AERIAL WARFARE: THE INDIAN WAY

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HISTORICAL BACKGROUND

Formative Inheritance

Aerial warfare over India has had a relatively short history. We can synchronise the clock of aerial warfare with the birth of the first Indian Air Force (IAF) squadron, that is, on October 1, 1933. In its formative years, the IAF had a start point already defined by its providers. The IAF was handed down the training, doctrinal concepts and, most importantly, obsolete – slow moving – short range aeroplanes. The British, with their exclusionary policy, ensured that exposure to strategic capability, equipment and responsibility was not entrusted with the IAF. Essentially, they made sure that we remained a tactical air force. The entire inventory had only one flavour: limited tactical reach. Apart from restricting our capabilities at that time, they perhaps hoped that our leadership would also get boxed in and remain short-sighted. However, as the future was to reveal, our leaders were very much aware of the strategic dimension of air power.

In the same period, the world was waking up to strategic implications of air power. Riding on the wings of the strategic bomber force, the economic wars were being carried deep into the enemy territory. Even population centres were not being spared. In fact, the end of World War II was triggered by the

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nuclear holocaust. We also witnessed the inter-theatre mobilisation of forces through our country. During the Burma campaign of World War II, American forces would leapfrog along the numerous airfields, starting from western India through central to northeast India. It was from examples like these that our leaders were visualising the "Strategic Predicament" of the IAF. Every passing interaction with air forces of other countries strengthened their resolve for keeping the strategic aspirations alive. The seeds that were sown in the minds of leadership are slowly showing results. With all the arrows in its quiver, the IAF will soon boast of long range offensive capability, strategic lift capability, all weather and night capable helicopter fleet, networked air defence (AD) environment, and a lead into the exploitation of space.

IAF's Operational Journey: A Summary

The journey from "then" to "now" has been on a road fraught with difficulties. The chronological milestones of this journey are:

- (a) Kashmir Campaign, 1947-48.
- (b) UN peacekeeping operations in Congo (with a Canberra Squadron, 1961-62).
- (c) Indo-China War, 1962.
- (d) Indo-Pak War 1965, the first war against aerial opposition.
- (e) Indo-Pak War, 1971.
- (f) Indian Peace-keeping Force (IPKF) Operations, Sri Lanka, 1987.
- (g) Operation Cactus, 1988, the response to the mercenary crisis in Maldives.
- (h) Operation Safed Sagar, the war over the icy heights.
- (i) UN peace-keeping and peace enforcing operations in Africa.
- (j) International exercises, the latest being the prestigious Ex "Red Flag" at the US Air Force (USAF) base, Nellis.

PILLARS OF AERIAL WARFARE STRATEGY

The evolution of aerial warfare in India rests basically on four pillars. The first pillar is the possession of a strategic mindset in its leadership even though the equipment inherited was tactical. This ensured that the air force never lost its vision. The next pillar is its allegiance to indigenous technology. Hindustan Aeronautical Limited (HAL) has developed into an aeronautics powerhouse due to constant support from the IAF. The third pillar consists of its instinctive reach for jointness amongst the Services as the IAF clearly understands that operational efficiency can come about only with one joint war plan. The fo

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come about only with one joint war plan. The fourth and the most important pillar has been its innovative approach. The IAF has always been brilliantly innovative in using its equipment and has exploited each situation for maximum gains.

Tactical Equipment: Strategic Mindset

A quote from the legendary Jumbo Majumdar underlines this thought, "If we do not fight this war for the British, we shall be nothing better than a flying club when the war ends. After the war is won, India will be a Dominion and we shall run our own air force. Free India without an air force with reach would be a helpless country."

Spurred by the prophetic words of Jumbo Majumdar and the aspirations of our leaders, IAF pilots and technicians were put to the acid test at the stroke of Independence. The obsolete inventory we received at the time Partition was immediately called upon to save Kashmir. Over the ensuing year and a half, and interspersed over two phases, the "tactical air force" of independent India went on to extend its reach from Kashmir Valley to the entire Ladakh region.

Our leaders, both political and military, had sized up the geo-political importance of our country. The vast size, substantial land and maritime borders – overlooking several important land and maritime economic routes – all contributed to the strategic importance of our country. Accordingly, they put the plan for acquisition of strategic assets into motion. The IAF was first to induct jets in Asia through the Vampires. Later, Canberras and Hunters added the strategic reach into our inventory. Karachi harbour and Sui gas plant would hold the testimony to that fact. Both of these were attacked in 1971.

We were forced to remain a tactical air force in the initial years as all the Russian aircraft that we got at that time had very limited operational range. In the late 1950s, the IAF was keen to acquire the F-104 (Starfighter) but the US treaty alignment with Pakistan resulted in a denial, and we were forced to go the Russian way. The Russian inventory reflected a defensive mindset, with their aircraft optimised for air defence. We bought the MiG-21 – variants of which we continue to fly

even today. Our exploitation of this specially designed interceptor with high altitude, Mach 2 capability, equipped with air-to-air missiles in the ground attack role is now a part of aviation folklore. However, we were forced to remain a tactical air force in the initial years as all the Russian aircraft that we got at that time had very limited operational range.

The strategic reach has now been firmly entrenched in our air strategy. It is not only the kinetic application of force but the dominance by being able to reach for the "out of area contingency" which has become part of our operational doctrine. Air-to-air refuellers, the soon to be inducted airborne warning and control system (AWACS) and aerostat radars have well been integrated in our concept of operations. Eight rounds of aid to the recent earthquake in Sichuan province in China and aid to the typhoon-affected areas of the US have showcased our ability to reach out. The Indian fleet of civil aircraft is also well endowed and it constitutes a significant part of our total strategic lift capability. The times of large occupation of land are over. Effect-based wars are the norm, and the criticality of dominance is in place. Space is the ultimate high ground. Warfare has evolved from the days of Alexander the Great, when he swept through continents, taking months and years to cover a few hundred kilometres. Then came the naval flotilla which moved at 15-20 knots, reducing the timeframes from years to months. This faster time-frame was one of the factors that helped the European powers to rule the world. However, naval power was available only with countries that could access the seas. All this has changed in the last century. Aerospace has injected speed and flexibility, cut time-frames (15-20 times faster) from months to hours. It has now become a major lever for foreign policy. The emergence of aerospace power is now universally recognised as the "most visible deterrent."

Leadership

The IAF, in its formative years, was led by dynamic and competent leaders at all levels. Jumbo Majumdar, Subroto Mukherji, P.C. Lal, Baba Mehar Singh, Arjan Singh, Harjinder Singh, the legendary Hawai Sepoy, are just a few of them. The pioneers always led from the front. This aspect has been amply demonstrated through every conflict. Baba Mehar Singh's feat of personally flying the first Dakota into Leh and Poonch is one of the most outstanding examples of professional skill. Higher echelon directions from the then Chief of Air Staff Air Chief Marshal P.C. Lal reorganised the Air and Command Headquarters (HQs) for efficient and quick response. He also paved the way to induct contemporary technology from outside the Soviet bearhug. Mobile observations posts (MOPs) to detect and report intruding aircraft were integrated with the railways communication set-up in 1971. Advanced HQ and Tactical Air Centres were established astride Army Command HQs and Corps HQs. At the field level, the skill of numerous Gnat pilots slaying the air-to-air missile equipped Sabres is an unparalleled example of exceptional professional skill and competence. Spurred from then on, our pilots, logisticians and technicians have been giving a rousing account of themselves in every international exercise.

High Altitude: Our Privilege

No other country in the world has the topography demanding round-the-year operations, at altitudes ranging from 14,000 to above 21,000 feet. As a result, from very early on, we realised that expertise and skill in providing all kinds of air support is going to be the exclusive privilege of the IAF. In the initial phase, post-Kashmir conflict of 1948, the IAF had concentrated more on air maintenance. It has garnered leading experience in carrying out air assault operations, including paradrop over some of the highest dropping zones (DZs) in the world. Stakna and South Pullu DZ in Leh sector are two such examples. The IAF has been carrying out transport aircraft operations at some of the world's highest airstrips such as

Daulat Beg Oldi (DBO) at 16,400 feet altitude since the 1960s. Similarly, Cheetah helicopter operations in the Siachen Glacier have been a record breaking feat. Sustained heli-ops, including landing and take-off in the altitude band of 21,000 feet have been the sole bastion of the IAF. In the second phase, especially post-Kargil, fighter operations were also given a new impetus in the high altitude operations. The MiG-29 operations at Leh is one such example. Our expertise in air transport and offensive high altitude operations has drawn significant interest from almost all the Western air forces. Helicopter pilots from various air forces have come and got exposure of flying in Ladakh. Some air forces have taken part in high altitude paradrop exercises in Leh region.

Allegiance to Indigenous Technology: A Strategic Concern

Faced with "technology apartheid," the IAF has been pushing for developing the indigenous capability. Eventually, in the technology intensive arena of aerospace power, only the capability to generate original and indigenous technical solutions will hold us afloat in the long-term. Our leaders spelt out a twopronged approach. Firstly, they wholeheartedly supported HAL. Secondly, they established base repair depots, BRD for short, which were fleet specific fourth line technical activity depots where overhaul of aircraft and associated equipment was accomplished. From its inception in 1940, HAL has now evolved into a large aeronautics complex. It has developed 11 types of aircraft from inhouse R&D and 14 types built under licensed production. It has produced over 3,500 aircraft and 3,800 aero engines and overhauled thousands of aircraft and engines. It initially produced the Marut (HF-24) aircraft with foreign design support. It then upgraded the Folland Gnat to its ground attack version, Ajeet. It licensed produced the Avro (HS-748) and Dornier. It produced a large number of Chetak/Cheetah and graduated to the indigenously designed advanced light helicopters (ALH). It produced fighter aircraft of the class of the MiG-21, MiG-27, Jaguar and Su-30 MKI, and is developing modern aircraft like the light combat aircraft (LCA) and the intermediate jet trainers (IJT), in spite of technology denials. There are only four main fighter aircraft producers in the world: the US, Russia, China and the European conglomerates. We have resorted to a large number of aircraft upgrades, as replacement costs are prohibitive. The requirements of offsets in future contracts will usher in greater defence equipment manufacture with big business houses like Tatas, Mahindras, Kirloskars actively investing. HAL and the IAF have worked in tandem to establish this indigenous capability. The level of self-reliance, though still being shaped, has provided us with distinct strategic depth.

Jointness for Synergy: Another Strategic Concern

Contrary to the commonly held view, the IAF instinctively knows the worth of jointness for generating synergised, effect-based war effort. Right from its inception as a tactical air force, the IAF has flown extensively in support of the other Services. As the Kashmir crisis started to develop in front of the "just born" nation and its armed forces - carrying forward the excellent traditions of jointness from the pre-Independence days - the IAF fought shoulder-to-shoulder with the Indian Army (IA) in Kashmir. Then Col Sam Manekshaw was onboard the first Dakota landing at Srinagar and Gen Thimaiyya accompanied Baba Mehar Singh on his first landing at Leh. The defence of Poonch garrison, right under the enemy's nose, and artillery barrage was planned and executed jointly. When the Dakotas were reinforcing the Indian Army through this 600-yard-long strip, the IAF Spitfires and Tempests were keeping the enemy's head down by accurate strafing. In 1962, our political masters, apprehending massive aerial retaliation on our cities, chose not to field the IAF in the war except for transport and helicopter support to the army. In the 1965 Indo-Pak War, the IAF played a great role, though its lack of knowledge of the army's plan resulted in the Pakistan Air Force (PAF) taking the initiative for the preemptive strike. Lessons from the 1965 War brought the army and air force to get down to better synergy. The 1971 Indo-Pak War saw the resurgence of jointness as the tenet of the Indian way of air warfare. Right from convincing the political leadership for the right campaigning season to the coordinated offensive actions at Karachi and Akhnoor, there were example galore. The Indian Navy and IAF attacked the Karachi harbour in tandem as well. In 1988, during Operation Cactus, excellent synergy among the three Services saw the first ever strategic projection of India's military power. Riding on the wings of One must understand that true jointmanship in war-fighting will only come if the basic planning for war is done jointly. the IL-76 from Agra, 50 Para Brigade saved the Maldives from the mercenaries – the Mirage 2000 provided protection as Indian Navy warships rounded up the mercenaries. In Kargil, most of the battle planning was done with the air officer commanding Jammu and Kashmir (AOC J&K) sitting side by side, with

the general officer commanding (GOC) 16 Corps Srinagar.

For a long time, we in the IAF have felt that perhaps we have been unable to make the army understand the role of air power in the entire surface war. The army always treats only battlefield air strike (BAS) as the air contribution to the surface war. But the entire counter-air campaign is aimed at keeping the enemy air force away from our army. Battlefield air interdiction (BAI) brings out much greater results in support of the surface war. Slowly but surely, the army leadership has begun to accept our viewpoint. We cannot carry on fighting turf wars for equipment. The core competencies of each Service have to be accepted by the other Services and domain space clearly spelt out. Only then will operational efficiency surface. One must understand that true jointmanship in war-fighting will only come if the basic planning for war is done jointly. The tendency to create a Service-specific war plan and then superimpose the other Service can never give true synergy and operational efficiency. There is no escaping the fact that only one joint plan must exist. May be we need to seek an institutional remedy for this.

Extending the Reach: Innovative Approach

All through our journey, the limitations of technology and equipment inspired us to devise innovative ways of employment. The innovative flair has become the most important pillar of the "Indian way of aerial war-fighting." It could be summarised as the "will and the thought process" to extend our reach – the will to take the war to the enemy's hinterland and hit him where it hurts the most. When the Packet aircraft had to operate in the high mountains in hot weather and better aircraft were denied to us, we installed the Orpheus engine of a Gnat aircraft on this transport aircraft for improving its high altitude handling. This was a measure that showcased our efforts to exploit the equipment beyond the limits specified by its manufacturer. Israel, with innovative means and initiative, could use excellent American equipment in a punishing manner against the Russian equipped Syria and Egypt. This gave rise to the myth of supremacy of American equipment over Russian equipment. The IAF, on the other hand, also equipped largely with Russian aircraft and AD equipment, consistently fared better against a determined Pakistan with its American equipment. The Sabre slayer Gnat busted the myth of the air-to-air missile equipped Starfighter and Sabre. The innovative spirit has acquired the status of a doctrinal percept that the "IAF shall use the equipment at its disposal with audacious innovation and will maximise the

spinoff from it." It has been a lesson which has been taught to us by our pioneers, the likes of AVM Harjinder Singh, the legendary Hawai Sepoy of yore. From fitting truck tyres to the aeroplanes to employing the aerostat radar as a mini AWACS-like aloft AD radar, the IAF's instinct of innovating has been accepted as one of its strongest elements.

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Operation Safed Sagar: Test of Innovative Spirit

The air war over the icy heights of the Himalayas has been the ultimate test of our innovative spirit. It was a case of use of air power in a limited localised war and in a restrictive manner. Our political masters tied our hands behind our backs. We could not cross the Line of Control (LoC). The IAF then used air power in an innovative way. What emerged was a lesson in escalation control dynamics. It kept its forces ready for an escalatory response by Pakistan and by its strong posturing convinced the PAF that any escalation would be futile. The pilots had never practised to deliver weapons at those altitudes and the transport aircraft and helicopters had not flown in that area for providing support. Even then, the IAF rose to the challenge. Our pilots went on to provide the best possible results under

conditions when even weapons ballistics data was not available for these heights. We resorted to using the global positioning system (GPS) for bombing without possessing GPS equipped bombs. A simple innovation of securing a handycam to the gun sight of the MiG-21 aircraft worked very well as a reconnaissance and battle damage assessment tool. Innovative use of the Aruna equipment of the Canberra which was essentially a jammer with partial electronic intelligence (ELINT) capability for gathering ELINT was a great help. The famous Indian *jugaad* was applied to Mirage weapon computers by our engineers to allow it a weapon delivery at these heights. The laser-guided bomb (LGB) attack on Tiger Hill and the logistics base at Muntho Dhalo provided the crucial breakthrough, and the tide reversed.

Air Strategy: The Indian Way

To understand the Indian way of air strategy, let us first see how air strategy evolved in the West. Initially, in the 1920s, aircraft were used as observation

The 1967 Arab-Israeli War began with the preemptive destruction of the Egyptian Air Force on the ground – a case of command of the air. posts in the air, followed by search and attack, both army support operations. By the time of World War II, aircraft speeds and weapons improved, destruction of air forces in being, active support to surface forces (including the navy), economic targeting (breaking the military industrial back), population centres (destruction of the will of the people) became the major air power operations. Technology

enhanced aviation tremendously. Radar, night sights, better weapons and more accurate navigation systems increased reach, flexibility and lethality. The Korea and Vietnam Wars saw the air-to-air and surface-to-air missiles come in. This changed the envelope. The 1967 Arab-Israeli War began with the preemptive destruction of the Egyptian Air Force on the ground – a case of command of the air. The 1973 War saw successful action of surface-to-air missiles followed by development of more active electronic warfare (EW) systems and the need for suppression of enemy air defence/destruction of enemy air defence

(SEAD/DEAD) which was practised successfully in the 1982 Bekaa Valley Operation. Now let us see what we Indians showcased in 1971. This war was jointly evolved with the army in terms of campaign launch time. Right in the very beginning, the PAF in the East was targeted and destroyed, both in the air and on the ground. We then enjoyed total air dominance in this sector. The The innovative and timely attack on the Governor's House in Dhaka, with a crucial meeting in progress, broke the will of the enemy leadership.

air operations like the Tangail drop and heli-bridge over the Meghna river were totally free of any enemy air opposition. Thus, ground forces could operate with a free hand with our aerial fire support. The result was the surrender of East Pakistan within a fortnight. Somehow, the world instead remembers the much longer period taken by the Americans in Iraq in the first Gulf War two decades later. Similarly, the innovative and timely attack on the Governor's House in Dhaka, with a crucial meeting in progress, broke the will of the enemy. However, the Western world credits Col John Warden as the first to conceptualise the five concentric circles, with leadership as the most sensitive centre of gravity. His paper was written decades after the 1971 War. The fact that the attack was done in an LGB like precise manner using an air-to-air missile fired from a high altitude Mach 2 interceptor proves our responsiveness and adaptability to the situation. It literally broke the political will of the enemy and resulted in immediate surrender. The IAF fought the war on two fronts. Economic targets like the Sui Gas plant and Karachi harbour were hit, simultaneously, signalling parallel warfare. Longewala and Chhamb Jaurian were classic cases of air power turning the tide of the ground war. The innovative use of creating a runway-like flare path at an air-to-ground range close to an airfield was an excellent example of deception which diverted the Pakistani air raids away from the Jamnagar airfield. Use of railway communication networks in Punjab to report aircraft movements which led to MOPs demonstrated our innovative spirit. Perhaps, unlike the Americans, we are not good at documenting our deeds, and then, blowing our trumpets. Like The Indian aerial warfare mantra has been to carry the war deep into enemy territory and make sure that the enemy air, at least at the predecided place and time, is not able to interfere with our surface forces. the saga of Basmati rice, some of the concepts that originated here were documented later as Western. The innovative use of two AN-32, escorted by Mirage 2000s, dropping rice bags in Jaffna in Sri Lanka was a strategic move and a clear foreign policy statement, demonstrating our will to step in, in support of the Tamils. It forced the Sri Lankan government to seek our support to resolve the issue. Our air support at New Orleans after Hurricane Katrina and the earthquakes in China/Mynamar have once again confirmed the global dimension and reach of the IAF. India is the country which has

taken the lead in employing the tethered aerostat radar in the AD role as against the coastal watch role in which the world has been using it. The marrying of Russian aeroplanes with Western avionics upgrade is another effort for making the low end aeroplanes capable for more complicated roles and tasks. The IAF has always consciously chartered its own applications, strategy and tactics. The jolt which the Western pilots have been receiving while exercising against us is a tribute to the establishments like TACDE and the adaptive skill of our pilots and technicians.

The Reach for the Sky and Beyond

The Indian aerial warfare mantra has been to carry the war deep into enemy territory and make sure that the enemy air, at least at the pre-decided place and time, is not able to interfere with our surface forces. In this effort, which has lasted for nearly two and a half decades, the following milestones can be identified:

- (a) Induction of Jaguars the so-called deep penetration aircraft, Mirage 2000 multi-role aircraft, IL-76 strategic lift transport aircraft, MiG-25 strategic reconnaissance aircraft and Su-30 aircraft.
- (b) Push for acquiring the strategic reach enablers like the AWACS, in-flight

refuelling aircraft and EW equipment.

- (c) Net-centricity as an overall synergiser was identified by the IAF in the early 1990s and efforts were started to acquire the technology and capability.
- (d) In the same time span, the push for the ultimate high ground space was also initiated. Today, the IAF, along with Integrated Defence Staff (IDS) is pushing the space programme.
- (e) As the efforts of the past several decades have come to fructify, all genres of technology applicable to every sphere of aerospace operations are in some or the other stage of induction.
- (f) We now have a very credible air presence in the UN peace-keeping arena. Today, we fly to the farthest nook and corner of the world and the advanced air forces are keen to train with us.

CONCLUSION

The history of the IAF reflects the Indian way of aerial war-fighting. It is seen that our air force inherited warplanes that restricted it to being a tactical air force. But the leadership refused to be tied down and has kept the quest for strategic reach alive, and now, it has shown results. In the 1971 War, the best of the strategic thoughts were showcased by the IAF well before these terms became famous – from air dominance, parallel warfare to attacking the centres of gravity – without copyrighting or patenting these terms. The strategic pursuits of the IAF included indigenous capability and jointness. The air warriors behind these machines have innovated brilliantly to maximise their output. Now the time has come when our machines are also reflecting our aspirations. The future is indeed bright.