PAKISTAN AIR FORCE: MODERNISATION TRENDS

SHALINI CHAWLA

> *Air power remains the primary vehicle of deterrence by punishment. With weapons reaching ever higher levels of precision attack and enhanced lethality, the value of air power for conventional deterrence by denial and/or punishment has only been increasing.*
>
> — Jasjit Singh, *Kargil 1999: Pakistan's Fourth War for Kashmir*

Air Cmde Jasjit Singh's conviction in the strategic potential of air power has proved increasingly true with time. His unrivalled passion for, and understanding of, the subject, and the increasing role of air power in crisis/war have comprised the strong motivation to bring out a volume of his writings on air power. I personally feel fortunate to have learnt immensely through his generous mentorship. Post Kargil War, he repeatedly talked/wrote about change in the Pakistani thinking which has been progressively inclined towards prioritising the build-up of the air force and the aerial maritime strike capabilities of the navy. It is interesting to see his views being reflected in Pakistan's military acquisitions. The paper aims to study the Pakistan Air Force (PAF) build-up for a better understanding of the modernisation trends in the PAF.

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It is my strong conviction that offensive application of air power is what can yield positive results in a war.

— Air Chief Mshl Mushaf Ali Mir, Chief of the Air Staff (CAS), Pakistan Air Force, 2002[1]

Pakistan has been on an arms acquisition spree focussed on a rapid modernisation of its air force since the Kargil War. Arms acquisitions since then have been exclusively centred on the modernisation and build-up of the air force and the aerial maritime strike capabilities of the navy.

Military modernisation has always been a priority for the policy-makers in Pakistan, and modernisation of both conventional and nuclear forces has been kept up with continued Chinese support (starting the mid-1960s) and the United States' (US) military assistance, which Pakistan managed to receive during three prolonged phases of its alliance with the Americans. Pakistan has been on an arms acquisition spree focussed on a rapid modernisation of its air force since the Kargil War. Arms acquisitions since then have been exclusively centred on the modernisation and build-up of the air force and the aerial maritime strike capabilities of the navy. This has to be viewed in the context of the reality that in Pakistan, the army, which has ruled the country for most of its existence, and was in direct control between 1999 and 2008, calls the shots in military priorities and modernisation. Pakistan has acquired some land systems, but they have been restricted to heavy artillery. The United States stood as Pakistan's major arms supplier post 9/11 (for about 10 years) when Pakistan once again became its "frontline state". However, Pakistan has made aggressive efforts to diversify the sources of its weapons supply in the last decade. China and Pakistan have entered into joint defence projects, adding to the import and production of the PAF and Pakistan Navy. The main suppliers to Pakistan have been the US and China. France has been an important partner in supporting the PAF's existing fleet of Mirages, while Turkey exported 34 T-37 fighter trainer aircraft to Pakistan.

1. Interview, *Asian Defence Journal*, September 2002, pp. 28-29.

To get an understanding of Pakistan's military capability, it is essential to look into the objectives behind its overall military build-up.

BASIC OBJECTIVES SHAPING PAKISTAN'S MILITARY CAPABILITY

Security concerns have always dominated the minds of Pakistan's leadership. Pervez Iqbal Cheema believes in "three possible roads to peace and security—disarmament, arms control and armament." According to him, "Most Third World countries view the first as idealistic, arms control as somewhat more pragmatic, and armament as necessary and realistic."[2] Pakistan has looked at arms procurement to satisfy its security concerns. The perceived threat perceptions from India, strategic developments on the border with Afghanistan, emerging technologies, alliance with the US and growing relationship with Beijing have been the dominant factors contributing to the sources and kind of arms procurement by the nation. Moreover, Pakistan's insecurities as a state emerging from its economic, social and political vulnerabilities also contribute towards its inclination to modernise its forces. The basic objectives shaping the arms acquisitions of Pakistan are as follows:

The perceived threat perceptions from India, strategic developments on the border with Afghanistan, emerging technologies, alliance with the US and growing relationship with Beijing have been the dominant factors contributing to the sources and kind of arms procurement by the nation.

- Pakistan's adversarial relationship with India has played a major role in the formation of its threat perception. The dominant military lobby in Pakistan has aggressively propagated the Indian threat within Pakistan to legitimise Pakistan's high defence spending, and, on the international front, to support the acquisition of high technology weaponry. This also interacts with, and promotes, the military's special and dominant role in the country's power structure.

2. Pervez Iqbal Cheema, "Arms Procurement in Pakistan: Balancing the Needs for Quality, Self-Reliance and Diversity of Supply", in Eric Arnett, ed., *Military Capacity and the Risk of War: China, India, Pakistan and Iran* (SIPRI, Oxford University Press, 1997), p. 148.

- Pakistan's urge to match India's conventional military superiority has perpetually driven Pakistan into ways and means to acquire superior technology. In 2006, the then PAF Chief of the Air Staff (CAS), Air Chief Mshl Kaleem Saadat stated in an interview to *Jane's Defence Weekly*,

  When US sanctions were imposed in 1990, both the PAF and the Indian Air Force were second-generation air forces. No real-time surveillance capability, no air-to-air refuelling capability, no airborne early warning capability, no beyond-visual-range capability, no stand-off weapon capability. However, after 13 years of sanctions, India had all the above and Pakistan had none until about three or four years ago. This is the gap…. We have to bridge this gap in the manner that we can deny the advantage that our neighbour has….[3]

The strategic aims for Pakistan, as outlined by Ross Masood Husain are: "to strengthen national power; to prevent open aggression by India; to induce India to modify its goals, strategies, tactics and operations; to attain a position of security or, if possible, dominance, which would enhance the role of other (non-military) means of conflict; to promote and capitalize on advances in technology in order to reach parity or superiority in military power."[4]

- Pakistan relies on high technology weapons to seek competitive military advantage. The desire to acquire high technology weapons has been very strong in the Pakistan military and its long alliance (in three phases) with the US assisted Pakistan to procure high technology equipment. Pakistan believes that acquisition of high technology weapons would boost the morale and capability of the air force, hence, improvement of the technological base and acquisition of advanced weaponry are vital for victory in war.[5]
- Pakistan has followed offensive aggressive strategies and has had a deep-rooted belief that by going on the offensive, smaller size forces

3. Robert Karniol, "Pakistan Plugging the Gaps," *Jane's Defence Weekly*, March 20, 2006.
4. Ross Masood Husain, "Threat Perception and Military Planning in Pakistan: The Impact of Technology, Doctrine and Arms Control", in Arnett, ed., n. 2, p. 130.
5. See Sobia Nisar, "The Pakistan Air Force", at http://www.defencejournal.com/2001/august/airforce.htm

in history have won wars against bigger enemies. All the four wars which Pakistan fought with India (in 1947-48, 1965, 1971 and 1999), were initiated by Pakistan. The war in 1971 was caused by Pakistan's internal instability. But the actual war was initiated by Pakistan with a preemptive air strike against Indian Air Force (IAF) bases on December 3. In addition, it adopted the offensive route for its covert war through terrorism in Jammu and Kashmir (J&K) since 1988 (besides that in Punjab in 1983-93).

Pakistan has relied heavily on the strategy of offensive action and, thus, the acquisitions of high technology weapons are sought to support this strategy. Compared to its unwillingness or inability to support its ground offensive during the Kargil War, the Pakistan Air Force chief clearly emphasised the offensive orientation of the air force three years later when he stated:

> It is my strong conviction that offensive application of air power is what can yield positive results in a war. In a scenario where one is placed against an adversary not only larger in size but also enjoying a considerable technological edge, offensive and innovative application of air power can pay required dividends. To this end, we have trained accordingly. The PAF has always given top priority to bold offensive planning and our performance was, thus, clearly visible in the last two wars.
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> — Air Chief Mshl Mushaf Ali Mir, CAS, Pakistan Air Force[6]

External military support (with even short-term arms additions, as in the case of one squadron of F-104 Starfighter aircraft from Jordon in 1971 besides extensive support from Iran, Iraq, etc. in 1965) has been a major element in Pakistan's arms acquisitions.[7]

6. n. 1, pp. 28-29.
7. Pervez Iqbal Cheema, *The Armed Forces of Pakistan* (Oxford: Oxford University Press, 2002), p. 164.

MODERNISATION OF THE PAF: BACKGROUND

Modernisation of the PAF in the 1950s

During the early decades, Pakistan acquired arms mainly from the US (for high-technology systems) and China (for low cost but efficient systems), with a small proportion contributed by France. In fact, the massive US arms aid to Pakistan in the late 1950s provided it with both the incentive to initiate the 1965 War as well as demonstrated the philosophy of high technology weapons providing a competitive advantage against India. India was, in any case, saddled at that time with obsolete systems being employed after the war in 1962. The classic case was the shooting down of four Vampire vintage aircraft by a combination of F-104 Starfighters and F-86 Sabres on the opening day of the war, forcing India to withdraw these older fighters from combat, thus, reducing the quantitative advantage that India was supposed to enjoy.

A mutual defence assistance agreement signed on May 19, 1954, between the US and Pakistan was the first formal bilateral security commitment between the two countries and also provided the legal basis to the US military assistance.[8] Following this, in the same year, US officials presented a secret *aide-memoire* boosting the military aid to $50 million, with specific programme goals. The *aide-memoire* committed Washington to equip "4 army infantry and 1.5 armoured divisions, to provide modern aircraft for 6 air force squadrons, and to supply 12 vessels for the navy. The estimated cost of this programme was $171 million."[9]

Pakistan entered the Southeast Asia Treaty Organisation (SEATO) in 1955 and the Baghdad Pact, renamed the Central Treaty Organisation (CENTO), after Iraq left the pact in 1956, ostensibly joining the chain erected by the United States around the Soviet Union and its then military-ideological ally, China, to check the spread of Communism.[10] This resulted in a robust inflow of military and economic aid for Pakistan. Being a member of these two security alliances provided Pakistan a

8. Dennis Kux, *The United States and Pakistan, 1947-2000* (Oxford: Oxford University Press, 2001), p. 67.
9. Ibid., p. 69.
10. Shahid Javed Burki, *Historical Dictionary of Pakistan* (New Delhi: Vision Books, 2003), p. 337.

stronger claim on US resources and the US also benefited with the regular interaction between the Pakistani civilian and military officials and their counterparts from the other member countries. In this process, the US acquired a larger stake in its Pakistan relationship.[11]

By the year 1957, Pakistan was receiving a massive amount of sophisticated military equipment, training and economic aid. The inflow from Washington included sophisticated Patton main battle tanks, modern artillery, howitzers, F-86 jet fighter squadrons, F-104 Starfighter supersonic interceptors, air-to-air missiles, submarines (the first submarine to be introduced into the Indian Ocean by a developing country, as, indeed, was the F-104 supersonic interceptor) and state-of-the-art radar, communications and transportation equipment. Further, a qualitative boost came from the military training by the US military teams and also in the US military schools for the Pakistan Army.[12] The US military also provided assistance in setting up intelligence and special operations facilities creating the Special Services Group (SSG) which was used unsuccessfully to try and capture Indian airfields in the 1965 War. While Pakistan failed to win the war in 1965, its military nevertheless projected it as a victory, especially in the air, and the thirst for high-technology systems intensified.

Alliance with China

But even as the 1965 War was getting underway, Pakistan sent its recently retired Air Chief, Air Chief Mshl Asghar Khan, to China to seek aircraft and weapon systems to meet Pakistan's "dire needs".[13] Pakistan's need for different sources was complemented by Zulfikar Ali Bhutto's approach which believed in maintaining relations with all the major powers whose interest lay in South and West Asia. Unlike Field Mshl Ayub Khan, Bhutto's diplomatic policy brought Pakistan closer to Beijing and Pakistan entered into several economic and military cooperation agreements with China. Pakistan received interest free economic aid and also a significant amount of free weapons from

11. Kux, n. 8, p. 74.

12. Ibid., pp. 86-87.

13. Asghar Khan, *The First Round: Indo-Pakistan War 1965* (New Delhi: Vikas, 1979).

In the 1970s, although US equipment was not available for Pakistan, modernisation of the PAF was kept up with the help of Chinese and French equipment. China supplied 115 F-6 fighters between 1971 and 1981. France supplied 72 Mirages between 1971-83.

China and became the only non-Communist Third World country to receive generous assistance from *it*.[14] *The Chinese F-6 entered the PAFs inventory in 1966, followed by other systems. Chinese military assistance came in not only in the form of arms but also development of the indigenous facilities for defence production in Pakistan [the F-6 Rebuild Factory (F-6RF) at Kamra was set up with Chinese assistance].*

1965 Arms Embargo and PAF Acquisitions in the late 1960s and 1970s

The United States arms' embargo followed by the 1965 Indo-Pakistan War led to the withdrawal of US military assistance and also the suspension of US equipment to Pakistan. Pakistan was compelled to look at alternate options and, thus, it turned to China, North Korea, Germany, Italy and France for military aid. In the late 1960s, Pakistan received the MiG-19 (F-6) fighter aircraft from China, apart from the substantive infantry equipment. France supplied a few Mirage aircraft and even the Soviet Union provided Pakistan the Mi-8 helicopters.

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Indigenous defence production was focussed to progress towards self-reliance and, more importantly, to revitalise the PAF in the 1970s. Rebuilding factories for the Mirages and F-6 planes and the production facility for the MFI-17 Mushshak trainer aircraft were set up. Apart from this, "The Air Defence System was modernised by inducting the latest radars linked with computerised data processing and display equipment".[15]

14. Ayesha Siddiqua Agha, *Pakistan's Arms Procurement and Military Buildup, 1979-99* (New York: Palgrave, 2001), p. 105..

15. Shafi, ''50 Years of the Pakistan Air Force'', September 7, 1997, as cited in Cheema, n. 7, p. 111.

The US Arms Pipeline Reopens in the 1980s

The Soviet invasion of Afghanistan in December 1979 led to the Americans' review of their South Asian policy and, consequently, Pakistan entered into a new engagement with the US. Pakistan was declared a "frontline state" and, in return, received massive military aid. Gen Zia-ul-Haq managed to negotiate an elaborate military and security-related aid package of $3.2 billion. The US military assistance programme included the sale of 40 F-16 Falcon multi-role combat aircraft, one of the most advanced military aircraft in the world at that time. Pakistan also received attack helicopters and second-hand destroyers.[16]

Chinese weapons, being cheaper, continued to hold a significant share in the Pakistani inventory. Although arms from China were technologically not as superior as those from the West, they were capable systems, were affordable and provided quantity to boost Pakistan's military powers.

The second US package, worth $4.02 billion, commenced in 1987 but was suspended after the US arms embargo in 1990 due to Pakistan crossing the "red line" to acquire nuclear weapons capability.

Chinese weapons, being cheaper, continued to hold a significant share in the Pakistani inventory. Although arms from China were technologically not as superior as those from the West, they were capable systems, were affordable and provided quantity to boost Pakistan's military powers. In fact, by the early 1980s, China had provided Pakistan with roughly about 65 per cent of its aircraft.[17]

During the 1980s, the focus of arms procurement was on strengthening the PAF. Pakistan had lost the last two wars and believed that effective air defence would give it leverage in future offensive operations against India. One of the lessons learnt from the last two wars was that an efficient air force

16. Rodney W. Jones, "The Military and Security in Pakistan", in Craig Baxter,ed. *Zia's Pakistan, Politics and Stability in a Frontline State* (Lahore: Vanguard, 1985), p. 83.

17. Cheema, n. 7, p. 164.

would be important in providing close-battle support to the ground forces.[18] According to the strategic thinkers in Pakistan, the acquisition of the F-16s proved vital for the morale of not only the PAF but the nation as a whole. And the modern aircraft was viewed as a technological acquisition guarding the territorial integrity of Pakistan.[19] Thus, the Pakistan military leadership, in their second deal with Washington, sought 70 F-16s, aiming to raise the inventory to 110 high performance multi-role combat aircraft. During the 1980s, Pakistan also made an unsuccessful attempt to acquire the Airborne Early Warning (AEW) system from the US which, if successful, would have dramatically increased the air force's combat capability.

China (besides France) continued to be a major source of PAF weapons and this increased after the US' arms embargo in 1990. About 90 A-5s were obtained in 1983-84 for the price of $1 million per aircraft. Its procurement of around 95 F-7 series aircraft added to the quantitative element in the PAF.[20]

PAF MODERNISATION FROM 1990-2018

Escalation in China's Defence Exports to Pakistan

American military and economic aid came to a halt following the sanctions in 1990. The sanctions were highly damaging in nature as they not only suspended the US military aid and assistance but the procurement of essential spares was also blocked. Intensive lobbying by Pakistan resulted in some relief under the Brown Amendment, passed in 1995. The amendment permitted taking possession of the military equipment frozen in the United States, with the exception of the nuclear capable F-16 combat aircraft.[21] Pakistan had paid for 28 F-16s, which were manufactured against the 1987 order of 110. But following the sanctions, the F-16s were not supplied.[22] These

18. Siddiqua Agha, n. 14, p. 139. The largest share of the American military aid (the first package) was used for the air force. Out of the military component of $1.6 billion, $1.2 billion was spent on the acquisition of 40 F-16 aircraft.

19. Ibid., p. 161.

20. Ibid., p. 144.

21. For details, see Kux, n. 8.

22. The United States government tried to help dispose of these aircraft to Indonesia to help Pakistan recover the money. But owing to the economic crisis of 1997 in Southeast Asia, it was unsuccessful.

sanctions actually impacted the PAF's capability and created confusion in the PAF's planning and procurement regarding the replacement of these aircraft. The post-nuclear test sanctions further hampered Pakistan's weapons supply as the United States persuaded the other G-7 countries to impose similar sanctions.

The decade of the 1990s was a setback for PAF modernisation due to the American sanctions and also Pakistan's crippling economy. Economic growth recorded a steep decline and Pakistan was under severe pressure from the international financial institutions to cut down the spending on defence. Despite the US sanctions, a low Gross Domestic Product (GDP) and a collapsed democratic structure, Pakistan tried hard to acquire the air force equipment. In 1990, 50 Mirage 3 (as indicated in Table 1) were acquired from Australia for a paltry sum of $28 million, along with the engines and spares.[23]

In the 1990s, Pakistan, with its nationalist ego boosted by the nuclear weapons tests (which, it also believed, would deter India from any robust response), launched the war in the Kargil sector of J&K in early 1999. This misadventure not only led to its defeat but triggered the return of the army in control of the country, displacing the elected government in the coup of October 12, 1999. With the emergence of the military regime, another set of democracy related sanctions was imposed on Pakistan, further restricting the acquisition of high technology weapons from the West. The result was China's pre-eminence in Pakistan's arms import.

Sino-Pakistan defence collaboration flourished under the umbrella of the US sanctions. The Aircraft Manufacturing Factory (AMF) under the Pakistan Aeronautical Complex (PAC) at Kamra, began the production of the Karakoram-8 jet trainer, in collaboration with the China National Aero-Technology Import and Export Corporation (CATIC). The jet trainer was initially launched as the NAMC L-8 in 1987 in the Paris Air Show and subsequently proposed to be co-developed in partnership with Pakistan (with a 25 per cent share).

23. Siddiqua-Agha, n. 14, p. 145. These aircraft were retired from the Royal Australian Air Force (RAAF) and most of them had about a hundred flying hours remaining on their airframes.

China and Pakistan entered into deals for the co-development of a fourth generation fighter aircraft, the JF-17 (earlier called the FC-1). China delivered two Joint Fighter (JF-17) Thunder advanced jets to the Pakistan Air Force in March 2007 for flight tests and evaluation. The JF-17 is designated to be a low cost combat aircraft to meet the tactical and strategic requirements of the Pakistan Air Force and reduce the reliance on imports. The JF-17 is co-developed by Pakistan and China and is being built by China's Chengdu Aircraft Industry Corporation (CAC) and Pakistan Aeronautical Complex (PAC). There have been reports that the design was developed by the MiG complex in Russia and transferred to China after the Russian Air Force cancelled procurements. The JF-17 is fitted with the RD-93 engine and the initial batch of JF-17s delivered to Pakistan were fitted with the Chinese radar, KLJ-7 multi-mode pulse Doppler radar.

In 2007, the Pakistan Air Chief announced that Pakistan had increased its initial target of buying 150 JF-17s to acquiring up to 250 aircraft.[24] This represented Pakistan's confidence in the aircraft and also a quantum jump in the Pakistan aircraft industry. Pakistan has received the JF-17 Blocks I and II, and the Block III is awaited. China has reportedly overhauled the JF-17 Block I. It is interesting to note that Pakistan still lacks the capability to overhaul its growing fleet of JF-17 fighter jets.[25] The PAF fleet currently has 85 JF-17 Blocks I and II, operationally deployed.[26] Regarding the production of the aircraft, reports suggest that PAC has been producing 58 per cent of the JF-17s airframe, and CAC 42 per cent of it.[27] All three JF 17 variants (Blocks I, II and III) are powered by the Chinese licence-built Klimov RD-93 (an RD-33 derivative) turbofan engine.[28]

Pakistan has also entered into the procurement of the airborne early warning systems from Sweden and China. In 2006, Pakistan entered into a deal with Sweden for the purchase of 4 SAAB-2000 turboprop aircraft

24. Interview, Air Chief Mshl Tanvir Mahmood Ahmed, Pakistan's CAS, *Jane's Defence Weekly*, April 4, 2007, p. 34.

25. Franz-Stefan Gady, "China Overhauls Pakistan Air Force JF-17 Fighter Jet", *The Diplomat*, May 22, 2019, https://thediplomat.com/2019/05/china-overhauls-pakistan-air-force-jf-17-fighter-jet/. Accessed on June 1, 2019.

26. *The Military Balance 2019, IISS* (London: Oxford University Press, 2019), p. 299.

27. Gady, n. 25.

28. Ibid.

equipped with the Erieye Airborne Early Warning and Control (AEW&C) systems.[29] Pakistan placed the order for four Chinese built airborne early warning aircraft, the ZDK-03 (KJ-200) Airborne Early Warning and Control System (AEW&C) aircraft, in 2008, and received the deliveries between 2011-14. Other sales from China include: WZ-10 combat helicopter, F-7 fighter aircraft and AS565S Panther Anti-Submarine Warfare (ASW) helicopter.[30]

With the uncertainty related to the inflow of US equipment, owing to the experience in the past, Pakistan has been aggressive in diversifying its sources of weapons supply. Pakistan acquired 34 T-37 B trainer aircraft in 2015 and ordered the A-129C Mangusta combat helicopters in 2018 from Turkey. The delivery for the A-129C is likely to take place in 2022-23. Other significant acquisitions have been from Russia and Ukraine.

In an interview with *Jane's Defence Weekly* in 2019, the Chief of the Air Staff, PAF, Air Chief Mshl Mujahid Anwar Khan talked about the PAF's upcoming procurement plans. Some of the important acquisitions which the PAF is planning include:[31]

- The production of the new Block III JF-17s is likely to start later this year (2019). The PAF "will make a decision on one of the two new Chinese AESA (Airborne Electronically Scanned-Array) radars" for these aircraft.
- The PAF plans to push for development of a Fifth Generation Fighter Aircraft (FGFA) capability.
- Before the FGFA capability comes online, the PAF is evaluating "a new trainer and the Leonardo M-346, Hongdu L-15 and KAIT-50".

PAF Acquisitions from the United States

The US' weapons sales to Pakistan were restarted following Pakistan's role as the chief ally in the global war against terrorism, which led to the removal of US sanctions on Pakistan. Pakistan's alliance with the United States post 9/11

29. For details, see Atul Kumar Singh, "AWACS: The Pivot of Aerospace Power", *Air Power Journal*, vol. 2, no. 1, Spring 2007(January-March), pp. 107-138.

30. Transfer of Major Weapons: Deals with Deliveries or Orders Made for 2008-2018, Supplier-China, Recipient-Pakistan, Trade-Register-2008-2018.rtf, SIPRI Arms Transfer Database Register. Accessed on June 1, 2019.

31. Chief of the Air Staff, Interview, Air Chief Mshl Mujahid Anwar Khan, Pakistan Air Force, *Jane's Defence Weekly*, May 22, 2019.

Pakistan's *non-NATO ally* status allows the sale of used US weapons well below their depreciated value. For example, the F-16s supplied to Pakistan in 2005, with the original unit acquisition value of $16.2 million, have been transferred at a current unit value of $6.48 million. The eight P-3 aircraft were delivered free of cost to Pakistan in 2006.

helped the recovery of Pakistan's economy and opened the long desired supplies of defence equipment from Washington. The Pentagon reports indicate that the Foreign Military Sales (FMS) agreements with Pakistan were estimated at $344 million in Financial Year (FY) 2003-2004, growing to $492 million in FY2005 alone.

The initial US supplies to Pakistan consisted of items like the UH-1 Huey-2 utility helicopters, Very High Frequency/ Ultra High Frequency (VHF/UHF) aircraft radios, air traffic control radars, night vision equipment and other equipment and support systems including intelligence gathering devices. High technology weapons and equipment from the United States included two F-16s which Pakistan received in 2005 and (initially) 50 plus F-16s were 'scheduled' to be followed (36 F-16 A&B + 18 F-16 C&D).[32] The actual number of aircraft received by Pakistan was different. Pakistan has been extremely keen to acquire the F-16s, partly for political/psychological reasons and partly because it has been familiar with multi-role combat aircraft since the early 1980s. Pakistan was aiming to achieve its original plan of 110 F-16s in its inventory.

On the naval aviation front, Pakistan received the first P-3C Orion maritime patrol aircraft in 2007 and the deliveries were extended till 2010. Pakistan's *non-NATO ally* status allows the sale of used US weapons well below their depreciated value. For example, the F-16s supplied to Pakistan in 2005, with the original unit acquisition value of $16.2 million, have been transferred at a current unit value of $6.48 million. The eight P-3 aircraft were delivered free of cost to Pakistan in 2006.

In 2008, Pakistan received 4 Bell-205/UH-1 Huey2 helicopters from the US. Other US exports to Pakistan include: Scan Eagle Unmanned Aerial Vehicles

32. *The Military Balance 2007, IISS* (London: Routledge, 2007), p. 330.

(UAVs) delivered in 2015, Cessna-U206 Light Utility aircraft delivered in 2017 and Bell-412 helicopters delivered in 2010 (see Table 1). Pakistan signed the deal for the acquisition of 12 AH-1Z Viper combat helicopters in 2015, but the delivery has been delayed after the US has suspended military aid to Pakistan in 2018.[33]

The US sales and military aid to Pakistan went up significantly during 2002-12 and contributed towards the accelerated modernisation of the PAF. It is interesting to note that the arms deliveries to Pakistan from the US alone in the period of 1999-2006 amounted to $4,600 million (US$)[34] at an average of $575 million per annum. The total value of US arms transfer agreements with Pakistan in 1999-2002 was estimated at $2,800 million (current US$), with Pakistan ranking number ten among the list of recipients. In the succeeding years, 2003-06, the value of arms transfer agreements amounted to $8,100 million (current US$) shifting Pakistan to number three in the list of the recipients. And in 2006 alone, the value of the arms transfer agreements was calculated at $5,100 million (current US$) making Pakistan the number one recipient of the US arms transfer agreements.[35]

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33. Transfer of Major Weapon: Deals with Deliveries or Orders made for 2010-2018, Supplier-United States, Recipient-Pakistan, Trade-Register-2010-2018.rtf, SIPRI Arms Transfer Database Register. Accessed on June 17, 2019.

34. Richard F. Grimmett, *CRS Report for Congress; Conventional Arms Transfers to Developing Nations, 1999-2006,* September 26, 2007, p. 71.

35. Ibid., pp. 62-63.

Washington slashed its Foreign Military Financing (FMF) to Pakistan from US$ 255 million to US$ 100 million for the 2018 fiscal. Total security related aid [which includes FMF and International Military Education and Training (IMET)] stood at $849 million in 2012 alone. The security related assistance was reduced to $23 million in 2018.[36]

The new US policy under President Trump is likely to further impact US assistance. The likely US responses being discussed at present include expanding the US drone strikes and eventually revoking Pakistan's status as a major *non-NATO ally*.

Table 1 : Pakistan Air Force: Major Acquisitions during 1990-2018

Supplier/ Licenser	No. ordered / Delivered	Weapon Designation	Weapon Description	Year(s) of Delivery
Australia	50	Mirage 3 aircraft	Fighter aircraft	1990-92
Britain	3	3 Lynx HAS- 3	ASW helicopters	1994-96
China	40	F-7P	Combat aircraft	1993
	6	K-8	Trainer aircraft	1994
	30+	K-8	Fighter/trainer aircraft	2003-10
	57	F-7 MG (F-7 PG version delivered)	Fighter aircraft	2001-03
	3	Type-347G	Fire control radar	1997-01
	6	A-5	Combat aircraft	2003
	400	FM-90	SAM	2014-16
	3	LY-80 SAMS	SAM System	2015-16
	4	F-7 A	Fighter aircraft	2010
	10	Skyguard	Fire control radar	2012
	600	PL-12/SD-10	BVRAAM	2010-18
	1000	PL-5E	SRAAM	2009-18

36. ''Direct Overt U.S. Aid Appropriations for and Military Reimbursements to Pakistan FY 2002-FY2020'', http://fas.org/sgp/crs/row/pakaid.pdf. Accessed on June 1, 2019.

Supplier/ Licenser	No. ordered / Delivered	Weapon Designation	Weapon Description	Year(s) of Delivery
	6	A-5C/Fantan	FGA aircraft	2003
	50	JF-17 Thunder/ FC-1 Block 1	FGA aircraft	2007-13
	4	ZDK-03	AEW&C aircraft	2011-14
	3	WZ-10	Combat helicopter	2015
	50	JF-17 Thunder/ FC-1 Block II	FGA aircraft	2015-18
	50	JF-17 Thunder/ FC-1 Block III	FGA aircraft	Delivery planned from 2020
	13	JF-17 Thunder/ FC-1 Block II	FGA aircraft	2018 Produced in Pakistan
	5	Wing Loong-1	UAV/UCAV	2015
	20	CH-3	UAV/UCAV	2013-16
France	4	SA316 Alouette III	Helicopters	1994
	3	Breguet Atlantique-1	MPA and strike aircraft	1996
	8	Upgraded Mirage-IIID/V	Combat aircraft	1999
	48	Mirage IIID/5	Combat aircraft	1998-00
	11	Mirage V	Combat aircraft	2000-02
	96	F-17P	AS torpedo	1999-04
	8	SA-316B Alouette-3	Light helicopter	2008
	10	AS-350/AS-550 Fennec	Light helicopter	2013-14

Supplier/ Licenser	No. ordered / Delivered	Weapon Designation	Weapon Description	Year(s) of Delivery
Italy	192	Grifo radar	Combat aircraft fire control radar (for Mirage and F-17/7 combat aircraft)	2000-04
	4	Galileo Falco	UAV	2006
Netherlands	5	Fokker F27-200	Aircraft	1994-96
Russia	2	Mi-8MT/Mi-17	Transport Helicopter	2016
	4	Mi-35M	Combat helicopter	2018
Sweden	1	Saab-2000 Eriey	Transport aircraft	2008
	4	Saab-2000 AEW	AEW&C aircraft	2009-10
	4	Saab-2000	Transport aircraft	2016-18
Turkey	34	T-37B	Trainer aircraft	2015
	30	A-129C Mangusta	Combat helicopter	Year of order -2018, delivery planned by 2022-23
USA	3	P-3C (update 2.5)	Orion maritime reconnaissance and strike aircraft	1996-97
	28	Harpoon	Anti-ship missiles for the P-3C Orions	1996-97
	10	Bell-209/AH-IS	Helicopters	1997
	5	Bell-205/UH-1 Huey-2	Helicopter	2002
	26	Bell-412 EP	Helicopter	2004-05
	6	C-130E Hercules*	Transport aircraft	2005-07
	4	Bell-205/UH-1 Huey-2	Helicopter	2008

Supplier/ Licenser	No. ordered / Delivered	Weapon Designation	Weapon Description	Year(s) of Delivery
	12	AH-1F Cobra	Combat helicopter	2007
	40	T-37 B	Trainer aircraft	2009-12
	7	P-CUP Orion	ASW aircraft	2007-12
	14	F-16 A*	FGA aircraft	2005 -08
	6	C-130E Hercules	Transport aircraft Ex-RAAF	2005-06
	5	Bell-205/UH-1 Huey-2	Helicopter	2009
	18	F-16 C Block-50/52	FGA aircraft	2010
	6	AN/TPS-77	Air surveillance radar	2008-09
	2	Bell-412	Helicopter	2010
	500	AIM-120C AMRAAM	BVRAAM	2010-14
	15	ScanEagle	UAV	2015
	12	AH-1Z Viper	Combat helicopter	2015
	4	Cessna-U206	Light aircraft	2017
	2	King Air-350 ISR	AGS aircraft	2013-18
Ukraine	4	IL-78M	Tanker/transport aircraft	2009-11

* US Excess Defence Articles, which are normally transferred at price of less than 10 per cent of the original. For example, the cost of each F-16 is a little over $6 million.

Source: Table based on, Stockholm International Peace Research Institute, *Yearbook* (issues of various years) (New York: Oxford University Press) and Pakistan's major arms imports, as cited in Jasjit Singh, "Trends in Defence Expenditure," *Asian Strategic Review*, 1998-99 (New Delhi: Institute for Defence Studies and Analyses, 1999), *SIPRI 2002, 2004, 2005*, *United Nations Register of Conventional Arms* for various years and Defence Security Cooperation Agency at, http://www.dsca.mil; "Update on Pakistan C-130E Acquisitions," *Air Forces*, January 2006, p. 22, *The Military Balance 2007*,*IISS* (London: Routledge, 2007), SIPRI Arms Trade Register-Transfer of Major Weapons: Deals with Deliveries or Orders made for 2001-2018, Suppliers: United States, Turkey, Russia, Ukraine, China, Sweden and France; Recipient-Pakistan, Trade-Register-2001-2018.rtf. Generated on June 17, 2019.

Pakistan's growing defence cooperation with China and support from the United States have been majors factor contributing to the modernisation of the PAF in the last two decades. The US sanctions in the 1960s and then in the 1990s not only gave space for Chinese (and French) defence equipment in the Pakistani market but also Pakistan made concerted efforts towards defence production which has provided an exposure to the Pakistan defence industry in the international market. The Chinese K-8 is under production at the Pakistan Aeronautical Complex. The assembly of the JF-17 is being done in Pakistan and the defence planners believe that Pakistan should be able to undertake the complete production soon. The JF-17 has displayed export potential and Nigeria, Myanmar and Malaysia have shown keen interest in procuring the aircraft. The Grifo-7 radar designed to improve air-to-air and air-to-ground performance is being produced with the objective of equipping 46 F-7 PG aircraft with the radar, together with approximately 45 Mirage IIIOs.[37]

PAF STRATEGY

Given all the indications, it is obvious that Pakistan has been focussed on the modernisation of its air force. This has been the trend since 1999 after Pakistan's defeat in the Kargil War. What does this massive modernisation signify for the doctrine and strategy that the PAF can be expected to follow in the future?

If past experience is any indication, Pakistan's overall national and military philosophy and culture tilt heavily towards an offensive and aggressive strategy. Pakistan initiated the 1947 War but could not manage the aggressive use of the air force mainly due to two factors: one, unavailability of the appropriate equipment to counter India and, two, the whole operation in 1947 was carried out under the name of 'tribal revolt' which provided Pakistan little leverage to use offensive strike capabilities. These are also indications that the PAF (as also the IAF) was restrained by the British.[38]

The 1965 War was again a planned covert war, followed by overt offensive aggression by Pakistan. What is the factual record? The following facts stand out with respect to the 1965 War:

37. See, Shalini Chawla, "Defence Production in Pakistan", in Air Cmde Jasjit Singh, ed., *Asian Defence Review 2007* (New Delhi: Knowledge World, 2007) pp. 33-64.

38. See, C Das Gupta, *War and Diplomacy in Kashmir* (New Delhi: Sage Publications, 2002).

- Joint plans: the PAF's plans for a "surprise attack" on IAF bases were made out more than two months earlier.[39]
- The PAF was fully activated, in full force, over the Chhamb sector to cover the armour offensive on September 1. The IAF lost four Vampires as a consequence.
- The PAF followed up with preemptive air strikes on IAF bases on September 6, as per the June 29, plan.
- The PAF claimed to have gained air superiority and dominated the war, shooting down many more IAF aircraft than it lost. The PAF also claimed to have destroyed a large number of IAF aircraft on the ground.

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In 1971, Pakistan initiated the war on December 3, with preemptive strikes on IAF air bases, hoping to damage and destroy as many aircraft and as much infrastructure as possible through the air offensive. However, it appears to have held back from serious counter-air operations which remained targeted against Indian forward bases. This was part of the grand military strategy to execute what came to be called the great "Tikka Offensive" to launch two strike corps in a *blitzkrieg* into India covered by the Pakistan Air Force. Attacks on Indian forward airfields were aimed at reducing/neutralising IAF capabilities to interfere with the offensive.[40] In the event the great offensive never got off the ground.[41] The PAF also kept asking the army if a ground offensive further south in Rajasthan (Jaisalmer sector) was planned so that it could provide the necessary air effort by activating the Jacobabad airfields, but the Army Headquarters (HQ) kept denying any such plans. Thus, the Pakistani armour offensive came to be destroyed by the IAF at Longewela.

Pakistan, in the 1965 War, miscalculated the Indian response. The Indian retaliation came as a surprise to Pakistan in the 1965 War and also in the 1971 War. According to Air Cmde Jasjit Singh, "It was the impact of the

39. B C Chakravorty, *History of the Indo-Pak War, 1965* (New Delhi: Ministry of Defence, Government of India, 1992), unpublished, p. 246.

40. *The Story of the Pakistan Air Force* (Islamabad: Shaheen Foundation, 1988).

41. Jasjit Singh, *Defence from the Skies* (New Delhi: Knowledge World, 2007), p. 145.

Indian retaliation came as a surprise to Pakistan in the 1965 War and also in the 1971 War. According to Air Cmde Jasjit Singh, "It was the impact of the performance by the Indian Air Force which strongly discouraged the Pakistani offensive. Pakistan's strategy has been sound but they have failed to take into account how the enemy would react".

performance by the Indian Air Force which strongly discouraged the Pakistani offensive. Pakistan's strategy has been sound but they have failed to take into account how the enemy would react".[42]

The second factor which can be traced for the PAF restricting itself, has been a lack of understanding of its role by the Pakistan Army. Air Mshl Asghar Khan had said in the 1960s:

> It is true that the PAF's primary role, in essence, is to assist the army in every possible way to achieve its objectives. But in order to do this, the PAF must first achieve a high degree of air superiority over the land battle areas, and it must be equipped to do this effectively. The army seldom understood or recognized this precondition.[43]

The Kargil War in 1999 was once again an attempt by the Pakistani military leaders to capture more Indian territory and Pakistan launched a military aggression across the well-established and mutually accepted Line of Control (LoC). The Pakistan Army lost over 1,200 fighting men in the 42-day war and suffered a humiliating defeat but did not use its air force to support its army that had been launched across the border. This aspect has never been adequately explained. Although the superiority of the Indian Air Force would have been a deterrent to the PAF, it is also possible that the Pakistan Army leadership wanted to keep pretending that the fighters across the LoC were "Mujahideen" freedom fighters.

On February 26, 2019, the IAF targeted a Jaish-e-Muhammed (JeM) camp at Balakot in Pakistan's Khyber Pakhtunkhwa (KP) province, after over 40 Central Reserve Police Force (CRPF) *jawan*s were killed in Pulwama, in J&K, India, in

42. Discussion at the Centre for Air Power Studies, New Delhi, November 2, 2007.

43. n. 40.

a gruesome terror attack claimed by the JeM. India's 'non-military preemptive action' against the JeM camp was aimed at countering future terror attacks for which the JeM was reportedly preparing. Pakistan's denial in the Pulwama attack was not surprising. The IAF strikes were conducted with Mirage-2000s equipped with the Israeli SPICE (Smart, Precise Impact, Cost-Effective) 2000 bombs, which function with deadly accuracy. The Mirages were accompanied by the Sukhoi-30s as Escorts, AWACS/AEW&C aircraft provided air cover, while IL-78s Flight Refulling Aircraft supported the mission. This was the first time India had conducted air strikes in mainland Pakistan since 1971. On February 27, Pakistan conducted air strikes in the Poonch-Rajauri-Naushera sector in J&K where the PAF violated the Indian air space, although Pakistan continues to claim that its fighter jets did not intrude into the Indian air space. The PAF strikes aimed at the military targets were conducted with the JF-17s, F-16s, Mirage 5PA, SAAB Erieye AEW&C system aircraft and DA-20 Falcon. The strikes did not lead to any military or civilian loss and Pakistan claimed that it was a 'deliberate' attempt to avoid any casualties. The briefing by the ISPR chief brought out that the PAF air strikes were demonstrative of PAF capabilities and resolve, and, clearly, Pakistan didn't want escalation in any form. Islamabad, at this point of time, cannot afford escalation when it is undergoing a major economic crisis, feeling the hit of international isolation and facing major pressure from the International Monetary Fund (IMF) and Financial Action Task Force (FATF). The air battle between India and Pakistan resulted in the loss of a MiG-29 for India and an F-16 for Pakistan.

Certainly, India's actions in Balakot mark the beginning of a new approach from India. The message to Pakistan is clear: New Delhi is no longer ready to absorb Pak-sponsored acts of terror, and the cost of terrorism has been raised for Pakistan. Air Cmde Jasjit Singh, after the Kargil War, very aptly pointed out the role of air power in *punishment capabilities:*

> India will have to increasingly rely on air power to deter war (limited, full-scale or even a nuclear exchange) both through its denial dimension as well as punishment capabilities.[44]

44. Jasjit Singh, "Beyond Kargil", in Jasjit Singh, ed., *Kargil 1999: Pakistan's Fourth War for Kashmir* (New Delhi: Knowledge World, 1999), pp. 227-228.

Pakistan's purchases in the last 18 years reflect the military's realisation that strengthening the PAF's capabilities and the maritime aerial strike capabilities is critical.[45]

To sum up, the following conclusions can be drawn based on the publicly known information and analysis of trends in the current phase of modernisation of the Pakistan Air Force:

- The Pakistan Air Force has been engaged in a massive modernisation since 1990 (boosted after 9/11) both qualitatively and quantitatively. The thinking, writing and arms procurement in Pakistan indicates the historical consistency of approach to military capability—that is, the desire and efforts to acquire high technology arms to compensate for the asymmetry in numbers with respect to India and increase the options for an offensive strategy.
- The overall modernisation process indicates focus on the build-up of the air force and maritime strike capabilities of the navy.
- Pakistan is making significant efforts to add force multipliers in the PAF inventory.
- Chinese imports dominate the PAF acquisitions as Pakistan does not expect more equipment coming from the United States. Also, with China being the largest exporter of defence equipment for Pakistan, we need to understand that the economic crisis in Pakistan will not have a severe impact on the defence procurements. China has been offering leverages to Pakistan in terms of relaxed modes of payment, easy instalments and long duration of loans. This trend is likely to continue as the modernisation of the Pakistan military is in sync with Beijing's 'strategic interests'.
- Russian imports have started to find space in Pakistan's arms imports and this trend could potentially help Pakistan in accelerating the military build-up with high technology weapons.

45. See, Jasjit Singh, "Kargil Echo in Pak Purchases", *The Indian Express,* November 28, 2004.