

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

10

Navy Space Systems Activity
Memorandum Report
NSSA-MR-50-82-01

ADA 124121

REFLECTIONS AND OPINIONS --
PAST AND FUTURE WARFARE

HUGH L. HANSON

December 1982

DTIC
ELECTE
FEB 4 1983
B



DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

Navy Space Systems Activity
P.O. Box 92960, Worldway Postal Center
Los Angeles, California 90009

DTIC FILE COPY

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NSSA-MR-50-82-01	2. GOVT ACCESSION NO. AD-A124121	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Reflections and Opinions -- Past and Future Warfare (U)	5. TYPE OF REPORT & PERIOD COVERED	
	6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s) HUGH L. HANSON	8. CONTRACT OR GRANT NUMBER(s)	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Navy Space Systems Organization P.O. Box 92960, WPC Los Angeles, CA 90009	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
11. CONTROLLING OFFICE NAME AND ADDRESS Commander Naval Electronics System Command Washington, D.C. 20360	12. REPORT DATE December 1982	
	13. NUMBER OF PAGES	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	15. SECURITY CLASS. (of this report) Unclassified	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) <div style="border: 1px solid black; padding: 5px; text-align: center;">DISTRIBUTION STATEMENT A Approved for public release; Distribution Unlimited</div>		
17. DISTRIBUTION STATEMENT (of the abstract entered in block 20, if different from Report)		
18. SUPPLEMENTARY NOTES This contribution does not necessarily represent the opinion of the Department of the Navy.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Space Systems, Future War, Space Organization, Space and Mobility, World War II Fighter Aircraft, Statistics, Navy, Air Force, Army, Space Technology, MX, B-1B, NATO, Defense Reorganization, Vietnam, Intelligence, Russian domination		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Summarizes WW II fighter aircraft statistics. Relates mobility to future warfare. Recommends dissolution of the Air Force, transfer of space systems to the U.S. Navy. Recommends cancellation of the MX missile, B-1B bomber, and removal of U.S. troops from Europe if allies cannot agree on a sensible defense plan for NATO financing.		

DD FORM 1473 1 JAN 73 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

PREFACE

As stated in the title, the positions taken by the author are indeed "opinions and reflections". The reader will no doubt categorize these "opinions and reflections" as ones which evoke considerable controversy. The recommendations, opinions, and views are those of the author and should not be interpreted as representing the official policies, either expressed or implied of the Navy, the Defense Department or the U.S. Government. Nevertheless an "open forum" such as created by the presentation of the material herein "clears the air" for the author who has dealt with these controversies first hand for a considerable number of years. The resolution of controversy as an element of strengthened national defense often times requires that we look back to see how we got where we are. Here is Mr. Hanson's look as he retires from Federal Service.

L. W. Brown
L. W. BROWN
CAPTAIN, U.S. NAVY
COMMANDING OFFICER



PER LETTER

DATE	INITIALS	REMARKS
A		



This report was prepared in accordance with an approved Merit Pay System objective.

The recommendations, opinions, and views are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied of the Navy, the Defense Department or the U.S. Government.


HUGH D. HANSON


L. W. BROWN
CAPTAIN, U.S. NAVY
COMMANDING OFFICER

ACKNOWLEDGEMENTS

The persons cited in Appendix A provided the initial inspiration that led to the writing of this report.

In recent years the following personnel were most helpful in providing valuable comments and statistics:

VADM F. S. Petersen, USN
VADM E. R. Seymour, USN
MGEN J. W. Huston, USAF
Mr. Gabrielle M. Neufeld
Mr. W. J. Armstrong

Data on the Vietnam War was provided by an article in the "Armed Forces JOURNAL International" of May 1974 (Table B-3).

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	5
THE SURVEY	5
THE INTELLIGENCE FACTOR	5
MOBILITY AND PAST EXPERIENCE	6
CONTROL OF THE AIR AND "KILL RATIO"	7
THE FIGHTER RECORD	8
THE VALUE OF A MOBILE BASE	10
THE MYSTERY OF THE BEST FIGHTER OF WORLD WAR II	10
MILITARY SPACE - - "WHO'S IN CHARGE?"	12
OBSTACLES TO THE MILITARY USE OF SPACE	12
MOBILITY VS MX, B-1B, SMALL NUCLEAR MISSILES, AND CONTROL TERMINALS	13
THE AIR FORCE - - A POSSIBLE THREAT TO OUR SECURITY	13
THE NAVY -- DOMINANT USER OF SPACE SYSTEMS	15

	<u>PAGE</u>
SPACE SYSTEMS -- THE NEXT 20 YEARS	16
A TRIGGER OF WORLD WAR III ?	16
CONCLUSIONS	17
RECOMENDATIONS	19
APPENDIX A	21
APPENDIX B	32
APPENDIX C	38

INTRODUCTION

In the years 1794 to 1913 aircraft were used to provide communication, targeting, surveillance, and reconnaissance support to armies. Employment of the aircraft as a weapon directly influencing the outcome of a battle was not intended.

Today, military space systems are at the same stage as military aircraft were prior to World War I. In less than 20 years after WW I, aircraft became a major combat weapon. Command of the air became a decisive factor, much like the command of the sea or land. Control of the air obtained by fighter aircraft was decisive in our last global conflict, World War II. Air supremacy in all theaters was required before other military operations could be successfully conducted. Fighter aircraft effectiveness was thus the keystone of nearly all military efforts.

WW II, fought over the vast areas of the Pacific offers lessons which apply to any future World War where control of space will be as vital as control of the air in WW II.

An effort was made by this writer during the years 1945-1956 to talk to many experienced Navy and Marine Corps officers who would have well-founded opinions concerning factors that were vital to the conduct of the War in the Pacific. See Appendix A for a partial list. During the years 1956 to the present additional information was collected. This report will provide a review of the data as related to military space systems and future warfare. In this report all references to "Navy" is intended to include the Marine Corps. Information, conclusions, recommendations, and opinions are included on various weapons and concepts because they relate to the realistic trade-offs that must be made, especially considering costs involved.

THE SURVEY

After several years of research there evolved a definite trend toward two factors that were vital to the outcome of a battle. Agreement was most prevalent among the highest military ranks that these two factors were intelligence and mobility.

THE INTELLIGENCE FACTOR

To know an enemy's plans before an attack is the fervent desire of any military commander. The interception and "breaking" of the highest-level, diplomatic and military German and Japanese Communication codes before and during WW II provided just the margin necessary for victory in many battles. An outstanding example of this "force multiplier" was the Battle of Midway where we were victorious, although outnumbered two to one. There are some historic examples

of victories against overwhelming odds where intelligence played a leading role:

- o (Circa 200 BC) Hannibal (40,000 men, 6,000 casualties) destroyed a Roman army (76,000 men, 70,000 casualties)
- o (Circa 50 BC) Julius Caesar (25,000 men) defeated 250,000 Gauls (French) under Vercingetorix

As technology advances the techniques of data gathering and analysis, the enhanced intelligence capability potentially increases the margin of victory. Good intelligence will be just as important for World War III as it was in WW II. However, this report will pay particular attention to the effect of the mobility factor, and how it may be related to the control and use of space in a future conflict.

MOBILITY AND PAST EXPERIENCE

About 2,000 years ago the mobility afforded by an amazing network of roads (some still in use) and the very active use of ships contributed greatly to a superior war-fighting capability resulting in the longest period of peace in recorded history. For over 200 years (14 BC to 192 AD) there was peace in the Roman Empire ("Pax Romana"). The mobility afforded by ships enabled England to become the world's first major colonial power, starting in 1763.

At the beginning of WW II the Germans capitalized on the mobility of armored vehicles and developed a strategy for rapid breakthroughs of static defenses (i.e. Maginot Line). This mobility, termed "Blitzkrieg" was the keystone of their "envelope, isolate, and destroy" tactics. More recently the Israeli army has adapted these tactics successfully.

Military history has many examples of the advantages of mobility during a battle. The most outstanding example to date is the combination of the inherently mobile aircraft and aircraft carrier in the Pacific during WW II. After Nov 1943 mobile concentrations of 400 to over 1,000 carrier aircraft were standard and the Fast Carrier Task Force (FCTF)* was a devastating combination. FLTADM William F. Halsey expressed the opinions of many:

"--It was the mobile concentration of our forces which permitted us to win the entire Naval war in the Pacific with less casualties than the allies sustained in the Italian Campaign alone. Mobile warfare is less costly in lives. The world-wide casualties of the Navy and Marine Corps were less than the casualties of the Fifth Army alone in the Italian Campaign."

*"The FCTF consisted of four carrier task groups. Each Group was made up of four or five carriers; usually two or three heavy carriers, and two or three light carriers, with support vessels in proportion. Thus the FCTF might have as many as 20 aircraft carriers plus support ships, including battleships, cruisers, and destroyers."

It is interesting to speculate concerning the conduct and outcome of the war in Europe if it were entirely under the control of the U.S. Navy with as much military power as available in the Pacific. Certainly the deplorable and futile waste of lives and treasure in conducting "strategic bombing" would have been held to a minimum.

It is hoped that this report will stimulate some constructive thinking and action. The questions resulting from a comparison of large-scale land warfare (Europe) and naval warfare (Pacific) will be left to others to debate. For example, how much difference did climate make in the outcome of various actions? This, and other key factors have never been really analyzed so that we may profit from past experience.

CONTROL OF THE AIR AND "KILL RATIO"

Because control of the air was so vital, and this control was gained with fighter aircraft, this report examines their use during WW II. In particular it will examine the mobility afforded by the aircraft carrier. Interesting is the fact that before, during and after WW II, the Army regarded carrier-type aircraft as inferior in performance to land-based designs, because of the limitations imposed by a mobile ship base. Of course, this theory was discarded after WW II when the new Air Force adopted three Navy designs, the F4, A-7, and A3D. It was also hoped that the statistics would show which fighter aircraft was the most outstanding--in terms of "kill-ratio" in air-to-air combat. This criterion** is the most universally recognized measure of merit.

**Kill ratio: enemy aircraft destroyed in aerial combat per own loss

THE FIGHTER RECORD

The following air-to-air combat numbers are listed in greater detail in APPENDIX B. Figure 1 gives a graphic illustration.

	<u>US LOSS</u>	<u>ENEMY LOSS</u>	<u>KILL RATIO</u>
U.S. Army vs Japan	931	3,960	4.3
U.S. Navy vs Japan	664	8,638	13.0
U.S. Army vs Germany	3,018	10,722	3.6

some more recent statistics:

U.S. Air Force vs Vietnam	60	129	2.2
U.S. Navy vs Vietnam	14	54	3.9

The Navy record against Japan is astounding--outperforming the Army by a factor of 3! The Army performed better against Japan than Germany.

Although handicapped by a political decision not to win the war, the Navy record was almost twice as good as the Air Force in Vietnam, mainly using the same Phantom F-4 fighter.

AIR-TO-AIR COMBAT RESULTS

US AIR FORCE VS VIETNAM

US ARMY AIR FORCES VS GERMANY

US NAVY VS VIETNAM

US ARMY AIR FORCES VS JAPAN

US NAVY VS JAPAN

KILL RATIO

1 2 3 4 5 6 7 8 9 10 11 12 13

US AIR FORCE VS VIETNAM
US ARMY AIR FORCES VS GERMANY
US NAVY VS VIETNAM
US ARMY AIR FORCES VS JAPAN
US NAVY VS JAPAN

THE VALUE OF A MOBILE BASE

The preceding numbers provide a solid background for an examination of the value of a mobile base, in this case the aircraft-carrier.

Referring to Table 1, Note 1, this indicates that the Navy land-based record was twice as good as the Army. The comparison is not clear-cut though, because of the differences in types of fighters and the fact the Army figures lump action against both the Germans and the Japanese. The numbers result from action only against Japan.

Note 2 is an excellent indicator of the value of mobility. Here we are comparing our Navy carrier-based fighters and Navy land-based fighters. All the pilots were Navy-trained, using the same F6F and F4U aircraft. The carrier base excels by a ratio of 2.5 to 1.

Note 3 regarding information on the Vietnam war was listed with reluctance. There was no really substantial air action, and the numbers of fighters involved were small--certainly by WW II standards. Another drawback was the fact that the carriers were very limited in the manner used, over a relatively small area. It was just as if the Navy was operating from a fixed base. One thing was fascinating though: both the Navy and the Air Force were primarily using the same fighter--the Navy developed F4 Phantom! For purposes of comparison, discounting the advantage of operating from a carrier base, the Navy air-to-air combat record is superior by a ratio of 1.8 to 1.

A mathematica' illustration showing the value of a mobile base is given in Appendix B, Table B-4.

THE MYSTERY OF THE BEST FIGHTER OF WW II

After several futile attempts to obtain data on the kill ratios for fighters of Great Britain, Russia, Italy, German, and Japan the effort to make a realistic comparison involving all major combatants was abandoned. Instead it was decided to try to identify the "best" United States fighter. The Navy identified their best fighter -- the F6F HELLCAT (see Appendix A). The effort to have the Air Force do the same was an exercise in frustration as may be noted from Appendix C. The only clue came from the Marine Corps (Appendix A) who stated "we believe that the P-47 THUNDERBOLT was probably the most effective Army Air Force fighter with respect to kill ratio used in World War II".

In absence of other information and considering the overall inferior performance of the USAAF (Table 1), it seems logical to assume that the best United States Fighter Aircraft was the F6F HELLCAT.

It is not known why the Air Force is so reluctant to name their WW II fighter with the best kill ratio in air-to-air combat. At least the Navy and Air Force can agree on the Navy F4 PHANTOM as the best fighter in the Vietnam conflict!

FIGHTER AIRCRAFT AIR-TO-AIR
COMBAT DATA
CARRIER VS LAND-BASED
WORLD WAR II & VIETNAM

	CARRIER BASED <u>KILL RATIO</u>	LAND BASED <u>KILL RATIO</u>
ARMY AF - WW II	-----	3.7
NAVY-MARINE - WW II	18.5	7.3
AIR FORCE - VIETNAM	-----	2.2
NAVY-MARINE - VIETNAM	3.9	-----

NOTE 1

WW II NAVY-MARINE VS ARMY KILL RATIO COMPARISON $7.3/3.7 = 2.0$
ALL LAND BASED

NOTE 2

WW II NAVY-MARINE CARRIER VS LAND-BASED KILL RATIO COMPARISON
 $18.5/7.3 = 2.5$

NOTE 3

VIETNAM NAVY-MARINE VS AIR FORCE KILL RATIO COMPARISON $3.9/2.2 = 1.8$
IN VIETNAM OVER 400 AIRCRAFT WERE DESTROYED AND 4,000 ADDITIONAL
AIRCRAFT DAMAGED--ON THE GROUND--ON LAND BASES--WHILE NOT ONE AIRCRAFT
ABOARD A CARRIER WAS DESTROYED OR DAMAGED THROUGHOUT THAT CONFLICT
AS A RESULT OF ENEMY ACTION.

NOTE 4

INSUFFICIENT DATA AVAILABLE FOR A KOREAN WAR COMPARISON

MILITARY SPACE -- "WHO'S IN CHARGE??"

Below the President there is no single manager. According to various reports:

- o "at least 13 separate Air Force organizations now handle space planning and programs, in addition to 12 functions for space planning in other services and the Defense Department"
- o "Our military space program is seriously fragmented, suffering from inadequate planning and organizationally diffused responsibilities -- (there are) 26 separate organizations impacting on military space activities"
- o "Presently there are twenty-one Pentagon and civilian offices that plan for or operate U.S. space programs"

The newly established Air Force "Space Command" provides for some consolidation, but even here it is noted that neither the Anti-Satellite (ASAT) or Space-based Laser program come under the new organization.

At the next level below the President our security is jeopardized by the split in responsibility between the Defense Department, the Intelligence organizations, and the National Aeronautics and Space Administration (NASA). The four categories of space systems are: Military, National, Civil, and Commercial. The lack of organization is painfully demonstrated by the fact that there is no realistic central planning for military space activities either for present operational projects or for future projects to result from the current willy-nilly research and development. For example, the Intelligence Community, the Navy, the Air Force, NASA, and the Defense Advanced Research Project Agency (DARPA) may all have separate programs to investigate applications of space-based radar. The confusion and lack of direction concerning our space programs goals will lead to our defeat in a future war, and Russian domination of the world in the next century.

OBSTACLES TO THE MILITARY USE OF SPACE

- o Lack of a rational and effective organization
- o Lack of communication between the developer and user
- o Lack of a well designed policy
- o Lack of a long range plan (Dictionary definition: "a detailed formulation of a program of action" -- the Navy has been pretending for years that they have long range space "plans")
- o An erroneous perception that space systems are less survivable than other military systems
- o Security blocks, lack of education concerning the capabilities of various systems, and traditionalism
- o Lack of communication between the intelligence community and the services

MOBILITY vs MX, SATELLITES, SMALL NUCLEAR MISSILES, and CONTROL TERMINALS

As if in further confirmation of the virtues of mobility, studies for the past 10 years on basing for a follow-on the MINUTEMAN ICBM missile have stressed that mobility is essential to survivability (the "Dense Pack" idea now being touted was rejected years ago). Some of the many recent statements:

- o "There is no practical basing mode for (MX) missiles on the land's surface". A mobile "continuous airborne patrol" aircraft was "the most promising approach" for a survivable basing mode for the MX (Townes 10 man panel appointed by SECDEF).
- o The United States should "drop the development of new ICBM's and instead place increased emphasis on submarine launched ballistic missiles and bomber-launched cruise missiles". "Survivability depends on mobility and deception". (Aspen Institute and Dr. William Perry, former Asst. SECDEF, R & E)
- o The next generation of DOD spacecraft "will be designed with -- large maneuvering propellant reserves". (SECAF -- V. Orr)
- o "Fixed-site ICBM's in the U.S. must be eventually eliminated" and "true mobility is the only means of prelaunch survivability --". (L.C. Carpenter, independent strategic weapons analyst for DOD the past 30 years)
- o "Our primary concerns with the U.S. Triad of strategic offensive forces are ICBM vulnerability and declining effectiveness against hard targets, SLBM limitations against hard targets, and decreasing ability of U.S. manned bombers to penetrate Soviet defenses." (JCS Congressional testimony)
- o The B-1B "will be capable of penetrating Soviet defenses well into the next decade, if not the next century". (Gen. B. B. Davis, USAF)
- o The dense-pack basing mode for the MX missile "would create a system more vulnerable than the rest of our land-based ICBMs". (Kosta Tsipis, MIT)

In view of the foregoing the Consolidated Space Operations Center under construction does not make any sense at all. The Russians to do the same task are investing in a multitude of mobile platforms. They will be far better prepared for future wars than the U.S.

THE AIR FORCE - A POSSIBLE THREAT TO OUR SECURITY

At the time the Air Force was created by Congress as a separate service in 1947, the B-36 bomber was flagrantly promoted as the ultimate weapon. This monstrosity, with a maximum range airspeed of 202 knots was portrayed as almost invincible,

in spite of the fact that jet fighters, air-to-air missiles, and ground-to-air missiles were a reality! Now these claims look ludicrous, except for the fact that in 1949 the Air Force and Army almost convinced the Administration, the Congress, and the Public. In fact, the following demands were made:

- o "Relegate the Navy to convoy and anti-submarine service."
- o "That Marine Corps units be limited in size to the regiment and the Corps itself reduced to 50,000 or 60,000 men."

Eight months later the Korean War probably saved the U.S. Navy from extinction as a viable fighting force. This was 33 years ago. Over the years the Air Force has advanced concepts and promoted weapons which seem to have lessened rather than increased our security.

Today, vast expenditures by the Air Force on concepts and systems which are obsolescent or not effective in practical sense, degrades the ability of other services. This applies to space as well as terrestrial military systems. A few of the questionable and seemingly contradictory items:

- o "American nuclear strategy rests on the concept of deterrence." (Note: deterrence, the prevention of war, is the province of diplomacy not of military strategy) -- The Russians place little importance on the "deterrence" concept. (JCS, Feb 1982)
- o The term "unacceptable damage" in connection with nuclear warfare using "strategic" weapons is a term which we have adopted and which we also attribute to the Russians -- in spite of the fact that they have not adopted this definition at all. The Russian "criteria for determining what constitutes strategic weapons is not geographic but functional -- the geographic criteria -- that is, losses of territory with the people and resources located on them - - has in their military thinking a secondary importance." (Richard E. Pipes, Chairman CIA Team B, 1977)
- o Minuteman ICBM's are rapidly becoming more vulnerable to a first strike as a result of increases in the accuracy, numbers, and power of Soviet multiple warheads (as many as 30 on each missile). Certainly B-52 bombers and their bases today are far more vulnerable than the Minuteman, yet the plan is to have a force of B-1B bombers 5 years from now!
- o The MX ICBM missile is to replace the Minuteman, yet every basing option appears to be unsatisfactory. Here again, what will the vulnerability picture look like 5 years from now, assuming we will then start replacing the MX? Unless the MX is survivable -- its deployment would be dangerous, and worse than useless.

- o The Russians have the most formidable air defense the world has ever seen now -- and the B-1B is not due to be operational until 5 years from now!
- o The Soviets have a considerable force of BACKFIRE bombers (similar to the B-1B with a follow-on design even more of a threat) NOW and we have NO air defense worth mentioning!

The United States has the greater need for space systems to compensate for our numerical inferiority. Studies by the Joint Chiefs of Staff indicate that the U.S. is more vulnerable to attack and has more to lose than the USSR.

The U.S. must be continually alert to the fact that increasingly large expenditures for space support systems at the expense of the rest of the force structure may actually have a negative effect on the ability to wage war.

The true "sitting duck" is the fixed ICBM or bomber located on a land-base. The Soviets now have the capability to destroy all important military targets in the United States in less than an hour. Soviet strategic nuclear doctrine calls for a preemptive attack to gain the initiative, with emphasis on mass attack and surprise. Why the Joint Chiefs of Staff point with alarm at the vulnerability of our ICBMs buried in the ground and also insist on the need to proceed with a B-1B bomber-force concentrated in a few bases above ground is a paradox that it is hoped future historians (if there are any left) will place in proper perspective.

THE NAVY DOMINANT: USER OF SPACE SYSTEMS

Of the military services, the Navy, now and in the future has the most pervasive need for the "force multiplier" which can be provided by space systems. Space systems have a unique value to our Navy because they have:

- o Mobile bases which are capable of staying away from home-port for weeks and months at a time.
- o Mobile bases which have their mobility multiplied by aircraft.
- o Mobile bases which can and do range over most of the Earth's surface -- typically geographic areas as large as the continental U.S.

Some of the requirements and problems of the U.S. Navy related to space systems:

- o Be prepared to battle in the enormous volume under the sea, on the sea, in the air - and soon - outer space.
- o The tremendous problem of surveillance in all of the above dimensions.
- o The possibility of attack from any sector and the fact that geographic indicators such as exist on land, have no meaning at sea.

- o Our combat-ready naval forces are often in close contact with Soviet forces.
- o Our Navy would have a global war to contend with from the early moments of hostility.

In summary, it is obvious the U.S. Navy has some challenging operational requirements, a number of which can only be met by space systems.

SPACE SYSTEMS - THE NEXT 20 YEARS

In the next 20 years the space systems which seem to have the greatest growth possibilities are:

- o Manned vehicles
- o Weapons
- o Surveillance (potential great benefits; and danger) (short-term tactical, early warning)
- o Shuttle-launch of multiple satellite nuclear weapons, poised for Earth target destruction

In the space systems primary support category the following will probably receive less attention (i.e. funding) than the above, but will be extremely important to the military:

- o Navigation (May be the most cost-effective payoff)
- o Communications
- o Meteorology
- o Reconnaissance (long-term national or "strategic")

A TRIGGER OF WORLD WAR III?

Our European friends are greatly disturbed by the prospect of having the nuclear Pershing II and Cruise Missiles based within their borders; Soviet Union's reaction borders on paranoia. Some military writers are of the opinion that USSR will conduct a preemptive "first strike" in late 1983 rather than allow these missiles to be installed. Congressional testimony from the Defense Department in June 1982 indicated "there is an incentive for a Soviet surprise attack that will worsen considerably over the next few years". In February 1982 the statement was made to the House of Representatives that "Soviet strategic nuclear doctrine calls for a preemptive attack". Defense Secretary Weinberger said the "unprecedented strategic tests by the Russians in June 1982 looked "like a scenario for fighting a nuclear war" - - - "displaying the fact that they believe a nuclear war can be fought, can be won". It never did make much sense to put these missiles on friendly territory, or our own land, and imperil

so many people. Basing missiles in the U.S. or Western Europe is the "greatest inversion of the rational position of armed forces with respect to the populace they are supposed to be protecting ever committed" (RADM E. P. Aurand). Space systems now coming on the line offer new options and enhance the desirability of basing missiles and terminals on sea-based mobile platforms. The Navy by virtue of its capabilities and expertise is in the best position to provide leadership in the deployment of this type of offensive weaponry.

CONCLUSIONS

- o Examination of wars and battles of the past show a definite pattern of factors which were decisive force multipliers. It seems reasonable to relate these factors to the conduct of war as the new dimension of space becomes more important.
- o World War II, as fought over the vast areas of the Pacific Ocean provides a preview of World War III which would be even more global in extent, a conflict in which space systems may be expected to play a crucial and possibly decisive role.
- o Air supremacy in all theaters of action in World War II was required before other military operations could be successfully conducted. Fighter aircraft effectiveness was thus the keystone of all military efforts.
- o In the Pacific, it was conclusively demonstrated that fighter aircraft operated from mobile sea-bases were 2½ times more effective than the same type of aircraft operated from land bases. The mobility offered by the aircraft carrier was decisive.
- o Just as control of the air was a decisive factor in WW II, so will control of space be the key during World War III.
- o Mobile bases are less vulnerable than fixed bases--whether on land, water, under the water, or in space.
- o On the basis of available information the most effective (kill ratio, air-to-air combat) fighter aircraft of any nation during WW II was the U.S. Navy Grumman F6F HELLCAT.
- o Our mobile sea-based forces operate on a global scale, and have the greatest need for space systems.
- o Extensive studies have shown that space systems can be made as survivable as other military systems.

- o Key to the control of space may revolve around the proliferation of small, quick reaction space vehicles which will take off and land on mobile platforms. These devices may be automated--man may function as a director, not an occupant of the aircraft.
- o The Federal Government, and especially the Department of Defense is poorly structured to exploit the military potential of space systems.
- o The fighter aircraft statistics of WW II and the Vietnam War show that there is a serious deficiency in the way the U.S. Air Force operates.
- o More than 400 USAF aircraft were destroyed and more than 4,000 USAF aircraft were damaged on the ground in Vietnam. This and the fighter statistics indicates that the Air Force should have been excluded from combat in Vietnam--the bulk of combat operations should have been conducted from mobile carrier bases.
- o Not one aircraft aboard a mobile carrier base was destroyed or damaged by the enemy during the Vietnam conflict.
- o The billions of dollars spent on airfields and other installations in Vietnam were not only lost completely due to our disastrous defeat (rout), but are now turned against us and used by the Russians.
- o Something needs to be done to insure a more timely introduction of space systems which have the latest technology. For example:
 - o Development of a system may take a long time (20 years for the Global Positioning System).
 - o To be economically feasible the system should have a lifetime of 7-10 years.

The above indicates that one usually does not have the justification to introduce new technology into a particular area for a long period of time.

- o The massive Russian military build-up, coupled with a huge nationwide civil defense organization suggest that the Russians regard a general war as possible -- even unavoidable.
- o A "preemptive-first-strike" by the USSR against the U.S. appears to be a possibility -- only the time is in question. Space systems should be more fully utilized to minimize this threat.
- o The U.S. support to NATO amounts to "more than half of our entire defense budget" -- or about \$133 billion. We have more than 350,000 troops stationed in Europe. The U.S. spends \$3.50 on social programs versus \$1.00 for defense. Western Europe spends \$7.00 in social programs versus \$1.00 for defense.

- o There is no clearcut agreement on the mission of our troops in Europe -- are they there to defend our allies (a fighting force, properly equipped) or are they there to trigger our retaliatory force ("a tripwire")?
- o We should be on our guard against spending so much for space support systems that : (1) they unwisely reduce the base force they are supposed to improve, and (2) we do not have enough well trained, high-quality people to operate and maintain them.
- o The preceding conclusion concerning spending does not apply completely when space systems: (1) cease to be mere "force multipliers" of terrestrial systems, (2) are developed to the point of providing a key part of the force architecture for wars, i.e., a potent direct warfare element.

RECOMMENDATIONS

1. Disestablish the Department of the Air Force (the reasons given for forming it in the first place were never valid).
2. Put back all elements of the Air Force under the Department of the Army except those relating to space systems.
3. Place all elements of the Air Force and other federal agencies concerned with military space systems under the Department of the Navy.
4. No military space system should be authorized for modification, development, or study unless there is a certified requirement from a user in the field.
5. Mobility with respect to all elements of space systems should be the rule rather than the exception. This includes launch platforms, control terminals, and devices, whether on land, water, under the water, or in space.
6. A high level "tiger team" (ad hoc working group) appointed by the President should be assigned the job of recommending a more timely introduction of the latest technology into our military and civilian space systems.
7. A special investigative group should be appointed to:
 - o Determine the reasons for the inferior performance of Air Force fighter aircraft compared to Navy-Marine aircraft.
 - o Make recommendations to improve the operation of our land-based fighter aircraft.
8. Deployment of the land-based PERSHING II and the CRUISE missiles should be cancelled. In the European theater strong emphasis should be placed on placing nuclear weapons on mobile platforms, predominately at-sea. Maximum use should be made of space systems in order to make this policy a practical reality. A move such as this is required in order to reduce the probability of a Soviet preemptive-first-strike.

9. Cancel the B-1B bomber unless the U.S. Navy can use it against the Soviet Navy (one-half the BACKFIRE fleet is assigned to the Soviet Navy). It is not a cost-effective Air Force weapon on at least 4 counts:

- o The idea of using an unescorted bomber without first gaining control of the air was a wasteful use of funds and lives during WW II. The 202-knot B-36, thirty-three years ago, and the B-1B bomber of 1987 seem to be in the same category.
- o If the MINUTEMAN missiles are vulnerable sitting in their holes, the B-1B's sitting on their bases are really exposed to a first strike unless in the air at the time.
- o There is no plan to keep 55% of our B-1B's in the air at all times.
- o The Russians have the most massive air defense system yet devised -- and it will probably be more potent years from now when the B-1B bomber is scheduled to be fully operational.

10. Cancel the MX missile. Ten years of study have not resulted in viable basing solution.

11. For now, place increased emphasis on cruise missiles and ballistic missiles launched from mobile platforms.

12. Have six submarines on patrol at all times that can place a gigaton (10^9) weapon on the Soviet Union. This would neutralize the Russian strategy as pronounced by our key DOD officials:

- o "Soviet strategic nuclear doctrine calls for a preemptive attack--". (DeLauer, Feb 1982)
- o "--they believe a nuclear war can be fought, can be won". (Weinberger, June 1982)

13. If we cannot agree with our NATO allies on a feasible theory of defense that responsible leaders can execute with the full support of the civilian population concerned (including a 3.5 to 1 ratio of social to defense spending) -- then we should remove our troops from Europe.

14. The troops removed from Europe should be in part distributed to regions that are essential to our security, particularly in regions such as the Persian Gulf and other threatened areas. There is no point in having our largest force in an area (Western Europe) that does not believe in local defense.

15. Source selection procedures for new military space projects should include an evaluation to determine if the net effect will be an overall improvement in war fighting capability, and there is a firm provision for a long term commitment that will insure the availability of the correct numbers and quality of trained personnel.

APPENDIX A

- o PERSONNEL INTERVIEWED CONCERNING WORLD WAR II (1945-1956,
VARIOUS TIMES)
- o NAVY AND MARINE CORPS CORRESPONDENCE

PERSONNEL INTERVIEWED BY HUGH L. HANSON CONCERNING WW II (1945-1956, VARIOUS TIMES, PARTIAL LIST)

FLTADM E.J. KING, USN
FLTADM C.W. NIMITZ, USN
FLTADM W.F. HALSEY, USN

ADM A.W. RADFORD, USN
ADM W.H.P. BLANDY, USN
ADM R.L. CONOLLY, USN
ADM T.C. KINKAID, USN
ADM R.A. SPRUANCE, USN
ADM L.E. DENFELD, USN

VADM R.B. CARNEY, USN
RADM R.A. OFSTIE, USN
RADM L. DEFLOREZ, USNR
RADM A.M. PRIDE, USN
RADM J. CLARK, USN

CAPT F.M. TRAPNELL, USN
CAPT J.H. SIDES, USN
CAPT A.A. BURKE, USN
CAPT J.S. THACH, USN
CAPT W.S. DIEHL, USN
CAPT T.C. LONNQUEST, USN
CAPT J.N. MURPHY, USN
CDR W.N. LEONARD, USN
CDR K.C. CHILDERS, JR., USN
CDR W.I. MARTIN, USN
CDR A.B. METSGER, USN
CDR E. TATOM, USN
LCDR E.W. HARRISON, USN
CDR E.P. AURAND, USN
CDR T. CALDWELL, USN
CDR T. CONOLLY, USN
CDR J. KLEISS, USN

GENERAL A.A. VANDERGRIFT, USMC
GENERAL C.B. CATES, USMC
BG V.E. MEGEE, USMC
MAJ A. HYATT, USMCR
MAJ M. CARL, USMC

OTHER PERSONNEL

JAMES FORRESTAL
CARL VINSON
VANNEVAR BUSH
KARL T. COMPTON
ORVILLE WRIGHT



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
WASHINGTON, DC 20361

IN REPLY REFER TO
10 Nov 1981

Dear Mr. Hanson:

In your letter of October 16th, you asked for air combat statistics of World War II and for my personal opinion on the difference in the records of carrier and land-based fighters. Enclosed is a table that describes the Navy and Marine Corps aviation record for that period. The data it contains should answer some of your questions. However, statistics are only numbers and while they can easily tell us which aircraft was the most effective, the question of why is left unanswered. For example, there can be no doubt that the F6F Hellcat was a more effective fighter than the F4F Wildcat, but the Hellcat was a generation later than the F4F and should have been more effective. Also, when comparing the Hellcat with the F4U Corsair, the F6F again reveals a superior record. But compared to the Hellcat, the Corsair had short wartime service as a carrier-based fighter. Nevertheless, all qualifications aside, the F6F still holds its outstanding position.

The questions surrounding relative effectiveness of carrier-based and land-based fighters do not lend themselves to simple answers, and certainly cannot be answered by tables of statistics. For example, it is true that carrier-based fighters hold a superior overall record for the war, but the best annual record was set by their land-based counterparts. In 1945, land-based fighters shot down 507 Japanese aircraft and lost only 14 of their own, thus achieving 36.2 kills for each loss incurred. That year, carrier-based fighters also achieved their best annual record—22 kills for each loss incurred. But these figures do not reveal that the land-based fighters ran up this high score largely against Japanese suicide planes manned by inferior pilots, at Okinawa. This is only one explanation for the difference in the records of land and carrier-based fighters. Other factors include the types of operations—offensive strikes and defensive tactics—which can make a great difference in the picture of statistics at the end of an engagement. My personal opinion is that the difference can be adequately explained only by a thorough investigation of the battle reports, war diaries, aircraft action reports, and squadron histories for World War II. These are available for research at the Navy's Operational Archives, Building 210, Washington Navy Yard, Washington, DC 20374.

Your interest in naval aviation is appreciated. I hope I have helped to answer some of your questions.

Sincerely,

E. R. SEYMOUR
Vice Admiral, USN
Commander

Enclosure

GENERAL A.A. VANDERGRIFT, USMC
GENERAL C.B. CATES, USMC
BG V.E. MEGEE, USMC
MAJ A. HYATT, USMCR
MAJ M. CARL, USMC

OTHER PERSONNEL

JAMES FORRESTAL
CARL VINSON
VANNEVAR BUSH
KARL T. COMPTON
ORVILLE WRIGHT

AERIAL COMBAT DATA, FOR ENTIRE WAR
By Model of Aircraft, Carrier-Based and Land-Based
and for own VF, by Type of Carrier and by Service (Navy-Marine)

BASE PLANE-MODEL TYPE CARRIER, SERVICE	SORTIES ENGAGING ENEMY AIRCRAFT	ENEMY AIRCRAFT		ENEMY AIRCRAFT DESTROYED IN COMBAT		OWN AIRCRAFT CASUALTIES BY ENEMY A/C		ENEMY A/C DESTROYED PER OWN LOSS	PERCENT OF OWN A/C	
		ENGAGED							ENGAGING	
		Bombers	Fighters	Bombers	Fighters	Lost	Damaged		Lost	Damaged
CARRIER-BASED	9820	2974	9792	1997	4487	452	622	14.3	4.6	6.3
F6F	6582	1878	6888	1387	3568	245	419	20.2	3.7	6.4
F4U, FG	1042	200	1026	159	419	34	31	17.0	3.3	3.0
F4F, FM	1175	722	782	384	340	60	49	6.6	5.1	4.1
SB2C, SBW	237	37	243	13	30	18	11	2.4	7.6	4.6
SBD	301	76	357	31	75	43	66	2.5	14.3	21.9
TBF, TBM	429	60	458	22	50	27	46	2.7	6.3	10.7
TBD	54	1	38	1	5	25	0	0.2	46.3	0.0
LAND-BASED^e	4488	1617	6846	759	2048	455	545	6.2	10.1	12.1
F4U, FG	2258	462	3617	319	1241	155	231	10.1	6.9	10.2
F6F	393	76	482	58	150	25	38	8.3	6.4	9.7
F4F	704	653	948	228	375	131	62	4.6	18.6	8.8
F2A	17	31	15	6	4	14	3	0.7	82.4	17.6
SBD	163	2	351	0	32	36	26	0.9	22.1	16.0
SB2U	11	0	25	0	6	1	0	6.0	9.1	0.0
TBF-TBM	94	2	142	1	25	20	34	1.3	21.3	36.2
PB4Y	595	275	979	125	181	28	99	10.9	4.7	16.6
PV	76	22	107	8	12	6	9	3.3	7.9	11.8
PBJ	11	2	8	0	0	0	0	#	0.0	0.0
PBY	101	56	110	0	9	36	32	0.3	35.6	31.7
PBM	47	26	56	6	10	3	6	5.3	6.4	12.8
PB2Y	17	10	4	7	1	0	5	#	0.0	29.4
F6F, CV, Navy	4712	1295	5115	933	2641	185	*	19.3	3.9	*
F6F, CVL, Navy	1712	508	1689	406	876	58	*	22.1	3.4	#
F6F, CVE, Navy	158	62	83	48	51	2	*	49.5	1.3	*
F6F, Land, Navy	307	25	423	12	103	23	*	5.0	7.5	*
F6F, Land, USMC	86	51	59	46	47	2	*	46.5	2.3	*
F4U, CV, Navy	603	131	610	100	260	18	*	20.0	3.0	*
F4U, CV, USMC	419	63	416	53	159	16	*	13.3	3.8	*
F4U, CVE, USMC	20	6	0	6	0	0	*	#	0.0	*
F4U, Land, Navy	215	23	423	19	141	14	*	11.4	6.5	#
F4U, Land, USMC	2034	439	3194	300	1100	141	*	9.9	6.9	*
F4F, CV, Navy	409	409	370	185	109	44	*	6.7	10.8	*
F4F, CVE, Navy	13	8	5	5	3	3	*	2.7	23.1	*
F4F, Land, Navy	245	132	316	53	94	56	*	2.6	22.9	*
F4F, Land, USMC	459	521	423	12	103	75	*	1.5	16.3	*
FM, CVE, Navy	753	305	407	194	228	13	26	32.5	9.7	3.5

No losses.

@ Includes a negligible amount of combat by planes of unidentified types, not shown separately.

* Data not available.



DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

IN REPLY REFER TO

HDH-2/FMS/588/sa
5750
6 July 1978

Mr. Hugh L. Hanson
28062 Calle Casal
Mission Viejo, California 92675

Dear Mr. Hanson:

In response to your recent letter, we have enclosed an interesting extract from "Men and Planes" Vol 6, The Army Air Forces In World War II. This extract mentions the P-51 Mustang as the best all-around fighter in the U.S. inventory during World War II. Of course the opinions on this subject vary as to criteria, but from a performance standpoint the Mustang had many noteworthy advantages over the other fighter aircraft of this period.

The most "effective" Navy/Marine Corps fighters of the Pacific Theater were the F6F Hellcat and F4U-A1 Corsair with kill ratios of nineteen to one and eleven to one respectfully. From the secondary source information available to this Division, we believe that the P-47 Thunderbolt was probably the most effective Army Air force fighter with respect to kill ratio used in World war II. The Thunderbolt saw combat in both the European and Pacific Theaters.

Thank you for your interest in Marine Corps history.

Sincerely,

G. M. NEUFELD
Head, Reference section
History and Museums Division

Encl: (1) Fortitudine, Spring 1978
(2) Army Air Forces for World war II



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
WASHINGTON, D.C. 20361

IN REPLY REFER TO

12 OCT 1977

Mr. Hugh L. Hanson
28062 Calle Casal
Mission Viejo, California 92675

Dear Mr. Hanson:

In your letter of 22 September, you asked our opinion as to which United States fighter aircraft was the most effective in World War II. Of course, we can speak only for the Navy and must let the Air Force voice its own opinion regarding other aircraft of that era.

The two outstanding Naval fighters of the war were the F4U Corsair and the F6F Hellcat. During the war years, the Navy accepted about 11,400 of the former and about 12,200 of the latter. The Corsair shot down a total of 2,140 enemy aircraft and suffered a loss figure of 189, ending the war with a ratio of eleven to one. The Hellcat shot down 5,156 enemy aircraft and suffered a loss of 270, ending the war with a ratio of nineteen to one. Obviously, the Hellcat has a substantial edge over the Corsair as the most effective Navy fighter of the war.

For information on non-Navy aircraft, I suggest that you write to Major General John W. Huston, USAF, Chief, Office of Air Force History, Washington, D. C. 20314.

I appreciate your interest in aviation and hope that this response is helpful.

Sincerely,

A handwritten signature in cursive script, which appears to read "F. S. Peteresen", is written over a horizontal line.

F. S. PETERESEN
Vice Admiral, USN
Commander



COMMANDER IN CHIEF PACIFIC
AND
UNITED STATES PACIFIC FLEET
C/O FLEET POST OFFICE
SAN FRANCISCO, CALIFORNIA

July 23, 1950

Dear Hugh:

A very belated reply to your letter of April 25th which arrived during the time that I was travelling extensively in the Pacific. I was away from Pearl Harbor from about the middle of April until almost the middle of June, and I no sooner returned--trying to dig my way out of a pile of correspondence--when this emergency occurred. As you can imagine, all hands have been quite busy for the last four weeks.

In regard to the question you posed as to why statistics show carrier air based aircraft to be three times as effective as land based aircraft in the Pacific during World War II, my feelings are as follows:

- (1) Navy basic and squadron training was far more thorough than that of the Air Force, and individual squadrons were far more ready for action when they went in than the Air Force squadrons. Also another contributing factor in this respect was our system of replacing whole squadrons versus replacing individuals after so many missions--their system kept over all squadron efficiency lower.
- (2) At the point of contact the Navy carrier based planes usually had more superiority than land based planes, and that, as you can imagine, counts heavily. In many respects Navy fighters were actually better aircraft than the Air Force's counterparts.
- (3) and last, the Navy and the Marine Corps have an esprit de corps that no other service as yet has been able to match.

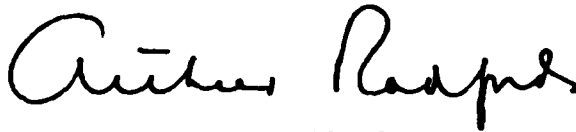
- 1 -

- 2 -

Hope this will help you somewhat, and that you will understand that I have dictated these answers rather hastily. They cover the main points, but there are many contributing factors that go back to the basic organization in Washington.

With kindest personal regards and the hope that you are studying the results of the present actions with interest. When this is all over I hope that some of our long range planning can be radically changed.

Best of luck always.

A handwritten signature in cursive script that reads "Arthur Radford". The signature is written in dark ink and is centered on the page.

Arthur Radford

Mr. Hugh L. Hanson,
1515 Fairfield Street,
Glendale 1, California.

THE SECRETARY OF DEFENSE
WASHINGTON

2 December 1948

My dear Mr. Hanson:

The work I had in mind for you when we talked in September was with Dr. Vannevar Bush who, as you know, has since retired as Chairman of the Research and Development Board.

His successor is Dr. Karl T. Compton. I suggest that you make an appointment with him, and I shall speak to him about it.

Sincerely yours,



James Forrestal

Hugh L. Hanson, Esq.
2877 S. Buchanan St.
Arlington, Va.



DEPARTMENT OF THE NAVY

OFFICE OF NAVAL RESEARCH

WASHINGTON 25, D. C.

June 28, 1957

ONR:710:esw

P14-2-12

Ser

From: Chief of Naval Research

To: Hugh Lowell Hanson

Subj: Roster of key scientists and engineers

1. The roster of key scientists and engineers being established by the Office of Naval Research may facilitate professional recognition of Navy's scientists and engineers in standard biographical reference works.
2. Your questionnaire has been reviewed, and as a result, you have been nominated for possible inclusion in the next issue of American Men of Science, Who's Who in America and Who's Who in Engineering.

Edward McCremsky

EDWARD McCRENSKY

By direction

APPENDIX B

TABLES

TABLE B-1 WORLD WAR II FIGHTER AIRCRAFT LOSSES IN THE AIR.
U.S. ARMY AIR FORCES (USAAF) VS ENEMY IN THE AIR.

TABLE B-2 NAVY-MARINE FIGHTER AIR-TO AIR-COMBAT DATA -
WORLD WAR II CARRIER VS LAND BASED

TABLE B-3 VIETNAM AIR-TO-AIR COMBAT DATA -- USN, USAF

TABLE B-4 THE MOBILITY FACTOR

WORLD WAR II FIGHTER AIRCRAFT
LOSSES IN THE AIR
US ARMY AIR FORCES (USAAF)
vs ENEMY IN THE AIR

	<u>AAF LOSS</u>	<u>ENEMY LOSS</u>	<u>LOSS (KILL) RATIO</u>
EUROPEAN THEATER	1,691	7,422	4.4
MEDITERRANEAN THEATER	1,327	3,300	2.5
PACIFIC OCEAN AREAS	33	370	11.2
FAR EAST	583	2,709	4.7
CHINA-INDIA-BURMA	295	847	2.9
ALASKA & 20TH AAF	20	34	1.7
TOTALS	3,949	14,682	3.7

SOURCE: USAAF STATISTICAL DIGEST DEC 1945
(REF LTR TO H L HANSON FROM MAJ GEN JOHN W HUSTON, USAF
CHIEF, OFFICE OF AF HISTORY DTD 6 JUNE 1978)

ALL COMBAT LOSSES

EUROPE & MEDITERRANEAN	22,948	40,259	1.8
PACIFIC, Etc	4,530	10,343	2.3
TOTALS	27,478	50,602	1.8

NAVY-MARINE FIGHTER AIR-TO-AIR
COMBAT DATA-WORLD WAR II
CARRIER vs LAND-BASED

<u>BASE AND TYPE OF AIRCRAFT</u>	<u>US LOSS</u>	<u>ENEMY LOSS</u>	<u>LOSS (KILL) RATIO</u>	<u>CARRIER VS LAND BASED KILL RATIOS</u>
<u>CARRIER-BASED</u>				
FGF HELLCAT	245	4,955	20.2	2.4
F4U, FG CORSAIR	34	578	17.0	1.7
F4F, FM WILDCAT	<u>60</u>	<u>724</u>	<u>12.1</u>	<u>2.6</u>
TOTALS	339	6,257	18.5	2.5
<u>LAND-BASED</u>				
FGF HELLCAT	25	208	8.3	
F4U, FG CORSAIR	155	1,560	10.1	
F4F, FM WILDCAT	131	603	4.6	
F2A BUFFALO	<u>14</u>	<u>10</u>	<u>0.7</u>	
TOTALS	325	2,381	7.3	
<u>COMBINED TOTALS</u>	664	8,638	13.0	

VIETNAM AIR-TO-AIR COMBAT DATA -- USN, USAF

<u>Southeast Asia Air-to-Air Combat</u>									
	<u>MiGs Killed</u>	<u>U.S. a/c Shot Down</u>	<u>Overall Kill Ratio (MiG/U.S.)</u>	<u>USAF</u>			<u>NAVY^b</u>		
				<u>MiGs Killed</u>	<u>Losses</u>	<u>Ratio</u>	<u>MiGs Killed</u>	<u>Losses</u>	<u>Ratio</u>
1965	5	4	1.25	2	3	0.67	3	1	3.00
1966	22	9	2.44	16	5	3.20	6	4	1.50
1967	69	25	2.76	55	21	2.62	14	4	3.50
1968	14	10	1.40	8	7	1.14	6	3	2.00
1969	0	0	—	0	0	—	0	0	—
1970	1	0 ^a	∞	0	0 ^a	—	1	0	∞
1971	0	1	∞	0	1	∞	0	0	∞
1972	71	26	2.73	47	23	2.04	23	2	11.50
1973	2	0	∞	1	0	∞	1	0	∞
TOTAL	184	75^a	2.45	129	60	2.15	54	14	3.85

^a Plus 1 U.S. helicopter shot down by a MiG
^b Does not include USMC, which shot down 1 MiG-21 with 1 F-4 lost in 1972, for a 1:1 kill ratio

armed forces JOURNAL international/May 1974

<u>What Plane Killed the MiGs?</u>				
	<u>USAF</u>	<u>USN & USMC</u>	<u>TOTAL</u>	<u>%</u>
F-4	104	33	137	74
F-105	23	—	23	13
F-8	—	18	18	10
A-1	—	2	2	1
A-4	—	2	2	1
B-52	2	—	2	1
TOTAL	129	55	184	100%

VIETNAM AIR-TO-AIR COMBAT DATA -- USN, USAF

Who Killed Which MiGs?				
	USAF	USN & USMC	TOTAL	%
MiG-17	56	36	92	50
MiG-19	8	2	10	5
<u>MiG-21</u>	<u>65</u>	<u>17</u>	<u>82</u>	<u>45</u>
TOTAL	129	55	184	100%
% Kills	70%	30%	100%	100%
Losses	60 ^a	15	75 ^a	100%
% Losses	80%	20%	100%	100%

* Does not include 1 helicopter shot down by a MiG

How the Vietnam Air War Changed					
4-Year Period	MiGs Killed	U.S. Losses	Overall Kill Ratio	USAF Ratio	USN Ratio ^d
1965-1968	110	48	2.29	2.25	2.42
1970-1973	<u>74^a</u>	<u>27^b</u>	<u>2.74</u>	<u>2.00^c</u>	<u>12.50</u>
TOTAL	184	75	2.45	2.15 ^c	3.86

Note: No planes were shot down on either side in 1969 air-to-air combat.

a Two of the 74 MiG kills in this period were by B-52 tail gunners during the Linebacker II 1972-1973 bombing offensive.

b Does not include 1 U.S. helicopter shot down by a MiG in 1970.

c If the 2 B-52 MiG kills are excluded, the Air Force's kill ratio in the last four years of the air war over North Vietnam is reduced to 1.92:1 and to 2.12:1 for the entire war.

d Does not include USMC, which shot down 1 MiG-21 and lost 1 F-4 in 1972.

THE MOBILITY FACTOR

To fully illustrate the value of mobility it is necessary to look at the full probability equation to determine enemy effectiveness:

$$P_E = P_{DE} \times P_I \times P_L \times P_S \times P_H \times P_{DA}$$

	<u>Fixed</u>	<u>Mobile</u>
	<u>Base and/or Weapon</u>	<u>Base and/or Weapon</u>
P_{DE} : Probability of target detection	1.0	0.2 - 0.7
P_I : Probability of target identification	1.0	0.1 - 0.6
P_L : Probability of localizing target or moving within range	1.0	0.8
P_S : Probability of base and/or weapon survivability	0.5	0.5
P_H : Probability of base and/or weapon sustaining a hit	0.9	0.7
P_{DA} : Probability of base and/or weapon receiving damage	0.5	0.9
P_E : Probability of enemy effectiveness	0.225	0.005 - 0.106

Note: The probability values given above are arbitrary, but serve to illustrate the value of mobility.

APPENDIX C

USAF CORRESPONDENCE

MISC CORRESPONDENCE

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON, D.C.



Hugh L. Hanson
28062 Calle Casal
Mission Viejo
CA 92675

5 MAR 1980

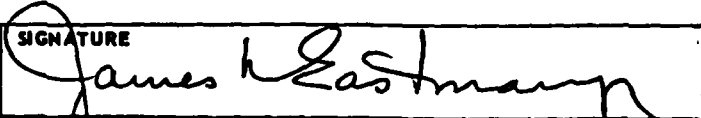
Dear Mr. Hanson

I am replying for Dr. Hans Mark, Secretary of the Air Force, to your 14 Feb 1980 letter regarding the most effective fighter aircraft of World War II. We have checked our records here and at the Albert F. Simpson Historical Research Center AFSHRC, at Maxwell AFB, Alabama for the information you requested:- "Based on air to air combat kill ratios, what was the most effective fighter aircraft of World War II?" We have been unable to locate any such comparisons or measures of merit for combat kill ratios. Such statistics were never compiled probably because of the number of variables involved. There were many different USAAF pursuit/fighter aircraft employed during the war (e.g., P-38, P-39, P-40, P-47, P-51, P-400), and within the basic types, there were vast differences in production models (e.g., the P-47N used in the Pacific differed significantly from the P-47D in the European theater). These variations coupled with the vast number of different enemy aircraft types, (e.g., in the European theater alone, the FW-190, ME-109, ME-110, ME-210, AR-234, ME-262, among others), would have meant that to be meaningful, comparisons for each possible combination would be needed. These comparisons were apparently not considered necessary and were not made.

I am sorry we were unable to provide the answer to your specific question but it is clear that the information which you seek has not been compiled.

Sincerely


JOHN W. HUSTON, Maj Gen, USAF
Chief, Office of Air Force History

SUBJECT: Request for Material Info on fighter aircraft		DATE: 7 Mar 79
TO: Hugh L. Hanson 28062 Calle Casal Mission Viejo CA 92675	FROM: The Albert F. Simpson Historical Research Center, USAF HO Maxwell AFB, AL 36112	
1. Material requested <input type="checkbox"/> will have to be compiled. <input type="checkbox"/> is attached. <input type="checkbox"/> will be distributed automatically.	AFSHRC/HOR Maxwell AFB AL 36112 to cover. <input type="checkbox"/> will be sent as soon as possible.	
2. Material requested cannot be provided because it <input type="checkbox"/> cannot be loaned. <input type="checkbox"/> cannot be reproduced. <input type="checkbox"/> is not available. <input type="checkbox"/> is in single copy. <input type="checkbox"/> is classified.		
3. Material requested is available on 16 mm microfilm, roll number(s) _____ Although the Research Center maintains rigid microfilm processing quality controls, readability of offered microfilm cannot be guaranteed. While most is highly readable, some is not because of the poor quality of the original document and inherent limitations in all copying processes, as well as some reading equipment.		
14. Request for extension granted. New suspense date will be: _____		
15. Request return of material forwarded on Document Receipt Number _____ dated _____ with a suspense date of _____		
16. Remarks: Your letter to the Library of Congress was referred to us. However, as we told you on 14 Feb 1978, we do not have the statistical information necessary to answer this question. The effectiveness of aircraft was as much a function of the use and the pilot as of the aircraft itself. For example, the P-51 was faster, lighter, and more maneuverable than the P-47. Yet in April 1945, a young 1st Lieutenant flying the heavier, slower P-47 succeeded through outstanding pelatage in shooting down a German ME-262 jet flown by one of Germany's leading aces, General Adolf Galland. Further victory credits were maintained by the name of the pilot--no effort was made at that time to record the aircraft that they were flying. Because units transitioned from earlier aircraft to later aircraft and because these change-overs often took six to ten months or more, it often is extremely difficult to tell whether a pilot was flying the earlier aircraft or later aircraft.		
TYPED NAME AND TITLE JAMES N. EASTMAN, JR, Chief, Rsch Br	SIGNATURE 	

3800 FORM 0-245
SEP 77

PREV EDIT WILL BE USED



THE LIBRARY OF CONGRESS

WASHINGTON, D.C. 20540

ASSOCIATE LIBRARIAN FOR MANAGEMENT

January 4, 1979

Dear Mr. Hanson:

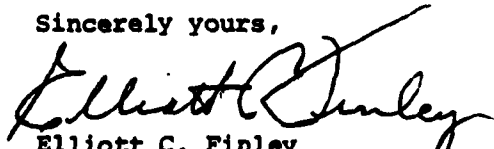
Your recent communication addressed to the Library of Congress has been referred to

United States Air Force
Mr. Albert F. Simpson Historical Research
Center
AFSHRC
Maxwell AFB, Alabama 36112

for action.

Any further correspondence with regard to this matter should be sent directly to the address above.

Sincerely yours,


Elliott C. Finley
Chief, Central Services Division

Mr. Hugh L. Hanson
28062 Calle Casal
Mission Viejo, California 92675

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON, D.C.
20314



6 JUN 1978

Mr. Hugh L. Hanson
28062 Calle Casal
Mission Viejo, CA 92675

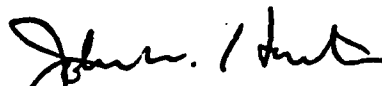
Dear Mr. Hanson.

Enclosed is an extract from the Army Air Forces Statistical Digest - World War II that provides general statistics about airplane losses on combat missions and enemy aircraft destroyed during World War II.

Unfortunately our collated data does not break out the figures the way you desire them in terms of either our losses or those of enemy forces. That information is able to be obtained only through your research of our records by you or your representative. You may wish to visit our Albert F. Simpson Historical Research Center where we would be pleased to assist your efforts to undertake additional study. A pamphlet describing that depository also is enclosed. Besides the original documentation located at the Simpson Center, most of the holdings have been microfilmed, and the microcopy can be made available to researchers who visit our Washington office.

We would welcome your visit to either of our facilities if you decide to pursue your project further.

Sincerely


JOHN W. HUSTON, Maj Gen, USAF
Chief, Office of Air Force History

2 Atch
1. Extract
2. Pamphlet

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE/CHO
WASHINGTON, D.C. 20314



3 MAY 1978

Mr. Hugh L. Hanson
28062 Calle Casal
Mission Viejo
California 92675

Dear Mr. Hanson:

I appreciate your letter of 20 April 1978 expressing disbelief "that the Air Force records are in such poor shape". We will continue to believe that our records, as they are evaluated by professional archivists and historians, are well above the standards established for them.

Your initial letter of November 3, 1977, to which we responded, asked for a subjective determination "of the two most effective fighter aircraft used by the Air Corps during World War II". Note effectiveness, like beauty, is in the eye of the beholder. Do you mean most effective in terms of enemy kills? Do you mean effectiveness in terms of firepower, escort duty, photo reconnaissance, strafing and close troop support? Do you mean effectiveness in terms of which fighters were most capable of sustaining battle damage? Also, do you mean over the entire course of the war as there were some fighters, such as the P-40 which played a significant role in the early days but were later overshadowed by technologically superior later ones? My point is that "effective" needs a specific definition.

This office answers more than 1,700 written inquiries each year and a greater number of oral ones. We will be happy to answer any you pose which are within our capability, but I feel that subjective analysis of such a question as "the two most effective aircraft used by the Air Corps during World War II" is not possible without more precise definition of "effective" as well as other delimitations.

Sincerely,

A handwritten signature in cursive script, appearing to read "John W. Huston".

JOHN W. HUSTON, Maj Gen, USAF
Chief, Office of Air Force History

SUBJECT: Request for Material		DATE:
Fighter aircraft used by the Air Corps during WWII		14 Feb 78
TO: Hugh L. Hanson 28062 Calle Casal Mission Viejo CA 92675	FROM: The Albert F. Simpson Historical Research Center, USAF HO Maxwell AFB, AL 36112	
1. Material requested <input type="checkbox"/> will have to be compiled. <input type="checkbox"/> is being forwarded under separate cover. <input type="checkbox"/> is attached. <input type="checkbox"/> will be distributed automatically. <input type="checkbox"/> will be sent as soon as possible.		
2. Material requested cannot be provided because it <input type="checkbox"/> cannot be loaned. <input type="checkbox"/> cannot be reproduced. X <input checked="" type="checkbox"/> is not available. <input type="checkbox"/> is in single copy. <input type="checkbox"/> is classified.		
3. Material requested is available on 16 mm microfilm, roll number(s) _____ Although the Research Center maintains rigid microfilm processing quality controls, readability of offered microfilm cannot be guaranteed. While most is highly readable, some is not because of the poor quality of the original document and inherent limitations in all copying processes, as well as some reading equipment.		
4. Material requested may be purchased for \$ _____, Make check or money order for exact amount stated and payable to AFO, Maxwell AFB, AL 36112, and send it to AFSHRC/HOA.		
<p>We cannot answer your questions. There is no general agreement on what the "most effective fighter" was during WWII. We have enclosed an extract from the WWII "Statistical Digest" which lists that number of fighters accepted by the AAF, but there is no way for us to readily determine what particular type of fighter shot down the most enemy aircraft, or was itself most shot down by enemy aircraft.</p>		
TYPED NAME AND TITLE		SIGNATURE
JAMES N. EASTMAN, JR. Chief, Research Branch		<i>James N. Eastman, Jr.</i>

FEB 14 1978

3800 FORM SEP 77 0-245

PREV EDIT WILL BE USED

LMEL

-83