

DOCUMENT RESUME

00099 - [A1051832]

Using Aviation Resources in the United States More Efficiently. LCD-76-445; B-164497(1). March 31, 1977. 65 pp. + appendices (28 pp.).

Report to the Congress; by Elmer B. Staats, Comptroller General.

Issue Area: Facilities and Material Management (700).

Contact: Logistics and Communications Div.

Budget Function: National Defense: Department of Defense - Military (except procurement & contracts) (051).

Organization Concerned: Department of Defense; Department of the Army; Department of the Navy; Federal Aviation Administration; Department of Commerce; Department of Transportation; Department of the Air Force.

Congressional Relevance: House Committee on Armed Services; Senate Committee on Armed Services; Congress.

Authority: P.L. 87-843, sec. 304; OMB Circular A-62. Federal Aviation Administration Act of 1958. P.L. 85-726, sec. 803.

There are 12,000 airfields in the United States, of which more than 4,000 serve the general public and the military community. To promote safety, manage airspace and resources, and provide the required logistics for these functions, the Federal Government has invested more than \$1.6 billion to support aviation. Findings/Conclusions: The Departments of Commerce, Defense, and Transportation provide overlapping services, including weather information dissemination and airspace management, much of which could be more efficiently managed and coordinated. The military services and the Federal Aviation Administration (FAA) unnecessarily operate radar approach control facilities independently in adjoining airspace sectors. All three departments operate duplicating weather facilities in some areas, which leads to excessive personnel requirements. FAA and the military developed navigational aids independently, and the military departments are maintaining rarely used navigational equipment. In addition, some military airfields operate when air traffic is virtually nonexistent. Legislation delegated the principal responsibility for aviation functions and air safety to Transportation and Commerce, and permitted the necessary latitude for the Defense Department to fulfill its national defense responsibilities. Lack of coordination among the three departments has resulted in inefficient use of facilities and personnel. Recommendations: The departments involved should support a high level effort to develop ways in which aviation requirements can be planned and coordinated to assure economy and efficiency. Collectively, civilian and military aviation support functions should be reviewed; services that can be consolidated, eliminated, or curtailed should be identified; and similar services within the agencies and departments should be taken advantage of. (Author/SS)

00099

REPORT TO THE CONGRESS

*BY THE COMPTROLLER GENERAL
OF THE UNITED STATES*

Using Aviation Resources In The United States More Efficiently

There are 12,000 airfields in the United States and over 4,000 of these serve the general public and military community. The Federal Government spends millions annually to promote safety in the Nation's airspace.

A high concentration of federally operated airfields in some parts of the country such as California, Hawaii, and Virginia offer excellent potential to consolidate and share functions and facilities, make better use of Federal support of aviation, and reduce costs.



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-164497(1)

To the President of the Senate and the
Speaker of the House of Representatives

The Federal Government spends millions of dollars annually to promote safe operation of aircraft in the Nation's airspace. This report identifies opportunities available to Government agencies to consolidate and share functions and facilities and to reduce Government investment and expenditures for Federal support of aviation.

In view of the number of airfields in operation and the similarity in supporting activities, we reviewed selected civilian and military airfields to see if any effort is being made to avoid unnecessary duplication and to limit the Government's investment in aviation support.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Office of Management and Budget; the Secretary of Commerce; the Secretary of Defense; and the Secretary of Transportation.

A handwritten signature in black ink, reading "Luther B. Starks".

Comptroller General
of the United States

REPORT OF THE
COMPTROLLER GENERAL
OF THE UNITED STATES

USING AVIATION RESOURCES
IN THE UNITED STATES
MORE EFFICIENTLY

D I G E S T

There are 12,000 airfields in the United States, of which over 4,000 serve the general public and the military community. To promote safety, manage airspace and resources, and provide the required logistics for these functions, the Federal Government has invested over \$1.6 billion and spends about \$865 million annually to support aviation in the United States.

It makes its investment and carries out its support through the Departments of Commerce, Defense, and Transportation.

The three departments provide overlapping services. For example,

--Each is involved in disseminating weather information.

--Defense and Transportation, through its Federal Aviation Administration, are involved in airspace management requiring large investments in similar navigational aid equipment and personnel skills.

In sum, American civilian and military activities--providing weather information facilities, flight planning and airspace management facilities, navigational aids, fire departments, maintenance facilities, ground support equipment, ground transportation, food service, fuel, runways and ramps--could be reduced or in some cases eliminated. The result would be more effective management and coordination of these activities.

Specifically:

--The military services and the Federal Aviation Administration are operating radar

approach control facilities independently in adjoining airspace sectors even though a single facility could manage the combined area. At Norfolk Regional Airport in Virginia, a Federal Aviation Administration-operated facility has the capability to cover the Norfolk area and reduce the need for the Navy's facility 11 miles away at Oceana Naval Air Station. (See pp. 6 and 59.)

- Defense, Commerce, and the Federal Aviation Administration operate many weather facilities which, in many areas, become duplicate support capabilities. (See p. 42.)
- In central California the agencies are forecasting weather, preparing flight briefings, and performing other tasks which overlap. Civilian and military personnel skills are extensive and can be merged in some areas. (See p. 43.)
- The Federal Aviation Administration and the military developed navigational aids independently of each other (p. 27), and the military departments are maintaining rarely used navigational equipment (p. 36). Some military bases operate with as many as four navigational aid systems unnecessarily. (See p. 29.)
- Military airfields are operating and/or providing support services when air traffic is virtually nonexistent. In the Norfolk area, military installations operate transient maintenance, ground controlled approach radar systems, and weather facilities 24 hours a day even though late night and early morning hours air traffic activity is low and services could be obtained from nearby commercial facilities. (See p. 58.)

The Congress enacted laws placing overall management responsibility for aviation functions and air safety under Transportation and Commerce. These laws delegate this responsibility to the military only where the military must support unique operational requirements.

This permits the Secretary of Defense the necessary latitude to fulfill his national defense responsibilities.

The absence of effective coordination between these departments is resulting in inefficient use of facilities and personnel which are a considerable drain on Federal resources.

Existing procedures do not require that civil agencies and the military review aviation support functions on a collective basis. (See pp. 11 and 15.)

GAO recommends that the Administrator of the Federal Aviation Administration, the Secretary of Defense, and the Secretary of Commerce support a high level effort emphasizing the development of ways by which the three agencies can plan and coordinate aviation requirements to assure economy and efficiency and reduce cost. They should collectively

- review civilian and military aviation support functions;
- identify services that can be consolidated, eliminated, or curtailed; and
- take advantage of similar services available within or between the agencies and departments. (See pp. 20, 37, 52, and 62.)

Defense and Transportation agree that increased planning and coordinating of aviation support functions is needed. (See pp. 66 and 88.)

The Administrator, National Oceanic and Atmospheric Administration, commenting for the Secretary of Commerce, was willing to work with Defense and Transportation to make weather services more economical and efficient. (See p. 89.)

Defense and Transportation state that these problems can be dealt with effectively through

existing activities in the three departments. But it is Transportation's belief that since the Defense Department has long assumed the position that at many locations military provision of aviation support is vital to defense needs, the Federal Aviation Administration should not question the validity of Defense's decisions.

GAO believes that top-level managers in these agencies should reassess their aviation requirements and resources and study ways for further coordination and reliance on the capabilities available in both the civilian and military aviation communities.

C o n t e n t s

		<u>Page</u>
DIGEST		i
CHAPTER		
1	INTRODUCTION	1
	Scope of review	2
2	MORE EFFICIENT USE OF THE NATION'S AIRFIELDS THROUGH BETTER MILITARY-CIVIL COOPERATION	4
	The Government's investment in civilian and military airports is extensive	4
	The military-civil relationship	5
	Aviation resources can be shared	11
3	POTENTIAL FOR CONSOLIDATING APPROACH CONTROL FACILITIES	12
	Control of aircraft in airspace	12
	Consolidating approach control opera- tions can result in savings	17
	Conclusion	20
	Recommendation	20
	Agency comments and our evaluation	21
4	DUPLICATE NAVIGATIONAL AID SYSTEMS ARE USED AT MILITARY AIRFIELDS	23
	Categories and functions of navigational aids	23
	Potential for standardization of civil and military equipments	27
	Effective management of navigational aids can reduce duplication	29
	Conclusions	36
	Recommendations	37
	Agency comments and our evaluation	37
5	CONSOLIDATION OF AVIATION WEATHER FACILITIES IS FEASIBLE	40
	Public laws provide for efficient Fed- eral weather support aviation	40
	Duplication among neigh. ng weather stations	42
	Integrating aviation weacher support without harming defense preparedness	50
	Conclusion	52
	Recommendation	52
	Agency comments and our evaluation	53

		<u>Page</u>
CHAPTER		
6	POTENTIAL FOR CURTAILING MILITARY AIRFIELD OPERATIONS	55
	Determining operation hours	55
	Potential to reduce services	56
	Installations having potential to reduce operations	58
	Actions to reduce airport activities	61
	Conclusion	61
	Recommendation	62
	Agency comments and our evaluation	62
7	THE NEED FOR EMPHASIS BY TOP-LEVEL MANAGERS	63
	Recommendation	64
	Agency comments and our evaluation	64

APPENDIX

I	Letter dated November 1, 1976, from Assistant Secretary of Defense (Installations and Logistics) with attachments	66
II	Letter dated November 9, 1976, from Assistant Secretary for Administration, Department of Transportation with enclosures	86
III	Letter dated September 15, 1976, from Administrator, National Oceanic and Atmospheric Administration, Department of Commerce	89
IV	Principal officials responsible for administering activities discussed in this report	90

ABBREVIATIONS

DOD	Department of Defense
FAA	Federal Aviation Administration
GAO	General Accounting Office
GCA	ground controlled approach
VHF	very high frequency

CHAPTER 1

INTRODUCTION

Both the Federal Government and private citizens operate numerous airfields in the United States. These airfields use many support services to insure safe and economical flights and to protect the environment. Over 170,000 aircraft, ranging from small propeller-driven craft to high performance military and commercial jetliners, operate in U.S. airspace. Supporting an aircraft from takeoff to landing requires a vast amount of information, service, and logistic support, such as communications, weather information, navigational support, maintenance, fueling services, personnel needs, and flight route information designed and controlled to insure safe departures and arrivals.

The Federal Government plays a major role in operating the Nation's airways and airports. This is vitally important from a control and safety standpoint. The movement of 20,000 military, 2,600 commercial, and 150,000 private aircraft under uncontrolled conditions would be disastrous. Therefore, the Congress has authorized certain Federal agencies to establish rules, provide necessary service, and coordinate air requirements.

The Federal Aviation Administration (FAA) is responsible for safeguarding flying aircraft and does so through enroute air radar traffic control centers. FAA centers control aircraft flying under Instrument Flight Rules in assigned airspaces. (An airspace is typically a circular area of about 25 nautical miles from an airfield up to an altitude of about 12,000 feet.) However, controlling an aircraft as it approaches an airfield can be the responsibility of FAA or the military services.

While FAA is mandated to manage airspace, it can delegate control of air traffic in some areas to the military services. The Department of Defense (DOD), therefore, has considerable investment in airport operations in the United States.

The Department of Commerce is responsible for providing U.S. weather information for safety of air operations. It provides weather forecast services and maintains a weather gathering network plus forecast offices. DOD also operates weather information systems throughout the world.

In view of the number of airfields in operation and the similarity in supporting activities, we reviewed selected civilian and military airfields to see if any effort is being made to avoid unnecessary duplication and to limit the Government's investment in aviation support.

DOD policy encourages using other Federal agencies' support services when advantageous to the Government. 1/ This reduces unnecessary duplication of Government resources and helps the military services achieve economy and effectiveness by using interservice support.

Several GAC reports 2/ have been issued addressing the opportunities to economize and maximize the use of existing Government facilities through consolidation and interservice agreements.

GAO is now studying increased use of commercial air cargo facilities for moving military freight. In surface transportation, military freight has long moved by carrier personnel. The Department of Defense is phasing out its ocean terminals for military ocean freight and relying increasingly on commercial facilities; and under the provision of Office of Management and Budget Circular A-76, support services are increasingly being contracted to the commercial sector.

SCOPE OF REVIEW

We reviewed public laws and FAA, DOD, Army, Navy, and Air Force regulations, procedures, and documents concerning airport support services. We discussed requirements and capabilities with Government officials at the various agency headquarters and installations.

1/Prescribed in DOD Directive 4000.19, entitled "Basic Policies and Principles for Interservice, Interdepartmental and Interagency Support."

2/"Potential for Greater Consolidation of the Maintenance Workload in the Military Services" (July 6, 1973, B-178736).

"Opportunities to Consolidate Support Functions in the Pacific to Reduce Military Cost" (May 11, 1972, B-160683).

"Productivity of Military Below-Depot Maintenance--Repair Less Complex Than Provided at Depots--Can Be Improved" (Aug. 28, 1975, LCD-75-422).

The principal installations visited were:

Oceana Naval Air Station, Virginia.
Norfolk Naval Air Station, Virginia.
Moffett Field Naval Air Station, California.
Lemoore Naval Air Station, California.
McClellan Air Force Base, California.
Mather Air Force Base, California.
Langley Air Force Base, Virginia.
Fort Eustis, Virginia.
FAA regional office, Los Angeles, California.
Hickam Air Force Base, Hawaii.
Wheeler Army Activity, Wheeler Air Force Base.
Hawaii.
Naval Air Station, Barbers Point, Hawaii.
Marine Corps Air Station, Kaneohe Bay, Hawaii.
Norfolk Regional Airport, Virginia.
Patrick Henry Airport, Virginia.
Sacramento Metropolitan Airport, California.
Sacramento Executive Airport, California.
Honolulu International Airport, Hawaii.
Alameda Naval Air Station, California.
Castle Air Force Base, California.
Fort Ord, California.
San Francisco International Airport, California.
Metropolitan Oakland International Airport,
California.
Weather Service Forecast Office, California.
Flight Service Station, Oakland, California.
Flight Service Station, Sacramento, California.
Flight Service Station, Virginia.
Flight Service Station, Hawaii.

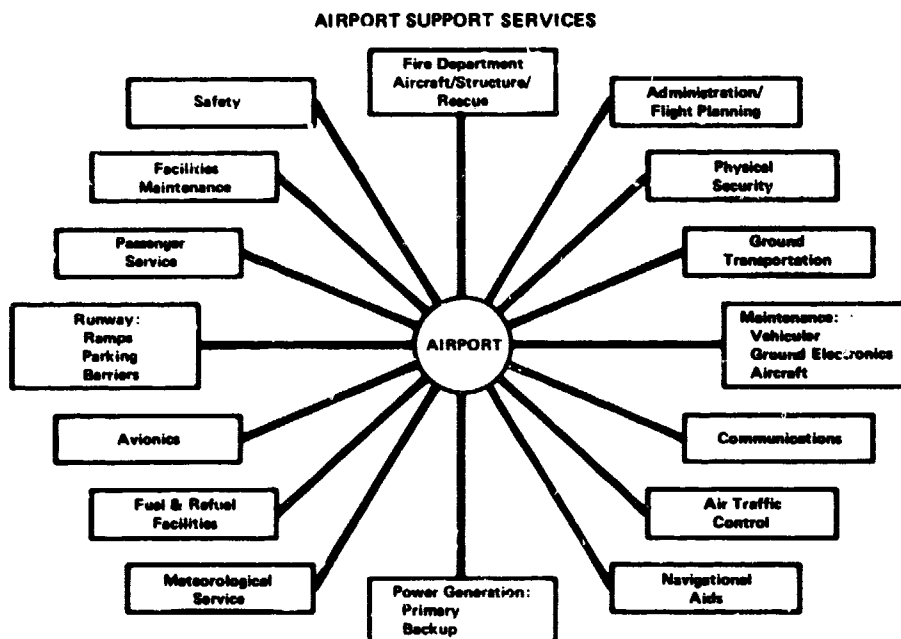
CHAPTER 2

MORE EFFICIENT USE OF THE NATION'S AIRFIELDS THROUGH BETTER MILITARY-CIVIL COOPERATION

Over 12,000 airports are operating in the United States. Many of these airports are small landing strips used only by the general aviation community for landings, takeoffs, and limited service to private (business and pleasure) air traffic. However, about 4,000 airports serve the needs of the general public and the military services. The Government has invested almost \$1.7 billion in facilities to support domestic air traffic control and aircraft weather requirements, and it spends millions of dollars a year to operate and maintain these facilities.

THE GOVERNMENT'S INVESTMENT IN CIVILIAN AND MILITARY AIRPORTS IS EXTENSIVE

Airport operation requires a considerable investment because of the numerous services necessary, such as weather information facilities, flight planning and airspace management facilities, air traffic control, navigational aids, fire departments, maintenance, ground support equipment, ground transportation, food, fuel, runways, and ramps. The support requirements of an operational airport are shown graphically below.



The Government's investment to support air traffic control and weather operations and its annual operating budget for this investment are shown below:

	Estimated value of capital equipment	Estimated operating budget	
		Fiscal year 75	Fiscal year 76
----- (millions) -----			
Air Force	\$ 187.7	\$141.9	\$145.1
Navy/Marine	112.3	41.8	41.8
Army	40.0	15.9	27.9
FAA	<u>1,353.0</u>	<u>591.2</u>	<u>650.2</u>
Total	<u>\$1,693.0</u>	<u>\$790.8</u>	<u>\$865.0</u>

THE MILITARY-CIVIL RELATIONSHIP

To promote economy and efficiency, the Congress enacted laws which placed overall management responsibility for aviation functions under the Departments of Transportation and Commerce. This responsibility can be delegated to the military in cases where it must support unique operational requirements. This gives the Secretary of Defense the necessary latitude to fulfill his national defense responsibilities.

Our study suggests that military assumption of responsibility for aviation support has in many cases gone beyond unique requirements to the point of virtual self-sufficiency of military airports. Operating under a self-sufficient concept, military airports require resources to meet the needs of all likely users under all possible contingencies, thus we have such duplicating services:

- Weather stations, even though civilian weather agencies or other nearby military activities can often provide required information.
- Infrequently used approach and landing navigational aids and backup systems, although neighboring civil or military airports could provide an alternate or backup capability.
- Around-the-clock operations, even though neighboring airports are always open and could handle all flying activity during certain periods.

Coordinating requirements between military and civilian departments having air management responsibility has been primarily a matter of resolving conflicts between aviation support facilities. As long as military support services do not interfere with the civil agencies' management of their aviation support activities, the military seems to move for full control of its airfields and services.

In the Norfolk area, for example, the military and FAA operate approach control facilities. The FAA facility, located at the Norfolk Regional Airport, provides approach control services for the Norfolk Regional Airport, Langley Air Force Base, Norfolk Naval Air Station, Felker Army Airfield, Fort Eustis, and Patrick Henry Airport. These airports are located within 30 miles of the FAA facility. The Navy, however, operates its own approach control facility at the Oceana Naval Air Station to serve only the Oceana area. Since it is only 11 miles away, the Oceana facility could be served by the FAA facility. (See p. 59.)

A similar situation exists in California where an FAA-operated approach control facility at McClellan Air Force Base and an Air Force facility at Travis Air Force Base manage adjacent airspace. According to FAA officials, the airspace of both facilities could be managed by its McClellan facility at substantial savings. (See p. 18.) However, the Air Force has been reluctant to rely on FAA support at Travis and nothing has been done to implement such an economy measure.

DOD policy encourages interagency cooperation

DOD policy Directive 4000.19, entitled "Basic Policies and Principles for Interservice, Interdepartmental and Interagency Support," provides guidance for the services to achieve efficiency and economies through interservice and interagency support arrangements.

The Secretary of Defense in his annual report for fiscal year 1975 stated that:

"The notion that each of the services should be independent of the others so that it doesn't have to rely, as it were, on external sources of support is outdated. We can no longer afford it. We have to now think in terms of Total Force structure as opposed to separate interests."

Also in his fiscal year 1976 report, the Secretary pointed out that applying the principle of mutual support and force interdependence is completely feasible and desirable. Although the Secretary was addressing air defense forces, the principle of interdependence is applicable to a wide range of support requirements and capabilities.

Military officials justify self-sufficiency for each military airfield because of requirements, such as providing a trained force to meet wartime contingencies, stateside assignments for personnel rotating from overseas, and support to meet unique military requirements.

The basic question, therefore, is what constitutes unique military operational requirements. It must be remembered that the civil logistics base of the country, including air terminals and ocean terminals and their accessories, is a potentially powerful military resource. Therefore, the broader problem is to maximize the use or potential use of this resource for military support. To the extent the civil infrastructure necessary to the Nation in peacetime can be used for military support, the less military support will be required and more military resources will be released for direct combat uses. As pointed out in chapter 1, there is a gradual shift by the military to greater use of civil resources for support activities.

The following chapters discuss in detail some of the areas that we feel could be consolidated.

Duplications identified during this review (as listed on p. 8) pertain to:

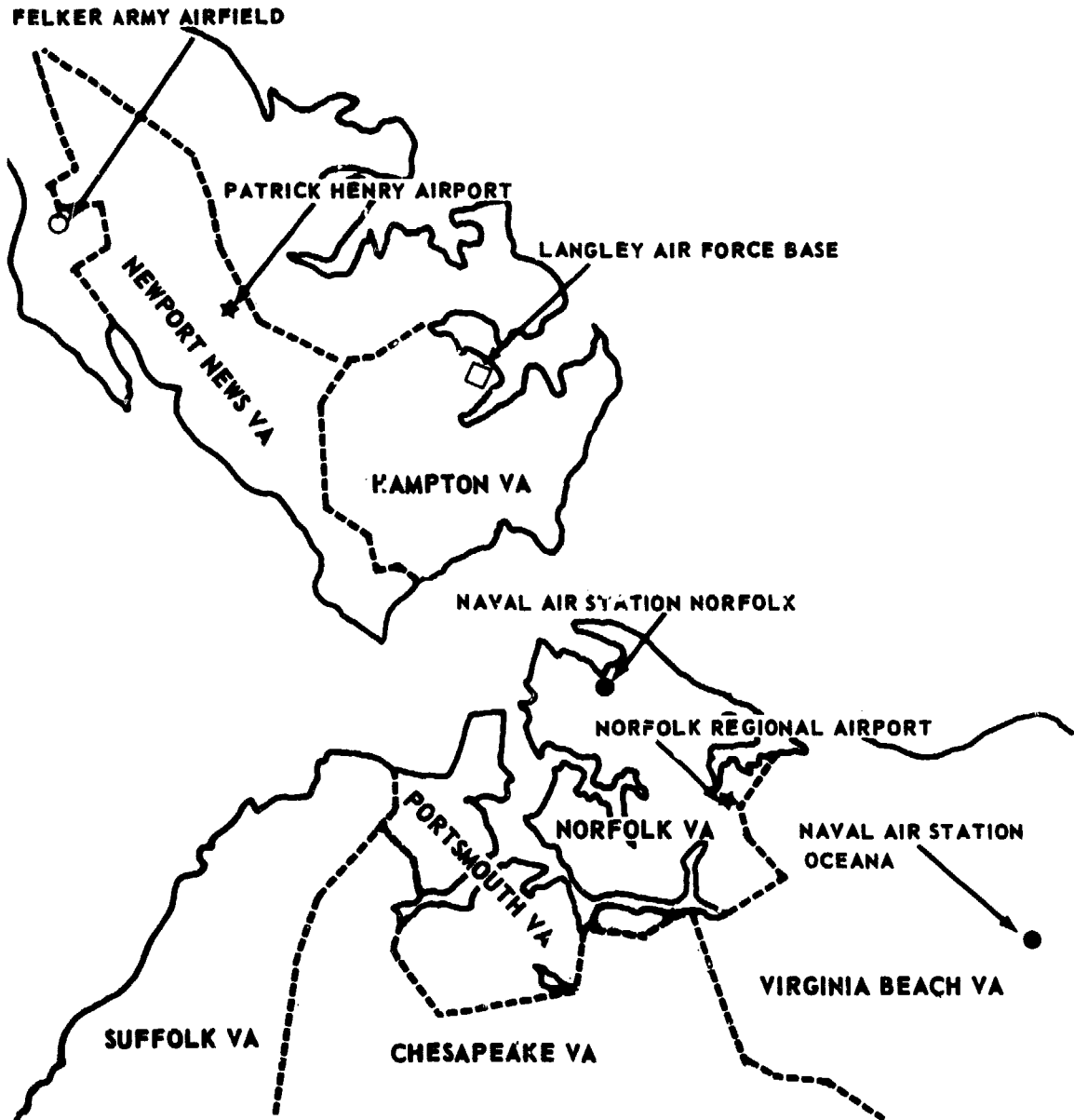
- Management of airspace used for aircraft approaches and departures.
- Multiple navigational aid systems that assist pilots to locate airfields and land aircraft.
- The development and dissemination of weather information to flyers by local weather stations.
- Military around-the-clock support at airfields located near other civilian or military airfields during periods of reduced activity.

EFFECTIVE USE OF AVIATION RESOURCES

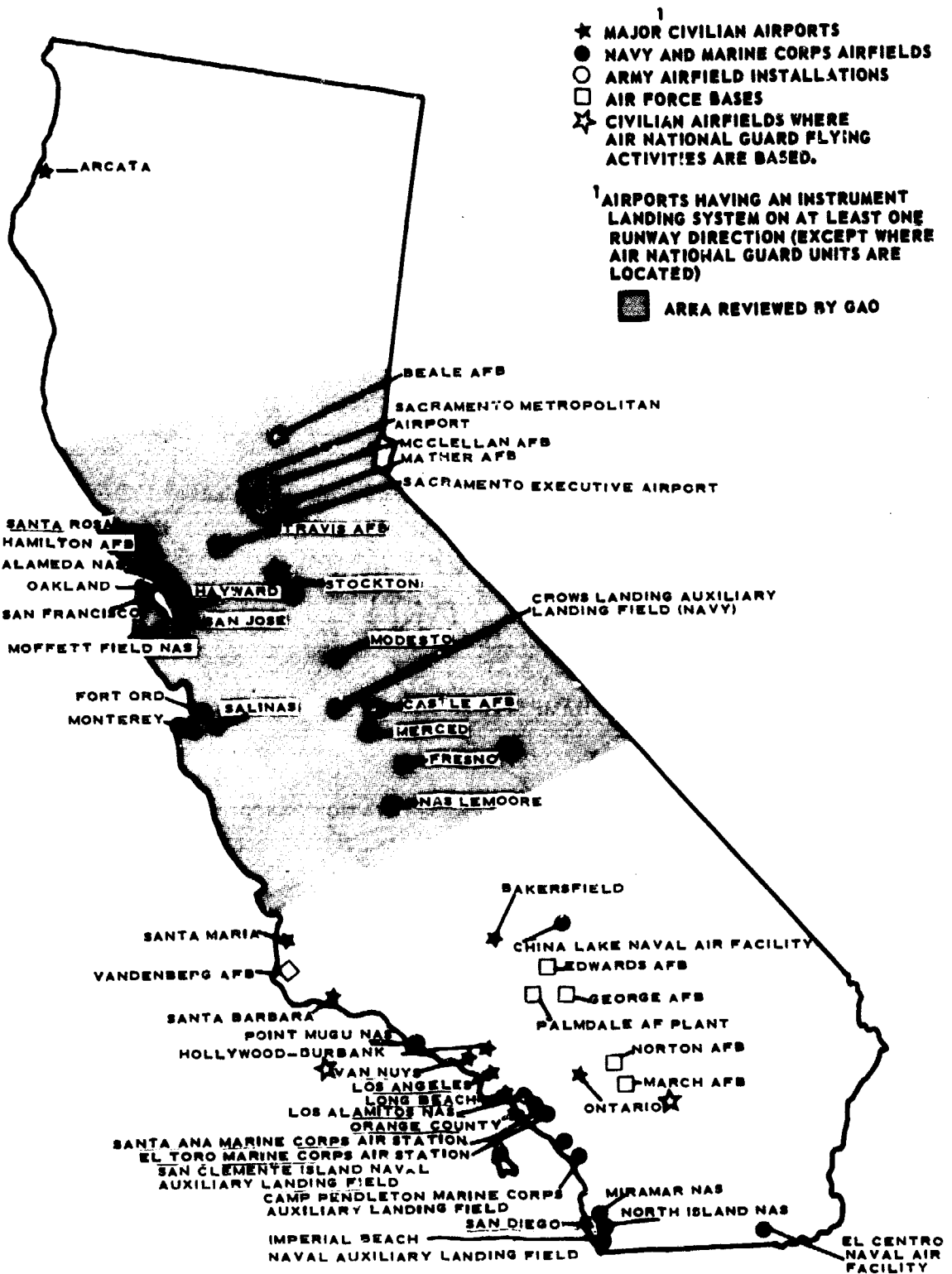
<u>Types of activities</u>	<u>Report reference</u>	<u>Annual savings</u>
		(000 omitted)
1. Curtailing night operations:		
Naval Air Station, Norfolk	p. 60	\$ 40
Langley Air Force Base	p. 58	70
2. Consolidating approach control activities:		
McClellan/Travis Air Force Base	p. 19	450
Naval Air Station Lemoore/ FAA Fresno/Castle Air Force Base	p. 19	338
Marine Corps Air Station Kaneohe Bay Oahu Island	p. 20	3,600
FAA Air Route Traffic Control Facility/Honolulu Approach Control Center	p. 20	1,500
3. Coordination requirements for navigational aid equipment:		
Mather Air Force Base	p. 31	650
4. Potential elimination of non-essential NAVAIDS:		
VHF Omnidirectional Range (VOR)	p. 36	1,600
Nondirectional Beacons (NDB)	p. 36	135
5. Coordinating military and civilian weather requirements:		
Sacramento Area	p. 45	600
Hawaii	p. 47/48	632

NORFOLK, VIRGINIA AREA AIRPORTS

- ★ MAJOR CIVILIAN AIRPORTS
- AIR FORCE BASES
- ARMY AIRFIELD INSTALLATIONS
- NAVY AND MARINE CORPS AIRFIELDS



CALIFORNIA AIRPORTS



AVIATION RESOURCES CAN BE SHARED

Because many services at military and civilian airfields are similar, the greater the concentration of airfields in one vicinity, the greater the potential for sharing resources. The concentration of airports in two geographical areas is illustrated by the maps on pages 9 and 10. Some aviation services are already controlled by a single agency; for example, the responsibility for enroute navigational aid systems belongs to FAA for both the civilian and military communities. On the other hand, radar approach control, which must be provided to safely position aircraft for final landing approach, is provided by both the military services and FAA. Operating under delegation from FAA, the military services operate this approach service at some military airfields as though they are isolated from the rest of the aviation community, even if sharing this service is possible. The approach control facilities operated by the different military services and FAA perform identical functions; although the techniques may vary and the systems are referred to by different names.

<u>Agency/department</u>	<u>Approach control facility</u>
FAA	Terminal Radar Approach Control
Air Force	Radar Approach Control
Navy	Radar Approach Traffic Control Center
Army	Army Radar Approach Control

At some locations local agreements have been made for civilian operated facilities to provide approach control and other services for nearby military bases during periods of light military traffic. FAA, however, has no procedure that we could pinpoint for systematic review of delegated airspace to determine when consolidating approach control facilities might result in lower cost or improved safety and effectiveness.

CHAPTER 3

POTENTIAL FOR CONSOLIDATING

APPROACH CONTROL FACILITIES

Under the Federal Aviation Administration Act of 1958, the Federal Aviation Administration is authorized to provide facilities and establish procedures for regulating air traffic for efficient use of the Nation's airspace. FAA may assign air traffic control authority and related airspace to the military services when it is mutually agreeable. According to FAA officials, in some cases, delegating airspace to the military is not efficient or economical. FAA officials told us that the agency has no procedures for determining when consolidating adjacent approach control facilities may result in lower costs or improved effectiveness.

CONTROL OF AIRCRAFT IN AIRSPACE

FAA has divided air traffic operations into three functions: enroute control, approach control, and airport traffic/terminal control. (See p. 13.)

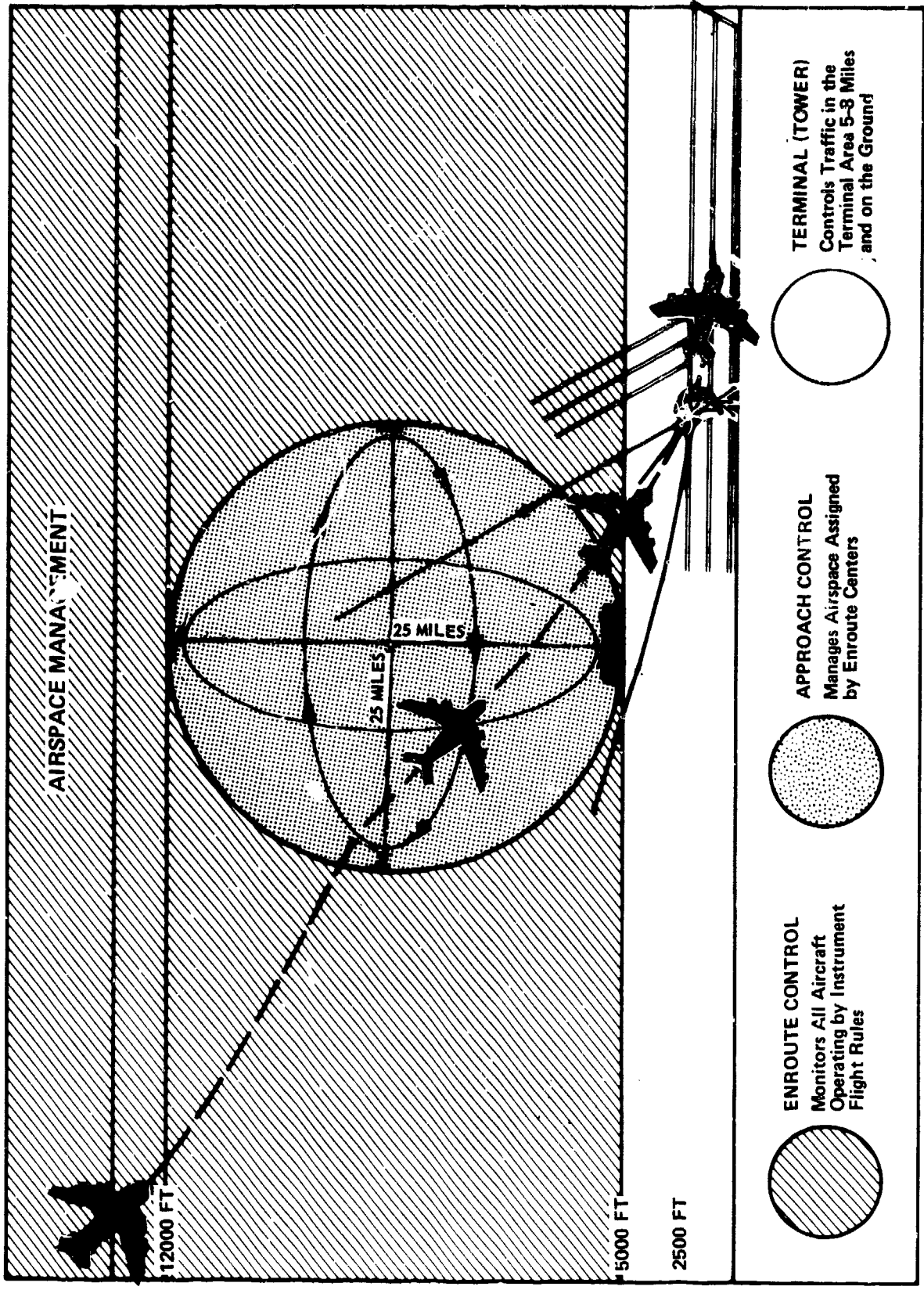
Enroute traffic

Enroute control is handled by 21 FAA Air Route Traffic Control centers that monitor all aircraft operating under instrument flight rules within their space. When flying in airspace controlled by the centers, a pilot files a flight plan and is assured separation from other planes flying under instrument flight rules but not from planes flying under visual flight rules.

The centers operate with an array of sophisticated electronic radar, communication, and computer equipment. Enroute centers are responsible for airspace covering many thousands of square miles, from 5,000 feet upward. They also delegate airspace and monitoring responsibility to terminal radar approach control facilities.

Radar approach control facilities

These facilities handle traffic in airspace delegated by the enroute centers. Radar approach control facilities provide air traffic control for arriving and departing aircraft and are the vital air traffic control link between the tower and the enroute control centers. They are generally associated





SOURCE: U.S. AIR FORCE

AIR FORCE RADAR APPROACH CONTROL FACILITY

PICKS UP FROM ENROUTE AIR TRAFFIC CONTROL CENTER AND GUIDES INCOMING AIRCRAFT TO THE PROPER POSITION FOR THE FINAL APPROACH AT WHICH TIME CONTROL IS TRANSFERRED TO THE CONTROL TOWER AT THE AIRFIELD WHERE THE AIRCRAFT IS LANDING.

with a primary airport but also serve satellite or secondary airports. Each facility (see p. 14) has surveillance radars and controls traffic in a rather large airspace. The airspace delegated to a center varies depending on the location, but it usually covers about 25 nautical miles, up to an elevation of 12,000 feet. (See p. 13.)

At the time of our review, FAA operated about 158 such facilities in the United States and the Defense Department operated 57. Based on Navy estimates, the annual operating cost for each DOD facility averaged about \$1.4 million. The facilities operated by the military also serve civilian airports located in their areas of responsibility.

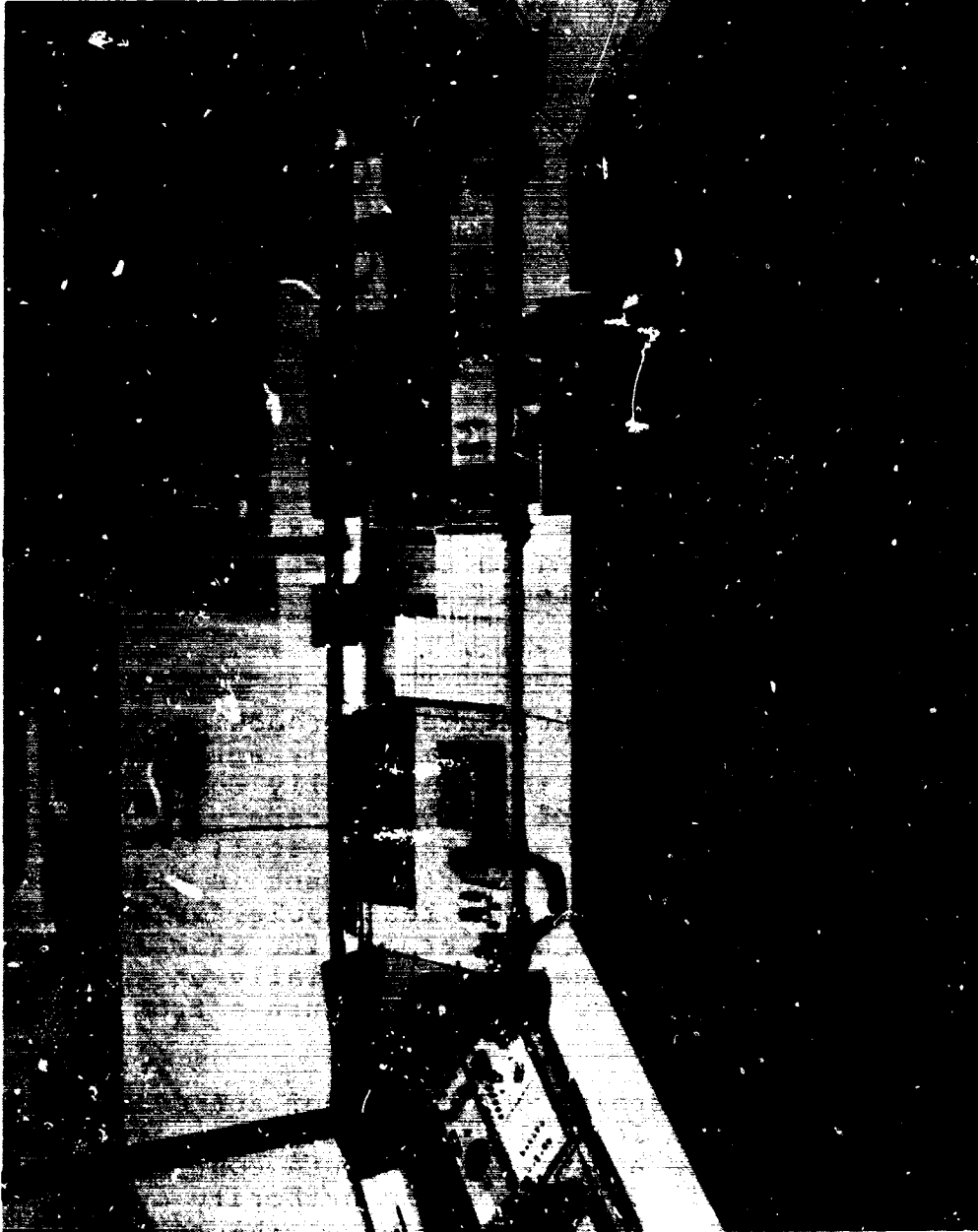
Airport traffic/ terminal control

Once an aircraft is on a final approach, about 5 nautical miles from the tower, up to an altitude of approximately 2,500 feet, monitoring responsibility is transferred to controllers at the airport. This is called terminal control. (See p. 16.) Pilots land their aircraft with or without the aid of the controller, depending on the capability of the airport's navigational aid system.

Delegation of approach control function

By formal agreement, FAA delegates approach control authority to the military when it is mutually agreeable. According to one FAA official, this is usually done whenever the military requests control of a given airspace, provided such control does not conflict with FAA's overall air traffic management. The official said the arrangement is based partially on the belief that it is more reasonable for the military to control air traffic in some areas (for example, where military aircraft are predominant) and partially on the military's need to use controllers who have returned from overseas duty.

Recommendations concerning delegation of approach control authority are made at the local level between military installation commanders and the appropriate enroute control center. However, approval and withdrawal of this authority must be approved by FAA and the military services at the national level. Also, local differences must be resolved through appropriate channels at the national level. But, according to FAA officials, no procedures exist for systematically reviewing the operational or cost effectiveness of delegated approach control authority, even in disputed cases.



SOURCE: U.S. AIR FORCE

AIRPORT (TERMINAL CONTROL) TOWER

THE AIRPORT TOWER USUALLY TAKES CONTROL OF AIRCRAFT FROM THE APPROACH CONTROL FACILITY WHEN THEY ARE 5 TO 8 NAUTICAL MILES (UP TO AN ALTITUDE OF ABOUT 2,500 FEET) AWAY.

Within the continental United States, there are 20 enroute control centers and 208 approach control facilities. Fifty-seven of the approach control facilities are operated by the military, 133 by FAA, and 18 jointly.

CONSOLIDATING APPROACH CONTROL OPERATIONS CAN RESULT IN SAVINGS

The delegation of approach control authority to the military departments without periodic review by FAA to assess continued need has resulted in duplicate operations in localities where a single approach control would seem both feasible and cost effective. Since approach control facilities generally have the capability to monitor and control traffic in a large area, the need to operate facilities where airspace can be covered by a nearby facility is questionable. We visited FAA and military facilities near Norfolk, Virginia; the Central Valley of California; and on the island of Oahu, Hawaii.

Norfolk area approach control operations

Both FAA and the military operate approach control facilities in the Norfolk area. The FAA-operated facility, located at the Norfolk Regional Airport, serves Langley Air Force Base, the Norfolk Naval Air Station, Felker Army Airfield, and Patrick Henry Airport. The Navy's radar approach traffic control center located at the Oceana Naval Air Station, is responsible only for traffic in that area. (See map on p. 59.)

Military and FAA officials disagree over the Navy's need to operate the Oceana center. Navy officials contend that the Oceana center is justified because of

- the high volume of military jet traffic at the air station and
- the military's unique flight rules (for example, aircraft separation needs to be controlled but does not have to conform to the FAA standard).

However, a local FAA official pointed out that aircraft separation criteria could be adjusted to accommodate the Navy's needs, as they are for the military jet traffic at nearby Langley Air Force Base.

FAA officials in Norfolk emphasized that a detailed study would be required to determine the effect of merging the two facilities, but they said they believe a consolidated approach control facility would result in lower operating costs and more efficient use of the airspace. In fact, in a recent FAA-sponsored study by a joint military and civilian group, local FAA officials recommended that their facility assume the Oceana approach control responsibility within 3 years. The study group, however, disagreed and stated that the Oceana requirement is best served by military controllers because of the type of aircraft and mission involved.

The chairman of the study group told us the group did not actually investigate the recommendation that the centers be consolidated. He said that the group's disagreement was based on its hesitancy to add another military airfield to FAA facility's already heavy workload. He did acknowledge that there are enough potential advantages to warrant a review of consolidation, but he pointed out that FAA has no program for periodically conducting such reviews. A local FAA official did not believe Oceana's mission or the type of aircraft which used the airfield would prevent a consolidation.

Approach control operations in Central Valley

Two locations in the Central Valley of California offer the potential for consolidated approach control facilities. One of these locations includes separate facilities at the Lemoore Naval Air Station, Fresno Air Terminal, and Castle Air Force Base, and the other includes adjacent facilities at McClellan and Travis Air Force Bases. In discussing these arrangements with local FAA and military officials, we found that consolidating control at two locations would dramatically lower operating costs.

The FAA terminal radar approach control for the Sacramento area is located at McClellan and is the product of an earlier merger involving McClellan, Mather, and Beale Air Force Bases. The Sacramento facility's assumption of approach control responsibility for the Beale area was made possible by relaying a radar signal between the two bases. According to an FAA official, a similar system could be installed between McClellan and Travis, thus enabling the Sacramento facility to assume control of the Travis airspace. We were told the system would cost about \$876,000, including site acquisition, engineering, procurement, and other support items. The resulting merger of McClellan and Travis would eliminate the need for about

32 controllers, lower operating costs by an estimated \$450,000 1/ a year, and eliminate the need for the \$2.7 million Travis facility. In addition to reduced operating cost, an FAA official said that consolidation would result in safer, more efficient use of the available airspace.

Until 1974, FAA also operated the approach control facility for the Lemoore Naval Air Station. At that time, FAA relinquished control to the Navy and began operating a smaller approach control facility in nearby Fresno. These two facilities, plus the Air Force facility at the Castle base, employ a total of 64 controllers. However, an FAA official told us that the Lemoore facility could handle all approach control services at the three bases using only 40 controllers. The reduction of 24 controllers would save an estimated \$338,000 1/ a year in operating costs.

Approach control on Oahu Island

Air traffic around Hawaii is monitored by FAA through a joint use FAA and Air Force Air Route Traffic Control Center. The center tracks aircraft until they are about 25 to 30 miles from the island, at which time they are transferred to the approach control at Honolulu International Airport for landing at Honolulu International Airport; Hickham Air Force Base; Wheeler Army Activity; Wheeler Air Force Base; and the Naval Air Station, Barbers Point. Aircraft destined for the Marine Corps Air Station, Kaneohe Bay, are transferred to the Kaneohe Approach Control Facility.

Permanent radar approach traffic control center for Kaneohe

The approach control center at Honolulu International Airport does not cover the Kaneohe Bay side of the island because of nearby mountain ranges which peak at over 3,100 feet. The Kaneohe Bay station uses radio communications to guide aircraft into approach position or into position to be picked up by its ground controlled approach (CCA) unit since it does not have radar with sufficient range to provide approach and departure coverage.

During the review of facilities in Hawaii, we found that the Marine Corps Air Station, Kaneohe Bay, is planning to install a permanent radar air traffic control facility. The

1/Includes salaries only, not fringe benefits.

estimated cost for such a facility--not including equipment--is estimated at about \$938,000. According to Navy estimates, a typical radar approach traffic control center's capital equipment costs about \$2.7 million. There is little traffic in the Kaneohe airspace and only one runway is used for arrivals and departures. The station operates on a 16-hour a day basis and is generally closed on Sundays, holidays, and some Saturdays. During the periods when it is closed, the joint use Air Force and FAA air route traffic control center monitors and controls the Kaneohe airspace. Few, if any, aircraft use Kaneohe Bay during the night, and FAA rarely has to direct aircraft to that location.

We identified three organizations at Kaneohe which have surveillance radar that could be used for control purposes if properly located on the base. We suggested possible alternatives to building the proposed facility.

Additionally, we found that FAA had completed a study on the feasibility of consolidating its approach control facility at Honolulu International Airport into its air route traffic control center. The study concluded that such a consolidation would save approximately \$1.5 million annually. Since the center currently controls the Kaneohe airspace 8 hours daily, it too appears to be a consolidation alternative to be considered.

The Navy did not find the alternatives we suggested suitable. Instead, the Navy plans as another alternative to update the present system in lieu of constructing a new facility. They state that the new system will provide adequate air control capability without the need for the proposed construction.

CONCLUSION

The absence of periodic evaluations of approach control arrangements by FAA has limited its ability to insure maximum and efficient use of the Nation's airspace and the resources necessary to manage the airspace.

RECOMMENDATION

We recommend that the Administrator of FAA, in coordination with the Secretary of Defense, establish procedures for evaluating the potential for consolidating the management of adjacent airspaces and consolidate where practical.

AGENCY COMMENTS AND OUR EVALUATION

DOD and Transportation in response to an earlier version of this report (see apps. I and II) generally agree that increased planning and coordination to assure economy, efficiency, and minimum investment in aviation resources is desirable. The Navy and Air Force were also willing to actively participate in evaluations of potential consolidation. DOD, however, cites the

- need to operate facilities to train and maintain the proficiency of military air traffic controllers,
- fear of being overly committed to a civilian controller force, degrading the readiness posture of the military services, and
- need to operate facilities at stations with a large volume of high performance air traffic (jet aircraft).

While the Navy agrees that consolidating its Oceana facility with the FAA's approach control facility at the Norfolk Regional Airport is possible, they do not feel such a move is viable for reasons cited above.

Both the military services and the FAA approach control facilities are staffed with highly trained and experienced personnel who are performing basically the same functions. Much larger areas than Norfolk that have more diverse aircraft and a variety of sophisticated military operations have been consolidated under an FAA approach control. The FAA approach control facility for the San Francisco Bay-Oakland area, for example, manages the airspace for two major international airports and two naval air stations, handling a variety of aircraft including high performance aircraft. The FAA Sacramento approach control facility serves three Air Force bases and two major civilian airports. The military aircraft include fighters and bombers.

We recognize the need to train military air traffic controllers for combat situations. What is needed, in our view, is a determination of the minimum number of military controllers needed to operate military facilities in a combat situation and the assurance that these individuals are properly trained. Staffing should not be based on the number needed to operate facilities in the United States.

We are proposing that the opportunities for consolidation be independently examined from a total resource standpoint and that the most appropriate action be taken to increase efficiency. In the San Joaquin Valley, for example, the most appropriate action may be to expand the Navy facility. The Navy indicates that this would be necessary if they assume the responsibility for the FAA facility.

We believe that the activities discussed in this chapter offer an excellent potential, because of their geographical location, for using resources more efficiently through inter-service/interagency coordination and cooperation.

The Air Force, in responding to our suggestion that the Central Valley offers potential for consolidation, agrees that such a venture, in some cases, permits more efficient use of airspace and resources. The Air Force will not accept that our suggestion offers valid economic and operational advantages until a detailed evaluation is made. They are willing to participate in such an evaluation.

DOD's willingness to actively participate in evaluations of potential consolidations or mergers is constructive and will result, we believe, in more efficient use of the Nation's aviation resources and a broader national logistics base for support of military operations.

CHAPTER 4

DUPLICATE NAVIGATIONAL AID SYSTEMS

ARE USED AT MILITARY AIRFIELDS

Better coordination between the military and civil aviation sectors, as well as within the military itself, could provide operational safety and result in more efficient use of navigational aids at airfields.

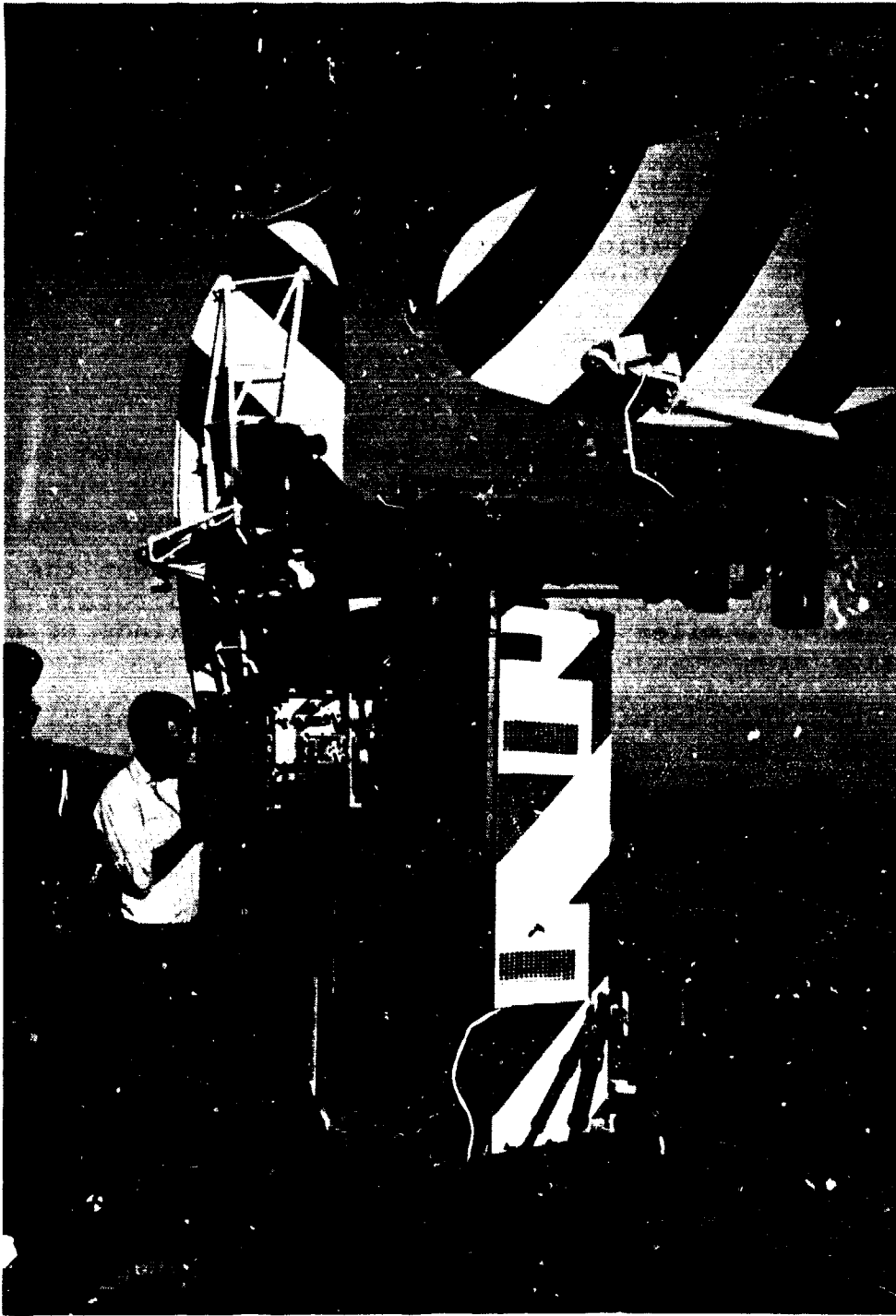
CATEGORIES AND FUNCTIONS OF NAVIGATIONAL AIDS

Pilots use navigational aids to help locate airports and land aircraft. Generally, these aids fall into one of two categories, precision or nonprecision, depending on the kind of information they provide.

A precision system provides information about the direction of flight and angle of descent once the aircraft is within about 8 miles of the runway. The two kinds of precision aids are:

- The instrument landing system which automatically relays the approach information to cockpit instruments enabling the pilot to read the data and to make landing decisions based on this information.
- The precision approach radar which is operated by a radar technician on the ground. In a precision approach radar system, the technician obtains the data, interprets it, and relays the information to the pilot. When used with a nonprecision airport surveillance radar, the combination is known as the ground controlled approach radar system. (See pp. 24 and 25.)

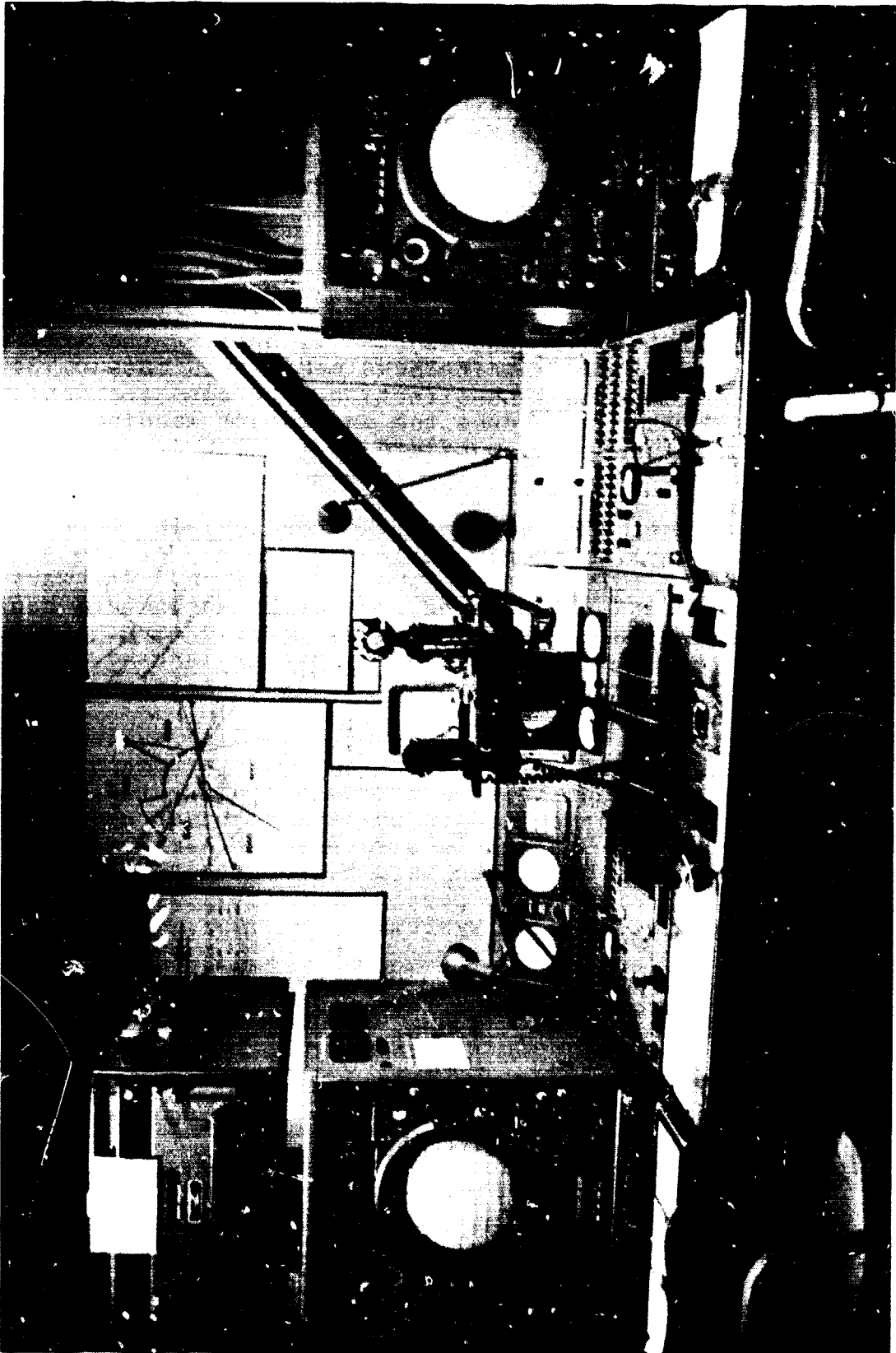
Nonprecision aids provide directional guidance and sometimes distance measurement but no angle of descent information. However, these devices emit radio signals which aircraft can pick up sometimes as far as 200 miles from the airport. They also can align the aircraft with the airport runway, sometimes before the approach control facility has the aircraft under surveillance. In good weather, a pilot can bring the aircraft down using nonprecision navigational aids (without an instrument landing system or precision approach radar). The common nonprecision radio aids are the very high frequency (VHF) omnidirectional range system, the tactical air navigation (TACAN) system, and nondirectional beacons.



SOURCE: U.S. ARMY

GROUND CONTROLLED APPROACH (GCA) RADAR

UNIT CONSISTS OF TWO RADAR SYSTEMS-- PRECISION APPROACH AND AIRPORT SURVEILLANCE. OPERATING TECHNICIANS AT THE RADAR INDICATORS TAKE CONTROL OF THE AIRCRAFT FROM THE APPROACH CONTROL CENTER AND GUIDE THE PILOT TO THE RUNWAY.



SOURCE: U.S. ARMY

GROUND CONTROL APPROACH RADAR INDICATOR

Whether or not precision or nonprecision aids are required for landing aircraft depends generally on visibility and prevailing wind conditions.

Military and civilian use of navigational aids

The military services and civilian aviation use several different types of navigational aids. For example, the Army uses ground controlled approach radar as its precision system. The VHF omnidirectional range system is used as the Army non-precision system; however, it lacks mobility. (See p. 34.) Therefore, the Army uses nondirectional beacons for deployment purposes. The Army also uses the instrument landing system at a few installations to keep pilots proficient in instrumentation procedures.

The Navy uses GCA radar and the nonprecision tactical air navigation system (see p. 35) at naval air stations. Both systems are suited to deployed operations. The Navy also uses the less precise nondirectional beacon as a backup or alternative tactical system. And, at five naval air stations, the automatic carrier landing system is used as a precision system for aircraft carrier landing training.

The Air Force uses the instrument landing system as its primary precision navigational aid and the tactical air navigation system for nonprecision purposes. Since the instrument landing system is not suited to operations under deployed conditions, a GCA radar system is also used at Air Force installations. The GCA system acts as a backup for the instrument landing system and provides precision capability on runways without instrument landing systems.

In summary, navigational aids are used at military and civilian airfields throughout the Nation as follows:

<u>Navigational aids</u>	<u>Army</u>	<u>Navy</u>	<u>Air Force</u>	<u>Civilian</u>
Precision approaches:				
Precision approach radar	<u>a</u> /X	<u>a</u> /X	<u>a</u> /X	
Instrument landing systems	limited	<u>b</u> /limited	X	X
Nonprecision approaches:				
Tactical air navigation VHF omnidirectional range	-	X	X	<u>c</u> /limited
Nondirectional beacons	X	-	X	X
Localizer portion of instrument landing systems	limited	-	X	X
Airport surveillance radar	<u>a</u> /X	<u>a</u> /X	<u>a</u> /X	<u>d</u> /X

a/Part of the ground control approach.

b/Automatic carrier landing system.

c/Distance measurement portion.

d/Very rare in occurrence.

POTENTIAL FOR STANDARDIZATION OF CIVIL AND MILITARY EQUIPMENT

Due to the lack of navigational aid standardization, military airfields, particularly those of the Air Force, provide multiple systems, some which accommodate few users. For example, the VHF omnidirectional range system was initially developed by the civil aviation community. Later the military developed the tactical air navigation system which provides the basic functions of the VHF omnidirectional range system (to emit radio signals long distances to aircraft instruments). The tactical air navigation system, however, has an additional capability of distance measurement not available from the VHF omnidirectional range system.

Because the VHF omnidirectional range and tactical air navigation systems use different frequency ranges (very high frequency (VHF) and ultra-high frequency, respectively), they require different equipment on the ground as well as in the air. While civil aviation continues to use the VHF omnidirectional range system, they developed a modification to

aircraft instrumentation which permits them to use the distance measurement portion of the tactical air navigation system. Thus our National Airways System requires both systems. The ground equipment is often combined and is called a VORTAC.

In that the tactical air navigation system was developed to support military requirements, Navy and Air Force aircraft are equipped with that system's instrumentation. The Air Force, however, also equips its aircraft with the older VHF omnidirectional range capability. For some Air Force aircraft (particularly certain trainers), VHF omnidirectional range rather than tactical air navigation is the nonprecision system. As a result, Air Force airfields tend to be equipped with both systems.

Nineteen Air Force and three other military installations have invested over a half million dollars in VHF omnidirectional range systems to support the T-37 training aircraft. This is 1 of 3 types of aircraft out of 37 in the Air Force inventory equipped for the VHF omnidirectional range system but not the tactical air navigation system. Additionally some bases require the VHF omnidirectional range system for contractor aircraft or aircraft of other military services or nonmilitary Federal agencies.

Navigational aid systems are expensive to install and operate and therefore proliferation of such aids should be avoided where possible. Based on a June 1974 Air Force study of flight facilities at a sample of 47 installations, average staffing and investment and operating costs per unit were as follows:

<u>Navigational aid</u>	<u>Average initial investment cost per unit (note a)</u>	<u>Average annual operating and maintenance cost per unit</u>	<u>Average number of personnel authorized for each type of facility</u>
Ground controlled approach (airport surveillance radar plus precision approach radar)	\$1,637,325	\$431,087	18
Precision approach radar	810,835	339,314	13
Instrument landing system	66,478	15,954	2
Tactical air navigation system	18,831	31,005	2
VHF omnidirectional range system	23,776	20,892	1

a/Represents cost for equipment only. Military construction and installation cost not included. Equipment has been in operation over 15 years.

EFFECTIVE MANAGEMENT OF NAVIGATIONAL AIDS CAN REDUCE DUPLICATION

Navigational aids provide a variety of capabilities. Some of the bases visited operate multiple aids. McClellan and Travis Air Force Bases, for example, operate instrument landing, VHF omnidirectional range, precision approach radar, and tactical air navigational systems and nondirectional beacons. Considering their use, some of the various navigational aids at military airfields could be eliminated without reducing safety.

Reducing requirements for precision navigational aids at Air Force bases

The instrument landing system based on the Air Force regulation 100-11 and implemented by the "Terminal Precision Approach Control Program," is the primary Air Force precision approach system. The precision approach radar acts as a backup capability.

As of August 1975, the Air Force had 143 precision approach radar systems operating at an estimated \$48.6 million annually. At the same time 107 instrument landing systems were operating at about \$5 million annually. The reason precision approach radar is so much more expensive is that each system requires about 13 people to operate and maintain it, while an instrument landing system requires only 2 maintenance people.

In the past the Air Force has operated many airfields with only one instrument landing system servicing one runway direction. To allow use of the other runway direction, the Air Force provided precision approach radar capability which actually could serve both runway directions.

Ultimately, precision approach radar and instrument landing systems are to be replaced by a microwave landing system. While initial installation of the microwave system at Air Force bases will begin after 1980, full implementation is not expected until sometime between 1991 and 1995.

Meanwhile the Air Force is renovating its instrument landing systems by replacing older tube-type systems with more reliable solid state systems. These solid state systems are being installed at many airfields and will cover both runway directions. This will permit the Air Force to phase out some 66 approach radar systems by about 1981.

The Air Force plans to keep about 77 precision approach systems operational beyond 1981 for (1) tactical deployment in contingency situations since no suitable mobile instrument landing system exists, (2) overseas locations where foreign military aircraft not equipped to use the instrument landing system must be accommodated, (3) locations where terrain, excessive site preparation costs, or airspace restrictions prevent instrument landing system installations, (4) geographically remote bases where no practical alternate base exists, (5) bases with mission requirements of such sensitivity that duplicate approach aids are warranted, and (6) locations where pilot training is the primary mission.

Savings from adjusting the instrument landing system renovation schedule

While the Air Force program will apparently save the Government millions of dollars, we believe additional savings are available from

- eliminating precision approach radar systems earlier,
- forgoing installation of instrument landing systems for seldom used runway directions, and
- forgoing the installation of instrument landing systems at airfields which are to continue using precision approach radar until full microwave landing system implementation.

Under the program, the precision approach radars to be eliminated will be removed when both runway directions of airfields are covered by instrument landing systems. The Air Force is first replacing the older tube-type instrument landing systems with solid state systems. In subsequent years it will install the new solid state system for runway directions not previously covered. If this procedure were reversed, however, the costly precision approach radars could be removed sooner because runways would have complete coverage by using the old instrument landing system for one direction and the new system for the other.

To illustrate, Mather Air Force Base, California, has an instrument landing system on one of its runways. Its first solid state system was scheduled for 1976 installation with the second following in 1978. The 1976 installation will replace the existing system and thus the airfield's precision approach radar will continue until 1978 for coverage of both

runway directions. By installing the first solid state instrument landing system on the runway direction that does not have the system, the precision approach radar could probably be eliminated 2 years early saving the Government about \$650,000 in operating costs. Additionally, the base operates VHF omnidirectional range and tactical air navigational systems.

We noted many such cases where the expensive precision approach radar operation could apparently be eliminated earlier. An Air Force official said the tube-type instrument landing systems are being replaced first because funds are available for replacement but not for new construction, which is required for runway directions not previously covered.

Coordinating the need for seldom used navigational aids

The program generally calls for an instrument landing system for both runway directions at its airfields. Weather conditions at some Air Force bases, however, are such that the instrument landing system or precision approach radar would seldom be required for both runway directions. For example, at McClellan Air Force Base the weather is characteristically clear when the less frequently used runway direction is in operation. In fact, Air Force weather analyses showed that the instrument landing system on that runway direction should be required, due to weather conditions, only about 9 hours per year. Yet both runway directions are scheduled to receive new solid state systems.

The nearby Sacramento Metropolitan Airport commissioned a new instrument landing system in January 1977 which enables aircraft to land in either direction. This runway has the same alignment as McClellan's, and military aircraft making instrument landings during emergency conditions could be accommodated. Three other Air Force bases are scheduled to receive multiple instrument landing systems.

Air Force officials said that the Air Force had not established frequency-of-need criteria for justifying instrument landing systems; any need could be sufficient justification. We question, however, the need for multiple instrument landing systems at many Air Force bases, especially those

--in areas which have prolonged periods of clear weather and one direction landings predominate and

--where another military or civilian airport is nearby and can provide emergency support during unusual weather situations.

We also noted that the Air Force is planning to install a second instrument landing system at some bases even though precision approach radar is to be retained for training and other contingencies. Operating both of these systems at the same installations is unnecessary.

Many major civilian airports do not use multiple instrument landing systems. A number of air reserve flying units are based at such civilian airports and apparently operate without duplicate precision approach capabilities available at Air Force bases. Further, the Army and Navy rely on only one precision approach aid.

To ascertain if weather conditions will permit a safe approach at the destination airfield, pilots are briefed before flying. Additionally, flight plans include suitable alternate airfields for landing in the event weather conditions ultimately do not permit the pilot to land at the planned destination. This is another alternative to establishing functionally duplicate navigational aid systems at military airfields.

Duplicate precision navigational aids at Navy installations

Five naval air stations use the automatic carrier landing system, a precision navigational aid which can provide varying services. Each of these stations also operates precision approach radar systems and/or instrument landing systems. However, the services provided by these systems are also provided by the carrier landing system. The necessity of this costly duplication is questionable.

Oceana Naval Air Station, for example, has precision approach radar that is used for approaches to all four primary and two of four secondary runways. A carrier landing system is used on one of the primary runways. Plans have been made to expand the carrier landing system to all primary and secondary runways. Furthermore, another type of precision aid, similar to the instrument landing system, is also planned for one runway. When all the plans have been carried out, Oceana will have the following types of precision navigational aid coverage on its eight runways:

Precision navigational aid coverage	Runways							
	Primary				Secondary			
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Precision approach radar (existing)	x	x	x	x	x	x		
Automatic carrier landing system (existing) (note a)	x							
Automatic carrier landing system (planned) (note a)		x	x	x	x	x	x	x
Type of instrument landing system [RN-28]	x							

a/Under this arrangement, the older, traditional precision approach radar apparatus could be eliminated. However, Navy officials disagreed about whether the automatic carrier landing system would be an acceptable replacement for the existing precision approach radar system.

Our analysis indicates elimination of precision approach radar at Oceana could reduce staffing by five positions and save about \$52,000 a year in personnel costs alone.

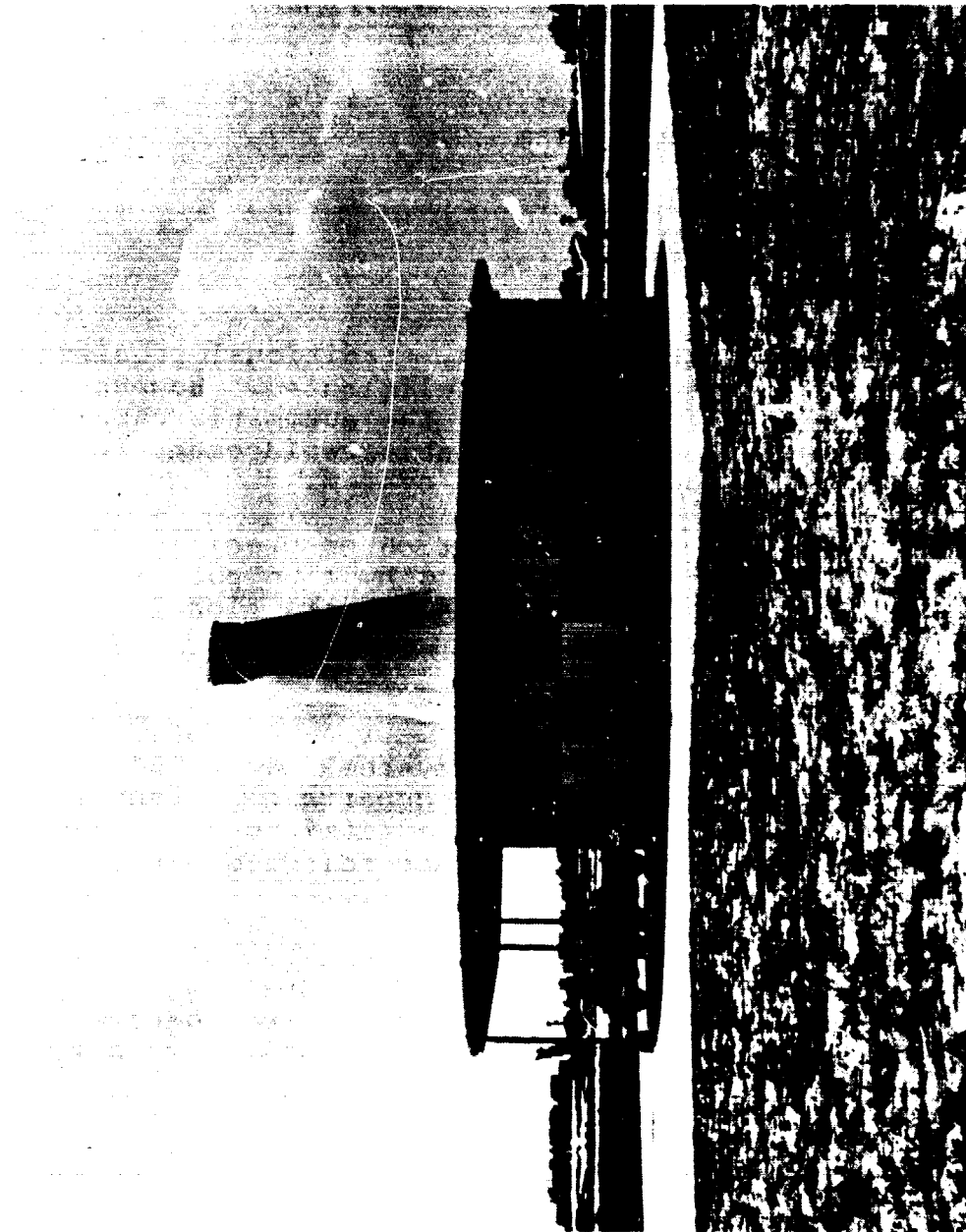
Duplicate VHF omnidirectional range capability at Air Force installations

The VHF omnidirectional range system (see p. 34) is a radio facility used extensively for departure, enroute, and approach navigation. Its reception is limited to line-of-sight, and its usable range varies according to aircraft altitude.

Air Force regulations state that, because of the infrequent need for airfield VHF omnidirectional range capability, the omnidirectional facilities will be operated only under exceptional circumstances. Two circumstances specified as acceptable are

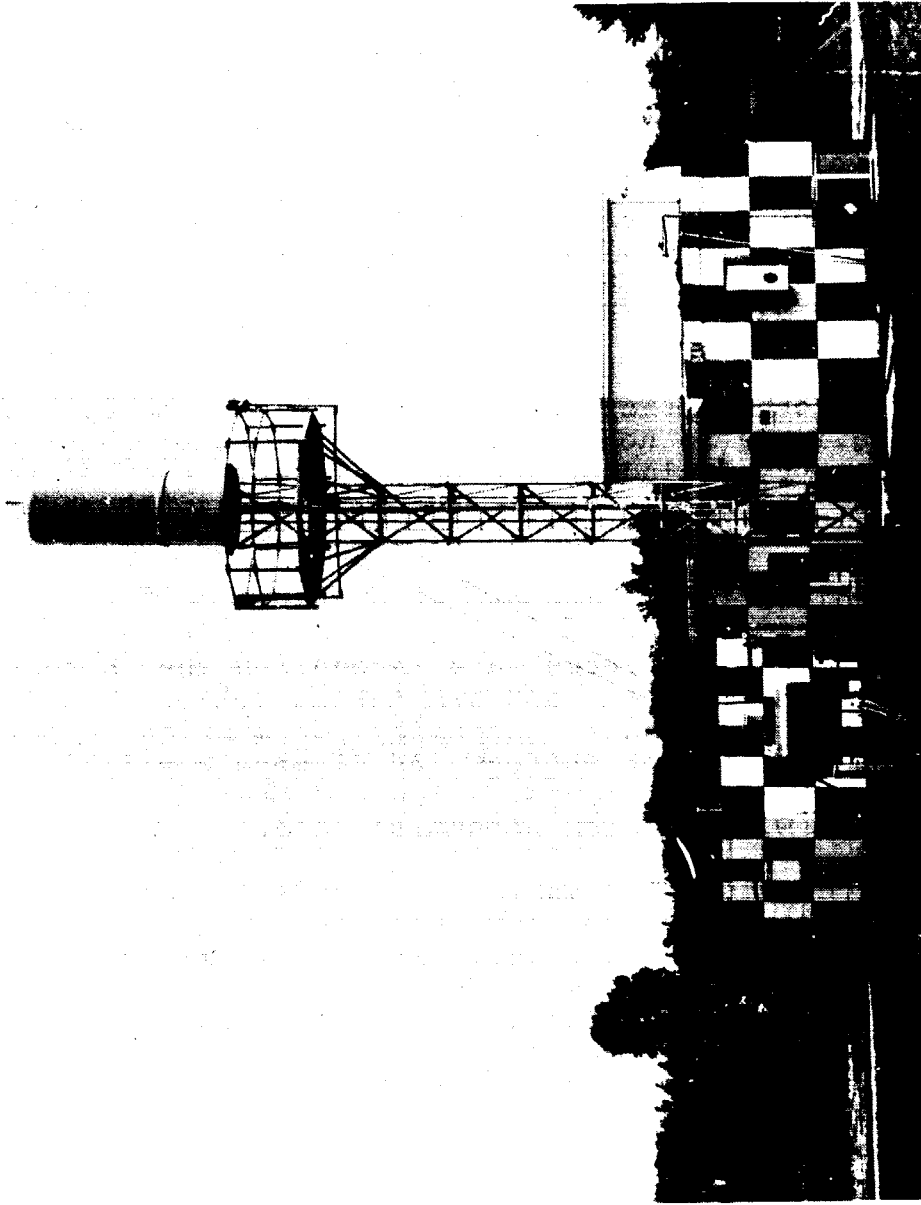
- area navigational assistance for training aircraft not equipped with the tactical air navigational system and
- unique requirements essential to flying safety.

These circumstances can apparently be used to justify the need for a VHF omnidirectional range capability at most Air Force bases. In October 1975, Headquarters, U.S. Air Force, questioned its subordinate commands regarding the need for VHF omnidirectional range and VHF omnidirectional range tactical air navigational facilities at 53 installations (36 VOR and 17 VORTAC). One command listed 81 Air Force installations



SOURCE: U.S. ARMY

VHF OMNIDIRECTIONAL RANGE FACILITY
A NONPRECISION GUIDANCE SYSTEM LIMITED TO DIRECTIONAL
GUIDANCE. USED IN CONJUNCTION WITH CONTROL TOWER.



SOURCE: U.S. AIR FORCE

FIXED BASE TACTICAL AIR NAVIGATION SYSTEM

A NONPRECISION GUIDANCE SYSTEM USED FOR FINAL APPROACH AND LANDING, INVOLVES DIRECTIONAL GUIDANCE, DISTANCE MEASUREMENT, BUT NO ANGLE OF DESCENT. USED IN CONJUNCTION WITH CONTROL TOWER.

frequently visited by the T-37 aircraft involved in instrument and approach training requiring VHF omnidirectional range support. This would represent an investment of over \$1.9 million, plus an annual operating cost of over \$1.6 million.

Other justifications included the need to support other aircraft not equipped with the tactical air navigational system and the need to provide a backup for the tactical air navigational system.

At the time of our review 38 responses had been received indicating some achievement had been made toward reducing VHF omnidirectional range levels; only 4 responses recommended decommissioning. Six systems were subsequently decommissioned.

In light of other precision and nonprecision navigational aid systems available to nontactical air navigational system compatible aircraft, including FAA and military radar approach control centers, extensive use of VHF omnidirectional equipment at Air Force airfields and in aircraft is questionable.

Little used nondirectional beacons

The Navy and the Air Force have recognized the infrequent use of nondirectional beacons and are taking action to eliminate these aids when no longer necessary for mission accomplishment. For example, at Moffett and Alameda Naval Air Stations, nondirectional beacons, which had been in operation early in our review, have been decommissioned.

An Air Force message to various commands stated that budget constraints, congressional investigations, and our reviews require that redundant navigational aids be minimized and that certain nondirectional beacons be decommissioned. It pointed out that the primary reason for retaining the beacons had been proficiency training, but tactical air navigation systems and radar service were now available as alternative aids at all bases. The message addressed 14 of about 50 beacons. According to Air Force estimates, decommissioning the 14 will save about \$135,000 in annual operating and maintenance costs.

CONCLUSIONS

Military and civilian aviation administrators have not established effective procedures for coordinating their navigational aid equipment requirements. Further, DOD is not controlling the authorization and use of navigational aids to avoid duplication and assure use only where there is a valid requirement.

RECOMMENDATIONS

We recommend that the Secretary of Defense and the Administrator of FAA establish effective procedures to coordinate requirements for navigational aid systems and promote equipment standardization. We recommend that the Secretary of Defense develop effective criteria and standards for the authorization and use of navigational aid systems at military airfields and take action to decommission those navigational aids that are not necessary for safe aircraft operation.

AGENCY COMMENTS AND OUR EVALUATION

DOD, in its response to our draft report, recognizes the need to avoid proliferation of redundant equipment. The Navy and Air Force are willing to meet with the Federal Aviation Administrator and actively participate in efforts to improve coordination procedures, establish standards, and eliminate duplication.

The Secretary of Transportation pointed out that DOD has historically taken the position that at many locations aviation facilities and support services are vital to defense needs. He did not feel that FAA is in a position to make judgment on matters involving DOD's determination of national defense interest.

While FAA is not in a position to make final defense determinations, we believe they have the capability and expertise to assist DOD in assuring that there is a minimum of duplication and investment in equipment and personnel at Federal airfields. The Navy recognizes this in referring to the lack of coordination in the past. They point out that the recent coordination between DOD and FAA on next generation navigational aids (i.e., Global Positioning System and Microwave Landing System) is expected to result in development of systems which will meet the needs of both the military and the civil aviation community. This should reduce the number of systems in use. We believe this is indicative of the coordination efforts to be emphasized in planning requirements for current and future systems and for identifying potential approaches to reduce investment in equipment and personnel resources through the means of effective interagency/interdepartmental coordination and support.

The Navy fully supports our recommendation to decommission navigational aids not absolutely necessary for safe

aircraft operation. They agree to thoroughly explore the feasibility of eliminating the older precision approach radar apparatus with the expansion of the automatic carrier landing system at the five air stations. Also, they state that consideration is being given to authorizing the automatic carrier landing system as a shore-based system, once certain technical and support problems are resolved. We believe this proposed action will result in considerable savings.

The Air Force also states that they will continue to decommission those systems not absolutely necessary, and after January 1977, will only operate three nondirectional beacons in the United States.

The Air Force does not agree with our suggestion to install the new solid state instrument landing system instead of first replacing the old tube-type system. This would permit earlier removal of the costly precision approach radars. The Air Force stated that the need to replace the old systems is urgent because logistical support could not be provided beyond 1977. The Air Force's terminal precision approach control program, however, lists several old tube-type systems that are scheduled for replacement as late as 1980. Provisions will have to be made for support for old systems remaining beyond 1977; otherwise, other available navigational aids will be required.

The Air Force also states that all Air Force aircraft are not equipped with instrument landing system receivers and that precision approach radar equipment will be required until the 1980s, when it is projected that all aircraft will be so equipped. We recognize the requirement for precision approach radar will continue at some bases; but, at many bases, there will be infrequent requirements to support the few aircraft currently not equipped with instrument landing receivers. We believe the Air Force should consider the early elimination of precision approach radar equipment and personnel at bases where they are not absolutely necessary for aircraft safety, particularly where more than one airfield can serve the same vicinity. In the Sacramento area, for example, there are four Air Force airfields within a 50-mile radius with precision approach radar systems. One of these airfields could provide a landing alternative for the other airfields in the vicinity when visibility, cloud cover, and/or prevailing winds make using the system mandatory.

The steps taken by the Navy and Air Force are positive actions to reduce duplications in their airport equipment. However, we believe that the Secretary of Defense and the Secretary of Transportation, through FAA, should take a more active role in coordinating navigational aid requirements and promoting standardization.

CHAPTER 5

CONSOLIDATING AVIATION

WEATHER FACILITIES IS FEASIBLE

The objective of the Department of Commerce aviation weather service is to furnish weather information necessary for safe and efficient flights. Though Commerce is responsible for insuring that aviation weather information needs are met efficiently, duplications exist. In many areas the information developed by the Defense Department's weather stations could be obtained from Federal weather information systems supporting civilian aviation. While it is recognized that the military needs to provide its own support in many overseas areas, coordination with other agencies on weather information in the United States could reduce the cost.

PUBLIC LAWS PROVIDE FOR EFFICIENT FEDERAL WEATHER SUPPORT OF AVIATION

Under section 803, Public Law 85-726, dated August 23, 1958, Commerce was assigned responsibility for

- making observations, measurements, investigations, and studies of atmospheric phenomena and establishing weather offices and stations for information concerning probable weather conditions;
- preparing reports, forecasts, warnings, and advisories for safety and to facilitate air navigation; and
- coordinating weather requirements in the United States to maintain standard observations, promote efficient use of facilities, and avoid unnecessary duplication of services.

Subsequently, section 304, Public Law 87-843, directed the Bureau of the Budget (now Office of Management and Budget) to provide the Congress annually with a budget showing (1) the scope of weather programs, (2) the specific program aspects and funding assigned to each agency, and (3) the estimated goals and financial requirements. In implementing this law, the Bureau issued Circular A-62 on November 13, 1963. This circular directed Commerce to prepare and maintain, with the assistance of other concerned agencies, a plan for the efficient use of Federal weather services and supporting research. The circular stated "the purpose of such planning is to achieve

the maximum integration of current and future services and research consistent with the effective and economical accomplishment of mission requirements."

The Federal Coordinator for Meteorological Services and Supporting Research, Commerce Department, has responsibility for preparing the plan which is coordinated through inter-agency committees that continuously review weather requirements, services, and supporting research.

Although the Federal weather plan describes coordinated programs for serving the public, it does not foster the integration of common requirements and functions of the military services and civilian agencies. In addressing aviation weather services, the fiscal year 1976 plan stated:

"Responsibility for the Service is shared among three Federal departments--Commerce, Transportation, and Defense.

--The Department of Commerce provides meteorological services used by domestic and international civil aviation, and is responsible for meeting the common requirements of other agencies.

--The Department of Transportation makes recommendations to the Department of Commerce on civil aviation meteorological services, provides specialized equipment and surface observations at certain airfields, disseminates weather information to users, and distributes weather data over civil teletypewriter systems.

--The Department of Defense serves the specialized global needs of military aviation and makes meteorological information from its facilities available to civil aviation."

The major reason for the separate Defense system apparently is the philosophy that the military must retain self-sufficiency to support its U.S. operations during wartime conditions. Strict adherence to this philosophy inhibits the potential economies available from consolidating requirements and functions.

Agencies operate many weather stations which, in many areas of the Nation, become duplicate support capabilities.

We believe these functions can be consolidated, resulting in substantial savings, within the United States without affecting the military's readiness posture. Jointly operated military-civilian weather stations could support military and civilian requirements while reducing overhead expenses.

DUPLICATION AMONG NEIGHBORING WEATHER STATIONS

As of April 1975, there were about 530 local weather activities directly supporting civilian and military flight operations throughout the Nation at an estimated annual cost of about \$72 million.

<u>Agency</u>	<u>Number of facilities</u>	<u>Fiscal year 1975 operating budget</u> (millions)
Department of Commerce:		
National Oceanic and Atmospheric Administration	a/52	\$11.0
Department of Transportation:		
Federal Aviation Administration	<u>326</u>	<u>28.8</u>
Total	<u>378</u>	<u>39.8</u>
Department of Defense:		
Air Weather Service (Air Force)	105	21.8
Naval Weather Service (Navy)	b/47	<u>8.4</u>
Total	<u>152</u>	<u>30.2</u>
TOTAL	<u>530</u>	<u>\$70.0</u>

a/Weather support is also available from other National Oceanic and Atmospheric Administration facilities.

b/Includes Marine Corps stations.

While some differences in operating styles exist, civilian and military weather stations perform essentially the same types of functions. Generally, they (1) observe and report weather conditions, (2) formulate short term forecasts, and (3) brief pilots or flight crews on anticipated weather conditions. The information for their forecasts and briefings is compiled from local observations and data provided by the Air Force Weather Service, Naval Weather Service, and the National Weather Service, Department of Commerce.

In the geographical areas reviewed, we found

- four Air Force weather service stations operating near an FAA flight service station,
- two Navy weather service stations operating near a Federal Aviation Administration flight service station,
- six Federal weather activities supporting aviation on one island, and
- Naval, Air Force, and FAA aviation weather stations operating near each other.

Civilian and military personnel skills are extensive and can be merged in some areas.

We believe that substantial savings are available from integrating military and civilian aviation weather support requirements and capabilities. Military requirements could be reduced by

- assigning surface weather observation to base organizations such as the control tower or fire department, as FAA does at some civilian airfields,
- using the National Weather Service forecast network for all short range local forecasts, and
- merging military aviation weather briefing requirements and capabilities with those of FAA flight service stations to create regional briefing stations.

Four Air Force weather service stations near an FAA station

Within 50 miles of Sacramento there are air weather service stations at Beale, Mather, McClellan, and Travis Air Force Bases. An FAA flight service station is in the same area. All of these activities are considered to have similar weather characteristics by the National Weather Service.

As of June 30, 1975, the Air Force stations were assigned 98 personnel, although authorized 84. Distribution of the authorized positions was as follows:

<u>Position</u>	<u>Beale</u>	<u>Mather</u>	<u>McClellan</u>	<u>Travis</u>	<u>Total</u>
Administrative staff	1	1	1	1	4
Weather officers	6	4	3	7	20
Weather observers	8	4	7	8	27
Weather forecasters	5	9	3	6	23
Communications/ electronics main- tenance staff	<u>4</u>	<u>3</u>	<u>-</u>	<u>3</u>	<u>10</u>
Total	<u>24</u>	<u>21</u>	<u>14</u>	<u>25</u>	<u>84</u>

During fiscal year 1975 the operating cost for these four stations was an estimated \$1 million, of which \$900,000 represents personnel costs.

The FAA flight service station nearby, as of June 30, 1975, was assigned 22 personnel. A major difference between the military weather stations and the FAA flight service station is that the FAA does not forecast weather. The National Weather Service provides forecasts for major civilian airports in northern California from its office at Redwood City. These forecasts are distributed to the flight service stations to be used by civilian aviation. The Redwood City office employs about five personnel for this function.

According to the meteorologist in charge, the Redwood City forecast office could, with three more personnel, provide aviation forecast services for the four Sacramento area military installations plus five other northern California military installations. (These additional personnel could be military.)

Forecasting is only part of the duties of a military forecaster; he also prepares and provides weather briefings

to flight crews. During fiscal year 1975, the four military stations gave about 38,000 briefings. FAA's Sacramento flight service station during the same period gave some 117,000 briefings. Although there are some differences in briefing requirements, the flight service station has the weather information and resources needed to furnish a standard military briefing.

Combining the briefing workloads and calculating the required manpower based on FAA staffing criteria, the flight service station would require only five additional personnel to handle the entire briefing workload.

Each of the four military installations employs weather observers around the clock to observe and report airfield conditions. Under Air Force manning criteria, this results in a minimum staffing allotment of 5 observers per installation, or 20 for the 4 installations. Military observers perform other functions, generally pertaining to administrative activities or support of the station's forecasting or briefing workloads. In contrast, FAA's flight service station is allotted one staffyear to make around-the-clock observations at one Sacramento airport. At the Sacramento Metropolitan Airport, FAA tower controllers make the observations as secondary duties.

Assuming complete integration of military and civilian weather requirements and capabilities in the Sacramento area and an allotment of one staffyear to each military installation airfield for surface observations, savings could possibly reach 57 positions and \$600,000 annually. The savings in positions are summarized as follows:

	<u>Number of positions</u>		
	<u>Existing</u> <u>operations</u>	<u>Integrated</u> <u>operations</u>	<u>Savings</u>
Weather officers	20	a/4	16
Observers	27	b/4	23
Forecasters	23	c/8	15
Administrative	4	0	4
Communications-electronic maintenance staff	<u>10</u>	<u>10</u>	<u>0</u>
Total	<u>84</u>	<u>26</u>	<u>58</u>

a/One officer for each installation to act as a command weather liaison for such things as exercises and classified missions.

b/One staffyear per installation.

c/Five briefers for the flight service station plus three forecasters for the Redwood City office.

Two Navy weather service stations
near an FAA station

Naval Air stations at Moffett Field and Alameda, California, are located in northern California about 30 miles apart, and each has a weather station. As of late 1975, the Moffett Field weather station had a staff of 20 to support anti-submarine warfare operations. Across the bay the Alameda station had 14 personnel assigned to support the Naval Air Rework Facility, Navy Reserve, and Fleet Tactical Support Squadron flight operations. Both stations operate around the clock at an annual combined cost of about \$421,000, of which \$363,000 is for personnel.

These personnel observe airfield weather conditions, forecast weather, and provide weather briefings to flight crews. During the year ended September 1975, the two stations provided about 23,000 briefings by telephone, in face-to-face meetings, or by recorded message. At Moffett Field 6,600 or 64 percent of the briefings were by telephone or recorded message.

Seven miles from Alameda and 23 miles from Moffett Field is an FAA flight service station located at the Metropolitan Oakland International Airport. Staffed with 43 personnel as of June 30, 1975, this station is allotted one staffyear for

taking the weather observations for the Oakland airport and during fiscal year 1975 provided over 215,000 pilot briefings. The flight service station used data from the Redwood City National Weather Service forecast office about 7 miles from Moffett Field.

The National Weather Service meteorologist in charge indicated that Alameda and Moffett Field could receive forecast support from the Redwood City office.

As with the Sacramento area, opportunities are evident for savings in northern California through integration of the military and civilian capabilities and requirements for aviation weather support.

Six aviation weather stations on one island

On the island of Oahu, Hawaii, there are six weather stations: an FAA flight service station, a National Weather Service forecast office, Air Force stations at Hickam Air Force Base and Wheeler Army Activity, plus the Navy and Marine Corps detachments at the Naval Air Station, Barbers Point, and Marine Corps Air Station, Kaneohe. At the time of our review the military had 63 personnel assigned to these stations which incurred an estimated fiscal year 1975 operating cost of \$734,000. About \$674,000 of this cost was for personnel.

The National Weather Service forecast office is at the Honolulu International Airport, where runways are also used by Hickam Air Force Base. Since the forecast office handles the airport weather observations and forecasts, the Hickam Air Force Base weather station workload is primarily providing weather briefings to the departing Air Force flight crews and weather advisories to military activities. The briefings, which depict the weather conditions the military flight is expected to encounter, are compiled in weather packets developed by the base air weather station.

The National Weather Service forecast office prepares long distance flight packages two to four times daily for commercial aircraft scheduled to depart from the Honolulu airport. Each package contains the departure airport forecast and enroute and destination weather information, plus data on possible alternate airports. The briefing packages prepared by the National Weather Service for the FAA flight service station contain all the data that would be necessary

to brief military pilots. Also FAA charts for long distance flights are sufficient for use in briefing transoceanic military flights. Thus at the same airfield, the National Weather Service and the Air Force independently develop similar weather briefing packages.

Each of the three other military stations has forecasters who develop airfield forecasts and provide flight crew briefings, and observers who report airfield weather conditions. According to its meteorologist in charge, the Honolulu airport National Weather Service forecast office could, with 5 additional personnel, provide all local forecasts for the military.

The average monthly briefing activity for the military facilities follows:

<u>Installation</u>	<u>Long distance flights</u>	<u>Local flights</u>
Hickam Air Force Base	1,000	500
Wheeler Army Activity	0	350
Naval Air Station, Barbers Point	<u>a/150</u>	450
Marine Corps Air Station, Kaneohe	<u>b/0</u>	<u>c/80</u>
Total	<u>1,150</u>	<u>1,380</u>

a/Half of these involve classified missions.

b/There is an occasional long distance briefing.

c/Includes only in-person briefings. Briefings are also issued hourly by telewriter.

The long distance briefings which the Navy's Barbers Point detachment provides are prepared and given independently of the Hickam station and the Honolulu forecast office.

Briefings for civilian general aviation (private and noncommercial) local flights are provided by the Honolulu FAA flight service station. These briefings include the forecasts for the entire area developed by the National Weather Service forecast office. An FAA official advised us that the flight service station has the capability to provide the weather briefings for local military flights from the four military installations without increasing the staff.

Navy and Air Force weather stations
near an FAA flight service station

Within 20 miles of Norfolk, Virginia, the Air Force and Navy each operate two weather stations at an annual cost of about \$770,000. While these stations support military operations, civilian aviation in the area receives its weather information from the FAA flight service station at Newport News, Virginia, about 25 miles from Norfolk. The manpower authorized for these facilities at the time of this review was as follows:

<u>Facility</u>	<u>Authorized personnel</u>
<u>Military</u>	
Air Force:	
Langley Air Force Base	21
Fort Eustis	12
Navy:	
Norfolk Naval Air Station	14
Oceana Naval Air Station	<u>16</u>
Total	<u>63</u>
<u>Civilian</u>	
Flight service station:	
Newport News	<u>18</u>
TOTAL	<u>81</u>

Each military station has staff who develop short range forecasts for their respective airfields and provide weather briefings to pilots and flight crews. In contrast, the National Weather Service provides the forecasts for the Newport News and Norfolk airports from its Washington, D.C., forecast office about 150 miles away. According to the chief meteorologist from the forecast office, this office could provide the forecasts for all of the Norfolk area military installations with two additional personnel.

Langley Air Force Base, Oceana and Norfolk Naval Air Stations, and the Newport News flight service station independently provide around-the-clock weather briefings. The Langley station acts as a regional briefing station and, as such, provides telephone briefings to aircrews at two other

Air Force and one Army installation during their hours of reduced operation. The two Air Force bases are located over 275 miles away.

Eight miles from Langley the FAA flight service station also acts as a regional briefing station for civilian aviation operating from that location and from the Norfolk Regional Airport located about 25 miles away. The Oceana and Norfolk Naval Air Stations' weather activities not only provide face-to-face briefings but also use closed circuit television systems to provide remote briefings to aircrews located at the station but some distance from the weather briefing facility.

Thus, four weather stations close to one another brief aircrews electronically and do so with virtually no coordination.

INTEGRATING AVIATION WEATHER SUPPORT
WITHOUT HARMING DEFENSE PREPAREDNESS

Reasons given by weather officials for the military to operate weather detachments in the United States included the need to provide

- a trained deployable force to meet wartime contingencies,
- stateside assignments for personnel rotating from overseas or shipboard,
- observations of weather conditions for flight operations and resource protection, and
- specialized mission support to military flights which sometimes involve classified information.

We believe each of these requirements can be met while achieving the efficiencies available through consolidation.

A trained deployable force

The primary mission of the Air Force air weather service is to provide a trained deployable weather information force to support military operations overseas in the event hostilities erupt. Under the Air Force plan, personnel from weather stations in the United States would deploy to supplement the weather force already assigned overseas. Positions vacated in the United States would be filled from the Reserves.

As of November 1975, the Air Force estimated it would need 932 Reserve personnel to fill positions of deploying weather service personnel. In other words, approximately 900 active duty personnel are required to be trained and ready for deployment in a contingency. However, air weather service stations in the United States employ approximately 2,000 personnel. The other 1,100 personnel are therefore needed more for operating U.S. bases than for military contingencies. To the extent that the National Weather Service can provide the weather information needs for certain air bases, the 2,000 personnel requirement could be reduced.

Stateside military assignments

Obviously, as long as the military requires weather personnel overseas or on ships, there will be a requirement for positions to accommodate these people when they rotate back to the United States. Such positions should facilitate retention of occupational proficiency. We believe, however, such positions would not have to be sacrificed under integrated management of local aviation weather activities. Civilian and military personnel could jointly operate a weather station to provide for all aviation users.

Observations of weather conditions

Military weather detachments observe weather at their installations to provide for (1) safe use of runways, (2) adequate protection of facilities during bad weather, and (3) development of short range forecasts. Thus, military weather officials contend observers are required at the installations.

While observations are apparently necessary, assignment of surface observing responsibility to other base organizations could reduce the number of observers required. FAA, for example, assigns surface observing responsibility to such activities as the control tower or runway fire department at some civilian airports. In early 1975 the Air Force estimated 155 observer positions could be saved worldwide by transferring this responsibility to the airfield control tower, but took no action to eliminate the positions.

Specialized mission support

According to top-level military weather officers, military flights require support not typically provided civilian aviation because

- military aircraft have unique performance characteristics;
- military missions may not follow standard aviation routes;
- military missions, such as practice bombing or mid-air refueling, require very detailed weather data; and
- some weather briefings involve classified missions.

We recognize that at times military flights operate under unique situations which require specialized support. With respect to the standard DOD weather briefing format, however, we found civilian weather stations have the capability to provide virtually all of the required information. Therefore, ample opportunity exists for eliminating redundancies while providing for unique military requirements. Joint military-civilian weather stations, for example, could be responsive to the military while eliminating the existing redundancies in developing aviation weather information.

Weather information becomes classified when it could reveal the classified nature of a mission. In the Air Force, the installation weather detachment does not prepare classified weather briefings. Instead, a staff weather officer obtains unclassified general weather data from the station and then develops the classified briefing for the mission. This practice seems to negate the need for a resident weather detachment to support classified missions.

CONCLUSION

The weather information capabilities existing in the locations covered during this review offer an excellent opportunity for Commerce, DOD, and FAA to pool resources.

RECOMMENDATION

We recommend that the Secretary of Commerce direct the Federal Coordinator for Meteorological Services and Supporting Research to review, in coordination with the Secretaries of Defense and Transportation, the aviation weather requirements of the military and civilian communities in an effort to detect those areas where duplicate capabilities can be consolidated or provided under interservice/interdepartmental arrangements.

AGENCY COMMENTS AND OUR EVALUATION

In response to an earlier version of this report, the Administrator of the National Oceanic and Atmospheric Administration concurred with our recommendation and was willing to work with DOD and Transportation to achieve further improvements in economy and efficiency in providing weather services. He states that the Federal Coordinator for Meteorological Services and Supporting Research has begun considering problems common to the National Weather Service and FAA and as a result of our report will consider those of DOD.

The Navy agrees that opportunities exist for exchanging airways weather information with certain civil activities and tactical weather information with certain military activities in locations where the nature of supported military aviation operations permits. They state that Navy environmental support requirements are such that they can generally provide needed support to other agencies, but, without increased personnel education and training and an expanded environmental data base, other agencies could not meet Navy needs. In addition to their unique needs cited earlier, they indicate the need for oceanic and atmospheric information, magnetics, and ballistics.

While the National Oceanic and Atmospheric Administration may not distribute this type of information in the format used by the Navy, it does accumulate the data and could furnish the needed information in the desired format, if required. Regardless of the agency providing weather data, once given the raw data, the skills, and requirements, that agency could interpret and provide the needed weather information for everyone. Any agency performing the mission could still provide for military training and proficiency.

The Navy also indicated that consolidating weather facilities at the Norfolk and Oceana stations, which incur volumes of 61,000 and 26,000 briefings per year, appears economically disadvantageous. We note that certain FAA flight service stations have provided substantially more weather briefings than the combined total for both subject facilities. The Oakland flight service station, for example, gave some 215,000 briefings during fiscal year 1975.

The Air Force agrees that the three regions identified in the earlier version of this report (Norfolk, Sacramento, and Honolulu) and others of a similar nature should be examined in an effort to identify areas offering potential

savings of resources. The Air Force does not agree, however, that other base organizations should be tasked to make weather observations. They point out that the original Air Force space-saving estimate of 155 spaces made in their 1975 study (see p. 51), upon closer examination turned out to be only a saving of 54 spaces worldwide.

We believe, however, that there is an opportunity to reduce personnel requirements at some locations. At civil airports, FAA permits weather observations to be performed by nonweather activities.

The Air Force stated that it is embarked on an orderly program to make its weather service more efficient by combining weather forecaster and observer career fields and automating weather sensors and short range terminal forecasts. The automation program is not to be fully implemented until the 1980s. These actions, coupled with more effective coordination between military and civil agencies to eliminate the weather forecaster and observer functions at some bases, should provide for more effective use of resources.

The Air Force agreed that there are opportunities to derive manpower economies by either integrating Air Force forecasters into the National Weather Service or by inter-departmental arrangements with the National Weather Service, particularly during normal base flying hours. However, the Air Force wished to be assured of a quick response with weather assistance for efficient use of flying periods. We believe that centralized facilities coordinated between FAA, National Weather Service, and the military departments can provide real time weather service using closed-circuit television and other electronic means. These techniques are being used currently for across base dissemination of weather information. It would seem that similar means could be used from a joint centralized coordinated facility.

The considerations by the Federal Coordinator for Meteorological Services and Supporting Research of the problems pertaining to aviation weather services involving the National Weather Service and FAA and the extension of these considerations to the needs of DOD, should eliminate some unnecessary duplication and increase efficiency throughout the Federal Government in meeting weather information requirements.

CHAPTER 6

POTENTIAL FOR CURTAILING

MILITARY AIRFIELD OPERATIONS

Certain military airfields operate 24 hours a day, 7 days a week, even though traffic during late night hours and on weekends is very light. In some cases these airfields are within a few miles of another military or civilian airport which can provide adequate services during periods of low demand. We reviewed three of the many services provided at airfields and identified numerous opportunities to reduce expenditures by having airfields share services.

DETERMINING OPERATION HOURS

Military airfields usually operate around the clock, but their operating hours may be curtailed under certain circumstances. For example, the Navy permits an airfield to close when (1) there is little traffic during recurring periods, (2) a nearby facility can handle any aircraft arriving in the area, and (3) the airfield's mission will not be affected.

The Air Force criteria for an airfield to remain operational on a 24-hour basis are that the base must (1) have an air defense commitment, (2) have a strategic air commitment, or (3) be 1 of 11 bases designated as "queen bee." (The latter are selected on the basis that their locations permit an Air Force pilot to fly any place in the United States and be within 500 nautical miles of a base having landing and refueling services.) Otherwise the local commander determines the operating hours.

Likewise at Army airfields, commanders have jurisdiction over all matters concerning the operation and use of Army aviation within their commands. They determine the airfield functions and services and set operating hours based on the mission, available resources, and manpower.

Occasionally the military services have attempted to reduce airfield costs by curtailing operations, but their efforts have not always been successful. In 1972, for instance, the Air Force identified 57 airfields for possible conversion from 24-hour to 16-hour a day operations, but only 11 of these airfields actually reduced their operating hours.

POTENTIAL TO REDUCE SERVICES

We selected three of the many support services provided at military airfields to assess the potential for reducing expenditures. We looked at (1) ground controlled approach radar, (2) weather services, and (3) transient aircraft maintenance.

Ground controlled approach radar

Numerous types of navigational aids can be used to assist pilots in making instrument approaches; most transmit signals directly to the aircraft, enabling pilots to navigate without ground assistance. GCA radar systems, unlike most other types of navigational aid systems, do not transmit signals to the aircraft. The system consists of an Airport Surveillance Radar and/or Precision Approach Radar and associated communication equipment and controllers. The system displays azimuth and elevation information on its scopes. Controllers on the ground are required to observe and interpret radar displays and transmit course and glide slope information by radio to the pilot and direct him to a safe approach route.

An FAA official told us that civilian airports do not use GCA radar systems; they use only unmanned approach aids. The military's requirement for GCA radar at airfields in the United States is based on the need to

- train or maintain the proficiency of pilots in its use, since in contingency operations it may be the only system available for precision approach landings;
- provide a backup to the instrument precision landing systems at remote installations or where mission sensitivity warrants such duplication; and
- provide a precision approach radar system at installations where a precision instrument landing system is impractical.

These requirements would not in our opinion justify operating a GCA radar system when there is little or no air traffic, when training opportunities are minimal, and when unmanned navigational aids are available.

Weather services

Military installation weather stations observe and report weather conditions at airfields to provide information for safe runway use. Furthermore, they brief pilots before their flights on weather conditions they can expect to encounter. To provide these services, some airfields employ observers and forecasters 24 hours a day.

Military officials generally object to obtaining weather briefings by telephone or having weather conditions recorded by personnel as a secondary duty. They contend that telephone briefings do not provide the free flow of information that can be obtained in a face-to-face situation and that weather conditions may not be recorded as promptly as necessary. They point out, for instance, that controllers might be able to record weather conditions at most times but would be unable to do so when air traffic is heavy.

However, weather service regulations permit pilots to obtain briefings by telephone--a practice already used by some military and civilian pilots. Some civilian airfields also use controllers or other employees to record weather conditions, and it seems unlikely that military controllers would be unable to do so during nights or weekends when air traffic is extremely light.

Transient maintenance

Some military airfields employ a crew 24 hours a day to service transient aircraft, although few transient aircraft arrive or depart during certain times.

Military regulations do not require that all airfields employ transient maintenance crews and, in some instances, the regulations specify the volume of traffic needed to justify around-the-clock operations. In our opinion, however, these criteria are too broad and subject to wide interpretation. The Air Force, for example, authorizes around-the-clock maintenance crews whenever an airfield averages more than 350 transient arrivals a month--regardless of the time of day the aircraft arrive or depart. If an airfield meets the numerical criteria, it is authorized to have a crew on duty at night, even if no aircraft ever arrive or depart at night.

INSTALLATIONS HAVING POTENTIAL
TO REDUCE OPERATIONS

Langley Air Force Base

Transient maintenance, radar, and weather crews are employed 24 hours a day at Langley despite little air traffic between midnight and 6 a.m. For example, an average of

- one transient aircraft a night arrived at Langley between midnight and 6 a.m. during fiscal year 1975,
- one instrument approach a night was made between midnight and 6 a.m. during fiscal year 1975, and
- one weather briefing a day was given between 7 p.m. and 4 a.m. during a 3-month period.

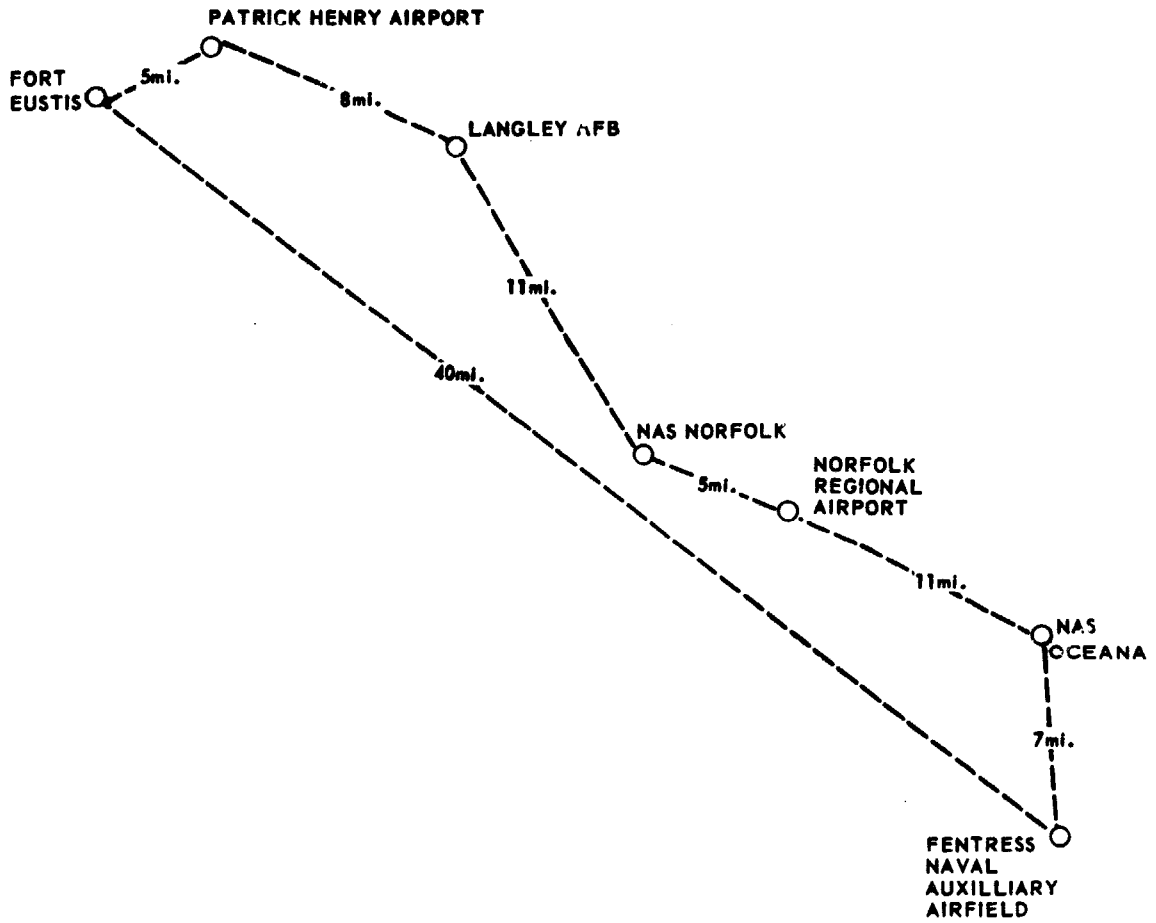
In addition to its GCA radar, Langley has two unmanned navigational aids for instrument approaches and nearby airfields offer additional aids--including GCA radar--that could be used by Langley traffic in an emergency. (See p. 59.) Weather conditions between midnight and 6 a.m. have historically been above minimum operating conditions 95 percent of the time for one of Langley's unmanned approach aids and 98 percent of the time for the other. In comparison, weather conditions have also been above GCA minimum 98 percent of the time.

The few weather briefings given at Langley during the night could be easily obtained by telephone from a nearby FAA flight service station or other military bases. Although Langley serves as a regional weather office for three bases that operate less than 24 hours a day, it averages less than one briefing a day for these bases between 7 p.m. and 4 a.m. Since these bases receive their briefings by telephone they could just as easily receive them from some other weather facility.

Although night staffing of GCA radar, weather, and transient maintenance services is normally light, we estimate that Langley spends at least \$70,000 1/ annually for these services.

1/Includes salaries only, not fringe benefits.

**MILITARY AND CIVILIAN AIRFIELDS
IN THE NORFOLK, VIRGINIA, AREA**



Norfolk Naval Air Station

This air station also provides GCA radar and weather services around the clock but, like Langley, has little need for these services during late night hours. For example, during a 6-week period the air station averaged only eight arrivals or departures a night between 11 p.m. and 7 a.m. About 95 percent of the time between midnight and 8 a.m., weather conditions at the Norfolk air station are within the limits that allow use of the station's unmanned navigational aid. Therefore, most late night flights probably did not need GCA radar. Also, the departing flights could have received their weather briefings from other military and civilian weather offices in the area.

About a year before our review, the station proposed to the Chief of Naval Operations that its GCA radar system be closed at night due to personnel shortages. In making the proposal, the air station pointed out that weather conditions at night would rarely prohibit use of the field's unmanned approach aid--less than 4 percent of the time, according to our computations. The Commander, Naval Air Atlantic, responded and stated that the interservice support arrangement with the Military Airlift Command precluded closing the GCA at night. A review of the agreement by the Naval air station with the Military Airlift Command indicated that operating the GCA on a 24-hour basis was not a required service. Nevertheless, the Commander, Tactical Wings Atlantic, directed the stations to hold the proposal in abeyance.

Considering the unmanned navigational aids available to the station and the little amount of time the GCA system was needed, the station's proposal to close it at night appears feasible. This station spends more than \$40,000 1/ a year in personnel costs to operate its GCA radar and weather services at night.

McClellan Air Force Base

While McClellan provides various airfield support services around the clock, the need for the airfield to remain open continuously is questionable. Air traffic is extremely light during the night, and virtually all of the base's users have acknowledged that they could operate satisfactorily if the field were closed at night. For example, one of the users

1/Includes salaries only, not fringe benefits.

is a rescue and recovery squadron that requires 3 hours leadtime before its aircraft can depart--sufficient time for on-call airfield personnel to report for duty.

ACTIONS TO REDUCE AIRPORT ACTIVITIES

Although the military services stress self-reliance, this does not mean that each facility has to be self-sufficient. Moreover, the services agree that interservice support is a management technique that should be sought whenever financially advantageous to the Federal Government. Military airports located near other airports offer the potential for economy by reducing operations or eliminating marginally needed services. For example, the Army operated at Fort Leavenworth, Kansas, a fully instrumented airfield 16 hours a day, 7 days a week, but the actual number of instrument landings was relatively small. Through coordination with the Kansas City International Airport, the Fort Leavenworth instrument landings are now handled at the Kansas City facility, thereby making possible the reduction of instrumentation and personnel requirements.

We noted that, in keeping with DOD policy to reduce resource expenditures, the Air Force began three separate actions to

- reduce many airfield support services from 24 to 16 hours a day,
- eliminate very high frequency omnidirectional navigation equipment at bases where it is no longer needed, and
- decommission nondirectional radio beacons that are no longer justified.

According to the Air Force, the action to decommission the beacons was taken partially as a result of GAO's efforts and could result in annual savings of about \$135,000. These are only illustrative of the many airport services that offer potential for consolidation, reduction, or elimination.

CONCLUSION

Despite recent efforts by the military services, many airfields provide support services during periods of little or no air traffic. Although our review was limited to only a few of the airfields and services provided, there are numerous services that are operated at night and during other periods of low use which are costly and potentially available from other sources.

RECOMMENDATION

We recommend that the Secretary of Defense identify and curtail airport services

--that are not required because of an insufficient volume of air traffic or

--which can be obtained through arrangements with nearby facilities.

AGENCY COMMENTS AND OUR EVALUATION

DOD responded to our draft report on November 1, 1976. The Air Force cited its policy which provides for limiting manpower based on the workload involved during reduced periods of activity. In other words, the manpower assigned to night airfield activities should be commensurate with the level of activity. In our view this policy is good if the functions supported are required; however, the necessity to operate, even at a low level, the services described in this report is questionable, particularly when there are alternatives available.

The Navy cited the need to maintain the capability to support the combat readiness of each assigned operating aviation unit. Nevertheless, the Navy said it will actively pursue further curtailments and consolidations consistent with the readiness requirements of their aviation installations.

The Navy agrees that it is possible to curtail services at the Norfolk Naval Air Station during late night hours. However, the Navy points out that the station serves as an aerial port for Military Airlift Command flights and investments have been made to establish equipment and facilities in agreement with the Command to support its contract carrier requirements. They feel these factors require that late night hour services be retained. However, with the small volume of traffic and the history of good weather at the Norfolk station described previously, it is doubtful that the Navy needs to provide GCA radar and weather services during late night hours on a regular basis when there are unmanned navigational aids available at the air station and weather briefings are available at the FAA flight service station. Moreover, on those infrequent occasions where the weather is below the unmanned navigational aid minimum, there is ample notification of pending arrivals to permit activation of the ground control approach radar.

CHAPTER 7

THE NEED FOR EMPHASIS BY TOP-LEVEL MANAGERS

The three Government agencies involved in aviation-- Federal Aviation Administration, Defense, and Commerce--need to take action to effectively coordinate their aviation requirements. There is presently no method by which these agencies jointly assess their common requirements to achieve more efficient use of the Federal Government's aviation resources.

Though FAA is mandated by law to manage the Nation's airspace, it has no procedures for systematically identifying the most economical approach to accomplish this function insofar as it involves the most effective integration of military-civil requirements. If, for example, FAA were to periodically evaluate existing approach control arrangements as described in chapter 3, it would improve its ability to control the use of the Nation's airspace in the most efficient manner.

Commerce, in coordination with DOD and FAA, should evaluate the requirements for weather information for the aviation community as a whole to assess essential requirements and develop new approaches for providing this data with a minimum of overlap. Working together FAA, Commerce, and the military departments could work out ways to rely on each other more extensively; to share all types of aviation support facilities, equipment, and personnel to assure maximum use of scarce resources; and to avoid developing and authorizing unneeded facilities and equipment.

Better management of DOD aviation facilities is also essential for more efficient use of existing resources. We also believe that a more extensive integration of military-civil aviation management improves the Nation's total defense capability.

We surveyed only a few of the many airport activities supported by the Federal Government. There are a number of other activities which offer potential for achieving savings through interdepartmental coordination.

The fact that management officials in the military departments have prompted the elimination of some facilities and the consolidation of some functions is indicative of what can be done in the furtherance of economy and effectiveness in managing aviation resources.

RECOMMENDATION

In view of the magnitude of the Government's investment in aviation support functions and the potential to achieve greater efficiency through a coordinated Government effort, GAO recommends that the Administrator of FAA and the Secretaries of Defense and Commerce support a high level effort within their agencies emphasizing effective planning and coordination of aviation requirements. They should emphasize the advantages of interdependence on the supporting capabilities of both the military and civilian community. This includes

- eliminating redundancies between aviation support systems,
- developing a program for eventual standardization of Federal airport functions, particularly navigational aids, and
- evaluating support activities in geographical areas having multiple Federal involvement to consolidate support capabilities where possible.

AGENCY COMMENTS AND OUR EVALUATION

We brought our conclusions and recommendations to the attention of the Secretaries of Defense, Commerce, and Transportation in our August 11, 1976, report.

DOD feels that its Advisory Committee on Federal Aviation, established to carry out the exchange of information required by the Federal Aviation Act of 1958, has led to significant coordination with FAA and can be used to effect further coordination of the matters described in our report.

Transportation agrees that increased emphasis needs to be placed on more effective planning and coordination of aviation requirements among FAA, DOD, and Commerce.

The Secretary of Defense also stresses that DOD airfields are in support of national defense objectives, and the criteria for their operation cannot be the same as that for civil airports. The Secretary of Transportation notes that DOD takes the position that its operation of approach control, landing and navigation facilities, and weather services at military installations is vital to defense needs.

As a result, the Secretary does not feel that FAA is in a position to judge DOD's determination of national defense interests.

As we have already stated, we believe that the total military-civil aviation resources are a valuable national resource for both defense and civil requirements. To the extent that the military and civilian personnel operating and using these resources to develop the capacity to relate, interoperate, and cross service, we believe the total aviation resources of the Nation will be more efficiently used, and the experience and duplication available to the military through the civil facilities will improve the Nation's defense capabilities.

To bring these results about will require top-level management commitment in the agencies involved to provide both the guidance and motivation of operating personnel.



ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

OPERATIONS AND LOGISTICS

November 1, 1976

Mr. Fred J. Shafer
Director, Logistics and
Communications Division
General Accounting Office
Washington, D. C. 20548

Dear Mr. Shafer:

This is in reply to your letter of August 11 to Secretary Donald Rumsfeld transmitting copies of your draft report entitled, "More Effective Use of Aviation Resources in the United States Can Be Achieved," OSD Case #4433.

Your recommendation that the Administrator of the Federal Aviation Administration (FAA), the Secretary of Defense and the Secretary of Commerce establish a high-level task force to develop procedures for assuring maximum effectiveness and minimum investment of aviation resources has merit.

Within the Department of Defense (DoD) there currently exists an Advisory Committee on Federal Aviation which was established to carry out the exchange of information required by the Federal Aviation Act of 1958. This has led to significant coordination with the FAA and can be used to effect further coordinations on such matters as contained in your draft report. We participate in the procurement of air traffic control systems where there is a common need and it is most effective. There are locations where DoD provides air traffic control services to civil aviation and locations where the FAA serves the DoD, as well as several joint-use facilities. We will continue our efforts to achieve efficiency where possible, but it must be recognized that the DoD airfields are in support of national defense objectives, and most airfields must be operated 24 hours a day to accomplish a combat readiness or wartime mission. Criteria and standards to authorize support systems for DoD airfields cannot be based solely on the number of air traffic operations and passenger usage as applied to civil airports.



Further, DoD manpower must be sufficient to support the most demanding wartime requirements as directed by National Strategies.

Specific comments to your report are included in the enclosures.

Sincerely,



FRANK A SHRONTZ
Assistant Secretary of Defense
(Installations and Logistics)

Enclosures
as stated

Department of the Navy Comments
on
GAO Draft Report of 11 August 1976
on
More Effective Use of Aviation Resources
in the United States Can Be Achieved
(OSD Case No. 4433)

1. Summary of GAO findings and recommendations

The GAO report presents findings, conclusions, and recommendations concerning possible economies in four support areas related to military and civil aviation. The report notes apparent redundancies between military and civil support functions and recommends further action with the objective of curtailing military airfield operations, consolidating approach control facilities, decommissioning redundant navigation aids, and consolidating aviation weather facilities. Additionally, the report recommends that the Administrator of the FAA, the Secretary of Defense, and the Secretary of Commerce establish a high level task force to identify ways in which the three agencies can plan and coordinate aviation requirements.

2. Summary of Department of the Navy position

The Navy has been active in the review of the shorebased aviation support facilities and functions cited in the report and will actively participate or assist in joint military efforts to review the investment in these aviation support functions. Navy reviews of airfield operations and navigation aids have been recent and have resulted in economies in many areas. The Navy participates in several cooperative efforts with other Departments in the utilization of approach control and weather facilities.

It is essential that each aviation installation maintain its capability to support the combat readiness of each of its assigned operating aviation units. Further curtailments and consolidations to achieve economy will be actively pursued, consistent with the requirements for mission readiness of each individual aviation installation. Of particular concern

is the requirement to maintain the military training of air control and weather personnel. Although there are similarities between the functions performed by these personnel and their civilian counterparts, which may lead to conclusions concerning the ease of consolidation of approach control and weather facilities, the military application of these functions is very specialized and requires that these personnel regularly function in the military environment. Air control and weather personnel are not quickly or easily trained or replaced and a shortage of these personnel when required greatly restricts the capability of air installations or operating units to meet contingency requirements. The elimination of shore duty billets and the resultant effect on retention would further limit the ability of the Navy to maintain combat and mission readiness.

Concerning the specific recommendation to stop the currently proposed construction of a radar approach traffic control facility at MCAS Kaneohe Bay, the program to replace obsolete GCA's at all air installations (including MCAS Kaneohe Bay) will provide adequate radar air control capability, without the need for the proposed construction.

With regard to the GAO recommendation to establish a high level task force to develop procedures to assure maximum effectiveness and minimum investment of aviation resources, the Navy would willingly participate, if requested.

3. Statement

a. Chapter 3. Potential for Curtailing Military Airfield Operations

Page 22.

Finding: Naval Air Station Norfolk...provides ground control approach and weather services around the clock but... has little need for these services during the late night hours.

Comment: Although it is possible to curtail night ground controlled approach and weather services at NAS Norfolk, there are other factors which require these services be retained.

By joint directive applicable to the Air Force, the Army, and the Navy, NAS Norfolk has been designated as an Aerial Port and must support sustained air movement of personnel and material and serve as an authorized port of entry and departure. Such airfields are designated on the basis of

being most advantageously located for the distribution of DOD authorized traffic by air, recognizing airlift service requirements as well as economic considerations. Considerable investment has been made to establish the equipment, facilities (including passenger and cargo terminals), and personnel required to support Military Airlift Command (MAC), MAC contract carrier and Navy logistic missions. Reducing the hours of operation of this important logistic head through airfield closure or diminished aircraft recovery capability could prove costly in terms of world-wide DOD logistics capability.

An existing Interservice Support Agreement between NAS Norfolk and the Military Airlift Command (MAC) specifically requires 24 hour, seven days per week support, including NAVAIDS, approach facilities and weather services. Commander in Chief, U. S. Atlantic Fleet (CINCLANTFLT) approved this agreement in January 1976 in recognition of NAS Norfolk as the focal point of a major world-wide logistic supply network which is and must be responsive to fleet demands on a 24 hour basis.

Cargo processed at NAS Norfolk runs the gamut of the supply system and can be time sensitive, dangerous, expensive or classified. Flights originating or terminating at NAS Norfolk may be constrained by departure or arrival times at origin or destination which are beyond CINCLANTFLT control. This dictates that support facilities must be available for aircraft arrivals and departures. To provide adequate cargo handling and storage facilities at another site if NAS Norfolk were below nonprecision minimums or closed, or incur additional cost in double handling, would be uneconomical and ineffective. Because of its importance as a logistic head, it is inappropriate to restrict NAS Norfolk support services.

Page 24.

Conclusion: ...many airfields remain operational or provide support services during periods when there is little or no air traffic...

Recommendation: ...the Secretary of Defense take action to identify and curtail airport functions and services--that are not required...

Comment: Navy policy specifically encourages Commanding Officers to seek permission to reduce airfield (and airfield services) operating hours whenever possible to achieve economy. This policy has resulted in significant reductions in airfield

operating hours for 39 naval air installations and restricted hours of availability for transient aircraft maintenance for 44 naval air installations. These reductions reflect the results of previous actions to curtail airfield operations. The Navy will continue to emphasize the curtailment of airport services where economies can be achieved, which do not result in lower mission or combat readiness of the installation or its critical personnel.

b. Chapter 4. Potential for Consolidating Approach Control Facilities

Page ii, Page 33.

Finding: ...the military services and FAA independently operating radar approach control facilities to manage airspace bordering on another even though each facility could have the capability to manage the total assigned airspace. (NAS Oceana and NAS Lemoore)

Comment: The Navy should continue to operate the approach control facilities at NAS Oceana and NAS Lemoore. Navy policy regarding operation of approach control facilities is based on the Memorandum of Agreement (MOA) executed on 2 June 1969 between the Departments of Transportation, Army, Navy, and Air Force. Under the terms of this MOA and pursuant to the Federal Aviation Act of 1958, where the FAA and military mutually agree, the approach control authority for the military terminal area will be delegated to the military. Unless agreed to the contrary, where a military facility is located near an FAA approach control facility, the FAA will perform the approach control function. Approach control service should be provided by the Navy at Naval Air Stations with a large volume of high performance air traffic which does not require integration with civil air traffic. This service should also be provided by the Navy at sufficient locations to insure the combat readiness of an adequate number of shorebased Navy air controllers. The Navy operation of the approach controls at NAS Oceana and NAS Lemoore is in accordance with this rationale and the MOA. Without provisions for additional facilities and personnel, neither NAS Oceana or NAS Lemoore nor the FAA approach controls at Fresno and Norfolk have the capability to manage the total assigned airspace.

Consolidating the NAS Oceana approach control with the FAA's approach control at Norfolk Regional Airport, is possible but not recommended. The addition of more than 150,000 annual operations generated by NAS Oceana would require the FAA to make significant investments in equipment and training to insure an equivalent level of safety and responsiveness to tactical aircraft operations. In the Norfolk area, Navy air

traffic predominates. Because NAS Oceana is located east of civil airways and directly adjacent to the offshore operating areas, ninety percent of NAS Oceana's air traffic remains entirely under that facility's approach control authority. This greatly facilitates the quick response capability required for fleet training effectiveness, reduces operating costs through the use of military handling procedures, and simplifies the control of other aircraft, both civil and military, operating in the Norfolk area. NAS Oceana air traffic is often continued through the night in response to fleet training requirements. In addition to providing the responsiveness required to support fleet carrier aviation, the NAS Oceana facility is the single radar approach control facility available to Commander Naval Air Forces, U. S. Atlantic Fleet, with sufficient air traffic volume to train naval air traffic controllers in an environment simulating that encountered at sea.

Consolidating San Joaquin Valley approach control requirements with the Navy at NAS Lemoore as a means of achieving savings was studied by the FAA in 1971. This study identified the Navy as the predominant user for the approach control services then provided by the FAA from this naval facility. This study resulted in the relocation of these FAA personnel to the smaller Fresno approach control facility. The personnel costs incurred in support of naval requirements were a significant factor in this decision. After the departure of the FAA from NAS Lemoore the Navy assumed approach control responsibility at that station. The facility now provides the Commander Naval Air Force, U. S. Pacific Fleet with a radar approach control capability suitable for training naval air traffic controllers in a simulated carrier environment. The NAS Lemoore facility has been upgraded since the FAA's departure in order to support the large volume of air traffic and meet fleet pilot and controller training needs. The facility is no longer adequate in size or equipment to absorb FAA personnel and would require significant facility expansion to fulfill the GAO proposal. During CY 1975 the Fresno facility handled 61,084 operations while the Navy handled 254,818 operations at NAS Lemoore.

(See GAO note 1, p. 85.)

(See GAO note 1, p. 85.)

Page 40.

Recommendation: ...Administrator of the Federal Aviation Administration, in coordination with Secretary of Defense, establish procedures for evaluating the potential of consolidating the management of adjacent...airspace...

Comment: In keeping with the previously cited MOA and Navy requirements to exercise approach control authority for purposes of training and readiness, the Navy will actively participate in future evaluations of the potential of consolidating airspace management, as requested.

(See GAO note 1, p. 85.)

Page 54.

Finding: Redundant precision NAVAIDS. (Automatic Landing System (ACLS) and Precision Approach Radar (PAR))

Comment: ACLS was installed ashore to provide simulated carrier approach training on one runway at each of the five major jet bases. ACLS systems have not yet been authorized as shorebased instrument landing systems, however, the Navy is presently reviewing ACLS to determine its suitability as a shorebased landing system. Of concern are indications of shortened range in heavy precipitation and erratic signal return from non-ACLS equipped aircraft when used in a talk-down mode. Further, material support levels necessary to

permit full reliance upon the system ashore are being determined. Upon completion of this review and upon the establishment of all-runway capability at each of the five locations the Navy intends to thoroughly explore the feasibility of eliminating PAR at those locations.

(See GAO note 1, p. 85.)

Page 61.a

Conclusion: Military and civilian aviation administrators have not established effective procedures for coordinating their navigational aid equipment requirements.

Comment: Although lack of coordination in the past may have contributed to the present wide variety of navigational aids, recent coordination between DOD and FAA on next-generation navigational aids is well organized and productive. The continuing dialogue on the Global Positioning System (GPS) and the National Microwave Landing System (NMLS) is expected to result in development of systems which fully meet both civil and military needs and reduce the number of systems in use.

Page 61.a

Conclusion: The Department of Defense is not controlling the authorization and use of navigational aids to avoid duplication and assure use only where there is a valid requirement.

Comment: Periodic reviews such as those conducted on the NDBs by the Navy in 1974 are accomplished to eliminate unnecessary duplication. A review of potentially redundant TACAN installations was completed in 1975 and at present, requirements for airport surveillance radar (ASR) are being reviewed to eliminate duplicate installations. Military requirements of each service, including coordination of mission equipment, location, and need must be considered in the formulation of requirements for navigation aids. The Navy has established procedures within the Naval Air Traffic Control, Air Navigational Aids, and Landing Systems (NAALS) Program during the last year to insure comprehensive management of these equipments.

Page 61.a

Recommendation: The Secretary of Defense and the Federal Aviation Administration establish effective procedures to coordinate and avoid the proliferation of redundant equipment.

Recommendation: The Secretary of Defense develop effective criteria and standards for the authorization and use of navigational aid systems at military airfields.

Comment: The Navy concurs with the need to avoid the proliferation of redundant equipment and will actively participate in the establishment of procedures and standards as requested.

Page 61.a

Recommendation: The Secretary should also take action to decommission those redundant navigational aid systems...

Comment: This recommendation is fully supported and as noted above, the Navy has a continuing program of reevaluation to determine excessive redundancy and will vigorously pursue such action in the future.

d. Chapter 6. Consolidation of Aviation Weather Facilities is Feasible

Page 70.

Finding: Navy weather stations near a Federal Aviation Administration Flight Service Station.

Comment: Navy Weather Environmental Support Detachments (NWESED), FAA Flight Service Stations (FSS), and National Weather Service Forecast Offices (WSFO) perform dissimilar functions. FAA pilot weather briefers are not authorized to provide forecasts, but make local observations and provide pilots with current and forecast aviation weather provided by WSFO's. WSFO personnel provide a range of weather products, including aviation forecasts, to FSS's and NWESED's.

The responsibilities of the NWESED at a naval aviation installation are considerably broader than those of the FSS. In addition to airways weather, the NWESED provides several environmental data needs unique to naval missions not readily available from an FSS or a WSFO, related to ocean acoustic propagation, atmospheric refractivity, magnetics, ballistics, etc. To effectively provide these weather needs, naval weather personnel require specialized training beyond that provided for FSS personnel. To insure technical proficiency and shore assignment opportunity for these skilled personnel it is essential that they function regularly in the military weather environment. Although the Navy has examined the possible consolidation of weather service functions at certain adjacent naval air installations, such consolidations, if accomplished, would require the resolution of problems related to providing graphic weather depictions, automated flight plans, classified weather briefs, and shipboard training requirements from one station to another. Although NAS Norfolk and NAS Oceana are proximate, there is a high degree of variability in actual weather experienced, particularly in marginal situations. NAS Norfolk provides 61,000 briefings per year. NAS Oceana provides 26,000 briefings per year. Because of this high volume consolidation of these facilities appears economically disadvantageous.

Page 79.

Conclusion: ...a lucrative opportunity for the Departments of Defense and Commerce and the FAA to pool resources... to enhance efficiency and economy.

Comment: The Navy agrees that opportunities exist for exchanging airways weather information with certain civil activities and tactical weather information with certain military activities, in locations where the nature of supported military aviation operations permits. The Navy agrees that observations should be made by Navy weather personnel at each

station. Although further consolidation may be achieved, in certain cases at certain locations, the general requirement for observation and forecasting capabilities of the NWSED's at each naval air installation, must be maintained.

At the present time, extensive cooperative efforts are already in being. A total of 17 domestic naval air facilities (and others overseas) either receive or provide remote aviation weather support, and others are being considered for it. Current arrangements include participation of Army, Air Force, Coast Guard, Treasury, FAA, Marine Corps, civil and state government elements, as well as other Navy activities. The environmental support requirements placed upon the NWSED's are such that they can generally provide needed support to other agencies, but, without increased personnel education and training and an expanded environmental data base, the reverse is not true. Examples of special inter-agency cooperation include the Navy's Fleet Weather Central in Hawaii where two National Weather Service personnel assist in computer programming and the adapting of Navy products for use by the National Weather Service in the Pacific area. At Suitland, Maryland, the Navy Fleet Weather Facility provides operational sea ice analyses to NOAA and also backup communications for the National Meteorological Center. The Navy will continue to consolidate weather support where practical, but primary Navy concerns must include the adequate provision of fleet environmental support, aviation weather capability, and classification of certain naval operations, the nature of which may be revealed through weather information.

Page 79.

Recommendation: ...The Secretary of Commerce direct the Federal Coordinator for Meteorological Services and Support Research to review in coordination with the Secretaries of Defense and Transportation the aviation weather requirements of the military and civilian communities.

Comment: Coordination and review of federal weather activities has been quite productive in the past. There is every indication that this will continue in the future. The Navy will actively participate in future reviews of military and civilian weather requirements, as requested.

DEPARTMENT OF THE AIR FORCE

COMMENTS/ERRATA ITEMS ON GAO DRAFT REPORT, "MORE EFFECTIVE USE
OF AVIATION RESOURCES IN THE UNITED STATES CAN BE ACHIEVED"
(OSD CASE NO. 4433)

Page 8:

Reference lines four, five, and six, which refer to isolation of military facilities. The Air Force has worked with the FAA over the years to consolidate air traffic control services to support the civil and Air Force communities, when such consolidation proved to be safe and economical. The result is that the FAA provides approach control service at 41 Air Force bases, while 38 Air Force approach controls serve some 119 satellite civil airports. The remoteness of many Air Force airfields require that they function in isolation. The Air Force is willing to assist the FAA in developing further consolidation of approach control facilities, if such studies would prove to be more safe and economical, and at the same time insure national defense commitments are met.

Page 19:

Reference first paragraph that states Transient Maintenance manpower is provided for night shift operation even though there are no transient landings. It is Air Force policy to provide manpower based on either workload or wartime requirements, whichever is higher. For transient maintenance, transient landings constitute the majority of workloads. The manhours of actual workload determine the manpower required. The Air Force does not authorize Transient Maintenance manpower solely on the basis of airfield operating hours, although minimum manning may occasionally be warranted due to team size requirements and the low number of Transient landings experienced at a specific location.

Shift requirements must necessarily be determined by local base management officials due to transient landing demands. However, these shift requirements are taken from the manpower earned from the actual number of landings.

Page 24:

Reference recommendation that the Secretary of Defense take action to identify and curtail airport functions and services. Recommendation has been previously implemented by the Air Force. Reduction of airfield operating hours has been a continuing

project since 1972; since then, 37 bases have reduced various support functions from 24 hours a day to 16 hours or less. While volume of air traffic is a reasonable criteria for determining operating hours of civil facilities, it is essential that operating hours for military air traffic control facilities be adequate to support the base mission. The Air Force is continuously striving to consolidate functions and reduce hours in the interest of cost savings, but the requirements to maintain a specified defense posture must take priority.

Page 36:

Reference paragraph one and two, referring to merger of approach control operations in the Central Valley of California. The consolidation of facilities does, in some cases, permit more efficient use of airspace and resources. However, any consolidation of specific facilities must result from a detailed evaluation at the local level. This evaluation must consider services required, radar/communications coverage, traffic volume and flow, space and equipment availability, etc. The Travis/McClellan and Castle/Lemoore recommended consolidations are not the result of such an evaluation. In the case of Travis/McClellan, an official at FAA Headquarters stated that this consolidation had been considered several times in the past and rejected each time as too cumbersome.

(See GAO note 1, p. 85.)

Although the consolidations mentioned in the report, as well as others, may be possible, the economics and operational advantages alluded to must be regarded as suspect until validated by the detailed evaluation process. The Air Force is willing to participate in any evaluation pertaining to the consolidation of the above facilities.

Page 40:

Reference recommendation pertaining to consolidating approach controls. The Air Force concurs with the recommendation that the Administrator of the Federal Aviation Administration, in coordination with the Secretary of Defense, establish procedures for evaluating the potential for consolidating the management of adjacent approach/departure airspace and take action to consolidate where practical. Although this report

seems to "zero in" on adjacent civil/military and military/military facilities and airspace, the evaluation procedures should address not only these, but the civil/civil situation. Because of the large number of civil facilities, the potential consolidation savings could be significant.

The Air Force must be very cautious when studying consolidations, to insure that we do not become overly committed to a CONUS civilian controller force for the following reasons: (a) The Air Force has no control over a civil force; (b) The civil air traffic controllers are unionized and can participate in "job actions", which could preclude us from accomplishing our training mission; (c) The Air Force must maintain an adequate, well-trained CONUS controller force and appropriate facilities to insure that we can support all contingency and combat situations; and (d) The civilian controller force cannot be committed to the combat or contingency situation.

Page 47:

Reference the second paragraph regarding the need for standardization of civil and military equipments. The VHF omnidirectional range (VOR) and Tactical Air Navigation (TACAN) were not simultaneous developments. The TACAN followed the VOR for several significant reasons. The VOR could not satisfy military tactical/mobility requirements because of siting problems, it is unreliable for seaborne forces, saturation of the Very High Frequency (VHF) Spectrum prohibited expansion of the VOR to meet navigational aid requirements, and the VOR did not provide distance measuring equipment (DME).

Page 48:

Reference first paragraph which states 81 Air Force and three other military installations, etc. The Air Force maintains 32 VHF omnidirectional ranges (VOR), of which 19 are for support of T-37 operational requirements.

Page 51:

Reference first paragraph referring to adjusting the instrument landing system (ILS) renovation schedule. There is an urgent need to replace the old tube type ILS's because of their age and lack of a capability to provide

logistical support beyond calendar year 1977. These ILS's are being installed on the primary instrument runways. Secondly, one of the major controlling factors for removal of the precision approach radars (PAR) is the aircraft avionics. The PARs will be required until the installation of the ILS receivers in all of the aircraft, which is not expected to be complete until 1980.

(See GAO note 1, p. 85.)

Page 58:

Reference line five referring to one command listing 81 Air Force installations requiring the VHF omnidirectional range (VOR) capability. It should be noted that the Air Force only maintains 19 VORs for the primary support of the T-37 training aircraft.

Page 61:

Reference second paragraph referring to the nondirectional beacons (NDBs). The Air Force will operate approximately 40 NDBs after January 1977, of which only three will be in the CONUS. Air Force requirements for these beacons are primarily for operation in the Arctic regions and other remote areas. As long as the Air Force mission requires operations in these areas, the NDBs will be required. Air crews must maintain proficiency in the use of this navigational aid to respond to worldwide contingencies.

Page 61a:

Reference recommendations. The Air Force will be happy to meet with the Federal Aviation Administrator (FAA) to further improve and refine present coordination procedures on support requirements, standardization of equipment, and eliminate redundancy, if any. There are several factors that

must be recognized. First, the Air Force operates airfields in support of the national defense and must maintain navigational aids necessary to launch and recover forces in all weather conditions. The Air Force cannot establish criteria and standards such as that used by the civil community, i.e., the number of arrivals and departures, the number of passengers enplaning and deplaning. It should be noted that the Air Force has been negotiating with the FAA for almost two years, attempting to get the necessary landing aids to support the Air National Guard forces hosted by civil airports that do not meet FAA navigational aid establishment criteria. Secondly, the Air Force must maintain some navigational aids for training only - those that may be used in a combat environment, and other contingencies.

(See GAO note 1, p. 85.)

The Air Force will continue its program to decommission navigational aid systems that are not absolutely necessary. This program has resulted in the decommissioning of over forty navigational aids within the past 12 months. There is a distinction between redundant navigational aids and those aids "rarely used." Similar navigational aids are sometimes located in close geographical proximity. There may be a mixture of landing aids at a given airfield, and any two of the aids may provide like capabilities. This situation does not necessarily mean there is redundancy. Requirements are determined based on mission, avionics in assigned aircraft, and training requirements. The siting of navigational aids to obtain the lowest weather landing minimums is extremely critical. A navigational aid may be used to reach a geographical area in which several airfields are located, but it normally cannot be sited to provide landing approaches to the multiple runways serving all the airfields within that area.

Page 77:

Reference last paragraph referring to other base organizations being tasked to perform the observer function. Do not concur with the recommendation that weather observations should be

made by tower controllers or other on base personnel. As stated by the GAO, the concept of tower operators taking surface weather observations was thoroughly studied in 1975. It was originally estimated that a manpower savings of 155 spaces would result; however, the study results showed only a 54 space savings. The study stated, "consolidation of surface weather observing and tower controller duties are no longer considered valid.

(See GAO note 1, p. 85.)

Further, it is not practical for other base personnel to make weather observations for the same rationale as the tower people.

Page 79:

Reference recommendation to eliminate redundancy and consolidate functions. Agree with the recommendation that the three regions identified in the report (Norfolk, Sacramento, and Honolulu), and others of a similar nature, should be examined for potential savings of weather resources. The Air Force will continue to work to conserve its weather resources, and with other agencies to avoid unnecessary duplication.

Presently the Air Force is embarked on an orderly program to make its weather service more efficient. The initial step was to combine the weather forecaster and observer career fields. The change is well along, the necessary training is being accomplished with little personnel turbulence, and the program will be completed by 1980. The next step, now being readied by MAJCOM planners for Air Staff evaluation, is a multiphased effort to automate the weather sensors and short range terminal forecasts to the degree possible. This program is similar to FAA and National Weather Service (NWS) plans and will use their development experience and instrumentation to the degree possible. Full operation of this program is expected in the mid-80s.

Costs of these programs will be offset by officer to enlisted conversions and significant manpower reductions. In the meantime, other efforts are underway to conserve manpower associated with the weather service:

(J.) The expected transfer of weather maintenance people to the Air Force Communications Service will produce savings.

(2) A Military Airlift Command review of all Weather Service functions was just completed which resulted in an across the board reduction in weather manpower. Further reductions of this nature do not appear feasible.

(3) Reduced services at Richards-Gebaur AFB are now being staffed by Headquarters AFCS.

(4) The FAA plan to modernize its FAA System offers an opportunity to provide more remote weather services, and will be watched by the Air Force to realize economics where possible.

It is pertinent to state that in 1973 and 1974, tests were conducted respectively in the San Antonio and San Bernardino areas to determine if an around-the-clock remote forecast service would be adequate. The goal was to reduce manpower. Results of these tests showed degraded terminal forecasts and services, and recommended that on-base face-to-face service be reestablished (which it was). However, the tests did reveal "that remote briefings to aircrews are adequate, if good communications were available, the crews educated, and the briefings were standardized."

The primary objective for the operation of Air Force base weather services is to serve the facility during the period a majority of the aircrew activity takes place. During periods of low activity and when the base is closed for flying, the residual weather service is limited to what is essential for resource protection. The occasional need for a briefing, and all the forecast requirements are essentially handled from a designated remote location. These programs are described in Air Force Weather Service (AWS) Regulations 105-21 and 105-28. Most of the designated remote facilities must operate around-the-clock because of mission demands, e.g., facilities which support the SAC alert force.

Air Force meteorologists might augment the Flight Service Station (FSS); however, this would add a new function to the facility--forecasting. In such an arrangement, terminal forecasts, weather warning, and briefings could be provided. However, this arrangement would duplicate the inbeing remote forecast system and could result in additional manpower costs.

There may be an opportunity to derive manpower economies by either integrating Air Force forecasters into the National Weather Service (NWS), or by interdepartmental arrangements with NWS. Since remote service is now provided during slack periods, manpower savings could only be made during the normal base flying hours. However, during these periods, it is standard Air Force procedure to:

(1) Give real time weather assistance so operations people can make cost effective use of flying periods.

(2) Provide for safety of flight. Note that Air Force personnel are relatively inexperienced compared to airline people.

The program to make weather NCOs dual skilled (forecaster/observer) will reduce weather station manpower. Since the Air Force requires an on-the-spot specialist to observe environmental conditions during active flying, this same dual skilled specialist can make the short period forecasts. There would be additional manpower cost if a NWS facility was also responsible for the same forecast.

Page 31:

Reference the GAO recommendation that a high level task force be established to plan and coordinate aviation requirements to include, for example, the evaluation of support activities in geographical areas having multiple Federal involvement to consolidate support capabilities where possible. However, the DOD has an ongoing program (initiated in 1968) to evaluate such support as it pertains to real property operations and maintenance. Therefore, any initiatives to eliminate/consolidate aviation support facilities should complement the current DOD efforts. Although manpower savings might accrue from implementation of the GAO recommendation, such military reductions must not reduce the Air Force in the affected specialties below the level required to support the National Strategy or adversely impact operational readiness.

- GAO notes.
1. Portions of this letter have been deleted because they are no longer relevant to the matters discussed in this report.
 2. Page references in this appendix may not correspond to pages of this final report.



OFFICE OF THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

ASSISTANT SECRETARY
FOR ADMINISTRATION

November 9, 1976

Mr. Henry Eschwege
Director
Community and Economic Development Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Eschwege:

This is in response to your letter of August 11, 1976, requesting comments from the Department of Transportation on the General Accounting Office draft report entitled "More Effective Use of Aviation Resources in the United States Can Be Achieved," dated July 1976. We have reviewed the report in detail and prepared a Department of Transportation reply.

Two copies of the reply are enclosed.

Sincerely,


William S. Heffelfinger

Enclosures

Enclosure

DEPARTMENT OF TRANSPORTATION REPLY
TO
GAO DRAFT REPORT OF JULY 1976
ON
MORE EFFECTIVE USE OF AVIATION RESOURCES
IN THE UNITED STATES CAN BE ACHIEVED

SUMMARY OF GAO FINDINGS AND
RECOMMENDATIONS

The General Accounting Office (GAO) states that many military and civil airports duplicate capabilities, functions and facilities. As a result, a potential for consolidation and/or elimination of unnecessary Government investment exists. The GAO found that there is no effective procedure for civil agencies and the military on a collective basis to systematically review requirements for the development and continued operation of aviation support functions. Examples cited by the GAO were: (1) the military services and the Federal Aviation Administration (FAA) are each independently operating radar approach control facilities to manage airspace bordering one another even though each facility individually has the capability to manage the total assigned airspace, (2) the military and the FAA are independently developing redundant navigational aids, and the military maintains unnecessary navigational equipment, (3) the Department of Defense (DOD), the FAA and the Department of Commerce are not reviewing the potential to share facilities and capabilities of their respective weather activities in close geographical proximity to each other, and (4) military airfields are operating and/or providing support services during periods when there is virtually little or no air traffic.

The GAO recommends that the FAA, DOD, and the Secretary of Commerce establish a high-level task force to identify ways in which the three agencies can plan and coordinate aviation requirements to assure maximum effectiveness and minimum investment and to take advantage of the supporting capabilities of both the military and civilian aviation community. For the specific functions reviewed by the GAO, it recommends that (1) the FAA and DOD establish the means for consolidating approach control facilities where feasible, (2) the FAA and DOD coordinate and standardize equipment requirements, (3) the Secretary of Commerce direct the Federal Coordinator for Meteorological Services and Supporting Research to review, in coordination with the DOD and the Secretary of Transportation, the aviation weather requirements of the military and civilian communities to identify and eliminate redundant capabilities, (4) the DOD identify and curtail unneeded airfield operations, develop

effective criteria and standards for the authorization and use of navigational aid systems at military airfields, and decommission redundant systems, and (5) the Secretary of the Navy stop the currently proposed construction of a radar approach traffic control facility at Kaneohe Bay, Hawaii and instead use one of the available alternatives.

DEPARTMENT OF TRANSPORTATION POSITION
ON
GAO RECOMMENDATIONS

We agree that increased emphasis needs to be placed on more effective planning and coordination of aviation requirements among FAA, DOD, and Commerce. However, we do not believe that the GAO recommendation to establish yet another high-level task force is an appropriate solution. We feel that the problems which GAO identifies in its report can be effectively dealt with through existing mechanisms, such as: (1) the DOD Advisory Committee on Federal Aviation which reports on DOD requirements in aviation matters; (2) the recently issued Air Force Traffic Control and Landing Systems Plan which is intended to provide FAA with the data necessary for the development of equipment common to both civil and military air traffic control; (3) the Joint FAA/DOD Review Group's efforts to improve safety of operations and reduction of the midair collision potential; and (4) various other FAA and DOD coordination efforts, both formal and informal, to work together jointly to ensure that the National Aviation System meets civil and military aviation needs.

It should be pointed out that DOD has historically taken the position that at many locations military provision of approach control, landing and navigation facilities, and weather services is vital to defense needs. We do not feel that the FAA is in a position to make judgments on matters involving the determination of national defense interests by the DOD.

(See GAO note.)


Acting Deputy Administrator

GAO note: This portion of the letter has been deleted because it is no longer relevant to the matters discussed in this report.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Rockville, Md. 20852

W116/SJL


September 15, 1976

Mr. Henry Eschwege
Director, Community and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Thank you for the opportunity to review and comment on the draft report, "More Effective Use of Aviation Resources in the United States Can Be Achieved."

My comments are restricted to Chapter 6, "Consolidation of Aviation Weather Facilities is Feasible," and Chapter 7, "The Need for Emphasis by Top Level Managers." I concur with the recommendations set forth on pages 79 and 81, and am willing to work with the Departments of Defense and Transportation to achieve further improvements in economy and efficiency in the provision of weather services. Because of the existence of the Federal Aviation Administration (FAA) long range plan for modernization of the Flight Service System and for other reasons, the Federal Coordinator for Meteorological Services and Supporting Research has begun to consider problems pertaining to aviation weather service involving the National Weather Service and the FAA. The advent of this GAO Report provides the basis for a natural extension of these considerations to include the Department of Defense.

Sincerely,


Robert M. White
Administrator

PRINCIPAL OFFICIALS
RESPONSIBLE FOR ADMINISTERING
ACTIVITIES DISCUSSED IN THIS REPORT

Tenure of office
From To

DEPARTMENT OF DEFENSE

SECRETARY OF DEFENSE:

Dr. Harold Brown	Jan. 1977	Present
Donald H. Rumsfeld	Nov. 1975	Jan. 1977
James R. Schlesinger	July 1973	Nov. 1975
William P. Clements, Jr. (acting)	Apr. 1973	July 1973

DEPUTY SECRETARY OF DEFENSE:

Charles W. Duncan, Jr.	Jan. 1977	Present
William P. Clements, Jr.	Jan. 1973	Jan. 1977

ASSISTANT SECRETARY OF DEFENSE
(INSTALLATIONS AND LOGISTICS):

Dale R. Babione (acting)	Jan. 1977	Present
Frank A. Shrontz	Feb. 1976	Jan. 1977
John J. Bennett (acting)	Mar. 1975	Present
Arthur I. Mendolia	June 1973	Mar. 1975

ASSISTANT SECRETARY OF DEFENSE
(COMPTROLLER):

Fred P. Wacker	Sept. 1976	Present
Terence E. McClary	June 1973	Aug. 1976

DEPARTMENT OF THE ARMY

SECRETARY OF THE ARMY:

Martin R. Hoffman	Aug. 1975	Present
Howard H. Callaway	July 1973	Aug. 1975

<u>Tenure of office</u>		
	<u>From</u>	<u>To</u>

DEPARTMENT OF THE ARMY (continued)

UNDER SECRETARY OF THE ARMY:

Vacant	Jan. 1977	Present
Norman R. Augustine	May 1975	Jan. 1977
Vacant	Apr. 1975	May 1975
Herman R. Staudt	Oct. 1973	Apr. 1975

ASSISTANT SECRETARY OF THE ARMY
(INSTALLATIONS AND LOGISTICS):

Edwin Greiner (acting)	Dec. 1976	Present
Harold L. Brownman	Oct. 1974	Dec. 1976
Edwin Greiner	Aug. 1974	Oct. 1974
Edwin Greiner (acting)	May 1974	Aug. 1974
Vincent P. Huggard (acting)	Apr. 1973	May 1974

CONTROLLER OF THE ARMY:

Lt. Gen. John A. Kjellstrom	July 1974	Present
Lt. Gen. E. M. Flanagan, Jr.	Jan. 1973	July 1974

DEPARTMENT OF THE NAVY

SECRETARY OF THE NAVY:

Gary D. Penisten (acting)	Feb. 1977	Present
Joseph T. McCullum	Feb. 1977	Feb. 1977
David R. MacDonald	Jan. 1977	Feb. 1977
J. William Middendorf	June 1974	Jan. 1977
J. William Middendorf (acting)	Apr. 1974	June 1974
John W. Warner (acting)	May 1972	Apr. 1974

UNDER SECRETARY OF THE NAVY:

Vacant	Feb. 1977	Present
David R. MacDonald	Sept. 1976	Feb. 1977
John Bowers (acting)	July 1976	Aug. 1976
Vacant	Mar. 1976	June 1976
David S. Potter	Aug. 1974	Mar. 1976
Vacant	June 1974	Aug. 1974
J. William Middendorf	June 1973	June 1974

<u>Tenure of office</u>	
<u>From</u>	<u>To</u>

DEPARTMENT OF THE AIR FORCE

SECRETARY OF THE AIR FORCE:

Thomas C. Reed	Jan. 1976	Present
James W. Plummer (acting)	Nov. 1975	Jan. 1976
Dr. John L. McLucas	July 1973	Nov. 1975

ASSISTANT SECRETARY OF THE AIR
FORCE (INSTALLATIONS AND
LOGISTICS):

Richard J. Keegan (acting)	Feb. 1977	Present
Hon. J. Gordon Kapp	Mar. 1976	Jan. 1977
Frank A. Shrontz	Oct. 1973	Feb. 1976
Richard J. Keegan (acting)	Aug. 1973	Oct. 1973
Lewis E. Turner	Jan. 1973	Aug. 1973

COMPTROLLER OF THE AIR FORCE:

Lt. Gen. Charles G. Buckingham	Sept. 1975	Present
Lt. Gen. J. R. DeLuca	Oct. 1973	Sept. 1975
Lt. Gen. D. L. Crow	Apr. 1969	Oct. 1973

DEPARTMENT OF TRANSPORTATION

SECRETARY OF TRANSPORTATION:

Brock Adams	Jan. 1977	Present
William T. Coleman, Jr.	Mar. 1975	Jan. 1977
John T. Barnum (acting)	Feb. 1975	Mar. 1975
Claude S. Brinegar	Feb. 1973	Feb. 1975

FEDERAL AVIATION ADMINISTRATION

ADMINISTRATOR:

John L. McLucas	Nov. 1975	Present
James E. Dow (acting)	Apr. 1975	Nov. 1975
Alexander P. Butterfield	Mar. 1973	Mar. 1975

<u>Tenure of office</u>	
<u>From</u>	<u>To</u>

DEPARTMENT OF COMMERCE

SECRETARY OF COMMERCE:

Juanita M. Kreps	Jan. 1977	Present
Elliott L. Richardson	Feb. 1976	Jan. 1977
Rogers C. B. Morton	May 1975	Feb. 1976
John F. Tabor (acting)	Mar. 1975	Apr. 1975
Frederick B. Dent	Feb. 1973	Feb. 1975

FEDERAL COORDINATOR FOR METEOROLOGICAL SERVICES
AND SUPPORTING RESEARCH

Dr. Edward S. Epstein	June 1975	Present
Dr. Clayton E. Jensen	July 1973	Dec. 1975