. I was put in the "C" flight. The flight commander was Flt Lt Woodroffe. My instructor was Flt Lt Tate but after taking me up for 4 to 5 dual flights he was posted out and I was assigned to Flt Lt Stott. Stott was a huge man known for his unsmiling and tough attitude towards life. It was said that he was a London Bobby joined up for the duration. Whatever the truth both of us took an instant dislike to each other. Had he had his way I would have been thrown out of the Ambala training, but fortunately for me Woodroffe and Middleton were very understanding and soon gave me a change of instructor.

We were busy being trained on the Hawker Audax and the Hawker Hart aircraft. They were originally Army Cooperation aircraft and bi–planes and had fabric covered wings. The rear cockpit was really meant for an observer or an air–gunner. There was position for a revolving gun platform on which a Lewis gun could be fitted. However, some of the aircraft were fitted with dual controls. The instructor normally occupied the rear seat whereas in Tiger Moth, the instructor flew from the front seat. The Audax and Hart were bigger, heavier and more powerful than the Tiger Moth on which we were trained at the Elementary Flying Training Schools.

The full photograph shows three Hawker Audax aircraft belonging to No.3 Squadron, Indian Air Force. The Audax feature the 'MR' fuselage code. The British got Hawker Audax aircraft manufactured for army complementary role. The first Audax flew in 1931. It was a single engine, two–seater and fighter–bomber aircraft. Royal Air Force and Indian Air Force extensively used it in early Second World War. (photo: www.bharat–rakshak.com)

Hawker Hart (India), Operator: Royal Air Force, Photographer: Dave Welch Collection.

Because of the attitude of Flt Lt Stott, I spent some very unhappy and anxious days at Ambala. We had a busy time—alternately flying in the morning and afternoon lectures or afternoon flying and morning lectures. Some of our senior Indian Air Force pilots used to take us up in the Tiger Moths and the Leopard Moth for navigational training and instrument flying. There were Plt Off Rehman, Fg Off P C Lal and one or two others. Fg Off G S Singh took me up for a few training sorties after I was taken away from the terrors of Flt Lt Stott. We commenced training in Ambala in September 1941 and by the end of November, we had graduated to the Applied Stage where the stress was on operational training such as air photography, air gunnery, formation flying etc.

De Havilland DH.82 Tiger Moth (photo: www.bharat–rakshak.com).

During the night flying training, we had a fatal accident involving Plt Off Gulam Nabi Khan. He was a pathan hailing from Peshawar. On the final approach, he undershot and went into a tree between our officer's mess and a church. He was burnt along with the aircraft. I happened to be in the mess at that time and saw Gulam Nabi still strapped to his seat but the fire was so extensive that no one could have dared to go near it. Khan must have been killed immediately on impact before the aircraft caught fire. This was a very sad event and of course very demoralising for us trainees. I remember how we were all assembled the next morning and given a pep talk by the instructors preparing us for many such happenings during the war and our flying careers.

At Ambala we had plenty of time to relax. We used to cycle down to the town and saw Hindi films as often as possible. We also got ourselves photographed individually and in groups after we were commissioned. Although the rank indicator stripe on our shoulder and our sleeves was so thin as to be unnoticeable, we were very proud of it. After finishing the Advanced Flying, we were commissioned as Pilot Officers. We also had to wear the letters VR (Volunteer Reserve) on our collars.

Newly minted Pilot Officers Pandit and HSR Gohel with VR collar badges and their Pilot's badge.

All of us were instructed to open a bank account each at the Imperial Bank of India Ambala Cantt. A long association started with the bank in Nov'41. We were also, as promised, commissioned with effect from 14 September 1941. From the back–pay that we got, I remember, my roommate, Nair, and I bought jointly a "His Master's Voice" portable gramophone for Rs. 75/–, then a large amount, sharing Rs. 37–8–0 each. At Ambala when we arrived, No. 6 Pilots Course was finishing their training. Notably on this course were Fg Off PC Lal, Plt Off Asghar Khan, Noor Khan Akhtar, Tutu Amber, Padam Singh Gill and Cheema. The other courses under training at this place were No. 5 and 6 Observers Courses and No. 7 Pilots training course. Most of the members of the No. 6 Observers course were our ex–colleagues who were taken off pilot's training. Notably amongst the 7th Pilots Course were Fg Off Rajaram, Plt Off Bobb, Barker, Kagal, NB Lal, Ganguly, Sanyal and Imtiaz Khan. Before the departure of No. 6 Pilots course we had a group photograph taken of all the trainees under training in Ambala.

Group photo of 6, 7, 8 Pilots Courses and 5,6 Observers Courses. Pandit seated 4th from left on the ground. To Pandit is sitting left of Gulam Nabi Khan. (3rd from left first row) (Photo Courtesy Gita Gohel Rathore).

As I've said earlier from Nov to the end of Jan '42 we were learning the operational exploitation of the aircraft. In aerial photography, we flew 2 pilots in one aircraft – one doing the flying and the other operating the camera. In Air Gunnery also two of us flew together – one flying and the other observing the strikes of the ammunition or the bomb. Vickers machine guns were used for air to ground and air to air firing. In Ambala, we did not do any live firing except for low–level bombing with practice 8 and a half pound bombs. For our live firing, we were taken to Kohat by train and from Kohat to Miranshah by air for the live firing exercises. I remember going with Flt Lt Hammerbeck in an Audax from Kohat to Miranshah when he told me how one day I would look forward to flying in these areas for operations. The entire area was over rugged barren hills and narrow valleys. The entire area was treeless and the consequences of a forced landing anywhere en route would mean capture and torture by the hostile tribesmen who were the habitants of these areas known as Waziristan. Although I did well in bombing and air–to–ground front gun firing my air–to–air exercises were poor. The strikes attained on the sleeve–target towed behind the Wapiti aircraft were as low as 1 in 100 and 3 in 150.

No. 9 Pilot's course arrived at Ambala in Oct/Nov'41. We were awarded the flying badges. There was no passing out parade. One morning we were lined up on the tarmac and the station commander pinned the coveted wings on our chests. However, in the evening there was a party in the Mess. We, trainees, were not allowed to consume any alcoholic drinks. As the training was coming to an end we were asked by our instructors where each of us would like to be posted. There were No. 2 and No. 3 Squadrons at Kohat and No. 4 was on the verge of being formed. No. 1 Squadron was on its way to Burma so there was no chance of anyone going to that squadron. In addition, there were 6 Coastal Defence Flights at Karachi, Bombay, Madras, Cochin, Calcutta and Vizakapatnam. Naturally, everyone opted to be posted to the Coastal flights as they were located in cities where the young pilots could show off. 8th Pilot's course, on completion had thinned down to 21 or 22 pilots only.

No 8 Pilots Course passing out.

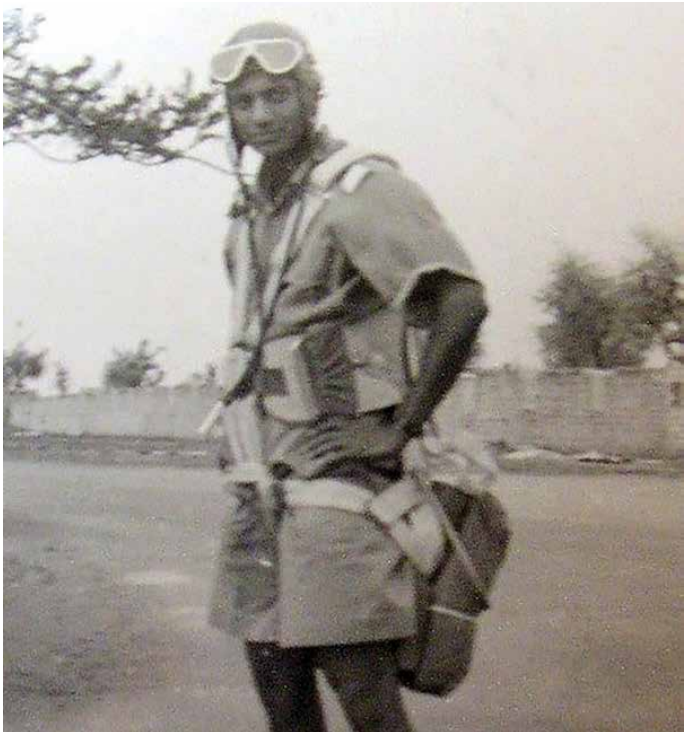
L to R Back Row – Georges, HSR Gohel, Zal Sanjana, Mehta, Rao, Sequeira.

Middle Row – Joe Ezekiel, TAM Andrade, Atal, Hussain, Goordeen, Guha Roy, AR Pandit, D Ranga Reddy.

Front Row – Pratap Lal Singh, Irani, Dorabji, BS Dastoor, Behman Sanjana, Anwar, Keshav Reddy, Chakravarty, R Atmaram.

Most of us were posted to Nos. 2, 3, and 4 Squadrons at Kohat with only a few people going to the coastal flights. On our course the best trainee trophy was awarded to Plt. Off. Dastur and the best in Aerobatics trophy to Plt Off Bohman Sanjana. Both these officers were killed soon after in flying accidents within a year of joining their respective Squadrons.

We had a big sendoff party in the Mess. The junior course No. 9 Pilots course was playing host to us. I vividly remember Plt Off Tahilramani treating us to classical and light vocal Indian music. It was remarkable about this officer. He stammered and stuttered extensively during normal conversation but sang so fluently without any interruption that it was unbelievable that he suffered from any disability. We were allowed to consume alcohol for this party but I do not remember anyone drinking anything stronger than beer. We were also given 14 days leave before joining our new units. I was posted to No. 2 Squadron.



Flight Cadet AR Pandit, Jodhpur, 1941.

Notes:

1. This is a handwritten article by Air Marshal Pandit typed by his daughter Mrs Kalpana Moghe. The original article was untitled.
2. Some photographs are from the personal collection of Air Marshal Pandit
3. Other photographs are taken from BharatRakshak.com courtesy of contributions made by family members of other veterans like Gp Capt HSR Gohel, Plt Off Ghulam Nabi Khan and others
4. Map of Karachi and article review by Jagan Pillarisetti.

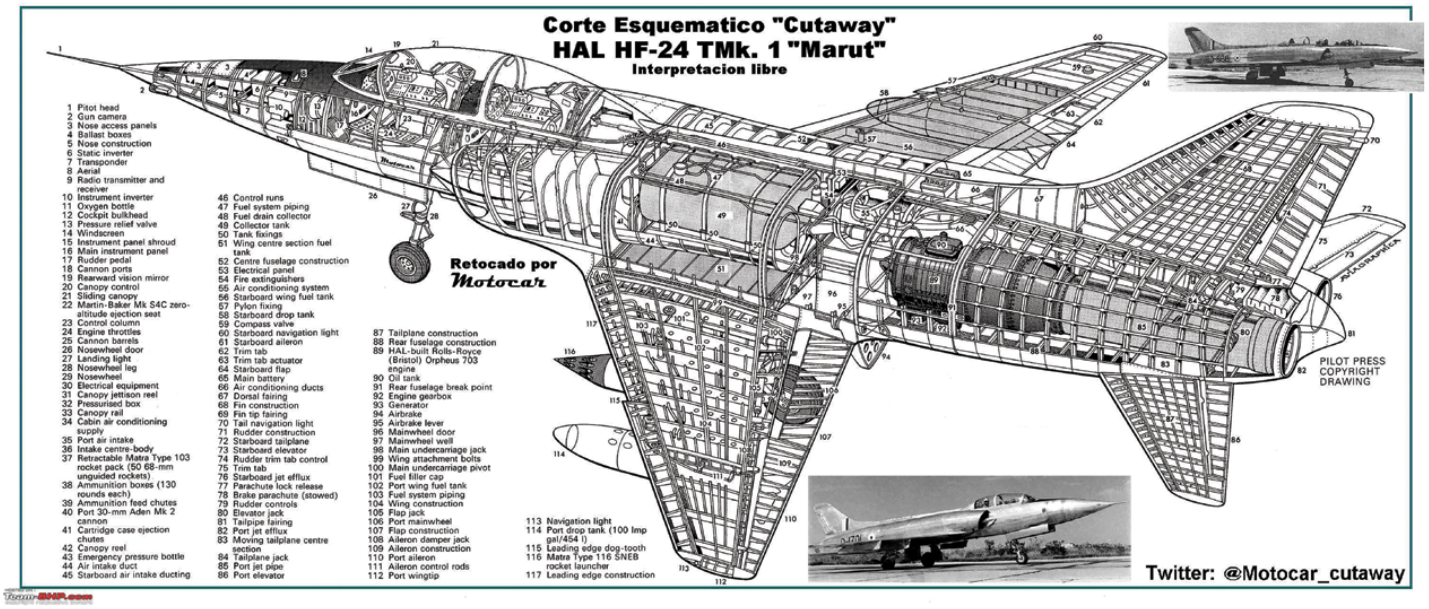
HF–24 Marut and the lost decades/opportunities

Air superiority aircraft, supersonic ground attack fighters, light transport aircraft and advanced jet trainers represent the spine of a modern air force and constitute the bulk of its tactical inventory. The Indian Air Force is such a modern air arm. In the seventies, or some two decades ago, the IAF had formulated a number of key air staff requirements (ASRs) to meet its needs for replacement of ageing aircraft with more modern equivalents. The MiG–21 FLs, which were the spearhead of the air defence system, was an excellent air superiority fighter but with severe limitations of endurance, armament and airborne radar ranging. The fleet of Su–7s. HF–24s and Hunters had to be replaced by a single supersonic tactical air strike aircraft (TASA) type. The Canberra bomber/interdictors were to give way to the supersonic deep penetration strike aircraft (DPSA) while the Vampire trainer would eventually be supplanted by an advanced jet trainer (AJT). The IAF's fleet of aging C–47 Dakotas, Devons and Otters needed replacement by a fuel efficient, versatile STOL light transport aircraft. Obviously, not all programmes could be realised at the same time but long term re–equipment plans were formulated, firming priority and funding because foreign exchange was always limited and precious.

In Hindustan Aeronautics Limited (HAL), the Indian Air Force, indeed the nation, had an enormous reservoir of opportunity to meet the IAF's requirements for most, if not all, its needs of the forthcoming generation from the mid–70s till the end of the century. HAL had built up a design and development capability through the 'fifties and 'sixties with a number of rational and practical projects, starting with the primary, piston–engined trainer HT–2

and a number of light utility and sports aircraft types such as the HUL–26 Pushpak, HAOP–27 Krishak and HA–31 Basant. The first combat aircraft, the HF–24 Marut, was developed in the late sixties and had entered operational service. The HAL design team, led by Prof. Kurt Tank and including veterans from Germany's World War II design bureau of Focke Wulf fame were of course engaged in the search for more powerful engines to fully exploit the HF–24's potential and the powerplants considered included candidates from Britain, the USA, France, the Soviet Union and even the German–developed Egyptian E–300. In the event, the HF–24 was not re–engined and remained transonic but this was more due to lack of sustained Government/indsutry effort than technological reasons. The Egyptian jet fighter/ jet engine development programme had come to an abrupt end after Israeli fighters attacked the Helwan works near Cairo in 1973, but the HF–24 was still the subject of two more major re–design efforts before the type was finally relegated to history. Since then, the mid–70s HAL's considerable design and development team were virtually without work for over a decade till

but no series production took place: the second wherein prototype development led to production and the aircraft went into operation: the third wherein design studies, building of mock–ups and testing of wind tunnel models took place but no follow–up development activity emerged.



the Light– Combat Aircraft (LCA) programme was finally launched in 1986. Meanwhile, a great deal of experience, talent and time had been irretrievably lost.

Hindustan Aeronautics Limited mark their 50th year of foundation in December 1990 and it is pertinent to review the various design plans and projects that were considered in that

lost decade and to speculate on what might have been had the powers–that–were persisted — with the several opportunities that came up.

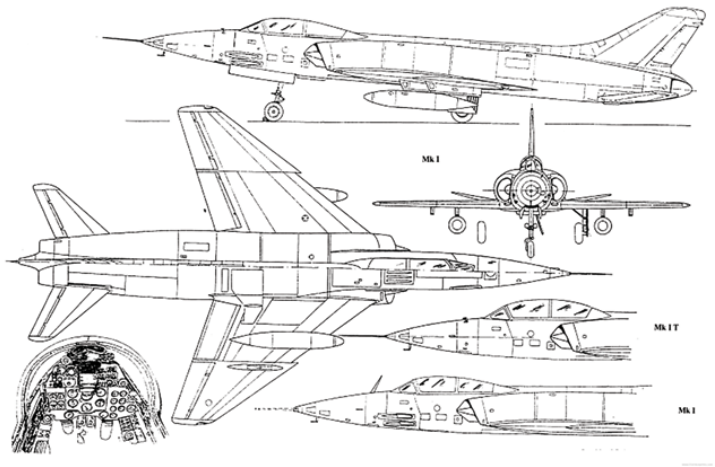
Aircraft design and development activity at HAL goes back to 1948 when the HT–2 primary trainer was launched. Aircraft design and development as has surely happened everywhere else in the world, falls into three distinct streams – one wherein prototypes were built

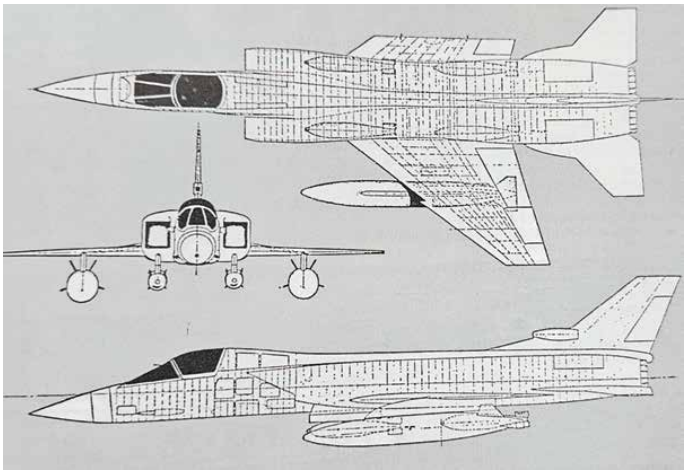
Unfortunately, the last category was the fate of most of the efforts of HAL's design teams in the lost decade of the seventies, a fact barely known to most and the real story, to just a few.

Had some of the projects which were studies in detail and which had shown reasonably good promise been allowed to go ahead, many more indigenously developed aircraft would have flown in India's skies.

With the benefit of hindsight, one can firmly state that most of these projects were contemporary with those elsewhere in advanced aerospace countries. In HAL's 50th year, it is important to recall some of these to provide a perspective on the design capability and associated technological expertise that existed at Hindustan Aeronautics Limited but was not exploited.

HISTORY



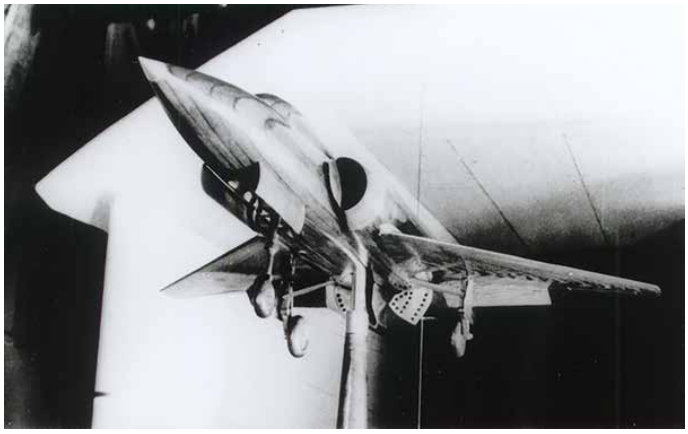


Realising the need to visualise and conceptualise future programmes, an Advanced Projects Group (APG) was created as far back as 1964 under the design leadership of Raj Mahindra who, besides his other duties of heading the HJT–16 (Kiran) basic trainer aircraft project, was assigned the task to focus on likely military and civil aircraft requirements, and oversee feasibility studies.

Interestingly, the Group made extensive design studies firstly on an STOL transport–cum–freighter aircraft suited to the Indian environment, followed by a preliminary study on a transonic fighter aircraft.

However, because of the rapidly changing defence scenario in the country at that time, the Group was soon directed to concentrate on meeting the requirements for a supersonic combat aircraft for the Indian Air Force. Before describing this study, a brief outline of the earlier transonic fighter aircraft (Ground Attack Fighter I or GAF I) is pertinent. This fighter was conceived taking into consideration various lessons learnt from the 1965 air battles with Pakistan.

The transonic fighter was to be powered by the M–45 engine which was being developed as a family concept jointly by Bristol Siddeley of the UK and Snecma of France. The version chosen was without reheat, with an estimated performance near Mach 1.0. A wide array of armament, besides integral guns would have been carried externally and the GAF I would have also been deployed for intermediate interdiction tasks up to 150 miles behind the battle–field.



The study of an STOL transport–cum–freighter was made with a view to meet the domestic airline's requirement for a 100 seat jetliner as also that of the IAF for a medium tactical transport aircraft (METAC) to replace the Fairchild Packet, Dakota and Caribou for air maintenance and logistic support needs both in the plains as well as in the mountains.

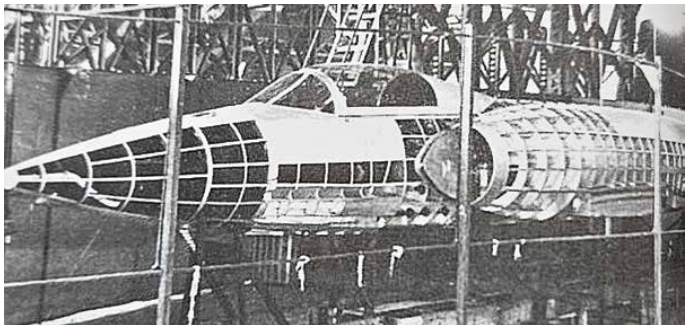
A feasibility study was performed embodying the most advanced aerodynamic and propulsive concepts known at the time. Concepts such as fan–in–wing and turbofan engines with blown flaps and thrust vectoring capability were extensively studied. Use of slip stream from the specially designed propellers for the turbo–prop engines was also considered before finally deciding on the best configuration suited to the Indian environment.

The configuration using four Rolls–Royce RB–153/ RB–172 turbofans of 6850 lb thrust each was the preferred choice. Four 1500 shp engines based on the RR Dart turboprops was the other configuration studied in great detail. The aircraft was to have a 6 tonne (13,200 lb) payload over a stage length of up to 1150 nautical miles, depending on the passenger/ freight demand. The aircraft's all–up weight was 26,000 kg (57,000 lbs) with a take off distance of 550 m length runway using Medway type deflection nozzles for thrust vectoring combined with blown flaps deflected through 60 degrees. The turbo–propeller configuration had full blown double slotted large chord flaps. A high wing, all aspect ratio of 7 and a wing loading of 57 lbs/sq.ft were chosen to reach a judicious compromise between the civil airliner and the military freighter versions. Gust intensity of 66 ft/ sec at 22,000ft altitude was specified for structural design.

The turbofan version would have a maximum cruise speed of 470 kts while the turboprop version had 295 kts. The study established the operating cost over several stage lengths for each of the configurations. The design configuration was not only contemporary but had advanced features which were later seen to have been adopted by advanced aerospace companies in the West. Unfortunately, development work on this project was abandoned in favour of combat aircraft which had all the priorities. However, as later events unfolded, the tremendous efforts put in by parallel design teams at HAL (besides the Advanced Project Group) did not succeed in persuading the Defence

Ministry to launch full–fledged design and developed of even the combat aircraft in the country, until the Light Combat Aircraft more than ten years later.

In 1967, the Advanced Projects Group took up the feasibility study for an interceptor–ground attack aircraft to counter the fighters expected to be in service with China and Pakistan in the succeeding decade. The threat as perceived then indicated the requirement for a long range potent aircraft/weapon system capable of deep penetration raids as well as having credible self–defence capabilities. The multi–role capability of the F–4 Phantom type aircraft became the target to emulate. These were the Ground Attack Fighter I (transonic) powered by the M.45 and the Ground Attack Fighter II (supersonic) to be powered by two R.11F–300s (same as on the MiG–21 FL). Detailed wind tunnel model testing of the configurations were carried out and many combinations of internal and external loads tried out for optimising the supersonic and subsonic performance of the fighter. The GAF II was designed to achieve Mach 0.9 with a multi–array of ordnance at 300m and also Mach 2.2 at altitude with air–to–air missiles. The design drivers inevitably resulted in the selection of the M.45 by–pass engine with reheat.



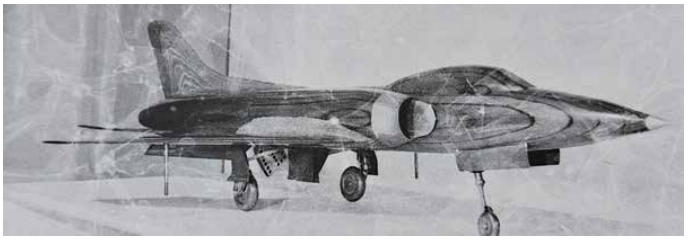
This engine family, as mentioned earlier, was under development in the UK and France at Bristol Siddeley and Snecma respectively. High speed wind tunnel tests confirmed many of the theoretical estimates in the study as at one time doubts had been expressed about the drag of the aircraft. The configuration presented a very good basics on which to launch a prototype development effort. It was however clear that a far more elaborate infrastructure would be required for HAL to develop and build a new generation fighter.

Therefore, a parallel design using the forward fuselage of the HF–24 MK.IR with some modifications to its canopy contour was offered to the IAF. This design retained the essential structural features of the HF–24 for the wing, empennage and other structural members. The aircraft was so sized as to carry internal and external fuel to provide better than a 300 n.m. radius of action with maximum ordnance specified for the ground attack mission, the aircraft was to be fitted with the Soviet R.11 turbojet enabling a speed of 690 kt with maximum reheat at low level and Mach 2.0 at 36,000ft altitude. Contemporary avionics, including navigation and weapon aiming systems were offered. The study was completed in 1970 and indicated a potential induction of this version of the fighter into service in 1976. However, this did not receive any go–ahead and instead Air Headquarters issued a firm requirement for an Advanced Strike Aircraft (ASA) but even here, great emphasis was laid by the IAF on the secondary ground attack role. The aircraft was to achieve Mach 1.2 with maximum reheat at sea level, and acceleration from high sub–sonic speed to Mach 1.2 was to be in less than 30 secs.

The design team conducted multiple studies on the ASA using four different engines. These were the Rolls–Royce RB 168–69R Spey. Rolls–Royce RB 199–34R, Tumansky R.11F–300 and the indigenous GTX–37 (still at conceptual stage). The configuration finalised was with the RB199, to be later supplanted by the GTX–37.

The final configuration of the Advanced Strike Aircraft as proposed by HAL met most of the essential requirements of the Indian Air Force. While evaluation continued for some time, approval for prototype development simply did not materialise.

In 1973 Messerschmift–Bolkow–Blohm MBB of Germany made a dramatic offer to jointly develop the HF–24, using two RB 199s, into the Hindustan Supersonic Strike aircraft labelled the HSS–73, later known as the HF–73. The HF–24 main frame was retained but radical change made to the fuselage, the side air intakes and the centre wing. The horizontal tail was increased in size, the cockpit modified to improve vision, but the outboard wings, beyond minor changes, were retained. All tanks in the fuselage were made integral to increase fuel capacity. A new avionics suite consisting of an advanced fire control system, inertial platform, central computer, head–up display and laser ranging including passive warning devices etc. were incorporated in the design. Weapon stations were sited under the fuselage to carry additional armament. The engine selected for the proposal was the Rolls–Royce RB.199–34R, rated to produce 8,000 lbs dry and 14,000 lbs reheat static thrust at sea level. The radius of action was double to what was available with the HF–24 while manoeuvrability levels were substantially enhanced. High and low speed wind tunnel models were tested and a full–scale mock–up of the proposed prototype was built. Eventually, this project had to be abandoned because, as some said, of non–clearance of the RB 199 by the UK and Germany, the two partner Governments involved in the engine development for the Tornado MRCA programme. Thus, all efforts in developing an Indian combat aircraft had come to naught.



HAL's Design Bureau then took up the feasibility study of a multi–role small passenger aircraft, the HAC–33. It was configured for an 18–seat passenger capacity, or 6 stretchers, 2 ton of freight, or the carriage of mixed passenger/cargo loads. HAC–33 was' to be pressurised and powered by two French Astazou–20 engines of 1420 e.s.h.p. each. The all–up weight of the aircraft was 7250 kg and it would take off and land from a 500m length runway. For the executive role, its range was 2000 km at an cruising altitude of 25,000 ft. A wind tunnel model was built but not tested as development funds were once again, not approved.

Strike aircraft capability having been acquired through other means (eventually the Anglo–French Jaguar), the IAF had showed interest in the development of an air superiority aircraft. So in 1974, the design teams at HAL addressed themselves to the task of studying a configuration suited for the Air Superiority Fighter (ASF). The single engined ASF–300 had two engine variants, one powered by the Indian GTX–37–14–UB and the other by the French Snecma M–53 engine. Both the engines had low bypass ratios, the former 0.2 while the latter had 0.4, and thrust ratings were comparable. The GTX was rated at 6,000 lbs dry and 8,500 lbs with reheat. Sustained turn rates at low and high altitudes and at high subsonic Mach numbers was the most demanding operational parameter, followed by acceleration with maximum reheat at supersonic Mach numbers. The configuration proposed, even though it did not meet the Air Staff Requirements, could have provided a reasonable solution as the aircraft was being offered with complete operational systems such as fire control radar, Head Up Display, inertial navigation, integral guns, close combat missiles and associated avionics. The airframe also had the flexibility of accepting either of the two engines so that the Indian engine when developed could replace the M–53 engine. A low speed wind tunnel model was built but no tests were carried out as (once more) the development programme did not find favour with the intended customer.

At this stage the HAL design team, resilient as ever, projected a low cost HF–24–M53 configuration requiring development funds of no more than Rs. 50 crore. This variant, when compared with the ASF–300, was 2–tons lighter, and was comparable with the Jaguar for bomb carriage capability as well as penetration distance. This aircraft was offered as a multi–role fighter as it was capable of achieving Mach 2 + at altitude with the speed of 700 kts at sea level. The aircraft could accelerate from Mach 1.2 to Mach 1.6 in 3.5 minutes. Its turning performance at altitude was, however, lower than specified. It was estimated that, given a go–ahead in 1975, the HF–24–M53 could enter operational service from 1981/82 onwards. Low speed and high speed models were tested to confirm the aerodynamic data. The combat capability offered through this configuration and the delivery schedules were not acceptable to the IAF, and therefore the work was discontinued.

How much discouragement does a man (or design team) need? But the never say–die HAL designers then worked on a detailed feasibility study of a close support and interdiction aircraft designated the HF–25. This configuration was evolved once more using the HF–24 philosophy but designing most of the airframe afresh. The aircraft was to be powered by a single R–25–300 reheat engine as used on the MiG–21bis aircraft, to be later replaced by the Indian GTX–37–14–U engine. The HF–25 intakes were new and so were the horizontal and vertical stabilisers. The landing gear was to be changed as the HF–25 was heavier than the HF–24 by about 5 tons. Air Staff Requirements other than the maximum speeds and "g" manoeuvres both in dry and reheat modes, were fully met. The engine was rated at 4100 kg dry thrust with 7070 kg emergency reheat thrust at sea level static conditions. Use of emergency reheat was limited but 6850 kg. reheat thrust was available for operations without any restrictions.

The entire HF–25 development programme was estimated to cost Rs. 64 crore at 1978/79 price levels and the roll out of the first prototype was scheduled three years from go–ahead with delivery to squadrons 7 years later i.e. from 1986 onwards. Low and high speed wind tunnel models were built and tested, and a full scale mock–up constructed. In spite of the low development cost of the project and low unit cost of the HF–25, the IAF showed preference for the Soviet MiG–23/27. The project was therefore discontinued.

In 1980–82, HAL's Design Bureau worked on feasibility studies for an Advanced Jet Trainer, powered by a non–reheat version of the RR/ Turbomeca Adour turbofan engine, similar to that which powered the Jaguar. The programme was not proceeded with because of the lack of design resources which were almost entirely to be soaked up by the Advanced Light Helicopter (ALH) and forthcoming Light Combat Aircraft (LCA) projects.

It was not until 1986, thus, that the Ministry of Defence with its constituent departments encompassing the conceiver (Defence Research & Development Organisation) producer (Hindustan Aeronautics Limited) and operator (Indian Air Force) got its act together to clear the Light Combat Aircraft (LCA) project which has since been underway under the aegis of the Aeronautical Development Agency (ADA) which manages, funds and monitors the programme from its headquarters in Bangalore.

By Raj Mahindra

(Formerly Managing Director Design & Development with Hindustan Aeronautics Limited)

Lieutenant General (Retd) Syed Ata Hasnain says...

....Don't lose a victory

"How could we be so naive as to allow a major military victory to flounder...50 years after the victory, we lost the very same nation we helped create?" This question has haunted many observers of India's strategic history with regard to Bangladesh, 1971. Answering it becomes essential, especially as we assess the follow–up to Operation Sindoor and India's long–term objectives in Jammu & Kashmir. These are all aspects of conflict management that are often neglected.

India's 1971 war with Pakistan, which led to the creation of Bangladesh, was among the most decisive military victories of the 20th century. It birthed a new nation and showcased Indian military strength and political will. Yet, over time, the warmth between New Delhi and Dhaka faded into estrangement. Today, Bangladesh is no longer among India's reliable partners. How did this happen? The answer lies in a key principle of strategic affairs: initiating and winning a conflict is far easier than managing the peace that follows.

Every conflict follows a progression. It begins with initiation – often dramatic and kinetic. Then comes stabilisation where gains are consolidated, adversaries deterred and legitimacy secured. After that, conflict termination – when hostilities cease or shift to a new equilibrium. Finally, the most overlooked stage – conflict resolution. This determines whether peace is lasting or temporary, and whether victory can be strategically harvested.

India has historically prioritised the first two stages, often neglecting the latter. Bangladesh is a telling example. After the Pakistani surrender, we withdrew early, released over 93,000 prisoners of war, and facilitated Sheikh Mujibur Rahman's return. But we assumed Bangladesh's gratitude meant no further investment was needed. We saw its independence as our gift, forgetting that its people had fought for their freedom with their own national ethos.

In hindsight, we did little to nurture Bangladesh's national identity or support its sense of agency in liberation. We celebrated our victory but insufficiently endorsed the sacrifices of the Mukti Bahini and the millions who fought, bled and suffered. The absence of a shared commemorative space in Dhaka speaks volumes. The iconic photograph of the Pakistani surrender on 16 December 1971 features no Mukti Bahini or Bangladeshi political representative.

This disconnect struck me years later during UN peacekeeping missions. Working alongside Bangladeshi army contingents, I noticed discomfort when Indian officers invoked 1971 as a basis for camaraderie. Rather than nostalgia, it often evoked silence or unease. None of us had been briefed on this sentiment because few in our military

leadership had examined the post–victory relationship. Perhaps our Pakistan fixation overshadowed that necessity. I wonder if it still does.

This lack of post–conflict political and psychological resolution is something we must avoid repeating in the context of Op Sindoor and the broader transformation in J&K since 5 August 2019. The abrogation of Article 370 was a tectonic political step, akin to a revolution. Op Sindoor followed six years later, aimed at deterring Pakistan's asymmetric warfare and dismantling terrorist infra. Tactically and operationally, Sindoor was a success. Strategically, it put Pakistan on the back foot. But will this victory endure?

The real battleground is not along the ceasefire line but in the minds of people. Conflict resolution in Kashmir–like in Bangladesh – will be long and demanding.

The goal is not merely territorial security or threat neutralisation, but trust building, shared narratives,

and lasting integration of hearts and minds. This means investing in J&K's youth, enabling their full participation in India's mainstream, and building pride in a pluralistic national identity. It also means fostering friendships across states and faiths and creating platforms where Kashmiri youth don't feel "othered" or under suspicion.

We must also stay alert to emerging threats in psychological, cognitive, and virtual domains – areas where adversaries will try to exploit residual disaffection.

The war of narratives is no less critical than the war of weapons. Psychological operations, disinformation, AI–driven perception shaping, and digitally stoked grievances will form tomorrow's battle–fronts. Are our institutions resilient enough to uphold the spirit of 5 August and Op Sindoor over the long haul?

The answer must be yes. But only if we remain vigilant and wise. History warns us that unmanaged victory becomes deferred conflict. The Treaty of Versailles ended World War I with pomp, only to sow the seeds of World War II. The 2003 Iraq War toppled Saddam Hussein but fractured the region. Victory, if not consolidated, creates space for the defeated to re–emerge. India now has a unique opportunity to shape a new era of peace in J&K. To achieve that, we must avoid complacency, stay alert to invisible frontlines, and remain committed to the long road.

Bangladesh's post–1971 journey is a cautionary tale. It reminds us that nations are built not just by battles, but by the stories and sentiments that follow. By the respect shown to partners, and the emotional bridges constructed long after the last bullet is fired. Bangladesh's choices today are shaped by internal churn, regional dynamics, and broader contestations. Its leadership is confused and diffused. A nuanced diplomatic outreach – one that acknowledges the pride of the Bangladeshi people in their liberation and co–creates a shared historical narrative–can re–anchor the Indo–Bangla relationship.

Applying this lesson to post–Sindoor J&K is equally important.

By Lieutenant General (Retd) Syed Ata Hasnain

The writer is a former commander of the Srinagar–based Chinar Corps

Photo of the author: DFFSS/ HQ–IDS

Article courtesy: The Times of India

Black/White images from the 1971 war in Bangladesh

The MiG Operational Flying Training Unit (MOFTU)

Line up of MiG–21FLs at MOFTU

Air Commodore Parvez Khokhar, who commanded the MOFTU at Tezpur from August 1990, writes about this unique unit which at its peak, had the largest number of MiG–21s on establishment. The MiGs of MOFTU flew the highest number of sorties years after year, imparting Stage III flying training to IAF fighter pilots for over two decades.

The long delay in procurement of an Advanced Jet Trainer and geriatric vintage of the Hawker Hunter, that served as a great lead–in fighter after being taken off the frontline, little option with the IAF, but to call upon the MiG–21FL (Type 77) to take on this role that it was never meant for. Thus at the end of 1986, the MiG Operational Training Unit was created with the aircraft hauled over by Nos. 47 and 28 Squadrons, which were converted to the MiG–29. The 'Mecca' of all MiG–21 pilots, Tezpur in Assam, was selected to become base for the MOFTU. Sqn Ldr N Thomas, a seasoned MiG–21 pilot and test pilot, first put this unit together, and was followed by Gp Capt Prabhakar, who initiated the training and worked out a viable syllabi, to encompass both the advanced training and the applied stage, rolling the training into a single composite one. His successor, Gp Capt KP Sreekanth then got the flying into a more streamlined training mode and when Gp Capt Parvez Khokhar, took over the reins in August 1990, he found all the assets in place. Still, a great amount of confusion prevailed because of poor serviceability and different types of the two–seat trainers on strength of the unit.

MiG–21U

HISTORY

Gp Capt Parvez Khokhar, with Wg Cdr Ajit Singh on his left, addressing the parade (note thatched roof basha at the back).

The Type 66 was original trainer for the Type 77, but age and non–availability of this aircraft forced a plethora of two–seaters to be procured from wherever they were available, including Romania. The Type 66, though sans a periscope, had a better forward view, but a large parallax error while looking through the front glass in the rear seat, which detracted from its better all round view. Only at night one had to get used to landing on a 'wavy' runway! The light controls and only 25 degrees of flaps, which best replicated the Type 77, made this an apt trainer. The Type 69 U/UB was meant for the Type 96/75 aircraft, catering for 45 degree flaps and lift augmentation, through boundary layer blowing. To make it compatible with the Type 77, the flap selection lever was wire locked at the 25 degree flap position, used both for takeoff and landing. While landing from the rear cockpit with better forward view through a periscope, but sans a good depth perception, made life easier for the instructor pilot, but did not faithfully replicate flying qualities of the Type 77. This fact, added with non–standard switch positions on aircraft from different origins, compounded the student pilots' woes.

Young pilots with statue of a fledgling student outside 'A' Flight of MOFTU.

General flying briefing at 'A' Flight ('Aggressors').

Senior instructor at MOFTU.

With this background and a flying training backlog longer than a roll of toilet paper, MOFTU faced a Herculean task of coming abreast of the task allotted. Despite having 35 staff members, including five technical officers, training of 60 pilots in a time bound programme, was no mean task. The station, under the aegis of Air Cmde MS Vasudeva, took on this challenge head on. The Technical staff, directed

by the Chief Engineering Officer, Gp Capt PK Desai and all support services geared up to do what was then thought to be impossible. Commanding Officer of No. 30 Squadron, Wg Cdr GS Nijjar and the CO MOFTU, Gp Capt Parvez Khokhar, reached a tacit understanding to produce three thousand sorties in November 1990: two thousand by MOFTU (Alpha and Bravo Squadrons) and another one thousand by No. 30 Squadron. While sharing their plans with the AOC, the two COs found spontaneous support being extended by him, though he did, at that time, have a skeptical smile across his face. He probably appreciated the resolve of the COs, but did not quite believe that they would reach the target. HQ Eastern Air Command was informed about this and also extended their support, albeit with some reservations about the outcome of resolve of the two COs. The restriction of flying 50 sorties per month by each pilot on the staff, was given a waiver, extending this to 80 sorties/pilot/month.

Tezpur has always been famous as an airbase for generating intensive fighter flying and, having been host to a number of MiG–21 squadrons, prided itself on its ability to cope with demanding situations. So the 1 November 1990, saw perfect weather and unceasing roar of afterburners lighting up…there was no let up throughout the month. Even a brief break between the roar, when aircraft were landing, seemed like eerie silence. Flying continued unabated, throughout the week, with pilots and ground staff taking a rest in rotation, without affecting the flying. The AOC and the COO, Gp Capt 'Charlie' Verma, chipped in to help, along with the 'jehadi' resolve to reach the target. Come half an hour before sun down on 30 November 1990, when the last aircraft landed, the tally stood at an unbelievable 3005 sorties and that too without a mishap. MOFTU had flown 2003 sorties and No. 30 Squadron had chipped in with 1002 sorties; the extra number having been flown to compensate for basic calculation errors. Most staff pilots had flown over 70 sorties each, with CO MOFTU and Squadron Commander 'Alpha' Squadron, Wg Cdr Ajit Singh, marginally exceeding the 80 sorties limit. This was graciously condoned by the Command HQ, on the recommendation of the AOC, attributing it to inherent weakness in the mathematical acumen of these two gentlemen!

Typical scene at the MOFTU flight line.

MiG–21U taxies out for armament sortie.

Although this figure has never been even remotely challenged, the tempo did not abate. An incredible 26,000 plus sorties were flown by MOFTU over a period of 25 months. This is a unique achievement and tribute to the support staff, the engineering staff and the pilots that may have got calluses on their behinds, sitting strapped in the cockpits. This was achieved with a strength of 56 MiG–21s, the largest flying unit in the IAF (that this number also presented a maintenance nightmare will make for a different story). A decent serviceability was pegged at about 25–30 aircraft on line with a single aircraft flying as many as seven sorties in a day. The designers and manufacturers of this aircraft could scarce have envisaged such a high utilisation rate!

One of the early MiG–21Us at MOFTU

Whilst the glamorous, but largely unknown achievements of MOFTU, have been covered, but in all fairness, the many challenges and heart burns need to be mentioned, as well. The Type 77 was most unsuitable for training a rookie pilot. The two most limiting factors were its endurance and high speeds. Limited endurance, first manifested itself in teaching a pupil to taxi…..pneumatic brakes pressed by a hand lever, which had to have foot coordination to obtain directional control was no easy task, when the trainee's meagre flight experience had been with toe brakes. The air, once expelled, could not be recharged till the aircraft returned to the dispersal area and a minimum pressure had to be preserved to cater for an emergency while taking off. To demonstrate

this to a student pilot and allow him to practice this at will, was just not possible. Kudos to all those young men, who learnt to taxi the MiG–21 on their own. Any aircraft with sufficient power will take off on its own, provided directional control by the pilot keeps it on the runway. That's exactly what the MiG–21 did with the rookie pilots, but landing required skill, otherwise the consequences did not bear thinking…this was the area of training that took precedence over all others…that there were no landing accidents, once again reflects on training standards and ability of the youngsters' to quickly absorb instruction in a life threatening situation. The twenty odd minutes one could spend in the sector, were devoted to demos and practice of exercises ranging from slow speed handling to air combat. Today, those rookies are at the mid seniority levels will soon assume Air Ranks, but it can be safely stated that they are self– taught pilots…the MiG–21 ensured that!

Men behind the machines: the DSS of 'B' Flight ('Bravehearts'), at MOFTU.

Before night sortie in MiG–21FL

Student pilot and instructor getting into MiG–21U

After completing their MOFTU syllabus, young fighter pilots before posting out to operational squadrons.

The thirty odd staff pilots consisted of QFIs, FCLs and an occasional test pilot, who also sported the basic training qualifications. The few staff members, who were awaiting suitable qualification, were used copiously for lead sorties, but a strange challenge presented itself with such an assorted staff. Flight Lieutenants were a rare commodity, although Squadron Leaders made up a significant percentage. But the highest percentage of staff was occupied by Wing Commanders. At one time there were fourteen of them….a man–management challenge for the CO. These Wing Commanders were very close in seniority, if not actual course mates. Having served as senior flight commanders in various MiG–21 squadrons, and on promotion to Wing Commander, they were put onto a holding pattern, before being given command of fighter squadrons. This involved their filling a cockpit as MOFTU.

The first problem for the CO was the constant hassling between some wing commanders of similar seniority. The CO found a novel way of resolving this problem, without seeming to take sides. When the aggrieved parties (often more than two) trooped into the CO's office early in the morning, without hearing their grievances, they were chased off to the cockpit, to fly their routine four to five

sorties and to return at the end of the day to his office, for them to be listened to. Flying in temperatures of up to 35 degrees Celsius and a humidity count that seldom dropped below 90%, howsoever intrepid a fighter pilot, there never was one who returned back to the CO's office for redress after sundown (usually around 4pm), but instead proceeded home onwards for a well–deserved shower and a some liquid sustenance, a quick dinner, before retiring early for another early start the next morning!

The second issue was a bit more prickly. The Wing Commanders had held a second–in–command position in their respective squadrons and had the prerogative to select and appoint other officers to discharge 'secondary duties' (officer in charge garden, tea club, diary etc). Not exactly the dream of a fighter jock, who had already graduated to a higher plane in life, but now found the clock being wound backwards.

But for the two senior most Wing Commanders, who were appointed Squadron Commander "Alpha' and 'Bravo' squadrons, respectively, the others were reduced to the status of 'Mango People'! This, obviously, did not go down with a newly promoted Wing Commander, but a stern look by the CO, indicating that there was to be no further discussion on the subject, sealed the deal. This steely resolve with appropriate countenance expression had to be rehearsed several times in front of the mirror by the CO, before the actual encounter with a highly aggrieved and agitated Wing Commander, so as to have the desired effect!

MOFTU also had an operational role, which was kept on the backburner for many years in the maze of meeting training targets for young pilots, though some portion of the flying was devoted to operational training for the staff. Having got the basic task well under control, a detachment set course for Amritsar, via Bagdogra and Bakshi–ka–Talab in early 1992. All aircraft made it to Amritsar, flew extensively, by day and night and then proceeded to Halwara to undergo more operational training for another week. After an intensive familiarisation spree, all aircraft returned to Tezpur, without a single drop out at any base. That was the reliability of the oldest variant of the MiG–21 family. Yet another detachment was mounted to Bagdogra, which was another operational base marked for MOFTU.

Though MOFTU had been doing valley flying in the Tenga valley, leading up to Tawang and areas around, flying in the Sikkim and Darjeeling valleys was a unique experience. Once again, the aircraft gave excellent accounts of themselves and serviceability remained very encouraging. MOFTU was last activated in 2002 during OP Parakram and ready for a real time situation.

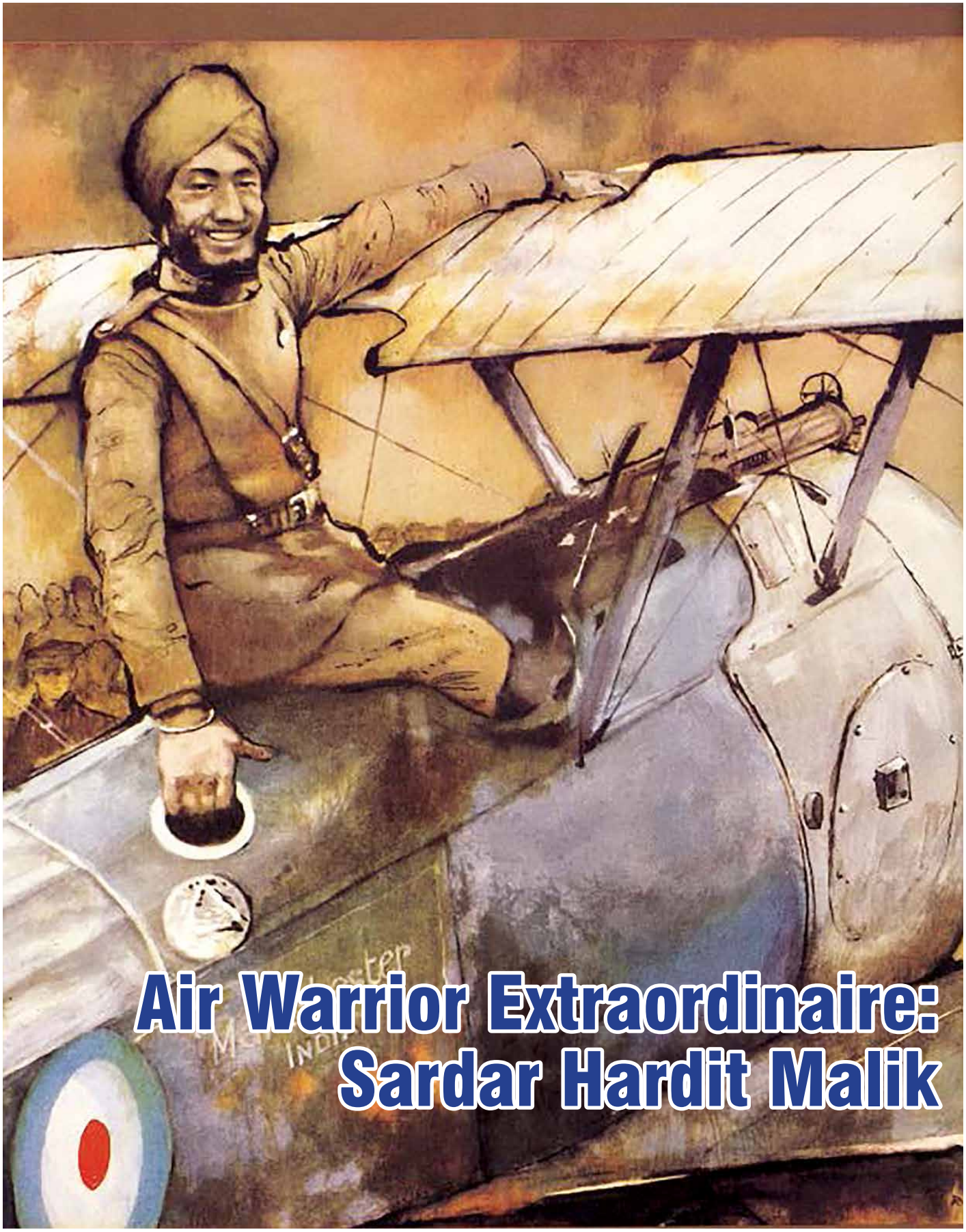
Basing MOFTU in Tezpur, whether intentionally or unintentionally, was a master stroke. Apart from the superb environment for flying, the North East offers unmitigated beauty, and a culture resplendent with a rich mixture of tradition and modernity. Regrettably, a large number of officers who have not served in this beautiful land have an unfounded bias towards this area.

Now that hundreds of pilots have been exposed to the secret treasures that the NE region holds, that bias is being dispelled by the wonderful experience they have had as young men. As the strategic importance of this area increases, these men will shortly return to command these bases with full knowledge of what the North East holds for them and the squadrons that are based there.

Gp Capt Parvez Khokhar escorting Air Marshal Brijesh Jayal, AOC–in–C Eastern Air Command on a visit to MOFTU at Tezpur.

Finally, as all good things must come to an end, MOFTU remained the last unit to be flying the Type 77, albeit, with the unit being reduced to one squadron, as the oldest MiG–21s slowly retired…..but like old soldiers, they never died…they just faded away….

About the author: Air Commodore Parvez Khokhar, VM (retd) was commissioned as a Fighter pilot of the IAF in 1968 and has witnessed combat action in December 1971 from two forward bases in the Punjab. Having had the opportunity to fly 60 types of aircraft, in over 5000 hours of accident free flying, which included frontline fighters like the Rafale, F–18, Su–30, Mirage 2000, MiG–29, MiG–25 etc., and some transport and helicopters as well, he has commanded a forward fighter base in the Rann of Kutch and was later the Commandant of the Aircraft and Systems Testing Establishment. He has also participated in the development of the LCA Tejas, as Project Director of the National Flight Test Centre.



Air Warrior Extraordinaire: Sardar Hardit Malik

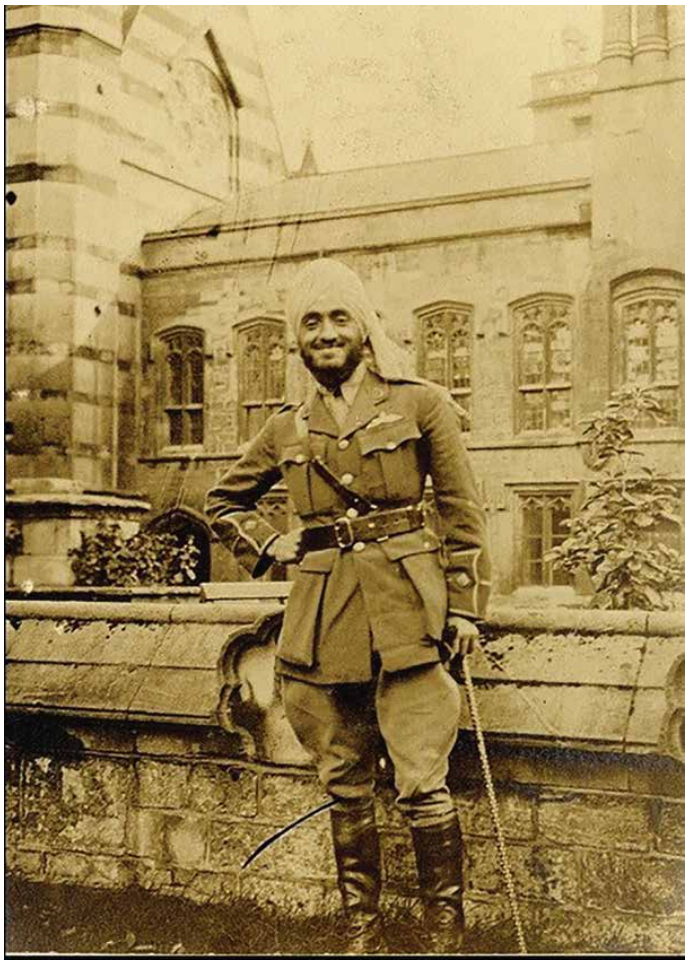
Soldier and sportsman, administrator and statesman, scholar and diplomat, Sardar Hardit Singh Malik CIE, OBE, ICS was one of the most accomplished and versatile of Indian public men of his times.

He was born on 23 November 1894 at Rawalpindi where he received part of his early education. When he was 14, he was sent to the English public school Eastbourne College and in 1912 passed out with the highest honours in the classical languages (Greek and Latin). Later he went to Oxford and in 1915 graduated with honours in modern history. During his scholastic days in England he captained the cricket team at Eastbourne College and represented Oxford University at both cricket and golf.

World War One broke out when he was only 20. In 1916 he served with the French Army on the Western Front, and subsequently joined the Royal Flying Corps (which later became the Royal Air Force) and saw operational service in France with the famous No. 28 Squadron. Wounded in air combat over France, he returned to England and later served with No. 141 Squadron at Biggin Hill for the air defence of London.

After the war he entered the prestigious Indian Civil Service (ICS) and served in the Punjab from 1922 to 1930 as Assistant Commissioner and later as Deputy Commissioner.

In 1931 he was appointed Deputy Trade Commissioner in the Office of the High Commissioner for India in London and served there till 1933. After serving for a year as India's Trade Commissioner in Hamburg he returned to India to become Deputy Secretary in the Commerce Department.



Three years later he was promoted to Joint Secretary and, in 1938, was sent abroad again as India's first Trade Commissioner to the USA and Canada. While there, he represented India at the International Cotton Conference at Washington, the International Labour Conference, New York, the UN Food Conference at Hot Springs, Virginia and the UNRRA Conference at Atlantic City in the USA (1943). He also represented the Government of India at the first and second sessions of the UN Preparatory Committee on trade and employment in Havana. In 1949, he was a member of the Indian delegation to the UN General Assembly.

Sardar Hardit Singh Malik, who was also an accomplished administrator of Princely India, was from 1944 to 1947, the Prime Minister of Patiala State. In this capacity he brought about many administrative reforms, thus paving the way for the State's seamless integration with the Union.

As leader of the Indian States Industrial Delegation to the UK, the USA and Canada he rendered signal service by establishing valuable contacts with industrial magnates and laid the foundation for industrialisation projects in the States. Himself an ideal "public relations man", he foresaw early the importance of public relations and created the Directorate of Public Relations in Patiala, the first of its kind amongst the States of India.

S. Hardit Singh Malik's funeral was as unique as had been his life. At his wife's behest, the raagis sang hymns of joy and hope, not of mourning. In the room where his body lay, Sardarni Prakash Kaur Malik prayed while the tape recorder played recitations from the Granth Sahib in Hardit Singh's own voice. When the funeral van moved out, there were triumphant jaikars of Sat Sri Akal.

When he was to be cremated, a golf club and golf ball were placed besides him. "If there are good golf courses in paradise, Sardar Hardit Singh Malik should be playing with the finest golfers, for infinity".

Extracts from the autobiography

There are people who from their early childhood are interested in flying, making model planes etc. I can claim no such early interest unless a passion for flying kites along with the kites battles that went on, one kite diving on another, attempting to cut off he cord with the glass coated cord of one's kite, can ever be called an interest in flying. This passion I share as a youngster with a number of my contemporaries during the kite flying season.

Certainly when I arrived in England, at the early age of 14 to enter school there, I had no thoughts of ever being a pilot myself, although, along with a lot of other people, I was fascinated by Louis Bleriot's crossing of the English Channel and seeing the monoplane in which he had achieved this historical landmark, exhibited at Selfridges, one of the big stores in London at that time.

When the First World War came in 1914 I was in my second year at Oxford. Practically all of my British

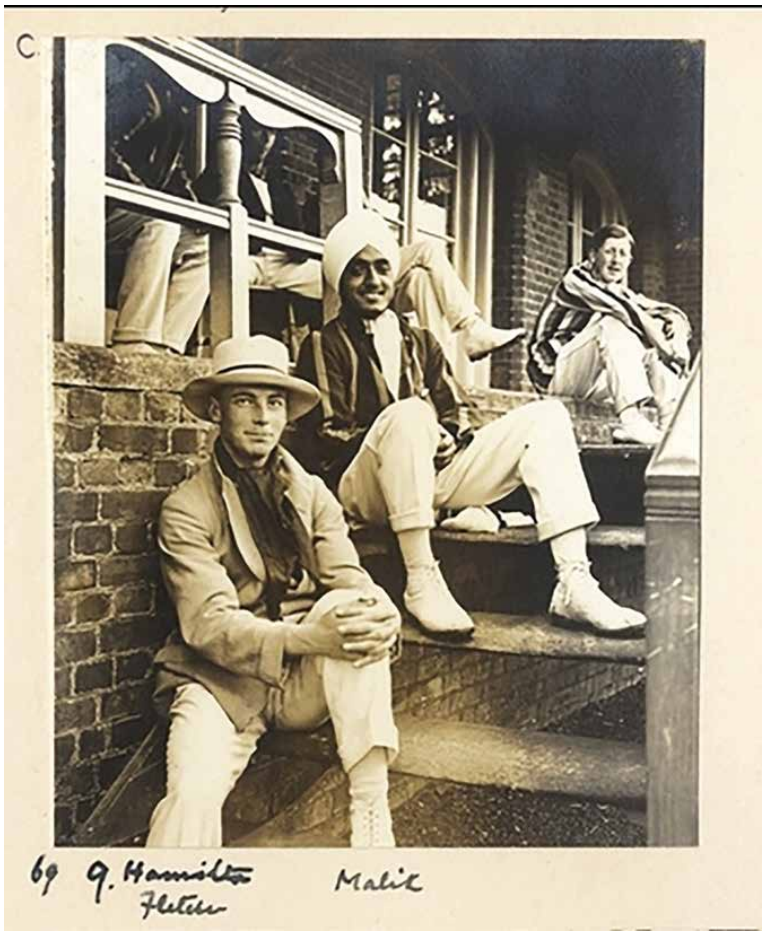
colleagues who were physically fit volunteered to join the fighting services and it was not long before I also caught the fever. I had a strong feeling that this was going to be a unique adventure in which every young man should participate.

There was one problem which as an Indian I was immediately conscious of. This was said to be a war for freedom. How could I, a native of a country that was itself not free, engage in a struggle in which I might well lose my life when its outcome, one way or the other, would have no effect on my freedom since my country would continue to be under foreign rule? However, my wish to join my friends and fight alongside them got me over this hurdle.

For an Indian student, however, getting into the war was not easy in the days. My attempts to get a commission in the fighting services as most of my British friends had done were not successful and all I was offered was a job as orderly in one of the hospitals in England where the wounded soldiers of the Indian Army who had joined the British Expeditionary Force were being looked after. This was not my idea of active service.

Eventually, with the help of my tutor at Balliol, 'Sligger' Urquhart who was also a good friend I succeeded in getting out to France as an ambulance driver with the rank of an officer in the French Red Cross.

It was during this period of service on the Western Front that I made up my mind that I would be a fighting pilot. The exploits of Guynemer the famous French pilot who was worshipped by the French as a great national hero and who seemed to be like a knight in shining armour of the days of my boyhood when I was fascinated by Henty's Tales of Chivalry and Romance, thrilled me and fired my imagination. I was determined to fly.



Sitting with students, Oxford 1914. Hardit Singh Malik sitting with fellow students, Balliol Pavilion, on the Master's Field, Whit Monday, 1 June 1914. Courtesy: Balliol Archives and Manuscripts. On the right: Second Lieutenant Hardit Singh Malik proudly wearing both beard and turban with his 'maternity' jacket and Sam Browne belt, c. 1917. (Courtesy: Mr Somnath Sapru)

As luck would have it I was able, by pestering some of my French friends whom I got to know at that time, to arrange for admission to the French Air Force as a Volunteer. In the meantime I had kept up regular correspondence with 'Sligger' who had got me into the French Red Cross and when he heard of the possibility of my being taken into the French Air Force he called on General Sir David Henderson, who was commanding the Royal Flying Corps at that time and who was a friend of his, and expressed his indignation at the possibility of my being taken into the French Air Force when I, as a British subject should by all rights be in the Royal Flying Corps (RFC).

General Henderson was over and before long I was called to London for a personal interview with him. To my great delight and excitement the General, after a brief interview offered me a cadetship in the RFC as soon as I could secure my release from the French Red Cross. This did not take long and early in 1917, I joined the RFC, as a cadet. It seemed almost like a dream and I shall never forget the thrill of putting on the prestigious uniform — the famous old 'maternity jacket' — for the first time!

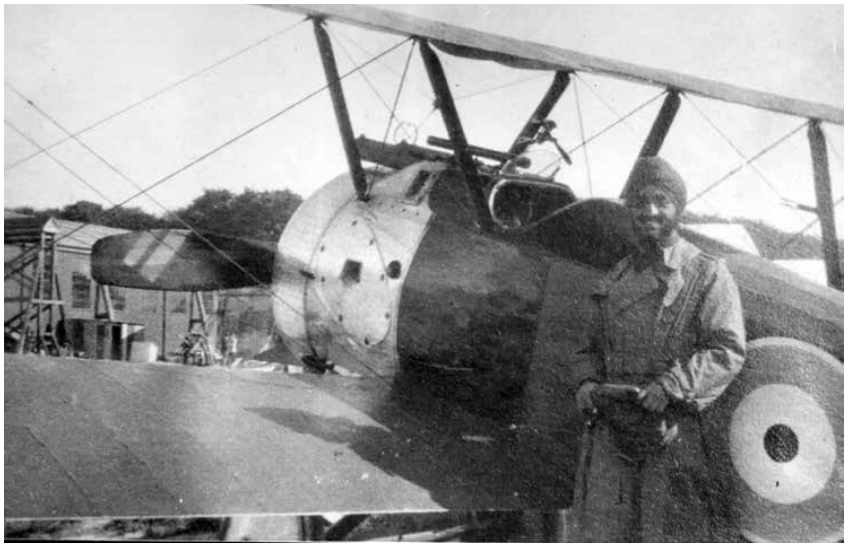
All the excitement was dampened somewhat by my start as a Cadet at Aldershot. The camp in which we cadets were located to start our life in the R.F.C., military drill and exercises with which I was already familiar during my cadet's life in the Officers Training Corps at school – P.T. early morning etc. – had been hastily organised and was most inadequate. We slept on the floor, on mattresses, there were no washing facilities indoors and we had to wash in the early morning with the cold water from the taps outside our barracks. As it was bitterly cold, there were quite a few pneumonia cases, some fatal, as this was the pre–penicillin era.

I have often been asked if as a Sikh – with my keshas and turban – I did not have problems in the RFC. Well, on my very first parade the Sergeant Major in charge of the parade pulled me out of the ranks and said "Why are you not wearing a hat? You are not in uniform", I tried to explain that as a Sikh with my long hair I had to wear a turban and this was a part of my uniform. He would have none of it and would have ordered me off parade, but, fortunately for me, the Adjutant who was watching the parade, noticing the incident, came up. I explained the position to him and he told me and the Sergeant Major to carry on adding that the matter would have to be referred to the War Office. Presumably the War Office gave me a special dispensation as I heard no more about it.

The only other problem of this nature that cropped up was over the question of my flying helmet. This was very important in those days of open cockpits and l got over this one by having an especially large one made to fit over my turban.

I confess that while I thoroughly enjoyed the period of preliminary training, first at Aldershot – despite the physical discomfort already referred to – and later at Reading, learning all about the theory of flight and rigging etc. of the flying machines of those days which were mostly wood fabric and wire and about aero engines, and realised all this was basically essential, I was impatient actually to get into the air.

I did not have long to wait, for on the successful completion of my course at Reading I was posted to the Preliminary Flying Training Station at Vendome in central France which was run by the RNAS (the Royal Naval Air Service) but where both RFC and RNAS cadets did their preliminary flying.



With his Sopwith Camel fighter, 1917. Second Lieutenant Hardit Singh Malik. Courtesy of Mr Somnath Sapru.

It was here that the cadets were sorted out, those who were considered fit to fly the single seater fighters of those days, the Sopwith Camel, the Sopwith Pup, the SE.5 etc. which required a lighter touch and more skillful handling then the heavier mad lines the RES etc. mostly used for artillery observation and others. The heavier handed pilots whose reflexes were supposed to be slower were put in this category while those who tailed in the various tests were declared unfit for flying relegated to ground duties. All these of course had their important roles to play in war but human nature being what it is, the fighter pilots were considered the elite in a Corps which itself was considered elite.

Great was my delight therefore when, after successfully going through the various tests I was put into the first category and picked for further training as a fighter pilot. I was fortunate in picking up a knack of flying an aeroplane very quickly – being allowed to go 'solo' after only 2½ hours 'dual' – and what a thrill, truly unforgettable, it was to be allowed to go up alone to pilot the Caudron in which I had received my dual instruction for the first time.

The time at Vendome was comparatively short, only a month or so, but very enjoyable as the Loire country in which Vendome lies is very beautiful and I was a member of a small group who became close friends as we had been together at Reading. Besides I thoroughly enjoyed the flying and happy that I had taken to it so easily.

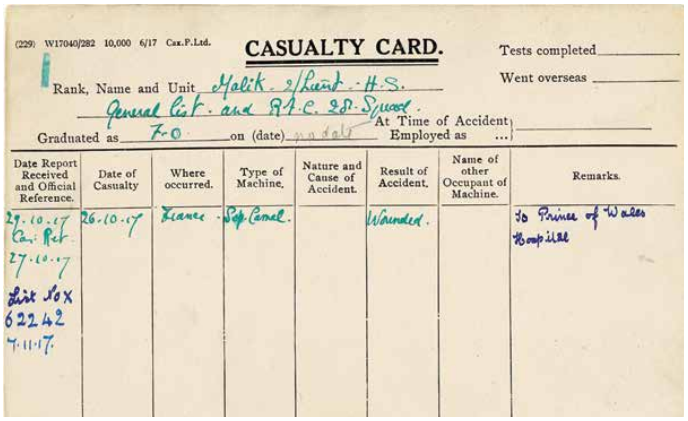
I was fortunate in having as my Instructor a man who not only took a real interest in his pupils but became a good friend and it was due to his special interest that I learnt to pilot a plane so quickly. His name was Carr and he later came out to India as Air Officer Commanding the RAF there.

At my next posting which was at Filton near Bristol, well known as the location of the Bristol Aircraft Co. who brought out the well known Bristol Fighter, probably the best fighter aeroplane, on either side, in the closing months of the war and which I had the good luck to pilot in France in 1918 with No. 11 Squadron. Again I was fortunate in having an excellent Instructor, a regular Army officer who had joined the RFC, Captain Chadwick who also became a good friend. Here at Filton we had our secondary flying and our preliminary training as fighter pilots. Starting with BE.2Cs which had a stationary engine and was a stable plane, we learnt to fly the unstable planes with rotary engines. Beginning with the Avro 504 which was the most popular training plane at that time for fighter pilots we moved on to planes like the Sopwith Pup the Nieuport and so on, ending up with the Sopwith Camel the most sophisticated fighter plane at that time—and the trickiest to fly.

A dapper Hardit Singh Malik with his RFC wings.

At Filton we were taught aerobatics, the famous 'Immelmann' turn named after the renowned German ace, looping the loop, rolling, spinning, steep diving etc., all of which were so vital for the fighter pilot of those days whose life literally depended on his ability to manoeuvre his plane. Under Chadwick's expert and sympathetic instruction I soon got the knack of flying these sensitive planes and doing aerobatics in them and I won my 'wings' and became a full–fledged pilot inside a month of my posting at Filton.

It so happened that Berkeley Castle, one of the most famous country homes in England and the seat of Lord Berkely whom I had known during my Oxford days and who had become a good friend was only about 40 miles or so from Filton and I wanted as soon as I felt I could handle a plane properly to give my friends a surprise and arrive there by plane. So one fine day I flew over the castle in my B.E.2C and landed it in the meadow near the castle as of course there was no recognised landing ground there. Soon after I landed, Lord Berkeley and his stepdaughter turned up and it was not long before a crowd of people including the Mayor of the village of Berkeley complete with ceremonial top hat arrived. There was much excitement as no plane had ever landed there and much friendly interest. I could not linger too long however as my landing there was completely unauthorised and I felt if I stayed too long I would get into trouble with my Instructor. So, I persuaded one of the villagers who said he thought he could do it to "swing" my propeller which one had to do to start the engine of a plane in those days before the age of self–starters just as one had to start an automobile by "cranking" the engine, and saying good–bye to my friends, took off and flew back to Filton. Chadwick was waiting anxiously for me as I was long overdue and asked me what had happened. I told him I had lost my way. However, there was some hay on my tail skid, which he spotted and he said "I see that you had a forced landing in a hay–field." I then told him about my escapade. He pretended to be very angry with me but I was able to pacify him and eventually persuaded him to come with me on my next visit which he did and we had a very pleasant cup of tea at Berkely castle with Lord Berkeley and his stepdaughter. Chadwick who himself came from a good family thoroughly appreciated the visit to this historic place redolent with the memories of Edward the Second (who was murdered there) and Queen Elizabeth I who stayed at the time when Sir Francis Drake lived there.



(229) W17040/282 10,000 6/17 Cax.P.Ltd.

CASUALTY CARD.

Tests completed _____

Went overseas _____

Rank, Name and Unit Malik. 2/Lieut. H.S. General List. and R.F.C. 28. Squad.

Graduated as F.O. on (date) [illegible] At Time of Accident Employed as ...

Date Report Received and Official Reference.	Date of Casualty	Where occurred.	Type of Machine.	Nature and Cause of Accident.	Result of Accident.	Name of other Occupant of Machine.	Remarks.
29.10.17 Com. Rep. 27.10.17 List Sox 62242 7.11.17.	26.10.17	France	Sop. Camel.		Wounded.		To Prince of Wales Hospital

Hardit Singh Malik's Casualty Card. This Casualty Card records that on 26 October 1917 Hardit Singh Malik was wounded in action and taken to the Prince of Wales Hospital. Courtesy: RAF Museum.

From Filton I moved on to Yatesbury where after further flying various kinds of 'Scouts' as the single seater fighter planes were called we finally formed a Sopwith Camel Squadron, No. 28, and it was from here that we flew out to France. We were stationed at an airfield in Flanders near the village of Droglandt. This was wally a marsh as most of the land in Flanders is which had been made into an airfield by putting cinder tracks on it. As the field was comparatively small, landing on these cinder tracks was quite tricky, but most of us knew how to handle our Camels and had no difficulty. It was a different story however when a Squadron of DH.4s which were heavier, and ran more after landing than a Camel did. The first four planes ran into the hedge at the end of the runway and the plan to have the DH.4 squadron stationed at Droglandt was abandoned.

In No. 28 Squadron the only pilot who had any active service was our CO, Major Glanville, a nice enough person but very shy and retiring, certainly not the man to command a fighter squadron. The role of leader in our Squadron was soon taken over by William Barker, a Canadian, who had served in the Infantry in France and then changed over to the RFC. Barker made it his business to master flying and particularly the business of aerial warfare. He became a first class pilot, complete master of his aeroplane and spent days and nights studying enemy planes, their performance, their manoeuvrability, the tactics of German fighter pilots like Immeleman and Richtofen. Realising the vital importance of shooting in the air, by sheer hard work and perseverance he made himself a first class shot. He ended up, I believe, as the most successful lighting pilot of all those who fought in the First World War either with the Allied Forces or the enemy, winning the Victoria Cross, the DSO with three Bars, the MC with three bars, the DFC and various foreign decorations.

William George Barker and his Sopwith Camel on the Western Front. Malik's CO, 'Billy' Barker earned the VC, DSO and Bar, MC and Two Bars and was arguably the most highly decorated fighter pilot in history.

Barker was my flight commander and initiated me into the art of aerial combat. A great many pilots were shot down very early in their careers through sheer inexperience. Many never saw the enemy plane until they were hit and I was fortunate in being guided during my first flights over the lines by Barker who would fly close to me and often indicate by pre–arranged signals, as there was no such thing as aerial telephoning in those early days where enemy planes were and which direction they were coming from.

I recollect during one of these early flights that Barker signalled to me and before I realised what had happened, saw a Fokker diving on Barker and opening fire but before he got within shooting range Barker did a climbing turn and got on to the tail of the diving German shooting him down in flames. It all happened in a few seconds, almost before I realised what was going on.

On another occasion our Squadron joined up with two other squadrons to do a massive patrol against the German fighter squadrons posted across the lines not far from us including Richtofen's – the legendry Red Baron – who had been playing havoc with our artillery observation planes and balloons. It was an unforgettable sight when our three squadrons, 54 aircraft in all, Sopwith Camels, SE.5s, Sopwith two seaters, assembled to cross over to the German lines. We soon ran into the enemy fighters and a regular dog fight ensued. In such a battle in those days each pilot had to look after himself and I soon found myself engaged in combat with a German Fokker. I was able to get into a position finally to dive on him and shoot him down. During the excitement of the combat, however, I had lost nearly 6000 ft of height without knowing it, and after the German went down I looked around for the rest of our formation. Not an aeroplane to be seen! I became rather anxious, but then I looked up and saw a lot of our aeroplanes. Barker, after the battle, looked around for our aeroplanes, some of which had been shot down, and spotted me five or six thousand feet below. He brought the entire formation down to where I was, thus probably saving my life because alone in enemy country with plenty of German planes around, my chances of survival would have rather dim. This indeed was one of the ways in which the inexperienced lost their lives.

Barker who became a good friend, was associated with probably the most vital and unforgettable experience of my life. The incident is well worth describing in some detail.

In this painting, the legendary 'Red Baron' is seen making one of his 80 aerial 'kills'

We had had a spell of very bad weather, preventing all flying and as happens at such times we were all feeling rather bored and restless. In those days without any navigational aids except the compass and one's own sense of direction and observation we did no flying when the sky was completely clouded and visibility at 1000 ft or less was practically nil. Barker got particularly impatient and, weather or no weather, had made up his mind to fly. He told the CO that even in the prevailing bad weather he felt that he could find his way to Richtofen's Squadron who were just across the lines from us and his plan was to fly over there with three other pilots, who would volunteer to go with him, and shoot up the Germans. Glanville told Barker that he was crazy and categorically refused to give his permission. Barker, however, persisted and he was finally able to persuade Glanville to call up Headquarters and see if the General would give permission. The General who knew Barker said that he had no objection to Barker's plan.

Three of us, Fenton, Cooper and I volunteered to go with Barker and almost immediately on taking off in our

respective Camels we flew into thick cloud and as planned started to fly a compass course to the German airfield. I kept as close as I dared to Barker but we lost touch both with Fenton and Cooper. Barker and I realised that we were lost when we suddenly flew into a clear patch of sky in the clouds. A large number of German aeroplanes had flown into the same gap and before we knew what had happened we were engaged in a dogfight. We were completely outnumbered of course and both of us, I am sure, felt that we had had it. However, there was no time for such thoughts as I saw a German coming straight for me with his machine guns blazing. I fired back at him but we both missed. At the same time I felt a sting in the lower part of my right leg and smelt petrol which meant that the main tank, which was below my seat, had been pierced. At the same time the German who had hit me continued in his dive – foolishly – and presented an easy target. I automatically pressed both the triggers of my Vickers guns and riddled him with bullets and he went down in flames. At the same time my engine began to splutter and I realised that there was no longer any petrol coming from my main tank which fed the engine by pressure and which had been shot through. (It was discovered later that the two bullets which had lodged in the lower part of my right leg must have come through the tank and it was a lucky break for me that they had come through the lower part which still had some petrol because if they had come through the petrol vapour in the upper part of the tank the plane would have caught fire and that of course would have been the end).

I realised immediately that my chances of survival were dim. I was about 40 miles over the lines in enemy territory, crippled, as without my pressure tank I could not do a climbing turn (so important in those days for aerial combat), completely isolated and exposed both to attack from the air and from the ground as I had to fly very low. At the same time I was not sure if I had enough fuel to be able to fly the distance to our lines. I felt sure that I would either be killed or taken prisoner. Almost immediately four German fighter aeroplanes caught up with me and began shooting at my Sopwith Camel one after the other. They hit my plane several times but never hit me nor any vital part of my aeroplane (afterwards it was reported that my aeroplane had over 400 bullet marks on it!) I was scared at first but after the first few minutes when I felt the bullets hit the plane or ricochet over my head after hitting the wooden part of the plane immediately behind my head, I felt absolutely calm as if I was protected somehow and would not be shot down.

In due course the four German aeroplanes left me, having presumably exhausted their supply of ammunition and I continued my 'hedge hopping' westwards, being shot at and shooting such objects as I could spot on the ground, trucks, camps, groups of troops etc.

Great was my relief when I saw the Zillebake Lake, a familiar landmark just on our side of the lines. And, just as I saw this, my engine began to splutter showing that my fuel supply had given up. I landed almost immediately and as that part of the front was nothing but craters and shell holes, the result of constant fighting in the same area over about three years, I crashed without, however, hurting myself. I must have fainted however because I had been bleeding from my leg wound for about 45 minutes and the only thing I remember after the crash was lying in a stretcher by the side of my plane along with some other wounded soldiers, mostly Canadians.

There was an amusing sequel to this incident because when I rejoined my Squadron about four months later, after recovering from my wounds, I saw the report that Barker, who had got back unhurt from this escapade, had submitted which was almost identical with the report I had sent in from hospital. Both reports, after describing the flight ended up "The last I saw of Malik (Barker's report)/Barker (my report) was that he was surrounded by Huns, fighting like hell, but I did not think there was any chance of his getting back"!

This miraculous escape (for I should have been killed a hundred times) had a profound effect on my subsequent life as it convinced me that we die only when our time has come and this bred in me a kind of fearlessness, a most valuable asset in dealing with such crisis as I had to often in my subsequent careers.

Scene of an aerial duel near Cambrai in France, November 1917 between a Bristol F.2b of No.11 Squadron RFC and German Albatross DVs (painting by Robert Taylor).

Hardit Singh Malik with No.151 Squadron RAF, flying Bristol Fighters from Biggin Hill in 1918.

The RFC, later the RAF, were unique in one respect in those days among the fighting services. Discipline there was, of course, because without that no Service can survive but there was comparatively little "hot air" and "red tape" associated with the older fighting services and so long as one did one's job, much was overlooked.

I had two vivid experiences of this. The first occasion was in the early summer of 1918 when I was with the famous No.151 "Bristol Fighters" Squadron at Biggin Hill, my C.O. Squadron Leader (later Air Marshal retired) Brian Baker put me in charge of a flight of our planes that were being flown over to replace the planes lost at that time through some intensive bombing by the Germans. We flew over to St. Omer in northern France as per our instructions and handed over our planes. While waiting to fly back to England by the ferry plane, which was to fly me and my fellow pilots back we saw the transport, a large Handley–Page come in and land but we did not like the way the pilot handled the plane. After consulting the other pilots with me I informed the C.O. that we would not fly with that particular pilot. He was very angry and threatened to take action against me for insubordination. I persisted, however, and he finally arranged, under protest, to have us go back by a ferry boat which was fortunately available. As I was in charge of our little party the C.O. at St. Omer had no control over me. He knew it and I knew it and that was why he could do nothing.

When we got back to Biggin Hill, however, Baker told me that I was to consider myself under arrest as these were the orders he had received from the General Commanding the area, who had no doubt received the report from the C.O. at St. Omer. And then Baker added with a twinkle in his eye "Technically you are under arrest but you can go away for a week and do what you like, for news has just come in that the Handley Page you were supposed to fly back in, crashed on landing at Lympne (in England) and every one on it was killed. Thank God you refused to fly with that pilot!" I spent that week of my "arrest" very pleasantly with some old friends.

The other example of getting away with a breach of discipline was after the armistice in November 1918 when I was posted with No. 11 Squadron again a 'Bristol Fighter' Squadron at Nivelles near Brussels. As the war was over, flying was severely restricted and we were ordered to fly only when it was necessary for testing etc. We were all rather restless at this forced idleness and I got the brilliant idea of using this opportunity to visit an old friend of mine whom I had known in the old days at Eastbourne. She was the daughter of a great Alsatian patriot who died in a German prison during the war and she also had been persecuted by the Germans for her strong condemnation of German behaviour towards the Alsatians. For her courage she had been awarded the Croix de Guerre, a rare decoration for a civilian, particularly a woman, by the President of France.

When I asked my CO for leave to fly over to Colmar where my friend lived some two and a half hours flight from Nivelles, Heath said "No I can't let you fly, but you can have as much leave as you want and go by train".

As a journey by train from Nivelles to Colmar at that time was completely impracticable I foolishly made up my mind to fly, whatever the consequences. And, at the earliest opportunity, on the excuse of testing my aeroplane I took off and headed due south for Colmar! All would have been well if the flight had succeeded. I could have flown to Colmar and got back after seeing my friend, saying I had lost my way and nothing would have been said.

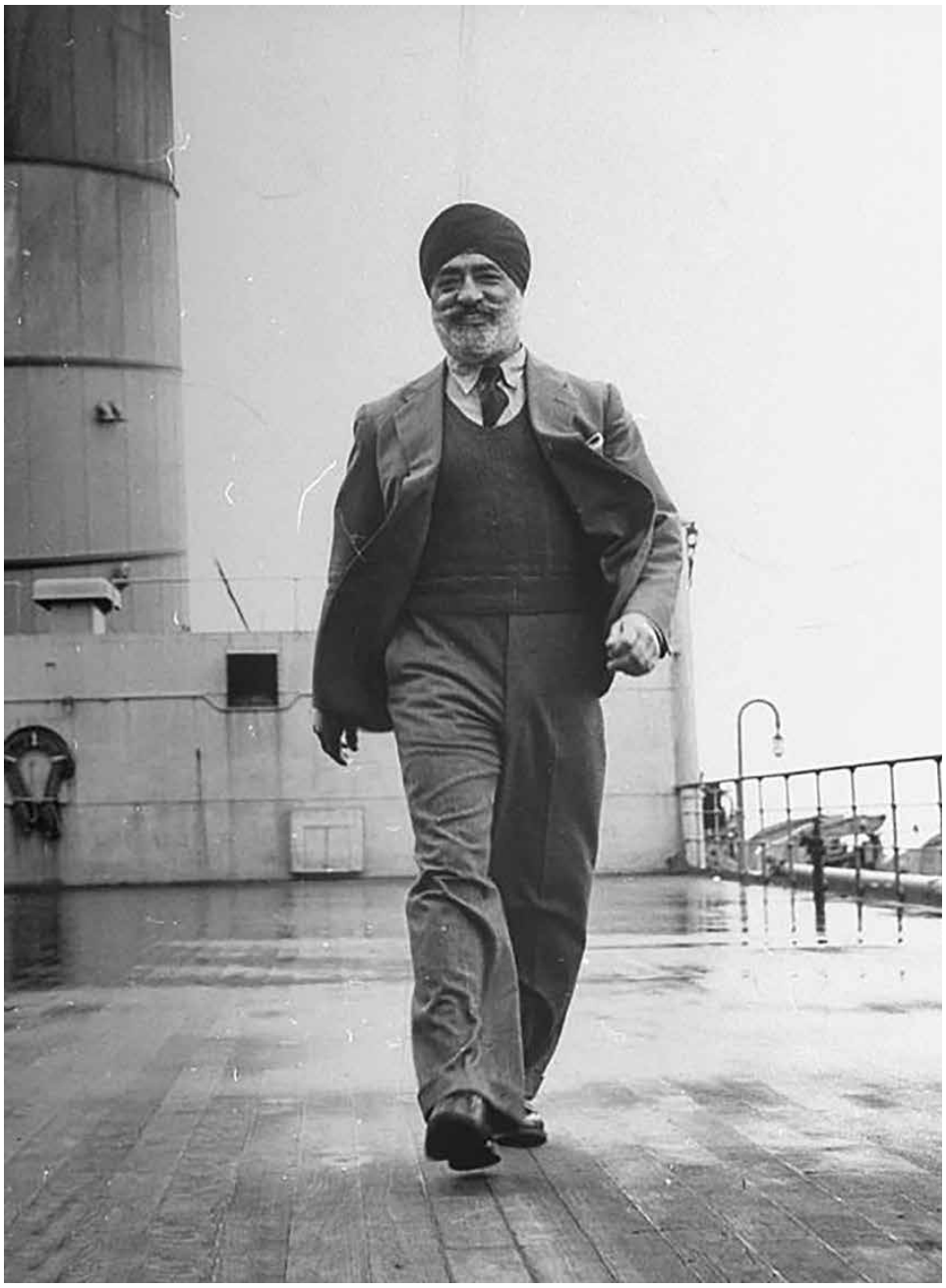
Unfortunately however one of the oil pipes in my engine broke and I had to come down when I was only about half an hour from my destination. To cut a long story short I was able to hand over my damaged machine to the RAF at Nancy and so got back to my Squadron after about ten days absence without leave mainly by getting lifts from various people.

I fully expected to be court–martialled for having deliberately disobeyed the General orders and particularly my CO's instructions and was reconciled to this mentally as I knew I deserved to be punished.

HISTORY

However, Heath, my CO was absolutely wonderful about it. He pretended to be very angry with me but no action was taken and I am sure that he must have persuaded the General to overlook this lapse on my part in the spirit 'Well the lad has done his bit in the war so what the hell, the war is over anyhow. Forget it'! Talk about being magnanimous!

What about racial feeling? From what I have already written it will be clear that I was not the victim of any racial feeling. My fellow officers, superiors and also the airmen, mechanics, riggers etc. who worked under me never showed any signs of racial prejudice. I got along very well with them and I believe that on the whole they respected me for being loyal to my own faith and traditions.



Hardit Singh Malik walking on deck of the Queen Elizabeth ocean liner, c. 1946. Courtesy: Sam Shere/Time & Life Pictures/Getty Images.

The only exception was an incident when I was serving with No. 11 Squadron in the summer and autumn of 1918. Among the pilots in this Squadron was a South African. Previously I had known a number of South Africans and got along well with them. One or two of them had particularly become good friends. This man, however, was a thoroughly unpleasant fellow, foul–mouthed, dirty, obscene, a thoroughly nasty piece of work. When I joined the Squadron, he was often heard speaking about "natives" being in the R.A.F. One night, in mess when we were all at dinner, he made a very rude remark about me which was heard all over the room. Before there could be any reaction to this, my observer "Jock" Crighton jumped across the table, got hold of him by the neck saying "Apologise, you bastard, or I will wring your neck!" He apologised and I had no further trouble. Our CO, Major Heath, realising that this man was a misfit, had him transferred immediately.

The other incident was of a different kind. After the war I got 8 months leave and came back to India with the intention of joining the RAF at the end of my leave. Among the officers on the military transport on which I was travelling was a Captain Keene of, I think, the 28th Punjabis. We became quite friendly and one day after he had had several drinks he said to me "Malik, I advise you not to serve in the RAF in India". I was taken aback by this remark and asked him to explain himself. He said "You know we don't want Indians in the RAF. All the mechanics and riggers in the Squadron will be Britishers and one fine day you will find that your plane will break up in the air and that will be the end of you."

In those days, of course, the Indians in the Indian Army were only in the Infantry and Cavalry.

I was furious at what Keene had said particularly as I realised that he was being sincere and friendly, and I was determined more than ever to stay on in the RAF. However, I could never try this out as soon after I returned to India, I got married and decided to get out of the RAF and get into the Indian Civil Service.

(The autobiography of Sardar Hardit Singh Malik by his daughter Harji. Extracts from his memoirs are reproduced with permission of his family).

Indian Army vs New Zealand

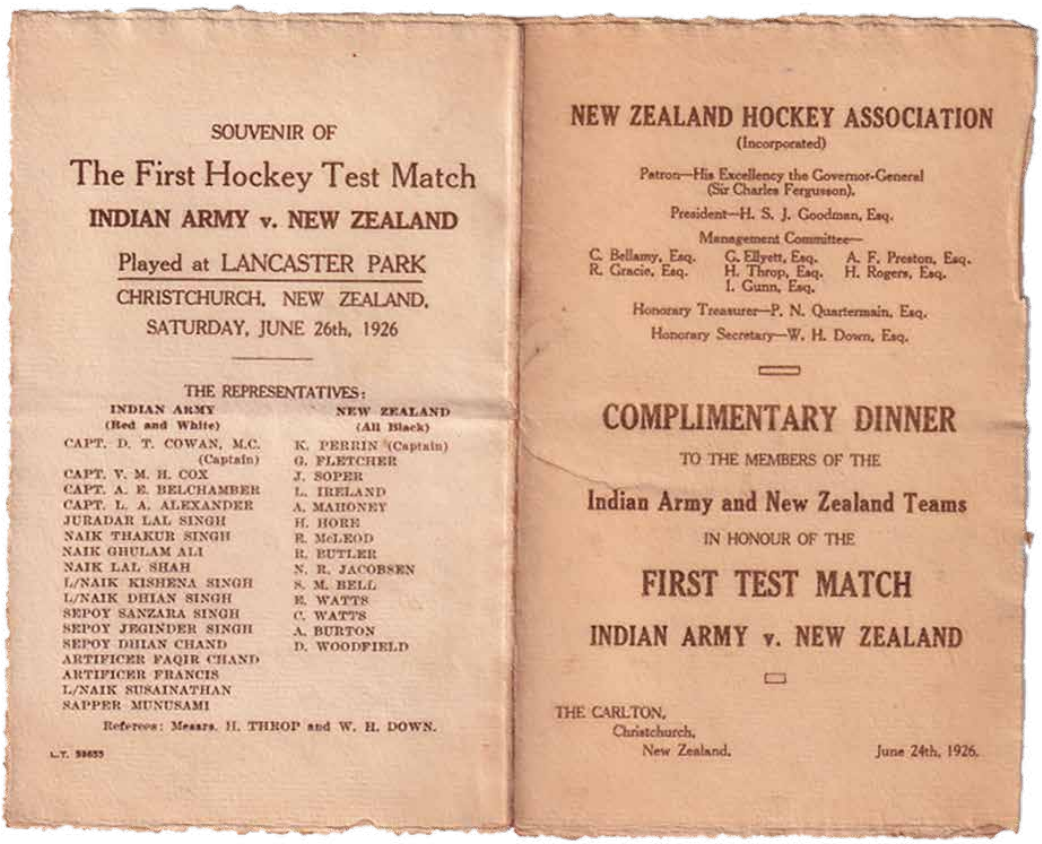
The first hockey test match: 26 June 1926

The Indian Hockey team after a practice session.

NK Ghulam Ali our goalkeeper.

The victorious career of the visiting hockey players was checked when the New Zealand representatives gained a narrow decision from their redoubtable opponents. Having come so far through their programme without a defeat, it is natural to suppose the visitors were hoping to complete it without experiencing one. That they have not done so will doubtless be a disappointment, but there are two considerations to mitigate such a feeling.

Their list of successes has been so long and so brilliant that the loss of the second test, match cannot really dim its lustre. Again, interest in the third and last test match has been enormously intensified by Saturday's event. Another deduction to be drawn from the reversal of fortunes is likely to bring more satisfaction to New Zealand enthusiasts, but should be recognised with



SOUVENIR OF

The First Hockey Test Match

INDIAN ARMY v. NEW ZEALAND

Played at LANCASTER PARK

CHRISTCHURCH, NEW ZEALAND,

SATURDAY, JUNE 26th, 1926

THE REPRESENTATIVES:

INDIAN ARMY (Red and White)	NEW ZEALAND (All Black)
CAPT. D. T. COWAN, M.C. (Captain)	K. PERRIN (Captain)
CAPT. V. M. H. COX	G. FLETCHER
CAPT. A. E. BELCHAMBER	J. SOPER
CAPT. L. A. ALEXANDER	L. IRELAND
JURADAR LAL SINGH	A. MAHONEY
NAIK THAKUR SINGH	H. HORE
NAIK GHULAM ALI	R. McLEOD
NAIK LAL SHAH	R. BUTLER
L/NAIK KISHENA SINGH	N. R. JACOBSEN
L/NAIK DHIAN SINGH	S. M. BELL
SEPOY SANZARA SINGH	E. WATTS
SEPOY JEGINDER SINGH	C. WATTS
SEPOY DHIAN CHAND	A. BURTON
ARTIFICER FAQIR CHAND	D. WOODFIELD
ARTIFICER FRANCIS	
L/NAIK SUSAINATHAN	
SAPPER MUNUSAMI	

Referees: Messrs. H. THROP and W. H. DOWN.

L.T. 59655

NEW ZEALAND HOCKEY ASSOCIATION

(Incorporated)

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President—H. S. J. Goodman, Esq.

Management Committee—

C. Bellamy, Esq. G. Ellyett, Esq. A. F. Preston, Esq.
R. Gracie, Esq. H. Throp, Esq. H. Rogers, Esq.
I. Gunn, Esq.

Honorary Treasurer—P. N. Quartermain, Esq.

Honorary Secretary—W. H. Down, Esq.

COMPLIMENTARY DINNER

TO THE MEMBERS OF THE

Indian Army and New Zealand Teams

IN HONOUR OF THE

FIRST TEST MATCH

INDIAN ARMY v. NEW ZEALAND

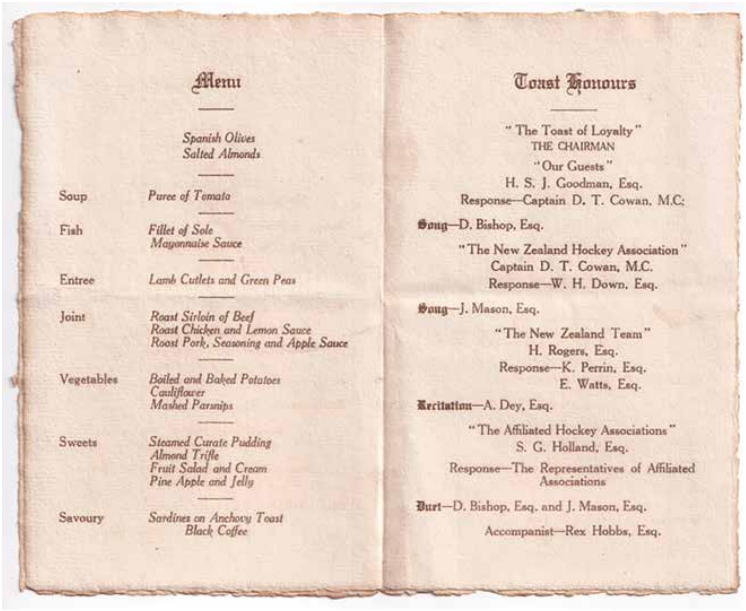
THE CARLTON,
Christchurch,
New Zealand. June 24th, 1926.

Invitation: The first hockey test match Indian Army vs *New Zealand.*

HISTORY

some degree of pleasure by the Indian visitors. It is evident their hosts have learned by the experience of meeting them. The same polished, finished stick–work was not displayed by the winners as by the losers.

It may have been noted as an ideal, but time has not allowed of its acquirement yet. On the other hand, the New Zealanders have obviously learned to modify their own tactics to deal with the opposition they have had to face. They realised that the only way to meet such an attack as that of the visitors was by attacking and keeping up the pressure to the utmost extent possible.



Menu

Spanish Olives
Salted Almonds

Soup — Puree of Tomato

Fish — Fillet of Sole
Mayonnaise Sauce

Entree — Lamb Cutlets and Green Peas

Joint — Roast Sirloin of Beef
Roast Chicken and Lemon Sauce
Roast Pork, Seasoning and Apple Sauce

Vegetables — Boiled and Baked Potatoes
Cauliflower
Mashed Parsnips

Sweets — Steamed Curate Pudding
Almond Trifle
Fruit Salad and Cream
Pine Apple and Jelly

Savoury — Sardines on Anchovy Toast
Black Coffee

Toast Honours

"The Toast of Loyalty"
THE CHAIRMAN
"Our Guests"
H. S. J. Goodman, Esq.
Response—Captain D. T. Cowan, M.C.

Song—D. Bishop, Esq.

"The New Zealand Hockey Association"
Captain D. T. Cowan, M.C.
Response—W. H. Down, Esq.

Song—J. Mason, Esq.

"The New Zealand Team"
H. Rogers, Esq.
Response—K. Perrin, Esq.
E. Watts, Esq.

Recitation—A. Dey, Esq.

"The Affiliated Hockey Associations"
S. G. Holland, Esq.
Response—The Representatives of Affiliated Associations

Duet—D. Bishop, Esq. and J. Mason, Esq.
Accompanist—Rex Hobbs, Esq.

This course gave them the lead, and they then managed to keep it. The victory was the reward of determined aggressiveness, backed in great measure by a superior turn of speed. The defensive qualities of the New Zealand rearguard, especially the goalkeeper, should not be overlooked; but, allowing it full value, it was still the spirit of attack which brought victory. It will be doubly interesting to see whether similar tactics will be adopted next match and, if so, whether they will bring a like reward.

Message to the Editor and readers from Air Marshal Shashi Ramdas

Dear Editor,

Reference our telecon recently regarding articles for your "VAYU" magazine. I had said I would email you some information about myself, my earlier association with your magazine and drafts of the two articles I would request you to consider for inclusion in your magazine.

I had been crazy about aeroplanes ever since I was a young boy and had started collecting pictures of all types of aircraft during the latter part of World War! I was also determined to become an engineer. Wanting both, I joined the famous COEP (College of Engineering, Poona) and, at the same time, joined the Poona Gliding Club where there were no membership charges but the flying fees were Re 1 per launch. Needless to say, the latter ridiculously heavy fees had to be paid out of my measly pocketmoney. By the middle of 1954 I had received my degree BE (Mech&Elec) Hons and flown quite some time in Primary, Sedbergh T21B and Grunau Baby gliders. Then came a voluntary 6 month apprenticeship with a famous British company (Ruston Hornsby) in Bombay, manufacturing horizontal single cylinder diesel engines and paying me a fantastic salary of Rs 146/– pm (Basic Rs 40 + DA Rs 106). After finishing my six months there, I took up a job with Mahindra & Mahindra in Calcutta which was making the same type and size of diesel engine and paying me the grand sum of Rs 350/–pm. While there I applied for selection to the technical branch of the Indian Air Force, appeared before the Selection Board in DehraDun, was selected and reported at the IAF Technical Training College in Jalahalli West on 4 April 1955 along with 32 other young men. That very day all 33 of us men were commissioned as Pilot Officers in the Technical branch of the Indian Officer at a salary of Rs 450/–pm. On 26 September 1956, after 18 months of intense theoretical and practical training all 33 of us had a passing–out parade and were given posting orders to our respective units.

My very first posting was to ATW (Armament Training Wing) at Air Force Station Jamnagar, for about 5 months, after which I was posted to 27 Sqn which was at Air Force Station Adampur operating Vampires. While I was in Adampur I asked for and received permission to join the Jullundur Flying Club. I soon started flying Tiger Moths there and even soloed on one. My Commanding Officer (Sqn Ldr G D "Nobby" Clarke) noticed my craze for flying and often took me up in one of our Vampire T55s and let me handle the controls. About a year later, when I was only a Fg Offr, I was sent to the UK, along with a small team of technical officers and airmen from the Squadron, for training on the Hunter which was being inducted in our Air Force at the time. As soon as this team returned from the UK after training, all the Vampires were ferried out into storage and all officers and airmen of the Squadron were moved to Air Force Station Ambala where they were trained and converted to Hunters.

Representative photo of the Vampire.

During 1959 I had been repeatedly submitting applications to Air HQ requesting to be given flying training along with flight cadets who were being trained for commissioning in the flying branch. There had been a deafening silence from Air HQ till December 1959 when there was an order for me to report to the AFFC in Jodhpur to join the 79th Pilots Course which was starting on 1 January 1960. My intense happiness was soon killed when the AOC 7 Wing (Ambala) called me to his office and told me that I was not going for the 79th PC because he needed me on the Station for the oncoming Republic Day Fly Past in Delhi. All my requests and pleading had no effect on him, even when I reminded him I was only a Flt Lt and he had so many more senior engineers on the Station. He was absolutely adamant.

(Note: How the then Officer i/c Flying (Gp Capt "Ronnie" Engineer) finally got me into 79th PC, even though it was 30 days late, is another story).

Though I was a month late, the Commandant and Senior Instructors were very nice and I finally got my 'Wings" on 31 May 1961, along with all the others. And I continued my flying training with the 79th PC for another 5 months and with the same syllabus as all fighter pilots.

I am qualified to fly and have flown the Vampire, Hunter, Marut as well as the Devon and the Chetak/ Cheetah.

Representative photo of the Hunter.

Your Angad Singh has seen my Logbooks and can tell you what he thinks of it. PS: When I went to the UK for training on the Hunter, I was the only Fg Offr and the other engineer officers were Flt Lts and Sqn Ldrs. When our officers went for training on the Jaguar, I was a Gp Capt and designated Leader of the Team while all other officers, pilots/engineers, were placed under me.

As regards my five earlier articles, one of your staff (I think it was Angad Singh) had called me about three years ago and said that they had found five articles written by me among the late Pushpindar's possessions and asked whether they could use them in "Vayu". Frankly I had completely forgotten those articles and I told Angad that they now belonged to "Vayu" and he could do whatever he wanted with them. I had never thought much of my own writing and little did I think you would ever use even one of them in your lovely magazine.

As regards the two articles I have now told you about, I did not expect you to even have a look at them. But the friends for whom I had written them have urged me to go ahead and send them to you. I have attached both articles to this email and I would like to explain why I had written them in the first place.

The first article is about Flt Lt Ubgade, a friend of mine who was my instructor during the 79th PC and who died from a heart problem which had bothered him for quite some time. I used to visit him every time he was in hospital and I grew to love his grown up children who would be with him. After my friend died, all three children asked me to write about him. And they liked what I had written.

The second article is about Wg Cdr Samuel who had been with me when I was commanding 5BRD. He too had a long drawn out heart problems after he retired and the doctors had opined that he would soon die. His wife and two daughters decided to take him round every unit where he had been posted and 5BRD was one of them. I was told he was very happy when he read what I had written.

I do not expect or want to submit either of these articles in the way they are now. I will rewrite both of them. There will be quite a number of characters added, with their real life names.

I want to particularly concentrate on the article on 5BRD, because aviation magazines have more if not all articles only on pilots and aircraft whereas there are very few if at all any articles covering engineers and servicing, overhaul or repair of airframes and engines.

With Best Wishes,
Air Marshal Shashi Ramdas
14 July 2025

Air Marshal Shashi Ramdas remembers…

….My Flying Guru: Group Captain N N Ubgade

It had been my dream, since I was a youngster, to fly fighter aircraft. But I was an engineer, with a BE (Mech & Elec) Hons degree, and didn't have the slightest idea of how I could even go near an aircraft. Then a friend suggested I could join the Air Force. I thought that was a brilliant idea and immediately applied for enrolment in the Indian Air Force. To cut a long story short, I was selected and was told to report to the TTC (Technical Training College) in Bangalore on 4 April 1955, which I eagerly did and was given the rank of Pilot Officer in the Tech (Eng) branch. The technical training was carried out by a team of ex–RAF officers and SNCOSs and our Passing Out Parade was on 26 September 1956.

My first posting, in Oct 1956, was to ATW (Armament Training Wing) at Jamnagar where there were Vampires and Dakotas, but I was a supernumerary officer. Fortunately, I soon got my next posting. In Feb 1957, I was posted to 27 Sqn at Air Force Station Adampur. To my delight, that unit was a fighter squadron with Vampires and I was posted as the EO (Engineer Officer), the sole technical officer in the squadron while I was still a Plt Offr. I had, at long last got my fighter aircraft, but I couldn't fly it.

IAF Vampires lined up.

Being an integral part of an operational unit was very exciting and working with fighter pilots was even more so. I was particularly close to the following pilots from 65th Pilots Course who took special interest in explaining to me the finer points of fighter aircraft:

Fg Offr K N "Pinky" Pillai (4874)
Fg Offr N N "Ubee" Ubgade (4878)
Fg Offr N "Swami" Swaminathan ((4886)
Fg Offr O S "Pop" Wadhawan (4899)
Fg Offr K S "Kamo" Vohra (4915)
Fg Offr B P "Beepee" Singh (4918)

I found Fg Offr Ubgade to be the most interesting one as he was very knowledgeable in technical matters. He owned a sophisticated motorcycle which he used to maintain and repair all by himself. This particularly impressed me as it was very unusual for a fighter pilot to be such an accomplished technician.

I soon settled into my job of servicing Vampires. I loved it. The best part was when my Commanding Officer (Sqn Ldr "Nobby" Clarke), realising my keen interest in flying, would occasionally take me up in a Vampire trainer and let me handle the controls for a while. That made me want to fly myself. I submitted an application to Air HQ requesting I be trained as a pilot. There was no response, in spite of repeated reminders.

In August 1958 the Squadron moved to Ambala and re–equipped with Hunters, an aircraft on which I had been specially trained in the UK. So there was no point in pursuing my application for flying training at that point in time. But a year later I started pestering Air HQ again. Finally, in late November 1959, Air HQ issued orders for me to report to AFFC (Air Force Flying College) in Jodhpur to join 79th Pilots Course which was starting in the first week of January 1960 and I was to report to AFFC by 31 December 1959.

IAF Hunters over the Himalayas.

Even though I had received posting orders from Air HQ to join 79th Pilots Course, our Station Commander said he would not let me go as I was Engineer Officer of 27 Sqn (Hunters) and specially qualified on that recently acquired aircraft. When I begged him to let me go, as this was the only opportunity I had to learn flying, he remained adamant. When I told my Commanding Officer the plight I was in, he personally went to the Stn Cdr and assured him he could spare me as he had another technical officer in his Squadron. But the Stn Cdr would still not give way. However, my CO kept on pleading on my behalf. Eventually the Stn Cdr said I could go, but only after the

"Ubee Sir" and his Pupils Advanced Term – Vampire aircraft

Republic Day Flypast in January 1960, as he wanted to ensure 100% serviceability of Hunters for that occasion. That meant I would report to AFFC a full month late and be refused acceptance to the 79th Course. I had no other choice. My CO took me away to his office and told me not worry. He said he would make sure a slot would be kept open for me in 79th Course.

I finally reported to AFFC Jodhpur on 30 January 1960, to find 79th Course had commenced more than four weeks earlier. I was told to immediately report to "A" Flight where the Flt Cdr (Flt Lt M S Rane) was irritably awaiting my arrival. He brusquely ordered me to immediately report to Flt Lt N N Ubgade who had been assigned only two pupils till then (Sub/Lt Ashok Sinha and Flt Cdt Ashok Oza) and I was to be his third. It was only then that I knew that Flt Lt "Ubee" Ubgade, having qualified as a flying instructor (QFI), had only recently been posted to AFFC. I was so happy he was going to be my instructor. But suddenly I was apprehensive about how our new instructor/pupil relationship would work, as Ubee and I had been such close friends and squadron mates in 27 Sqn. But Ubee, in his inimitable style, soon sorted out that and we had a wonderful professional relationship right from the beginning. I called him "Sir" and he called me Shashi.

"Ubee Sir" and his Pupils Basic Term– HT–2 aircraft

Intermediate Term – Texan aircraft

He would treat me precisely like his other pupils and I was not to expect any special consideration.

The Pupils on the Course were in two categories. The first category was the Flight Cadets, the majority of who were from the NDA and the rest were Direct Entry Cadets. The second category had Commissioned Officers of the Army, Navy or Air Force. All Pupils, whether Flight Cadets or Commissioned Officers, were treated alike during Flight Training.

The Course consisted of three terms, each term on a different aircraft, with holiday breaks between. The first term was the Basic Term on HT–2s, a basic propeller aircraft. The second term was the Intermediate Term on Texans, a more advanced propeller aircraft. And the final term was the Advanced Term on Vampires, a jet propelled aircraft. The Army Officers did only the Basic Term after which they went to their own training centre where they were trained on their own specific aircraft.

The Flight Instructors were all Commissioned Officers, a majority from the Air Force and a few from the Navy, all of who were Qualified Flight Instructors (QFIs). Every QFI generally had three or four Pupils at a time, but not necessarily the same in all three terms. "Ubee Sir" was the only QFI who had the same three Pupils throughout the entire Course; Sub/Lt Ashok Sinha, Flt Cdt Ashok Oza and Flt Lt Shashi Ramdas. And those three Pupils never had any other Instructors.

"Ubee Sir" was in a class by himself. He had a unique way of teaching. He was always so patient and never raised his voice at any of his pupils. He was meticulous in his pre–flight briefings, in–flight instruction and post–flight debriefing. During his pre–flight briefings he would make it a point to explain in detail the aerodynamic principles that would be involved during the flight that was to follow. During the flight he would first demonstrate how and what his pupil was expected to do and then left his pupil free to fly accordingly. He would first do this in stages and then smoothly in one continuous manoeuvre. He would then point out mistakes, if any, his pupil had made and make him repeat the manoeuvre till he could perform it faultlessly. He did all this with a gentle voice without losing his temper. On the other hand, he would keep speaking encouragingly with his pupil. If his pupil kept making mistakes, he would take over control and demonstrate the correct way to fly and then hand back control to his pupil. His post–flight debriefings were just as gentle. He never shouted at his pupils, like other instructors did. He would gently point out where and why his pupil had made mistakes and what he needed to do to avoid making those mistakes again. All this was not because he was too lax. In actual fact, he was very firm and insisted on perfection.

During our year and a half at AFFC Jodhpur, we Naval and Air Force pupil officers were neither fish nor fowl. As commissioned officers we dined in the Officers' Mess, but lived in a separate block near the Cadets' Mess, a considerable and safe distance from where our instructors lived. During working hours, there was absolutely no differentiation between pupil officers and flight cadets. We shared the same trepidation and exchanged the same confidences as any new entrants to the wonderful world of flying.

"My Guru" and me.

When we pupils were not flying or attending lectures, we used to relax in the crew rooms which adjoined the tarmac where the aircraft were parked. This was also a place and time to discuss and compare our experience and progress in flying, including the manner in which we were being trained by our instructors. We three pupils of "Ubee Sir" soon realised how lucky we were to have him as our instructor.

Eventually, all us pupils did our Final Flying Tests on Vampires. Those who passed that Test were separated into two batches; one batch for further training on fighter aircraft at FTW (Fighter Training Wing), Hakimpet and the other batch for further training on transport aircraft at TTW (Transport Training Wing), Begumpet. All three of "Ubee Sir's" pupils went on to fighters.

Then, on 31 May 1961, the Chief of Air Staff, Air Chief Marshal A M Engineer, commissioned the Fight Cadets by putting on their Pilot Officer's rank badges, and awarded all of us pupils our much cherished and coveted "Wings".

I am eternally grateful to "Ubee Sir" for the thorough training he gave me in this year and a half. Mainly for the way he taught me flying, which stood me in good stead throughout my subsequent thirty years in the Air Force. But also for teaching me how to deal with my contemporaries and subordinates. He was, in every way, "My GURU".

My only regret was that my Guru "Ubee Sir", who had tutored us three pupils through all three terms till we got our "Wings", would not be coming to FTW Hakimpet with us. Instead, he was posted as an Instructor to FIS (Flight Instructors School), Tambaram where experienced pilots are trained to become QFIs. This itself goes to show what an exceptional instructor he himself was and how his talent was recognised and rewarded.

Later, my Guru went on to Canberras where he commanded a Squadron, and then retired as a Group Captain.

Article by Air Marshal Shashi Ramdas
(Written on 26 July 2025)

HISTORY

Air Marshal Shashi Ramdas remembers....

....'5 Base Repair Depot'

All aircraft, whether civil or military, are required to be regularly overhauled at stated intervals based on flying hours. Such overhauls of IAF aircraft are carried out by designated BRDs (Base Repair Depots). Overhaul of Kiran (HJT–16) aircraft, operated mainly by AFFC (Air Force Flying College), are carried out by 5 BRD. The number of Kiran aircraft requiring overhaul during the year is estimated by HQ TC (HQ Training Command) and passed on to HQ MC (HQ Maintenance Command) which then tasks 5 BRD for the ensuing year. In this case, HQ MC had tasked 5 BRD for overhaul of 36 Kirans in 1981–82.

A new Gp Capt (Group Captain) had recently been posted to 5 BRD and had taken over command on 28 July 1981. This new CO had a vast experience of field servicing fighter aircraft but had never been posted in a BRD. Consequently, he was unfamiliar with overhaul of aircraft and immediately got down to understanding his duties, responsibilities and working of the BRD that was overhauling jet trainer aircraft that are such an important and integral factor in training pilots for the Indian Air Force. He first found out the task for the year 1981–82. It was originally overhaul of 36 aircraft, but had recently been increased to 42 aircraft to meet an unpredicted requirement of additional aircraft at AFFC. The BRD had, to date, overhauled only15 aircraft and was confident of overhauling the remaining 27 aircraft by 31 March 1982. He then proceeded to study the working of the BRD.

The BRD consisted of three main Sections, each of which had an Officer–in–Charge. These three officers were the CPCO (Chief Planning and Coordination Officer), the CKO (Chief Kiran Officer) and the CTP (Chief Test Pilot).

The CPCO (Wg Cdr V V Samuel) was tasked with planning and coordinating the progress of work in various sections of the BRD. He spoke with authority and professional confidence. He was meticulous in his planning and had facts and figures at his fingertips. His job included coordination with various external repair agencies (for overhaul of engines, components, accessories, etc), he knew precisely what was happening in the hangar in real

time. One could look at the work–in–progress chart in his office, pick an aircraft number, go down to the hangar to that particular aircraft, and see precisely the requisite operations being carried out. He had close rapport with the CKO in the hangar. The CPCO would plan the entire work schedule, on a daily basis, for every individual aircraft taken up for overhaul. This involved making sure that all requisite men, material and resources, required for that task, were in place. This daily task was then passed on to the overhaul team in the hangar. At the end of the day, the actual progress of work, against planned task, was recorded and evaluated. The CPCO's office was literally the nerve centre of the aircraft overhaul activities of the BRD.

The CKO (Wg Cdr K V Kandaswamy) was in charge of all the activities that together constituted overhaul of an aircraft. The main such activity was in a big hangar in which the aircraft was completely dismantled and various components, such as engines, components, accessories, etc. sent to their respective agencies for overhaul and calibration. The engines were sent to HAL Engine Division and smaller components were handled in house, in individual subsections. The main airframe was then inspected in detail and repaired as and when necessary. Any component, instrument or accessory found unserviceable was replaced with a new one from the Logistic Section where all spares were stored. The aircraft was then reassembled and all systems tested. Thereafter, the aircraft was taken out of the hangar and the engine ground run by a certified technician. Any snags found were repaired and tested. The aircraft was then offered for an Air Test.

The CTP (Sqn Ldr P M Velankar) was a pilot specially trained to carry out Air Tests. He had a small team of technicians to carry out Daily Servicing of aircraft under test. The BRD was supposed to have two test pilots but actually had only one test pilot, who was the CTP. He therefore had to Air Test every overhauled aircraft. Any

snags reported were immediately rectified by a team of specially trained technicians before the aircraft was offered for another Air Test. These Air Tests were carried out till all snags were cleared and the aircraft certified fit for regular flying.

Having been round the entire Unit, the CO was convinced his team was thoroughly professional and competent. He was sure they would succeed in meeting the 1981–82 task of overhauling 42 Kiran aircraft.

A few weeks later, in September 1981, the CO received a call from HQ Maintenance Command that the earlier revised 1981–82 task of 42 aircraft had been further revised to an unprecedented 52 aircraft (a steep increase of 44% over the original task of 36 aircraft) to meet a sudden and unexpected increased requirement from AFFC. With almost half the year gone and limited resources, this was going to be an extremely difficult task. The CO thought over this unexpected challenge and decided to discuss it further with his CPCO. On reaching the CPCO's office, and after exchanging a few pleasantries, the CO broke the news to the CPCO. To the CO's surprise, the CPCO did not react violently as expected. He just sat back in his chair with a faraway look in his eyes. After some time, he leaned forward and said, "Sir, we will do it!" That was it. No histrionics, no tantrums, no swearing. Just a bland statement of fact. The CPCO called for some tea and they discussed their plan of action in detail.

Soon after, the CO held a conference with all Section heads to discuss the nitty–gritty of how this unexpected task of 52 overhauls could be completed in the next six months. Apart from the heavy additional load on the hangar staff, the sheer amount of planning and coordination involved was mindboggling. It had to be fine–tuned to the minutest detail. And this colossal task would be entirely that of the CPCO.

From then on, there was a whirl of intense activity on the Station. Yes, there were occasional hitches, but these were quickly sorted out and did not affect the progress of work. The entire Station worked as a team. And work went ahead precisely according to the master plan charted by the CPCO and his team. The CKO got his hangar working with great enthusiasm and strict adherence to professional standards. And the CTP, all by himself, Air Tested every aircraft in great detail.

During this time the AOC–in–C Maintenance Command came to 5 BRD on a formal Inspection. After having gone around the entire Station he turned to the CO and said he bet the BRD would never be able to overhaul 52 aircraft by 31 March 1982. When the CO assured him they would meet that target, the AOC–in–C bet a bottle of Scotch that they wouldn't. This irked the CO who angrily took on that bet.

The CPCO, CKO, CTP and their teams continued to work with great enthusiasm. And the Chiefs would tell their CO, "Don't worry, Sir". Finally, on 29 March 1982, the CTP took the 52nd Kiran (HJT–16) for an Air Test and

landed it saying it had no snags. During the last nine months he had, singlehandedly, flown 278 sorties/165:45 hours. And 5 BRD had successfully completed its Task for 1981–82. The CO promptly rang up his AOC–in–C and told him he had lost his bet. The AOC–in–C couldn't believe it.

The annual Commanders Conference at HQ Maintenance Command, was scheduled for 1 April 1982. The night before the Conference, there was a Dinner at the Officers' Mess. During the interaction prior to Dinner, the AOC–in–C came up to the CO of 5 BRD and told him his BRD had been found to be the Best BRD of the Year and this would be declared at the Commanders Conference the next day. He then asked the CO which of the two he would like; the Best BRD award or the bottle of Scotch. The CO told the AOC–in–C he would like to have both. The AOC–in–C was taken aback and said he knew the CO did not drink. To which the CO snapped back, "But my Officers do". The next day the CO received both.

Greeting card painted by Sujata Balakrishnan.

There was great excitement when the CO returned to Sulur on 5 April 1982 and announced that 5 BRD had received the Best BRD award. The icing on the cake was the CO's next announcement that Sulur's AFWWA (Air Force Wives Welfare Association) had won the Best AFWWA award.

There was still more jubilation all over the station. And the daughter of one of the officers painted this lovely greeting card.

The celebrations started the following evening, with a "Rum Punch" and Dinner for all personnel of 5 BRD, ranging from NCs to the CO. The next evening was Dinner at the Officers' Mess where the Officers drank their well–earned Scotch, the wives drank whatever they liked and the CO drank his usual Orange Squash.

In recognition of his devotion, abilities and skill the CO recommended the CTP, Sqn Ldr P M Velankar, for the VM (Vayu Sena Medal) which was awarded to him by the President of India on 26 January 1983.

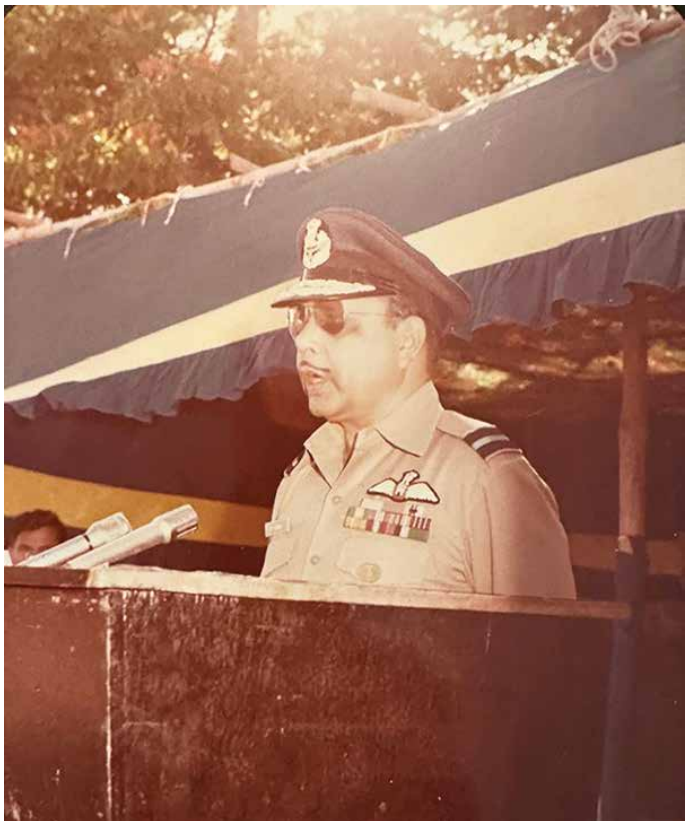
There was an interesting corollary to this account. Air HQ had been considering transfer of the Kiran (HJT–16) overhaul task from 5 BRD to HAL, Bangalore. In May 1982, the MD of HAL Bangalore had visited 5 BRD to assess the workload of the Kiran overhaul task. He spent three full days, going through various sections and hangars, particularly the CPCO's Planning and Coordination Section. Eventually he came back to the CO's office for a cup of tea. The CO asked him about his findings. The MD admitted that HAL could never match the performance of 5 BRD, both in terms of quality and quantity. That was a Medal for the entire Unit.

By Air Marshal Shashi Ramdas
Images for representational purposes only

HISTORY

Air Marshal (R) Harish Masand says...

I learnt more than flying from them: JP Singh



JP Singh

JP Singh

The first time I met Air Commodore Janak Pratap Singh was when he was Joint Director Air Staff Inspections (ASI) in the rank of Group Captain in Air HQ (Vayu Bhavan) in July 1981. I had just returned from Iraq after a two year stint on deputation flying MiG–21s with 17 Squadron of the Iraqi Air Force which was essentially based in Al–Kut in a training role for young pilots. I use the word 'essentially" because after the start of the Iraq–Iran War in September 1980, we were moved to Baghdad for operating from H–3 air base, close to the Jordanian border in Western Iraq. I was posted to the Directorate of ASI as an Inspector with Air Commodore MSD "Mally" Wollen as the Director.

Almost immediately, ASI visited Hindon where I flew the Su–7 with the local Squadron commanded by then Wing Commander "Mian" Naqui. JP Sir, better known as "Japua" to his friends, was warm and friendly but kept a discreet eye on his latest young inspector, me, to ensure that the required standards were met. In this visit to Hindon, I think he was satisfied with the way I flew and conducted myself including the manner in which I tried to bring back my old friend, "Ben" Kuruvilla who was leading a 2 vs 1 sortie and had developed a fuel leak as soon as we started the situation. As the attacker, I saw this fuel leak and immediately asked Ben to switch off the afterburner and head for home for a direct straight–in approach and landing. While Ben still ran out of fuel and had to eject while I was shepherding him home, JP Sir just gave me a pat on the back with a smile to show that I had been accepted in the ASI community.

Almost immediately after that, in between the annual inspection programme, he sent me off to Poona to do a few sorties on the MiG–21 Bis with 4 Sqn since that was the only version of the MiG–21 that I had not flown earlier. Apart from the M, MF and FL versions that I had flown in India, we were required to fly all types like the PF, PFM and many different combinations with different cockpit switches in each aircraft that existed in 17 Squadron of Iraq without any formal conversion or training. Soon thereafter, came a test for me in which I almost lost JP Sir's trust but somehow survived because he took my word on what had happened and so conveyed it to the Director. The incident has been described in detail in another article that I published in VAYU on "Vaps" Nair earlier and available at *https://vayuaerospace.in/article/1034/air–marshal–r–harish–masand–says–i–learnt–more–than–flying–from–them–vaps–nair* but a brief recap would be in order to highlight JP Sir's role and his technique

of man–management in it. The exact dates are in my log book which is not with me right now but I think it was some time in October 1981 when we went to Halwara on an inspection visit with 17 Squadron, commanded by "Vaps" Nair, and 23 Squadron, commanded by Sukrat "Scooter" Raj, on MiG–21s based there. On the very first day, after the written tests given to all the pilots of these two squadrons, I was flying an inspection sortie with 23 Squadron as the attacker. The briefing for this sortie was attended by JP Sir as well as another slightly senior inspector, "Nippy" Arora, perhaps since they wanted to guide me, a fresh and young inspector new to this game, in these exercises. During the briefing for the mission, the leader briefed tactics which were at variance with what had been standardised in the Air Force by TACDE with the claim that the squadron had tried these out and these worked better. Nippy objected to this variation on safety grounds while I opined that the squadron should be allowed to try these out with us so that we could try and defeat such tactics in the mission and then highlight the weaknesses and flaws after the mission instead of not letting the squadrons develop and recommend new stuff on their own. Of course, this approach placed a greater responsibility on the supervisory staff of the squadrons in terms of safety. JP Sir agreed with me even though he hardly knew me and let me fly the mission with such new tactics, perhaps taking a risk himself. I saw this trait in him even later and found him to be a great leader who listened to all sides from his subordinates accepting with humility that he may not always know everything and then take a decision.

The mission debrief was expectedly long and attended by both the squadron pilots because they wanted to see how these had worked out. Quite naturally, I had figured out the weaknesses and flew the mission accordingly to highlight these in the two situations we flew. Because of the long discussions in the debrief, in which JP Sir also

JP Singh Flying Officer.

JP Singh and Mystere days.

participated, it got pretty late and dark before we finished. JP Sir got into his car with Nippy and left while we were waiting for the aircrew vans to take us home. For some strange reason, the drivers of the vans were missing. So after a while, I offered to drive one of the vans and get back to the Officers' Mess since I still had the task of correcting all the written test papers that night. As it happened, both the commanders of these two squadrons were known people from our earlier service, as was the Flight Commander of 17 Sqn, Anil "Sinch" Sinha, my course mate. Even Vaps and Scooter, did not seem to have their vehicles with them and jumped in the van along with Sinch, with me in the driver's seat. Those who are familiar with Halwara would know that the squadron complexes in Halwara are some distance away from the domestic area and married quarters and quite unsuitable for a quick walk.

Sinch was the first to be dropped home followed by Scooter and finally, Vaps, whose house was the same house that I had stayed in during my earlier tenure in 17 Sqn in 1975–76. This house was almost across the Base Commander's, then Air Commodore Upkar Singh, house and one house further away from the Officers' Mess which was just 200 meters or so from these houses. Upkar Sir also knew me from Adampur days when I was in 101 Sqn on Su–7s in 1973 and he was commanding 1 Sqn on MiG–21s. When I dropped Vaps, he insisted that I come in and, at least, say hello to Dana, his wife. Having known both from FIS days in 1974, I couldn't refuse without seeming to be impolite and distant just because now I was an Inspector. I was also curious to see the old house and accepted the offer of "just one quick drink and hello to Dana". Little did I know that I was being ambushed and within minutes, Scooter, with his wife Sughi, and Sinch, with his wife Pushy, landed up. Well, one thing as they say, or drink, led to another and Vaps and Scooter just would not let me leave even after the second drink and a quick bite when

JP Singh inspecting 28 Sqn.

JP Singh with C–in–C Polly Mehra & Visiting Russian Team–47 Sqn.

I said I would just walk across the 200 odd meters to the Mess. Vaps kept insisting that he would not let me walk and drop me in his personal car and it got later and later with Vaps and Scooter, old buddies from Tikrit in Iraq, arguing loudly over some unimportant issue that I couldn't even recall the very next day. Upkar Sir heard these loud voices and guessed that there was a party going on in Vaps' house during the inspection. I think I somehow managed to escape sometime after midnight, sat up till about 2 am correcting the test papers and still went for the briefing at the appointed time.

JP Sir called me aside after the briefing and asked me what had transpired the night before. Quite obviously, Upkar Sir had mentioned the incident to Mally Sir including the fact that one of the inspectors was socialising with the squadrons. Mally Sir was naturally upset with this report but left it to JP Sir to handle it. I told JP Sir the truth admitting that I should have been firm in my resolve to leave immediately after one drink and saying hello. I added that this was an error on my part for which I took full responsibility and was willing to accept any punishment that they thought fit. I think my forthrightness in accepting my mistake without making an excuse or laying the blame on anyone else convinced JP Sir that I was sincere and he let me off with a verbal warning not to fraternise with my friends on any inspection and not to indulge in such activities in future.

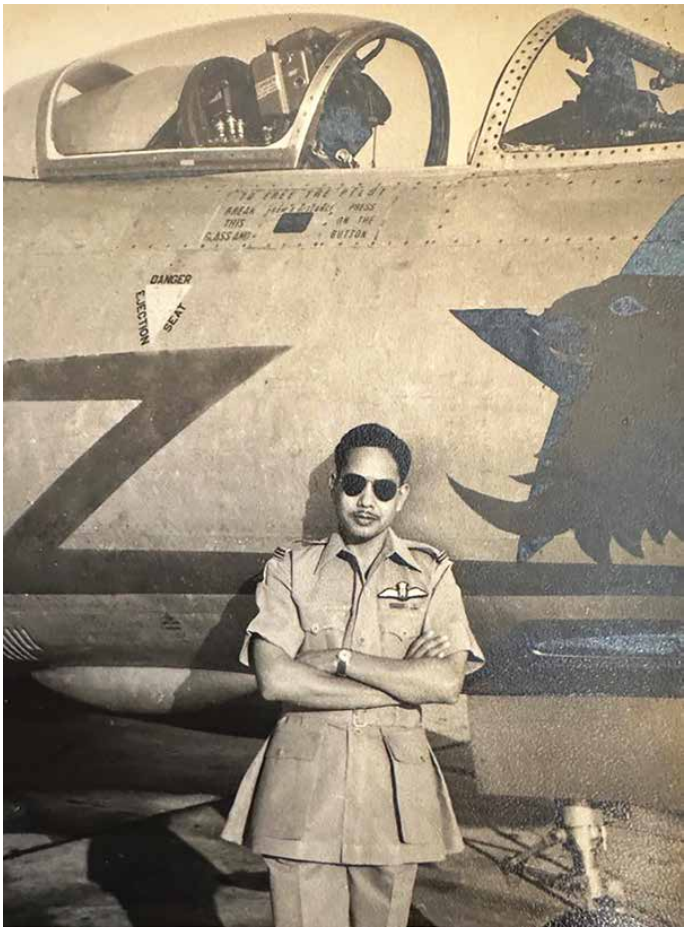
During my short stint in DASI, we had a wonderful working and social relationship and JP Sir was kind and big–brotherly in every interaction we had in my remaining tenure in ASI. I used to prepare my draft reports and submit these drafts to the Director through JP Sir well in time. Mally Sir also started giving me greater responsibility and used to leave most drafting of notes and reports to me while also asking me to prepare papers on various subjects demanded from the Directorate. Socially also, I met all the ladies in the Directorate in the get–togethers and they were all gracious and friendly to me even though I was single in this tenure since my wife, Malini, was expecting our first child and did not join me in Delhi for this short tenure. As a matter of fact, we were in Tezpur in the end of September and while returning to Delhi, Mally Sir told JP Sir to have me dropped off at Hasimara, closest to where Malini was with her parents, for the long weekend including the Air Force Day on 8 October. Our child was expected only in the end of October but the seniors in the Directorate were kind and thoughtful to give me a few days to meet Malini who was in Druk's Hotel in Phuntsholing with her parents at that time. As it happened, our daughter, Ruheene, arrived early on the second day itself that I was there and was

JP Singh receiving C–in–C Polly Mehra–MiG–29 Inauguration December 1987.

born in 10 Air Force Hospital in Hasimara on 7 October when I was supposed to leave on the 8th and fly back to Delhi for work on the 9th. As per tradition, I made sure I carried chocolates for everyone in the Directorate.

While I learned a lot in my time in ASI under the guidance of JP Sir, my tenure there was limited since I had cleared the Staff College examination while in Iraq and was required to be in Wellington for the 38th Staff Course in January 1982. The next time I met JP Sir was in 1987 in Poona after I converted on the MiG–29 in the Soviet Union and was to raise 28 squadron in Poona on the new aircraft. JP Sir was then an Air Commodore and commanding the base. As soon as I reported to him in June 1987 after almost 3 years in the Staff College as DS, he showed his trust in me by tasking me to prepare for a war game–cum–presentation in HQ South Western Air Command (SWAC). With a big smile, he told me that after all he had to utilise a DS from Staff College appropriately. For this paper exercise, JP Sir had been designated as AOC–in–C Sindh from the Pakistani side and was required to present his plan to take on SWAC in the war game. I formulated a rather unusual approach to hit and neutralise SWAC in a preemptive strike gaining air superiority in that sector in quick time. I would not like to divulge the details here in an open forum and, in any event, those details are not relevant to this story. However, when I took the draft plan to JP Sir, he smiled and said in a lighter vein that while what I was suggesting was certainly doable but, due to its unorthodox surprise move, his career would certainly get axed because he would surprise SWAC and the AOC–in–C, then Air Marshal "Polly" Mehra. At the same time, he himself said that he liked my plan because our job was to point out the weaknesses, or the chinks in SWAC's armour, in a bold and ingenuous plan so that SWAC could be forewarned of such a possibility and prepare itself to counter such a threat. Having got his approval, I polished up and finalised the plan.

Sure enough, after JP Sir presented the plan and each move while I was handling the slides, Polly sir was a bit taken aback because his staff had not thought of such moves and had not taken any measures for such a



JP Singh with Mystere.

contingency. The Chief of Air Staff, Air Chief Marshal "Dennis" LaFontaine was also present during the presentation and appreciated the plan. Polly Sir, after the initial reaction, agreed and directed his staff to come back to him with measures to counter not just this but also other contingencies that they may not have thought of. During the lunch after the presentation, the Chief congratulated JP Sir for such a bold and out of the box plan. JP Sir was

JP Singh with Rajiv Gandhi in January 1988

JP Singh with Russian Delegation & CinC–MiG–29 Inauguration–December 1987

JP Singh with CNS.

gracious enough to tell him that it was "Harish's idea". This reinforced the earlier lesson that had been taught to me that while the commander did get the kudos, as well as the brickbats when things went wrong, the juniors must get the credit for their good work. Some of the Command staff like Vaps Nair, who was Ops 1A in SWAC at that time, also congratulated JP Sir and me but, I think, I left some with a bad feeling which emerged much later. Through this episode, JP Sir taught me and reinforced the belief that honesty in our professional approach was more important, even at the cost of possibly offending, than merely pleasing one's superiors by saying whatever they wanted to hear. The intent essentially being to improve our system and its capabilities for any future contingency. Also, the responsibility for the failures of subordinates must be taken by the Commander and not just the rewards for their good work.

As a commander, JP Sir was very kind and benevolent to all his subordinate commanders giving them every kind of administrative support so that they could do their job well. Even though he had earlier commanded 47 Squadron on MiG–21s which was my sister squadron on MiG–29s in Poona, I felt no difference or step–motherly treatment towards 28 Squadron. In the early days from June till September 1987, I was busy in setting up the squadron complex with little help since all the personnel of 28 Squadron had moved from Tezpur to Poona and all, pilots and technicians, had almost immediately gone for conversion training to the TETTRA. This left only the few non–technical tradesmen with me. Amongst them was JWO Khan ACH/GD, as the Sqn Warrant Officer and between Khan and me, we literally formed a two man team and managed the few men and non–combatants to clean up and organise the abandoned hangar and squadron complex given to us as also the Squadron's Airmen's Mess. Since the squadron had come with few assets and just about Rupees 25,000/– in funds, I had to go to the AOC, JP Sir, a few times and ask for some funds to buy the basic necessities. This included a very amusing episode during these requests, as described below.

In the Station administrative set–up, we had Wing Commander "Macky' Palamkote whom I had known earlier, though briefly when he was the staff officer to C–in–C WAC, Air Marshal E Dhatigara, in the mid–1970s and they had visited Adampur where I was. Macky Sir was in charge of the PSI in Poona as a re–employed officer under JP Sir. I went to Macky first since I did not want to bother the AOC with such requests every time, as also follow the chain of command, and asked him for Rs 10,000/–. Macky was known for his flowery language and unless he used a few choicest abuses in each sentence for you, you knew he didn't like you. Sure enough, the moment he heard my request, he burst into the best of his collection of abuses since in 1987, 10K was quite a princely sum. After briefly arguing with him as to why I needed that kind of money, I told him straight either to give me a grant of Rs 10K from the SI or I would go the AOC. And, if the AOC agreed to 10K, Macky would have to give me double that, i.e. 20K.

JP Singh–JDASI on arrival.

JP Singh JDASI Visiting on Inspection

JP Singh with Toofani.

Macky sent me off with some more flowery language and asked me to try my luck.

So, off I went to JP Sir who offered me a cup of tea and, after a few pleasantries, asked me how the squadron set–up was coming up. I told him everything was going well and I was being well–supported by his staff, including Group Captain Radhakrishnan, the Chief Adm Officer, and others including Macky Sir. Gently, I then said that the squadron didn't have any funds left and just to make my men comfortable in the airmen's mess, I needed 20K to buy some chairs and the basic crockery and cutlery since I didn't think the men should come to the Mess with their service–issue enamel plates and mugs. Also, we needed some curtains and other stuff for the air crew and ground crew rooms. I did not tell him that I had gone to Macky and he had refused to grant me the money. JP Sir immediately picked up the phone and told Macky to give me 20K. I promptly went back to Macky and collected 40K along with some of his choicest words. After I had done up the Airmen's Mess, and started pulling away the casual meal income of the Wing Mess, JP Sir just smiled but did not curtail his generosity towards 28 Squadron. As a matter of fact, he showed his appreciation by surprise visits to our mess a couple of times and dining with the men to assess their satisfaction level.

I would leave the scene with Macky to your imagination but he did not take any personal offence at my approach. Macky, and his wife Naushad, were great friends and guides to Malini and me and remained good friends and benefactors for life. Macky and Naushad stayed in their own apartment in Poona and Malini and I saw a lot of them in this tenure as well as when I came back as the AOC in 1997. Unfortunately, Macky Sir passed away a few years ago but I still see Naushad and the family every time I pass through Poona.

In this tenure, I found out that JP Sir came from a principality near Lucknow in UP. So, Malini and I naturally started calling him Raja and Mrs JP as Rani amongst our peers. Socially, the JPs were very warm and hospitable and we would be frequently invited to their house for a drink and a meal. Those were evenings that we truly enjoyed. They were also very informal in their social interaction and would, sometimes, just drop in and share a few drinks and whatever was in the fridge with us. Sometimes, JP Sir casually dropped in to listen to some of my music. Soon, I got busy with flying training when the squadron received its aircraft in September/October 1987. I was out till after the Air Force Day that year with two aircraft borrowed from 47 Squadron for the aerobatic display over Palam and we flew the inaugural sortie with the SASO, Air Mshl "Minhi" Bawa, who happened to be visiting the station at that time, soon after my return. Due to the urgency of getting the squadron operational on the new aircraft at the earliest, I did not get to see or speak with JP Sir for a while. A few weeks later, as I got into the office around 1.30 pm after flying to clear the mail and some paperwork before lunch, the phone rang and I picked it with my typical response of "Masand". Prompt came the words I still remember from the other side, "Aur hamara naam JP Singh hai, Aajkal aap apne naye toy ke saath hamen bhool gayen hain. Kabhi aake hamare saath ek cup

JP Singh–Handing and Taking Over with Kamli Khanna.

coffee bhi le lijeeye, meaning; And my name is JP Singh, Nowadays, you seem to have forgotten us because of your new toy. Come sometime and have a cup of coffee with us". I, somehow, managed to stutter my apologetic response and immediately went across to his office and invited him over that evening to our humble abode. Graciously, and without any rancour, he accepted and we had a wonderful evening laughing about my state that afternoon when I got his call. The grace and royalty of the JP Sir and Mrs JP was so very obvious in this exchange and in the way they always conducted themselves. As a matter of fact, I got along like a house on fire even with their young son, Vikram, and was fortunate to meet him many years later on board with him as the Captain of an Air India flight that I was taking out of Bombay in 2010.

Thereafter, I made it a point to call the Boss, JP Sir, or just drop in on him in his office even when I had no business with him. Frankly, I found JP Sir appreciated the way I got going because soon we were the richest squadron on base from our frequent detachments and the way we ran our Mess and other funds. Even then, he still displayed his generosity and offered to help whenever he got the opportunity even though he knew I didn't need any financial grants from the station. However, whenever he gave anything to 47 Squadron, he made it a point to be even–handed to ensure that 28 Squadron also got the same so that we did not feel like stepchildren. With him at the helm and with his professional subordinates like the Chief Operations Officer, Jeff D'Souza that I wrote about earlier in VAYU available at *https://www.vayuaerospace.in/article.aspx?d=1040&n=i–learnt–more–than–flying–from–them–jeff–d–souza*, and Radha Sir & Macky on the administrative side, I had an easy and fruitful tenure bringing up the squadron to speed on the MiG–29. I had also taken his approval for a shorter and different pre–flight servicing schedule on the MiG–29 and from Day–1, we followed it in the squadron much to the chagrin of the C Eng O, Gp Capt Magdum, who protested to JP Sir. JP Sir just pointed out to the better utilisation rate and the serviceability maintained in the Squadron through this procedure without compromising on the safety issue to pacify him.

JP Singh Mystere days.

JP Singh–Training days with Harvards.

In December 1987, we had the formal inauguration ceremony for the MiG–29s in the Air Force with the Defence Minister, Shri KC Pant, as the Chief Guest and, what came to be known as the "Big–MiG Show", was held at Poona, I think on 5 December 1987. The way JP Sir and Jeff handled all the detachments of outside aircraft and the arrangements taught me how to conduct such events without too much fuss or tension. In this show, apart from the fact that I was performing the Low–Level aerobatic display, JP Sir handed over the responsibility of seating and tea over to me in 28 Squadron. I promptly asked Flying Officer "Fuzz" Moulik, the O I/C Tea club of the squadron to organise the tea at his level. JP Sir once told me that the C–in–C wanted to know the menu for the tea. I replied that he should tell the C–in–C not to worry about such petty issues and leave it to Fuzz and me. Once again, his trust and ability to delegate came to the fore and he never bothered to breathe down my neck to ask how and what I was organising. In the end, when it all went well, he just patted us on the back.

The show was a big event with the Chief, C–in–C and the Russian Ambassador attending the event amongst many other dignitaries. Quite obviously, due to security reasons, the event was only by invitation. As it happened, my father decided to visit me for the first time in 20 years of service and drove up to Poona just two days before the event. Why my father visited me after 20 years is another story for another day. JP Sir, on finding out that my father was on the station, promptly sent out an invitation to him to attend too and gave him such a warm welcome and respect that my father finally got convinced that I had not made a mistake joining the Air Force. After the event, he also hosted my father and they shared some good laughs along with their drinks.

Soon after this, as we were approaching operational status for most of the pilots in the squadron, I found out that there were some pilots who were not performing at the desired level and could become a flight safety liability in the MiG–29. After personally flying about 10 missions with each of these pilots, I was compelled to raise an unsuitability report on two of them with a recommendation to move them out, preferably out of fighter flying. JP Sir looked at the report and with an understanding smile and said, "these guys are unlucky to be serving with you. If they had been in the other squadron, they would have probably survived." I told him that the option to shift them to the other squadron was with him as the commander but he declined and said he had full faith in my assessment and promptly forwarded the recommendations to HQ SWAC. Unfortunately, JP Sir left Poona in early April 1988 and I had to then face a lot of questions over this assessment. In the end, of course, I prevailed when I told the new AOC that he was welcome to reverse my decision and let these two fly with 47 Squadron but he should be ready to take the responsibility if something went wrong. In the end, the C–in–C accepted my recommendations and the pilots were re–streamed and survived through their Air Force lives. One, whom I met a few years later, even thanked me for this action because he could not bring up his weakness in flying on his own.

Unfortunately, Air Commodore JP Singh was posted out in March 1988 and I lost a great trusting commander under whom the Squadron and I had flourished. In early 1989, I came to know that JP Sir had been sent to Iraq as the Air Attache and I missed meeting them in Delhi before they left for Baghdad. Thereafter, somehow, we did not meet ever till he passed away at the age of just 70 in 2008. There were no cell phones or email those days in the 1990s and we lost touch but I bumped into his son, Vikram, over four years after retiring and had the pleasure of flying with him in an Airbus 320 when he was flying as a commercial pilot and a big shot in Air India. It was such a pleasure to spend this little time with Vikram and relive those days in Poona. Mrs JP is still very much with Vikram in Powai in Mumbai and I always pay my compliments to her through Vikram. It is due to JP Sir and others like him who groomed me in the Air Force and made Malini and me better people for which I owe the JPs more than I can ever repay.

Photo on the left: The author of this series, Air Marshal (R) Harish Masand is 3rd from the left. Photo on the right: AM Harish Masand.

Commemorating the 1965 War

Insights, reflections and lessons for the future

The Indo–Pak War of 1965, often called "The War of Redemption," restored India's military confidence after 1962 and exposed Pakistan's miscalculations born of overconfidence and political turmoil. A recent seminar revisited the conflict's forgotten battles, leadership lessons, and enduring strategic insights that continue to shape India's defence posture today.

The Indo–Pak War of 1965 holds a unique place in South Asian military history. Overshadowed by the trauma of 1962 against China and the apparent victory of 1971, the 1965 conflict remains a study of bravery, misjudgment, and especially, the steadfast resilience and strengthening of the soldiers' national will. Lt Gen Vinod Bhatia (Retd), former Director General Military Operations, called it "The War of Redemption".

A seminar jointly organised by the Chintan Research Foundation (CRF) and Valley of Words (VoW), led by Lt Gen (Dr) PJS Pannu (Retd), with support from Mr. Shishir Priyadarshi, President of CRF, and Mr. Sanjeev Chopra, Festival Director of VoW, aimed to revisit this war with rare candour.


Jats atop two captured tanks: 'We were too good for them!'

The Battle of Dograi and Batapore

The day long event was addressed by distinguished veterans and thought leaders, notably Lt Gen Kamal Davar (Retd), of the 7th Light Cavalry, and Maj Billie Bedi, of The Scinde Horse (former head of the Aviation Research Centre and founding Director General of the National Technical Research Organisation, NTRO). Both, alongside the late Air Marshal Asthana, belong to the 23rd course of the National Defence Academy (NDA), an exceptional cohort that contributed to India's leadership in the Defence Intelligence Agency (DIA), NTRO, and the Strategic Forces Command (SFC), as well as the key recommendations of the Kargil Review Committee Report.

The seminar not only honoured the sacrifices of 1965 but also revealed forgotten episodes, overlooked tactical decisions, and the strategic contexts that influenced the war. These lessons are crucial for understanding our military history and developing future strategies.

The 7th Light Cavalry and the spirit of defiance

In 1965, the 7th Light Cavalry was converting to PT–76 tanks. According to Army Headquarters' policy, the unit was not expected to be battle–ready. However, the commanding officer, Colonel Dalip Jind, showed remarkable determination. He persuaded higher authorities to let his regiment march to the concentration area with the available rolling stock, continuing training en route.

This act of defiance epitomised the ethos of the Armoured Corps: to never let institutional inertia override operational readiness. It also highlighted the vital role of leadership in shaping the course of the war. Lt Gen Kamal Davar, then a young officer in his twenties with barely three years of service, would carry this ethos into battle.

Maj Billie Bedi, of the Scinde Horse, a young and spirited individual, was pulled out of the prestigious Gunnery Instructors' course at the Armoured Corps Centre and School (ACC&S) at his request. This was after he personally petitioned the Commandant, ACC&S, to allow him to rejoin his regiment in combat.

PM Lal Bahadur Shastri greets the Indian Army Soldiers

The episode revealed a stark truth: wars are not always won by armies that are fully equipped and prepared, but by soldiers and leaders who refuse to bow to circumstances. Whether on land or air, the Indian man behind the machine was demonstrated as India created a Patton Nagar with 103 Patton Tanks.

Geopolitical Backdrop: Perceptions of weakness and miscalculation

The perception of a weakened India significantly influenced Pakistan's decision to start the conflict in 1965. The 1962 debacle against China left scars on the Indian military and political psyche. The death of Prime Minister Jawaharlal Nehru in 1964, followed by the appointment of Prime Minister Lal Bahadur Shastri, created an impression of leadership flux.

During this interregnum, a man of few words, returning from a Non–Aligned Summit, reportedly conveyed to Field Marshal Ayub Khan in Rawalpindi that peaceful coexistence with India was desirable. Pakistan, however, chose aggression over accommodation.

Another key factor was the assassination of US President John F. Kennedy in November 1963. Kennedy had promised to supply ten Indian Army divisions after the 1962 war to bolster India's defences against China; his commitment concerned Ayub Khan, who saw it as shifting the balance of power. However, when Lyndon B. Johnson took office, US priorities changed. Focused on Vietnam and cautious about alienating Pakistan, a vital Cold War ally in SEATO and CENTO, Johnson quietly delayed the promised arms support to India.

This lack of external support to India emboldened Ayub, who was keen on importing the latest weapons from the US. Ayub was convinced that the superiority of their weapons would probably have him having dinner at the Red Fort in Delhi within 24 hours.

However, the volte face and the Indian Army allowed Shastri to quip, "We saved Ayub the travel to Delhi, we can have dinner together at Lahore".

Lal Bahadur Shastri may have been short in height and had a quiet demeanour. Still, he stood ten feet tall when his political directive to the Indian defence forces was clear, which enabled the Indian military to achieve what it did.

Convinced that India remained militarily vulnerable and seeking to strengthen his hold after rigging elections against Fatima Jinnah, Ayub launched a series of operations starting on 1 January 1965. These included probes in Kutch, infiltration under Operation Gibraltar, and the offensive move of Operation Grand Slam. The gamble was intended both to exploit India's perceived weaknesses and to rally Pakistan behind his leadership.

Indian armour and air power: Numbers and limitations

At the cusp of 1965, the balance of armour and air power was stark:

- Pakistan possessed 15 armoured regiments, bolstered by M–48 Patton tanks courtesy of its SEATO and CENTO alignments. It also had advanced aircraft such as F–86 Sabres and F–104 Starfighters.
- India, by contrast, fielded 17 regiments. Its inventory included Stuart and Sherman tanks, AMX–13s, PT–76s, and one regiment of Centurions. The Indian Air Force relied on Hunters and the nimble Gnats.
- When Pakistan commenced operations in the Rann of Kutch, its armour manoeuvred with agility, exposing India's underdeveloped road infrastructure and lack of availability of armour along the border.
- The bigger issue that surfaced was not about numerical deficit but about institutional bias. The Indian Army's emphasis on the Himalayan border and dismissive remarks by the then Chief of Army Staff at Armoured Corps Centre that "the days of armour are numbered" highlighted a dangerous underestimation of the importance of mechanised forces in plains warfare.

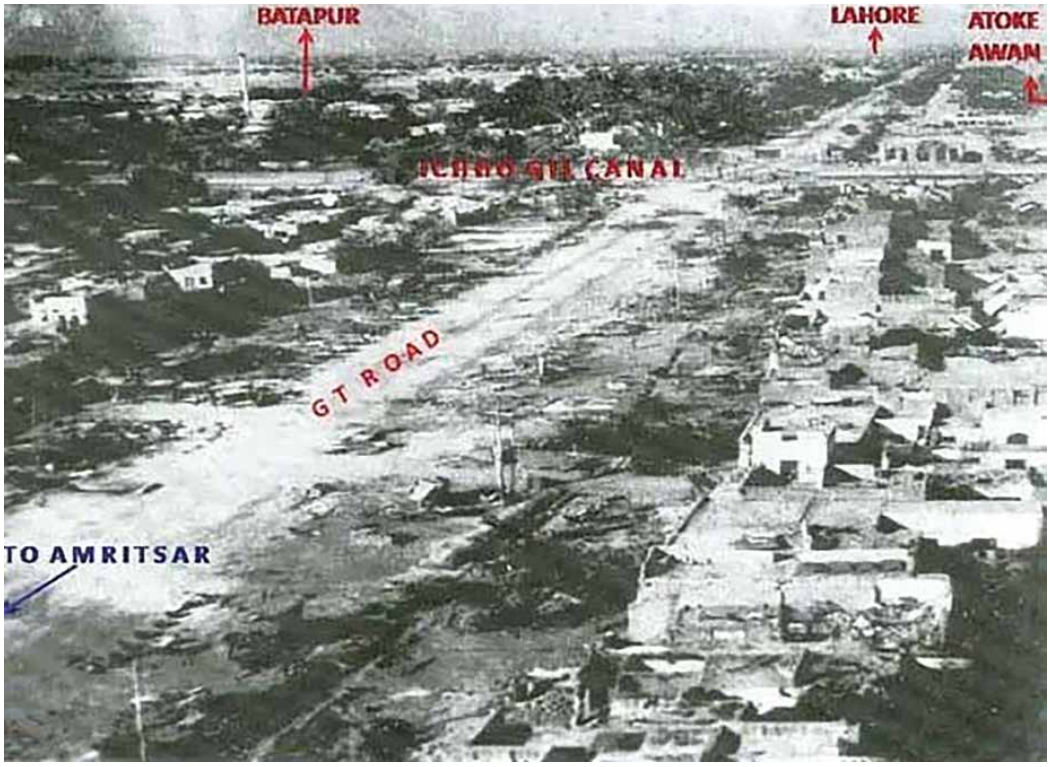
Since then, many a time has the death knell of armour been called out, including the Ukraine–Russia conflict and the recent OP Sindoor.

Political undercurrents in Pakistan

The war also coincided with political turmoil in Pakistan. Fatima Jinnah, sister of Pakistan's founder, contested the 1965 presidential elections against Ayub Khan. Although she had clearly won the popular vote, the military regime manipulated the election, giving Ayub a fraudulent victory by a margin of 10,000 votes.

Facing a legitimacy crisis, Ayub resorted to external conflict to strengthen his power. The promise of quick gains in Kashmir was presented as a route to national glory, concealing internal divisions.

Thus, Pakistan's military adventurism was as much about strengthening Ayub's domestic political position as it was about changing the regional balance.



Battlefield of Dograi. Image via History Under Your Feet Blogspot.

The course of Battle: From Punjab to Hajipir

India responded decisively once provoked. On the night of 6/7 September 1965, formations crossed into Pakistani Punjab. 3 JAT, 15 Dogra and 13 Punjab, supported by the Scinde Horse, advanced to the outskirts of Lahore (Bata Nagar), breaching the formidable Ichhogil Canal.

The 3rd Battalion of the Jat Regiment (3 JAT), under the unwavering command of Lt Col Desmond Hayde, with Capt Baldev Raj Varma as his adjutant, demonstrated extraordinary gallantry in the capture of Dograi. They not only seized the position once but twice, each time against heavily fortified Pakistani resistance. The assaults incurred a high toll, with significant casualties, including the grievous wounding of Capt Baldev Raj Varma, who survived, continued his career with distinction, and retired as Maj Gen Baldev Raj Varma.

3 JAT feat at Dograi remains legendary in the annals of the Indian Army. Despite being outnumbered and fighting without adequate replenishment, 3 JAT embodied the highest traditions of courage, resilience and determination. The eventual recapture of Dograi on the night of 22/23 September stood as a symbol of Indian resolve and an emphatic response to Pakistan's boast of martial superiority.

Simultaneously, in the high Himalayas, Indian troops captured the Hajipir Pass and Point 13260 in Leh, both strategically valuable. Tragically, these gains were returned during post–war negotiations, reflecting political compulsions rather than military logic.

The human toll of the 1965 war was significant for both sides.

The Indian Army lost about 2862 soldiers killed in action, with around 8000 wounded and nearly 2000 taken prisoner. The Pakistan Army's losses were higher, with estimates indicating 3800–4000 killed, 8000–9000 wounded, and approximately 2400 prisoners of war held by India.

While Pakistan's official figures acknowledged only about 1800 killed, neutral assessments from the United States, Britain and other observers confirm considerably higher losses.

These figures highlight the intensity of the 22–day conflict, during which neither side achieved a decisive breakthrough. Still, both paid a heavy price in blood before the United Nations ceasefire and the Soviet brokered Tashkent Agreement of January 1966.

Field Marshals and the Pakistani Psyche

Over the last six decades, Pakistan's military elite has consistently positioned itself as the saviour of the nation: Field Marshal Ayub Khan initiated the misadventure of 1965. Gen Yahya Khan presided over the disastrous 1971 war. Gen Zia–ul–Haq entrenched military rule under an Islamist veneer. Gen Pervez Musharraf launched the ill–conceived Kargil conflict.

Today, Gen Asim Munir continues to cast the Pakistan Army as the sole custodian of national interest.

This narrative maintains the Pakistani Army's dominance over the civilian government. The Pakistani military remains perhaps the only army in the world that owns and governs a country rather than serving it.

India–Pakistan as nuclear rivals

The nuclearisation of South Asia further complicates the landscape. India and Pakistan are often called "nuclear flashpoints," yet the global discourse rarely applies similar terms to India and China despite their equally hostile disputes and comparable arsenals. This selective framing exposes geopolitical biases, often exploited by Pakistan to sustain international relevance.

Strategic and tactical lessons

The 1965 war, revisited through the voices of veterans like Lt Gen Kamal Davar and Maj Billie Bedi, offers enduring lessons:

- Operational readiness over bureaucratic caution.
- The insistence of Col Jind and the youthful determination of his officers underscore the need to prioritise initiative and adaptability over rigid policy.
- Infrastructure is strategy.
- Pakistan's ability to exploit developed border roads highlighted the strategic importance of infrastructure. India must never neglect its border connectivity again, a lesson still pertinent in the context of Ladakh and Arunachal.
- Armour and air power matter: Dismissive attitudes toward mechanised forces nearly cost India dearly. Modern wars reaffirm that combined arms, integrating armour, artillery, air power and logistics, remain the cornerstone of battlefield success.
- Political–Military synchronisation: Victories at Dograi, Hajipir, and Point 13260, relinquished under political pressure, demonstrate the dangers of a disconnect between battlefield gains and diplomatic negotiations. Military success must inform political strategy, not be bartered away.
- Understanding the adversary's psyche: The Pakistani Army thrives on projecting India as the existential enemy. Recognising this pathology is critical to shaping India's military, diplomatic, and informational responses.

Over the past six decades, a discernible pattern has defined Pakistan's approach to conflict with India. Time and again, Islamabad has relied on non–state actors and irregulars to make limited incursions, with the deliberate aim of internationalising the dispute and inviting third–party intervention in its favour. From 1948 through 1999, this strategy was repeatedly employed—and repeatedly thwarted. The 1965 war ended with Russian mediation at Tashkent, while subsequent crises in 1987, 1999, and even up to 2025 saw US involvement to defuse tensions, each time under the looming shadow of nuclear escalation. The pattern remains clear: Pakistan manufactures crises to draw in global powers, while India has consistently worked to resist external interference and maintain the primacy of bilateral resolution.

In Operation Sindoor, the Government of India has taken a clear stance: non–state actors and irregulars hired by the Pakistan military would be considered as part of the Pakistani state itself. Any such provocation will prompt a complete and proportional response, leaving Pakistan no room to hide behind proxies while denouncing responsibility.

Deterrence messaging must be unambiguous. India's defence forces cannot afford to speak in the language of "restraint" alone. It must follow the dictum, "In God we trust, the rest we monitor."

India's adversaries must hear a single, unwavering message: provocation will be met with a disproportionate response.

Broader reflections

The seminar organised by Lt Gen (Dr) PJS Pannu, with intellectual input from Mr. Shishir Priyadarshi and Mr. Sanjeev Chopra, was more than just a celebration. It also served as a collective reminder that history should be examined critically, not just honoured. The stories of Gen Davar, Maj Bedi, Lt Col Desmond Hayde, and Maj Gen Baldev Raj Varma reminded the audience that courage, initiative, and professionalism can change the course of war, even when institutions falter. Equally, the recollection of missteps, including underdeveloped infrastructure, underestimation of armour, and premature relinquishment of territorial gains, underscored the importance of learning from history.

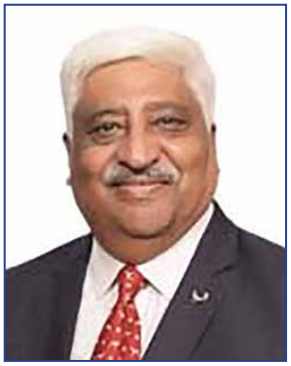
Conclusion

The Indo–Pak War of 1965 was not a decisive victory for either side. Yet for India, it was a crucible that restored confidence shattered in 1962. It proved that Pakistan's myths of martial superiority were hollow. It revealed the vulnerabilities of relying too heavily on alliances and foreign weaponry. Most importantly, it forced India to introspect on modernising its forces, building its infrastructure, and integrating political and military strategies.

Today, as India faces persistent challenges from both Pakistan and China, the lessons of 1965 echo with renewed urgency. Our armed forces must remain decisive, technologically advanced, and operationally ready. Our political leadership must synchronise battlefield gains with diplomatic posture. Our national message must be unambiguous: if provoked, India will not hesitate to impose costs that cannot be borne.

History is not a static record; it is a teacher. The commemoration of 1965, led by stalwarts like Lt Gen Kamal Davar and Maj Billie Bedi, Lt Col Desmond Hayde and Maj Gen Baldev Raj Varma, is a reminder that the past speaks to the present and prepares us for the future.

About the author



Lt Col Manoj K Channan (Retd) served in the Indian Army, Armoured Corps, 65 Armoured Regiment, 27 August 83– 7 April 2007. Operational experience in the Indian Army includes Sri Lanka – OP Pawan, Nagaland and Manipur – OP Hifazat, and Bhalra – Bhaderwah, District Doda Jammu and Kashmir, including setting up of a counter–insurgency school – OP Rakshak. He regularly contributes to defence and security issues in the Financial Express online, Defence and Strategy, Fauji India Magazine and Salute Magazine. Views are personal.

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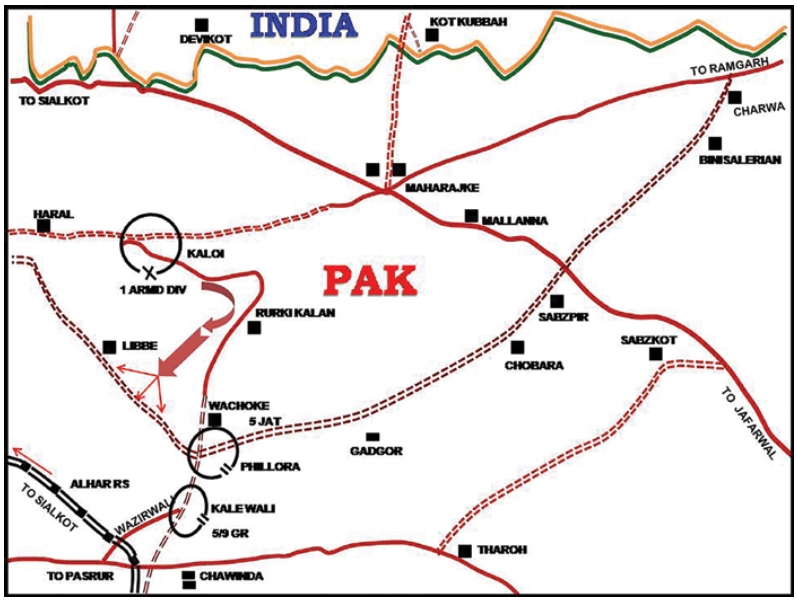
Battle of Phillora



1964: During their arduous time in Ladakh during the 1962 War, the Jats were at last making their way from Darbuk to the plains. On 20 July 1964, Paltan landed in Jhansi and joined the 43 Lorried Brigade. Following Pakistan's aggressiveness on the Kutch border, the entire brigade—which included the 5 Jat, 8 Garhwal, and 5/9 Gorkha Rifles—left Jhansi for Beas at the end of April 1965 on very short notice. Lt Col Bakhtawar Singh, who commanded the battalion during the 1962 War, remained in command of the unit. The battle clouds were approaching once more, but this time they were on the western borders. Lt Col Raj Singh, an officer of the unit, assumed command after Lt Col Bakhtawar relinquished command on 8 July 1965. After spending four months in Beas, the battalion finally proceeded on 5 September towards Bazpur, which is close to Samba and only three miles from the Indo–Pakistani border.

Young Officers of 5 Jat who participated in 1965.

OP Nepal

The brigade was assigned to the 1 Armoured Division, which was tasked with capturing Pagowal–Phillora–Chawinda. On 8 September, at 0600 hours, 2 Lancers and 8 Garhwal were to form the brigade's advance guard and cross the border. However, on the night of 7–8 September, there was a lot of rain, which caused a small stream to breach its banks. When the advance started at 0200 hours, the tanks were unable to move, and the vehicles of the leading battalion became stuck. The plan of action changed, and 5 Jat was given the order to spearhead the advance via the Jakh–Bazpur–Charwa–Sapzpir–Kaloi–Pagowal road.

The battalion began marching at 0900 hours, although the advance was hours behind schedule. In order to provide flank protection on the right, Delta Company, led by Lt. RK Mazumdar, was detached and grouped with 62 Cavalry. Bravo Company, under Captain Bimal Kumar Das, was in the lead, followed by Charlie Company, under Captain Harish Chandra Gujral, VrC, and Alpha Company, under Captain Mohinder Pal Singh and the Battalion HQs.

Despite intense artillery shelling and armour fire from the Sabzpir region, the battalion eventually crossed the border at 1330 hours and arrived in Charwa at 1500 hours. The unit advanced forward and encountered no opposition from the regular army. While A and C company protected the flanks, Mujaheedin resisted the move but B company cleared the region of Bini Salehrian. There was a major airstrike shortly after. The commander of C company, Captain HC Gujral, VrC, courageously left his defence to target the enemy aircraft with medium machine gun. Along with Sepoy Sukhbir Singh, he was killed after being hit in the neck during staffing.

10 ORs from C company and Subedar Rup Ram were wounded. Recently returned from leave, Lt GS Kahlon was assigned to lead Charlie Company. As the enemy armour withdrew farther south, the unit successfully took control of the Sabzpir road junction about 1800 hours. The operation was proceeding as planned, but the brigade was asked to retire to Bini Salehrian, where it spent the night, after it was reported that the enemy was backed by heavy armour south of Sabzpir. This caused concerns to be raised and the plans to need to be reevaluated. Continuous shelling occurred, and the unit's patrols engaged the enemy, resulting in about 30 enemy troops killed and some PoWs, and Jats suffered no casualties.

The brigade began the advance at 0700 hours on 9 September, with 8 Garhwal serving as the advance guard. This column arrived in Kaloi just before sunset. Taking over the Kaloi defences from 8 Garhwal and D company, which was part of 62 Cavalry, the battalion returned to the battalion. The following day, the brigade remained in defence despite the intense rains. Aggressive patrols were carried out, conflicts occurred, and the enemy was

HISTORY

repelled. Due to the altered enemy situation, the brigade was given the order to capture Phillora on 11 September. Heavy rains on the evening of the 10th prevented the vehicles from moving, therefore the advance was made on foot. RCL weapons and mortars were abandoned alongside the vehicles. Another change of plan occurred when an officer patrol that had gone on recce reported enemy tanks in Rurki Kalan. The armoured brigade was then ordered to clear the enemy tanks. Soon after 0230 hours, the enemy in company strength attempted to breach the Bn positions at Kaloi; after an hour and a half of firing, the enemy withdrew as a result of our artillery fire. By 0400 hrs, the area was cleared.

The Battalion moved forward on the Chakli–Rurki Kalan–Libbe–Phillora axis at 0630 hours. A half hour long enemy airstrike followed, and as the unit approached Rurki Kalan, artillery fire began to engulf the entire force. The unit crossed Rurki Kalan and waited for 5/9 GR, which was right behind, to re–join the force.

Around 1030 hrs, two enemy armoured regiments confronted our troops in the Libbe region. Tank battle along the Libbe–Nathupur–Sadoke line was intense, and the battalion was located short of Kotli Bagga. With a void between each battalion, the brigade was set up to allow an armoured regiment to move through. Consequently, the unit was frequently subjected to effective high explosive and medium machine gun fire. As a result, C Company sustained the most casualties.

Since such a confrontation had not been anticipated, the situation was somewhat ambiguous at first, but as time went on, things began to become evident. The tank combat lasted until approximately 1415 hours. In the east, 4 Horse outflanked the enemy. After retreating, the enemy armour gathered in the region south of Khakanwali–Phillora. Barely 1,000 yards separated our tanks from the enemy armour as they fought a fierce battle. Two Patton tanks approached Lt Col Raj Singh within 50 yards. The commanding officer asked C Company, which was placed close by, to provide a volunteer tank hunting party. In order to throw a grenade into the opposing tank, Sepoy Sukhbir Singh stepped forward and crept up to it and lobbed a grenade inside it. It quickly caught fire and was destroyed. The crossfire killed Sukhbir Singh while he was returning after finishing his assignment. He was mentioned in dispatches for his extraordinary bravery.

With 5 Jat and 5/9 GR advancing on the left and right of the Libbe–Phillora route, the brigade advance was resumed. One squadron protected the flanks. Companies A and B moved first, then C and D. Wachoke was cleared and defences were set up at 1500 hours. The battalion established a position north of the intersection of the Phillora and Sabazpir roads. The other two companies were in depth, while B and C Companies were positioned east and west of the road, facing the enemy. The enemy was preparing a counterattack, as reported by one of our patrols. At 1700 hrs B Company was pushed forward and the enemy attack was foiled. B Company lost its two forward platoon commanders, Naib Subedars Ram Kishan and Hanuwant Singh along with 4 ORs.

Battle of Phillora

On their way to Phillora, a group of three vehicles and six enemy tanks were contacted at around 1900 hours. Everyone was taken aback. 9 Frontier Force's commanding officer drove a vehicle to lead the convoy. Subedar Mukhtiar Singh of A Company pulled over the car. In the pandemonium that ensued, the officer fled by jumping into a field of sugarcane. The driver and the jeep were taken into custody. In the meanwhile, fire had begun. The enemy was aided by the darkness and shot indiscriminately with machine guns and high explosive rounds as they ran away. This firefight cost the enemy eighteen men.

Around 2015 hrs, a second group of five or six tanks came up the same way and began firing into the battalion area. Nearby artillery OP opened fire on them right away, but they were able to flee in the direction of Chawinda. D Company reinforced the defences. A roadblock was formed by two abandoned trailers positioned across the road.

While moving south towards Phillora, the remaining enemy in the region was contacted at 2100 hrs. Major AS Pawar and Captain BK Das were instructed by the CO to handle it; the Jats were better prepared this time, and the ambush succeeded. The Pakistanis quickly disembarked, opened up with all of their weapons, and fled, abandoning all of their vehicles and equipment, after discovering that they were encircled and that their path was barred.

The Jats held Phillora strongly in place during two counterattacks.

After approximately an hour of fighting, it quickly devolved into an open ended affair. After moving forward, two 17 Horse tanks provided crucial support. With 18 dead and 60 wounded, the enemy swiftly gave up and fled into the sugarcane fields. 3 PoWs were captured. 13 vehicles containing valuable equipment, records, and stores were taken, and one enemy truck was destroyed. While in the area at the time, Major AS Pawar showed remarkable leadership and courage.

The performance of A and D companies was outstanding. 4 ORs were killed. 10 ORs were injured, along with Subedar Richpal Singh and Lt RD Sharma (B Company). The adversary identified Lt Col Raj Singh, who was also present and personally leading the operations, at one point during the conflict. Paki Soldiers attempted to overwhelm him. Lt RK Mazumdar who was nearby went up with some troops to help the CO, the commanding officer was released during the subsequent hand–to–hand fighting. It was later discovered that Lt Mazumdar went missing during this combat.

His body was discovered tied to a tree trunk by a patrol on 19 September while the battalion was in the Josun area. His eyes were bandaged, and a rope was fastened around his hands and feet. His body had many bayonet wounds. This was a popular young battalion officer's tragic end. C Squadron 17 Horse was redeployed in the harbour area, and patrols were sent out. The remainder of the night was incident free.


Lt Col Raj Singh, CO 5 JAT

The battalion's night action received high appreciation from everyone. The following morning, Maj Gen Rajendra Singh, GOC 1 Armd Div, arrived and praised Subedar Major Parbhu Ram and the commanding officer on this outstanding accomplishment. "We are grateful to the Fighting Fifth for holding on to Phillora and having captured so much equipment," he stated.

1 Corps made some reorganisations the following day. After being relieved by 99 Brigade elements, the battalion and the Lorried Brigade reorganised and resupplied in the Kaloi area about 1900 hrs.

Capture of Kalewali

At 0300 hours on the 14th, the march started, and by dawn light, the forward assembly area west of Wachoke was occupied. During the day, the area was directly under enemy artillery observation, making movement impossible.

The battalion was instructed to secure Kalewali at 1800 hours. The move to the FUP was made right away. During the advance and assault, there was still a lot of shelling. With A Company (Captain MP Singh) on the left and B Company (Captain BK Das) on the right, it was a two–up attack. In–depth were C Company (Lt GS Kahlon) and D Company (Second Lt BS Malik). The attack started at 1900 hours, and the objective had been captured in two hours. On the right, B Company faced fierce pushback. Twelve ORs were injured and four were killed during the attack. The enemy suffered severe damage from our artillery.

As Kalewali was deemed too far forward and would have been untenable against an infantry counterattack during the night or a tank assault by enemy armour at first light the next morning, the battalion was later ordered to withdraw to Wachoke, in the rear.

In order to establish a firm base for the assault on Chawinda, the battalion needed to recapture Kalewali. The advance started on 15 September at noon. Shortly after 1330 hrs, A and B Companies took the lead in the attack once more and seized the objective.

One formidable enemy patrol made it to our defences at around 2300 hours. The Pakistanis, who were in danger of being surrounded, withdrew before any substantial action could be taken. Twenty ORs and one JCO, Subedar Mukhtiar Singh, were injured, and six ORs were killed during shelling.

After one troop of 2 Lancers relieved 17 Horse and C Company at Changarian, A Company marched to Wazirwali the following day. However, D Company was unable to get in touch with 4 Horse and returned to base that same evening.

The battalion was divided into two groups while preparations were being made for the attack at Chawinda. Under Lt Col Raj Singh, C Company, support elements, and battalion headquarters relocated from Kalewali to Wazirwali, where A Company was already stationed. Major A.S. Pawar oversaw the establishment of the other two companies at Kalewali. Under intense enemy shelling, hastily constructed defences were set up in the dark. At Wazirwali, A Company was on the right and C Company was on the left. Mortar sites and battalion headquarters were protected and given depth by the support company elements. There was a troop of 2 Lancers in the vicinity of A Company.

Lt Col Raj Singh, CO with destroyed Pak Tank

One enemy infantry company tried a spoiling attack at around 0100 hours while our defences were still being prepared, but it was repulsed. Excellent support was given by the gunners, and the enemy suffered greatly from the medium machine guns and battalion mortars. This onslaught was also largely repelled by tank machine guns. During this battle, Sepoy Datta Ram and Naib Subedar Zile Singh lost their lives.

On 18 September, there was a lot of patrol activity. B and D companies were dispatched to the regions of Alhar and Khananwali, respectively, for harbour protection in the evening. After that, Major A.S. Pawar returned to battalion headquarters. Due to a significant concentration of artillery and mortar fire, as well as an attack by a powerful enemy patrol, B Company was unable to get in touch with 4 Horse while enroute to Alhar. The men held their ground despite the fact that there were no practical alternatives. Subedar Lajje Ram and seven other ranks were killed in this battle. Twenty five other ranks were injured, along with Captain BK Das and Second Lt Gurdev Singh. Later, Lt Gurdev Singh passed away in a hospital.

On the evening of 18/19 September, 14 Rajput troops accidentally fired at our troops while enroute to a defensive position for an assault on Chawinda. Captain MP Singh, who stood atop a tank and yelled at the Rajputs to alert them to the presence of their own troops despite the intense fire, he and 1 OR was killed by friendly fire and 2 OR were injured.

B Company spent the 18/19 night there since it was unable to proceed to join 4 Horse or return to battalion headquarters. At 2300 hours on the night of 19 September, it returned to battalion headquarters.

Along the front, the adversary intensified its operations. Throughout the following day and night, aggressive patrolling persisted. A hostile convoy was successfully engaged by the battalion mortars, forcing it to retreat back to Jassoran. On this day, shelling wounded three more ranks. On the evening of 20–21 September, a vigorous counterattack was launched against the battalion position. Subedar Chhotu Ram and Havildar Sunda Ram used heavy mortar fire to repel the attack. During enemy firing, 2/Lt GN Gujral and 5 OR were wounded and 1 OR was killed. On 21 September, enemy airstrikes and shelling injured Sepoy Chander Singh and Major AS Pawar.

On 22 September, 4 Madras relieved the battalion, which then relocated to the Mallahna region. At Khakanwali, one company stayed behind with 16 Cavalry and eventually re–joined. Since the battalion had been under fire continuously since 8 September, change was essential. Havildar Sunda Ram along with Naib Subedar Kanwal Singh, Lts OP Tandon, SL Guleri, BS Malik, BS Dhaka, and AK Kakkar were dispatched on a reconnaissance mission near the Alhar railway station on 2 October. The JCO suffered a leg injury after unintentionally entering a minefield. When Lt Kakkar attempted to save him, he was also hurt. Lt Kakkar's leg had to be amputated while the JCO recovered. The battalion stayed in the region until 17 February 1966, when it relocated to Mandlial. On 21 September, 5 Jat returned to Kapurthala.

43 all ranks were killed and 102 were wounded. Captain HC Gujral who as a youngster in Charlie Company in 1962 received his VrC, died as its commander in 1965, coincidentally he was born in Pakistan and he died there, a destined death. Captain MP Singh and Lt RK Mazumdar had returned from home just days before the war, never to return back. Despite their extensive combat, 5 Jat did not receive any significant gallantry decorations; instead, they were awarded the Battle Honour Phillora and became well–known as the Phillora Captors, a title that has been inscribed as the battalion's moniker.

The following awards were announced:

Mentioned in Despatches: Subedar Major Prabhu Ram, Subedar Richhpal Singh, Havildar Ram Kishan (Posthumous) and Sepoy Sukhbir Singh (Posthumous).

Chief of Army Staff's Commendation Card: Lt Col Raj Singh and 2/Lt Gurdev Singh (Posthumous).

"For the Fighting Fifth"

~ Jai Samota

Article by Jai Samota

X: @jai_samota

A biographer specialising in the life of Major Shaitan Singh, PVC (P), has conducted in–depth research into the Ladakh Theatre of the 1962 War. This research will soon be published in a dedicated book, providing a comprehensive history of this critical period in military history.

Sivrihisar Air Show

Sivrihisar Airshow 2025 was held at the Sivrihisar Aviation Centre/S.H.M. on 20–21 September 2025. The M.S.O. Air and Space Museum was established at the Sivrihisar Aviation Centre in 2018. Many aircraft in the museum's inventory are not only on display but also in flying condition. The largest participants in SHG Airshows are the classic aircraft from the museum's inventory.

The SHG Airshow, held for the first time in 2015, occasionally features military aircraft alongside civilian aircraft. This year's military participants were the Solo Turk from the Turkish Air Force and the Typhoon Display Team from the Royal Air Force. The demonstrations began with parachute jumps on and continued with formation flights of two Boeing Stearmans, modeled 1940 and 1943. The 1940 Boeing Stearman, serial number 75–863, is the oldest aircraft flying in Turkey. The Vecihi XIV, designed and built in 1930 by Vecihi Hurkus, a prominent figure in Turkish aviation history, was the first aircraft to receive

certification in Turkish aviation history. A replica of this aircraft was built using the Boeing Stearman's engine and participated in the demonstrations for the first time this year.

The Tiger Moth, serial number T7471, located in the inventory of the M.S.O. Aviation Museum, was manufactured in 1942. One of the most significant aspects that makes this Tiger Moth special is its status as a "movie star." It was the aircraft with serial number T7471 featured in the 1996 film "The English Patient."

Another aircraft participating in the show was a 1940 Douglas DC–3 Dakota, number 2204. Purchased in 2009 by the Swiss based Super Constellation Flyers Association, the DC–3 continued its flights under Breitling sponsorship.

In 2017, it completed a full world tour sponsored by Breitling and earned the title of "oldest aircraft to circumnavigate the globe." During its world tour, the DC–3 travelled 45,400 km, logged 258 flight hours, and completed 147 takeoffs and landings, visiting 27 countries and 62 cities. In March 2019, the DC–3 was added to the inventory of the M.S.O. Air & Space Museum and named Turkish Delight.

A 1953 T–6G Texan, serial number SA079, continues to fly in the same condition it served in the South African Air Force. Having trained thousands of pilots from dozens of countries over the years, the T–6 aircraft has earned its place among the legends. Texans, which were used in the Turkish Air Force for many years, hold a significant place in our aviation history.

Their agile maneuvers delighted spectators and captivated photographers with their Texan livery. Another training aircraft, a 1955 T–28B Trojan, serial number 138354, added colour to the show in US Air Force colours.

The star of the show was undoubtedly the 1944 P–51D "Ferocious Frankie," serial number 44–73149. The Mustang is painted to represent the mount of 374th Fighter Squadron, 361st Fighter Group ace Wallace E. Hopkins. Watching the Mustang whistle during maneuvers, thanks to the removal of its .50 cal machine guns from its wings, is a true sensory experience.

A 1945 Spitfire Mk.IX, serial number E517, which was added to the museum inventory last year, is painted as it flew in the Turkish Air Force. The Turkish Air Force received a total of 196 Mk.IX Spitfires from the United Kingdom between January 1947 and February 1948. They served as standard fighters until the P–47D entered

service. Another rare aircraft participating in this year's shows was the Polish Lim–2 (a license produced version of the MiG–15). Despite being 70 years old, this classic aircraft, still as fast and agile as its first day, was a major draw at the shows.

A true oasis in the desert for Turkey, the SHM serves as a bridge from past to present through its air shows. We hope to see you next year at this special venue, which preserves aircraft that hold significant places in aviation history and ensures their visibility for future generations.

Article and photos: Cem Dogut
(Instagram: cem_dogut and twitter/X: DogutCem)

VAYU on–the–spot report

The Tank Museum, Bovington, UK-Part 2

Chieftain

A13 Cruiser Mark III

Char B1

Daimler Armoured Car

The Tank Museum is the regimental museum of the Royal Tank Regiment and the corps museum of the Royal Armoured Corps. The purpose is to tell the story of tanks and the crews who served in them.

The Tank Museum is an army museum in Bovington, Wareham, Southwest England, located at Bovington Camp, Linsay Road. It is accessible by Wool railway station. It features armoured fighting vehicles with interactive activities. It also features various events, exhibitions, a shop and a restaurant. The museum was established in 1947 and the collection follows the history of the tank. The Tank Museum has the largest collection of tanks in the world and has the world's biggest collection of armored vehicles as well. The Tank Museum's collection includes Tiger 131 which is a German Tiger–1 tank and is known as the only operational Tiger–1 in the world. The museum has also preserved the world's oldest surviving combat tank.

Leopard

Alvis Scorpion

The Tank Museum brings history to life, with the world's best collection of tanks and explosive live displays. The exhibitions tell the story of armoured warfare spanning over 100 years of history. Exploring ten powerful exhibitions, one can come face to face with almost 300 armoured vehicles. This unique collection includes the world's first ever tank, the feared German Tiger and the modern Challenger 2. There are special events going on throughout the year at The Tank Museum including TANKFEST, Tiger Day and the Vintage Christmas Festival and Craft Fayre, as well as special activity programmes during the school holidays.

A definite must visit if one is on holiday in the UK!

T–34176

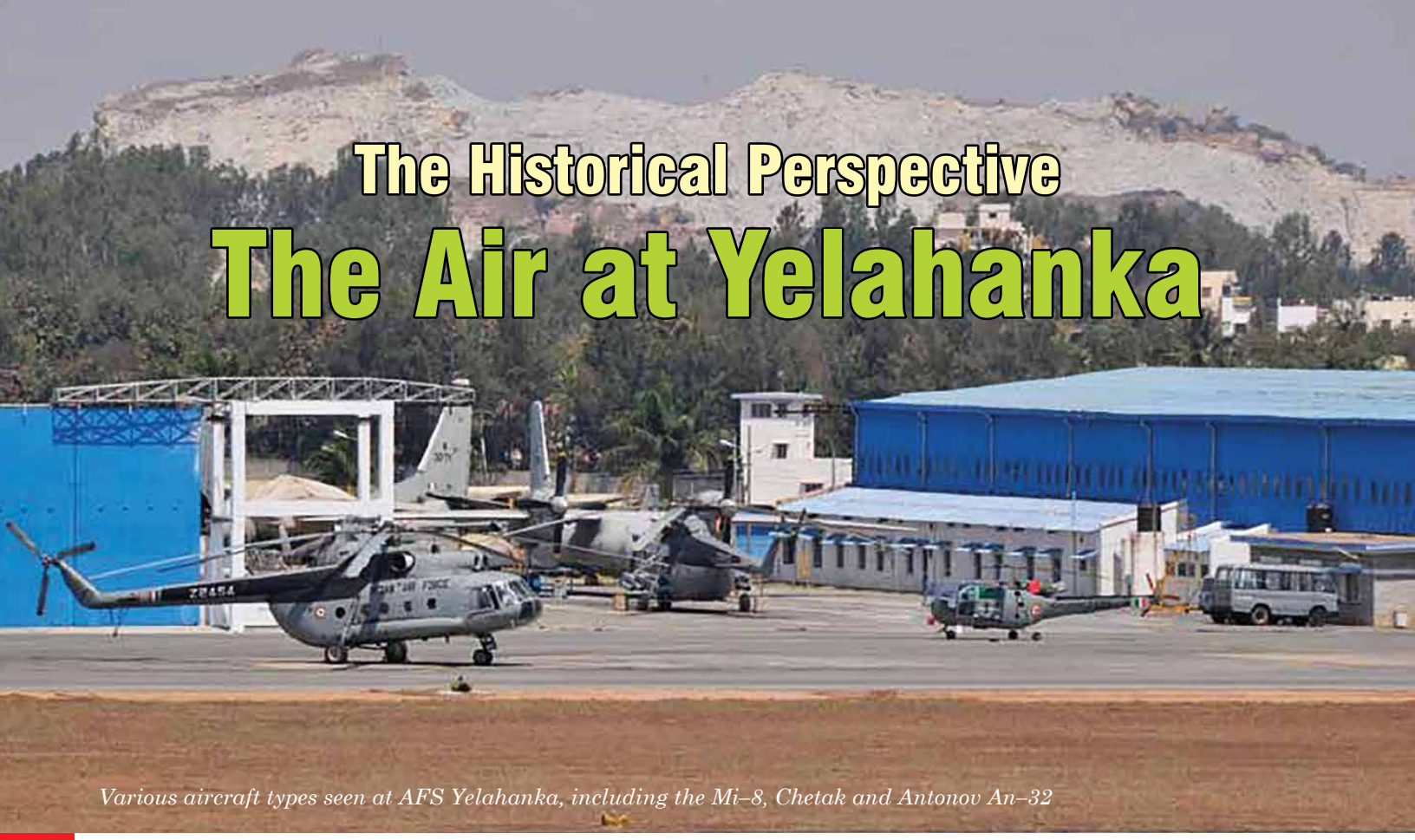
The Churchill Mark 7 Crocodile

Light Mark VIB

The Cromwell Cruiser Tank

The Sherman Firefly

The T–62



The Historical Perspective

The Air at Yelahanka

Various aircraft types seen at AFS Yelahanka, including the Mi–8, Chetak and Antonov An–32

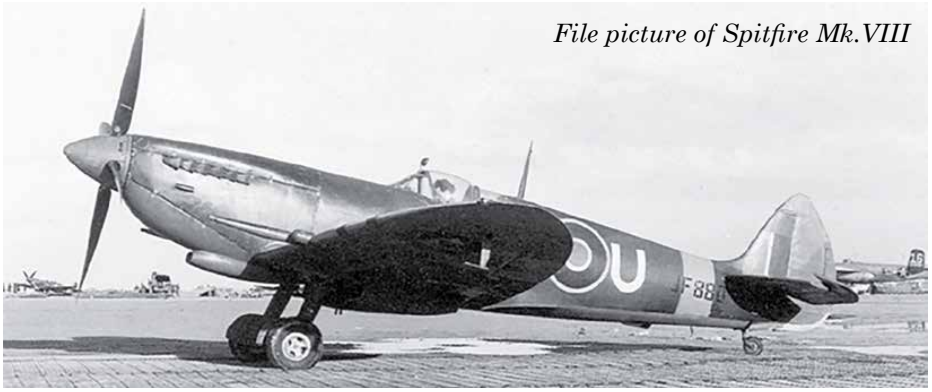
HISTORY

AFS Yelahanka, where the biennial Aero India international air shows have been held since the 1990s, is nearing its Platinum Jubilee since its establishment in the 1940s. Joseph Antony recalls its chequered history.

Air Force Station Yelahanka (AFSY) is located on the NH–7 from Bangalore to Bellary/ Hyderabad. The airfield has had an association of over 75 years with military Aviation in India since its inception in the 1940s to the present time. It is the alma mater through whose portals most transport and helicopter pilots of the IAF have graduated over the past fifty years. Having first visited the airfield almost 52 years ago (when my father was an instructor pilot based there) and thereafter during various Aero India shows, I thought it fit to compile some of its aviation related history.

File picture of de Havilland Mosquito.

During World War II, the Italian Tenth Army under the command of Marshal Rodolfo Graziani had made inroads from Libya into Egypt in September 1940, only to be beaten back by a much smaller Allied force under General Sir Archibald Wavell, British Commander–in–Chief, Middle Eastern forces in February 1941. Over 130,000 Italians were taken Prisoners of War (POWs) after five Italian Divisions were mauled in two days of fighting. Later, more Italians became POWs as their forces were



File picture of Spitfire Mk.VIII

comprehensively defeated in North and East Africa. A large number of these POWs were sent to India for internment in 29 camps forming 6 Groups between the years 1941 to 1946. Of these, Group I with 8 camps were in Bangalore and were located at Jakkur, Hebbal and Jalahalli. The remaining Groups were located at Bhopal, Ramgarh, Clement Town (Dehra Dun) and Yol (near Dharamshala).

The POWs at Bangalore (numbering over 20,000) were put on the job of constructing three airfields, at Jalahalli (present AF Station but the airfield is no longer in use), Jakkur (presently in limited civilian use) and Yelahanka. The POWs walked from either Jalahalli or Jakkur to Yelahanka in the mornings and returned to their camps in the evenings. The airfield was initially designated as RAF Station Yelahanka when it commenced operations in July 1942. A search on the Internet revealed that a number of Royal Air Force (RAF) and later Indian Air Force/ Royal Indian Air Force (RIAF) squadrons were either based for short terms at the airfield or used its facilities, which was a beehive of flying activity. These included :

- No. 1302 (Meteorological) Flight, RAF, from July 1943 till it was disbanded in June 1946 which operated the Bristol Blenheim, Vickers Wellington and Hawker Hurricane at different times.
- No. 684 Squadron RAF, a photoreconnaissance squadron from 1943– 1946 had a detachment here, operating the de Havilland Mosquito and later converted to the Bristol Beaufighter.
- No. 60 Squadron, RAF between May to September 1943 with the Bristol Blenheim and later the Hawker Hurricane IIC Fighter.
- No. 30 Squadron, RAF, between April to September 1944 flying the Hawker Hurricane IIC and the P–47 Republic Thunderbolt.
- No. 1672 (Mosquito) Conversion Unit between February–June 1944 and again from October 1944 to August 1945.
- No. 211 Squadron, RAF around June– July 1945 operating the Mosquito aircraft.

Nur Khan as Sqn Ldr with the RIAF

Author's Note: There were some fourteen Mosquito aircraft related incidents during the period October 1944 to July 1945 which testifies to the high levels of intense/accelerated training imparted on this base. The causes were overshot landing, undercarriage(u/c) collapse on landing, swing on landing and u/c collapse (four instances), swing on take–off and u/c collapse, engine cut–out on overshoot followed by stall, bounced on landing and u/c collapse, overshot on landing and hit vehicle, collision after bird hit, etc.

- No. 4 Squadron, Royal Indian Air Force (Oorials), between December 1943 and February 1944 and again from April 1945 to March 1946, flying the Spitfire Mk VIII. One of its daredevil pilots was one Flt Lt Malik Nur Khan, a Pathan. He had earlier perfected the technique of making landing approaches in a Hurricane aircraft while inverted, lowering the undercarriage (which would open upwards), carrying out a last minute roll to normal level flight, before touching down. Twenty years later as Air Marshal, he was Chief of the Pakistan AF during the 1965 Indo–Pak War. He later became Chairman of Pakistan International Airlines and Governor of Punjab after retirement. As Chairman, he overpowered a hijacker on the PIA airliner at Karachi but was hit by a bullet in the process. Incidentally, No. 4 Squadron RIAF was assigned to Japan at end of the War and pilots flew their aircraft from this base to Cochin where they were loaded on to an aircraft carrier for transportation to Japan.
- No 84 Squadron RAF, between October 1944 to April 1945, Vultee Vengeance and Mosquito.
- One RAF Sergeant Pilot from Palestine, Ezer Weizman, underwent flying training here for six months in 1944–45. Later he went on to become the Commander of the Israeli Air Force, subsequently the Defence Minister and finally became the seventh President of Israel. His wife and the wife of the legendary General Moshe Dayan were sisters. As president he returned to AFS Yelahanka in 1997 and planted a tree during his visit.

Ezer Weizman in his early Air Force days

Corporal Arthur Goodinson, an RAF Flight Mechanic and Warrant Officer Eric Watts a RAF Volunteer Reserve pilot penned their experiences and the following extracts from their diaries/web–pages pertain to the eventful period of two months in Yelahanka during June–July 1945 when with No. 211 Squadron, RAF.

There used to be a Camp cinema in the base (the ruins of which one could see until the late sixties) which screened films like 'They Live Dangerously', 'Sqdn Leader X', 'Design For Scandal', 'Seven Miles from Alcatraz', 'Fallen Sparrows', 'The Cross of Lorraine',

RAF technicians service a P–47 Thunderbolt fighter bomber, the type that Ezer Weizman flew at Yelahanka

'Heaven Can Wait', 'Nick Carter Master Detective', etc. Draught beer was available in the canteen and playing or watching soccer (usually between different squadrons or formations on the base), was a favourite pastime. Otherwise, like most other RAF airfields in WW II, the facilities were primitive and most personnel did not even have permanent toilets, having to use dugouts. The sound of jackals in chorus during the night was common occurrence.

On 29 June 1945, Warrant Officer Lowcock (Jeff) & Flight Sgt Wilkes while flying a Mosquito aircraft (HR554) employing evasive tactic manoeuvres (practice) against a Spitfire lost control and dived vertically into a village hut killing about 40 local villagers (and cattle) who were either attending a weekly fair or a wedding (at Kogilu village, S–E of AFSY). Only three days later on 2 July 1945, there was a formation dive bombing display and another Mosquito (RF779) failed to pull out, killing Warrant Officer Webster & Flight Sergeant Hopes (Corky & Jackie). The loss of Webster and Hopes, just three days after that of Lowcock and Wilkes, was deeply felt by the men of 211 Squadron—perhaps the more so during a non–operational period. The funerals were held in Bangalore on 30 June and 3 July 1945 respectively. However, the funerals did not stop the game of soccer later on each day!

The nearest escape to unwind was Bangalore city, which was reached after negotiating the narrow road piled with bullock carts and crossing at–least four manned railway crossings. The Standard Brick & Tile Co. Pvt. Ltd. at Yelahanka (1930) and the Parsee Tower of Silence at Hebbal (1940), major landmarks enroute to the city. The Tower of Silence exists

Indian Air Force C–47 Dakotas

even today, however only the Chimney of the tile factory located amidst real estate development, remains.

After end of the War, the airfield had No. 2 (Indian) Group Communication Flt as its last flying element when it was transferred to the Royal Indian Air Force (RIAF) in June 1947. The airfield fell into disuse after World War II and Indian Independence in 1947 when the open spaces became grazing areas for cattle from the neighbouring villages. Thereafter, it was used occasionally for holding Motor racing events some times in a year (like Sholavaram and Sulur, other World War II airfields near Madras and Coimbatore respectively), or sometimes by pilots of the nearby Government Flying Training School in Jakkur who could not resist stealing touch and go landings of their Tiger Moth aircraft on the long and wide runway of this deserted airfield.

Resurrection

The Sino–Indian border war in 1962 contributed to re–kindling life at the airfield in its military role in order to cater to the expanding needs of pilots for the IAF's transport squadrons. The Indian Air Force established No. 2 TTW (Transport Training Wing) at the re–commissioned airfield in August 1963 under the command of a World War II veteran and Dakota king–pin, Gp Capt PL Dhawan, VrC (Dakota supply and night bombing operations under enemy fire during the J&K Operations in 1948) and Bar to VrC (Dakota supply operations in Daulat Beg Oldi area in 1962). As a young officer, Flt. Lt. Dhawan would carry out stall turns on the Dakota transport aircraft.

In 1964, C–47 Dakotas carried out numerous supply dropping and casualty evacuation sorties in the disaster–hit areas around Dhanushkodi and Rameshwaram. A Dakota of this Wing participated in the scattering the ashes of the late Prime Minister Jawaharlal Nehru, as per his last will. Aircraft from this base participated in numerous missions of mercy over the years.

During the Indo–Pak war in September 1965, around ten C–47 Dakotas of this Wing were hastily converted for operational tasks and

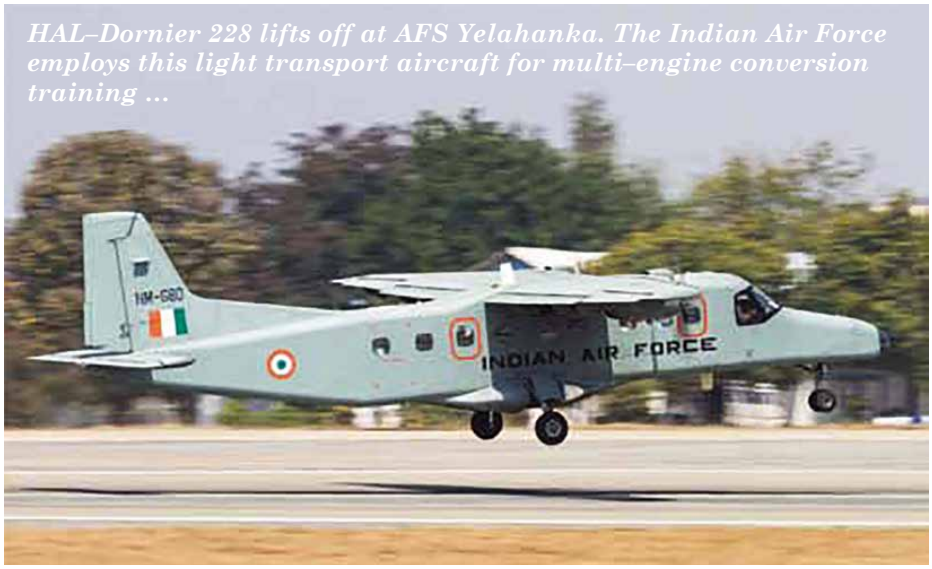
IAF Mi–8 lifts off at AFS Yelahanka

played a supply role in the war. Gp Capt John Francis Lazaro, VSM (later Air Vice Marshal), the then Station Commander, around thirty officers (including the author's father then Sqn Ldr VJ Antony) and over a hundred airmen were part of the task force. Supply sorties were carried out for movement of troops and transportation of arms, ammunition and spares in support of the war effort. One of these aircraft on a supply mission carrying naval munitions from the Naval Air Station at Willingdon Island (Cochin) to Jamnagar was lost over the Baba Budan range area near Mangalore on 7 September 1965. Sqn Ldr Asit Kumar Ghosh and all members of the Dakota C–47 perished in the accident. In fact, the wreckage of the aircraft was located only after the cessation of hostilities and search operations were mounted by the remaining aircraft from this Wing after return to home base.

In January 1968, the previously existing No. 1 TTW in Begumpet was also moved to AFS Yelahanka and merged with No. 2 TTW to form a single TTW and renamed as AF Station Yelahanka.

C–47 Dakotas were still the backbone of the IAF Transport fleet during the 1971 operations and TTW contributed once again to the war effort operations in airlifting supplies, troop movement and refugee evacuation which commenced with airlift of refugees from East Pakistan to Agartala much before the actual


The Sarang Helicopter Display team perform over Yelahanka



HAL–Dornier 228 lifts off at AFS Yelahanka. The Indian Air Force employs this light transport aircraft for multi–engine conversion training ...

... before pilots move on to the Antonov An–32 or the Avro HS–748

war commenced. They also formed a major part of the airborne fleet that carried out the famous Tangail airdrop in Bangladesh. In addition maritime reconnaissance duties were carried out over the East and West Coasts of India to detect enemy ship movements to and from East Pakistan. Flt Lt Arunesh Prasad and crew flying Dakota (J975) from this Wing located one such ship MV Toronto in the Arabian Sea and guided the destroyer INS Godavari, which shepherded the ship into Cochin harbour.

During the Sri Lankan Civil War, on 4 June 1987, Operation Poomalai ('Flower Garland'), also known as Eagle Mission 4, was undertaken by the Indian Air Force to air–drop supplies over the besieged town of Jaffna in Sri Lanka. Five An–32s from Agra staged through Yelahanka loaded with relief supplies, the An–32s escorted by Mirage 2000s.

No.112 Helicopter Unit 'Throughbreds' is a Mi–8 Conversion and Training Unit based at Yelahanka for many years which carries out the operational conversion of pilots, flight engineers and flight gunners. It also operates a small sub–flight of these helicopters for VIP tasks in the region. No.151 Helicopter Unit (Sarang Display Team), was set up in 2005 operating the HAL Advanced Light Helicopter Dhruv and was based here for some years before moving to Sulur AFS.

The Station was renamed the Air Lift Forces Training Establishment in the 1990s but the name reverted back to AFS Yelahanka after a short time.

During the Andhra Pradesh floods in August 2000, 127 adults and 15 infants who were marooned atop a building were winched to safety by the crew on to a Mi–8 helicopter piloted by Sqn Ldr GS Padda (awarded VSM) from this base. The rescue was completed in eight shuttles without refuelling.

Hindustan Aeronautics Ltd (HAL) has also had a long association of over fifty years with AFS Yelahanka since flying operations re–commenced in the nineteen sixties. The HAL detachment at AFSY used to initially support the repair and maintenance of C–47 Dakota aircraft which was later followed by similar support for the HAL built HS–748 and Dornier 228 and An–32 aircraft. HAL has been the major participant at the biennial Aero India Airshows since 1996.

The present Air Officer Commanding AFSY is Air Cmde Tejbir Singh, VM and the main role of the airbase remains multi–engine conversion training of pilots to fly transport aircraft like the An–32, HS–748 and Do228 or helicopter pilots to fly the Mi–8. There are Flight Simulators for imparting training on the An–32 and Dornier 228. It also conducts type–conversion of navigators on the Antonov An–32. There are three aircraft types as gate guardians at AFSY: the Iskra jet trainer (W–1759), a Mi–8 helicopter (Z–1372) and the C–47 Dakota (BJ–1045) ex–USAAF and later with the IAF which has been recently relocated from AFS Belgaum.

Thus, apart from hosting the Aero India Shows, Yelahanka has contributed in both war and peace time relief operations over several decades, with exceptions being the Kashmir Operations of 1948 and the Goa Operations in 1961, when the base was not active. In addition, it has attained two unique achievements as an Indian airbase remains having handled the most diverse types of military aircraft platforms (considering WW II and the various Aero India airshows) and also of having the most number of cumulative flying hours recorded by the fleet based at any IAF airbase over the past half century.

Joseph Antony
(Ex–Deputy General Manager – Marketing, HAL)

Pratt & Whitney celebrates a century of flight

Pratt & Whitney founder Frederick B. Rentschler in front of his Wasp-engined Vought O2U Corsair.

Pratt & Whitney, on 22 July 2025, celebrated one hundred years since being incorporated and revolutionising military and commercial aviation with its R–1340 Wasp radial engine. A century later, Pratt & Whitney's products have helped shape the modern world and the company continues to be a global leader in aircraft propulsion technology, with more than 90,000 engines in service, powering all types of fixed–wing aircraft and helicopters.

"Since our founding in 1925, the people of Pratt & Whitney have designed, built and supported the safest, most dependable engines in aerospace, united by a common purpose: connecting people, growing economies and defending freedom," stated Shane Eddy, President, Pratt & Whitney. "Our 45,000 employees worldwide work every day to uphold our 100–year legacy of safety, innovation and dependable engines. The words 'dependable engines' are literally stamped on every engine we produce – it's a mission our entire team lives by and a commitment to our customers."

Pratt & Whitney's founder, Frederick B. Rentschler, saw the potential of a lightweight, air–cooled radial engine to enable unparalleled levels of power and reliability for aviation. By October 1926, Pratt & Whitney's first 425–horsepower R–1340 Wasp engine had won the approval of the US Navy, which ordered 200 engines to power its early carrier–based aircraft, paving the way for the company's rapid growth. With the development of more powerful variants, Wasp family engines propelled hundreds of aircraft types through the early to mid–20th century, and played a vital role in enabling Allied victory in the skies during World War II, when more than 363,000 engines were produced during the conflict.

At the dawn of the jet age, Pratt & Whitney successfully pivoted from its commitment to radial engine development by leading another major innovation in aircraft propulsion technology with one of the world's first twin–spool gas turbine engines. The J57 engine and its commercial equivalent, the JT3C, powered aircraft such as the Boeing B–52 Stratofortress and 707 and DC–8 airliners, ushering in a new era of commercial air travel and laying the foundation for advancements in gas turbine technology which have continued ever since.

Today, the business provides propulsion technologies for more than 17,000 customers. The Pratt & Whitney GTF engine is the most fuel efficient engine for single–aisle aircraft, powering the Airbus A220, A320neo and Embraer E2 jet families for more than 85 airlines worldwide. The Pratt & Whitney F135 engine is the safest, most capable and reliable fighter engine, powering the Lockheed Martin F–35 Lightning II. Pratt & Whitney Canada plays a leading role in powering a wide array of general, regional and business aviation aircraft, having independently developed and certified more than 200 engine types since the introduction of the PT6 turboprop engine in 1963.

"From the introduction of the PW127XT and GTF Advantage, to the development of the F135 Engine Core Upgrade, our world class team is redefining what's possible for our customers," said Eddy. "Leveraging the unrivalled breadth and scale of RTX, we are well positioned to shape the future of flight for the next 100 years, as we continue to build on our legacy of innovation with investments in advanced technologies such as hybrid–electric, hydrogen, rotating detonation and adaptive propulsion."

Pratt & Whitney has been powering Indian aviation's growth for more than seven decades. Engines like the JT3D and JT9D powered India's jet age, and today modern fuel–efficient engines like the IAE V2500, GTF and the PW127 fly passengers across India and the world. Our propulsion systems also power Indian Air Force's modern transport platforms like the C–17 Globemaster III and the C–295.

"Our India story is an integral part of Pratt & Whitney's 100–year legacy," stated Ashish Saraf, Vice President & Country Head, Pratt & Whitney, India. "With our increased footprint and growth across engineering, digital and supply chain, I am confident that India will also play a defining role in shaping the future of Pratt & Whitney and RTX."

As part of centennial celebrations taking place throughout the year, Pratt & Whitney is engaging its employees with a travelling exhibit visiting 11 of its facilities around the world, including at the Pratt & Whitney India Customer Training Centre in Hyderabad from July to February 2026. A digital version of the exhibit can also be experienced online. A historical marker will also be unveiled at the site of Pratt & Whitney's original headquarters in Hartford, Connecticut.

Text and image courtesy: PW

Germany orders 20 new Eurofighters

Germany is strengthening its defence capabilities with the purchase of 20 new Eurofighters. Under the contract, Airbus will produce the multi–role combat aircraft at its final assembly line in Manching, near Munich in Germany. The first aircraft is scheduled for delivery to the German Air Force in 2031, the last in 2034.

MBDA unveils Stratus

UK Minister of State for Defence Procurement and Industry, Luke Pollard MP and Armament General Engineer Gael Diaz De Tuesta of France's DGA (Direction Generale de l'Armement) unveiled MBDA's Stratus as the new name for FC/ASW.

Switchblade 600 launched from MQ–9A UAS

General Atomics and AeroVironment collaborated on the air launch of a Switchblade 600 loitering munition (LM) from a GA–ASI Block 5 MQ–9A unmanned aircraft system (UAS). The flight testing took place at the US Army Yuma Proving Grounds Test Range.

Air Defence Foxhound with RIwP turret

Moog and General Dynamics Land Systems UK have teamed up to demonstrate a highly capable short range air defence (SHORAD) variant of the British Army's Foxhound 4x4 protected patrol vehicle. The Foxhound 4x4 will be the latest vehicle to host Moog's Reconfigurable Integrated–weapons Platform (RIwP), an innovative modular and reconfigurable weapon system that is currently in service with the US Army in both SHORAD and counter–UAS roles.

Hensoldt offers Spexer radar

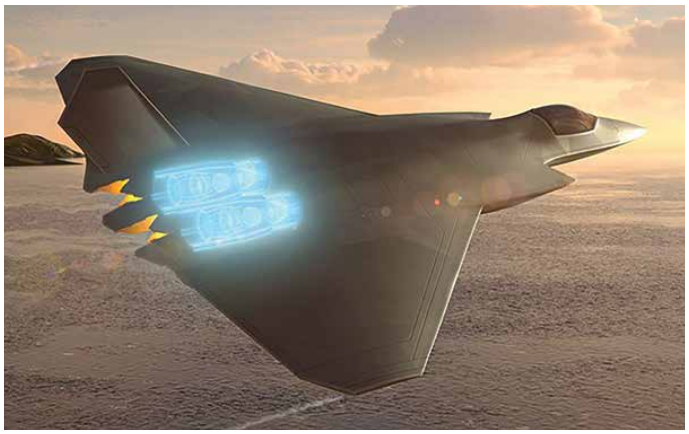
Hensoldt is now offering its Spexer radar family as naval solution. An initial contract has already been signed with the navy of a NATO country. The naval version focuses on the detection and defence against drones at sea. In addition, the Spexer radar scans the sea surface for anti–ship missiles and submarine periscopes.

Rolls–Royce expands Mtu Series 199

Rolls–Royce is expanding its Mtu Series 199 for military land vehicles into a comprehensive product family with an increased power range for new vehicles and for the repowering of existing vehicles. In future, the Mtu Series 199 will consist of four different cylinder variants with outputs ranging from 260 to 1,300 kW.

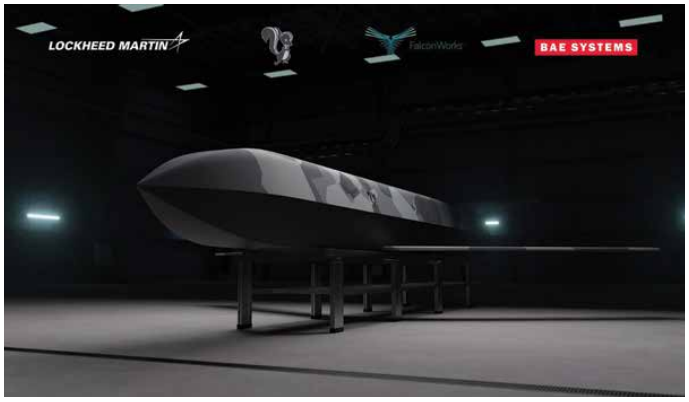
GCAP consortium expands partnership

The international consortium comprised of Rolls–Royce (UK), Avio Aero (Italy) and IHI (Japan) have announced a major expansion of their partnership to accelerate development of the power and propulsion system for the next generation fighter aircraft being developed through the Global Combat Air Programme (GCAP). As a consortium, Rolls–Royce, Avio Aero and IHI are transforming how they work to enable continued innovation and advance combat air propulsion technology to meet the timeline for GCAP's first flight.



Skunk Works and FalconWorks collaboration

Lockheed Martin Skunk Works and BAE Systems FalconWorks announced a strategic partnership at DSEI global defence conference in the United Kingdom, to develop a range of uncrewed autonomous air systems. The collaboration will see their advanced research and development divisions – Lockheed Martin Skunk Works and BAE Systems' FalconWorks – work together on a common design that will be rapidly deployable and modular to deliver a range of effects, including disruptive capabilities.



Elbit Systems launches Frontier

Elbit Systems has introduced Frontier, its wide area persistent surveillance system, designed to address the increasing complexity and intensity of border defence challenges.

Patria 6x6 vehicles for Denmark

Patria has delivered the first Common Armoured Vehicle System (CAVS) 6x6 armoured vehicles based on Patria 6x6 to Denmark and kicked off the related training programme. Denmark completed the final steps in the multinational CAVS programme in July this year and similarly ordered 129 vehicles.

Raytheon achieves longest known AMRAAM shot

Raytheon and the US Air Force's Air Combat Command have successfully executed the longest known AMRAAM air–to–air missile shot by a fifth generation fighter during a series of tests in Eglin Air Force Base airspace.

Portugal for sixth KC–390

Embraer and the Portuguese State have signed the amendment to the current contract for the acquisition of the sixth KC–390 Millennium aircraft and the inclusion of ten new purchase options for potential acquisitions by future partner nations.

Sweden orders four Embraer C–390s

Sweden has ordered four C–390 Millennium multi–mission aircraft from Embraer. The contract also includes seven additional purchase options, paving the way for future acquisitions by other European nations.

RTAF orders Airbus A330 MRTT+

The Royal Thai Air Force (RTAF) has ordered an Airbus A330 Multi Role Tanker Transport Plus (MRTT+). The A330neo based evolution of the aerial refuelling and transport aircraft A330 MRTT, will be equipped with both the hose–and–drogue, and a boom, as refuelling systems. Also included is the Airbus Medical Evacuation kit solution and will come in a VVIP cabin configuration.

RTAF adds Airbus H225's

Airbus Helicopters has signed a contract with the Royal Thai Air Force (RTAF) for two H225 multi–role helicopters. These new aircraft will significantly enhance the RTAF's capabilities in vital search and rescue (SAR) and emergency medical services (EMS) operations, reinforcing their commitment to national security and humanitarian support.

Elbit Hermes 900 sale

Elbit Systems Ltd has been awarded a contract valued at approximately $120 million to supply its Hermes 900 Unmanned Aerial System (UAS) for long range maritime surveillance to an international customer. Since its first order in 2011, the Hermes 900 has been selected by over 20 customers worldwide.

Turkish Airlines for 75 Boeing 787's

Boeing and Turkish Airlines announced a firm order for up to 75 787 Dreamliners, the flag carrier's largest ever Boeing widebody purchase. The deal includes 35 of the 787–9 model, 15 of the larger 787–10, and options for 25 787 Dreamliners to grow and modernise the airline's fleet.

LM Sikorsky to build 99 CH–53K's

Sikorsky has received a $10.85 billion contract from the US Navy to build up to a maximum of 99 CH–53K King Stallion helicopters for the US Marine Corps over five years, the largest quantity order to date for the aircraft.

MBDA TESEO MK2/E for Italian Navy

MBDA has signed a contract with the National Directorate of Naval Armaments for the production of the TESEO MK2/E anti–ship missile, which is currently under development for the Italian Navy. The contract covers the supply of new generation TESEO MK2/E anti–ship missiles, which will equip new units of the Italian Navy.

France places Falcon Albatros order

The French Defence Procurement and Technology Agency (DGA) has placed an order with Dassault Aviation for five Falcon 2000 Albatros aircraft as part of the Maritime Surveillance and Intervention Aircraft (AVSIMAR) programme. A total of twelve aircraft are planned under this programme, of which seven were previously ordered in December 2020.

Korea for 44 AGM–65G2 Mavericks

Korea has requested to buy forty–four (44) AGM–65G2 Maverick tactical missiles. The following non–major defence equipment items will be included: US Government and contractor engineering; technical, and logistics support services; and other related elements of logistics and program support. The estimated total cost is $34 million.

Canada for 26 M142 HIMARS

Canada has requested to buy twenty–six (26) M142 High Mobility Artillery Rocket Systems (HIMARS); one hundred thirty two (132) M31A2 Guided Multiple Launch Rocket System (GMLRS) Unitary pods with Insensitive Munitions Propulsion System (IMPS); one hundred thirty two (132) M30A2 GMLRS Alternative Warhead (AW) pods with IMPS, etc.

Dassault Aviation: Delivery of the 300th Rafale

The production of the 300th Rafale has been completed. This milestone reflects the operational, industrial and commercial success of this combat aircraft, which "has no equivalent in its category in terms of versatility and proven operational effectiveness". To date, 533 Rafale aircraft have received firm orders from France and eight export customer countries. Thus, 233 examples are yet to be delivered, with production rates planned to increase to 4 aircraft per month.

Boeing contract for 8 MH–139A's

In a deal worth more than $173 million, the US Air Force has awarded Boeing a contract to produce eight more MH–139A Grey Wolf helicopters and provide training and sustainment support services.

BAE signs agreement with Rheinmetall

BAE Systems Hagglunds is teaming up with Rheinmetall Weapon and Ammunition to integrate the 120mm

L44A1 Low Recoil (LR) weapon system onto the latest CV90120 vehicle, leveraging the expertise and capabilities of two leading European defence companies to deliver a tailored solution.

GA–ASI and Hanwha finalise deal

General Atomics Aeronautical Systems, Inc (GA–ASI) and South Korea industry leader Hanwha Aerospace signed an agreement to partner in development of the Gray Eagle Short Takeoff and Landing (GE STOL) unmanned aircraft system (UAS).

TrueNoord for 20 Embraer E195–E2

TrueNoord, the specialist regional aircraft leasing company, has signed a firm order agreement with Embraer to acquire twenty factory–new E195–E2 aircraft. The agreement also includes purchase rights for up to twenty additional new E195–E2 aircraft and up to ten new E175–E1 aircraft. At list price, the firm order is valued at USD 1.8 billion.

Saab receives Spanish artillery radar contract

Saab has received an order from the NATO Support and Procurement Agency (NSPA), for the life time extension of the Arthur radar systems for the Spanish Army. The order value is approximately SEK 540 million (EUR 49.4 million).

Airbus's tactical uncrewed aerial system

Airbus has streamlined its small and medium tactical uncrewed aerial systems (UAS) from Survey Copter, Aliaca and Capa–X, into a single comprehensive portfolio that will be managed by its Airbus Helicopters division. The aim is to deliver a focused market approach for defence and security customers across both the Helicopters and Defence and Space divisions.

Saab order from FMV

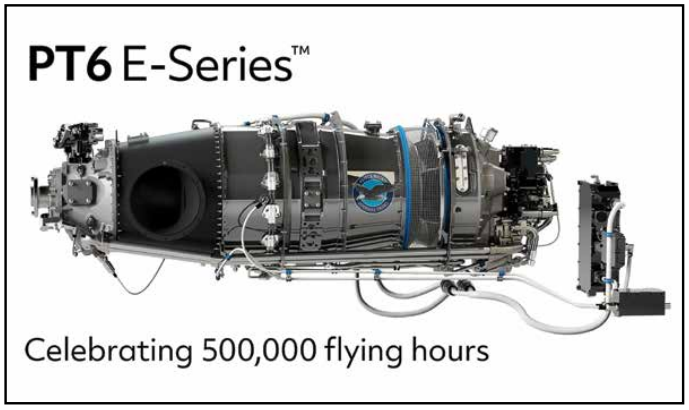
Saab has received an order from the Swedish Defence Materiel Administration (FMV) regarding continued conceptual studies for future fighter systems. The order value amounts to approximately SEK 2.6 billion. The contract period is 2025–2027.

Boeing contract for PAC–3 seeker production

Boeing has been awarded a combination of multiyear contracts valued at approximately $2.7 billion to produce additional Patriot Advanced Capability–3 (PAC–3) seekers. Under the agreements, Boeing will deliver more than 3,000 seekers at rates of up to 750 units per year through 2030.

P&WC PT6 E–Series in 500,000 FH

Pratt & Whitney Canada announced that its PT6 E–Series engine family has surpassed 500,000 flying hours since entering service in 2020. Powering the Daher TBM 960 and the Pilatus PC–12 NGX and recently launched PRO, more than 700 PT6 E–Series engines are now in service with operators worldwide.



Hanwha agreement for additional T700 and F404s

Hanwha Aerospace has signed an agreement with GE Aerospace to purchase additional T700 and F404 engine kits to power Korea Aerospace Industries' Surion helicopter and T–50/TA–50/FA–50 Golden Eagle jet trainer and multirole light attack aircraft. Under this agreement, Hanwha will receive 88 T700 engine kits and 40 F404 engine kits with GE Aerospace manufacturing the engine hardware and Hanwha assembling and testing the engines.

Thundart: The French solution

Created by the alliance between MBDA and Safran Electronics & Defense, Thundart is part of the Long Range Land Strike (FLP–T) programme, a 100% French programme initiated by the French Defence Procurement Agency (DGA) in 2023. Demonstration firings are planned for mid–2026. This is a solution based on maturity. Thundart, the next generation artillery system, built mainly around a 150 kilometre range ground–to–ground rocket, was first presented at the Eurosatory defence exhibition in 2024.

Contract with Turkey for Typhoons

The UK Government has announced an agreement with Turkey for the purchase of 20 Typhoon aircraft and an associated weapons and integration package, sustaining more than 20,000 highly skilled jobs across the UK supply chain. Under the agreement, BAE Systems will manufacture major airframe components, conduct the final assembly of the aircraft and lead the weapons integration at its sites in Lancashire. The weapons package will be primarily provided by MBDA.

NGC elevates F–16 with next–gen technologies

"On their own, Northrop Grumman's Integrated Viper Electronic Warfare Suite (IVEWS) and Scalable Agile Beam Radar (SABR) Active Electronically Scanned Array (AESA) radar are formidable capabilities for the F–16. Together, they're even better, providing unmatched survivability and lethality for the Viper".

ECRS Mk1 for Eurofighter Tranche 5

In a formal ceremony, NETMA and Eurofighter Jagdflugzeug GmbH signed the contract for 20 new Eurofighter Tranche 5 for the German Air Force. The aircraft will be equipped with the newly developed ECRS Mk1 radar (Eurofighter Common Radar System Mark 1) developed by HENSOLDT and Indra, as is already the case with the Quadriga fleet. The new radar provides Eurofighter with unique detection capabilities indispensable for the future air combat environment.

Mount Pleasant Airport, Falkland Islands

Mount Pleasant Airport, formally RAF Mount Pleasant and now the Mount Pleasant Complex, is a UK Ministry of Defence Joint Operating Base in the Falkland Islands. It is operated by the British Armed Forces and is used for air operations, including both military and civilian flights. Opened in 1985, it was constructed following the Falklands Conflict to bolster the islands' defence capabilities and serve as a major airbase. The airport replaced previous RAF facilities at Port Stanley Airport.

The original decision to build an airport in the Falklands was made in 1982. The following year Michael Heseltine, the Secretary of State for Defence, announced that the decision had been made to build the airport at Mount Pleasant rather than Stanley as, despite the remoteness of the location and the need for the long road to Stanley, it was a more cost effective and straightforward solution than upgrading the airport at Stanley. Building Mount Pleasant Airfield was a significant achievement, particularly given the logistical challenges (apart from stone and water everything had to be shipped from the UK) and the strategic importance of the project.

The first flight to the new airfield landed 12 May 1985. Despite having to slow down to avoid arriving early, 6 new world records were set during the inaugural flights, for each leg of the journey and for the overall time (including the refuelling stop at Ascension) of 18 hours 28 minutes. Similar records were set two days later on the return flights which took just 17 hours and 22 minutes.

Waiting to welcome Flight 3759 were Sir Rex Hunt and Major General Peter de la Billiere, Commander British Forces Falkland Islands, together a crowd of thousands. The inaugural flight marked the completion of the first phase of the airport that had taken just 16 months. The second phase, which included the operational and accommodation buildings, was completed the following year and Mount Pleasant became fully operational on 1 May 1986.

Among the many dignitaries aboard the inaugural flight was Michael Heseltine. In his speech he explained many of the benefits of the new airport. The ability to land wide–bodied jets would transform defence operations on the islands and it would play a major part in the islands' economic and social development as once completed it would offer an International Airport to Civil Aviation Authority standards for use by the public, linking the Falklands to the outside world assisting the growth of both trade and tourism.

The sense of security that the Mount Pleasant complex and runway offered then to the people of the Falklands has not diminished today, providing its valuable link with the UK and its representation of a huge commitment from the British Government. Many different aircraft have landed and been stationed at Mount Pleasant. A selection are featured in this special stamp issue.

£38p The Lockheed TriStar was the first aircraft to land at Mount Pleasant and played a significant role in supporting the Falklands. The RAF's TriStar fleet served as both air–to–air refuelling tankers and transport

aircraft. Based at RAF Brize Norton their service in the Falklands and other operational areas was crucial.

£86p The A320 Airbus is a narrowbody, single aisle jetliner that can operate on the flight route between Mount Pleasant, Falkland Islands and Punta Arenas, Chile. LATAM Airlines uses the A320 on this service. A typical configuration on this route allows for 174 passengers with flights taking approximately 1 hour and 40 minutes.

£1.18 The Phantom FGR2 played a significant role in the air defence of the Falkland Islands, particularly before the introduction of the Tornado F.3. Initially, Phantom FGR2s were stationed on Ascension Island before being deployed to Mount Pleasant, providing a prominent presence in the South Atlantic for several years.

£1.52 The Atlas C1 (A400M) plays a crucial role in the Falkland Islands. It provides tactical airlift, maritime patrol, search and rescue, and humanitarian assistance capabilities. The Atlas C1 also supports air–to–air refuelling operations, enhancing its ability to operate at range and deliver cargo to the Falklands. In August 2022, the Atlas C1 was refuelled for the first time over the South Atlantic by a Voyager tanker flying from the Falkland Islands. This demonstrated the aircraft's ability to extend its operational range and support deployments to the Falklands. Its primary role is to conduct Maritime Reconnaissance and SAR in the Falkland Islands and South Georgia and the South Sandwich Islands. In January 2025, it conducted a flight over The Antarctic in support of the British Antarctic Survey. The flight motto is 'Uphold the Right'; the motto of the Falkland Islands is 'Desire the Right'.

The First Day Cover depicts the RAF's Voyager aircraft from TriStar following its 30 years of service. Voyager offers advanced air–to–air refuelling capabilities and conducts regular flights between the UK and the Falklands. In June 2022, Voyager achieved two new records for uninterrupted flights between the UK and the Falkland Islands, showcasing its ability to sustain the South Atlantic Airbridge without refuelling. Covering 6834 nautical miles, the journey was completed in 15 hours and 9 minutes, surpassing previous records that had stood for over three decades. The RAF Voyager is stationed at RAF Brize Norton with frequent deployments to Mount Pleasant, primarily supporting air to air refuelling with a secondary medical evacuation role. Additionally, a civilian Voyager is operated by AirTanker under contract, supporting the South Atlantic Airbridge between the UK and Falkland Islands. The set of four stamps was issued on 28 May 2025.

70th Anniversary of the first direct airmail flight

On 2 June 2020, a Voyager aircraft flew return flights from RAF Brize Norton, England, to Mount Pleasant Airfield, the Falkland Islands, breaking the existing 30–year–old record on each journey, with the return journey to the UK of 6,948 miles taking a mere 13 hours and 22 minutes. The flights were carried out non–stop, with no inflight refuelling – a far cry from the 1952 flight!

In 1952, the Falkland Islands Company commissioned Aquila Airways to conduct the first airmail survey and expedition flight – Aquila were already used to long–range flights in their small retinue of flying boats, having made their name during the Berlin Airlift. The aircraft they chose for this epic journey was a Short Sunderland III, G–AGJN 'Hudson'. Originally built at the Short factory in Rochester, Hudson was built as a military bomber, but was one of the aircraft passed to BOAC as a civilianised 'Hythe' class aircraft, delivered on 24 November 1943.

All BOAC Hythe class aircraft were named with the letter 'H', hence 'Hudson' in this case. When BOAC decided to cease operations of their Hythe 'boats, the fledgling Aquila Airways snapped 13 of them up in October 1949 at a knockdown price of £10,000 each to greatly increase their existing fleet, and retained the individual aircraft 'H' names. Usually, only the state airline would carry mail, using the title 'RMA' (Royal Mail Aircraft), however in this case, Aquila were allowed to retitle the aircraft, as an official air mail carrier, as the RMA Hudson.

Under the control of Captain Douglas Pearson and an experience crew, RMA Hudson set off from Southampton on 21 April 1952 on her epic journey of 7,563 miles, with stops at Lisbon, Madeira, Cape Verde, Natal, Rio de Janeiro and Montevideo, finally arriving in Port Stanley harbour on 28 April. The crew rested up for a few days, then made the return journey to Southampton on 2 May, arriving on 8 May. All this was done in an aircraft with no pressurisation, no autopilot (hands–on flying!), for a total of 96 hours flying over 16,000 miles.

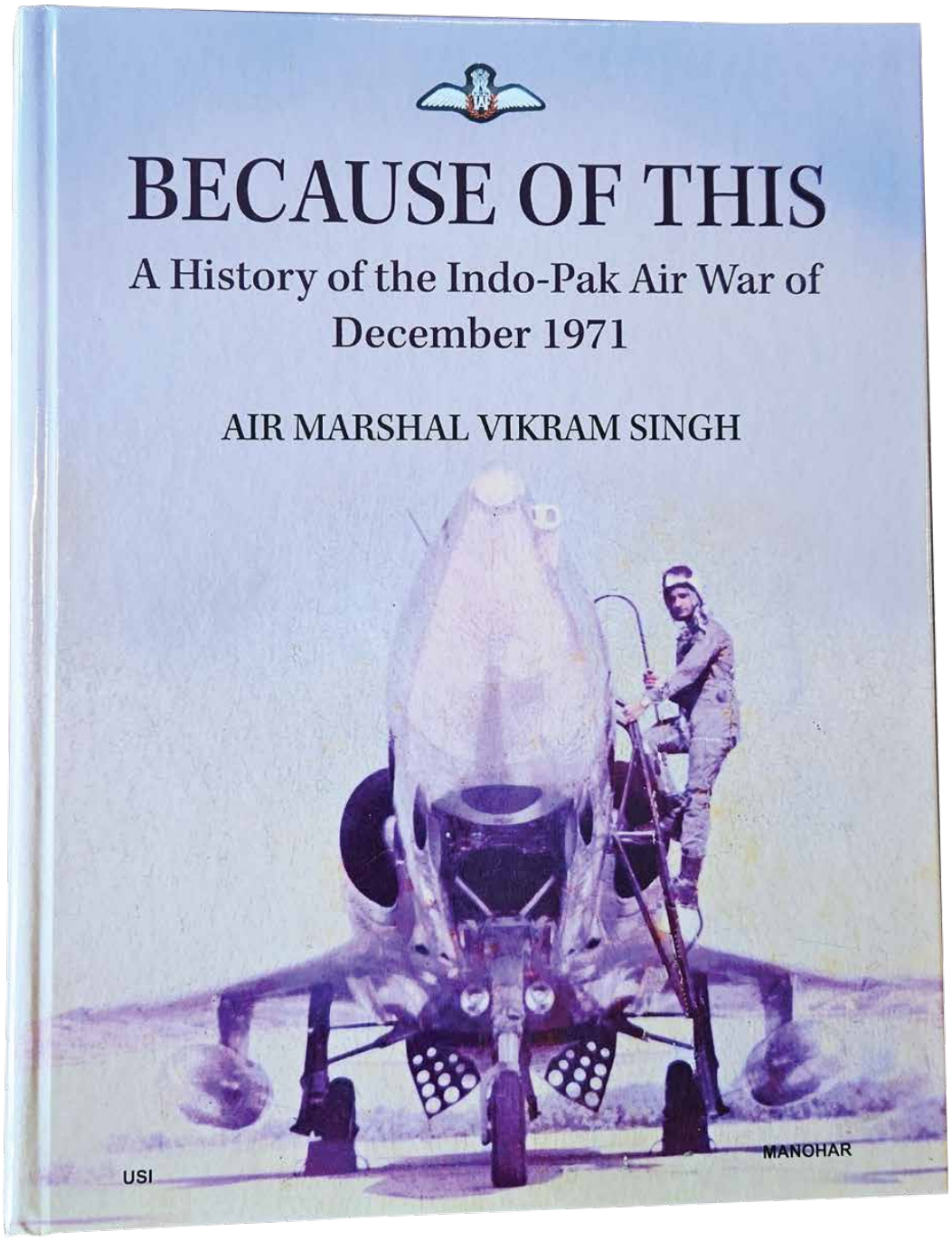
Sadly, RMA Hudson did not survive much longer, being damaged beyond repair after a scheduled flight to Madeira on 21 January 1953. Although there were congratulations for the Voyager crew for their recent achievements, the original RMA Hudson crew must surely have most of the praise and admiration. Falkland Islands commemorated this flight on 2 June 2022 with a set of two stamps £1.30 RMA Hudson, £2.05 A33 Voyager.

By Vijay Seth
Aerospace Heritage Trust

Book review

‘Because of This’ by Air Marshal Vikram Singh

Note from the author



The 1971 Indo–Pak war was the last ‘traditional’ war between two countries deploying 2nd generation weapons and aircraft with no technology asymmetry except for the IAF deploying the S–75 Dvina SAMs and the PAF deploying the Matra R–530 Beyond Visual Range (BVR) AAM. It was the first Indo–Pak war involving all arms, and also all domains, sub surface to air, and India was to fight a two and a half–front war with several troops dedicated to defending the border against China. It was also a war of three protagonists: Pakistan, India and Bangladeshi Freedom Fighters.

The air war was closely linked to the ground war and hence the ground battles have also been covered in some detail. The war has been examined against the campaigns prosecuted ie, Counter Surface Operations (CSFO) which include Close Air Support (CAS) or Battlefield Air Strike (BAI) and Interdiction, Counter Air Operations (CAO), Air Defence Operations (AD) and Combat Support Operations by transports and helicopter Air Lift operations. Strategic attacks against harbours, energy plants, and factories are also covered separately along with the IAF’s nascent Electronic Warfare attempts in the last chapter. Separate chapters on the final collapse of the Pakistani army and surrender in Dacca and an assessment of the cost of war and post war mopping up events in Bangladesh are covered in separate chapters.

Straight off the bat, it is necessary to explain what to some may sound a rather arrogant assertion in the title of the book. After the surrender at Dacca, at tea, General Niazi was asked by a foreign journalist why he had thrown in the towel when he had some 70,000 troops and ammunition and supplies to hold out for another six months. Niazi looked around and pointed to the IAF pilot’s wings brevet on the chest of a senior IAF officer (reportedly

Group Captain Chandan Singh) and said "Because of this, you the air force".

The book is fundamentally divided into two parts, West and East. The narrative is laid out in the Indian Army's Corps–wise and the attached IAF's Tactical Air Centre–wise Air–Land battles from the north to the south on the western front and west to east in the eastern front. Counter–air and air defence battles are covered together for each side while the dedicated bomber operations (IAF and PAF Canberra) are also examined in separate chapters. Every viewpoint is examined, the forward air controller, the tank commander, the pilot and the view from the other side's trench.

Extensive data and numbers are necessarily included as the war has also been examined in quantitative terms. The numbers vary from other figures mentioned in several other publications including the Indian Ministry of Defence's Official version. There are two reasons for this; this book benefits from the latest data available and documents now made available allow for a careful squadron–wise and type–wise calculation of sorties flown, ordnance employed, losses etc. While detailed date–wise official data was available, it was inaccurate as complete data was not then available, especially of aircraft and pilots lost in enemy territory. Role–wise data was also confused as air defence roles were mixed up with escort and sweep sorties etc. Data from various Command HQs, itself received from various Base Operations Centres was compiled in a somewhat compartmentalised manner at the Statistics Directorate at Air HQs with varying levels of inaccuracies creeping in due omissions, typos and duplication. It has taken me a month of long nights to cross correct all the data presented. However, I apologise for any minor contradictions that may yet exist and am confident that those that might remain are not material to the final understanding of the tables and charts.

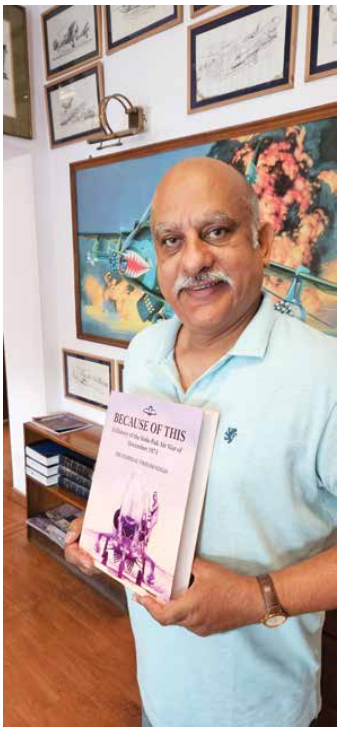
A much contested topic especially for the PAF is the number of aircraft lost from either side. Given the recent research from both sides and a balanced approach by historians, this matter is more or less settled even as the PAF still desperately hopes to gain that 'one more kill' that it is sure the IAF is hiding. The PAF continues to live in the fond belief that while Pakistan lost the war, the PAF did not lose to the IAF. Readers will find this theme throughout the book. This is a most strange contention and is examined in the last chapter.

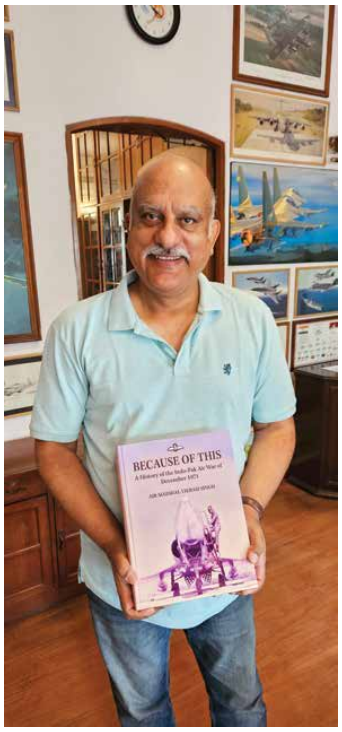
No adequately researched book on the 1971 air war had yet been written and those that had emerged were unnecessarily jingoistic rendering them incredulous. On the other hand, Indian Army veterans have put out a plethora of literature on their victories. Yet not one cared to acknowledge the IAF's role in the outcomes. This is an age old failing where airpower is not understood or given its due by the protagonists on the ground, usually leading to self–defeating consequences. Thus, I found a very one – sided approach to the 1971 war from both the protagonists with the IAF being the target of fuzzy facts on one side and completely being ignored by the other. In all fairness, it was perhaps not possible to critically research the IAF's role as no documents were available or, were not allowed to be viewed at the time. In the recent past, I must add happily, there have been a few books from both armiesy's that have mentioned the role played by the IAF especially in the battle of Chhamb, perhaps the most bitterly fought battle of the war.

To give more 'life' and context to people, place names and other events of historical significance, I have extensively used the notes and reference section at the end of each chapter. A historical work is only as credible as its willingness to make refutation easy, thus almost every fact, number or assertion is backed by sources or explanation to make verification and understanding easy.

Like all war histories, I have struggled with the distinction between fact and value and the profane glare of the purist historian who abhors the new 'cult of quantitative history'. In the end I am convinced that this book must also be a comprehensive repository of rare and accurate data and information simply for its own sake even if only to provide that small nugget to some enthusiastic historian of the future.

I have retained place names and spellings as they were in 1971. So Sri Lanka is Ceylon, Dhaka is Dacca and Kolkata is Calcutta etc. All units are in the SI system with the Imperial units in parentheses. While the book is based on official documents, interpretations and assertions are mine alone.





In the photos above is the author of this book, Air Marshal Vikram Singh.

Reliving their second childhood!

This write up is about twin brothers Alak and Palak Bhattacharyya retired professional engineering graduates, who have a fascination for building model aircraft both static and flying ones as a thrilling and rewarding pursuit that combine creativity, technical skills, and excitement.

The story began in the 1960's with a desire to build their own toys to suit the play themes in their childhood. The lack of scale, variety and size that they wanted was perhaps the beginning of this adventure. Readymade kits or dicast toys were either too expensive, disproportionately scaled or out of the family budget.

The Indian Hobby Centre provided some solace in middle school where they flew some light flying model kits and later crafted control line flying models powered by miniature IC engines. This was short lived when they moved to bigger cities where space was a constraint and high school academics began to cut into hobby time.

The desire to continue this creative pursuit, however, continued and they did have a shot at launching rockets with the composition of solid fuel being inspired from projects found in the Scientific American Journal, to making a wind tunnel simulator which won a rank in the national science talent exam. These projects weren't all without mishaps, one of which occurred at a Vigyan Mela in Dehradun, when due to oversight in isolating the anchoring to the launch pad, one of the rockets took off with the launch pad in a parabolic path.

A five year stint at IIT/IISc was a bit of a lean period but their interests turned from aircraft models to railway locomotives and rolling stock and turning metal wheels on the workshop lathes.

Hobbies need space which was a paucity in large cities, so when computer programmers discarded their old used punched cards, the brothers converted one man's trash into another man's treasure and made small static models of railway diesel engines like the diesel electric WDM2 and WDM1, out of them.

A lot of the models were based on out–of–a hat attention to detail and making them look as realistic as possible while being created out of used and waste wood that was shaped and finished to look like replicas of real aircraft.

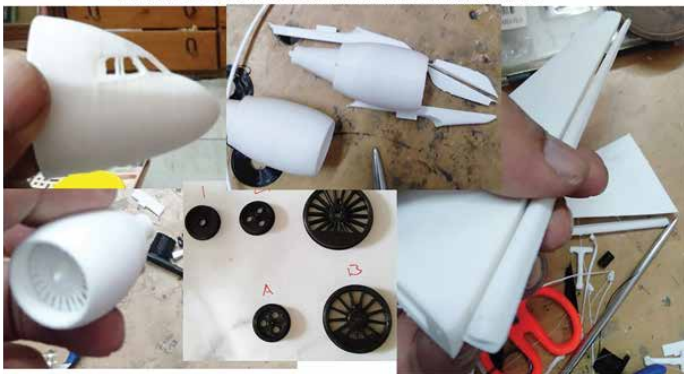
They received an opportunity to make scale models for a corporate theme film in the late '80s involving a stevedoring corporation in which the theme of the film involved ships from a sailing galley, a bulk carrier to a futuristic Star Wars–esque inter–planetary space ship that was shot at the famous Filmistan studio. This among others like a UFO model for GITS papad, and a shoot for a child film involving a model of a MiG–21 aircraft helped provide capital to buy electric tools for further projects.

New materials and CAD help make very complicated parts with ease, particularly complex requirements such as recesses and difficult to machine contours. The world opens and is limited only by your imagination and verve to do things differently.

Subscribing to magazines like VAYU have inspired them to both subscribe to the magazine and who knows they may bring out the futuristic designs for the next gen defence equipment for Bharat.

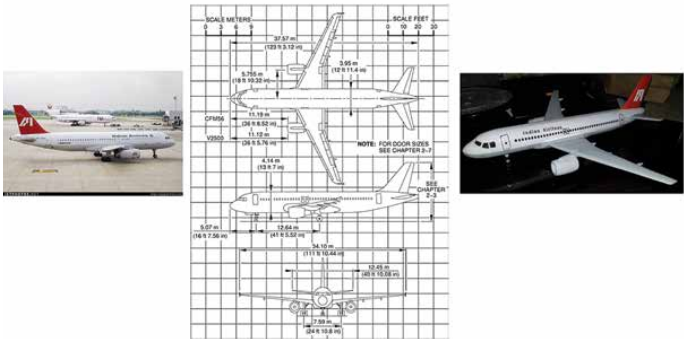
Having retired as Vice Presidents from Tata Projects and Gammon India respectively, the latent boyish charm of building and amusing the younger generation and getting involved in their fantasies and with friends still excites them to carry out their hobby using new technology such as 3D printing to quickly replace time consuming and laboriously hard jobs involving hand–crafted models.

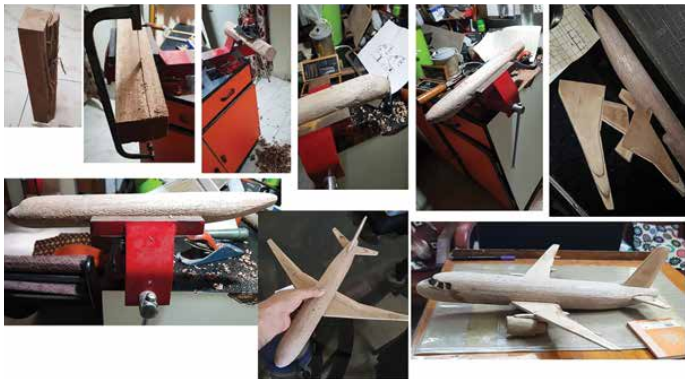
3D PRINTED MODEL COMPONENTS FOR AIRBUS A320

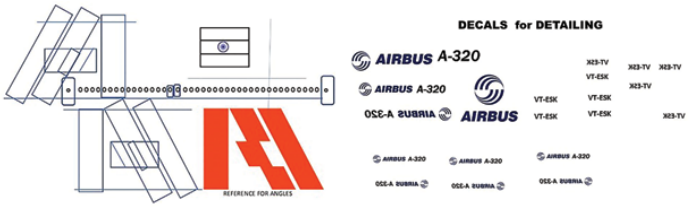


The story of building an Airbus A320 out of waste wood is illustrated in the pictures below.

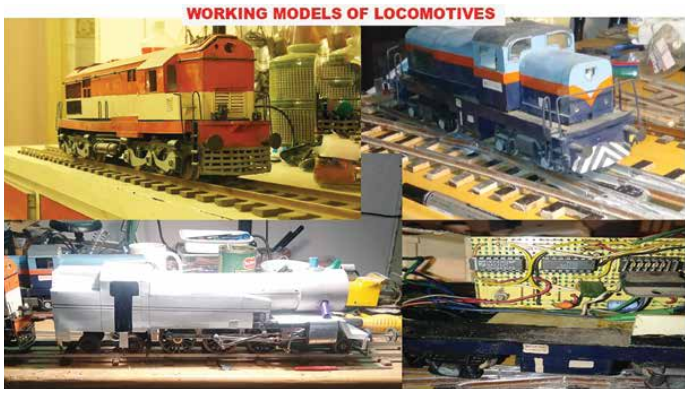
A320 Project scratch to finish







From fascination for aircraft, the next fascination moved to more down to earth projects like locomotives and rolling stock; perhaps Kharagpur being a big railway hub had something to do with it.



The train models control systems evolved over the years, from a simple variable voltage controller controlling the speed of the locomotives, to more sophisticated Pulse Width Modulation (PWM) controllers which had better crawling characteristics. As these systems were inherently handicapped in so far as independent control of each locomotive was concerned, as they all drew their power from the rails, advancements in IC Technology made us consider an encoder/decoder combination.

Thereafter there was no looking back as they used a 9–bit code with the first 5 bits used for address and the remaining 4 for data. One bit for forward/reverse and 3 bits for speed control using onboard PWM control which basically equated to 2^3 bits, i.e. 8 speeds. The locos each had their address bits hardwired to the +ve (binary 1) or to the ground –ve (binary 0). It was thus possible to control each locomotive by addressing them. We could finally even have two locomotives running on the same track in opposite directions at different speeds.

One of the Models of a Bulker for a Corporate film

ALAK BHATTACHARYYA

- Graduated from IISc Bangalore BE Electrical.
- Worked with Tata Electric Co. Mumbai
- Worked with L&T Power Baroda
- Worked and retired as Vice President from Tata Projects

PALAK BHATTACHARYYA

- B.Tech Graduate from IIT Kharagpur
- Worked with TIL Limited
- Worked with ABG Heavy Engineering
- Worked with TAFE
- Worked with HYVA India Ltd
- Worked and retired as Vice President from GAMMON INDIA Ltd

25 Years Back

From Vayu Aerospace Review
Issue VI/2000

Russia & India sign defence deals worth $3 billion

Major defence agreements worth $3 billion were signed between India and Russia on October 4 during the visit to New Delhi by a Russian government delegation headed by President Vladimir Putin that included 310 T–90 main battle tanks.

Alternatives to the LCA

Air Chief Marshal AY Tipnis has said that the IAF is considering an alternative to the Light Combat Aircraft (LCA), including purchase of new aircraft. Continuing delays with development of the LCA, which has still not flown, means that a stop–gap is needed to make up for an expected deficiency of ten squadrons projected over the next five years.

Indian Navy buys Barak missile systems

Israel has sold India Barak state–of–the–art anti–missile/ anti–aircraft system to protect naval ships. The purchases were "forced" on the Navy as the Defence Research and Development Organisation (DRDO)'s work on the sea–skimming Trishul short range surface–to–air missile for the Navy has been delayed for several years.

Russians negotiate with HAL for Il–214

Negotiations on the joint venture design and production of the Il–214 have reached a final stage. During the first–ever meeting to the JWG on Civil Aviation in Moscow, the Indian and Russian delegations agreed that HAL and Russia's Ilyushin Company will continue further discussions on the joint design and production of the Il–214.

Indian Ka–31 production begins

Production has begun in Bashkortostan of the first batch of Kamov Ka–31 Helix AEW helicopters for the Indian Navy. First deliveries of the four Ka–31s ordered are expected to be made by December 2001, although the final number of helicopters required has yet to be established.

Indian Green Pine Radar concerns

Following the decision to abandon the A–50 AEW deal with China, IAI has expressed concern that the USA could apply pressure to drop other contracts, particularly the deal signed with India for the Green Pine radar – originally developed by IAI's Elta division for the Arrow missile, using US funding.

Israel offers India Phalcon AEW

Israel has made an offer to India for the purchase of at least one Phalcon airborne early warning system but Tel Aviv has to overcome India's concerns following the cancellation of the sale of a similar system to China after intense US pressure.

India plans PSLV upgrade

India is working on a new version of its Polar Satellite Launch Vehicle. The upgraded version will have an LEO capability of 1.6 metric tons, compared to1.4 tons presently, and a GTO capacity of 1 ton geared to low budget weather and telecom satellite applications.

DRDO yet to test Dhanush

The DRDO has told the parliamentary consultative committee on defence that the launch of the Dhanush, the naval version of the Prithvi with a reach of about 100–200km, will be in December 2000. The Dhanush can carry a warhead of 1000kg.

300 Prithvi Missiles

India will go ahead with full production of about 300 short–range surface–to–surface Prithvi missiles for all three branches of the defence forces, according to news reports quoting Indian Government sources said. The decision, taken by the Defence Minister, George Fernandes, was prompted by Pakistan's test–firing of its Ghauri–III.

"Bulls" Golden Jubilee

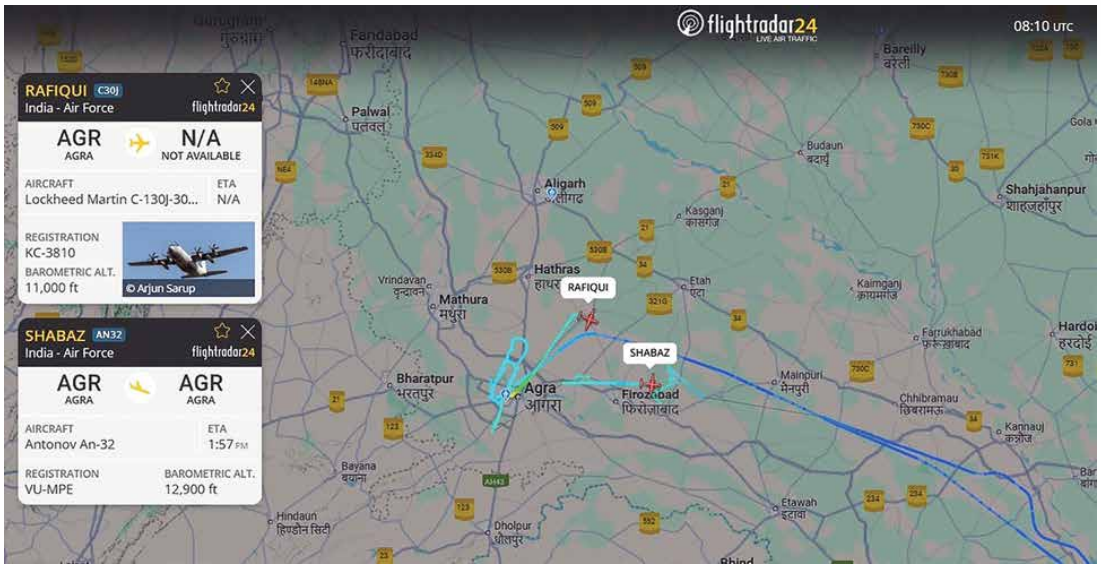
No.14 Squadron, IAF, marked the 50th Anniversary, or Golden Jubilee, of their formation with a series of functions over 17–19 November 2000. Formed at Ambala on 15 August 1951, and equipped with Spitfire Mk.XVIIIs, No.14 were the first new fighter squadron to be raised after India's independence.

Fairchild Dornier complete CDRs on 728JET programme

Fairchild Dornier aims to complete critical design reviews (CDR) of all 728JET subassemblies and systems by the end of November as it gears up for the start of production of the 70–80–seat regional airliner.

Rafiqui and Shabaz in Pakistan? Nope!

On 6 October 2025 an IAF C–130J and an An–32 departed from Agra using call signs named after Pakistani airbases! Post Operation Sindoor, no rest for the PAF! Next level trolling?



Operation Sindoor 'precision strike menu'

At the 93rd IAF Day celebrations at Chandigarh, post parade on 8 October 2025, a bara khana (grand feast) was organised with an exciting food choice especially created by the chefs. Hard to digest for the PAF, the ingredients were purchased at a "Kirana" shop!

'Make for India'... and the world?

Airbus Helicopters is establishing a Final Assembly Line (FAL) for the H125 in partnership with Tata Advanced Systems in India. This marks India's first 'Made in India' private sector helicopter project. But helicopters for Pakistan from this FAL? A big gaffe for sure! Image from the official Twitter handle shows why it is very important to doubly cross check what is put out. Social media can be merciless.

Our own office copy!

A pleasure to have Angad Singh @zone5aviation drop in to our office with a copy of his fabulous book that was recently released by the IAF's CAS. The book is called "Icon of the Sky: A History of the MiG–21 in the IAF". We got our autographed copy as well! Congratulations!

50 years later!

While the Vayu Aerospace & Defence Review is celebrating the completion of 50 years (Golden Anniversary) this year in 2025, we came across some great photos of our Founder and Editor, the late Mr. Pushpindar Singh, who 50 years ago this year (in 1975), flew on the Concorde and was given (along with others) a certificate to commemorate the occasion. Now soon to be framed and put up in the office wall galleries! (PS: Pushpindar Singh is 5th from the right).

This is to certify that

Pushpindar Singh Chopra

today flew in a production

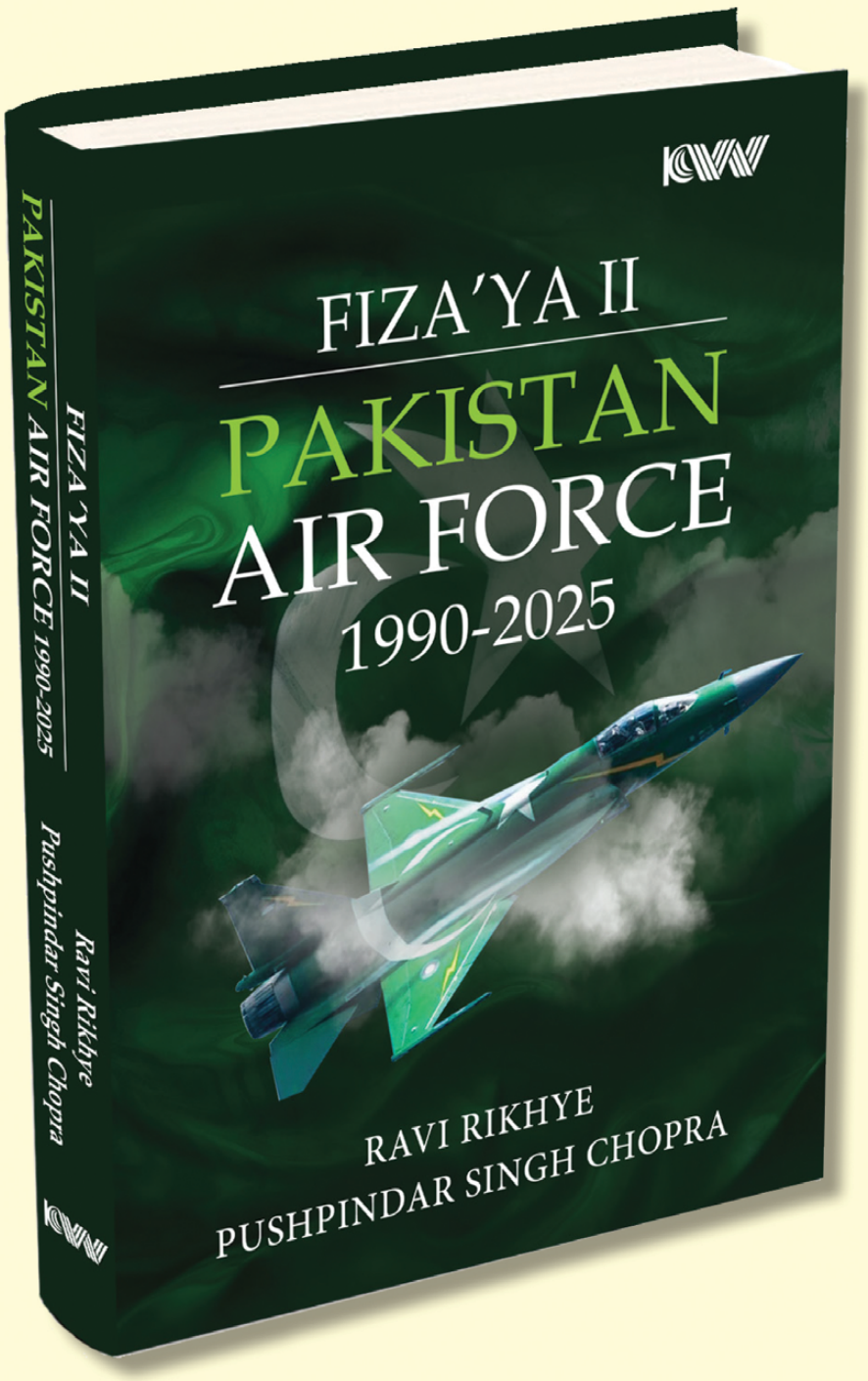
Concorde

Registration Number	G-BOAC
Maximum speed	M. 2.04
Maximum altitude	60,227 feet
Duration of flight	1 hour 48 minutes
Supersonic flight time	1 hour 3 minutes
Date	27th July 1975
Signed	Ronain Tomlinson.

DIRECTOR OF FLIGHT TEST, BAC COMMERCIAL AIRCRAFT DIVISION

BRITISH AIRCRAFT CORPORATION AEROSPATIALE-FRANCE

RNI NO. DELENG/2003/9958



This is a long-delayed follow-up to Fiza'ya: The Pakistan Air Force 1947-1990, by Pushpindar Singh Chopra and Ravi Rikhye. The delay was occasioned by Ravi's departure in 1989 for home in the US, and then the unfortunate and much-too-early death of Pushpindar Singh.

The book covers the PAF 1990-2025; its successes and failures; and particularly its orders of battle during this period. It covers PAF operations, modernisation, and the growth of Pakistan Air Force co-operations with a variety of allies and like-minded nations. The book particularly emphasises the growth of Pakistan-China air nexus.

Though direct comparison with the Indian Air Force is avoided, it becomes clear meanwhile India has failed in its air modernisation to the point it is barely superior to the PAF as opposed to the former's historic 3-1 superiority. Factor in the rise of China as a co-belligerent against India, and the salient point of this book is India is totally outclassed in the air.

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