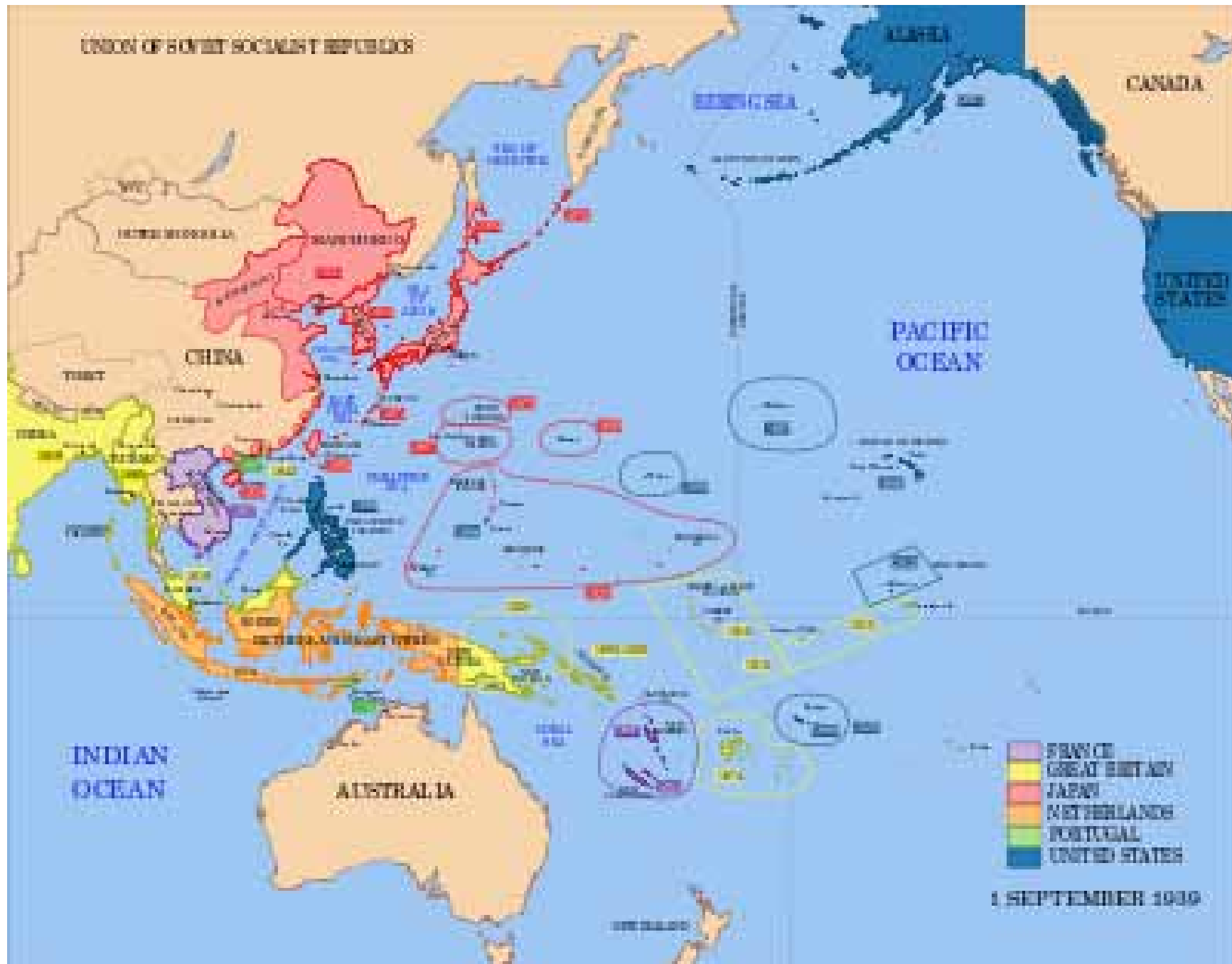


Pacific Campaign



Air War in the Pacific and Timeline

- **Pearl Harbor (December 7, 1941)**
- **Doolittle raid (April 1942)**
- **Battle of Midway (June 1942)**
- **Two prong air war: Island Hopping -MacArthur[Southwest Pacific] & Nimitz [Central/North Pacific] (1942-1945)**
- **China-Burma-India and flying the Hump supplying China (1942-1945)**
- **The Solomon Islands as a linchpin in Australian supply line defense (1942-1944)**
- **Strategic bombardment of Japan (March-August 1945)**
- **Atomic Bomb attack on Japan (August 1945)**

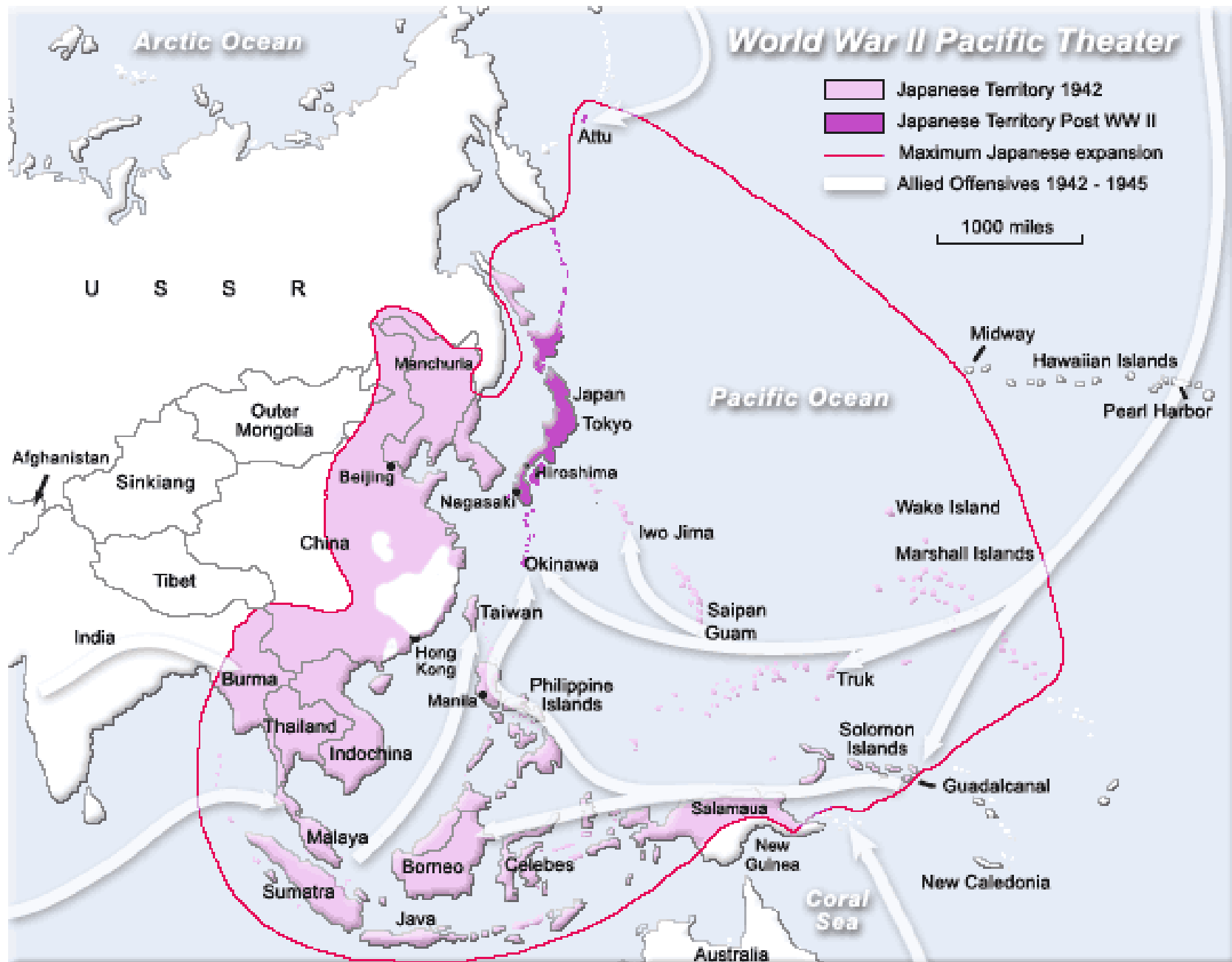


Pacific National Status in September 1939



Japanese attacks in 1941 and 1942





US, Australian, Dutch and British Counter Attacks



Russian and Japanese Neutrality

- There was a series of short “undeclared” skirmishes on the Manchurian/Siberian border in August-September 1939. The Russians were very successful.
- It served the mutual interests of Russia and Japan to remain neutral [1941 treaty].
 - Hitler continually pressed the Japanese to open a second Russian Front
 - US and Britain tried to convince the Russians to put pressure on the Japanese in Manchuria and Korea, using lend-lease as the carrot and the stick, didn't work
 - With Russia neutral the Japanese went south to Dutch colonies for resources
 - The Russian embassy in Tokyo was a back-channel to the Japanese Government

US WW II Naval Air War

- **Naval aviation was predominantly in the Pacific**
 - **Conducted by carrier Task Forces**
 - **In December 1941 the US had 5 Carriers in the Pacific**
 - **After initial combat in 1942 the US was down to two carriers**
 - **Fortunately, US started building new carriers in 1940**
 - **By the end of the war the Navy had over 90 carriers, mostly in the Pacific**
- **Extensive sea-lane patrols and Atlantic convoy protection**
 - **Blimps and long range patrol aircraft**

US WW II Air War

- **Pacific Theater**

- Initially predominantly Naval Aviation, island hopping and attacking the Japanese fleet at sea.
- Army aviation was Tactical air warfare, logistics and ground support in the Southern Pacific areas.
- The CBI area concentrated on ground support and logistics. RAF units flew in India/Burma front.
- Late 1944 and 1945 long rang strategic bombing by the B-29 force and shore line US naval aviation attacks hit the Japanese home Islands.

Turn of Turn of the Tide and the Battle of Midway

Here a Japanese carrier, the *Hiryu*, burns
before sinking.



Ensign George Gay, Sole Survivor

Ensign George H. Gay at Pearl Harbor Naval Hospital
reads an account of the Battle of Midway in the
Honolulu Star-Bulletin. He was the only survivor of
Torpedo Squadron Eight (VT-8) attacks on the
Japanese carrier force at Midway on June 4, 1942.



Admiral Chester W. Nimitz

Admiral Nimitz's brilliant and instinctive gambles resulted in victory at the crucial Battle of Midway.



As overall commander in the central and north Pacific, he led the island-hopping amphibious drive, in which the Navy and Marines took Guadalcanal, Tarawa, Kwajalein, Eniwetok, Saipan, Tinian, Guam, Pelelui, Iwo Jima, and Okinawa; each a step closer to Japan.

In December 1944 Nimitz was promoted to the grade of fleet admiral (5-stars, as seen in the photo).

Tactical Aviation



GOALS of Tactical Aviation

- **Gain and Maintain Air Superiority**
- **Isolate the Battle Space**
- **Provide Close Support to Fielded Forces**
- **Move Flexibly and Rapidly between these missions**

Navy, Marine and Army Aircraft

- **The Navy and Marines used a variety of aircraft to support amphibious landing operations in the Pacific.**
- **As the island-hopping campaigns advanced, Army Air Forces' heavy and medium bombers aided both the Army and Navy through interdiction of enemy supplies and direct air support to landing forces.**

Lockheed P-38 Lightning and the Demise of Admiral Yamamoto



The Demise of Admiral Yamamoto

- Naval Intelligence learned that Admiral Yamamoto would be flying to Bougainville in the Solomon Islands.
- On April 18, 1943, fourteen Australian based P-38 from 347th Fighter Group, intercepted Yamamoto.
- The Lightning pilots downed both bombers, but lost one of their own fighters in the mission.
- There was concern that the attack on Yamamoto would tip off the Japanese that their codes had been broken, but the target was too tempting.
- It was hoped that the two aircraft could be destroyed without sending a warning. That was not to be; but the codes remained unchanged.

PBY Catalina

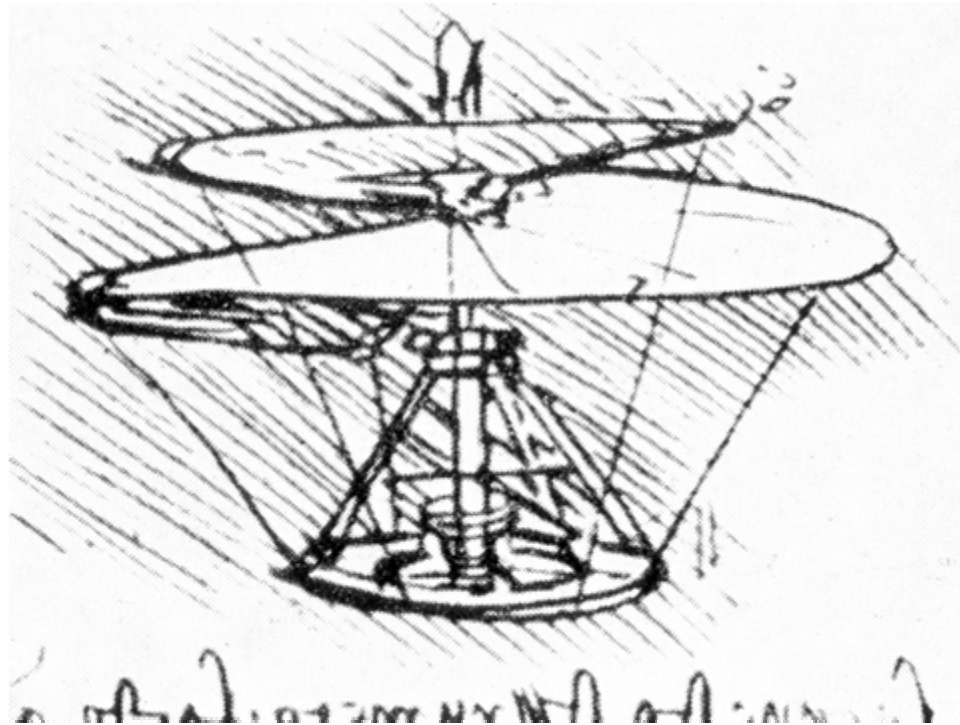


PBY Catalina

The Consolidated PBY Catalina was the U. S. Navy's most successful patrol flying boat of the war but naval aviators also used the PBY to attack ships at night, and to search for and rescue people stranded at sea.

Extensively used anti-submarine warfare and convoy protection

**400 Years Earlier in Italy, a painter,
inventor and tinkerer was thinking
outside the box**



Along Comes This Russian Immigrant With a Strong Work Ethic. Result: Sikorsky R-4

First Production Helicopter and First Used in Combat



R-4 with Dr. Sikorsky

A two-place helicopter with a single, three-bladed main rotor, a tail rotor and powered by a radial engine.

Delivered in **1945**, the R-4 was the world's first large-scale mass-produced helicopter and the first helicopter to enter combat service with the United States Army Air Forces in the **Philippines**.

It was also delivered to and used by the Navy and Coast Guard, plus the United Kingdom's Royal Air Force and Royal Navy.

Canvas covering an aluminum tubing frame

Air Transport: Douglas C-47 and C-54

**Both aircraft started as civilian airliners:
The DC-3 to the C-47 and the DC-4 to the C-54.
After the war they returned to civilian roles
for decades to follow.**

**Over 13,000 C-47 were build and used in
multiple roles. Note the invasion stripes**



**Over 1300 C-54 were built beginning in 1942.
It had 50 passenger trans-Atlantic capacity.**



Flying the Hump - Supplying the Chinese



The Low Hump route over the southern end of the range was less perilous, but Japanese fighters forced most missions over the main Hump—including the 15,000-foot-high Sansung range between the Salween and Mekong rivers.

Flying the Hump - 1

UNITED STATES ARMY AIR FORCES (USAAF) CHINA-BURMA-INDIA (CBI) THEATER OF OPERATIONS

- **The Japanese cut the 1100 mile supply road from India to China**
- **The only option was ‘The Hump’ a high altitude military aerial supply route over the Assam Valley in northeastern India, across northern Burma, to Yunnan province in southwestern China. April 1942 to September 1945.**
- **It was a start-from-scratch operation. There was no precedent for it.**
- **This operation was the first sustained, long range, 24 hour around the clock, all weather, military aerial supply line in history.**
- **The Hump route was an unlikely route for regular flight operations due to high terrain and extremely severe weather. It crossed a north-south extension of the main Himalayan Mountains that ran south through northern Burma and western China. On the very north end of the extension terrain exceeded 20,000 Mean Sea Level in height.**
- **Average elevations lowered to the south but did not fall below 12,000 Mean Sea Level for approximately 140 miles. The routes flown fell between these two extremes.**

Flying the Hump -2

- **It was at the end of every supply line.**
- **Inadequate aircraft. The fleet was kept running by cannibalizing disabled aircraft and by sending salvage crews to near by crash sites for what ever could be scrounged.**
- **Miserable weather, no NAV-aids, inadequate maps, mountains and jungle below.**
- **A critical problem proved to be finding a cargo aircraft capable of carrying heavy payloads at the high altitudes required, and four types were eventually used in the airlift: C-47 and variants, C-46, C-87/C-109 (modified B-24s) and C-54. Each had a problem!**

Flying the Hump -3

Total logged flight time in the airlift was 1.5 million hours.

The Hump ferrying operation was the largest and most extended strategic air bridge (in volume of cargo airlifted) in aviation history until exceeded in 1949 by the [Berlin airlift](#). an operation also commanded by Gen. William H. Tunner.

Tunner, writing in *Over the Hump*, described the significance of the Hump Airlift:

"Once the airlift got underway, every drop of fuel, every weapon, and every round of ammunition, and 100 percent of such diverse supplies as carbon Paper and C rations, **every such item used by American forces in China was flown in by airlift.**

Never in the history of transportation had any community been supplied such a large proportion of its needs by air, even in the heart of civilization over friendly terrain...After the Hump, those of us who had developed an *expertise* in air transportation knew that we could fly anything anywhere anytime."

Post WW II Airlift Operations

- **Berlin Airlift**
- **Korea**
- **Vietnam – routine 12,000 mile cargo, casualty and passenger runs**
- **October 1973 airlift to Israel**
- **Gulf I, burnt out the C-141 fleet**
- **Gulf II**
- **Afghanistan with major cargo hubs in Uzbekistan and Tajikistan**
- **Then there is FedEx, UPS, DHL and a host of wide bodied jet cargo capacity. Plus hundreds of local short haul air carriers like Buffalo Airways at Yellowknife in the Canadian NWT.**

Prominent Japanese Aircraft



Mitsubishi A6M Reisen -Zero

It achieve a speed of 310mph. originally designated to fulfill a Japanese Navy requirement but it eventually went on to become a legend in its own self, **appearing in every major naval battle in the Pacific**. It actually dominated the sky for years until Allied aircraft design, and tactics over powered it.

10,929 built



Nakajima Ki-84 Frank

Featuring excellent performance and high maneuverability, the Ki-84 was considered to be the best Japanese fighter to see large scale operations during World War II. It was able to match any Allied fighter, and to **intercept t the high-flying B-29 Superfortresses**. Franks proved to be fearsome opponents.

3,514 built.

Japanese Kamikaze Campaign-1

- **By the end of 1944 the Japanese realized that they were on the verge of defending the Home Islands.**
- **By then, they had lost thousands of aircraft and their most skilled aviators.**
- **By the US invasion of the Philippines, Feb 1945, the result of the numbers of US aircraft and shipboard anti-aircraft fire made many Japanese attacks a one way trip.**
- **The Japanese intentionally changes tactics to suicide attacks. Naval aircraft attacked carriers and Army aircraft attacked troop transport ships.**

Japanese Kamikaze Campaign-2

- **There was limited success in the Philippines, but the Japanese had too few aircraft.**
- **Iwo Jima was too far from the Home Islands.**
- **Okinawa was part of the Home Islands and the Japanese sent thousands of Kamikaze against US the Invasion fleet.**
- **The US Navy suffered its greatest WW II loses at Okinawa.**
- **The Japanese were down to using trainer aircraft with pilots with 30-50 flying hours, just enough to fly to a target.**
- **Fortunately the Atomic bomb removed the need for an invasion, as the Japanese had thousands of Kamikazes in reserve.**

Final Attack on the Home Islands

The B-29 Campaign and Carrier Attacks



Kobe, Japan after fire bombing raid



Japanese Good Luck Flag



Generals LeMay & Hansell

Pacific Strategic Bombardment

- Strategic bombing--attacks against the mainland industrial base of Japan--during the early years of the Pacific war was beyond the range of US bombers and carriers.
- A few raids on far northern Japan from the Aleutian Islands.
- The first bombing mission against the Japanese main islands since the Doolittle Raid in 1942 was launched from Chinese airfields in January 1945, with poor results. [Seven B-29 supply runs from India required for one combat run].
- **Turning point!** The capture of Guam, Saipan and Tinian (provides one way to Japan) in the Marianas Islands and further north on the fringe of the Japanese Home Islands provided usable B-29 airbases closer to Japan.



Atomic Bomb Flight Routes from Tinian to Japanese Home Islands

There is discussion that Iwo Jima was invaded to provide an emergency landing field for B-29s carrying both conventional and the A-Bombs.

B-29 engines were unreliable.
2,200 emergency landings were made [10 crew per aircraft x 2,200]
and the US only had two A bombs.
Cost: 6,000 dead and 12,000 wounded Marines

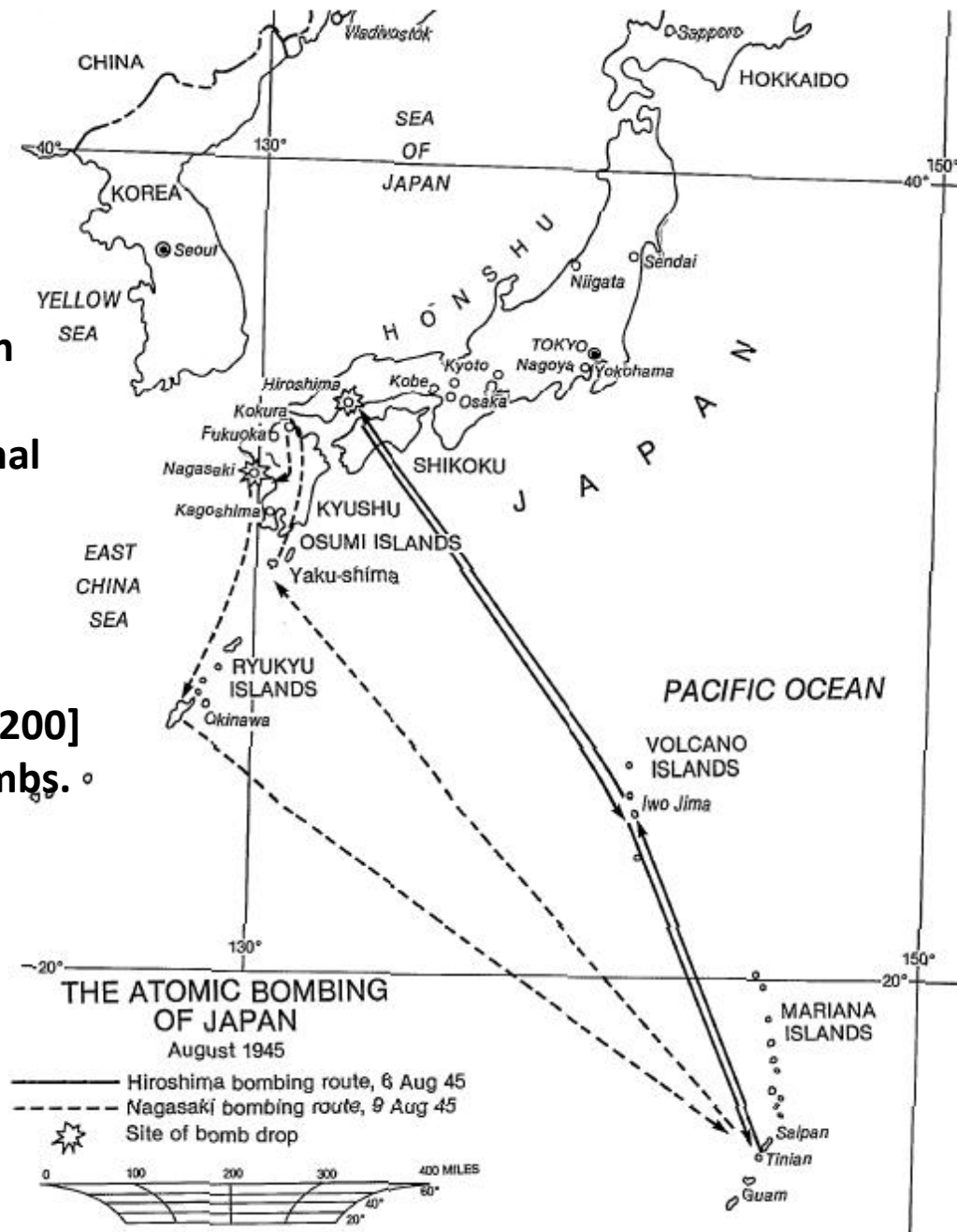
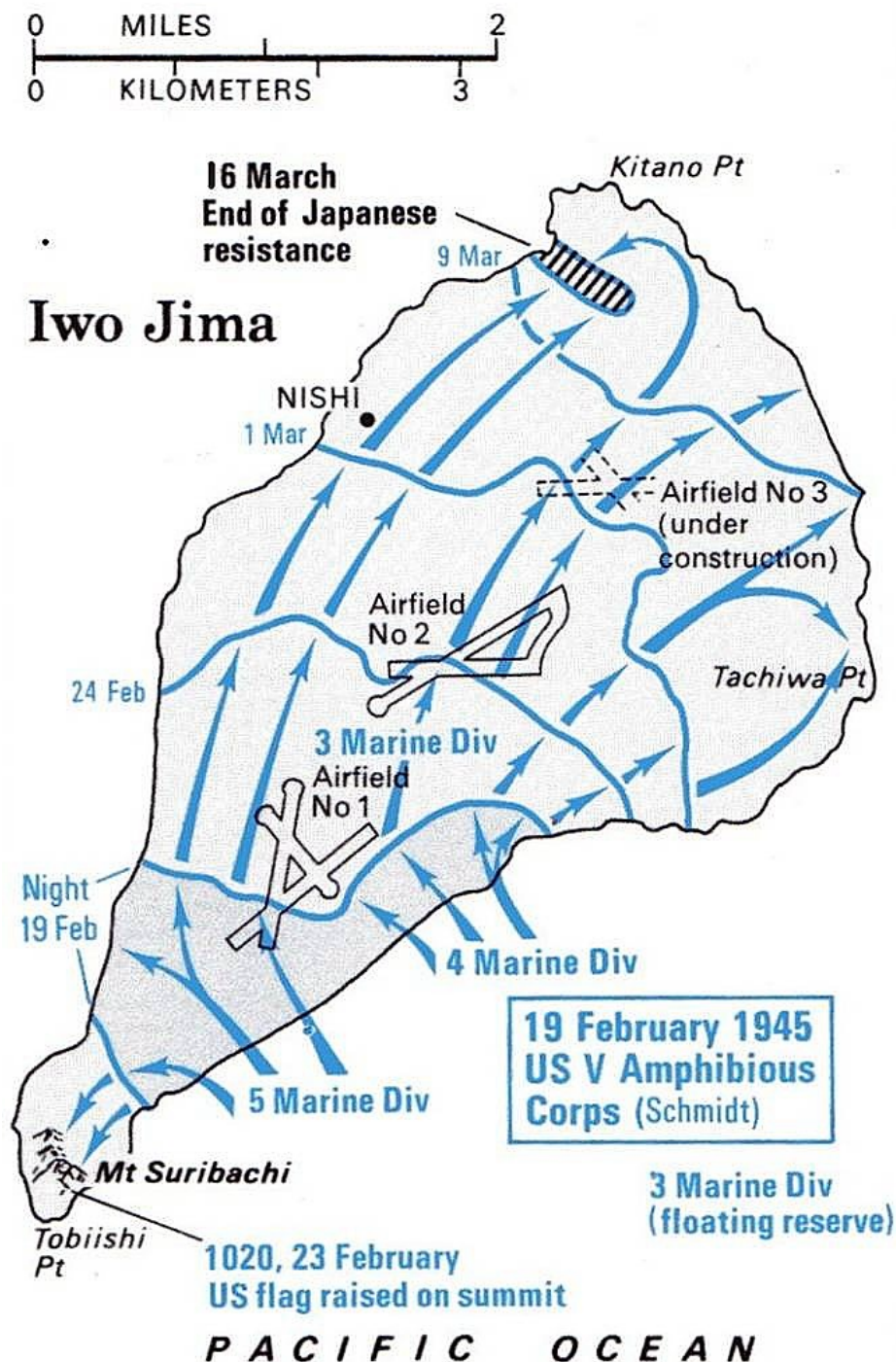


Photo # NH 104139 Southern part of Iwo Jima, during a raid by Navy carrier planes



Mount Suribachi



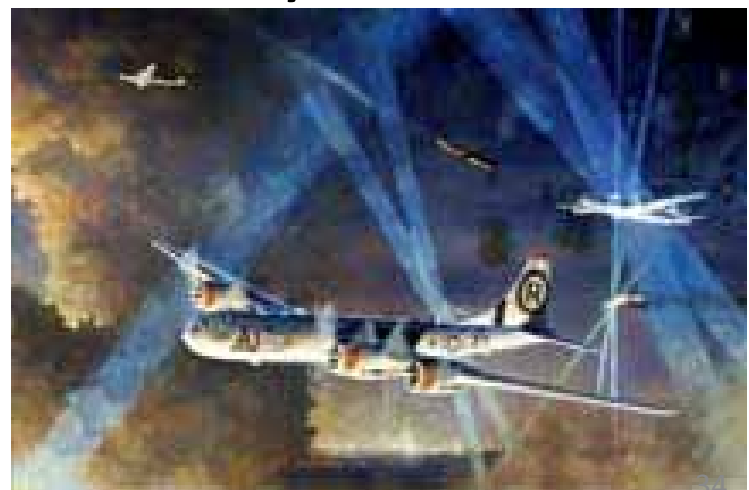
Iwo Jima

- Mid way to Japan
- USMC 19 Feb-16 Mar 45
 - 6891 killed; 18,070 wounded
 - Neutralized fighter airfields and RADAR site
 - 21,000+ Jap. Troops KIA
 - New bases for US P-51s (ops start 11 Mar)
- Emergency field for crippled B-29s
 - First B-29 emergency landing, 4 Mar 45
 - Eventually, 2251 aircraft landed there
 - Saved 10-20,000 airmen?



The Effects of Fire Bombing

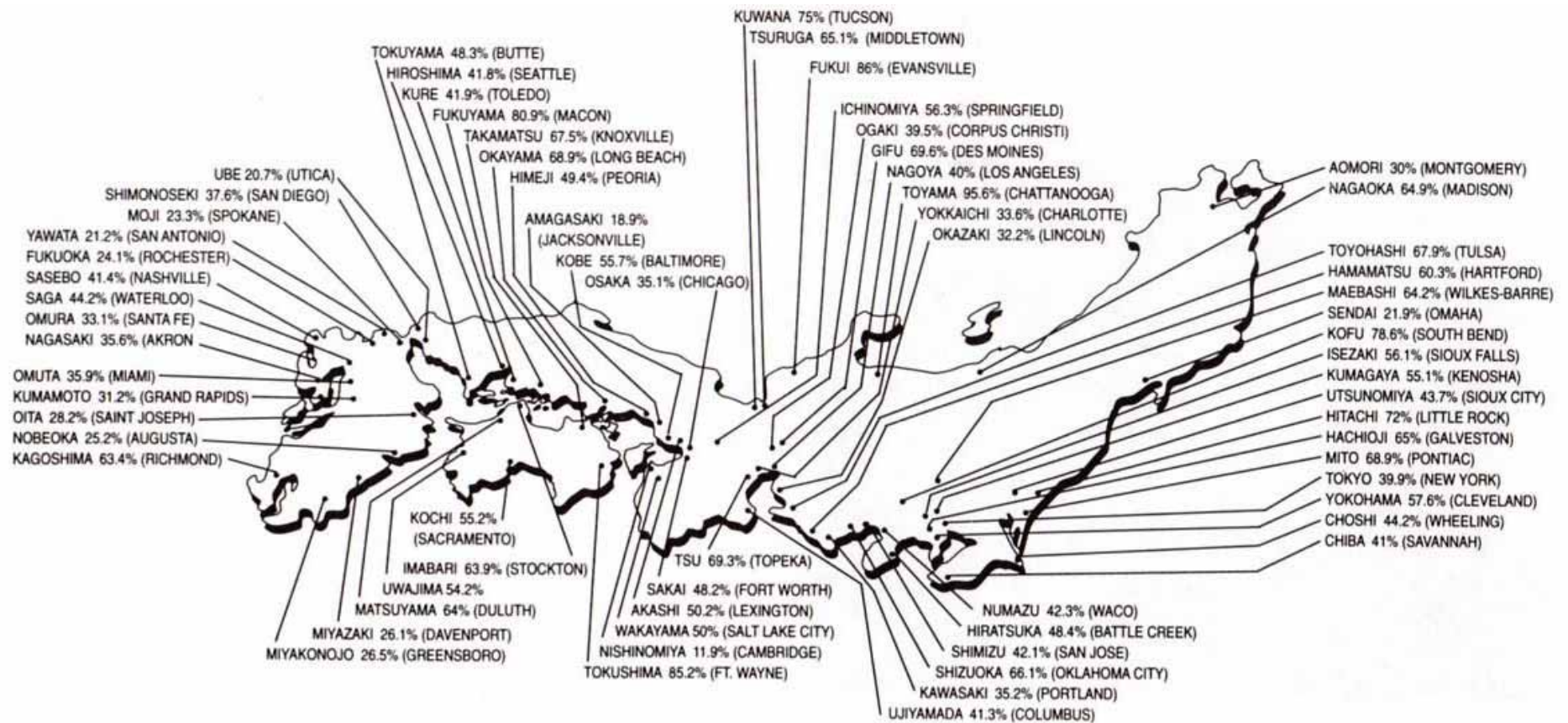
- In March 1945, Maj. Gen. Curtis E. LeMay ordered the B-29 units to switch from day light precision attacks and use on board RADAR to strike instead at night, from low altitudes, using incendiary bombs.
- These daily attacks, carried out by 800 to a 1000 B-29s, devastated Japan's industrial and economic infrastructure, killed thousands of Japanese citizens, soldiers, and factory workers.
- By August 1945 66 major Japanese cities were destroyed.



Naval Carrier Attacks on the Japanese Home Islands

- By February 1945 US and newly Arrived British fleets and carriers surrounded the Home Islands.
- 1300 Carrier based aircraft began daily sweeps of Japanese airfields, but many were secured in caves.





Three Legs of the Atomic Bomb

- Albert Einstein's 1939 letter to President Roosevelt—initiates the Manhattan Project.
- The 1940 mindset of the Air Force Air Staff that the Battle of Britain defense may not succeed and the US and the Western Hemisphere may be alone—the impetus for the B-29: 5000 mile range, 5000 lbs bomb load.
- Silver Plate program, specially modified B-29s to carry the 10,000 # A-bomb, by the 509th composite wing under the command of Col Paul Tibbitts.

TOP SECRET

TOP SECRET

Auth: C.O., Site Y, N.M.

Initials: Date: 12 May 1945

This document consists of 7 Page(s)

No. 1 of 4 Copies, Series A

U-13-XIX-1A

Truncated Version

DECLASSIFIED E.O. 11653, Sec. 3(E) and 5(D) or (6) NND 730039 By ERC NARS,
Date 6-4-74

12 May 1945

Memorandum For: Major General L. R. Groves

Subject: Summary of Target Committee Meetings on 10 and 11 May 1945

1. The second meeting of the Target Committee convened at 9:00 AM 10 May in
Dr. Oppenheimer's office at Site Y with the following present:

General Farrell

Colonel Seeman

Captain Parsons , USN

Major Derry

Dr. Stearns

Dr. Tolman

Dr. Oppenheimer

Dr. C. Lauritsen

Dr. Ramsey

Dr. Dennison

Dr. von Neumann

Dr. Wilson

Dr. Penney

Minutes continued

B. It was the recommendation of those present at the meeting that the first four choices of targets for our weapon should be the following:

- a. Kyoto
- b. Hiroshima
- c. Yokohama
- d. Kokura Arsenal

Distribution:

Copy 1: Maj Gen L. R. Groves

Copy 2: Capt. Parsons

Copies 3 & 4: J. R. Oppenheimer

Copyright Notice: The original of this document is believed to be in the public domain. Its transcription and formatting as an e-text, however, is copyright 1995-1998 by Gene Dannen (gene@dannen.com).

The URL of this page is: <http://www.dannen.com/decision/targets.html>

Potsdam Agreement July 1945

- War in Europe was over
- US, England and Russia agree that the Japanese to be given an ultimatum of unconditional surrender or they will be invaded.
- In 1944-1945 Japanese sent feelers through the Russians proposing an armistice, with
 - The Emperor to remain Head of State
 - No invasion of the Home Islands
 - Japanese overseas holdings [Korea, Taiwan, Manchuria, China] would be retained
 - The Japanese would reduce the size of their armed forces
 - The Japanese government would deal with Japanese officers accused of war crimes

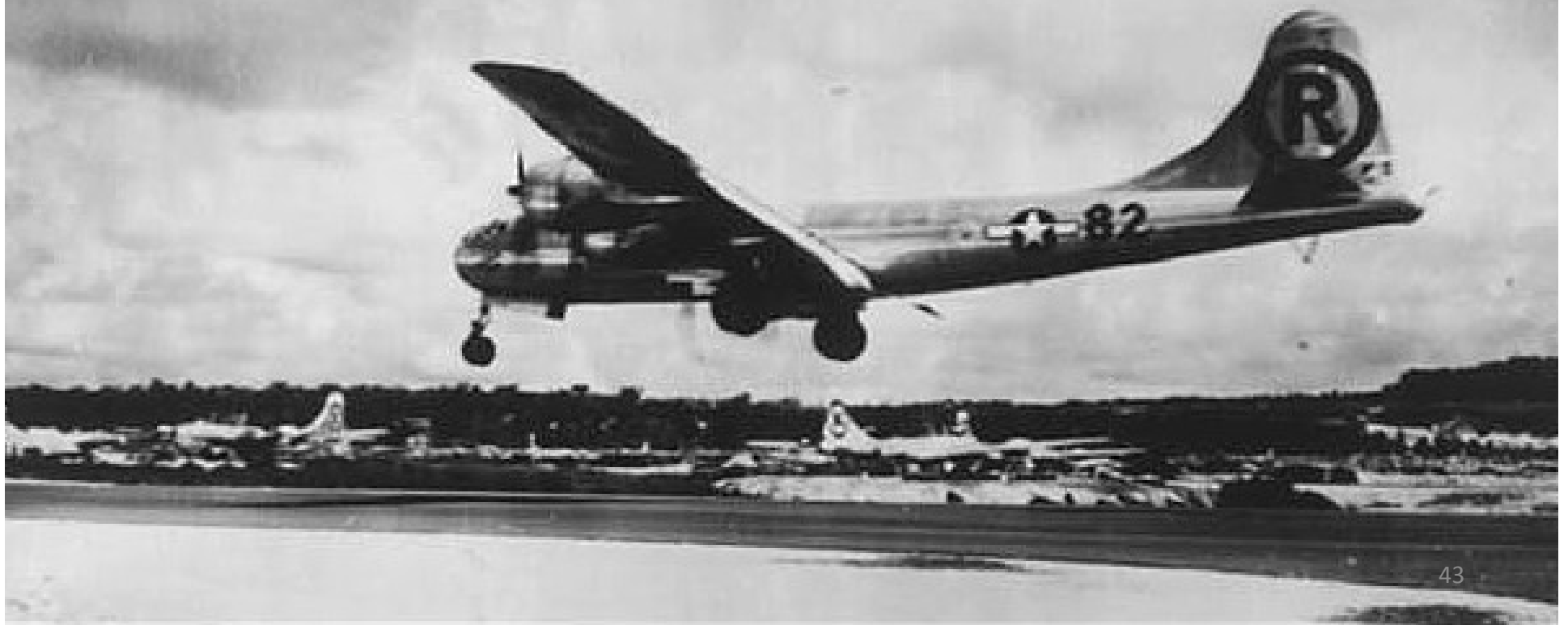
Potsdam Agreement July 1945, con't

- Japanese armistice feelers are rejected.
- During the meeting the Plutonium bomb, **Fat Man, is detonated** in New Mexico. Russian Premier Stalin is informed by President Truman that a new weapon has been developed and successfully tested. It is reported that Stalin nods.
- The **509th relocates to Tinian** Island.
- Massive preparations are under way for a **November 1945 invasion** of Kyushu Island.
- The Russians move hundreds of thousands of troops to Eastern Siberia.
- On **8 August 1945, Russia declares war on Japan** and Manchuria and Korea are invaded, as part of Soviet master plan for hegemony in the area after the fall of Japan.
- The Russians took back islands lost in the 1906 Russo-Japan War and passed confiscated weapons, vehicle and supplies to Mao and his Chinese Communist Army.



MacArthur's Strategic Strategy was to first invade the southern Island of Kyushu, which was separated from most of the Japanese forces and would be more difficult to reinforce.

Enola Gay



A New Age, the Rubicon
had been crossed!



Fat Man explodes over
Nagasaki after being
delivered by the B-29
Bockscar.

On August 6 and 9, 1945, specially
modified B-29s, flown by the 509th
Composite Group, carried out **two**
of the **final strategic bombing**
missions of the war.

On those days only **6** B-29s flew
over Japan.

They each dropped **a single atomic**
bomb first on Hiroshima and then
on Nagasaki.

There were conventional raids
flown on the days before, between
and after these A-bombs were
dropped.

The Emperor made a political
decision and Japan surrendered
days later. **Ma**

Atomic Bomb Inventory

- In August 1945, after three years of work and one test, the US only had two operational bombs.
 - One plutonium design
 - One enriched uranium design
- It would take months to produce enough nuclear material for one more bomb.

Boeing B-29-45-MO

Superfortress, *Enola Gay*



Smithsonian
National Air and Space Museum
Steven F. Udvar-Hazy Center

Carolyn Russo/NASM Photo

Installation of Propeller #4 on the Enola Gay at the Steven F. Udvar-Hazy Center

The German Surrender

- **Hitler, beaten on all fronts, waited in Berlin so that he could still command his forces. As his last significant official act, he named Grand Admiral Karl Doenitz to succeed him as chief of state.**
- **On the afternoon of April 30, 1945, Hitler committed suicide in his Berlin bunker.**
- **Doenitz surrendered. His representative, General Alfred Jodl, signed an unconditional surrender of all German armed forces at General Eisenhower's headquarters on May 7.**
- **The full unconditional surrender took effect at one minute past midnight. The U.S. and British governments declared May 8, 1945, V-E Day (Victory in Europe).**



The Japanese Surrender

- On September 2, 1945, The Japanese surrender aboard the *USS Missouri* anchored in Tokyo Bay while Allied staff looks on.
- General Douglas MacArthur officiated the ceremony while hundreds of Allied aircraft flew overhead celebrating the victory.
- Fleet Admiral Nimitz signed the surrender document on behalf of the United States.



USAAF World War II Battle Casualties – Combat Flying Was Dangerous

- The USAAF incurred 12% of the Army's 936,000 battle casualties in World War II. 52,173 were battle casualty deaths: 45,520 [killed in action](#), 1,140 died of wounds, 3,603 were [missing in action](#) and declared dead, and 1,910 were non-hostile battle deaths.
- Additionally there were 35,946 non-battle deaths included 25,844 in aircraft accidents, more than half of which occurred within the Continental US.
- 63,209 members of the USAAF were other battle casualties: 18,364 were [wounded in action](#) and required medical evacuation, and 41,057 became [prisoners-of-war](#).
- UASSF casualties were 5.1% of its strength, compared to 10% for the rest of the Army.
- Of the US military and naval services, only the Army Ground Forces suffered more battle deaths

US WW III Aircraft losses and cost

- Total aircraft losses by the USAAF from December 1941 to August 1945 were 65,164, with 43,581 lost overseas and 21,583 within the Continental United States.**
- Combat losses of aircraft totaled 22,948 world wide, with 18,418 lost in theaters fighting Germany and 4,530 lost in combat in the Pacific.**
- The USAAF credited its own forces with destroying 40,259 aircraft of opposing nations by all means; 29,916 against Germany and its allies and 10,343 in the Pacific.**
- USAAF operations and equipment cost approximately \$50 billion, or about 30% of the War Department budget**

World War II Aviation Contribution Summary

- Europe: Tactical and strategic airpower supported and shortened the time of final land warfare drives from the east by the Russians, from the west by the US, England and other allies and from the south by the US, England France and ultimately Italy into Germany proper.
- Pacific: Naval aviation came into its own and with Army aviation island hopping made possible the relentless advance on Japan. **The final strategic fire bombing of Japan and the two atomic weapons brought the war to an abrupt end.**



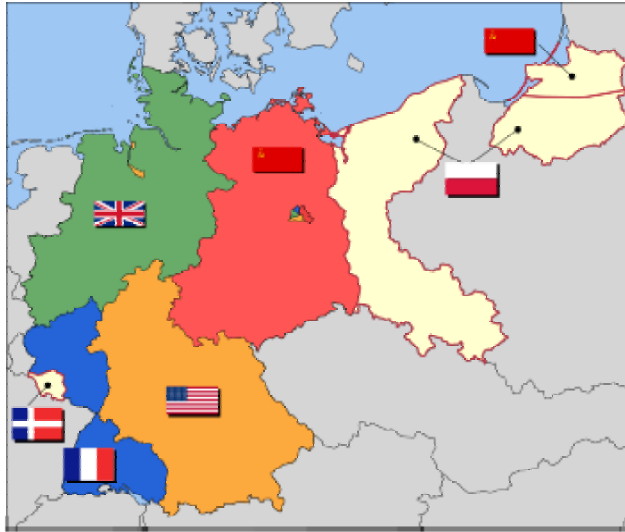
No Rest for the Weary



- **Even before the end of WW II the United States and the Soviet Union were engaged in a continual struggle for dominance.**
 - **Berlin Airlift**
 - **The B-36 and far flung overseas airfields**
- **Next sessions: Commercial Aviation with elements of competition and then concluding with Military Aviation with a decades long “at each other’s throat” competition.**

Pre-Korea

The Berlin Airlift



Pre-Korea

The Berlin Airlift

- **The Berlin blockade (24 June 1948 – 12 May 1949)** was one of the first major international crises of the Cold War.
- During the multinational occupation of post–World War II Germany, the Soviet Union blocked the Western Allies' railway, road and canal access to the sectors of Berlin under Allied control. Their aim was to force the western powers to allow the Soviet zone to start supplying Berlin with food and fuel, thereby giving the Soviets practical control over the entire city.
- In response, the Western Allies organized the Berlin airlift to carry supplies to the people in West Berlin.¹ The United States Air Force and the British Royal Air Force flew over 200,000 flights in one year, providing up to 4700 tons of daily necessities such as fuel and food to the Berliners.

The Berlin Airlift

- **By the spring of 1949, the effort was clearly succeeding and, by April, the airlift was delivering more cargo than had previously been transported into the city by rail.**
- **The success of the Berlin Airlift brought embarrassment to the Soviets who had refused to believe it could make a difference.**
- **The blockade was lifted in May 1949 and resulted in the creation of two separate German states. The Federal Republic of Germany (West Germany) and the German Democratic Republic (East Germany) split up Berlin.**
- **In remembrance of the airlift, three airports in the former western zones of the city served as the primary gateways to Germany for another fifty years.**

See you in the Winter term

- **Commercial aviation**
- **General Aviation**
- **Military Jet Aircraft**
 - **Korean era and beyond**