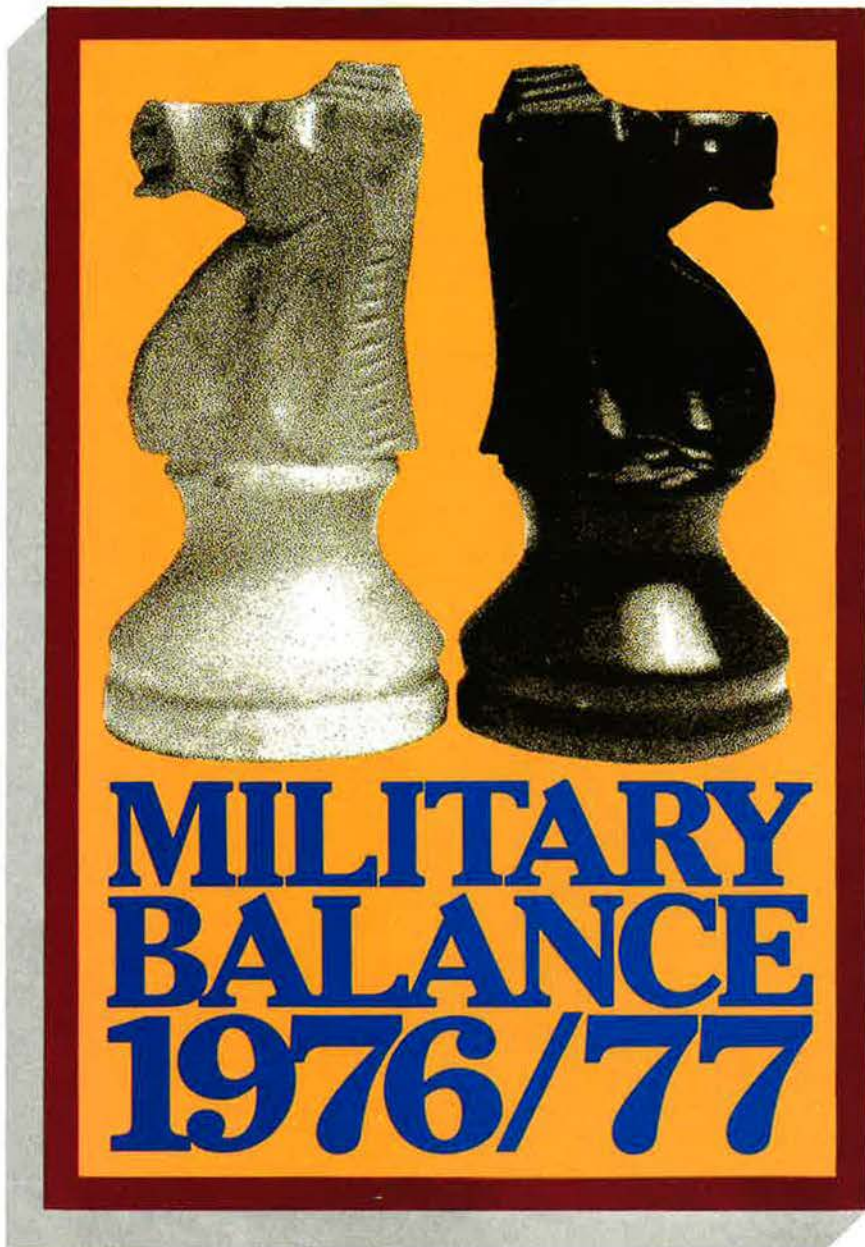


DECEMBER 1976/77

# AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

# MAGAZINE





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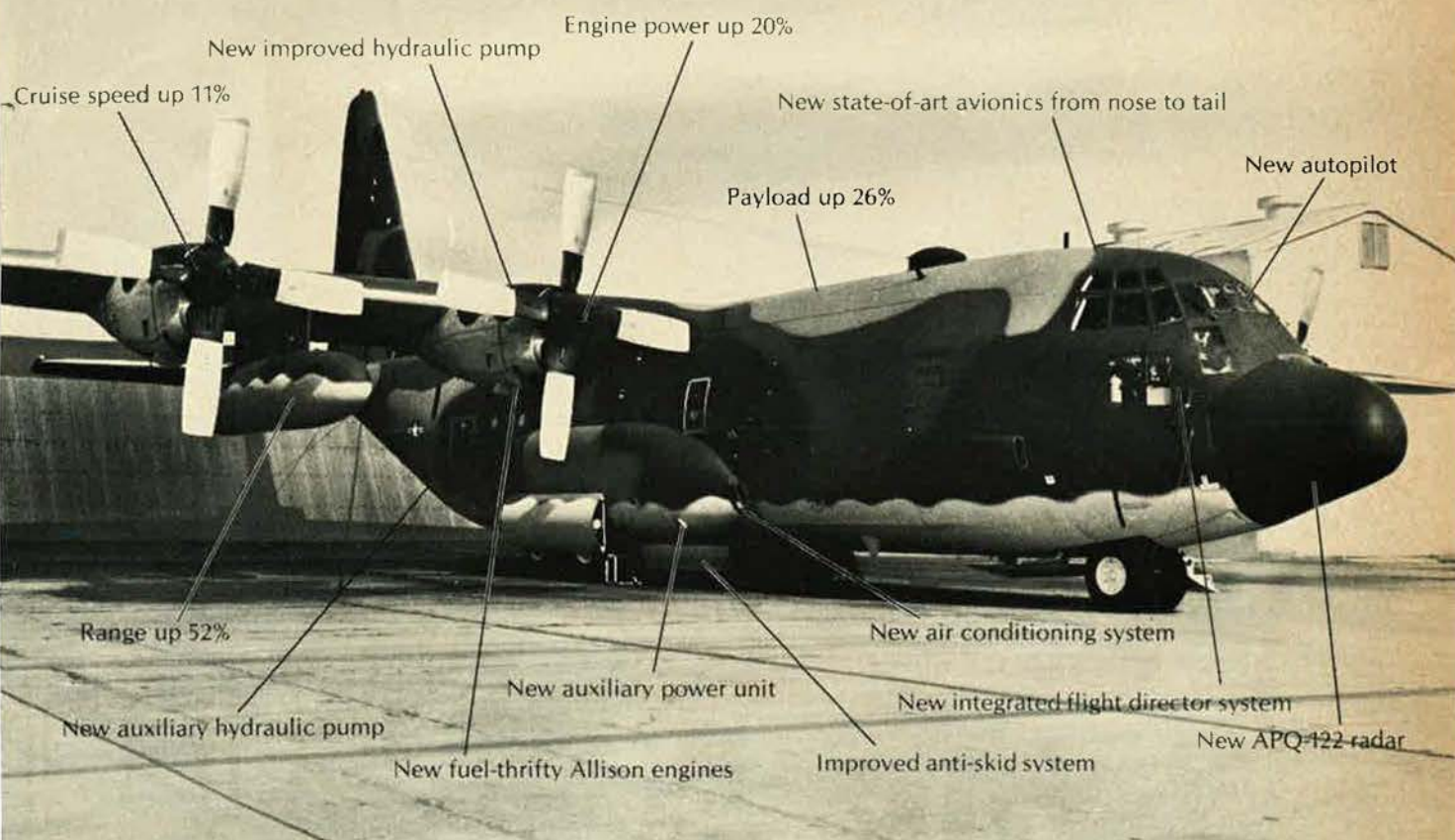
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Link, originator of the "Blue Box" trainer, has expanded its simulation capability to include the range from single engine private aircraft to NASA's Space Shuttle Orbiter. In addition, advancements in the field of visual simulation include digitally generated full

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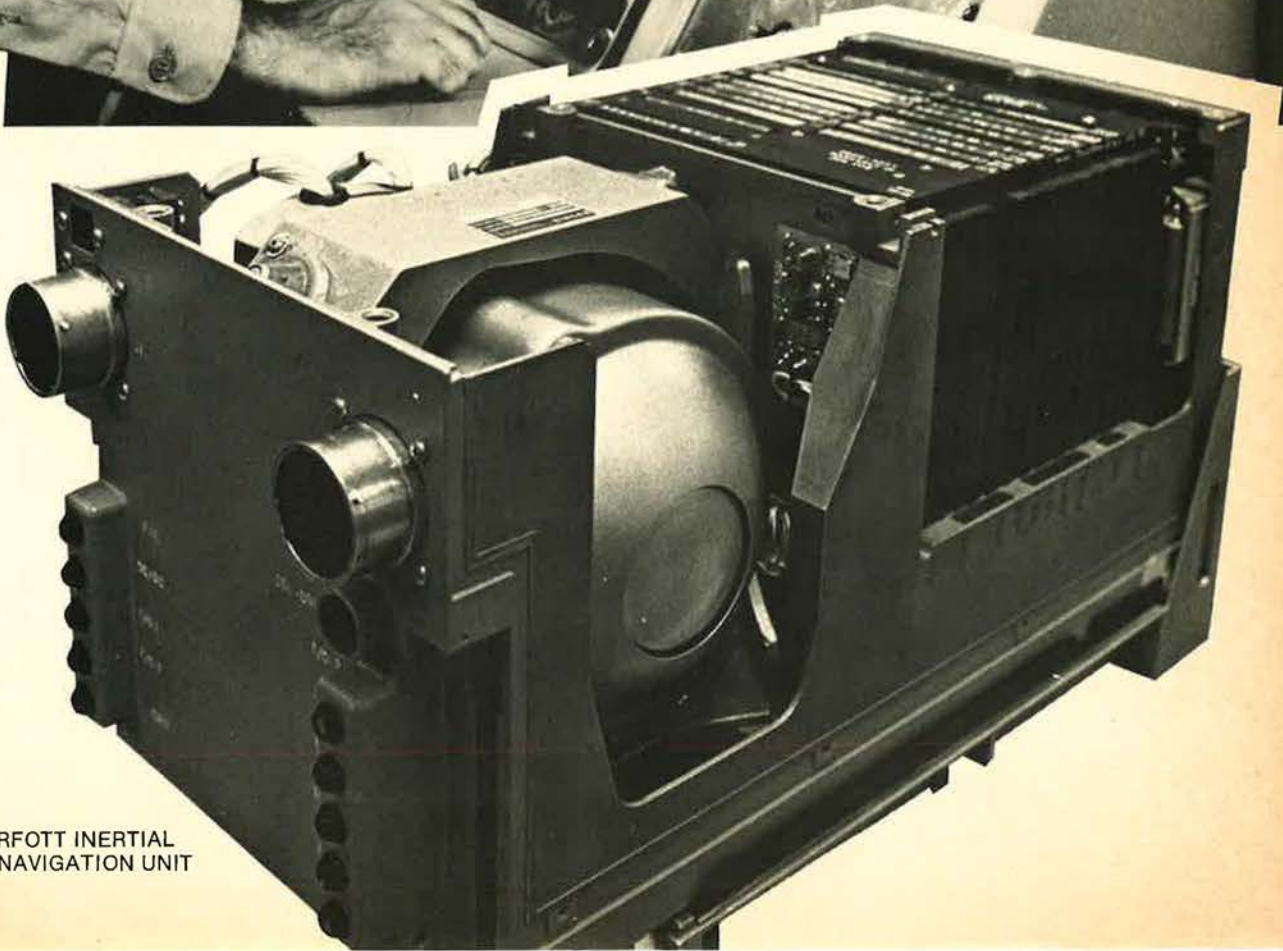
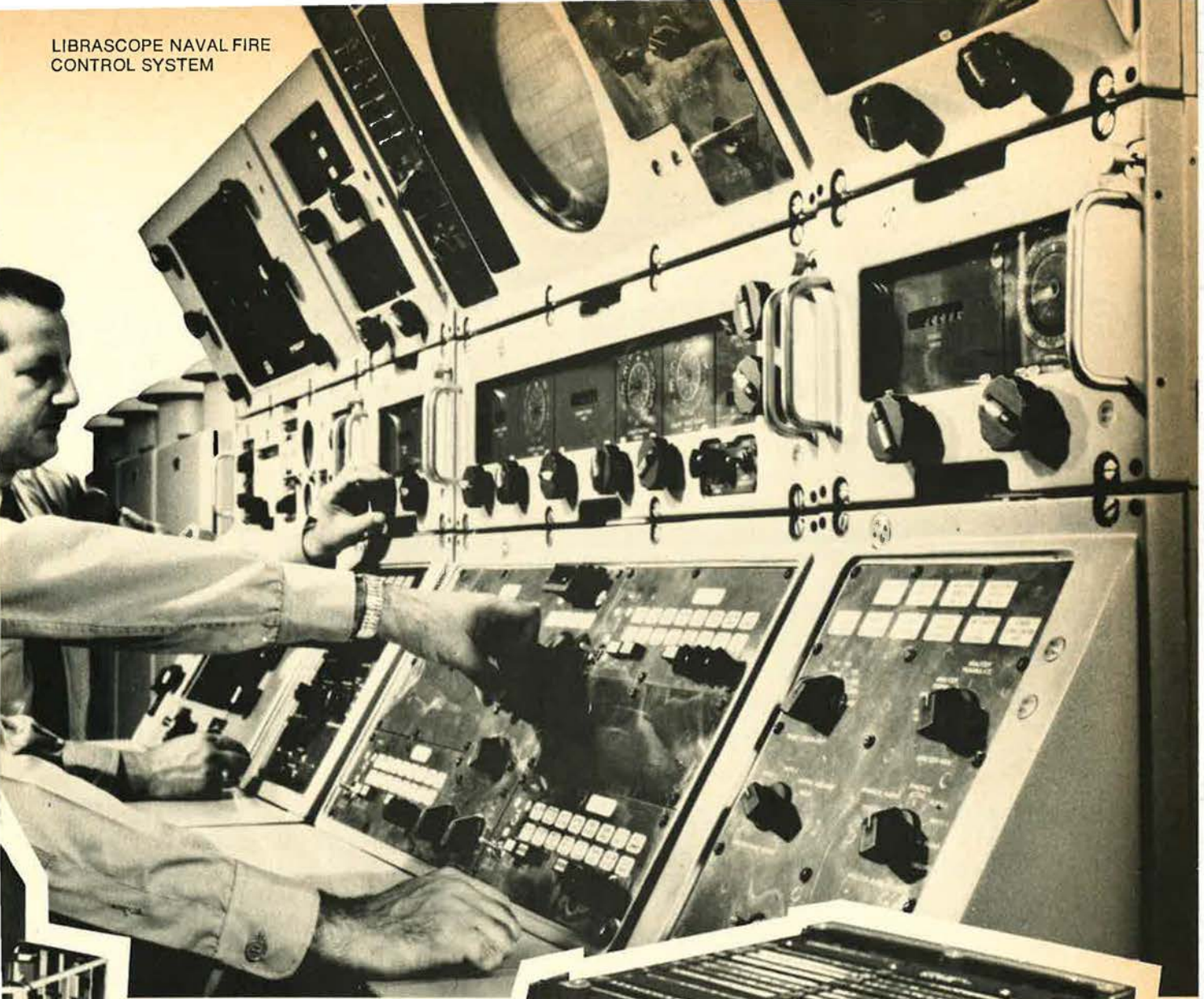
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## **SCIENCE / SCOPE**

The world's first all-weather, day-and-night attack system for aircraft has been ordered for the Navy's A-6E Intruder. The TRAM (Target Recognition and Attack Multisensor) System, built by Hughes, is the only attack system that successfully integrates a forward-looking infrared (FLIR) sensor, a laser designator-ranger, a laser receiver, and a precision-stabilized turret. The FLIR is the first one designed with a continuous optical-zoom capability. Because the FLIR forms an image from heat radiated by objects in view, it can operate as well in total darkness as in daylight and can also "see" through bad weather. A ship can be seen on the blackest of nights or an oil depot can be spotted on land with the amount of fuel clearly visible because of temperature differences. TRAM can deliver a variety of laser-guided and conventional weapons.

Detection and identification of tactical-size targets in any weather, day or night, has been a major goal of the US Air Force. This goal has been achieved by the development of real-time Synthetic Aperture Radar (SAR), made possible through new digital signal-processing technology. The Hughes-built APG-63 radar with its basic digital signal processing and coherent-frequency technology, will provide a SAR capability with the inclusion of programmable signal processing. Not only are smaller tactical targets visible, but also SAR detects mobile targets, cues forward-looking infrared and electro-optical sensors, and allows precise navigation.

An advanced, laser fire-control system for the Army's main battle tank, the M60A1, will improve the firing accuracy of the tank's 105-mm gun. The Hughes-built system, described as a full-solution fire-control system, will increase the tank's first-round hit capability against standing or moving targets and thereby enhance crew survival. In operation, the system reflects a laser beam off the target; the beam returns to a receiving telescope. The elapsed time gives accurate range information that is fed into a computer. This, along with other factors of influence (e.g., air temperature, air density, crosswind velocity), is processed by the computer, which then provides aiming information to the gunner.

The famous sound of Morse code's dah-dit may be phasing out for the maritime industry. This is because two communications satellites are in synchronous orbit over the Atlantic and Pacific oceans. These maritime satellites, built by Hughes, are owned and operated by a consortium of carriers headed by COMSAT General Corporation. Called Marisat, the satellites are currently relaying high-quality voice, telex, facsimile, and data over both oceans for the international maritime industry. Marisat also serves the US Navy for fleet communications.

A third satellite, for Navy use and commercial backup, was placed in synchronous orbit over the Indian Ocean last October. Four-foot-diameter ship antennas allow ships to make instant contact with home port or to be reached instantly by ship telephone. Ships can also reach other ships via the system's ground stations for telex messages.

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Editor: John F. Loosbrock  
Executive Editor: John L. Frisbee

Senior Editors:  
Claude Witze, Edgar Ulsamer

Military Relations Editor:  
James A. McDonnell, Jr.

Contributing Editors:  
Ed Gates, Don Steele, John W. R. Taylor  
("Jane's Supplement"), Maj. Terry A. Arnold,  
USAF

Regional Editors:  
Stefan Geisenheyner, Wiesbaden, Germany  
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Managing Editor: Richard M. Skinner

Ass't Managing Editor: William P. Schlitz

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Editorial Assistants:  
Nellie M. Law, Pearlle M. Draughn,  
Grace Lizzio

Administrative Assistant to the Publisher:  
Ethel J. Vernon

Assistant for Editorial Promotion:  
Robin Whittle

Advertising Director:  
Charles E. Cruze  
1750 Pennsylvania Ave., N.W.  
Washington, D.C. 20006  
Telephone: (202) 452-7330

Advertising Service Manager:  
Patricia Teevan

Area Sales Managers:  
Bayard Nicholas, Stamford, Conn.  
(203) 357-7781  
James G. Kane, Chicago (312) 296-5571  
Harold L. Keeler, Los Angeles (213) 879-2447  
William Coughlin, San Francisco  
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Yoshi Yamamoto, Tokyo 535-6614

European Sales Representative:  
Richard A. Ewin  
Overseas Publicity Ltd.  
214 Oxford St.  
London W1N 0EA, England  
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AIR FORCE



For the sixth consecutive year, the Editors of AIR FORCE Magazine are privileged to present "The Military Balance," the detailed compilation of the world's armed strength and resources, as assembled by The International Institute for Strategic Studies, London. See p. 41.



# NOT MUCH ELBOW ROOM

By John F. Loosbrock, EDITOR

**T**HE AMERICAN political rubric demands that a national election take on the appearance of an either/or adversary relationship—a kind of war to be won by one side, lost by the other.

Even the vocabulary of politics bears this out. The campaign is waged. The tide of battle ebbs and flows. Each side has a strategy. Each side employs tactics as it maneuvers for advantage. Alliances and coalitions are formed. Forces are massed. Local engagements are bitterly contested and may or may not affect the outcome. Candidates bring in their big guns. Propaganda becomes a weapon. The differences between the opposing camps are exaggerated. Their similarities are minimized. Neutrals are wooed. Et cetera, et cetera.

Most of the time, and the election of 1976 is no exception, the end result is not nearly so dramatic as the trappings have led us to believe. We have a new leadership *de facto* as of now, *de jure* in just a few short weeks. The style of government will change in ways it would be foolish to prognosticate in any detail at this writing. But the substance of government, undergirded as it is by thick layers of economic, political, sociological, and diplomatic realities, does not change violently, abruptly, or even substantially to any great degree. The vast bureaucracy has its own inertia. Federal revenues, in large part, are committed even before they are raised. The constants outweigh the variables. There simply is not all that much elbow room for the wielders of new brooms.

There are decisions that President-elect Jimmy Carter and his new Administration will have to make. But, in the main, they are decisions left over in one degree or another from Administrations that have gone before.

We do not envy Jimmy Carter, nor would we have envied Gerald Ford. On the domestic front lies the dilemma of putting the unemployed to work without fanning the fires of inflation. But our concern, of course, focuses on our own area of special interest—the imperatives of national security and the ramifications thereof. Abroad there is the precarious state of our key alliance, NATO, as well as a profusion of prospective trouble spots, notably in the Middle East and in that perennial tinderbox, the Balkans, where the prospect of a Tito-less Yugoslavia may offer the first test of the new President's judgment and resolve. There is the aftermath of Helsinki, with its formalizing of Soviet hegemony in Eastern Europe. There are the SALT negotiations and the future of détente. There is the frightening vision of a

rapprochement between the Soviets and the People's Republic of China. And overshadowing all is the burgeoning technological and military might of the Soviet Union itself, which is steadily eroding the ability of the United States to control its own destiny, much less to help our friends and allies control theirs.

There is really very little elbow room at all, which makes decisions more agonizing and at the same time more far-reaching in their consequences.

More specifically, can the national security budget be cut as promised without damaging muscle and bone? There is fat in the defense budget. There always has been. But there is less, proportionately, than in most federal department budgets of any meaningful size, largely because the Pentagon has more experience, and is scrutinized more closely, from within and without, than are the newer, fast-growing, and relatively unfocused socially oriented agencies. But the Pentagon fat, and this is why it has accumulated over the years, lies primarily in politically protected sanctuaries—payrolls and installations—where the strongest of Presidential wills has had minor impact.

Likewise, the future strategic posture of the country is in a state of flux, with large and important programs just beginning to make their impact. The strategic mix for the balance of this century—as among the manned bomber, the missile-carrying submarine, the land-based ballistic missile, and the cruise missile—will be determined during the Carter Administration—a heavy burden where major mistakes are going to be quite unforgivable.

The future of NATO—its crumbling flanks, its need for a reevaluation of strategy and tactical deployment, all in the face of a toughening Warsaw Pact posture—forms still another critical decision point for the new leadership.

And perhaps the most critical of all—the prospect that the Soviet Union may choose a time, early in the game, to test the will and resolve of the new government while it is still in transition.

We think, on balance, that the President-elect is a realist. He has participated, as a professional, in the military establishment. He can read the maps. He knows it is a tougher job to exercise responsibility than it was to seek it. He has no wish, we are sure, to become a prisoner of history. He would rather, we are equally sure, become a shaper of it.

The opportunities are as manifold as the problems. We wish him the very best in the facing of them. ■



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# Airmail

## Unclaimed Claim

We have really come to a deplorable state of affairs when blind endorsements of government proposals—the B-1 program in particular—is the litmus test of good citizenship. In "Walking a Tightrope" (September 1976), Claude Witze apparently thinks military programs should be immune to doubts and questions, although I suppose they're permissible if you are wearing the right color of shirt and have not been caught talking to "outsiders" about sacrosanct matters.

I share some of Mr. Witze's concerns about the inconsistencies of our national political processes, but I doubt they are in much danger of instant correction by papering them over with natty labels that are meant to warn good people away from dangerous ideas.

Mr. Witze bemoans misrepresentation by others, but sees none in his own editorial wanderings describing me as "now in the forefront of the disarmament drive." If supporting a \$100 billion military budget makes me a pacifist, one of us is going to have to explain to the other how many bucks make a patriot.

Actually, I do prefer peace to war, but I don't think it's achievable by looking down the barrel of a gun—ours or anyone else's. Whether these queer opinions make me a liberal or a conservative doesn't much matter, but Mr. Witze's printed innuendo of dark conspiracy does. The Center for Defense Information, as a project of the Fund for Peace, does indeed share a building with other Fund projects, including In the Public Interest.

Contrary to Mr. Witze's claim, however, ghostwriting scripts for prominent speakers taped by our building co-tenant isn't one of my specialties—in fact, I am not especially known for saying my piece in other people's voices. I am encouraged if they share my opinions or choose to cite CDI papers in their talks, but In the Public Interest makes its own way without the kind of help Mr. Witze imputes.

I have never seen anything particularly sinister in the give-and-take of defense politics (however foolish), or even in the license editors have to vent their predilections (and to control what is published in reply). But I do think any government or editorial viewpoint is open to fair comment, especially when accuracy has been victimized by slanted language.

Mr. Witze may disagree that he has skewed his text to serve his own purposes. If that is the case, I offer him a bargain: I will accept his description of me, provided he acknowledges that his articles are really written for him by aerospace industry lobbyists. False, of course, but a fair exchange under the circumstances.

Rear Adm. Gene R. La Rocque,  
USN (Ret.)

Director  
Center For Defense Information  
Washington, D. C.

• *Admiral La Rocque seems to have read into Mr. Witze's column something that was not there. Mr. Witze did not say the Admiral was a ghostwriter for In the Public Interest. He did say that Edward P. Morgan of IPI advertised that IPI speakers use material prepared by the Center for Defense Information. If Mr. Morgan's statement is incorrect, the matter should be taken up with Mr. Morgan.*—THE EDITORS

## Terrorism and Bright Ideas

I feel compelled to respond to Gen. T. R. Milton's September 1976 article, "Tankers, Task Forces, and Terrorism." I regret not having read the September issue until late in the month as I was in the Middle East when I noted the article. The author's criticism of bright ideas such as gunships, WW II aircraft, and Air Commandos during the Vietnam War is as unfortunate as it is uninformed. The A-1s, C-123s, T-28s, O-1s, and the AC-130s (which grew from the AC-47 basic gunship design) were produced and/or designed post-WW II. The AC-130 was without question the finest close air

support system employed in SEA.

Having served ten and a half years in SEA during the period 1960-1976 and commanded two Air Force Air Commando wings, I think it is necessary to remind your readers of the continuous combat records of these kinds of units from 1962 through to the end of the war. The effectiveness of these operations was beyond question, in my opinion. The night and marginal weather, close support, and interdiction efforts by these aircraft were sagas and lessons which should not be forgotten. I believe a great majority of our ground combat commanders would support this view, and, of course, the A-1 Sandy rescue escort missions represent a long series of heroic and highly effective combat operations—"a bright idea" and originated in the Air Commando combat forces.

Although the author's article is vague, I do agree with the need to be able to react with our regular forces. I do not agree, however, that our forces are properly balanced to meet the range of threats now facing us. We need all the bright ideas we can get. Our command authorities should certainly be capable of evaluating and using this kind of thinking. Dogmatic preconceptions can only lead to catastrophe in the military profession.

Finally, I would commend to all including General Milton, a recent article by North Vietnamese Senior General Van Tien Dung entitled "Great Spring Victory." The obvious NVA disdain for what Milton classifies as regular tactical air forces comes through loud and clear. The enemy was able to build thousands of kilometers of all-weather roads in North and South Vietnam after the '68 Tet offensive to supply the forces in the spring '75 victory, in spite of almost continuous interdiction by tactical air.

In closing, I would be grateful you would print the following comments by one of history's greatest air generals, and his thoughts on bright ideas and initiative which General Milton cautions against:

"I believe that, as a result of my own experience, no officer of our military, especially our flying force should hesitate to break with tradition if, in his judgment, a departure will improve the chances of success for his unit or his side in the overpicture.

(Continued on page 13)



Reference Joan Gillman's letter in the October '76 issue. Please advise Ms. Gillman I agree with her wholeheartedly. And I've just canceled my subscription to *American Home* and *Woman's Day*!

Lt. Col. Charles G. Voegelin,  
USAF (Ret.)  
Seaford, Va.

If you check the definition of "association" in the dictionary, you will find it reads: "an organization of people with a common purpose." Really—that is enough to reply to Sergeant Malcolm, but I would like to submit further thoughts on the subject in hopes that he will not feel so left out.

First of all, "people" include *all* those individuals that have a desire to associate with our common goal—maintenance and strengthening of the USAF. Just because officers belong to the same association that I happen to belong to does not mean it's only for officers. I grant you that there is a larger percentage of officers than enlisted personnel. So what!

Regarding his comment on the "grip-and-grin" photos concentrating on high-ranking VIPs—yes, there are more officers than enlisted in those photos. It's only that the EM just doesn't affiliate with Chapters as much as they should, and, of course, there are more officers that do. I did note that in the September issue three out of six photos in the "gallery" had enlisted personnel represented.

I agree that the majority of EM do not identify with AFA. If enlisted members of the Association would get out and talk about AFA and what it is doing for the enlisted member, we might change that perception. AFA does support us. The AFA Policy Paper on Defense Manpower Issues, adopted on September 20, 1976, supported over fifty areas of people programs. Over half of these were specifically for the enlisted men and women. And that's nothing new for AFA. Last year, fifty-six General and Continuing Resolutions were adopted by the National Convention; thirty-four of these were for the benefit of the enlisted force. This fact is not well known. How about spreading the word?

I really do not believe that Sergeant Malcolm has given his one-year membership a chance. Ask those 15,000-plus enlisted members what they think about the Association. Give it a chance, Sergeant Malcolm. We would like to have you stay with us.

CMSgt. John E. Schmidt, Jr.  
Tyndall AFB, Fla.

Joan Gillman says that "I find that I have accidentally joined another male club." I just wonder why she joined the AFA in the first place—to get a better knowledge of Air Force missions, or did she join because she thought there would be a lot of women in it?

## AFA: Officers' Club? Male Chauvinists?

It is a shame that she asked to have her subscription canceled, because she missed a very good article on "Women and Their New Role in the Air Force," in the October issue.

I should also like to ask 1st Sgt. David R. Malcolm, who also writes in the October issue, "What do you feel is the purpose of any journal that discusses problems of national defense and deterrence, military strategy, and command policies?" I am sure you will agree that it isn't a medium for the enlisted man. I was always under the impression, when I was on active duty, that the magazine *Airman* was primarily for the enlisted men.

There are few journals of any sort that discuss the strategic and tactical problems of nuclear deterrence. AIR FORCE is an excellent magazine that is willing to discuss these problems in an era of defense budget cutbacks by people who are not fully aware of the consequences. I would hate to see what the American Air Force would be like if there was no AIR FORCE to speak up for it.

SSgt. Robert C. Bishop  
Pawcatuck, Conn.

Re the letter in your October '76 issue from Joan Gillman (What? No Ms!). This woman complains of joining another "male club." Did it ever occur to her that if every female member calls it quits then AFA will always remain so? She says the staff is all men. I would rather see qualified men fill these positions than token women. People like her do us far more harm than good. I prefer to be judged on my merits and professional performance than on my sex. I'm not alone. We are a vital, dedicated, and professional part of the Air Force. We are generals, staff sergeants, and airmen, working in jobs from A to Z with equal pay and opportunity and, as an aside, we are also women.

I read this letter on the eighth anniversary of my enlistment. In those eight short years, the Air Force has made great strides in equality for women and AFA has been an important part of this progress. In 1968, I asked only that the Air Force give me a chance to prove that I could serve my country in a professional manner and in a demanding field. They gave me that chance in Air Traffic Control. I'm now a supervisor working with men and women both on the ground and in the air on equal terms. I'm accepted as a professional and judged by my performance.

As for the "Sergeant's Viewpoint" in

the same issue, I do not feel the AFA is for officers only. It's for intelligent people who are military professionals regardless of rank. Read the article for the content and not for the rank of the writer. You don't have to fly an aircraft to identify with what it represents. If it doesn't do a little something to you inside when you see a flight of four jets hit the break, or the Thunderbirds perform, or the B-1 or SR-71 just sitting there, then you don't belong in the Air Force no matter what your sex or rank.

I thank AFA for its devotion to equality—male or female, officer or enlisted, flying and nonflying. The articles are intelligent and informative and I have used them as a source of material many times in my field. "There I Was" applies to all of us at one time or another. I'm proud to be a member of the USAF and AFA, proud to wear the stripes of Staff Sergeant, proud to be an Air Traffic Controller, and also proud to be a woman.  
SSgt. Laurie E. Ross  
Hill AFB, Utah

I am replying to the letter by Joan Gillman, of Kelly AFB, Tex. I wish to dissent from her opinion that the Air Force Association is "another male club."

My experience with AFA does not support Ms. Gillman's conclusion that women are excluded from either the decision-making processes or from participating in the broadening of knowledge through publication of articles.

I am also, incidentally, a dedicated feminist both in my profession and in my politics. And as a feminist, I feel that Ms. Gillman does not contribute to "The Cause" by terminating her subscription and membership. If she is seriously interested in Air Force problems, policies, and issues, as well as in being a rhetorical feminist, she would be better advised to continue membership and work to gain more influence within the organization.

Amoretta M. Hoerber  
Arlington, Va.

Sergeant Malcolm should stop looking at the ads, pictures of colonels, captains, and generals, and read the countless articles about Air Force personnel, airman basic and up (both male and female), and the jobs they are doing. Also about the equipment they are using now and the better equipment to come.

And now for poor dear Joan Gillman, I hope you received the October issue of AIR FORCE Magazine. I think you had better look over the staff of the magazine again, then give Mr. Ed Gates credit for writing a good article on women in the USAF.

Maj. Paul R. Renfro, CAP  
Houston, Tex.





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**NORTHROP**



# Airmail

"However, I am obligated to point out, any officer who decides to depart from customary method of military business by exercising his individuality must be fully prepared to accept the consequences of failure. He can be certain that those consequences will be immediate and probably painful. I have known several officers who failed miserably after executing their orders in strict conformity with doctrine, accepted techniques, and established practices who were decorated and promoted promptly. In some of these cases, it was my firm belief that a resort to individualism might have averted failure or at least diminished the degree of failure.

"On the other hand, I have never known any officer whose failure was condoned by higher authority if any taint of individualism was attached to the execution of his orders. Peculiarly, the officer who exercises initiative, dares to think differently and succeeds, no matter how brilliant his success may be, is often sidetracked in his career at the first opportunity. Neither his associates nor his superiors understand him, and lack of understanding leads to lack of confidence. But I believe that men who 'insist upon flexibility in all things' and who retain their individualism, are the ones who win battles, especially in the air. Fortunately, our nation has had enough of them when they were needed. I hope we always do."—Maj. Gen. Claire L. Chennault.

Brig. Gen. Harry C. Aderholt (Ret.)  
Ft. Walton Beach, Fla.

... we are given to understand that terrorism is viewed as an increasing threat, and that we cannot deal with this problem in the manner of Commodore Decatur's solution to the Barbary pirates, and also to beware of "bright ideas."

It has apparently escaped General Milton that in any act of terrorism, air hijacking specifically, those involved in executing the crime are equally or more frightened than the victims. A policy of immediately hooting all apprehended terrorists would significantly reduce the number of "martyrs" available for such adventures.

Secondly, the nations which

spawn such acts as an extension of their own foreign policies should not be permitted to continue without punishment. Measured retaliation in the form of both economic and similar trade boycotts would yield immediate results. Repeated offenders could be shown the error of their ways with naval and air actions, limited, but sufficiently impressive in terms of punishment, as, for example, the actions taken by the Israelis in destroying the MiG fighters at Entebbe. Cuban missiles anyone?

As for bright ideas, they probably have their limitations, but anyone traveling around the major airports in this country can't help but notice the laxness with which supposed airport security measures are averted. We are spared the act of hijacking not so much by our search techniques as by a lack of motivated terrorists.

Sol Greenberg  
Roslyn Estates, N. Y.

I read and reread General Milton's one-page panacea, seeing, but not believing, the incredible explanation of how the tanker fleet, along with the transports and fighters, would provide the USAF's counter to the terrorism threat.

The article boiled down to a plug for the tanker force. Don't get me wrong. I think the SAC gas passers are a vital part of our total force and believe we should improve the tanker force commensurate with their increasing responsibilities. But I don't believe in giving the tanker banner a boost by stepping on another—the proud flag of the special operations force.

If I sound a little miffed at General Milton's remarks, it's because I happen to be one of those "people with bright ideas" who banged around SEA in WW II airplanes and wore the funny hat of the Air Commandos he so arrogantly labled one of the costly lessons of Vietnam. Intending no disrespect for the conventional forces which were employed in the Vietnam conflict, the record quite vividly shows the impressive statistics compiled by the Army Special Forces, Navy Seals, and Air Force Air Commandos.

This comes through especially clear when one compares the results vs. cost (in dollars and casualties) side-by-side with the results of the conventional forces. The A-1s,

T-28s, AC-47s, A-26s, and others were extremely successful weapon systems, and the men who flew them were no less brave for not having ejection seats, Mach indicators, or computerized target displays.

The use of these aircraft in SEA was indeed a bright idea. It's just too bad we didn't stick to it instead of trying to fight an unconventional war with conventional (and costly) weapons. Once the conventional managers moved in, the psychological objectives of the war were obscured by military objectives, political constraints, and interservice rivalry. When the psychological objectives of the war were lost, so was the war. *This* was the costly lesson that is derived from the Vietnam mess, and apparently not everyone has gotten the word.

I agree with General Milton that terrorism is a threat for which we must be prepared, but again, a conventional task force is not a viable approach to countering the threat. He mentioned that the US was accused of overkill in the *Mayaguez* incident, then later concluded that we should "put together . . . airborne task forces, with transports, fighters, tankers, . . . and an AWACS" to deal with terrorists. Now that's what I call overkill, and a not-too-bright idea.

Indeed, we do need a force capable of responding to international crises brought about by radical terrorist activities. The Israelis realized their need some time ago and have a special force in-being to counter terrorist intimidations, as we all well know. Their success at Entebbe is a tribute to their "people with bright ideas" who had the foresight to propose such a force.

There are many in our Air Force today with the same foresight, trying to get someone to listen. To them I say, "Keep trying." Our great country was created by people with bright ideas and has been fueled by bright ideas for 200 years. God help us if we ever run out of bright ideas or quit listening.

Pipeline Willy  
(Pseudonym used at request of writer)

General Milton's article left me somewhat befuddled. He stated that another Entebbe operation is unlikely. He predicts terrorism and blackmail will be on the rise, and



# Airmail

that little can be done about it. But he said that with the aerial tanker, an air task force can leap, at a moment's notice, for any spot on the globe, intimating, I presume, that this sort of maneuver was the answer to whatever.

Nonsense. The Entebbe affair was brilliantly conceived, beautifully planned, and courageously executed, resulting in a highly successful operation, a natural panacea for dealing with similar situations in the future.

The Son Tay debacle mentioned by the General was apparently caused by the lack of real-time intelligence (shades of World War II and Korea). How many times in the past has a tactical force leaped off into the dark of night, hitting the tankers either over the Atlantic or Pacific, later to land at some remote spot to close the barn door after the horse has been stolen, their presence changing nothing except the population of some lend-lease base. Tankers only carry fuel. It's conceiving, planning, executing, and last but not least, winning—like in the Entebbe affair.

J. L. Brooks  
Los Angeles, Calif.

## Viking/Mars Team

It was a gratifying and exhilarating experience for me to represent industry in receiving your von Kármán Award in recognition of the accomplishments of the Viking program/Mars exploration. There can be no doubt that we in industry are very proud of the Viking results, and we are flattered by the recognition provided by the Air Force Association.

Although Viking has been primarily a NASA/Industry effort, the Air Force also played an important role. The launch vehicle, Titan III, is an Air Force machine and the Air Force was active in the program from inception through launch. As you know, we did have two perfect launches. In addition, the Viking landers were built in the Martin Marietta Denver facility, which is under Air Force surveillance, and the Air Force Plant Representative and his team were also active in the support of Viking from the moment

of contract award in 1969 right up to today.

It was great to be on the team and we thank the Air Force Association for its tribute.

Thomas G. Pownall  
Executive Vice President  
Martin Marietta Corp.  
Rockville, Md.

## A Unique Leader

The innumerable friends of James H. Straubel will be ever grateful for your timely editorial ["Making It All Possible," by John F. Loosbrock, p. 8, September '76]—tactfully, objectively, and comprehensively written. In times when a constant flow of news emanates from our nation's capital which is focused on human frailties, it is refreshing to read your tribute to Jim Straubel.

In our Bicentennial Year, the AIR FORCE Magazine editorial concentrates upon the dedication of a unique and eminent Air Force Association leader who has always chosen to remain in the background while he projects others into the limelight. Your editorial will stimulate others to render even greater service to the Air Force Association as well as to other merited enterprises.

Congratulations for a deed superbly done.

Charles H. Boehm  
Morrisville, Pa.

## Who's Afraid of Congress

Coming toward the end of your "Speaking of People" discussion on CHAMPUS's forty-mile rule [October '76], I saw the following:

"The situation can place hospital commanders in a tight spot. Do they please a patient? Do they draw the wrath of Congress? Or vice versa?"

If a hospital commander doesn't know what to do, he'd better give up that golden word "Command" and call himself something else, like a Hospital Bureaucrat or a Hospital Schlock.

Our problems lie in our failure to keep the sane and sensible congressmen apprised of the facts of life, and, conversely, failing to take the high ground and dish it right back to the dimwits and misguided people whose destructive voices, unfortunately, are often the only ones heard.

We old Navy types had only one word after the entry "Commanding Officer" in our Duty description in

our Manning Tables. It was "Morale." And considering the performance of duty of the officers and men of our Navy over the centuries, it wasn't such a dumb job description . . . and it sure makes decision-making easier.

Capt. Joseph K. Taussig, Jr.,  
USN (Ret.)  
Annapolis, Md.

## UNIT REUNIONS

### Airborne Communications

Individuals who worked on the design of the WW II Command Sets SCR-274-N, Type K, AN/ARC-5, etc., interested in an April 1977 meeting in Dayton, Ohio, please write

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### Eglin AFB Test Operations

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Capt. Jim Dunn  
(904) 882-2134

### Martin Provisional Group

The Martin Provisional Group (WW II), which supplied many fine Groups in the 8th AF in England, is having its 3d reunion in New Orleans in January 1977. Inquiries to

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### Tours for Vets

The 20th AF Association has announced final plans for two special 1977 tours. February 12 departures from New York, Miami, and Los Angeles for a 22-day "Around South America Tour," visiting Rio de Janeiro and the Iguassu Falls Brazil; Buenos Aires, Argentina; La Paz, Bolivia; Lake Titicaca, the Altiplano Cuzco, Machu Picchu and Lima, Peru ending with a safari on the headwaters of the Amazon River. Tour is limited to first 45 to make application.

In early August, for the 8th consecutive year, vets will depart from the West Coast for a 3-week tour to the Marian Islands—Guam, Saipan, and Tinian—Tokyo and Osaka, Japan; Manila, Corregidor, and Baguio, in the Philippines; Bangkok; Hong Kong; Hawaii, and return. All vets and families are eligible at greatly reduced air and land fare. Details from

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# Airpower in the News

By Claude Witze, SENIOR EDITOR

## A New Day, New Problems

Washington, D. C., Nov. 1

The nation goes to the polls tomorrow. Deadlines are like death and taxes: They are inevitable and sometimes, as in this case, cruel, as well. In this business, you go with what you've got, as every newspaperman knows, because deadlines also are inexorable.

There are other things as certain as death, taxes, and deadlines. One of them is that the new Ninety-fifth Congress, most of which will be selected tomorrow, will have more new faces than we have seen before. There will be at least fifty-four freshmen in the House of Representatives that convenes in January. That figure may go to more than sixty, depending on how many incumbents are defeated. It is possible that the Ninety-fifth will have a majority of members who have served no more than two terms. Contributing to this is the fact that the retiring Ninety-fourth Congress brought in a record number of freshmen; most of them hope to continue. On the Senate side, the figures are less spectacular, but at least eight new members will be brought in because incumbents have retired.

There is another thing that is inevitable. No matter who is elected President, Jimmy Carter or Jerry Ford, something has to be done to improve relations between Congress and the Department of Defense. While the presidential and congressional campaigns were raging, and particularly in the month that has passed since Congress adjourned to go out and hustle up votes, this reporter has heard increasingly loud laments in the corridors on Capitol Hill. Veteran staff members of the Armed Services

Committees are increasingly critical of Defense Department liaison failures, of delays, tactical maneuvering, and inadequate information. One old-timer said he never has seen relations between Congress and the Pentagon in such low estate. They find this development more puzzling because Congress, generally, has backed the Ford Administration in its funding requests. The Ninety-fourth, which started off two years ago with an influx of young and skeptical members, nourished on the malady of Vietnam, and full of hope for détente, turned out to be less dovish than expected. Both houses of Congress turned down efforts to cut the defense budget and did so by large vote margins.

Lost in the flurry of adjournment actions and the noise of the campaign was a heated exchange between Defense Secretary Donald H. Rumsfeld and the Chairman of the House Armed Services Committee, Rep. Melvin Price. The issue was a

request from President Ford for supplemental authorization of \$1.6 billion for additional warships. A House Armed Services subcommittee on seapower went along to the extent of \$1.1 billion, but the full committee tabled the bill. It did so twice, the second time by a vote of 20 to 16. That killed the proposal, on the eve of adjournment, despite an urgent plea from the White House.

Secretary Rumsfeld was provoked. His attack was on the committee:

"The real loss as a result of the dilatory handling of a vital national security budget request will be in America's confidence in the capability of our Navy to maintain freedom of the seas . . . freedom upon which the nation's economy and security have always depended, and will continue to depend," the Secretary declared.

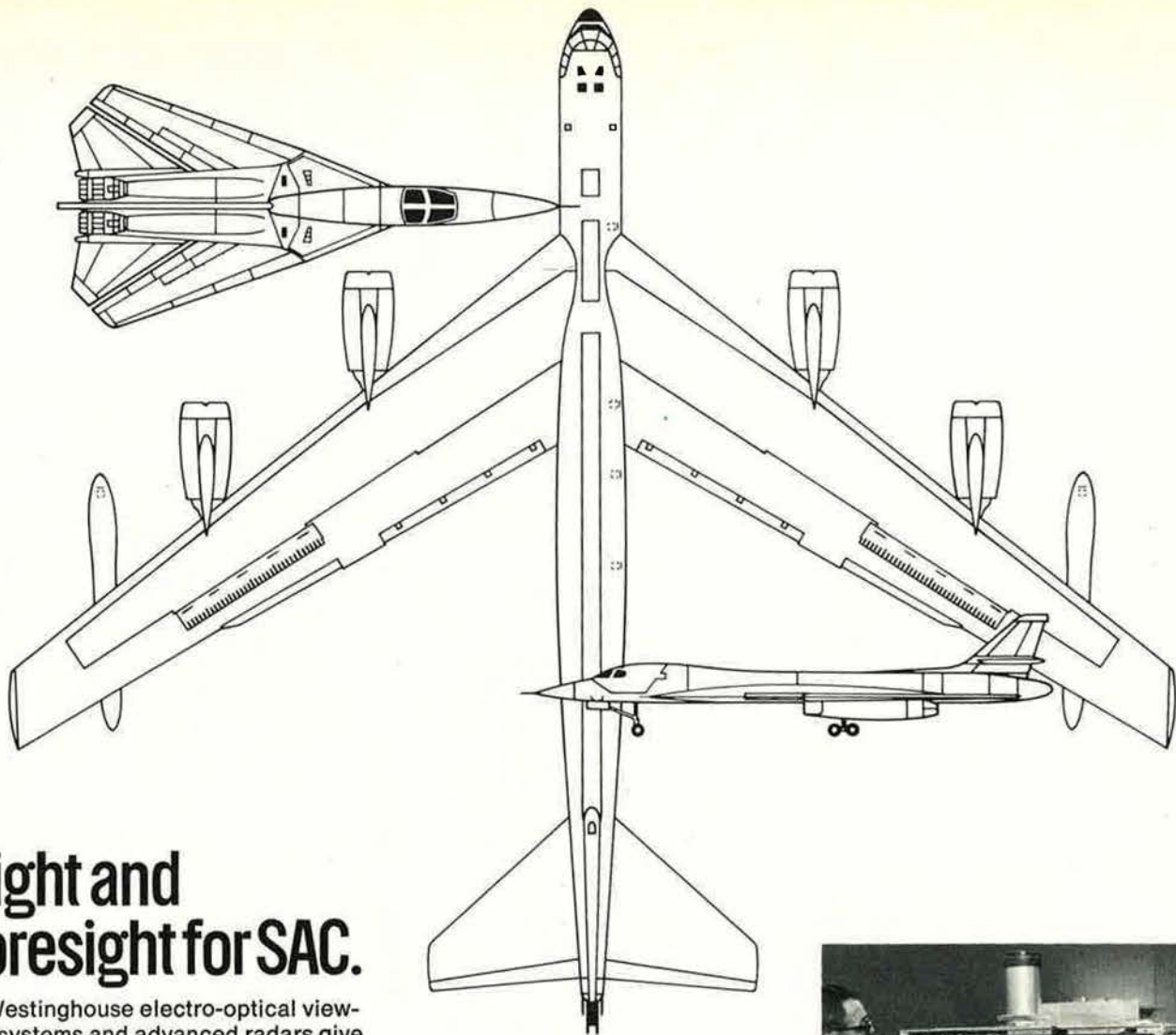
He went on to attack Congress for acting "unwisely in its failure to pass a variety of cost-saving initiatives that would have saved the government hundreds of millions of dollars in 1977 alone and billions of dollars over the next ten years in civilian manpower, reduced training costs, and other operational efficiencies."

Mr. Rumsfeld was disappointed in more than the reluctance to conserve on base activities. He also blamed Congress for not accepting the Administration proposal to dispose of excess goods in the stockpile. He claimed about \$746 million could be recovered by selling excess commodities and the money



SECDEF Rumsfeld attacked Congress for not passing cost-saving proposals.





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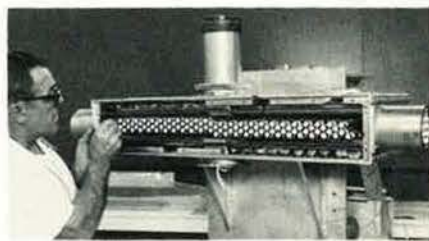
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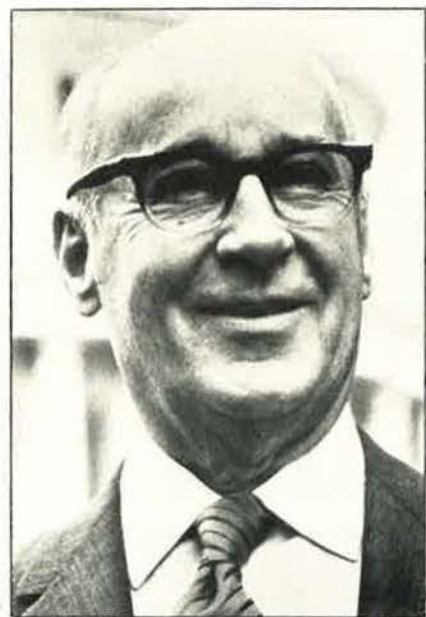
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# Airpower in the News



HASC Chairman Melvin Price charged Rumsfeld with "political skulduggery."

used to offset defense expenditures.

Both of the proposals were in the President's budget, Mr. Rumsfeld pointed out, Congress did not act, and that means "roughly \$1.4 billion needed for essential defense programs will not be available." And, he added: "Had the Congress passed these restraints, the savings could have paid for the major portion of the urgently needed shipbuilding program, as proposed by the President."

There was an instant, and stormy, response from Capitol Hill.

"The credibility of the Secretary of Defense has been seriously diminished," declared Chairman Price. He added a portentous:

"I fear, therefore, for the future relationship between the Congress and the Pentagon—and its ultimate impact on our defense establishment."

Mr. Price maintained that the committee vote to table the shipbuilding fund request, three days before adjournment, was based on the sheer impossibility of completing action in this session of Congress. "It clearly was not a decision on the merits or demerits of the

Executive Branch recommendation," he added.

The Chairman went on:

"Every Pentagon official, including Mr. Rumsfeld, the Secretary of the Navy, Mr. [J. William] Mendenhall, and all of their responsible subordinates, was apprised of this fact. Yet, the Pentagon launched an unprecedented lobbying effort to attempt to force the committee to send this legislative recommendation to the floor of the House. Obviously, this was a transparent effort to attempt to create a political issue on defense.

"I am saddened by this kind of political skulduggery, since heretofore defense had always been a nonpartisan issue. Apparently, that is no longer true."

Chairman Price said his indignation is shared by most members of his committee. He quoted Rep. F. Edward Hébert, his predecessor as chairman, as saying that "for the first time in thirty-four years, crass political considerations have been injected into defense policy considerations." Mr. Hébert added: "Pentagon officials were warned by me and other members of Congress of the pitfalls they would encounter if they persisted in their efforts. Yet, they persisted into falling into the abyss of political chicanery."

The complaints from the Senate side are less vehement, but the unrest is evident. One example will suffice. Following a spate of newspaper publicity, starting last summer, the Defense Department announced it would issue new regulations to bar military officers from contributing to payment for travel costs when they accompany members of Congress on defense-related trips overseas. There were reports of abuses, that in 1975 the Pentagon spent about \$600,000 for such things as hotel, restaurant, and bar bills for junketing legislators.

The Pentagon move brought a sharp response from Senators Mike Mansfield, the majority leader, and Hugh Scott, the minority leader. In a letter signed by both of them, Mr. Rumsfeld was told the funding was provided by law, and the law was passed by Congress. It said expenditure of funds by escort officers "should only be as authorized by the chairmen" of the committees involved. It said the Senate staff, and not the Pentagon, should be responsible. If abuses arose, that would be a Senate problem.

A month later, Mr. Mansfield wrote a second letter to the Secretary of Defense, complaining that there had been no response. In both letters, the majority leader was particularly critical of William K. Brehm, the Assistant Secretary of Defense for Legislative Affairs. The demand was for Mr. Brehm to confer with the Senate staff before issuing new regulations bearing on the implementation of a congressional edict.

Both Senate and House critics are inclined to put the blame for strained relations with the Pentagon on "just politics." The outcome of the election may determine, among other things, whether "just politics" is a manifestation of party differences or those differences, increasingly germane to national security, between the executive and legislative branches of the government.

## A New Look at the Budget

In this short interim, between the signing of the defense appropriations bill for Fiscal 1977 and presentation of the Fiscal 1978 proposals, the Congressional Research Service, part of the Library of Congress, has come up with an analysis of cuts made in the budget for Fiscal Years 1971 through 1976. The study is one made specifically for Rep. Les Aspin, the Wisconsin maverick who sits on the House Armed Services Committee. He has interpreted the results, for his audience in the press corps, as meaning that when Congress cuts the defense request it has little or no impact on national security. This time, the press did not pay much attention.

Here are the main points:

- Congress has cut about \$33 billion from the funding requested by the White House for the Pentagon between 1971 and 1976.

- The cuts can be categorized, the report says, as follows: Substantive, 40.7 percent; Noncritical, 7.5 percent; Postponements and Deferrals, 17.8 percent; and Adjustments, 34 percent. By the definitions given in the report, the substantive cuts were cuts that related to the primary military mission. This means O&M, procurement, and most RDT&E. "Adjustments," the second major item, refers to bookkeeping, such as the reapplication of funds already voted but not expended. Another example is the



# Airpower in the News

acceptance by Congress of a new weapons program, but its refusal to vote more than the first year's required funding.

- Because the adjustments category is so high, total cuts in the defense budget are less critical than the overall figures seem to indicate. Still, the "substantive" cuts are large (\$13.6 billion out of \$33.3 billion) and, in dollar terms, there was not much difference between the cuts suffered by O&M (\$3.5 million), Procurement (\$3.5 million), and RDT&E (\$3.1 million). Other items, such as military assistance, also were classified as "substantive."

- If the figures for O&M, procurement, and RDT&E cuts are ex-



Rep. Les Aspin claims that Hill budget cuts affect national security but little.

pressed as percentages, or proportions of the request eliminated, the picture changes. O&M funding was slashed 2.4 percent in the six years.

Procurement was cut 2.6 percent. Meanwhile, RDT&E was pushed back 5.8 percent.

Well, Representative Aspin interpreted all this to mean Congress has not impeded the defense effort. "I wish we had slashed defense expenditures," he said in a prepared statement, "but it just ain't so. Congress has done little more than toy with the Administration's requests."

When the budget hearings are held in 1977, Pentagon witnesses can use the Library of Congress report to bolster their case. For the long look ahead, the important item, overlooked by Mr. Aspin, is the magnitude of the cut, percentage-wise, in the requests for work on advanced technology, the RDT&E that looks years into the future.

It is the area we have neglected, while Russia has been spurring its activity. Contrary to the Aspin press release, it has a major impact on our national security program. ■

## The Wayward Press

It is too early to effectively evaluate the performance of the press during the past ten months of presidential campaigning. It was a campaign in which issues were fuzzy, if they were there at all, and we think much of the blame for this rests with the media. If the press has any power at all, it should have the power to find the real issues and make them boil. Even with three teams of ink-stained interlocutors taking part in the major televised debates, this did not come about.

This brings up the whole subject of the Power of the Press. Last spring, Edwin Diamond, writing in the *Columbia Journalism Review*, gave it as his opinion that the press "is not prepared for political power." Certainly this is evident if one merely observes the intellectual caliber of the questions thrown out at press conferences in the White House and, lately, in the Pentagon. Ed Diamond sensed this and turned to a political reporter, Richard Reeves, for support.

The press, Mr. Reeves said, is essentially an immature institution, something like "a lovable little child. . . . It has trouble concentrating on more than one thing at a time. . . . It is not an institution constantly and consistently dedicated to accumulating the exercise of control over other institutions or other people's lives."

Mr. Diamond went on to suggest that the press might consider relinquishing some of the power it thinks it possesses. A good first step would be to spend more money and talent on news, and less on polls.

John Midgley, who is the American editor and Washington correspondent of the British *Economist*, seems to think our press has been thrown out of whack by the Watergate scandal. He points out it was not the press that dislodged the Nixon Administration, but the judicial and legislative branches of our government. The feeling of power that the press derived from the way it handled the news, therefore, has no basis in fact. What power the press has, Mr. Midgley says in an erudite essay in *The Annals of the American Academy of Political and Social Science*, derives from this right, guaranteed by the constitution, to decide what to print and what not to print.

Even movie-goers know, from seeing "All the President's Men," there can be real drama surrounding the editor's desk while he makes up his mind what to tell the public. There was no better example of this during the campaign than the crisis created for editors when John Dean, now a member of the press corps, gave a detailed report of a distasteful story told on an airplane by Earl Butz. It was a private conversation, not unlike many conversations more experienced reporters have had with even higher-ranking government officials. After careful consideration, Mr. Butz resigned. It was the press that was responsible, because it exercised its power to print, which is the only power it has.

The final word comes from a study of "leadership groups" in the United States, conducted by the *Washington Post* and the Harvard University Center for International Affairs. Part of the research centered on the news media. More than 300 members of the trade were interviewed. Sixty percent were from newspapers, the rest from radio and television. According to the *Post*, there were these revelations:

- Media employees think the press is very influential. Most of them think it is too influential and wish they had less influence. They think their influence keeps increasing.

- Most of those interviewed have incomes between \$20,000 and \$50,000, with another eight percent higher than that.

- Forty-three percent of news managers consider themselves moderate in political matters, forty percent as liberal, and seventeen percent as conservative. Among reporters, only twenty percent call themselves moderate, fifty-nine percent say they are liberal, and eighteen percent conservative.

The report apparently recognizes that "influence" is an abstract concept and may mean different things to different people.

It is unlikely that many in the media would admit their "influence"—pretentiously called the Power of the Press—is limited to their power to determine what to print, but it is. In the campaign, John Dean and the editors of *Rolling Stone* demonstrated this, and so did Robert Scheer and the editors of *Playboy*.



# Aerospace World News, Views & Comments

By William P. Schlitz, ASSISTANT MANAGING EDITOR



Air Force Secretary Thomas C. Reed is briefed, prior to a recent B-1 flight, by Program Director Maj. Gen. Abner B. Martin, right. Mr. Reed is reviewing the program pending a production decision.

Washington, D. C., Nov. 1

★ The first full-scale development F-16 Air Combat Fighter was unveiled on October 20 at General Dynamics' Fort Worth Div. Principal speaker at the rollout ceremony was Secretary of Defense Donald H. Rumsfeld. Sharing the speakers' platform with him were senior defense representatives of the NATO nations that are participating in the F-16 program: Belgium, Denmark, the Netherlands, and Norway.

The new F-16A is one of eight, including two dual-cockpit B models, that will be flown in a joint USAF/General Dynamics evaluation program. First flight is scheduled for December of this year with deliveries of squadron-ready aircraft planned for January 1979.

The rollout was a major milestone for the F-16 program, which so far has included two years of prototype flight testing (see "YF-6 Pilot Report," by Lt. Col. James

G. Rider, in the October '76 issue); award of the 1976 Collier Trophy by the National Aeronautic Association for "setting new standards of fighter aircraft performance"; and historic coproduction agreements among the five coproducing nations.

★ All major objectives of the B-1 strategic bomber avionics Phase One test program have been achieved in the first five months of a six-month flight-test program, according to the Boeing Co., which is responsible for avionics subsystems and integration.

The avionics test aircraft, the No. 3 B-1, made its maiden flight in April. By September 1, the offensive avionics system met or exceeded performance criteria established by the Air Force.

Navigation performance has been as much as fifty percent better than required, simulated bomb release errors up to forty percent better than criteria, and avionics performance has been demonstrated at 200 feet altitude.

Among the system functions demonstrated in the five-month flight-test program were navigation ground and air alignment; navigation system operation in inertial and Doppler inertial modes; forward-looking radar fix-taking; instrument approach and landing; SRAM initialization, alignment and simulated launch; in-flight SRAM launcher rotation with a full load; simulated bomb delivery; automatic and manual bomb steering; automatic and manual terrain-following flight; automatic and manual let-down; and rendezvous and direction-finding in-flight refueling. All secondary test objectives also were met.

During the time remaining in the

avionics Phase One test program, additional data were gathered to verify the avionics performance report, which was to be presented to the Air Force on November 1.

★ On October 8, an overlook at the Air Force Academy was dedicated to the memory of Gen. Carl A. Spaatz, first Chief of Staff of the Air Force. Gen. David C. Jones, USAF Chief of Staff, presided over the ceremony, which was attended by Mrs. Ruth Spaatz, widow of General Spaatz, and two of the Spaatz daughters, Mrs. Steven Nagel and Mrs. Francis Thomas. Also in attendance were many retired and active Air Force leaders.

An outdoor setting for the memorial was chosen in recognition of General Spaatz' interest in wildlife. Preparation of the site, which commands a magnificent view of the cadet area, was financed by private contributions to the Spaatz Memorial Fund. The overlook will be open to the more than one million people who visit the Academy campus each year.

★ In a recent Pentagon ceremony, Chief of Staff Gen. David C. Jones presented the 1975 Mackay Trophy to Maj. Robert W. Undorf, now assigned to the Directorate of Programs and Resources at Air Force Headquarters.

The Mackay Trophy is awarded annually to Air Force participants in the most meritorious flight of the year. The award, established in



Chief of Staff Gen. David C. Jones and Mrs. Spaatz at the Air Academy overlook dedicated to General Spaatz. (See item.)



# Aerospace World

1912 by Clarence H. Mackay, an industrialist and aviation enthusiast, is now sponsored by the National Aeronautic Association.

Major Undorf was pilot of an OV-10 forward air control aircraft during the joint military operation to rescue the crew of the SS *Mayaguez* in May 1975. Major Undorf assumed on-the-scene command of the evacuation of some 225 Marines from the island of Koh Tang in the Gulf of Thailand. The citation accompanying the award states that "Major Undorf's heroic actions were primarily responsible for the timely evacuation of the United States ground forces and the saving of many lives."

★ USAF is well into a program to develop airborne missiles capable of angles of attack of ninety degrees or more.

Tactical missiles of the "air-slew" variety are needed because of the high performance and maneuverability of today's aircraft. For example, current air-to-air missiles—those that armed US aircraft in Southeast Asia—have an effective maneuvering capability of only about thirty degrees to follow target aircraft after launch. Air-slew missiles hold promise of combining vectored thrust with sophisticated control surfaces to achieve greater maneuverability.

Presently under analysis is a data base derived from two years of wind-tunnel tests of a family of missile models especially designed with interchangeable noses, bodies, and aft control fins. These were the subject of tests in a multitude of configurations in wind tunnels at AFSC's Arnold Engineering Development Center, Arnold AFS, Tenn. Air Force Flight Dynamics Lab, Wright-Patterson AFB, Ohio, is already using some of the wind-tunnel data to define a preliminary air-slew concept.

Air-slew techniques that result from this research may also be applicable to such nonmissile designs as the Space Shuttle's recoverable solid-rocket boosters, officials said.

★ In mid-October, just forty-eight hours after launch, Soyuz-23 descended through a blizzard to splash down in a lake in Soviet Kazakhstan.

The two rookie cosmonauts aboard—pilot Lt. Col. Vyacheslav Zudov and engineer Lt. Col. Valery Rozhdestvensky—were reported to be in good condition.

The Soyuz-23 mission was aborted when a malfunction kept the spacecraft from docking with orbiting space station Salyut-5, for

what was believed to be another attempt to break the US record of eighty-four days in space.

The water landing was the first in the USSR's fifteen years of manned spaceflight, causing speculation among US experts that it was not intentional.

The Soviets have had serious problems with their manned space program of late: The Soyuz-21 cosmonauts in August broke off their stay aboard Salyut-5 after forty-eight days, apparently because of

## Return of the American Eagles

Some of the young American volunteers who crossed the Atlantic before Pearl Harbor to join the air war against Hitler's Luftwaffe thirty-six years ago returned to England to attend a special September reunion in London. They were members of the famous 71, 121, and 133 American "Eagle Squadrons" of the Royal Air Force, who flew the immortal Hurricane and Spitfire fighters in combat for two years before being transferred to the US Army Air Forces in 1942.

Hosted by the Royal Air Force, the group were guests at RAF Station Biggin Hill for the Battle of Britain Celebration. They also attended the world renowned Farnborough Air Show and visited the RAF Museum at Hendon. Led by Eagle Squadron Association president Richard L. "Dixie" Alexander, the group presented a silver chalice and paten at a special service held in the Battle of Britain Memorial Chapel of St. George's at Biggin Hill. The chalice was engraved "To those who came with us, and now remain forever." Wreaths of remembrance were laid at the grave sites of their fallen comrades-in-arms.

Thirty-six years ago, these then young men were welcomed to threatened England with open arms as that nation stood with its back to the wall facing a seemingly invincible German enemy. Now older, grayer, and in some cases heavier, the American Eagles returned for a nostalgic reunion, and once again they were welcomed with open arms by the people of Britain.

—By Lt. Col. Bill Dunn, USAF (Ret.)



Former Eagle Squadron members pose with the famed Spitfire. From left, R. J. Wood, Sir Michael Duff, Richard L. Alexander, P. T. Salkeld, William R. Dunn, Danny Daniel, R. C. Wilkinson, Michael Miluck, Bert Stewart, James A. Gray, Chesley G. Peterson, F. D. Smith, and Reade Tilley. Wood, Duff, Salkeld, and Wilkinson are Britishers who served with the American-manned squadrons. Peterson is a retired Air Force major general; Alexander is the past Eagle Squadron Association president; Dunn was the first American ace of World War II; Daniel is the only full-blooded American Indian to serve in the RAF; Tilley is the newly elected Eagle Squadron Association president.



# Conversation Pieces

## C<sup>3</sup>-Key to crisis management.

Every time there's a flare-up in Xenobia or Whereistan, staff officers have to work overtime. And, nowadays, crises seem to be erupting almost continuously. Tidal waves of data come in from all over the world, but what senior commanders need is *significant* information for making decisions. It's the age-old problem of command, control, and communications, or C<sup>3</sup> for short, but it's much more complicated than it used to be. So, we rely on sophisticated electronics to do the drudge-work of sorting, storing, retrieving, correlating, and displaying data.

TRW builds a lot of these electronic systems; we also build the Air Force's global communication satellite system...and a more advanced system that's now in production for the Navy.

But, even more challenging than the hardware for C<sup>3</sup> is the software that makes it work. And we're using the term software, here, to mean more than just computer programming. It includes an enormous amount of front-end analysis and systems engineering. We emphasize this because we've found it's the only way to deliver systems that work properly, and do it without delays or over-runs.

For example, we've developed ASSIST, the Army System for Standardized Intelligence Support Terminals. It will eventually centralize the data from intelligence-gathering units and make it readily accessible.



We've also built a combined Arms Tactical Training Simulator for the Army. CATTs is a computer-based system that gives potential commanders low-cost practice in making battlefield decisions. Users at Fort Benning tell us it provides such realistic simulations that students get much more out of field exercises than they would without such training.



help FLTCINCs and the CNO to manage any level of crisis; they also interface with WWMCCS, the Worldwide Military Command and Control System.

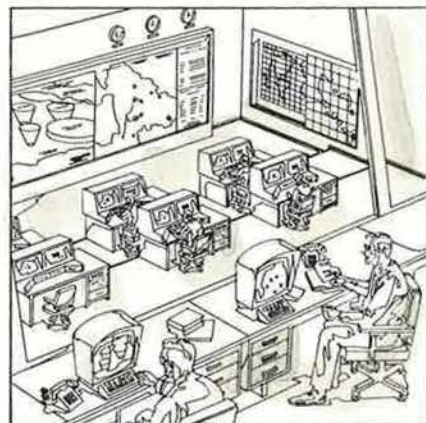


At the uppermost levels of command and control, we are supporting the Defense Communications Agency's development of a master plan for MEECN, the Minimum Essential Emergency Communications Network. Our modeling of advanced systems and concepts helps to give decision-makers a quantitative basis for achieving an optimum balance between adding to network survivability and meeting other vital defense objectives.

If you are interested in putting this broad-gage C<sup>3</sup> capability to work in your area of the national defense program, we invite you to write and let us know your specific needs.

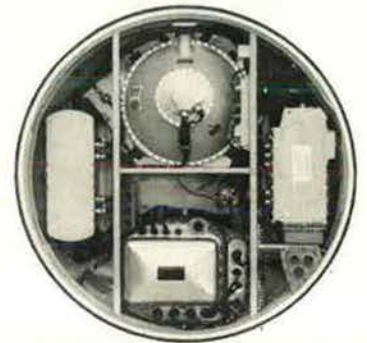
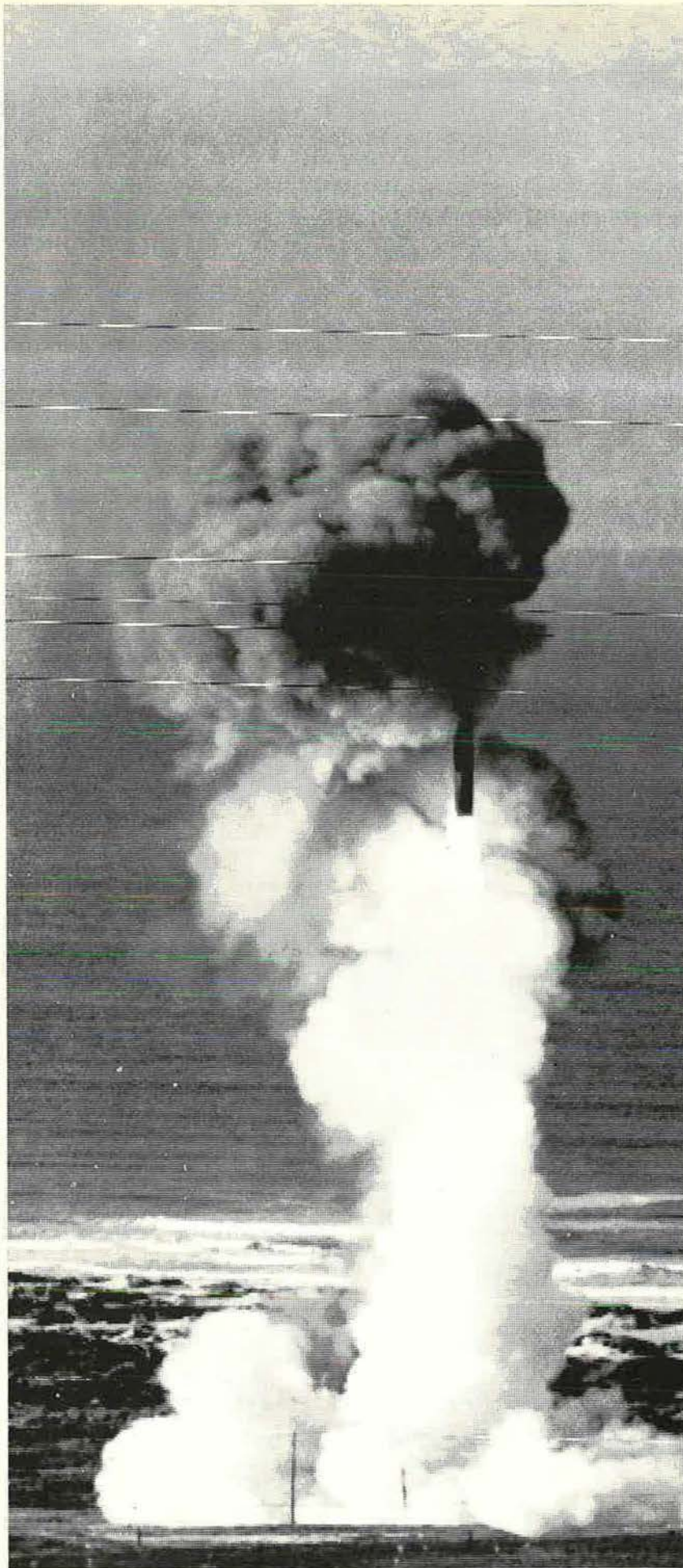
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# Aerospace World

weightlessness problems; in September, Soyuz-22 reentered after only eight days in orbit and without attempting a linkup with Salyut-5.

★ Space scientists from twenty-five nations attended the twenty-seventh Congress of the International Astronautical Federation in Anaheim, Calif., this fall. Theme of the meeting: "The New Era of Space Transportation."

The space experts presented more than 300 papers on subjects ranging from space law to exploration of the solar system.

The meeting included field trips to observe first-hand results of the Viking Mars mission as well as a look at the Space Shuttle Orbiter, which made its debut in rollout ceremonies in mid-September.

A highlight of the international space congress was the presentation of a Soviet-produced film, "Meeting in Space," by the crews of Apollo-Soyuz Test Project.

The nongovernmental IAF was founded in 1950 with eleven members; today, it has fifty-nine member organizations in thirty-four countries. Its goals:

The development of astronautics for peaceful purposes; the dissemination of technical data; stimulation of public interest in spaceflight; the encouragement of astronautical research; and fostering cooperation among organizations involved in all aspects of astronautics and the peaceful uses of space.

More than 1,000 industry and government leaders from around the world attended the California space congress.

★ Another professional meeting concerned with flight—the Ninth Symposium on Scientific Ballooning—took place in Portsmouth, N. H., October 20–22.

Sponsored by AFSC's Air Force Geophysics Lab, the Symposium touched on such topics as balloon technology, airships, balloon-borne experiments and instrumentation, and scientific balloon operations.

Participants included representatives from DoD and the services, NASA, the universities, and industry. Also present were scientists from Great Britain, France, Germany, and India.

The Symposium is of more than passing interest because of the recent rebirth of interest in balloons as a potentially economic and efficient means of transport, the first serious consideration of lighter-than-air vehicles since the dirigible disasters of the '30s.

★ Out of ballast and buffeted by winds, Ed Yost ditched in the ocean near the Azores—750 miles (1,207 km) short of crossing the Atlantic by balloon. He was picked up in good shape by a German freighter.

Thus ended the fifteenth attempt to be first across in a balloon. Several of the flights have ended tragically.

The balloon manufacturer from Sioux Falls, S. D., did, however, break two records—those for length and duration of flight. The fifty-seven-year-old Mr. Yost man-

aged to keep his balloon, the *Silver Fox*, aloft for nearly 107 hours following launch from the Maine coast on October 5. This topped the mark of eighty-seven hours set in 1913. The *Silver Fox* traveled about 2,500 miles (4,024 km), to beat the 1,897 miles (3,053 km) recorded in 1914.

In the 1950s, during a lifelong interest in balloons, Mr. Yost designed the first such vehicle that could be heated in midflight to stay airborne.

★ Money dropped into collection baskets at Air Force chapels around the world is helping to send needy black students to college in America.

The Air Force Chaplain's Fund recently donated \$25,000 to the United Negro College Fund, which helps to support forty-one predominantly black-member colleges with a student population of 50,000.

Maj. Gen. Henry J. Meade, Air Force Chief of Chaplains, said that the board of directors of the Chaplain's Fund "looked at the massive leadership void in this country,

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# Aerospace World

looked at the Fund's schools producing leaders for the future, and decided to make the gift."

The colleges turn out more black professionals than any other single source, according to UNCF, a non-profit fund-raising organization that is trying to raise \$15 million this year to support its member institutions.

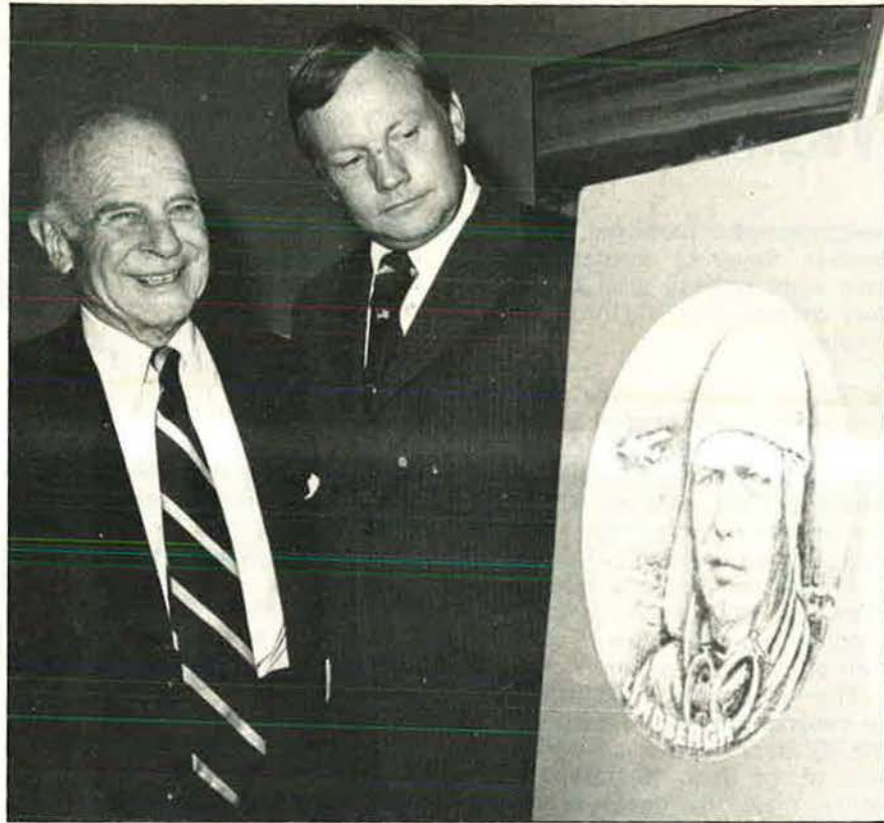
★ This past fall, fifty-one French men and women—representing the "Shelburn" underground network of World War II fame—were honored during a visit to the US. (In 1944, members of Shelburn, at the risk of their lives, helped hundreds of Allied airmen evade capture and escape to freedom.)

During its whirlwind tour in the US, the group visited New York; Niagara Falls; Birmingham, Mich. (where they were overnight guests in private homes); Pittsburgh; and Washington, D. C.

After placing a wreath at Arlington Cemetery's Tomb of the Unknowns, the Shelburn members were given a VIP tour of the Pentagon, where they were greeted by Maj. Gen. George J. Keegan, Jr., USAF Assistant Chief of Staff for Intelligence. They were then briefed on American POW experiences in Southeast Asia by Claude Watkins, an Air Force civilian expert on escape, evasion, and POW affairs. Mr. Watkins made the point that in the Vietnam War, no underground existed to lend downed flyers a helping hand.

Two former Southeast Asia POWs also addressed the group with a word of thanks—Lt. Gen. John P. Flynn, currently USAF IG, and Col. Wayne Waddell.

Throughout its stay in the US, the Shelburn group was hosted by the Air Forces Escape and Evasion Society, an organization of former escapees that through the years has welcomed visiting European resistance groups to the US. In fact, Detroit's Ralph Patton, President of the AFEES, bailed out of a burning B-17 in 1944 and was shepherded across France to safety in England via the Shelburn net.



With a design for the commemorative medallion to mark the fiftieth anniversary of Lindbergh's historic solo transatlantic flight are James H. Doolittle and Neil Armstrong. The two are cochairmen of the Lindbergh Memorial Fund. (See below.)

★ Two prominent Americans—James H. Doolittle and Neil A. Armstrong—are cochairmen of a group that plans to raise \$5 million to establish a Charles A. Lindbergh Memorial Fund.

The money would finance research in environmental and scientific fields in which the late Lone Eagle had a lifelong interest.

A number of special events and celebrations to highlight the fiftieth anniversary of the first solo flight over the Atlantic is already being planned. These include a "Spirit of St. Louis II" commemorative flight on May 20, 1977, by a Pan Am Boeing 747 following Lindbergh's route, and fund-raising dinners at major cities around the country on May 21.

The Lindbergh fund headquarters is at 30 E. 42d St., New York, N. Y. 10017.

★ NASA has been looking into the application of remotely piloted vehicles to civilian uses.

According to a report prepared jointly by NASA Ames Research Center and Lockheed Missiles & Space Co., RPVs could be employed

extensively in the civil world—from pipeline patrol to forest fire detection.

In cataloguing possible RPV tasks, the study also defined the type of vehicle best suited. (Both fixed-wing and helicopter craft working alone or in combination were considered.) For example, the more range required the larger the vehicle—because of the greater amount of fuel required.

The civil RPVs could be equipped for various missions with TV camera, infrared sensor, or dispensing or sampling gear. And the vehicles could also be preprogrammed for their chores by instructions fed into on-board autopilots.

Other suggested uses: security of high-value property, fishing-law enforcement, weather research, agriculture monitoring and crop dusting, highway and roadnet patrol.

The NASA/Lockheed study also detailed legal and technical hurdles that would have to be cleared before RPVs could come into common use. For example, FAA regulations would have to be developed, especially in such safety areas as collision avoid



ance, power loss, and continuous positive control.

Despite the drawbacks, NASA experts said current technology could provide government and commercial RPVs within a decade.

★ In wars of the future, large numbers of mini-remotely piloted vehicles may be used to confuse and otherwise harass enemy radar defenses.

Northrop Corp. has built three prototypes of such a device, known as Very Low Cost Expendable Harassment Vehicles. Each has an eight-foot (2.44 m) wingspan, weighs seventy-five pounds (34 kg), and is powered by a five-horsepower gasoline engine.

Flight tests—to determine speed, altitude, climb rate, endurance, stability, and loiter capability—began at Fort Irwin, Calif., in September.

Costs have been kept to a minimum by using plastics to mold parts, in much the same way that the toy and recreational industries mass produce their products.

★ Comsat General Corp.'s third

maritime communications satellite (Marisat) was put into synchronous equatorial orbit over the Indian Ocean in mid-October.

Marisats in orbit over both the Atlantic and Pacific Oceans already have been providing the US Navy, offshore industries, and the ships of ten other nations with voice, telex, facsimile, and other communications. The two were launched earlier in the year.

The maritime satellites, with their much more secure, reliable, and modern communication techniques, may be signaling *dit-dah dit-dah-dit* ("end of transmission") to the use of Morse Code by the maritime industry. The familiar dit-dah of International Morse had been universal in the world's oceans since the turn of the century. The end of an era.

★ **NEWS NOTES**—Gen. Curtis E. LeMay, former Air Force Chief of Staff, proved he still has what it takes by placing first in a field of twenty-five in a pistol match during September's Worldwide Security Police Marksmanship Tournament, Van-

denberg AFB, Calif. The special match featured security police chiefs from the major commands and guests. General LeMay retired in 1965 at the age of fifty-eight.

USAF tapped **Raytheon Co.'s Equipment Div.**, Wayland, Mass., to build the PAVE PAWS SLBM warning system at Beale AFB, Calif.

After four previous successful test flights, the fifth ended disastrously when the **Air-Launched Cruise Missile** "impacted prematurely" seven minutes into a planned thirty-three-minute flight at White Sands Missile Range, N. M. Investigators are looking for the cause.

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In other NCO news, the Air Force's newest command academy—**US-AFE's Noncommissioned Officers Academy**—began operation at Kaun AS, Germany, this fall. ■

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# Comment & Opinion

BY 1ST LT. WAYNE R. KURTH, USAF, MAC DILL AFB, FLA.

In the peacetime Air Force, where funds are diminishing, there is a necessary emphasis on getting the most from our resources. Many programs exist to ensure that materiel and systems are used in the most advantageous manner; however, in some areas the personnel machine is proving ineffective in managing our human resources.

The field of personnel management is a difficult one, consisting of balancing personal goals on one hand and the needs of the Air Force on the other. Yet, understanding this does not put our personnel managers above criticism, particularly when an assignment policy is introduced that jeopardizes the training and retention of productive officers.

The policy referred to is the fully noncompetitive assignments for officers in undergraduate pilot and navigator training (UPT and UNT), affecting a vast percentage of the incoming officer force. That policy was introduced when one of the major commands complained of not getting a fair share of the top graduates of flying training. Thus, Military Personnel Center (MPC) developed a program whereby all commands supposedly receive a proportionate share of the ability spectrum.

Previously, students were ranked by academic and flying grades. As graduation approached, available assignments came down to each class from MPC, listed according to base and aircraft. Students would then pick their assignments from what was available, in descending order of class rank. In this manner, a student's performance was directly related to his ability to influ-

ence his assignment goals, within the limits of the available aircraft.

The major reason for changing the competitive system was the tendency of high-ranking students to select high-performance aircraft, usually in Tactical Air Command (TAC), with the likelihood that aircraft of certain other commands would be left to the lower-ranking students. Thus, the current system was instituted in which students fill out "assignment preference sheets" listing their assignment choices in order of preference *before* seeing what assignments are available. All students are then presumably given equal consideration regardless of class rank, so that all commands supposedly receive a commensurate number of high-ranking students.

The new policy has a few twists that render it less equitable in practice than in theory. For example, students in UPT may not list a T-37 or T-38 Instructor Pilot (IP) assignment along with their other choices. They must either "volunteer" for an

The purpose of this department is to encourage the presentation of novel ideas and constructive criticism pertinent to any phase of Air Force activity or to national defense in general. Submissions should not exceed 1,000 words. AIR FORCE Magazine will pay an honorarium to the author of each contribution accepted for publication. We need a title for this new department and will pay \$100 for the best one we receive. Deadline for submission—March 1, 1977.

—THE EDITORS

IP assignment, or be listed as "non-volunteer" or "undecided." The same is true for Electronic Warfare Training (EWT) and Navigator Bombardier Training (NBT) assignments at UNT. Furthermore, all IP, NBT, and EWT slots are filled first, before any consideration is given to filling other available assignments. In fact, these positions are determined at the base of training before the preference sheets are sent to MPC for the remaining assignments, thus eliminating the selected students from further assignment consideration.

Another device used at UPT is the fighter/attack/reconnaissance (FAR) aircraft recommendation, which a student must have to receive an assignment in that operational area. An FAR recommendation is also necessary to qualify as an IP candidate. These recommendations are determined by the students' instructors and commanders during the latter phases of training. It is interesting to note that while IP assignments now remain almost entirely in the top ranks of each class, many fighter assignments are going to students at the bottom of the class. Corresponding with this is the significantly increased rate of failure to check out at fighter replacement training units (RTUs) and fighter lead-in training, which was virtually unknown under the old system. Apparently, in many cases, an FAR recommendation is not an accurate judgment.

Students being introduced to the new assignment policy are supposed to be impressed by the advertised satisfaction rate for first and second choices, usually quoted to be around sixty-five percent. One should realize that with a given group of assignments, it is not mathematically possible to satisfy more people under the new system than it was under the old; the real difference concerns *who* is getting what they wanted. No explanation is given to the flying students of the priorities used to determine which students will receive which assignments. It is informally understood that much importance is attached to satisfying either first or second choices, so a student who does not receive his first or second choice often receives one of his last choices. For this reason, students will not always list their actual first preferences, if they are not likely to be available, in order



to avoid getting their last choice. This makes the advertised satisfaction rate somewhat less indicative than it outwardly appears.

The present policy is damaging morale and incentive in the flying training program in many ways, primarily by eliminating new officers' ability to attain their career goals. How should a top-performing student react when a marginal or indolent classmate has an equal chance of realizing his assignment preferences? Even worse, the only significant result of a student pilot performing to his maximum capability is a greatly increased chance of selection as an IP, despite his assignment goals. Competition is a part of military life: OERs, regular commissions, and promotions are all based on recognizing the best performing officers. Why, then, has such an effective practice been compromised, except to satisfy certain commands' demands for more top students than they could attract on their own merits?

What seems to have been neglected is that high-performance fighter-type aircraft require a higher degree of flying proficiency than do

multiplace aircraft. The significantly increased failure to check out in fighter training is evidence of this fact. Military flying in any aircraft is extremely demanding: There is no easy way to win a pair of silver wings. Yet it makes little sense to put anyone but the most highly qualified people in fighter aircraft if the mission is not to be adversely affected. Even Strategic Air Command recognized this when initially selecting crew members for its FB-111 aircraft, and Air Training Command (ATC) is demonstrating similar awareness in filling IP slots. It seems far wiser to use less proficient people initially in copilot roles, where they may continue to develop their skills, rather than place them in high-performance aircraft, where they fail to qualify, and are subsequently transferred or grounded. Theoretically, the FAR recommendations should prevent such occurrences; results at fighter training bases indicate they do not.

The noncompetitive assignment policy has now appeased a command that sought skills it didn't require, to the detriment of a command that did. ATC must also be

pleased, since it alone has first choice of the new graduates. The Air Force has entered an era in which it is policy to keep crew members with a particular aircraft during the majority of their careers to reduce training costs. The combination of these factors is virtually certain to cause the separation of competitive officers who are permanently denied their career goals. With the reduction of the force, their loss is apparently considered unimportant, but such an attitude will prevent retention of the best possible people in a time of severely limited personnel.

Without question, the need for professionalism has increased in peacetime while we struggle to maintain a credible force. Yet, professionalism cannot reasonably be expected on one level while it is ignored on another. Career-minded officers must, of course, shape their future within the requirements of the service. The "needs of the Air Force" is a fact we all have to live with, but it must remain a real and demonstrable quantity, not a fiction used to justify the extraneous desires of certain commands. ■



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At a time when space is rapidly gaining importance as a military medium, the US lead over the Soviet Union in space-based strategic and tactical capabilities is shrinking. As the pace of Soviet space programs quickens and the nature of some of them becomes more ominous, the question arises . . .

# Will The Soviets Wage War In Space?

BY EDGAR ULSAMER SENIOR EDITOR

**D**EFAULT, more than design, probably accounts for space having acquired the image of a sanctuary from warfare even though it fairly bristles with the overt and covert hardware essential for supporting deterrence or combat on earth. During the early use of space for military purposes, the incentives and the technological means for carrying combat operations into the new medium were limited, except for large nuclear weapons whose effects were not clearly understood. Then, as now, a successful, broad attack on the other side's space-based early warning and command and control systems with conventional means was probably neither technically feasible nor operationally sound; the "victim" might be driven toward a spasm response—that is, launch his entire arsenal—by the gravity of such a provocation, which is exactly what the attacker must avoid.

The likelihood that this standoff can be perpetuated indefinitely rates less than even money as more and more combat-related functions such as target designation, weapons guidance, and real-time reconnaissance of ground, sea, and air forces move into space and as technology provides better means to jam, blind, or destroy an adversary's spacecraft

selectively or even surreptitiously. Under such conditions, the tenet of "balanced capabilities," keystone of US deterrence, must apply also to the ability to wage war in space. If either side were to gain a substantial, demonstrated lead in space warfare capability, the deterrence balance would be destabilized.

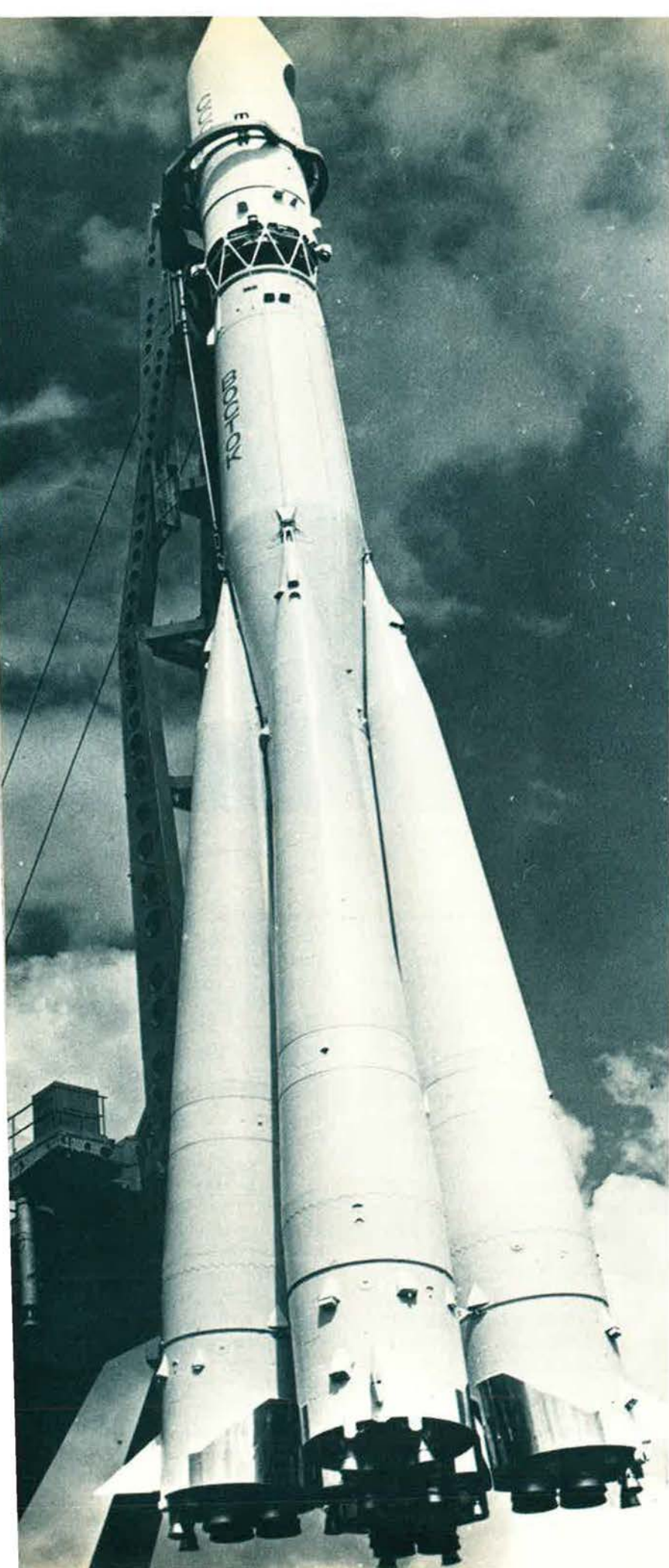
The entire subject is shrouded by security classification—and the only open references are bowdlerized to "space defense capabilities." But there is evidence that the United States is not willing to take a back seat to the USSR in space warfare capabilities. This presumably extends to such options as the Soviet Union's recently reactivated and refined antisatellite system (ASAT) that appears capable of surprise attack on primary US spacecraft when they are out of sight of US tracking stations and at low orbital altitudes.

There also have been several authoritative statements about US research on protecting spacecraft against jamming and blinding by lasers as well as about the feasibility of space-based laser weapons to defend against ASAT attack on US spacecraft. In addition, security has been relaxed recently to permit use of the term "dark satellites at high

altitude," meaning spacecraft in a dormant, unpowered state and at extremely high altitudes that are "hidden" from the adversary's ground-based detection system and can only be detected with space-based Long Wave Infrared (LWIR) systems, provided there is some foreknowledge of their general location. Hidden satellites, it can be argued, represent formidable deterrence against attack on standard early warning and command control and communications satellites. The reason is that by attacking the latter the aggressor merely causes the other side to switch on its dark systems while the aggressor himself provides unambiguous warning of impending drastic action. Admittedly, such schemes do not help the most vulnerable link in the C<sup>3</sup> chain, the ground terminals, but that deficiency can be alleviated by coupling E-4 Advanced Airborne Command Post aircraft to the Defense Support Program (DSP) and other primary satellites or, eventually, by providing for a space-based command post.

Possibly the stickiest question associated with military space systems is the degree to which their operation can be disrupted at critical moments through massive nuclear bursts at high altitude. Some sectors of the





frequency spectrum can be put out of commission—perhaps for several hours—by the widespread disturbances of the ionosphere that can result from such detonations. While this phenomenology is not completely understood in the US (in part because of the 1963 treaty banning atmospheric nuclear testing), it is probable that sufficient redundancy and diversity are packed into US military space systems to assure minimum essential command control and communications capabilities under such conditions. There can be no doubt, however, that the US is more vulnerable in this regard than the Soviet Union. The latter's strong reliance on ICBMs for the bulk of its strategic nuclear might eases the command and control task because hardened, multiple land lines can be used. In addition, Soviet nuclear doctrine seems to be based mainly on a "preemptive strike" strategy; hence, force execution and the associated command and control operations most likely would not take place in a degraded, nuclear environment.

#### **US Space Lead Shrinking**

For the time being, the US seems to be ahead qualitatively in space prowess, according to recent DoD testimony, but the USSR appears to be determined to close the gap by *tours de force*. "The Soviets are investing increasing resources in space technology for military purposes. Their level of activity reached an all-time high in 1975, and the systems they put into orbit are significantly more sophisticated than those deployed in the past. The trend signified by these activities indicates that their space systems will soon contribute substantially to the effectiveness of their command and control systems, and directly to the performance of their strategic and general-purpose forces. Soviet space technology must be taken into account in the strategic equation, in calculating the balance of forces for conventional war," Dr. Malcolm Currie, Director of Defense Research and Engineering, has testified.

A just-released comprehensive staff

*The Vostok launcher and spacecraft took Yuri Gagarin into space in 1961 for the first manned orbital spacelift in history. This launcher system is still in use today.*



report by the Library of Congress for the Senate Committee on Aeronautical and Space Sciences backs up DoD's concern over growing Soviet space capabilities with a welter of evidence. The report, prepared under the direction of Dr. Charles S. Sheldon II (this country's foremost expert on Soviet space activities), concludes that the Soviet Union carried out sixty-two successful space launches for military purposes last year involving eighty-three individual payloads. The US made only ten military launches deploying thirty-four payloads in 1975, the report states.

Military influence over the Soviet space program, the report finds, is pervasive: "The Air Force is responsible for cosmonaut training and vehicle recovery. The Strategic Rocket Forces conduct all space launches. The three major launch sites are administered by the military." Principal control over all Soviet space activities is exerted by the Ministry of Defense; the Ministry of Defense Industries; the State Committee on Science and Technology; the State Committee on Planning; the Military-Industrial Commission; and the Ministry of Instrument Making, Automation Equipment, and Control Systems. More than half of all Soviet space launches have been in direct support of military missions. Almost all launch vehicles, according to the report, are derivatives of military missiles.

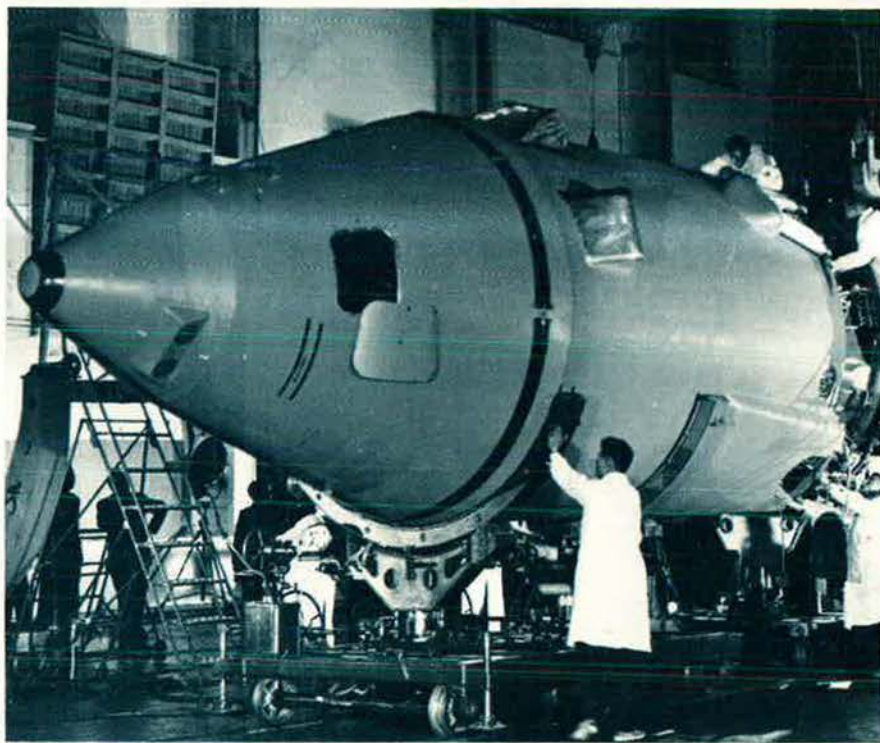
Although the total US launch pace has declined since 1966, the Soviet record shows no corresponding curbs and currently runs at about three times this nation's level. While the US record of failures generally is made public, the Soviet Union continues to hide most of its failures, according to the report.

Despite Soviet and US secretiveness regarding military spaceflight, the report suggests that it is possible to deduce the purpose of these missions from open sources: "The largest single component in both programs [is] the flights which have a recoverable payload from low earth orbit, presumably flown for observation purposes. Examination of twenty-seven program elements shows that both the US and Soviet programs are broadly based, seeking multiple goals, with the primary

difference being the Soviet inclusion of fractional orbital bombardment satellites (FOBS), and satellite inspector/destroyer flights."

Because of the very size of the Soviet space program—currently about four times the space payload

used to count Soviet missile silos and slight differences in their dimensions are freely cited by Secretaries of Defense, one has to assume that this nation should have a fair idea of the scope of work associated with such a postulated vehicle. . . . Although a



Vostok spacecraft, one of the few space systems the Soviets freely show to Western visitors, consists of a reentry vehicle up front, and an expendable support and instrument compartment.

of the United States—"there seems little challenge to the notion [that] they can sustain the present high level of activity indefinitely. At least until the American [Space] Shuttle becomes operational, continuation of these trends would guarantee Soviet leadership in space over a period of time. . . . Soviet capabilities will be enhanced as their computer capacity grows and as they apply more attention to cybernetics, to quality control, and to advanced industrial management and operation," according to the Library of Congress study.

A continuing enigma is the status of the Soviet "G" class launch vehicle whose existence has never been confirmed officially but which NASA estimates to be in the range of 4.5 to 6.35 thousand metric tons (first stage). This compares to 3.4 thousand metric tons for Saturn V, this country's Apollo launch vehicle. The report hypothesizes that "since the 'national technical means' that are

decision to abandon could still come, the best guess now is that one of these days, we shall see a successful flight of a very large vehicle. After the troubles it has already experienced, one can imagine a possible redesign effort and also major steps to increase testing, reliability, and simplified operations to ensure that so expensive a vehicle will do what is intended of it."

One surprising finding is that the "Russians have not been in any hurry to move to high-energy fuels as we understand them, because they had the early advantage of bigger capacity in their conventional rockets. [This presumably applies to military as well as other space launch or ICBM systems.] Also, high chamber pressures were fairly typical so that they got quite a bit of performance from these engines. It is really a surprise that, a decade behind the Americans, we have not had any good indications of Soviet



operational use of hydrogen/oxygen combinations. In general, they are content to cluster large numbers of engines of moderate size as they need more thrust. Perhaps, since they have not taken the fairly obvious and clean route to use of hydrogen and oxygen, it is even less likely that we shall see early Soviet use of hydrogen-fluorine, metallic fuels, or other exotic and toxic types."

### Major Military Activities

The Library of Congress report points out that, while the Soviet Union persists in claiming that all its space programs are of scientific rather than military character, the maturing of Soviet military space capabilities, and their growth in variety and operational effectiveness, have muted propagandistic charges that the United States is the only power to use space for military purposes: "A certain accommodation between the [two] nations has been tacitly developed in this regard."

The report identifies several major categories of Soviet military space missions, including such obvious ones as weather reporting (now apparently assigned to the Meteor-1 satellites) and geodesy and mapping.

In another key area, navigation, the Soviets have claimed that they operate dedicated satellite systems but have never identified specific payloads assigned to this use. "They probably have gone the same technical route as the Americans in building a system which leaves the using submarine or surface ships passive, manipulating the signal heard in an onboard computer to establish the ship location in reference to the known position of the satellite," the Library of Congress study suggests. Secretary of the Navy J. William Middendorf, at a recent American Security Council press briefing, confirmed that the Soviets use satellites for real-time, midcourse guidance of ballistic missiles, and added that "we have got to work like mad" to be able to neutralize these spacecraft, either through the use of chaff or by interdiction. When asked whether the US is developing a satellite killer, Mr. Middendorf replied: "Well, we are working in that direction."

The report finds "there is no sign that the Russians yet operate a spaceborne traffic control system.

They probably do use space links for military command and control, and to maintain clandestine channels of communications." So far as electronic ferreting and ELINT space missions are concerned, the study comments: "Russian concern with all kinds of electronic intelligence is so well noted in their literature that one must assume many flights gather such intelligence, whether in the form of message traffic or of radar characteristics." The report suggests that the Soviets gather ELINT signals "by spacecraft that are relayed either in real time or taped for delayed re-broadcast to analytical centers in the Soviet Union."

Quoting news accounts about alleged clandestine Soviet sensors emplaced on the ocean bottom off the coast of California and near SAC Headquarters, the report comments "it is possible that a relatively secure system of space communications could be constructed that would collect and store signals from clandestine sources, whether these were remote, automatic devices, or live espionage agents, and then dump these findings by narrow beam to collection stations in the interior of the USSR."

Treating the existence of Soviet early warning satellites as a foregone conclusion, the report theorizes that the USSR's approach to these systems may vary from the geosynchronous, twenty-four-hour systems used by the US: "Because the Russians have the same need for early warning to supplement their home ground-based radars, it seems only natural with their most frequent use of inclined, eccentric orbits for communications, that they would transfer this proven technique to their early warning needs as well. The twelve-hour orbit with its two high lobes in the northern hemisphere would be very good in supplying wide coverage in those regions where missile operations would be most likely. On one daily pass, all of North America would be in view, plus coverage of the Arctic; on the other pass all of Eurasia would be in view plus coverage of the Arctic." The report suggests that the present system may be changed in the future to geosynchronous satellites and continuous surveillance.

Many generations of recoverable

observation satellites have been introduced by the Soviets, "as they enjoy a high priority and presumably are being improved. Such flights can be expected to give close attention to both area searches and close inspection, with larger numbers put up in times of crisis, and with some of them maneuvered to give more frequent coverage of order of battle data. Already there is circumstantial evidence that they are learning the techniques of returning data capsules, as done with Salyut-3 and as beacon signals suggest with some other flights. . . . The principal competitor to these automated flights is likely to be manned military space stations, although there are indications that a fourth generation of unmanned flight of longer duration is about to be introduced."

Resumption this year of the Soviet inspector/destroyer satellite flights represents a "destabilizing" development, according to the report: "Inspection seems harmless enough, but the problem is that if satellites conducting military functions co-orbit with uncooperative targets of investigation, the added capability of destruction is a very simple step compared with the rendezvous and the selection of sensors capable of doing a good inspection. Any space power must worry about the possibility that another space power may escalate rivalries to the point of interference with satellites in orbit, whether it is to blind the eyes of some, to deafen their ears, or disrupt communications, or take away some abilities to navigate. This means that such nations must consider a range of both passive and active countermeasures, available on a contingency basis. . . . Passive steps may include [measures] to make radar and visual detection more difficult, or possibly to have so many decoys that the expense of interception would be very heavy for the returns; also, there might be increasing use of signals buried in 'noise' so they [are] harder to intercept, and more of them might be highly directional, [thus] further adding to the difficulty of finding them. For the longer run, some types of payloads may be placed at greater distance from earth."

The report asserts that there is neither evidence of a Soviet inspector satellite flying a co-orbit with a US



## THE REAL STORY BEHIND FOXBAT

What figuratively was technological manna from heaven for the US intelligence community has turned into a mixed blessing. The arrival of Soviet Air Force Lt. Viktor Belenko in a MiG-25 Foxbat interceptor at the Hakodate air terminal on Japan's Hokkaido Island in September obviously was a major intelligence bonanza, but subsequent media coverage, in the main, created the impression that the US had overestimated the state of Soviet military technology and, therefore, the magnitude of the threat. A combination of factors accounts for these reports which, in the opinion of AIR FORCE Magazine, are misleading and incorrect.

The US government, presumably in concert with Japan, decreed an official, temporary news blackout of the findings by US experts engaged in painstaking examination of Foxbat. The blackout was pierced by "news leaks" involving fragmentary and exaggerated information. Starting from a skewed premise, many reports tilted their findings further through either tendentious or facile interpretations. The result was that the Soviet aircraft was portrayed as being outclassed by the F-14, F-15, and F-16, as employing technologies up to fifteen years behind those of the US, as shoddy in quality, and as displaying a universal lack of technical sophistication. None of these conclusions is fully correct.

US analysis supports the assertion that the MiG-25 is the world's top-performance high-altitude interceptor. The aircraft reflects traditional Soviet design approaches, such as dedication to a specific mission rather than encompassing a variety of operational roles. Foxbat was designed rapidly, economically, and with mass production in mind to cope, in concert with high-altitude SAM systems, with the B-70 and SR-71 threat. The fact that the United States abandoned its high-altitude bombing strategy in the mid-1960s is attributable largely to the MiG-25's ability to launch its four 1,200-pound, air-to-air missiles against targets up to forty km away while cruising at speeds about Mach 2.5 and at altitudes in excess of 70,000 feet. Following cancellation of USAF's B-70 program, the MiG-25 developed into a high- and fast-flying reconnaissance system similar to the SR-71, but some interceptor models were retained, presumably to guard against penetration of Soviet airspace by SR-71 or similar aircraft. There are about 400 MiG-25 interceptors and reconnaissance aircraft in the Soviet inventory.

Detailed examination of Foxbat by western specialists brought out lack of sophistication in some areas compared to certain US aircraft, but no evidence suggested it could not perform its assigned mission reliably and efficiently. While the quality of the aircraft's surface

finish, especially the use of round-headed rivets and rough welding, is below US standards, no such blemishes showed up in those structural areas that affect performance. Similarly, while Foxbat uses more steel and aluminum than expected, heat-resisting titanium shows up in all surface areas where kinetic heating mandates its use. While the MiG-25 has no look-down, shoot-down capability, its basic radar is the most powerful of any combat aircraft in the world today. Its ECCM (avionics equipment that combats electronic countermeasures) equals the best of the US and other free world countries.

The fact that Foxbat employs vacuum tube avionics technology is being portrayed in press reports as evidence of the immaturity and inadequacy of Soviet weapons technology. Such assessments, while partly correct, fail to take into account basic differences in Soviet and Western design philosophies and disregard an all-important consideration: While some on-board avionics lack sophistication, the way they are integrated with automatic flight control and air/ground data link systems rivals the best state of the art available in the US at the time Foxbat was built. This innovative and sophisticated arrangement makes it possible for ground controllers to fly the aircraft to the point of intercept, launch missiles, and recover the aircraft automatically with the pilot merely monitoring his instruments except during takeoff and landing. The Soviet TACAN (tactical air navigation) system appears to be superior to any US system and eliminates the need for inertial guidance aboard Foxbat.

The MiG-25 contained other surprises: The aircraft turned out to be much heavier than US experts expected, but at the same time showed that Soviet designers are much more skillful in squeezing a maximum amount of fuel into a given amount of space than their American counterparts. The fuel tanks are welded into the aircraft as an integral structural element and require neither sealants nor bladders. Nitrogen purging is used to reduce the danger of explosion because of combat damage. Overall, Foxbat's fuel system is considered superior to that of the SR-71 and worthy of emulation by US designers.

The central finding of US experts examining Foxbat is the "disciplined" approach to design and manufacture: There are no frills. Only performance essential to the basic mission is provided. Whenever and wherever off-the-shelf components *can* be used, they *are* used. This tendency is dramatized vividly in the case of the engines, which are adaptations of powerplants designed for high-altitude supersonic cruise drones. Simplicity, durability, ruggedness, ease of maintenance, and design approaches requiring minimum pilot skill stand out as the aircraft's dominant features.

In summary, a detailed examination has confirmed that Foxbat is unequalled as a high-altitude, high-speed interceptor. These capabilities are not compromised by performance requirements in other regimes, such as air combat at low and medium altitudes and speeds. To downgrade the MiG-25 because it can't match F-15/F-16 type aircraft on their home ground is to misread Foxbat's purpose and design philosophy.

In connection with Lieutenant Belenko's defection, information was obtained suggesting that a follow-on aircraft to the MiG-25 may soon enter the Soviet operational inventory. It is believed that the new design will employ more powerful and advanced engines as well as a significantly improved missile attack system. —E.U.



—WIDE WORLD PHOTOS



spacecraft nor of a ground-based Soviet rocket interceptor having been deployed against this country's space systems. While applauding the fact that the Soviets have not flown their fractional orbital bombardment system (FOBS) since 1971, presumably in deference to the treaty barring the deployment of weapons of mass destruction in space, the Library of Congress report takes a novel tack regarding the long-term advisability of maintaining space sanctuaries: "Let it be clear that this paper does not recommend or even predict the abandonment of restrictions on putting weapons of mass destruction into space. Intellectually, it still can be recognized that in some future age if military rivalries of national states continue, and if major arms are not limited and controlled, one can imagine situations in which arms in space might be a lesser evil. Just as today, moving the nuclear deterrent forces to sea in submarines has been seen as a way to avoid the temptation of a preemptive strike against land targets, one could argue that some day a deterrent based in deep space, say at a distance farther away than the moon, or even on the far side of the sun, might supply a believable, survivable deterrent that would have to be overcome before major powers could risk wholesale warfare close to home. The notion of the bloodless war fought by computer-controlled automatons, machine against machine . . . in another century might become a part of the institution of war."

In assessing the practical value of FOBS, the report suggests that such a system, by flying the long way around the world, arrives at its target "in exactly the opposite direction from which the principal defending radars have been pointed. For example, if the big defense radars are in the Arctic, and the missile comes to a US target by way of Antarctica, the main defense system would miss it." FOBS can be called down in six minutes and "would not have to be large in number to destroy most of the available Strategic Air Command . . . bases, and certainly to raise hob with many other aspects of US second-strike capabilities," the Library of Congress study states. Yet, FOBS lacks accuracy for attack against such strategic targets as hardened

silos and, therefore, has only limited utility. The report points out that its researchers found neither evidence to suggest that the Soviets have abandoned the FOBS approach as not cost-effective nor to refute the assumption that FOBS weapons

tive US studies of modifying Titan ICBMs to permit penetration of the Soviet target system from the unprotected south have been scuttled as a result of the SALT I ABM Treaty.

In summarizing the Soviet Union's broad philosophy toward space, the



*The Soviet military is involved in and to some extent controls all Soviet space activities. Soviet military space technology is gaining in sophistication and oriented toward space warfare.*

"are fully operational and sitting in their silos intermixed with regular SS-9s [the heavyweight Soviet ICBMs used originally to launch FOBS test flights]. It could even be that, behind the scenes, missile commanders chafe at the restrictions on troop training normally afforded by practice flights, and at limits on product improvements through evolution, all in the interest of a political decision not to risk détente and future arms agreements."

Conversely, it is reasonable to assume that previous, highly tenta-

Library of Congress report observes "for a system that flaunts its atheism, there is a certain element of secular religion in the official attitude that Soviet man through his mastery of science and technology can control his destiny for the good of his system of society and government. Overall, their space program is pursued consistently, in orderly fashion, seeking multiple goals; and the investment in support of these ends is substantial, and probably in real terms is in excess of the US program at its previous peak." ■



In a September ceremony at High Wycombe, England, commemorating the World War II cooperation of RAF Bomber Command and the US Eighth Air Force, the wartime chief of Bomber Command presented a new interpretation of the results of the Combined Bomber Offensive. Through the good offices of retired USAF Lt. Gen. Ira Eaker, who headed Eighth Air Force in 1942-43 and who was present at the ceremony, the RAF's "Bomber" Harris agreed to set down the substance of his remarks for AIR FORCE Magazine.

# The Three Victories of the Bomber Offensive

BY MARSHAL OF THE ROYAL AIR FORCE  
SIR ARTHUR T. HARRIS (RET.)

**I**ESTEEM it an honor to be invited here today to unveil this plaque, commemorating as it does that hereabouts during the war was located the Headquarters of the United States Strategic Bomber Force, whence issued the plans and orders which sent those gallant aircrews on their forays deep into the enemy's heartland.

In cooperation with the Royal Air Force bombers, the combined bomber forces achieved decisive results towards the defeat of the enemy, although those crews—who faced and overcame desperate odds such as few warriors in the whole history of warfare have seldom if ever been called upon to face—are only now beginning to receive recognition of their major contribution to the final victory.

Truth will out—even historical truth—and those truths we are now getting straight from the horse's mouth, to wit, from the surviving top leaders of the enemy's war efforts.

Herr Albert Speer, Hitler's armament production chief, and for much of the war Hitler's close confidant, has kindly sent me both his books. In his second book he inscribed the flyleaf with the words, *inter alia*, that the effect of the strategic bomber offensive "has al-

ways been underestimated." He went on to say that it was in fact "the greatest lost battle for Germany" and he thereafter elaborated these statements with reasons expanded in these books, which prove incontrovertibly that the strategic bombers:

a. Won by far the greatest Land Victory of the war.

b. Won by far the greatest Air Victory of the war.

c. Won by far the greatest Naval Victory of the war.

With regard to (a): Herr Speer says that the bombers opened a "gigantic second front," long before our invasion of France, because, owing to the unpredictability of where attacks would strike next, defenses had to be spread out to cover every city or important factory in Germany and German-occupied territory.

This meant that 20,000 of their best dual-purpose anti-tank/antiaircraft guns had to be kept away from their armies on the fronts and stationed all over German territory together with vast stockpiles of ammunition and "hundreds of thousands" of soldiers to man those guns.

General Field Marshal Erhard Milch, who commanded the antiaircraft defenses, said he had in his Command 900,000 "fit" soldiers, and to that one

must add at least another 100,000, probably vastly more, retained as expert skilled men for the repair of such essential services as electricity, water, and gas supplies, sewage works, war material, machine tools, oil plants, railways, etc., damaged by air attacks, in all depriving the hard-pressed German armies in the field of well over a million men and in Speer's opinion reducing the German armies' antitank capability by half.

As any successful advance by any of the armies depended in the first place on an initial breakthrough by the armored force vanguard, this deprivation of antitank guns and the million men who manned the AA defenses was beyond a doubt a major cause of German defeats on land.

Speer sums up the results of the Allied strategic bombing as causing Germany losses "greater than all the losses in their retreats in Russia and their surrender at Stalingrad." In addition to the above, the Germans had to keep back in Germany for air defense 26,000 heavy automatic guns—what our bombers called "light flak"—together with their millions of rounds of ammunition.

Finally, Speer also says that, even as early as 1943,

when the bomber forces were only really getting built up and into their stride, the bombing had already deprived the German army on the Eastern front of 10,000 heavy guns of 7.5 cms caliber and over, and 6,000 medium-heavy and heavy tanks.

Now one can add to all the above that the bombers deprived the enemy of movement by rail to the front, during our invasion of France, and finally of enough petrol to move their forces by road or across country. Furthermore, whenever our armies got stuck, mass bombing was called for and never failed to shift the defending Germans.

Field Marshal Rommel told his superiors, "If you can't stop the bombing we cannot win, and all we can get by going on is to lose another city every night."

General Sepp Dietrich, commanding the armored spearhead of the enemy's so-nearly-successful attempt to break through the Allied line in the Ardennes (held up, as legend holds, by a mild four-letter word fired at them by the allied commander at Bastogne), rounded on Speer, who had personally delivered to him Hitler's order "to go on at all costs," with the brusque retort: "Go on! How can we go on! We have no ammunition and all our supply lines have been cut by air attack." A potent reason indeed for the hold-up and defeat of that offensive.

Speer also relates that in his subsequent talk that night with Sepp Dietrich, with the constant "roar of heavy four-engine bombers overhead," Sepp Dietrich remarked that "people do not understand that not even the best troops can stand this heavy bombing. After experiencing it they lose all their fighting spirit." That bombing, during those



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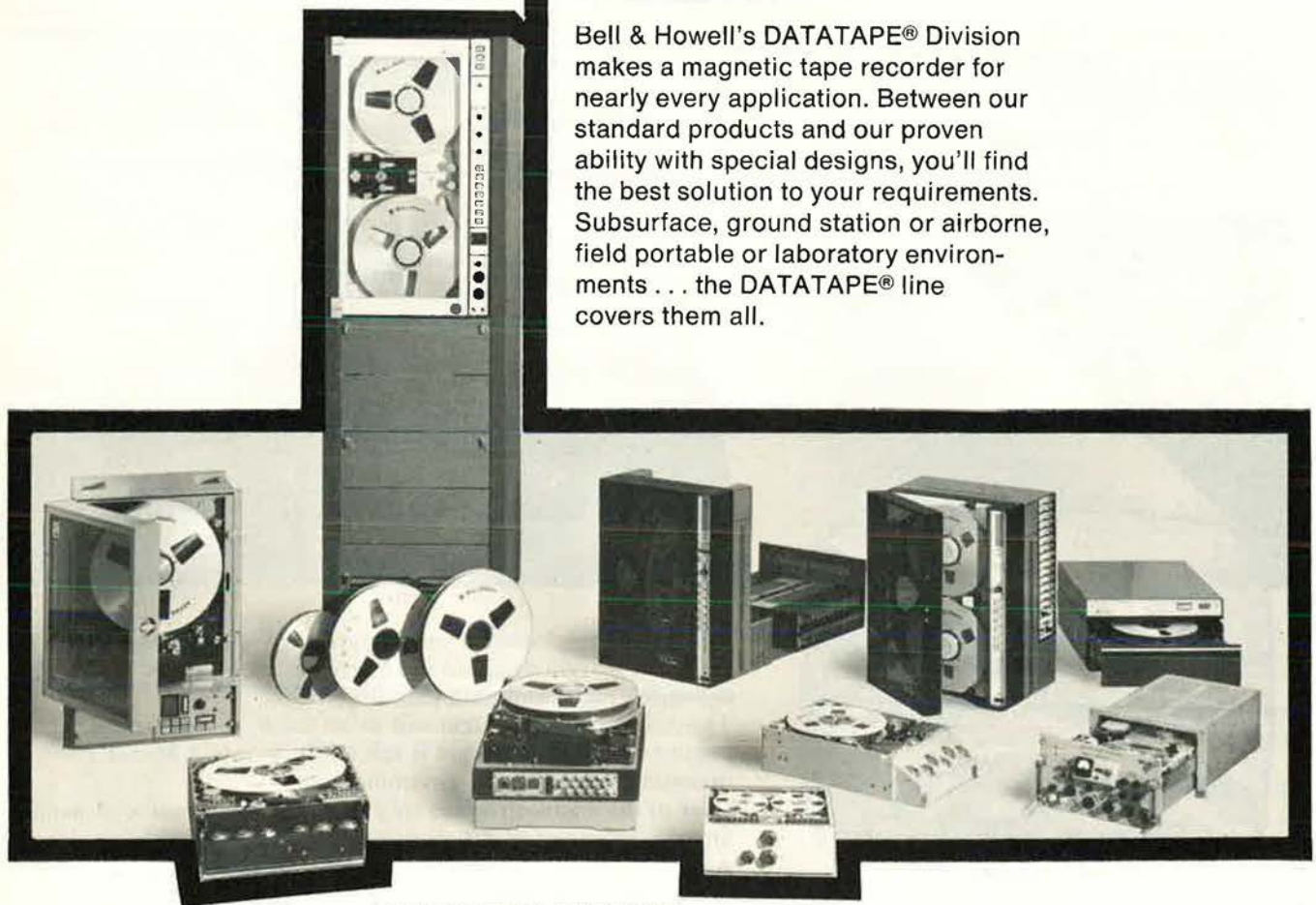
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vital days and nights, was done by the strategic bombers alone, because the Allied air bases on the Continent were closed by fog. Tedder described that bombing as "beyond praise." Eisenhower described it as "achieving the impossible," and the final accolade was from "Monty," who repeatedly took opportunity publicly to state that the bombers "did more than anybody towards winning the war."

So much for the bombers' success on land.

With regard to (b): The strategic bombers won the greatest air victory of the war.

Ever increasingly, during the last three years of the war, Germany was forced to turn more and more of her aircraft manufacturing resources and her pilot training and her air force as a whole over to the defenses of the homeland against the increasingly devastating attacks of the strategic bombers. That led necessarily to the increasing deprivation of her armies in the field of those air resources upon which her initial victories had so largely depended.

The major cause of our success in the Allied invasion was the absolute air supremacy of the air forces working with our invading forces. That supremacy was, in the first place, due to the enemy's absorption of airmen and air material in ever-increasing numbers in a despairing attempt—which failed—to overcome the strategic bomber forces which were wreaking more and more vital injuries to his entire economic and military systems. Past experience in World War I led soldiers to conclude that the attacker in modern war needed at least a two-to-one advantage in men and material over the defender at the chosen point of impact to have a reasonable chance of success.

Yet what happened? In the invasion of France, *thirty-seven* Allied divisions containing a large propor-

tion of green, untried, and inexperienced troops, swept *sixty-one* German defending divisions clean across Europe from the Atlantic to the Elbe, destroyed the German Seventh Army of half a million men, captured hundreds of thousands of prisoners and all their material, and beat them down to total defeat and surrender. Why? In the main, that victory was due to the Allies' absolute air supremacy and the enemy's lack of antitank essentials and of men and material, both factors due to the facts and effects of strategic bombing of the German homeland.

Meanwhile, the consequent concentration on fighter aircraft to the virtual abandonment of bomber production in Germany had put a complete stop to the enemy's air bombardment of the United Kingdom and of all the Allied rear areas. German rocket warfare was no more than a feeble and totally ineffective gesture. For example, according to Speer, the maximum possible production of the V-2 rocket was 5,000 a month. Five thousand V-2 rockets carried less explosive power than *one* raid by the Allied strategic bomber forces.

With regard to (c): The strategic bombers won by far the greatest naval victory in the war in Europe.

The Navy continually demanded the turnover of large numbers of our bombers to aid in the antisubmarine war in the wide wastes of the Atlantic. We said that would be looking for needles in a haystack and would provide, in addition, the best of all anti-aircraft defenses for Germany. The place to tackle the submarine was where it came from and not where it went or was going to or coming from. Who was right?

One simple sentence in Speer's first book—and Speer was responsible for all war production: "We would have kept our promised delivery of submarines

to Admiral Doenitz if the bombers had not destroyed a third of them in the ports."

In an effort, which failed, to avoid or reduce those losses in the ports, the Germans started to prefabricate submarines in sections inland.

But those sections were too big to go by rail or road; they could only go by canal to the ports, which was why the strategic bomber forces repeatedly wrecked the two canals—the Mittelland and the Dortmund Ems—thus reducing the delivery of prefabricated sections of submarines to the ports from a maximum of 130 a month to a handful, and to zero.

In addition, the bombers laid 30,000 tons of sea mines in enemy waters, which caused the German admiral in charge of submarine crew training to inform his superiors: "Without trained U-boat crews you cannot have a U-boat offensive, and I cannot train crews unless my training grounds are kept clear of these air-laid mines."

Moreover, those mines created the biggest strain of the war on such German naval manpower and material as minesweepers, etc.

The bombing and air mining also almost annihilated the German merchant marine on which they depended for essential imports of ores from Scandinavia, and, when the German pistol in the back of their necks no longer posed a serious threat to Sweden, the Swedes withdrew the remains of their merchant fleet from those trades sooner than accept further losses of ships and men.

Finally, the German High Seas Fleet of some sixteen to eighteen top-quality major vessels, ship for ship more modern and better than we possessed. What happened to them? Corporal Hitler, that great Naval strategist, decided on uses which frittered them away in twos and threes;

and who was it bagged them?

The Navy bagged three and frightened one into committing suicide in Montevideo harbor sooner than come out and face the music.

The US Army Air Forces bagged one.

The Fleet Air Arm bagged one.

The Norwegian land batteries bagged one.

The Soviet Navy heavily damaged one.

RAF Bomber Command bagged six.

Bomber Command repeatedly put two out of action for long periods.

Bomber Command would certainly have bagged the last two—*Prince Eugen* and *Nurnberg*—where they lay unprotected by anything except their own guns, off Copenhagen, toward the end of the war. Just as the bombers, with the big Wallis bombs that had blown 120 feet out of the side of *Tirpitz* and turned her upside down, were drawing a bead on *Eugen* and *Nurnberg*—who had no hope for survival under those conditions—the Admiralty called off the raid and have never given the reason why.

Consequently those ships bombarded Copenhagen, did a great deal of damage, and caused a number of casualties.

But it saved *Eugen* and *Nurnberg* being numbered seventeen and eighteen in the demise of the German main fleet ships and being the final example of the hopelessness of pitting surface ships, uncovered by airpower, against airpower, a lesson which will be finalized in the Atlantic in the next war.

I will conclude by adding how glad I am to see my fellow Commanders and so valued friends here—Generals Ira Eaker and Jimmy Doolittle. I am sad that Gen. Fred Anderson is no longer with us, but knowing him as I did I'll bet he sports an even better pair of wings today than he did here on earth! ■



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## THE MILITARY BALANCE 1976/77

As compiled by the International Institute for Strategic Studies, London

# FOREWORD

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AIR FORCE Magazine is privileged again this year to present "The Military Balance," an exclusive feature of each December issue since 1971.

"The Military Balance," an annual assessment of the military forces and defense expenditures of the major nations, is compiled by The International Institute for Strategic Studies, London, England. The Institute, an independent center for research and discussion in defense-related areas, is universally recognized as the leading authority in its field.

The national entries that follow are grouped geographically, with special reference to the principal defense pacts and alignments. A short description of multilateral and bilateral pacts and military agreements introduces each of the regional sections. The section on the US and USSR includes an assessment of the changing strategic balance between the two superpowers. There is a separate section analyzing the European theater balance between NATO and the Warsaw Pact and summarizing the forces and weapons in Europe that are involved in mutual force reduction negotiations.

This year, an essay, "Measuring the Strategic Nuclear Balance," appears for the first time. There is also a short essay on the difficulties of estimating Soviet defense expenditures.

As in past years, space limitations make it necessary for us to exclude some tabular material, including data on cruise missiles and attack submarines, artillery, tanks, and armored personnel carriers; arms agreements that have been negotiated since the last issue of "The Balance"; and force structures of smaller countries that maintain only minimal defense forces.

In preparing "The Military Balance 1976/77" for our use, we have retained the Institute's system of abbreviating military weapons and units as well as British spelling and usage. A list of the abbreviations found in the text appears on the following page.

"The Military Balance" examines the facts of military power as they existed in July 1976. No projections of force levels or weapons beyond that date have been provided, except where explicitly stated. The study should not be regarded as a comprehensive guide to the balance of military power, since it does not reflect the facts of geography, vulnerability, or efficiency, except where these are touched on in the essays on balances.

Figures for defense expenditures are the latest available. Those for the USSR and the People's Republic of China are estimates. Because estimates of defense expenditure have been amended in the case of certain countries, figures in Table 4 on page 97 will not in all cases be directly comparable with those in previous editions of "The Balance." Where a \$ sign appears, it refers to US dollars unless otherwise stated.

GNP figures are usually quoted at current market prices (factor cost for East European countries). Where figures are not currently available from published sources, estimates have been made, and



Table 2 uses both published and estimated GNP figures. Wherever possible, the United Nations System of National Accounts has been used, rather than national figures, as a step toward greater comparability. For the Soviet Union, GNP estimates are made in roubles, following R. W. Campbell, "A Shortcut Method for Estimating Soviet GNP" (*Association for Comparative Economic Studies*, vol. XIV, no. 2, Fall 1972). East European GNPs at factor cost are derived from Net Material Product, using an adjustment parameter from T. P. Alton, "Economic Growth and Resource Allocation in Eastern Europe," *Reorientation and Commercial Relations of the Economies of Eastern Europe*, Joint Economic Committee, 93d Congress, 2d Session (Washington: USGPO, 1974). For the People's Republic of China a range of estimates of GNP has been given in a note on page 80.

In order to make comparison easier, national currency figures were converted by the Institute into US dollars at the rate prevailing during the second quarter of the relevant year. An exception is the Soviet Union, where the official exchange rate is unsuitable for converting rouble estimates to GNP. The official rate is given in the country section, together with one estimated conversion rate. Further exceptions are certain East European countries that are not members of the International Monetary Fund and Romania (which is), for which conversion rates used are those described in Alton's study cited above. The conversion rates used in the country entries may not always be applicable to commercial transactions.

## ABBREVIATIONS

AA	Anti-aircraft	Hel	Helicopter(s)	NATO	North Atlantic Treaty Organization
AAM	Air-to-air missile(s)	How	Howitzer(s)		
AB	Airborne	HQ	Headquarters		
ABM	Anti-ballistic missile	Hy	Heavy	Para	Parachute
Ac	Aircraft			Pdr	Pounder
AD	Air Defence	ICBM	Inter-continental ballistic missile(s)	RCL	Recoilless rifle(s)
AEW	Airborne early warning			Recce	Reconnaissance
AFV	Armoured fighting vehicle(s)	Incl	Including	Regt	Regiment
APC	Armoured personnel carrier(s)	Indep	Independent	RL	Rocket launcher(s)
Armd	Armoured	Inf	Infantry	RV	Re entry vehicle(s)
Arty	Artillery	IRBM	Intermediate-range ballistic missile(s)		
ASM	Air-to-surface missile(s)			SACEUR	Supreme Allied Commander, Europe
ASW	Anti-submarine warfare	KT	Kiloton (1,000 tons TNT equivalent)	SAM	Surface-to-air missile(s)
ATGW	Anti-tank guided weapon(s)			SAR	Search and rescue
ATk	Anti-tank	LCT	Landing craft, tank	SEATO	South-East Asia Treaty Organization
AWX	All-weather fighter	LPH	Landing platform, helicopter	SHAPE	Supreme Headquarters, Allied Powers in Europe
		LRCM	Long-range cruise missile(s)		
Bbr	Bomber	LST	Landing ship, tank	Sig	Signal
Bde	Brigade	Lt	Light	SLBM	Submarine-launched ballistic missile(s)
Bn	Battalion or billion			SLCM	Sea-launched cruise missile(s)
Bty	Battery	M	Million	SP	Self-propelled
		MARV	Manoeuvrable re-entry vehicle(s)	Sqn	Squadron
Cav	Cavalry	MCM	Mine counter-measures	SRAM	Short-range attack missile(s)
Cdo	Commando	Mech	Mechanized	SRBM	Short-range ballistic missile(s)
CENTO	Central Treaty Organization	Med	Medium	SSBN	Ballistic-missile submarine(s), nuclear
COIN	Counter-insurgency	MGB	Motor gunboat	SSM	Surface-to-surface missile(s)
Comms	Communications	MICV	Mechanized infantry combat vehicle(s)	SSN	Submarine(s), nuclear
Coy	Company	MIRV	Multiple independently-targetable re-entry vehicle(s)	Sub	Submarine
Det	Detachment	Mk	Mark	S/VTOL	Short/vertical take-off or landing
Div	Division	Mob	Mobile		
ECM	Electronic counter-measures	Mor	Mortar(s)	Tac	Tactical
Engr	Engineer	Mot	Motorized	Tk	Tank
Eqpt	Equipment	MR	Maritime reconnaissance	Tp	Troop
		MRBM	Medium-range ballistic missile(s)	Tpt	Transport
FB	Fighter-bomber	MRV	Multiple re-entry vehicle(s)	Trg	Training
FGA	Fighter, ground-attack	Msl	Missile		
FPB	Fast patrol boat(s)	MT	Megaton (1 million tons TNT equivalent)	UN	United Nations
FPBG	Fast patrol boat(s), guided-missile	MTB	Motor torpedo boat(s)	UNDOF	United Nations Disengagement Observation Force
GDP	Gross Domestic Product			UNEF	United Nations Emergency Force
GNP	Gross National Product	n.a.	Not available	UNFICYP	United Nations Force in Cyprus
GP	General purpose				
Gp	Group				
GW	Guided weapon(s)				



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The manpower figures given are, unless otherwise stated, those of active regular and conscript forces. An indication of the size of militia, reserve, and paramilitary forces is also included in the country entry where appropriate and in Table 3, page 96. Paramilitary forces are here taken to be forces whose equipment and training go beyond that required for civil police duties and whose constitution and control suggest that they may be usable in support of, or in lieu of, regular forces.

Equipment figures in the country entries cover total holdings, with the exception of combat aircraft, where front-line squadron strengths are normally shown. Except where the contrary is made clear, naval vessels of less than 100 tons of structural displacement have been excluded. The term "combat aircraft" used in the country entries comprises only bomber, fighter-bomber, strike, interceptor, reconnaissance, counterinsurgency, and armed trainer aircraft (*i.e.*, aircraft normally equipped and configured to deliver ordnance or to perform military reconnaissance). It does not include helicopters.

Where the term "mile" is used when indicating the range or radius of weapon systems, it means a statute mile.

The Institute assumes full responsibility for the facts and judgments contained in the study. The cooperation of the governments that are covered was sought and, in many cases, received. Not all countries were equally cooperative, and some figures were necessarily estimated.

Photographs and captions have been added by AIR FORCE Magazine, and we assume full responsibility for them.

—THE EDITORS





# The United States And the Soviet Union

## STRATEGIC WEAPONS

The United States and the Soviet Union each continued to modernize, and in some cases expand, their offensive forces within the limits imposed by the 1972 five-year Interim Agreement, having failed to agree on the terms for a new ten-year accord outlined at Vladivostok in 1974.

The United States, having completed initial deployment of 550 *Minuteman 3* ICBM, each with 3 MIRV, concentrated on improvements in guidance, re-targeting, and silo hardness for land-based ICBM, including the 450 single-warhead *Minuteman 2* and 54 single-warhead *Titan 2*. Plans to procure an additional 60 *Minuteman 3* were approved by Congress, and research continued on a higher-yield MIRV warhead, the 370KT Mk 12A. Development of components for a larger-payload ICBM also proceeded, with emphasis on a land-mobile launch system and a terminally-guided warhead, for deployment in the 1980s.

At sea, the programmed deployment of 496 *Poseidon* SLBM, each with 10-14 MIRV, in 31 submarines was completed. Development of the 4,600-mile-range *Trident 1* SLBM and the 24-tube *Trident* submarine continued, both to be operational in 1978. Ten *Trident* submarines are planned, but the construction of additional boats is not ruled out. (Procurement of *Trident* boats will follow an annual 1-2-1 schedule.) The *Trident 1* SLBM is also to be fitted in place of *Poseidon* in 10 submarines beginning in 1978. With the full deployment of the 8-MIRV *Trident 1*, American missile warheads could exceed 10,000 in the mid-1980s. Development of the *Trident 2*, a 6,000-mile-range SLBM with 14 MIRV, proceeded, as did research on a manoeuvrable warhead, the MK 500 *Evader*. Sea-launched cruise missiles (SLCM), capable of being launched from surface vessels and from submarine torpedo tubes, were tested during the year, and a terminally-guided, 2,000-mile-range strategic version is projected for the early 1980s.

Modernization of the B-52G/H bomber force proceeded. Three prototypes of the swing-wing B-1 underwent test flights, and funds were approved for production to start; a force of 241 is scheduled. Air-launched cruise missiles (ALCM), for deployment aboard B-52s, were also tested.

After becoming operational in 1975, the *Safeguard* ABM complex at Grand Forks, North Dakota, was deactivated, with the perimeter acquisition radar remaining operational as an early-warning system. Air-defence interceptor aircraft were further reduced in numbers. The development of a new bomber and missile attack warning radar continued, as did the Advanced Airborne Command Post and the

*Seafarer* submarine communications system, to improve strategic command and control.

The Soviet Union proceeded with the deployment of new, large-payload ICBM. The total ICBM force declined during the year to 1,527, as older ICBM were replaced by new SLBM. However, at least 80 new ICBM were deployed, including SS-18 (in 5-8-MIRV and two single-warhead modes) and the 4-MIRV SS-17 and the 6-MIRV SS-19 (also tested in single-warhead modes). The Vladivostok guidelines put a ceiling of 1,320 on MIRV launchers. If the Soviet Union deploys new ICBMs up to this figure, her missile warheads would number over 7,500 in the early 1980s. The SS-X-16 mobile ICBM and a shorter-range derivative, the MIRV-equipped SS-X-20 IRBM, remained under development. Programmes for a new generation of land-based missiles were also in progress.

Soviet SLBM increased to 845 in 78 submarines, with 785 counting against the existing SALT ceilings. Four enlarged *Delta-II*-class submarines were launched, each with 16 4,800-mile-range SS-N-8. (*Delta*-class boats are being built at a rate of 4-6 a year.) The SS-N-X-12, a replacement for the SS-N-3 SLCM with a maximum range of 500 miles, was reportedly under development, together with a new 600-mile-range SLBM, the SS-N-X-13.

Deployment of the *Backfire B* (which has in-flight refuelling) to the Long Range and Naval Air Forces continued. A new ASM for *Backfire*, the AS-6, was apparently tested during the year.

Air defence forces were modernized, with the continued acquisition of new SAM and *Foxbat* and *Flagon E* interceptors. The 64 ABM launchers around Moscow remained in operation, and construction of two over-the-horizon radar installations began.

## GENERAL-PURPOSE FORCES

Numbers in the American armed forces fell slightly by 43,000, while those of the Soviet Union rose by 75,000. The steady improvement of conventional capabilities continued on both sides. The United States proceeded with plans to raise the number of army divisions from 13 to 16, with 2 additional brigades being moved to Europe to give the equivalent of 5 divisions there. Comparative testing of three new tank prototypes (two American and one West German) was begun, and development of the Mechanized Infantry Combat Vehicle (MICV) continued. The procurement



rate of TOW and Dragon ATGW remained high and procurement of ATGW-equipped helicopters continued. Development of improved versions of Pershing and Lance SSM began.

The Soviet Union procured further BMP armoured combat vehicles and T-62 tanks and began to deploy a new tank, the T-72. Self-propelled 122mm and 155mm guns, new low-altitude SAM, and ATGW helicopters also entered service.

A second American nuclear-powered carrier, *Nimitz*, became operational in 1976, but the USN carrier force was reduced to 13 with the retirement of two of the *Hancock* class. Eight new guided-missile frigates (FFG-7) were programmed, to reverse the decline in the size of the Navy, and studies began of a nuclear-powered strike cruiser which would use the *Aegis* air-defence system. Advanced

development of *Harpoon* and *Condor* anti-ship missiles continued.

The Soviet Union began building a third *Kiev*-class aircraft carrier, while the first conducted sea trials with VTOL aircraft embarked. Surface combatants and submarines were modernized with the acquisition of more accurate but shorter-range anti-ship missiles and advanced torpedoes.

The United States continued deployment of the Air Force F-15 and the Navy F-14 fighters, and procurement of the A-10 close-air-support aircraft began. Advanced development of the Air Force F-16 proceeded, and initial work began on the FX-18 for the Navy. The E-3A AWACS aircraft was scheduled to enter service by the end of 1976.

Soviet emphasis on the ground-attack role was shown, with the MiG-21 *Fishbed* J, MiG-23 *Flogger* D, and Su-19 *Fencer* fighters being deployed.

## THE UNITED STATES

Population: 215,310,000.  
 Military service: voluntary.  
 Total armed forces: 2,086,700, incl 110,500 women.  
 Estimated GNP 1975: \$1,498.8 bn.  
 Defence expenditure 1976-77: \$100.1 bn.  
 (Budget Authority for FY-1977 is \$104.3 bn.)

### Strategic Nuclear Forces:

#### Offensive:

- (a) Navy: 656 SLBM in 41 submarines.  
 31 SSBN (*Lafayette*-class), each with 16 *Poseidon* C3.  
 10 SSBN (5 *Washington*-, 5 *Allen*-class), each with 16 *Polaris* A3.

#### (b) Strategic Air Command:

- ICBM: 1,054.  
 450 *Minuteman* 2.  
 550 *Minuteman* 3.  
 54 *Titan* 2.
- Aircraft:  
 Bombers: 453 in 26 squadrons.  
 66 FB-111A in 4 sqns.  
 151 B-52G in 11 sqns } with  
 (to be 10). } 1,500  
 90 B-52H in 6 sqns. } SRAM  
 75 B-52D in 5 sqns.  
 Training: 24 B-52F, 47 B-52D.  
 Tankers: 583 KC-135 in 39 sqns.  
 Storage or reserve: 153, incl B-52D/F/G.  
 Strategic Reconnaissance and Command:  
 18 SR-71A in 1 sqn; U-2C/K; 4 E-4A/B  
 (3 more on order), 28 RC/EC-135.

#### Defensive:

North American Air Defense Command (NORAD), HQ at Colorado Springs, is a joint American-Canadian organization. US forces under NORAD are in Aerospace Defense Command (ADCOM).

ABM: *Safeguard* system (missiles being deactivated).

Aircraft (excluding Canadian and tactical units):

- Interceptors: 331  
 (i) Regular: 6 sqns with 141 F-106A.  
 (ii) Air National Guard: 4 sqns with 80 F-101B (being phased out), 1 sqn with 20 F-4C, 6 sqns with 90 F-106A.  
 AEW aircraft: 2 sqns with 10 EC-121 (being withdrawn in 1979).

#### Warning Systems:

- (i) Satellite-based early-warning system: 3 DSP satellites, 1 over Eastern Hemisphere, 2 over Western; surveillance and warning system to detect launchings of SLBM, ICBM, and Fractional Orbital

Bombardment Systems (FOBS).

- (ii) *Space Detection and Tracking System* (SPADATS): USAF *Spacetrack* (7 sites), USN *SPASUR*, and civilian agencies; Space Defense Center at NORAD HQ; satellite tracking, identification, and cataloguing control.
- (iii) *Ballistic Missile Early Warning System* (BMEWS): 3 stations, in Alaska, Greenland, and England. Detection and tracking radars with an ICBM and IRBM capability.

ual Control Center (MCC) in Alaska (to be replaced by 7 Region Operations Control Centers, 4 in US, 1 in Alaska, 2 in Canada. When complete, to be known as Joint Surveillance System).

- (x) *Ground radar stations*: some 51 stations manned by Air National Guard, augmented by the Federal Aviation Administration stations.
- (xi) An Over-the-Horizon Back-scatter aircraft early-warning system is under development.



The US Air Force plans to modernize the bomber leg of the strategic triad with the B-1 bomber, which is expected to enter active service in the 1980s.

- (iv) *Distant Early Warning (DEW) Line*: 31 stations roughly along the 70° N parallel.
- (v) *Pinetree Line*: 25 stations in Central Canada.
- (vi) *474N*: SLBM detection and warning net of 4 stations on East, 1 on Gulf, 3 on West coast of US (to be replaced by 2 *Pave Paw* phased-array radars: 1 on East, 1 on West coast).
- (vii) *Perimeter Acquisition Radar*: 1 north-facing phased-array, 2,000-mile system at inactive ABM site in North Dakota.
- (viii) *Back-up Interceptor Control (BUIC)*: system for air-defence command and control (all stations but 1 semi-active).
- (ix) *Semi-Automatic Ground Environment (SAGE)*: system for co-ordinating all surveillance and tracking of objects in North American airspace. 6 locations (2 in Canada); combined with BUIC and Man-

**Army:** 782,000, incl 48,900 women.

- 4 armoured divisions.
- 5 mechanized divisions.
- 5 infantry divisions.
- 1 airmobile division.
- 1 airborne division.
- 1 armoured brigade.
- 1 infantry brigade.
- 3 armoured cavalry regiments.
- 1 brigade in Berlin.
- 2 special mission brigades in Alaska and Panama.
- Army Aviation: 1 air cavalry combat bde, indep bns and coys assigned to HQ for tactical tpt and medical duties.
- 6 *Honest John* and *Pershing*, 8 *Lance* SSM bns.
- Tanks*: some 10,000 med, incl 3,300 M-48, 5,900 M-60 (M-60A2 with *Shillelagh* ATGW), some 1,600 M-551 *Sheridan* It





The twenty-four-tube Trident submarine, equipped with 4,600-mile-range missiles, shown above in an artist's conception, will become operational in 1978. Below is a US Army M-113 armoured personnel carrier. The USSR has a wide lead over the US in both inventory and production of tanks, APCs, and artillery.

tkts with *Shillelagh*.

AFV: about 21,000 M-577, M-114, M-113 APC.

Artillery and missiles: Some 3,000 175mm SP guns and 105mm, 155mm, and 203mm SP how; about 2,500 towed 105mm and 155mm guns/how; some 3,200 81mm, 2,700 107mm mor; about 6,000 90mm and 106mm RCL; *Honest John*, *Pershing*, *Lance* SSM; 2,400 TOW and *Dragon* ATGW.

AA Artillery: about 600 20mm, 40mm towed and SP AA guns; some 20,000 *Redeye* and *Chaparral/Vulcan* 20mm AA msl/gun systems.

SAM: about 900 *Nike Hercules* and *HAWK* (*Roland* on order).

Aircraft/Hel: about 1,000 ac, incl OV-1/-10, U-8/-21, T-41/-42; 8,600 hel, incl 690 AH-1G/S, UH-1/-19, CH-37B/-47/-54, OH-6A-58, H-13, TH-55A.

#### Deployment:

##### Continental United States:

Strategic Reserve: (i) 1 armd, 1 mech, 3 inf, 1 airmobile, 1 AB divs. (ii) To reinforce 7th Army in Europe: 1 armd, 2 mech divs, 1 armd cav regt. (One armd div, 1 mech div, and 1 armd cav regt have heavy equipment stockpiled in West Germany.)

Europe: 198,400.

(i) Germany: 189,000. 7th Army: 2 corps, incl 2 armd, 2 mech divs, 1 armd, 2 mech bdes plus 2 armd cav regts; 2,500 med tks. (Includes those stockpiled for the strategic reserve formations.)

(ii) West Berlin: 4,400. HQ elements and 1 inf bde.

(iii) Greece: 800.

(iv) Italy: 3,000.

(v) Turkey: 1,200.

##### Pacific:

(i) South Korea: 30,000. 1 inf div, 1 AD arty bde.

(ii) Hawaii: 1 inf div less 1 bde.

Reserves: 592,400.

(i) Army National Guard: 380,000; capable some time after mobilization of manning 2 armd, 1 mech, 5 inf divs, 18 independent bdes (3 armd, 6 mech, 9 inf), and 3 armd cav regts, plus reinforcements and support units to fill regular formations.

(ii) Army Reserves: 212,400, in 12 trg divs, 3 indep trg bdes; 49,000 a year do short active-duty tours.



##### Marine Corps: 196,000, incl 3,500 women.

3 divs (each of 18,000 men).

2 SAM bns with *HAWK*.

430 M-48 med tks (being replaced by M-60); 950 LVT-7 APC; 175mm SP guns; 105mm, 155mm how; 105mm, 203mm SP how.

3 Air Wings: 386 combat aircraft.

12 fighter sqns with 144 F-4J/N with *Sparrow* and *Sidewinder* AAM.

13 FGA sqns: 3 with 60 AV-8A *Harrier*, 5 with 80 A-4E/F/M, 5 with 60 A-6A.

2 recce sqns with 21 RF-4B and 21 EA-6A.

3 tactical air control dets with 30 OV-10A.

3 assault tpt/tanker sqns with 36 KC-130F.

3 close-support hel sqns with 54 AH-1J.

4 utility hel sqns with 84 UH-1N.

9 med assault hel sqns with 162 CH-46E.

6 heavy hel sqns with 126 CH-53D.

##### Deployment:

(i) Continental United States: 2 divs, 2 air wings.

(ii) Pacific: 1 div, 1 air wing.

Reserves: 33,500.

1 div and 1 air wing: 2 fighter sqns with F-4B, 5 attack sqns with A-4C/E/L (to get A-4F), 1 observation sqn with OV-10A, 1 tpt/tanker sqn with KC-130, 7 hel sqns (1 attack with AH-1G, 2 hy with CH-53, 3 med with CH-46, 1 lt with UH-1E), 1 SAM bn with *HAWK*.

Navy: 524,600, incl 23,500 women; 176 major combat surface ships, 75 attack submarines.

Submarines, attack: 65 nuclear, 10 diesel.

Aircraft carriers: 13.

2 nuclear-powered: *Nimitz*, 96,000 tons, *Enterprise*, 90,000 tons (*Eisenhower* in service by 1978).

8 *Forrestal/Kitty Hawk*-class (78/87,000 tons).

3 *Midway*-class (64,000 tons, 1 training ship).

These normally carry 1 air wing (85-95 ac in the larger ships, 75 in the smaller) of 2 fighter sqns with F-14 or F-4; 3 attack sqns (1 all-weather) with A-7 or A-6; RA-5C recce; 2 ASW sqns (1



with S-2E, 1 with SH-3A/D/G/H hel); 1 ECM sqn with EA-6B; 1 AEW sqn with E-2B; EKA-3B tankers and other specialist ac.

#### Other surface ships:

(A reclassification of US ships has placed most frigates in the cruiser class; smaller frigates have become destroyers and smaller escorts frigates.)

5 nuclear-powered guided missile cruisers with SAM and ASROC (4 building).

19 guided-missile cruisers with SAM and ASROC.

2 guided-missile light cruisers with SAM. 39 guided missile destroyers with SAM and ASROC.

34 gun/ASW destroyers, most with SAM or ASROC.

6 guided-missile frigates with SAM and ASROC.

58 gun frigates.

7 patrol gunboats, 4 with SAM.

2 hydrofoil patrol ships with Harpoon SSM.

17 fast patrol craft.

65 amphibious-warfare ships, incl 7 LPH. 3 MCM ships.

129 logistics and operations support ships.

#### Missiles:

Standard SSM/SAM, Tartar, Talos, Terrier, Sea Sparrow SAM, ASROC, SUBROC ASW.

#### Ships in reserve:

3 subs, 5 carriers, 4 battleships, 10 cruisers, 5 amphibious-warfare, 25 MCM, 64 logistic support ships. (239 cargo ships, 162 tankers could be used for auxiliary sea-lift.)

**Aircraft:** 13 attack carrier air wings; about 1,200 combat aircraft.

26 fighter sqns: 10 with F-14A, 16 with F-4.

39 attack sqns: 12 with A-6, 27 with A-7. 7 recce sqns with RA-5C, RF-8.

24 maritime patrol sqns with 220 P-3A/B/C.

11 ASW ac sqns: 8 with S-3A, 3 with S-2.

13 AEW sqns: 12 with E-2B/C, 1 with E-1B.

10 ASW hel sqns with 80 SH-3A/D/G/H.

17 misc support sqns with 20 C-1, 12 C-2, 8 C-9B, 7 C-130, 12 CT-39, 30 C-118, 50 EA-6B ac; 30 RH-53D,

CH-46, SH-3, SH-2B/C hel.

**Deployment** (average strengths of major combat ships; some ships in the Mediterranean and Western Pacific are selectively based overseas, the remainder rotated from the US):

**Second Fleet** (Atlantic): 5 carriers, 68 surface combatants.

**Third Fleet** (Eastern Pacific): 4 carriers, 59 surface combatants.

**Sixth Fleet** (Mediterranean): 2 carriers, 16 surface combatants, 1 Marine Amphibious Unit. (Marine Amphibious Units (MAU) are 5-7 amphibious ships with a Marine battalion embarked. Only 1 in the Mediterranean and 1 in the Pacific are regularly constituted. 1 Bn Landing Team (MAU less hel) is also deployed in the Pacific; 1 is occasionally formed for the Atlantic.)

**Seventh Fleet** (Western Pacific): 2 carriers, 18 surface combatants, 1 Marine Bn Landing Team.

**Middle East Force** (Persian Gulf): 1 command ship, 2 surface combatants.

**Reserves:** 101,100. Ships in commission with the Reserve include 30 destroyers, 5 patrol gunboats, 3 amphibious warfare ships, 22 MCM ships.

#### Aircraft:

2 carrier attack wings: 5 A-7, 1 A-4E/L attack sqns, 2 F-4B, 2 F-8J fighter sqns, 2 RF-8G recce sqns, 2 KA-3B tanker sqns, 2 E-1B AEW sqns.

5 hel sqns: 4 with SH-3A/G, 1 SAR with HH-3.

12 MR sqns: 9 with P-3A, 3 with SP-2H (to be phased out).

4 tpt sqns with C-118.

**Air Force:** 584,100, incl 34,600 women; about 4,500 combat aircraft.

74 fighter/attack sqns: 50 with F-4, 2 with F-105 (to be replaced by F-4G), 12 with F-111, 2 with F-15, 8 with A-7D (to be replaced by A-10).

9 tactical recce sqns with RF-4C.

3 ECM sqns with EB-57 (to be increased by 3 sqns with 42 EF-111A).

5 special operations sqns: 3 with C-130 E/H, 1 with AC-130A/H ac, 1 with UH-1, CH-3 hel.

1 tactical drone sqn with DC-130.

15 tactical drone sqns with 234 C-130.

17 hy tpt sqns: 4 with 70 C-5A, 13 with 234 C-141.

3 sqns: medical tpt with 11 C-9, weather recce with 13 WC-130, SAR hel with 30 UH-1, CH/HH-3/-53.

Trg sqns with some 900 aircraft.

#### Deployment:

**Continental United States** (incl Alaska):

(i) Tactical Air Command: 82,000; 37 fighter sqns. 9th and 12th Air Forces.

(ii) Military Airlift Command (MAC): 64,500. 21st and 22nd Air Forces.

**Europe:** US Air Force, Europe (USAFE): 73,000. 3rd Air Force (Britain), 16th Air Force (Spain; units in Italy, Greece, and Turkey), 17th Air Force (W. Germany and Netherlands). 1 AD sqn in Iceland. 21 fighter sqns (plus 4 in the US on call) with 390 F-4C/D/E and 72 F-111E; 3 tactical recce sqns (plus 3 in the US on call) with 54 RF-4C; 2 tactical airlift sqns (plus 6 in the US on call) with 32 C-130.

**Pacific:** Pacific Air Forces (PACAF): 50,000; 9 fighter sqns. 5th Air Force (Japan, Okinawa, 1 wing in Korea), 13th Air Force (Philippines, Taiwan).

**Reserves:** 147,500.

(i) Air National Guard: 94,600; about 900 combat aircraft.

11 interceptor sqns (under ADCOM, see above); 29 fighter sqns (16 with F-100C/D, 3 with F-105B/D, 2 with F-4C, 6 with A-7, 2 with A-37B); 9 recce sqns (2 with RF-101, 7 with RF-4C); 17 tac tpt sqns (16 with C-130A/B/E, 1 with C-7); 12 tanker sqns with 32 KC-135, 8 with 70 KC-97; 3 ECM sqns with 8 EC-121 (ADCOM), 18 EB-57B; 2 SAR sqns with HC-130/HH-3; 7 tac air support gps with O-2A.

(ii) Air Force Reserve: 52,900; about 200 combat aircraft.

3 fighter sqns with F-105D; 4 attack sqns with A-37B; 20 tac tpt sqns (14 with C-130A/B/E, 4 with C-123K, 2 with C-7); 2 special operations sqns with AC-130, CH-3; 4 SAR sqns, 2 with HC-130, 2 with HH-1H/-3. 17 Reserve Associate sqns (personnel only): 4 for C-5A, 13 for C-141A.

(iii) Civil Reserve Air Fleet: 243 commercial ac (152 cargo/convertible, 91 passenger).

## THE SOVIET UNION

Population: 255,580,000.

Military service: Army and Air Force 2 years, Navy and Border Guards 2-3 years.

Total armed forces: 3,650,000. (Excludes some 750,000 uniformed civilians.)

Estimated GNP 1975: 492.4 bn roubles.

Official exchange rate 1975, \$1 = 0.72; estimated rate, \$ = 0.5.

Estimated defence expenditure 1976: see p. 49.

#### Strategic Nuclear Forces:

##### Offensive:

(a) Navy: 845 SLBM in 78 submarines.

4 D-II-class SSBN, each with 16 SS-N-8.

13 D-I-class SSBN, each with 12 SS-N-8.

34 Y-class SSBN, each with 16 SS-N-6 Sawfly.

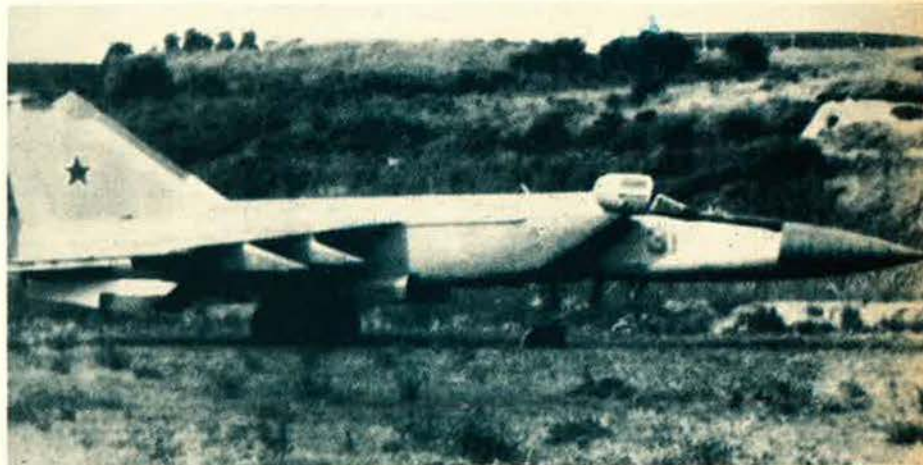
7 H-class SSBN, each with 3 SS-N-5 Serb.

11 G-II-class diesel, each with 3 SS-N-5 (not considered strategic missiles under the terms of the Strategic Arms Limitation (Interim) Agreement).

9 G-I-class diesel, each with 3 SS-N-4 Sark (not considered strategic missiles

under the terms of the Strategic Arms Limitation (Interim) Agreement).

(b) Strategic Rocket Forces (SRF): 375,000.



This is the MiG-25 Foxbat that was flown to Japan in September by a defecting Soviet pilot. For a report on the Foxbat's technological sophistication, see p. 34.



(The SRF, a separate service, has its own manpower.)

ICBM: 1,527.

140 SS-7 *Saddler* (being phased out).

19 SS-8 *Sasin* (to be phased out.)

252 SS-9 *Scarp*.

900 SS-11 *Sego* (100 in M/IRBM fields).

60 SS-13 *Savage*.

20 SS-17.

36 SS-18.

100 SS-19.

M/IRBM: about 600 (most near Soviet western border, the rest east of the Urals).

100 SS-5 *Skean* IRBM.

500 SS-4 *Sandal* MRBM.

(c) **Long-Range Air Force (LRAF):** 785 combat aircraft. (About 75 per cent based in European USSR, most of the rest in the Far East; there are also staging and dispersal points in the Arctic.)

Long-range bombers: 135.

100 Tu-95 *Bear*.

35 Mya-4 *Bison*.

Medium-range bombers: 650.

450 Tu-16 *Badger*.

170 Tu-22 *Blinder*.

30 *Backfire* B.

Tankers: 70.

20 Tu-16 *Badger*.

such radar building). Target acquisition and tracking by phased-array *Dog House*, early warning by phased-array *Hen House* radar on the Soviet borders. Range of *Galosh* believed to be over 200 miles; warheads are nuclear, presumably megaton-range.

SAM: 10,000 launchers, at over 1,000 sites. SA-1 *Gullid*: HE warhead (being phased out).

SA-2 *Guideline*: about 3,500 HE warhead, slant range (launcher to target) about 25 miles; effective between 1,000 and 80,000 ft.

SA-3 *Goa*: Low-level, slant range about 15 miles.

SA-4 *Ganef*: Twin-mounted (on tracked carrier), air-transportable, medium range.

SA-5 *Gammon*: High-level, slant range 50-150 miles, limited anti-missile capability.

SA-6 *Gainful*: Triple-mounted (tracked carrier), low-level, slant range about 17 miles.

**Army:** 1,825,000.

50 tank divisions.

111 motor rifle divisions.

7 airborne divisions.

Tanks: 41,500: JS-2/-3, T-10, T-10M hy,

tions), including *FROG-3/-4/-5/-7* (range 10-45 miles), *Scud A* (range 50 miles), *Scud B* (range 185 miles), *Scale-board* (range 500 miles).

SAM: SA-2, SA-4, SA-6, SA-7 *Grail* (man-portable), SA-8 *Gecko*, SA-9 *Gaskin* (both multiple and BRDM-mounted).

**Deployment and Strength:**

**Central and Eastern Europe:** 31 divs: 20 (10 tk) in East Germany, 2 tk in Poland, 4 (2 tk) in Hungary, 5 (2 tk) in Czechoslovakia; 9,000 med and hy tks.

**European USSR** (Baltic, Byelorussian, Carpathian, Kiev, Leningrad, Moscow, and Odessa Military Districts): 64 divs (about 23 tk).

**Central USSR** (Volga, Ural MD): 6 divs (1 tk).

**Southern USSR** (North Caucasus, Trans-Caucasus, Turkestan MD): 24 divs (3 tk).

**Sino-Soviet border** (Central Asian, Siberian, Transbaikal, and Far East MD): 43 divs, incl 3 in Mongolia (about 7 tk).

Soviet divisions have three degrees of combat readiness: Category 1, between three-quarters and full strength, with complete equipment; Category 2, between half and three-quarters strength, complete with fighting vehicles; Category 3, about one-third strength, possibly complete with fighting vehicles (although some may be obsolescent).

The 31 divisions in Eastern Europe are Category 1, as also are about a third of those in the European USSR and the Far East. The remaining divs in the last two areas are probably evenly divided between Categories 2 and 3. Divs in Central USSR are likely to be in Category 3. At full strength, tk divs have 316 med tks, motor rifle divs have up to 266.

**Navy:** 450,000, incl 50,000 Naval Air Force, 14,500 Naval Infantry, and 6,000 Coast Artillery and Rocket Troops; 214 major surface combat ships, 231 attack and cruise-missile submarines (84 nuclear, 147 diesel).

**Submarines:**

**Attack:** 40 nuclear (13 N-, 19 V-, 5 E-I-, 1 V-II-, 2 A-class), 122 diesel (60 F-, 9 R-, 10 Z-, 40 W-, 3 T-class).

**Cruise-missile:** 44 nuclear (1 P-, 14 C-, 29 E-II-class), 21 diesel (16 J-, 5 W-class).

**Coastal:** 4 diesel (B-class).

**Surface Ships:**

1 *Kiev*-class carrier with 25 V/STOL ac or 36 hel (2 more building).

2 *Moskva*-class ASW helicopter cruisers, each with 2 twin SAM and about 20 Ka-25 hel.

4 *Kara*-class ASW cruisers with SSM and SAM.

4 *Kresta-I*-class ASW cruisers with SSM and SAM.

8 *Kresta-II*-class ASW cruisers with SSM and SAM.

4 *Kynda*-class cruisers with SSM and SAM.

12 *Sverdlov*-class cruisers (3 with SAM, 2 with hel, 2 in reserve).

2 training cruisers (1 *Chapaev*, 1 *Kirov*-class).

12 *Krivak*-class ASW destroyers with SSM and SAM. (A proportion of the destroyers and smaller vessels may not be fully manned.)

7 *Kanin*-class ASW destroyers with SAM.

2 *Kildin*-class destroyers with SSM.

17 *Kashin*-class ASW destroyers with SAM.

8 modified *Kotlin*-class destroyers with SAM.

34 destroyers, 16 *Kotlin*- 18 *Skory*-class.



An An-22 of the USSR's increasingly capable Air Transport Force unloading FROG missiles. Various models of the FROG are provided to all Warsaw Pact armies.

50 Mya-4 *Bison*.

**Defensive:**

**Air Defence Force (PVO-Strany):** 550,000: early warning and control systems, with 5,000 early warning and ground control intercept (EW/GCI) radars; interceptor squadrons and SAM units. (The Air Defence Force, a separate service, has its own manpower.)

**Aircraft:** about 2,650.

Interceptors: include about 350 MiG-17 *Fresco*/-19 *Farmer* B/E, 750 Su-11 *Fishpot*, 1,550 Yak-28P *Firebar*, Tu-28P *Fiddler*, Su-15 *Flagon* A/D/E, MiG-25 *Foxbat* A.

Airborne Warning and Control Aircraft: 10 modified Tu-111 *Moss*.

ABM: 64 *Galosh*, 4 sites around Moscow, with *Try Add* engagement radars (another

T-62, T-54/55 med, T-72, PT-76 amphibious recce lt (most tanks fitted for deep wading).

AFV: 37,500: BTR-40/-50/-60/-152 APC; BMP MICV; BRDM scout cars; BMD AB AFV.

**Artillery:** 17,500 100mm, 122mm, 130mm, 152mm, 180mm, and 203mm field and SP guns/how; 8,500 120mm, 160mm, and 240mm mor; 122mm, 140mm, 200mm, 240mm, and 250mm multiple RL; ASU-57 and ASU-85 SP, 76mm, 85mm, 100mm ATK guns; *Swatter*, *Sagger* ATGW.

**AA Artillery:** 23mm and 57mm towed, ZSU-57-2 57mm twin-barrelled, and ZSU-23-4 23mm four-barrelled tracked SP, 85mm, 100mm, 130mm guns.

SSM (nuclear capable): about 1,000 launchers (units are organic to forma-





The USSR's ability to project its forces overseas is exemplified by the new aircraft carrier Kiev, which recently appeared for the first time in international waters.

97 ocean escorts: 20 *Mirka*, 46 *Petya*, 30 *Riga*, 1 *Kola*.  
 16 *Nanuchka*-class missile patrol ships with SSM and SAM.  
 185 submarine chasers (22 *Grisha*, 67 *Poti*, 80 SO-1, 16 *Kronstadt*).  
 120 *Osa*- and 15 *Komar*-class FPBG with *Styx* SSM.  
 160 torpedo boats (*Shershen* and P-6 classes).  
 About 300 minesweepers (120 coastal).  
 About 100 amphibious ships (*Alligator*-, *Ropucha*-, *Polnocny*-, and MP-4 classes).  
 60 landing craft.  
 100 fleet-supply ships/oilers.  
 45 depot/repair ships.  
 50 intelligence collection vessels (AGI).

**Naval Air Force:** about 645 combat aircraft.  
 280 Tu-16 *Badger* medium bombers with ASM.  
 30 *Backfire* B medium bombers with ASM.  
 60 Tu-22 *Blinder* medium bombers.  
 10 Il-28 *Beagle* light bombers.

Some V/STOL fighter aircraft.  
 50 Tu-16 *Badger* reconnaissance ac.  
 45 Tu-95 *Bear* D long range MR aircraft.  
 15 Tu-95 *Bear* F MR aircraft.  
 55 Il-38 *May* MR aircraft.  
 100 Be-12 *Mail* MR amphibians.  
 85 Tu-16 *Badger* tankers; 200 transports.  
 250 Mi-4 *Hound* and Ka-25 *Hormone* ASW hel.

**Naval Infantry (Marines):**  
 5 naval infantry regiments, each of 3 inf, 1 tk bns, assigned to fleets. T-54/-55 med, PT-76 lt tks; BTR-60P/PB APC; 122mm RL; ZSU-23-4 SP AA guns; SA-9 SAM.

**Coastal Artillery and Rocket Troops:**  
 Heavy coastal guns, *Samlet* and SS-C-1B *Sepal* SSM (similar to SS-N-3) to protect approaches to naval bases and major ports. Coasts covered by radar and visual reporting system.

**Deployment** (average strengths only, excl

SSBN): **Northern Fleet:** 126 subs (about 54 nuclear), 51 major surface combat ships.  
**Baltic Fleet:** 12 subs, 47 major surface combat ships.  
**Black Sea Fleet** (incl Caspian Flotilla and Mediterranean Sqn): 19 subs, 59 major surface combat ships.  
**Pacific Fleet:** 74 subs (about 30 nuclear), 57 major surface combat ships.

**Air Force:** 450,000; about 5,350 combat aircraft, excluding Air Defence Force (*PVO-Strany*) and Naval Air Force.  
**Long-Range Air Force:** (see above).  
**Tactical Air Force:** about 4,500 aircraft, incl 260 Il-28 *Beagle*, Yak-28 *Brewer*, 550 MiG-17, 400 Su-7, 700 MiG-23 *Flogger*, about 1,900 MiG-21 *Fishbed*, Su-17 *Fitter* C, Su-19 *Fencer* A; about 750 *Beagle*, MiG-25 *Foxbat*, *Fishbed* recce, *Brewer* E and An-12 *Cub* ECM ac; 150 tpt ac; 400 hy, 2,500 lt and med hel.  
**Air Transport Force:** about 1,550 aircraft: 700 Il-14, An-8, An-24/-26 lt, some 800 An-12, Il-76 *Candid*, and Il-18 med, 50 An-22 hy tpt ac; 320 hel, incl 160 Mi-1, Mi-2, Mi-4, 160 Mi-6, Mi-8, Mi-10, and Mi-24 *Hind* A.

**Deployment:**  
 16 Tactical Air Armies: 4 (1,700 ac) in Eastern Europe and 1 in each of 12 MD in the USSR.

**Reserves** (all services):  
 Soviet conscripts have a reserve obligation to age 50. Total reserves could be as high as 25,000,000, of which some 6,800,000 have had service in the last five years.

**Para-Military Forces:** 350,000.  
 175,000 KGB border troops, 175,000 MVD security troops. Border troops equipped with tks, AFV, ac, and ships; MVD with tks and AFV. A part-time military training organization (DOSAAF) takes part in such activities as athletics, shooting, and parachuting, and assists in pre-military training given to those of 15 and over in schools, colleges, and workers' centres. Membership is perhaps 9 million, but the number of effectives is likely to be much smaller.

## SOVIET DEFENCE EXPENDITURE

The difficulties of estimating Soviet defence expenditure in roubles or in dollar value stem from two factors: the considerable uncertainty over what is covered by the official Soviet defence budget and how adjustments should be made for the suspected omissions, and the completely different pricing practices in the Soviet economy.

In the past year, US official (CIA) assessments of Soviet defence spending in roubles have roughly doubled in size, so that the Soviet defence burden is now judged to be 11-13 per cent of GNP (against the 6-8 per cent previously estimated, itself a little higher than was suggested in *The Military Balance*). The revised assessments have been made possible by information newly available, which has supported frequently-expressed doubts that the clearly heavy scale of the Soviet defence effort could represent such a modest share of GNP. The new information is not related to higher estimates of force levels but to a rouble cost of operating and provisioning them much higher than previously supposed. Some 90 per cent of the difference between the new and the old cost assessments stems from a changed view of the Soviet defence industries, which appear to be far less efficient than had been imagined. The change in rouble cost estimates seems not to have altered US official estimates of the dollar values of the Soviet defence effort, since these are arrived at by costing the observed military components (manpower, procurement, operations, and maintenance, etc.) at equivalent US dollar prices. (It should be noted that the ratio of Soviet to US defence spending will be higher if US prices are used to calculate the dollar equivalent of Soviet defence expenditure than it would be if Soviet prices were used to find the rouble equivalent of US defence spending.)



## METHODS USED IN MAKING ASSESSMENTS

For its dollar estimates of Soviet defence activities the CIA uses a building-block technique which involves costing in dollars its own intelligence assessments of the physical size of Soviet armed forces. In theory these estimates represent the cost to the United States of reproducing the Soviet defence effort, but in practice they do not do so in two major areas: first, Soviet Research, Development, Testing, and Evaluation (RDT&E) is determined by taking a percentage of the financial resources allocated to 'Science'; second, when intelligence on certain Soviet weapons or operating techniques is incomplete, a similar American system or practice, adjusted for known Soviet features, is costed instead.

Suitable conversion rates are then prepared to convert these dollar estimates to roubles. Official dollar-rouble exchange rates, since they do not accurately reflect the purchasing power of foreign currencies *vis-à-vis* the rouble, are unsuitable for this. New information on the efficiency, or otherwise, of Soviet industries has led the CIA to revise its previous conversion rates to give more roubles per dollar. The rouble measurement of Soviet defence spending is intended to reflect a Soviet valuation of the resources foregone in producing the defence effort, to the extent that it is possible in a totally planned economy, and is therefore suitable as a method for calculating burden. The doubling of CIA rouble estimates merely reflects a change in conversion rates, so the dollar estimate has remained the same.

There are other methods currently discussed among academics, particularly that employed by W. T. Lee, who argues that the official Defence Budget covers only the operating and military construction costs of the Soviet armed forces and excludes all weapon procurement and most RDT&E. The evidence for this interpretation has been growing in recent years, so that the simpler method of adding to the official Defence Budget a portion of the 'Science' allocation is no longer valid. Lee calculates the missing procurement component by taking the gross value of the output of the Machine-Building and Metal-Working (MBMW) industries, deducting identifiable internal transfers within the industry, domestic demand, and net exports, leaving a residual which is assumed to be the undisclosed weapon and space (or hardware) procurement element. By adding the defence budget, the hardware residual, and his own estimate of RDT&E, Lee produces rouble estimates which are independent of intelligence assessments of the size of Soviet armed forces.

On the assumptions of their authors, the alternative set of figures reached by these methods suggests that Soviet defence expenditure during 1975 could run between 50 and 75 billion roubles, producing a defence burden of 10-14 per cent of GNP. In dollar terms, an expenditure figure in the region of \$115-125 billion seems possible. While there is little doubt that the Soviet defence burden is much higher than previously supposed, the figures reveal some disagreement about the rate of growth in defence spending. Lee's higher estimate of real growth implies a rising defence burden, while the CIA's figures suggest a constant burden. It is perhaps wise to suspend judgement for the moment; the CIA itself warns that its current estimates are only interim and are liable to revision, because the new information is still being evaluated.

The following table summarizes the estimates that have been made for 1975, showing expenditures expressed in dollars and roubles and the burden percentages that result from them.

Source	Price base	Defence expenditure		1970-1975	
		1970	1975	Real annual growth rate	Burden (% of GNP)
<i>Billions of Roubles</i>					
CIA <sup>a</sup>	1970 prices	40-45	50-55	4-5%	11-13%
Lee <sup>b</sup>	1970 prices	43-50	68-78	9%	—
Lee <sup>b</sup>	Current prices	43-50	64-73	—	12-14.5%
<i>Billions of Dollars</i>					
CIA <sup>c</sup>	1974 prices	96-100	114	3%	—
CIA <sup>c</sup>	Current prices <sup>d</sup>	66-69	124	—	—
Lee <sup>e</sup>	Current prices	80-105	105-135	—	—

<sup>a</sup> Estimated Soviet Defence spending in Roubles 1970-75, CIA SR 76-10121U, May 1976. The Ministry of Defence in London released similar figures for 1975, giving expenditure at 50+ billion roubles and burden at 11-12% (Ministry of Defence News Release 32/76, London, 19 May 1976).

<sup>b</sup> W. T. Lee, *Soviet Defence Expenditure for 1955-1975*, Tempo GE75 TMP-42, Washington, D.C., 31 July 1975.

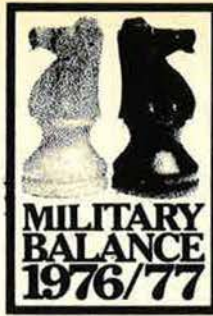
<sup>c</sup> A Dollar Comparison of Soviet and US Defence Activities, 1965-75, CIA SR 76-10053, February 1976 (1970 figure taken from diagrams).

<sup>d</sup> 1974 price series converted to current prices using Wholesale Price Index.

<sup>e</sup> W. T. Lee, 'Soviet Defence Expenditures', in W. Schneider and F. P. Hoerber (eds), *Arms, Man & Military Budgets, Issues for Fiscal Year 1977* (New York: Crane Russak, 1976).

In this year's table of comparative defence expenditure (Table 2 on p. 95) the figures used have been taken from CIA publications because, unlike the other sources, they provide a complete series in dollars. Though they have been reproduced in *The Military Balance* this year, they must be seen in the light of the reservations made above.





# The Warsaw Pact

## TREATIES

The Warsaw Pact is a multilateral military alliance formed by the 'Treaty of Friendship, Mutual Assistance, and Co-operation' which was signed in Warsaw on 14 May 1955 by the Governments of the Soviet Union, Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania; Albania left the Pact in September 1968. The Pact is committed to the defence only of the European territories of the member states.

The Soviet Union is also linked by bilateral treaties of friendship and mutual assistance with Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania. Members of the Warsaw Pact have similar bilateral treaties with each other. The essence of East European defence arrangements is not therefore dependent on the Warsaw Treaty as such. The Soviet Union concluded status-of-forces agreements with Poland, East Germany, Romania, and Hungary between December 1956 and May 1957 and with Czechoslovakia in October 1968; all these remain in effect except the one with Romania, which lapsed in June 1958 when Soviet troops left Romania.

## ORGANIZATION

The Political Consultative Committee consists, in full session, of the First Secretaries of the Communist Party, Heads of Government, and the Foreign and Defence Ministers of the member countries. The Committee has a Joint Secretariat, headed by a Soviet official and consisting of a representative from each country, and a Permanent Commission, whose task is to make recommendations on general questions of foreign policy for Pact members. Both are located in Moscow.

Since the 1969 reorganization of the Pact the non-Soviet Ministers of Defence are no longer directly subordinate to the Commander-in-Chief of the Pact but, together with

the Soviet Minister, form the Council of Defence Ministers, which is the highest military body in the Pact. The second military body, the Joint High Command, is required by the Treaty 'to strengthen the defensive capability of the Warsaw Pact, to prepare military plans in case of war and to decide on the deployment of troops'. The Command consists of a Commander-in-Chief and a Military Council. This Council meets under the chairmanship of the C-in-C and includes the Chief-of-Staff and permanent military representatives from each side of the allied armed forces. It seems to be the main channel through which the Pact's orders are transmitted to its forces in peacetime and through which the East European forces are able to put their point of view to the C-in-C. The Pact also has a Military Staff, which includes non-Soviet senior officers. The posts of C-in-C and Chief-of-Staff of the Joint High Command have, however, always been held by Soviet officers, and most of the key positions are still in Soviet hands.

In the event of war, the forces of the other Pact members would be operationally subordinate to the Soviet High Command. The command of the air defence system covering the whole Warsaw Pact area is now centralized in Moscow and directed by the C-in-C of the Soviet Air Defence Forces. Among the Soviet military headquarters in the Warsaw Pact area are the Northern Group of Forces at Legnica in Poland; the Southern Group of Forces at Budapest; the Group of Soviet Forces in Germany at Zossen-Wünsdorf, near Berlin; and the Central Group of Forces at Milovice, north of Prague. Soviet tactical air forces are stationed in Poland, East Germany, Hungary, and Czechoslovakia.

The Soviet Union has deployed short-range surface-to-surface missile (SSM) launchers in Eastern Europe. Most East European countries also have short-range SSM launchers, but there is no evidence that nuclear warheads for these missiles have been supplied to them. Longer-range Soviet missiles are all based in the Soviet Union.

## BULGARIA

Population: 8,780,000.  
 Military service: Army and Air Force 2 years; Navy 3 years.  
 Total regular forces: 164,500, incl 100,000 conscripts.  
 Estimated GNP 1975: \$20.6 bn.  
 Defence expenditure 1976: 525 m leva (\$438 m). \$1 = 1.2 leva.

**Army:** 131,000, incl 82,000 conscripts. (East European Warsaw Pact divisions are not all manned at the same level. Category 1 formations are at up to three-quarters of establishment strength; Category 2 are unlikely to be at more than a quarter of establishment strength. (See p. 101.)  
 8 motor rifle divisions.  
 5 tank brigades.  
 3 Scud brigades.

4 artillery regiments.  
 3 AA artillery regiments.  
 1 airborne battalion.  
 1 mountain battalion.  
 2 reconnaissance battalions.  
 150 T-34, 1,800 T-54/-55, some T-62 med, 250 PT-76 lt tks; 300 BTR-40/BRDM AFV, 2,000 BTR-50/-60/OT-62, some M-1970 APC; 58 100mm, 420 122mm, 54 130mm, 200 152mm guns/how; 300



120mm mor; 144 130mm RL; 40 FROG, 20 Scud SSM; 500 57mm, 76mm, and 05mm ATK guns; 82mm, 107mm RCL; 125 Sagger and Snapper ATGW; 600 37mm, 57mm, 85mm, 100mm, 130mm, and 23mm SP AA guns; SA-6/-7 SAM.

Reserves: 250,000.

**Navy:** 8,500, incl 5,000 conscripts.  
4 submarines (2 R-, 2 W-class ex-Soviet).  
2 Riga-class escorts.  
2 Kronstadt- and 7 SO-1-class coastal escorts.  
3 Osa-class FPBG with Styx SSM.  
4 Shershen- and 8 P-4-class MTD.  
6 MCM ships (2 I 43, 4 Vanya-class)  
20 PO-2-class small patrol/minesweeping boats.  
20 landing craft (10 Vydra- and 10 MFP-class).  
2 Mi-1, 6 Mi-4 helicopters

Reserves: 15,000.

**Air Force:** 25,000, incl 13,000 conscripts; 253 combat aircraft.  
6 FGA squadrons with 72 MiG-17.  
12 interceptor sqns: 4 with 48 MiG-21, 3 with 36 MiG-19, 5 with 60 MiG-17.  
3 recce sqns with 12 MiG-21, 20 MiG-15, 5 Il-28.  
1 tpt regt with 6 Il-14, 4 An-24.  
1 hel regt with 30 Mi-4 and 30 Mi-1, Mi-2, and Mi-8.  
150 L-29, 45 MiG-15/-17/-21 trainers.  
132 SA-2 at about 22 SAM sites.  
1 parachute regiment.

Reserves: 20,000.

**Para-Military Forces:** 12,000 border guards; 4,000 security police; 150,000 volunteer People's Militia.

## CZECHOSLOVAKIA

Population: 14,860,000.  
Military service: 2 years.  
Total regular forces: 180,000, incl 110,000 conscripts.



The forward deployment of these Soviet MiG-23s is improving Pact capabilities for ground support and interdiction.

Estimated GNP 1975: \$44.3 bn.  
Defence expenditure 1976: 20,400 m koruny (\$1,805 m).  
\$1 = 11.3 koruny.

**Army:** 135,000, incl 95,000 conscripts.  
5 tank divisions.  
5 motor rifle divisions.  
1 airborne regiment.  
3 Scud brigades.  
1 anti-tank brigade.  
1 artillery brigade.  
2 AA artillery brigades.  
3,300 T-54/-55, some T-62 med tks; 85 BMP, OT-65 scout cars; OT-62/-64, TOPAS 2AP APC; 300 85mm and 100mm, 700 122mm and 130mm, 180 152mm guns/how; 250 RL; 40 FHUG, 27 Scud SSM; 85mm SP ATK guns; Sagger, Snapper ATGW; 82mm, 107mm RCL; 30mm, 57mm, 85mm, 30mm SP AA guns; SA-7 SAM.

Reserves: 300,000.

**Air Force:** 45,000, incl 15,000 conscripts; 458 combat aircraft.  
14 FGA sqns with 72 Su-7, 50 MiG-15, 36 MiG-21.  
18 interceptor sqns with 240 MiG-15/-21/L-29.  
6 recce sqns with 60 MiG-21 and L-29.  
About 40 An-24 and Il-14 transports.  
Hel incl 100 Mi-1, Mi-2, Mi-4, and Mi-8.  
Trainers incl 200 L-29/-39, Il-14/-28, MiG-15/-21.  
120 SA-2 at some SAM sites.

Reserves: 50,000.

**Para-Military Forces:** 10,000 border troops; about 10,000 part-time People's Militia.

## GERMAN DEMOCRATIC REPUBLIC

Population: 17,230,000.  
Military service: 18 months.  
Total regular forces: 157,000, incl 92,000 conscripts.  
Estimated GNP 1975: \$43.7 bn.  
Defence expenditure 1976: 10,233 m Ostmarks (\$2,729 m).  
\$1 = 3.8 Ostmarks.

**Army:** 105,000, incl 67,000 conscripts.  
2 tank divisions.  
4 motor rifle divisions.  
1 Scud brigade.  
2 artillery regiments.  
2 AA artillery regiments.  
2 anti-tank battalions.  
1 airborne battalion.  
About 2,400 T-54/-55, T-62, 600 T-34 med tks; about 115 PT-76 lt tks; BRDM scout cars; BMP, BTR-50P/-60P/-152 APC; 76mm, 335 122mm, 108 130mm, 85 152mm guns/how; 120mm mor; 110 122mm, 140mm, 240mm RL; 24 FROG-7, 12 Scud B SSM; 57mm, 85mm, 100mm ATK guns; 82mm RCL; Sagger, Snapper ATGW; 14.5mm, 23mm SP, 57mm and 100mm AA guns; SA-7 SAM.

Reserves: 350,000.

**Navy:** 16,000, incl 10,000 conscripts.  
3 Riga-class escorts.  
4 SO-1- and 14 Hai-class submarine chasers.  
12 Osa-class FPBG with Styx SSM.  
50 MTB (15 Shershen-, 35 20-ton Ilitis-class).  
25 patrol craft (18 Kondor-class ex-mine-sweepers).  
3 Krake-class ocean, 34 Kondor-class medium minesweepers.



These highly mobile Sagger guided anti-tank weapons are found in the forces of most Warsaw Pact countries.

6 Robbe-class, 12 Labo-class landing craft.  
1 helicopter squadron with 13 Mi-4.

Reserves: 25,000.

**Air Force:** 36,000, incl 15,000 conscripts; 441 combat aircraft.  
3 FGA sqns with 36 MiG-17.  
18 fighter sqns with 310 MiG-21/-21UTI.  
2 fighter/training wings with 45 L-29, 50 MiG-21.  
2 tpt sqns with 34 Il-14, Tu-124, and Tu-134.  
75 Mi-1, Mi-2, Mi-4, Mi-8 hel.  
20 MiG-15, L-29, Yak trainers.  
5 AD regts: 120 57mm and 100mm AA guns.  
144 SA-2 at some 24 SAM sites.  
2 parachute battalions.

Reserves: 30,000.

**Para-Military Forces:** 69,000, 47,000 border guards, 22,000 security troops, 350,000 Workers' Militia.

## HUNGARY

Population: 10,520,000.  
Military service: 2 years.  
Total regular forces: 100,000, incl 60,000 conscripts.  
Estimated GNP 1975: \$20.8 bn.  
Defence expenditure 1976: 12,275 m forints (\$551 m).  
\$1 = 22.3 forints.

**Army:** 80,000, incl 52,000 conscripts.  
1 tank division.  
5 motor rifle divisions.  
1 Scud brigade.  
3 artillery regiments.  
1 AA artillery regiment.  
1 airborne battalion.  
Danube Flotilla: 2 MCM units, 1 AA gunboat unit.  
About 1,300 T-34, T-54/-55 med, 175 PT-76 lt tks, about 600 FUG 65, 1,500 PSZH scout cars; 200 BTR-50/-60/-152 APC; 300 76mm, 85mm, 100mm, 250 122mm, 35 152mm guns/how; 150 120mm, 160mm mor; 100 122mm RL; 24 FROG, 9 Scud SSM; 200 57mm and 85mm ATK guns; 82mm, 107mm RCL; Snapper, Swatter ATGW; 150 57mm, 85mm, and 100mm





The Polish-built TS-11 Iskra has been in production since 1963. Both two-seat trainers and this single-seat light attack version are being produced.

AA guns, 100 23mm, 57mm SP AA guns;  
10 100-ton patrol craft (MCM and AA),  
5 landing craft.

Reserves: 135,000.

**Air Force:** 20,000, incl 8,000 conscripts; 140 combat aircraft.  
9 interceptor sqns with 30 MiG-15/-17/-19 and 110 MiG-21.  
Some 10 An-2, 10 Il-14, 10 Li-2 transport ac.  
About 30 Mi-1, Mi-4, and 35 Mi-8 helicopters.  
About 80 MiG-15UTI/-21UTI trainers.  
108 SA-2 at about 18 SAM sites.

Reserves: 13,000.

**Para-Military Forces:** 20,000 border guards;  
50,000 Workers' Militia.

## POLAND

Population: 34,300,000.

Military service: Army, internal security forces, Air Force 2 years; Navy, special services 3 years.

Total regular forces: 290,000, incl 190,000 conscripts.

Estimated GNP 1975: \$65.6 bn.

Defence expenditure 1976: 52,928 m zloty (\$2,252 m).

\$1 = 23.5 zloty.

**Army:** 204,000, incl 166,000 conscripts.

5 tank divisions.

8 motor rifle divisions.

1 airborne division.

1 amphibious assault division.

4 Scud brigades.

3 artillery brigades.

5 AA artillery regiments.

3 anti-tank regiments.

3,400 T-34, T-54/-55 med, about 375 PT-76 lt tks; FUG, BRDM scout cars; OT-62/-64, TOPAS 2AP, BTR-152 APC; about 450 76mm, 85mm, and 100mm, 700 122mm, 310 152mm guns/how; 85mm, 100mm, 122mm, 152mm SP guns; 82mm, 120mm mor; 250 122mm, 140mm RL; 45 FROG-7, 32 Scud SSM; 76mm, 85mm, 100mm ATK, 57mm and 85mm SP ATK guns; 82mm RCL; Sagger, Snapper, Swatter ATGW; 23mm, 57mm, 85mm, and 100mm towed, ZSU 23-4, ZSU 57-2 SP AA guns; SA-6/-7/-9 SAM.

Deployment: Egypt (UNEF): 785; Syria (UNDOF): 84.

Reserves: 400,000.

**Navy:** 25,000, incl Marines and 6,000 conscripts.

6 W-class submarines.

2 *Kotlin*-class destroyers with 2 SA-N-1.

12 *Osa*-class FPBG with Styx SSM.

27 submarine chasers.

9 *Wisla*-class MTB.

24 *Krogulec*- and T-43-class ocean minesweepers, 20 K-8-class minesweeping boats.

24 *Polnocny*-class landing ships.

1 Naval Aviation Regiment (61 combat aircraft):

4 fighter sqns with 15 MiG-15, 36 MiG-17.

1 lt bomber/recce sqn with 10 Il-28.

2 hel sqns with some 22 Mi-1, Mi-2, Mi-4.

Reserves: 45,000.

**Air Force:** 61,000, incl 18,000 conscripts; 804 combat aircraft.

1 light bomber squadron with 23 Il-28.

15 FGA sqns: 14 with 190 MiG-17 and 30 Su-7, 1 with 10 Su-20.

36 interceptor sqns with 110 MiG-17, 12 MiG-19, 330 MiG-21.

6 recce sqns with 84 MiG-15/21 and 15 Il-28.

Some 30 tpts, incl An-12, 14 An-26, Il-14/-18, Tu-134; some Yak-40 lt liaison ac.

172 hel, incl Mi-1, Mi-2, Mi-4, and Mi-8.

480 trainers, incl Yak-18, TS-11, MiG-15, MiG-17, and MiG-21.

240 SA-2 at about 40 SAM sites.

Reserves: 60,000.

**Para-Military Forces:** 80,000 border troops, some tanks; 34 small boats operated by coastguard; 350,000 Citizens' Militia.

## ROMANIA

Population: 21,410,000.

Military service: Army and Air Force 16 months; Navy 2 years.

Total regular forces: 181,000, incl 100,000 conscripts.

Estimated GNP 1975: \$41.0 bn.

Defence expenditure 1976: 10,400 m lei (\$759 m).

\$1 = 13.7 lei.

**Army:** 145,000, incl 85,000 conscripts.

1 tank division.

9 motor rifle divisions.

3 mountain brigades.

1 airborne regiment.

2 Scud brigades.

2 artillery brigades.

3 artillery regiments.

2 AA artillery regiments.

1,800 T-34, T-54/-55 med, 270 PT-76 lt tks;

1,500 BTR-40/-50/-152, OT-62/-65/-810,

250 TAB-71/-72 (BTR-60) APC; 76mm,

85mm, 100mm, 540 122mm, 55 130mm,

150 152mm guns/how; 85mm, 100mm SP

guns; 150 120mm mor; 122mm, 125

130mm RL; 30 FROG, 12 Scud SSM;

57mm, 85mm, 100mm, 57mm, 85mm SP

Atk guns; 120 Sagger, Snapper, Swatter

ATGW; 300 30mm, 37mm, 57mm, 100mm,

and 57mm SP AA guns.

Reserves: 500,000.

**Navy:** 11,000, incl 5,000 conscripts.

7 coastal escorts (3 *Poti*-, 3 *Kronstadt*-class).

5 *Osa*-class FPBG with Styx SSM.

6 P-4-class and 1 *Hu Chwan*-class MTB.

10 *Shanghai*-class MGB.

22 MCM craft (4 coastal, 10 inshore, 8 river).

4 Mi-4 helicopters.

Reserves: 20,500.

**Air Force:** 25,000, incl 10,000 conscripts; 320 combat aircraft.

5 FGA sqns with 75 MiG-15/-17.

15 interceptor sqns with 230 MiG-15/-19/-21.

1 reconnaissance squadron with 15 Il-28.

2 transport sqns with some 30 Il-14 and Il-18.

About 5 Mi-4, 20 Mi-8, and 20 *Alouette* III hel.

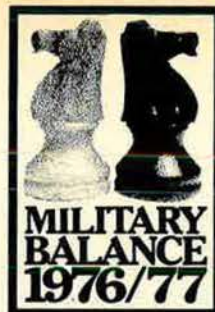
Trainers include 130 L-29, MiG-15, and MiG-17.

108 SA-2 *Guideline* at about 18 SAM sites.

Reserves: 25,000.

**Para-Military Forces:** 30,000; 10,000 border troops, 20,000 security troops. Militia of about 500,000.





# The North Atlantic Treaty

## TREATIES

The North Atlantic Treaty was signed in 1949 by Belgium, Britain, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, and the United States; Greece and Turkey joined in 1952 and West Germany in 1955. The Treaty unites Western Europe and North America in a commitment to consult together if the security of any one member is threatened, and to consider an armed attack against one as an attack against all, to be met by such actions as each of them deems necessary, 'including the use of armed force, to restore and maintain the security of the North Atlantic area'.

The Paris Agreements of 1954 added a Protocol to the Treaty aimed at strengthening the structure of NATO and revised the Brussels Treaty of 1948, which now includes Italy and West Germany in addition to its original members (Benelux countries, Britain, and France). The Brussels Treaty signatories are committed to give one another 'all the military and other aid and assistance in their power' if one is the subject of 'armed aggression in Europe'.

Since 1969, members of the Atlantic Alliance can withdraw on one year's notice; the Brussels Treaty was signed for 50 years.

## ORGANIZATION

The Organization of the North Atlantic Treaty is known as NATO. The governing body of the Alliance, the North Atlantic Council, which has its headquarters in Brussels, consists of Ministers from the fifteen member countries, who normally meet twice a year, and of ambassadors representing each government, who are in permanent session.

In 1966, France left the integrated military organization, and the 14-nation Defence Planning Committee (DPC) was formed, on which France does not sit. It meets at the same levels as the Council and deals with questions related to NATO integrated military planning and other matters in which France does not participate. Greece has announced her intention of withdrawing from the integrated military organization; she left the DPC in autumn 1974.

Two permanent bodies for nuclear planning were established in 1966. The first, the Nuclear Defence Affairs Committee (NDAC), is open to all NATO members (France, Iceland, and Luxembourg do not take part); it normally meets at Defence Minister level once a year to associate non-nuclear members in the nuclear affairs of the Alliance. The Secretary-General is Chairman of the NDAC.

The second, the Nuclear Planning Group (NPG), derived from and subordinate to the NDAC, has seven or eight members and is intended to go further into the details of topics raised there. The composition consists, in practice, of Britain, Germany, Italy, and the United States, plus three or four other member countries serving in rotation, each for a term of 18 months. On 1 July 1976, there were four such members: Canada, the Netherlands, Norway, and Turkey. The Secretary-General also chairs the NPG.

The EUROGROUP, which was set up by West European member states of the Alliance (with the exception of France, Portugal, and Iceland) in 1968, is an informal consultative body acting to co-ordinate and improve the West European military contribution to the Alliance. Its activities have included the European Defence Improvement Programme (1970) and principles of co-operation in the fields of armaments (1972), training (1973), and logistics (1975).

The Council and its Committees are advised on politico-military, financial, economic, and scientific aspects of defence planning by the Secretary-General and an international staff. The Council's military advisers are the Military Committee, which gives policy direction to the NATO military commands. The Military Committee consists of the Chiefs-of-Staff of all member countries except France, which maintains a liaison staff, and Iceland, which is not represented; in permanent session the Chiefs-of-Staff are represented by Military Representatives, who are located in Brussels together with the Council. The Military Committee has an independent Chairman and is served by an integrated international military staff. The major NATO commanders are responsible to the Committee, although they also have direct access to the Council and heads of Governments.

The principal military commands of NATO are Allied Command Europe (ACE), Allied Command Atlantic (ACLANT), and Allied Command Channel (ACCHAN).

The NATO European and Atlantic Commands participate in the Joint Strategic Planning System at Omaha, Nebraska, but there is no Alliance command specifically covering strategic nuclear forces. The United States has, however, committed a small number of ballistic-missile submarines (and Britain all hers) to the planning control of SACEUR and a larger number to SACLANT.

The Supreme Allied Commander Europe (SACEUR) and the Supreme Allied Commander Atlantic (SACLANT) have always been American officers; and the Commander-in-Chief Channel (CINCHAN), Deputy SACEUR, and



Deputy SAQLANT British. SACEUR is also Commander-in-Chief of the United States Forces in Europe.

(I) ALLIED COMMAND EUROPE (ACE) has its headquarters, known as SHAPE (Supreme Headquarters, Allied Powers in Europe), at Casteau, near Mons, in Belgium. It is responsible for the defence of all NATO territory in Europe except Britain, France, Iceland, and Portugal, and for that of all Turkey. It also has general responsibility for the air defence of Britain.

The European Command has some 7,000 tactical nuclear warheads in its area. The number of delivery vehicles (aircraft, missiles, and howitzers) is over 3,000, spread among all countries, excluding Luxembourg. The nuclear explosives themselves, however, are maintained in American custody, with the exception of certain British weapons. (There are, additionally, French nuclear weapons in France.) Tactical nuclear bombs and missile warheads are all fission. There is a large number of low-yield weapons, but the average yield of the bombs for the use of NATO tactical aircraft is about 100 kilotons, and of the missile warheads, 20 kilotons.

About 70 division equivalents are available to SACEUR in peacetime. The Command has some 2,900 tactical aircraft, based on about 200 standard NATO airfields and backed up by a system of jointly financed storage depots, fuel pipelines, and signal communications. The majority of the land and air forces stationed in the Command are assigned to SACEUR, while the naval forces are normally earmarked.

The 2nd French Corps of two divisions (which is not integrated in NATO forces) is stationed in Germany under a status agreement reached between the French and German Governments. Co-operation with NATO forces and commands has been agreed between the commanders concerned.

The following Commands are subordinate to Allied Command Europe:

(a) *Allied Forces Central Europe* (AFCENT) has command of both the land forces and the air forces in the Central European Sector. Its headquarters are at Brunssum in the Netherlands, and its Commander (CINCENT) is a German general.

The forces of the Central European Command include 26 divisions, assigned by Belgium, Britain, Canada, West Germany, the Netherlands, and the United States, and about 1,600 tactical aircraft.

The Command is sub-divided into Northern Army Group (NORTHAG) and Central Army Group (CENTAG). NORTHAG, responsible for the defence of the sector north of the Göttingen-Liège axis, includes the Belgian, British, and Dutch divisions and four German divisions and is supported by 2nd Allied Tactical Air Force (ATAF), composed of Belgian, British, Dutch, and German units. The American forces, seven German divisions, and the Canadian battle group are under CENTAG, supported by the 4th ATAF, which includes American, German, and Canadian units and an American Army Air Defense Command. A new headquarters, Allied Air Force, Central Europe, was set up in 1974 to provide centralized control of air forces in the sector.

(b) *Allied Forces Northern Europe* (AFNORTH) has its headquarters at Kolsaas, Norway, and is responsible for the defence of Denmark, Norway, Schleswig-Holstein, and the Baltic Approaches. The commander (CINCNORTH) has always been a British general. Most of the Danish and Norwegian land, sea, and tactical air forces are earmarked for it, and most of their active reserves assigned to it. Germany has assigned one division, two combat air wings,

and her Baltic fleet. Apart from exercises and some small units, United States naval forces do not normally operate in this area.

(c) *Allied Forces Southern Europe* (AFSOUTH) has its headquarters at Naples, and its commander (CINCSOUTH) has always been an American admiral. It is responsible for the defence of Italy, Greece, and Turkey and for safeguarding communications in the Mediterranean and the Turkish territorial waters of the Black Sea. The formations in the area include 22 divisions from Turkey, 14 from Greece, and 8 from Italy, as well as the tactical air forces of these countries. Other formations have been earmarked for AFSOUTH, as have the United States Sixth Fleet and naval forces from Italy. The ground-defence system is based upon two separate commands: the Southern, comprising Italy and the approaches to it, under an Italian commander, and South-Eastern, comprising Greece and Turkey, under an American commander. There is, however, an overall air command (AIRSOUTH), and there are two naval commands (NAVSOUTH and STRIKEFOR SOUTH), responsible to AFSOUTH, with headquarters in Naples.

A maritime air patrol unit with aircraft from Southern Region nations, Britain, and the United States is operating in the Mediterranean, co-ordinated by Maritime Air Forces Mediterranean (MARAIMED), a functional command of NAVSOUTH. French aircraft participate. The MARAIMED commander is an American rear-admiral.

The Allied Naval On-Call Force for the Mediterranean (NAVOCFORMED) has consisted of at least five destroyers, contributed by Southern Region nations, Britain, and the United States, and three smaller ships provided according to the area of operation.

(d) *United Kingdom Air Forces* (UKAIR) has its headquarters at High Wycombe, England.

(e) *ACE Mobile Force* (AMF), with headquarters at Seckenheim, Germany, has been formed with particular reference to the northern and south-eastern flanks. Formed by seven countries, it comprises seven infantry battalion groups, an armoured reconnaissance squadron, six artillery batteries, helicopter detachments, and ground-support fighter squadrons, but has no air transport of its own.

(II) ALLIED COMMAND ATLANTIC (ACLANT) has its headquarters at Norfolk, Virginia, and is responsible for the North Atlantic area from the North Pole to the Tropic of Cancer, including Portuguese coastal waters. The commander is an American admiral.

In the event of war, its duties are to participate in the strategic strike and to protect sea communications. There are no forces assigned to the command in peacetime except Standing Naval Force Atlantic (STANAVFORLANT), which normally consists, at any one time, of four destroyer-type ships. However, for training purposes and in the event of war, forces which are predominantly naval are earmarked for assignment by Britain, Canada, Denmark, Germany, the Netherlands, Portugal, and the United States. There are arrangements for co-operation between French naval forces and those of SAQLANT. There are six subordinate commands: Western Atlantic, Eastern Atlantic, Iberian Atlantic, Striking Fleet Atlantic, Submarine Command, and STANAVFORLANT. The nucleus of the Striking Fleet Atlantic has been provided by the United States 2nd Fleet with some four attack carriers; carrier-based aircraft share the nuclear strike role with missile-firing submarines.

(III) ALLIED COMMAND CHANNEL (ACCHAN) has its headquarters at Northwood, near London. The commander



(CINCCCHAN) is a British admiral. The wartime role of Channel Command is to exercise control of the English Channel and the southern North Sea. Many of the smaller warships of Belgium, Britain, and the Netherlands are earmarked for this Command, as are some maritime aircraft. There are arrangements for co-operation with French naval forces. A Standing Naval Force Channel (STANAVFORCHAN) was formed in 1973 to consist of mine counter-measures ships from Belgium, Germany, the Netherlands, and Britain; other interested nations might participate on a temporary basis. Its operational command is vested in CINCCCHAN.

## POLICY

Political guide-lines agreed between NATO members in 1967 include the concept of political warning time in a crisis and the possibility of distinguishing between an enemy's military capabilities and his political intentions. The strategic doctrine defined by the DPC in December 1967 envisaged attacks on NATO territory being met with appropriate levels of force, including nuclear weapons.

## BELGIUM

Population: 9,880,000.  
 Military service: 9 or 11 months. (Conscripts serve 9 months if posted to Germany, 11 months if serving in Belgium.)  
 Total armed forces: 88,300, incl 31,050 conscripts.  
 Estimated GNP 1975: \$66.4 bn.  
 Defence expenditure 1976: 57,700 m francs (\$1,479 m).  
 \$1 = 39.0 francs (1976), 35.4 francs (1975).

**Army:** 64,050, incl Medical Service and 26,200 conscripts.  
 1 armoured brigade.  
 3 mechanized infantry brigades.  
 3 reconnaissance battalions.  
 2 motorized infantry battalions.  
 1 para-commando regiment.  
 3 artillery battalions.  
 5 engineer battalions (3 field, 1 bridge, 1 equipment).  
 2 SSM battalions with 8 *Honest John*.  
 2 SAM battalions with 24 *HAWK*.  
 4 aviation squadrons.  
 334 *Leopard*, 85 M-47 med, 133 *Scorpion*, 62 M-41 lt tks; 1,300 M-75, 93 *Spartan*, and AMX APC; 29 105mm, 15 203mm how; 95 M-108 105mm, 26 M-44, 41 M-109 155mm, 11 M-110 203mm SP how; 119 C20mm, 153 *Scimitar* SP AA guns; 80 JPZ 4-5 SP ATK guns; *ENTAC* ATGW; 12 *Honest John* SSM (being replaced by *Lance*); 59 *HAWK* SAM; 11 Do-27, 5 BN *Islander* ac, 75 *Alouette* II hel. (266 *Spartan* APC, 43 *Striker* SP ATGW, 55 *Gepard* SP AA guns, 5 *Lance* SSM, 40 *Epervier* RPV, 12 *Islander* ac on order.)

**Deployment:** Germany: 32,000; 1 corps headquarters, 2 divisional headquarters, 1 armoured brigade, 2 mechanized infantry brigades.

**Reserves:** 50,000: 1 mech, 1 mot inf bde.

**Navy:** 4,350, incl 1,150 conscripts.  
 7 ocean minesweepers/minehunters (ex-US).  
 9 coastal minesweepers/minehunters.  
 14 inshore minesweepers.  
 2 support ships (1 with 1 hel).  
 1 HSS-1, 3 *Alouette* III helicopters.  
 (4 ASW escorts on order.)

**Reserves:** 7,600.

**Air Force:** 19,900, incl 3,700 conscripts; 144 combat aircraft.  
 2 fighter-bomber squadrons with 36 F-104G.  
 3 fighter-bomber squadrons with 54 *Mirage* VBA.  
 2 AWX squadrons with 36 F-104G.  
 1 reconnaissance squadron with 18 *Mirage* VBR.  
 2 lpt sqns with 12 C-130H, 3 HS748, 6 *Merlin* III AS, 3 *Pembroke*, 1 DC-3, 2 DC-6, 2 *Falcon* 20, 2 Boeing 727QC.  
 1 SAR sqn with 5 HSS-1 and 5 S-58 hel



Under a co-production agreement, four NATO nations—Belgium, the Netherlands, Denmark, and Norway—will replace their F-104s with these F-16 fighters, starting in 1979.

(being replaced by *Sea King*).  
 18 *Magister*, 34 SF-260, 15 T-33 trainers.  
 8 SAM sqns with 14 *Nike Hercules*.  
 (116 F-16, 33 *Alpha Jet* ac, 5 *Sea King* hel on order.)

**Para-Military Forces:** 15,000 Gendarmerie with 62 FN armd cars, 5 *Alouette* II, 3 *Puma* hel.

## BRITAIN

Population: 56,440,000.  
 Military service: voluntary.

Total armed forces: 344,150, incl 14,700 women and 9,300 enlisted outside Britain.  
 Estimated GNP 1975: \$226.0 bn.  
 Defence expenditure 1976-77: £5,632 m (\$10,353 m).  
 \$1 = £0.544 (1976), £0.456 (1975).

### Strategic Forces:

SLBM: 4 SSBN, each with 16 *Polaris* A-3 missiles.  
 Ballistic Missile Early Warning System (BMEWS) station at Fylingdales.

**Army:** 177,600, incl 5,800 women and 8,200 enlisted outside Britain.  
 14 armoured regiments.  
 5 armoured reconnaissance regiments.  
 47 infantry battalions.  
 3 parachute battalions.  
 5 Gurkha battalions.  
 1 special air service (SAS) regiment.  
 2 regts with *Honest John* SSM and 203mm SP how.  
 2 SAM regts: 1 with *Thunderbird*, 1 with *Rapier*.  
 22 other artillery regiments.  
 13 engineer regiments.  
 6 army aviation regiments.  
 910 *Chieftain* med, 270 FV-101 *Scorpion* lt tks; 120 *Saladin* armd cars; 100 *Scimitar*, 170 FV438/FV712 AFV (*Striker* entering service); 1,650 *Ferret*, 70 *Fox* scout cars, 1,520 FV-432, 600 *Saracen* APC (*Spartan* entering service); 100 *Abbot* 105mm, 40 M-109 155mm, 24 M-107 175mm, 12 M-110 203mm guns/how, 100 105mm pack how, and lt guns; 84mm *Carl Gustav*, 120mm RCL; *Vigilant*, *Swingfire* ATGW; 40mm L 40/70 AA guns; *Honest John* SSM (being replaced by *Lance*); *Blowpipe*, *Rapier*, *Thunderbird* SAM; 6 *Beaver* lt ac; 110 *Scout*, 10 *Alouette* II, 110 *Sioux*, 80 *Gazelle* hel. (*Lance* SSM, *Milan* ATGW, *Lynx*, and 80 *Gazelle* hel on order.)

### Deployment and Organization:

(The army organization is to be changed, eliminating the brigade as a level of command. BAOR is to have 4 armd, 1 arty divs, and a new inf formation (5th Field Force). By April 1978, UKLF (excluding Northern Ireland) consist of 6th Field Force (5 bns, incl 1 para bn gp), 7th Field Force (incl regular, TAVR, and reservists, and a number of separate units), and 8th Field Force (incl regular and TAVR units earmarked for Home Defence). Units in Hong Kong will form the Gurkha Field Force.)

**United Kingdom** (United Kingdom Land Forces (UKLF)): United Kingdom Mobile Force (UKMF)—1 div of 3 bdes, 1 para bde of 2 bns; ACE Mobile Force (Land)—1 bn gp; 1 SAS regt, 1 Gurkha inf bn; HQ Northern Ireland—3 inf bde HQs, 1 armd recce and 3 sqns, 13 units in inf role, 3 engr, 2 army aviation sqns.

**Germany:** British Army of the Rhine (BAOR): 55,000: 1 corps HQ, 3 div HQs, 5 armd, 1 mech, 2 arty bdes. Berlin: 3,000: 1 inf



bde (incl 1 para bn).  
**Brunei:** 1 Gurkha bn (being withdrawn).  
**Hong Kong:** 8,000: 2 bdes with 2 British, 3 Gurkha inf bns, 1 engr sqn, and support units. (Garrison being reduced to 4 bns.)  
**Cyprus:** 1 inf bn (less 2 coys), 1 armd recce sqn with UNFICYP; 1 inf bn, 2 inf coys, 1 armd recce sqn in garrison at Sovereign Base Areas.  
**Oman:** Training team and engr det.  
**Gibraltar:** 1 inf bn.  
**Belize:** 1 inf bn.

**Reserves:** 108,200 Regular reserves; 53,900 Territorial Army and Volunteer Reserve (TAVR—2 med, 3 lt AD, 7 engr, 2 SAS regts, 38 inf bns); 7,800 Ulster Defence Regiment (11 bns).

**Navy:** 76,350, incl Fleet Air Arm, Royal Marines, 3,900 women, and 700 enlisted outside Britain; 76 major surface combat vessels.

**Submarines attack:**  
 9 nuclear, 19 diesel.

**Surface ships:**  
 1 aircraft carrier (30 ac, 6 hel).  
 1 ASW carrier with *Seacat* SAM, 20 hel.  
 2 assault ships with *Seacat* SAM.  
 2 cruisers with 4 *Sea King* hel, *Seacat* SAM.  
 10 destroyers (7 County-class with *Seaslug* and *Seacat* SAM, ASW hel, 4 with *Exocet* SSM; 1 Type 82 with *Sea Dart* SAM and *Ikara* ASW; 2 Type 42 with *Sea Dart* SAM, ASW hel).

60 frigates: 39 GP (38 with 1 hel, most with *Seacat*, 8 with *Ikara* ASW, 1 with *Exocet* SSM, 1 with *Seawolf*), 15 ASW (9 with *Seacat*, hel); 2 AA; 4 aircraft direction (2 with *Seacat*).

35 coastal minesweepers/minehunters.  
 5 inshore minesweepers.  
 11 patrol/seaward defence craft.  
 6 landing ships (logistic), 43 landing craft.  
 2 hovercraft (SRN-6, BH-N7).  
 Included above are 3 nuclear, 6 diesel submarines, 1 commando carrier, 1 assault ship, 1 cruiser, 1 destroyer, 12 frigates, and 3 minesweepers in reserve or undergoing refit. (A further 1 ASW cruiser, 2 SSN, 4 destroyers, 4 frigates, 4 patrol craft building, *Sub-Harpoon* msls on order.)

**The Fleet Air Arm:**

1 strike sqn with 14 *Buccaneer* S2 (*Martel* ASM).  
 1 FGA squadron with 12 *Phantom* FG1.  
 2 AEW squadrons with 8 *Gannet* 30.  
 4 ASW hel sqns with 30 *Sea King* and 47 indep flights (40 with *Wasp*, 7 with *Wessex* 3).  
 2 commando assault sqns with *Wessex* 5.  
 1 utility hel sqn with *Wessex* 5.  
 7 training sqns: 1 each with *Sea King*, *Wasp*, *Wessex* 1/3/5, *Gazelle*, *Sea Prince*.  
 (13 *Sea King*, 6 *Gazelle*, 30 *Lynx* hel on order.)

**The Royal Marines:** 7,750.

1 commando bde with 4 commandos.  
 120mm RCL; SS-11 SSM; *Blowpipe* SAM; SRN-6 Mk 5 hovercraft. (*Milan* ATGW on order.)

**Deployment:**

**Malta:** 1 commando (to be withdrawn between 1 April 1977 and 31 March 1979).  
**Falkland Islands:** 1 detachment.

**Reserves** (naval and Marines): 27,800 regular and 6,700 volunteers.

**Air Force:** 90,200, incl 5,000 women and 400 enlisted outside Britain; about 450 combat aircraft.

6 strike squadrons with 50 *Vulcan* B2.

4 strike squadrons with 56 *Buccaneer*.  
 4 close support squadrons with 48 *Harrier*.  
 5 close support squadrons with 40 *Jaguar*.  
 9 interceptor sqns: 4 with *Lightning*, 5 with *Phantom* FG1/FGR2.  
 5 recce sqns: 1 with 10 *Vulcan* SR2, 2 with *Phantom* FGR2, 2 with *Canberra* PR7/9.  
 1 AEW squadron with 12 *Shackleton*.  
 5 MR squadrons with 43 *Nimrod*.  
 3 tanker squadrons with 24 *Victor* K1A/K2.  
 2 strategic tpt sqns: 1 with 11 VC-10, 1 with 10 *Belfast* (being phased out).  
 4 tac tpt sqns with 45 C-130.  
 3 lt comms sqns with HS-125, *Devon*, *Pembroke*, *Andover* ac; *Whirlwind* hel.

Estimated GNP 1975: \$US 137.0 bn.  
 Defence expenditure 1976-77: \$Can 2,977 m (\$US 3,041 m).  
 \$US = \$Can 0.979 (1976), \$Can 1.05 (1975).

**Army** (Land Forces): 28,500.

(The Canadian Armed Forces were unified in 1968; the strengths shown here for land, maritime, and air forces are only approximate.)

**Mobile Command** (about 17,500, land and air).

3 combat groups each comprising:  
 3 infantry battalions.



Both the British and French air forces are equipped with the jointly developed Jaguar tactical support aircraft. RAF Jaguars have been operational for two years.

Trg sqns with 14 *Jaguar* T-2, *Jet Provost*, *Gnat*.  
 8 hel sqns: 2 tac tpt with 26 *Puma* HC-1, 3 with 45 *Wessex* HC-2, 3 SAR with *Whirlwind* HAR-10; also 1 flight with 2 *Wessex*.  
 2 SAM sqns with *Bloodhound*.  
 (*Jaguar* FGA, *HAWK*, *Bulldog* trg ac, *Sea King* hel on order.)

**Royal Air Force Regiment:**

7 field and AD sqns: 5 with *Rapier*, 2 with L40/70 AA guns. 1 flight with *Tigercat* SAM.

**Deployment:**

The Royal Air Force includes an operational home command (Strike Command), responsible for the UK Air Defence Region and the Near and Far East, and 1 overseas command (RAF Germany: 8,600).  
 Sqns are deployed overseas as follows:

**Germany:** 1 *Phantom* FGR2, 2 *Buccaneer*, 2 *Lightning*, 3 *Jaguar*, 3 *Harrier*, 1 *Wessex*; 1 *Bloodhound*, 4 *Rapier*, 1 field sqn RAF Regt.

**Gibraltar:** Hunter detachment.

**Cyprus:** 1 *Whirlwind* (4 ac with UNFICYP); periodic det of other ac; 1 sqn RAF Regt.

**Malta:** 1 *Nimrod*, 1 *Canberra* PR7.

**Hong Kong:** 1 *Wessex*; 1 RAF Regt detachment.

**Belize:** RAF Regt detachment.

**Reserves:** 32,600 regular; about 300 volunteer.

1 reconnaissance regiment.  
 1 light artillery regiment of 2 batteries support units.  
 1 airborne regiment.  
 1 signals regiment.

226 *Centurion* med tks; 121 *Ferret* armd cars, 174 *Lynx* recce vehs; 827 M-113 APC; 55 105mm pack, 159 105mm how, 50 M-109 155mm SP how; 810 *Carl Gustav*, 137 106mm RCL; SS-11, *ENTAC*, 150 TOW ATGW; CL-89 drones; 40mm AA guns; 103 *Blowpipe* SAM. (128 *Leopard* med tks on order.)

**Deployment:**

One combat group of Mobile Command is intended for operations in Europe, part (an air transportable bn gp) with the AMF. The other groups contribute to North American ground-defence and UN commitments.

**Europe:** One mech battle group of 2,800 with 32 *Centurion* med tks, 375 M-113 APC/AFV, 18 M-109 155mm SP how, and 14 CH-136 *Kiowa* hel.

**Cyprus** (UNFICYP): 515.

**Egypt** (UNEF): 866.

**Syria** (UNDOF): 126.

Other UN: 122.

**Reserves:** about 15,200; 99 combat arms units plus support units (all in Mobile Command).

**Navy** (Maritime): 13,400.

**Maritime Command** (9,100).

3 submarines (*Oberon*-class).

4 ASW hel destroyers with 2 CH-124 *Sea King* hel and 2 *Sea Sparrow* SAM.

19 ASW frigates (8 with 1 CH-124 hel, 4 with ASROC, 3 in reserve).

3 support ships with 3 CH-124 hel, 2 with *Sea Sparrow* SAM.

6 coastal patrol training ships.

## CANADA

Population: 23,070,000.

Military service: voluntary.

Total armed forces: 77,900, incl 2,700 women.



5 reserve training vessels.  
1 hydrofoil (in reserve).

**Deployment:**

*Atlantic:* 3 submarines, 13 surface, 2 support ships.

*Pacific:* 10 surface, 1 support ships.

**Reserves:** about 3,200.

**Air Force (Air):** 36,000; some 210 combat aircraft. *Air Command* (22,800).

(Air Command was formed in 1975, with the re-alignment of the Canadian Forces Command structure, to command all air forces. Maritime Command has operational control of maritime air forces, and HQ 4 ATAF in Europe has operational control of 1 CAG. Maritime Command commands all naval forces, and Mobile Command army combat forces. There is in addition a Communications Command and a Canadian Forces Training System.)

**Air Defence Group:**

4 main, 18 auxiliary sites of Distant Early Warning (DEW) Line.

24 long-range radar sites (*Pine Tree Line*).

3 AWX sqns with 44 CF-101 *Voodoo*.

1 ECM sqn with 30 CF-100 and T-33.

1 trg sqn with 18 CF-101.

**Air Transport Group:**

4 tpt sqns: 2 with 24 C-130, 1 with 5 CC-137 (Boeing 707), 1 with 7 *Cosmopolitan*, 7 *Falcon*.

4 tpt/SAR sqns with 14 CC-115 *Buffalo*, 8 CC-138 *Twin Otter* ac, 10 CH-113 *Labrador*, and CH-113A *Voyageur* hel.

**Maritime Air Group:**

4 maritime patrol sqns with 26 CP-107.

1 MR sqn with 13 CP-121.

2 ASW hel sqns with 32 CH-124 *Sea King*.

2 sqns with 6 T-33, 3 CP-121 ac, CH-135 hel. (18 P-3 *Orion* on order.)

10 Tactical Air Group (10 TAG):

2 fighter sqns with 24 CF-5 (25 in storage).

4 hel sqns with CH-135 (*Twin Huey*).

1 tpt sqn with 7 CH-147 hel.

1 Canadian Air Group (1 CAG):

3 fighter sqns with 48 CF-104D.

1 hel sqn with CF-136 (*Kiowa*).

**Deployment:**

*Europe:* 1 Canadian Air Group (1 CAG).

**Reserves:** 700.

## DENMARK

Population: 5,110,000.

Military service: 9 months.

Total armed forces: 34,700, incl 12,270 conscripts.

Estimated GNP 1975: \$41.9 bn.

Defence expenditure 1976-77: kr 5,106 m (\$844 m).

\$1=6.05 kroner (1976), 5.47 kroner (1975).

**Army:** 21,800, incl 9,000 conscripts.

3 mechanized infantry brigades, each with 1 tk, 1 mech, 1 arty bn, and 1 recce sqn.  
2 mechanized infantry brigades, each with 1 tk, 2 mech, 1 arty bn, 1 engr coy, and support units.

1 independent reconnaissance battalion.

Some independent motorized infantry battalions.

Some *Leopard*, 200 *Centurion* med, 48 M-41 lt tks; 630 M-113, 68 mortar-armed APC; 24 155mm guns; 144 105mm, 96 155mm, 12 203mm how (dual-capable, but there are no nuclear warheads on Danish soil); 72 M-109 155mm SP how; 252 106mm RCL; TOW ATGW; 220 L 60/70 40mm AA guns; *Redeye* (*Hamlet*) SAM; 2 Piper L-18C, 12 KZ VII lt ac; 12

Hughes OH-6A hel. (120 *Leopard* med tks, 60 TOW ATGW, 9 Saab MFI-17 lt ac on order.)

**Deployment:** *Cyprus* (UNFICYP): 360.

**Reserves:** 4,500 Augmentation Force, subject to immediate recall; 41,000 Field Army Reserve, consisting of 12,000 Covering Force Reserve (to bring units to war strength and add 1 mech bn to each bde), 29,000 in other reserve units to provide combat and logistic support; 24,000 Regional Defence Force, with 21 inf, 7 arty bns, ATK sqns, support units; 54,400 Home Guard.

**Navy:** 5,800, incl 1,900 conscripts.

6 coastal submarines (2 German U-4 class).

2 frigates with *Sea Sparrow* SAM.

5 fishery-protection frigates, each with 1 hel.

3 coastal escorts (corvettes).

10 FPB, 3 FPBG.

4 minelayers.

1 coastal minelayer (2 more on order).

8 minesweepers.

8 seaward defence craft.

8 *Alouette III* helicopters.

(3 corvettes, 10 FPBG, *Harpoon* SSM on order.)

**Reserves:** 4,500, Home Guard 4,800.

**Air Force:** 7,100, incl 1,370 conscripts; 116 combat aircraft.

1 FB squadron with 20 F-35XD *Draken*.

2 FB squadrons with 40 F-100D/F.

2 interceptor sqns with 25 F-104G and 15 CF-104G.

1 recce squadron with 16 RF-35XD *Draken*.

1 tpt squadron with 8 C-47, 2 C-54, 3 C-130H.

1 SAR squadron with 8 S-61 hel.

8 SAM sqns: 4 with *Nike Hercules*, 4 with *HAWK*.

(48 F-16, 5 TF-35, 23 Saab MFI-17 on order.)

**Reserves:** 8,000; Home Guard 12,000.

## FRANCE

Population: 53,350,000.

Military service: 12 months.

Total armed forces: 512,900, incl 279,300 conscripts.

Estimated GNP 1975: \$359.2 bn.

Defence expenditure 1976: fr 50,000 m (\$10,661 m).

\$1=4.69 francs (1976), 4.04 francs (1975).

**Strategic Forces:**

**SLBM:** 3 SSBN: 2 with 32 MSBS M-1, 1 with 16 M-2 msls. (1 more with 16 M-20 in service end-1976.) (1 more SSBN building and plans for a sixth are being studied.)

**IRBM:** 2 sqns, each with 9 SSBS S-2 msls.

**Aircraft:**

9 squadrons with 36 *Mirage IVA* bombers.

3 squadrons with 11 KC-135F tankers.

14 *Mirage IVA* bombers in reserve.

**Army:** 338,500, incl Army Aviation and 221,000 conscripts.

(The army is to be re-organized between 1976 and 1980 to combine the *Force de Manoeuvre* and the *DOT* and to form 8 armd, 6 inf, 1 para, and 1 Alpine divs, plus corps troops incl 2-3 SSM and 4 SAM regts. An additional 14 divs will be formed on mobilization. The divisions will be smaller than now, armd divs consisting of

8,200 men, 2 tk, 1 mech Inf, and 2 arty regts; inf divs having 6,500 men, 3 mot inf, 1 armd car, 1 arty regts.)

5 mechanized divisions.

3 infantry divisions (1 Alpine div of 2 bdes formed in August 1976).

1 air-portable motorized division (Marines).

1 airborne division of 2 brigades.

11 armoured car regiments.

2 motorized infantry regiments.

2 parachute battalions.

10 infantry battalions.

4 SSM regiments with 24 *Pluton*.

4 SAM regiments: 3 with 60 *HAWK*, 1 with *Roland*.

1,060 AMX-30 med, 1,120 AMX-13 lt tks; some 950 AFV, incl 500 Panhard EBR hy and AML lt; VP-90, 330 AMX-10 APC;



The Franco-German Transall C-160 is used by France, Germany, Turkey, and South Africa.

GCT 155mm SP guns; M61 105mm pack, AMX 105mm and 155mm SP how; 120mm mor; 105/6mm RCL; 20mm SP, 30mm twin SP, 40mm AA guns; *STRIM*, *Milan*, SS-11/-12, *HOT* ATGW; *Pluton* SSM; *Roland*, *HAWK* SAM.

**Army Aviation (ALAT):** 3,700.

2 groups, 6 divisions, and 7 regional commands.

200 light fixed-wing aircraft.

85 Bell, 229 *Alouette II*, 84 *Alouette III*, 267 SA-330 *Puma*, and SA-341 *Gazelle* hel.

**Deployment and Organization** (incl Navy and Air Force):

**Manoeuvre Forces (Forces de Manoeuvre):** First Army: 2 mech divs in Germany (58,000); 3 mech divs in support in France; Berlin: 2,000.

**Territorial Defence Forces (Défense Opérationnelle du Territoire—DOT):** about 52,000, incl 2 inf, 1 alpine divs, 10 indep inf, 2 para bns, 2 mot inf, 11 armd car regts.

**Strategic Reserve (Force d'Intervention):**

1 AB div (2 bdes); 1 air-portable mot inf div.



#### Overseas Commands:

There are seven overseas commands (West Indies, West Africa, Central Africa, Territory of Afars and Issas, South Indian Ocean, New Caledonia, Polynesia), an independent command in the Ivory Coast, and a naval command. Some 22,000 from all services are deployed overseas (numbers can vary according to local circumstances); equipment includes: 130 AFV, 56 hel, 9 frigates, 2 FPB, 2 lt tpt ships, 21 combat and 26 tpt ac.

Reserves: about 400,000.

**Navy:** 70,000, incl Naval Air and 17,500 conscripts; 52 major surface combat vessels.

23 submarines (4 more under construction).  
2 aircraft carriers (each with 40 ac).  
2 cruisers: 1 with *Exocet* SSM and *Masurca* SAM, 1 with 4 by ASW hel.

20 destroyers: 2 with *Masurca* SAM and *Malafor* ASW msls, 3 with *Exocet* SSM and *Malafor* (1 more in service 1976), 6 ASW with *Malafor*, 4 with *Tartar* SAM, 4 GP (1 with *Exocet* and ASW hel).

28 frigates (7 building).

29 patrol craft (4 building).

9 ocean, 25 coastal minesweepers.

5 minehunters.

7 landing ships and 16 landing craft.

**Naval Air Force:** 13,000; 115 combat aircraft.

2 FB sqns with 24 *Etendard* IV-M.

2 interceptor sqns with 20 F-8E(FN) *Cru-sader*.

2 ASW sqns with 24 *Alizé*.

4 MR sqns with 25 *Atlantic* and 10 *Neptune*.

1 reconnaissance sqn with 12 *Etendard* IV-P.

3 ASW hel sqns with 12 *Super Frelon*, 11 HSS-1, 7 *Alouette* III.

2 SAR sqns with 9 *Alouette* II, 11 *Alouette* III.

1 hel sqn with 4 *Alouette* II, 2 *Super Frelon*.

9 comms sqns with DC-4, C-47 ac, 12 HSS-1, *Alouette* II/III, *Super Frelon* hel.

3 trg sqns with Nord 262, C-47, *Fouga Magister*.

(18 *Lynx* hel on order.)

**Marines:** 1 battalion.

Reserves: about 50,000.

**Air Force:** 104,400, incl 40,800 conscripts; 470 combat aircraft.

Air Defence Command (CAFDA): 9,000.

8 interceptor sqns: 2 with 38 *Mirage* IIIC, 4 with 60 *Mirage* F1, 2 with 38 *Super Mystère* B2.

Automatic *STRIDA II* air-defence system (11 *Crotale* SAM sections on order).

Tactical Air Force (FATAC): 14,200.

18 FB sqns: 9 with 120 *Mirage* IIIE, 2 with 48 *Mirage* VF, 2 with 30 F-100D (being phased out), 5 with 75 *Jaguar*.

1 lt bbr sqn with 16 *Vautour* (being withdrawn).

3 recce sqns with 45 *Mirage* IIIR/RD.

Air Transport Command (COTAM): 4,500.

8 tac tpt sqns: 3 with 50 *Transall* C-160, 4 with 122 *Nord* 2501 *Noratlant*.

2 heavy tpt sqns with 4 DC-6B, 4 DC-8.

1 tpt sqn with 53 *Alouette* II, 39 *Alouette* III, 14 SA-330 *Puma*, 15 HSS-1 *Seabat* hel.

Para-Military Forces: 73,000 Gendarmerie.

## GERMANY: FEDERAL REPUBLIC OF

Population: 62,790,000 (including West Berlin).

Military service: 15 months.

Total armed forces: 495,000, incl 227,000 conscripts.

Estimated GNP 1975: \$441.6 bn.

Defence expenditure 1976: DM 31,891 m (\$12,605 m).

\$1=DM 2.53 (1976), DM 2.36 (1975).

**Army:** 345,000, incl 177,000 conscripts.

(The army is being restructured to form 16 armd bdes—each with 3 tk, 1 armd inf, 1 armd arty bns—and 17 armd inf/*Jäger* bdes—each with 2 tk, 2 armd inf, 1 *Jäger*, 1 armd arty bns—and 3 AB bdes.)

16 armd brigades (2 tk, 1 armd inf, 1 armd arty bns).

12 armd inf bdes (1 tk, 2 armd inf, 1 armd arty bns).

3 motorized infantry brigades.

2 mountain brigades.

3 airborne brigades.

(Organized in 3 corps and 12 divisions—4 armd, 4 armd inf, 2 *Jäger*, 1 mountain, 1 AB.)

15 SSM bns: 11 with *Honest John*, 4 with *Sergeant* (to be replaced by *Lance*).

3 army aviation commands, each with 1 lt, 1 med tpt regt.

**Territorial Army:** peacetime strength 63,000, incl 30,000 conscripts; mobilization strength 504,000. 3 Territorial Commands of 5 Military Districts; 6 Home Defence brigade-sized units being formed. In support are 4 service support commands, 1 sig bde and 2 regts, 2 engineer regts. The Territorial Army provides defensive, communications, police, and service units on mobilization.

1,400 M-48A2, 2,600 *Leopard* med tks; 660 HS-30, 2,100 *Marder*, 1,300 Hotchkiss PZ4-5, and 3,350 M-113 APC; 100 Spä-PZ-2 recce, 1,120 ATK AFV (770 with 90mm gun, 350 with SS-11 ATGW); 150 175mm SP guns; 280 105mm, 80 155mm how, 600 155mm, 80 203mm SP how; 210 LARS 110mm multiple RL; *Cobra*, *Milan*, *TOW*, *HOT* ATGW; 1,400 20mm, 310 40mm, *Gepard* 30mm SP AA guns; 70 *Honest John*, 20 *Sergeant* SSM; 1,400 *Redeye* SAM; 18 Do-27, 18 OV-10Z ac; 200 UH-1D, 240 *Alouette* II, 110 CH-53G hel; CL-89 drones. (700 M-113 APC, 177 *TOW* ATGW, 450 *Gepard* SP AA, 26 *Lance* SSM, 140 *Roland* SAM on order.)

Reserves: 1,056,000: 615,000 field army, 441,000 Territorial Army.

**Navy:** 39,000, incl Naval Air Arm and 11,000 conscripts.

24 coastal submarines.

11 destroyers (3 with ASROC, 1 with *Exocet* SSM).

6 fast frigates.

5 ASW coastal escorts.

10 fast combat support ships.

57 MCM ships (incl 18 coastal, 21 fast, 18 inshore).

21 FPBG with *Exocet* SSM and 15 FPB.

19 landing craft.

(5 coastal submarines, 200 *Exocet* SSM on order.)

**Naval Air Arm:** 6,000; 135 combat aircraft.

3 FB sqns with 85 F-104G.

1 recce sqn with 30 RF-104G.

2 MR sqns with 20 Br-1150 *Atlantic*.

1 SAR hel sqn with 22 *Sea King* Mk 41.

2 utility sqns with 20 Do-28 and 15 H-34G.

Reserves: 25,000.

**Air Force:** 111,000, incl 39,000 conscripts; 462 combat aircraft.

18 FGA sqns: 4 with 60 F-4F, 8 with 144 F-104G, 6 with 120 G-91 (to be replaced by *AlphaJet*).

5 AWX sqns: 4 with 60 F-4F, 1 with 18 TF-104G.

4 recce sqns with 60 RF-4F.

5 tpt sqns with 76 *Transall* C-160.

4 hel sqns with 117 UH-1D.

(Other hel incl 18 Bell 47, 24 *Alouette* II.)

8 SSM sqns with 72 *Pershing*.

24 SAM batteries with 216 *Nike Hercules*.

36 SAM batteries with 216 *HAWK*.

4 aircraft control and warning regts.

Other ac: 4 Boeing 707, 3 C-140, 6 HFB-320, 121 Do-28D (10 F-4F FGA, 3 AB-212 hel on order).

Reserves: 100,000.

Para-Military Forces: 20,000 Border Police.

## GREECE

Population: 9,050,000.

Military service: 28-32 months.

Total armed forces: 199,500, incl 148,000



The Federal Republic of Germany's 345,000-man army is heavily motorized. About 2,600 of its force of 4,000 medium tanks are Leopards armed with 105mm guns.



conscripts.  
 Estimated GNP 1975: \$20.8 bn.  
 Defence expenditure 1976: 41,481 m drachmas (\$1,136 m).  
 \$1=36.5 drachmas (1976), 30.6 drachmas (1975).

**Army:** 160,000, incl 123,000 conscripts.  
 1 armoured division.  
 11 Infantry divisions.  
 2 armoured brigades.  
 1 para-commando brigade.  
 1 marine infantry brigade.  
 2 SSM battalions with 8 *Honest John*.  
 1 SAM battalion with 12 *HAWK*.  
 12 artillery battalions.  
 14 army aviation companies.  
 350 M-47, 650 M-48, 75 AMX-30 med, 160 M-24, M-41 lt tks; 100 M 8 armd cars; 400 M-59, 580 M-113 APC; 36 175mm SP guns; 75mm pack, 500 105mm, 240 155mm (some SP), 203mm how; TOW, *Milan* ATGW; *Honest John* SSM; 40mm AA guns; *Hamlet*, *HAWK* SAM; 2 Aero *Commander*, 25 U-17, 15 L-21 ac; 5 Bell 47B, 10 Bell UH-1D, 40 AB-204/-205 hel. (115 AMX-30 med tks, *Milan* ATGW on order.)

Reserves: about 200,000.

**Navy:** 17,500, incl 11,000 conscripts.  
 8 submarines (3 on order).  
 9 destroyers.  
 4 destroyer escorts.  
 5 coastal patrol vessels.  
 4 FPBG with *Exocet* SSM (4 more on order).  
 13 fast torpedo boats.  
 5 corvettes/auxiliaries.  
 2 coastal minelayers.  
 14 coastal minesweepers.  
 14 landing ships (8 LST, 5 med, 1 dock).  
 8 landing craft.

Reserves: about 20,000.

**Air Force:** 22,000, incl 14,000 conscripts; 247 combat aircraft.  
 6 FGA sqns: 2 with 38 F-4E, 2 with 18 F-84F and 18 A-7H, 1 with 15 F-104G, 1 with 20 *Mirage* F1CG.  
 5 interceptor sqns: 3 with 45 F-5A/B, 1 with 24 F/TF-102A, 1 with 15 F/TF-104G.  
 3 recce sqns: 1 with 18 RF-84F, 2 with 28 RF-5A.  
 1 MR squadron of 8 HU-16B *Albatross*.  
 2 tpt squadrons of 30 C-47 and 40 *Noratlans*, 8 C-103H, 1 *Gulfstream*.  
 3 hel sqns with 14 UH-1H, 10 Bell 47G, 12 SH-19D.  
 Trainers incl 60 T-33A, 20 T-41A, 18 T-37B, 8 F-5B, 5 CL-215.  
 1 SAM battalion with *Nike Hercules*.  
 (42 A-7H, 20 *Mirage* F1, 8 RF-4E, 40 T-2E, 10 C-130H on order.)

Reserves: about 20,000.

Para-Military Forces: 25,000 Gendarmerie, 78,500 National Guard.

## ITALY

Population: 56,250,000.  
 Military service: Army and Air Force 12 months, Navy 18 months.  
 Total armed forces: 352,000, incl 234,100 conscripts.  
 Estimated GNP 1975: \$177.5 bn.  
 Defence expenditure 1976: 2,956.7 bn lire (\$3,470 m).  
 \$1=852 lire (1976), 630 lire (1975).

**Army:** 240,000, incl 180,000 conscripts.  
 3 corps of 1 armd, 3 mech divs.  
 1 independent mechanized brigade.

5 independent motorized brigades.  
 5 alpine brigades.  
 1 airborne brigade.  
 2 amphibious battalions.  
 1 missile bde with 1 *Lance* SSM, 4 *HAWK* SAM bns.  
 670 M-47, 300 M-60, 330 *Leopard* med tks; 30 Fiat 6018 armd cars; 4,000 APC (AMX, M-106, M-113, M-548, M-577); 1,000 guns/how, incl 105mm (incl Model 56 pack), 155mm, 203mm; 340 SP guns/how, incl M-44, M-109 155mm, M-107 175mm; 76mm, 80mm, 104mm RL; 120mm mor; 57mm, 106mm RCL; 30mm, 40mm, M-42 40mm SP AA guns; *Mosquito*, *Cobra*, SS-11, TOW ATGW, *Honest John*, *Lance* SSM; *HAWK* SAM. (*Leopard* med tks, 267 M-113, 200 M-548, 36 M-109 SP how, *Lance* SSM, TOW ATGW, *Indigo* SAM, CL-89 drones on order.)

**Army Aviation:** 20 units with 79 Piper L-19E/-21B, 80 SM-1019 lt ac; hel incl 57 AB-47G/J, 36 AB-204B, 100 AB-205A, 141 AB-206A/A-1, 26 CH-47C, 5 A-109. (67 SM-1019, 12 AB-205, 16 AB-206A-1, 11 CH-47C, 5 A-109 on order.)

Reserves: 550,000.

**Navy:** 42,000, incl air arm, 1,700 Marines, and 27,700 conscripts.  
 8 submarines (4 more building).  
 3 cruisers (2 with *Terrier* SAM, 4 ASW hel; 1 with 9 AB-204B ASW hel, 1 *Terrier*/ASROC).  
 8 destroyers (4 with ASW hel, *Standard*, *Tartar* SAM).  
 10 frigates (6 with ASW hel, 4 more building).  
 4 ocean, 28 coastal, and 10 inshore minesweepers.  
 10 FPB (1 with *Seakiller* SSM) and 1 hydrofoil with *Otomat* SSM.  
 2 landing ships and 50 landing craft.  
 1 Marine infantry battalion, LVT-4 APC.

**Naval Air Arm:**  
 5 ASW hel sqns with 24 SH-3D, 28 AB-204B, 12 AB-212. (16 AB-212, 5 SH-3D on order.)

Reserves: 157,800.

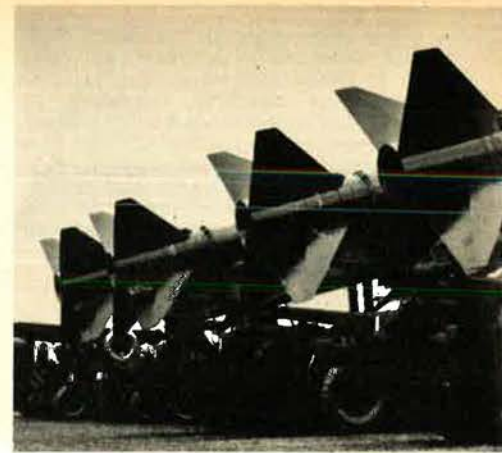
**Air Force:** 70,000, incl 26,400 conscripts; 296 combat aircraft.  
 6 FGA sqns: 1 with 18 F-104G, 3 with 54 F-104S, and 2 with 36 G-91Y.  
 3 light attack/recce sqns with 54 G-91R.  
 6 AWX squadrons with 72 F-104S.  
 3 recce squadrons with 30 RF-104G.  
 3 maritime recce sqns: 2 with 18 *Atlantic*, 1 with 8 S-2 *Tracker*.  
 1 ECM recce sqn with 6 PD-808 *VespaJet*.  
 3 tpt sqns: 2 with 28 C-119 (being replaced by G-222), 1 with 14 C-130H *Hercules*.  
 5 comms sqns with 50 P-166M, 40 SIAI-208M, 8 PD-808, and 2 DC-9.  
 2 SAR sqns with 11 HU-16 ac and 15 AB-204 hel.  
 Hls incl 40 AB-204B, 65 AB-47G/J.  
 10 trg sqns with 28 TF-104G, 75 G-91T, 130 MB-326, 10 P-148, 51 P-166M ac, AB-47, AB-204 hel.  
 12 SAM groups with 212 *Nike Hercules*.  
 (44 G-222, 20 SF-260 ac, 20 HH-3F, 2 S-61 hel on order.)

Reserves: 30,000.

Para-Military Forces: 80,000 *Carabinieri*.

## LUXEMBOURG

Population: 340,000.  
 Military service: voluntary.



The US Army and the armies of several NATO nations use the *Honest John*, a dual-capable, surface-to-surface missile with a range of twenty-five miles.

Total armed forces: 625.  
 Estimated GNP 1975: \$2.2 bn.  
 Defence expenditure 1976: 816 m francs (\$20.9 m).  
 \$1=39.0 francs (1976), 35.4 francs (1975).

**Army:** 625.  
 1 light infantry battalion.  
 1 independent company.  
 106mm RCL and 81mm mortars; TOW ATGW.

Para-Military Forces: 420 Gendarmerie.

## NETHERLANDS

Population: 13,810,000.  
 Military service: Army 14 months, Navy and Air Force 18-21 months.  
 Total armed forces: 112,200, incl 59,400 conscripts.  
 Estimated GNP 1975: \$83.4 bn.  
 Defence expenditure 1976: 7,845 m guilders (\$2,895 m).  
 \$1=2.71 guilders (1976), 2.44 guilders (1975).

**Army:** 75,000, incl 49,000 conscripts.  
 2 armoured brigades.  
 4 mechanized infantry brigades.  
 2 SSM battalions with *Honest John*.  
 3 army aviation sqns (Air Force crews).  
 340 *Centurion*, 460 *Leopard* med, AMX-13 lt tks; 2,000 AMX-VCL, YP-408, and M-113 APC; M-59 155mm, 24 M-107 175mm SP guns; 105mm, 155mm, 203mm how, AMX 105mm, M-109 155mm, M-110 203mm SP how; 107mm, 120mm mor; *LAW*, *Carl Gustav*, 106mm RCL; TOW ATGW; 40mm L70 AA guns; *Honest John* SSM; 60 *Alouette* III, 24 BO-105 hel. (850 M-113 APC, 95 *Gepard* SP AA guns, *Lance* SSM on order.)

Deployment: *Germany*: 1 armd bde, 1 tk, 1 recce bn.

Reserves: 145,000; 1 armd, 2 inf bdes, and corps troops, incl 1 indep inf bde, would be completed by call-up of reservists. A number of inf bdes could be mobilized for territorial defence.

**Navy:** 18,200, incl 3,000 Marines, 1,900 naval air arm, 3,000 conscripts.  
 6 submarines.  
 2 frigates with *Tartar*/Sea Sparrow SAM.





6 frigates with *Seacat* SAM and 1 lt ASW hel.  
10 destroyers.  
11 coastal escorts.  
37 MCM ships (3 support, 18 coastal, and 16 inshore).  
2 fast combat support ships.  
(8 frigates, *Harpoon* SSM on order.)

#### Marines:

2 amphibious combat groups.  
1 mountain/arctic warfare company.

#### Naval Air Arm:

2 MR sqns with 8 *Atlantic*, 15 P-2 *Neptune*.  
2 ASW hel sqns with 6 AB-204B and 12 *Wasp* (16 *Lynx* on order).

**Deployment:** *Netherlands Antilles*: 1 destroyer, 1 amphibious combat det, 1 MR det (3 ac).

**Reserves:** about 20,000; 9,000 on immediate recall.

**Air Force:** 19,000, incl 7,400 conscripts; 160 combat aircraft.

2 FB squadrons with 36 F-104G.  
4 FB squadrons with 70 NF-5A/B.  
2 interceptor squadrons with 36 F-104G.  
1 reconnaissance squadron with 18 RF-104G.  
1 transport squadron with 12 F-27.  
20 NF-5B trainers.  
4 SAM squadrons with *Nike Hercules*.  
8 SAM squadrons with 48 *HAWK*.  
(84 F-16 on order.)

**Reserves:** about 18,300.

**Para-Military Forces:** 3,700 Gendarmerie; 4,000 Home Guard.

## NORWAY

Population: 4,040,000.

Military service: Army 12 months, Navy and Air Force 15 months.

Total armed forces: 39,000, incl 25,000 conscripts.

Estimated GNP 1975: \$29.6 bn.

Defence expenditure 1976: 4,900 m kroner (\$896 m).

\$1 = 5.47 kroner (1976), 4.94 kroner (1975).

**Army:** 20,000, incl 16,000 conscripts.

1 brigade group of 3 inf bns in North Norway.

Indep armd sqns, inf bns, and arty regts.

78 *Leopard*, 38 M-48 med, 70 NM-116 lt tks (M-24/90); BV-202, M-113 APC; 105mm, 130 155mm (incl M-109 SP) how; 107mm mor; 75mm, 84mm *Carl Gustav*, 106mm RCL; *ENTAC*, *TOW* ATGW; 50 Rh-202

20mm, 40mm L-60 AA guns; L-18/-19 lt ac. (250 Rh-202 20mm AA guns on order.)

**Reserves:** 130,000. 11 Regimental Combat Teams (bdes) of about 5,000 men each, supporting units, and territorial forces; 21 days' refresher training each 3rd/4th year. Home Guard (all services) 80,000 (all have done full military service).

**Navy:** 9,000, incl 1,600 coastal artillery and 5,000 conscripts.

15 coastal submarines.

5 frigates/escorts with *Sea Sparrow* SAM and *Penguin* SSM.

2 coastal escorts.

26 FPBG with *Penguin* SSM.

20 MTB.

10 coastal minesweepers and 3 minelayers.

1 support ship.

7 landing craft.

6 patrol ships (fishery protection).

36 coastal artillery batteries.

(14 FPBG with *Penguin* SSM on order.)

**Reserves:** 22,000.

**Air Force:** 10,000, incl 4,000 conscripts; 131 combat aircraft.

3 FGA squadrons with 75 F-5A.

1 FGA squadron with 22 CF-104G.

1 AWX squadron with 16 F-104G.

1 reconnaissance squadron with 13 RF-5A.

1 MR squadron with 5 P-3B.

2 ipt sqns: 1 with 6 C-130H, 1 with 5 *Twin Otter*.

1 SAR sqn with 10 *Sea King* hel.

2 hel sqns with 32 UH-1B.

20 *Saab Safir*, 14 RF-5B trainers, 2 *Falcon* ECM ac.

4 lt AA bns with 40mm L70 guns.

4 SAM batteries with *Nike Hercules*.

(72 F-16, *Lynx* hel, *Roland II* SAM on order.)

**Reserves:** 18,000. 7 lt AA bns for airfield defence with 40mm L60 guns.

## PORTUGAL

Population: 8,770,000.

Military service: Army 15 months.

Total armed forces: 59,800.

(The three services are likely to be reduced, the army to 26,000, the navy and air force to 8,000 each.)

Estimated GNP 1976: \$18.1 bn.

Defence expenditure 1976: 28,775 m escudos (\$959 m).

\$1 = 30 escudos (1976), 24.4 escudos (1975).

**Army:** 36,000.

1 infantry brigade.

3 cavalry regiments.

11 infantry battalions.

5 artillery regiments.

2 engineer regiments.

1 signals regiment.

115 M-47 and M-4 med, 40 M-24 lt tks; 40

Humber Mk IV and EBR-75 armd cars;

40 FV-1609 and M-16 half-track APC; 130

25-pdr, 25-pdr SP, 30 5.5 in., 150 75mm,

105mm, 150mm guns/how; 106mm RCL;

coast and AA arty.

**Navy:** 13,800, incl Marines.

3 submarines (*Daphne*-class).

7 frigates.

10 corvettes.

10 patrol vessels.

4 coastal minesweepers.

16 landing craft.

**Air Force:** 10,000; 46 combat aircraft.

(Many aircraft are in storage, incl some

60 G-91, 16 F-86F, 70 T-6/-6K, 140 Do-

127, 20 *Alouette* III.)

2 FGA squadrons with 18 G-91.

1 interceptor squadron with 20 F-86F.

1 MR squadron with 8 P-2V5 *Neptune*.

2 Boeing 707, 20 *Noratlant*, 17 C-47, 10

DC-6, 16 Do-27, 24 *CASA* 212A/B tpts.

6 G-91T, 12 T-33, 25 T-37, 40 T-6, 30 *Chip-*

*munk*, 32 *Reims-Cessna* FTB 337G

trainers.

34 *Alouette* III, 12 SA-330 *Puma* hel.

1 parachute regiment of 2,000.

**Para-Military Forces:** 9,700 National Republican Guard; 13,700 Public Security Police.

## TURKEY

Population: 40,130,000.

Military service: 20 months.

Total armed forces: 480,000, incl 257,000 conscripts.

Estimated GNP 1975: \$33.1 bn.

Defence expenditure 1976-77: 44,700 liras (\$2,794 m).

\$1 = 16.0 liras (1976), 15.1 liras (1975).

**Army:** 375,000, incl 200,000 conscripts.

1 armoured division.

2 mechanized infantry divisions.

14 infantry divisions.

6 armoured brigades.

4 mechanized infantry brigades.

5 infantry brigades.

1 parachute brigade.

1 commando brigade.

3 SSM battalions with *Honest John*.

2,500 M-47 and M-48 med tks; 1,100 M-113

APC; 440 105mm, 200 155mm, 36 175mm

SP guns; 2,000 75mm, 105mm, 150mm,

155mm, and 203mm how; 60mm, 81mm,

4.2-in mor; 57mm, 75mm, 106mm RCL;

SS-11, *Cobra*, *TOW* ATGW; 37mm, 40mm,

77mm AA guns; 18 *Honest John* SSM; 10

*Beaver*, 110 U-17, 80 L-18, 15 Do-27, 9

Do-28D-1, 70 O-1E, 30 T-41/-42 ac; 55

AB-205/-206, 60 OH-135, 12 TH-13T, 20

UH-1B hel. (*TOW*, *Milan* ATGW on order.)

**Deployment:** *Cyprus*: 2 inf divs.

**Reserves:** 800,000.

**Navy:** 40,000 (32,000 conscripts).

14 submarines (3 more building).

12 destroyers (4 with hel).

2 frigates.

12 FPB (some with SSM).

41 large, 13 coastal patrol craft.

21 coastal and 4 inshore minesweepers.

9 minelayers (6 coastal).

Some 50 landing craft.

1 MR sqn with 14 S-2E *Tracker* (2 trainers).

3 AB-204A ASW helicopters.

(18 FPBG building, AB-212 hel on order.)

**Reserves:** 25,000.

**Air Force:** 45,000, incl 25,000 conscripts; 370 combat aircraft.

14 FGA sqns: 2 with 40 F-4E, 5 with 100G

F-5A, 1 with 18 F-104S, 2 with 36 F-104G,

3 with 50 F-100D/F, 1 with 24 F-84F.

3 AWX sqns: 2 with 36 F-102A, 1 with 18

F-104S.

3 recce sqns: 2 with 36 RF-5A, 1 with 12

RF-84.

7 ipt sqns with 20 C-47, 8 C-130E, 15

*Transall* C-160, 3 C-54, 6 C-45, 3 *Vis-*

*count*, 2 *Islander*.

1 SAR hel sqn with 15 UH-1H and 8 UH-19D.

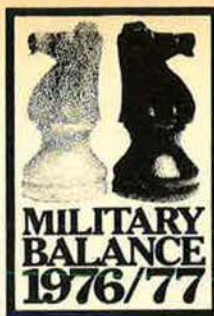
6 SAM squadrons with *Nike Ajax/Hercules*.

40 T-6, 80 T-33, 20 T-34, 45 T-37, 30 T-41

trainers. (F-104S, *Sparrow* AAM on order.)

**Para-Military Forces:** 75,000 Gendarmerie (including 3 mobile brigades).





# Other European Countries

## ALBANIA

Population: 2,570,000.  
 Military service: Army 2 years; Air Force, Navy, and special units 3 years.  
 Total armed forces: 47,000, incl 22,500 conscripts.  
 Estimated GNP 1974: \$1.1 bn.  
 Defence expenditure 1976: 783 m leks (\$157 m).  
 \$1=5 leks.

**Army:** 36,000, incl 20,000 conscripts.  
 1 tank brigade.  
 2 tank battalions.  
 8 infantry brigades.  
 1 artillery regiment.  
 2 air defence regiments.  
 3 light coastal artillery battalions.  
 70 T-34, 15 T-54, 15 T-59 med, 40 T-62 lt tks; 20 BA-64, BTR-40/-152 APC; SU-76 SP guns; 76mm, 85mm, 122mm, 152mm, guns/how; 120mm, 160mm mor; 107mm RCL; 76mm, 85mm ATK guns; 37mm, 85mm, 100mm AA guns; SA-2 SAM.

**Navy:** 3,000, incl 1,000 conscripts.  
 4 submarines (Soviet W-class, 1 training).  
 4 coastal escorts (Soviet *Kronstadt*-class).  
 42 MTB (12 Soviet P-4, 30 Chinese *Hu Chwan*-class hydrofoils).  
 4 *Shanghai*-class MGB.  
 8 MCM ships (2 Soviet T-43-, 6 T-301-class).  
 10 patrol boats (Soviet PO-2).

**Air Force:** 8,000, incl 1,500 conscripts; 96 combat aircraft.  
 4 fighter squadrons with 24 MiG-15, 24 MiG-17.  
 4 interceptor squadrons with 36 MiG-19/F-6, 12 MiG-21/F-8 (Chinese).  
 1 transport squadron with 3 Il-14, 3 An-2.  
 2 helicopter squadrons with 30 Mi-4.  
 Trainers include 10 MiG-15UTI, Yak-18.

Reserves (all services): 100,000.

Para-Military Forces: 13,000: Internal security force 5,000; frontier guard 8,000.

## AUSTRIA

Population: 7,600,000.  
 Military service: 6 months, followed by 60 days' reservist training for 12 years.  
 Total armed forces: 37,300, incl 25,000 conscripts.  
 Estimated GNP 1975: \$42.5 bn.



Finland's small navy and its army have largely Soviet-built equipment. The Finnish Air Force includes Soviet, British, and Swedish manufactured aircraft.

Defence expenditure 1976: 7,922 m schilling (\$433 m).  
 \$1=18.3 schilling (1976), 16.6 schilling (1975).

**Army:** 33,000, incl 23,000 conscripts.  
 3 mech brigades, each with 1 tk, 2 mech inf, 1 armd arty bns.  
 4 infantry brigades, each with 3 inf, 1 arty bns.  
 3 artillery battalions.  
 1 commando battalion.  
 5 engineer battalions.  
 5 signals battalions.  
 114 M-47, 120 M-60 med tks; 467 Saurer 4K4F APC; 132 M-2 105mm, M-1 155mm how, 38 M-109 155mm SP how; 18 130mm Praga V2S multiple RL; 300 81mm, 102 M-2 107mm, 82 M-30 120mm mor; 158 M-18 57mm, 47 M-20 75mm, 392 M-40 106mm RCL; 240 M-52, M-55 85mm, 120 *Kuerassier* SP ATK guns. (24 *Kuerassier* SP ATK guns on order.)

Deployment: Cyprus (UNFICYP): 1 inf bn (311 men); Syria (UNDOF): 1 bn (515); other Middle East UN: 12.

Reserves: 112,000; 3 reserve brigades (each of 3 inf, 1 arty bns), 16 regiments, and 4 battalions of *Landwehr* distributed among 8 regional military commands. 690,000 have a reserve commitment.

**Air Force:** 4,300, incl 2,000 conscripts; 30 combat aircraft. (Austrian air units, an integral part of the Army, are listed separately for purposes of comparison.)  
 3 FB sqns with 30 Saab 105Ö.  
 1 tpt sqn with 3 *Beaver*, 2 *Skyvan*.  
 6 hel sqns with 23 AB-204B, 13 AB-206A, 24 *Alouette* III, 12 OH-58B, 2 S-650E/OH-53A.  
 2 training sqns with 18 Saab 91D, 7 Saab 105Ö.  
 Other ac incl 23 Cessna L-19, 18 O-1A/E.  
 4 independent air defence battalions.  
 297 20mm Oerlikon, 72 35mm Z/65 *Super-Bat*, 61 Types 55, and 57 40mm Bofors AA guns; *Skyguard* AD system.  
 (12 *Turbo Porter* on order.)

Reserves: 700.

Para-Military Forces: 11,250 Gendarmerie.

## EIRE

Population: 3,150,000.  
 Military service: voluntary.  
 Total armed forces: 14,000.  
 Estimated GNP 1975: \$7.8 bn.  
 Defence budget 1976: £73.0 m (\$134 m).  
 \$1=£0.544 (1976), £0.456 (1975).

**Army:** 12,800.





Sweden's Air Force, with more than 600 combat planes in units or in storage, is one of the world's largest. It includes eighteen squadrons of these J-35 Drakens.

9 infantry battalions.  
 4 reconnaissance squadrons.  
 3 field artillery batteries.  
 7 engineer companies.  
 1 AA battery.  
 10 AML H90, 24 AML H60 AFV; 50 Panhard VTT/M3, 10 Unimog, some 6 Landsverk 180 APC; 48 25-pdr gun/how; 72 m/41C 120mm mor; 447 Carl Gustav, 96 90mm IIO RCL; 26 40mm Bofors AA guns.

**Navy:** 500.  
 1 fishery protection vessel (1 more on order).  
 3 coastal minesweepers (ex-British Ton-class).

**Air Force:** 700; 9 combat aircraft.  
 1 COIN sqn with 6 Super Magister.  
 3 Vampire, 7 Chipmunk, 8 Cessna FR-172H trainers; 2 Dove Lt tpts; 8 Alouette III hel. (10 SF-260W COIN ac on order.)

Reserves: 18,100; 1st line 600, 2nd line 17,500.

## FINLAND

Population: 4,720,000.  
 Military service: 8-11 months (11 months for officers and NCOs).  
 Total armed forces: 35,800 (28,000 conscripts).  
 Estimated GNP 1975: \$27.6 bn.  
 Defence expenditure 1976: 1,406 m markka (\$364 m).  
 \$1=3.86 markka (1976), 3.53 markka (1975).

**Army:** 30,300.  
 1 armoured brigade.  
 6 infantry brigades.  
 6 independent infantry battalions.  
 3 field artillery regiments.  
 1 independent field artillery battalion.  
 3 coast artillery regiments.  
 2 independent coast artillery battalions.  
 1 AA regiment.  
 4 independent AA battalions.

T-34, T-54, T-55, Charioteer med, PT-76 lt tks; BTR-50P APC; 105mm, 122mm, 130mm, 150mm, 152mm guns/how; 60mm, 81mm, 120mm, 160mm mor; 75mm, 95mm RCL; Vigilant, SS-11 ATGW; ZSU-57-2 SP, 30mm, 40mm, 80mm AA guns.

Deployment: Cyprus (UNFICYP): 425; Egypt (UNEF): 500.

**Navy:** 2,500.  
 2 Riga-class frigates.  
 2 corvettes.  
 4 Osa-class FPBG with Styx SSM.  
 15 MGB.  
 5 large, 13 small patrol craft.  
 1 coastal minelayer.  
 6 inshore minesweepers.  
 6 small landing craft/transports.

**Air Force:** 3,000; 80 combat aircraft.  
 3 fighter squadrons with 24 MiG-21F, 18 Saab Draken, and 38 Magister.  
 Tpts incl 6 C-47, 2 Beaver, 2 Pembroke, 5 Cherokee Arrow.  
 Trainers incl 33 Magister, 30 Saab Safir, 3 MiG-15UTI, 4 MiG-21UTI.  
 1 hel flight with 3 Mi-4, 4 Mi-8, 2 Alouette II, 1 Hughes 500, 1 AB-206A.  
 (6 Saab J-35 Draken, 6 J-35F, 3 J-35C on order.)

Reserves (all services): 690,000 (30,000 a year do training).

Para-Military Forces: 4,000 frontier guards.

## SPAIN

Population: 36,000,000.  
 Military service: 18 months.  
 Total armed forces: 302,300 (213,400 conscripts).  
 Estimated GNP 1975: \$94.5 bn.  
 Defence expenditure 1975: 119.2 bn pesetas (\$1.766 m).  
 \$1=67.5 pesetas (1976), 56.1 pesetas (1975).

**Army:** 220,000, incl 170,000 conscripts.  
 1 armoured division.  
 1 mechanized infantry division.  
 1 motorized infantry division. (about 70 per cent strength)  
 2 mountain divisions.  
 1 armoured cavalry brigade.  
 10 independent infantry brigades.  
 1 mountain brigade.  
 1 airportable brigade.  
 1 parachute brigade.  
 2 artillery brigades.  
 5 coast artillery regiments.  
 3 Foreign Legion regiments.  
 2 Regulares regiments (local forces in Ceuta and Melilla).  
 1 SAM bn with Nike Hercules and HAWK.  
 45 AMX-30, 500 M-47/-48 med, 230 M-41 lt tks; 40 AML-60/-90, 70 M-3, 150 M-113 APC; 1,000 105mm and 155mm guns/how; 80 105mm, 155mm, and 175mm SP guns/how; 108mm, 216mm, 300mm multiple RL; 60mm, 81mm, 120mm mor; 75mm, 90mm, 106mm RCL; Milan, Cobra, AS-11, ATGW; 550 40mm, 60mm, 88mm, and 90mm AA guns; 88mm, 6-in, 15-in coast artillery guns; Nike and HAWK SAM; 12 UH-1B, 16 UH-1H, 16 AB-206A, 6 CH-47C, 3 Alouette III, 6 Bell 47G hel. (160 AMX-30; BMR-600; 6 CH-47 hel on order.)

Deployment: 35,000:  
 Balearic Islands: 6,000.  
 Canary Islands: 10,000.  
 Ceuta: 9,000.  
 Melilla: 10,000.

**Navy:** 46,600, incl 8,000 Marines, 35,000 conscripts.  
 11 submarines (4 Daphne-class, 5 US, 2 midget).  
 1 helicopter carrier (capacity 20 helicopters).  
 13 destroyers (10 ex-US Gearing-, Fletcher-class).  
 13 frigates/corvettes (5 with Standard SAM and ASROC, 1 training, 5 more on order).  
 2 motor torpedo boats.  
 22 minesweepers.  
 21 patrol craft (13 coastal).



8 large landing ships, 8 tank landing craft. 1 comms sqn with 4 *Comanche*.  
6 helicopter squadrons with 12 SH-3D, 11 AB-204AS/-212AS, 12 Bell 47, 18 Hughes 500HM, 8 AH-1G, 5 S-55.  
4 marine lt inf regts and 2 indep gps. (8 AV-8A *Harrier* ac, 12 *Sea King*, 12 AH-1G hel on order.)

**Air Force:** 35,700, incl 8,400 conscripts; 205 combat aircraft.  
5 fighter sqns with 35 F-4C(S), 24 *Mirage* IIIE, 6 IIIDE, 15 *Mirage* F-1CE.  
1 FGA sqn with 18 F-5A, 2 F-5B.  
2 COIN sqns with 40 HA-200D, 25 HA-220 *Saeta*.  
2 recce sqns: 1 with 18 RF-5A, 2 F-5B, 1 with 6 CASA C-212B.  
1 MR sqn with 11 HU-16B *Albatross* and 3 P-3A.  
3 SAR sqns with 11 AB-205, 8 HU-16A, 10 *Alouette* III, and AB-206A hel.  
8 tpt/liaison sqns: 1 with 16 C-54, 2 with 28 C-47, 1 with 4 TK-10 (C-130H); 1 with 20 CASA 207A/B, 1 with 20 CASA C-212, 1 with 12 DMC-4 *Caribou*, 1 with 10 O-1E, 10 Do-27.  
1 sqn with 10 Canadair CL-215.  
1 tanker sqn with 3 KC-97.  
Other ac incl 5 Convair C-440, 1 *Falcon* 20, 8 *King Air*, 10 HU-16B.  
Trainers incl: 30 F-5B, 40 T-33, 25 T-34, 25 Bu 131, 55 AISA I-115, 20 T-6G, 30 HA-200A, 2 C-212E.  
Hel incl 15 AB-205, 5 AB-206, 15 Bell 47G. (42 F-4E, 14 CASA C-212 on order.)

*Para-Military Forces:* 65,000 Guardia Civil.

## SWEDEN

Population: 8,230,000.  
Military service: Army and Navy 7½–15 months, Air Force 9–14 months.  
Total armed forces: 65,400, incl 49,300 conscripts.  
(There are some 120,200 more conscripts—105,000 army, 9,400 navy, 5,800 air force—doing 18–40 days' refresher training at some time in the year, plus 15,000 officer and NCO reservists doing similar training.)  
Estimated GNP 1975: \$73.0 bn.  
Defence expenditure 1976–77: kr. 10,613 m. (\$2,418 m).  
\$1=4.39 kroner (1976), 3.94 kroner (1975).

**Army:** 46,000, incl 36,500 conscripts.  
5 armoured brigades.  
16 infantry brigades.  
4 *Norrland* brigades.  
50 independent infantry, artillery, and AA battalions.  
23 Local Defence Districts with 100 independent battalions and 400–500 independent companies.  
49 non-operational armoured, infantry, and artillery training units for basic conscript training.  
350 Strv 101, 102 (*Centurion*), 300 103B (S-tank) med, Strv 74, lkv 91 lt tks; Pbv 302A and SKPF APC; lkv 102 and lkv 103 105mm, and Bk 1-A (L/50) 155mm SP guns; 105mm, 150mm, 155mm how; 90mm ATK guns; SS-11, *Bantam* ATGW; *Carl Gustav*, *Miniman* RCL; 20mm, 40mm, 57mm AA guns; *Redeye*, RBS-70, *HAWK* SAM; 20 Sk-61 (*Bulldog*), 12 Piper *Super Cub*, 5 Do-27; 19 Hkp-3 (AB-204B), 40 Hkp-6 (*JetRanger*), 6 Hkp-2 (*Alouette* II) hel. (lkv 91 lt tanks on order.)

*Deployment:* Cyprus (UNFICYP): 425; Egypt (UNEF): 488.

**Navy:** 11,200, incl 7,100 conscripts.  
17 submarines (3 more building).

6 destroyers (2 with Rb-08 SSM, 4 with *Seacat* SAM).  
2 ASW destroyers (2 with lt hel).  
1 FPBG with *Penguin* SSM (16 more on order).  
21 large torpedo boats.  
12 MTB, 22 patrol launches (under 100 tons).  
3 minelayers (1 command ship).  
9 coastal minelayers.  
26 coastal minesweepers.  
18 inshore minesweepers (8 under 100 tons).  
69 landing craft (9 medium, 60 utility of under 100 tons).  
20 mobile and 45 static coastal artillery batteries with 75mm, 105mm, 120mm, 152mm, 210mm guns, and Rb-08, Rb-52 (SS-11) SSM.  
10 Hkp-2, 3 Hkp-4B (Vertol 107), 7 Hkp-4C (KV-107/II), and 10 Hkp-6 hel.

**Air Force:** 8,200, incl 5,700 conscripts; 550 combat aircraft. (There are further aircraft in storage, including 110 A-32A.)  
9 FGA sqns: 4 with 40 A-32A *Lansen* (with Rb-04E ASM), 4 with 72 AJ-37 *Viggen*, 1 with 20 Sk-60B/C (Saab 105).  
18 AWW sqns; 13 with J-35F, 5 with J-35D/F *Draken*.  
2 recce/fighter sqns with 30 S-32A *Lansen*.  
2 recce sqns with 36 S-35E *Draken*.  
2 tpt sqns with 3 C-130E, 3 *Caravelle*, 7 C-47.  
5 comms sqns with 110 Sk-60A/B, 57 Sk-61, 5 hel groups (2–4 ac each) with 1 Hkp-2, 6 Hkp-3, 10 Hkp-4B.  
2 SAM sqns with *Bloodhound* II.  
There is a fully computerized, fully automatic control and air surveillance system, *Stril* 60, co-ordinating all air defence components. (*Maverick* ASM on order.)

*Reserves* (all services): voluntary defence organizations 500,000.

## SWITZERLAND

Population: 6,640,000.  
Military service: 17 weeks' recruit training followed by reservist refresher training of 3 weeks for 8 out of 12 years for *Auszug* (age 20–32), 2 weeks for 3 years for *Landwehr* (33–42), 1 week for 2 years for *Landsturm* (43–50).  
Total armed forces: 46,500, incl 40,000 recruits. There are also some 300,000 reservists called up for refresher training at some time during the year. (Total mobilizable strength 625,000; militia can be mobilized within 48 hours.)  
Estimated GNP 1975: \$58.2 bn.  
Defence expenditure 1976: fr 3,041 m (\$1,221 m).  
\$1=2.49 francs (1976), 2.50 francs (1975).

**Army:** 37,500, incl 34,000 recruits, excluding Aviation Brigade.  
3 corps, each of 1 mech, 1 inf, 1 frontier div.  
1 mountain corps of 3 mountain infantry divs.  
23 independent brigades (11 frontier, 6 territorial, 3 fortress, 3 redoubt).  
Independent formations (1 armd car bn, 3 hy arty, 2 engr, 2 sig regts).  
300 *Centurion*, 150 Pz-61, 170 Pz-68 med, 200 AMX-13 lt tks; 1,250 M-113, Mowag APC; 105mm guns; 105mm, 155mm, 150 M-109U 155mm SP how; 80mm multiple RL; 120mm mor; 83mm, 106mm RCL; 75mm, 90mm, 105mm ATK guns; 10 patrol boats. (110 Pz-68 on order.)

**Air Force** (Aviation Brigade, part of the Army): 9,000, incl 6,000 recruits (maintenance is by civilians); 345 combat aircraft.

9 FGA sqns with 140 *Hunter* F58.  
9 FGA sqns with 150 *Venom* FB50.  
2 interceptor sqns with 39 *Mirage* IIIS/BS.  
1 recce sqn with 16 *Mirage* IIIRS.  
1 tpt sqn with 3 Ju-52/3m.  
5 lt ac sqns with 6 Do-27, 12 Pilatus PC-6 *Porter*.  
2 hel sqns with 30 *Alouette* II/III.  
Other ac incl 50 Pilatus P-2, 70 P-3, 65 *Vampire* FB6, 35 T55, 23 C-3605; 70 *Alouette* II/III hel.  
1 parachute company.  
3 air-base regiments.  
1 air-defence brigade with 1 SAM regt of 2 bns, each with 32 *Bloodhound*, and 7 arty regts (22 bns) with 176 20mm and 35mm AA guns. (66 F-5E, 6 F-5F on order.)

*Reserves:* 578,500.

## YUGOSLAVIA

Population: 21,540,000.  
Military service: Army and Air Force 15 months; Navy 18 months.  
Total armed forces: 250,000, incl 155,000 conscripts.  
Estimated GDP 1975: \$30.2 bn.  
Defence expenditure 1976: 32,370 m dinars (\$1,798 m).  
\$1=18.0 dinars (1976), 17.3 dinars (1975).

**Army:** 200,000, incl 140,000 conscripts.  
9 infantry divisions.  
7 independent tank brigades.  
11 independent infantry brigades.  
3 mountain brigades.  
1 airborne battalion.  
12 artillery regiments.  
6 anti-tank regiments.  
12 AA artillery regiments.  
1,500 T-54/55, T-34, and M-47, about 650 M-4 med, some PT-76 lt tks; M-3, M-8, BTR-50P/-60P/-152, M-60 APC; M-18 (76mm), M-36 (90mm), SU-100 SP guns; 105mm SP how; 76mm, 105mm, 122mm, 152mm, 155mm guns/how; 130mm multiple RL; 120mm mor; 75mm, 82mm RCL; 57mm, 75mm, 100mm ATK guns; *Snapper*, *Sagger* ATGW; 20mm, 30mm, 37mm, 40mm, 57mm, 85mm, 88mm, ZSU-57-2 SP AA guns.

**Navy:** 20,000, incl Marines and 8,000 conscripts.  
5 submarines.  
1 destroyer.  
10 Osa-class FPBG with *Styx* SSM.  
15 *Shersten*-class MTB.  
16 patrol craft.  
15 inshore, 14 river minesweepers.  
31 landing craft.  
25 coastal artillery batteries.  
1 marine brigade.

**Air Force:** 30,000, incl 7,000 conscripts; 350 combat aircraft.  
12 FGA sqns with 15 F-84G, 30 *Kraguj*, 150 *Galeb/Jastreb*.  
8 fighter sqns with 110 MiG-21F/PF.  
3 recce sqns with 20 RT-33A, 25 *Galeb/Jastreb*.  
56 tpts, incl C-47, Il-14, Il-18, An-12, and Yak-40.  
60 *Galeb*, 30 T-33, and 30 MiG-21UTI trainers.  
10 *Whirlwind*, 18 Mi-4, 12 Mi-8, 30 SA-341 *Gazelle*, 20 *Alouette* III, some Kz-25 ASW hel. (102 *Gazelle* on order.)  
8 SAM batteries with 48 SA-2.

*Para-Military Forces and Reserves:* 500,000 Reservists, 14,000 Frontier Guards, 600,000 Territorial Defence Force, 300,000 Youth units.



# YC-14 Airborne!

## General Electric F103 engines used in Boeing AMST for new concept in powered lift



In early August, the Boeing YC-14 Advanced Medium STOL Transport (AMST) made a flawless first flight to make the beginning of a planned 365-hour flight test program.

Engines for the YC-14 are two General Electric F103 high bypass turbofans in the 50,000 pound thrust class. The F103 is an advanced technology military version of the highly reliable GE CF6-50 that powers commercial wide-body transports.

An innovative upper surface blowing system provides power lift for the YC-14 by deflecting engine exhaust along the curve of the wing and downward.

This enables the aircraft to fly in and out of short, semi-prepared fields with relatively large loads. Air Force goals call for the aircraft to carry 27,000 pounds of cargo out of a 2000-foot field — about one third the distance needed by standard jet aircraft of comparable size.

The YC-14 is part of the Air Force AMST prototype development program, directed by Air Force Systems Command Aeronautical Systems Division at Wright Patterson Air Force Base, Ohio.

The F103 for the YC-14... yet another case of GE technology at work to help make major advances in military aviation possible.

205-161

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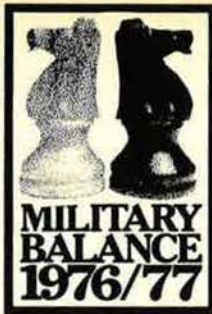


**WE FLY BY DATALINK**  
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*LEAR SIEGLER, INC. /  
ASTRONICS DIVISION*







# The Middle East and The Mediterranean

## BILATERAL AGREEMENTS WITH EXTERNAL POWERS

The Soviet Union has a fifteen-year treaty of friendship and co-operation with Iraq which was signed in April 1972. A similar but more comprehensive treaty with Egypt, signed in May 1971, was abrogated by Egypt in March 1976. Before May 1975 the Soviet Union was a major arms supplier to Egypt but no significant quantities of arms or spare parts have been delivered since then. She continues to deliver arms to Iraq, Syria, and Libya, and military assistance has also been provided to Algeria, Morocco, Sudan, and the People's Democratic Republic of Yemen.

The United States has varying types of security assistance agreements and has been providing military aid on either a grant or credit basis to Greece, Turkey, Portugal, Spain, Morocco, Tunisia, Lebanon, Jordan, Saudi Arabia, and Israel. She provides, in addition, a significant amount of military equipment on a cash-sales basis to many countries, notably Greece, Spain, Israel, Iran, Kuwait, Saudi Arabia, and Jordan, and has recently agreed to the cash sale of transport aircraft and a limited amount of military training to Egypt.

There are US military facilities in Greece, Portugal (Azores), and Turkey, all recently the subject of renegotiation. A treaty with Spain extending the use of military bases in Spain for five years was signed on 24 January 1976 and ratified in June 1976. The United States has limited and temporary base rights in Bahrain, and communications facilities are maintained in Morocco under informal arrangements.

Britain has a seven-year agreement with the Republic of Malta, which was signed on 26 March 1972. The agreement permits her to base forces on the island for British and for NATO purposes. This agreement expires on 31 March 1979, and Britain has announced that her forces will be withdrawn from Malta between April 1977 and that date. Britain concluded treaties of friendship with Bahrain, Qatar, and the United Arab Emirates in August 1971 and is also an arms supplier to Iran, Kuwait, Bahrain, Qatar, the United Arab Emirates, Saudi Arabia, Oman, Jordan, and Egypt. Some British troops have been aiding government forces in Oman and providing training and technical assistance.

Britain—a signatory, with Greece and Turkey, of the 1959 Treaty of Guarantee which guarantees the independence, territorial integrity and security of the Republic of Cyprus—maintains a garrison in two Sovereign

Base Areas in Cyprus. Greece and Turkey are each entitled to maintain a contingent in the island under an associated Treaty of Alliance with the Republic. Turkish forces in Cyprus were very substantially increased in July 1974, and the constitutional provisions of the 1959 Agreement are now under review.

The People's Republic of China has supplied arms to Albania, Sudan, and the People's Democratic Republic of Yemen.

France has a military mission in Morocco and supplies arms to a number of countries, including Greece, Libya, Morocco, Abu Dhabi, Iraq, Kuwait, and Saudi Arabia.

## MULTILATERAL AGREEMENTS INCLUDING EXTERNAL POWERS

The members of the Central Treaty Organization (CENTO) are Britain, Iran, Pakistan, and Turkey, with the United States as an associate. All sit on the Military, Economic, and Counter-Subversion Committees and on the Permanent Military Deputies Group. The Treaty provides for mutual co-operation for security and defence but has no central command structure for forces allocated to it. For the local powers, the economic organization of Regional Co-operation for Development (RCD), which has evolved independently out of CENTO, is a basis for more concrete co-operation.

There are United Nations forces stationed in Cyprus (UNFICYP), in Syria (UNDOF), and in Egypt (UNEF).

## ARRANGEMENTS WITHIN THE REGION

Algeria, Bahrain, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, the United Arab Emirates, the Yemen Arab Republic, and the People's Democratic Republic of Yemen are members of the League of Arab States. Among its subsidiary bodies are the Arab Defence Council, set up in 1959, and the Unified Arab Command, organized in 1964.

Defence agreements were concluded by Egypt with Syria in November 1966 and Jordan in May 1967, to which Iraq later acceded. These arrangements provided for the establishment of a Defence Council and Joint Command. The loosely associated Eastern Front Command, comprising Iraq, Jordan, the Palestine Liberation Army, and Syria, was reorganized in December 1970 into separate Jordanian and Syrian commands. Iraq and Syria concluded defence pacts in May 1968 and July 1969, but friction between the



two countries casts some doubt on their application. Jordan and Syria have recently set up a joint committee to co-ordinate economic and political planning and have set up a Syrian-Jordanian consultative body to co-ordinate military policy. The Federation of Arab Republics, formed by Libya, Syria, and Egypt in April 1971, provided for a common defence policy and a Federal Defence Council,

and in January 1973 an Egyptian Commander-in-Chief was appointed to command all Federation forces. The present status of this agreement is unclear. Algeria and Libya signed a defence agreement in December 1975.

Iran has provided military assistance to Oman, and Iranian and Jordanian troops have been assisting government forces there.

## ALGERIA

Population: 17,330,000.  
Military service: 6 months.  
Total armed forces: 69,300.  
Estimated GDP 1974: \$12.2 bn.  
Defence expenditure 1976: 1,288 m dinars (\$312 m). \$1=4.13 dinars (1976), 3.96 dinars (1974).

### Army: 61,000.

1 armoured brigade.  
4 motorized infantry brigades.  
3 independent tank battalions.  
50 independent infantry battalions.  
1 parachute battalion.  
12 companies of desert troops.  
10 independent artillery battalions.  
5 AA battalions.  
3 engineer battalions.  
100 T-34, 300 T-54/-55 med tks; 50 AMX-13 lt tks; 30 BTR-152 APC; 5 SU-85, 85 SU-100, and JSU-152 SP guns; 600 85mm, 122mm, 155mm guns and how; 240 120mm and 240mm mor; Sagger ATGW; 20 140mm and 40 240mm RL; 14 FROG-4 SSM; 85mm and 100mm AA guns.

Reserves: about 100,000.

### Navy: 3,800.

6 ex-Soviet SO-1 submarine chasers.  
6 Komar- and 3 Osa-class FPBG with Styx SSM.  
12 ex-Soviet P-6 torpedo boats.  
2 fleet minesweepers (ex-Soviet T-43 class).

### Air Force: 4,500; 182 combat aircraft.

2 lt bomber sqns with 24 Il-28.  
3 interceptor sqns with 40 MiG-21.  
6 FGA sqns: 1 with 20 Su-7BM, 4 with 50 MiG-17, 1 with 20 MiG-15.  
2 COIN sqns with 28 Magister.

2 tpt sqns with 8 An-12, 6 F-27, 4 Il-28, 12 Il-14.  
4 hel sqns with 4 Mi-6, 42 Mi-4, 5 Mi-8, 6 Hughes 269A, and 5 SA-330.  
1 trainers incl MiG-15/-17/-21UTI, Yak-11/-18.

Para-Military Forces: 10,000 Gendarmerie.

## EGYPT

Population: 38,040,000.  
Military service: 3 years.  
Total armed forces: 342,500.  
Estimated GNP 1975: \$11.7 bn.  
Defence expenditure 1976-77: £E 1,900 m (\$4,859 m).  
\$1=£E 0.391 (1976), £E 0.426 (1975).

Army: 295,000, incl Air Defence Command.  
3 armd divs (each with 1 armd, 2 mech bdes).

3 mechanized infantry divisions.  
5 infantry divisions (each with 2 inf bdes).  
1 Republican Guard Brigade (division).  
5 independent armoured brigades.  
2 independent mechanized brigades.  
2 airmobile brigades.  
1 parachute brigade.  
6 commando groups.  
4 artillery brigades.  
2 heavy mortar brigades.  
2 SSM regiments (up to 24 Scud).  
25 JS-3/T-10 hy, 1,100 T-54/-55, 820 T-62 med, 30 PT-76 lt tks; 2,500 OT-64, BTR-40/-50P (OT-62)/-60P-152 APC; 100 BMP-76PB AFV; about 200 SU-100 and JSU-152 SP guns; 1,300 76mm, 100mm, 122mm, 130mm, 152mm, 180mm, and 40 203mm guns and how; 120mm, 160mm, 240mm mor; 400 122mm, 130mm, 140mm, 240mm RL; 57mm, 85mm, and 100mm

ATk guns; 900 82mm, 107mm RCL; Sagger, Snapper, Swatter ATGW; 18 FROG-7, Scud, Samlet SSM; ZSU-23-4, ZSU-57-2 SP AA guns; SA-6 and SA-7 SAM. (Swingfire ATGW on order.) (There is a shortage of spares for Soviet equipment.)

Air Defence Command (75,000): 200 combat ac.

9 sqns of MiG-21MF interceptors; 360 SA-2, 200 SA-3, 75 SA-6 SAM; 2,500 20mm, 23mm, 37mm, 40mm, 57mm, 85mm, and 100mm AA guns; missile radars incl Fan Song, Low Blow, Flat Face, Straight Flush, and Long Truck; gun radars Fire Can, Fire Wheel and Whirl; early warning radars Knife Rest and Spoon Rest. (There is a shortage of spares for Soviet equipment.)

Reserves: about 500,000.

### Navy: 17,500.

12 submarines (6 W- and 6 R-class, ex-Soviet).  
5 destroyers (4 Skory, 1 ex-British Z-class).  
3 escorts (ex-British).  
12 SO-1 submarine chasers (ex-Soviet).  
8 Osa- and 5 Komar-class FPBG with Styx SSM.  
36 MTB (6 Shershen, 24 P-6, 6 Yugoslav).  
12 ex-Soviet MCM (6 T-43, 4 Yurka, 2 T-301).  
16 landing craft (10 Vydra, 4 MP-SMB-1, 2 Polnocny).  
(3 SRN-6 hovercraft on order.)

Reserves: about 15,000.

Air Force: 30,000; about 488 combat aircraft. (There is a shortage of spares for most Soviet equipment.)

25 Tu-16D/G medium bombers (10 with Kelt ASM).  
25 Il-28 light bombers.  
30 MiG-23 fighter-bombers.  
38 Mirage III fighter-bombers.  
120 Su-7 and 50 MiG-17 fighter-bombers.  
200 MiG-21 interceptors with Atoll AAM.  
90 MiG-15, MiG-21, Su-7, Yak-11/-18, some 100 L-29, and 200 Gomhouria trainers.  
About 40 Il-14 and 30 An-12 med tpts.  
20 Mi-4, 10 Mi-6, 70 Mi-8, 4 Sea King, and 24 Commando hel.  
(44 Mirage F-1, 6 Sea King, 4 Commando, 42 Gazelle, 6 C-130 on order.)

Para-Military Forces: about 120,000: National Guard 20,000, Frontier Corps 6,000, Defence and Security 60,000, Coast Guard 7,000.

## IRAN

Population: 33,810,000.  
Military service: 2 years.  
Total armed forces: 300,000.  
Estimated GDP 1975: \$56.8 bn.  
Defence expenditure 1976-77: 666,000 m rials (\$9,500 m).  
\$1=70.1 rials (1976), 66.6 rials (1975).

Army: 200,000.  
3 armoured divisions.



The air forces of Egypt and Iraq are equipped with Soviet-made Tu-16 bombers, with a range of about 4,000 miles and a bomb load of some 20,000 pounds.



4 infantry divisions.  
 4 indep brigades (2 inf, 1 AB, 1 special force).  
 1 SAM battalion with *HAWK*.  
 Army Aviation Command.  
 500 *Chieftain*, 400 M-47/-48, 460 M-60A1 med tks; about 2,000 M-113, BTR-50/-60 APC; 650 guns and how, incl 75mm, 330 105mm, 130mm, 100 155mm, 175mm SP, 203mm, 203mm SP; 64 M-21 RL; 106mm RCL; *ENTAC*, SS-11, SS-12, *TOW* ATGW; 650 23mm (20 SP), 35mm, 40mm, 57mm (80 SP), and 85mm AA guns; *HAWK* SAM. (1,480 *Chieftain* med, 250 *Scorpion* lt tks; *Fox* scout cars; *Dragon*, *TOW* ATGW; ZSU-23-4 SP AA guns; *Rapier* SAM on order.)  
 Aircraft include 45 Cessna 185, 10 O-2A, and 6 Cessna 310.  
 60 AH-1J, 100 Bell 214A, 20 *Huskie*, 52 AB-205A, 15 CH-47C hel (187 Bell 214A, 142 AH-1J on order).

**Deployment:** Oman: 3,000; 1 bde, 1 hel sqn; Syria (UNDOF): 391.

**Reserves:** 300,000.

**Navy:** 18,500.

3 destroyers (1 with *Seacat*, 2 with *Standard* SAM).  
 4 frigates with Mk 2 *Seakiller* SSM and *Seacat* SAM.  
 4 corvettes (ex-US patrol frigates).  
 25 patrol boats (9 under 100 tons).  
 5 minesweepers (3 coastal, 2 inshore).  
 2 landing ships.  
 2 landing craft.  
 2 logistic support ships.  
 8 SRN-6 and 6 *Wellington* BH-7 hovercraft.

**Naval Air:**

1 MR sqn with 6 P-3F *Orion*.  
 1 ASW hel sqn with 6 S-65A.  
 1 transport battalion with 5 AB-205A, 14 AB-206A, 6 AB-212, 10 SH-3D hel.  
 3 marine battalions.  
 (3 *Tang*-class submarines, 6 *Spruance*-class destroyers, 12 FPBG with *Exocet* SSM, 2 landing craft, 6 S-5A hel on order.)

**Air Force:** 81,500; 317 combat aircraft.

10 FB sqns with 32 F-4D, 141 F-4E with *Sidewinder* and *Sparrow* AAM, *Maverick* ASM.  
 10 FGA sqns with 12 F-5A, 100 F-5E.  
 1 fighter sqn with 15 F-14A *Tomcat*.  
 1 recce sqn with 4 RF-4E, 13 RF-5A.  
 4 med tpt sqns with 57 C-130E/H.  
 1 tanker sqn with 12 Boeing 707, 3 Boeing 747.  
 4 lt tpt sqns with 18 F-27, 6 C-54, 5 C-47, 7 *Beaver*, 3 *Aero Commander* 690, 4 *Falcon* 20, 30 F-33A/C.  
 10 *Huskie*, 45 AB-205, 70 AB-206A, 5 AB-212, 5 CH-47C, 16 *Super Frelon* hel.  
 Trainers incl 30 T-41, 9 T-33, T-6, 2 E-3A, 18 F-5B.  
*Rapier* and *Tigercat* SAM.  
 (65 F-14A, 36 F-4, 41 F-5E fighters; 12 RF-4E recce; 6 P-3 *Orion* MR; 12 Boeing 747, 19 *Bonanza*, 2 F-27 tpts; 22 CH-47, 39 Bell 214C hel; *Blindfire* SAM radar on order.)

**Para-Military Forces:** 70,000 Gendarmerie with lt ac and hel; 40 patrol boats.

**IRAQ**

Population: 11,490,000.  
 Military service: 2 years.  
 Total armed forces: 158,000.  
 Estimated GNP 1975: \$13.4 bn.  
 Defence expenditure 1975-76: 356 m dinars (\$1,191 m).



The Iranian Air Force, rapidly becoming one of the best-equipped of the world's mid-size air forces, has one squadron of F-14 Tomcats in its inventory.

\$1=0.299 dinars (1975), 0.294 dinars (1974).

**Army:** 140,000.

3 armoured divisions (each with 2 armd, 1 mech bde).  
 2 mechanized divisions.  
 4 infantry divisions.  
 1 Republican Guard mechanized brigade.  
 1 special forces brigade.  
 1,200 T-62, T-54/-55, 90 T-34 med, 100 PT-76 lt tks; about 1,600 AFV, incl BTR-60/-152, BMP-76; 700 75mm, 85mm, 100mm, 120mm, 130mm, 152mm guns/how; 50 SU-100, 40 JSU-152 SP guns; 120mm, 160mm mor; RL; *FROG*, *Scud* SSM; 800 23mm, 37mm, 57mm, 85mm, 100mm AA guns; SA-7 SAM.

**Reserves:** 250,000.

**Navy:** 3,000.

3 SO-1 submarine chasers.  
 8 *Osa*-class FPBG with *Styx* SSM.  
 12 P-6 torpedo boats.  
 2 minesweepers.  
 3 patrol boats (under 100 tons).

**Air Force:** 15,000; about 299 combat aircraft.

1 bomber sqn with 9 Tu-16.  
 1 lt bomber sqn with 10 Il-28.

11 FGA sqns: 2 with 40 MiG-23, 3 with 50 Su-7B, 3 with 30 MiG-17, 3 with 50 *Hunter*.

5 interceptor sqns with 90 MiG-21, 20 MiG-19.

2 tpt sqns with 12 An-2, 6 An-12, 10 An-24, 2 Tu-124, 13 Il-14, and 2 *Heron*.

7 hel sqns with 4 Mi-1, 35 Mi-4, 16 Mi-6, 30 Mi-8, 40 *Alouette* III, 9 *Wessex*.

Trainers incl 30 MiG-15UTI, MiG-21UTI, *Hunter* T66/T69, Yak-11/-18, L-29, 20 T-52.

SA-2, SA-3, and SA-6 SAM.  
 (L-39 trainers, 20 *Alouette* III hel on order.)

**Para-Military Forces:** 4,800 security troops, 50,000 People's Army.

**ISRAEL**

Population: 3,510,000.

Military service: men 36 months, women 24 months (Jews and Druses only; Muslims and Christians may volunteer). Annual training for reservists thereafter up to age 53/4 for men, 34 for women.

Total armed forces: 158,500, incl 123,000 conscripts (mobilization to 400,000 possible in 72 hours).

Estimated GNP 1975: \$12.1 bn.

Defence expenditure 1976-77: £1 32,320 m



Israel Aircraft Industries is turning out Kfir tactical support aircraft for the Israeli Air Force. The IAF now ranks among the top ten in size, and its crews are among the most combat-experienced and proficient in the world.



(\$4,214 m).  
\$1 = £1 7.67 (1976), £1 6.28 (1975).

**Army:** 135,000, incl women and 120,000 conscripts; 375,000 on mobilization. 11 brigades (5 armd, 4 inf, 2 para) normally kept near full strength; 6 (1 armd, 4 mech, 1 para) between 50 per cent and full strength; the rest at cadre strength.

15 armoured brigades.  
9 mechanized brigades.  
9 infantry brigades.  
5 parachute brigades.  
9 artillery brigades.  
2,700 med tks, incl 900 *Centurion*, 600 M-48, 650 M-60, 400 T-54/-55, some 150 T-62; 65 PT-76 lt tks; about 3,600 AFV, incl AML-60, 15 AML-90, *Ramte* armd cars; about 3,300 M-2/-3/-113, BRDM, BTR-40/-50P(OT-62)/-60P/-152 APC; 500 105mm, L-354, M-109, and 155mm, 60 175mm, some 203mm SP how; 450 120mm, 122mm, 130mm, and 155mm guns/how; *Lance*, *Ze'ev* (Wolf) SSM; 122mm, 135mm, 240mm RL; 900 120mm and 160mm mor (some SP); 106mm RCL; *LAW*, *TOW*, *Cobra*, SS-10/-11, *Sagger* ATGW; about 900 20mm, *Vulcan/Chaparral*, 30mm and 40mm AA guns; *Redeye* SAM.

(M-48, M-60 med tks; M-113 APC; *Dragon*, *TOW* ATGW; *Lance* SSM; *Redeye* SAM on order.)

**Navy:** 4,500, incl 1,000 conscripts; 6,000 on mobilization.

5 submarines (3 Type 206, 2 ex-British T-class).  
6 *Reshef*-class FPBG with *Gabriel* SSM.  
12 *Saar*-class FPBG with *Gabriel* SSM.  
2 large patrol boats and 43 small (under 100 tons).  
10 landing craft (3 under 100 tons).  
Naval commandos: 300.  
(6 *Reshef*-class FPBG and *Harpoon* SSM on order.)

**Air Force:** 19,000, incl 2,000 conscripts (AD only); 25,000 on mobilization; 543 combat aircraft. (In addition there are combat aircraft in reserve, incl 10 *Vautour* lt btrs, 25 *Mystère* IVA, 25 *Ouragan* FB, and 6 *Super Mystère* B2 interceptors.)

9 FGA/interceptor sqns: 6 with 204 F-4E, 3 with 50 *Mirage* III, 33 *Kfir*.  
6 FGA sqns with 250 A-4H/N *Skyhawk*.  
1 reconnaissance squadron with 6 RF-4E.  
5 Boeing 707, 12 C-97/*Stratocruiser* (incl 2 tankers), 20 *Noratlant*, 10 C-47, 24 C-130E/H, 14 *Arava*, 10 Do-27, 10 Do-28, 9 *Islander* tpts.

Trainers incl 24 TA-4H, 80 *Fouga Magister*, 20 *Beech Queen Air*.  
12 *Super Frelon*, 18 CH-53G, 23 AB-205A, 12 CH-3C, 25 UH-1D, 15 S-65, 12 S-61, and 12 *Alouette* II hel.  
15 SAM batteries with 90 *HAWK*.  
(25 F-15, 35 F-4, 4 E-2C; 8 CH-47 hel; *HAWK* SAM on order.)

Reserves (all services): 450,000.

Para-Military Forces: 4,000 Border Guards and 5,000 *Nahal* Militia.

## JORDAN

Population: 2,830,000.  
Military service: 24 months.  
Total armed forces: 67,900.  
Estimated GNP 1975: \$1.3 bn.  
Defence expenditure 1976: 51.0 m dinars (\$155 m).  
\$1 = 0.330 dinars (1976), 0.309 dinars (1975).

**Army:** 61,000.  
2 armoured divisions.  
1 mechanized division.  
2 infantry divisions.  
4 special forces battalions.  
2 AA brigades.  
290 M-47/-48/-60, 200 *Centurion* med tks; 100 *Saladin* armd cars; 140 *Ferret* scout cars; 320 M-113, 120 *Saracen* APC; 110 25-pdr, 50 105mm, and 155mm how; 35 M-52 105mm, 20 M-44 155mm SP how; 16 155mm guns; 81mm, 107mm, 120mm mor; 106mm, 120mm RCL; *TOW* ATGW; 200 M-42 40mm SP AA guns.

Deployment: *Oman*: engineer detachment.

**Navy:** 250.  
12 small patrol craft.

**Air Force:** 6,650; 66 combat aircraft.  
3 FGA sqns with 48 F-5A/E.  
1 interceptor squadron with 18 F-104A.  
1 *Falcon* 20, 4 *CASA* 212A *Aviocar*, 2 C-130B, 2 *Dove* tpts.  
3 *Whirlwind* and 18 *Alouette* III helicopters.  
2 F-5B, 6 *Chipmunk*, 1 *Hunter*, 2 F-104B, 6 T-37, and 8 *Bulldog* trainers.  
(18 F-5E/B FGA, 2 C-130B tpts, and 4 S-76 hel on order.)

Reserves: 30,000.

Para-Military Forces: 10,000; 3,000 Mobile Police Force, 7,000 Civil Militia.

## KUWAIT

Population: 1,040,000.  
Military service: 18 months.  
Total armed forces: 9,700.  
Estimated GNP 1974: \$11.0 bn.  
Defence expenditure 1975: 65.8 m dinars (\$230 m).  
\$1 = 0.286 dinars (1975), 0.291 dinars (1974).

**Army:** 8,500.  
1 armoured brigade.  
2 infantry brigades.  
50 *Vickers* and 50 *Centurion* med tks, 90 *Saladin* armd, 20 *Ferret* scout cars; 130 *Saracen* APC; 10 25-pdr, 20 AMX 155mm how; SS-11, *Vigilant* ATGW. (165 *Chieftain* tks; arty on order.)

**Navy:** 200 (Coastguard).  
12 inshore patrol boats.  
16 patrol launches.  
3 landing craft.

**Air Force:** 1,000, excluding expatriate personnel; 33 combat aircraft.  
1 FGA sqn with 4 *Hunter* FGA57, 5 T67.  
1 interceptor sqn with 10 *Lightning* F53, 2 T55.  
1 COIN sqn with 12 BAC-167 *Strikemaster* Mk 83.  
2 *Caribou*, 1 *Argosy*, 2 Lockheed L-100-20 tpts.  
1 hel sqn with 2 AB-204B, 4 AB-205, 2 *Whirlwind*, 20 *Gazelle*, 10 *Puma*.  
6 *Jet Provost* T51 trainers (in store).  
(20 *Mirage* F-1, 36 A-4M *Skyhawk*, 6 TA-4K; *HAWK* SAM on order.)

## LEBANON

Population: 2,950,000.  
Military service: 18 months selective.  
Total armed forces: 18,250. (The unity, organization, and state of equipment of the armed forces is in considerable doubt, and the figures given here must be treated with reserve.)

Estimated GNP 1974: \$3.7 bn.  
Defence expenditure 1976: £L 327 m (\$123 m).  
\$1 = £L 2.65 (1976), £L 2.26 (1974).

**Army:** 17,000.  
3 tank battalions.  
2 reconnaissance battalions.  
9 infantry battalions.  
1 commando battalion.  
4 artillery battalions.  
1 AA battalion.  
60 *Charioteer* med, 25 AMX-13, 18 M-41 lt tks; 100 M-706, M-6, AEC armd cars; 80 M-113, 16 M-59, *Panhard* M-3 APC; 6 75mm guns; 24 122mm, 20 155mm how; 25 120mm mor; *ENTAC*, SS-11, 20 *TOW* ATGW; 60 20mm and 30mm, 15 M-42 40mm SP AA guns.

**Navy:** 250.  
2 large patrol vessels.  
3 coastal patrol boats (3 more on order).  
1 landing craft.

**Air Force:** 1,000; 27 combat aircraft.  
1 FGA sqn with 14 *Hunter* F70 and 2 T66.  
1 interceptor sqn with 6 *Mirage* IIIEL with R.530 AAM (4 *Mirage* IIIEL and 1 IIIEL in storage).  
1 hel sqn with 17 *Alouette* II/III, 6 AB-212.  
10 *Chipmunk*, 8 *Magister*, 3 *Vampire* trainers.  
1 *Dove* transport.  
Some French early warning/ground radars. (6 SA *Bulldog* on order.)

Para-Military Forces: 5,000 Gendarmerie.

## LIBYA

Population: 2,550,000.  
Military service: voluntary.  
Total armed forces: 29,700.  
Estimated GNP 1975: \$12.2 bn.  
Defence expenditure 1975: 60 m Libyan dinars (\$203 m).  
\$1 = 0.296 dinars (1975).

**Army:** 22,000.  
1 armoured brigade.  
2 mechanized infantry brigades.  
1 National Guard brigade.  
1 commando battalion.  
3 artillery battalions.  
2 anti-aircraft battalions.  
200 T-62, 500 T-54/-55, 15 T-34 med tks; 100 *Saladin* armd cars; 25 *Ferret* scout cars; 220 BTR-40/-50/-60, 110 OT-64, 75 *Cascavel*, 30 *Saracen*, 170 M-113A1 APC; 70 122mm, 75 105mm, some 155mm how; 300 *Vigilant* ATGW; 120 23mm, 57mm, *Bofors* L40/70 AA guns; 6 AB-47, 5 AB-206, 4 *Alouette* III hel; some *Cessna* O-1 lt ac.

Deployment: *Lebanon* (Arab Peace-keeping Force): 500.

**Navy:** 2,700.  
1 frigate (with *Seacat* SAM).  
1 corvette.  
3 FPBG with SS-12M SSM.  
11 patrol craft (1 coastal, 1 with BM-21 RL).  
1 logistic support ship.  
(4 FPBG with *Otomat* SSM, 10 PR-72 FPB on order.)

**Air Force:** 5,000, including expatriate personnel; 129 combat aircraft. (Some *Mirages* may be in storage.)  
2 Interceptor sqns with 30 *Mirage* IIIEL.  
2 FGA sqns with 29 MiG-23.  
4 FGA sqns with 60 *Mirage* V.  
1 recce sqn with 10 *Mirage* IIIER.  
8 C-130E, 9 C-47, and 2 *Falcon* ST med tpts.



10 *Mirage* IIIB, 3 T-33, and 12 *Magister* trainers.  
 13 *Alouette* II/III, 3 AB-47, 9 *Super Frelon*, 12 Mi-8 helicopters.  
 3 SAM regts with 60 *Crotale* and 10 batteries with 60 SA-2, SA-3, and SA-6 SAM.  
 (12 Tu-22 bbrs, 38 *Mirage* F-1A/E interceptors, *Galeb* trainers on order.)

## MOROCCO

Population: 17,850,000.  
 Military service: 18 months.  
 Total armed forces: 73,000.  
 Estimated GNP 1975: \$7.9 bn.  
 Defence expenditure 1976: 1,129 m dirham (\$258 m).  
 \$1=4.37 dirham (1976), 3.76 dirham (1975).

### Army: 65,000.

1 light security brigade.  
 1 parachute brigade.  
 5 armoured battalions.  
 9 motorized infantry battalions.  
 22 infantry battalions.  
 2 Royal Guard battalions.  
 5 camel corps battalions.  
 3 desert cavalry battalions.  
 6 artillery groups.  
 2 engineer battalions.

50 M-48, 100 T-54 med, 50 AMX-30, 120 AMX-13 lt tks; 36 EBR-75, 50 AML-245, and M-8 armd cars; 40 M-3 half-track, 95 OT-62/-64 APC, 25 SU-100, 30 AMX-105, 50 M-56 90mm SP guns; 125 76mm, 85mm, and 105mm guns; 150 75mm and

105mm, 18 M-114 155mm how; 82mm, 120mm mor; 150mm RCL; ENTAC ATGW; 50 37mm, 40mm, and 100mm AA guns. (100 M-48 med tks, TOW ATGW on order.)

### Navy: 3,000, incl 500 Marines.

1 frigate (Royal Yacht, with 1 hel).  
 1 coastal minesweeper.  
 5 patrol boats (2 more on order).  
 1 landing craft.  
 1 naval infantry battalion.

### Air Force: 5,000; 59 combat aircraft.

(Some, incl 12 MiG-17 FGA, in storage.)  
 2 FGA sqns with 24 *Magister*.  
 2 interceptor sqns with 19 F-5A and 4 F-5B.  
 2 tpt sqns with 10 C-47, 10 C-119G, and 6 C-130H.  
 6 *King Air*, 35 T-6, 25 T-28, 2 SF-260M trainers.  
 24 AB-205A, 8 AB-206, 5 AB-212, 4 Bell 47G, 4 HH-43B, 4 *Alouette* II, *Gazelle*, and 6 *Puma* hel.  
 (25 *Mirage* F-1, 24 F-5E, 12 C-130H, 12 T-34C; 34 *Puma* hel on order.)

Para-Military Forces: 30,000, incl 11,000 *Suret  Nationale*.

## OMAN

Population: 790,000.  
 Military service: voluntary.  
 Total armed forces: 14,150.  
 Defence expenditure 1976: 265 m rial omani (\$768 m).  
 \$1=0.345 rial omani (1976).

### Army: 13,200.

6 infantry battalions.  
 1 Royal Guard regiment.  
 1 gendarmerie battalion.  
 1 artillery regiment.  
 1 signals regiment.  
 1 armoured car squadron.  
 1 engineer squadron.  
 38 *Saladin*, some 20 V-100 *Commando* armd cars; 20 *Ferret* scout cars; 75mm pack how; 25-pdr, 105mm, 5.5-in. guns; 120mm mor; 10 TOW ATGW. (36 105mm lt guns on order.)

### Navy: 400.

3 patrol vessels (1 Royal Yacht, 2 ex-Dutch MCM).  
 3 FPB (4 more on order).  
 3 small landing craft.

### Air Force: 550, excluding expatriate personnel; 44 combat aircraft.

1 FGA/recce sqn with 29 *Hunter* (ex-Jordan).  
 1 COIN sqn with 15 BAC-167.  
 1 tactical transport sqn with 16 *Skyvan*.  
 2 tpt sqns: 1 with 2 BAC-111 and 2 *Viscount*, 1 with 8 BN *Defender*.  
 1 hel sqn with 20 AB-205, 2 AB-206 hel.  
 (12 *Jaguar*, 5 AB-214A, *Matra* R-550 AAM, 28 *Rapier* SAM, *Blindfire* radar on order.)

Para-Military Forces: 2,000 tribal Home Guard (*Firqats*).

## SAUDI ARABIA

Population: 5-6,000,000.  
 Military service: voluntary.  
 Total armed forces: 51,500.  
 Estimated GNP 1974: \$24.8 bn.  
 Defence expenditure 1975-76: 23,700 m Saudi riyals (\$6,771 m).  
 \$1=3.50 riyals (1975), 3.54 riyals (1974).

### Army: 40,000.

1 armoured brigade.  
 4 infantry brigades.  
 1 parachute battalion.  
 1 Royal Guard battalion.  
 3 artillery battalions.  
 6 AA battalions.  
 10 SAM batteries with *HAWK*.  
 300 AMX-30, 25 M-47 med, 60 M-41 lt tks; 200 AML-60/-90, some *Staghound* and *Greyhound* armd cars; *Ferret* scout cars; 105mm guns; 75mm RCL; SS-11, *Harpon* ATGW; AA guns; *HAWK* SAM. (100 AMX-30, 250 M-60 med, 250 *Scorpion* lt tks; AMX-10P AFV; 250 APC; guns/how; AMX-30SA SP AA guns; *Rapier*, *Chahinn* (*Crotale*), and *HAWK* SAM on order.)

### Deployment:

*Jordan*: 1 brigade group.  
*Syria*: 1 brigade group.  
*Lebanon* (Arab Peace-keeping Force): 750.

### Navy: 1,500.

3 FPB (2 *Jaguar*-class, 1 ex-US coastguard cutter).  
 (6 FPB, 4 MCM, 4 landing craft on order.)

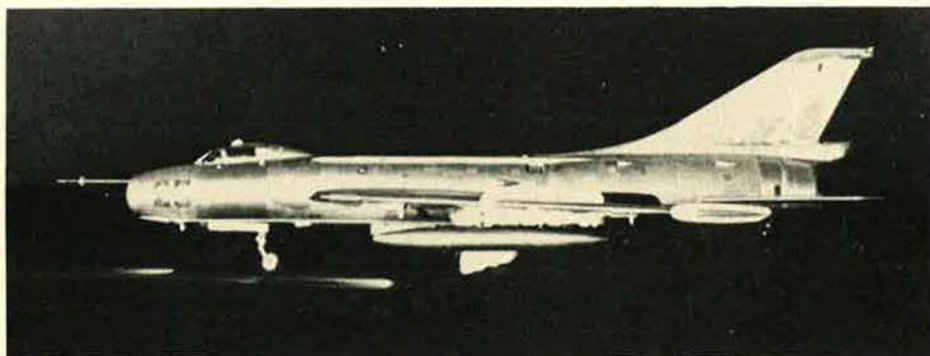
### Air Force: 10,000; 97 combat aircraft.

2 FB sqns with 30 F-5E.  
 2 COIN/training sqns with 30 BAC-167.  
 2 interceptor sqns with 37 *Lightning* F52/3/4.  
 2 tpt sqns with 24 C-130E/H.  
 2 hel sqns with 16 AB-206 and 24 AB-205.

The Algerian, Egyptian, Iraqi, and Syrian Air Forces have Su-7 ground attack aircraft supplied by the USSR.



The USSR has provided several Middle East countries with naval craft of various types, including patrol torpedo boats similar to this older P-4 type.





Other ac incl 1 Boeing 707, 4 KC-130 tankers; 20 F-5B, 5 *Lightning* T55 trainers; 2 *Falcon* 20 lt tpts; 12 *Alouette* III, 1 AB-204 hel.  
(100 F-5E/F, 38 *Mirage* VES/DS (believed to be for Egypt); 10 KC-130; *Alouette* III on order.)

**Para-Military Forces:** 20,000 National Guard in regular and semi-regular battalions; 6,500 Frontier Force and Coastguard with 50 small patrol boats and 8 SRN-6 hovercraft.

## SUDAN

Population: 18,200,000.  
Military service: voluntary.  
Total armed forces: 52,600.  
Estimated GNP 1974: \$2.8 bn.  
Defence expenditure 1975-76: £S 46 m (\$120 m).  
\$1 = £S 0.382 (1975), £S 0.339 (1974).

**Army:** 50,000.  
2 armoured brigades.  
7 infantry brigades.  
1 parachute brigade.  
3 artillery regiments.  
3 air defence artillery regiments.  
1 engineer regiment.  
20 T-34/85, 60 T-54, 50 T-55 med tks; 16 T-62 lt tks (Chinese); 50 *Saladin*, 45 *Commando* armd cars; 60 *Ferret* scout cars; 50 BTR-50, 60 OT-64, 50 BTR-152, 49 *Saracen* APC; 55 25-pdr, 40 100mm, 20 105mm, 18 122mm guns and how; 30 120mm mor; 30 85mm ATK guns; 80 Bofors 40mm, 80 Soviet 37mm, and 85mm AA guns.

**Deployment:** Lebanon (Arab Peace-keeping Force): 750.

**Navy:** 600.  
7 patrol boats (ex-Iranian).  
6 large, 6 small patrol boats. } (ex-Yugoslav)  
2 landing craft.

**Air Force:** 2,000; 50 combat aircraft.  
1 interceptor squadron with 20 MiG-21.  
1 FGA squadron with 17 MiG-17 (ex-Chinese).  
5 BAC-145, 8 *Jet Provost* Mk 55 (in storage).  
1 tpt sqn with 6 An-12, 5 An-24, and 4 F-27.  
1 hel sqn with 4 Mi-4 and 10 Mi-8.

**Para-Military Forces:** 3,500: 500 National Guard, 500 Republican Guard, 2,500 Border Guard.

## SYRIA

Population: 7,600,000.  
Military service: 30 months.  
Total armed forces: 227,000.  
Estimated GDP 1975: \$4.7 bn.  
Defence expenditure 1976: £Syr 3,690 m (\$1,003 m).  
\$1 = £Syr 3.68 (1976), £Syr 3.74 (1975).

**Army:** 200,000, incl Air Defence Command.  
2 armoured divisions (each 2 armd, 1 mech bde).  
3 mechanized divisions (each 1 armd, 2 mech bdes).  
3 armoured brigades.  
1 mechanized brigade.  
3 infantry brigades.  
2 artillery brigades.  
5 commando, 3 parachute battalions.  
1 SSM bn with *Scud*, 2 SSM btys with *FROG*.  
24 SAM btys with SA-2/3, 14 with SA-6.  
100 T-34, 1,400 T-54/-55, 800 T-62 med, 100 PT-76 lt tks; 1,200 BTR-50/-60, BTR-

152 APC; 800 122mm, 130mm, 152mm, and 180mm guns/how; 75 SU-100 SP guns; 140mm, 240mm RL; *FROG-7*, *Scud* SSM; 120mm, 160mm mor; *Snapper*, *Sagger*, *Swatter* ATGW; 23mm, 37mm, 57mm, 85mm, 100mm AA guns; SA-2/-3/-6/-7/-9 SAM.

**Deployment:** Lebanon: 13,000 (incl 500 in Arab Peace-keeping Force).

**Reserves:** 100,000.

**Air-Defence Command** (under Army command, with Army and Air Force manpower):  
SAM batteries, AA arty, interceptor ac, and radar.

**Navy:** 2,000.  
6 *Komar*- and 7 *Osa*-class FPBG with *Styx* SSM.  
1 T-43-class minesweeper.  
11 torpedo boats (ex-Soviet P-4).  
1 coastal patrol vessel.

**Reserves:** 2,500.

**Air Force:** 25,000; about 440 combat ac, some aircraft believed to be in storage.  
1 sqn with 10 Il-28 lt bombers.  
4 FGA sqns with 80 MiG-17.  
3 FGA sqns with 60 Su-7.  
2 FGA sqns with 50 MiG-23.  
About 220 MiG-21 interceptors.  
1 recce sqn with 20 MiG-25, (probably Soviet-manned).  
6 C-47, 8 Il-14, Il-18, and 6 An-12 transports.  
Trainers incl Yak-11/-18, L-29, MiG-15UTI, and 12 MBB 223 *Flamingo*.  
Hel incl 4 Mi-2, 8 Mi-4, 35 Mi-8, and 9 Ka-25.  
(15 *Super Frelon* hel on order.)

**Para-Military Forces:** 9,500: 8,000 Gendarm-erie; 1,500 Desert Guard (Frontier Force).

## TUNISIA

Population: 5,920,000.  
Military service: 12 months selective.  
Total armed force: 20,000, incl 13,000 conscripts.  
Estimated GNP 1975: \$4.8 bn.  
Defence expenditure 1976-77: 39 m dinars (\$91 m).  
\$1 = 0.430 dinars (1976), 0.368 dinars (1975).

**Army:** 16,000, incl 12,000 conscripts.  
2 combined arms regiments.  
1 Sahara regiment.  
1 para-commando battalion.  
1 artillery battalion.  
1 engineer battalion.  
30 AMX-13, 20 M-41 lt tks; 20 *Saladin*, 15 EBR-75, 14 AML-60, some M-8 armd cars; 10 105mm SP, 10 155mm guns.

**Navy:** 2,000, incl 500 conscripts.  
1 destroyer escort (ex-US radar picket).  
1 corvette (French A-69 type).  
1 coastal minesweeper (on loan from France).  
3 patrol boats with SS-12M SSM (1 more on order).  
13 coastal patrol boats (12 under 100 tons).

**Air Force:** 2,000, incl 500 conscripts; 20 combat aircraft.  
1 fighter sqn with 12 F-86F.  
1 COIN sqn with 8 MB-326B.  
3 *Dassault Flamant* light tpts (3 G-222 on order).

12 SF-260W, 12 T-6 trainers.  
2 *Alouette* II, 6 *Alouette* III, 1 *Puma* hel.

**Para-Military Forces:** 9,000: 5,000 Gendarm-erie (6 battalions); 4,000 National Guard.

## YEMEN ARAB REPUBLIC (NORTH)

Population: 6,860,000.  
Military service: 3 years.  
Total armed forces: 39,000.  
Defence expenditure 1975-76: 261.7 m riyals (\$60 m).  
\$1 = 4.33 riyals (1975).

**Army:** 37,000.  
10 infantry brigades (incl 3 reserve).  
1 parachute brigade.  
3 commando brigades.  
2 armoured battalions.  
2 artillery battalions.  
1 AA battalion.  
30 T-34 med tks; 30 *Saladin* armd cars; 100 BTR-40 APC; 50 SU-100 SP guns; 50 76mm, some 122mm guns; 75mm RCL; 120mm mor; 37mm AA guns.

**Navy:** 500.  
5 MTB (ex-Soviet P-4-class).

**Air Force:** 1,500; 28 combat aircraft, some believed to be in storage.  
1 light bomber sqn with 16 Il-28.  
1 fighter sqn with 12 MiG-17.  
Some C-47, 2 *Skyvan*, some Il-14 tpts.  
4 MiG-15UTI, 18 Yak-11 trainers.  
Mi-4, AB-205 hel.

**Para-Military Forces:** 20,000 tribal levies.

## YEMEN: PEOPLE'S DEMOCRATIC REPUBLIC (SOUTH)

Population: 1,740,000.  
Military service: conscription, term unknown.  
Total armed forces: 21,300.  
Estimated GNP 1972: \$500 m.  
Defence expenditure 1974: 13 m South Yemeni dinars (\$41 m).  
\$1 = 0.314 dinars (1974), 0.383 dinars (1972).

**Army:** 19,000.  
10 infantry brigades, each of 3 battalions.  
2 armoured battalions.  
1 artillery brigade.  
1 signal unit.  
1 training battalion.  
200 T-34, T-54 med tks; 10 *Saladin* armd cars; 10 *Ferret* scout cars; 25-pdr, 105mm pack, 122mm, 130mm how; mor; 122mm RCL; 23mm SP, 37mm, 57mm, 85mm AA guns; SA-7 SAM.

**Navy:** 300 (subordinate to Army).  
2 submarine chasers (ex-Soviet SO-1 class).  
2 MTB (ex-Soviet P-6 class).  
3 minesweepers (ex-British *Ham*-class).  
15 small patrol craft.  
2 landing craft (ex-Soviet *Polnocny*-class).

**Air Force:** 2,000; 27 combat aircraft, some believed to be in storage.  
1 FB sqn with 15 MiG-17.  
1 interceptor sqn with 12 MiG-21.  
1 tpt sqn with 4 Il-14, 3 An-24, some C-47.  
1 hel sqn with 8 Mi-8, some Mi-4.  
3 MiG-15UTI trainers.

**Para-Military Forces:** Popular Militia; 1,500 Public Security Force.



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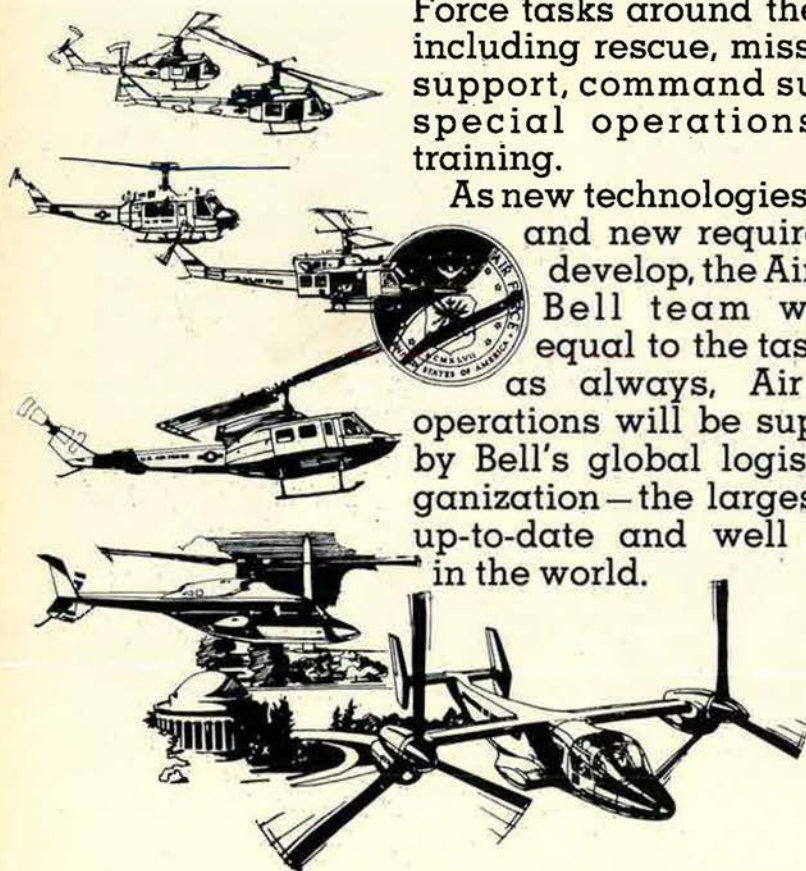


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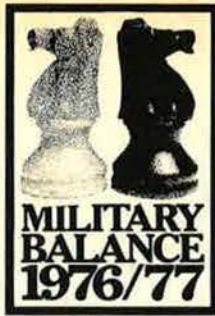


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# Sub-Saharan Africa

## MULTILATERAL AGREEMENTS

The Organization of African Unity (OAU), constituted in May 1973, includes all internationally recognized independent African states except South Africa. It has a Defence Commission which is responsible for defence and security co-operation and the defence of the sovereignty, territorial integrity, and independence of its members; however, it has rarely met.

## BILATERAL AGREEMENTS

The United States has security assistance agreements with Ethiopia, Ghana, Kenya, Liberia, Senegal, and Zaire.

The Soviet Union signed in July 1974 a Treaty of Friendship with the Somali Republic to whom she gives military aid. Military aid is also given to Angola, Guinea, Guinea-Bissau, Mali, Mozambique, Nigeria, and Uganda.

China has military assistance agreements with Cameroon, Equatorial Guinea, Guinea, Mali, and Tanzania.

Britain maintains overflying, training, and defence arrangements with Kenya.

France has agreements on defence and military co-operation with the Central African Republic, Gabon, Ivory Coast, Niger, and Upper Volta. The military agreement with the Malagasy Republic has been terminated but military

co-operation between the two countries maintained. Since March 1974, France has had a co-operation agreement for defence with Senegal, and since February 1974 a co-operation agreement including military clauses with Cameroon. The defence agreements between France and Benin, Chad and Togo have been terminated but replaced by agreements on technical military co-operation. Similarly, a defence agreement with the People's Republic of Congo has been terminated and replaced by an agreement on training and equipment for the Congolese armed forces.

Cuba has given military aid to The People's Republic of Congo, Guinea, and Somalia, and has sent some 15-20,000 men to Angola, now engaged in training Angola's armed forces and assisting with internal security.

## ARRANGEMENTS WITHIN THE REGION

Military links have existed in practice between South Africa and Rhodesia, although there is no known formal agreement. South Africa's para-military forces, in Rhodesia since 1967, were all withdrawn in August 1975, except for a few pilots who remained with the squadrons of South African helicopters operating under a contract with Rhodesia.

Kenya and Ethiopia have a defence agreement.

## ANGOLA

Population: 5,400,000.  
Military service: voluntary.  
Total armed forces: 30,000

(Angola has a single service. Equipment quantities are uncertain. Some 15-20,000 Cubans are serving with the Angolan forces and operate aircraft and heavy equipment. Some Portuguese are also serving with the forces, and a number of Soviet advisers and technicians are reported in Angola.)

**Army:** 85 T-34, 45 T-54 med, some 75 PT-76 lt tks; 90 BTR-40/BRDM-2 armd cars; 170 BTR-50P/OT-62 APC; 120 guns incl 105mm, 122mm; 110 BM-21 122mm multiple RL; 1,000 82mm mor; 2,000 76mm, 82mm, RCL; Sagger ATGW; 25mm, 85mm, 100mm AA guns; SA-7 SAM.

**Navy:**  
5 landing craft.

**Air Force:** Some MiG-15/-17, 12 Mig-21, 3 G-91 fighters.  
3 *Noratlans* transports.  
Some helicopters.

## PEOPLE'S REPUBLIC OF CONGO

Population: 1,400,000.  
Military service: voluntary.  
Total armed forces: 7,000.  
Estimated GNP 1972: \$314 m.  
Defence expenditure 1974: 4.61 bn CFA francs (\$19 m).  
\$1=241 CFA francs (1974), 256 CFA francs (1972).

**Army:** 6,500.  
1 armoured battalion (5 squadrons).  
1 infantry battalion.  
1 para-commando battalion.  
1 artillery group.

1 engineer battalion.  
14 Chinese T-62, 4 PT-76 lt tks; 10 BRDM scout cars; 24 BTR-152 APC; 6 75mm, 10 100mm guns; 8 122mm how; 10 120mm mor; 57mm ATk guns; 10 14.5mm, some 37mm, and 57mm AA guns.

**Navy:** 200.  
14 coastal patrol craft (2 *Shanghai*-class).  
9 river patrol boats.

**Air Force:** 300; no combat aircraft.  
3 C-47, 3 An-24, 1 Fokker F-28, 1 *Frégate* 262, some Il-14 tpts.  
4 *Alouette* II/III hel.

**Para-Military Forces:** 1,400 Gendarmerie; 2,500 militia.

## ETHIOPIA

Population: 28,620,000.  
Military service: voluntary.  
Total armed forces: 50,800.



Estimated GNP 1975: \$US 2.9 bn.  
Defence expenditure 1975: \$E 174.4 m  
(\$US 84 m).  
\$US 1 = \$E 2.07 (1975).

**Army:** 47,000, incl 6,000 Territorial Army.  
(Some 6,000 men of the Territorial Army have been mobilized to reinforce brigades in Eritrea. Reservists have also been called up and are largely employed on guard duties.)  
1 mech division with 1 mech, 2 inf bdes.  
3 inf divisions, each of 3 inf bdes.  
1 tank battalion.  
1 airborne infantry battalion.  
4 artillery battalions.  
2 engineer battalions.  
4 armoured car squadrons.  
24 M-60 med, 54 M-41 lt tks; about 90 M-113 APC; 56 AML-245/60 armd cars; 12 M-109 155mm SP, 36 75mm pack, 52 105mm, 12 155mm how; 146 M-2 107mm and M-30 4.2-in mor. (24 M-60, some M-113 on order.)

**Navy:** 1,500.  
1 coastal minesweeper.  
1 training ship (ex-US seaplane tender).  
5 large patrol craft (ex-US).  
4 coastal patrol craft (under 50 tons).  
4 landing craft (ex-US, under 100 tons).  
1 *Kraljevica*-class patrol boat.

**Air Force:** 2,300; 36 combat aircraft.  
1 light bomber squadron with 4 *Canberra* B2.  
1 FGA squadron with 11 F-86F.  
2 FGA squadrons with 16 F-5A/E.  
1 recce squadron with 5 T-28A.  
1 tpt sqn with 12 C-47, 2 C-54, 12 C-119G, 3 *Dove*.  
3 trg sqns with 19 *Safir*, 13 T-28A/D, 11 T-33A.  
1 hel sqn with 10 AB-204 and 6 UH-1H.  
(8 F-5E, 12 A-37B, and 15 Cessna 310 on order.)

Reserves: 20,000. Territorial Army 8,000.

Para-Military Forces: 11,200; 6,800 mobile emergency police force; 1,200 frontier guards; 3,200 commando force.

## GHANA

Population: 10,130,000.  
Military service: voluntary.  
Total armed forces: 17,600.  
Estimated GNP 1974: \$3.6 bn.  
Defence expenditure 1974-75: 95.8 m cedi (\$83 m).  
\$1 = 1.15 cedi (1974).

**Army:** 15,000.  
2 brigades (6 inf bns and support units).  
1 reconnaissance battalion.  
1 field engineer battalion.  
1 mortar battery.  
10 *Saladin* armd cars; 30 *Ferret* scout cars; 10 120mm mor.

Deployment: Egypt (UNEF): 1 bn, 500 men.

**Navy:** 1,200.  
2 ASW corvettes.  
2 FPB.  
1 coastal minesweeper.  
1 inshore minesweeper.  
2 patrol craft (ex-British *Ford*-class).  
1 training vessel.

**Air Force:** 1,400; 6 combat aircraft.  
1 COIN squadron with 6 MB-326F.  
2 tpt sqns with 8 *Islander* and 6 *Skyvan* 3M.  
1 comms and liaison sqn with 6 F-27.  
1 hel sqn with 2 Bell 212, 4 *Alouette* IIIB, 3 Hughes 269.  
12 *Bulldog* trainers.

Para-Military Forces: 3,000 in 3 Border Guard battalions.

## KENYA

Population: 13,860,000.  
Military service: voluntary.  
Total armed forces: 7,600.  
Estimated GNP 1975: \$2.8 bn.  
Defence expenditure 1976: 294 m shillings (\$35 m).  
\$1 = 8.40 shillings (1976), 7.13 shillings (1975).

**Army:** 6,500.  
4 infantry battalions.  
1 support battalion.  
1 engineer battalion.  
3 *Saladin*, 10 *Ferret* armd cars; 16 81mm, 8 120mm mor; 56 84mm *Carl Gustav* RCL. (*Fox* scout cars on order.)

**Navy:** 340.  
7 MGB (some with 2 40mm Bofors guns).

**Air Force:** 760; 15 combat aircraft.  
1 FGA sqn with 5 *Hunter* FGA9.  
1 COIN sqn with 5 BAC167 *Strikemaster*.  
1 COIN sqn with 5 *Bulldog* armed trainers.  
2 lt tpt sqns: 1 with 6 *Caribou*, 1 with 15 *Beaver*.  
Other ac incl 1 *Turbo Commander* 680F, 2 *Navajo*; 3 *Alouette* II, 2 Bell 47G hel. (12 F-5E/F on order.)

Para-Military Forces: 1,800 police.

## MOZAMBIQUE

Population: 8-9,000,000.  
Military service: unknown.  
(The size and composition of the armed forces is uncertain. At the time of independence in June 1975 the Frente de Libertação de Moçambique (FRELIMO) was estimated to have some 10,000 troops organized and equipped, but a number of them was reported to have been disbanded. Small armed groups of Mozambique troops have been operating in the area of the frontier with Rhodesia, and mortars and rocket launchers have been used. Equipment is mainly of Soviet origin. It includes small arms, 60mm and 82mm mor, 122mm RL, SA-7 SAM, and 14.5mm AA guns. Some MiG fighter aircraft are reported to have been flown, presumably by expatriate personnel. There are two battalions of Tanzanian troops deployed in Mozambique.)

## NIGERIA

Population: 64,620,000.  
Military service: voluntary.  
Total armed forces: 230,000. (Large-scale demobilization planned.)  
Estimated GDP 1974: \$22.8 bn.  
Defence expenditure 1976-77: 1,521 m naira (\$2,434 m).  
\$1 = 0.625 naira (1976), 0.613 naira (1974).

**Army:** 221,000.  
4 infantry divisions.  
4 reconnaissance regiments.  
4 artillery regiments.  
4 engineer regiments.  
Support and training units.  
*Scorpion* lt tks; 45 *Saladin*, 15 AML-60/90 armd cars; 25 *Ferret*, some *Fox* scout cars; 12 *Saracen* APC; 76mm, 25-pdr, 105mm, 122mm guns and how; 20mm, 40mm AA guns. (*Scorpion* lt tks, *Fox* scout cars on order.)

Reserves: 10,000.

**Navy:** 3,500.  
1 ASW/AA frigate.  
2 corvettes.  
8 patrol craft (4 large, 4 ex-British *Ford*-class).  
1 landing craft.

Reserves: 2,000.

**Air Force:** 5,500; 24 combat aircraft, plus some additional unserviceable aircraft.  
2 FGA/AD sqns: 1 with 12 MiG-17, 1 with 12 MiG-21J.  
2 med tpt sqns with 9 F-27, 6 C-130H, 7 C-47, 1 DC-6.  
1 SAR hel sqn with 3 *Whirlwind*, 4 B-105, 2 *Puma*.  
3 trg/service sqns with 4 MiG-15, 20 *Bulldog*, 5 P-149D, 23 Do-27/-28, 2 *Navajo*, 1 F-28, 8 L-29.

## RHODESIA

Population: 6,530,000 (270,000 White).  
Military service: 18 months (White, Asian, and Coloured population; Blacks may volunteer).  
(Since 1 May 1976 partial mobilization has been in effect, and all men aged 17-25 who have completed conscript service are liable to indefinite retention in the forces.)  
Total armed forces: 9,200.  
Estimated GNP 1975: \$US 3.6 bn.  
Defence expenditure 1976-77: \$R 80.4 m (\$US 130m). (A further \$R 15m is in the Treasury Vote as unallocated security expenditure, to be transferred to the appropriate security vote as required.)  
\$US 1 = \$R 0.617 (1976), \$R 0.560 (1975).

**Army:** 7,900, incl 2,400 conscripts, plus 2-6,000 Territorial Army called up for service at any one time.  
3 infantry battalions (1 White bn (1,000), 2 Black bns (2,400); a third Black forming. There is an establishment for 3 brigades, to be brought up to strength by mobilizing Territorials.)  
3 Special Air Service squadrons.  
1 artillery battery.  
1 engineer squadron.  
60 *Eland* 245/90 armd cars, 20 *Ferret* scout cars; lt armd APC; 25-pdr, 105mm pack how.

**Air Force:** 1,300; 44 combat aircraft.  
1 light bomber squadron with 8 *Canberra* B2 and T4.  
1 FGA sqn with 10 *Hunter* FGA9.  
1 FGA sqn with 18 *Vampire* FB9.  
1 reconnaissance sqn with 8 *Provost* T-52.  
1 tpt sqn with 11 C-47, 1 *Beech* 55 *Baron*, 5 T-28, 2 *Islander*.  
1 lt tpt sqn with 12 Al-60C4, Cessna 310.  
2 hel sqns with 16 *Alouette* II/III.

Reserves:  
(All White, Asian, and Coloured citizens completing conscript service are now liable to full-time National Service between ages 17-25 inclusive. Men aged 26-34 do 84 days' continuous training, followed by 5-week periods of active service in the Territorial Force. Men aged 35-38 do 5-week periods of active service with the Police Reserve or the Ministry of Internal Affairs. Ground personnel servicing Air Force units are reservists or civilians. The Territorial Force contains 10 bns, each with an establishment of 1,000 men, and support units. There is also a Reserve Holding Unit of 3,000 for men over 38.)

Para-Military Forces: British South African





About half of the Sub-Saharan countries have at least some British equipment, including Saladin armoured cars (center) and Ferret scout cars (left and right).

Police (BSAP): 8,000 active, 35,000 reservists (the White population provides about a third of the active strength but nearly three-quarters of the reserve strength). Guard Force: establishment 1,000.

## SENEGAL

Population: 4,520,000.  
 Military service: 2 years selective.  
 Estimated GNP 1974: \$1.2 bn.  
 Total armed forces: 5,950.  
 Defence expenditure 1976: 8,823 m CFA francs (\$38 m).  
 \$1=234 CFA francs (1976), 241 CFA francs (1974).

**Army:** 5,500.  
 3 infantry battalions.  
 1 engineer battalion.  
 1 reconnaissance squadron.  
 2 parachute companies.  
 2 commando companies.  
 1 artillery battery.  
 AML-245 armd cars; 6 105mm how; 8 81mm mor; 30mm, 40mm AA guns.

Deployment: Egypt (UNEF): 402.

**Navy:** 250.  
 3 patrol vessels.  
 17 small patrol vessels.  
 2 landing craft.

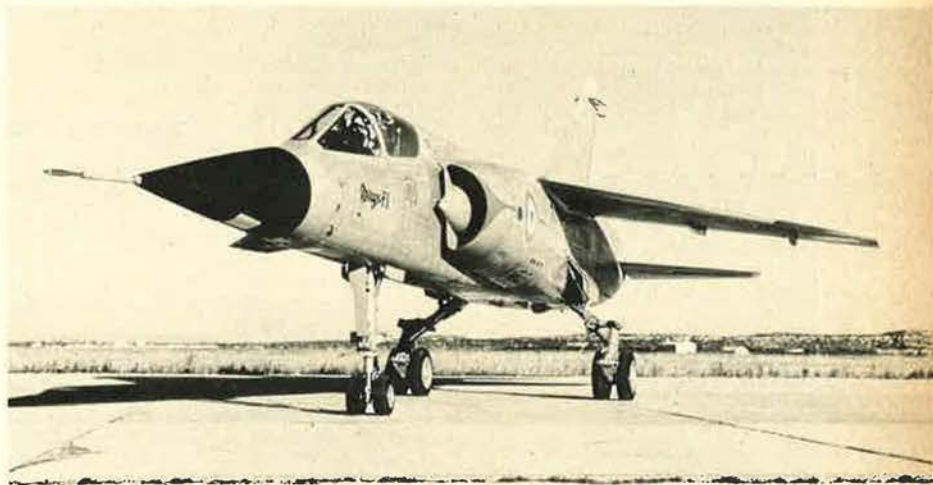
**Air Force:** 200.  
 6 C-47 medium, 5 light transports.  
 2 Bell 47G, 2 Alouette II, 1 Gazelle hel.

Para-Military Forces: 1,600.

## SOMALI DEMOCRATIC REPUBLIC

Population: 3,250,000.  
 Military service: voluntary.  
 Total armed forces: 25,000.  
 Estimated GNP 1972: \$0.3 bn.  
 Defence expenditure 1974: 100 m shillings (\$15 m).  
 \$1=6.55 shillings (1974), 6.93 shillings (1972).

**Army:** 22,000.  
 6 tank battalions.  
 9 mechanized infantry battalions.  
 5 infantry battalions.  
 2 commando battalions.  
 6 field, 5 AA artillery battalions.  
 200 T-34, 50 T-54/-55 med tks; 60 BTR-40, 250 BTR-152 APC; about 100 76mm and



The South African Air Force is the best equipped in the Sub-Sahara region. South Africa is buying these Mirage F1 fighters to replace older aircraft.



Somalia has a squadron of Soviet-made Il-28 bombers (left), and several of the area air forces Ily MiG-17s (right). MiG-21s are appearing in greater numbers.

85mm guns; 80 122mm how; 150 14.5mm, 37mm, 57mm, and 100mm AA guns. (In all services, spares are short and not all equipment is serviceable.)

**Navy:** 300.  
 2 Osa-class FPBG with Styx SSM.

6 P-4 and 4 P-6 MTB (ex-Soviet).  
 4 medium landing craft (ex-Soviet T-4 class).

**Air Force:** 2,700; 66 combat aircraft.  
 1 light bomber sqn with 10 Il-28.  
 2 FGA sqns with 44 MiG-15UTI and MiG-17.  
 1 fighter sqn with 12 MiG-21.



1 transport sqn with 3 An-2, 3 An-24/-26.  
Other aircraft include 3 C-47, 1 C-45, 8 P-148, 20 Yak-11.  
1 helicopter sqn with Mi-2, Mi-4, and Mi-8.

**Para-Military Forces:** 3,000: 500 border guards; 2,500 People's Militia.

## SOUTH AFRICA

Population: 26,230,000 (4,300,000 White).  
Military service: 12 months.  
Total armed forces: 51,500, incl 35,400 conscripts.  
Estimated GNP 1975: \$34.6 bn.  
Defence expenditure 1976-77: 1,300 m rand (\$1,494 m).  
\$1=0.870 rand (1976), 0.712 rand (1975).

**Army:** 38,000, incl 31,000 conscripts (180 women).

1 armoured brigade.  
1 mechanized brigade.  
4 motorized brigades.  
2 parachute battalions.  
6 field and 2 medium artillery regiments.  
6 light AA artillery regiments.  
8 field engineer squadrons.  
5 signals regiments.

(All of the above are cadre units that would be brought up to full strength on mobilization of the Citizen Force and would form 2 divisions.)

141 *Centurion*, 20 *Comet* med tks; 1,000 AML-245/60, AML-245/90 *Eland*, 50 M-3 armd cars; 230 scout cars; 250 *Saracen*, *Ratel* APC; 25-pdr, 5.5in gun/how; 17-pdr, 90mm ATK guns; *ENTAC* ATGW; 204GK 20mm, K-63 twin 35mm, L-70 40mm, 3.7-in AA guns; 18 *Cactus (Crotale)*, 54 *Tigercat* SAM.

**Reserves:** 138,000 Active Reserve (Citizen Force). Reservists serve 19 days per year for 5 years.

**Navy:** 5,000 incl 1,400 conscripts.

3 *Daphne*-class submarines.  
2 destroyers with 2 *Wasp* ASW helicopters.  
5 ASW frigates (3 with 1 *Wasp* hel).  
1 escort minesweeper (training ship).  
10 coastal minesweepers.  
5 patrol craft (ex-British *Ford*-class).  
(2 *Agosta*-class submarines, 2 Type A69 frigates, 3 FPBG, 6 corvettes with *Gabriel* II SSM on order.)

**Reserves:** 10,500 Citizen Force with 1 frigate and 7 minesweepers.

**Air Force:** 8,500, incl 3,000 conscripts; 133 combat aircraft.

2 light bomber sqns with 6 *Canberra* B(I)12, 3 T4, and 9 *Buccaneer* S50.  
3 FGA sqns with 16 *Mirage* IIIEZ, 14 IIIDZ.  
1 FGA sqn with 15 F-86 (being replaced by *Mirage* F1AZ).  
1 fighter/recce sqn with 27 *Mirage* IIICZ/BZ/RZ.  
1 interceptor sqn with 16 *Mirage* F1CZ.  
2 MR sqns with 7 *Shackleton* MR3, 20 *Piaggio* P166S *Albatross*.  
4 tpt sqns with 7 C-130B, 9 *Transall* C-160Z, 23 C-47, 5 DC-4, 1 *Viscount* 781, 4 HS-125, 7 *Swearingin Merlin* III.  
4 hel sqns: 2 with 40 *Alouette* III, 1 with 25 SA-330 *Puma*, 1 with 15 SA-321L *Super Frelon*.  
1 flight of 12 *Wasp* (naval assigned).  
2 comms and liaison sqns (army assigned) with 22 *Cessna* 185A/D/E, 36 AM-3C *Bosbok*, 3 C-4M *Kudu*.  
Trainers incl *Harvard*, 145 MB-326 *Impala* I (some armed), 22 *Impala* II, 25 *Vampire*, C-47, and *Alouette* II/III.

(32 *Mirage* F-1AZ, 30 *Impala* II, and 37 *Kudu* on order.)

**Reserves:** 25,000 Citizen Force.  
6 sqns: with 36 *Impala* I/II, 145 *Harvard*, T-6G.

**Para-Military Forces:** 90,000 Commandos (infantry battalion-type units grouped in formations of 5 or more units with local industrial and rural protection duties). Members do 12 months' initial and 19 days' annual training. There are 12 Air Commando squadrons with private aircraft.

## TANZANIA

Population: 15,570,000.  
Military service: voluntary.  
Total armed forces: 14,600.  
Estimated GNP 1974: \$1.9 bn.  
Defence expenditure 1975: 520 m shillings (\$70 m).  
\$1=7.43 shillings (1975), 7.16 shillings (1974).

**Army:** 13,000.

1 tank battalion.  
7 infantry battalions.  
2 artillery battalions.  
1 engineer battalion.  
20 Chinese T-59 med, 14 T-62 lt tks; BTR-40/-152 APC; 24 ex-Soviet 76mm guns, 30 ex-Chinese 122mm how; 50 ex-Chinese 120mm mor; 14.5mm and 37mm AA guns.

**Deployment:** Mozambique: 2 inf bns.

**Navy:** 600.

6 *Shanghai*-class MGB, 4 *Hu Chwan*-class hydrofoils. 6 FPB.

**Air Force:** 1,000; 33 combat aircraft.

3 fighter sqns with 15 MiG-21, 10 MiG-17, and 8 F-6/MiG-19 (ex-Chinese).  
1 tpt sqn with 1 An-2, 12 *Caribou*, 8 *Otter*, 6 *Cessna* 310.  
2 MiG-15UTI, 6 *Cherokee* trainers.  
2 Bell 47G and 2 AB-206 hel.

**Para-Military Forces:** A police marine unit; 35,000 Citizen's Militia.

## UGANDA

Population: 11,920,000.  
Military service: voluntary.  
Total armed forces: 21,000.  
Estimated GNP 1974: \$2.0 bn.  
Defence expenditure 1974-75: 350 m shillings (\$49 m).  
\$1=7.16 shillings (1974).

**Army:** 20,000.

2 brigades, each of 4 battalions.  
1 mechanized infantry battalion.  
1 parachute/commando battalion.  
1 marine/commando battalion.  
1 artillery regiment.  
1 training battalion.  
15 T-54/-55, 10 M-4 med tks; 15 *Ferret* scout cars; 100 BTR-40/-152, OT-64, BRDM APC; 76mm guns; 120mm mor; *Sagger* ATGW; 50 AA guns.

**Navy:** A small lake patrol service being formed.

**Air Force:** 1,000, excluding expatriate instructors and maintenance personnel; 21 combat aircraft.

2 fighter sqns with 3 MiG-21, 8 MiG-17, 2 MiG-15UTI.  
1 COIN sqn with 8 *Magister* armed trainers,

probably unserviceable.  
1 tpt sqn with 6 C47, 1 DHC-6, 1 IAI-1123 *Westwind*.  
1 hel sqn with 6 AB-205, 4 AB-206, 1 AB-212.  
Trainers incl L-29, 10 Piper It ac.

## ZAIRE REPUBLIC

Population: 25,600,000.  
Military service: voluntary.  
Total armed forces: 43,400.  
Estimated GNP 1974: \$3.5 bn.  
Defence expenditure 1974: 78.8 m zaires. (\$157m).  
\$1=0.501 zaires (1974).

**Army:** 40,000.

1 armoured battalion.  
1 mechanized battalion.  
14 infantry battalions.  
7 parachute battalions.  
4 'Guard' battalions.  
Some T-62 lt tks (ex-Chinese); 100 Panhard armd cars; M-3 and 30 *Ferret* scout cars; 130mm, 122mm guns; 75mm how; 107mm mor; 57mm ATK guns; 75mm RCL; 20mm, 37mm, 40mm AA guns.

**Navy:** 400.

1 70-ton coastal patrol craft.  
11 patrol boats (6 ex-US *Stewart* type) all under 100 tons.

**Air Force:** 3,000; 40 combat aircraft.

1 fighter squadron with 5 *Mirage* VM.  
2 COIN sqns with 17 MB-326GB, 8 AT-6G, and 10 AT-28.  
1 tpt wing with 5 C-130, 2 DHC-4A, 2 DC-6, 4 C-54, 10 C-47, 15 *Cessna* 310, 2 Mu-2.  
1 hel sqn with 15 *Alouette* II/III, 9 SA-330 *Puma*, 7 Bell 47.  
Trainers incl 23 SF-260MC, T-6.  
(9 *Mirage* VM, 3 VDM, 1 C-130, 6 DHC-5 on order.)

**Para-Military Forces:** 20,000: 8 National Guard and 6 Gendarmerie battalions.

## ZAMBIA

Population: 5,070,000.  
Military service: voluntary.  
Total armed forces: 7,800.  
Estimated GNP 1974: \$2.5 bn.  
Defence expenditure 1974: 50 m kwacha (\$78 m).  
\$1=0.644 kwacha (1974).

**Army:** 6,300.

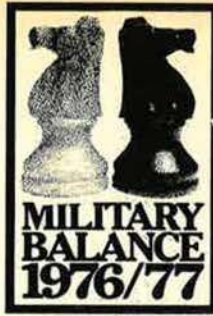
4 infantry battalions.  
1 reconnaissance squadron.  
1 artillery battery.  
1 SAM battery.  
1 engineer squadron.  
1 signals squadron.  
*Ferret* scout cars; 8 M-56 105mm pack how; 34 20mm AA guns; 4 *Rapier* SAM.

**Air Force:** 1,500; 24 combat aircraft.

3 COIN sqns: 1 with 2 *Soko* G-2A *Galeb* and 4 J-1 *Jastreb*, 2 with 18 MB-326GB armed trainers.  
1 transport squadron with 10 Do-28 *Sky-servant*, 10 C-47, 5 *Caribou*, 7 *Beaver*, 2 *Pembroke*, 1 HS-748.  
8 SF-260MZ trainers.  
25 AB-205, 1 AB-212, 7 Bell 47G, 8 *Alouette* III hel.  
(7 DHC-5 *Buffalo* on order.)

**Para-Military Forces:** 2,500: 1,000 mobile police border guard, 1,500 territorial forces.





# CHINA

Chinese defence policy operates at the two extremes of nuclear deterrence and People's War. The former aims to deter strategic attack, and the latter, by mass-mobilization of the country's population, to deter or repel any conventional land invasion.

## NUCLEAR WEAPONS

The Chinese nuclear programme continued slowly during the year. There were two nuclear tests, one in October 1975 (an underground test, the second) and one in January 1976 (a surface burst), bringing the number to eighteen since testing started in 1964. A theatre nuclear force is operational, capable of reaching large parts of the Soviet Union and Asia. The stockpile of weapons, both fission and fusion, probably amounts to some two or three hundred, and could grow rapidly. Fighter aircraft could be used for tactical delivery, and for longer ranges there is the Tu-16 medium bomber, with a radius of action up to 2,000 miles. MRBM with a range of some 600–700 miles are operational but may be phased out and replaced by IRBM, also operational now, with a range of 1,500–1,750 miles. The nuclear missile force seems to be under the control of the Second Artillery, apparently the missile arm of the People's Liberation Army (PLA).

A multi-stage ICBM with a range of 3,000–3,500 miles has been developed, and some have been deployed. An ICBM thought to have a range of 8,000 miles has also been under development but is unlikely to become operational for some years yet. Full-range testing, which would require impact areas in the Indian or Pacific Oceans, has not yet been carried out, but the missile has been successfully used (and thus tested) as a launcher for satellites. China has one G-class submarine with missile launching tubes, but does not appear to have missiles for it. All the present missiles are liquid-fuelled, but solid propellants are being developed.

## CONVENTIONAL FORCES

The PLA is organized in 11 Military Regions and divided into main and local forces. Main Force (MF) divisions, administered by the Military Regions in which they are stationed but commanded by the Ministry of National Defence,

are available for operations in any region and are better equipped. Local Forces (LF), which include Border Defence and Internal Defence units, are predominantly infantry and concentrate on the defence of their own localities in co-operation with para-military units.

The PLA is generally equipped and trained for the environment of People's War, but increasing effort is being made to arm a proportion of the formations with modern weapons. Infantry units account for most of the manpower and 121 of the 178 Main Force divisions; there are only 10 armoured divisions. The naval and air elements of the PLA have only about one-seventh of the total manpower, compared with over a third for their counterparts in the Soviet Union, but their equipment, and notably that of the Navy, is steadily being modernized. The PLA is essentially a defensive force and lacks the facilities and logistic support for protracted large-scale military operations outside China. It is, however, gradually acquiring greater logistic capacity.

Major weapons systems produced include MiG-19 and F-9 fighters (the last Chinese-designed), SA-2 SAM, Type 59 medium and Type 60 amphibious tanks, and a Chinese-designed Type 62 light tank and APC. R- and W-class medium-range diesel submarines are being built in some numbers, together with SSM destroyers and fast patrol boats; a nuclear-powered attack submarine (armed with conventional torpedoes) has been under test for some years. Most military equipment is 10–20 years out of date, but China has recently shown some interest in acquiring Western military technology.

## BILATERAL AGREEMENTS

China has a 30-year Treaty of Alliance and Friendship with the Soviet Union, signed in 1950, which contains mutual defence obligations, but it is highly unlikely that this remains in force. There is a mutual defence agreement with North Korea, dating from 1961, and an agreement to provide free military aid. There are non-aggression pacts with Afghanistan, Burma, and Cambodia. Chinese military equipment and logistic support has been offered to an increasing number of countries, particularly in Africa. Major recipients of arms in recent years have been Albania, Pakistan, and Tanzania.



Much of the PRC's military equipment is either Soviet-built, as is this late World War II-vintage T-34 medium tank, or the equipment has been derived from Soviet designs.



## CHINA

Population: 850-900,000,000.  
 Military service: Army 2-4 years, Air Force 3-5 years, Navy 4-6 years.  
 Total regular forces: 3,525,000.  
 GNP and defence expenditure—see box below.

### Strategic Forces:

IRBM: 20-30.  
 MRBM: 30-50.  
 Aircraft: about 65 Tu-16 medium bombers.

### Army: 3,000,000.

Main Forces:  
 10 armoured divisions.  
 121 infantry divisions.  
 3 cavalry divisions.  
 4 airborne divisions.  
 40 artillery divisions (incl AA divisions).  
 41 railway and construction engineer divisions.  
 Local Forces:  
 65 infantry divisions.  
 110 independent regiments.  
 8,000 Soviet JS-2 hy, T-34, and Chinese-produced T-59 med, T-60 (PT-76 type) amphibious and T-62 lt lks; 3,000 APC; 20,000 guns, how, and RL to 152mm, incl SU-76, SU-100, and JSU-122 SP arty; 6,000 120mm, 160mm mor; 75mm RCL; 37mm, 57mm, 85mm, 100mm AA guns.

### Deployment:

China is divided into 11 Military Regions (MR), in turn divided into Military Districts (MD), with usually two or three Districts to a Region. Divisions are grouped into some 40 armies, generally of 3 infantry divisions, 3 artillery regiments and, in some cases, 3 armoured regiments. Main Force (MF)

divisions are administered by Regions but are under central command.

The distribution of formations, excluding artillery and engineers, is believed to be:  
**North and North-East China** (Shenyang and Peking MR; figure includes the equivalent of 2-3 divs of border troops in each of these MR, as do figures for West and South-West China): 55 MF divs, 25 LF divs, 31 indep regts.  
**North and North-West China** (Lanchow and Sinkiang MR): 20 MF divs, 7 LF divs, 5 indep regts.  
**East and South-East China** (Tsinan, Nanking, Foochow, and Canton MR; the latter includes Hainan island): 30 MF divs, 15 LF divs, 28 indep regts.  
**Central China** (Wuhan MR): 15 MF divs, (incl 4 AB), 11 LF divs.  
**West and South-West China** (Chengtu and Kunming MR): 18 MF divs, 7 LF divs, 46 indep regts.

**Navy:** 275,000, incl 30,000 Naval Air Force and 28,000 Marines.

1 G-class submarine (with ballistic missile tubes). (China is not known to have any missiles for this boat. There is also 1 Han-class boat, nuclear-powered, armed with conventional torpedoes, which has been under test for some years.)  
 55 fleet submarines (34 Soviet R-, 21 W-class), including older training vessels.  
 5 Luta-class destroyers with Styx SSM (more building).  
 3 ex-Soviet Gordy-class destroyers with Styx SSM.  
 10 destroyer escorts (4 Riga-type with SSM).  
 15 patrol escorts.  
 30 submarine chasers (Soviet Kronstadt-type).  
 80 Osa- and 60 Komar-type FPBG with Styx SSM (more building).  
 150 MTB (under 100 tons).  
 70 hydrofoils (under 100 tons).

320 MGB (Shanghai-, Swatow-, Whampoa-classes).  
 30 minesweepers (20 Soviet T-43 type).  
 35 landing ships (ex-US).  
 300 coast and river defence vessels (most under 100 tons).  
 400 support ships.

### Deployment:

**North Sea Fleet:** about 150 vessels; deployed from the mouth of the Yalu river to Lienyunkang; there are major bases at Tsingtao, Lushun, and Luta.  
**East Sea Fleet:** about 400 vessels; deployed from Lienyunkang to Chaoan Wan; major bases at Shanghai, Chou Shan, and Ta Hsiehtao.  
**South Sea Fleet:** about 150 vessels; deployed from Chaoan Wan to the Vietnamese frontier; major bases at Huangpu, Chanchiang, and Yulin.

**Naval Air Force:** 30,000; about 700 shore-based combat aircraft, organized into 4 bomber and 5 fighter divisions, including about 100 Il-28 torpedo-carrying and Tu-2 light bombers and some 500 fighters, incl MiG-17, MiG-19/F-6, and some F-9; Be-6 Madge MR aircraft; 50 Mi-4 Hound helicopters. Naval fighters are integrated into the air defence system.

**Air Force:** 250,000, incl strategic forces and 120,000 air defence personnel; about 4,250 combat aircraft.

About 65 Tu-16 and a few Tu-4 medium bombers.

About 300 Il-28 and 100 Tu-2 light bombers.  
 About 200 MiG-15, 1,500 MiG-17, 2,000 MiG-19, 75 MiG-21, and some F-9 fighters organized into air divisions and regiments.  
 About 400 fixed-wing transport ac, incl some 200 An-2, Li-2, 50 Il-14 and Il-18, and 300 hel, incl Mi-4 and 13 Super Frelon. These could be supplemented by about 400 aircraft from the Civil Aviation Administration.

There is an air-defence system, capable of limited defence of key urban and industrial areas, military installations, and weapon complexes. Up to 4,000 naval and air force fighters are assigned to this role, also several hundred CSA-1 (SA-2) SAM and several thousand AA guns.

**Para-Military Forces:** Public security force and a civilian militia with various elements: the Armed Militia, about 5 million, organized into about 75 divisions and an unknown number of regiments; the Urban Militia, of several million; the Civilian Production and Construction Corps, about 4 million; the Ordinary and Basic Militia, who receive some basic training but are generally unarmed.

## Gross National Product and Defence Expenditure

### Gross National Product

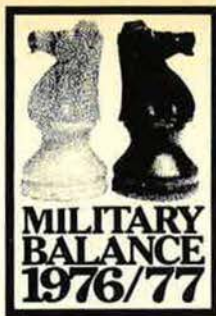
There are no official Chinese figures for GNP or National Income. Western estimates have varied greatly, and it is difficult to choose from a wide range of figures, variously defined and calculated. For example, the Chinese Prime Minister indicated a figure of \$120 billion in 1970 as the gross value of industrial, transport, and agricultural production, but this is not the same as GNP, since it excludes certain services and probably includes some double-counting. An estimate published in *Handbook on the Far East and Australasia 1975-76* has placed 1975 National Income, which is less than GNP to the extent of depreciation, at \$115 bn. This compares with a recent US estimate

for 1974 of \$223 bn at 1973 prices, which at 1974 prices is \$245 bn.

### Defence Expenditure

China has not made public any budget figures since 1960, and there is no general agreement on the resources that are devoted to defence. Such estimates as there have been are only speculative. The United States Arms Control and Disarmament Agency (ACDA) has recently estimated the 1974 expenditure at \$17 billion. Observers in the United States have, however, noted a fall in the level of Chinese weapon procurement between 1971 and 1974, with most of the fall occurring in 1972.





# Other Asian Countries And Australasia

## BILATERAL AGREEMENTS

The United States has bilateral defence treaties with Japan, the Republic of China, Taiwan, and the Republic of Korea, and one (being renegotiated) with the Philippines. Under several other arrangements in the region, she provides military aid on either grant or credit basis to Taiwan, Indonesia, the Republic of Korea, Malaysia, the Philippines, and Thailand, and sells military equipment to many countries, notably Australia, Japan, Korea, and Taiwan. There are military facilities agreements with Australia, Japan, the Republic of Korea, the Philippines, and Taiwan. There are major bases in the Philippines and on Guam. The 1973 Diego Garcia Agreement between the British and American governments provides for the development of the present limited US naval communications facility on Diego Garcia into a US naval support facility.

The Soviet Union has treaties of friendship, co-operation, and mutual assistance with India, Bangladesh, Mongolia, and the Democratic People's Republic of Korea. Military assistance agreements exist with Sri Lanka (Ceylon) and the Democratic Republic of Vietnam. Important Soviet military aid is also given to Afghanistan.

Australia has supplied a small amount of defence equipment to Malaysia and Singapore and is giving defence equipment and assistance to Indonesia, including the provision of training facilities.

## MULTILATERAL AGREEMENTS

In 1954 the United States, Australia, Britain, France, New Zealand, Pakistan, the Philippines, and Thailand signed the South-East Asia Collective Defence Treaty, which came into force in 1955 and brought SEATO into being. The parties agreed that, in the event of armed attack against any of their

territories in the Treaty area, or against the territory of any state designated by a protocol to the Treaty, each state would act to meet the common danger in accordance with its constitutional processes, or consult in the event of a lesser threat. The parties also agreed to co-operate in developing their economies to promote economic progress and social well-being. SEATO adopted a series of military contingency plans and held regular military exercises, but in recent years has turned its attention increasingly to rendering assistance to national counter-subversion programmes and to aid projects. Pakistan left SEATO in 1973, after formally denouncing the Treaty. France ceased her financial contributions in 1974 but continues to adhere to the Treaty. In September 1975, the members agreed to keep the Treaty in being but to phase out the organization over the next two years.

Australia, New Zealand, and the United States are the members of a tripartite treaty known as ANZUS, which was signed in 1951 and is of indefinite duration. Under this treaty each agrees to 'act to meet the common danger' in the event of armed attack on either metropolitan or island territory of any one of them, or on armed forces, public vessels, or aircraft in the Pacific.

Five-Power defence arrangements, relating to the defence of Malaysia and Singapore and involving Australia, Malaysia, New Zealand, Singapore, and Britain, came into effect on 1 November 1971. These stated that, in the event of any externally organized or supported armed attack or threat of attack against Malaysia or Singapore, the five governments would consult together for the purpose of deciding what measures should be taken, jointly or separately. Britain withdrew her forces from Singapore, except for a small contribution to the integrated air-defence systems, by 31 March 1976. New Zealand troops have remained, as have Australian air forces in Malaysia (as part of the air defence system).

## AFGHANISTAN

Population: 19,710,000.  
Military service: 2 years.  
Total armed forces: 100,000.  
Estimated GNP 1972: \$1.6 bn.  
Defence expenditure 1975-76: 3,650 m afghanis (\$60 m).  
\$1 = 61.1 afghanis (1975), 45.0 afghanis (1972).

**Army:** 90,000.  
3 armoured divisions (under strength).  
10 infantry divisions (under strength).

3 mountain infantry brigades.  
200 T-34, 500 T-54/-55, T-62 med, 40 PT-76  
lt tks; 400 BTR-40/-50/-60/-152 APC; 500  
76mm, 100mm, 122mm, and 152mm guns  
and how; 100 120mm mor; 50 132mm  
multiple RL; 350 37mm AA guns; *Snapper*  
ATGW.

*Reserves:* 150,000.

**Air Force:** 10,000; 152 combat aircraft.  
3 light bomber squadrons with 30 Il-28.  
7 FGA sqns with 50 MiG-17, 12 MiG-19,

24 Su-7.  
3 interceptor sqns with 36 MiG-21.  
2 transport sqns with 10 An-2, 25 Il-14, 2  
Il-18.  
3 helicopter sqns with 18 Mi-4, some Mi-8.  
Trainers incl 30 MiG-15UTI/-17UTI, Yak-  
11/-18.  
1 AD div; 1 SAM bde (3 bns with 48 SA-2),  
1 AA bde (2 bns with 85mm, 100mm  
guns), 1 radar bde (3 bns).

*Reserves:* 12,000.

*Para-Military Forces:* 25,000 Gendarmerie.



## AUSTRALIA

Population: 13,770,000.  
 Military service: voluntary.  
 Total armed forces: 69,350.  
 Estimated GNP 1975: \$US 77.3 bn.  
 Defence expenditure 1976-77: \$A 2,200 m (\$US 2,733 m).  
 \$US 1 = \$A 0.805 (1976), \$A 0.753 (1975).



The Royal Australian Air Force operates one squadron of CH-47 helicopters (above). Its combat aircraft include F-111Cs and Mirage IIIs. India's Navy has one aircraft carrier, equipped with the British Hawker Sea Hawk fighter (right).

**Army:** 31,600.  
 1 infantry division HQ and 3 task force HQs.  
 1 tank regiment.  
 2 cavalry/APC regiments.  
 6 infantry battalions.  
 1 Special Air Service regiment.  
 4 artillery regiments (1 med, 2 field, 1 lt AA).  
 1 aviation regiment.  
 3 field engineer regiments.  
 1 army survey regiment.  
 2 signals regiments.  
 1 logistic support force.  
 143 *Centurion* med tks; 753 M-113 APC; 35 5.5-in guns; 253 105mm how; M-40 106mm, L-6 *Wombat* 120mm RCL; *ENTAC* ATGW; 40mm AA guns; *Redeye* SAM; 29 Bell 47, 44 Bell 206B-1 hel; 18 *Pilatus Porter*, 11 *Nomad* lt ac; 65 watercraft. (87 *Leopard* med tks, 20 *Rapier* SAM, 9 Bell 206B-1 hel on order.)

**Reserves:** 20,110. Army Reserve of 19,750 intended to form 7 field force groups with supporting arms and services; Emergency Reserve 360.

**Navy:** 16,200.  
 4 *Oberon*-class submarines.  
 1 aircraft carrier (carries 8 A-4, 6 S-2, 10 hel).  
 3 ASW destroyers with *Tartar* SAM, *Ikara* ASW msls.  
 3 GP destroyers (1 training).  
 6 frigates with *Seacat* SAM/SSM, *Ikara* ASW msls.  
 1 coastal minesweeper. } (modified British  
 2 coastal minehunters. } *Ton*-class  
 12 *Attack*-class patrol boats.  
 2 fleet support ships; 6 landing craft.  
 (2 submarines, 2 destroyers, *Harpoon* SSM on order.)

**Fleet Air Arm:**  
 1 FB sqn with 8 A-4G *Skyhawk*.  
 2 ASW sqns with 13 S-2E *Tracker*, 2 HS-748.

1 ASW hel sqn with 8 *Sea King*.  
 1 hel sqn with 4 Bell UH-1H, 2 Bell 206B, 4 *Wessex* 31B.  
 1 training sqn with 7 MB-326H, 7 TA-4G.

**Reserves:** 5,365: 5,140 Navy Citizen Military Force; 225 Emergency Reserve.

**Air Force:** 21,550; 183 combat aircraft. (A

Estimated GNP 1972: \$5.3 bn.  
 Defence expenditure 1975-76: 710 m taka (\$52 m).  
 \$1 = taka 13.7 (1975), taka 7.30 (1972).

**Army:** 59,000.  
 1 infantry division HQ.  
 5 infantry brigades.  
 1 tank regiment.  
 3 artillery regiments.  
 3 engineer battalions.  
 30 T-54 med tks; 30 105mm, 5 25-pdr gun/how; 50 120mm mor; 106mm RCL.  
 (Both Army and Air Force spares are short and some equipment unserviceable.)

**Navy:** 1,000.  
 4 patrol craft.  
 3 armed river patrol boats.  
 1 support vessel.

**Air Force:** 3,000; 9 combat aircraft.  
 1 fighter sqn with 9 MiG-21.  
 1 tpt sqn with 1 An-24, some An-26.  
 1 hel sqn with 5 *Alouette* III, 2 *Wessex*, 4 Mi-8.  
 Trainers incl 2 MiG-21UTI, 1 T-33A.



further 9 *Canberra* B20 and 67 *Mirage* IIID/O are also held.)  
 2 FB squadrons with 24 F-111C.  
 3 interceptor/FGA squadrons with 48 *Mirage* IIIO.  
 1 recce squadron with 13 *Canberra* B20.  
 2 MR sqns: 1 with 10 *Orion*; 1 with 12 *Nep-tune*.  
 5 tpt sqns: 2 with 24 C-130A/E; 2 with 22 DHC-4; 1 with 2 BAC-111, 10 HS-748, 3 *Mystère* 20; 17 C-47.  
 1 Forward Air Controller flight with 6 CA-25 *Winjeel*.  
 1 hel tpt sqn with 12 CH-47 *Chinook*.  
 2 utility hel sqns with 47 UH-1H *Iroquois*.  
 80 MB-326, 33 CA-25 *Winjeel*, 37 CT-4 *Air-trainer*.  
 (8 P-3C *Orion* on order.)

**Deployment:** *Malaysia/Singapore:* 2 sqns with *Mirage* IIIO.

**Reserves:** 1,215: 570 Air Force reserves, 5 Citizens Air Force sqns; 645 Emergency Reserve.

## BANGLADESH

Population: 78,630,000.  
 Military service: voluntary.  
 Total armed forces: 63,000.

**Para-Military Forces:** 20,000 Bangladesh Rifles.

## BURMA

Population: 31,780,000.  
 Military service: voluntary.  
 Total armed forces: 169,500.  
 Estimated GDP 1975: \$2.7 bn.  
 Defence expenditure 1976-77: 787 m kyat (\$113 m).  
 \$1 = 6.96 kyat (1976), 6.56 kyat (1975).

**Army:** 153,000.  
 3 infantry divisions each with 10 battalions.  
 2 armoured battalions.  
 84 indep inf battalions (in regional commands).  
 5 artillery battalions.  
 Supporting services.  
*Comet* lt tks; 40 Humber armd cars; 45 *Ferret* scout cars; 24 25-pdr gun/how; 120 76mm, 80 105mm how; 120mm mor; 50 6-pdr and 17-pdr ATK guns; 10 40mm, 3.7-in AA guns.

**Navy:** 9,000, incl 800 marines.  
 2 frigates.  
 4 coastal escorts.  
 5 MGB/MTB (under 100 tons).  
 36 gunboats (some 15 under 100 tons).



35 river patrol boats (under 100 tons).  
10 transports.

**Air Force:** 7,500; 10 combat aircraft.  
1 COIN sqn with 5 AT-33, some *Vampire*, F-86.  
4 C-45, 6 C-47, 2 Bristol 170, 6 DHC-3, 10 Cessna 180 tpts.  
Trainers incl 20 *Provost*, T-37C, 10 *Chipmunk*.  
Hel incl 13 KB-47G, 12 HH-43, 13 *Alouette III*, 18 UH-1.

**Para-Military Forces:** 35,000 People's Police Force.

## CHINA: REPUBLIC OF (TAIWAN)

Population: 16,910,000.  
Military service: 2 years.  
Total armed forces: 470,000.  
Estimated GNP 1975: \$16.1 bn.  
Defence expenditure 1974-75: 38.0 bn New Taiwan dollars (\$1,000 m).  
\$1 = \$NT 38.0 (1975), \$NT 38.0 (1974).

**Army:** 330,000.  
2 armoured divisions.  
12 heavy infantry divisions.  
6 light infantry divisions.  
2 armoured cavalry regiments.  
2 airborne brigades.  
4 special forces groups.  
1 SAM battalion with 24 *HAWK*.  
2 SAM battalions with 24 *Nike Hercules*.  
1,500 M-47/48 med, 625 M-41 lt tks; 400 M-18 SP ATK; 250 M-113 APC; 450 105mm, 300 155mm guns and how; 350 75mm M-116 pack, 10 240mm how, 225 105mm, 100 155mm SP how; 300 40mm AA guns (some SP); *HAWK*, *Nike Hercules* SAM; 50 UH-1H hel.

**Deployment:** *Quemoy*: 60,000; *Matsu*: 20,000.

**Reserves:** 1,000,000.

**Navy:** 35,000.  
2 submarines (ex-US *Guppy-II*-class).  
18 destroyers.  
14 frigates (12 ex-US armed transports).  
3 patrol vessels (plus up to 10 small patrol boats).  
22 MCM craft (9 coastal minesweepers).  
6 torpedo boats.  
50 landing vessels: 2 dock, 2 command, 20 LST, 4 medium, 22 utility.

**Reserves:** 45,000.

**Marines:** 35,000.  
2 divisions.  
M-47 med tks; LVT-4 APC; 105mm, 155mm how; 106mm RCL.

**Reserves:** 35,000.

**Air Force:** 70,000; 268 combat aircraft.  
13 fighter sqns with 90 F-100A/D, 100 F-5A/B/E/, 60 F-104.  
1 recce sqn with 7 RF-104G.  
1 MR sqn with 10 S-2A *Tracker*.  
1 SAR sqn with 10 UH-1H and 10 HU-16A.  
25 C-47, 100 C-119, and 5 C-123 tpts.  
125 trainers, incl PL-1B *Chien Shou*, T-28, T-33, T-38, F-5BF, F-100, F-104B.  
6 Hughes 500, 7 UH-19, 10 Bell 47G, 50 UH-1H hel.

**Reserves:** 90,000.

**Para-Military Forces:** 100,000 militia.

## INDIA

Population: 610,930,000.  
Military service: voluntary.  
Total armed forces: 1,055,500.  
Estimated GNP 1975: \$89.7 bn.  
Defence expenditure 1976-77: 25,250 m rupees (\$2,812 m).  
\$1 = 8.98 rupees (1976), 8.55 rupees (1975).

**Army:** 913,000.  
2 armoured divisions.  
15 infantry divisions.  
10 mountain divisions.  
5 independent armoured brigades.  
6 independent infantry brigades.  
1 parachute brigade.  
9 indep arty bdes, incl about 20 AA arty regts, 4 observation sqns, and indep flights.  
180 *Centurion* Mk 5/7, 1,000 T-54/-55, some 700 *Vijayanta* med, 150 PT-76 lt tks; 700 OT-62/-64(2A) and Mk 2/4A APC; about 2,000 75mm, 76mm, and 25-pdr (mostly towed), about 300 100mm, 105mm (incl pack how), and *Abbott* 105mm SP, 550 130mm and 5.5-in guns and how; 500 120mm, 160mm mor; 57mm, 106mm RCL; SS-11 and *ENTAC* ATGW; 100mm ATK guns; 30mm, 40mm AA guns; 40 *Tiger* SAM; 40 *Krishak*, 20 *Auster* AOP9 lt ac, some *Alouette III*, 25 SA-315 *Cheetah* hel (75 more on order).

**Reserves:** 200,000. Territorial Army 40,000.

**Navy:** 42,500, incl Naval Air.  
8 submarines (Soviet F-class).  
1 aircraft carrier (capacity 25 ac, incl 18 *Sea Hawk*, 4 *Alizé*, 2 *Alouette III*).  
2 cruisers.  
3 destroyers.  
26 frigates (3 *Leander*-class with 2 *Seacat* SAM, 10 *Petya*-class, 9 GP, 1 AA, 3 trg).  
8 *Osa*-class FPBG with *Styx* SSM (8 more on order).  
15 patrol boats (14 coastal, incl 5 *Poluchat*-class).  
8 minesweepers (4 inshore).  
1 landing ship, 6 landing craft (5 *Polnochny*-class).

**Naval Air Force:** 2,000.  
1 attack sqn with 25 *Sea Hawk* (10 in carrier).  
1 MR sqn with 12 *Alizé* (4 in carrier).  
1 MR sqn with 3 *Super Constellation*, 3 Il-38.  
2 hel sqns with 22 *Alouette III*.  
2 ASW sqns with 12 *Sea King* hel.  
2 *Devon*, 7 HJT-16 *Kiran*, 5 BN *Islander*, 4 *Vampire* T55 ac, 4 Hughes 300 hel.

**Air Force:** 100,000; about 950 combat aircraft.  
3 lt bbr sqns with 80 *Canberra* B(I)58, B(I)12.  
13 FGA sqns: 5 with 130 Su-7B, 3 with 80 HF-24 *Marut* 1A, 5 with 130 *Hunter* F56.  
11 interceptor sqns with 275 MiG-21PFMA/FL/MF.  
8 interceptor squadrons with 250 *Gnat* Mk 1.  
1 reconnaissance squadron with 12 *Canberra* PR57.  
14 tpt sqns: 1 with 12 Il-14; 1 with 28 HS-748, 3 Tu-124; 2 with 40 C-119G; 2 with 30 An-12; 1 with 29 *Otter*; 3 with 40 C-47; 1 with 21 *Caribou*.  
12 hel sqns: 6 with 100 Mi-4; 3 with 35 Mi-8; 3 with 120 *Chetok* (*Alouette III*); 12 AB-47, *Mystère IV*, *Kiran*, HT-2, *Hunter*, *Canberra*, MiG-21U, Su-7U, C-47 trainers.  
20 SAM sites with 120 SA-2.  
(110 MiG-21MF, 100 *Ajeet* (*Gnat*), 10 HS-748, 55 *Marut*, 90 *Iskra* on order.)

**Para-Military Forces:** About 80,000 Border

Security Force, about 100,000 in other organizations.

## INDONESIA

Population: 133,110,000.  
Military service: selective.  
Total armed forces: 246,000.  
Estimated GNP 1975: \$29.2 bn.  
Defence expenditure 1975-76: 460 bn rupiahs (\$1,108 m).  
\$1 = 415 rupiahs (1975).

**Army:** 180,000. (About one-third of the army is engaged in civil and administrative duties.)  
1 armd cavalry bde (1 tk bn, support units).  
14 infantry brigades (90 inf, 1 para, 9 arty, 11 AA, 9 engr bns) 3 in KOSTRAD.  
2 airborne brigades (6 bns).  
(Above units are in Strategic Reserve Command.)  
1 independent tank battalion.  
7 independent armoured cavalry battalions.  
4 independent para-commando battalions.  
*Stuart*, 50 AMX-13, 75 PT-76 lt tks; 78 *Saladin*, 58 *Ferret* armd cars; *Saracen*, 130 BTR-40 APC; 50 76mm, 40 105mm, 122mm guns/how; 200 120mm mor; *ENTAC* ATGW; 20mm, 37mm, 40mm, 200 57mm AA guns; 1 *Beaver*, 6 *Otter*, 2 C-47, 2 *Aero Commander*, Cessna 185, Piper L-4, some PZL *Wilga* 32 ac; 7 *Alouette III* hel.  
(Some equipment and ships are non-operational for lack of spares.)

**Deployment:** *Egypt* (UNEF): 1 battalion, 447 men.

**Navy:** 38,000, incl Naval Air and 5,000 Marines.  
3 submarines (ex-Soviet W-class).  
9 frigates (3 ex-Soviet *Riga*-, 4 ex-US *Jones*-class).  
20 coastal escorts (13 ex-Soviet *Kronstadt*-class).  
9 *Komar*-class FPBG with *Styx* SSM.  
40 patrol craft (16 under 100 tons).  
14 MCM (incl ex-Soviet T-43-class, 6 ex-US).  
3 command/support ships.  
10 amphibious vessels.  
1 Marine Brigade.  
(3 corvettes on order.)

**Naval Air:** 1,000.  
5 HU-16, 6 C-47, 6 *Nomad* MR ac; 4 Bell 47G, 6 *Alouette II/III* hel.

**Air Force:** 28,000; 30 combat aircraft. (Some aircraft are non-operational, for lack of spares. In addition to the aircraft shown above, some 22 Tu-16, 10 Il-28, 40 MiG-15/-17, 35 MiG-19, 15 MiG-21, 10 Il-14, 10 An-12 ac, 20 Mi-4, 9 Mi-6 hel are in store.)  
2 FGA sqns with 16 CA-27 *Avon-Sabre*, 14 F-51D *Mustang*.  
61 tpts: 8 C-130B, 12 C-47, 3 *Skyvan*, 1 C-140 *Jetstar*, 12 Cessna 207/401/402, 18 *Gelatik*, 7 *Otter*.  
2 hel sqns with 4 UH-34D, 5 Bell 204B, 4 *Alouette III*, 1 S-61A.  
Trainers incl T-6, T-33, T-34, *Airtourer*.  
(16 OV-10, 8 F-27, 2 *King Air* A-100, 3 CASA 212 21 *Musketeer* ac; 3 Bell 47G, 2 206B hel on order.)

**Para-Military Forces:** 12,000 Police Mobile Brigade; about 100,000 Militia.

## JAPAN

Population: 112,540,000.



Military service: voluntary.  
Total armed forces: 235,000.  
Estimated GNP 1975: \$502.5 bn.  
Defence expenditure 1976-77: 1,512.4 bn yen (\$5,058 m).  
\$1=299 yen (1976), 296 yen (1975).

**Army:** 153,000.  
1 mechanized division.  
12 infantry divisions (7,000-9,000 men each).  
1 tank brigade.  
1 airborne brigade.  
1 composite brigade.  
1 artillery brigade.  
1 signal and 5 engineer brigades.  
2 anti-aircraft artillery brigades.  
7 SAM groups (each of 4 batteries) with 170 HAWK.  
1 hel wing and 33 aviation sqns.  
560 Type 61, 40 Type 74 med, 140 M-41 lt tks; 430 Type 60, 50 Type 73 APC; M-2 155mm guns; 390 M-2 105mm, 220 M-1 155mm, 30 M-52 105mm SP, 10 M 44 155mm SP, 203mm how; 107mm mor (some SP); 57mm, 75mm, 106mm, 106mm SP RCL; Type 30 SSM; Type 64 ATGW; 35mm twin, 40mm, 75mm AA guns; HAWK SAM; 50 L-19, 20 LM-1/2, 91 O1-A/E, 10 LR-1 ac; 49 KV-107, 25 UH-1H, 83 UH-1B, 83 OH-6J, 10 H-13 hel. (2 LR-1, 9 KV-107, 30 UH-1H, 31 OH-6J, 3 TH-55J on order.)

Reserves: 39,000.

**Navy:** 39,000 (including Naval Air).  
16 submarines.  
30 destroyers (2 with 3 hel and ASROC, 2 with Tartar SAM and ASROC, 4 with 2 hel and ASROC, 8 with 2 hel or ASROC, 14 GP).  
17 frigates (10 with ASROC; 7 GP).  
20 coastal escorts.  
5 motor torpedo boats.  
9 coastal patrol craft (all under 100 tons).  
37 MCM (1 tender, 2 minelayers, 28 coastal, 6 inshore).  
4 LST (4 more on order).

**Naval Air:** 14,000.  
10 MR sqns with 70 P-2H/J, S2F-1, 15 PS-1 ac, and 57 SH-3 hel.  
7 hel sqns with 60 S-61A, KV-107A, HSS-2.  
1 tpt sqn with 4 YS-11, 1 S-2A.  
3 SAR sqns and 3 indep flts with 2 UF-2 ac, 3 S-61A, 8 S-62A hel.  
Trainers incl 6 YS-11T, 5 King Air, 29 Queen Air, 11 T-34, 29 KM-2 ac; 8 Bell 47, 4 OH-6J hel.  
(6 PS-1, 8 KM-2, 3 OF-2 ac, 6 SH-3, 3 KV-107 hel on order; 5 P-2H, 21 S-2A in store.)

Reserves: 600.

**Air Force:** 43,000; 448 combat aircraft.  
5 FGA sqns with 150 F-86F.  
10 interceptor sqns: 6 with 170 F-104J; 3 with 80 F-4EJ, 1 with 30 F-86F.  
1 recce sqn with 14 RF-4E, 4 RF-86F.  
2 tpt sqns with 7 C-46D, 11 YS-11A, 15 C-1A.  
210 trainers incl T-1A/B, T-2, T-33, T-34A, F-104DJ.  
1 SAR wing with 19 MU-2E ac, 20 V-107, 7 S-62 hel.  
5 SAM groups with Nike-J (6th forming).  
A Base Defence Ground Environment with 28 control and warning units.  
(10 F-4EJ, 26 FST-2, 17 T-2A, 6 KM-2B, 3 MU-2 ac, 2 KV-107 hel on order.)

## KAMPUCHEA (CAMBODIA)

Population: 8,340,000.  
Estimated GNP 1971: \$1.5 bn.  
Total armed forces: 80,000.

## Army:

(The former Khmer Liberation Army, which was organized into some 4 divisions and 3 independent regiments, appears still to have the same strength it had at the end of hostilities in 1975, and none of the former regime's troops seems to have been incorporated into the structure. The forces are deployed in small detachments on internal security duties throughout the country. Their equipment, a mixture of Soviet, Chinese, and American arms, includes: 175 M-113 APC; 200 105mm, 20 155mm gun/how; 107mm mor; 107mm RCL.)

**Navy:** Some 150 small patrol, river, and landing craft. (Both the Navy and Air Force may be part of the Army.)

**Air Force:** Aircraft are thought to include some 10 AU-24 COIN, 9 C-47 and C-123 transports, 15 T-41, 20 T-28 trainers; 25 UH-1H hel gunships; but their condition is not known.

## KOREA: DEMOCRATIC PEOPLE'S REPUBLIC (NORTH)

Population: 16,280,000.  
Military service: Army 7 years, Navy 5 years, Air Force 3-4 years.  
Total armed forces: 495,000.  
Estimated GNP 1972: \$3.5 bn.  
Defence expenditure 1975: 1,800 m won (\$878 m).  
\$1=2.05 won.

**Army:** 430,000.  
2 tank divisions.  
22 infantry divisions.  
3 independent infantry brigades.  
6 independent tank regiments.  
3 AA artillery brigades.  
250 T-34, 900 T-54/-55, and T-59 med, 150 PT-76, 50 T-62 lt tks; BTR-40/-60/-152, M-1967 APC; 3,000 guns and how up to 203mm; 700 RL; 2,500 120mm, 160mm mor; 82mm RCL; 57mm ATK guns; 24 FROG-5/-7 SSM; 2,500 AA guns, incl 37mm, 57mm, ZSU-57, 85mm, 100mm.

**Navy:** 20,000.  
8 submarines (4 ex-Soviet W-class, 4 ex-Chinese R-class).  
21 submarine chasers/escorts (ex-Soviet SO-1 class).  
10 Komar- and 8 Osa-class FPBG with Styx SSM.  
50 MGB (20 under 100 tons, 15 Shanghai-, 8 Swatow-class, 27 inshore).  
150 torpedo boats (all under 100 tons, 45 ex-Soviet P-4-, 30 P-6-class).

**Air Force:** 45,000, 600 combat aircraft.  
2 light bomber squadrons with 70 Il-28.  
13 FGA sqns with 30 Su-7 and 300 MiG-15/-17.  
10 fighter sqns with 150 MiG-21 and 50 MiG-19.  
100 transports, incl An-2, Il-14/-18, Tu-154.  
Hel incl 20 Mi-4, 20 Mi-8.  
Trainers incl Yak-18, MiG-15UTI/-21UTI, Il-28U.  
3 SAM brigades with 250 SA-2.

**Para-Military Forces:** 40,000 security forces and border guards; a civilian militia of 1,800,000 with small arms and some AA artillery.

## KOREA: REPUBLIC OF (SOUTH)

Population: 34,610,000.  
Military service: Army and Marines 2½ years, Navy and Air Force 3 years.  
Total armed forces: 595,000.  
Estimated GNP 1975: \$18.4 bn.  
Defence expenditure 1976: 726 bn won (\$1,500 m).  
\$1=484 won (1976), 491 won (1975).

**Army:** 520,000.  
18 infantry divisions.  
2 armoured brigades.  
2 infantry brigades.  
5 airborne brigades.  
2 air defence brigades.  
7 tank battalions.  
30 artillery battalions.  
1 SSM battalion with Honest John.  
2 SAM battalions with HAWK and Nike Hercules.  
840 M-47/-48 med lks; 500 M-113/-577 APC; 2,000 105mm, 155mm, 175mm, and 8-in guns/how; 107mm mor; 57mm, 75mm, 106mm RCL; Honest John SSM; 48 HAWK, 45 Nike Hercules SAM.

Reserves: 1,000,000.

**Navy:** 25,000.  
7 destroyers (Gearing-, Sumner-, Fletcher-classes).  
9 destroyer escorts (6 escort transports).  
14 coastal escorts.  
44 patrol boats (under 100 tons).  
12 coastal minesweepers.  
18 landing ships (8 LST, 10 med).  
70 amphibious craft.  
(120 Harpoon SSM on order).

Reserves: 33,000.

**Marines:** 20,000.  
1 division.

Reserves: 60,000.

**Air Force:** 30,000; 204 combat aircraft.  
10 FB sqns: 4 with 72 F-4D/E; 2 with 50 F-86; 4 with 70 F-5A/E.  
1 recce sqn with 12 RF-5A.  
44 transports, incl 20 C-46, 12 C-54, 12 C-123.  
Trainers incl 20 T-28D, 30 T-33A, 20 T-41D, 20 F-5B.  
6 UH-19, 5 UH-1D, 2 Bell 212 hel.  
(18 F-4E, 60 F-5E/F on order.)

Reserves: 55,000.

**Para-Military Forces:** A local defence militia, 750,000 Homeland Defence Reserve Force.

## LAOS

Population: 3,420,000.  
Military service: conscription, term unknown.  
Total armed forces: 42,500.  
Estimated GNP 1972: \$211 m.  
Defence expenditure 1974-75: 16 bn kip (\$27 m).  
\$1=600 kip (1974), 500 kip (1972).

**Army:** (Lao People's Liberation Army): 40,000.  
(The Royal Lao Army has been disbanded; some men may have been absorbed into the Liberation Army.)  
65 infantry battalions (under Military Regions).  
Supporting arms and services.  
M-24, PT-76 lt tks; BTR-40, M-706 scout cars; M-113 APC; 75mm, 85mm, 105mm,





The Japanese Air Force's T-2 jet trainer was the first supersonic aircraft to be developed by the Japanese aircraft industry. It has a Mach 1.6 top speed.

155mm how; 57mm, 81mm, 82mm, 4.2-in mor; 107mm RCL; 4 Cessna U-17A.

**Navy:** about 500.

20 patrol craft.

16 landing craft/tpts (all under 100 tons).

**Air Force:** 2,000; 73 combat aircraft (all inherited from the Royal Lao Air Force; degree of serviceability unknown).

63 T-28A/D COIN aircraft.

10 AC-47 gunships.

Tpts incl 18 C-47, 1 Aero Commander, 1 Beaver.

6 T-41D trainers.

6 Alouette II/III, 42 UH-34 hel.

## MALAYSIA

Population: 12,950,000.

Military service: voluntary.

Total armed forces: 62,300.

Estimated GNP 1975: \$US 9.5 bn.

Defence expenditure 1976: \$M 901 m

(\$US 353 m).

\$1=\$M 2.55 (1976), \$M 2.29 (1975).

**Army:** 52,500.

8 infantry brigades, consisting of:

29 infantry battalions.

3 reconnaissance regiments.

3 artillery regiments.

1 special service unit.

3 signals regiments.

5 engineer and administrative units.

600 Ferret scout cars; 200 Commando, 140

AML/M-3 APC; 80 105mm how; 35 40mm

AA guns. (100 Commando on order.)

**Reserves:** about 26,000.

**Navy:** 4,800.

2 frigates (1 ASW with Seacat SAM, 1 training).

8 FPBG (4 with SS-11/-12, 4 with Exocet SSM, 4 more on order).

28 patrol craft.

6 coastal minesweepers.

12 riverine craft.

**Reserves:** 500.



This F-5B is used to train pilots for the Republic of Korea's Air Force. The ROK Air Force is buying additional F-4s and F-5s to supplement its operational squadrons.

**Air Force:** 5,000; 50 combat aircraft.

2 FB sqns: 1 with 16 CA-27 Sabre (being withdrawn), 1 with 14 F-5E.

2 COIN sqns with 20 CL-41G Tebuan.

3 tpt, 1 liaison sqns with 17 DHC-4A, 8 Herald 401, 5 Dove, 3 Heron, 2 HS-125, 2 F-28-100, 8 Cessna 402B.

5 hel sqns with 14 S-61A, 25 Alouette III, 9 Bell 47G.

1 training sqn with 2 F-5B, 15 Bulldog 102, 4 Cessna 402B.

(6 C-130H; 5 Bell 206B, 6 S-61A hel on order.)

**Para-Military Forces:** Police Field Force of 22,000 with 17 bns and 40 patrol boats; local Defence Corps; about 60,000 border scouts.

## MONGOLIA

Population: 1,490,000.

Military service: 2 years.

Total armed forces: 30,000.

Estimated GNP 1974: \$2.8 bn.

Defence expenditure 1975: 373 m tugrik (\$93 m).

\$1=4.00 tugrik.

**Army:** 28,000.

2 infantry brigades.

30 T-34, 100 T-54/-55 med tks; 10 SU-100

SP guns; 40 BTR-60, 50 BTR-152 APC;

100mm, 130mm, 152mm guns/how; Snapper ATGW; 37mm, 57mm AA guns.

**Reserves:** 30,000.



**Air Force:** 2,000, excluding expatriate personnel; 10 combat aircraft.  
 1 fighter squadron with 10 MiG-15.  
 20 An-2, 6 Il-14, 4 An-24 transports.  
 10 Mi-1 and Mi-4 helicopters.  
 Yak-11/-18 trainers.  
 1 SAM battalion with SA-2.

**Para-Military Forces:** about 18,000 frontier guards and security police.

## NEPAL

**Population:** 12,890,000.  
**Military service:** voluntary.  
**Total armed forces:** 20,000.  
**Estimated GNP 1972:** \$1.0 bn.  
**Defence expenditure 1973-74:** 83.2 m rupees (\$8 m).  
 \$1=10.6 rupees (1973), 10.1 rupees (1972).

**Army:** 20,000. (There is no Air Force: the 70-man Army Air Flight Department operates the aircraft.)  
 5 infantry brigades (1 Palace Guard).  
 1 parachute battalion.  
 1 artillery regiment.  
 1 engineer regiment.  
 4 3.7-in pack how; 4 4.2-in, 18 120mm mor; 2 40mm AA guns; 2 *Skyvan*, 1 DC-3, 1 HS-748 tpts; 3 *Alouette III*, 2 *Puma* hel.

## NEW ZEALAND

**Population:** 3,140,000.  
**Military service:** voluntary, supplemented by Territorial service of 12 weeks for the Army.  
**Total armed forces:** 12,575.  
**Estimated GNP 1975:** \$US 13.5 bn.  
**Defence expenditure 1975-76:** \$NZ 186.6 m (\$US 243 m).  
 \$1=\$NZ 0.768 (1975).

**Army:** 5,432. (Plus 6,171 active Territorials for 12 weeks a year.)  
 2 infantry battalions.  
 1 artillery battery.  
 Regular troops also form the nucleus of 2 brigade groups and a logistic group; these would be completed by mobilization of Territorials.  
 10 M-41 lt tks; 9 *Ferret* scout cars; 66 M-113 APC; 17 25-pdr, 10 5.5-in guns; 28 105mm how; 23 106mm RCL.

**Deployment:** Singapore: 1 inf bn, logistic support.

**Reserves:** 1,753 Regular, 6,200 Territorial.

**Navy:** 2,843.  
 4 frigates with *Seacat* SAM (2 with *Wasp* hel).  
 1 escort minesweeper (training).  
 14 patrol craft (11 under 100 tons).  
 7 motor launches.  
 1 survey ship.

**Deployment:** Singapore: 1 frigate.

**Reserves:** 3,039 Regular, 283 Territorial.

**Air Force:** 4,300; 36 combat aircraft.  
 1 FB sqn with 10 A-4K, 3 TA-4K *Skyhawk*.  
 1 FB/trg sqn with 16 BAC-167 and 2 *Harvard*.  
 1 MR sqn with 5 P-3B *Orion*.  
 3 med tpt sqns with 5 C-130H, 6 Bristol *Freighter*, 6 *Dakota*, and 2 *Devon* (10 *Andover* on order).  
 1 tpt hel sqn with 8 Bell 47G, 2 *Sioux*, and 10 UH-1D/H *Iroquois*.  
 13 CT-4, 10 *Devon*, 4 *Airtourer*, 4 *Sioux* trainers.



New Zealand's small but efficient air force is partially equipped with US-manufactured A-4 attack aircraft.

**Deployment:** Singapore: 1 transport squadron (3 Bristol *Freighter* tpts and 4 *Iroquois* hel).

**Reserves:** 1,220 Regular, 140 Territorial.

## PAKISTAN

**Population:** 72,790,000.  
**Military service:** 2 years selective.  
**Total armed forces:** 428,000.  
**Estimated GNP 1975:** \$10.1 bn.  
**Defence expenditure 1976-77:** 7,980 m rupees (\$807 m).  
 \$1=9.89 rupees (1976), 9.72 rupees (1975).

**Army:** 400,000 (incl 29,000 *Azad Kashmir* troops).  
 2 armoured divisions.  
 14 infantry divisions.  
 2 independent armoured brigades.  
 1 air defence brigade.  
 5 army aviation squadrons.  
 M-4, 250 M-47/-48, 50 T-55, and 700 T-59 med, 50 M-24 lt tks; 400 M-113 APC; about 1,000 25-pdr, 100mm, 105mm, 122mm, 130mm, and 155mm guns/how; 270 107mm, 120mm mor; 6-pdr ATK guns; 75mm, 106mm RCL; *Cobra* ATGW; 37mm, 40mm, 57mm, 3.7-in AA guns; 50 O-1E lt ac; 12 Mi-8, 20 *Alouette III*, 20 Bell 47G hel. (9 btys *Crotale* SAM on order.)

**Reserves:** 500,000.

**Navy:** 11,000.  
 3 submarines (*Daphne*-class, 3 more on order).

6 SX-404 midget submarines.  
 1 light cruiser (training ship).  
 4 destroyers (ex-British *Battle-*, CH-, and CR-classes).  
 4 frigates (ex-British Type 16 and *Whitby*-class).  
 17 patrol boats, incl 4 ex-Chinese *Hu Chwan-*, 12 *Shanghai*-class.  
 8 coastal minesweepers.  
 2 UH-19, 2 *Sea King* hel (4 *Sea King* on order).

**Reserves:** 5,000.

**Air Force:** 17,000, 217 combat aircraft.  
 1 light bomber squadron with 15 B-57B.  
 3 fighter sqns with 28 *Mirage III*EP/DP, 28 *Mirage* VPA.  
 8 FGA sqns with 60 F-86, 80 MiG-19/F-6.  
 1 recce sqn with 3 *Mirage III*RP.  
 1 MR sqn with 3 *Atlantic*.  
 Transports include 6 C-130B/E, 1 L-100, 1 *Falcon* 20, 1 F-27.  
 10 HH-43B, 14 *Alouette III*, 1 *Puma*, and 12 Bell 47 hel.  
 Trainers incl 50 Saab *Supporter*, 30 T-6, 12 T-33, 30 T-37.  
 (10 *Mirage III*RP ac, 4 *Super Frelon* hel on order.)

**Reserves:** 8,000.

**Para-Military Forces:** 75,000: 33,000 Civil Armed Forces, 22,000 National Guard, 20,000 Federal Security Forces.

## PHILIPPINES

**Population:** 43,980,000.



Military service: selective.  
Total armed forces: 78,000.  
Estimated GNP 1975: \$15.6 bn.  
Defence expenditure 1976-77: 3,050 m pesos (\$410 m).  
\$1 = 7.43 pesos (1976), 7.13 pesos (1975).

**Army:** 45,000.  
3 light infantry divisions.  
2 independent infantry brigades.  
1 artillery group.  
7 M-41 lt tks; 35 M-113 APC; 100 105mm, 5 155mm how; 40 4.2in mor; 75mm, 106mm RCL.

Reserves: 17,000.

**Navy:** 17,000, incl 7,000 Marines and naval engrs.  
1 destroyer escort.  
75 coastal/river patrol craft.  
4 minesweepers.  
11 landing, 2 command ships.  
1 SAR squadron with 6 BN *Islander*.  
Marine battalion landing teams.

Reserves: 12,000.

**Air Force:** 16,000; 56 combat aircraft.  
1 FGA sqn with 20 F-5A/B.  
2 fighter sqns with 20 F-86F.  
1 COIN sqn with 16 SF-260WP.  
1 SAR sqn with 4 HU-16 *Albatross*.  
5 tpt sqns with 30 C-47, 10 F-27, 4 L-100-20, 4 YS-11, 15 C-123K, 12 *No-mad*, 12 *Beaver*.  
Hel incl 12 UH-1D, 8 FH-1100, 5 UH-19, 2 H-34, 2 S-62.  
Trainers incl 2 F-5B, 30 T-28/-34, 12 T-33, 36 T-41, and 32 SF-260MP.  
(2 C-130 tpts, 38 Bo-105 hel on order.)

Reserves: 16,000.

**Para-Military Forces:** 60,000: 35,000 Philippine Constabulary, 25,000 Local Self-Defence force.

## SINGAPORE

Population: 2,300,000.  
Military service: 24-36 months.  
Total armed forces: 31,000.  
Estimated GNP 1975: \$US 6.5 bn.  
Defence expenditure 1976-77: \$S840 m (\$US 340 m).  
\$US 1 = \$S 2.47 (1976), \$S 2.28 (1975).

**Army:** 25,000.  
1 armoured brigade (1 tk, 2 APC bns).  
3 inf brigades (9 inf, 3 arty, 3 engr, 1 sigs bns).  
75 AMX-13 tks; 250 V-200 *Commando*, 250 M-113 APC; some 6 25-pdr, 20 155mm guns/how; 120mm mor; 90 106mm RCL.

Reserves: 45,000, 18 reserve battalions.

**Navy:** 3,000.  
6 FPBG (*Jaguar*-class with *Gabriel* SSM).  
6 MGB.  
5 patrol craft (4 under 100 tons).  
1 ex-US LST and 4 landing craft.

**Air Force:** 3,000; 97 combat aircraft.  
2 FGA/recce sqns with 42 *Hunter* FGA/FR74/T75.  
2 FGA sqns (being formed) with 40 A-4.  
1 COIN/trg sqn with 15 BAC-167.  
2 tpt/SAR sqns: 1 with 6 *Airtourer*, 1 with 6 *Skyvan*.  
1 SAR hel sqn with 7 *Alouette* III.  
*Hunter*, 4 T-66, 16 SF-260MS, 3 TA-4S trainers.  
1 SAM sqn with 24 *Bloodhound* (1 *Rapier* sqn forming).

**Para-Military Forces:** 7,500 police/marine police; Gurkha guard units; Home Guard 30,000.

## SRI LANKA (CEYLON)

Population: 14,320,000.  
Military service: voluntary.  
Total armed forces: 13,600.  
Estimated GNP 1975: \$3.3 bn.  
Defence expenditure 1976: 159.8 m rupees (\$19 m).  
\$1 = 8.56 rupees (1976), 7.10 rupees (1975).

**Army:** 8,900.  
1 brigade of 3 battalions.  
1 reconnaissance regiment.  
1 artillery regiment.  
1 engineer regiment.  
1 signals regiment.  
6 *Saladin* armd cars; 30 *Ferret* scout cars; 10 BTR-152 APC; 76mm, 85mm how.

Reserves: 12,000; 1 brigade of 3 battalions.

**Navy:** 2,400.  
1 frigate (ex-Canadian *River*-class).  
5 fast gunboats (ex-Chinese *Shanghai*-class).  
23 coastal patrol craft (1 hydrofoil).  
1 *Osa*-class FPB.

**Air Force:** 2,300; 5 combat aircraft.  
1 FGA sqn with 5 MiG-17.  
1 trg sqn with 8 *Jet Provost* Mk 51, 1 MiG-15UTI.  
1 tpt sqn with 2 *Riley*, 2 *Heron*, 5 *Dove*, 1 CV-440.  
1 comms sqn with 4 Cessna 337, 2 DC-3.  
1 hel sqn with 7 *JetRanger*, 2 KA-26, 6 Bell 47-G2.  
6 Cessna 150, 9 *Chipmunk*, 4 *Dove* trainers.

Reserves: 1,100; 4 sqns Air Force Regt, 1 sqn Airfield Construction Regt.

**Para-Military Forces:** 16,300.

## THAILAND

Population: 43,690,000.  
Military service: 2 years.  
Total armed forces: 210,000.  
Estimated GNP 1975: \$14.7 bn.  
Defence expenditure 1975-76: 11,164 m baht (\$542 m).  
\$1 = 20.6 baht (1975).

**Army:** 141,000.  
6 infantry divisions (incl 4 tank battalions).  
3 independent regimental combat teams.  
1 SAM battalion with *HAWK*.  
5 aviation companies and some flights.  
20 M-24, 175 M-41 lt tks; 200 M-113 APC; 130 105mm, 12 155mm how; 57mm, 75mm, 106mm RCL; 40mm AA guns; 40 *HAWK* SAM.  
90 O-1 lt ac; 90 UH-1B/D, 4 CH-47, 24 OH-13, 16 FH-1100, 3 Bell 206, 6 OH-23F hel.

Reserves: 350,000.

**Navy:** 27,000, incl 9,000 Marines.  
7 frigates (1 with *Seacat* SAM, 2 in reserve).  
14 patrol vessels.  
28 river patrol boats.  
26 coastal gunboats (under 100 tons).  
18 mine warfare ships.  
9 landing craft.  
1 MR sqn with 10 S-2F *Tracker* and 2 HU-16B *Albatross*.  
1 marine brigade of 3 infantry and 1 artillery battalions.  
(3 FPBG on order.)

**Air Force:** 42,000; 179 combat aircraft.  
1 FGA sqn with 24 F-5A/E, 2 F-5B.  
7 COIN sqns with 36 T-28D, 30 T-6G, 32 OV-10C, 16 A-37B, 11 AU-23A.  
1 recce sqn with 20 T-33, 4 RT-33A, 4 RF-5A.  
1 utility sqn with 25 O-1 lt ac.  
3 tpt sqns with 20 C-47, 40 C-123B, 5 C-45, 2 HS-748 med tpts, 25 O-1 lt ac.  
2 hel sqns with 40 CH-34C, 50 UH-1H, 13 UH-19, 3 *Huskie*.  
4 battalions of airfield defence troops.  
Trainers incl 10 *Chipmunk*, 14 T-33A, 14 T-37B, 4 T-41, 12 SF-260, 24 CT-4.  
(16 F-5E, 20 AU-23A on order.)

**Para-Military Forces:** 52,000 Village Defence Corps, 14,000 Border Police with hel and light aircraft.

## VIETNAM: DEMOCRATIC REPUBLIC

Population: 45,760,000.  
Military service: 2 years minimum.  
Total armed forces: 615,000.

**Army:** 600,000.  
18 infantry divisions, 2 training divisions. (Inf divs, normally totalling 8-10,000 men, include 3 inf, 1 arty regt, 1 tk bn, and support elements.)  
1 artillery command (of 10 regiments).  
3 armoured regiments.  
About 15 independent infantry regiments.  
20 SAM regiments (each with 18 SA-2 launchers).  
40 AA artillery regiments.  
900 T-34, T-54, and T-59 med, PT-76, Type 60 lt tks; BTR-40 APC; SU-76, JSU-122 SP guns; 85mm, 100mm, 105mm, 122mm, 130mm, 152mm, 155mm guns/how; 82mm, 100mm, 107mm, 120mm, 160mm mor; 107mm, 122mm, 140mm RL; *Sagger* ATGW; 12.7mm, 14.5mm, 23mm, 37mm, 57mm, 85mm, 100mm AA, ZSU-23-4, ZSU-57-2 SP AA guns; SA-2, SA-3, SA-7 SAM.

Deployment: 35,000 in Laos.

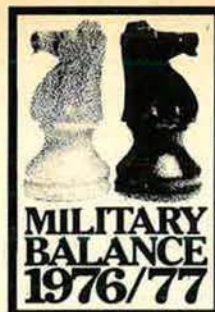
**Navy:** 3,000.  
2 coastal escorts (ex-Soviet SO-1 type).  
4 *Komar*-class FPBG with *Styx* SSM.  
30 MGB (*Shanghai*- and *Swatow*-class).  
4 MTB (ex-Soviet P-4-, P-6-classes).  
About 30 small patrol boats (under 100 tons).  
Some 20 landing craft.  
10 Mi-4 SAR helicopters.

**Air Force:** 12,000; 198 combat aircraft.  
1 light bomber sqn with 8 Il-28.  
8 FGA sqns with 80 MiG-17, 30 Su-7.  
6 interceptor sqns with 30 MiG-19, 50 MiG-21.  
20 An-2, 4 An-24, 12 Il-14, 20 Li-2 transports.  
15 Mi-4, 10 Mi-6 helicopters.  
About 30 training aircraft.

(The equipment of the former forces of South Vietnam is not included above. It is estimated to have included up to 500 M-48 med and M-41 lt tks; 1,200 M-113 APC; 1,300 105mm and 155mm guns/how (some SP); 2 frigates; 2 patrol vessels; 42 patrol gunboats; 13 landing ships; 17 landing craft; 600 riverine craft; 11 support vessels; 1,100 ac of all types, incl F-5A, A-37B, 25 A-1H/J, 37 AC-119C/K, 10 AC-47, 114 O-1, 33 *Beaver*, 13 C-47; 32 CH-47, 434 UH-1 hel.)

**Para-Military Forces:** 50,000 Frontier, Coast Security, and People's Armed Security Forces; Armed Militia of about 1,500,000.





# Latin America

## CONTINENTAL TREATIES AND AGREEMENTS

In March and April 1945, the Act of Chapultepec was signed by Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the United States, Uruguay, and Venezuela. This Act declared that any attack upon a member party would be considered an attack upon all, and provided for the collective use of armed force to prevent or repel such aggression.

In September 1947, all the parties to the Chapultepec Act—except Ecuador and Nicaragua—signed the Inter-American Treaty of Reciprocal Assistance, otherwise known as the Rio Defence Treaty (Cuba withdrew from the Treaty in March 1960). This Treaty constrained signatories to the peaceful settlement of disputes among themselves and provided for collective self-defence should any member party be subject to external attack.

The Charter of the Organization of American States (OAS), drawn up in 1948, embraced declarations based upon the Rio Defence Treaty. The member parties—the signatories to the Act of Chapultepec plus Barbados, El Salvador, Jamaica, and Trinidad and Tobago—are bound to peaceful settlement of internal disputes and to collective action in the event of external attack upon one or more signatory states. (Legally, Cuba is a member of the OAS but has been excluded—by a decision of OAS Foreign Ministers—since January 1962. Barbados and Trinidad and Tobago signed the Charter in 1967.)

The United States is also a party to two multilateral defence treaties: the Act of Havana (1940), signed by representatives of all the then 21 American Republics, which provides for the collective trusteeship by American nations of European colonies and possessions in the Americas should any attempt be made to transfer the sovereignty of these colonies from one non-American power to another; and the

Havana Convention, which corresponds with the Act of Havana, signed in 1940 by the same states, with the exception of Bolivia, Chile, Cuba, and Uruguay.

A Treaty for the Prohibition of Nuclear Weapons in Latin America (The Tlatelolco Treaty) was signed in February 1967 by 22 Latin American countries; 20 countries have now ratified it (Argentina and Chile have signed but not ratified, and Brazil has ratified but reserved her position on peaceful nuclear explosions). Britain and the Netherlands have ratified it for the territories within the Treaty area for which they are internationally responsible. The United States, Britain, France, and China have signed Protocol II to the Treaty (an undertaking not to use or threaten to use nuclear weapons against the parties to the Treaty). An Agency has been set up by the contracting parties to ensure compliance with the Treaty.

## OTHER AGREEMENTS

In July 1965, El Salvador, Guatemala, Honduras, and Nicaragua agreed to form a military bloc for the co-ordination of all resistance against possible Communist aggression.

The United States has bilateral military assistance agreements or representation with Argentina, Bolivia, Brazil, Chile, Colombia, the Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela. She has a bilateral agreement with Cuba for jurisdiction and control over Guantanamo Bay. (This agreement was confirmed in 1934. In 1960 the United States stated that it could be modified or abrogated only by agreement between the parties, and that she had no intention of agreeing to modification or abrogation.) She also has a treaty with the Republic of Panama granting her, in perpetuity, full sovereign rights over the Canal Zone, but negotiations on its revision have been under way since 1971.

The Soviet Union has no defence agreements with any of the states in this area, although in recent years she has supplied military equipment to Cuba.

## ARGENTINA

Population: 25,710,000.

Military service: Army and Air Force 1 year, Navy 14 months.

Total armed forces: 132,800.

Estimated GNP 1975: \$120.4 bn. (Rapid inflation makes defence expenditure and GNP figures in local currency and dollar terms unreliable.)

Defence expenditure 1975: 10,309 m pesos (\$1,031 m).  
\$1 = 10.0 pesos (1975).

**Army:** 83,500.

1 armoured brigade.  
1 mechanized brigade.  
2 motorized infantry brigades.  
2 infantry brigades.  
2 mountain brigades.

1 airmobile brigade.  
5 air defence battalions.  
1 aviation battalion.

120 M-4 *Sherman* med, 120 AMX-13 lt tks; 250 M-113, some AMX, 150 Mowag, M-3, and M-16 APC; 200 105mm and 155mm guns; 105mm pack how; 155mm how, 24 French Mk F3, some US M-7 155mm SP how; 120mm mor; 75mm, 90mm, 105mm RCL; SS-11/12, *Cobra* ATGW; 30mm,



40mm AA guns; *Tigercat* SAM; 2 DHC-6 *Twin Otter*, 1 *Queen Air*, 5 Cessna 207, 5 T-41 ac; 7 *JetRanger*, 7 FH-1100, Bell 47G hel.

Reserves: 250,000: 200,000 National Guard, 50,000 Territorial Guard.

**Navy:** 32,300, incl Naval Air Force and Marines.

4 submarines (2 Type 209, 2 ex-US *Guppy*-class).

1 aircraft carrier (21 S-2A/A-4Q/SH-3D hel).

2 cruisers (1 with *Seacat* SAM, 2 hel).

9 destroyers (1 with *Sea Dart* SAM, 5 *Fletcher*-class, 3 more ex-US).

11 patrol vessels (2 training, 1 coastguard).

6 coastal minesweepers/minehunters.

5 large patrol craft (3 in coastguard).

2 FPBG.

2 FPB.

5 landing ships, 20 landing craft (1 LCT).

(2 Type 42 destroyers, 6 Type 21 frigates,

2 Type 148 FPBG, *Exocet* SSM, *Sea Dart* SAM on order.)

**Naval Air Force:** 4,000.

1 FB sqn with 15 A-4Q *Skyhawk*.

1 FB/trg sqn with 8 MB-326GB.

1 MR sqn with 6 S-2A, 6 P-2H, PBY-5A *Catalina*.

1 SAR sqn with 3 HU-16B *Albatross*.

Tpts incl C-45, 8 C-47, 3 C-54, 3 *Electra*,

DC-4, 1 *Guarani* II, 1 HS-125, 3 *Beaver*,

1 DHC-6, 2 *Super King Air* 200.

Hel incl 9 *Alouette* III, 4 *Sea King*, 5 S-55

and Bell 47G.

28 T-28, 12 T-6, AT-11 trainers.

**Marines:** 7,000.

5 battalions.

1 field artillery battalion.

1 air defence battalion.

20 LVTP-7 and 15 LARC-5 APC; 105mm,

155mm how; RCL; *Bantam* ATGW; 30mm

AA guns, 10 *Tigercat* SAM.

**Air Force:** 17,000; 115 combat aircraft.

1 bbr sqn with 9 *Canberra* B62 and 2 T64.

2 FB sqns with 45 A-4P *Skyhawk*.

1 interceptor sqn with 12 *Mirage* IIIEA, 2

IIIDA.

3 FGA sqns with 20 F-86F *Sabre* (to be re-

placed by A-4).

1 COIN sqn with 5 IA-58 *Pucarà*.

1 recce sqn with 20 IA-351-IV *Huanquero*.

1 SAR sqn with 3 HU-16B *Albatross* ac, 6

*Lama* hel.

1 hel sqn with 14 Hughes 500M, 6 Bell

UH-1H.

Tpts incl 1 Boeing 707-320B, 7 C-130E/H,

2 DC-6, 6 F-28, 1 C-118, 1 HS-748, 9

F-27, 7 C-47, 6 DHC-6, 22 IA-50 *Guarani*

II, 14 *Shrike Commander*.

Hel incl 2 S-61NR, 1 S-61R, 4 UH-1D, 6

UH-19, 4 Bell 47G.

35 T-34, 35 MS-760, *Mirage*, *Canberra*

trainers.

(25 A-4, 25 *Pucarà*, 2 G-222, 20 *Turbo Com-*

*mander* 690A on order.)

**Para-Military Forces:** 20,000. Gendarmerie:

11,000, 10 hel under Army command,

mainly for frontier duties. National Mari-

time Prefecture: 9,000, 1 patrol vessel, 3

patrol craft, 8 hel, 5 *Skyvan*, subordinate

to Navy, for coastguard duties.

## BOLIVIA

Population: 5,760,000.

Military service: 12 months selective.

Total armed forces: 22,000.

Estimated GNP 1975: \$2.0 bn.

Defence expenditure 1974: 691 m pesos

(\$35 m).

\$1=20.0 pesos (1975), 20.0 pesos (1974).



Several Latin American air forces have *Mirage III* fighters in their operational inventories.

**Army:** 17,000.

4 cavalry regiments.

13 infantry regiments (1 Palace Guard).

1 mechanized regiment.

1 motorized regiment.

2 ranger regiments.

1 paratroop battalion.

3 artillery regiments.

6 engineer battalions.

10 M-706, 18 M-113, 20 Mowag APC; 25

75mm pack, 20 FH-18, and 25 M-101

105mm how.

**Navy:** 1,000.

2 small patrol craft.

13 small river transports.

**Air Force:** 4,000; 58 combat aircraft.

1 fighter sqn with 13 T-33 and 4 F-86.

3 COIN sqns with 10 F-51D *Mustang*, 18

AT-26 *Xavante*, 13 AT-6D.

1 hel sqn with 12 Hughes 500M, Hiller OH-

23C/D.

12 C-47, 4 CV-440, 5 *Arava*, C-45 tpts; 15

Cessna 185, 6 Cessna 172, 2 *Turbo-*

*Centurion* lt tpts.

10 T-6, 5 T-28, 6 T-41D, 18 T-23 *Uirapuru*

trainers.

(2 C-130, 18 *Pucarà*, and 1 *Arava* tpts on

order.)

**Para-Military Forces:** About 5,000 armed

police and frontier guards.

## BRAZIL

Population: 110,160,000.

Military service: 1 year.

Total armed forces: 257,200, incl 121,000

conscripts.

Estimated GNP 1975: \$100 bn.

Defence expenditure 1976: 18,335 m cru-

zeiros (\$1,780 m).

\$1=10.3 cruzeiros (1976), 8.19 cruzeiros

(1975).

**Army:** 170,000, incl 118,000 conscripts.

8 divisions, each with up to 4 armd, mech,

or mot inf bdes.

3 independent infantry brigades.

5 light 'jungle' infantry battalions.

1 parachute brigade (second forming).

150 M-4 med, 200 M-3A1 *Stuart*, and 250

M-41 lt tks; 120 EE-9 *Cascavel* armd cars;

EE-11 *Urutu*, M-3A1, M-4, M-8, M-59, and

600 M-113 APC; 500 75mm, 450 105mm

(some SP), 90 155mm how; 108-R and

114mm RL; 106mm RCL; 40mm, 90mm AA

guns; *HAWK* SAM. (*Cobra* ATGW and 4

*Roland* SAM on order.)

**Navy:** 45,800, incl 3,000 conscripts, 13,500

Naval, Air Force, Marines, and Auxiliary

Corps.

8 submarines (1 *Oberon*-, 7 *Guppy* II/III-

class).

1 aircraft carrier.

1 cruiser with 1 hel.

14 destroyers.

10 corvettes (fleet tugs).

5 river patrol ships.

1 river monitor.

6 gunboats.

6 coastal minesweepers.

2 coastal auxiliaries.

2 LST, 35 small landing craft.

(2 *Oberon* submarines, 6 frigates on order.)

**Naval Air Force:**

1 ASW sqn with 6 SH-3D *Sea King*.

1 utility sqn with 3 *Whirlwind*, 3 *Wasp*, 8 Bell

206B.

1 trg sqn with 10 Bell 206B.

(9 *Lynx*, 30 *Gazelle* hel on order.)

**Air Force:** 41,400; 169 combat aircraft.

1 interceptor sqn with 11 *Mirage* IIIEBR, 3

DBR.

2 FGA sqns with 39 F-5B/E.

7 COIN sqns with 85 AT-26 *Xavante*, T-6

ac, 6 UH-1D, 4 Bell 206 hel.

1 ASW sqn with 13 S-2A, 8 S2-E (6 in car-

rier).

1 MR sqn with 10 P-2E *Neptune* (with Navy).

1 SAR sqn with 13 SA-16 *Albatross*, 3

RC-130E.

110 L-42/*Regente* observation (with Army).

7 tpt sqns: about 120 tpts, incl 2 Boeing

737, 56 C-47, 12 C-130, 10 HS-125, 12

HS-748, 1 *Catalina*, 2 BAC-111, 21 DHC-5,

5 *Pilatus Porter*, and 40 C-95 *Bandeirante*.

60 Bell 47, 11 Bell 206A, 36 UH-1, 4 OH-4

hel.

6 F-5B, 100 T-33 *Uirapuru*, 150 T-25 *Uni-*

*versal*, 50 Cessna T-37C, 6 T-6 trainers.

(40 C-95, 12 EMB-III MR, and 2 Boeing

737 tpts on order.)

**Para-Military Forces:** Public security forces

about 200,000. State militias in addition.

## CHILE

Population: 10,760,000.

Military service: 1 year.

Total armed forces: 79,600, incl 21,600 con-

scripts.

Estimated GNP 1975: n.a.

Defence expenditure 1975: n.a.

(Rapid inflation makes defence expendi-

ture and GNP figures in local currency and

dollar terms unreliable.)

**Army:** 45,000 (20,000 conscripts).

5 divisions, incl 7 cav regts (3 armd, 3

horsed, 1 hel-borne), 20 inf regts (incl 9

mot, 3 mountain), 5 arty regts, some AA,

support dets.

76 M-4 med, 10 M-3, and 60 M-41 lt tks;

some Mowag MR-8 APC; 105mm how,

M-56 105mm pack how; 155mm SP guns;



106mm RCL; AA guns; 9 *Puma*, 3 UH-1H, 2 *JetRanger* hel. (AS-11/-12 ASM on order.)

Reserves: 160,000.

**Navy:** 23,800, incl Naval Air, Marines, and 1,600 conscripts.  
3 submarines (1 *Oberon*, 2 ex-US *Fleet-class*) (1 *Oberon* on order).  
3 cruisers (2 ex-US *Brooklyn-*, 1 ex-Swedish *Tre Kroner-class*).  
6 destroyers (2 ex-US *Sumner-*, 2 *Fletcher-*, 2 *Almirante-class*).  
2 frigates (*Leander-class*).  
3 destroyer escorts (ex-US fast transport).  
7 large patrol craft.  
4 motor torpedo boats.  
6 landing ships/craft (4 ex-US LST, 2 medium).

Naval Air Force: 500.

5 HU-16B, 3 PBV-6A *Catalina*, 4 SP-2E *Neptune* MR ac.  
1 tpt sqn with 5 C-45, 5 C-47, Beechcraft D-18S.  
4 Bell *JetRanger*, 4 UH-19, 2 UH-1D, 14 Bell 47G hel.  
(3 *Bandeirante* on order.)

Marines: 3,800.

1 brigade; coast-defence units.

**Air Force:** 10,800; 67 combat aircraft.

1 bbr sqn with 15 B-26 *Invader*.  
2 fighter sqns with 32 *Hunter* F71.  
1 COIN sqn with 20 T-6G.  
3 tpt sqns: 1 with 2 C-130H, 6 DC-6B, and 25 C-47; 1 with 11 DHC-6. Other ac incl 10 C-45, 9 Beech 99A, 5 C-118, 5 *Twin Bonanza*, 10 Cessna 180, and 5 T-6.  
Hel incl 6 S-55T, 6 SH-4, 2 UH-1H, 6 UH-12E, 6 *Lama*.  
36 T-34, 30 T-37B, 11 *Vampire* T22/55, 4 *Hunter* T77, 10 *Neiva* T-25, 8 T-33, 9 F-80 trainers.  
(18 F-5E/F, 34 A-37B, 8 T-25 on order.)

Para-Military Forces: 30,000 *Carabineros*.

## COLOMBIA

Population: 25,510,000.

Military service: 2 years.

Total armed forces: 54,300.

Estimated GNP 1975: \$13.4 bn.

Defence expenditure 1974: 2,393 m pesos (\$102 m).

\$1=32.0 pesos (1975), 23.4 pesos (1974).

**Army:** 40,000.

10 infantry brigades ('Regional Brigades').

1 Presidential Guard.

1 airborne battalion.

Some mech cav, 20 inf, 5 arty, 6 engr units.

M-4A3 med, M-3A1 lt tks; M-8 and M-20 armd cars; M-101 105mm how; mor.

Reserves: 250,000.

**Navy:** 8,000, incl 1,500 Marines.

4 submarines (2 midget, 2 Type 209).

4 destroyers (2 Swedish *Holland-class*, 2 ex-US *Sumner-class*).

1 destroyer escort (ex-US *Dealy-class*).

4 frigates.

4 river gunboats (1 hospital boat).

21 coastal patrol craft (13 under 100 tons).

1 marine battalion.

**Air Force:** 6,300; 28 combat aircraft.

1 bbr sqn with 8 B-26.

1 fighter sqn with 14 *Mirage* VCOA, 2 VCOR.

4 PBV-6A *Catalina* MR aircraft.

Tpts incl 2 C-130B, 6 C-47, 10 C-54, 3 HS-748, 7 *Beaver*, 4 *Otter*, 6 *Porter*, 1 F-28.

16 Bell 47, 6 UH-1B, 12 OH-6A, 6 TH-55, 4 H-23, 6 HH-43B *Huskie*, 27 *Lama* hel.  
2 *Mirage* V, 10 T-37, 30 T-41D, 10 T-33, 30 T-34 trainers.

Para-Military Forces: 5,000 National Police Force.

## CUBA

Population: 9,420,000.

Military service: 3 years.

Total armed forces: 175,000.

Estimated GNP 1970: \$4.5 bn.

Estimated defence expenditure 1971: 290 m pesos (\$290 m).

\$1=1 peso.

**Army:** 146,000.

15 infantry 'divisions' (brigades).

3 armoured brigades.

Some independent 'brigades' (battalion groups).

Over 600 tks, incl 60 JS-2 hy, T-34, T-54/-55 med, and PT-76 lt; 200 BTR-40/-60/-152 APC; some BRDM armd cars; 100 SU-100 SP guns; 105mm, 122mm, 130mm, and 152mm guns and how; 30 *FROG-4* SSM; 57mm, 76mm, and 85mm ATK guns; 57mm RCL; *Snapper* ATGW; 12.7mm, 14.5mm, 37mm, 85mm, and 100mm AA guns.

Deployment: Angola 15-20,000.

Reserves: 90,000.

**Navy:** 9,000.

1 escort patrol vessel (ex-US).

18 submarine chasers (12 ex-Soviet SO-1, 6 *Kronstadt*).

5 *Osa-* and 18 *Komar-class* FPBG with *Styx* SSM.

24 MTB (ex-Soviet P-4 and P-6).

15 armed patrol boats (under 100 tons).

Some 50 *Samlet* coast-defence SSM.

**Air Force:** 20,000, incl Air Defence Forces; 195 combat aircraft.

4 fighter-bomber sqns with 75 MiG-17.

5 interceptor sqns with 50 MiG-21, 30 MiG-21MF.

2 interceptor sqns with 40 MiG-19.

About 50 Il-14, An-24, and An-2 tpt ac.

About 30 Mi-1 and 24 Mi-4 helicopters.

Trainers incl MiG-15UTI and Zlin 226/326.

24 SAM bns with 144 SA-2 *Guideline*.

Para-Military Forces: 10,000 State Security troops; 3,000 border guards; 100,000 People's Militia.

## DOMINICAN REPUBLIC

Population: 4,830,000.

Military service: 1 year, selective.

Total armed forces: 18,000.

Estimated GNP 1975: \$3.5 bn.

Defence expenditure 1974: 36 m pesos (\$36 m).

\$1=1 peso.

**Army:** 11,000.

3 infantry brigades.

1 artillery regiment.

1 anti-aircraft regiment.

Reconnaissance, engineer, and signals units.

20 AMX-13 lt tks; some APC; armed cars; 105mm how; AA arty.

**Navy:** 3,500.

3 frigates (2 ex-US *Tacoma-*, 1 ex-Canadian *River-class*).

2 corvettes (ex-Canadian *Flower-class*).

2 fleet minesweepers.

12 patrol craft (9 under 100 tons).

1 landing ship medium, 2 landing craft.

**Air Force:** 3,500; 32 combat aircraft.

1 FGA sqn with 7 B-26, 10 *Vampire*, 15 F-51D *Mustang*.

2 PBV-5 *Catalina* MR aircraft.

1 tpt sqn with 6 C-46, 6 C-47, 3 *Beaver*.

4 T-6 *Texan*, T-11, 6 T-28, 4 Cessna 172.

2 Hiller UH-12, 7 Hughes OH-6A, 2 Sikorsky UH-19, and 3 *Alouette* II/III hel.

Para-Military Forces: 10,000 Gendarmerie.

## ECUADOR

Population: 7,430,000.

Military service: 2 years, selective.

Total armed forces: 23,550.

Estimated GNP 1975: \$4.3 bn.

Defence expenditure 1974: 1,288 m sucres (\$52 m).

\$1=25.0 sucres (1975), 24.9 sucres (1974).

**Army:** 17,500.

11 infantry battalions (2 motorized).

1 parachute battalion.

3 reconnaissance, 4 horsed cavalry sqns.

10 independent infantry companies.

3 artillery groups, 1 anti-aircraft battalion.

2 engineer battalions.

15 M-3, 25 M-41, and 41 AMX-13 lt tks;

AML-60 armd cars; some APC, incl amphibians; 105mm and 6 155mm SP

how; 40mm AA guns; 1 *Skyvan*, 2 *Arava*, 3 *Porter*, 1 *Learjet* tpts, 7 lt ac, 2 hel.

**Navy:** 3,450, incl 700 marines.

3 destroyers (1 ex-US fast transport, 2 ex-British *Hunt-class*).

2 coastal escorts (ex-US).

3 FPB.

14 patrol craft (6 under 100 tons, 6 river).

2 landing ships (medium).

3 lt ac, 2 *Alouette* hel, 1 *Arava* lt tpt.

(2 Type 209 submarines, 3 FPBG on order.)

**Air Force:** 2,600; 27 combat aircraft.

1 lt bomber sqn with 5 *Canberra* B6.

1 recce sqn with 6 *Meteor* FR9.

1 COIN sqn with 14 BAC-167 *Strikemaster*.

2 PBV-5A *Catalina* MR aircraft.

5 HS-748, 2 *Skyvan* 3M, and 12 C-47, 6 C-45, 4 DC-6B, 3 DHC-6 tpt ac.

2 *Puma*, 6 *Alouette* III, 4 *Lama*, 3 Bell 47G hel.

Trainers incl 12 T-33, 20 T-41, 22 Cessna 150 *Aerobat*.

(12 *Jaguar* A/B fighters, 12 A-37B COIN, 6 *Arava*, 2 DHC-5 *Buffalo* tpts on order.)

Para-Military Forces: 5,800.

## HONDURAS

Population: 3,170,000.

Military service: voluntary.

Total armed forces: 14,200.

Estimated GNP 1975: \$1.0 bn.

\$1=2.0 lempira (1975).

**Army:** 13,000.

3 infantry battalions and 20 infantry coys.

1 engineer, 1 signals battalion.

2 artillery batteries.

12 75mm pack, some 105mm how; 57mm RCL; 82mm, 120mm mor.

**Air Force:** 1,200; 12 combat aircraft.

1 FB sqn with 6 F-4U, 6 B-26.

Other ac incl 6 C-47, 2 C-54, some C-45, 1 *Arava*, 4 Cessna 180 tpts, 3 H-19 hel.

6 T-6, 5 T-41, 3 RT-33A trainers.

Para-Military Forces: 3,000.



## MEXICO

Population: 62,260,000.  
Military service: voluntary, with part-time conscript militia.  
Total armed forces: 89,500 regular; 250,000 part-time conscripts.  
Estimated GDP 1975: \$79.8 bn.  
Defence expenditure 1975: 7,262 m pesos (\$586 m).  
\$1=12.4 pesos (1975).

**Army:** 69,000 regular, 250,000 conscripts.  
1 mechanized brigade group (Presidential Guard).  
1 infantry brigade group.  
1 parachute brigade.  
Zonal Garrisons incl:  
23 indep cav regts, 64 indep inf bns, 1 arty regt.  
Anti-aircraft, engineer, and support units.  
M-3 lt tks; HWK-11 APC; 100 armd cars; 75mm, 105mm how.

**Navy:** 14,500, incl Naval Air Force and Marines.  
2 destroyers (ex-US *Fletcher*-class).  
1 frigate (ex-US *Edsall*-class).  
6 transports (5 ex-US, 1 gunboat).  
35 escort and fleet minesweepers.  
17 *Azteca*-class patrol craft (4 more on order).  
10 river and coastal patrol boats.  
3 LST.

Naval Air Force: 350.  
4 HU-16 *Albatross*, 5 PB-5 *Catalina* MR ac.  
Other ac incl 2 *Bonanza*; 4 *Alouette* II, 5 Bell 47 hel.

Marines: 2,000; 19 security companies.

**Air Force:** 6,000; 42 combat aircraft.  
2 COIN sqns with 15 AT-33A, 12 *Vampire*.  
1 recce sqn with 15 AT-11.  
1 SAR sqn with 18 *LASA-60* ac, 9 *Alouette* III hel.  
About 65 tpts, incl 5 C-54, 2 C-118, 6 C-47, 12 *Islander*, 1 *Jetstar*, 5 *Arava*, 1 *Skyvan*.  
Hel incl 10 Bell 205A, 5 206B, 1 212, 14 Bell 47G.  
Trainers incl 3 T-55, 45 T-6, 30 T-28, 20 Beech F33-19, 20 *Musketeeer*.  
1 parachute battalion.

## PARAGUAY

Population: 2,670,000.  
Military service: 18 months.  
Total armed forces: 16,600.  
Estimated GNP 1975: \$1.5 bn.  
Defence expenditure 1974: 2,640 m guaranies (\$21 m).  
\$1=124 guaranies (1975), 125 guaranies (1974).

**Army:** 12,300.  
1 cavalry 'division' (bde) with 1 med, 1 lt tk regt.  
6 infantry 'divisions' (bn gps).  
2 indep horsed cavalry regiments.  
1 Presidential Guard battalion.  
5 motorized engineer battalions.  
1 artillery regiment of 3 batteries.  
9 M-4 med, 6 M-3 lt tks; APC; 75mm guns; 75mm and 105mm how; 6 L-40 AA guns.

**Navy:** 1,800, incl 500 Marines and Naval Air.  
1 large patrol vessel with 1 hel.  
4 patrol boats (3 ex-Argentinian minesweepers).  
8 coastal, 2 river patrol craft (under 20 tons).  
2 LCT.  
1 marine battalion.

**Air Force:** 2,500; 12 combat aircraft.

1 COIN sqn with 12 AT-6 *Texan*.  
2 C-54, 10 C-47, 1 DHC-3, 1 DHC-6 tpts.  
14 Bell UH-13A and 3 H-12 helicopters.  
8 S-11, 20 T-23 *Uirapuru*, T-6 trainers.  
1 parachute battalion.

Para-Military Forces: 5,000 security forces.

## PERU

Population: 16,380,000.  
Military service: 2 years, selective.  
Total armed forces: 63,000, incl 40,000 conscripts.  
Estimated GNP 1975: \$12.5 bn.  
Defence expenditure 1975: 16,860 m soles (\$383 m).  
\$1=43.4 soles (1975), 44.0 soles (1974).

**Army:** 46,000, incl 40,000 conscripts.  
1 armoured 'division' (brigade).  
2 armoured, 2 horsed regiments (cavalry 'division').  
7 infantry and mech 'divisions' (brigades).  
1 para-commando 'airborne division' (brigade).  
1 jungle 'division' (brigade).  
3 armoured recce squadrons.  
Artillery and engineer battalions.  
Up to 200 T-55, 60 M-4 med tks; 100 AMX-13 lt tks; 50 M-3A1 scout cars; 300 APC; 75mm, 105mm, 130mm, 155mm how; 5 Helio U-10B, 5 Cessna 185 lt ac; 8 Bell 47G hel. (2 *Nomad* lt tpt ac on order.)

**Navy:** 8,000, incl Naval Air and 1,000 Marines.  
8 submarines (2 ex-US *Guppy* I, 4 ex-US *Mackerel*-class, 2 Type 209).  
3 light cruisers (1 ex-Dutch, 2 ex-British).  
4 destroyers (2 with 8 *Exocet* SSM).  
2 destroyer escorts (ex-US *Bostwick*-class).  
2 corvettes (ex-US fleet minesweepers).  
8 large patrol craft.  
3 coastal patrol craft.  
6 river gunboats (one hospital ship).  
1 coastal minesweeper.  
17 landing ships/craft (2 LST, 1 med).  
9 S-2A *Tracker* ASW ac, 6 C-47 tpts, 5 Bell 47G, 10 Bell 206, UH-1D, 2 *Alouette* III hel. (4 *Lupo*-class frigates with *Otomat* SSM and *Albatros* SAM on order.)  
1 marine battalion.

**Air Force:** 9,000; 92 combat aircraft.  
2 light bomber sqns with 32 *Canberra*.  
4 fighter sqns: 2 with 20 *Mirage* VP and 2 *VDP*; 1 with 12 F-86F; 1 with 10 *Hunter* F52.  
2 COIN sqns with 12 A-37B.  
1 MR sqn with 4 HU-16A *Albatross*.  
3 L-100-20, 4 C-54, 6 C-47, 7 F-28, 7 DHC-6, 16 DHC-5, 18 *Queen Air*, 12 *Pilatus Porter*, 2 *Learjet* 25B, 5 Cessna 185 tpt ac.  
12 *Alouette* III, 20 Bell 47G, 17 Bell 212, 5 Mi-8 hel.  
15 T-6, 6 T-34, 8 T-33A, 19 T-41, 26 T-37B trainers.  
(3 L-100-20 tpts on order.)

Para-Military Forces: 20,000 *Guardia Civil*.

## URUGUAY

Population: 3,100,000.  
Military service: voluntary.  
Total armed forces: 23,000.  
Estimated GNP 1975: \$2.8 bn. (Rapid inflation makes defence expenditure and GNP figures in local currency and dollars unreliable.)  
Defence expenditure 1973: 61.1 bn pesos (\$68 m).  
\$1=2,765 pesos (1975), 895 pesos (1973).

**Army:** 17,000.

4 regional 'Armies' (divisions) comprising:  
2 armoured regiments.  
13 infantry battalions.  
8 cavalry regiments.  
4 artillery 'battalions' (batteries).  
6 engineer battalions.  
17 M-24 *Chaffee* and 18 M-3A1 lt tks; 10 M-3A1 scout cars; 15 M-113A1 APC; 25 105mm how.

**Navy:** 4,000, incl naval air, naval infantry, and coastguard.  
4 destroyer escorts (1 training).  
2 escorts (ex-US minesweepers).  
5 patrol craft (all under 100 tons).  
1 coastal minesweeper.  
3 S-2A MR ac; 3 SNB-5 (C-45) tpts; T-34B, SNJ-4, 4 T-6 trainers; 2 Bell 47G hel.

**Air Force:** 2,000; 14 combat aircraft.  
1 fighter sqn with 8 F-80, 6 AT-33A.  
12 C-47, 2 F-27, 3 FH-227, 2 *Queen Air*, 6 U-17, 2 *Bandeirante* tpts (3 more on order).  
2 Bell UH-1H and 2 Hiller UH-12 hel.  
15 T-6, 10 AT-11, T-33 trainers.

Para-Military Forces: 22,000.

## VENEZUELA

Population: 12,360,000.  
Military service: 2 years, selective.  
Total armed forces: 42,000.  
Estimated GNP 1975: \$28.9 bn.  
Defence expenditure 1975: 2,100 bolivares (\$494 m).  
\$1=4.25 bolivares (1975).

**Army:** 28,000.  
2 medium, 1 light tank battalion.  
2 mechanized, 11 infantry battalions.  
13 ranger battalions.  
1 horsed cavalry battalion.  
7 artillery groups.  
5 anti-aircraft and engineer battalions.  
120 AMX-30 med tks; 40 AMX-13, 35 M-18 76mm SP ATK guns; 12 M-8 and 15 *Shorland* armd cars; 20 AMX 155mm SP guns; M-101 105mm how; AA guns; some 20 hel, incl 2 UH-19D, *Alouette* III, Bell 47G. (22 AMX-30 on order.)

**Navy:** 8,000, incl 2,500 Marines.  
3 submarines (1 *Balao*-, 2 *Guppy II*-class).  
5 destroyers (1 with *Seacat* SAM).  
6 destroyer escorts.  
3 FPBG, 3 FPB.  
10 patrol craft.  
16 coastal patrol craft (27 more on order).  
6 landing ships (2 LST, 4 med).  
3 S-2E *Tracker*, 4 HU-16 SAR ac, 2 C-47 tpts.  
(2 Type 209 submarines, 6 *Lupo*-class frigates with *Albatros* SAM, 1 ASW hel on order.)

Marines: 3 battalions.

**Air Force:** 6,000; 100 combat aircraft.  
2 light bomber sqns with 29 *Canberra* and 16 OV-10E *Bronco*.  
3 fighter sqns: 1 with 16 CF-5A, 4 -5B; 1 with 9 *Mirage* IIIIEV, 4 VV, 2 DV; 1 with 20 F-86.  
2 tpt sqns with 6 C-130H, 20 C-47, 12 C-123B *Provider*, 1 Boeing 737.  
15 *Alouette* III, 12 UH-1, 10 UH-19 hel.  
12 T-52 *Jet Provost*, 12 T-2D *Buckeye*, 25 T-34, 12 Cessna 182, 2 Beech 95, 9 *Queen Air* trainers.  
(12 T-2D on order.)

Para-Military Forces: 10,000 National Guard, a volunteer force for internal security.





# Tables of Comparative Strengths

## 1. Nuclear Delivery Vehicles Comparative Strengths and Characteristics (A) UNITED STATES AND SOVIET UNION

(i) Missiles and Artillery

	Category <sup>a</sup>	Type	United States				Soviet Union				
			Max. range <sup>b</sup> (statute miles)	Estimated warhead yield range <sup>c</sup>	First deployed	No. deployed (July 1976)	Type <sup>d</sup>	Max. range <sup>b</sup> (statute miles)	Estimated warhead yield range <sup>c</sup>	First deployed	No. deployed (July 1976)
Land-based	ICBM	LGM-25C <i>Titan 2</i>	7,250	5-10MT	1962	54	SS-7 <i>Saddler</i>	6,900	5MT	1961	140 <sup>e</sup>
		LGM-30F <i>Minuteman 2</i>	8,000	1-2MT	1966	450	SS-8 <i>Sasin</i>	6,900	5MT	1963	19 <sup>e</sup>
		LGM-30G <i>Minuteman 3</i>	8,000	3 × 170KT	1970	550	SS-9 <i>Scarp</i>	7,500	18-25MT <sup>f</sup>	1965	252
								SS-11 <i>Sego</i>	6,500	{ 1-2MT or 3 × KT <sup>g</sup>	1966
							SS-13 <i>Savage</i> <sup>h</sup>	5,000	1MT	1968	60
						SS-17	6,500	4 × KT	1975	20 <sup>i</sup>	
						SS-18	7,500	{ 18-25MT or 8 × MT <sup>j</sup>	1975	36	
						SS-19	6,500	6 × KT	1975	100 <sup>i</sup>	
	M/IRBM					SS-4 <i>Sandal</i> <sup>k</sup>	1,200	1MT	1959	500	
						SS-5 <i>Skean</i> <sup>k</sup>	2,300	1MT	1961	100	
	SRBM	MGM-31A <i>Pershing</i> <sup>l</sup>	450	KT	1962	18 <sup>m</sup>	SS-1b <i>Scud A</i> <sup>l</sup>	50	KT	1957	(300) <sup>n</sup>
		MGM-52A <i>Lance</i> <sup>l</sup>	70	KT	1972	36 <sup>n</sup>	SS-1c <i>Scud B</i> <sup>l</sup>	185	KT	1965	
		MGR-113 <i>Honest John</i> <sup>l</sup>	25	KT	1953	n.a.	SS-12 <i>Scaleboard</i>	500	MT	1969	
						<i>FROG 3-7</i> <sup>l</sup>	10-45	KT	1957-65	(600) <sup>n</sup>	
	LRCM					SS-N-3 <i>Shaddock</i>	450	KT	1962	(100) <sup>n</sup>	
Sea-based	SLBM	UGM-27C <i>Polaris A3</i>	2,880	3 × 200KT	1964	160	SS-N-4 <i>Sark</i>	350	MT	1961	27
		UGM-73A <i>Poseidon C3</i> <sup>o</sup>	2,880	10 × 50KT	1971	496	SS-N-5 <i>Serb</i>	750	MT	1964	54
						SS-N-6 <i>Sawfly</i> <sup>u</sup>	1,750	MT	1969	544	
						SS-N-8	4,800	MT	1972	220	
	SLCM					SS-N-3 <i>Shaddock</i> <sup>q</sup>	450	KT	1962	312 <sup>r</sup>	
Air-launched	ALCM	AGM-28B <i>Hound Dog</i>	600	KT	1961	(400) <sup>n</sup>	AS-3 <i>Kangaroo</i>	400	KT	1961	n.a.
	ALBM	AGM-69A SRAM	100	KT	1972	1,500	AS-4 <i>Kitchen</i>	450	KT	1962	(800) <sup>n</sup>
Artillery	Self-propelled	M-110 203mm (8-in) how <sup>t</sup>	10	KT	1962	200 <sup>m</sup>					
		M-109 155mm how <sup>t</sup>	10	2KT	1964	300 <sup>m</sup>					
	Towed	M-115 203mm (8-in) how <sup>t</sup>	10	KT	1950s	n.a.	M-55 203mm gun/how <sup>t</sup>	18	KT	1950s	n.a.



(ii) Aircraft\*

Category	United States					Soviet Union						
	Type	Max. range <sup>f</sup> (statute miles)	Max. speed (Mach no.) <sup>g</sup>	Max. weapons load (lb)	No. deployed (July 1976)	Type <sup>v</sup>	Max. range <sup>f</sup> (statute miles)	Max. speed (Mach no.) <sup>g</sup>	Max. weapons load (lb)	First deployed	No. deployed (July 1976)	
Long-range bombers <sup>o</sup>	B-52 D-F	11,500	0.95	60,000	1956	} 387 <sup>z</sup>	Tu-95 <i>Bear</i>	7,800	0.78	40,000	1956	100
	B-52 G-H	12,500	0.95	70,000	1959		Mya-4 <i>Bison</i>	6,050	0.87	20,000	1956	35 <sup>v</sup>
Medium-range bombers	FB-111A	3,800	2.5	37,500	1969	66	Tu-16 <i>Badger</i>	4,000	0.8	20,000	1955	750 <sup>z</sup>
Land-based strike aircraft (incl short-range bombers)	F-105D	2,100	2.25	16,500	1960	} (1,400) <sup>m</sup>	<i>Backfire B</i>	5,500	2.5	20,000	1974	60 <sup>z</sup>
	F-4C-J	2,300	2.4	16,000	1962		Il-28 <i>Beagle</i>	2,500	0.8	4,850	1950	} 2,500 <sup>m</sup>
	F-111 A/E	3,800	2.2/2.5	25,000	1967		Su-7 <i>Fitter A</i>	900	1.7	4,500	1959	
	A-7D	3,400	0.9	15,000	1968		Tu-22 <i>Blinder</i>	1,400	1.5	12,000	1962	
							MiG-21MJ					
					<i>Fishbed J</i>	1,150	2.2	2,000	1970			
Carrier-based strike aircraft	A-4	2,055	0.9	10,000	1956	} (1,400) <sup>m</sup>	MiG-23 <i>Flogger D</i>	1,800	2.5	2,800	1971	
	A-6A	3,225	0.9	18,000	1963		Su-17/-20 <i>Fitter C</i>	1,100	1.6	5,000	1974	
	A-7A/B/E	3,400	0.9	15,000	1966		Su-19 <i>Fencer A</i>	1,800	2.3	8,000	1974	
	F-4	1,997	2.4	16,000	1962							

(iii) Historical Changes of Strength 1963-1976 (mid-years)

	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
<b>USA</b>														
ICBM	424	834	854	904	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,054
SLBM	224	416	496	592	656	656	656	656	656	656	656	656	656	656
Long-range bombers <sup>o</sup>	630	630	630	630	600	545	560	550	505	455	442	437	432	387
<b>USSR</b>														
ICBM	90	190	224	292	570	858	1,028	1,299	1,513	1,527	1,527	1,575	1,618	1,527
SLBM	107	107	107	107	107	121	196	304	448	500	628	720	784	845
Long-range bombers <sup>o</sup>	190	175	160	155	160	155	145	145	145	140	140	140	135	135

\* ICBM range=4,000+ miles; IRBM range=1,500-4,000 miles; MRBM range=500-1,500 miles; SRBM range=under 500 miles. LRCM range=over 350 miles.

<sup>o</sup> Operational range depends upon the payload carried; use of maximum payload may reduce missile range by up to 25 per cent.

<sup>f</sup> MT range=1 MT or over; KT range=less than 1 MT; figures given are estimated maxima.

<sup>g</sup> Numerical designations of Soviet missiles (e.g. SS-9) are of US origin; names (e.g. *Scarp*) are of NATO origin.

<sup>v</sup> The dismantling of SS-7 and SS-8 launchers is under way.

<sup>z</sup> The SS-9 exists in three operational modes: 18 or 25 MT single warhead and 3 MRV of 4-5MT each.

<sup>m</sup> A version of the SS-11 with 3 MRV has replaced some of the single-warhead systems.

<sup>n</sup> A solid-fuel replacement for the SS-13, the SS-X-16, which has about twice the throw-weight and may also be deployed in a land-mobile mode, is undergoing tests.

<sup>o</sup> The SS-17 and SS-19 have begun deployment in modified SS-11 silos.

<sup>p</sup> The SS-18, a follow-on to the SS-9, has been tested in three modes, two single warhead versions and a 5-8 MRV version.

<sup>q</sup> A MRV-equipped replacement for the SS-4 and SS-5, the SS-X-20, is presently under development for deployment in silos and in a mobile mode. It reportedly consists of the second and third stages of the SS-X-16.

<sup>r</sup> Dual-capable (i.e., capable of delivering conventional or nuclear warheads). Although shown in the table, it is uncertain whether the Soviet 203mm artillery is nuclear-capable.

Conventional warheads for the US *Lance* and *Pershing* are under development.

<sup>s</sup> Figures are only for systems in Europe.

<sup>t</sup> Figures in brackets are estimates only.

<sup>u</sup> *Poseidon* can carry up to 14 RV over a reduced range.

<sup>v</sup> The SS-N-6 has been tested with new single warhead (MT range) and with 3 MRV.

<sup>w</sup> A longer-range version of the SS-N-3, the SS-X-12, is reportedly under development.

<sup>x</sup> 264 SS-N-3 are deployed aboard submarines and 48 on surface vessels.

<sup>y</sup> All aircraft are dual-capable, but some in the strike aircraft categories are not presently configured for the nuclear role.

<sup>z</sup> Theoretical maximum range, with internal fuel only, at optimum altitude and speed. Ranges of strike aircraft assume no weapons load. Especially in the case of strike aircraft, therefore, range falls sharply for flights at higher speeds, lower altitude or with full weapons load.

<sup>aa</sup> Mach 1.0= speed of sound.

<sup>ab</sup> Names of Soviet aircraft (e.g. *Bear*) are of NATO origin.

<sup>ac</sup> Long-range bomber=maximum range 6,000+ miles; medium-range bomber=maximum range 3,500-6,000 miles, primarily designed for bombing missions. *Backfire* is classified as a medium-range bomber on the basis of reported range characteristics.

<sup>ad</sup> Excluding aircraft in storage or reserve.

<sup>ae</sup> Excluding approximately 50 Mya-4 aircraft configured as tankers.

<sup>af</sup> Including aircraft in the Naval Air Force, configured for attacks on shipping (some 280 Tu-16 and 30 *Backfire*).



## (B) OTHER NATO AND WARSAW PACT COUNTRIES

## (i) Missiles and Artillery

	Category <sup>a</sup>	NATO (excluding USA)						Warsaw Pact (excluding USSR)					
		Type <sup>b</sup>	Operated by <sup>c</sup>	Max. range <sup>d</sup> (statute miles)	Estimated warhead yield range <sup>e</sup>	First deployed	No. deployed (July 1976)	Type <sup>f</sup>	Operated by <sup>c</sup>	Max. range <sup>d</sup> (statute miles)	Estimated warhead yield range <sup>e</sup>	First deployed	No. deployed (July 1976)
Land-based missiles	IRBM	SSBS S-2	FR	1,875	150 KT	1971	18	SS-1b Scud A <sup>h</sup> SS-1c Scud B <sup>h</sup> FROG 3-7 <sup>h</sup>	All	50 185 10-45	KT KT KT	1957 1965 1957-65	(100) (200)
	SRBM	Sergeant <sup>g</sup>	GE	85	KT	1962	20						
		Pershing <sup>g</sup>	GE	450	KT	1962	72						
		Lance	IT	70	KT	1976	6						
		Pluton	FR	75	15-25 KT	1974	24						
	Honest John <sup>i</sup>		25	KT	1953	(160)							
SLBM	SLBM	UGM-27C	BR	2,880	3 × 200 KT	1967	64						
		Polaris A3											
		MSBS M-1	FR	1,550	500 KT	1972	32						
		MSBS M-2	FR	1,900	500 KT	1974	16						
	MSBS M-20	FR	3,000	1 MT	end-1976	16							
Artillery	SP	M-110	j	10	KT	1962	n.a.						
		203mm how											
		M-109	k	10	2 KT	1964	n.a.						
	Towed	155mm how											
		M-115	j	10	KT	1950s	n.a.						
		203mm how											

<sup>a</sup> IRBM range 1,500-4,000 miles; SRBM range under 500 miles.

<sup>b</sup> All NATO vehicles are of American origin, with the exception of the SSBS IRBM and the MSBS SLBM, which are of French origin.

<sup>c</sup> BR = Britain, FR = France, GE = Germany, IT = Italy.

<sup>d</sup> Use of maximum payload may reduce missile range by up to 25 per cent.

<sup>e</sup> KT range = less than 1 MT; figures given are estimated maxima.

<sup>f</sup> All Warsaw Pact vehicles are of Soviet origin. Numerical designations (e.g., SS-1b) are of American origin, names (Scud A, FROG) of NATO origin.

<sup>g</sup> These SRBM are operated by Germany but the nuclear warheads for them are in American custody. Sergeant and Honest John are dual-capable.

<sup>h</sup> These dual-capable systems are operated by the countries shown, but nuclear warheads for them are in Soviet custody.

<sup>i</sup> Honest John is dual-capable and is operated by Belgium, Britain, Denmark,

Germany, Greece, Italy, the Netherlands and Turkey, but with the nuclear warheads held in American custody. In the case of Denmark, there are no nuclear warheads held on Danish soil. France also has Honest John but the nuclear warheads for it were withdrawn in 1966 and its nuclear role has been taken over by the Pluton, which has a French nuclear warhead.

<sup>j</sup> The 203mm (8-in.) how is dual-capable and is operated by Belgium, Britain, Denmark, Germany, Greece, Italy, the Netherlands and Turkey but any nuclear warheads for it are in American custody.

<sup>k</sup> The 155mm how is primarily a conventional artillery weapon but is dual-capable. It is operated by Belgium, Britain, Canada, Denmark, Germany, Greece, Italy, the Netherlands, Norway and Turkey, but in very few cases is it likely to have a nuclear role, certainly not in the case of Canada. Any nuclear warheads would be in American custody, none of them being held on either Danish or Norwegian soil.

(ii) Aircraft<sup>a</sup>

Category <sup>b</sup>	NATO (excluding USA)						Warsaw Pact (excluding USSR)							
	Type <sup>c</sup>	Operated by <sup>d</sup>	Max. range <sup>e</sup> (statute miles)	Max. speed (Mach no.) <sup>f</sup>	Max. weapons load (lb)	First deployed	No. deployed (July 1976)	Type <sup>g</sup>	Operated by <sup>d</sup>	Max. range <sup>e</sup> (statute miles)	Max. speed (Mach no.) <sup>f</sup>	Max. weapons load (lb)	First deployed	No. deployed (July 1976)
Medium-range bombers	Vulcan B2	BR	4,000	0.95	21,000	1960	50							
Strike aircraft (incl. short-range bombers) <sup>h</sup>	F-104	i	1,300	2.2	4,000	1958	n.a. <sup>j</sup>	Il-28 Beagle <sup>i</sup>	PO	2,500	0.81	4,850	1950	n.a. <sup>j</sup>
	F-4	{BR GE}	1,600	2.4	16,000	1962	n.a. <sup>j</sup>	Su-7 Fitter <sup>i</sup>	{CZ PO}	900	1.7	4,500	1959	n.a. <sup>j</sup>
	Buccaneer	BR	2,000	0.95	8,000	1962	70	Su-20 Fitter <sup>i</sup>	PO	1,100	1.6	5,000	1974	n.a. <sup>j</sup>
	Mirage IVA	FR	2,000	2.2	8,000	1964	52							
	Jaguar	{BR FR}	1,000	1.1	8,000	{1973 1974}	40 75							

<sup>a</sup> All aircraft listed are dual-capable and many would be more likely to carry conventional than nuclear weapons.

<sup>b</sup> Medium-range bomber = maximum range 3,500-6,000 miles, primarily designed for bombing missions.

<sup>c</sup> Vulcan and Buccaneer are of British origin; F-104 and F-4 are of American origin; Mirage is of French origin; Jaguar is Anglo-French.

<sup>d</sup> BR = Britain, FR = France, GE = Germany, CZ = Czechoslovakia, PO = Poland.

<sup>e</sup> Theoretical maximum range, with internal fuel only, at optimum altitude and speed. Ranges for strike aircraft assume no weapons load. Especially in the case of strike aircraft, therefore, range falls sharply for flights at lower altitude, at higher speed or with full weapons load (e.g., combat radius of F-104, at operational height and speed, with typical weapons load, is approximately 420 miles).

<sup>f</sup> Mach 1 = speed of sound.

<sup>g</sup> Warsaw Pact aircraft are of Soviet origin; the names listed (e.g., Beagle) are of NATO origin.

<sup>h</sup> The dual-capable F-104 is operated by Belgium, Canada, Denmark, Germany, Greece, Italy, the Netherlands, Norway and Turkey, but the Canadian aircraft no longer have a nuclear role. The nuclear warheads for these aircraft are held in American custody.

<sup>i</sup> Nuclear warheads for these dual-capable aircraft are held in Soviet custody.

<sup>j</sup> The absence of figures here reflects the uncertainty as to how many of these nuclear-capable aircraft actually have a nuclear role.

<sup>k</sup> A number of strike aircraft, such as the A-4 and Mirage III, may also be capable of carrying tactical nuclear weapons.



## 2. Comparisons of Defense Expenditures 1973-76

Country	\$ million				\$ Per head				% Government spending <sup>a</sup>				% of GNP <sup>b</sup>				
	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	1972	1973	1974	1975	
<b>Warsaw Pact<sup>c</sup></b>																	
Bulgaria	352	403	457	438	41	46	52	50	6.3	6.0	6.0	6.0	2.4	2.5	2.7	2.7	
Czechoslovakia	1,564	1,602	1,706	1,805	107	109	116	121	7.4	7.0	7.3	n.a.	3.8	4.0	3.8	3.8	
Germany, East	2,218	2,373	2,550	2,729	129	138	148	158	8.9	8.6	7.9	7.8	5.1	5.4	5.4	5.5	
Hungary	442	477	506	551	42	46	48	52	4.2	3.7	3.5	3.6	2.5	2.3	2.4	2.4	
Poland	1,718	1,832	2,011	2,252	51	54	59	66	8.4	7.2	7.0	7.0	3.3	3.2	3.0	3.1	
Romania	577	626	707	759	28	30	33	35	4.7	4.1	3.7	4.0	1.9	1.7	1.7	1.7	
Soviet Union <sup>d</sup>	88,000	109,000	124,000	n.a.	352	432	490	n.a.	n.a.	n.a.	n.a.	n.a.	—	11-13%			
	-92,000	-113,000			-368	-447											
<b>NATO<sup>e</sup></b>																	
Belgium	1,360	1,506	1,971	2,013	139	153	200	204	10.2	9.8	10.0	10.2	2.8	2.7	2.8	3.0	
Britain	9,033	10,041	11,118	10,734	161	179	198	190	12.9	12.9	11.6	11.0	5.2	4.9	5.1	4.9	
Canada	2,417	2,944	2,965	3,231	109	131	130	140	12.0	14.3	11.9	10.0	2.2	2.0	2.1	2.2	
Denmark	625	741	939	861	125	147	185	168	7.6	7.4	7.3	7.4	2.4	2.1	2.2	2.2	
France	9,818	9,970	13,984	12,857	189	190	264	241	18.3	20.3	20.2	20.6	3.7	3.5	3.6	3.9	
Germany*	13,295	13,923	16,142	15,220	215	224	259	242	26.2	26.7	24.4	23.5	3.4	3.4	3.6	3.7	
Greece	664	807	1,435	1,249	74	90	159	138	21.7	25.2	25.5	26.0	4.6	4.1	4.0	6.9	
Italy	4,131	4,415	4,700	3,821	75	80	84	68	10.1	11.0	9.7	8.6	3.1	3.0	2.9	2.6	
Luxembourg	17	19	22	23	49	56	65	68	3.5	3.5	3.0	2.9	0.9	0.8	0.9	1.1	
Netherlands	2,102	2,406	2,978	2,825	157	178	218	205	11.9	12.2	11.0	9.8	3.4	3.3	3.4	3.6	
Norway	669	723	929	902	169	181	232	223	9.4	8.5	8.2	7.6	3.3	3.2	3.1	3.1	
Portugal	734	1,000	1,088	748	80	114	124	85	34.2	47.3	35.2	n.a.	6.9	6.2	6.6	6.0	
Turkey	892	1,173	2,200	2,800	23	30	55	70	21.1	19.2	26.6	29.4	4.2	4.1	3.7	9.0	
United States	78,472	85,906	88,983	102,691	372	405	417	477	29.2	26.5	23.8	26.0	6.7	6.1	6.1	5.9	
<b>Other Europe</b>																	
Austria	295	323	410	433	39	43	54	57	3.6	3.7	3.7	3.7	1.0	0.9	0.9	1.0	
Eire	85	98 <sup>f</sup>	128	134	28	32	41	43	2.9	3.9	4.3	4.3	1.3	1.2	1.4	1.6	
Finland	255	313	388	364	55	67	83	77	5.5	5.3	5.0	4.8	1.5	1.4	1.4	1.4	
Spain	1,162	1,372	1,701	1,766	33	39	48	49	14.0	14.1	14.5	15.2	1.9	1.9	1.9	1.8	
Sweden	2,012	1,903	2,483	2,418	246	233	303	294	11.4	10.3	10.5	9.6	3.7	3.7	3.4	3.4	
Switzerland	808	832	1,047	1,221	124	126	160	184	20.1	19.2	19.3	19.1	1.9	1.8	1.8	1.8	
Yugoslavia <sup>g</sup>	1,045	1,295	1,705	1,798	50	61	80	84	48.1	49.5	49.9	40.9	4.8	5.3	5.1	5.6	
<b>Middle East</b>																	
Algeria <sup>h</sup>	146	221	285	312	9	14	17	18	5.3	6.2	4.7	5.5 <sup>i</sup>	1.7	1.7	1.8	n.a.	
Egypt	2,757	4,071	6,103	4,859	77	111	163	128	34.4	26.8	42.0	n.a.	19.9	31.0	22.8	n.a.	
Iran <sup>j</sup>	2,096	5,550	8,800	9,500	67	172	268	281	23.7	27.1	24.9	21.4	7.0	7.0	14.0	17.4	
Iraq	837	2,701	1,191 <sup>k</sup>	n.a.	80	251	107	n.a.	17.9	59.4	43.7	n.a.	7.2	9.8	18.7	n.a.	
Israel	3,644	3,869	3,552	4,214	1,146	1,173	1,045	1,201	60.4	51.0	50.1	56.7	20.3	40.8	31.8	35.9	
Jordan	147	142	155	155	58	54	57	55	31.6	26.6	22.0	19.4	16.0	16.4	12.1	12.2	
Libya	145	169	203	n.a.	67	72	83	n.a.	18.5	16.1	13.7	n.a.	2.6	2.3	1.4	1.7	
Morocco	196	190	224	258	12	11	13	15	11.5	8.6	4.5	6.0	3.2	3.5	3.0	2.8	
Saudi Arabia	1,478	1,808	6,771	n.a.	267	329	1,153	n.a.	23.7	25.6	20.0	n.a.	19.2	17.9	7.3	n.a.	
Sudan	114	118	120	n.a.	7	7	7	n.a.	18.6	14.9	15.1	n.a.	5.2	4.6	4.3	n.a.	
Syria <sup>l</sup>	405	452	706	1,003	59	64	96	132	44.1	24.5	25.3	22.3	9.0	16.0	11.0	15.1	
<b>Africa</b>																	
Ethiopia	51	89	84	n.a.	2	3	3	n.a.	12.3	19.8	19.4	n.a.	2.0	2.1	3.3	2.9	
Nigeria <sup>m</sup>	562	653	1,786	2,434	9	11	28	38	26.4	15.2	11.8	16.7	4.5	4.3	2.9	n.a.	
Rhodesia	59	80	102	130	10	13	16	21	12.2	11.1	12.3	14.1	1.9	2.7	2.6	3.0	
South Africa	702	1,052	1,332	1,494	30	43	53	57	13.3	16.0	18.5	16.4	2.2	2.6	3.2	5.3	
<b>Asia</b>																	
Australia	1,993	2,661	2,492	2,733	154	199	184	198	11.5	10.0	8.6	n.a.	3.6	3.4	3.6	3.2	
China (Taiwan)	818	1,000	n.a.	n.a.	53	63	n.a.	n.a.	40.7	40.9	n.a.	n.a.	9.3	8.0	7.2	n.a.	
India	2,418	2,443	2,660	2,812	4	4	4	5	21.1	22.1	21.1	n.a.	3.9	3.4	2.7	3.0	
Indonesia	452	601	1,108	n.a.	4	5	9	n.a.	16.1	15.8	16.7	n.a.	3.3	2.9	2.6	3.8	
Japan	3,769	4,300	4,620	5,058	35	39	42	45	7.0	6.4	6.6	6.2	0.9	0.9	0.9	0.9	
Korea, South	473	742	943	1,500	14	22	28	42	22.1	25.3	29.2	34.6	4.5	3.7	4.3	5.1	
Malaysia	287	311	385	353	25	26	31	27	20.4	17.3	17.3	16.9	4.5	4.1	3.8	4.0	
New Zealand	187	242	243	n.a.	63	80	79	n.a.	4.7	4.5	4.3	n.a.	1.8	1.6	1.8	1.8	
Pakistan	509	713	725	807	9	11	10	11	11.0	12.7	12.3	n.a.	9.8	7.5	8.4	7.2	
Philippines	172	312	407	410	4	8	10	9	22.6	24.2	19.3	n.a.	1.6	1.6	2.1	2.6	
Singapore	210	263	344	340	96	118	152	149	15.4	19.1	18.1	17.4	5.8	4.9	5.1	5.3	
Thailand	358	430	542	n.a.	10	10	13	n.a.	22.8	24.5	25.7	n.a.	3.8	3.4	3.2	3.7	
<b>Latin America</b>																	
Argentina	958	1,609	1,031	n.a.	40	65	41	n.a.	n.a.	8.5	9.7	n.a.	1.5	1.3	1.9	n.a.	
Brazil	956	1,154	1,283	1,780	9	11	12	16	11.0	11.0	9.3	9.7	2.3	1.2	1.3	1.3	
Colombia	93	102	n.a.	n.a.	4	4	n.a.	n.a.	8.9	8.0	n.a.	n.a.	1.2	0.9	0.8	n.a.	
Mexico <sup>n</sup>	352	423	586	n.a.	6	8	10	n.a.	2.2	2.2	2.4	n.a.	0.7	0.7	0.7	0.7	
Peru	238	226	383	n.a.	16	15	24	n.a.	13.6	9.9	15.3	n.a.	3.3	2.9	2.4	3.1	
Uruguay	68	n.a.	n.a.	n.a.	23	n.a.	n.a.	n.a.	15.7	n.a.	n.a.	n.a.	3.6	3.1	n.a.	n.a.	
Venezuela	325	406	494	n.a.	29	35	41	n.a.	9.8	8.9	5.4	n.a.	2.3	2.0	1.6	1.7	

\* Incl aid to W. Berlin. 16,012 16,668 19,540 18,758 259 268 313 299 31.6 28.8 29.2 28.9 4.1 4.1 4.3 4.4

<sup>a</sup> This series is designed to show national trends only; differences in the scope of the government sector invalidate international comparisons.

<sup>b</sup> Based on local currency. GNP estimated where official figures unavailable.

<sup>c</sup> This section is not directly comparable with the others. The difficulty of calculating suitable exchange rates makes conversion to dollars imprecise. GNP estimates are at factor-cost (market-price for USSR).

<sup>d</sup> See pp. 109-110.

<sup>e</sup> Defence expenditures based on NATO definition, but some 1976 figures estimated from nationally-defined data. Figures from 1974 are still provisional and decreasingly reflect inflation.

<sup>f</sup> Nine-month figure only.

<sup>g</sup> Gross domestic product at market prices, not GNP.



### 3. Comparisons of Military Manpower 1972-76 (in thousands)

Country	1972-76					1976						
	Numbers in armed forces					Armed forces				Estimated reservists <sup>a</sup>	Para-military forces	
	1972	1973	1974	1975	1976	Army	Navy	Air	% of men 18-45			
<b>Warsaw Pact</b>												
Bulgaria	146.0	152.0	152.0	152.0	164.5 <sup>d</sup>	131.0	8.5	25.0	9.2	285.0	16.0	
Czechoslovakia	185.0	190.0	200.0	200.0	180.0	135.0	—	45.0	6.0	350.0	10.0	
Germany, East	131.0	132.0	145.0	143.0	157.0	105.0	16.0	36.0	4.7	405.0	69.0	
Hungary	103.0	103.0	103.0	105.0	100.0	80.0	—	20.0	4.6	148.0	20.0	
Poland	274.0	280.0	303.0	293.0	290.0	204.0	25.0	61.0	3.9	505.0	80.0	
Romania	179.0	170.0	171.0	171.0	181.0	145.0	11.0	25.0	4.1	545.5	30.0	
Soviet Union <sup>b</sup>	3,375.0	3,425.0	3,525.0	3,575.0	3,650.0	1,825.0	450.0	450.0	6.9	6,800.0	350.0	
<b>NATO</b>												
Belgium	90.2	89.6	89.7	87.0	88.3	64.0	4.4	19.9	4.7	57.6	15.0	
Britain <sup>c</sup>	372.3	361.5	354.6	345.1	344.2	177.6	76.4	90.2	3.3	237.3	—	
Canada	84.0	83.0	83.0	77.0	77.9	28.5	13.4	36.0	1.6	19.1	—	
Denmark	43.4	39.8	37.1	34.4	34.7	21.8	5.8	7.1	3.4	82.0	—	
France	500.6	503.6	502.5	502.5	512.9	338.5	70.0	104.4	4.9	450.0	73.0	
Germany	467.0	475.0	490.0	495.0	495.0	345.0	39.0	111.0	3.9	1,181.0	20.0	
Greece	157.0	160.0	161.2	161.2	199.5	160.0	17.5	22.0	11.6	240.0	103.5	
Italy	427.6	427.5	421.0	421.0	352.0	240.0	42.0	70.0	3.2	737.8	80.0	
Luxembourg	0.6	0.6	0.6	0.6	0.6	0.6	—	—	0.8	—	0.4	
Netherlands	122.2	112.2	113.9	112.5	112.2	75.0	18.2	19.0	4.0	183.3	3.7	
Norway	35.9	35.4	34.9	35.0	39.0	20.0	9.0	10.0	5.2	170.0	—	
Portugal	218.0	204.0	217.0	217.0	59.8	36.0	13.8	10.0	3.8	—	23.4	
Turkey	449.0	455.0	453.0	453.0	460.0	375.0	40.0	45.0	5.7	825.0	75.0	
United States	2,391.0	2,252.9	2,174.0	2,130.0	2,086.7	782.0	720.6	584.1	4.9	874.5	—	
<b>Other European</b>												
Austria	43.0	52.0	37.3	38.0	37.3	33.0	—	4.3	2.7	112.7	11.3	
Eire	9.9	10.6	12.3	12.1	14.0	12.8	0.5	0.7	2.5	18.1	—	
Finland	39.5	39.5	35.8	36.3	35.8	30.3	2.5	3.0	3.5	690.0	4.0	
Spain	301.0	293.0	284.0	302.3	302.3	220.0	46.6	35.7	4.4	700.0	65.0	
Sweden	72.5	74.8	72.2	69.8	65.4	46.0	11.2	8.2	4.1	635.2	—	
Switzerland	29.5	33.5	42.5	42.5	46.5	37.5	—	9.0	3.5	578.5	—	
Yugoslavia	229.0	240.0	230.0	230.0	250.0	200.0	20.0	30.0	5.3	500.0	14.0	
<b>Middle East</b>												
Algeria	60.2	63.0	63.0	63.0	69.3	61.0	3.8	4.5	2.4	100.0	10.0	
Egypt	325.0	323.0	323.0	322.5	342.5	295.0	17.5	30.0	4.5	515.0	120.0	
Iran	191.0	211.5	238.0	250.0	300.0	200.0	18.5	81.5	4.6	300.0	70.0	
Iraq	101.8	101.8	112.5	135.0	158.0	140.0	3.0	15.0	8.3	250.0	54.8	
Israel	77.0	115.0	145.5	156.0	158.5	135.0	4.5	19.0	23.9	450.0	9.0	
Jordan	69.3	72.9	74.9	80.2	67.9	61.0	0.3	6.6	13.6	30.0	10.0	
Libya	25.0	25.0	32.0	32.0	29.7	22.0	2.7	5.0	n.a.	n.a.	n.a.	
Morocco	53.5	56.0	56.0	61.0	73.0	65.0	3.0	5.0	2.3	n.a.	30.0	
Saudi Arabia	40.5	42.5	43.0	47.0	51.5	40.0	1.5	10.0	n.a.	n.a.	26.5	
Sudan	36.3	38.6	43.6	48.6	52.6	50.0	0.6	2.0	n.a.	n.a.	3.5	
Syria	111.8	132.0	137.5	177.5	227.0	200.0	2.0	25.0	18.7	102.5	9.5	
<b>Africa</b>												
Ethiopia	44.6	44.6	44.6	44.8	50.8	47.0	1.5	2.3	0.9	28.0	11.2	
Nigeria	274.0	157.0	210.0	208.0	230.0	221.0	3.5	5.5	n.a.	12.0	—	
Rhodesia	4.7	4.7	4.7	5.7	9.2	7.9	—	1.3	0.8 <sup>d</sup>	13.0	44.0	
South Africa	44.3	46.0	47.5	50.5	51.5	38.0	5.0	8.5	1.1 <sup>e</sup>	173.5	90.0	
<b>Asia</b>												
Australia	88.1	73.3	68.9	69.1	69.4	31.6	16.2	21.6	2.5	26.7	—	
China	2,880.0	2,900.0	3,000.0	3,250.0	3,525.0	3,000.0	275.0	250.0	2.0	n.a.	n.a.	
China (Taiwan)	500.0	503.0	491.0	494.0	470.0	330.0	70.0	70.0	n.a.	1,170.0	100.0	
India	960.0	948.0	956.0	956.0	1,055.5	913.0	42.5	100.0	0.8	240.0	180.0	
Indonesia	317.0	322.0	270.0	266.0	246.0	180.0	38.0	28.0	1.0	n.a.	112.0	
Japan	260.0	266.0	233.0	236.0	235.0	153.0	39.0	43.0	0.9	39.6	—	
Korea, South	634.8	633.5	625.0	625.0	595.0	520.0	45.0	30.0	8.2	1,115.0	750.0	
Malaysia	50.5	56.0	66.2	61.1	62.3	52.5	4.8	5.0	2.7	26.5	82.0	
New Zealand	12.6	12.8	12.6	12.7	12.5	5.4	2.8	4.3	2.0	12.6	—	
Pakistan	395.0	420.0	392.0	392.0	428.0	400.0	11.0	17.0	4.1	513.0	75.0	
Philippines	31.0	42.7	55.0	67.0	78.0	45.0	17.0	16.0	1.0	45.0	60.0	
Singapore	17.1	20.6	21.7	30.0	31.0	25.0	3.0	3.0	6.1	45.0	37.5	
Thailand	150.0	180.0	195.0	204.0	210.0	141.0	27.0	42.0	2.9	350.0	66.0	
<b>Latin America</b>												
Argentina	135.0	135.0	135.0	133.5	132.8	83.5	32.3	17.0	2.6	250.0	20.0	
Brazil	198.0	208.0	208.0	254.5	257.2	170.0	45.8	41.4	1.2	—	200.0	
Colombia	63.2	63.2	63.2	64.3	54.3	40.0	8.0	6.3	n.a.	250.0	5.0	
Mexico	73.2	71.0	82.0	82.5	89.5	69.0	14.5	6.0	0.8	250.0	—	
Peru	54.0	54.0	54.0	56.0	63.0	46.0	8.0	9.0	2.1	—	20.0	
Uruguay	15.8	21.0	21.0	22.0	23.0	17.0	4.0	2.0	3.8	—	22.0	
Venezuela	33.5	37.5	39.5	44.0	42.0	28.0	8.0	6.0	1.9	—	10.0	

<sup>a</sup> Reservists with recent training.

<sup>b</sup> Service breakdown excludes *PVO-Strany* (550,000) and Strategic Rocket Forces (375,000).

<sup>c</sup> Includes men enlisted outside Britain.

<sup>d</sup> Or about 16.0 per cent of European males 18-45.

<sup>e</sup> Or about 7.1 per cent of European males 18-45.



#### 4. Indices of NATO Defense Expenditure, Current and Constant Prices<sup>a</sup> (in local currency, 1970 = 100)

Country	1960	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	% Growth <sup>b</sup>	
													1960-70	1970-75
Belgium	53.9	70.9	75.1	81.1	87.1	90.4	100.0	105.8	117.7	130.5	153.0	186.1	6.4	13.2
Britain	72.5	84.2	85.6	89.8	93.9	94.0	100.0	101.3	107.0	110.9	115.4	124.5	3.3	4.5
Canada	67.7	85.6	88.1	93.1	95.4	94.2	100.0	115.2	133.3	143.4	172.1	207.4	4.0	15.7
Denmark	100.6	107.0	106.0	109.3	106.9	100.2	100.0	103.7	113.7	112.0	115.9	112.5	0	2.4
France	80.3	80.5	85.7	95.3	93.5	92.1	100.0	103.4	108.6	116.7	138.9	151.0	2.2	8.6
Germany	40.4	71.6	75.4	81.6	94.0	95.8	100.0	115.9	122.8	127.7	161.0	186.1	9.5	13.2
Greece	71.4	98.7	97.0	97.3	103.7	102.0	100.0	109.4	108.9	103.6	113.2	119.4	3.4	3.6
Italy	57.7	76.2	80.5	87.1	91.0	95.5	100.0	105.4	110.8	121.2	147.4	172.9	5.6	11.6
Luxembourg	85.7	94.4	97.1	102.3	102.3	101.1	100.0	99.8	99.2	101.1	108.1	113.6	1.6	2.5
Netherlands	53.7	88.2	89.7	94.8	85.5	95.6	100.0	112.7	127.2	141.4	157.9	168.8	6.4	11.0
Norway	70.2	100.7	98.7	102.6	91.1	99.2	100.0	107.2	114.6	119.0	124.2	125.3	3.6	4.6
Portugal	36.0	44.3	50.5	66.1	77.4	89.8	100.0	109.0	121.1	139.8	169.8	309.1	10.8	25.3
Spain	44.2	50.2	54.3	70.0	81.7	92.6	100.0	105.8	112.6	112.9	108.7	172.6	8.5	11.5
Sweden	45.5	77.6	85.9	87.0	89.8	90.4	100.0	118.6	138.4	153.1	182.6	189.6	8.2	13.6
Switzerland	67.0	89.9	97.1	95.0	96.8	94.8	100.0	113.1	125.0	124.7	124.8	110.7	4.1	2.1
United States	63.2	114.7	119.5	99.3	89.9	94.0	100.0	106.3	124.3	144.5	170.7	188.9	4.7	13.6
Turkey	81.5	131.1	134.1	109.1	96.1	98.3	100.0	101.6	112.9	124.1	133.5	133.3	2.1	3.9
USSR	43.5	68.4	70.3	80.6	82.7	92.8	100.0	112.6	125.4	137.7	161.9	183.1	8.7	12.8
USSR (cont.)	65.6	87.5	84.0	93.1	92.0	96.1	100.0	104.7	108.2	110.0	117.9	121.0	4.3	3.9
USSR (cont.)	38.1	68.4	70.2	75.6	82.9	90.2	100.0	108.9	116.8	126.4	142.0	165.4	10.1	10.6
USSR (cont.)	39.2	87.0	86.5	89.3	94.5	99.8	100.0	102.5	102.6	103.3	106.0	110.6	5.4	2.0
USSR (cont.)	24.1	53.3	59.0	76.4	85.3	86.0	100.0	117.2	128.0	133.5	200.3	211.8	15.3	16.2
USSR (cont.)	37.3	72.5	76.4	93.7	98.7	91.0	100.0	104.7	103.3	95.4	114.4	105.5	10.4	1.0
USSR (cont.)	38.6	61.3	64.1	73.7	82.7	86.5	100.0	136.1	159.7	195.5	253.8	532.6	10.0	39.3
USSR (cont.)	68.4	90.5	87.0	87.7	93.0	92.6	100.0	114.3	123.6	131.1	147.0	259.8	3.9	21.1
USSR (cont.)	58.3	66.6	81.7	96.9	103.7	104.6	100.0	96.2	99.7	100.8	110.3	114.3	5.5	3.4
USSR (cont.)	76.5	82.1	97.6	112.7	115.7	110.8	100.0	92.3	92.6	88.1	86.9	82.5	2.7	-3.8

<sup>a</sup> To produce constant price series (in italics) defence expenditures are deflated by the defence sector consumer price indices. These reflect general rates of inflation, not rates in the defence sector.  
<sup>b</sup> Average annual compound growth rates over periods shown.

#### 5. Comparative Strengths of Armed Forces 1955-75 (in thousands)

Year	USA	Japan	Germany	France	Britain <sup>a</sup>	USSR
1955	3,049	178	20	568	800	5,000
1956	2,857	188	66	785	760	4,500
1957	2,800	202	122	836	700	4,200
1958	2,637	214	175	797	615	4,000
1959	2,552	215	249	770	565	3,900
1960	2,514	206	270	781	520	3,623
1961	2,572	209	325	778	455	3,800
1962	2,827	216	389	742	445	3,600
1963	2,737	213	403	632	430	3,300
1964	2,687	216	435	555	425	3,300
1965	2,723	225	441	510	424	3,150
1966	3,123	227	455	500	418	3,165
1967	3,446	231	452	500	417	3,220
1968	3,547	235	440	505	405	3,220
1969	3,454	236	465	503	383	3,300
1970	3,066	259	466	506	373	3,305
1971	2,699	259	467	502	365	3,375
1972	2,391	260	467	501	363	3,375
1973	2,253	266	475	504	352	3,425
1974	2,174	233	490	503	345	3,525
1975	2,130	236	495	503	345	3,575

<sup>a</sup> Excluding forces enlisted outside Britain.

#### 6. Average Strength of Military Formations (in thousands)

	Division					Brigade				Squadron Fighter/FGA aircraft
	Armoured		Mechanized		Airborne	Armoured		Mechanized		
	Men	Tanks	Men	Tanks	Men	Men	Tanks	Men	Tanks	
United States	16,500	324	16,000	216	15,000	4,200	108	4,500	54	18-24
Soviet Union	11,000	316	14,000	266	7,000	3,000 <sup>a</sup>	95 <sup>a</sup>	2,500 <sup>a</sup>	40 <sup>a</sup>	10-14
China	10,000	270	12,000 <sup>b</sup>	30 <sup>b</sup>	9,000	1,200 <sup>a</sup>	90 <sup>a</sup>	2,000 <sup>a</sup>	—	9-10
Britain <sup>c</sup>	12,500	300	12,000	300	—	4-5,000	100	4-5,000	50	8-15
Germany	14,000	300	15,000	250	8-9,000	3,550 <sup>d</sup>	108 <sup>d</sup>	3,900 <sup>d</sup>	54 <sup>d</sup>	15-21
India	15,000	200	17,500 <sup>b</sup>	—	—	6,000	150	4,500	—	12-20
Israel	—	—	—	—	—	3,500	80-100	3,500	36-40	15-20
Egypt	11,000	300	12,000	190	—	3,500	96	3,500	36	10-12

<sup>a</sup> Strength of a regiment, which is the equivalent formation in the Russian and Chinese command structures. (The term 'regiment' is, however, often employed, particularly in West European countries, to describe a battalion-size unit, and it is so used in *The Military Balance*.)

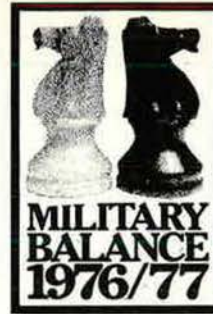
<sup>b</sup> Infantry division.

<sup>c</sup> Britain is proposing to eliminate the brigade as a formation and have armoured divisions smaller than above and a new infantry formation of about brigade size, to be known as a Field Force.

<sup>d</sup> Proposed new armoured brigades will have 3,026 men and 99 tanks, mechanized brigades 3,730 men and 66 tanks.

Divisional strengths cover organic units only and exclude support units or services outside the divisional structure. Warsaw Pact formations and squadrons have strengths similar to those of the Soviet Union. NATO formations and squadrons not included in the table above have similar totals to those of Germany unless otherwise mentioned in the text. Iran, Pakistan, the Philippines, Thailand, Japan, South Korea and Taiwan have tended to adopt American military organization, while Australia, New Zealand, Malaysia and Singapore generally follow British practice.





# The Theatre Balance Between NATO And the Warsaw Pact

Any assessment of the military balance between NATO and the Warsaw Pact involves comparison of the strengths of both men and equipment, consideration of qualitative characteristics, factors such as geographical advantages, deployment, training, and logistic support, and of differences in doctrine and philosophy. It must be set within the context of the strategic nuclear balance and of the relative strengths of the navies of the two sides.

Certain elements in the equation are of special importance. For a variety of reasons, the Soviet Union has within the theatre, or nearby, forces which closely reflect her doctrine and strategy; on the other hand, NATO, bound as it is by a multi-national political process and by public pressures that do not exist in the Soviet Union, has tended to compromise on its military requirements. Warsaw Pact equipment, though often inferior to that of NATO, is standardized, whereas that of NATO is not and is therefore subject to limitations on interoperability and thus flexibility. NATO has certain strengths, such as the striking power of its tactical air forces, but there is little depth in the NATO central sector, which presents problems in its defence. On the other hand, the Warsaw Pact has its own vulnerabilities, notably in logistics, in addition to which there may be doubts about the reliability of some of its members and the value of their forces.

The appraisal which follows should therefore be regarded as primarily a quantitative guide, since there are difficulties in giving, in so short a space, values to qualitative factors and deciding on their relevance. It is military only, and thus one-dimensional. Furthermore, any single, static comparison of opposing forces can only give a limited insight into what might happen under the dynamic conditions of conflict. The two sides do not have the same military requirements: Soviet forces are designed for an offensive; NATO forces for defence, for creating at least a reasonable Soviet doubt about the possibility of the speedy success of a conventional attack and the nuclear consequences that might follow. This presentation necessarily oversimplifies what is by its nature a complex problem, not easily responsive to analysis.

The characteristics of the military balance are central to any consideration of Mutual Force Reductions (MFR), but the geographical area being considered in the MFR negotiations covers only part of the NATO area. A section at the end of this appraisal notes some special factors relating to MFR.

## LAND AND AIR FORCES

The three major NATO subordinate commands, Northern, Central, and Southern Europe, at first seem to offer a convenient basis for making a direct comparison with the opposing forces of the Warsaw Pact, but there are problems. The Northern European Command covers not only Norway but also the Baltic area, including Denmark, Schleswig-Holstein, and the Baltic Approaches. It is not possible to make precise judgements on the Warsaw Pact formations that would be committed to the Baltic area rather than towards the NATO Central European Command, since in both land and air forces there is a considerable degree of flexibility to do either. For the Warsaw Pact this geographical area is a coherent front, though a number of Soviet divisions stationed well to the north, discussed later, are undoubtedly directed towards Norway. Northern and Central Europe have therefore been grouped together in the tables which follow. Southern Europe is shown separately.

## GROUND FORMATIONS

A traditional basis of comparing strengths is the number of combat divisions that the two sides have and this is shown in the table below. This is far from an adequate guide by itself,



since not only do divisions vary greatly in their organization, size, and equipment, but there are many combat units outside divisional structures. As one very broad indication of the front-line

Ground Forces Available in Peacetime (division equivalents)	Northern and Central Europe			Southern Europe		
	NATO	Warsaw Pact	(of which USSR)	NATO	Warsaw Pact	(of which USSR)
Armoured Infantry, mechanized, and airborne	11	31	19	6	6	3
	18	36	21	35	27	7

*In this table (and the ones that follow in this section), the portion headed 'Northern and Central Europe' includes (on the NATO side) the commands for which AFCENT and AFNORTH commanders have responsibility. France is not included, nor are any allied ground forces in Portugal or Britain. On the Warsaw Pact side it includes the command for which the Pact High Commander has responsibility, but excludes the armed forces of Bulgaria, Hungary, and Romania. Certain Soviet units normally stationed in western USSR and such troops as might be committed to the Baltic and Norwegian theatre of operations have, however, been included on the Warsaw Pact side. The entries under the heading 'Southern Europe' include, on the NATO side, the Italian, Greek, and Turkish land forces (including those in Asian Turkey) and such American and British units as would be committed to the Mediterranean theatre of operations, and on the Warsaw Pact side, the land forces of Bulgaria, Hungary, and Romania and such Soviet units normally stationed in Hungary and southwestern USSR as might be committed to the Mediterranean theatre. (In the table, all divisions, brigades, and similar formations are aggregated on the basis of three brigades per division.)*

combat resources on the ground in peacetime a divisional count has some utility if taken in conjunction with the various tables which follow, but to read too much from it could be misleading.

Greek forces are included in the table. French formations are not; if included they would add two mechanized divisions to the NATO totals. (These are the two divisions stationed in Germany. There are seven more in France, outside the area of the NATO command. French divisions are in process of reorganization, however.) Though these divisions are stationed in Germany, and there has been some joint planning with NATO military commanders, they are not committed to NATO. They have no operational sectors, and there has been far from full agreement on the military strategy under which they might be employed. All the appropriate forces of the Warsaw Pact countries are included, though the military value of some of them might be suspect for political reasons, dependent on circumstances. An offsetting advantage to NATO in the central sector is the fact that most of the NATO strength is in West Germany, where it is wanted, while about a third of the Soviet divisions shown here are some distance away in the western military districts of the Soviet Union. The figures for Northern and Central Europe therefore show what is, from a NATO viewpoint, the worst case; those for Southern Europe show the best, as noted below.

The table conceals a marked imbalance in North Norway. In Norway there are only Norwegian forces, a brigade group being located in the north. There are strong Soviet forces in the Kola peninsula, some two divisions and a marine brigade, and at least five divisions in the Leningrad Military District, with more formations to the south in the Baltic states. While many of these formations may have other missions, it is clear that large forces could be brought against Norway (and indeed Denmark) and could be rapidly reinforced. The Soviet naval strength in the region is massive, and sea power, including amphibious capacity, is an important element in the military and, particularly, regional balance. The wide disparity highlights the problem of the defence of North Norway against surprise attack. To meet this difficulty a system of self-defence, based on a strong Home Guard and rapid mobilization, has been designed to take maximum advantage of the ruggedness of the country and the poor road and rail communications, but it is clear that defence against attack of any size depends on timely external assistance, including air and naval support.

Two further imbalances are worth noting. The first is that the whole of the Italian land forces, included in the table under Southern Europe, are stationed in Italy and are thus at some distance from the areas of potential confrontation both in the South-East and the Centre. The second, a legacy from the post-war occupation zones, is a certain maldeployment in the Central European Command, where the strong US formations are stationed in the southern sector, an area which for the most part lends itself to defence, while in the north German plain, across which the routes to allied capitals run and where there are few major obstacles, certain of the forces are less powerful. (This pattern of deployment also leaves US forces reliant on logistic communications running north-south, since they can no longer use French territory.) In wartime, lateral movement of forces might have to be made and, in particular, reinforcements would have to be directed to the sector where they were most needed rather than to existing national sectors. In peacetime, adjustment of this maldeployment would be very costly, involving



problems of barracks and logistics, but a partial correction is to be made with the stationing of one of the two additional US brigades (see p. 44) in the northern sector, which has the further advantage of making emergency reinforcement of the sector by US troops easier.

## MANPOWER

A comparison of front-line combat manpower deployed on the ground in normal peacetime circumstances (as distinct from total manpower, which is referred to later) fills out the picture further. The figures shown reflect the variations in divisional establishments mentioned above but also include combat troops in formations higher than divisions and those men who directly support them. They take account of undermanning as well—many NATO and Warsaw Pact divisions are kept well below strength in peacetime. Figures calculated on this basis, which can only be very approximate, give the comparison below. The figures do not include French forces; if those stationed in Germany are counted, the NATO figure for Northern and Central Europe might be increased by perhaps 50,000. Again, they include Greece.

The table still reveals a marked advantage to the Warsaw Pact in Northern and Central Europe (subject to the caveat about the value to be placed on the forces of the East European

	Northern and Central Europe			Southern Europe		
	NATO	Warsaw Pact	(of which USSR)	NATO	Warsaw Pact	(of which USSR)
Combat and direct support troops available (000)	635	910	620	540	395	155

countries). It does not, of course, include the men in the US dual-based brigades, because they are not physically present in Europe, but does include on the Warsaw Pact side some 183,000 in, or in direct support of, divisions in the western military districts of the Soviet Union, since these formations are clearly designed for operations in Central Europe, though they are at some distance in time and space from the area.

In Southern Europe the figures favour NATO but conceal the fact that the forces are widely separated, with Italian troops deployed at a very considerable distance from those of Greece and Turkey.

## REINFORCEMENTS

The movement of reinforcements to the theatre and the mobilization of first-line reserves would materially alter the above figures. Indeed there are severe limitations in comparing purely peacetime strengths, since in crisis or conflict the total combat manpower that can be brought to bear in time becomes the key indicator. There are, however, acute difficulties in making a numerical comparison of anything other than the numbers of reinforcements potentially available, since there are so many variables and a good many unknowns affecting the speed with which reinforcements and reserves could or would be deployed operationally.

Implicit in NATO defence plans is the concept of political warning time: that there will be enough warning of a possible attack to enable forces to be brought to a higher state of readiness, and reinforcement and mobilization to take place. This does, of course, assume the willingness—which applies to both sides—to reinforce in a crisis situation, at the risk of heightening tension by doing so. Advantage here will generally lie with an attacker, who can start mobilization first, hope to conceal his intentions, and finally achieve some degree of tactical surprise. The point of attack can be chosen and a significant local superiority built up. The defender is likely to start more slowly and will have to remain on guard at all points.

NATO forces would be built up from two sources: the mobilization of reserves to increase the strength or the number of existing formations, and the movement into the theatre of active army formations stationed elsewhere in peacetime.

Potentially the most rapid build-up of any size would be that from the mobilization of reserves in Europe, occurring within days. This applies particularly to Germany, where reserves would bring units up to wartime strength (but not increase their number) and mobilize the Territorial Army of some 500,000 men, designed to assist with home defence. Other European nations could also use mobilized reserves to strengthen units and, in certain cases, augment them with others. Formations from outside the immediate area would come from Canada, Britain, Belgium, the Netherlands, and possibly France, but principally from the United States. There are two divisions and an armoured cavalry regiment in the United States with equipment stockpiled in Germany, and their personnel could be moved very quickly, using the very considerable airlift available. There are in the United States at least another 7 divisions (some with heavy equipment) plus several brigades also available for use in Europe, but, though they might be available very early, much of their equipment would have to be moved by sea. The



	Divs			Bdes/regts			Marines
	Armd	Mech	Other	Armd	Mech	Other	Divs
<i>Active Forces</i>							
United States	2	2	5	—	1	1	2
Belgium	—	—	—	—	1	1	—
Britain	—	—	1	—	—	4	—
Canada	—	—	—	—	—	2	—
Germany	—	—	—	—	—	—	—
Netherlands	—	—	—	1	4	—	—
France	—	3	1	—	—	—	—
Totals	2	5	7	1	6	8	2
<i>Reserve Forces</i>							
United States	2	1	5	3	6	12	1
Belgium	—	—	—	—	1	1	—
Britain	—	—	—	—	—	—	—
Canada	—	—	—	—	—	—	—
Germany	—	—	—	—	—	6	—
Netherlands	—	—	1	—	—	1	—
Totals	2	1	6	3	7	20	1
Grand Totals	4	6	13	4	13	28	3

US reinforcements include light (infantry and airborne) divisions. British reinforcements will be reduced by 1979 to one army brigade. Some countries, particularly Britain, Canada, the Netherlands, and France, have plans to mobilize battalion-sized units in some numbers in addition to the formations shown here. German Reserve Forces are Home Defence Groups of brigade size which could have limited defensive combat tasks.

same would apply to the 8 divisions and some 18 independent brigades in the National Guard; these could nominally be ready perhaps five weeks after mobilization but might need further training (as might Soviet reserves). The table above summarizes the formations that NATO countries have available to provide reinforcements for the critical central sector.

Warsaw Pact reinforcement plans follow a rather different pattern. There are a large number of active Soviet divisions, but they are kept at three different manning levels, and other Warsaw Pact formations at two. Reinforcement depends on filling out these divisions by mobilization and on moving some forward from the Soviet Union. All Soviet divisions stationed in East Germany, Poland, or Czechoslovakia are in Category 1 and would need little reinforcement, but some of those of the East European countries in the central sector are at a lower level. The divisions in the Soviet Union which would move forward first would be those in the western part of the country, of which up to a third are normally in Category 1. With more time and risk, reinforcing divisions could also be deployed from as far away as the Sino-Soviet border area. The total number and state of readiness of Soviet and East European divisions (which, it will be remembered, are smaller than those of NATO) is shown in the following table:

	Armd divs			Mech divs			Other divs			Indep bdes		
	Category			Category			Category			Category		
	1	2	3	1	2	3	1	2	3	1	2	3
Czechoslovakia	5	—	—	3	2	—	—	—	—	1	—	—
East Germany	2	—	—	4	—	—	—	—	—	—	—	—
Poland	5	—	—	6	2	—	2	—	—	—	—	—
Soviet divs												
In above area	14	—	—	13	—	—	—	—	—	—	—	—
Elsewhere	13	12	11	29	32	37	2	4	1	—	—	—
Soviet totals	27	12	11	42	32	37	2	4	1	—	—	—

Included among the divisions deployed 'elsewhere' are 4 Category 1 divisions in Hungary and a number of divisions that might reinforce Southern Europe rather than the central sector. Soviet naval infantry are not included.

As far as can be judged, mobilization by the Soviet Union in particular could be very speedy, and it has been estimated that the 27 Soviet divisions in Eastern Europe could be increased to over 80 in a few weeks—if mobilization were unimpeded. Of course it might not be. If hostilities had already started, movement by rail and road could be interdicted and the build-up slowed down considerably. Nonetheless, the Soviet Union, a European power



operating on interior lines, has geographical advantages and in the early weeks should be able to move reinforcements with heavy equipment faster overland than the United States could by sea, and she could also use heavy airlift. American ability to bring back the men of the dual-based brigades in days by air has been demonstrated on exercises, and for the two divisions with equipment in Germany the airlift of personnel would be a matter of another week or so. As with Soviet Forces, this would depend on movement not being hindered, on a secure air environment, and safe airfields to fly into; and quick dispersal from airfields could be difficult once fighting had started. The increase of manpower strengths in combatant units could take place rapidly, both from the United States and from the European NATO countries, but the real problem for a fast build-up of the number of combat divisions lies in the inevitable time lag before the American follow-up formations, dependent on sealift for their heavy weapons, could be ready for operations.

A fair summary of the initial reinforcement position might be that the Warsaw Pact is intrinsically capable of a faster build-up of formations in the early weeks, particularly if local surprise is achieved, and has a large pool on which to draw; that NATO can only match such a build-up if it has, and takes advantage of, sufficient warning time; that the subsequent rate of build-up of formations also favours the Warsaw Pact unless the crisis develops slowly enough to permit full reinforcement; in this last case the West could eventually reach a considerably better position. Alliance countries including France maintain rather more men under arms than the Warsaw Pact. For Army/Marines the figures (in thousands) are: NATO 2,877; Warsaw Pact 2,645. And the Soviet Union has a large number of her divisions on her border with China. Clearly, Soviet plans will put a premium on exploiting a fast build-up of forces, and NATO's on having adequate standing forces to meet any attack and on augmenting them in good time.

## EQUIPMENT

In a comparison of equipment one point stands out: the Warsaw Pact is armed almost completely with Soviet or Soviet-designed material and enjoys the flexibility, simplicity of training, and economy that standardization brings. NATO forces have a wide variety of everything from weapons systems to vehicles, with consequent duplication of supply systems and some difficulties of interoperability; they do, however, have many weapons qualitatively superior. As to numbers of weapons, there are some notable disparities, of which that in tanks is perhaps the most significant. The relative strengths are:

	Northern and Central Europe			Southern Europe		
	NATO	Warsaw Pact	(of which USSR)	NATO	Warsaw Pact	(of which USSR)
Main battle tanks in operational service in peacetime	7,000	19,000	11,000	4,000	7,500	2,750

*These are tanks with formations, or which are earmarked for the use of dual-based or immediate reinforcing formations (some 550). They do not include those in reserve, or small stocks held to replace tanks damaged or destroyed. In this latter category NATO has perhaps 2,000 tanks in Europe. There are tanks in reserve in the Warsaw Pact area, but the figures are difficult to establish. The total tank holdings are, however, materially higher than the formation totals in the table.*

French forces are not included in the above figures. If the two divisions stationed in Germany are taken into account, 325 should be added to the NATO total; if the three divisions in eastern France are counted, a further 485 should be added.

It will be seen that in Northern and Central Europe NATO has little more than a third as many operational tanks as the Warsaw Pact, though NATO tanks are generally superior (not, perhaps, to the T-72 now being issued to the Soviet forces; Soviet tank production is high: some 1,000 T-72 have been built in the last two years). This numerical weakness in tanks (and in other armoured fighting vehicles where the Soviet forces are notably well-equipped) reflects NATO's essentially defensive role and is offset to some extent by a superiority in heavy anti-tank weapons, a field in which new missiles rapidly coming into service in NATO forces will increasingly give more strength to the defence. NATO probably also has more effective airborne anti-tank weapons carried by fighter aircraft and helicopters.

The Warsaw Pact is also significantly stronger in conventional artillery in Northern and Central Europe: counting field, medium, and heavy guns, mortars and rocket launchers with formations, NATO has some 2,700 against a Warsaw Pact total of 5,600. In Southern Europe the position reverses, NATO having 3,500 against 2,700 in the Warsaw Pact, though about one-third of the NATO total is in Italy. To some extent the imbalance is redressed by the greater



lethality of NATO ammunition and a greater logistic capacity to sustain higher rates of fire, stemming from a much higher transport lift. Soviet forces are, however, augmenting their logistics, particularly with formations, and new self-propelled guns are replacing older towed models. NATO is also modernizing its artillery, in which it has achieved a fair degree of standardization, and in particular is developing a precision-guided shell and other munitions which would give artillery, *inter alia*, much improved anti-tank capability.

## LOGISTICS

NATO has an inflexible logistic system, based almost entirely on national supply lines with little central co-ordination. It cannot now use French territory and has many lines of communication running north to south near the area of forward deployment. Certain NATO countries are, furthermore, short of supplies for sustained combat, but Warsaw Pact countries may well be no better off.

## AIRCRAFT

If NATO ground formations are to be able to exploit the mobility they possess by day as well as by night, they must have a greater degree of air cover over the battlefield than they now have. Such cover is provided by a combination of rapid warning and communications systems, fighter aircraft, and air defence weapons both for defence of key areas or in the hands of forward troops. In numbers of aircraft NATO is inferior but has, however, a higher proportion of multi-purpose aircraft of good performance over their full mission profiles, especially in range, payload, and all-weather capability; considerable power can be deployed in the ground-attack role in particular. Many of the Warsaw Pact aircraft are rather elderly and designed primarily for air defence, but both sides are modernizing their inventories. The Soviet Union is introducing

Tactical Aircraft in Operational Service	Northern and Central Europe			Southern Europe		
	NATO	Warsaw Pact	(of which USSR)	NATO	Warsaw Pact	(of which USSR)
Light bombers	185	225	200	—	50	50
Fighter/ground-attack	1,250	1,375	950	450	250	100
Interceptors	375	2,050	950	275	700	200
Reconnaissance	275	550	400	150	100	50

*The area of Northern and Central Europe in the table above is slightly wider than for ground troops described previously. Many aircraft have a long-range capability and in any case can be re-deployed very quickly. Accordingly, the figures here include the appropriate British and American aircraft in Britain, American aircraft in Spain, and Soviet aircraft in the Western USSR. They do not, however, include the American dual-based squadrons, which would add about 100 fighter-type aircraft to the NATO totals, nor French squadrons with perhaps another 400 fighters. Carrier-borne aircraft of the US Navy are excluded, but so are the medium bombers in the Soviet Air Force, which could operate in a tactical role.*

new ground attack aircraft and also, for the first time, fighters specifically designed for deep strike and interdiction. (The latest versions of the MiG-23 *Flogger*, Su-17/-20 *Fitter*, and Su-19 *Fencer* are reported to have substantially improved range, payload, avionics, and electronic countermeasures capabilities. This may well be at the expense of overall numbers in future, since there has been an increase of some 1,300 tactical aircraft in the Pact in the last seven years or so.) NATO is also bringing into service new fighter aircraft of many types, and the US forces in Europe in particular can now be assumed to have available very advanced air-delivered weapons, such as laser-guided bombs and other precision-guided munitions. The air forces of the two sides, however, still have rather different roles: long range and payload have had lower priority for the Warsaw Pact. NATO has maintained a long-range deep-strike tactical aircraft capability; the Soviet Union has chosen to build an MRBM force which could, under certain circumstances, perform analogous missions, though not in a conventional phase of any battle, for which the new fighters have been designed.

The Warsaw Pact enjoys the advantage of interior lines of communication, which makes for ease of command and control and logistics. It has a relatively high capability to operate from dispersed natural airfields serviced by mobile systems, far more airfields with protective shelters, and the great advantage of standard ground support equipment which stems from having only Soviet-designed aircraft. These factors make for greater flexibility than NATO has, with its wide variety of aircraft and support equipment. NATO suffers from having too few airfields, which are thus liable to be crowded and has been slow to build shelters. It undoubtedly still has superiority in sophistication of equipment but this technological edge is being eroded as the newer Soviet aircraft, which are very advanced, are brought in. The capability of NATO air crews



(which in general have higher training standards and fly more hours) and the versatility of its aircraft, gives operational strength, and the quality of Western electronic technology is such that ground and airborne control equipment is almost certainly superior to that of the Warsaw Pact. NATO has a further advantage in having available more reinforcement aircraft. Since squadrons can be moved quickly, the NATO numerical inferiority shown above could rapidly be turned into superiority if enough airfields were available. The total American tactical aircraft inventory, for example (excluding training or home air defence), is 5,000, and there are other allied aircraft as well; that for the Soviet Union is 4,500.

The Soviet Union has always placed heavy emphasis on air defence, evident not only from the large number of interceptor aircraft in the table but from the strength of its deployment of surface-to-air missiles and air defence artillery both in the Soviet Union and with units in the field. These defences would pose severe problems for NATO attack aircraft, drawing off much effort into defence suppression. NATO territory and forces are much less well provided with air defences, but heavy expenditure is now going into new systems of many sorts, both low and high level, missiles and artillery.

## **THEATRE NUCLEAR WEAPONS**

NATO has been said to have some 7,000 nuclear warheads, but this number has undoubtedly changed as weapon systems have been modernized and redeployed. They are deliverable by a variety of vehicles (over 3,000 in all): aircraft, short-range missiles, and artillery of the types listed in Table 1 on p. 92. (These nuclear weapons are in general designed for use against targets within the battlefield area or directly connected with the manoeuvre of combatant forces—which could be described as a 'tactical' use. The warheads include, however, a substantial number carried by aircraft such as the F-4 or F-104, which could be delivered on targets outside the battlefield area or unconnected with the manoeuvre of combatant forces, and thus be put to 'strategic' use. There is inevitably some overlap when describing delivery vehicles, aircraft and missiles capable of delivering conventional or nuclear warheads as 'tactical' or 'strategic'. The warhead total also includes nuclear warheads for certain air-defence missiles and nuclear mines.) Yields are variable but are mainly in the low kiloton range. The ground-based missile launchers and guns are in formations down to divisions and are operated both by American and allied troops, but in the latter case warheads are under double key. The figure for Soviet warheads is probably about 3,500, similarly delivered by aircraft and missile systems (see Table 1). Soviet warheads are thought to be somewhat larger, on average, than those of NATO and the delivery systems, both ground and air, notably less accurate. Soviet doctrine has concerned itself more with area targets than precision (it also appears to contemplate the use of launchers for the delivery of chemical weapons).

Each side has the ability to deliver tactical weapons from outside the theatre. The Soviet Union has a large medium-bomber force, being equipped with *Backfire*; Long-Range and Naval Air Force aircraft; IRBM and MRBM including the new SS-X-20; and cruise missiles on submarines and surface ships. NATO has fighter aircraft on carriers and on airfields in Britain, and could use SLBM for certain tactical roles. Some of the delivery vehicles, but not the warheads, are in the hands of non-Soviet Warsaw Pact forces.

This comparison of nuclear weapons must not, however, be looked at in quite the same light as the conventional comparisons preceding it, since on the NATO side the strategic doctrine is not based on the use of such weapons on this sort of scale. The warhead numbers were accumulated to implement an earlier, predominantly nuclear, strategy, and an inventory of this size now has the chief merit of affording a wide range of choice of weapons, yield, and delivery system if controlled escalation has to be contemplated. A point that does emerge from the comparison, however, is that the Soviet Union has the ability to launch a battlefield nuclear offensive on a massive scale if she chooses, or to match any NATO escalation with broadly similar options, though with less ability to limit collateral damage.

## **CHANGES OVER TIME**

The comparisons above are not very different from those of a few years ago, but over a longer period the effect of small and slow changes can be marked, and the balance can alter. In 1962 the American land, sea, and air forces in Europe totalled 434,000; now the figure is around 300,000. There were 26 Soviet divisions in Eastern Europe in 1967; now there are 31. The numerical pattern over the years so far has been a gradual shift in favour of the East, with NATO relying on offsetting this by a qualitative superiority which is itself, in certain areas, in danger of erosion. The advent of new weapon systems, particularly precision-guided munitions and anti-tank and air defence missiles, may, however, cut into the Warsaw Pact's advantage in tank and aircraft numbers in the future.

## **SUMMARY**

It will be clear from the foregoing analysis that a balance between NATO and the Warsaw Pact cannot be struck by a mere comparison of manpower, combat units, or equipment. In the first place, the Pact has numerical superiority by some measures, and NATO by others, and there



is no fully satisfactory way to compare these asymmetrical advantages. Secondly, qualitative factors that cannot be reduced to numbers, such as training, morale, leadership, tactical initiative, and geographical positions could prove dominant in warfare. However, three observations can be made by way of a summary:

First, the overall balance is such as to make military aggression appear unattractive. The defences are of such a size and quality that any attempt to breach them would require major attack. The consequences for an attacker would be incalculable, and the risks, including that of nuclear escalation, must impose caution. Nor can the theatre be seen in isolation: the central strategic balance and the maritime forces (not least because they are concerned to keep open sea lanes for reinforcements and supplies, and because of their obvious role in the North and in the Mediterranean) play a vital part in the equation as well.

Second, NATO has emphasized quality, particularly in equipment and training, to offset numbers, but this is in danger of erosion. New technology has strengthened the defence, but it will become increasingly expensive in the future. If defence budgets in the West are maintained no higher than their present level and manpower costs continue to rise, the Warsaw Pact may be able to buy more of the new systems than NATO. Soviet spending has been increasing steadily, in real terms, for many years. Furthermore, technology cannot be counted on to offset numerical advantages entirely.

Third, while an overall balance can be said to exist today, the Warsaw Pact appears more content with it than NATO. It is NATO that seeks to alter the numerical balance through Mutual Force Reductions while the Pact seeks to maintain the existing correlation.

## MUTUAL FORCE REDUCTIONS

Negotiations on the mutual reduction of forces and armaments and associated measures in Central Europe have been under way since 30 October 1973. 'Central Europe' was not defined in the communiqué agreed in the preparatory consultations, but the talks have been concerned with forces and armaments in Poland, Czechoslovakia, East Germany, West Germany, the Netherlands, Belgium, and Luxembourg (the so-called NATO Guidelines Area, or NGA). France is taking no part in the discussions, so her forces are presumably excluded (except perhaps, under certain circumstances, French forces in Germany), as are any Soviet or NATO troops not stationed in the area described. Forces stationed in Berlin under quadripartite jurisdiction are unlikely to be covered *per se*, but would almost certainly be embraced by overall ceilings.

Since the area is a narrower one than that with which this appraisal has largely been concerned, and total manpower rather than combat strength is a main yardstick, the table below has been constructed to show the broad figures with which NATO negotiators are concerned. The manpower figures are for ground forces and marines, in thousands. The tanks represent those in formations and exclude reserve stocks.

NATO	Manpower		Equipment		Warsaw Pact	Manpower		Equipment	
	Ground	Air	Tanks	Aircraft		Ground	Air	Tanks	Aircraft
United States	189	41	2,500	260	Soviet Union	455	60	7,900	1,300
Britain	55	9	650	130	Czechoslovakia	135	45	2,900	450
Canada	3	2	30	50	East Germany	105	36	1,700	400
Belgium	64	20	325	140	Poland	204	63	3,200	850
Germany	345	117	2,400	580					
Netherlands	78	21	525	160					
France	734	210	6,430	1,320					
	58		325						
<b>Totals</b>	<b>792</b>	<b>210</b>	<b>6,755</b>	<b>1,320</b>	<b>Totals</b>	<b>899</b>	<b>204</b>	<b>15,700</b>	<b>3,000</b>

The two sides each made initial proposals. NATO suggested reductions in two phases. The first phase would involve a 15 per cent cut in American and Soviet ground troops in the NGA, a reduction of 29,000 US troops and 68,000 Soviet troops. In the second phase there would be a reduction of all NATO and Warsaw Pact ground forces to a common ceiling of 700,000, involving further NATO cuts of some 70,000 and Warsaw Pact cuts of 130,000. No doubt a reason for proposing that cuts should start with ground forces is that this could be a relatively simple matter, free from the complexities of weapons comparisons and thus analytically easier to agree. It was also a product of NATO concern over the power of Soviet ground forces, notably tank divisions. Obviously it took no account of the fact that tactical air and ground forces must militarily be seen as a combined whole, each dependent on the other. Such an approach is somewhat complicated, however, by the fact that some countries have surface-to-air forces in their armies, others in their air forces.

The Warsaw Pact proposal covered both ground and air forces in the area. It envisaged cuts in all national contingents, not merely those of the United States and Soviet Union. These were to be in three stages: an initial reduction of 2,000 by both sides in 1975; a second



reduction of 5 per cent by 1976; and a third and final reduction of 10 per cent by 1977, leaving Warsaw Pact forces then substantially greater than those of NATO. The Warsaw Pact also proposed that aircraft in the area should be included (see table above), as should nuclear forces (see Table 1, p. 92 for details of types and some numbers).

NATO then offered, in December 1975, an alternative proposal—to withdraw 1,000 tactical nuclear warheads, together with 54 nuclear-capable F-4 aircraft and 36 *Pershing* SSM, plus the 29,000 US troops, in exchange for 68,000 Soviet ground forces and 1,700 medium tanks. NATO also modified its position on air forces and offered to include them (but not aircraft other than those covered by the nuclear weapons proposal) within the common ceiling. The resulting ceiling would be 900,000 for ground and air forces, with a sub-ceiling of 700,000 for ground forces. The ceilings were to be collective, with no national sub-ceilings. The Warsaw Pact view on this point was that there should be national limits agreed and it restated its view that reductions should be equal in number and not asymmetrical. In February 1976 it put forward a new plan allowing for initial cuts to be made only by the Soviet Union and the United States, but requiring, before any reductions were carried out, a commitment for cuts to be made in 1977–78 by all nations with forces in the NGA. Cuts would be by equal percentages, there would be ceilings for each country, and in the meantime force levels would be frozen. The NATO reaction was to continue to resist the principle of equal percentage reductions, to press for an agreement which would have a common ceiling as the outcome, and to ask again for the Warsaw Pact to provide data on its forces so as to help the talks progress. Some data on ground and air forces was then put forward by the Pact in June 1976. The figures given were, it seems, somewhat below those set out in the table above.

## Measuring the Strategic Nuclear Balance

Table 1 on p. 92 is largely concerned with only one measurement of strategic nuclear strength, the number of nuclear delivery vehicles, summarized in the historical table on p. 93. It is important to note, however, that no one measurement can give an accurate impression of the balance. In the short tables which follow, three additional indicators are given: deliverable warheads, equivalent megatonnage, and missile throw-weight and bomber payload. (Only US and Soviet ICBM, SLBM, and long-range bombers are considered here. Depending on the circumstances the two sides must also take into account other nuclear-capable systems, such as the US forward-based aircraft in Europe, Soviet submarine-based cruise missiles, and the British and French nuclear forces.)

As is the case with launcher numbers, these are *static* measures of the balance, useful in comparing force size, but giving limited information about force effectiveness. More elaborate *dynamic* presentations of the balance can be constructed to try to portray how strategic forces would interact in time of war and to depict the position after nuclear exchanges. Dynamic models can provide insight into the nature of the balance, particularly because they highlight factors, such as accuracy and defensive capability, not normally given sufficient weight in static comparisons. But the results of dynamic calculations are highly sensitive to performance and other assumptions, which can vary widely. For this reason the comments below are largely confined to static and quantitative measurements.

### DELIVERABLE WARHEADS

The table below shows the number of nuclear warheads that can be delivered by bomber, ICBM, and SLBM forces

and thus compares the number of targets that each side can attack.

**Deliverable Warheads, mid-1976**

Warheads	US	USSR
ICBM*	2,154	2,195
SLBM*	5,120	785
BOMBERS†	1,256	270
	8,530	3,250

\* Separately-targetable delivery vehicles; ICBM or SLBM with MRV are counted as having a single warhead.

† This assumes that B-52s are each armed with four gravity bombs and Tu-95 and Mya-4 with two bombs. If each B-52G/H is additionally armed with 20 SRAM, the US bomber warhead total would exceed 5,000.

Since the United States has completed the programme for equipping part of her ICBM and SLBM forces with MIRV the figures show the United States with a large lead.

The American lead in warheads is likely to decline as the Soviet Union continues to deploy new ICBM and MIRV. As numbers grow, however, comparisons may become less meaningful, because the number of available warheads could substantially exceed the numbers of targets to be destroyed.

### EQUIVALENT MEGATONNAGE

The aggregate yield of the warheads, expressed in megatons, provides a very crude measurement of the capability to destroy targets. A more precise indicator, however, is equivalent megatonnage (EMT), which takes into account the fact that destructive power does not grow



proportionately with an increase in weapon yield. Scaling factors can be used to obtain approximate measures of capabilities to inflict damage. (Assuming that a warhead falls within the boundary of the target area, the EMT of a specific weapon is expressed as the two-thirds power of its explosive yield or  $Y^{2/3}$ . The EMT of a 200Kt warhead, for instance, is 0.34. For yields above 1MT, however, the lethal area of a warhead will in most cases exceed the size of the target, and the lower scaling of  $Y^{1/2}$  is used for larger weapons. The EMT of a 25MT warhead is then 5.) These show more realistically the effect of Soviet deployment of very-high-yield warheads on ICBM, but, despite this, the Soviet Union still has a large margin of superiority by this measurement.

The figures need two important qualifications, however. The first is that the yield of bomber-delivered weapons has not been included, because of the wide variety of weapons aircraft can carry. If US bombers were all armed with high-yield gravity bombs, the EMT of this force might exceed that of the Soviet ICBM and SLBM forces combined, but this would not be so if the B-52 force were armed with SRAM, which has a warhead in the low KT range. The

#### Equivalent Megatonnage, mid-1976

Systems	US	USSR
ICBM	1,150	2,950
SLBM	780	785
	<u>1,930</u>	<u>3,735</u>

second qualification is that the EMT of US missiles has gone down in recent years, with the replacement of single MT-range warheads by larger numbers of much lower-yield, KT-range MIRV. (The impact of MIRV deployment on Soviet EMT may not be as noticeable, because Soviet MIRV have higher yields than their US counterparts.)

A further point is that EMT only measures the damage to unprotected area targets, like cities, and is not a measure of effectiveness against hardened point targets.

## BOMBER PAYLOAD AND MISSILE THROW-WEIGHT

Missile throw-weight is the weight of the missile delivery package after the boost phase of flight. It includes the weight of the warheads, their guidance systems, penetration aids, and (if the warheads are MIRV) the weight of the MIRV dispenser and its fuel. Bomber payload is the weight of the full weapons load that an aircraft can deliver at intercontinental ranges (over 6,000 km). Neither provides a measure of destructive capability, but both give some indication of the capacity of a given system to be exploited for different military ends. A ballistic missile, for example, can be used to deliver a small number of larger-yield warheads, so as to maximize EMT, or a larger number of smaller warheads, so as to maximize the number of delivery vehicles. This is also true for bomber payload, but the comparative advantages of different weapon loads is complicated by the greater range versatility of aircraft, as well as the fact that there is a choice between gravity weapons, stand-off ballistic, and cruise missiles. Bomber payload is thus a far less precise index of potential military capacity than missile throw-weight. For this reason, the table below gives separate estimates for missiles and bombers. (Official estimates of the throw-weight of specific

Soviet and American systems are not publicly available. The figures here are derived from statements made in testimony to the US Congress. See particularly *Soviet Compliance with Certain Provisions of the 1972 SALT I Agreements*, Hearing before the Sub-committee on Arms Control of the Senate Foreign Relations Committee, 6 March 1975.)

#### Missile Throw-weight\* and Bomber Payload,† mid-1976

	US	USSR
<i>Missile Throw-weight</i>		
ICBM	2.4	7.0
SLBM	0.9	1.2
	<u>3.3</u>	<u>8.2</u>
<i>Bomber Payload</i>		
	<u>22.8</u>	<u>4.7</u>

\* In millions of pounds at maximum range.

† In millions of pounds. Assumes maximum weapons load in bomb bays and on external mountings under optimum flight conditions.

In comparing relative throw-weight and payload capabilities, it is important to note that assumptions must be made about the level of technology available. Within a given state of technology, for instance, the throw-weight of a particular ICBM determines how many warheads of a given yield it can carry, but over time improvements in warhead design would enable more or higher-yield warheads to be carried. Asymmetries in technology could thus allow one side to exploit the delivery potential more fully, making the simple comparison of throw-weight less relevant.

## OTHER MEASURES

Taken together, the indices given above provide a picture of the general size and destructive capabilities of strategic forces but do not give any indication of how forces would perform in conflict. Such factors as readiness, reliability, and command-and-control have to be taken into account, but especially important in calculations of this sort is the relative ability of forces to destroy hardened point targets, such as missile silos. This is known as counter-military potential (CMP) or 'lethality'. The CMP of a given strategic system is a function of its destructiveness in EMT and its delivery accuracy in terms of the circular error probable (CEP). (CEP is the estimated radius of a circle (in nautical miles) within which 50 per cent of the warheads are expected to fall.) For CMP, these two measurements are inversely related. (The formula for deriving CMP is  $Y^{2/3}/CEP^2$ . This provides a measure for comparing the relative effectiveness of systems with different yields and accuracies against point targets, but it does not reveal their actual effectiveness against specified targets. To determine the kill probabilities of warheads, it is necessary to introduce target hardness into calculations. This can be done, but measurement then becomes more complex and less certain.) CMP is thus far more sensitive to accuracy than to yield, which means that improvements in accuracy will generally be more effective against hard targets than increases in yields. The United States has in fact emphasized accuracy in her forces, while the Soviet Union has developed higher yields. However, because of the difficulty of obtaining sufficiently reliable estimates of the accuracy of the various systems involved, it is not possible to give here comparative figures for hard-target capabilities.



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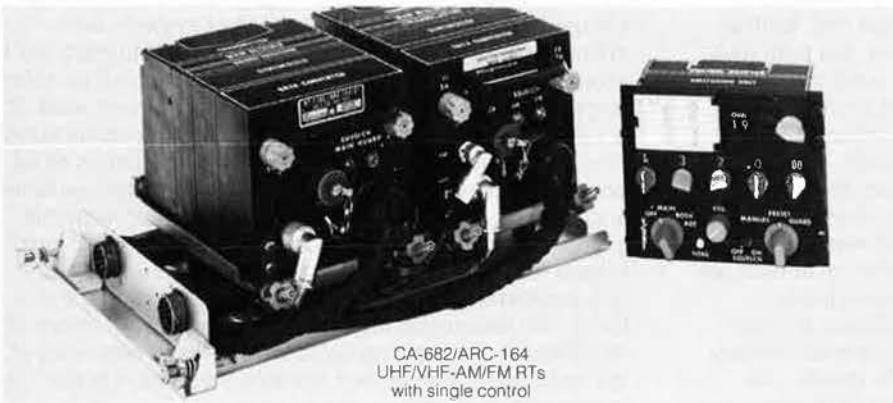
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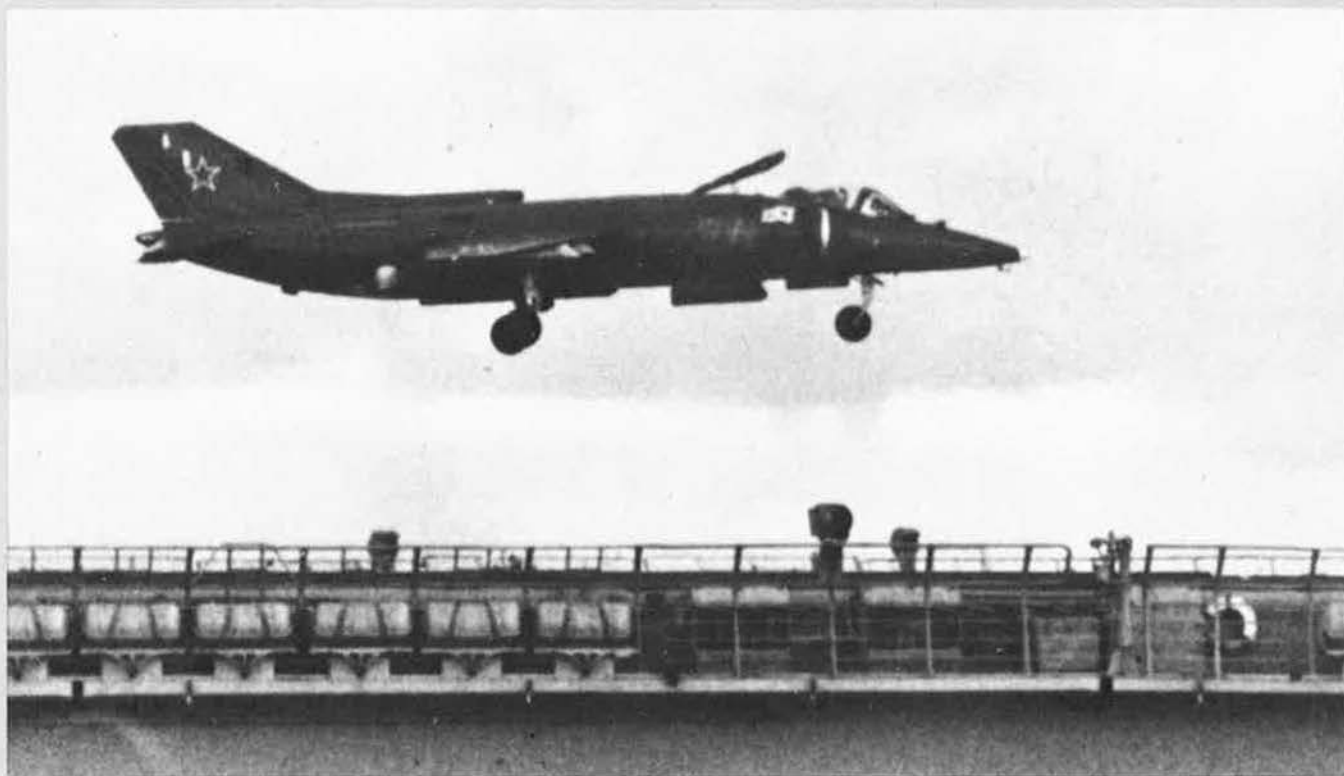
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# JANE'S

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Yakovlev Yak-36 (Forger-A) over the deck of the Kiev, as seen from HMS Torbay

**YAKOVLEV**  
GENERAL DESIGNER IN CHARGE OF  
BUREAU: Alexander Sergeivich Yakovlev,  
USSR

The Yakovlev experimental V/STOL aircraft demonstrated during the 1967 Soviet Aviation Day display at Domodedovo Airport, Moscow, was allocated the NATO reporting name *Freehand* and was generally believed to have the Soviet designation Yak-36. This designation is now questionable, as the US Department of Defense has suggested that Yak-36 is the official Soviet military designation of the new VTOL combat aircraft (NATO *Forger*) deployed on

the Soviet Navy's carrier/cruiser *Kiev*. Until the facts are clarified, it is advisable to refer to the 1967 experimental aircraft only by its NATO reporting name of *Freehand*. Details of this aircraft can be found in the 1975-76 edition of *Jane's*. It is believed to have been used for initial Soviet experiments in the shipboard operation of jet-powered V/STOL aircraft, from a specially-installed platform on the helicopter cruiser *Moskva*. Production is thought to have totalled about six or seven aircraft.

**YAKOVLEV Yak-36**  
NATO reporting name: "Forger"

This is the VTOL combat aircraft de-

ployed by the Soviet Navy on the *Kiev*, first of its new class of 40,000 ton carrier/cruisers to put to sea. It has been referred to as the Yak-36 by the US Department of Defense, presumably on the basis of official declarations made to the Turkish authorities when the *Kiev* passed through the Bosphorus. Its NATO reporting name is *Forger*.

Two versions have been observed on the *Kiev*, as follows:

**Forger-A.** Basic single-seat combat aircraft. About ten or twelve appear to be operational on the *Kiev*, in addition to Kamov Ka-25 anti-submarine helicopters. Primary operational roles are assumed to be attack and reconnaissance.



Forger-As and Ka-25 helicopters on the Kiev, photographed by a Nimrod of No. 203 Squadron, RAF, from Malta



**Forger-B.** Two-seat training version, of which one example was seen on the Kiev. A second cockpit is located forward of the normal cockpit, with the blister canopy at a lower level, as on the training version of the MiG-25. To compensate for the longer nose, a 'plug' is inserted in the fuselage aft of the wing, lengthening the constant-section por-

tion without requiring modification of the tapering rear fuselage assembly. The two-seater lacks the dielectric nose cap and weapon pylons of the single-seater. In other respects this version appears to be identical to Forger-A.

The likelihood that an aircraft of this type was under development in the Soviet Union

was first confirmed in 1974 by Admiral Thomas H. Moorer, then Chairman of the US Joint Chiefs of Staff. In his annual report, he said of the Kiev: "This ship is over 900 ft in length and should displace 30-40,000 tons. The deck configuration and the lack of catapults or arresting gear indicate that this ship apparently is designed to operate V/STOL aircraft and helicopters. It should be capable of carrying 25 V/STOL aircraft or 36 helicopters. It is believed, however, that a mixture of new V/STOL tactical aircraft and *Hormone* (Ka-25) helicopters is the most likely complement."

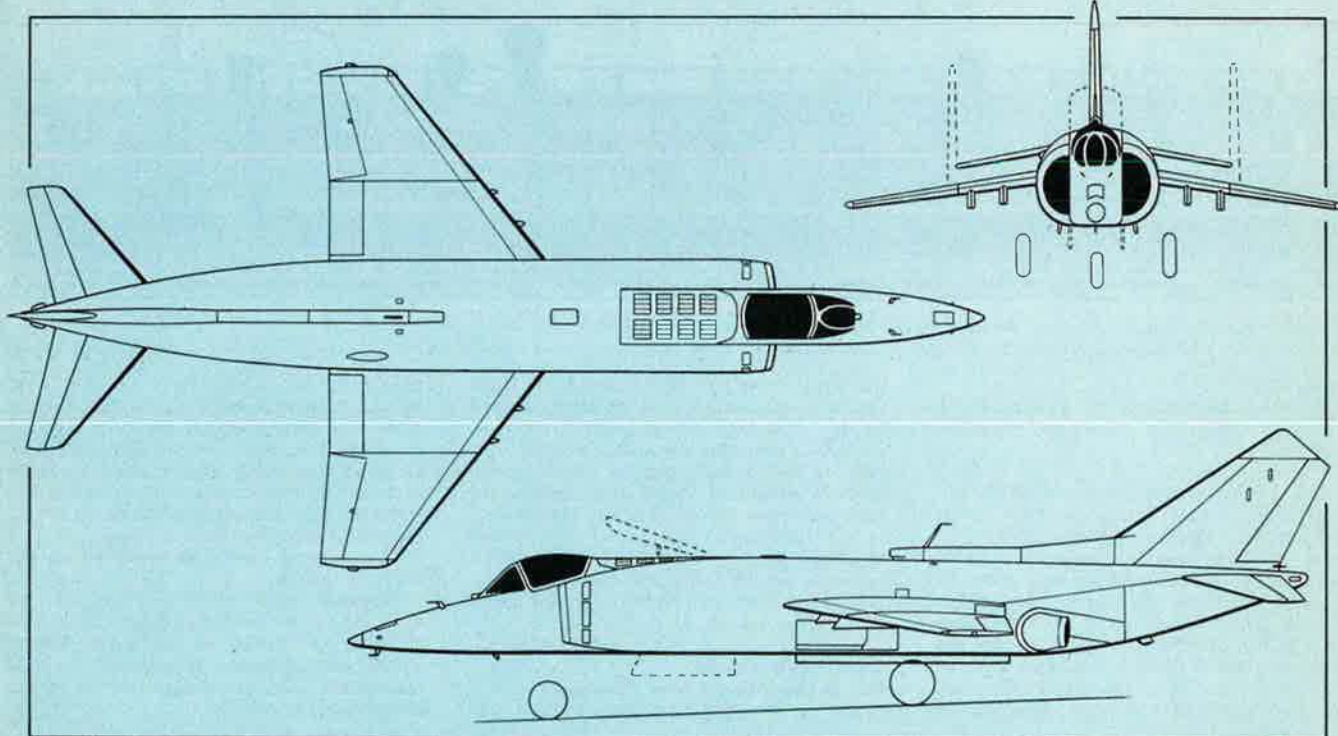
The 1975-76 *Jane's* contained the remark that "A strike/reconnaissance V/STOL aircraft is thought to have been evolved from the Yak-36 (*Freehand*) by the Yakovlev bureau, utilising a mixture of vectored thrust and direct jet-lift." This belief was confirmed when the Kiev entered the Mediterranean in July 1976 and subsequently operated its complement of *Forgers* extensively during passage through that sea and the Atlantic en route to Murmansk. These aircraft were assumed to be operated by a development squadron.

The general appearance of the single-seat *Forger-A* is shown in the accompanying illustrations. Its basic configuration is conventional, except that VTOL capability has permitted the mid-set wings to be made relatively small in area. They fold upward at approximately mid-span, for stowage on board ship. No leading-edge devices are fitted, but the entire trailing-edge of each wing is made up of an aileron on the outboard (folding) panel and a large Fowler-type flap on the inboard panel. Sweepback is approximately 45° on the leading-edge, and there is considerable anhedral from the wing roots.

All tail surfaces are swept, with conventional rudder and elevators. 'Puffer-jet' stability control orifices are apparent at the tail and each wingtip, but the presence of a nose jet has not been confirmed.

Each leg of the trailing-link tricycle landing gear carries a single wheel. The nose

Yakovlev Yak-36 (Forger-A) single-seat carrier-based VTOL combat aircraft (Michael A. Badrocke)







First photograph of the two-seat Forger-B version of the Yak-36. Note the deepened and lengthened nose containing the second cockpit, and the continuous canopy over both cockpits

gear retracts rearward, the main units forward into the fuselage. A small bumper is fitted under the upward-curving rear fuselage.

Precise details of the engine installation are unknown. Primary propulsion appears to be by a single large turbojet, exhausting through a single pair of vectoring side-nozzles aft of the wing. No afterburner is fitted. The large lateral air intake ducts do not appear to embody splitter plates.

Two lift-jets are installed in tandem in the fuselage immediately aft of the cockpit, under a rearward-hinged louvred door of the kind fitted to the Mikoyan and Sukhoi STOL prototypes demonstrated in 1967. The position of the corresponding underfuselage doors implies that the lift-jets are mounted at an angle, in such a way that their thrust is exerted both upward and slightly forward. As the main vectored-thrust nozzles also turn up to 10° forward of vertical during take-off and landing, the total of four exhaust effluxes can be envisaged as forming a V under the fuselage. There appears to be a small intake for cooling air at the front of the dorsal fin fairing.

Observers of deck flying by Forger-As from the Kiev report that the aircraft appeared to be extremely stable during take-off and landing. Take-offs were made vertically, with a smooth conversion about 5 to 6 m (15-20 ft) above the deck, followed by a fairly shallow climb-out as forward speed increased. Landings were so precise that some form of control from the ship during take-off and approach has been suggested, perhaps in association with laser devices lining each side of the rear deck. The purpose of the aircraft's small dielectric nose cap is as yet conjectural; a ranging radar installation appears most likely.

At no time was a STOL take-off observed, as practised by the Hawker Siddeley Harrier/AV-8A combat aircraft of the Royal Air Force and US Marine Corps to increase their load-carrying capability. It is suggested that anything but direct vertical take-off might be difficult for the pilot of Forger-A, as take-off with forward speed over the deck would impose formidable stability and safety problems. The Soviet aircraft must also lack the Harrier's ability to increase its combat manoeuvrability by the use of thrust vectoring in forward flight (VIFF).

Initial estimates put the thrust of Forger-A's primary power plant at around 75 kN (17,000 lb), and the thrust of each lift-jet at 25 kN (5,600 lb). This would appear adequate to permit a considerable weight of fuel and weapons to be carried. Gun pods and rocket packs have been photographed

on four pylons under the aircraft's inner wing panels on deck, but no stores have yet been seen on these stations in flight. Performance of Forger-A is estimated to include a maximum level speed of Mach 1.3 at altitude.

**DIMENSIONS, EXTERNAL (estimated):**

Wing span	7.00 m (23 ft 0 in)
Length overall:	
Forger-A	15.00 m (49 ft 3 in)
Forger-B	17.66 m (58 ft 0 in)

**WEIGHT (estimated):**

Max T-O weight:	
Forger-A	10,000 kg (22,050 lb)

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**DHC-7R RANGER**

First details of this maritime reconnaissance version of the Dash 7 were given on 5 September 1976, on the opening day of the Farnborough International air show in the UK.

Principal differences from the standard Dash 7 airliner, described in the current edition of *Jane's*, are increased fuel tankage,

to provide approx 10-12 hour endurance at normal patrol speeds; two observers' stations in the fuselage, with bubble windows; Litton LASR-2 search radar in an underfuselage radome; and on-board electronics and equipment for a range of maritime surveillance duties including day and night photography. The Ranger can be converted easily to a standard 50-passenger transport configuration, and retains the capacity to carry up to 26 passengers without removal of the reconnaissance installation.

In addition, the advantages inherent in the basic DHC-7 design include multi-engine safety; low fuel consumption; quiet operation, with low interior vibration and noise levels; and the ability to use short, semi-prepared airstrips close to the reconnaissance area.

Engineering design work on the Ranger is under way, and a prototype is scheduled to fly in the Autumn of 1978.

**TYPE:** Four-turboprop maritime reconnaissance aircraft.

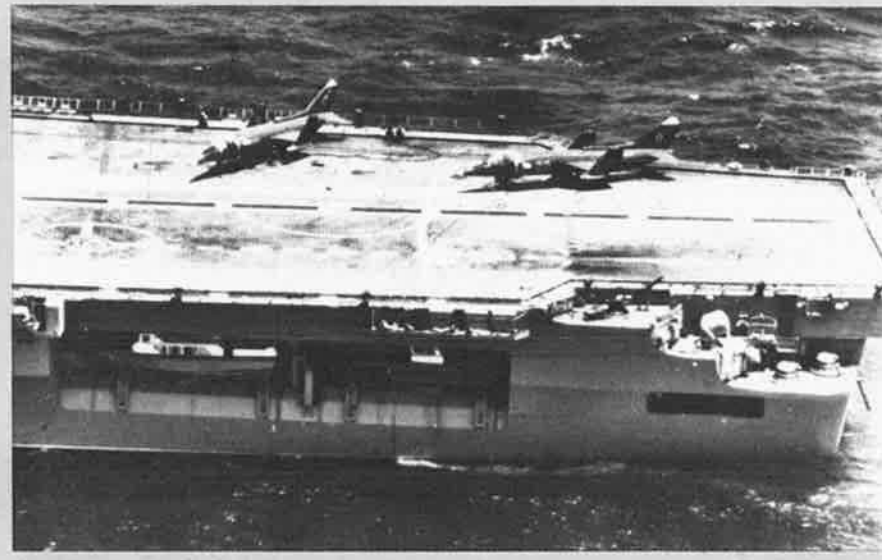
**WINGS:** As for DHC-7.

**FUSELAGE:** Generally as for DHC-7, except for addition of ventral radome.

**TAIL UNIT AND LANDING GEAR:** As for DHC-7.

**POWER PLANT:** Four 835 kW (1,120 shp)

Two Forger-As on the Kiev, with underwing gun pods, photographed by a Canberra of No. 13 Squadron, RAF, from Malta





Pratt & Whitney Aircraft of Canada PT6A-50 turboprop engines, as in DHC-7, each driving a Hamilton Standard 24PF series constant-speed fully-feathering reversible-pitch slow-turning (1,210 rpm) propeller with four glassfibre blades. Fuel load increased from 4,626 kg (10,200 lb) in DHC-7 to 7,734 kg (17,050 lb) in DHC-7R, equivalent to increase in total tank capacity from 5,602 litres (1,480 US gallons; 1,232 Imp gallons) to 9,350 litres (2,470 US gallons; 2,056 Imp gallons).

**ACCOMMODATION:** Pilot and co-pilot on flight deck. Work stations in forward part of cabin for two observers (one each side), with swivelling seats and 180° bubble windows, and for navigator/tactical co-ordinator aft of starboard observer's station. Fully-equipped galley and toilet/washroom at rear of cabin. All reconnaissance installations are of modular design, permitting quick and easy removal to make entire interior available for use in transport role. Alternatives to

Litton LTN-72 inertial navigation system; Doppler navigation system; and Ontrac III VLF navigation system.

**OPERATIONAL EQUIPMENT:** Electronics racks on port side near front of cabin, just aft of observer's station, with flare stowage and flare launcher (for night photography) to rear of these racks. On centre-line of cabin are the 360° scan Litton LASR-2 search radar, between electronics racks and navigator's station, and a vertical camera installation and floor window opposite the flare stowage racks. Photo annotation system records on the film the appropriate position data obtained from the aircraft's navigation system. Main camera can be supplemented by hand-held cameras at the two observers' stations. Six-man life raft at front of cabin, adjacent to starboard observer's station. Nose-mounted weather radar is optional. A range of specialised sensing equipment can be installed, to customer's requirements, for resource surveillance.



Artist's impression of the de Havilland Canada DHC-7R Ranger maritime reconnaissance aircraft

primary reconnaissance layout include 50-passenger transport, with reconnaissance installation removed; seating for up to 26 passengers in rear of cabin without removal of reconnaissance installation at front; or mixed passenger/cargo layout with reconnaissance installation removed, freight loading door and movable cabin bulkhead added (typical load, three standard freight pallets and 18 passengers). With all of these layouts, toilet and buffet provisions at rear of cabin, and 6.8 m<sup>3</sup> (240 cu ft) of baggage space, are standard.

**SYSTEMS:** Generally as described for DHC-7, including cabin pressurisation at 0.294 bars (4.26 lb/sq in); dual hydraulic systems, each of 207 bars (3,000 lb/sq in); and 115/200V AC and 28V DC electrical systems. Adequate electrical power is provided to allow mission to be completed in event of an engine shutdown.

**ELECTRONICS:** Standard electronics comprise VHF/FM (maritime), dual VHF, and HF/SSB communications; Canadian Marconi CMA-734 Omega VLF navigation system; dual VHF nav with glideslope; marker beacon; DME; ATC transponder; ADF with remote magnetic indicator; radar altimeter; gyro magnetic compass system; autopilot; dual flight director system; two air data computers; flight data recorder; flight compartment voice recorder; integrated audio system; and emergency locator beacon. Optional electronics include UHF com; UHF/DF receiver;

**DIMENSIONS, EXTERNAL:**

Wing span	28.35 m (93 ft 0 in)
Length overall	24.58 m (80 ft 7.7 in)
Height overall (approx)	
	7.98 m (26 ft 2 in)
Wheel track	7.16 m (23 ft 6 in)
Wheelbase	8.38 m (27 ft 6 in)
Propeller diameter	
	3.43 m (11 ft 3 in)
Propeller ground clearance	
	1.60 m (5 ft 3 in)

**DIMENSIONS, INTERNAL:**

Cabin, excl flight deck:	
Length	12.04 m (39 ft 6 in)
Max width	2.596 m (8 ft 6.2 in)
Floor width	2.13 m (7 ft 0 in)
Max height	1.94 m (6 ft 4.5 in)
Height under wing	
	1.85 m (6 ft 1 in)
Volume	54.1 m <sup>3</sup> (1,910 cu ft)
Baggage compartment volume	
	6.8 m <sup>3</sup> (240 cu ft)

**WEIGHTS AND LOADINGS (estimated):**

Basic weight empty (standard)	11,282 kg (24,874 lb)
Operating weight empty (standard)	12,927 kg (28,500 lb)
Max payload	4,332 kg (9,550 lb)
Max fuel (standard tanks)	7,734 kg (17,050 lb)
Max T-O weight	20,411 kg (45,000 lb)
Max zero-fuel weight	17,690 kg (39,000 lb)
Max landing weight	18,597 kg (41,000 lb)

Max wing loading  
255.5 kg/m<sup>2</sup> (52.3 lb/sq ft)  
Max power loading  
6.11 kg/kW (10.04 lb/shp)  
PERFORMANCE (estimated, at max T-O weight except where indicated):

Max cruising speed at S/L:  
ISA 233 knots (432 km/h; 268 mph)  
ISA + 15°C  
230 knots (426 km/h; 265 mph)

Service ceiling:  
ISA 6,705 m (22,000 ft)  
ISA + 15°C 6,100 m (20,000 ft)

Service ceiling, one engine out:  
ISA 5,030 m (16,500 ft)  
ISA + 15°C 4,420 m (14,500 ft)

T-O run at S/L:  
ISA 787 m (2,580 ft)  
ISA + 15°C 860 m (2,820 ft)

Landing run at S/L at max landing weight:  
ISA and ISA + 15°C 677 m (2,220 ft)

Typical mission profile, incl radar search at 1,525 m (5,000 ft) and 30 min inspection at 305 m (1,000 ft), at 800 nm (1,480 km; 920 miles) from base, reserves for 45 min hold at 1,525 m (5,000 ft):

time on search, out and back at 3,050 m (10,000 ft) 2 hr 30 min  
time on search, out and back at optimum altitude 3 hr 40 min  
total mission time, out and back at 3,050 m (10,000 ft) 11 hr 0 min  
total mission time, out and back at optimum altitude 12 hr 0 min

Typical patrol endurance, cruising at 80% power at 4,570 m (15,000 ft), reserves as above:

total mission time 9 hr 30 min  
Range with max fuel, cruising at 80% power at 4,570 m (15,000 ft), reserves as above:

with recce installation and 26 passengers 1,430 nm (2,650 km; 1,646 miles)  
with 50 passengers and no recce installation 800 nm (1,482 km; 921 miles)

**SCOTTISH AVIATION**

SCOTTISH AVIATION LTD (Member Company of the Laird Group); Head Office and Works: Prestwick International Airport, Ayrshire KA9 2RW, Scotland

Following delivery of a total of 290 Bulldog Series 100/120 primary trainers to the air forces of eight countries, Scottish Aviation has built and flown the prototype of a new version, known as the Bulldog Series 200 in military form and as the Bullfinch in civilian form.

**SCOTTISH AVIATION SA-3-200 BULLDOG SERIES 200 AND BULLFINCH**

In the Autumn of 1974, Scottish Aviation announced that it was developing a further version of the Bulldog, to be known as the Series 200. Major differences compared with the original versions were to include a fully-retractable landing gear, instead of fixed gear, and provision for an optional fourth seat. The engine cowling was to be made longer and cleaner; the firewall deepened and repositioned to give more space for electronics and instruments, with easier access; the cockpit canopy changed to a plug type, with revised contours; and the aerobatic and non-aerobatic weights increased.

The military Bulldog Series 200 is intended not only to meet basic, aerobatic, and weapons training requirements, but to offer dual capability as an observation, liaison, recon-





The prototype Scottish Aviation Bullfinch, photographed during its early flight trials

naissance, forward air control, light strike, and supply dropping aircraft. In civilian form it is known as the Bullfinch, and a prototype of this version (G-BDOG) flew for the first time on 20 August 1976. Deliveries of production aircraft are scheduled to begin in 1977 in parallel with Series 120.

**TYPE:** Two/four-seat light aircraft.

**WINGS:** Cantilever low-wing monoplane. Wing section NACA 63<sub>2</sub>615. Dihedral 6° 30'. Incidence 1° 9' at root. Conventional single-spar riveted stressed-skin structure of light alloy. Electrically-operated slotted trailing-edge flaps and slotted ailerons of similar construction. Ground-adjustable tab on starboard aileron.

**FUSELAGE:** Conventional light alloy stressed-skin semi-monocoque structure.

**TAIL UNIT:** Cantilever two-spar light alloy stressed-skin structure. Fixed-incidence tailplane. Full-span trim tab in starboard elevator. Manually-operated trim tab in rudder. Ventral fin.

**LANDING GEAR:** Retractable tricycle type, with single wheel on each unit. Steerable

nosewheel, with Automotive Products oleo-pneumatic shock-absorber and Goodyear wheel and tyre, size 5.00-5, pressure 2.76 bars (40 lb/sq in). Main units have Automotive Products oleo-pneumatic shock absorbers and Goodyear wheels and tyres, size 6.00-6, pressure 2.07 bars (30 lb/sq in). Goodyear hydraulic disc brakes on main wheels.

**POWER PLANT:** One 149 kW (200 hp) Lycoming AEIO-360-A1B6 flat-four engine, driving a Hartzell HC-F27R-1F-F7666A-2 two-blade constant-speed metal propeller. Four removable metal fuel tanks, two in each wing, with total usable capacity of 145.5 litres (32 Imp gallons). Refuelling point in top surface of each wing. Oil capacity 7.6 litres (1.67 Imp gallons).

**ACCOMMODATION:** Enclosed cabin seating up to four persons, in pairs, with dual controls standard. Large plug-type canopy. Cabin heated and ventilated.

**SYSTEMS:** Heat exchanger for cabin heating. Hydraulic system, pressure 40 bars (580 lb/sq in), for main-wheel brakes only. Vacuum system available optionally.

Engine-driven alternator to supply 24V DC power, with 24V 18Ah storage battery.

**ELECTRONICS AND EQUIPMENT:** Radio to individual customer's requirements; panel can accommodate dual VHF and nav aids. Blind-flying instrumentation standard. Glider towing attachment optional.

**ARMAMENT (Bulldog):** Standard aircraft is unarmed, but has provision for four underwing hardpoints for weapons and other stores. Maximum underwing load 290 kg (640 lb).

**DIMENSIONS, EXTERNAL:**

Wing span	10.29 m (33 ft 9 in)
Wing chord at root	1.51 m (4 ft 11¼ in)
Wing chord at tip	0.86 m (2 ft 9¾ in)
Wing aspect ratio	8.4
Length overall	7.59 m (24 ft 11 in)
Height overall	2.54 m (8 ft 4 in)
Tailplane span	3.35 m (11 ft 0 in)
Wheel track	2.28 m (7 ft 6 in)
Wheelbase	1.75 m (5 ft 9 in)
Propeller diameter	1.88 m (6 ft 2 in)
Propeller ground clearance	0.26 m (10¼ in)

**AREAS:**

Wings, gross	12.02 m <sup>2</sup> (129.4 sq ft)
Ailerons (total)	0.87 m <sup>2</sup> (9.4 sq ft)
Trailing-edge flaps (total)	1.30 m <sup>2</sup> (13.95 sq ft)
Vertical tail surfaces (total)	2.11 m <sup>2</sup> (22.72 sq ft)
Horizontal tail surfaces (total)	2.55 m <sup>2</sup> (27.50 sq ft)

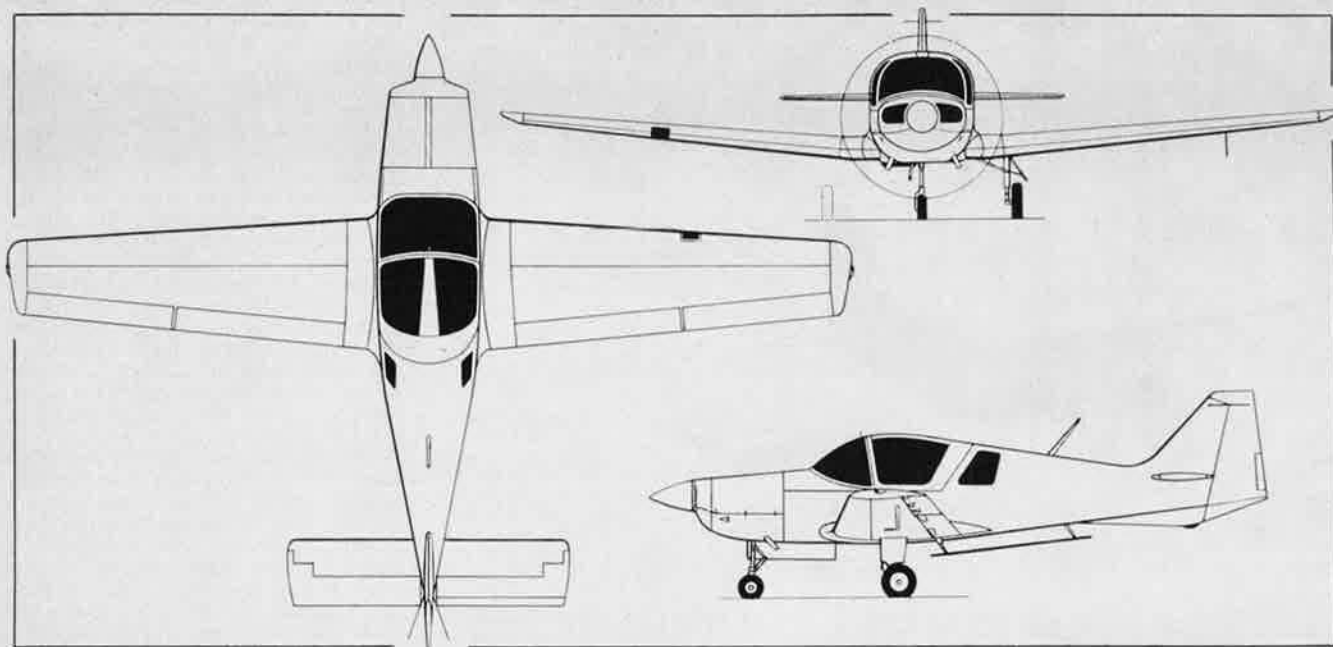
**WEIGHTS AND LOADINGS:**

Typical operating weight empty	821 kg (1,810 lb)
Max aerobatic T-O weight	1,045 kg (2,304 lb)
Max T-O weight	1,179 kg (2,601 lb)
Max wing loading	98.08 kg/m <sup>2</sup> (20.10 lb/sq ft)
Max power loading	7.91 kg/kW (13.01 lb/hp)

**PERFORMANCE (estimated, at 1,045 kg; 2,304 lb AEW):**

Max level speed at S/L	150 knots (278 km/h; 173 mph)
Max cruising speed at 1,220 m (4,000 ft)	141 knots (261 km/h; 162 mph)
Max rate of climb at S/L	353 m (1,160 ft)/min
Service ceiling	5,640 m (18,500 ft)

Scottish Aviation Bulldog Series 200/Bullfinch four-seat general-purpose light aircraft (Pilot Press)





T-O to 15 m (50 ft) 390 m (1,280 ft)  
Landing from 15 m (50 ft) 377 m (1,238 ft)  
Range (55% power) with max fuel  
540 nm (1,000 km; 622 miles)

#### AERITALIA

AERITALIA SpA; Head Office: Piazzale  
Vincenzo Tecchio 51 (Casella Postale 3065),  
80125 Naples, Italy

#### AERITALIA G222

The G222 was conceived in four separate configurations, three of which were halted at the research project stage. Two prototypes were built of the military transport version, originally designated G222 TCM; the first of these (MM582) flew for the first time on 18 July 1970 and the second on 22 July 1971. The first prototype was handed over to the Italian Air Force in December 1971 to begin operational evaluation. An additional airframe was completed for static and fatigue testing.

The Italian Air Force has ordered 44 production G222s, the first of which flew on 23 December 1975. Deliveries were scheduled to start in late 1976. These will be operated in the primary roles of troop, paratroop, and cargo transport, and for aeromedical duties. The G222 can operate from semi-prepared airstrips and in all weathers.

In December 1974 the Argentine government ordered two G222s, and has an option on a third. In February 1976 the Dubai government ordered one G222, with an option for a second.

Several major Italian airframe companies are sharing in the construction programme, including Aeromacchi (outer wings); Piaggio (wing centre-section); SIAI-Marchetti (tail unit); CIRSEA (landing gear); and SACA (miscellaneous airframe components). Fuselages are built by Aeritalia's Transport Aircraft Group, in the Pomigliano d'Arco Works near Naples; final assembly and flight testing is done by the Aeritalia Combat Aircraft Group, at the Caselle Works at Turin.

Design of the G222 makes it suitable for adaptation to such other roles as maritime patrol and anti-submarine warfare, and for such civil applications as firefighting, crop-spraying, aerial photogrammetry, and radio calibration.

The following description applies to the military transport version currently in production:

TYPE: Twin-turboprop general-purpose transport aircraft.

WINGS: Cantilever high-wing monoplane, with thickness/chord ratio of 15%. Dihedral 2° 30' on outer panels. Aluminium alloy three-spar fail-safe box structure, built in three portions. One-piece constant-chord centre-section fits into recess in top of fuselage and is secured by bolts at six main points. Outer panels tapered on leading- and trailing-edges. Upper-surface skins are of 7075-T6 alloy, lower-surface skins of 2024-T3 alloy. All control surfaces have bonded metal skins with metal honeycomb core. Double-slotted flaps extend over 60% of trailing-edge. Two-section spoilers ahead of each outboard flap section, used also as lift dumpers on landing. Spoilers and flaps fully powered by tandem hydraulic actuators. Manually-operated ailerons, each with inset servo tab. Pneumatically-inflated de-icing boots on leading-edges.

FUSELAGE: Pressurised fail-safe structure of aluminium alloy stressed-skin construction and circular cross-section. Easily removable stiffened panels form cabin floor.

TAIL UNIT: Cantilever safe-life structure of aluminium alloy, with sweptback three-spar fin, and two-spar variable-incidence tailplane. Pneumatically-inflated de-icing boots on fin and tailplane leading-edges. Rudder and elevators of honeycomb metal construction. Two tabs in each elevator; no rudder tabs. Rudder fully powered by tandem hydraulic actuators; elevators operated manually.

LANDING GEAR: Hydraulically-retractable tricycle type, suitable for use from prepared runways or grass fields. Messier-Hispano design, built under licence by CIRSEA (Nardi-Magnaghi). Steerable twin-wheel nose unit retracts forward, main units retract into fairings on sides of fuselage. Oleo-pneumatic shock-absorbers. Gear can be lowered by gravity in emergency, the nose unit being aided by aerodynamic action and the main units by the shock-absorbers, which remain compressed in the retracted position. Oleo pressure in shock-absorbers is adjustable to permit variation in height and attitude of the cabin floor above the ground. Low-pressure tubeless tyres on all units, pressure 3.93-4.41 bars (57-64 lb/sq in). Hydraulic multi-disc brakes. No anti-skid units.

POWER PLANT: Two 2,535 kW (3,400 shp) Fiat-built General Electric T64-GE-P4D turboprop engines, each driving a Hamilton Standard 63E60 three-blade variable-

pitch propeller with spinner. Provision in fuselage for eight Aerojet General JATO rockets with total additional thrust of 35.3 kN (7,937 lb), for T-O with extra-heavy loads. Fuel in two outer-wing main tanks, combined capacity 6,800 litres (1,495 Imp gallons), and two centre-section auxiliary tanks, combined capacity 5,200 litres (1,143 Imp gallons), with cross-feed provision to either engine. Total overall fuel capacity 12,000 litres (2,638 Imp gallons). Single pressure refuelling point in starboard wheel fairing. Overwing gravity refuelling point above each tank. Electrical de-icing of spinners and propeller leading-edges. Engine intakes anti-iced by combined electrical and hot air system.

ACCOMMODATION: Normal crew of three (two pilots and radio operator/flight engineer) on flight deck. Provision for fourth crew member or jumpmaster when required. Standard troop transport version has 32 sidewall seats and 12 stowable seats for 44 fully-equipped troops, and carries also two 20-man life rafts stowed in the wing/fuselage fairing, and a single 9-man life raft in the cargo compartment. Paratroop transport version can carry up to 32 fully-equipped paratroops, and is fitted with the 32 sidewall seats and life rafts as in the troop transport version, plus door jump platforms and static lines. Cargo transport version can accept standard pallets up to 2.24 m (7 ft 4 in) wide, and can carry up to 8,500 kg (18,740 lb) of freight. Provision is made for 135 cargo tiedown points and a 1,500 kg (3,306 lb) capacity cargo hoist. Typical Italian military equipment loads can include two CL-52 light trucks; one CL-52 with a 105 mm L4 howitzer or one-ton trailer; Fiat AR-59 Campagnola reconnaissance vehicle with 106 mm recoilless gun or 250 kg (550 lb) trailer; or five standard A-22 freight containers. In the aeromedical role the G222 can accommodate 36 stretchers, two sitting patients, and four medical attendants. A second toilet can be installed, and provision can be made to increase the water supply and to install supplementary electrical points and hooks for medical treatment bottles. In this version, the cabin oxygen system is available to all stretcher positions. Crew access door is forward of cabin on port side. Passenger doors are at front and rear of main cabin on starboard side and at rear on port side. Underside of upswept rear fuselage lowers to form loading ramp, which can be opened in flight for air-drop operations. In cargo version, five loads of up to 1,000 kg (2,205 lb) each can be air-dropped from rear opening, or a single load of up to 5,000 kg (11,023 lb). Paratroop jumps can be made either from this opening or from the rear side doors. Windscreens and quarter-light panels are de-iced and demisted electrically. Wipers and water-repellent fluid system for both windscreens.

SYSTEMS: Cabin pressurised and air-conditioned. Pressurisation system maintains a cabin differential of 0.41 bars (5.97 lb/sq in), giving a 1,200 m (4,000 ft) environment at altitudes up to 6,000 m (20,000 ft). Air-conditioning system uses engine bleed air during flight; on ground, it is fed by compressor bleed air from the APU to provide cabin heating to a minimum of 18°C. Two independent hydraulic systems, each of 207 bars (3,000 lb/sq in) pressure. No. 1 system actuates flaps, spoilers, rudder, and wheel brakes; No. 2 system actuates flaps, spoilers, rudder, wheel brakes, nosewheel steering, landing gear extension and retraction, rear ramp/door, and windscreen wipers. Auxiliary

Air delivery of a 5,000 kg palletised load by an Aeritalia G222 twin-turboprop transport





hydraulic system, fed by APU-powered pump, can take over from No. 2 system in flight, if both main systems fail, to operate essential services. In addition, a standby hand pump is provided for emergency use to lower the landing gear and, on the ground, to operate the ramp/door and parking brakes. Three 45kVA alternators, one driven by each engine through constant-speed drive units and one by the APU, provide 115/200V three-phase AC electrical power at 400Hz. 28V DC power is supplied from the main AC buses via two transformer-rectifiers, with 24V 34Ah nickel-cadmium battery and static inverter for standby and emergency power. External AC power socket. Garrett-AiResearch 113.3 kW (152 hp) APU, installed in port main landing gear fairing, provides power for engine starting, hydraulic pump and alternator actuation, air-conditioning on ground, and all hydraulic and electrical systems necessary for loading and unloading on ground. Liquid oxygen system for crew and passengers (with cabin wall outlets); this system can be replaced by a gaseous oxygen system if required.

**ELECTRONICS AND EQUIPMENT:** Standard communications equipment includes 3,500-channel UHF/AM; 1,630-channel VHF/AM; 930-channel VHF/FM; 28,000-channel HF/SSB/CW; crew intercom; and PA system. Navigation equipment includes dead-reckoning system with projected-map display, Doppler radar, two-axis gyro platform, PHI, and TAS computer; and an integrated ground-based system incorporating Collins autopilot, flight director, two compasses, two vertical gyros, two VOR, marker beacon, two ILS, ADF, two Tacan, and horizontal situation display. Other electronic equipment includes Meteor weather radar, with secondary terrain-mapping mode; radar altimeter; and IFF/ATC transponder including altitude reporting. Provision for head-up display. Landing light on nosewheel leg.

**DIMENSIONS, EXTERNAL:**

Wing span 28.70 m (94 ft 2 in)  
 Wing chord at root 3.40 m (11 ft 1 3/4 in)  
 Wing chord at tip 1.685 m (5 ft 6 1/4 in)  
 Wing aspect ratio 9.15  
 Length overall 22.70 m (74 ft 5 1/2 in)  
 Height overall 9.80 m (32 ft 1 3/4 in)  
 Fuselage: Max diameter

3.55 m (11 ft 7 3/4 in)  
 Tailplane span 12.40 m (40 ft 8 1/4 in)  
 Wheel track 3.668 m (12 ft 0 1/2 in)  
 Wheelbase (to c/l of main units)

6.23 m (20 ft 5 1/4 in)  
 Propeller diameter 4.42 m (14 ft 6 in)  
 Distance between propeller centres

9.50 m (31 ft 2 in)  
 Rear-loading ramp/door:  
 Width 2.45 m (8 ft 0 1/2 in)  
 Height 2.25 m (7 ft 4 1/2 in)

**DIMENSIONS, INTERNAL:**

Main cabin:  
 Length 8.58 m (28 ft 1 3/4 in)  
 Width 2.45 m (8 ft 0 1/2 in)  
 Height 2.25 m (7 ft 4 1/2 in)  
 Volume 74.0 m<sup>3</sup> (2,613 cu ft)

**AREAS:**

Wings, gross 82.00 m<sup>2</sup> (882.6 sq ft)  
 Ailerons (total) 3.65 m<sup>2</sup> (39.29 sq ft)  
 Trailing-edge flaps (total) 18.40 m<sup>2</sup> (198.06 sq ft)  
 Spoilers (total) 1.65 m<sup>2</sup> (17.76 sq ft)  
 Vertical tail surfaces (total) 19.21 m<sup>2</sup> (206.67 sq ft)  
 Horizontal tail surfaces (total) 23.70 m<sup>2</sup> (255.11 sq ft)

**WEIGHTS AND LOADINGS:**

Weight empty 14,590 kg (32,165 lb)  
 Weight empty, equipped 15,400 kg (33,950 lb)

**Operating weight empty**

15,600 kg (34,392 lb)  
 Max payload 8,500 kg (18,740 lb)  
 Normal T-O weight 24,500 kg (54,013 lb)  
 Max T-O and landing weight 26,500 kg (58,422 lb)  
 Max zero-fuel weight 24,400 kg (53,792 lb)  
 Max cargo floor loading 750 kg/m<sup>2</sup> (155 lb/sq ft)  
 Max wing loading 323 kg/m<sup>2</sup> (66.2 lb/sq ft)  
 Max power loading 5.23 kg/kW (8.6 lb/shp)

**PERFORMANCE (at max T-O weight except where indicated):**

Max level speed at 4,570 m (15,000 ft) 291 knots (540 km/h; 336 mph)  
 Cruising speed at 4,500 m (14,750 ft) 194 knots (360 km/h; 224 mph)  
 Air-drop speed (paratroops or cargo) 110-140 knots (204-259 km/h; 127-161 mph) IAS  
 Stalling speed, flaps and landing gear down 84 knots (155 km/h; 96.5 mph)  
 Time to 4,500 m (14,750 ft) 8 min 35 sec  
 Max rate of climb at S/L 520 m (1,705 ft)/min

Rate of climb at S/L, one engine out 125 m (410 ft)/min

Service ceiling 7,620 m (25,000 ft)  
 Service ceiling, one engine out 2,280 m (7,500 ft)

T-O run 840 m (2,756 ft)  
 T-O to 15 m (50 ft) 1,250 m (4,101 ft)

Landing from 15 m (50 ft) 850 m (2,789 ft)  
 Landing run at max landing weight 550 m (1,805 ft)

Min ground turning radius 20.80 m (68 ft 3 in)

Range with max payload, optimum cruising speed at 6,000 m (19,685 ft) 378 nm (700 km; 435 miles)

Range with 44 troops 1,198 nm (2,220 km; 1,380 miles)

Range with 36 stretchers and 4 medical attendants 1,349 nm (2,500 km; 1,553 miles)

Ferry range with max fuel 2,670 nm (4,950 km; 3,075 miles)

g limit + 2.5

**LOCKHEED**

**LOCKHEED-CALIFORNIA COMPANY (DIVISION OF LOCKHEED AIRCRAFT CORPORATION);** Head Office: Burbank, California 91520, USA

**LOCKHEED CP-140 AURORA**

The purchase of 18 special variants of the Lockheed P-3 Orion maritime patrol aircraft for the Canadian Armed Forces was announced by the Hon James Richardson, then Canadian Minister of National Defence, on 21 July 1976. This marked the terminal phase of a procurement programme that originated in 1972, when Air Specification 15-14 defined the Canadian government's requirements for a Long-Range Patrol Aircraft (LRPA) to replace the CP-107 Argus maritime reconnaissance aircraft serving currently with the CAF. Following two years of concept definition by five aerospace companies, Lockheed and The Boeing Company were selected for final contract definition; in late 1975 Lockheed's 'P-3 LRPA' design was announced as the winner.

Designated subsequently as the CP-140 Aurora, this new aircraft combines the P-3 Orion's airframe, power plant, and basic aircraft systems with the electronic systems and data processing capability of the carrier-

based Lockheed S-3A Viking. Able to perform missions involving a range of more than 4,000 nm (7,400 km; 4,600 miles), or flights of up to 17 hours' duration, the CP-140 will be deployed initially for ASW duties; national sovereignty patrols; shipping, fisheries, and Arctic surveillance; ice reconnaissance; and search and rescue. By the addition of a weapons bay sensors canister at a later date, the CP-140 will be able to undertake such additional civilian tasks as resources location, pollution control, and aerial survey.

The cabin interior of the P-3C has been changed extensively to meet Canadian requirements; immediately aft of the flight deck are an observer's station on the port side and crew rest bunks on the starboard side. Moving aft, the tactical compartment comes next, with accommodation for the Tactical Navigator (TACNAV), Navigator/Communicator (NAVCOM), two Acoustic Sensor Operators (ASO), and two Non-Acoustic Sensor Operators (NASO), all on the port side. Aft of the tactical compartment is the search stores and camera bay, with two more observer stations, one on each side. At the rear of the cabin are a galley, on the port side, a dinette area, and an airborne maintenance station on the starboard side. A toilet is located on the port side of the cabin, immediately aft of the forward observer's position.

On the flight deck, an ASA-82 Multi-Purpose Display (MPD) provides the pilots with a real-time presentation of the tactical situation and sensor information; directions from the TACNAV and NAVCOM are fed through the computer for display on both the MPD and the Flight Director Indicators (FDIs). Cues and alerts, indicating required sequences of action, are displayed on the periphery of the MPD.

An AJN-15 Flight Director system supplies attitude, heading, and fly-to-point references. For long-range navigation, data from the Horizontal Situation Indicator are normally adequate. For precise, close-in tactical manoeuvring the FDI is used, and the automatic flight control system includes full-time attitude control and proportional control-wheel steering.

The three observer stations each have a fully-swivelling seat and are provided with intercom. Each of the observation windows gives full hemispherical view, and there are power and storage provisions for a hand-held camera. Each position is provided with isolation curtains, to screen observer and window from cabin lighting during night visual search. A fourth station can be made available, on the starboard side, by removal of the crew rest bunks.

The TACNAV has a console which includes an ASA-82 MPD, an ASQ-147 keyset and trackball, and armament controls. With his keyset the TACNAV can control, via the computer, the Sonobuoy Reference System (SRS), and can call up and display FLIR and other radar data on his MPD. The NAVCOM also has an ASA-82 and ASQ-147, plus HF, VHF (FM), and UHF transceivers; inertial, VLF (Omega), and Doppler navigation sets; LF and UHF ADF, and VHF homer; a high-speed teleprinter and teletype keyboard; provisions for Tactical Satellite Communications (TACSATCOM); data link; control of reconnaissance photography; provisions for control of survey photography; and provisions for secure communications. The NAVCOM's MPD and keyset serve as a backup for the TACNAV in the event of equipment failure.

The two ASO operators share a dual console and each has an ASA-82 MPD and ASQ-147 keyset and trackball. They share also an ASA-82 Auxiliary Readout Unit



(ARU), a time code generator, and an AN/ASH-27 28-track tape recorder. Their MPDs can display acoustic data or the tactical plot, but the ARU is a dedicated acoustic display. The acoustic functions of receiving, processing, display, and recording are controlled by the keysets through the computer.

The two NASOs also have a dual console, each with an ASA-82 MPD and ASQ-147 keyset and trackball, the keysets being used to control radar, Electronic Support Measures (ESM), and FLIR through the computer. Principal controls shared by these two operators, or available to only one of them, include ASQ-501 MAD, OA-5150/ASQ (FACS II) MAD compensator, video tape recorder, SIF, and provisions for SLAR.

The heart of the entire control system is a Univac AN/AYK-10 Navigation/Tactical computer. Its two central processors function independently, but both have co-ordinated access to a core memory of 65,536 words. There is growth capacity for an additional 32,000 words, and space has been allocated for a 127,000-word auxiliary memory in the acoustic system processor for the computer.

The search stores and camera bay has stowage for 'A' size sonobuoys, large and small marine markers, Signals Underwater Sound (SUS), and flares. Intercom controls and an ordnance status panel are provided for the ordnance crew member. The com-

puter-controlled electrically-fired cartridge-actuated A-size launchers can all be operated with the aircraft pressurised. They comprise 36 underfloor launchers, loadable only on the ground, and three which can be loaded from the cabin with the aircraft pressurised or unpressurised. A C-size chute, just aft of the three cabin launch tubes, allows free-fall launch (with the aircraft unpressurised) of flares, small marine markers, SUS and mail, and air drops to remote ships or stations.

A KA-107A day/night reconnaissance camera is installed beneath the floor in this area, and is accessible in flight through a floor hatch. The illuminator for night reconnaissance photography is located beneath the floor of the in-flight maintenance station. This position has a bench with 28V DC and 115V 400Hz AC power outlets, and there are provisions for a microfiche reader.

Aircraft operational support equipment for the CP-140 includes the ground-based Data Interpretation and Analysis Center (DIAC), and a Ground Support Computer Complex (GSCC). The former provides operational support for the operating squadrons; the latter provides technical support for the operational software, and maintains software configuration records.

The aircraft's weapon bay, which has a maximum capacity of 2,177 kg (4,800 lb)

on eight stations, can accommodate and drop the Canadian SKAD/BR search and rescue kit, as well as a variety of ordnance. There are ten underwing hardpoints, with an individual capacity ranging from 277 kg (611 lb) to 1,111 kg (2,450 lb).

The CP-140 Aurora is designed primarily to carry out military tasks essential to North American and NATO defence, and to provide long-range surveillance of Canada's coastal waters. It is scheduled to enter service in 1980 and, because of the growth potential of its equipment, is expected to serve into the next century.

**TYPE:** Four-turboprop long-range ASW and maritime patrol aircraft.

**WINGS:** Cantilever low-wing monoplane. Wing section NACA 0014 (modified) at root, NACA 0012 (modified) at tip. Dihedral 6°. Incidence 3° at root, 0° 30' at tip. Fail-safe box beam structure of extruded integrally-stiffened aluminium alloy. Lockheed-Fowler trailing-edge flaps. Aluminium alloy ailerons operated by dual hydraulic boosters supplied from two independent hydraulic systems. Trim tabs in ailerons. Anti-icing by engine bleed air ducted into leading-edges.

**FUSELAGE:** Conventional aluminium alloy semi-monocoque fail-safe structure.

**TAIL UNIT:** Cantilever aluminium alloy structure with dihedral tailplane and dorsal fin. Fixed-incidence tailplane. Rudder and elevators each operated by dual hydraulic

boosters, supplied from two independent hydraulic systems. Trim tabs in elevators and rudder. Electrical anti-icing system for leading-edges of fin and tailplane.

**LANDING GEAR:** Hydraulically-retractable tricycle type with twin wheels on each unit. All units retract forward, main wheels into inner engine nacelles. Oleo-pneumatic shock-absorbers. All units can free-fall to the down and locked position in emergency. Hydraulically-powered steerable nose unit, controlled by hand wheel on the pilot's side console. Hydraulically-operated dual segmented-disc brakes. Pneumatic emergency braking system.

**POWER PLANT:** Four 3,661 kW (4,910 ehp) Allison T56-A-14 turboprop engines, each driving a four-blade metal constant-speed fully-feathering and reversible propeller. Fuel in one fuselage and four wing integral tanks, with total usable capacity of 34,826 litres (9,200 US gallons). Single-point pressure refuelling, and four overwing gravity refuelling points are provided. Fuel dump system. Propeller blade cuffs and spinners de-iced by electric heating.

**ACCOMMODATION:** Normal eleven-man crew, with seating for five additional passengers. Dual controls standard. Flight deck has wide-vision windows, and circular windows for up to four observers are provided in the main cabin, each bulged to give 180° visibility. Main cabin fitted out as detailed

in introductory paragraphs. Door on port-side, aft of wing. Overwing emergency exit on each side of cabin; others in side and ceiling of flight deck. De-fogging and anti-icing of windscreens by electrical heating; windscreens have mechanical wipers, a washing system for the removal of salt deposits, and a rain-repellent spray system. Stowage for clothing, life jackets, and parachute harness. Four floor tie-down areas have a combined baggage/cargo capacity of 442 kg (975 lb).

**SYSTEMS:** Air-conditioning and pressurisation system supplied by two engine-driven compressors, maintaining cabin temperatures between 15.6°C and 26.7°C (60°F and 80°F), and a cabin altitude of 2,440 m (8,000 ft) to a height of 9,145 m (30,000 ft). Two independent hydraulic systems, each at a pressure of 207 bars (3,000 lb/sq in) are powered by three interchangeable electrically-driven pumps, any two of which can maintain full hydraulic services. Pneumatic system at pressure of 207 bars (3,000 lb/sq in) for emergency braking. Electrical system of 120/208V 400Hz AC supplied by three 60/90kVA engine-driven generators, any one of which can maintain full normal load. DC power supplied by three 200A 24V transformer-rectifiers and one 31Ah storage battery. APU drives a 60/90kVA generator and provides power and bleed air for ground air-conditioning, weapons bay heating, and engine starting; it can also provide emergency electrical power in flight. Oxygen system for crew of three on flight deck with 3.5 hour capacity. Individual portable chemical oxygen generators for emergency use by all crew members. Automatic flight control system (AFCS) with dual-channel fail-safe autopilot; includes tactical and airways nav modes and proportional control wheel steering.

**ELECTRONICS AND EQUIPMENT:** Univac AN/AYK-10 navigation/tactical computer; digital magnetic tape units; teleprinter; display generator units; APS-116 search radar; OR-89/AA (modified) FLIR; video recorder for FLIR imagery; ARS-2 sonobuoy reference system; OL-82 (modified) acoustics data processor; RD-348, ASQ-147, and ASA-82 displays; LN-33 inertial navigation system; APN-208 Doppler; ARN-115 Omega; Tacan; revised airways/approach nav aids; dual VOR/ILS; communications sets comprising HF, UHF, VHF(AM), VHF guard receiver, VHF (FM); HF SIMOPS filters; RCVR homing; USH 502 CPI/FDR; ASW-31 AFCS; ALR-47 ESM; AN/ASH-27 28-track tape recorder; ASQ-501 MAD; OA-5150/ASQ (FACS II) MAD compensator; SLAR provisions; IFF; data link; Airborne Radiation Thermometer (ART) provisions; and time coding generator. Equipment includes KA-107A day/night reconnaissance camera and night illuminator; provisions for civil sensors canister; galley with refrigerator and sink; white edge lighting for all console-mounted control panels; white cabin lighting; reading lights at all crew positions; white overhead lights; and aisle lights.

**PERFORMANCE** (with mission payload of 2,540 kg; 5,600 lb, except where stated otherwise):

Max transit speed at optimum altitude

395 knots (732 km/h; 455 mph)

Max level speed below cruise ceiling

375 knots (695 km/h; 432 mph)

FAR balanced field length

2,408 m (7,900 ft)

T-O to 15 m (50 ft) 1,829 m (6,000 ft)

\*Landing from 15 m (50 ft)

975 m (3,200 ft)

\* at 51,714 kg (114,000 lb) landing weight



Artist's impression of the Lockheed CP-140 Aurora, a variant of the P-3 Orion for the Canadian Armed Forces



Secretary of Defense Donald Rumsfeld's decision to seek maximum commonality between the new US and German battle tanks is a start toward the essential goal of putting NATO interests above the national interests of the allies . . .

# One Small Step for NATO

By Gen. T. R. Milton, USAF (Ret.)

**I**T MAY appear to be stretching things a bit, but Defense Secretary Donald Rumsfeld's tank decision last fall is closely tied to the justification for our troops in Europe. Mr. Rumsfeld, you will recall, intervened at the eleventh hour just as the Army was about to announce its choice for a new main battle tank. His purpose was to require the Army to get together with the Germans, who also have a new tank coming along, and achieve a maximum degree of standardization.

As we have learned, sometimes painfully, standardization, or commonality, does not necessarily produce the best weapon systems. The Army thus may not get as good a tank as it would otherwise have produced on its own. However, that is beside the point that Mr. Rumsfeld seems to have been making. The US Army is in Europe as part of an Alliance, committed to fight in that Alliance, not on its own. Viewed from that perspective, it is better to have weapons that can be serviced and supplied on the broad base of the Alliance, rather than superior weapons solely dependent on national support.

It was, then, an important decision and the first one in memory to overrule national interests in favor of the Alliance.

That same philosophy, a philosophy that enhances the importance of the Alliance at the expense of national interests, is badly needed in NATO. It has been needed for a long time, ever since the US nuclear

capability ceased being the answer to all major crises, but the need is now becoming more pressing. The immediate future holds some problems that NATO is going to have to face. It can face them as it has faced things in the past, which is to say in a diplomatic forum requiring unanimous approval for any decision, or it can tighten things up a little in anticipation of some strains that may be put on it.

As an example of these strains, Yugoslavia looms as a near-term possibility. Conceivably, Marshal Tito has arranged matters in that land of Serbs, Croats, Montenegrins, and other ethnic groups so that the succession will be a serene one. There are some well-informed Europeans who believe that, and we can all hope it will turn out to be so. But if affairs in Yugoslavia become chaotic after Tito's death, NATO will be faced with an explosive situation. If the Soviets move in, or use instead their Hungarian satrapy, NATO will have a grave problem.

In its present configuration, it is unlikely that NATO could make a militarily credible defensive reaction to a fast-moving situation in Yugoslavia. For while NATO is, in theory, a military alliance, it is mainly an alliance of façades, of flags, honor guards, headquarters staffs, and good intentions. The forces come to the NATO commands only when the North Atlantic Council, or its alter ego (less France and Greece), the Defense Planning Committee, meets, debates, gets instructions from the NATO capitals, and then agrees unanimously on turning the forces over to international command. As we know, this has never happened, so there is no way of knowing how it would work. It is a fair assumption that there

would be a few hitches here and there, a moth or two in the switchboards, in the first days of such a mobilization.

The United States has a very deep commitment to NATO. It is undeniably our most important foreign commitment. A substantial share of our defense budget is devoted to NATO. Justification for the US Army force structure can be found, to a considerable extent, in NATO. The same is true for tactical air wings, airlift, and Navy ships. Our status as the leader of the West, the alternative to the Soviet Union, is symbolized in the NATO commitment. And so our national reputation, to a far greater extent than was the case in Vietnam, is on the line in the NATO obligation we have taken on. Since we have so much at stake in seeing that NATO will work when it has to, we should show some of that interest now. Advance planning for a crisis is so much better than recriminations later.

It has been a long time since anyone took a serious look at that venerable Alliance. The organization is still fundamentally as General Eisenhower left it in those long ago days. The Supreme Allied Commander, Europe, presently Gen. Alexander Haig, has his subordinate commanders in the Northern, Central, and Southern Regions. Each of these subordinate commanders has a headquarters and, in theory, forces. But until that day when the diplomats can come up with a unanimous decision, the forces remain under national command.

Secretary Rumsfeld's philosophy of putting the interests of NATO ahead of our own in the matter of a tank needs a broader application. A great many national interests need to be subordinated to the collective interest of NATO if it is to be an effective instrument in what may be some turbulent years ahead. A good objective look at the whole NATO structure by some knowledgeable outsiders—the Presidential Commission approach on an international scale—would seem a logical way to go at it. Out of such a survey might come a recommendation to take a few steps toward real military integration, at least in the Central Region. ■



# The Bulletin Board

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

## AFRES Realigned

In October, the Air Force Reserve redesignated its three Regions as numbered Air Forces (Reserve), or NAF(R), and aligned them with the active-duty numbered Air Forces of the commands that would gain the Reservists upon mobilization.

On November 1, Maj. Gen. Richard Bodycombe became Vice Commander of the Air Force Reserve, Robins AFB, Ga., replacing Maj. Gen. Earl O. Anderson, who retired. General Bodycombe was formerly Mobilization Assistant to the Commander, Eighth Air Force, Barksdale AFB, La.

The former Eastern Region, Dobbins AFB, Ga., has become the Fourteenth Air Force (Reserve), and the Western Region, McClellan AFB, Calif., is now the Fourth Air Force (Reserve), aligned with the Twenty-first and Twenty-second Air Forces (MAC), respectively. Brig. Gen. Ed-

ward Dillon recently became commander of the Fourteenth. Brig. Gen. Sidney S. Novaresi heads the Fourth.

The former Central Region, Bergstrom AFB, Tex., is now the Tenth Air Force (Reserve). It is linked with SAC's Eighth and Fifteenth Air Forces and TAC's Ninth and Twelfth Air Forces. Brig. Gen. Roy M. Marshall commands the Tenth.

Officials hailed the changes as increasing the responsiveness of the Reserve to mobilization requirements. They said it will help establish an improved wartime mission for the Reserve numbered Air Forces and provide the needed Reserve intermediate management structure.

## 1976 Held a "Plus" for Benefits

The Air Force has weighed the pluses and minuses surrounding government actions in the benefits-

entitlements arena this year and feels that members came out "on the plus side of the ledger." That message, in a detailed report signed by Maj. Gen. B. L. Davis, the Hq. USAF Director of Personnel Plans, isn't the way many blue-suiters and military-oriented groups view the picture, however. Their perception, which the Pentagon hopes to change, is that benefits are being slashed.

The USAF "recap of entitlements" for 1976 contains "gains, losses, and in some cases the *status quo*," though each item is not specifically identified. The list follows:

- **Pay Raise Reallocation.** This new law giving the President authority to allocate more of a pay raise to the allowances, led to October increases of 3.62 percent in basic pay, 4.83 in BAS, and ten to sixteen percent in BAQ, depending on grade. And bachelors in government quarters now get monthly BAQ rebates ranging from \$3.90 to \$29.40.

- **Commissary Subsidy.** The Administration recommended, but Congress rejected, a three-year phase-out of the subsidy. Thus, the *status quo* is maintained, at least temporarily.

- **Survivor Benefits Plan Amendments.** The Davis report calls the new changes "favorable" (see separate item below).

- **Moving Expenses.** Congress permanently exempted military people from having to report the government costs associated with a PCS move as gross income. This would have caused havoc by requiring them to pay taxes for many types of moves.

- **GI Bill Changes.** Persons on active duty not only retained their benefits but now get up to forty-five instead of thirty-six months of schooling and an eight percent raise in the monthly stipend. Persons entering service after December 31, 1976, have a new contributory GI education program; if they contribute \$50-\$75 per month, the government will match it on a two-for-one basis so they will have school funds on completion of their service.

- **Leave.** Sellback of leave was cut to sixty days over a career. Payment for BAQ and BAS (officers had received it) was dropped.

- **Increased Meal Changes for Members on BAS.** Lunch and dinner prices were raised a dime each; breakfasts remain the same.

- **Trailer Allowance.** The services



The SAC SR-71 pilots, who last summer broke altitude and speed records previously held by USAF YF-12s and Soviet MiG-25s, called on Secretary of Defense Donald H. Rumsfeld recently. From left are Maj. Larry A. Elliott, Capt. Robert C. Holt, Maj. John T. Fuller, Maj. Adolphus H. Bledsoe, Jr., and Secretary Rumsfeld. Elliott and Holt reached an altitude of 85,126 feet, while Fuller and Bledsoe set a record of 2,116 mph.



formally sought to lift the seventy-four cents per mile reimbursement limit on the move of mobile homes. Congress refused.

- **Increase in PCS Unaccompanied Baggage Weight Allowance.** Single and unaccompanied E-4s with more than two years of service and higher assigned overseas got a better shake: the option of (1) shipping the existing unaccompanied baggage allowance by air, or (2) an increased allowance by surface, including furniture pieces.

- **State Income Tax.** A recent congressional decision means that starting early next year, state income taxes of military members will be withheld by the services.

- **Fair Market Rental.** The lawmakers rejected Defense's recent recommendation that military housing be handled on an FMR basis. However, the Air Force said that "other alternatives" are being considered.

- **Soldiers' and Airmen's Home.** The Army and Air Force got authority to tap enlisted pay checks up to fifty cents, rather than the previous twenty-five cents, to support the Home. USAF was studying the matter at press time. And the Home can now charge residents rent.

- **CHAMPUS.** Proposals to eliminate funding for pastoral, family, and marital counseling services, and reimbursement for the costs of perceptual and visual training, were rejected.

- **The One Percent Add-on in Retired Pay** was eliminated.

- **MIA Tax Relief** was extended until January 1978.

- **Per Diem Rate Increase.** CONUS rates of \$35 (up to \$50 in certain high cost areas) are now authorized. The breakdown: \$13.50 for subsistence, \$2.50 for incidental expenses, and up to an average of \$19 for lodging expenses.

- **120 Days Notice to EM Crew Members.** This Presidential Executive order guarantees EM crew members 120 days of flight pay when the requirement to fly is suddenly withdrawn.

- **Variable Incentive Pay for Medical Officers.** Authority to pay the VIP (up to \$13,500 a year) was extended through next September. Congress also extended through 1979 the tax moratorium on Armed Forces Medical Scholarships now held by 5,000 persons, but not for new scholarship students next year. The latter will pay tax on those



*Among the twenty women officers chosen for USAF pilot training is 2d Lt. Marilyn R. Mosser, of Beach, N. D. Lieutenant Mosser enlisted in the North Dakota ANG last February and was commissioned through the ANG Training Center at McGhee-Tyson Airport, Tenn.*

pacts and their \$400 monthly stipends.

The Air Force also noted that Congress rejected cuts in the compensation of certain Reservist groups and Academy cadet pay. One new benefit for Reservists allows them to set up individual retirement accounts if self-employed or if their employers have no retirement program.

That sums up the 1976 benefits action. What's your view—an overall plus? Or minus? Or a standoff?

### **New Benefits in 1977?**

Travel-transportation entitlements for junior airmen and their families remain at the top of USAF's list of new benefits the services hope to secure next year. And lifting the seventy-four cents per mile reimbursement ceiling on trailer moves, though it failed this year (*see above item*), probably will receive strong USAF backing again in 1977. Authorities also told AIR FORCE Magazine they may push for "space required" travel authority, instead of the present space-available, for overseas students away from their parents.

Depending on what the Quadrennial Review of Military Compensation comes up with in new proposals, USAF in 1977 also may push for changes in the dislocation and family-separation allowances. QRMC staffers, meantime, are reportedly pushing for a "salary system," though most military members, including the leaders, oppose it.

And USAF hinted that the De-

fense Department may move to correct some of the per diem inequities enlisted members long have suffered.

### **Retiree Benefits, Perceptions**

All USAF retired members are being asked if they "strongly disagree," "disagree," "agree," or "strongly agree" with this statement: "There has been no significant erosion in Retired Benefits." This is one of many questions in a new official survey of USAF retirees that focuses heavily on retirement benefits and members' perceptions of them. Commissaries, hospitals, exchanges, etc., figure prominently in the questioning.

### **SBP Improved Partially**

The military community has an improved Survivor Benefits Program, but, because of last-minute axe-wielding by the Senate, several changes AFA and other groups feel are of great importance are missing. Supporters plan to make another attempt to secure these improvements next year. Meanwhile, the Defense Department said it is reviewing the entire SBP and will give Congress its findings very soon.

Under the original SBP statute, enacted in September 1972, service members can earmark up to fifty-five percent of their eventual retired pay for their survivors. But there are numerous complicated provisions that have soured many members on the program. While sixty-six percent of the retired USAF officers are enrolled in the SBP, only forty percent of its enlisted retirees are.

The changes that became law late this year (1) cut the required marriage period of an eligible spouse from two years to one, and (2) erase the despised "lock-in" proviso that required a retiree to pay premiums even if there were no spouse. Also, in the final version the President signed into law are provisions for a modest raise in payments to low-income widows and a language clarification about children as beneficiaries when a spouse is still living.

One important section removed by the Senate would reduce the militarily-earned Social Security offset in SBP annuities from 100 to fifty percent. Another would remove the offset entirely when the annuity is being received by a widow and



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one child and in certain other cases.

Another key section approved by the House Armed Services Committee but blocked by the Appropriations Committee would have reopened SBP membership, for an eighteen-month period, to retirees who passed up the chance during the original enrollment period.

Defense says it is looking closely at the SBP cost aspects in its current "thorough review" of the program. And the Air Force Association and other military-oriented groups have vowed to press for approval of the rejected provisions in 1977.

## Report from SOS

Young officers are embracing USAF's suggestion that they get Squadron Officer School on their records, if not by taking the resident course at Maxwell AFB, Ala., then by correspondence. There appear to be some promotion payoffs.

Another interesting development: more Reserve officers took the resident SOS course last year than Regulars although Air Force-wide Regular graduates are well in the majority. The FY '76 attendance breakdown in the four eleven-week classes was 1,576 Reservists, 1,457 Regulars (plus eighty-two allied and ANG attendees). Five years earlier, Regulars outnumbered Reservists at SOS better than two to one.

Resident SOS production last year was the highest since early in the Vietnam era when all Air University school enrollments were slashed. Last year's SOS correspondence course enrollments ranged from 22,000 to 24,000.

On the promotion front, AU Commander Lt. Gen. R. B. Furlong told AIR FORCE Magazine recently that in the 1975 race for temporary major, SOS distinguished graduates had a below-the-zone selection rate four times better than eligibles generally. And in that year's primary zone, while only thirty-four percent of the O-4 eligibles had been to SOS, seventy percent of those selected were graduates of the

school. Seven percent of the SOS students are named "distinguished," a fact stamped clearly on each one's records for easy identification by superiors, boards, etc., General Furlong said.

The SOS student educational level rose last year to twenty-four percent with master's degrees or higher. That's up from sixteen percent five years earlier.

## AFROTC's Slender New Look

Just a few years ago, the AFROTC produced 4,500 new officers annually and was by far USAF's largest source of new pilots. Now, annual production is half that, and a mere 400 graduates are being squeezed into pilot training this year.

With the emergence of this slender new look, Hq. USAF officials report that the excessive waits for active-duty call-up—up to two years for some AFROTC grads—are over. They report the backlog has ended, and delays now range from a few months to not more than one year.

This welcome change follows the service's placing a tight rein on new officer production. The change also, according to officials, is restoring the credibility certain AFROTC units lost earlier when, because of large pilot overages, Air Force had to deny pilot training to many AFROTC graduates and cadets who had been headed in that direction (see "Speaking of People," in the February '76 issue).

The resulting uproar triggered stacks of congressional and other inquiries and, according to close observers, hurt USAF's image on some campuses. But that's history. The image is improving. "We have changed the AFROTC from a heavily rated to a heavily nonrated production source, and scholarships have been redistributed accordingly," an official said. "We are no longer categorizing cadets as pilot, navigator, or nonrated until their senior year," he added.

So severe is the change that of the 2,200 March-June 1976 AFROTC graduates, only 400 have gone, or soon will, to pilot school; 350 are headed for navigator training; and the rest are nonrated officers. Similarly, with the 2,500 cadets scheduled to graduate throughout FY '77, only 400 are due for pilot school. Fewer than 200 will take navigator training; the remaining

1,900-plus, including some who earlier had expected to become pilots, will serve as nonrateds.

A similar pattern is planned for the following year, though pilot production could rise to perhaps 600 by 1979. Meanwhile, the bulk of USAF's pilot training spaces will continue to be reserved for Academy graduates.

So there'll be no misunderstanding, about two months before graduation each AFROTC cadet will be told exactly when he or she will be called, where assigned, and in what skill area. Except for educational delays or hardship cases, each graduate will be aboard no later than twelve months after commissioning, officials said.

In a related move, Air Force has asked the Defense Department to restore some of the AFROTC scholarships it withdrew recently. Although authorized 6,500 scholarships by law, USAF's actual total was cut to 4,375. Authorities are seeking 4,800 this fiscal year and a boost to 5,500 the following two years.

## "Look Sharp," USAF Says Again

Few organizations concentrate on personal appearance, weight control, and grooming standards as heavily as the USAF. Reminders to cut those locks, stay trim, and wear the uniform properly—even down to heel heights and shoe-sole thickness—hit the field frequently. With the exception of numerous non-active-duty Reservists whose hair styles remain more civilian-oriented than military-oriented, most USAFers do look pretty sharp. And Hq. USAF intends to keep it that way.

The latest such message directs commanders and supervisors "at all levels" to keep the pressure on "and continuously emphasize the responsibility of all personnel to project a professional Air Force image." The Hq. USAF message also announced several newly approved uniform item changes from a list of forty-six proposed changes (see July "Bulletin Board").

One change allows Air Force women to wear boots with various uniform combinations. But umbrellas for male Air Force members didn't make it—the Uniform Board said no. An updated AFR 35-10, the uniform wear directive, is due out momentarily.

In a related matter, Hq. USAF in-



licated that the current physical fitness program is too lax and may need "revitalizing." Seems that too many people aren't participating. Air Staff officials are studying the matter.

### Veterans Population Rises

The nation's veteran population increased by 148,000 during the past year to 29,607,000, according to the Veterans Administration. Vietnam-era vets rose past the 8,000,000 mark, a large enough increase to offset deaths of persons who served in previous wars. About 200,000 World War II vets died during the year, for example, but the 13,400,000 living participants of that war comprise the largest share of the entire veteran population.

VA also reported that 3,235,778 of the living veterans are on the Agency's pension or compensation rolls. So are more than 2,000,000 children and widows and 184,056 parents; the latter figure includes 323 parents of World War I participants.

In a separate announcement, the VA said that "many veterans" who are also retired service members, and who have their government insurance premiums deducted from their retirement checks, are not receiving annual insurance dividends. Reason: they have neglected to notify VA of a change of address. They should notify the VA Center, P. O. Box 8079, Philadelphia, Pa. 19101, promptly.

### Riding Herd on Manpower Outlays

Air Force manpower experts estimate that in four years, figuring a four to five percent annual people-cost increase, an extra \$2.1 billion may be required to keep USAF military-civilian manpower at present levels. Looking at it another way, to avoid raising manpower costs during the next four years some 127,000 persons on the 836,000-member USAF military and civilian payroll would have to be dropped.

These disturbing possibilities explain why Maj. Gen. Jack I. Posner, USAF's Manpower Director, is searching for economies in the military-civilian job management area. His major task is to decide which USAF jobs should be military, which are properly civilian in-ser-

vice, and which can best be handled by civilian contractors.

Contracting jobs out to civilian firms has always been a touchy issue, especially with federal unions. General Posner reports that he makes detailed cost studies to help determine which route to take. Of 208 such studies performed from 1973 to 1975, he says there were "150 conversions from in-house to contract" at an estimated three-year cost advantage of more than \$53 million. During the same period, he kept fifty-eight functions "in-house" because the studies indicated a savings of \$6.5 million over contracting out.

General Posner's report appears in the October *Defense Management Journal*, an official Pentagon publication.

The manpower chief said Air Force has seventeen "major contractor-operated" bases. If the contracts were discontinued USAF would have to hire 22,000 more civilian workers to perform the chores. To replace all Air Force contractor-operated arrangements, 70,000 more civilian employees would be required, General Posner said. His basic message is that with "the manpower resource becoming a diminishing and increasingly expensive commodity, it is critically imperative that the right type of resources be selected to do a given job."

### Defense Staff Cuts Continue

The Office of the Secretary of Defense is quietly reducing its staff by several hundred spaces; sixty-three Information, or "Public Affairs," posts are being eliminated, for example. The JCS organization is also being cut from 1,483 to 1,261 military and civilian spaces. It's all part of a three-year-old program the Defense Department says has resulted in elimination of 20,000 manpower spaces at various headquarters throughout the armed forces.

### USAF Civilian Health Plan Rates Up

Air Force civilian employees will be paying from five to twenty percent more for their health plans next year. And the costs are expected to jump another ten to fifteen percent in 1977, according to the Office of the Secretary of the Air Force.

Seven new comprehensive medical plans (health maintenance organizations) are being offered civil servants. Each is open to employees and federal retirees who live in a plan's enrollment area. The seven newcomers bring to sixty the total number of health plans that will participate in the program in 1977.

The new higher rates become effective next month. Last month employees had an opportunity to change from one plan or option to another, or from self-only to family coverage.

### Senior Staff Changes

**RETIREMENTS:** AFRES M/G Earl O. Anderson; M/G Oliver W. Lewis.

**CHANGES:** B/G John H. Bennett, from Insp. Gen., Hq. TAC, Langley AFB, Va., to Asst. DCS/Ops. for Ops. & Tng., Hq. TAC, Langley AFB, Va. . . . AFRES M/G Richard C. Bodycombe, from inactive status, to V/C, Hq. Air Force Reserve, Robins AFB, Ga., replacing retiring AFRES M/G Earl O. Anderson . . . B/G William R. Coleman, from DCS/Maint., Hq. AFLC, Wright-Patterson AFB, Ohio, to Cmdr., Defense Property Disposal Service, DSA, Battle Creek, Mich. . . . AFRES B/G Edward Dillon, from Dep. Chief, Air Force Reserve, Washington, D. C., to Commander, 14th AF (Reserve), Dobbins AFB, Ga.

M/G George A. Edwards, Jr., from C/S, Hq. TAC, Langley AFB, Va., to DCS/Plans, Hq. TAC, Langley AFB, Va., replacing M/G Malcolm E. Ryan, Jr. . . . AFRES B/G James E. McAdoo, from inactive status to Dep. Chief, Air Force Reserve, Washington, D. C., replacing AFRES B/G Edward Dillon . . . B/G Len C. Russell, from Asst. DCS/Ops., for Ops. & Tng., Hq. TAC, Langley AFB, Va., to C/S, Hq. TAC, Langley AFB, Va., replacing M/G George A. Edwards, Jr. . . . M/G Malcolm E. Ryan, Jr., from DCS/Plans, Hq. TAC, Langley AFB, Va., to Cmdr., USAF Tactical Air Warfare Center, Eglin AFB, Fla.

**CORRECTION:** B/G William R. Yost, from Cmdr., Northern Comm. Area, AFCS, Griffiss AFB, N. Y., to V/C, Hq. AFCS, Richards-Gebaur AFB, Mo. (rather than to Hq. AFMPC, Randolph AFB, Tex., as erroneously reported on p. 143 of the September '76 issue of this magazine). ■



## Making a Good Service Better

"Heartburn issues"—problems of almost any nature that bug Air Force people—are what a new group of peripatetic USAF problem-solvers is looking for as they roam bases far and wide. They report early success in unraveling snags or, as they put it, "improving organizational health."

The five recently formed teams of officer-NCO experts, each composed of eight to ten persons, are part of the Air University's Leadership and Management Development Center, Maxwell AFB, Ala. The LMDC, just a year old and now a major AU activity, serves as a focal point for leadership and management education throughout the USAF.

When a traveling team hits a base it conducts seminars for the commander and his staff, chief master sergeants, and other groups. Team members pass along to their audiences the latest leadership-management guidance and philosophies from Hq. USAF as advanced by Chief of Staff Gen. David C. Jones.

But at each stop, team members also fan out—some visit the flight line, others the dining halls, clubs, commissary, offices, etc. They particularly zero in on night-shift workers, take midnight chow, and in other ways talk with scores of USAF people. The purpose of all this: find out what problems exist and how serious they are. Their next step is to figure out solutions.

Are the visitors welcome? Do the locals level with the outsiders? "Definitely," said Capt. James Maxwell, an enthusiastic younger member of a traveling team. "The people are hungry for someone's ear," he declared. Like his associates, the Captain volunteered for the job.

Col. Robert E. Chapman, the Center Commander, also told AIR FORCE Magazine that local commanders have been highly receptive to the visits. "The demand for seminars exceeds the capability of our teams to provide them. The people we talk with are candid, and the problems are easy to identify," he added.

A typical team, during a one- to two-week visit, will conduct seminars for up to fifteen separate groups. And in less formal sessions with people on and off the job, team members will rap with scores of individuals. Depending on the size of the base, they'll appear before from 700 to 2,500 persons. By early fall, the LMDC teams had visited about forty bases.

The traveling teams are headed by Col. John Davis. His people, all hand-picked, bring a wide background of skills to the task. In addition, to flesh out the expertise, civilian consultants and military experts are frequently borrowed from other AU activities for team duty.

LMDC authorities claim many problems were identified and some solved on the spot during the teams' first months of operation. In other cases, guidance was provided which has led gradually to solutions.

The problem-solving takes some strange twists. At one base, horrendous delays in getting the engineers to fix faulty plumbing in family quarters had created a serious morale—and sanitary—problem. "It was a management problem that affected the attitude of people, so our visiting team checked into it, got all the parties together, and worked out a solution. The waits for a plumber dropped to two weeks," Colonel Chapman said.

At another site a young officer headed a large section in which dissension flared between certain young airmen and senior NCOs. There was some feeling it was racially inspired, but a visiting team's probe disagreed. It recommended minor shifting of jobs within the section and a brief re-

training program for other personnel. Chapman reports that the bickering has stopped and production increased.

At other bases the visitors:

- Ran up against what some call a "major heartburn" item: the "lack of opposite sex visitation rights in their dormitories." One wing commander, the LMDC reported, decided to take action. He checked on how neighboring colleges handled the situation, then came up with a visitation plan that meets proper appearance and conduct standards and has been successful in both the men's and women's dorms. The Center endorsed the plan for use by other commands.

- Learned that the sponsorship program, under which an old hand is assigned to help new arrivals settle in, was sputtering, had stopped completely on weekends. Thus, new airmen were deposited in transient barracks, not issued meal cards, etc. Their first days in service were entirely negative. The Center's recommendation: a full-fledged sponsorship program service-wide.

- Found that the most frequent complaint involves a lack of recognition for good work or special accomplishment. More than naming an "Airman of the Quarter" or something similar is needed, the LMDC said. Suggestions include a "gilt-edged three-day pass" presented at commander's call for exemplary performance, favorable citations like those given by some Security Police units for outstanding personnel appearance, or in other situations merely "a verbal kudo or a simple note of thanks."

"These gestures occur all too infrequently," the teams reported in urging their adoption Air Force-wide.

Perhaps the thing that really makes the traveling team problem-solving program click with the troops is its informal, non-inspector general approach. The teams don't suddenly spread out over a base and start writing up gig sheets. In fact, they won't visit a site unless invited. But most bases want to participate, and the teams are booked solid for the next several months.

Based on a team's findings, recommendations are made at the lowest command level at which problems may be solved. Those needing the host commander's attention are explained to him by the team chief. But there is no up-channel reporting of the findings. The local commander is not under the gun to higher authority, Colonel Chapman says.

How do commanders feel about the program? Apparently they're enthusiastic, judging from a stack of laudatory letters Chapman has received from nearly all the commanders whose bases were visited during the first few months of the project.

LMDC's game plan calls for teams to visit all installations about once each year. The teams also act as a conduit for good ideas that can be used USAF-wide. Colonel Chapman compiles these "tips for commanders" periodically and distributes them to commanders throughout the service. And of course the travelers are in an excellent position to flag big problems that exist at many locations, such as the OER flap, and alert the higher echelons.

In related areas, the year-old LMDC is quarterbacking the expansion of USAF's Professional Military Education program for the enlisted sector. There are now five separate PME phases for career airmen. The Center has also been assigned responsibility for the USAF Judge Advocate School, the Chaplain Board and School, and certain other Air University activities.

But it's the traveling teams and their unique approach to solving "people" problems that have taken the spotlight in USAF's continuing drive to "make a good service better." ■



# INDUSTRIAL ASSOCIATES OF THE AIR FORCE ASSOCIATION

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# Airman's Bookshelf

## A Definitive Biography

*Adolf Hitler*, by John Toland. Doubleday & Co., New York, N. Y., 1976. 1,035 pages including index and 87 pages of notes. \$14.95.

This reporter spent most of 1934 in Nazi Germany. I never knew what happened in The Second Revolution—the Röhm purge of June 1934—until I read John Toland's extraordinary biography of Hitler. I doubt that any American newspapermen then in Berlin or Munich—which is where most of them were interviewing each other—knew what happened. Neither did their readers. Toland has all the details.

The sensational story, when Hitler had been Chancellor for barely a year, involved the crass execution, or scattered massacre, of almost all top leaders of the Nazi SA (Brownshirts). Capt. Ernst Röhm was their leader. Homosexual himself, his band of noisy bullies was despised by the Reich's traditional military hierarchy.

In 1971, Toland interviewed Werner Naumann, who was a young SA leader in 1934. Naumann was only one of the more than 150 people involved in Hitler's life who were hunted down by the author for meetings that date back, according to his notes, to at least 1956. In 1971, Naumann told Toland:

"The Röhm affair was important to the development of the Third Reich because here for the first time we had an unlawful, illegal action, one sanctioned by the Reichswehr [Army], as well as the entire bureaucracy and legal body of the nation. It was totally unlawful and illegal, and nobody stood up to say, 'So far and no further.' Not even the Church. And none of these groups could say they knew nothing

about the matter. Everyone knew what happened. And, in my opinion, this was the beginning of the end, because from now on the move was from the lawful and legal to the illegal and unlawful, and from now on there could be no turning back the clock."

As Toland makes clear, Hitler's movement from the legal to the illegal came about gradually, entirely with the consent of the governed, and with the support of many people who should have known better. For some, there will be more in this biography than they want to know about the Führer. But there is not more than they should know. Mr. Toland's research knocks down many of the myths. Hitler was not a house painter. His World War I record, in the German army, was commendable. And, in Toland's opinion, it was Woodrow Wilson who made the big mistake. The US President refused to make an armistice after World War I with the Germans who had waged the war. He insisted on dealing with "democratic elements." And, "by forcing the socialists to assume the blame for something they had not brought about, Wilson gave Adolf Hitler a political tool that he was destined to wield with devastating force."

The story put together by Mr. Toland is one that none of us oldsters has seen before in such fascinating detail. Yet it is a book that should be read by the youngsters, who are more in need of it. The Hitler calamity was a world calamity and recognized as such by a generation now fading from the scene. But today the thought of totalitarian government no longer seems to scare anybody. Maybe this biography will help.

Toland says the first World War turned Hitler into a man "ready to

take a man's place in the world." In 1918, discharged from a military hospital, he checked in at a Munich barracks on Türkenstrasse, and there encountered a "spirit of rebellion" among the defeated soldiers who feared a Communist takeover in Germany. Well, in 1934, I lived at 76 Türkenstrasse, and those old barracks were occupied by the Reichswehr. And there were mornings, during the continuing crises on the Austrian border, when a solid phalanx of troops in black uniforms, gutter to gutter and boot to boot, passed under my window in a parade that lasted for at least an hour. They were the meanest looking soldiers I ever have seen. My landlord was employed at the BMW factory, where I thought he made motorcycles. He confided, at last, that he made parts for fighters.

While this was going on, nobody was alarmed. We could do business with Hitler. He was the Chancellor and held in check by President von Hindenburg, who held the respect of the nation. The New York *Times* editorialized: "The composition of the cabinet leaves Herr Hitler no scope for the gratification of his dictatorial ambition." While this view prevailed, Mr. Toland writes, Hitler "was hiding his revolutionary intentions behind a flow of inspirational but conservative phrases. . . . [He] wanted only a return to the old virtues of the past. . . ."

The author details how the Führer gathered up support from unlikely places. It was easy to win what we call the labor vote. He did it with his oratory, which was good, and his showmanship. And what we call Big Business fell into line, with some exceptions. Here Hjalmar Schacht, later President of the Reichsbank, was a big help. For one of the early election efforts, according to Toland, the industrialists raised 3,000,000 marks for the Nazi effort and helped make it look legitimate. Said Schacht, who was a close adviser to Hitler, the Nazis will "make no attempt to carry out their well-known demagogic reforms" and, consequently, all big business viewed the new regime "with sympathy." The Church was won over. And, along came many intellectuals, including Oswald Spengler and Gerhart Hauptmann.

The Toland biography is heavy with detail, and he does not appear to have forgotten a line picked up in the 150 interviews, many of them



with important contributors who had never before been questioned. At the same time, the author does not impose his own interpretations on the reader. The result is authoritative and good reading, every line of it.

—Reviewed by Claude Witze,  
Senior Editor.

## Taking War Seriously

*The Soviet Theater Nuclear Offensive, Studies in Communist Affairs, Volume 1*, by Joseph D. Douglass, Jr. US Government Printing Office, Washington, D. C., 1976. 127 pages. \$1.60.

At \$1.60, this is probably the best value of any book or monograph currently on sale. Relying exclusively on open sources, Douglass lays out, for the benefit of anyone willing to learn, how the Soviets propose to conduct theater nuclear operations in Europe—by and large allowing Soviet commentators to tell the story. This simple tale, and its likely implications for NATO, should be little short of shattering to anyone who reposes confidence in MC14/3—the doctrine of “flexible response”!

Summarizing the probable Soviet style of war-waging, Douglass writes: “In any Soviet discussion of nuclear war, there is one word that dominates above all others—decisive. Although war might not be started by the socialist countries, they certainly intend to finish it in a decisive and triumphant manner . . . and the primary instrument in bringing this about is the initial, mass, simultaneous, in-depth nuclear strike.”

For years Western commentators and theoreticians have been speculating upon the growth of a conventional emphasis in Soviet theater capability and doctrine. Douglass points out that conventionally armed ground forces are *the* means for exploiting the opportunities opened up by nuclear strikes, and that for all the genuine Soviet attention paid to the nuclear revolution in military affairs, the Soviet military really has grafted theater-nuclear forces onto its theater war posture and that the Soviet Ground Forces have evolved very much (in a doctrinal sense), as a consequence of the lessons derived from World War

II. Nuclear strikes make no sense, in the Soviet view, unless they are followed up immediately on the ground. Anyone who finds comfort in the recent vast improvement in Soviet nonnuclear capability *vis-à-vis* Europe had better think again.

Douglass makes no claims that he is revealing Soviet war plans, or that the Soviets could accomplish what they envisage: all he claims to have done is to present succinctly what Soviet writers say (almost exclusively for the benefit of a Soviet audience—let it be understood) about their concept of war in Europe. To an American or NATO-European reader deeply imbued with the premises of “flexible response,” Douglass’ work makes disturbing reading. We are told that the Soviets may give us only a few hours’ tactical warning of an invasion; they would not (if they have any choice) mobilize their Category II divisions in the Western military districts of the Soviet Union. In short, NATO’s assumption that the Soviets conveniently would provide twenty-three days’ notice of a forthcoming attack is wildly unrealistic. Furthermore, NATO’s hope that a war in Europe would progress at a fairly stately and dignified pace through an initial conventional “pause” to the initial (NATO) small-scale use of theater nuclear weapons, following which “shock” introduction the Soviets would choose to desist from their aggression, is probably mere wishful-thinking.

If the Soviets mean what they say in their military literature, they would wage war in Europe with a degree of ferocity appropriate to maximize their chances of a very swift victory. Preceded by in-depth nuclear strikes launched on a massive scale, up to seven Soviet airborne divisions and the groups of forces *in place* in East Germany, Poland, and Czechoslovakia would unleash an avalanche of armor westward—with much of NATO’s order of battle incompletely deployed and/or damaged and paralyzed by the initial nuclear strikes. That is what the Soviets say they would do.

No less valuable than Douglass’ honest presentation of Soviet statements of Soviet strategy (when so many American commentators prefer to substitute their intuition and logic for Soviet reasoning) is his challenging diagnosis of the vulner-

abilities in Soviet strategy. Attacking from a near standing-start in order to secure the advantage of surprise, and to hit hard (and exploit deep) while NATO is still reeling from the initial Soviet nuclear strikes, precise—almost mechanical—attack timing is critical to Soviet prospects. The foul-up possibilities are enormous—which a resolute, prepared NATO could and should exploit. Douglass’ analysis will provide fuel for those NATO analysts who believe that the time to stop a Soviet offensive is before it properly starts to roll. As Douglass correctly argues, nuclear strikes by NATO directed in front of, and at, the Soviet second echelon (the exploitation force) should promote traffic jams of historic proportions and should throw the Soviet attack timetable totally out of gear.

If current majority opinion in Washington is correct, and Douglass’ portrait is inaccurate, and the Soviets seek a very rapid *non-nuclear* victory in Europe, the chances of an American President ordering nuclear weapons released in time for it to have any effect upon the momentum of a Soviet advance probably range from very poor to nonexistent. If Douglass is accurate in his presentation of Soviet views, and a massive Soviet first strike demolishes or paralyzes NATO’s C<sup>3</sup>, and eliminates most of NATO’s theater-nuclear forces, would a President have the courage to employ, very promptly, the NATO-dedicated SLBMs to fill the gap?

—Reviewed by Colin S. Gray,  
Hudson Institute.

## New Books in Brief

*Brassey's NATO Infantry and its Weapons*, edited by J. I. H. Owen. A new Brassey series of defense reference books to be revised and republished regularly includes this volume on the training, organization, and equipment of NATO’s infantry. Much of the book is devoted to weapons specifications. Photos, charts, illustrations. Westview Press, Boulder, Colo., 1976. 194 pages. \$14.50.

*Brassey's Warsaw Pact Infantry and its Weapons*, edited by J. I. H. Owen. Companion to the above, this volume covers equipment, training, and weapons of the seven Warsaw Pact members. Includes articles on tactics by well-known Soviet mili-



# Airman's Bookshelf

tary writers and a review of the Pact's history. Photos, charts, illustrations. Westview Press, Boulder, Colo., 1976. 96 pages. \$12.

*The Cradle of American Aviation: The National Aviation Field, College Park, Md.*, by Ken Beatty. While serving as Director, National Aerospace Educational Memorial Center, College Park, Md., the author discovered facts about the National Aviation Field at College Park (where World War I and earlier aviators were trained) that he believes earn the site distinction as the cradle of American aviation. Here is a photo history of the nation's first federally recognized airport and oldest continually operating airport in the world. Bibliography. Profits from the sale of the book will be used to support construction of a museum at the airport. College Park Airport, College Park, Md. 20740. 72 pages. \$5.50 postpaid.

*The Empire Express*, by Charles L. Scrivner. The US Navy's PV bomber units pounded the northern end of the Japanese Islands from their base on Attu in the Aleutians during WW II. Here is the story of that little-known operation undertaken in bad weather and unbelievable conditions. Aviation Book Co., 555 W. Glenoaks Blvd., Glendale, Calif. 91202, 1976. 64 pages. \$6.95.

*Famous Fighters of the Second World War*, by William Green. This revised edition offers histories of the best and most famous fighters in the air forces of Britain, Germany, Italy, Japan, Russia, and the US. Drawings, photos, armament specifications. Doubleday & Co., New York, N. Y., 1976. 276 pages. \$9.95.

*Fifteenth Air Force Story*, by Ken C. Rust. Illustrated history of combat operations in Europe during WW II by units of the Fifteenth Air Force based in Italy. Compiled from official and unofficial records and personal accounts, the book describes missions, aircraft, markings, and aces. Aviation Book Co., 555 W. Glenoaks

Blvd., Glendale, Calif. 91202, 1976. 64 pages. \$6.95.

*The Flier's World*, by James Gilbert. Aptly titled, this magnificent, large-format book by a *Flying Magazine* writer and prize-winning aerial photographer lifts the reader into the flier's realm. A beginner's first solo, aerobatics, flying conditions, world destinations, gliding, hand-gliding, racing, soaring, home-built planes, jets, pilot careers, and airline operations are beautifully explained in color photos and the author's prose. Random House/Ridge Press, New York, N. Y., 1976. 252 pages. \$19.95.

*The Helicopter: A Pictorial History*, by H. F. Gregory. From first thoughts of flight by men such as Leonardo da Vinci, through early efforts to build and fly helicopters and the personal experiences of those assigned to fly them, this book is full of facts, figures, diagrams, and photos detailing helicopter development. A. S. Barnes & Co., Cranbury, N. J., 1976. 223 pages, large format. \$15.

*How Weapons Work*, edited by Christopher Chant. From pistols to guided missiles, this thorough book uses many large-scale, cutaway color drawings to explain exactly how modern weapons work. Brief history and specifications accompany each description. Henry Regnery Co., Chicago, Ill., 1976. 249 pages, large format. \$14.95.

*Now is the Time! To Prepare a Guide for Your Survivor*, by Benjamin Katz. Much of the burden facing survivors can be eased if couples plan ahead for the inevitability of death. The author, a retired rear admiral, has prepared a step-by-step guide to do just that. Funeral plans, survivor and burial benefits with specifics and forms for military personnel, notification of death requirements, details on changing ownership of property, where and how to obtain death certificates, forms for finances, records, taxes, income, expenses, and obligations, do's and don'ts on settling estates, the \$30,000 lifetime gift tax exemption, and the \$60,000 exemption on the federal estate tax are among items covered. Overlook Co., 910 N. Overlook Drive, Alexandria, Va. 22305, 1976. 46 pages. \$2.25, includes mailing and handling.

*Orders of Magnitude*, by Frank W. Anderson, Jr. From a rider to a Navy appropriations bill that President Wilson signed in 1915 establishing NASA's predecessor—the National Advisory Committee for Aeronautics (NACA)—through Apollo, Skylab, Mariner, and Viking, here is the short but incredible history of NASA that, in the words of the author, has taken us "from the thin ribbon of earth's atmosphere out to the edge of the solar system in two decades." Bibliography. Superintendent of Documents, Government Printing Office, Washington, D. C., 1976. 100 pages. \$2.20.

*Rise and Fight Again*, by Charles Bracelen Flood. A rare view of the American Revolution as glimpsed in humiliating disasters at Quebec, Fort Mifflin, and Fort Mifflin, and Camden. Four years after his famous midnight ride, Paul Revere (later to be court-martialed) was so busy at Penobscot Bay making arrangements for himself and his baggage that his men starved and watched their ships burn. The famous and infamous, their bravery and cowardice, make this well-researched book a fascinating narrative. Maps, photos, index. Dodd Mead & Co., New York, N. Y., 1976. 464 pages. \$12.95.

*Soviet Strategy in Europe*, edited by Richard Pipes. Four of the eight papers consider political issues: the Soviet concept of détente, nature of Soviet decision-making and its influence on foreign affairs, and Russia's relationship with West and East European states. Remaining papers discuss Soviet military activities in Europe, stressing the relationship of military power to political objectives and the extent to which the growth of trade between the Common Market and East Europe fosters ties of mutual dependence. Crane, Russak and Co., New York, N. Y., 1976. 316 pages. \$14.50 clothback, \$7.50 paperback.

*Strategic Air Command*, by David H. Anderton. A compact history of SAC from 1947 to 1973 by a highly competent aviation writer. About a fifth of the text is devoted to SAC combat operations in the Korean and Southeast Asian wars. In addition to its many fine illustrations, the author has included appendices giving data on all aircraft and missiles used by SAC throughout its



history, records and extraordinary flights, competitions, organization, and the threat. Charles Scribner's Sons, New York, N. Y., 1976. 316 pages. \$12.50.

*Strategic Survey 1975*, by The International Institute for Strategic Studies. A review of events and trends of world security and arms limitation during 1975 from the prestigious IISS. Topics include decolonization, new factors in security, the superpowers, Middle East and the Gulf, Asia after Vietnam, arms control, and a chronology of events in various countries. International Institute for Strategic Studies, 18 Adam St., London WC2N 6AL, 1976. 130 pages. \$4.

*Strategic Weapons: An Introduction*, by Norman Polmar. The editor of the US section of *Jane's Fighting Ships* outlines chronologically and nontechnically strategic weapons development in the US and USSR. This simplified, layman's monograph describes existing strategic weapons and the rationale behind their development, and possible future trends. Nuclear weapons of other nations are reviewed. Six appendices cover strategic force levels, past and present strategic bomber aircraft, strategic cruise missiles, ICBMs, SLBMs, and strategic missile submarines. Crane, Russak and Co., New York, N. Y., 1975. 164 pages. \$3.95.

*The War of the American Revolution*, by Robert W. Coakley and Stetson Conn. This volume condenses existing information on the military history of America's revolution. Part I narrates colonial beginnings, the Revolution, and independence; Part II is a chronology of military events 1763-1784; Part III is a selected bibliography. Maps, illustrations, index. Superintendent of Documents, US Government Printing Office, Washington, D. C. 20402, 1975. 257 pages. \$3.15.

*War Report on the O. S. S.*, by Kermit Roosevelt. Recently declassified, this top secret report written in 1946-47 describes formation and operations of the Office of Strategic Services, shedding light on the gathering of intelligence by American agents all over the world. A new introduction by the author discusses the implications and significance of the OSS thirty years later.

Index. Walker and Co., New York, N. Y., 1976. 261 pages. \$9.95.

*World Armaments and Disarmament, SIPRI Yearbook 1976*. Describes major quantitative and qualitative changes in the world's arsenals up to the beginning of 1976. Stockholm International Peace Research Institute, MIT Press, Cambridge, Mass., 1976. 493 pages. \$25 (approximate).

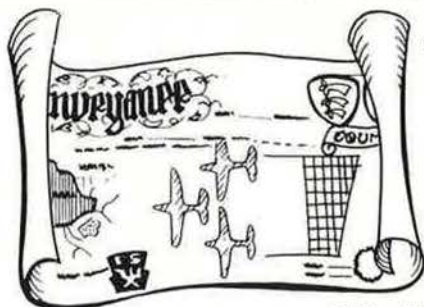
*World War II: An Account of its Documents*, edited by James E. O'Neill and Robert W. Krauskopf. Eighteen papers presented at a National Archives Conference on WW II historical research comprise this book. Wartime diplomacy; research here and abroad; military biography; access to archival sources; the role of science and technology and of wartime emergency agencies; and official historical programs are discussed. Bibliography, index. Howard University Press, Washington, D. C., 1976. 269 pages. \$15.

*The World's Worst Aircraft*, by James Gilbert. A humorous, fascinating account of the boners in aircraft design from homemade wings

through the 1950s, and of the flamboyant personalities behind some of them. Among the many aircraft and airships discussed are the Caproni CA-90, the Gee Bee racers, Dornier flying boats, the Barling bomber, and some monstrosities of World War II. Bibliography, index. St. Martin's Press, New York, N. Y., 1976. 192 pages. \$10.95.

These recently published Adelphi Papers will interest students of military/political affairs: *Strategic Deterrence Reconsidered*, by Richard Rosecrance, 37 pages; *Power at Sea II: Super-powers and Navies*, a compilation, 32 pages; *Power at Sea III: Competition and Conflict*, a compilation, 36 pages; *India's Security in the 1980's*, by G. S. Bhargava, 30 pages; *Limited Nuclear Options: Deterrence and the New American Doctrine*, by Lynn Etheridge Davis, 22 pages; *The Alliance and Europe: Part V, Nuclear Weapons and East-West Negotiation*, by Uwe Nerlich, 35 pages. Copies may be ordered from The International Institute for Strategic Studies, 18 Adam St., London WC2N 6AL, England. \$1.50 each postpaid.

—Reviewed by Robin Whittle



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# AFA News

By Don Steele, AFA AFFAIRS EDITOR

## Senator Goldwater Presents Jimmy Doolittle Fellow Awards

At a meeting of the Aerospace Education Foundation's Board of Trustees during AFA's Thirtieth Anniversary Convention, the Foundation's Board Chairman, Sen. Barry Goldwater (R-Ariz.), accepted a check for the Foundation, presented three Jimmy Doolittle Fellow Awards and several Certificates of Appreciation to award donors.

In photo No. 1, Senator Goldwater, right, accepts an Iron Gate Chapter check for \$12,000 from AFA National Director J. Gilbert Nettleton, Jr., left, Chairman of the Chapter's Twelfth National Air Force Salute; and Chapter President J. Clarence Davies, Jr., center.

In photo No. 2, Senator Goldwater, left, presents Jimmy Doolittle Fellow Award to Sol Love, right, President, Vought Corp.

Photo No. 3 was taken after Senator Goldwater had presented a Jimmy Doolittle Fellow Award sponsored by the Wright Memorial Chapter for the late Col. Raymond H. Horne to his widow. Shown are, from left, Senator Goldwater; Ohio State AFA President Ed Nett; Chapter President N. C. Heilman; Mrs. Horne; and Jack Withers, Vice Pres-



ident for AFA's Great Lakes Region.

In Photo No. 4, Senator Goldwater presents a Jimmy Doolittle Fellow Award to Jack Haire, Vice President for AFA's South Central Region. The award was sponsored by the five AFA State Organizations in the South Central Region. Representing the State Organizations

were, from left in the background, Alabama State AFA President James Tipton; AFA National Director Daniel F. Callahan, Tennessee; Mississippi State AFA President Billy McLeod; and Louisiana State AFA President Toulmin H. Brown. The Arkansas State AFA did not have a representative present.





# chapter and state photo gallery



More than 900 members and guests attended a gala Bicentennial Ball recently sponsored by the Utah State AFA in cooperation with the Salt Lake Chapter. Utah State AFA President Jim Taylor, left, and Salt Lake Chapter President George Thiergartner, right, welcome Salt Lake City Mayor Ted Wilson, center, to the Ball. Other notable guests included Sen. Frank Moss (D-Utah); Gov. Calvin Rampton; and Lt. Gen. Edmund A. Rafalko, Commander, Ogden Air Logistics Center. Entertainment was furnished by the US Air Force Academy "Falconaires."



Maj. Gen. Thomas P. Stafford, right, Commander, Air Force Flight Test Center at Edwards AFB, Calif., the guest of honor and speaker at a recent meeting of General Robert F. Travis Chapter, presents the California State AFA's 1976 "NCO of the Year Award" to CMSgt. Walter E. Scott, left, 60th Military Airlift Wing, Travis AFB, in recognition of his dedication to the objectives of AFA, and for his outstanding work in personally recruiting more than 250 new AFA members. Chapter President Arthur Littman is behind Sergeant Scott.



Gen. Robert J. Dixon, Commander, Tactical Air Command, was the guest speaker at a recent meeting of AFA's Swamp Fox Chapter in the Shaw AFB, S. C., Officers' Club. After his address, General Dixon, right, received a memento of the occasion from Chapter President L. F. Tanberg, Maj. Gen., USAF (Ret.).



AFA's Cape Canaveral Chapter celebrated the thirtieth anniversary of AFA at a dinner in the Patrick AFB, Fla., Officers' Club. Shown admiring the birthday cake are, from left, Brig. Gen. Don M. Hartung, Commander, Air Force Eastern Test Range; Chapter President Howard McClellan; and Col. Joseph A. McClure, Patrick AFB Commander.



# AFA News

More than 600 members and guests from all over the country attended the Wright Memorial Chapter's recent Dean Martin-style "Roast" of Lt. Gen. James T. Stewart, the retiring Commander of Aeronautical Systems Division (AFSC), Wright-Patterson AFB, Ohio. Participants included, from left, AFA National Director Jack Withers, the General Chairman and one of the roasters; movie actor Jackie Coogan, the master of ceremonies; General Stewart; Ms. Lucille Schlosser, the Chapter's "Woman of the Year" and one of the roasters; and Lt. Gen. R. Thomas Marsh, Vice Commander, AFSC.



A recent New Jersey State AFA Executive Committee meeting at McGuire AFB included a memorial service for the thirteen Air Force Reservists of the 514th Military Airlift Wing (Associate) who were killed in the recent crashes of two of the Wing's airplanes. Participants in the service included, from left, N. J. State AFA President Len Schill; AFA National Director James Grazioso; Brig. Gen. James McAdoo, Wing Commander; AFA National Director Herb Fisher; Col. James Gardner, 438th Military Airlift Wing Commander; Mrs. Eric Scales; Squadron Leader Eric Scales, RAAF, representing the United Kingdom; Mrs. Leif Fisher; and Capt. Leif Fisher, Danish Army, representing Denmark.

Following his presentation at a recent Tucson, Ariz., Chapter meeting, Steve Ritchie, right, the only Air Force pilot ace of the Vietnam War, is congratulated by Chapter President Charles Niblett, left, as AFA National Director Hugh Stewart, left rear; Mrs. Chandler, center; and Dill Chandler, right rear, Vice President for AFA's Far West Region, look on.



During a visit to San Antonio, newly elected AFA Board Chairman Gerald V. Hasler and his son, John, visited Kelly AFB, Tex. Shown in the cavernous interior of a C-5 Galaxy are, from left, John Hasler; Maj. Gen. John R. Kelly, Jr., San Antonio Air Logistics Center Commander; Texas State AFA President Sandy Faust; and Mr. Hasler.



# photo gallery



The US Air Force "Strolling Strings" performed at a recent meeting of AFA's Scott Berkeley Chapter at Seymour Johnson AFB, N. C. Shown following the group's performance are, from left, North Carolina State AFA President Dozier Murray; Lt. Lowell Graham, "Strolling Strings" Conductor; Chapter President Bill Bowden; CMSgt. Greg Christy; Col. Wayne Calhoun, 68th Bombardment Wing Commander; and Col. Robert Russ, 4th Tactical Fighter Wing Commander.



The some one hundred members and guests who attended the Tacoma Chapter's Annual Golf Tournament and Cook-Out at the Whispering Firs Golf Course at McChord AFB, Wash., included, from left, Maj. Gen. W. E. Elder, USAF (Ret.); R. D. Harkness, retired President, United Mutual Savings Bank; Past Chapter President H. P. Glaisyer; Col. A. K. Andreason, 62d Military Airlift Wing Commander; Chapter President E. V. Hudson; Col. R. H. Campbell, McChord AFB Commander; retired Col. D. J. Williams; retired Maj. Gen. Kenny Powell; and retired Col. R. E. Ainslie.



The recent "AFA Night at the Ballgame," cosponsored by the Southern California AFA Chapters, drew some 1,000 AFA members, their families, and guests. Shown in front of the Dodger dugout are, from left, AFROTC Cadet 2d Lt. James Casey, Loyola-Marymount College; Long Beach Chapter President Doug Gibson, who was Chairman of the event; C. Jay Golding, California State AFA Vice President, Southern Area; and AFROTC Cadet Capt. Janice Forsen, Loyola-Marymount College. The California Air National Guard's 562d Air Force Band performed before the game, and announcements pertaining to AFA and its leaders were flashed on the scoreboard throughout the game.

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# AFA State Contacts

Following each state name, in parentheses, are the names of the localities in which AFA Chapters are located. Information regarding these Chapters, or any place of AFA's activities within the state, may be obtained from the state contact.

**ALABAMA** (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma): **James B. Tipton**, 3032 Hill Hedge Dr., Montgomery, Ala. 36111 (phone 205-263-6944).

**ALASKA** (Anchorage, Fairbanks): **Edward J. Monaghan**, 2401 Telequana Dr., Anchorage, Alaska 99503 (phone 907-279-3287).

**ARIZONA** (Phoenix, Tucson): **Robert J. Borgmann**, 2431 E. Lincoln Cir., Phoenix, Ariz. 85016 (phone 602-955-7845).

**ARKANSAS** (Blytheville, Fort Smith, Little Rock): **Jack Kraras**, 120 Indian Trail, Little Rock, Ark. 72207 (phone 501-225-5575).

**CALIFORNIA** (Apple Valley, Edwards, Fairfield, Fresno, Hawthorne, Hermosa Beach, Long Beach, Los Angeles, Marysville, Merced, Monterey, Novato, Orange County, Palo Alto, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Barbara, Santa Monica, Tahoe City, Vandenberg AFB, Van Nuys, Ventura): **Dwight M. Ewing**, P. O. Box 737, Merced, Calif. 95340 (phone 209-722-6283).

**COLORADO** (Aurora, Boulder, Colorado Springs, Denver, Ft. Collins, Grand Junction, Greeley, Littleton, Pueblo): **Edward C. Marriott**, 11934 E. Hawaii Cir., Aurora, Colo. 80012 (phone 303-934-5751).

**CONNECTICUT** (East Hartford, Stratford, Torrington): **Margaret E. McEnerney**, 1476 Broadbridge Ave., Stratford, Conn. 06497 (phone 203-377-3517).

**DELAWARE** (Dover, Wilmington): **George H. Chabbot**, 33 Mikell Dr., Dover, Del. 19901 (phone 302-697-6943).

**DISTRICT OF COLUMBIA** (Washington, D. C.): **James M. McGarry**, 2418 N. Ottawa St., Arlington, Va. 22205 (phone 703-534-2663).

**FLORIDA** (Bartow, Broward, Cape Coral, Ft. Walton Beach, Gainesville, Jacksonville, New Port Richey, Orlando, Panama City, Patrick AFB, Redington Beach, Sarasota, Tampa): **John H. deRussy**, 529 Andros Ln., Indian Harbour Beach, Fla. 32937 (phone 305-773-2339).

**GEORGIA** (Athens, Atlanta, Rome, Savannah, St. Simons Island, Valdosta, Warner Robins): **James D. Thurmond**, 219 Roswell St., Marietta, Ga. 30060 (phone 404-252-9534).

**HAWAII** (Honolulu): **James Dowling**, 2222 Kalakaua Ave., Honolulu, Hawaii 96815 (phone 808-923-0492).

**IDAHO** (Boise, Pocatello, Twin Falls): **Larry L. Leach**, 6318 Bermuda Dr., Boise, Idaho 83705 (phone 208-344-1671).

**ILLINOIS** (Belleville, Champaign, Chicago, Elmhurst, O'Hare Field): **Hugh L. Enyart**, 112 Ruth Dr., O'Fallon, Ill. 62269 (phone 618-498-1950).

**INDIANA** (Logansport, Marion, Mentone): **William Pfarrer**, 604 Green Hills Dr., Logansport, Ind. 46947.

**IOWA** (Des Moines): **Ric Jorgensen**, 4055 Kingman, Des Moines, Iowa 50311 (phone 515-255-7656).

**KANSAS** (Topeka, Wichita): **Albin H. Schweers**, 7221 Woodward St., Overland Park, Kan. 66204 (phone 816-374-4267).

**KENTUCKY** (Louisville): **Charles R. Head**, 9412 Habersham Dr., Louisville, Ky. 40222 (phone 502-425-9237).

**LOUISIANA** (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Shreveport): **Norman L. Gunn**, 4510 Willowick Blvd., Alexandria, La. 71301 (phone 318-487-2431).

**MAINE** (Limestone): **Alban E. Cyr**, P. O. Box 160, Caribou, Me. 04736 (phone 207-492-4171).

**MARYLAND** (Andrews AFB, Baltimore): **James W. Poultney**, P. O. Box 31, Garrison, Md. 21055 (phone 301-363-0795).

**MASSACHUSETTS** (Boston, Falmouth, Florence, Hanscom AFB, Lexington, Taunton, Worcester): **Frederick J. Gavin, Jr.**, 38 Tremlett St., Boston, Mass. 02124 (phone 617-282-2059).

**MICHIGAN** (Detroit, Kalamazoo, Lansing, Marquette, Mount Clemens, Oscoda, Petoskey, Sault Ste. Marie, Southfield): **Dorothy Whitney**, 3494 Orchard Lake Rd., W. Bloomfield, Mich. 48033 (phone 313-682-4550).

**MINNESOTA** (Duluth, Minneapolis, St. Paul): **Joseph J. Sadowski**, 1922 Malvern St., St. Paul, Minn. 55113 (phone 612-631-2781).

**MISSISSIPPI** (Biloxi, Columbus, Jackson): **Billy A. McLeod**, P. O. Box 1274, Columbus, Miss. 39701 (phone 601-328-0943).

**MISSOURI** (Kansas City, Knob Noster, Springfield, St. Louis): **Robert E. Combs**, 2003 W. 91st St., Leawood, Kan. 66206 (phone 913-649-1863).

**MONTANA** (Great Falls): **James E. Huber**, P. O. Box 685, Great Falls, Mont. 59403.

**NEBRASKA** (Lincoln, Omaha): **Lyle O. Remde**, 4911 S. 25th St., Omaha, Neb. 68107 (phone 402-731-4747).

**NEVADA** (Las Vegas, Reno): **Dale G. Nelson**, 1321 Ralston Dr., Las Vegas, Nev. 89106 (phone 702-736-7071).

**NEW HAMPSHIRE** (Manchester, Pease AFB): **William W. McKenna**, RFD #5, Strawberry Hill Rd., Bedford, N. H. 03102 (phone 603-472-5504).

**NEW JERSEY** (Andover, Atlantic City, Belleville, Camden, Chatham, Cherry Hill, E. Rutherford, Forked River, Fort Monmouth, Jersey City, McGuire AFB, Newark, Trenton, Wallington, West Orange): **Leonard Schiff**, 246 Franklin Ave., Cliffside Park, N. J. 07010 (phone 201-861-2950).

**NEW MEXICO** (Alamogordo, Albuquerque, Clovis): **William J. Denison**, 2615 Vista Larga Ave., N. E., Albuquerque, N. M. 87110 (phone 505-264-1733).

**NEW YORK** (Albany, Bethpage, Binghamton, Buffalo, Catskill, Chautauque, Griffiss AFB, Hartsdale, Ithaca, Long Island, New York City, Niagara Falls, Patchogue, Plattsburgh, Riverdale, Rochester, Staten Island, Syracuse): **Kenneth C. Thayer**, R. D. #1, Ava, N. Y. 13303 (phone 315-827-4241).

**NORTH CAROLINA** (Charlotte, Fayetteville, Goldsboro, Greensboro, Raleigh): **Dozier E. Murray, Jr.**, 1600 Starbrook Dr., Charlotte, N. C. 28210 (phone 704-523-0045).

**NORTH DAKOTA** (Grand Forks, Minot): **Leo P. Makelky**, 611 16th Ave., S. W., Minot, N. D. 58701 (phone 701-839-5186).

**OHIO** (Akron, Cincinnati, Cleveland, Columbus, Dayton, Newark, Toledo, Youngstown): **Edward H. Nett**, 1449 Ambridge Rd., Centerville, Ohio 45459 (phone 513-461-4823).

**OKLAHOMA** (Altus, Enid, Oklahoma City, Tulsa): **David L. Blankenship**, P. O. Box 51308, Tulsa, Okla. 74151 (phone 918-835-3111, ext. 2207).

**OREGON** (Corvallis, Eugene, Portland): **Philip G. Saxton**, 15909 N. E. Morris, Portland, Ore. 97230 (phone 503-254-0145).

**PENNSYLVANIA** (Allentown, Beaver Falls, Chester, Erie, Homestead, Horsham, King of Prussia, Lewistown, New Cumberland, Phila-

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**WISCONSIN** (Madison, Milwaukee): **Charles W. Marotske**, 7945 S. Verdev Dr., Oak Creek, Wis. 53154 (phone 414-762-4383).

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30-34	65,000	<del>50,000</del>	12,500	10.00
35-39	50,000	<del>40,000</del>	12,500	10.00
40-44	35,000	<del>25,000</del>	12,500	10.00
45-49	20,000	<del>15,000</del>	12,500	10.00
50-54	12,500	<del>10,000</del>	12,500	10.00
55-59	10,000	<del>10,000</del>	12,500	10.00
60-64	7,500	<del>7,500</del>	12,500	10.00
65-69	4,000	<del>4,000</del>	12,500	10.00
70-75	2,500	<del>2,500</del>	12,500	10.00

### The AFA High-Option Plan

Insured's Age	New Benefit	Old Benefit	Extra Accidental Death Benefit*	Monthly Cost Individual Plan
20-24	\$112,500	<del>\$100,000</del>	\$12,500	\$15.00
25-29	105,000	<del>90,000</del>	12,500	15.00
30-34	97,500	<del>75,000</del>	12,500	15.00
35-39	75,000	<del>60,000</del>	12,500	15.00
40-44	52,500	<del>37,500</del>	12,500	15.00
45-49	30,000	<del>22,500</del>	12,500	15.00
50-54	18,750	<del>15,000</del>	12,500	15.00
55-59	15,000	<del>15,000</del>	12,500	15.00
60-64	11,250	<del>11,250</del>	12,500	15.00
65-69	6,000	<del>6,000</del>	12,500	15.00
70-75	3,750	<del>3,750</del>	12,500	15.00

### Optional Family Coverage

(May be added either to the Standard or High-Option Plans)

Insured's Age	Spouse Benefit New	Spouse Benefit Old	Benefit, Each Child**	Monthly Cost Family Coverage
20-24	\$10,000	<del>\$6,000</del>	\$2,000	\$2.50
25-29	10,000	<del>6,000</del>	2,000	2.50
30-34	10,000	<del>6,000</del>	2,000	2.50
35-39	10,000	<del>6,000</del>	2,000	2.50
40-44	7,500	<del>5,250</del>	2,000	2.50
45-49	5,000	<del>4,050</del>	2,000	2.50
50-54	4,000	<del>3,000</del>	2,000	2.50
55-59	3,000	<del>3,000</del>	2,000	2.50
60-64	2,500	<del>2,250</del>	2,000	2.50
65-69	1,500	<del>1,200</del>	2,000	2.50
70-75	750	<del>750</del>	2,000	2.50

\*In the event of an accidental death occurring within 13 weeks of the accident, the AFA plan pays a lump sum benefit of \$12,500 in addition to your plan's regular coverage benefit, except as noted under AVIATION DEATH BENEFIT, below.

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**Disability Waiver of Premium,** if you become totally disabled for at least nine months, prior to age 60.

**Keep Your Coverage at Group Rates to Age 75,** if you wish, even if you leave the military service.

**Guaranteed Conversion Provision.** At age 75 (or at any time on termination of membership) the amount of insurance shown for your age group at the time of conversion may be converted to a permanent plan of insurance, regardless of your health at that time.

**Reduction of Cost by Dividends.** Net cost of insurance to AFA insured persons has been reduced by payment of dividends in 10 of the last 13 years. However, dividends naturally cannot be guaranteed.

**Convenient Premium Payment Plans.** Premium payments may be made by monthly government allotment, or direct to AFA in quarterly, semi-annual or annual installments.

**EFFECTIVE DATE OF YOUR COVERAGE.** All certificates are dated and take effect on the last day of the month in which your application for coverage is approved. AFA Military Group Life Insurance is written in conformity with the insurance regulations of the State of Minnesota. The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minnesota as trustee of the Air Force Association Group Insurance Trust.

**EXCEPTIONS.** There are a few logical exceptions to this coverage. They are:

**Group Life Insurance:** Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane shall not be effective until your coverage has been in force for 12 months.

**The Accidental Death Benefit and Aviation Death Benefit** shall not be effective if death results: (1) From injuries intentionally self-inflicted while sane or insane, or (2) From injuries sustained while committing a felony, or (3) Either directly or indirectly from bodily or mental infirmity, poisoning or asphyxiation from carbon monoxide, or (4) During any period a member's coverage is being continued under the waiver of premium provision, or (5) From an aviation accident, either military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved, except as provided under AVIATION DEATH BENEFIT.

### PLEASE RETAIN THIS MEDICAL INFORMATION BUREAU PRENOTIFICATION FOR YOUR RECORDS

Information regarding your insurability will be treated as confidential. United Benefit Life Insurance Company may, however, make a brief report thereon to the Medical Information Bureau, a nonprofit membership organization of life insurance companies, which operates an information exchange on behalf of its members. If you apply to another Bureau member company for life or health insurance coverage, or a claim for benefits is submitted to such a company, the Bureau, upon request, will supply such company with the information in its file.

Upon receipt of a request from you, the Bureau will arrange disclosure of any information it may have in your file. (Medical information will be disclosed only to your attending physician.) If you question the accuracy of information in the Bureau's file, you may contact the Bureau and seek a correction in accordance with the procedures set forth in the federal Fair Credit Reporting Act. The address of the Bureau's information office is P.O. Box 105, Essex Station, Boston, Mass. 02112. Phone (617) 426-3660.

United Benefit Life Insurance Company may also release information in its file to other life insurance companies to whom you may apply for life or health insurance, or to whom a claim for benefits may be submitted.



# Increase in Premium MILITARY GROUP LIFE INSURANCE



## APPLICATION FOR AFA MILITARY GROUP LIFE INSURANCE



Group Policy GLG-2625  
United Benefit Life Insurance Company  
Home Office Omaha Nebraska

Full name of member \_\_\_\_\_  
 Rank Last First Middle  
 Address \_\_\_\_\_  
 Number and Street City State ZIP Code

Date of birth Mo. Day Yr.	Height	Weight	Social Security Number
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Please indicate category of eligibility and branch of service.

Extended Active Duty       Air Force  
 Ready Reserve or National Guard       Other \_\_\_\_\_ (Branch of service)  
 Air Force Academy       \_\_\_\_\_ Academy  
 ROTC Cadet \_\_\_\_\_  
 Name of college or university

Name and relationship of primary beneficiary \_\_\_\_\_

Name and relationship of contingent beneficiary \_\_\_\_\_

This insurance is available only to AFA members

I enclose \$10 for annual AFA membership dues (includes subscription (\$9) to AIR FORCE Magazine).  
 I am an AFA member.

Please indicate below the Mode of Payment and the Plan you elect.

### HIGH OPTION PLAN

Members Only	Members and Dependents
<input type="checkbox"/> \$ 15.00	<input type="checkbox"/> \$ 17.50
<input type="checkbox"/> \$ 45.00	<input type="checkbox"/> \$ 52.50
<input type="checkbox"/> \$ 90.00	<input type="checkbox"/> \$105.00
<input type="checkbox"/> \$180.00	<input type="checkbox"/> \$210.00

### Mode of Payment

**Monthly** government allotment. I enclose 2 months' premium to cover the period necessary for my allotment to be established.

**Quarterly.** I enclose amount checked.

**Semiannually.** I enclose amount checked.

**Annually.** I enclose amount checked.

### STANDARD PLAN

Members Only	Members and Dependents
<input type="checkbox"/> \$ 10.00	<input type="checkbox"/> \$ 12.50
<input type="checkbox"/> \$ 30.00	<input type="checkbox"/> \$ 37.50
<input type="checkbox"/> \$ 60.00	<input type="checkbox"/> \$ 75.00
<input type="checkbox"/> \$120.00	<input type="checkbox"/> \$150.00

Names of Dependents To Be Insured	Relationship to Member	Dates of Birth			Height	Weight
		Mo.	Day	Yr.		

Have you or any dependents for whom you are requesting insurance ever had or received advice or treatment for: kidney disease, cancer, diabetes, respiratory disease, epilepsy, arteriosclerosis, high blood pressure, heart disease or disorder, stroke, venereal disease or tuberculosis? Yes  No

Have you or any dependents for whom you are requesting insurance been confined to any hospital, sanitarium, asylum or similar institution in the past 5 years? Yes  No

Have you or any dependents for whom you are requesting insurance received medical attention or surgical advice or treatment in the past 5 years or are now under treatment or using medications for any disease or disorder? Yes  No

IF YOU ANSWERED "YES" TO ANY OF THE ABOVE QUESTIONS, EXPLAIN FULLY including date, name, degree of recovery and name and address of doctor. (Use additional sheet of paper if necessary.)

I apply to United Benefit Life Insurance Company for insurance under the group plan issued to the First National Bank of Minneapolis as Trustee of the Air Force Association Group Insurance Trust. Information in this application, a copy of which shall be attached to and made a part of my certificate when issued, is given to obtain the plan requested and is true and complete to the best of my knowledge and belief. I agree that no insurance will be effective until a certificate has been issued and the initial premium paid.

I hereby authorize any licensed physician, medical practitioner, hospital, clinic or other medical or medically related facility, insurance company, the Medical Information Bureau or other organization, institution or person, that has any records or knowledge of me or my health, to give to the United Benefit Life Insurance Company any such information. A photographic copy of this authorization shall be as valid as the original. I hereby acknowledge that I have a copy of the Medical Information Bureau's prenotification information.

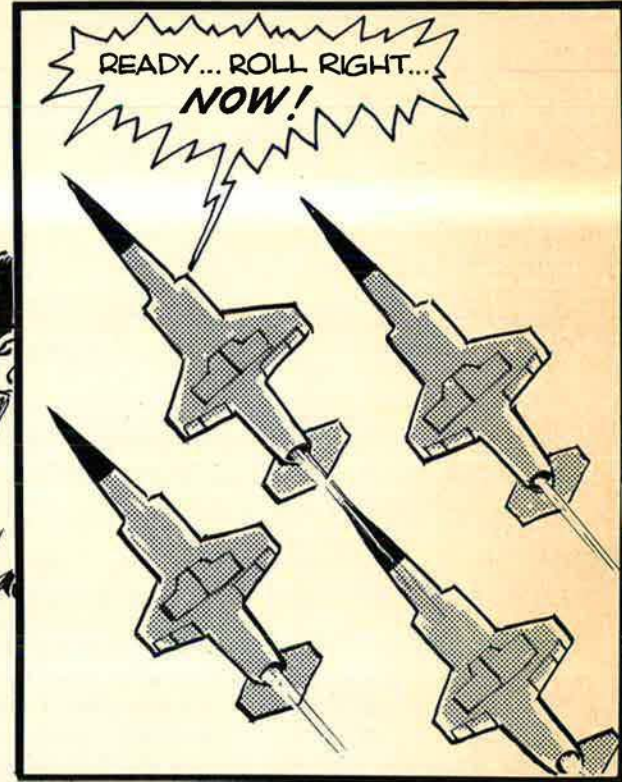
Date \_\_\_\_\_, 19\_\_\_\_ Member's Signature \_\_\_\_\_



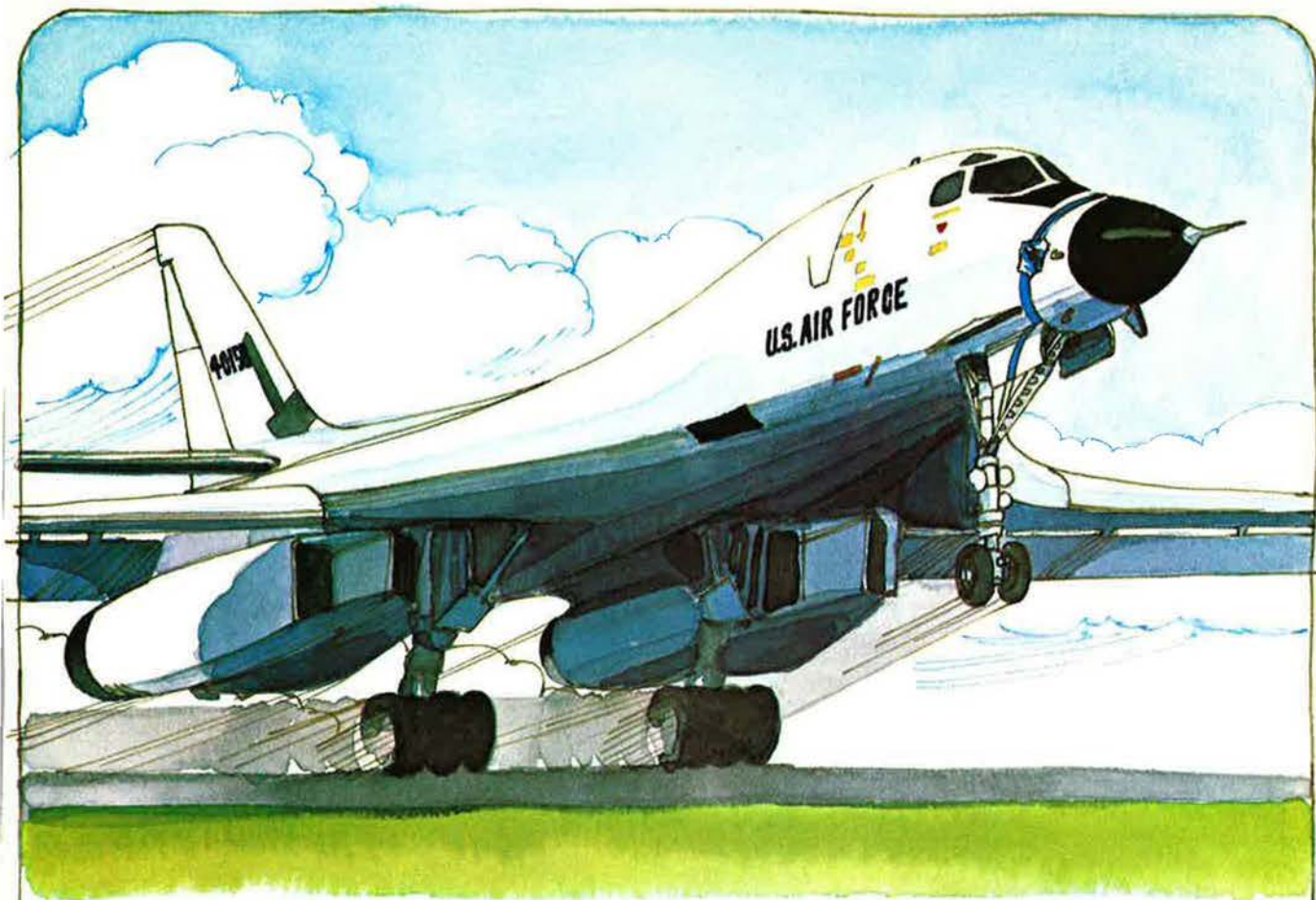
Bob Stevens'

# "There I was..."

TO ALL WHO HAVE SEEN OUR NATION'S OUTSTANDING AIR DEMONSTRATION TEAM'S PERFORM, ONE THING IS VERY APPARENT—THEIR ABSOLUTE PRECISION IN EVERYTHING THEY DO. NOW IF WE CARRY THAT PRECISION INTO THE POST-FLIGHT PHASE, WE HAVE...







## We produce VSDs for the F-15. Now the B-1 will have ours, too.

Sperry is fast becoming *the* name in cathode ray tube displays for aircraft of all types—fighter, bomber, transport and helicopter.

F-15 pilots have been praising our Vertical Situation Display, commenting on its "sharp, bright symbols" and the ability to read the display even when the cockpit is bathed in sunlight.

Now Sperry is delivering VSDs to Rockwell International for the new B-1 strategic bomber. In addition to displaying symbology normally seen on an electromechanical attitude director indicator, the Sperry VSD has provisions for displaying a picture of approaching terrain sensed by a low light level television or an infrared system.

Sperry CRTs have also been

used successfully in a number of subsonic aircraft. They are being used in NASA's STOLAND project aboard a Convair 340, deHavilland Buffalo, Twin Otter and a Bell UH-1. The Air Force used a Sperry display in a C-141 during an all-weather landing program.

In the near future our CRT will be installed in Boeing's YC-14 as an electronic attitude director indicator, and aboard Navy SH-3H helicopters, where our display will be part of Teledyne Systems' tactical navigation system.

If you would like to test our CRT capability, call on us. We're Sperry Flight Systems of Phoenix, Arizona, a division of Sperry Rand Corporation, making *flying* machines do more so man can do more.



B-1 VSD

 **SPERRY**  
FLIGHT SYSTEMS



# What can outfox a Foxbat? An Eagle with Sparrows.

F-15. The world-record-setting time-to-climb fighter that brings true all-weather air superiority into the inventory.

Combining advanced IFF with long-range look-down, shoot-down radar and improved AIM-7F Sparrow missiles, the F-15 can identify and attack hostile aircraft far beyond visual range. Tests have demonstrated the lethal accuracy of the F-15/Sparrow combination against high Mach targets at extremely high altitudes.

For close-range attacks, the F-15 combines high-G maneuverability with AIM-9 Sidewinders and an M-61 20mm Gatling gun.

The F-15. The air superiority fighter that lives up to its name.

## F-15 Eagle

MCDONNELL DOUGLAS

