



Why Air Forces Fail; Learning From History's Lessons

Purpose

"We better be prepared to dominate the skies above the surface of the earth or be prepared to be buried beneath it."

**- General Carl A. "Tooeey" Spaatz
(1st CSAF)**





History's Lesson...

Why Air Forces Fail

- **Constant themes emerge from:**
 - 100+ years of powered flight
 - Analysis of combat, operational exercises
- **Air forces consistently failed that:**
 - Did not understand or underestimated their enemy
 - Were not strong independent services, part of a joint team
 - Didn't increase training pipelines and/or infrastructures & were not prepared for the long haul
 - Didn't have sufficient numbers of modern aircraft, munitions and other equipment
- **Caveats & Methodology**
 - No single lesson is necessary or sufficient to ensure or cause failure
 - If an air force makes these mistakes it's likely to fail
 - A "failed air force" does not necessarily equate to an entire nation's failure
 - An air force's "failure" is defined as an inability to play its role to the expected or necessary degree





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- Dik Daso, LtCol, USAF (Ret). Curator of Modern Military Aircraft, National Air and Space Museum, Smithsonian Institution.
- Dr Chris Cain, ACSC Instructor, Maxwell AFB, AL
- Dr Tom Hughes, SAASS Instructor, Maxwell AFB, AL
- Images courtesy the Smithsonian Institution’s National Air and Space Museum, Air Force Magazine and the Air Force Association, and AF/HOH.



Failed to Understand or Underestimated the Enemy

■ Impacts:

- Mistook enemy intent, likely courses of action
- Expected enemy to capitulate quickly
- Not prepared for attrition of a long war
- Didn't organize, train or equip themselves properly for the enemy at hand
- Got surprised

■ Reasons include mirror imaging, racism, and poor or poorly used intelligence

■ Examples:

- ✚ Luftwaffe in WWII
- 🇷🇺 RAF in Norway, France, Greece, Malaya in WWII
- 🇯🇵 Imperial Japanese AFs in WWII
- 🇺🇸 US in Pacific in '41-'42
- 🇺🇸 USAF in Southeast Asia





Not a Strong Independent Service, Part of a Joint Team

■ **Impacts:**

- Military structure or doctrine did not establish air power as an independent combat arm
 - Air Force a supporting vs. independent Service
 - Confused about what/who to support – Army or Navy?
- Not organized, trained or equipped to fight interdependently as part of a Joint Team
- Inter-service rivalry, duplication of effort and inefficiency

■ **Examples:**

- 🎯 France in 1933-'40
- ✚ Luftwaffe in WWII
- 🎯 RAF in Norway, France, Greece, Malaya in WWII
- Imperial Japanese AFs in WWII
- 🎯 Argentinean AF in Falklands
- 🇺🇸 USAF in Southeast Asia





Training Pipelines & Infrastructure Not Postured for Long War

■ Impacts:

- Programs and personnel structures unable to keep pace with attrition, meet the needs of a modern air force
 - Training pipelines
 - Support infrastructures
 - Replacement and repair arrangements
- Highly-qualified aircrews, combat-ready aircraft and war materiel in short supply after conflict's initial stages
 - Poorly trained aircrews less effective, lost at higher rates

■ Examples:

- ✝ German AF in WWI
- 🎯 France in 1933-'40
- ✝ Luftwaffe in WWII
- Imperial Japanese AFs in WWII
- 🇺🇸 USAF in Southeast Asia





Insufficient Numbers of Modern Aircraft, Munitions & Equipment

■ Impacts:

- Ineffective strategic deterrent or offensive fighting force
- Unable to effectively match political objectives/ends with means and ways

■ Examples:

- ✝ German AF in WWI, ✝ Luftwaffe in WWII
- 🇮🇹 Italian AF 1933-'43 and 🇫🇷 French AF in 1933-'40
- 🇵🇱 Polish AF in 1939
- 🇷🇺 RAF in Norway, France, Greece, Malaya in WWII
- 🇯🇵 Imperial Japanese AFs in WWII
- 🇺🇸 US in Pacific in 1941-'42
- 🇦🇪 Arab Air Forces vs. Western Technology (Israelis)
- 🇦🇷 Argentinean AF in Falklands
- 🇺🇸 USAF in Southeast Asia














“Technological achievement requires risky investments to keep a nation’s air force at the peak of modernization.” -Dr Chris Cain



Why Air Forces Fail

Letter of Xs

<div style="text-align: right; padding-right: 10px;">Air Force</div> <div style="text-align: left; padding-left: 10px;">Failure Reason</div>	 German AF, WW I	 Italian AF, 1933-1943	 French AF, 1933-1940	 Polish AF, 1939	 Luftwaffe, WW II	 RAF, WWII (in Norway, France, Greece, Malaya)	 Imperial Japanese, WW II	 US in Pacific, 1941-1942	 Arab Air Forces vs Israel	 Argentine AF, Falklands	 USAF in Southeast Asia
Did not understand or underestimated the enemy					X	X	X	X			X
Were not strong independent services, part of a joint team			X		X	X	X			X	X
Not trained / prepared for the long haul	X		X		X		X				X
Insufficient numbers of modern aircraft, munitions, equipment	X	X	X	X	X	X	X	X	X	X	X

Our Job...

Organize, Train & Equip America's Air Force

“The past offers us a rich database from which we can learn, in order that we may keep on succeeding.”
- Jared Diamond, in Collapse: How Societies Choose to Fail or Succeed





Failure is NOT an Option



Headquarters U.S. Air Force

Integrity - Service - Excellence

Linked Slides

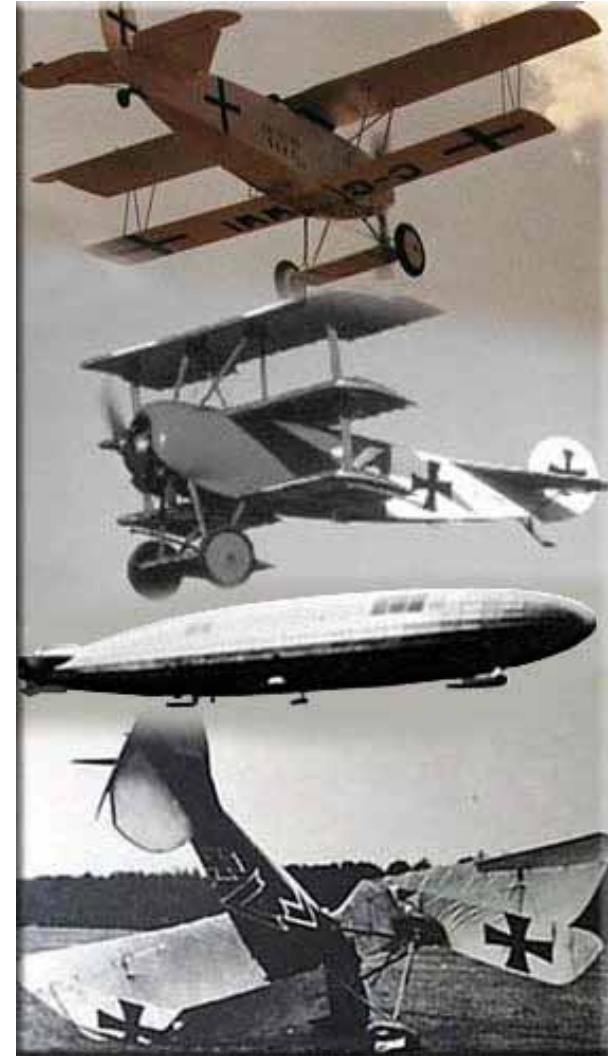




Not Prepared for a Long War: The German AF in WWI

- **British and French industrial capacity out-classed the Germans in the war of attrition**
 - **Divided resources/emphasis between heavier and lighter than air platforms**
 - **Wasted resources despite ineffectiveness**
 - **Could not keep pace with losses of material resources, especially oil and fuel**
 - **Military training schools, infrastructure, aviation industry could not produce enough equipment, aviators**

- **Results:**
 - **Quality and numbers of trained aircrews diminished**
 - **German AF only able to achieve a temporary, localized aerial superiority**





Equipment Issues: The German AF in WWI

- Germany initially technologically on par with France & Britain
 - In aircraft, engine design and manufacturing
- Subsequently lagged French & British technological innovation
 - Government military investment remained contingent on industry's prior development
 - Industry required state money for capital required to develop equipment in the first place
- Even superior aircraft designs couldn't overcome engine shortcomings
 - Albatros, Junkers, Fokker *Eindecker* aircraft
 - Engines qualitatively & quantitatively inferior
 - Germans engines consistently out-muscled
 - Not able to reproduce Hispano-Suiza V-8 or Rolls-Royce V-12 engines like France





Equipment Issues: The Regia Aeronautica, 1933-1943

- Italy technologically backward compared to its enemies
 - Air industry unable to adopt mass production techniques
- Outmoded aircraft, all powered by deficient engines
 - Four outmoded fighter designs: CR.32, CR.42, G.50, MC.200
 - “...one of which was already obsolete, another obsolescent, and two of rapidly fading modernity.”
 - Only roughly equivalent to Hurricane
 - Inferior to Spitfire
 - Three pre-war bombers
 - Two existed only on paper, the third had unreliable engines and structural problems





A Supporting Service: The French AF in 1933-1940

- Failed to forge a force that could translate vision into reality
 - Envisioned both an independent and a supporting force
- Reliance on air power as a strategic deterrent was bankrupt/hollow
 - Had not invested its resources to make AF viable as either strategic deterrent (defensive) or effective offensive force
- Lacked joint coordination with other Services
 - Accepted supporting role vs. co-equal role for air power
 - Subservient, reactive, defensive
 - Dispersed vs massed
 - No unity of command in the air because it parceled out components to army commanders



French Air Ministers Guy la
Chambre and Pierre Cot,
Air Chief Joseph Vuillemin

***"...French air leaders allowed the army to force their service into a mold that, at best gave the air service only a tactical role. In their country's hour of greatest need, airmen chose to restrict their vision of the war to the cockpit. This loss of operational vision and the inability to present the unique aviation options to the supreme war council deprived France of one of its most potent weapons."
- Why Air Forces Fail, pp. 64-65***



Not Postured for a Long War: The French AF in 1933-1940

- Failed to look beyond the initial defensive battle to a stalemate to devise a war-winning strategy or doctrine
- Schools, training programs & personnel structures inadequate to meet needs of a modern AF
 - Did not train sufficient numbers of world-class aviators to fly the machines
 - Also failed to provide realistic combat training despite national maneuvers throughout '30s simulating a German invasion
 - France produced 358 planes in Jan '40
 - French AF only accepted 198 because all others were “unusable”
 - Improperly equipped
 - No one to fly them





Equipment Issues: The French AF in 1933-1940

- Ended WWI as arguably the world's preeminent air power
- Failed to recapitalize at the right time
- Made poor choices with the aircraft & equipment it purchased
 - French AF, aircraft design and building industries had all atrophied by '33
 - BCR series aircraft – still “modern” in '36 – were technologically obsolete by '40
 - Bomber, Combat, Reconnaissance – do it all
 - Amiot 143, MS-406, Potez 63 light bomber, Dewoitine D-520
 - Luftwaffe had 3:1 advantage in numbers of aircraft, with a huge technological lead
 - Especially in high-speed pursuit aircraft and bombers





Equipment Issues: The Polish AF in 1939

- Country had insufficient territory, manpower to counter its enemies (Germany, Russia)
 - Was not backed by a viable alliance system
- Cost & demands of a modern AF beyond the country's means
 - Went to war with early 1930s aircraft, few spares, insufficient logistics
 - Inadequate comms, radio navigation systems
 - Aircraft
 - Outdated equipment in fighter squadrons
 - PZL37 "LOS" bomber as good as any in class in '39
 - Tried to correct, but too late
 - Couldn't get Brits to give up Spitfires or Hurricanes
 - Didn't have money to buy US warplanes





Failed to Know the Enemy: The Luftwaffe in WWII

- Surprised England and France would declare war over attack on Poland
 - Expected quick wars against them
- German high command assumed Soviet Union would collapse and victory would be quick
 - No planning for winter combat
 - No planning to make air power infrastructure expeditionary
 - Move depot facilities forward from Germany
 - Improve transport capabilities to move enabling resources (POL, spare parts, etc.)
- Dismissed US (and its industrial potential) as potential threat

"My Luftwaffe is invincible...And so now we turn to England. How long will this one last – two, three weeks?" - Hermann Göring - June 1940





A Supporting Service: The Luftwaffe in WWII

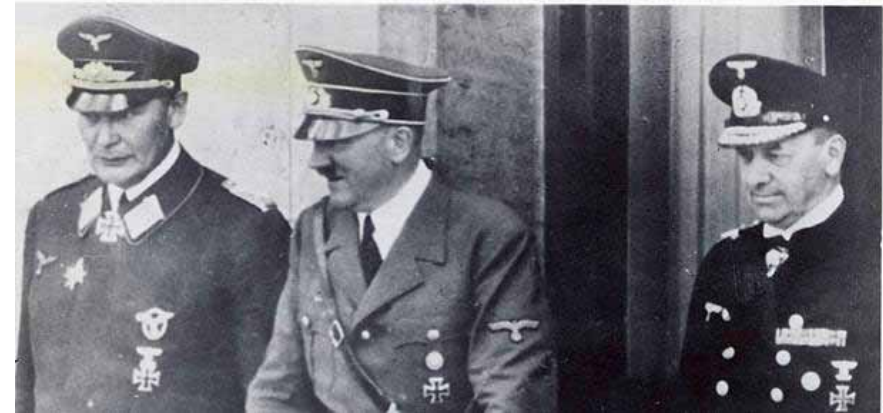
- **Leadership did not understand air power or the value of range and payload**
 - **Didn't understand value of strategic attack or air force's independent ability to deter, dissuade, defeat**
 - **Hitler, Air chiefs Göring & Jeschonnek**
- **Key decisions**
 - **Not to build a 4-engine bomber**
 - **Made Luftwaffe a Wehrmacht adjunct**
 - **Not able to bring air power's full weight to bear**
 - **Lost them the Battle of Britain**
 - **Required that all aircraft be capable of dive bombing**
 - **Delayed development, production of promising designs**
 - **Ju-88, Do 217, He 177**
 - **Not to develop/use fighter drop tanks**
 - **Short range precluded escorting bombers beyond London**





A Supporting Service: The Luftwaffe in WWII

- No naval air arm, bitter inter-service rivalry between Luftwaffe and Navy
 - Navy wanted to rebuild its air arm, wanted to be able to do fleet recon and attack enemy shipping
 - Göring insisted on one air force...his Luftwaffe
 - Promised but never delivered these capabilities
 - Adm Raeder never got the Ju-88s or He-111s he wanted and needed
 - Couldn't attack shipping effectively or work in conjunction with U-boats to destroy Allied shipping



Top: Göring, Hitler and Raeder
Bottom: He-111 crew marks a submarine kill





Not Postured for a Long War: The Luftwaffe in WWII

- **Luftwaffe initially well-rounded force with excellent equipment & combat experienced aircrews**
 - **First class aviation industry, modern industrial base**
 - **2nd largest economy in the world, and highly skilled workforce**
- **By 1942 it was nearly all gone**
 - **Halfway through war they were on a steady, irreversible decline**
- **No assistance to allied nations so they could build a better AF and contribute to Axis cause**
 - **Policies ensured allies remained militarily and technologically weak**
 - **Never took advantage of allies' resources, industrial capacity and military capability**
 - **Italy, Romania, Hungary and Finland**
 - **Göring denied them licenses until Nov '42**
 - **Couldn't buy high-performance German aircraft or engines**
 - **No financing to buy modern equipment**



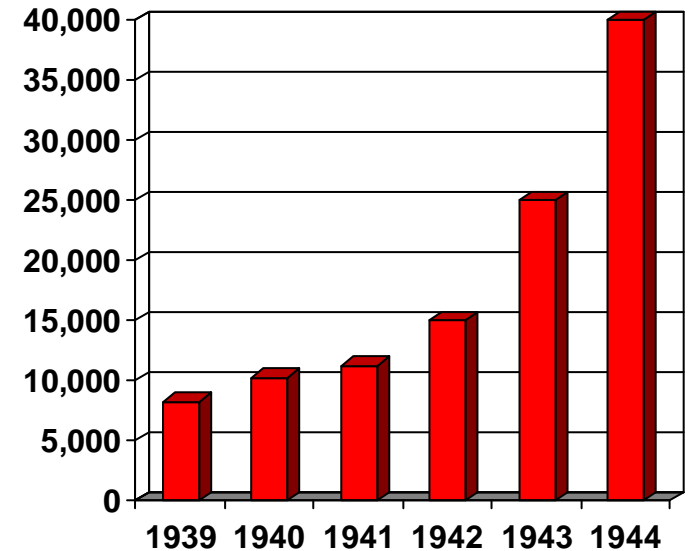


Not Postured for a Long War: The Luftwaffe in WWII

■ Didn't fully mobilize the German economy for war

- German aero designs & technology ahead of competition under Wilhelm Wimmer ('33-'36)
- Small factories and low per-worker productivity limited ability to translate good ideas into mass production
 - Significant parts of engine/heavy industry sectors lay almost idle 'til late in war
 - 1940: UK out-producing Germany
 - 1944: USA alone produced 96,000 aircraft
- Wimmer replaced by Ernst Udet, who mismanaged industrial production
 - Next-generation aircraft delayed in development/production or poorly designed
 - Would not kill bad programs
- Lufthansa's Ehrhard Milch replaced Udet too late
 - Allies out-produced Germans by 4:1 at height of war

German Aircraft Production



Wimmer, Udet and Milch



Not Postured for a Long War: The Luftwaffe in WWII

- **Didn't sufficiently expand training pipelines**
 - Only expanded training programs a fraction in 1940-'41
 - Stripped training schools with each new campaign
 - Dropped training standards (vs. Allies, who increased theirs)
 - 1940-'41
 - Luftwaffe pilots entered operational units with 250 total flying hrs, 100 hrs in their combat aircraft
 - RAF pilots had 200 total hrs, 60-75 in their combat aircraft
 - 1944
 - Luftwaffe pilots thrown into battle with 100 total hrs, little if any in combat aircraft
 - USAAF: 325-400 total hrs, 125-200 hrs in operational aircraft
- **Inexperienced aircrews lost at higher rates than experienced**
 - Shot down, unable to deal with bad WX, engine trouble, bad airfields
 - 1944 lost more planes/men to accidents than combat
- **Inexperienced pilots unable to exploit superior technology (e.g., Me 262)**





Equipment Issues: The Luftwaffe in WWII

- **Aircraft built for continental warfare**
 - Most aircraft had limited range (100-200NM), loiter time
 - Acceptable for combat in Poland, Norway, the Low Countries and France
 - Not for Britain, Soviet Union or Africa
- **Logistics system required depot maintenance for almost all repairs/rebuilds**
 - Short range aircraft with high sortie/UTE rates
 - Pushed fuel and bombs to the front
 - Intended to do repairs at depots...damaged aircraft out of combat for long durations
 - MR rates ~50-60% vs RAF & USAAF at ~70-80%
 - Forced to abandon planes...accounted for ~1/3 of Luftwaffe aircraft losses in '43-'44





Failed to Know the Enemy: ***The RAF in Norway, France, Greece, Malaya in WWII***

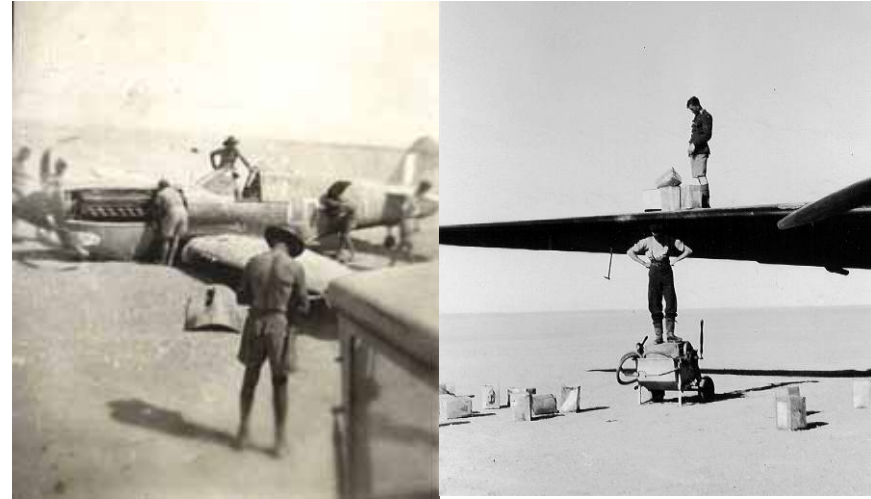
- Assumed they knew the enemy's intent/COAs, but didn't
 - “Mirror imaged” Luftwaffe would have same purpose as RAF
 - Did not prepare for Luftwaffe to be the tactical AF it was
 - Designed to assist a continental army win land battles
- Racism
 - Didn't see opponents as equals or better





Doctrine Problems & Not a Joint Team: The RAF in Norway, France, Greece, Malaya in WWII

- **“Doctrine of hope” vs. capabilities/technology-based doctrine**
 - Spent little to no money on intel
 - Lacked:
 - Language skills, cultural understanding
 - Ability to think like a potential opponent
- **Failed to understand infrastructure requirements of deployed Sqdns**
- **Bomber forces incapable of ground support**
 - Untrained in tactics, ineffectively armed for that purpose, defensively weak
 - Trenchard insisted on decisiveness of aerial/strategic bombing
 - AF cooperation with Army a “poor relation” compared to RAF Bomber and Fighter Commands



Above: Deployed RAF operations
Below: Sir Hugh Trenchard





Equipment Issues:

The RAF in Norway, France, Greece, Malaya in WWII

- **Equipment quantitatively & qualitatively inferior to Luftwaffe at war's start**
- **Hoarded best equipment in the UK (Spitfires)**
 - **Ten Year Rule (introduced in 1919) meant a late start to rearmament**
 - **No time to catch up**
- **Obsolete aircraft**
 - **Gloster Gladiator bi-plane "fighters"**
 - **Lysander attack aircraft, designed for coordination with Army**
 - **Blenheim I and Wellington bombers**
 - **Limited range and payload**





Failed to Know the Enemy: The Imperial Japanese AFs in WWII

- Gambled on their ability to win a short war thanks to superior quality of forces
 - Higher performance aircraft
 - Better-trained, combat-experienced aircrews
- Unrealistic long-term expectations fed by initial combat successes
 - Did not expect, could not match U.S. aviation industry's faster development cycles
 - Relied on West for technology, designs thru mid-1930s
 - Apparent “self-sufficiency” in late ‘30s actually depended on imported technology, components and subsystems
 - Failed to design, manufacture and field world-class equipment to keep pace with U.S.
 - Japan: No follow on to Zero
 - U.S.: P-38 and P-40 gave way to P-51s



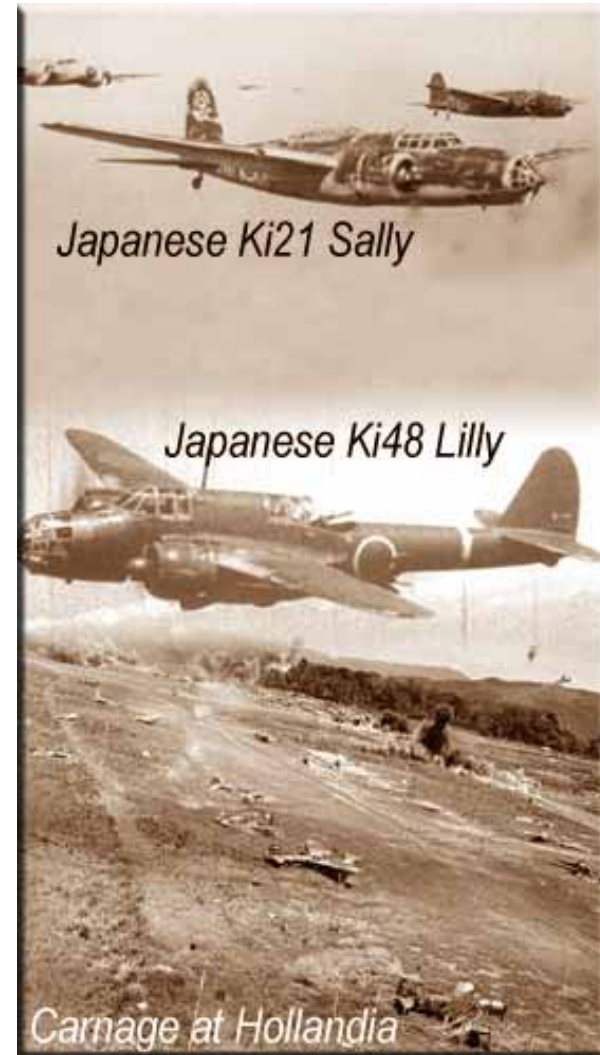
Saburo Sakai, Imperial Japanese Navy Pilot





Supporting Services: *The Imperial Japanese AFs in WWII*

- **Lacked cooperation between Army and Navy**
 - Competed over scarce resources
 - Waste & inefficiency in duplicating effort
 - Affected strategies, weaponry, personnel and training
 - No standardization or uniformity, different:
 - Airplane engines, weapons, radio equipment and voltages, spare parts, and fuel grades
- **Army Aviation**
 - Trained, equipped for limited tactical ground war vs. USSR
 - Short range aircraft, pilots not trained to navigate long distance over water
 - No way to deploy assets to invasion beachheads following a landing
 - No way to project air power over Pacific
 - No one with bombardment expertise or force of personality like Mitchell
 - Never had a flying prototype 4-engine bomber
 - Proposed independent air arm, rejected by Navy
 - Entered war with doctrinal objective to be indirect support of ground forces





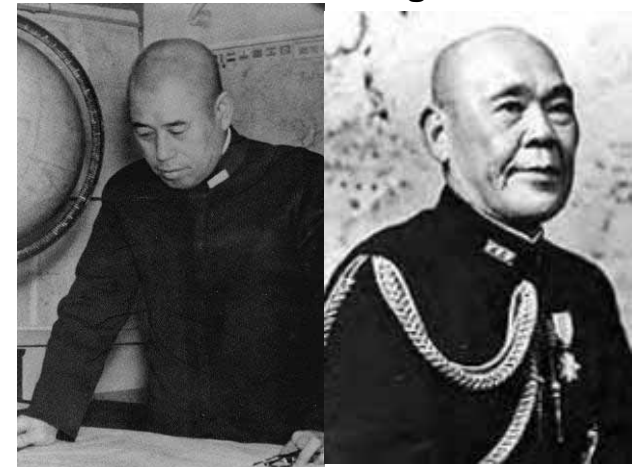
Supporting Services: The Imperial Japanese AFs in WWII

■ Naval Aviation

- U.S. main potential enemy, Pacific Ocean the expected battleground
- More appreciation for air power & technology
 - More “air-minded” senior officers
 - Its 10 aircraft carriers on eve of Pearl Harbor was more than any other navy
 - World’s first navy to operate carriers *en masse*
 - Ushered in dominance of carriers at sea
- Fulfilled nation’s “strategic bombing capability” with its carrier-based aircraft
- Thought & decisions dominated by surface warfare officers
 - Fleet structure focused on battleships until July 1942
 - Formation of carrier-centered Third Fleet
 - Adm Nagano’s General Staff initially opposed carrier-centric Pearl Harbor strike proposed by Adm Yamamoto



Above: Japanese B5N Kate
Below: Admirals Isoroku Yamamoto
and Osami Nagano





Not Postured for a Long War: The Imperial Japanese AFs in WWII

- Failed to fully mobilize national/natural resources
 - Not prepared for war's duration, violence or sophistication
- Imbalance in aircraft, aircrews, maintenance capabilities, logistics and infrastructure
 - Over-emphasized battle in a contest that required enormous logistics and support operations
 - Vast distances required transport
 - Yet targeted warships vs transports
 - Pulled combat pilots to fly replacement aircraft to the "front" because they lacked ferry crews
 - Manual labor took 1-month or more to construct jungle airstrips
 - Allies used mechanized equipment to build them in days with fewer men
 - Restricted their ability to project air power
 - Under-developed airfields easy targets for Allied air power...Wewak, Hollandia (at right)





Equipment Issues: The Imperial Japanese AFs in WWII

- **Technically, industrially, numerically inferior to US**
 - **Lacked:**
 - Radar for early warning
 - Good short wave radios in aircraft
 - Self-sealing fuel tanks
 - Armored airplanes to protect pilots, critical systems and subsystems
 - Powerful engines like those in US aircraft
 - **Zero/Zeke superior aircraft at war's start, but quickly obsolete**
 - No new designs introduced 'til too late to make a difference





Failed to Know the Enemy: The US in the Pacific, 1941-1942

- **Failures of:**
 - **US intelligence analysis and aerial reconnaissance**
 - **Radar (including ineffective CONOPs)**
 - **C² – Poor command relationships & arrangements**
 - **Code breakers in P.I./HI sent all intel to Wash Navy Yard vs. organic leadership**
 - **Army responsible for defending Navy at Pearl Harbor**
- **Mindset, anti-Japanese racism led to underestimating enemy**
 - **Believed Japanese “incapable of such a complicated, long-distance operation”**
 - **Feared sabotage much more...aircraft parked wingtip to wingtip**
- **Gave Japanese element of surprise, increased destructiveness of their attacks**





Equipment Issues: The US in the Pacific, 1941-1942

- No budget for military buildup in Pacific ... a “neglected theater”
 - Defense took backseat to regenerating the national and world economies
- Equipment Issues:
 - Obsolete aircraft
 - B-18s only beginning to replace B-10s
 - P-26A until eve of war, P-35As, P-39s
 - Inadequate numbers of pilots/aircrew
 - Insufficient training
 - Inadequate quality and quantity airfields
 - Obsolete defense weapons (AAA)
 - Lacked modern EW system (radar)
- Out-numbered, out-trained, had no combat experience
 - Not battle ready, in contrast to Japanese

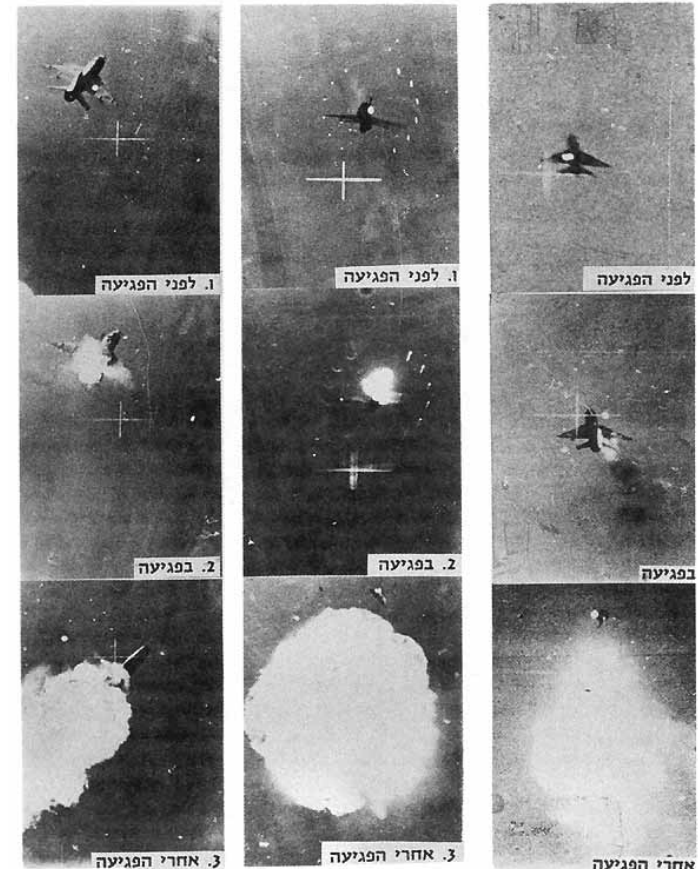
Nothing would please me better than if they would give me three months and then attack here. - General Douglas MacArthur, Supreme Allied Commander of South-West Pacific, Speaking of the Philippines on the 5th of December 1940





Equipment Issues: Arab AFs Against the Israelis

- Arab countries with Soviet equipment and training pitted against Western technology and training
 - Consistently lost vs. better-trained, more flexible, more centrally-controlled opponents
 - Welded wing formations and close GCI control vs. fluid pairs and GCI tactical control
 - Didn't invest enough money for aircraft, technology, training
 - Insufficient national industrial bases
 - Insufficiently trained indigenous populace
 - Scientists, engineers, and NCOs





Not Part of a Joint Team: The Argentine AF in the Falklands

- **Lacked aircraft/aircrews capable of long-range strikes**
 - Designed for short-range ground support missions
- **Lacked effective joint coordination**
 - Army and Navy kept AF out of planning for Malvinas Operation until last minute
 - Then assigned AF the main burden of defending the Falklands
 - Pre-war, AF not allowed to practice over water missions
 - AF planes lacked navigation equipment, radar
 - AF didn't have or understand correct fuzing for anti-ship munitions (60% dud rate in combat)
- **Made poor tactical decisions**
 - Attacked warships (which can defend themselves and don't carry many troops) rather than landing and cargo aircraft
 - Attacked piecemeal rather than in large attack formations (mass)





Equipment Issues: The Argentine AF in the Falklands

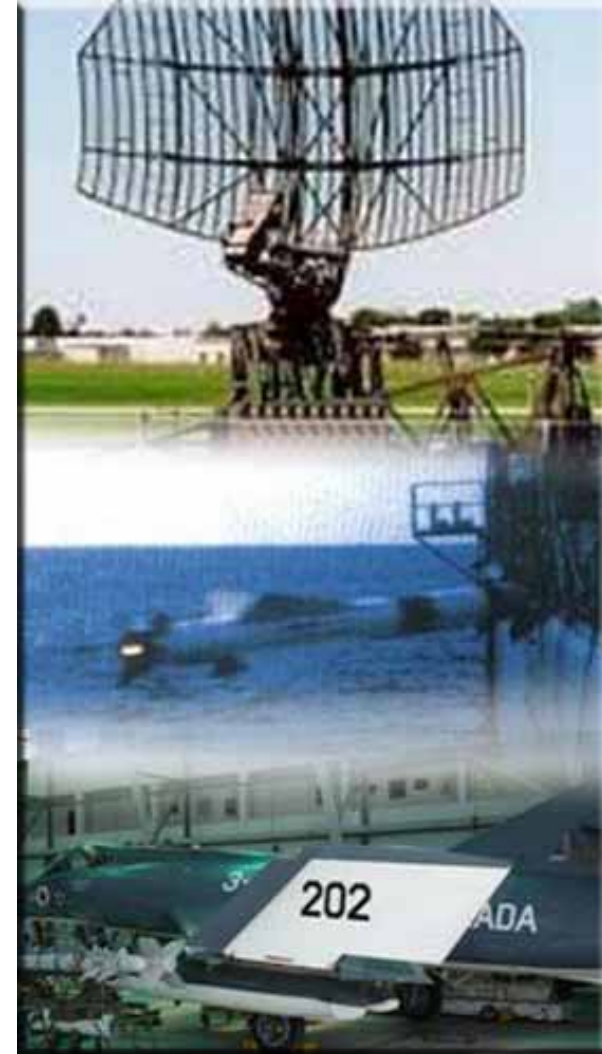
- **Air Force arsenal included more than 200 planes**
 - 9 British-made Canberra bombers
 - 19 Mirage III/EA fighters
 - 26 Israeli-made Dagger fighter-bombers (akin to Kfir, Mirage V)
 - ~68 A-4 Skyhawks
 - 45 Pucara
 - Remainder were trainers, transports, helos
- **Limits included:**
 - Only Canberra had range to fly to Falklands & back
 - Most vulnerable to British attacks
 - Mirages/Daggers could only reach islands w/o going supersonic
 - AAR not possible
 - A-4s could AAR and reach the islands, but not carrying a full bomb load
 - Even then had limited loiter time
 - Falklands had 3 runways, longest was too short for jet aircraft – could not forward deploy to islands





Equipment Issues: The Argentine AF in the Falklands

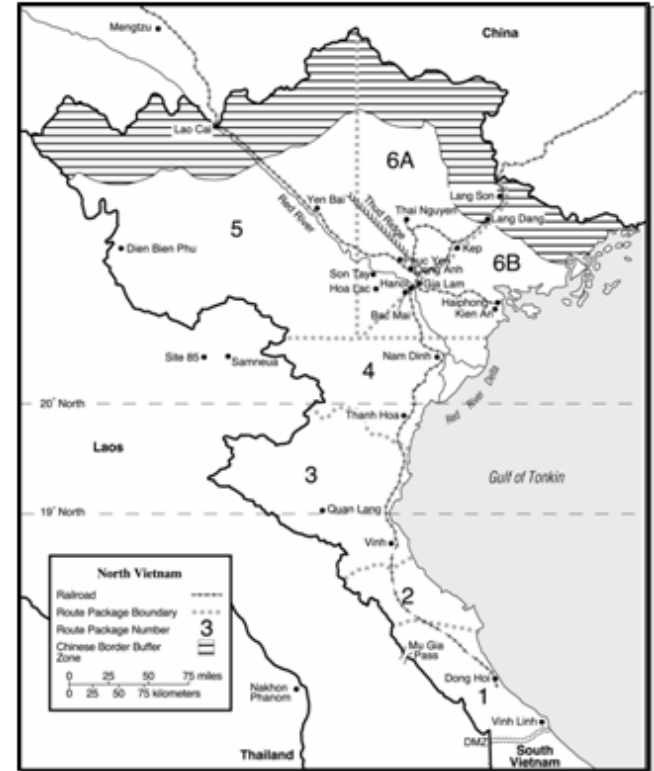
- **Westinghouse AN/TPS-43 F radar at Port Stanley was critical**
 - Never backed up with a second radar
 - Radar shadowing due to improper positioning allowed Brits in to islands undetected
- **Missiles**
 - Argentine Navy had good quantities of ship-to-ship Exocet missiles
 - AF had no ASM variants and Navy had only 5 for use with Super Etendards





Failed to Know the Enemy: The USAF in Southeast Asia

- Failed to understand *nature of war* in Vietnam
 - North Vietnamese and Viet Cong saw S. Vietnam as part of one country
 - Fight was for national cohesion
 - Did not expect them to fight a long war
 - Hanoi openly indicated it was prepared to do just that
- Failed to understand *war-fighting requirements* prior to Vietnam
 - Failed to develop and institute appropriate acquisition and training strategies
 - Failed to anticipate doctrine, tactics and equipment required for fight in SEA





Failed to Know the Enemy: The USAF in Southeast Asia

- Failed to match ways and means with political & military objectives
 - JCS' target list (94, then 242) consistent w/ enemy fighting conventional war, consistent with pre-World War II "industrial web theory"
 - Emphasized transpo-related targets, POL, airfields, military training facilities & power plants
 - N. Vietnam's "modern industrial sector" accounted for just 12% of country's \$1.6B GNP in 1965
 - Not an important source of war matériel
- Interdiction efforts ineffective
 - Might have been effective if North Vietnam had relied on armor, artillery and large-scale troop movements
 - Did not until at least after the 1968 Tet Offensive (or more conservatively after the NVA's 1972 attacks)
 - Despite 200,000 NVA/Viet Cong troops in the field '65-'68, warfighting supplies never exceeded 380 tons/day
 - North had to ship just 15-34 tons/day to the southern insurgents...10 oz. of provisions per day per person





Deconfliction vs Interdependence: The USAF in Southeast Asia

- Deconfliction vs integration or interdependence
 - Divided AOR with route pack system
- No single air component commander
 - 7AF, 13AF, SAC, Washington all had elements of control
 - Army, Navy, USMC each maintained tasking, control authority over their own aircraft
 - Violated Centralized Control
 - Inefficient use of air resources

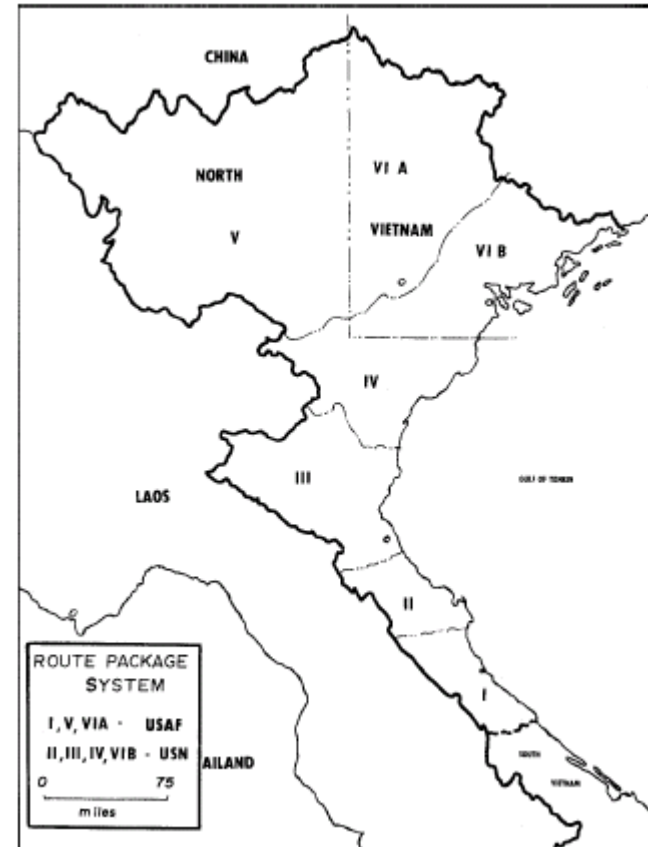


“Strategic air attack is wasted if it is dissipated piecemeal in sporadic attacks between which enemy has an opportunity to readjust defenses or recuperate.”
-General H. H. “Hap” Arnold



Not Postured for a Long War: The USAF in Southeast Asia

- **Never expected the long war that Hanoi did**
 - Didn't wage air war to quickly end conflict
 - Did not quickly adjust training to ready increasing number of pilots for war
 - “Universally assignable” pilots...any UPT graduate can fly any USAF aircraft
 - No pilot required to do a 2nd Vietnam tour until all pilots had done 1st
 - Tremendous decreases in experience, combat capability from 1965 to 1972
 - 1965: average pilot had 1000 hrs UE
 - 1972: average pilot had 250 hrs UE
 - 1966: pilots lost to enemy action at 0.25 aircraft per month
 - 1968: 4.5 per month
 - USN did not follow those policies, rotated pilots regularly through Vietnam, maintained steady loss rate
- **Fluctuating goals, no single, coherent strategy for long term victory**
 - ROLLING THUNDER's three phases ('65-'68)
 - “In between years”
 - LINEBACKER I and II (1972)





Not Postured for a Long War: ***ROLLING THUNDER (24 Feb '65 – 31 Oct '68)***

- **A classic study in how *not* to use air power**
 - USAF aircraft, munitions and training were unable to effectively achieve US National Military Strategy of “flexible response”
 - National, military & USAF leadership failed to match means and ways with ends
- **Incoherent strategy over three phases**
 - Overall positive objective: secure a safe and free South Vietnam
 - Conventional/nuclear-focused USAF vs N. Vietnamese/Viet Cong guerrillas
 - Could not have shut down NVA & Viet Cong’s extremely low re-supply needs
 - Unable to engage because not properly equipped (see next slide)
 - Overall negative objective: limit war, avoid direct intervention/confrontation by PRC & USSR
 - Pres Johnson personally controlled/restricted target lists (vs. relying on expert advice)
 - LBJ ordered limited bombing effort with gradual rate of increase
- **Phases req’d changes to target sets, aircraft types, munitions and tactics**
 - Coerce N. Vietnam by threats to impose increasing penalties on the population, limit bombing to North’s industrial economy
 - Raise current costs to N. Vietnam, wreck its political & social fabric by destroying industrial war potential (94 economic / military targets...increased to 242)
 - Exploit military vulnerabilities, interdict war matériel and isolate Viet Cong in the south, denying Hanoi a battlefield victory



Equipment Issues: The USAF in Southeast Asia

- **Equipment emphasis remained on nuclear fight**
 - **Fighters attacked targets in areas with heavy SAM/AAA protection without EW protection**
 - **Lacked RWRs and radar jammers**
 - **Fighters expected to engage BVR against non-maneuvering targets**
 - **Unsuitable weapons for actual fight**
 - **No internal gun on many fighters**
 - **Poor WVR missile (early AIM-9)**
 - **Heavy airplanes built for speed vs maneuverability**
 - **Fighters lacked good pilot visibility**
 - **Pilots had never shot at aerial targets, had limited if any BFM experience**
- **Conventional / nuke forces vs. guerrillas**
 - **Lacked precision engagement capability**
 - **Poor sensors (on aircraft, on ground)**
 - **Struggled to locate, target, track, and accurately strike supply columns and vehicles**

