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AIR FORCE MAGAZINE

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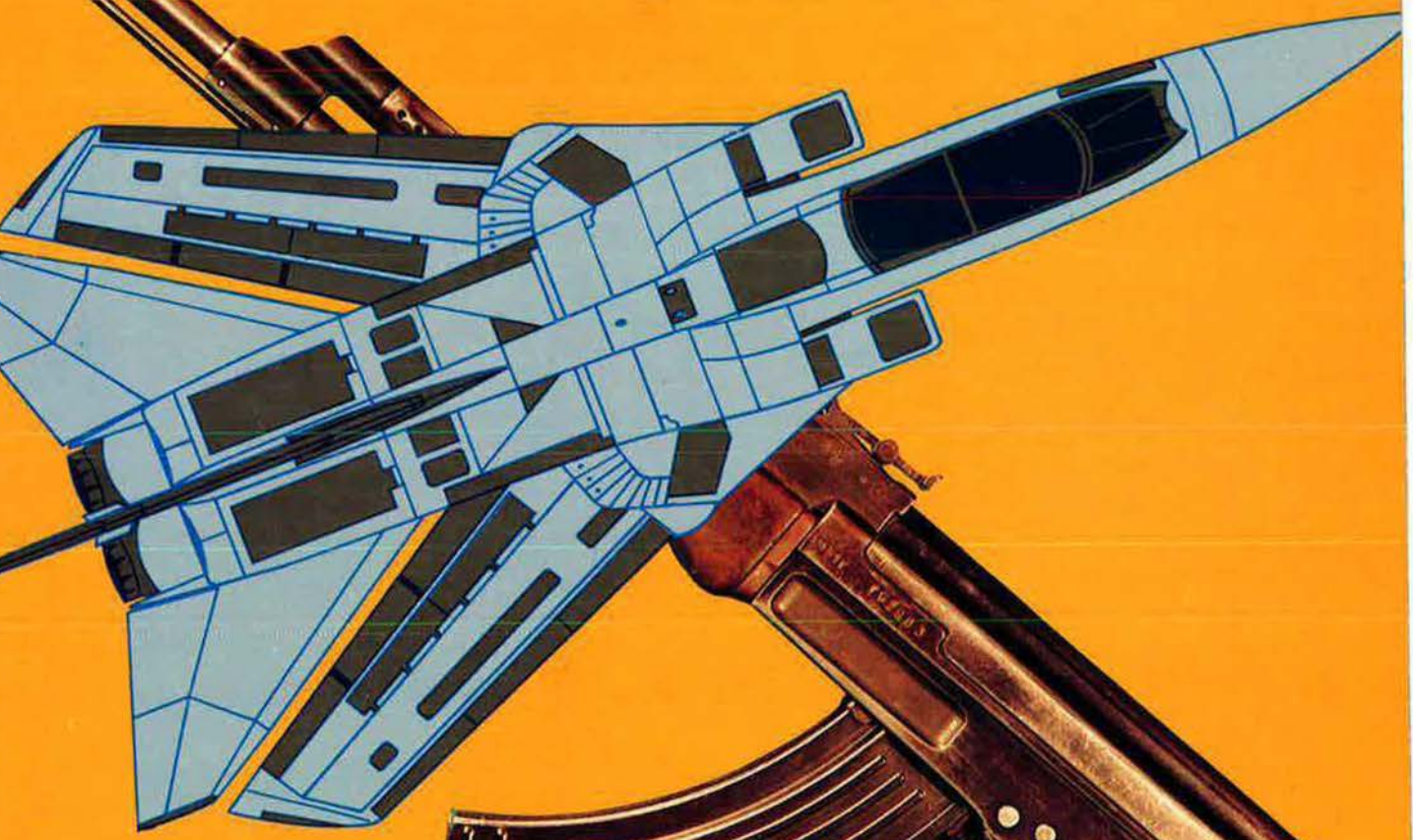
The Military Balance 1983/84



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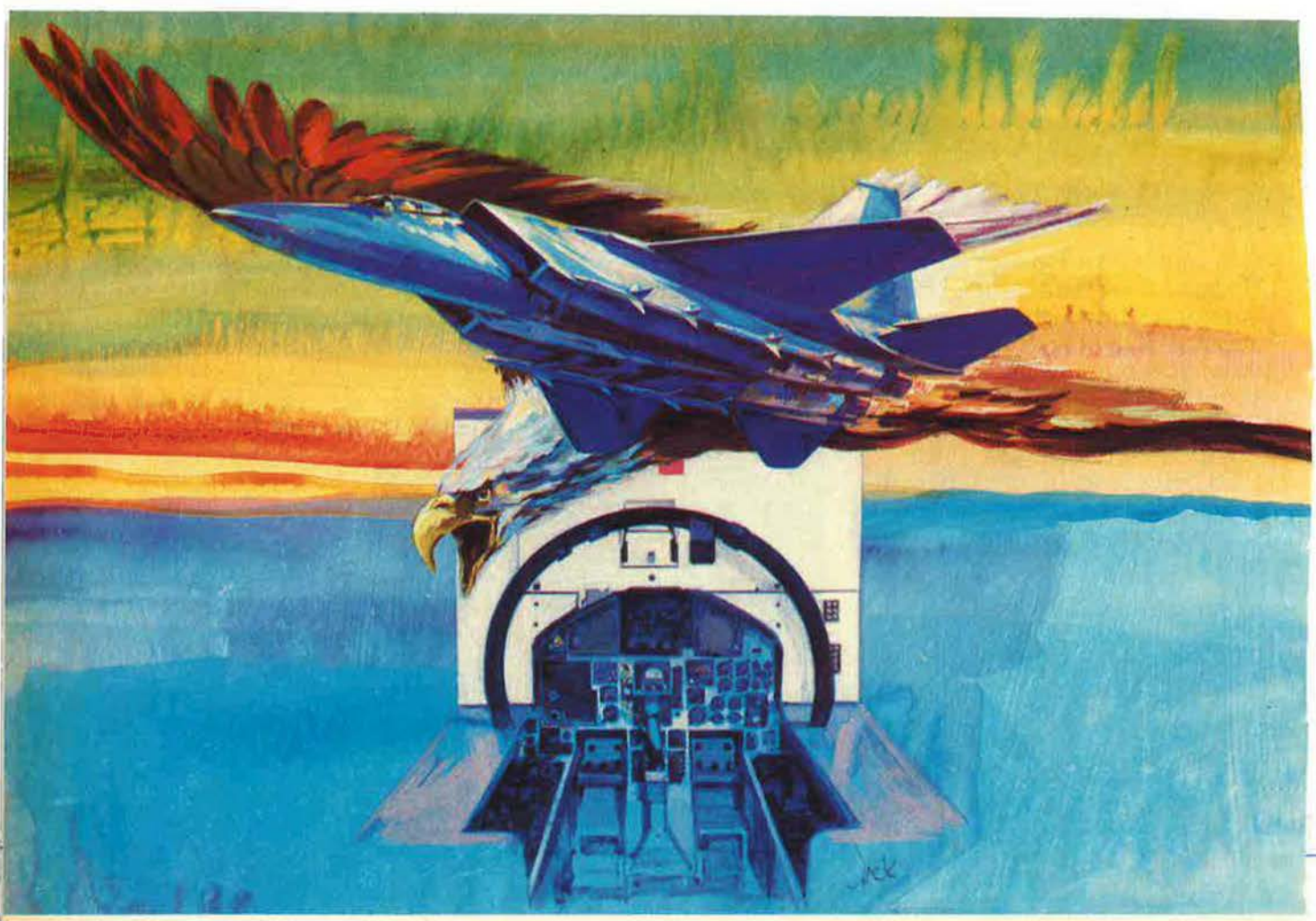

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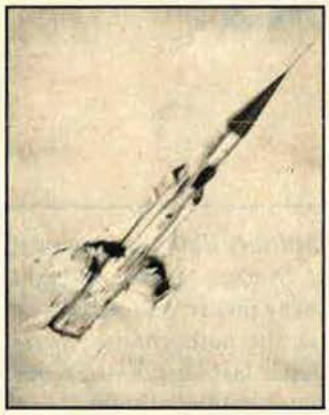

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About the cover: This issue features the exclusive US presentation of "The Military Balance 1983/84," compiled by The International Institute of Strategic Studies in London. "The Military Balance" is a handy year-round quantitative reference guide to the world's armed forces. Cover design by Art Director William A. Ford.

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AN EDITORIAL

Ours or Theirs?

As in Decembers past, this issue updates *The Military Balance*, compiled by The International Institute for Strategic Studies. It is a thought-provoking, quantitative assessment of world military power, and serves—in conjunction with such companion documents as the authoritative *Soviet Military Power* published by the Secretary of Defense last March—to reveal the awesome and growing dimensions of the Soviet military threat.

Some, however, will persist smugly in twisting those revelations into a *gotcha* question: "If the Soviet force is that good and that powerful, which force would you rather have—ours or theirs?" A response of "ours" will be taken to mean that efforts to upgrade and modernize US forces are wasteful. A response of "theirs" would instantly and dangerously undermine the credibility of US deterrent power.

The problem with the *gotcha* crowd is that their *question* is wrong. The relative value of military forces can be assessed only in the context of the strategic objectives those forces serve. Given the militant, offensive nature of Soviet doctrine and the facts of Soviet geography, then one would choose Soviet forces as preferable.

But US forces become preferable—for our purposes—since US strategic doctrine is different from that of the Soviet Union. We have asserted that we will not start a war, and we have postured our forces accordingly. Our need is for a force that responds to aggression, not a force that initiates it. No serious planner on our side aspires to mirror-image Soviet forces. The geography of our situation and that of our allies—widely separated, lacking land lines of communication, without depth for maneuver, not self-sustainable, and having forsworn the initiative of firing the first shot—puts a premium on survivability, flexibility, and mobility. We must be ready to respond to Soviet adventurism or aggression in a broad range of circumstances.

The political limitations of sovereign, democratic governments dictate that, in peacetime, we forgo any attempt to achieve *quantitative* comparability with the Soviets. Lacking quantitative balance, we must exploit fully the available technology in our weapon systems and optimize the training of those who operate and support them. We can do these sorts of things very well, if we will. We need to use effectively the full range of our technology, our tactics, and our imagination.

The lack of a quantitative military balance, so evident in the statistics we present in this issue, demands that we busy ourselves with helping shape our strategies and design our forces to do the *right things*—not with asking cute, clever, and *wrong* questions. And, in the doing, we must not require our defense planners to cut it too close.

Defense planning is not a precise art. We would do a great disservice if we were to insist on a force posture too precisely developed and too finely drawn—and then have it turn out to be *precisely second-best*.

—RUSSELL E. DOUGHERTY, EDITOR IN CHIEF AND PUBLISHER

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JTIDS, the Joint Tactical Information Distribution System, will soon be a reality as the Collins Government Avionics Division of Rockwell International and Singer's Kearfott Division complete full-scale development and begin production of Class 2 terminals.

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Singer and Rockwell are committed to providing the Air Force and Army the lightning-fast information they need. To find out more about the JTIDS program and Rockwell's role in it, contact:

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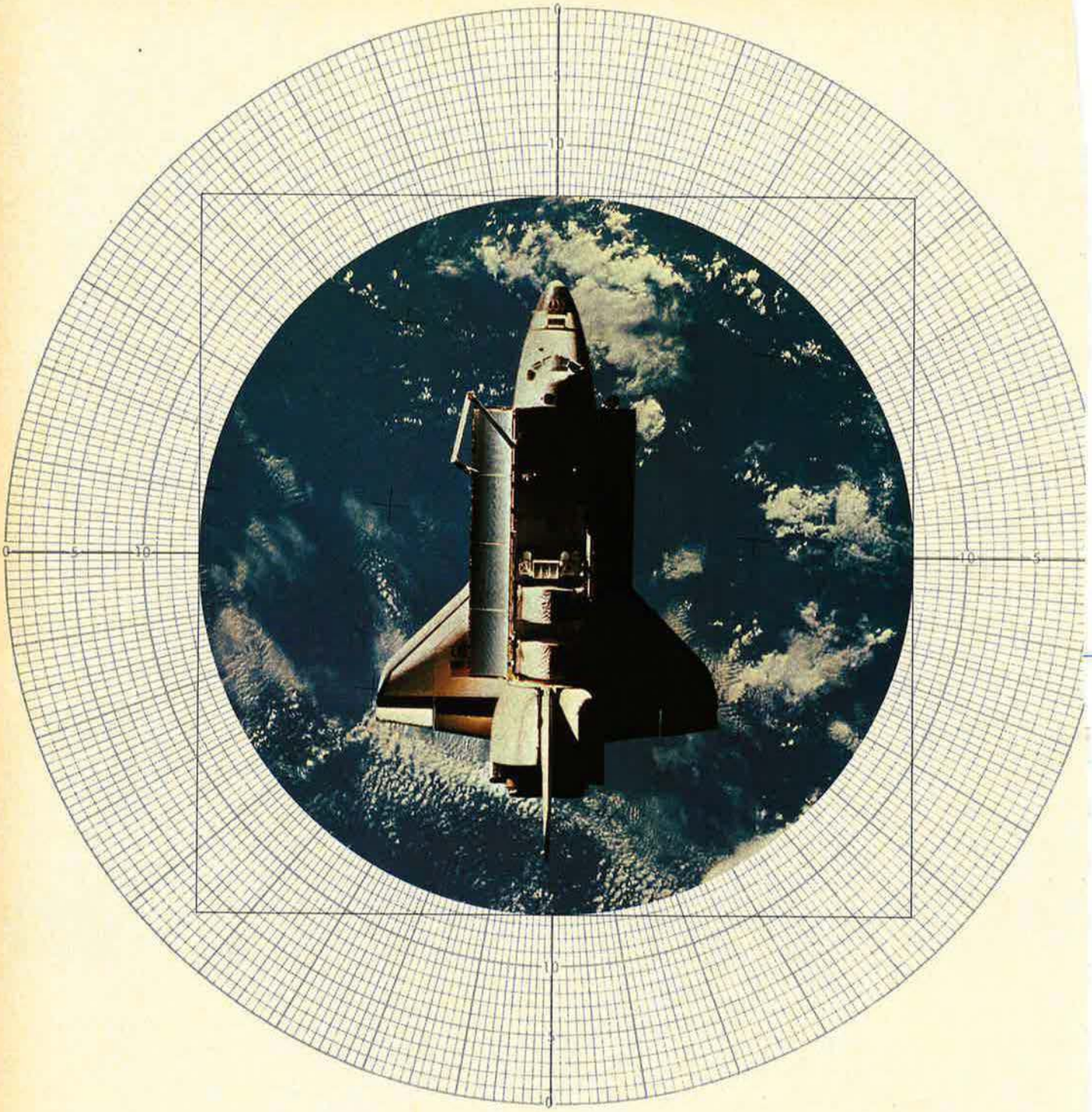

A New Frontier

The outstanding achievements of America's Space Transportation System have opened a new frontier—the development of space as a great natural resource. As each shuttle performs a vast array of in-orbit tasks, essential flight and payload data are collected, processed, and transmitted by on-board Harris equipment. From this information, critical decisions are made concerning the uses and benefits to be derived from operating in space. As a key element in the successful development of space, the Tracking and Data Relay Satellite System uses Harris deployable antennas to provide the vital communications link between hundreds of spacecraft and Earth. Building on a long tradition of success in aerospace technology, Harris is a pioneer in this new frontier.

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AIRMAIL

Footsteps of Giants

I found the cover story of the October issue of AIR FORCE Magazine inspiring *("In the Footsteps of Giants," p. 34).* The story of the deeds of the best airlift crew, aerial warfare tactician, strategic aircrew, and missile crew and their awards in honor of Generals Tunner, Chennault, LeMay, and Power made mighty interesting reading.

Those who would denigrate US military preparedness should remove their heads from the sand and be made aware of the airmen of the United States Air Force who have made such unselfish sacrifices in order to make our defensive capabilities second to none. They richly deserve recognition, as well as our gratitude.

Harold O. Christensen
San Francisco, Calif.

I was very interested—as well as impressed—by the accomplishments of the aircrews and missile crew presented in your article "In the Footsteps of Giants" in the October 1983 issue. Their combined outstanding performance is to be commended.

However, one area that seems to be somewhat questionable is the manner in which these individuals were presented. On page 36, we see photographs of Lt. Col. Ralph H. Oates and Lt. Col. Jere T. Wallace, and on page 38 is a very official photograph of Capt. Michael S. Reese. All three are pilots. In contrast, on page 39 is an excellent *group* photograph of the entire award-winning missile crew (S-200) for 1983.

I was a B-52H electronic warfare officer for four years and observed that bomber crews always consisted of six crew members. Likewise, although I was never on a C-5 crew, I am sure that their crews are made up of more than one individual. This fact is established by Colonel Oates's statement that he attributed the successful recovery of the aircraft to the crew's experience and calm coordination. Captain Reese also proved he was not the only person on the crew when he stated, "Each crew member flew every mission with the goal of doing his best every time out."

Since these aircrews are made up of many talented and essential individuals, why weren't photographs of all the crew members included in the article? I was glad to see the missile crew was given full exposure.

I fear this article will only help to reinforce a predominant Air Force mentality that the pilot, not the crew, is responsible for the crew's achievements. With an improving economy, maybe some of these forgotten crew members, like myself, will find more recognition and greener pastures outside of the Air Force.

Scott P. Moeller
Grand Forks, N. D.

Involving the Users

Your item on the portable handheld computer on page 23 of the October '83 issue *("Aerospace World")* prompts me to write this letter.

I suspect you were working from a Lockheed press release when you developed this item. The computer in the picture on page 24 appears to be a standard Epson model, which can be purchased by anyone for about $800, rather than one "developed by Lockheed-Georgia at Marietta." Indeed, the brand name "EPSON" is clearly visible on the computer in the picture.

The calculation of aircraft performance data from tabulated or graphic flight-manual information is a straightforward, if somewhat tedious, mathematical process. Application of a handheld computer to this task would be similarly straightforward. It does not speak well for Air Force utilization of operational and computer expertise possessed by blue-suiters that such application need be accomplished by a contractor.

Irrespective of his technical background or interest level, it is not in the job description of, say, a C-130 pilot or navigator to develop computational aids, such as the flight data computer described in your item. Those Air Force agencies tasked with such development, however, do not appear to be responsive to the needs of end-users. This results in many computer applications that could be developed in-house actually being developed by (expensive) contractors. The flight data computer is but one example of this. I have observed many others.

I suggest that a thorough overhaul of the Air Force data automation structure is long overdue, with emphasis to be placed on constructive involvement in all phases of computer application development by the end-users of the applications. Could it be that such involvement would expose the preponderance of unproductive bureaucrats in data automation billets?

In the case of the flight data computer, I am certain (based on some years of experience with aircraft, mathematics, computers, and crew members) that it would be fairly easy to assemble a group of C-130 crew members who would be both capable of and willing to develop the required programs at little added expense to the taxpayer. Current data-processing directives do not allow this, and I do not expect to see any such thing happen in the foreseeable future.

Capt. Richard F. Colarco, USAF
Offutt AFB, Neb.

Project Warrior

I was pleased to see in my October issue of AIR FORCE Magazine the article by Capt. Valerie Elbow, USAF, entitled "The Warrior Spirit." I would like, however, to amplify the Captain's

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article by noting that USAF's commitment to the study of history and heritage extends further than was indicated.

Starting in September of this year, the University of Alabama began a master of arts in history with a concentration in military history taught at the Air University at Maxwell AFB. This program was begun at the request of the Air Force and has one track that is specifically designed to allow a student coming to Maxwell for one of the PME schools (especially the Air Command and Staff College) to complete their M.A. in history with a specialization in military history while they are doing their PME work.

Despite very little advance notice and almost no advance publicity, due to the quickness with which the program was instituted, we have enrolled more than fifty students for the first term. It is hoped that next year, with more lead time, we will have even more Air Force officers and noncommissioned officers pursuing an advanced degree focused on their profession.

As a military historian and longtime AFA member, it is especially gratifying to me to see the Project Warrior spirit up close and to see it as a participant.

Anyone interested in this program should either contact the Department of History of the University of Alabama or the Base Education Office at Maxwell AFB.

W. Robert Houston
University, Ala.

EWI Birds

I noted with interest your report that Capt. Pat Rogers, your new EWI bird, is the fourth to have served in the 388th Tactical Fighter Wing *("Intercom," October '83, p. 99).* Sorry, the answer is not four, but five. I also served in the 388th TFW—not once, mind you, but twice.

My first Air Force duty assignment twenty-one years ago was with the 388th at McConnell AFB, Kan. While I was there, that unit was redesignated the 23d TFW, "The Flying Tigers." A year later, I was sent to Thailand where the provisional unit I was assigned was redesignated to—you guessed it—the 388th TFW.

I'm sure that Captain Rogers will carry on the fine tradition of excellence established by the former 388ers who were EWI birds. As the old 388th motto says, "Liberty or Death!"

Lt. Col. Terry A. Arnold, USAF
Alexandria, Va.

• *Colonel Arnold's Education With Industry (EWI) tour at* AIR FORCE *Magazine was in 1976–77. And, as he says, his 388th TFW credentials are impeccable.*—THE EDITORS.

AIRMAIL

The A-10 Bridge

As an armored division operations officer in Germany, I enjoyed the responsive close air support provided by the A-10s of Lt. Col. Paul Dembrowsky's Detachment 1 *("Getting A-10 Firepower Forward," July '83, p. 44).* While my experience as a ground force "customer" confirms the truth of every detail of your A-10 article, you err on the side of (rare?) modesty. These Warthogs and their pilots are superlative.

Whether complementing armored ground forces directly or through OV-10s, hunting by themselves or with Cobras, the A-10s assure consistent target destruction. They do it with class. The design characteristics make for a particularly convinced customer. The low speed and long loiter time help train the inexperienced ground FAC. It's not "two quick passes and homeward bound," regardless of results. Their low-level maneuverability demonstrates continuously how difficult it would be to get an A-10 in your cross hairs, especially if the peacetime low-level restrictions were lifted and if there's another one firing at you. The communication setup means that a platoon leader in trouble can talk directly to the A-10 pilot and bring him in. The pilot's appreciation of the terrain (he's almost sharing it with us on the ground) means that he can understand quickly how to help, and without the lengthy descriptions and briefings that invite misunderstandings and jamming.

Why my enthusiasm? My unit was one of the three French armored divisions in Germany (your article discreetly did not mention this as part of the A-10's work). My ground FACs were French armor and infantry officers with little appreciation of how a pilot sees the ground and with a command of English ranging from none to high-school Shakespeare, and skeptical of using anything beyond their own organic firepower. But you don't discuss Shakespeare with a Warthog—counting to ten and a twenty-word vocabulary are plenty.

The Joint Air Attack Team film (from the Sembach or Frankfurt libraries) convinced us (the French) of their firepower. Colonel Dembrowsky's A-10s convinced us of the availability of immediately useful airpower. Instant coordination, through ATOCs or OV-10s, showed the meaning of the word "responsive." But, further, work with the A-10s provided confidence in using our own Mirages and Jaguars, and 4th ATAF's [Allied Tactical Air Force] F-4s and F-104s. Finally, those A-10s helped lower that persistent threshold of reluctance of calling on another arm, from another service, and from even another country's forces in another language.

The A-10s made the point: Regardless of your national or service orientation, if you plan to fight in Germany, you've got to be able to use allied air—and you can! It helped us make the case for internally streamlining French-allied air request procedures. It made the case for real-time ("integrated" is not an acceptable word) air-ground coordination instead of liaison staffs and long lead times. It helped assure French ground force support to 4th ATAF's exercise Central Enterprise this June, and encouraged the request to 4th ATAF for support of the major French division-level exercise in Germany this fall. That Paul Dembrowsky himself is flying many of these missions is very appropriate.

That your A-10 article comes on the heels of "USAF Doctrine Comes Alive" in the same issue strengthens your point in that discussion of doctrine. Fewer and fewer of the services' tasks are single-service tasks.

The air-ground teams that operate together in the field learn to work things out quickly, as a matter of survival. On the longer term, however, it's vital that this operational understanding connect the services at the top. It focuses our "how to fight" when we coordinate doctrine. And it streamlines an approach to the question "fight with what?" in the competition for resources.

The A-10 is the best bridge ever built between services, and is a far better ally to boot than you would have imagined.

Lt. Col. William Bergman, USA
Washington, D. C.

Florida Veterans

With the Air Force Association standing solidly behind the policy of supporting the medical needs of veterans, I recommend that you devote some space to what has happened and is happening in Florida.

The problems of veterans are not distributed uniformly across the US. In fact, relatively speaking, some areas of the US may have no serious

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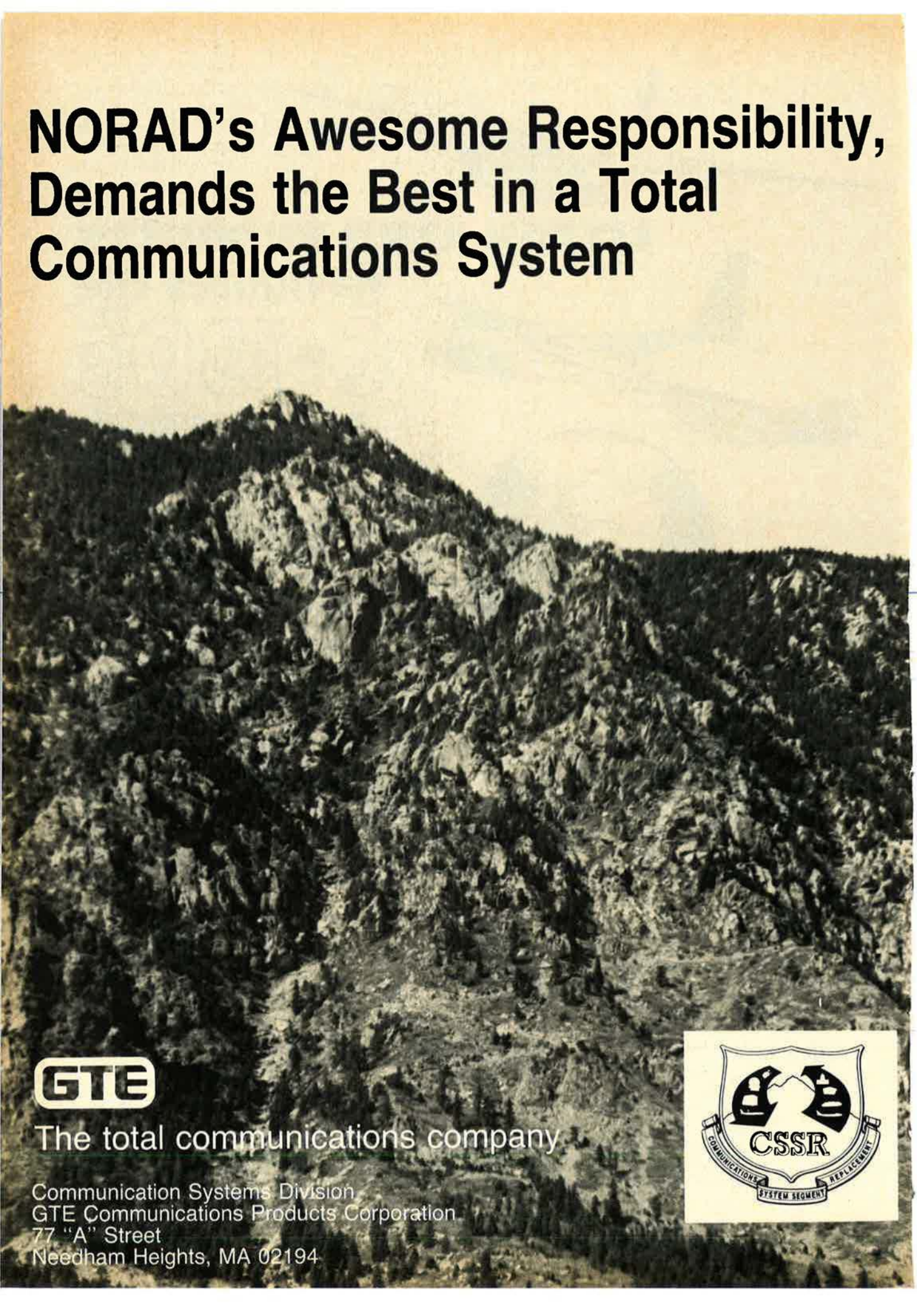

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problems at all. Florida is not one of those areas. As veterans problems are measured, Florida's may be the most severe in the nation. As such, I urge that the weight of AFA be brought to bear on the Florida veterans' needs.

Congressional hearings have just been concluded in Florida to hear the local voices.

The prime point to give attention is the fact that Florida has an enormous medical capability deficiency that is growing daily. The VA and the congressional committee are talking only of relief ten or more years in the future. As many veterans say, "I'll be dead by the time they get around to fixing the situation."

As one of the major growth areas of veterans in the US and with medical facilities already a fraction of the US average, something quick needs to be done in Florida. VA admits that Florida is now short 1,050 beds as measured against the US average of three beds per 1,000 veterans and, with some 6,000 new veterans arriving in Florida monthly, the situation is becoming an emergency. Medical treatment for veterans that is routine in much of the US is unheard of in Florida.

To put it bluntly, AFA now needs to put its weight where its mouth has been. AFA has a positive policy statement respecting veterans needs. Those needs are nowhere as critical as in Florida. Bureaucratic action on this matter will only come about if the various military-related organizations bring sufficient pressure to bear on getting the problem fixed.

AFA should do its part and, as an element of that, I think AIR FORCE Magazine needs to come out with an exposé.

Maj. Gen. John O. Moench,
USAF (Ret.)
Longwood, Fla.

The Word Man

Re: the article "The Word Man" in the September '83 issue:

Twenty years ago, while writing an intelligence manual, I tried to apply the readable writing principles I'd learned in SOS ten years earlier. I hit a stonewall with the civilians, who restored the gobbledygook.

I hope that they have now retired, along with the colonels and generals who never took the course in the first place, and that things are more readable now.

Lt. Col. W. G. Ghormley,
USAF (Ret.)
Georgetown, Tex.

94th Troop Carrier Sqdn.

A unit that hauled combat troops and cargo to the front lines in Europe during World War II has been reactivated as the 94th Airmanship Training Squadron at the Air Force Academy in Colorado.

During WW II, the 94th Troop Carrier Squadron flew C-47 and C-46 aircraft in support of major combat operations, including airborne assaults of Normandy, southern France, Holland, and Germany. The unit also towed Waco CG-4A gliders carrying troops and equipment.

Today, the unit carries on the operations of the Airmanship Division, which was renamed the 94th ATS on October 1. The squadron provides training to cadets in aviation, soaring, and parachuting.

The 94th ATS is interested in obtaining pictures, memorabilia, and information about the 94th TCS for a permanent display of the unit's history. Anyone who wishes to donate such items or to provide information should contact the address below.

MSgt. Edward P. Lapham III,
USAF
94th ATS/DA
USAF Academy
Colorado Springs, Colo. 80840
Phone: (303) 472-2495/7
AUTOVON: 259-2495/7

416th Bomb Wing

The 416th Bombardment Wing (H) located here at Griffiss AFB, N. Y., is in the process of creating a Wing Heritage Hall and needs assistance from previous members.

The 416th Bomb Wing was originally activated as a light bombardment unit in early 1943 at Will Rogers Field, Okla.; it was deactivated at Camp Miles Standish, Me., on October 24, 1945. In January 1959 the 4039th Strategic Wing was activated at Griffiss AFB, and in February 1963 the 4039th was replaced by the reactivated 416th.

Anyone with photos, historical information, or other items of interest from the wing's history who would be willing to permit the wing to use, borrow, or copy the material is requested to contact the address below.

Capt. Probyn Thompson, USAF
416th BMW/HO
Griffiss AFB, N. Y. 13441

ACSC PME Extension

The Air Command and Staff College (ACSC) at Air University will soon extend the time limitation for completion of associate program courses. Members of the 1984 seminar program and enrollees in the correspondence course after January 1, 1984, will be allotted three years to complete this intermediate professional military education (PME) program. However, those officers who fail to complete all requirements within the three-year enrollment period will be barred from reenrollment for a period of two years.

Lt. Col. William E. Klein, Director of Associate Programs at Air Command and Staff College, explained that the present two-year limitation prevents many officers from completing the program because of their duty schedules or frequent PCS moves. The extended time limit should assist officers in such situations and improve overall completion rates for the College's associate programs.

Air Command and Staff College Associate Seminar Programs are conducted at 130 locations worldwide and serve more than 5,000 officers and civilians. Additionally, nearly 9,000 members are enrolled in ACSC correspondence courses offered through the USAF Extension Course Institute.

Col. Robert W. Kline, USAF
Vice Commandant
Air Command and Staff College
Maxwell AFB, Ala.

Frangible Bullet Program

I am soliciting information on the Frangible Bullet Flexible Training (Pinball) Program of World War II to complement research I have been conducting over the past few months. I would very much appreciate hearing from anyone with knowledge of the program, especially from those who actively participated.

Contact me at this address:

Maj. I. L. Hickman, USAF (Ret.)
2524 E. Buena Ventura
Colorado Springs, Colo. 80909
Phone: (303) 475-2557

Barrage Balloons

I am seeking information on the development of barrage balloons in the US during World War II by the Army Air Corps and the Coast Artillery Corps.

I would like to correspond with anyone who was involved in the development or operational use of US barrage balloons. This information is needed for an article on antiaircraft defense.

Please contact me at the address below.

Charles H. Bogart
201 Pin Oak Pl.
Frankfort, Ky. 40601

AIRMAIL

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397th Bomb Group

I am currently preparing a book on the Douglas A-26 Invader in USAF service. It is my intention to devote a section of the book to the 397th Bomb Group, its aircraft, and its activities.

I am in need of additional information and photographs on the 397th. If anyone has such information, I would like to hear from you.

John Horne
15/20-22 Speed St.
Liverpool, N.S.W.
Australia 2170

460th Bomb Group

In several recent issues of AIR FORCE Magazine, I noted requests for information on the 460th Bomb Group and its squadrons—760th, 761st, and 762d—that were in Fifteenth Air Force in Italy during World War II.

For information on these units, please contact the address below, as we are now forming a 460th Bomb Group Association.

Robert F. Cutler
1335 US Hwy. 19 South
Apt. A-16
Clearwater, Fla. 33546
Phone: (813) 536-1018

Collectors' Corner

I am collecting aircraft replica tie tacks for all the aircraft that I have been associated with during my twenty-five-year tour in aircraft maintenance. My collection is complete except for the B-52, B-58, B-47, and KC-135.

I would appreciate any information that would lead me to a source where I might obtain these items.

SMSgt. Norman D. Viehweg,
USAF (Ret.)
3 Wentworth Pl.
Hampton, Va. 23666

I am a USAF Vietnam veteran who was stationed in Thailand from 1972–73. I am also a patch collector of both USAAF and USAF patches.

I picked up only a few Thailand-made patches in the fifteen months that I was stationed there because I didn't collect at the time, but I would now like very much to obtain some Vietnam- or Thailand-made USAF patches (regulation or novelty patches welcome). I will trade World War II AAF patches for Vietnam- or Thailand-made patches. For the best offer of Vietnam- or Thailand-made patches, I will trade my World War II leather China-Burma-India flag.

Anyone interested in trading or selling is asked to contact me.

Kent Johnson
455 E. 81st St.
Kansas City, Mo. 64131

I am looking for complete volumes of AIR FORCE Magazine for the years 1964 through September 1981, or for loose second-hand copies from those years. I would like to receive notes stating the volume, or the year/month of individual copies, and prices. (I am, of course, willing to accept donations.)

I will pay postage and handling once an agreement is worked out. Please send your offers to the address below.

B. J. Douma
Bonifaciusstraat 7
3768 CR Soest
The Netherlands

I will pay the asking price for a copy of the class book of any class that went through basic flight training at Waco AAF after August 1943, but preferably for the class that went through during the months of August and September 1943 (probably 43-L).

I would also like to hear from any of my former students and fellow instructors regarding their interest in a reunion.

John B. McMaster
7004 Osuna N. E.
Albuquerque, N. M. 87109

Many things are hazy after nearly forty years. I think the Mediterranean Allied Air Force had a relatively short life (1944–45?). Also, as I recall, only the Headquarters personnel and members of the few units attached to it wore the MAAF patch. Hence those patches may be scarce. I am about to dispose of the half dozen I have.

If there are more than six requests for my patches, I will give preference to persons having an interest in, or a connection with, MAAF or the MTO.

Lt. Col. Harold C. Banks,
USAF (Ret.)
Lake Tower Apts., #440
Coeur d'Alene, Idaho 83814

I am a military aviation enthusiast who is looking for original Kodak slides of military aircraft that were taken prior to 1972. I will buy individual slides, collections, or will trade. The slides *must* be Kodak originals.

Please contact me at the address below.

Henry Tenby
1226 W. 27th Ave.
Vancouver, B. C.
Canada V6H 2B9

I have two photos of Flying Cadet Class 40-B, Randolph Field, December 9, 1939, that belonged to the late Lt. Col. Richard H. Cole. Dick Cole was the CO of the 359th Bomb Squadron, 303d Bomb Group, and led the first daylight raid on Berlin.

If any person or organization would like these photos, I will be glad to send them free of charge.

Col. Harry P. Wilson,
USAF (Ret.)
109 Towler Dr.
Hampton, Va. 23666

I am in the process of collecting and restoring old aviation items from any country and covering the period from 1915 through the 1950s. Of specific interest are cloth and leather helmets, goggles, and oxygen masks.

I would greatly appreciate hearing from anyone who has these items for sale or who knows the whereabouts of such items.

Col. William L. Evans,
USAF (Ret.)
4390 N. 125 W.
Ogden, Utah 84404

I am looking for Fiberglas flight helmets and oxygen masks, foreign or US. Please send a description and price to the address below.

F. R. Cole
149 Simmons Dr.
East Islip, N. Y. 11730

Where Are You?

I have recently been trying to contact an old friend of mine and have been unsuccessful.

Could anyone tell me what became of Richard (Dick) Stevens? At one time he lived on Oxford Avenue in Buffalo, N. Y. He helped organize the AFA chapter, the Air Force Reserve squadron in Buffalo, and the New York Air National Guard at Niagara Falls.

Anyone with any information is asked to contact me at the address below.

William J. Keeler, Sr.
25391 Classic Dr.
Mission Viejo, Calif. 92691

I am trying to locate friends who were stationed at Moore Army Air Field, McAllen, Tex., from 1943–45. I would like to inform them of the death of my wife, Dorotha Roberson (Hall).

My late dear wife was in the WAAC and WAC and at Moore AAF—she worked in the IG section. I would very much like to hear from her (and my) many friends.

MSgt. Gilmer M. Hall,
USAF (Ret.)
Rte. 2, Box 293
Comfort, Tex. 78013

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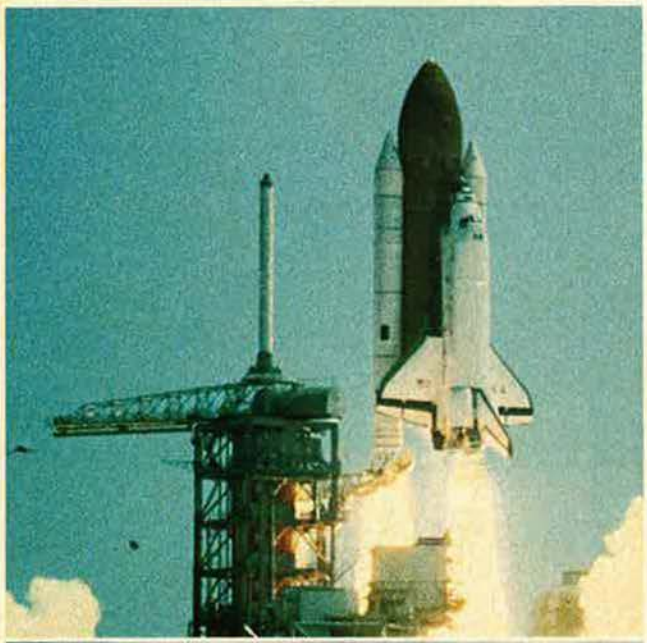

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IN FOCUS...

The Half-Zero Option

By Edgar Ulsamer, SENIOR EDITOR (POLICY & TECHNOLOGY)

"Unilateral build-down" concessions undermine START, meet with more Soviet intransigence.

Washington, D. C., November 2

Soviet intransigence at the two major arms-control negotiations under way in Geneva—the Strategic Arms Reduction Talks (START) and discussions of Intermediate-Range Nuclear Forces (INF)—reportedly continues in spite of significant new US concessions, beyond those offered earlier this year.

As President Reagan explained on October 18, "We stand ready to make any arrangement with the Soviets which will be verifiable and fair to all sides. This includes eliminating an entire class of nuclear weapons [IRBMs, or intermediate-range ballistic missiles] or, if they won't go that far, at least a portion—and the more the better. But we can't negotiate forever with ourselves. If Soviet intransigence continues, we will move forward to reestablish balance and ensure NATO's deterrent ability."

The Soviet response to US efforts to find an equitable solution to the IRBM problem has been what he termed a "half-zero option—zero for us, and many hundred of warheads for them." In terms of START, the President stressed that "from the first day of [these] negotiations, our highest goal has been to achieve a stable balance at reduced levels of nuclear arsenals. We want to reduce the weapons of war, pure and simple."

Early in October the Administration announced the results of a detailed review of its START position involving intense consultations with Congress and the bipartisan Scowcroft Commission that melded essential strategic force-modernization goals with this country's arms-control objectives. As Kenneth L. Adelman, Director of the US Arms Control and Disarmament Agency, explained to Congress: "We are incorporating into START a proposal for a mutual guaranteed build-down designed to encourage stabilizing systems."

This proposal, tabled in Geneva on October 6, 1983, contains specific provisions for "building down missile warheads and, concurrently, for addressing the parallel build-down on bombers." Also, Mr. Adelman explained, this country is "willing to explore ways to limit further the size and capability of air-launched cruise missile forces in the context of reciprocal Soviet flexibility on items of concern to us."

The US proposal for a mutual, guaranteed build-down is somewhat fluid to provide negotiating flexibility. Central features of the US build-down formula that are probably firm include a provision linking reductions to modernization using variable ratios that identify how many existing nuclear warheads must be withdrawn as new warheads of various types are deployed. The objective here is to squeeze the ballistic missile arsenals of each side down to 5,000 over an eight-year period. While not all pertinent details of this provision are known, the basic concept is to insist that MIRVed ICBMs are to be reduced at a two-for-one ratio, meaning that for each new MIRV, two existing warheads have to be taken out of the inventory. In the case of SLBMs, the ratio is three for two, and in the case of single-RV ICBMs—presumably of the US Midgetman type—the ratio is one for one.

The US negotiators at the Geneva START negotiations have also been instructed to seek a concurrent build-down of bombers, including additional limitations on the number of ALCMs carried by strategic bombers.

The Soviet response to the two sets of concessions offered by the US has been confined to "some adjustments" involving peripheral issues rather than "the issues central to START," according to ACDA Director Adelman.

Sixteen US Senators, meanwhile, warned the White House in a joint letter that recent US moves constitute a "unilateral build-down" that seriously undermines the START negotiations. Coupled to this warning was the admonition that "these unilateral actions be suspended so that our negotiators in Geneva will be able to bargain from a position of strength." In recent months, the group of Senators wrote, the US engaged in the "unilateral deactivation of 292 strategic missiles and bombers counted in the SALT II Treaty, including Polaris SLBMs, Titan II ICBMs, and B-52D bombers. These forces carried over 500 nuclear warheads—or more than one-third of the existing US nuclear megatonnage."

Further, the Senators claimed, the Administration's strategic force modernization has also been cut back "unilaterally by at least forty-six percent, mostly because of MX and B-1B reductions." The sixteen Senators expressed special concern over the Administration's plans—first published in this space two months ago and subsequently reprinted in the *Congressional Record*—"to deactivate unilaterally ninety B-52G bombers, which are also among the forces we have told the Soviets that we count within the levels of SALT II."

The letter also registered concern over other Administration plans to deactivate unilaterally two Poseidon submarines "carrying thirty-two SLBMs in order to continue compliance with the expired SALT I Interim Offensive Weapons agreement."

Questions About the Kennedy-Khrushchev Agreement

Recent hearings by the Senate Foreign Relations Committee concerning Soviet compliance with the Kennedy-Khrushchev Agreement of 1962 on removing and keeping out of Cuba Soviet offensive weapons reportedly ended in a "hung jury," but raised important questions. A majority of the Senators attending reportedly feared that any US moves challenging the accord at this time might increase the risk of the Soviets putting SS-20 inter-

mediate-range ballistic missiles or Backfire bombers in Cuba or elsewhere close to US borders. Senior Soviet officials continue to hint at such "reprisals" for the deployment of US Pershing IIs and ground-launched cruise missiles in support of NATO, scheduled to start in December of this year.

While the scope and exact extent of the agreement—especially subsequent protocols—are shrouded in diplomatic confidentiality, both the US and the Soviet Union have released the gist of the agreement that revolves on an exchange of ten letters by the two heads of state in October 1962 that ended the Cuban missile crisis. Increasing the murkiness is the fact that Cuba itself is not a party to the bilateral accord. Khrushchev wrote the US President on October 27, 1962, that the USSR agrees to "remove these weapons from Cuba which you regard as offensive weapons. . . ."

The same day Kennedy informed the Soviet leader that "the first thing that needs to be done is for . . . all weapon systems in Cuba capable of offensive use to be rendered inoperable, under effective United Nations arrangements . . . [and] you would agree to remove these weapon systems from Cuba under appropriate United Nations observation and supervision, and undertake, with suitable safeguards, to halt further introduction of such weapon systems into Cuba. . . ."

President Kennedy, on November 20, 1962, elaborated on the nature of the agreement, saying that "Chairman Khrushchev . . . agreed to remove from Cuba all weapon systems capable of offensive use, to halt the further introduction of such weapons into Cuba. . . . In addition, the Soviet government has stated that all nuclear weapons have been withdrawn from Cuba and no offensive weapons will be reintroduced."

Confirming the US President's interpretation of the agreement, Khrushchev acknowledged that "those types of weapons on the removal of which we have agreed are not brought back to Cuba." Specifically included among the weapons to be removed, he confirmed, were the Il-28 light bombers. As late as October 13, 1970, the USSR, in an official "authorized" statement by the government news agency Tass, averred that Moscow was not doing, and would not do, anything to "contradict the understanding reached between the governments of the USSR and the United States in 1962."

Meanwhile, President Reagan has

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on two occasions since assuming office questioned Soviet compliance with the Kennedy-Khrushchev agreement. In April 1982, the President said at a televised news conference, "There's *[sic]* been other things we think are violations also of the 1962 agreement." On September 14, 1983, President Reagan publicly answered a question about Soviet violations of the 1962 accord on Soviet offensive weapons in Cuba with the statement that the "agreement has been abrogated many times by the Soviet Union and Cuba in the bringing of what can only be considered offensive weapons, not defensive, there."

The key concessions by the US in exchange for the permanent withdrawal of offensive Soviet weapons from Cuba were the pledge not to invade Cuba at the time and the withdrawal of Thor and Jupiter medium-range and intermediate-range ballistic missiles from Britain, Italy, and Turkey.

Sen. Steven D. Symms (R-Idaho), in an opening statement at the Foreign Relations Committee hearings, charged that the Soviets have now deployed in Cuba the following offensive nuclear-capable weapons:

- A squadron of twelve Tu-95 Bear intercontinental bombers, with bomb bays, that are counted as strategic offensive weapons under the SALT II Treaty.
- Four squadrons totaling more than forty MiG-23 or -27 nuclear-capable fighter-bombers with longer ranges than the light Il-28 bombers that the Soviets deployed to Cuba in 1962.
- A strategic submarine base at Cienfuegos, complete with a nuclear warhead storage facility, that has been used to support *Golf* diesel submarines capable of carrying nuclear-tipped ballistic missiles counted in SALT I and *Echo* nuclear-powered submarines carrying nuclear-armed long-range cruise missiles.
- A combat brigade of ground forces, complete with artillery, tanks, and long-range air transports, that is reportedly guarding nuclear storage facilities.

Senator Symms warned the committee that compounding the danger of Soviet nuclear weapons in Cuba is the "highly significant but little-realized fact that the US has no capability to detect the presence of Soviet nuclear warheads or bombs in Cuba." The US, therefore, needs to ask the crucial question of "why the Soviets would deploy to Cuba bomb-bay-equipped long-range bombers, nuclear-capable fighter-bombers, and a nuclear warhead storage facility for submarine-launched missiles if they did not also already have nuclear warheads in Cuba."

Advances in Exotic Weapons Technology

Dr. George A. Keyworth II, Director of the White House Office of Science and Technology Policy and the President's Science Advisor, recently suggested that ground-based laser weapons may be able to compensate for atmospheric dispersion in laser beams through "adaptive optics and mirrors that can be pointed electromechanically like phased-array radars" as a result of a series of technological advances.

Placing such weapons on the ground, rather than in space, would enhance their survivability and make them easier to operate, Dr. Keyworth pointed out.

In addition, Dr. Keyworth announced that "we are also seeing good progress in using ultrashort laser pulses to create damage quickly by impulse rather than through the thermal effects of slower-acting continuous beams."

These developments coincide with advances in traditional terminal ballistic missile defense (BMD) technology and, in concert, enhance the prospects for a "workable strategic defense system," according to the Presidential Science Advisor. As a result, a special panel of experts headed by former NASA Administrator James Fletcher has just concluded "that we can now project the technology—even though it hasn't been demonstrated yet—to develop a defense system that could drastically reduce the threat of attack by nuclear weapons," he said.

Dr. Keyworth envisioned such a BMD system as a "multitiered array, probably designed to respond first to ballistic missiles in the boost phase, second to midcourse vehicles, and third to vehicles during reentry into the atmosphere." Acknowledging the monumental funding challenge associated with such an undertaking, he explained that "some of the money . . . will come from new funds, but some will also come from shifting funds out of existing R&D programs. Our goal now is to keep building momentum for the program and to build national support for the effort in order

SCIENCE/SCOPE

A new device "super cools" spaceborne infrared sensors to increase their sensitivity to thermal radiation. The Vuilleumier cycle cryogenic refrigerator is especially suited for use in space. The low internal forces required in this type of cooling cycle cause little wear on bearings and seals. The result is a long, maintenance-free operating life. Hughes Aircraft Company engineers, under U.S. Air Force contract, expect to extend the operating life of the cooler beyond three years by 1985. Three space-qualified models have already been built. Over 60,000 hours of tests have been run on three engineering development models.

Computers are being called upon to help create the "super chips" that will give military electronics systems a tenfold increase in data processing capability. Hughes is using computer-aided design programs to develop Very High Speed Integrated Circuits (VHSIC) and the systems in which these chips will be used. Computer help is essential because of the tremendous amount of circuitry per unit area. VHSIC chips are as complex as 100 Los Angeles street maps printed on a thumb tack, and they themselves are mere components of larger, more complex systems. Computer programs will help engineers design, lay out, and test a chip. They describe an entire system at many different levels of detail simultaneously to predict the system's performance under various operating conditions.

In the 80 seconds a cruise missile reaches a ship after breaking the horizon, an advanced radar system directs counterfire with extreme accuracy. The Hughes Mk-23 Target Acquisition System (TAS) combines with NATO's Seasparrow missile system to defend ships from sea-skimming and high-diving missiles that often escape conventional radar detection. TAS detects anything that flies above the water -- even a small cruise missile skimming the waves at the speed of sound -- because it filters out radar clutter caused by interference from the sea, land, weather, chaff, or electronic countermeasures. TAS will be carried by all U.S. Navy aircraft carriers and over 40 other ships.

Printed circuit boards made of a new material may permit better direct soldering of large leadless ceramic chip-carriers. A Hughes study proposes using quartz-fabric-reinforced polyimide resin in place of glass-epoxy or glass-polyimide boards. The new material has nearly the same thermal expansion coefficient as ceramic chip carriers. When a leadless carrier is soldered directly to a quartz-polyimide board, there are no shear stresses caused by heating or cooling. Such stresses often cause solder joints to fail on conventional reinforced boards.

Canada's new CF-18 is performing "superbly" during early flight operations, according to the first Canadian Forces squadron to fly the strike fighter. Pilots of the 410 Operational Training Squadron called the CF-18 the easiest aircraft they have ever flown, noting that they completed the initial 18 flights in less than five days rather than two weeks. They are enthusiastic about the results of all air-to-air and air-to-surface radar and weapons delivery tests, and said the radar's built-in problem-warning system "opens up a new era in aircraft maintenance." Hughes manufactures the AN/APG-65 radar under contract with McDonnell Douglas Corp., builder of the Hornet.

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to attract the best talent to a formidable but worthy goal."

The White House official warned that "it is likely to take five or six years of R&D to bring us to the point where we can make the critical decisions about developing and deploying actual systems." The Administration's view, he suggested, is to resist understandable temptations and pressures to move quickly to near-term deployment of the best available technologies because "it's important to give the R&D [community] a reasonable amount of time to explore some of the less well-developed technical options."

In this context, Dr. Keyworth said that particle beam weapons should not be ruled out prematurely "simply because they aren't as well developed as, say, chemical or excimer [rare gas] lasers." Even more exotic approaches—such as "free-electron and bomb-pumped lasers," whose nature and potential are even less well understood—also should not be ruled out from ultimate consideration for the BMD mission.

Even though nuclear weapons probably offer a cost-effective approach to strategic defenses, the Administration believes that "the American people are not likely to enthusiastically support the placement of nuclear weapons in space." The Pentagon, incidentally, is also known to fear a public backlash from rumors about using space for offensive purposes, especially the notion that nuclear weapons might be put in orbit. The concern is that such loose talk might create a "second front" for the nuclear freeze movement.

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Dr. Keyworth's recommendation for a measured, evolutionary approach to exploring the potential for comprehensive ballistic missile defenses was echoed by President Reagan on October 19 when he played down news media speculation about Administration intent to commit "billions of dollars" to the development of space-based defense systems. The President said that in terms of specific Defense Department or other executive branch recommendations, "nothing has actually been presented to me as yet." While research into the feasibility of strategic defense systems is proceeding, the President said, "I think there's a great exaggeration of the kind of money" the Administration plans to allocate to this program.

Washington Observations

★ Industry reaction to recent recommendations by Air Force and other Pentagon leaders to hold down wage and salary rates has been guarded. The general feeling is that the government's concern about increasing costs is justified, but that exhortations to curtail wage and salary increases fail to allow for the competitive environment of the defense industry. There is the fear that if industry were to heed the government's recommendations, the so-called "Route 128 syndrome" would be catapulted across the nation.

Route 128 is a beltway in the greater Boston area along which are situated many of the country's important electronic and computer companies. The rapacious appetite of these companies for scientific and engineering talent has created fiercely competitive salary escalations and pirating of technical personnel. If individual industries were to freeze the pay of such "hot properties" as specialists in "Stealth" technologies, the specialists would get around these pay caps

by moving from company to company to the highest bidders, senior industry executives believe.

★ The Chairman of the Senate Armed Services Committee, Sen. John Tower (R-Tex.), recently told this writer that he and other members of Congress are working toward a broad restructuring of the budget, authorization, and appropriation process in both houses. Explaining that he favored a biennial rather than annual cycle, Senator Tower said the functions of the Budget and Appropriations Committees should be consolidated. Appropriating powers should be transferred to the authorizing committees to the extent that these bodies would appropriate funds requiring authorization while the combined budget-appropriation committees would control the appropriation of funds that don't require authorization.

Although Senator Tower declined to comment directly about the public feud between Deputy Secretary of Defense Paul Thayer and Secretary of the Navy John Lehman, he expressed himself unambiguously in support of a 600-ship Navy, the issue dividing the two Pentagon officials. Senator Tower stressed that "the 600-ship Navy is now an element of national policy so that no single man in the Pentagon [meaning presumably Secretary Thayer] or in Congress can change that."

★ One of the ancillary aspects of the Soviet downing of the Korean Boeing 747 civilian airliner is the presumption that at one time it might have been confused with the US Air Force RC-135 military reconnaissance aircraft that briefly operated in the vicinity of KAL 007. Apologists for Soviet callousness manifested by that action should remember that the RC-135 is an integral element of the national technical means used by the US to verify compliance of the Soviet Union with bilateral arms-control accords, such as SALT.

While there is no formal accord between the two countries about the makeup of the national technical verification means, the Soviets presumably knew that the RC-135 was in the area at that time because of the pending test-firing of a new type of Soviet ICBM. Even if the Soviet pilot who downed the Korean airliner had mistaken it for the RC-135—a farfetched notion since he reported seeing the flashing lights identifying a commercial aircraft—the Soviets still would have been guilty of interfering with this country's national technical means of verification.

★ Gen. Richard L. Lawson, the US European Command's Deputy Commander in Chief, recently announced at a symposium sponsored by the MITRE Corp. significant advances in the integration and coordination of NATO forces in such key areas as intelligence, command and control, reinforcement, and air defense. The first SACEUR (Supreme Allied Command Europe) air defense plan will be issued in July 1984, while the NATO Reinforcement Plan is in effect already and gives the head of SACEUR "the approval of all the [member] nations to deploy the forces which are assigned to him where he wants anywhere in the Alliance when he wants them."

On the negative side, he pointed out that the NATO AWACS "is fast falling behind the US AWACS, the US Navy Hawkeye, and the UK Nimrod in interoperability." The reason for the deficiency, he said, is that the NATO AWACS belongs to all sixteen NATO nations and thus "requires the votes of all sixteen," which is time-consuming. The command and control aircraft owned by one nation are not so encumbered. ■

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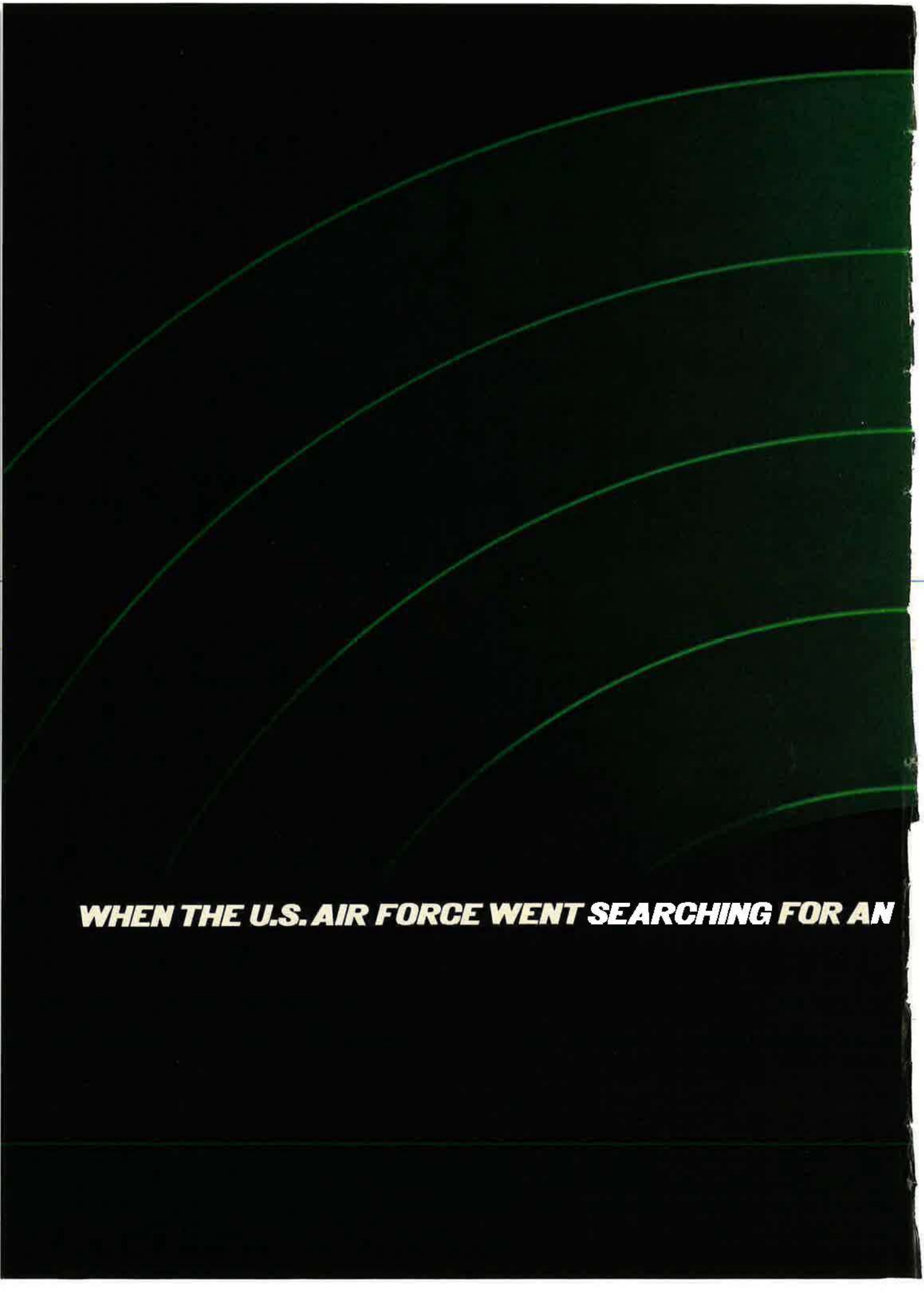
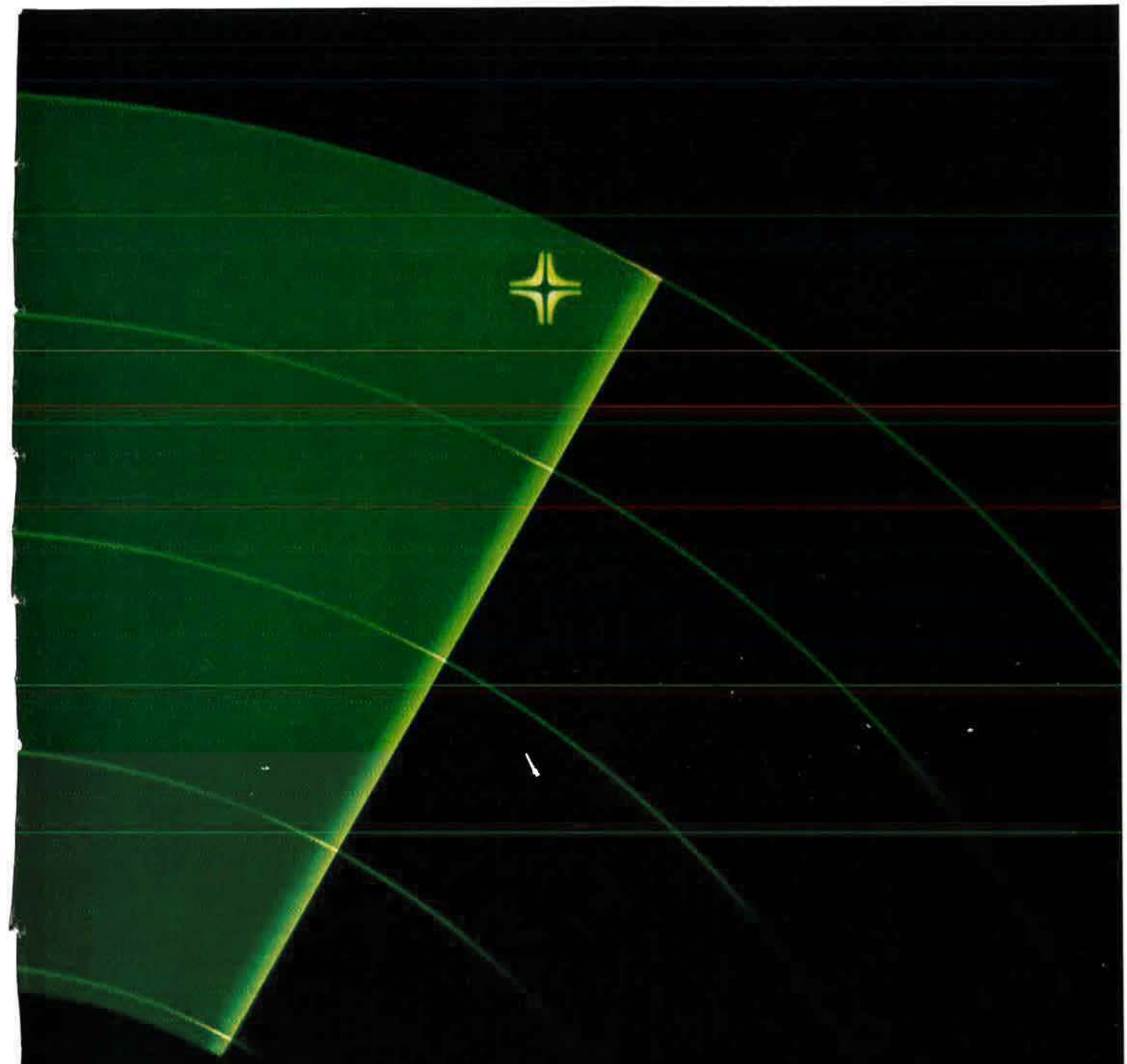

WHEN THE U.S. AIR FORCE WENT SEARCHING FOR AN



ADVANCED TACTICAL RADAR, IT LOCKED IN ON SPERRY.

The new U.S. Air Force Advanced Tactical Radar (ATR) will be the first ever using a cylindrical antenna configuration.

It is a C-Band, electronic scanning system, capable of multi-target tracking at any azimuth or elevation. Highly resistant to jamming and anti-radiation missiles, it is rapidly deployable and ground-mobile as well.

Sperry's radar capabilities sweep along the entire RF spectrum, from baseband to millimeter wave.

Under a joint award by the Departments of Commerce, Defense and Transportation, Sperry is developing NEXRAD, the next-generation weather radar system.

ATR and NEXRAD are the most recent in a continuing series of definition and development contracts won by Sperry to further the use of radar and related technologies for all services.

Sperry Corporation, Electronic Systems, Great Neck, NY 11020.

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WE UNDERSTAND HOW IMPORTANT IT IS TO LISTEN.

AEROSPACE WORLD
News, Views & Comments

By William P. Schlitz, SENIOR EDITOR

Taking advantage of its nap-of-the-earth capabilities, a Hughes Helicopters/US Army AH-64A Apache Attack Helicopter prototype skims along the Colorado River, following the natural contours of the river and surrounding area. The first production Apache was recently rolled out at Hughes Helicopters' Apache Assembly and Flight Test Center in Mesa, Ariz. The new facility is the most advanced helicopter assembly center in the world, notes Hughes.

Washington, D. C., Nov. 7

★ The Air Force has awarded contracts to seven aerospace companies for conceptual designs of the Advanced Tactical Fighter (ATF).

The awards, each close to $1 million, were received by Boeing Co., General Dynamics Corp., Grumman Aerospace Corp., Lockheed California Co., McDonnell Douglas Corp., Northrop Corp., and Rockwell International Corp.

The companies are to present design concepts to the ATF Concept Development Team at AFSC's Aeronautical Systems Division, Wright-Patterson AFB, Ohio, by late spring of next year. An interim report is due by the end of 1983.

ATF is to be USAF's air-superiority fighter for the 1990s and beyond. Areas to be specially emphasized in the conceptual designs will include performance against all anticipated threats, to include weapons and electronic jamming. Other considerations include cost—both initial and life-cycle—and risk and supportability.

The increased emphasis on supportability at this phase of the ATF program recognizes the requirement to operate from austere or battle-damaged sites as well as an awareness of supportability problems in earlier programs.

According to Col. Albert C. Piccirillo, director of the ATF program for ASD's Deputy for Development Planning, "The contractors must integrate the best features of current technologies. Some areas to be considered will be such new materials as composites and advanced metallics; new electronics, including advanced cockpit automation, integrated fire and flight controls, and advanced radars and sensors; vectored thrust; built-in test and support equipment; and low-observables technology.

"The ATF will be the sum of the proper integration of all these things into a blended weapon system that will achieve optimum air superiority," he noted.

★ NASA and Fairchild Industries, Germantown, Md., have agreed on the development of a space platform that could house the first factories in orbit.

Dubbed "Leasecraft," the first space platform would be launched from the Space Shuttle in 1987, undergo a six-month testing and demonstration period, and then become operational, officials said. Within five years of the first launch, Fairchild hopes to have ten such platforms in space.

Price tag for the first Leasecraft would be about $200 million. When in operation, Fairchild will provide services to commercial and governmental customers. With the Leasecrafts to be built at its Germantown plant, Fairchild plans to hire some 200 new scientists and engineers and in the future may put its own technicians aboard Space Shuttles to service the platforms.

The Space Shuttle would rendezvous with Leasecraft about every six months to service and change or service payloads. The first visit is part of the agreement package; afterward, Fairchild would pay commercial user rates, officials said.

The platforms are to measure fifteen feet square by fourteen and a half feet high. Electrical power would be generated by a pair of sixty-six-foot-long solar panels. Fairchild would also be responsible for providing communications between the platforms and earth stations.

The platforms could have an operational life as long as ten years, officials declared.

★ This year marks the twenty-fifth anniversary of the founding of the partnership between USAF and ANSER.

ANSER (which stands for "Analytic Services") was created in 1958 at the request of USAF and with the assistance of the Rand Corp. as an independent and nonprofit organization in support of the Air Staff Director of Development Planning under the Deputy Chief of Staff for R&D.

ANSER was established to provide a resource of studies and analyses free of institutional biases and potential conflicts of interest. ANSER research has included subjects ranging

from the general B-1 configuration to the Air Force Space Test Program.

Over the years, ANSER has expanded its work to such other agencies as OSD and NASA and its staff has grown from forty to 250.

★ The US Air Force Aeronautical Station System, which has provided communications between DoD aircraft operating in oceanic airspace and military and civilian ground agencies, has been given a new name and a restructured mission.

With sixteen stations sited strategically around the world and operated by personnel of Air Force Communications Command, the operation has been redesignated the US Air Force Global Command Control System.

According to AFCC officials, the new name defines better the system's revised mission to provide command and control and other operational communications between DoD aircraft on transoceanic flights and military ground agencies.

The stations no longer relay air traffic control information between aircraft and International Civil Aviation Organization agencies. Instead, aircrews will contact those agencies directly.

The change, according to officials, allows the station operators to concentrate their efforts on command and control communications, to standardize procedures among DoD airborne elements, and to ensure the most expeditious handling of time-sensitive air traffic control information.

The change came about as a result of a two-year test program during which, among other advantages, enhanced flying safety was noted.

The mission change will reduce manning slots in all but three of the stations and allow the excess people to be shifted to high-priority areas in AFCC. Dollar savings will also accrue with the discontinuance of some leased circuitry.

★ In another recent realignment, the Air Force Acquisition Logistics Division at Wright-Patterson AFB, Ohio, has been changed from "Division" to "Center."

AFALD had been strictly an Air Force Logistics Command agency, but from now on as AFALC—it will serve as an interface between Air Force Systems Command, Andrews AFB, Md., and AFLC. In the revised mission, the acquisition logistics field resources of both commands have been merged.

AFALD Commander Maj. Gen. Monroe T. Smith has assumed command of the newly formed AFALC.

★ The Air Force has decided on man-portable Stinger for use as a ground-based Point Air Defense (PAD) weapon.

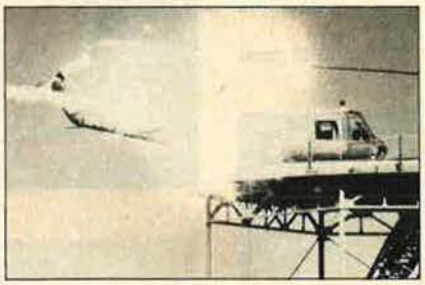
Stinger is currently in production for the US Army and Marines. The shoulder-launched, fire-and-forget missile "is highly effective against high-speed maneuvering aircraft as well as slow or hovering helicopters," noted officials, who cited the system's high reliability as another plus.

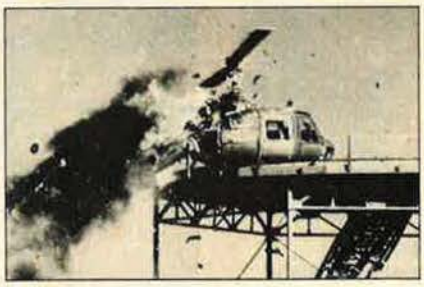
"At a unit cost of approximately $70,000, including training and support equipment, the Stinger represents an extremely cost-efficient point air defense system. The maintenance-free design affords the Air Force a minimum ten-year storage life without degradation of performance and is ideal for deployment to air bases worldwide," Air Force officials declared.

USAF plans to line up the necessary support for the weapon by using the existing Army logistics system, including facilities, equipment, and procedures. "The Air Force's goal is to deploy Stinger with little or no duplication of Army efforts," officials stressed.

★ In the latter half of 1983, Venezuela is scheduled to receive six F-16s, the first South American nation to purchase the aircraft.

By the end of 1985, a total of twenty-four F-16s—eighteen "A" and six "B" versions—are to be delivered to Venezuela.





In test-firing, a helicopter is hit by a Stinger missile and then explodes. USAF plans to acquire the shoulder-launched weapon. (See item above.)

In preparation, Venezuelan pilots have undergone F-16 flight training at Luke AFB, Ariz., and maintenance personnel have received training at General Dynamics Corp.'s plant at Fort Worth, Tex.

According to spokesmen, only a year and a half elapsed from the purchase agreement to first delivery—the fastest production effort so far without diverting USAF assets.

The fast delivery, officials noted, would enable Venezuelan pilots to fly an aerial demonstration on December 10, 1983, the anniversary of the Venezuelan Air Force and the 200th anniversary of the birth of Simón Bolívar, the liberator of South America.

★ FAA has selected Indianapolis, Los Angeles, New York City, and New Orleans as sites for the National Prototype Demonstration Heliport Program. The move is the first step in the establishment of a nationwide network of downtown urban heliports capable of all-weather operations.

The program calls for the evolution of the prototype heliports from VFR-only to full precision instrument approach capability by 1986–87. FAA plans to support the development of the heliports with funding under the Airport Improvement Program and will equip the heliports with the most advanced technology flight aids, including the new-generation microwave landing system and automated weather reporting device.

The heliports in New Orleans and Los Angeles will be entirely new facilities, while New York City and Indianapolis will operate existing sites that are to be substantially upgraded. The New Orleans heliport is to be built adjacent to the Super Dome. At Los Angeles, the heliport is expected to have an interim VFR facility ready in time for the 1984 Olympic Games.

In a related matter, a recent survey indicates that the percentage of rotary-wing aircraft increased more than twice as much as that of fixed-wing aircraft over a five-year period.

The study, reflecting registration figures from 1976 to 1981, measured the number of general-aviation aircraft on register in International Civil Aviation Organization contracting states. Rotary-wing aircraft increased from 7,733 to 12,337—a 37.3 percent gain. Fixed-wing aircraft rose from 251,899 to 309,759—an 18.7 percent increase.

The largest gain in helicopter registrations was in twin-engine, turbine-powered aircraft.

★ An Air Force balloon-borne radar

at Cape Canaveral AFS, Fla.—similar to one operating since late 1980 at Cudjoe Key—is now extending low-level air defense surveillance along the southern and eastern coasts of Florida.

What's more, the two "eyes in the sky" are also helping the US Customs Service in its war on drug smuggling.

AFSC's Electronic Systems Division, Hanscom AFB, Mass., developed the balloon radar systems under a program called Seek Skyhook to detect ship traffic as well as aircraft. Both sites are operated by TAC.

The radar is a 1,000-pound RCA model AN/DPS-5 with a twelve-and-a-half by twenty-two-foot rotating antenna. It is in a pressurized pod laced underneath the balloon. Data from the radar is transmitted to TAC's Region Operation Control Center at Tyndall AFB, Fla. From there, pertinent information is relayed to the Customs Service.

The blimp-shaped balloon, called an aerostat, hovers at 10,000 to 12,000 feet on a tether. The tether is attached to a diesel-electric-powered launch control vehicle similar to a locomotive that runs on tracks around the circular launch pad.

The aerostat can remain aloft in winds up to sixty-five knots and is designed to withstand surface winds up to ninety knots when moored to its tower.

AEROSPACE WORLD

★ The National Aeronautic Association announced the recipients of a pair of its most prestigious annual awards.

John "Lee" Atwood is to receive NAA's Wright Brothers Memorial Trophy. A former head of Rockwell International Corp., he has been a prominent aerospace industry figure for more than fifty years, leading the fledgling North American Aviation, Inc., to a key role in the production of military aircraft during World War II. The list of defense and space products manufactured by the company spanning more than five decades reads like an honor role of aerospace accomplishment. It ranges from the P-51 Mustang to today's B-1 and Space Shuttle.

A second, no less noteworthy NAA award—the Frank G. Brewer Trophy—is going to John V. Sorenson, former Deputy Chief of Staff for Aerospace Education and Cadet Training for Hq. Civil Air Patrol.

"Until he retired in July 1983, Sorenson worked tirelessly throughout the United States and in many foreign countries in planning, evaluating, and administering one of the largest and most effective aviation education programs anywhere in the world. His many talents include writing, editing, public speaking, negotiating, lead-

British Aviation Artist Exhibit at National Air and Space Museum

A retrospective show of paintings by Frank Wootton, one of today's foremost aviation artists, opened recently at the Smithsonian's National Air and Space Museum in Washington, D. C.

The major exhibit, entitled "At Home in the Sky: The Aviation Art of Frank Wootton," contains fifty-seven paintings and sketches of civil and military aircraft, landscapes, and other subjects. Paintings from around the world were collected for the exhibit, the British artist's first in the US.

The display represents forty years of work, including paintings of the air war in Europe in the 1940s, night reconnaissance over Vietnam, and aircraft of the Royal Navy on their way to the Falkland Islands during that conflict.

Wootton is considered a pilots' artist; one pilot explained why: "Frank's aircraft always look as if they are flying." His work is found in RAF messes, war museums, and private collections around the world.

The paintings will remain on exhibit at NASM until next September.

UPPER RIGHT: "Boeing B-17 Flying Fortress," oil on canvas, 1965. AT RIGHT: "Major Inspection of a Westland Lysander, Royal Canadian Air Force 400 Squadron," oil on canvas, 1940. ABOVE: "Royal Air Force Fodder Drop to Snowbound Exmoor Ponies," oil on canvas, 1982.

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ing, and publishing. The aerospace education textbooks, study guides, and supporting materials he has been responsible for developing, publishing, and distributing are among the finest to be found," NAA noted.

NAA is the oldest independent, public service, nonprofit aviation organization in the nation. Throughout its seventy-eight-year history its primary objective has been "to keep the United States first in air and space flight," officials said.

★ Lt. Col. John Hoffman has been named "Test Pilot of the Year" by the worldwide Society of Experimental Test Pilots.

Colonel Hoffman has spent nearly half his twenty-three-year military career as an Air Force test pilot at Edwards AFB, Calif.

He was selected for the coveted Iven C. Kincheloe Trophy for hazardous flight testing of the Mach 2-plus F-15 Eagle equipped with new type exterior fuel tanks.

Results of the high-risk testing determined that the performance of the F-15 when fitted with the conformal tanks would not be adversely affected and the flight capabilities of the fighter in air-to-air and air-to-ground missions would be much the same as the standard F-15.

Another matter related to Edwards AFB involves a joint Air Force and US Coast Guard project.

An initial series of flight tests has been conducted by the Air Force Flight Test Center (AFFTC) at Edwards that could dramatically enhance the Coast Guard's ability to carry out search and rescue missions at sea, detect illegal drug trafficking aboard ships, and protect the nation's coastal maritime environment.

The tests, conducted by AFFTC's 6512th Test Squadron, are clearing the way for the Coast Guard to mount three state-of-the-art surveillance pods under the wings of new Falcon 200 twin-engine jets recently purchased from France.

Flights of a test version of the aircraft—designated the HU-25 by USCG—determined that the pods would not cause flutter or vibration problems.

The Coast Guard bought forty-one HU-25s. Once the pod testing is completed, the aircraft will be fitted with the Coast Guard's first-ever airborne surveillance system: a side-looking radar pod to help with search and rescue missions, an infrared ultraviolet line scanner to help locate illegal drugs aboard ships and oil dumping at sea, plus a television pod that will enhance videotaping at night while investigations of illegal offshore activities are conducted.

AEROSPACE WORLD

★ The first of eighty new Learjet 35A aircraft is to be delivered to USAF next March. The aircraft will carry the Air Force designation C-21A.

They are to replace part of MAC's aging fleet of CT-39s and support USAF's Operational Support Aircraft (OSA) program. In this, they'll be operated by MAC to deliver high-priority and time-sensitive cargo, season newly rated pilots, and provide passenger airlift. The C-21As are also capable of quick and easy conversion to such other missions as medevac and long-range ferry flights.

Under the $175 million contract with Gates Learjet Corp., company employees will provide maintenance and logistics support for the aircraft at various Air Force bases. Under terms of the agreement, USAF will initially lease the aircraft with a later option to purchase.

Designated C-21A, eighty new Learjet 35A aircraft are being purchased by the Air Force as replacements for part of MAC's aging fleet of CT-39s. First delivery is expected early in 1984. As a light transport, the C-21A will have a crew of two and seat seven passengers.

The C-21As will have a two-person crew and will seat seven passengers.

★ The Air Force has named its EF-111 aircraft the "Raven." A version of the F-111, the aircraft provides electronic countermeasures support for tactical air forces.

The EF-111 detects enemy radar signals and then counters them. The Raven has been the symbol of electronic warfare since the earliest days of airborne radar jamming.

Some sixteen EF-111s have entered USAF's inventory since 1981. The last of an intended buy of forty-two is scheduled to be delivered in 1985.

EF-111s are currently serving with the 390th Electronic Combat Squadron, Mountain Home AFB, Idaho, and are to be assigned to the 42d ECS, RAF Upper Heyford, UK, early in 1984.

★ The RAF recently received a wartime-configured B-17 Flying Fortress, courtesy of USAF. The aircraft was flown from California and across the Atlantic in October. It will be a major exhibit at the RAF Museum at Hendon. The aircraft had been owned by a private company and had 2,000-gallon tanks aboard in its role as an aerial firefighter.

★ **NEWS NOTES**—The eighth annual **Air University Airpower Symposium** is to take place March 5–7, 1984, at the Air War College, Maxwell AFB, Ala. The topic is **"US Air Force Role in Security Assistance."** The symposium's objective is to provide an open forum in which key military and civilian theorists and practitioners can exchange ideas, officials said.

The Office of Air Force History's **Dissertation Year Fellowship program** stimulates research and study in the field of US military aerospace history. **Two fellowships of $8,000 each** will be awarded for the 1984–85 academic year. Applicants must be US citizens, be enrolled in a recognized graduate school, have successfully completed by September 1984

Gen. John D. Ryan, USAF (Ret.), 1915–83

Gen. John D. Ryan, USAF (Ret.), Air Force Chief of Staff from 1969 to 1973, died of a heart attack at Wilford Hall USAF Medical Center in Texas in October. He was sixty-seven. A 1938 graduate of West Point, General Ryan was a combat pilot in Europe during World War II and during his career of thirty-five years commanded SAC and PACAF among other major assignments. As USAF's seventh Chief of Staff, he was a steady influence during the war in Southeast Asia. General Ryan was also instrumental in the development of missile technology and the new generations of combat aircraft. The long-time AFAer had been a member of AFA's National Board of Directors since his retirement in 1973.

all requirements for a Ph.D., and have an approved topic in the field of US aerospace history. For additional details, write to the Chief, Office of Air Force History (AF/CHO), Hq. USAF, Bolling AFB, D. C. 20332.

Died: Internationally renowned aircraft designer **Leon F. "Lee" Begin, Jr.**, who played a major role in the development of every Northrop Corp. aircraft in the last four decades, in Arcadia, Calif., in October. He was fifty-nine.

Died: Gen. Frank F. Everest, USAF (Ret.), a West Point graduate who served in the Pacific during World War II and commanded Fifth Air Force during the Korean War. In the postwar years, General Everest had a distinguished career as a high-level Air Force planner. He later headed USAFE and retired as Commander of TAC in 1961. The Charter AFA member was seventy-eight at his death in Myrtle Beach, S. C., in October.

AEROSPACE WORLD

Died: Philip F. Hilbert, former Special Assistant to the Secretary of the Air Force, of kidney failure in August in Leesburg, Va. He was eighty-one. A pioneer and recognized expert in defense security aspects of international affairs, Mr. Hilbert was the recipient of Department of the Air Force Exceptional Civilian Service Award in 1956, 1964, 1969, and 1973. In 1968, he received the DoD Distinguished Civilian Service Award. He retired from federal service in 1975.

Died: Stephen F. Leo, USAF's first public-relations director and a retired Sverdrup Corp. executive, in Brunswick, Me., in October. The long-time AFA member, who was the recipient of an AFA Citation of Honor in 1954, was seventy-four.

Died: T. F. Walkowicz, in New York City in October. He was sixty-three. From 1941 to 1952 Dr. Walkowicz worked for Dr. Theodore von Kármán, the famed scientist who advised Gen. H. H. "Hap" Arnold in designing the modern Air Force. In the twenty-one years that followed, Dr. Walkowicz worked for the Rockefeller family, specializing in venture-capital investments and advising Laurance S. Rockefeller on aeronautical matters. Dr. Walkowicz also served on governmental commissions in areas of interest ranging from spaceflight to disarmament, and on one such commission acted as military assistant to General Jimmy Doolittle. A contributor to AIR FORCE Magazine, the Charter AFA Life Member also served on the Association's Board of Directors. At his death, he was a general partner in Advanced Technology Ventures. ■

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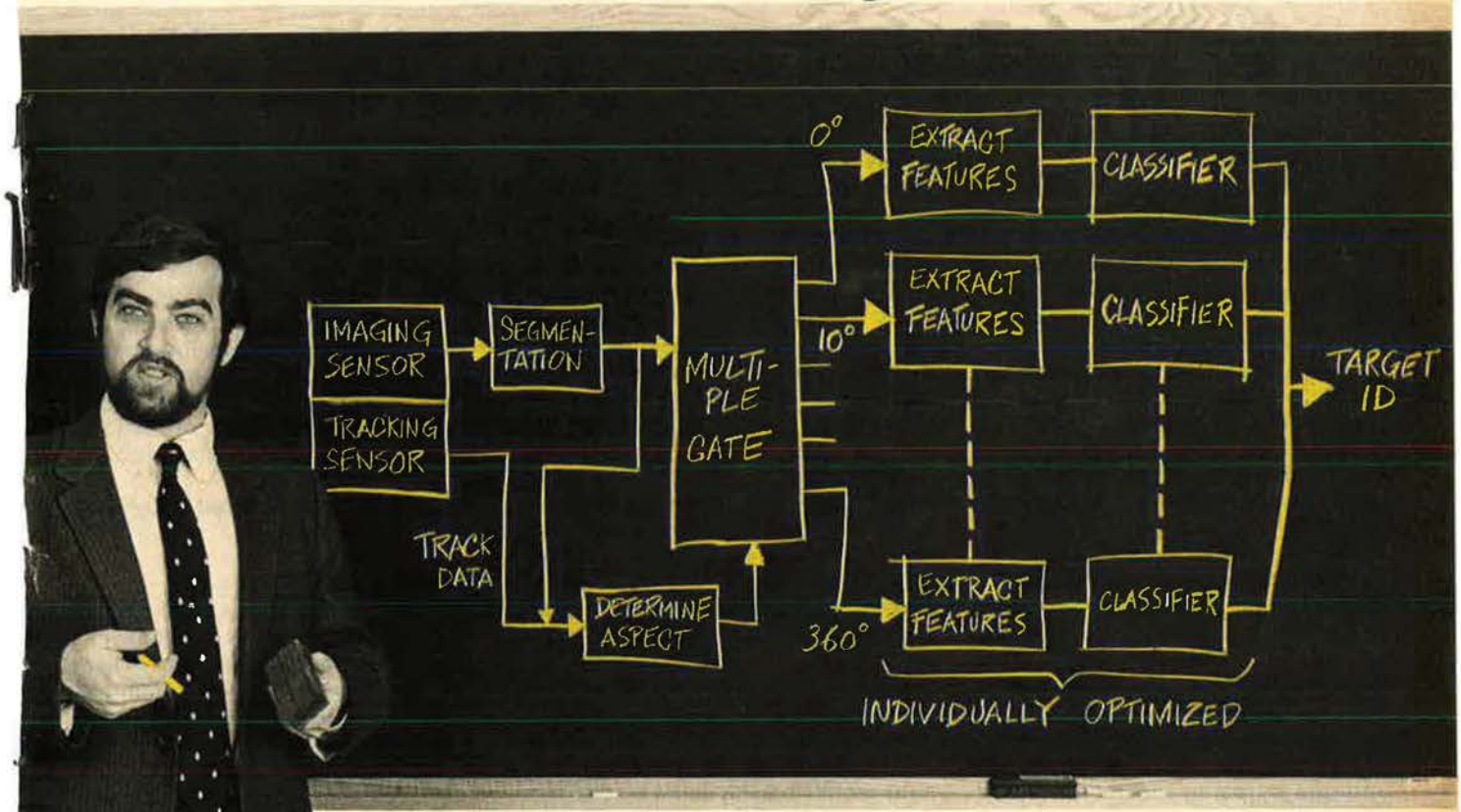
Image technology on the move.

Al Gorin on automatic target recognition systems.



"America's defense requires breakthroughs in automated target recognition systems that operate reliably in real- or near real-time and are able to adapt to changing tactical situations," says Dr. Al Gorin, Principal Scientist at Lockheed Electronics.

"These systems will combine processing that is both non-cooperative (such as imaging or ESM sensors) and cooperative (such as interrogation protocols). They also will involve networks of multiple sensors at disparate locations and will require distributed processing.

"They must be self-evaluating systems, deciding automatically on sensor dwell time on target, additional sensor allocation, and increased processing time necessary for highly accurate identification.

"Techniques used in automatic interpretation of image sensor data will range from sophisticated pattern recognition to complex image-understanding algorithms driven by knowledge-based systems. The ultimate solution will involve a unique blend of machine intelligence, operations research and real-time systems design.

"At LEC, we have made substantial progress in design and evaluation of adaptive target recognition systems that exploit data from multiple sensors and tactical and intelligence sources.

"Our work points to major advances in design and implementation of recognition systems. These systems will intelligently allocate sensor and computational resources to optimize performance over many targets within a wide range of tactical scenarios."

Engineers interested in contributing to advanced electronic systems are invited to write Employment Manager at the address at right.

Lockheed Electronics

Plainfield, New Jersey 07061

CAPITOL HILL

By Kathleen G. McAuliffe, AFA DIRECTOR OF LEGISLATIVE RESEARCH

Washington, D. C., October 24

Pentagon Funding

If, as expected, Congress adopts the regular FY '84 DoD Appropriations bill before adjournment in mid-November, DoD will not feel any adverse effects from being forced to operate under a continuing resolution until then. The stopgap funding measure was designed to prohibit DoD from using any funds to begin procurement or R&D projects not approved in the prior year's legislation, and no multiyear procurement programs were to be initiated during this period.

Meanwhile, the Senate Appropriations defense panel recommended a defense spending level of some $251 billion for FY '84, a reduction of about $3 billion from the authorized level. Even the $3 billion cut—in the form of minor reductions in numerous programs—was reportedly made primarily to accommodate expected add-ons by panel members. Those add-ons were not made, however, and DoD is seeking to get the $3 billion reinstated in order to get more bargaining leverage when the bill goes to conference with the House.

The House version, which allotted about $247 billion for DoD, reinstated funds for the Advanced Medium Range Air-to-Air Missile (AMRAAM) but cut funds for DoD-wide operations and maintenance, denied funds for production of binary chemical munitions, and zeroed advance procurement money for the antisatellite (ASAT) system. Some of these programs are expected to be funded by the Senate and, hence, survive in a House-Senate conference.

Optimism on MX

The Air Force is optimistic about getting all twenty-one MX missiles funded for production by the House and Senate in the FY '84 DoD Appropriations bill. The main reason for the positive outlook is the effect the President's revised START proposals had in Congress. Those initiatives, worked out in a bipartisan partnership with Congress, include a flexible build-down of forces, a willingness to negotiate limitations on air-launched cruise missiles, and tradeoffs that would take into account US advantages in bombers and Soviet advantages in throw-weight.

The House is expected to yield to Senate plans, once the Appropriations bill reaches conference, on ICBM follow-on technology funds that were cut substantially by the House. The Senate has a strong case for funding the full $210 million for silo-hardening technology, and it is also expected to prevail in funding deep underground basing, albeit at a reduced sum of $20 million. The House dropped all funds for the two R&D programs, claiming that funds in current and past budgets were adequate to continue R&D in those areas. Such is not the case in the current budget, according to an Air Force spokesman. Both the House and Senate are expected to fund R&D on the small, single-warhead missile and hard-mobile basing at the authorized levels of $279 million and $75 million, respectively.

Strengthening the JCS

The House passed legislation strengthening the role of the Chairman of the Joint Chiefs of Staff (JCS) and providing for a more effective overall JCS organization.

If the Senate agrees, the JCS Chairman would become part of the national military chain of command, being placed between the Secretary of Defense and combat commanders. Further, he would become a member of the National Security Council and be allowed to give military advice on his own. Other provisions of the bill expand the size and allow for improvements in the quality of the Joint Staff. These should ensure more staff continuity and experience and, hence, better advice to the JCS. An added provision allows the individual service Chiefs and the unified and specified commanders to provide their individual views on any report or recommendation by the Joint Staff before it is submitted to the JCS.

The legislation resulted in part from claims by then-JCS Chairman Gen. David Jones, USAF (Ret.), that the civilian leadership was not getting clear-cut, timely, effective military advice from the JCS. Principal reasons for the ineffectiveness of the JCS included "diluted" advice because of staff processing and conflicts of interest for Chiefs who had to suppress their individual service interests to provide advice from a joint perspective. This latter problem was especially severe on the issues of resource allocation, roles and missions, and doctrine.

The Senate is expected to consider similar provisions.

Future Cuts

Some Pentagon sources predict the Administration will hold down FY '85 defense spending in order to keep the DoD budget from becoming an issue in the 1984 election. Without restraint, real growth for FY '85 could reach up to twenty-two percent to make up for congressional cuts made over the last two years and to stay in line with original Administration plans. However, the White House will not accept such a high spending level should DoD make that recommendation, sources state. A senior Air Force official expressed one widely held view in the Pentagon that DoD should ask for what's needed, and if the level is to be cut, it should be done by the OMB or by Congress.

Such election-year belt-tightening could mean a real squeeze for some programs, and sources in the Pentagon and Congress suggest that the Air Force's derivative fighter—the E version of either the F-15 or F-16—could be one casualty. While current USAF plans call for buying 400 of the dual-role E version, this program is reportedly near the bottom of the Air Force tactical priority list. That, and the possibility of getting zero procurement money in FY '84, raises questions whether the program is worth doing, according to USAF sources. The Air Force is now more concerned with ensuring that its priority Advanced Tactical Fighter for the 1990s is adequately funded in future years despite budget constraints. ■

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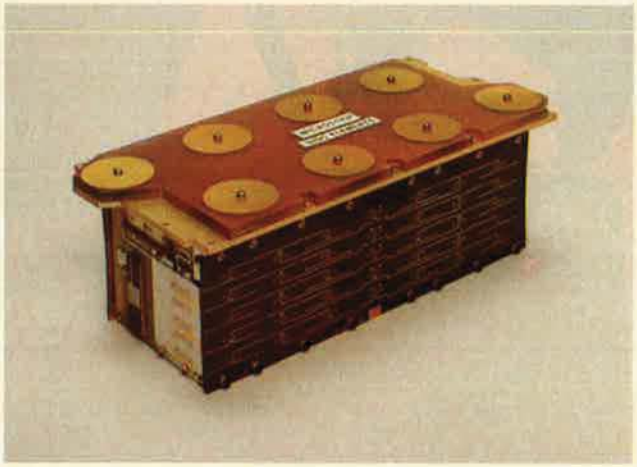
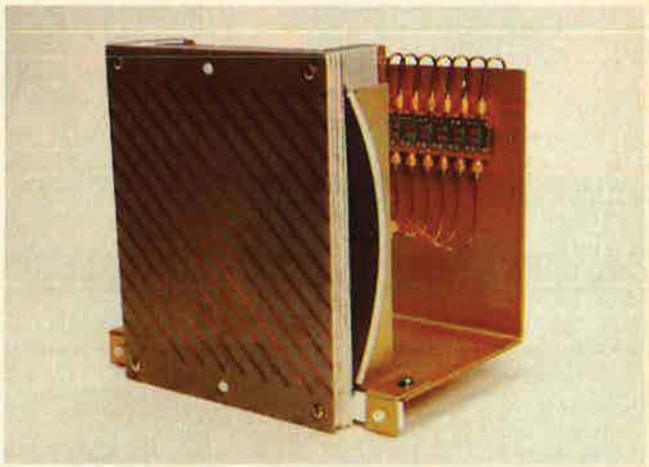
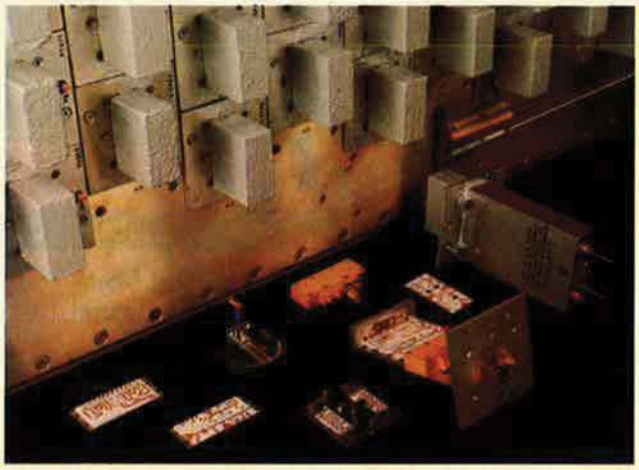


Modular packaging of array electronics.



Line array with polarization-sensitive reflector.



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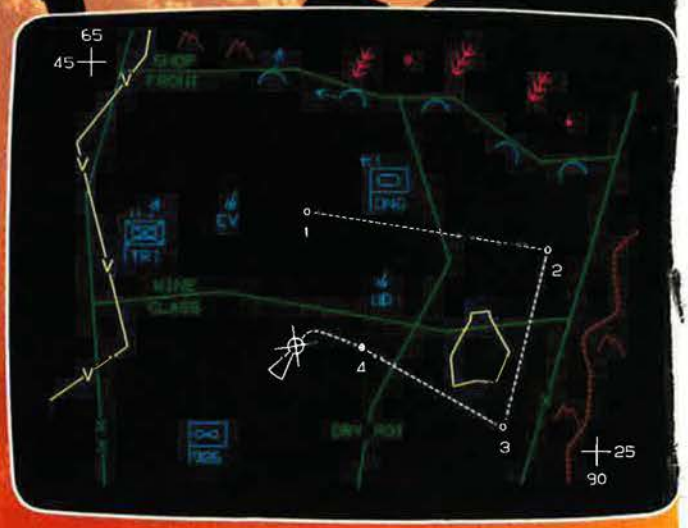

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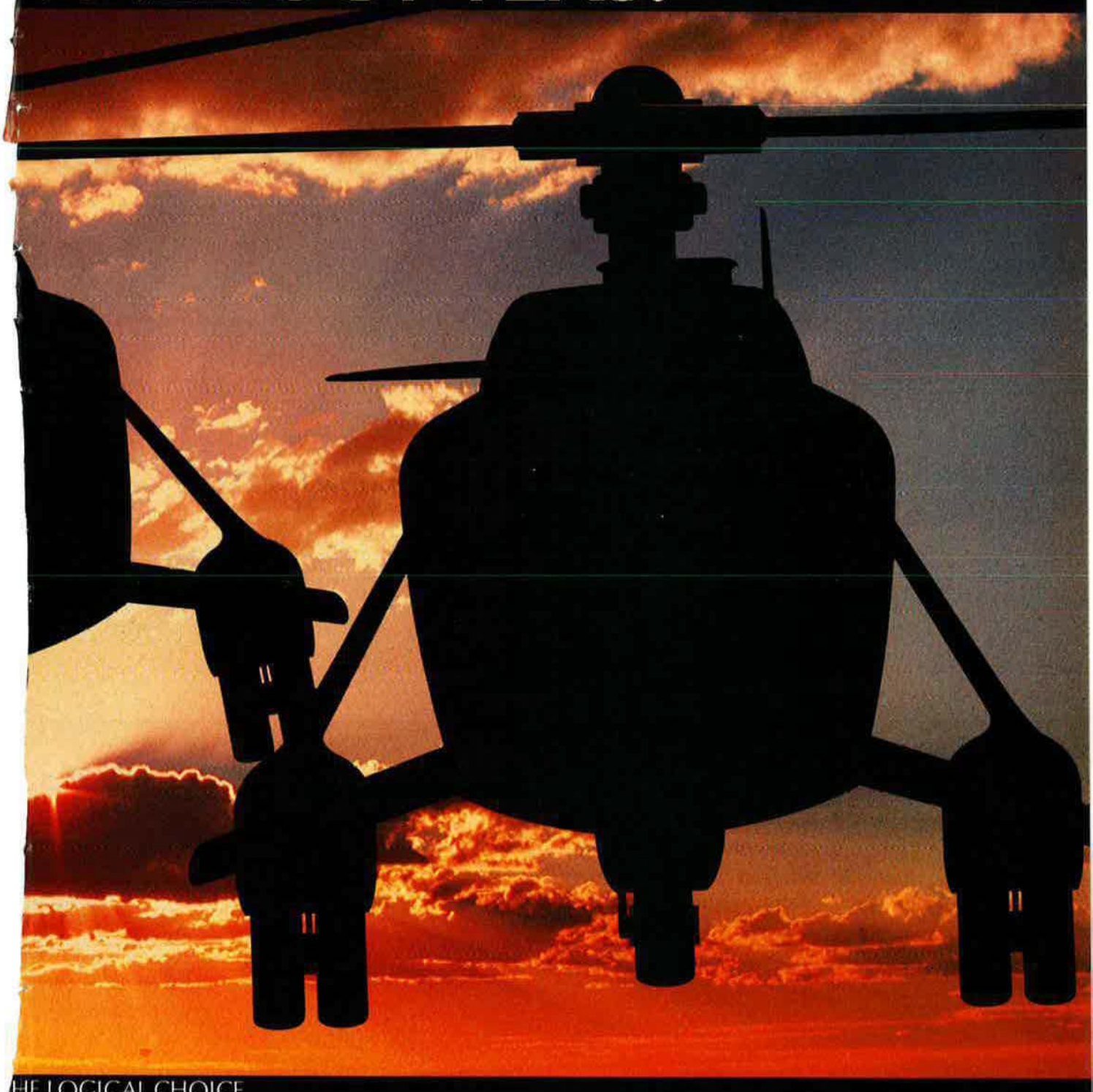

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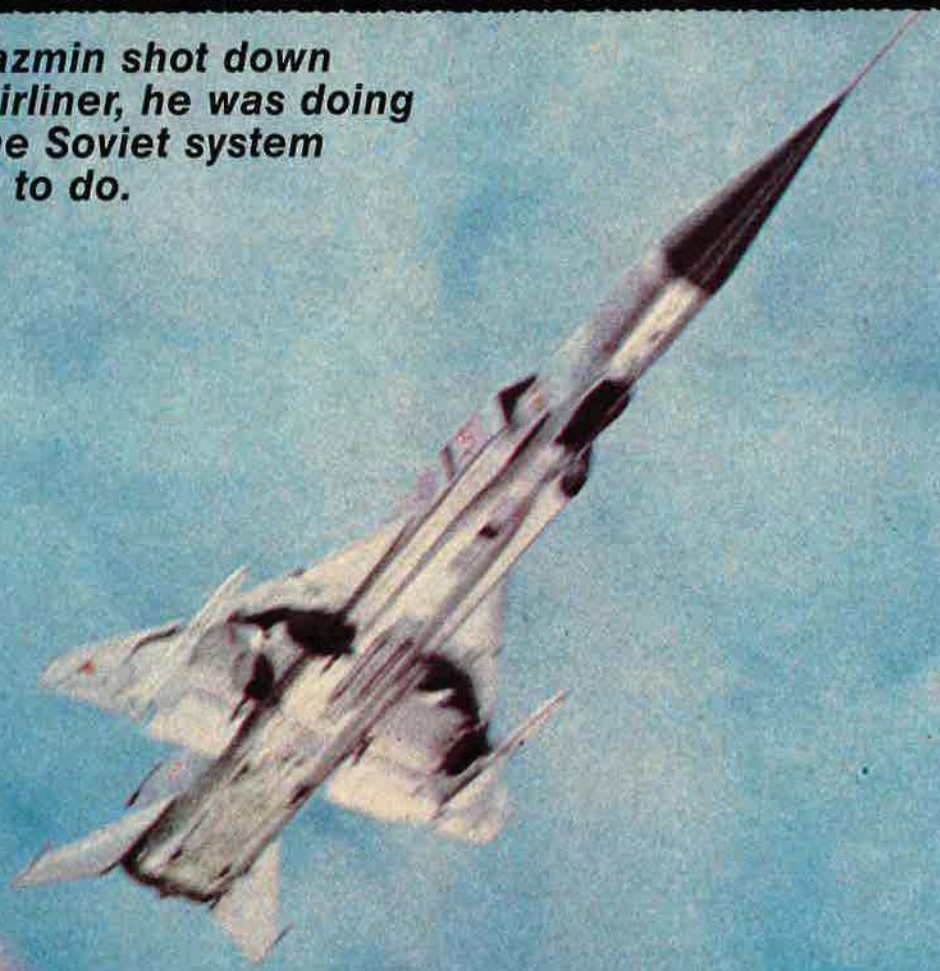
When Major Kazmin shot down the unarmed airliner, he was doing exactly what the Soviet system compelled him to do.



DEATH

BY YOSSEF BODANSKY

A Soviet Su-15 Flagon-E interceptor is shown at takeoff. A Flagon-E fired at a Korean Air Lines 707 in 1978, forcing it down on an icy lake.

BY THE BOOK

WHEN, in the predawn hours of September 1, Maj. Vasiliy Konstantinovich Kazmin took off to intercept Korean Air Lines Flight 007, he was operating according to strict, proven procedures.

An article that appeared in the Soviet journal *Aviatsiya i Kosmonavtika* in November 1981 had painted the fatal scenario ahead of time. It presented a doctrinal view of night intercepts and dealing with unidentified "violators" of Soviet airspace.

He tried IFF, the article said in a colorful passage. *Yes, it was the "violator"!* He maneuvered behind the target and, after some effort, locked on. *His prey slowly approached the cross hairs. Now it was centered. Launch! And immediately the airplane turned away. Out of the corner of his eye, the pilot caught the glimpse of the wing lights of the "violator" amid the stars. "I stopped him!" the officer thought joyfully as he reported to the command post.*

Nearly two years later, Major Kazmin played out the scenario in reality when he intercepted a "violator"—the KAL airliner—and shot it down.

Flying a Su-15 Flagon-F with call sign 805, Major Kazmin headed in the general direction indicated by the command post. He sighted the target visually and on radar at 1812:15 GMT. "The target isn't responding to IFF," he notified the command post (1813:26). This data was sufficient for the command post to authorize Major Kazmin to lock on (1815:47), thus sealing the fate of the "target." When he later reported, "The ANO [air navigational lights] are burning; the [strobe] light is flashing" (1818:34), it was in accordance with the procedures requiring him to report any development. Some eight minutes later (1826:20), Major Kazmin "executed the launch" and reported that his "target is destroyed" (1826:22). Throughout the shooting down of the airliner, Major Kazmin operated strictly by the book.

Examination of the events of September 1 and analysis of relevant Soviet writings tell much about the decision-making process in the USSR and provide insight into the Russian view of the Flight 007 downing.

The Meaning of *Maskirovka*

The Soviet Union defines itself as "A Nation in Arms," vigilantly on guard against the designs of aggressors. Achieving surprise and holding the initiative are critical preconditions to victory. Recently, the Soviets have emphasized the crucial significance of victory in the initial period of war. The key to that victory is a surprise attack utilizing only existing forces in their routine peacetime deployment.

"Surprise is achieved," according to the Soviets, "by misleading the enemy as to one's own intentions. . . ." Only *maskirovka* (camouflage, concealment, and deception) can secure the preconditions for surprise and, hence, victory in the initial period of war. The growing significance of *maskirovka* in the Soviet strategic posture has led to the establishment of the Chief Directorate of Strategic *Maskirovka* (GUSM) under the direct command of the senior First Deputy Chief of the General Staff, currently Marshal of the Soviet Union V. F. Akhromeyev. His unprecedented promotion last March indicated the growing significance of the central coordination and supervision of the Soviet strategic buildup, including the *maskirovka* component.

The Soviets believe that the enemy is determined to pierce their *maskirovka* shield. They perceive Western reconnaissance as a threat to that shield, and they have intensified their efforts to conceal their capabilities and thereby mislead the enemy as to their intentions.

The Soviets refer to the reconnaissance, especially ELINT, efforts by technical means as "the undeclared war" waged constantly by the West. They discuss this gathering of data in terms of winning and losing, "winning" being their ability to prevent the enemy's acquiring data on the very existence, let alone performance, of their strategic assets. GUSM has delivered, in the Soviet opinion, an unequivocal victory in "the undeclared war." By a careful monitoring of the enemy's technical means and a detailed knowledge of their performances and schedules, GUSM believes it has fulfilled the principle, "The enemy should see only what Ogarkov wishes to show them."

(Marshal of the Soviet Union N. Ogarkov, currently the First Deputy Minister of Defense and Chief to the General Staff, is the founder of GUSM. In his capacity as its commander, the Marshal was the chief

Soviet military delegate to SALT I.)

Strategic activities on the Kamchatka peninsula are among the most important and sensitive in the Soviet Union. Furthermore, most of them constitute apparent violations of arms-control agreements. All of these activities are carried out under the strict control and supervision of GUSM. Thus, they are supposed to be immune to the routine intelligence-gathering efforts of the enemy. However, a surprise penetration, especially at night when *maskirovka* is somewhat relaxed, can expose some of the activities. Thus, a breach of *maskirovka* cannot be tolerated.

Marshal of Aviation Piotr Kirsanov, the Commander of Aviation of the Far East Theater of Military Operations (VVS DV-TVD), explained the penetration of the Korean Air Lines 747 in these terms in a September 20 article: "Of late, the American special services have been displaying the greatest interest in the major areas of the basing of the strategic nuclear forces of the Soviet Union, the groupings of our Air Forces and Navy, as well as in the air defense system, and the facilities for the state and military control. Constant active intelligence is also being conducted by the USA in the Far East. . . . At present . . . [there is] evidence that the South Korean plane not only was fulfilling an intelligence assignment but also represented only one of the links in the overall system of large-scale intelligence actions carried out with the use of most diverse means from Soviet Chukotka to the Primorskiy Kraiy."

The Functioning of the System

Each Soviet wartime organization has a peacetime counterpart. In case of a war or emergency, all the applicable assets are turned over to wartime organizations. The wartime DV-TVD is, in peacetime, Troops of the Far East. The two organizations cohabit in the Far Eastern Military District (DV-VO).

As far as the Soviets were concerned, when the imminent penetration of Soviet airspace was discovered on September 1, the "violator" could have been a bomber. Thus, the warfighting control/management was activated. The Soviet Union, cherishing its own ability to achieve surprise, is sensitive to being surprised. Although the Soviets learned almost immediately that the intruder was an airliner, the operational-level warfighting command echelon continued to direct the interception and eventual termination of KAL Flight 007.

The KAL incident is of unique significance because of its timing. The Soviet air assets—both the Soviet Air Forces (VVS) and Troops of Air Defense (Voyska PVO)—have undergone unprecedented changes in the last five years. These have been in organization, doctrine, and operational concepts. The VVS DV-TVD, the most advanced among the theater-level aviation organizations, has been fully operational only since December 16, 1982. The KAL crisis was the first time it functioned under actual emergency.

The Soviet Air Defense Forces (PVOS), like the Air Forces (VVS), is a functional command. It has assets of its own as well as other combat and specialist troops for the fulfilling of a specific mission. The Aviation Commander of the TVD (Marshal of Aviation Piotr Kirsanov is the Commander of Aviation of the Far East Theater of Military Operations [VVS DV-TVD]) becomes the direct senior commander for the conduct of Independent Air Operations, both offensive and defensive. He controls/manages the defensive operations in his capacity as the commander of the Soviet Air Defense Forces (PVOS) of the TVD. He is then assigned assets of both the Frontal Aviation units and Troops of Air Defense units that can be brought into action if the need arises.

The area where the Korean airliner penetrated was also significant on September 1 because the Soviets planned an ICBM test in the Kamchatka impact range that night. In such a case, senior personnel of the General Staff—especially GUSM and the Strategic Rocket Forces (SRF)—were involved in the direction of the military activities in the area. This involvement took place at the theater or even national levels of command, where the overall policy of the conduct of the interception was decided.

The Soviets, who operate their intelligence assets in a well-coordinated fashion and under a centralized and unified command-management system, expect the enemy, in a given arena, to do likewise. On August 31, the Soviets surveyed US assets in the area. Regardless of the true missions of those assets, the Soviets, with worst-case mentality, assumed them to be components of some centralized, unified intelligence force.

Soviet radars can activate the transponders of Western airliners, and do so routinely with airliners operating in the trans-Siberian route. When the unidentified blip diverted from route R-20 and headed toward Soviet airspace, the Sovi-

The Korean passenger jet was shot down September 1 over the Sea of Japan by a Soviet Sukhoi Su-15 Flagon-F interceptor of the type photographed here by the Swedish Air Force. Two Flagon-Fs took off from Sakhalin Island and formed up with four Soviet MiG-23s to give chase. Their tactics were in keeping with Soviet doctrine.

ets could have had the data that the blip claimed to be KAL Flight 007. The fact that it was an airliner would not have reduced the Soviets' alarm. To them, the idea of an airliner on an intelligence mission seemed natural. Aeroflot is often involved in intelligence-gathering missions. Furthermore, the unexpected introduction of a surprise element into the intelligence conspiracy unfolding in the Far East fits the Soviet mindset. Should the blip penetrate Soviet airspace, it was to be regarded as hostile.

Two tasks confronted the Soviet Air Defense Forces of the Far East Theater of Military Operations (PVOS-DV-TVD): to establish the definite identification of the intruder, and to decide on the means, method, and place of attack. All this time, Soviet early warning radars were tracking the blip that claimed to be KAL Flight 007.

The first problem was solved quickly. Once it became clear that the aircraft was about to penetrate Soviet airspace (1630 GMT), the Soviets scrambled fighter-interceptors. Two pairs, each composed of a Su-15 and a MiG-23, were scrambled from Petropavlovsk-Kamchatkiy (1637 GMT). The mission leaders flew the Su-15s with the MiG-23s on their wings. The other MiG-23s proceeded under complete radio silence and at very low altitude as a precaution against surprises. The Soviets could have established at that time the identification of the "violator." As to the Su-15s, it was explained in *Krasnaya Zvezda* on September 7 this way:

"Several Soviet interceptor aircraft were sent aloft. One of them controlled-monitored the actions of the American RC-135 plane. A second flew into the area where the intruder plane was and signaled to it that it had intruded into the airspace of the USSR."

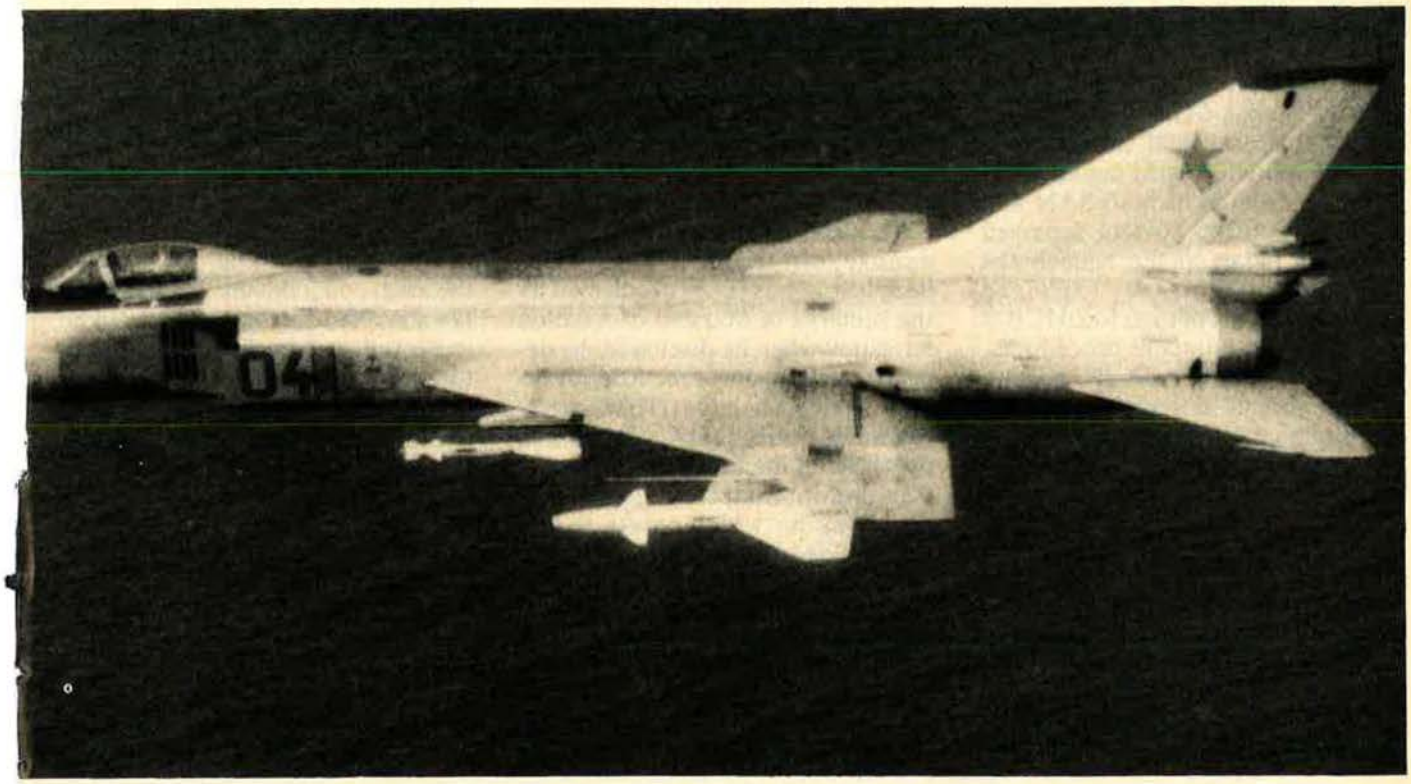
The mission was completed at 1708 GMT. By then, the Soviets had a positive identification of the intruder. Even at the time of the scramble, there was no confusion as to the fact that the intruder was *not* an RC-135. As a precaution, at least one additional composite pair was launched to patrol the shore area. Although this sortie was a result of the interception process, it was not an integral part of it, and thus is not counted by the Soviets in their analysis of the interception.

From all indications, the specific decisions on when, where, and by whom the kill would be made came from theater command. This was the only level with a detailed picture of the unfolding event and with the ability to compare actual assets in the area with the images presented to the West through *maskirovka*. The Soviets had air defense assets they chose not to use, because in doing so they would expose their existence.

A Previous Downing

It is useful here to recall a previous downing of a Korean airliner by the Soviets. It occurred on April 20, 1978.

In early 1978, the West estimated that units at only three of the nineteen air bases on the Kola peninsula, in northern Russia, adjacent to Finland, had all-weather capabilities, and that actually there was no permanent deployment of aircraft or SAMs in the area during winters. Thus, there was little wonder at the time when KAL Flight 902 flew for more than an hour above the area before being intercepted, and eventually shot down, by a Su-15. It was only in the fall of that year, following Marshal Ustinov's attempt to conduct Soviet military exercises in Finland, that the actual magnitude



of the regional buildup was exposed.

In reality, not only did all of the nineteen air bases on the Kola peninsula have all-weather capabilities, but sixteen of them had paved runways more than 2,000 meters long. There was a permanent deployment of more than 340 interceptors of the IA-PVO on these bases, as well as forward basing capabilities for an additional 120 fighters of the 13th Air Army of the Leningrad Military District. Furthermore, the area was saturated with newly installed SAM batteries and a sophisticated command and control system.

The Soviet regional commander was determined not to expose these capabilities. This meant that while the KAL Boeing 707 had to be shot down, it had to be done by assets known to the West. Hence, two Su-15s were scrambled from Loenoy Polye, northeast of Leningrad, and flown more than 1,000 kilometers in the darkness. They intercepted the Korean airliner in the morning and escorted it to a lake area away from military installations. There, a Su-15 tried to shoot it down. Only the skill of the Korean pilot saved the airliner.

A Soviet Antonov An-24 Coke reconnaissance aircraft is surrounded by curious American onlookers on an isolated airstrip at Gambell, St. Lawrence Island, in 1974. The An-24 was forced to land on the frozen Bering Sea island, between Siberia and Alaska, when it ran low on fuel. A US radar station at King Salmon detected the Soviet aircraft off Cape Romanzof, and F-4 Phantom interceptors were scrambled. In contrast to the Soviet practice of shooting down wayward military and civilian aircraft, the Phantoms escorted the An-24 to a safe landing on St. Lawrence. USAF also flew in a load of fuel, along with a mechanic, to help the An-24 and its twelve crew and passengers get back home. (Photo courtesy of Richard B. Risk, Jr.)

Similar considerations probably guided Marshal Kirsanov in the Flight 007 incident. Kamchatka peninsula is saturated with air defense assets, both aircraft and SAMs. The SA-5 Gammon is one of the most crucial and controversial factors in Soviet ABM capabilities, in that it doubles as both SAM and ABM. When the Soviets deployed an ABM radar on the Kamchatka peninsula in 1974, they explained that it was a part of their local ICBM range. Soviet intercept procedures, even if by fighter aircraft, require the operational activation of the entire regional air defense system to be able to cope with escalations.

Thus, had the Soviets decided to shoot down the KAL Boeing 747 above Kamchatka, they would have exposed their local radiotechnical means and their modes of operation. This would have exposed the relationship between the ABM radar and the SA-5s. In his press conference, Marshal Ogarkov indicated that the Soviet Union could have used the locally based SA-5s if it chose to shoot down the "violator" above Kamchatka. However, the Soviets would never expose the true capabilities of the SA-5 for such a trivial target as a Boeing 747. Marshal Ogarkov was practicing *maskirovka* by reinforcing the claim that the SA-5 is only a SAM.

The Soviet determination not to expose air defense assets unnecessarily was further indicated by the remarks of Marshal of Aviation Kirsanov when he discussed the decision to shoot down the Korean airliner above Sakhalin. The Soviets say a US Ferret-D spy satellite was overhead at the time of the penetration and intercept. Kirsanov said decisions on which assets to use were guided by the presence of the satellite and by the position of KAL 007. The airliner's presence above Kamchatka "had forced about a doubling of intensiveness [readiness] of the work of our radiotechnical means. . . . At the same time . . . the work of the Soviet PVO radiotechnical means on the Sakhalin Island and the Kuril Islands [worked] in their normal regular regime." Thus, at that point, the Soviets had not exposed their air defense assets on either Kamchatka or on Sakhalin and the Kuril Islands.

However, when the actual interception was conducted, it was done with a full awareness of the Ferret-D overhead and with the activation of the assets on Sakhalin and the Kuril Islands. "At that time, as was to be expected, it [the Ferret-D] monitored the work of all of our additionally switched-on PVO radiotechnical means on the Sakhalin Island, the Kuril Islands, and Primorskiy."

For the intercept itself, the Soviets chose the fighters deployed on Sakhalin Island, that being the easternmost belt of the stationary defense perimeter of the strategic Primorskiy territory with its vital centers of Komsomolsk, Khabarovsk, and Vladivostok.

The interception, thus, was decided upon at the TVD level, with

the local Soviet Air Defense Forces of the Far East Theater of Military Operations (PVOS-DV-TVD) commander, Marshal of Aviation P. Kirsanov, in charge. National considerations, especially strategic *maskirovka,* were examined and considered at that stage. The local commanders of both the TVD and the Front-VO were notified and consulted. Once the overall operational-level procedures were decided, the entire chain of command of the Air Defense Forces was activated, using assets of both the 12th TVA and 10th Armiya-PVO assigned to it with their regular commanders. The PVOS command post controlled-managed and coordinated the tactical performances of autonomous FA and Voyska-PVO subunits.

Termination of the Flight

Improvements in performance of fighter-interceptors and their subsystems enable them to conduct the final stages of an intercept and kill alone. "It would not be superfluous to note that practical use of modern fighters at night and in clouds has shown that the lone fighter can be thought of, and is now thought of, as the basic fire and tactical unit," wrote Col. V. Belyayev in *Aik* of November 1981, launching one of the most intense controversial debates in the Soviet military press—Single vs. Pair as the basic tactical unit in air combat.

When General-Colonel of Aviation S. Golubev concluded the debate in the November 1982 issue of *Aik,* the Soviets had introduced new concepts. The fighters that intercepted KAL Flight 007 operated according to Golubev's principles. The use of six-fighter formations was introduced in Golubev's article as a doctrinal solution. The Soviets scrambled six fighter-interceptors for the Korean airliner kill.

A single modern fighter, using onboard radar and beyond-visual-range (BVR) missiles, can safely engage a target and destroy it. On the other hand, air operations can escalate into a multiaircraft, tight-maneuver melee. In such cases, the pair is the smallest tactical formation that can ensure the survival of the participants. In most cases, at least an element is a precondition to mutual defense, survival, and ability to seize and maintain the initiative. However, all these activities rarely require sophisticated long-range radar and air-to-air missiles. An additional consideration is the ability of the Soviet aeronautical industry to produce large quantities of fighters and its inability to produce large numbers of sophisticated interceptors.

The Soviet solution is composite formations: pairs and elements. The Soviets claim that in a multiaircraft formation, only the few aircraft that conduct the initial intercept need BVR capabilities. Wingmen and others of the formation see action only in the course of close-range tight-maneuver combat. Pairs, therefore, can be formed by a leader with intercept capabilities and a fighter as wingman. A single interceptor with little maneuverability can be escorted by a pair of fighters with limited long-range capabilities.

For the shootdown of KAL Flight 007, the pair leader in the Su-15 performed the identify-intercept mission, while his MiG-23 wingman followed, ever ready had he been called upon to launch the surprise attack.

When KAL 007 approached Sakhalin, the Soviets scrambled six aircraft (1742 GMT). Two Su-15s took off from Dolinsk-Sokol and four MiG-23s launched from Novo-Aleksandrov. In a short time they formed three pairs. Two were Su-15/MiG-23 composite pairs. In one of them, Major Kazmin flew call sign 805, his wingman, 163. The composite pairs operated as primary and backup interception teams. There was no need for a decoy pair. The MiG-23 pair operated in complete radio and emission silence and at extremely low altitude as a reserve in case the West chose to escalate and retrieve its "intelligence asset"—the Korean airliner—by force. Major Kazmin carried out his orders efficiently and by the book. All six aircraft had landed by 1828 GMT. As was the case in Kamchatka, additional aircraft were scrambled for patrol duties during and after the intercept, but they were not part of the operation in the Soviet view.

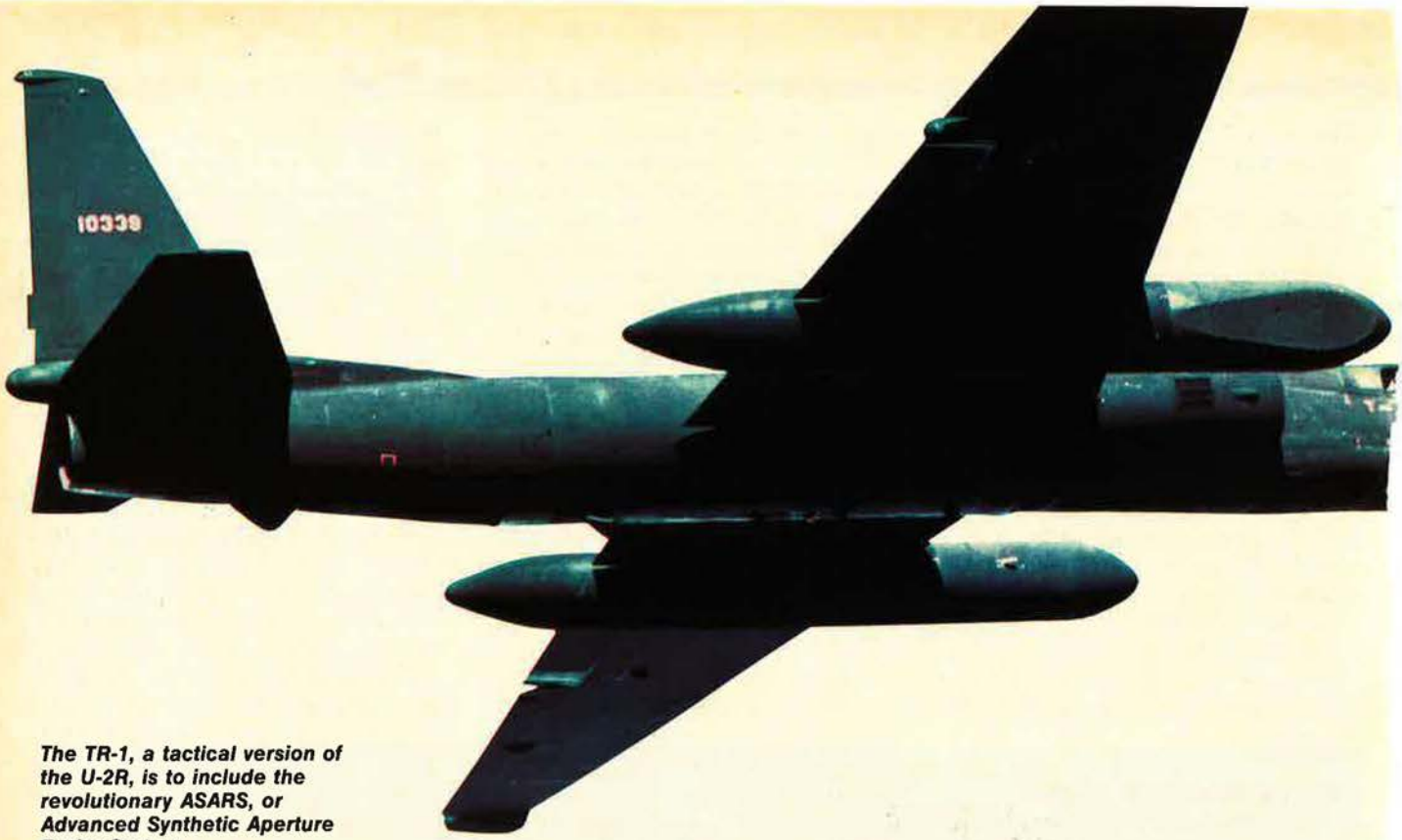
The regional PVOS commander had launched a small but highly flexible force. He organized it in a way that would ensure the quick downing of the violator. At the same time, he had a built-in reserve force capable of handling escalation. While the aircraft came from a mixed Frontal Aviation regiment of the 12th TVA, a centralized PVOS command post with two additional local command posts conducted the interception. It apparently was the PVOS regional commander who gave the specific order to shoot down the Boeing 747 in accordance with the tactical situation.

In an April 1982 interview with *Komsomol'shaya Pravda,* General-Colonel I. Meskvitelev addressed the new requirements placed on Soviet pilots.

"The all-weather fighter-interceptors are missile-carrying air-interception complexes," he said. "Together with the automated control equipment they make it possible to repel the air enemy at the distant approaches to the defended installations. For this reason, an air defense pilot, having straddled this fantastic equipment, should be ready to operate at an enormous distance away from the airfield, in any weather, to operate, if need be, independently, that is, without any suggestion from the ground and independently take decisions. It is essential to fly at maximum low altitudes, merging with the terrain, as well as in the stratosphere above the clouds, and at very great speeds. It is essential to assess a situation instantly and take the only correct decision."

Each of the Soviet formations involved in the intercept of KAL Flight 007 carried out some of these prescriptions. ■

Yossef Bodansky is an Israeli citizen who is currently engaged in research for the US State Department and DoD. Before assuming his present position he was a visiting scholar at Johns Hopkins University's School of Advanced International Studies in Washington, D. C. Prior to that he was technical editor for Israel's Air Force *Magazine.*



The TR-1, a tactical version of the U-2R, is to include the revolutionary ASARS, or Advanced Synthetic Aperture Radar System.

THE fundamental requirements of the tactical air forces (TAF) boil down to five specifics:

- Over the near term, the Air Force needs to flesh out the forty fighter wings it is authorized, meaning the acquisition of enough aircraft quickly enough to achieve that end before attrition and obsolescence can negate whatever progress is being made.
- Further, the aircraft the Air Force buys must represent a prudent mix of specialized and non-specialized designs.
- The existing force ought to be bolstered by upgrades in two areas: increased reliability and maintainability, on the one hand, and additional capabilities, such as night and all-weather features, on the other.
- New aircraft should be developed and procured. Over the near term, this means the Dual Role Fighter, or DRF, a derivative of either the F-15 or F-16 *(see November '83 issue)*. This process needs to be in phase with the replacement of the F-4s that are on average about sixteen years old and probably won't last more than five years.
- Lastly, in building the fighter force of the future, the Air Force should make full allowance for the threats, as they can be calibrated, and the fiscal realities that are likely to be encountered.

These were the key findings to emerge from the Air Force Association's National Symposium on "Tactical Air Warfare," held September 14 in Washington, D. C.

Calibrating the threat was the task of the Tactical Air Command's Deputy Chief of Staff for Intelligence, Col. Donald R. Arnaiz, who explained that the Soviet military aircraft arsenal is now in excess of 6,800 planes that can be shuffled rapidly between theaters of operations, depending on specific needs.

Among the most advanced recent entries into the Soviet fighter inventory, he told the AFA meeting, is the MiG-31, a "true look-down/shoot-down" fighter, similar to the F-15 Eagle. Two regiments of MiG-31s are now in being, and the aircraft is about to go into "full production." The MiG-31 Foxhound, TAC's intelligence head said, will markedly boost the Soviet Union's ability to detect and shoot down "low-altitude penetrating aircraft, such as our bombers."

Two other new fighters appear to be intended to narrow the performance gap with the Air Force's front-line fighters, according to Colonel Arnaiz. One is the MiG-29 Fulcrum, which recently achieved operational status. This new design is slightly larger than the F-16, incorporates advanced look-down/shoot-down capabilities, and exhibits "superb maneuverability for air-to-air dogfights." The other new Soviet fighter is the Su-27. This aircraft is expected to achieve operational status next year. Describing the Su-27 as somewhat larger than the F-15, Colonel Arnaiz said it "should be very competitive with our best fighters in terms of technology and maneuverability."

The Soviet Threat

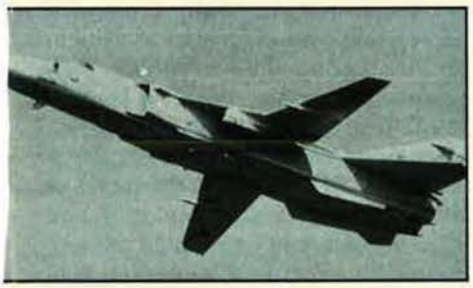
Within the present generation of Soviet fighters, the Su-24 Fencer should be seen as the most "worrisome" tactical ground attack aircraft. Describing the Su-24 as similar in configuration to the F-111, Colonel Arnaiz said the "Soviets have deployed this aircraft outside the USSR for the first time, in Eastern Europe, and there it poses a distinct threat to NATO forces." Fencers are being produced at the rate of eight per month, and a total of 800 of these aircraft probably will be built over the next few years.

Another formidable Soviet ground-attack fighter is the Su-25,

The traits likely to shape tactical airpower in the 1990s and beyond are survivability, lethality, agility, and self-sufficiency. A special AFA Symposium probed this issue and provided . . .

A Roadmap to Tomorrow's Tactical Airpower

BY EDGAR ULSAMER
SENIOR EDITOR (POLICY & TECHNOLOGY)



TOP: The MiG-29 Fulcrum, slightly larger than the F-16, is a highly maneuverable "dogfighter" with "look-down/shoot-down" capability. ABOVE: The Su-24 Fencer is the first true Soviet deep interdiction tactical bomber and poses a distinct threat to NATO forces. The Fencer resembles the F-111.

which "is similar in design and mission to our A-10. This aircraft will eventually be deployed throughout the Soviet tactical aviation forces and . . . has been used extensively in Afghanistan."

Providing operational command and control for the vast array of Soviet air-superiority and ground-attack fighters is the "Mainstay" SU-AWACS, patterned after the US Air Force's E-3A AWACS "but not quite as good," according to the TAC intelligence chief. Based on the Il-76 airframe, this aircraft uses a radar dome similar to that of the E-3A to "detect aircraft hundreds of miles away."

Augmenting the growing capabilities of Soviet Frontal (tactical) Aviation are the world's most advanced and dense tactical air defenses that, moreover, are being modernized at a furious rate. Between 1972 and 1980, Colonel Arnaiz told the AFA Symposium, the Soviets brought out three completely new surface-to-air missiles—the SA-6, the SA-8, and the SA-9. Since 1980, two additional systems—the SA-11 and the SA-13—have been brought into the inventory, and by the mid-1980s two more new SAM types are expected to achieve operational status—the SA-12 and the SA-8 FO.

Soviet tactical airpower is being bolstered by steady growth in the USSR's airlift capabilities. Military Transport Aviation and Aeroflot, the Soviet state-owned airline that becomes an appendage of the military in periods of crisis or war, are being equipped with large numbers of modern jet transports, soon to include "Condor," an aircraft similar to our C-5A Galaxy, according to TAC's intelligence chief.

The bomber element of the Soviet armed forces can back up Soviet tactical airpower and is growing steadily. The Backfire bomber keeps coming off the production line at a rate of about thirty planes per year. About 200 of these supersonic aircraft—which in addition to bombs can carry a variety of air-to-surface missiles—are now operational, according to Colonel Arnaiz. In addition, there are about 150 Bear and Bison bombers in the Soviet inventory, along with some 600 medium-range Badger and Blinder bombers.

The number of Bear bombers may be increasing, according to Colonel Arnaiz, because the Soviets are building new models to serve as ALCM (air-launched cruise missile) carriers. Of special concern here is the AS-4, an ALCM with a

range of about 200 miles and a maximum speed above Mach 2.

The Soviets' emphasis on cruise missiles comes to the fore also in their naval forces assigned to general-purpose tasks. *Yankee*-class submarines that had to be taken out of the Soviet strategic nuclear arsenal because of the numerical ceilings of SALT II are being revamped as "cruise missile shooters," according to Colonel Arnaiz. The very quiet *Victor*-class submarines also are being equipped with cruise missiles.

Probably the most prominent example of Soviet determination to exploit the cost-effectiveness of cruise missiles is the new *Oscar*-class submarine that carries twenty-four SS-N-19 cruise missiles with a range of more than 200 miles. *Oscar*, the world's largest attack submarine, serves primarily in an antiship role, but can be used for other general-purpose force missions.

In the area of aircraft carriers, the Soviet Union still lags behind the US, with only four carriers in being. But by the year 2000, the TAC intelligence chief predicted, there could be as many as ten aircraft carriers—equipped with fixed-wing fighters rather than helicopters—in the Soviet inventory.

Tac Air Technology

Two aircraft programs rank high among the five fundamental TAF requirements set forth by the symposium's moderator of a special "requirements panel," USAF's new Deputy Chief of Staff for Research, Development and Acquisition, Lt. Gen. Robert D. Russ. These are the Dual Role Fighter (DRF) and the Advanced Tactical Fighter (ATF), General Russ said.

The DRF, according to General Russ, could start to enter the operational inventory in 1986 if the decision to pick one of the two candidates—the F-15E or F-16E—for this derivative program is made early in 1984. If, on the other hand, the Pentagon waits much longer in making this decision, buying the Dual Role Fighter might not make too much sense since its advent would come close to the deployment of the Advanced Tactical Fighter, beginning probably in 1995.

Carl Smith, a professional staff member of the Senate Armed Services Committee and a panelist at AFA's Symposium, pointed out that delays in funding the DRF program were not caused by Congress but by the Air Force, "which put it near the bottom in terms of its requirements." General Russ and the other Air Force experts serving on the panel did not dispute Mr. Smith's contention.

Gen. Robert T. Marsh, Commander of Air Force Systems Command, told the AFA Symposium that the DRF would "provide significant improvements for both the air-to-surface and air-to-air capabilities of our tactical air forces." He added that the "flying part of the Dual Role Fighter evaluation is complete and we are now compiling the results." Although he declined to discuss the relative merits of either the F-15E or F-16E, he said that "among other enhancements, the range and payload improvements alone for either of these aircraft promise a dramatic improvement for our ability to accomplish interdiction."

Maj. Gen. Thomas G. McInerney, the Pacific Air Forces' Director of Operations and Intelligence, told the AFA meeting that because the Soviet Union is building up its force projection capabilities, "we will need a fighter with more range and payload, and that means the Dual Role Fighter," especially so far as the Pacific theater of operations is concerned.

Turning to the need for an Advanced Tactical Fighter, Maj. Gen. Thomas L. Craig, TAC's Deputy Chief of Staff for Requirements, told the AFA meeting that the ATF has gone through the painstaking SON (statement of operational need) process at TAC, PACAF, and USAFE. Following further coordination among the TAF components, the formal requirement for ATF will be forwarded to the Air Staff, probably before the end of this year, he predicted. The Air Force's Scientific Advisory Board is reviewing the technological options that the ATF might incorporate, he added.

He and other panelists explained that no decision has been made as yet on the ATF's engine and that it could be "either a derivative of an existing engine or a completely new design." Both General Electric and Pratt & Whitney, the two principal US engine manufacturers, are exploring a range of technological approaches for the ATF engine, according to General Craig. The Air Force, so far, has not yet decided whether the ATF design should be confined to STOL (short takeoff and landing) capabilities or aim for the more ambitious and "very interesting" V/STOL (vertical and short takeoff and landing) regime.

The Most Integrated Aircraft

There is no doubt in the TAF community, however, that the ATF needs to be "the most integrated aircraft we have ever built in terms of power, flight controls, and weapon systems," according to the members of the Symposium's requirements panel. There also was consensus on the imperative of channeling advanced low-observable (Stealth), aerodynamic, and electronic countermeasures technologies into the ATF's design and that the resultant benefits would be of a "synergistic nature."

General Marsh elaborated by explaining that the ATF's integrated electronic warfare system, as currently envisioned, "will combine sensors and jammers for the full spectrum of electronic warfare threats—lasers, infrared, and millimeter wave, as well as normal radar frequencies."

Defining ATF as the next-generation air-superiority fighter possessing "substantial air-to-ground capability," General Marsh said, "We are now looking at an aircraft with tremendous advances over existing systems, including fully integrated defensive and offensive avionics, greatly reduced observables, efficient supersonic cruise, a significant increase in fuel efficiency, greater range, forty percent fewer parts, a 100 to 300 percent increase in reliability, a short takeoff and landing capability, and high maneuverability provided by integration of systems, new aerodynamic design, and vectored thrust."

Looking at ATF and other next-generation fighters, Lt. Gen. Leo Marquez, USAF's Deputy Chief of Staff for Logistics and Engineering, told the AFA Symposium that "the tactical airpower of the future must be able to operate independently of

the fixed communications networks, the air terminals, and computer networks now extant. The fighter squadron of tomorrow must be mobile and lightly manned, and be dependent only on the availability of runway services and supply of water, fuel, and munitions."

Toward this end, the next-generation fighter must be "designed so that the lion's share of maintenance can be done on the aircraft and not in adjacent shops, which will require stabilized power supplies and cooling air to the complex support equipment we use today. In short, we must pay as much attention to the fault-isolation problem on the aircraft as we do to the performance specifications." These steps, he added, are needed to overcome longstanding maintenance problems that absorb a large share of the Air Force's airlift capacity and drain manpower resources.

Flexibility, Lethality, Survivability

For US tactical airpower to maintain its technological edge in the years ahead, three "musts" need to be met, according to General Marsh:

The MiG-25 Foxbat "E" is the world's fastest and highest-flying fighter. The Foxbat and the swingwing Flogger are the two most modern air-to-air fighters in the Soviet inventory.

"We must provide the capability to navigate at low level and find targets at night, under the weather.

"We must satisfy the end-game kill requirements with smarter and more affordable weapons.

"And we must enhance our aircrew survivability through improved standoff armaments and electronic warfare capabilities."

LANTIRN (the Low-Altitude Navigation and Targeting Infrared for Night system), he stressed, is of fundamental importance because it permits operation at night, in marginal weather, "down on the deck, where our pilots can take advantage of terrain masking for ingress and egress, and [because it enhances substantially] target acquisition in a hostile environment." LANTIRN's payoff is that tactical commanders "get more from their weapon systems. The capability to attack at night, under weather, and with lower attrition multiplies the effectiveness of our limited forces."

He added that the system boosts accuracy, especially when combined with some of the smarter weapons coming into the inventory. This leads to increased effectiveness over the target and denies the enemy the license to operate with immunity from attack during night and overcast conditions, according to the AFSC Commander.

LANTIRN's navigation system, he explained, includes a wide field of view forward-looking infrared sensor (FLIR), a terrain-avoidance radar, and a wide angle raster head-up display that enables the pilot to keep his eyes "out of the cockpit, much like daytime flying."

LANTIRN's second pod houses the target-acquisition system that "couples a maneuverable field of view FLIR with a laser ranger/designator to allow our pilots to identify targets and to . . . launch their munitions" with high precision, he said.

Pointing out that LANTIRN hardware is in being, General Marsh said the navigation pod is now in flight test "with the target-acquisition pod slated to begin flight tests in the near future." If Congress provides the needed funds, the Air Force plans to bring the first LANTIRN systems into the operational inventory in the second half of 1987, he explained.

JSTARS, the joint surveillance target attack radar system under development by AFSC's Electronic Systems Division, will improve tactical airpower's ability to find targets and obtain real-time targeting information, he said. Its purpose, General Marsh said, is "to provide an airborne radar platform capable of identifying moving or stationary targets well behind enemy lines and then directing weapon systems to the target."

The Navstar Global Positioning System (GPS) is another AFSC program bound to raise "drastically the effectiveness of our tactical aircraft and weapons," according to General Marsh: "It will offer pinpoint position accuracy for navigation in three dimensions, allowing our aircraft to accurately navigate to targets anywhere in the world. Eventually, we should be able to incorporate Navstar GPS into the terminal guidance systems of our weapons in order to provide true launch-and-leave capabilities with precise accuracy. This could be particularly useful as a terminal guidance update for long-range standoff weapons." He predicted that a full constellation of GPS satellites will be in place by 1988 to provide revolutionary accuracy gains on a global scale.

Weapons that combine standoff launch features with accurate terminal guidance for a high probability of kill in the end game can increase significantly the survivability of tactical strike aircraft. The Joint Tactical Missile (JTACMS) program that the US Army is pursuing jointly with AFSC "will provide just such a capability" and eliminate the current reliance on lasers or data links for weapon guidance, General Marsh told the AFA meeting. But he warned that money is scarce for the development of millimeter wave and infrared techniques for target acquisition and terminal guidance required for standoff weapons.

With defense suppression the key to increased survivability of tactical aircraft, AFSC is pursuing a host of programs designed to produce the means for identifying and destroy-

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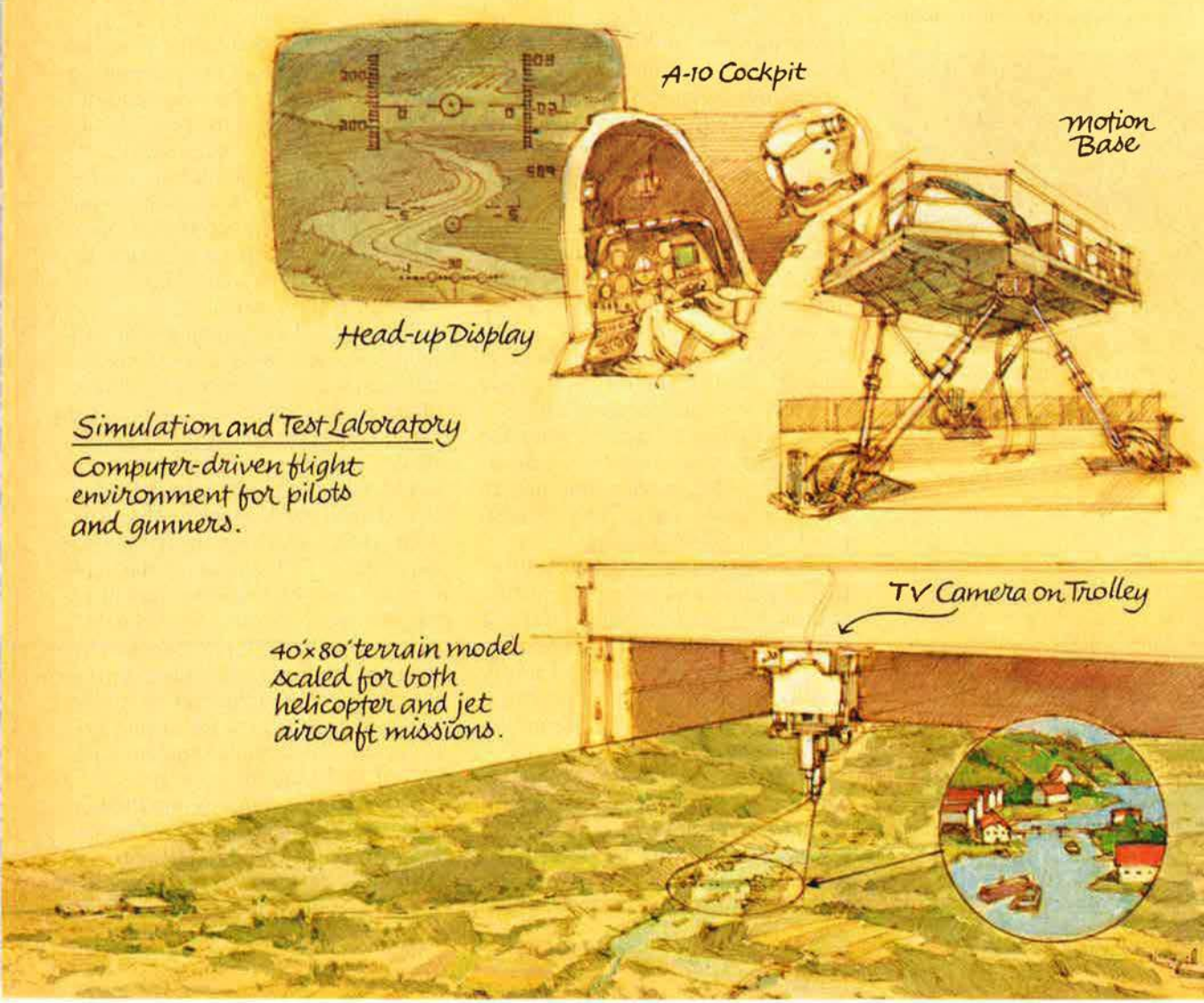

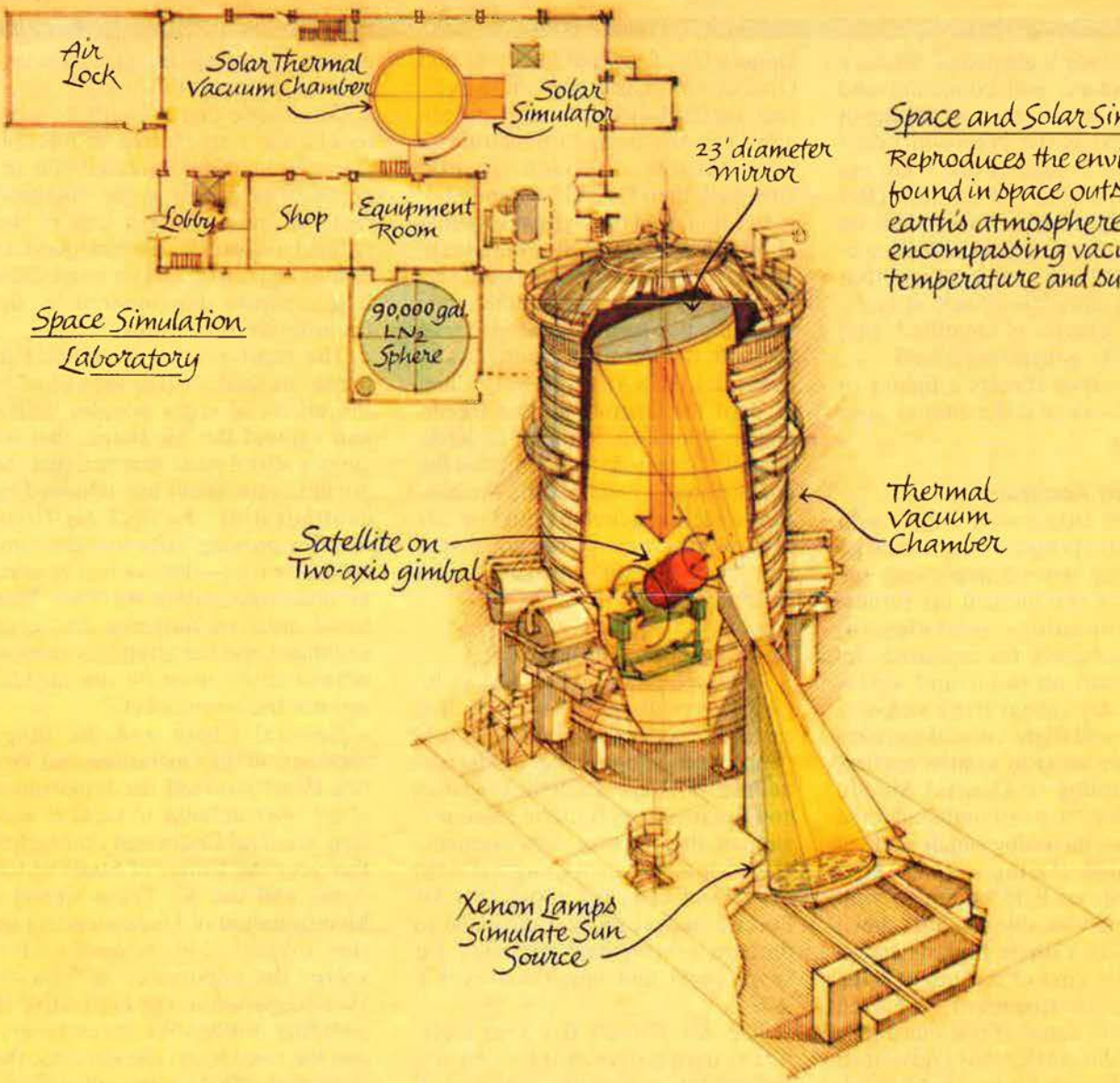

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ing the enemy's electronic warfare assets, radars, and command and control systems. Most promising in this context is the Precision Location Strike System (PLSS). He explained that PLSS draws on TR-1 aircraft to provide "recce data on enemy emitters, ground-based processing stations to analyze that data, and airborne attack aircraft. Once the emitter is identified, [its] location is pinpointed and . . . PLSS . . . then directs a fighter to the target—even if the emitter goes off the air."

Increased Accuracy

AFSC's Integrated Flight and Fire Control program also should go a long way toward improving the lethality of the tactical air forces. "This technology provides increased accuracy for ordnance delivery—both air-to-air and air-to-ground—by integrating sensors [and] fire and flight control systems to improve weapon system accuracy," according to General Marsh. He said that "in a test under adverse conditions, including a high angle of attack, high closing speed, and a 3.3-G turn, an F-15 equipped with this system was able to shoot down a drone with a single 20-mm cannon burst. This kind of accuracy in the air-to-air environment, coupled with greater standoff distances provided by the AMRAAM [Advanced Medium Range Air-to-Air Missile], will give our tactical forces a far better capability for achieving air superiority."

The long-range prognosis for tactical air warfare, according to General Marsh, hinges on advances in computational technologies that can "put real 'smarts' into very small packages that can be used efficiently in weapons. We are beginning to think in terms of true autonomous attack capabilities for our tactical weapons—that is, weapons with the computational capability necessary to actually be launched on search and destroy missions—thus seeking, acquiring, and hitting targets of opportunity on their own, with nothing more than general locations of potential targets" guiding them.

The AFA Symposium's panel on Operations and Tactics, headed by Lt. Gen. John T. Chain, Jr., USAF's Deputy Chief of Staff for Plans and Operations, cautioned, however, that tactical aircraft can't be absolved of the need to penetrate to their targets. Lt. Gen. Arnold Braswell, then PACAF's Commander in Chief, told the Symposium that although advanced standoff technologies should be pursued vigorously, "I don't expect that they will mitigate against the need to take the war to the enemy and . . . to penetrate." USAFE's Deputy Chief of Staff for Operations and Intelligence, Maj. Gen. William L. Kirk, similarly rejected the notion that the attack function against the Warsaw Pact's second echelon could be left to futuristic standoff weapons, saying, "You bet we will continue to penetrate!"

The Logistics Challenge

Although gratified by gains in logistics over the past few years that resulted in greater readiness and "improved staying power on the battlefield," USAF's DCS for Logistics and Engineering, General Marquez, warned that further improvements "face a tough road in Congress." He expressed concern about the Air Force's budget request designed to procure a sixty-day capability for spare parts and munitions by FY '87.

The Air Force's five-year logistics program concentrates on improvements in sustainability as well as mobility, he said, explaining that in the latter category the emphasis is on the "construction of facilities to preposition support equipment and flight-line vehicles in Europe and Southwest Asia, and to increase munitions and POL storage capabilities." In the sphere of mobility, "we logisticians face our greatest challenge," according to General Marquez.

"For the past three decades, we have seen the Air Force follow the trend of more and ever more centralization of logistics functions," he complained, because of the relentless press to save manpower and money. The net result, he said, "is that we have allowed the capability of tactical airpower to become limited by the infrastructure on which we are so dependent. Our challenge now is to expand the strictures of that infrastructure so that tactical airpower may regain its greatest tactical advantage—flexibility."

Cautioning that it won't be easy to change entrenched mindsets, General Marquez stressed the urgency of returning to the "premise that the basic fighting unit of the tactical air force is the independent fighter squadron, and we must allow it to operate unhampered by infrastructure limitations."

The most prevalent mindset to break, he said, "is the idea fixed in the minds of some people, within and without the Air Force, that we cannot afford to do that and that the greatest economies are achieved by centralization. Tactical Air Command is proving daily that this simply is not true—that we can operate as squadrons within the TAF. That trend must be nurtured and even expanded and our attendant combat infrastructure must be the facilitator, not the straitjacket."

General Chain and the other members of the Operations and Tactics Panel stressed the importance of air base defense to tactical warfare. General Chain said that earlier this year the Chiefs of Staffs of the Army and the Air Force signed a Memorandum of Understanding on this subject. This accord underscores the importance of interservice cooperation, the imperative of avoiding duplicative investments, and the need to get the job done the most cost-effective way and without regard to service parochialism, he told the AFA Symposium. He added that both services are cooperating on an important program bearing on air base defense that can't be discussed because of its classified nature.

The panel questioned the effectiveness of delivering conventional warheads or submunitions by means of medium-range ballistic missiles on grounds that CEPs (circular error probable, the statistical measure of accuracy) of fifty meters were adequate for nuclear and chemical weapons but not for conventional systems. There was consensus concerning the importance of acquiring and stocking the "Big Eye" binary chemical warfare munition "to deter the Soviets from using their chemical weapons and to keep conflicts from escalating to the nuclear level." ■

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THE PROTECTIONIST WEDGE

A British Member of Parliament explains why Europeans wonder if the Two-Way Street is policy or propaganda.

BY THE RT. HON. NEVILLE TROTTER, M.P.

For the trade in defense equipment between the United States and her European allies to be referred to as the "Two-Way Street" is perhaps unfortunate, for highway planners normally provide a road of equal dimensions for the traffic in both directions. From the European side of the Atlantic the Two-Way Street seems to provide eastbound a wide freeway and westbound a narrow, potholed lane strewn with obstacles that are often erected at very short notice.

With US sales many times greater than US purchases from Europe, there is inevitably bitterness and criticism that can only be harmful to the NATO Alliance. There is a very vocal anti-American lobby in Europe, and, while small in number, it is ready to exploit any difficulties in the transatlantic relationship.

The imbalance reflects the lack of coordination by the NATO allies in the use of their funds for R&D and acquisition. The resulting failure to obtain the best value for the money is one of the most serious problems facing NATO, but if this challenge can be faced up to it provides great opportunities to increase our overstretched conventional defenses without additional cost to the taxpaying voters.

NATO is basically much stronger than the Warsaw Pact. It possesses a far greater GNP, a larger population, a superior industrial and technological base, and yet, despite more or less equal defense spending, it is falling behind in the actual defense provided.

Duplicated Effort

On land, at sea, or in the air, the story is the same: inadequate numbers of tanks, escorts, and aircraft. These deficiencies are in no small measure due to the significant failure of the allies to rationalize their defense spending.

While the argument is sometimes advanced that the diversity of allied equipment complicates Soviet planning, it would seem absurd to suggest that any slight advantage in this direction can counter the huge losses in numbers resulting from duplicated effort.

It is disturbing to read suggestions made in the States that America is allocating inadequate funds for research and development at the national level. This must surely strengthen the case for international cooperation and for obtaining the best value for scarce money.

Ten Memoranda of Understanding between America and her NATO allies modeled on the US/UK Agreement of September 1975 provide the framework for the Two-Way Street. They set out the aims of the respective governments for greater cooperation in research, development, production, and procurement in order to make the most rational use of their respective industrial, economic, and technological resources, to achieve the greatest attainable military capability at the lowest possible cost, and to achieve greater standardization and interoperability of their weapon systems.

The governments would cooperate so as to maintain a long-term and equitable balance in reciprocal purchasing of defense equipment. With the objectives so obviously desirable and the governments committed to them, why have there been so many problems in practice?

American Reluctance

To start with, there is the understandable desire to maintain a national defense industrial base and a reluctance to depend on other countries for vital military equipment. However, if the NATO Alliance is to have real meaning, then interdependence must be accepted. Britain, with the most highly developed defense industry in Europe, must look to the States for its strategic nuclear weapon systems, where a certainty of supply is absolutely vital.

Europe has learned to accept interdependence and there is now much cooperation on arms production within Europe, with the Tornado aircraft currently produced by Britain, Germany, and Italy as a good example. There is, however, reluctance in the US to accept dependence on European suppliers. The easy excuse is that the sources of arms might be lost in wartime. In Europe, it seems that in such circumstances starting new production lines inside America would be the least of the US government's problems!

The pressures for nationalistic purchasing policies are, of course, greatly increased at a time of world recession and general high unemployment.

There may well be reference to "unfair foreign competition." While

most would agree that there is a case for trade restrictions where a trading partner behaves unfairly, this is not normally a factor in military sales across the Atlantic. While European defense industries receive much government money for R&D, so do the American industries, and Finance Ministers are not going to see their taxpayers' money used simply to lower the cost of weapons sold to America. Certainly, funds are not available for this purpose in Britain, and any argument that jobs would be created by so doing would not be regarded as justifying the expenditure.

Inevitable Retaliation

It is easy to argue that the economy and social well-being of the whole country require some degree of protection for industry and that the price advantage of cheaper foreign goods can be offset or exceeded by the social cost of supporting those becoming unemployed in the competitive industries. While this argument may be somewhat tempting at first sight, it surely is the way to national poverty. Isolating domestic industries from the international marketplace only damages them in the long term, and protectionism inevitably brings retaliation: "If you won't buy from us, we won't buy from you."

The old low-technology industries both in America and Europe are threatened in their long-term future by competition from the low-wage countries, especially in the Far East. It is, however, hard to believe that American industry is really threatened by European defense industries. Indeed, it is surely in the overall US interest that they be as strong as possible.

America preaches free trade, but seems increasingly to be finding ways of protecting its own industry in practice. In Europe, the fundamental question is: "Does the United States really want to encourage cooperation?"

The issue is causing much concern in Britain at this time because of the combination of the Specialty Metals Clause, the legislation on the Martin-Baker ejection seat, and US efforts to block the transfer of sensitive technology.

The British-made seats have saved more than 5,000 lives, most of them American. In the British view, the current argument over their use in the F-18 has frankly seemed very unfair, especially at a time when there are large purchases of US equipment in the pipeline.

"A Deplorable Action"

British Prime Minister Margaret Thatcher has referred to the Specialty Metals legislation as a deplorable action on the part of the United States. It is particularly resented in Europe because nearly all the high-technology components available for sale to the US include such metals. Suggestions from the States that the legislation is not real US policy and that it was approved "accidentally" do not go down well in Europe. For a government to allow something so damaging to its relationships with its close allies to take place by accident is most disturbing.

While the Department of Defense may be working to have the Specialty Metals Clause and the Martin-Baker legislation rescinded, the initial enactment of these measures was a serious blow to the allied cause and was interpreted in Europe as proof of the inadequacy of the US support for the Two-Way Street, whatever its protestations to the contrary.

The European industries are now accustomed to cooperating as partners in joint ventures. While there are problems as to who should take the lead, they are not insurmountable. Indeed, there is often more difficulty in establishing the same degree of partnership with US industries.

France is actively promoting cooperation among the European nations to the exclusion of the US. Current German thinking is tending toward concentrating procurement on a European source, even if this increases the costs.

To European minds it seems logical that there should be a national

A US Trident I sub-launched ballistic missile takes flight. Britain plans to buy follow-on Trident II missiles later this decade. The question: Will British industry be given adequate US offsets?

bargaining position with the US whereby there will be no flow of monies between the two countries. In other words, there should be a 100 percent offset, with perhaps specific offsets being sought for each major purchase from America. It will be interesting to see the extent to which British industry succeeds in obtaining offsets for the heavy cost of purchasing the Trident D-5 system.

Cooperation vs. Competition

To some extent the problem lies in differing attitudes. The Europeans see industrial cooperation as reasonable, spreading investment in expensive technologies among partners and contributing to standardization of equipment within NATO. In America, with its emphasis on competition, the word "cooperation" seems to have a sinister connotation, no doubt because of the long history of antitrust legislation.

Further problems arise from the traditional basing of US industry on national programs and from the military traditionally using US equipment. Often the rules and attitudes of mind do not assist foreign cooperation, and there is a clear need to simplify the complex procedural regulations and processes for procurement.

The legislative hurdles in the States are a major obstacle to a fair trading balance. The Culver-Nunn amendment may have expressly authorized the waiving of the Buy American Act so as to standardize NATO weapons, but this has not been much help in practice as there are so many other obstacles to be overcome.

The proposed amendment to the Defense Production Act requiring any foreign contract over $1 million to be certified as essential by the Secretary of Defense or the President has caused consternation in Europe. Such one-sided moves stress the Alliance.

In recent years, eighty congressional bills have directly or indirectly sought to apply protectionism. The constant attempts in Congress to introduce or amend legislation specifically to prevent the purchase of foreign military equipment is very much resented in Europe, where there is no similar legislation.

US reluctance to buy time-tested British-made ejection seats for the US Navy's F-18 fighter, shown here, "has frankly seemed very unfair," Trotter writes.

The Political Difference

There is a fundamental difference between the political systems in America and in Britain and the other European countries. The American process of government is far more complex, as a result of which foreign suppliers may be uncertain that a sale is firm until the equipment has actually been delivered. Political change at short notice as a result of congressional lobbying is, to the Europeans, a very unwelcome feature of the American scene.

European parliaments do not review executive decisions in great detail, as Congress does. The Defence Committee of the British House of Commons, for example, is not a gateway to the procurement process.

The British Parliament, with a majority of Members always coming from the Government Party, does not override the executive's desires. For the life of a Parliament, normally four or five years, the British Government can effectively do what it likes.

The British system results in far less lobbying of Members of Parliament. If the Government decides to purchase a foreign product, that is the end of the matter. By contrast, in the States a government decision is only the first stage of a political battle whose end result is far from certain. This ongoing battle creates great uncertainty in Europe and a feeling that the odds are stacked against those seeking to sell to America.

All politicians at times must balance local interests against the general good. It is naturally harder to take the broader view as elections approach, and a feature of the US parliamentary system is that elections are never far away! With its biennial elections, the House seems to be much more ready to take a short-term view. The Senate, by contrast, often seems to Europeans to be better able to balance issues.

Can the Administration Deliver?

As a result of the different relationship between the executive, Parliament, and industry, deals with the US administration are just not the same as with the British Government. To the Europeans it often seems that the US executive has more desire to maintain good relations with the allies than does Congress, but it cannot "deliver the goods."

The fact that a Memorandum of Understanding is not a treaty between the two governments is of considerable significance, as not having been ratified by Congress, it is seen in the United States as not being constitutionally binding. When cooperative programs are canceled by Congress against the wishes of the US government, it seems to Europeans that the US government is not in control and needs to show more skill and resolution.

Some US authorities blame the inequality of the Two-Way Street on the lack of European marketing effort. The European manufacturers respond that bitter experience has shown that time and money spent on marketing in the States has been frustrated by the obstacles placed in the way of success.

Europe must not expect to achieve sales in the States without working a program hard. It is entitled, however, to expect fair legislative treatment.

Technology Transfer

An additional hurdle to cooperation arises as a result of the recent thrust by the US to tighten controls on the transfer of US technology. People on both sides of the Atlantic agree that militarily useful weapons technology should not find its way to the Soviet Union and that examples do exist where controls have not worked. In many European minds, however, technology transfer controls are equivalent to US protectionism.

Britain certainly accepts the military dangers of allowing Russia to acquire high technology from the West. With NATO unable to match the forces of the Warsaw Pact in numbers, we must seek to maintain a qualitative advantage. Nevertheless, controls must be justified on security grounds and must not be used as a commercial weapon. They should apply only where the technology clearly has a military application, where there is a recognized deficiency in the Eastern Bloc, and where the East cannot obtain the technology from other sources.

Suggestions that security in Europe is looser than in the States are much resented, and technology transfer is not seen as being the same as technology leakage. Responsible European companies value security as highly as the US does. In fact, many in Europe believe that the open nature of US society is the greatest reason for the purloining of technology.

The restrictions can be expected to cut off the European allies from advanced technology as much as they do the Russians, who in any case may obtain the information through their intelligence services. Thus, unless the Europeans waste money on duplicating research, they will in some directions fall behind the Americans, and, in all probability, also behind the Russians.

Increased technical capability in Europe should be seen in the States as a resource strengthening the Alliance rather than as competition for US suppliers. In any case, there are no long-term monopolies on technology, and the question may well be not whether to transfer but when.

It will be interesting to see how long it is after Stealth technology appears in front-line US aircraft before it also appears in European and Soviet aircraft.

Frustration of British Firms

At the moment some British firms are facing much frustration. While a US-owned company in Britain is generally treated as a British company, the converse is not always true in the United States. It seems that foreign-owned companies can be removed from bidding lists and may be denied access to military technology. A US firm passing into British ownership may be debarred from further development of projects it had previously initiated.

Similarly, problems are arising where a UK company teams up with an American company but is not given adequate access to US information. Where components have been sent from the US to the UK for assembly before they are returned to the US, there have been difficulties in obtaining the necessary information about them.

Access to US seminars and academic exchanges is more restricted, too. The implementation of the Two-Way Street for European firms suffers when they are required to wait for many weeks before they can obtain clearance for official visits to US industry. It is no wonder that the Europeans are becoming more reluctant to accept coproduction agreements and are seeking to avoid using American parts.

Inevitably, the sheer relative size of the United States creates problems in ensuring a balance of trade across the Atlantic. The industrial base of the individual European countries is weaker than that of the United States, and their requirement always to buy some US weapons weakens their bargaining position.

While there have been some major successes, such as the Harrier, all too often the Europeans have succeeded only in relatively small projects and in the production of components. These contracts are less visible, involve fewer jobs, and have thus not drawn fire from congressional critics. The Europeans will inevitably need to obtain major weapon systems from the States, but a fair balance will not be achieved unless the US in turn buys some of its major weapon systems from Europe.

Equitable, Not Equal

It is worth noting that the Memorandum of Understanding refers to seeking an "equitable balance" and not an "equal balance." Europeans saw the Two-Way Street policy as a means of redressing the longstanding imbalance, and its lack of success has produced the present frustration, with the barriers against Europe seen as preventing the balance from being "equitable," let alone "equal."

Some US officials take the line that protectionism will end as the recession ends. While the pressure may abate somewhat as the economy improves, it is surely unrealistic to assume that the barriers to free trade will disappear.

The NATO Alliance is one of the great successes of history, but the imbalance in the Two-Way Street is a serious weakness. The present situation not only prevents NATO from obtaining the best value for its money, but it also drives a wedge between America and her European allies, thus playing into the hands of the Russians, who have always sought to establish such a division.

Many in Europe feel that US support of the Two-Way Street has so far been more propaganda than a real commitment to achieve the aims set out in the Memorandum of Understanding. The problem will not be solved unless positive action is taken by the US government. This challenge must be met, for industrial nationalism can be the enemy of freedom. ■

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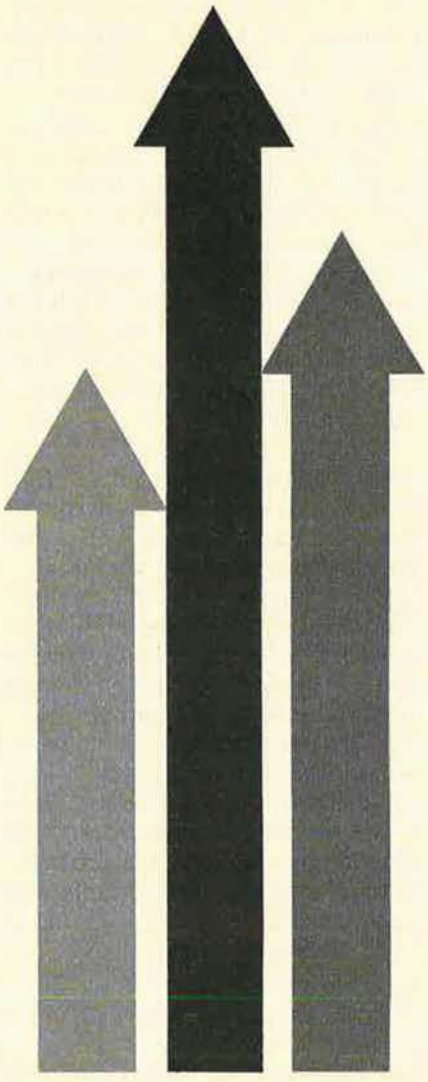
WHAT THE TASK FORCE FORGOT

Incredibly, the President's Private Sector Survey team did not consider how its findings on retirement cutbacks would affect morale and retention.

BY VINCENT C. THOMAS, JR.



On June 30, 1982, President Reagan announced the formation of his Private Sector Survey on Cost Control in the Federal Government and signed Executive Order 12369, which authorized a team of private citizens to begin an exhaustive search for ways to reduce government spending and save taxpayer money. To head that team the President named J. Peter Grace, Chairman of W. R. Grace & Co., a conglomerate that has enjoyed considerable success during the thirty-eight years Grace has served as chief executive officer.

Grace divided his team into thirty-six separate task forces, each headed by two or more members of the Grace Commission's Executive Committee. Almost all of those constituting the committee are or were senior industry officials—corporate chief executive officers, board chairmen, company presidents—whose respective businesses together make up the backbone of American industry. The cochairmen of the task force that studied the Air Force were typical of the caliber of the executives Grace persuaded to join in this undertaking. They included James H. Evans, Chairman of Union Pacific Corp.; Robert W. Galvin, Chairman and Chief Executive Officer of Motorola Corp.; and Paul F. Oreffice, President and Chief Executive Officer of Dow Chemical Co.

A year later, Grace announced that ten of his task forces had made recommendations that outlined more than $136.6 billion in savings and revenue generation over a three-year period. Of that tidy sum, $92 billion reflected military-related recommendations, with the Air Force leading the way among the three services with $27.6 billion, the Army with $12.5 billion, and the Navy at $7.2 billion. Savings of $45 billion were targeted within the Office of the Secretary of Defense.

Before one concludes that the task force found the Air Force to be the least cost-effective of the military services, it should be pointed out that that task force was the only one involved in studying a military service that elected to address the sticky issue of military retirement pay. Its recommendations on retirement pay would, it claims, save $15 billion if adopted. The task force studying the Office of the Secretary of Defense took a far less thorough look at the issue and came up with recommended savings of some $6 billion; however, it did not recommend as specific a plan of attack as did the Air Force study unit.

Before delving into the specific recommendations of the various task forces, and particularly those of the task force that studied the Air Force, the question of the status of the task-force recommendations should be addressed. They are now under close scrutiny. Grace and his commission members will ultimately decide which ones to submit to the President, with a firm recommendation for their adoption. These recommendations will probably go to the White House before year's end. Grace might also recommend that certain specific suggestions for saving money that are pertinent to one or two of the military services be adopted across the board; the recommendation made by the task force studying the Air Force pertaining to military retirement pay is likely to be handled in that manner.

Once the final recommendations are in the President's hands, the next step is up to him. So there is still much, much more to come!

Recommendations Affecting USAF

Now, what of those recommendations particularly affecting the Air Force and its people? Who arrived at them? What was the basis for their considerations and deliberations? Did they consider potential ramifications of their proposals, or were they interested solely in estimated dollar savings? Did the Air Force task force singly, or jointly with other task forces, seek to estimate the possible effect on force morale and effectiveness if their recommendations on people—and those of other task forces—were implemented?

Operating under the overall leadership of Evans, Galvin, and Oreffice were thirty-seven people, headed by Charles Eaton of Union Pacific Corp. (Eaton's deputy, interestingly enough, was retired Navy Rear Adm. L. Richard Myers, who only a few months before the study began had been Commandant of the Naval District of Washington.) The three corporations whose heads

were cochairmen of the task force were heavily represented, although the task force also included consultants, one retired businessman, and a representative from Catholic University.

Over a period of four months, the team visited thirteen Air Force bases and forty-six government agencies, interviewed more than 500 people, and studied more than 600 reports on Defense Department and Air Force operations. Then they made twenty-two recommendations, the foremost of which concerned military retirement pay.

All of the task forces were to place their recommendations into three categories: fully substantiated and defensible, substantially documented and supportable, and potentially justifiable and supportable. Although other task forces placed a number of items in the third category, the Air Force unit put all of its recommendations in the first two. Those recommendations pertaining to retirement pay were, in its view, fully substantiated and defensible.

Because of the scope of the study of the Air Force—the finished document weighs a good three pounds—and because of the tremendous actual and potential importance of the recommendations concerning military retirement pay, that issue alone will be the subject of this review of the Grace Commission's overall endeavors and those pertaining solely to the Air Force.

The single brief question that the Air Force study group asked as it began its exploration of military retirement pay was: "Are the military retirement program benefits and resultant costs to the Department of Defense excessive?" They did not ask if the benefits and costs were excessive with regard to anything in particular. Nor did they have as a part of their charter a requirement to estimate in any way the adverse impact on Air Force personnel of recommendations for reduction in retirement benefits, of personnel losses that might be incurred because of such reductions, and of costs to train replacements for those who might elect to leave the service.

Interestingly, in discussions seeking to ascertain the breadth of the charter of the study group, task force members questioned whether

The key question: "Are the military retirement program benefits and resultant costs to the Defense Department excessive?"

or not collectively they had the ability to make a valid determination of the effect their recommendations would have on morale. Whether or not they had the ability, the absence of such a charter provision appears to conflict with the study objective, which was stated as follows: "Our key objective is to recommend steps to effect a streamlined and efficient organization *without adversely affecting the Air Force mission or its readiness*" (emphasis added). It is difficult to envision the readiness of any organization, let alone a military one, not being adversely affected by recommendations to reduce benefits that had long been accepted as incentives to retain personnel who enable the organization to meet the requirements placed on it.

During its study of this particular issue, the task force reviewed a formidable array of documents: DoD's first Quadrennial Review of Military Pay, dating back to 1967–69; the report submitted in 1978 by the Defense Manpower Commission; commentaries on active and retired military pay by two of the most distinguished of the "think tanks," the Rand Corp. and the Brookings Institution; GAO reports; studies of both private and public employee retirement systems by the Wyatt Corp., long recognized for its studies in this field; numerous private-industry retirement plans; and many pay plans put together by various communities for their police and firemen. In short, the task force delved into almost every significant commentary on military retirement that has reached the public domain in the last fifteen years—no mean accomplishment—and a lot more besides.

Interviews, too, formed a basis for the judgments of task force members, although the list of those interviewed appeared to be, in comparison, considerably less extensive than that of the written materials that was scrutinized.

The Task Force's Conclusions

Ultimately, the task force came to these conclusions:

- Military personnel should be provided a retirement program superior to plans offered in the private sector. "However, it is our view that this country simply cannot continue to pay the excessive costs of the present military retirement system," the task force said.
- A large factor in the difference between the cost of the military plan and good private-sector plans is that the military plan has a much lower penalty for early retirement—2.5 percent per year of service vs. four to six percent in the private sector. The result is massive early retirement from military service.
- The combination of a generous basic formula plus low penalties for early retirement, leading to a general practice of early retirement, results in a military plan that, on a weighted-average basis, is more than five times more costly than the better private-sector plans.

The task force studying the Office of the Secretary of Defense, in its study of the retirement pay issue, also viewed early retirement—at twenty years—as the principal culprit producing the disparity between costs of the military plan and the better ones in the private sector. The OSD unit found even greater disparity than had the Air Force study unit—six times greater compared to five.

It also came to a conclusion more likely to bring a roar of protest from men and women in uniform than any other that either task force arrived at: "When the military retirement plan was developed, active-duty pay was low compared to pay in the private sector. The level and length of the retirement benefit were set in recognition of this and served to compensate the member for life. Today, the military has

achieved an active-duty pay level that is comparable to that in the private sector, and it is no longer necessary to provide overly generous retirement benefits."

It is remarkable that the collective memory of that task force is so short. Congress funded the first of two successive hefty pay raises for the military only four years ago in order to make military pay relatively comparable to private sector pay. This took place only after inaction by more than one President and by several Congresses had caused pay to fall well behind that in the private sector.

Encouraging Longer Service

The five recommendations stemming from the Air Force task force's conclusions and from extensive analyses of private-sector retirement plans were based on the assumption that Basic Military Compensation (BMC), the combination of pay and allowances received by personnel on active duty, "would be maintained on a competitive level with private industry."

- The basic formula (for calculation of retirement pay) should be 1.3 percent times the high three-year average BMC times the number of years of active-duty service. No years of service credits would accrue beyond thirty years, resulting in a maximum benefit percentage of thirty-nine percent.
- An immediate unreduced benefit would be available only after thirty years of active-duty service.
- A deferred benefit would be available at age sixty for retirees with twenty but less than thirty years of service.
- Indexing (linking increases in retirement pay to increases in the Consumer Price Index) should be eliminated.
- For all military personnel serving on the date of the initiation of the recommended retirement plan, the benefit formula will be 2.5 percent of the basic pay for service time prior to the initiation date and 1.3 percent of BMC for service time subsequent to the initiation date. The high three-year average BMC feature should be phased in over a three-year period, after which all personnel will be on a high-three basis.

The cost of this overall plan, the Air Force task force claimed, would be 14.6 percent of payroll—less than a third of the cost of the present military retirement plan, which is 50.7 percent of payroll. Further, despite the much lower cost, it would still be superior to the better private-sector plans.

The panel used the Dow Chemical retirement plan as a point of comparison.

The task force also said that the plan would encourage thirty years of service rather than retirement after only twenty years.

Following Dow's Example

How did it arrive at the 1.3 percent factor? First, it chose to translate military retirement into terms comparable to private industry. Then, for that purpose, it selected the retirement plan of Dow Chemical because that plan ranked in the top ten percent of the top fifty companies in the level of benefits. Dow offers full retirement benefits at age fifty-five with thirty years of service, and members of the task force were fully familiar with the formula and the entire benefit package.

Dow's formula is 1.2 percent times years of service times high three. Its 1.2 percent factor was arrived at by establishing a provision for a benefit equaling thirty-six percent of the average of the highest three consecutive years of pay (thirty-six percent divided by thirty years of service equals a factor of 1.2).

The task force proposed its 1.3 percent formula because it believed that the military retirement plan should be superior to the best in the private sector, although not disparate to the degree that the current plan is. The task force's recommendations would make the military plan worth eight percent more than the Dow plan and others like it in the private sector.

What kinds of savings to the government would be effected? To use the extremes of the many examples used in the voluminous study, a brigadier general retiring after thirty years of service at age fifty-three would receive annual benefits under the current plan of $39,425, but only $26,924 under the proposed plan. A technical sergeant retiring at age fifty after thirty years would now receive $10,306 annually, but only $7,830 under the proposed plan.

Estimated outlays in 1990, when the plan would be fully in effect—assuming an ultimate five percent cost-of-living rate, a five-and-one-half percent annual salary increase, and a six percent annual interest rate—would be $23.6 billion under the current plan, $18.7 billion under the proposed plan. A dozen years later, the gap between the costs of the two plans would widen dramatically—$50.3 billion to $29.4 billion—and would continue to widen over time.

The OSD task force took not one but *two* different tacks toward new military-pay retirement plans. The first would retain the present 2.5 percent factor for each year of service. Service members would be entitled to a deferred benefit at age sixty-five after twelve years of service, and could also receive benefits ten years earlier, but with a permanent reduction of 0.5 percent for each month the commencement date preceded the member's sixty-fifth birthday.

At the completion of twenty but less than thirty years' service, a member would be entitled to a deferred benefit to begin on the date when a "full career" of thirty years

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would have been achieved. And those who so desired could receive benefits immediately, but with a permanent reduction of 0.5 percent for each month the commencement date preceded the "full career" date. That would mean, for example, that a twenty-year retiree desiring to receive benefits immediately upon retirement would receive but forty percent of his calculated benefits.

Those who retired after completing thirty years would have the same benefit of seventy-five percent of base pay that characterizes the present plan.

Under this plan, cost-of-living adjustments would apply from the date of separation for those with twenty or more years of service. COLAs would not apply for the deferred benefits received by those with twelve to twenty years of service until age fifty-five.

The "vesting" philosophy contained in this plan resembles portions of the proposal made by the Defense Manpower Commission in 1978. That plan had been reasonably well received when it was first presented. However, in its attempt to win approval of it from those in uniform, the Department of Defense's Madison Avenue approach to selling it resulted in its being oversold to the point that it was overwhelmingly rejected.

The OSD task force made an interesting request in order to ascertain savings that might be realized from this plan. It asked the Office of the Actuary of the Department of Defense to compute them! The result was an estimated savings of $6.4 billion over three years.

Deductions for Earned Income

That task force's alternative proposal appeared to reflect the widely held view that it is somehow wrong for retired military people to receive both retired pay and whatever pay they might earn in a second career. The basic provision of that proposal would, for all persons under sixty-two, cause a dollar of retirement pay to be deducted for every two dollars of earned income in excess of two-thirds of retirement pay. At age sixty-two, a retiree would be entitled to both full retired pay and earnings from a second career.

The task force recommended that this proposal be phased in, commencing with a one-for-five offset initially. Were this done, and assuming, for example, annual base pay at retirement of $21,000, a twenty-year retiree would have to earn $59,500 before his retirement pay would be completely phased out, a twenty-five-year retiree $74,375, and a thirty-year retiree $89,250. However, when the $1 for $2 phase-in goal was attained, the twenty-year retiree would then have to earn only $28,000 before retirement pay would be phased out, the twenty-five-year retiree $35,000, and the thirty-year retiree $42,000.

Trained people are expensive to replace. And there's no quick way to replace experience at any price.

Savings under this proposal—presuming a four-year phase-in period and inflation of ten percent—would be $6.9 billion at the end of the first three years when the ratio would equal one-for-three, and another $5.2 billion the fourth year when the ratio would reach $1 for $2.

The savings forecast by the OSD task force were applicable to retired pay received by former members of *all* the services, whereas those claimed by the Air Force task force were applicable to that service alone.

The OSD task force also proposed two changes in the manner in which retired pay was computed, which would reduce outlays by the government by several millions of dollars annually. The first would require that retirement pay be offset by 1.25 percent of Social Security benefits for each year of service after September 15, 1940, but with a maximum offset of 37.50 percent. This change would be phased in over a three-year period; savings over that period, assuming ten percent inflation, would be $273 million. Another $213 million would be saved the fourth year.

The second proposal would base military retirement pay on the average of a retiree's highest thirty-six months of base pay. The intent of this proposal is to bring military pay in line with Civil Service and private-sector practices. It, too, would be phased in over a three-year period. Again assuming a ten percent inflation rate, savings over the three years would be $122 million.

Impact of the Recommendations

All these recommendations and plans, however, raise one obvious question: "If any one of the cochairmen of the Air Force task force were evaluating his own corporation, and as a result of that evaluation was making recommendations markedly reducing benefits to his own employees, would he not also seek to ascertain the impact of those recommendations on the ultimate performance of his work force and in turn on his ability to operate his corporation effectively?" The answer cannot be anything but a resounding "Yes!"

Given that presumption, the corporation head would probably seek to quantify as best as possible what that impact would be.

Had there been an attempt to quantify the impact of the Air Force task force's recommendations, the task force would have discovered:

- A requirement for 1,800 more pilots (more than all the pilots in United States Air Forces in Europe), 450 more navigators, 3,650 more nonrated officers, and an additional 62,500 enlisted personnel.
- A related loss of man-years of experience that would equal 375,000 for officers (equivalent to the total of all company grade officers) and 1,800,000 for enlisted personnel (equivalent to all technical sergeants E-6 and above).
- The slashing of the enlisted career force from fifty-one percent to thirteen percent of the force.
- Additional annual accession and training costs of $1.6 billion for officers and $700 million for enlisted personnel. (Over a three-year peri-

od, that would negate forty-six percent of the estimated dollar savings resulting from the implementation of the Air Force task force's recommended retirement plan.)

Over and beyond the dollar costs and the upheaval within the Air Force would be the ultimate cost in lives. No force could go into combat with the degree of inexperience that would result from these changes without undue loss of life—not only among those seeking to perform their primary missions, but also among those counting upon them to perform the missions but suffering because they weren't performed to desired standards.

The Effect on Readiness

It would be easy to agree that the task force had operated under the false premise that readiness would not be affected. Most obviously, readiness *would* be affected. However, that premise could easily be corrected.

What is of even greater concern is the fact that—despite the eloquence of so many who have led the military over these last three difficult decades, both those in mufti and those in uniform—Congress, leaders in industry, business, and academia, and the general public are still not persuaded that the merits of the present system warrant its retention "as is" or with only minor changes.

A senior task-force member was asked: "Did you at any time approach your study of the current retirement plan with the question in your own mind: 'We know this is expensive, but. . . .'?" His answer was "No." In short, the basic approach was simply that the system was too expensive and therefore had to be changed, without regard to consequences stemming from radical change.

The fact that there has been a dramatic failure to convince was further emphasized by a question asked by a task-force cochairman: "Don't you agree that it is indeed unfair for a lieutenant general who retired in the early 1970s to be receiving more than his counterpart today?" His question does relate to a fact. However, this fact is an aberration resulting from an attempt to play catch-up ball with COLAs at that time. Further, measures have since been taken that would preclude such a circumstance in the future. Yet this particular example is seized upon routinely today as "proof" that the current system is excessively costly.

Unless all the factors are weighed, both people and national security will be the losers.

Exigencies of Military Life

Another question is whether those who studied the retirement issue understand, in depth, the exigencies of military life. And by exigencies, we do not mean simply "hazardous duty." Rather, "exigencies" refers to such aspects of military life as, for example, moving fourteen times in nineteen years, and moving not just because of changes in duty stations but because leases expired on the only places available when one first arrived. Or having children reach the last two years in high school before being able to attend the same academic institution for two consecutive years. Or undergoing the indignities and perils of split incomes resulting from sustained deployments. Or having other than fully operational assignments that unexpectedly keep personnel away from their bases—and their families—more than fifty percent of the time. Or suffering perhaps the most crushing blow of all—being nonselected for promotion at the time when the bills for education of one's children are at their highest and just coming home for payment, and having to leave the service.

No matter how one tries, it is impossible to precisely quantify these unique difficulties of military life. Yet they deserve just as much consideration as the physical dangers encountered in all branches of the service. Regrettably, neither task force apparently devoted other than a modicum of thought to them. The Air Force task force did indeed seek to compare hazardous aspects of service life to those encountered by police and firemen and to relate and compare retirement plans affecting them. The OSD task force devoted a scant six lines of its study to a mention of the "difficulties and challenges of military life." That's all.

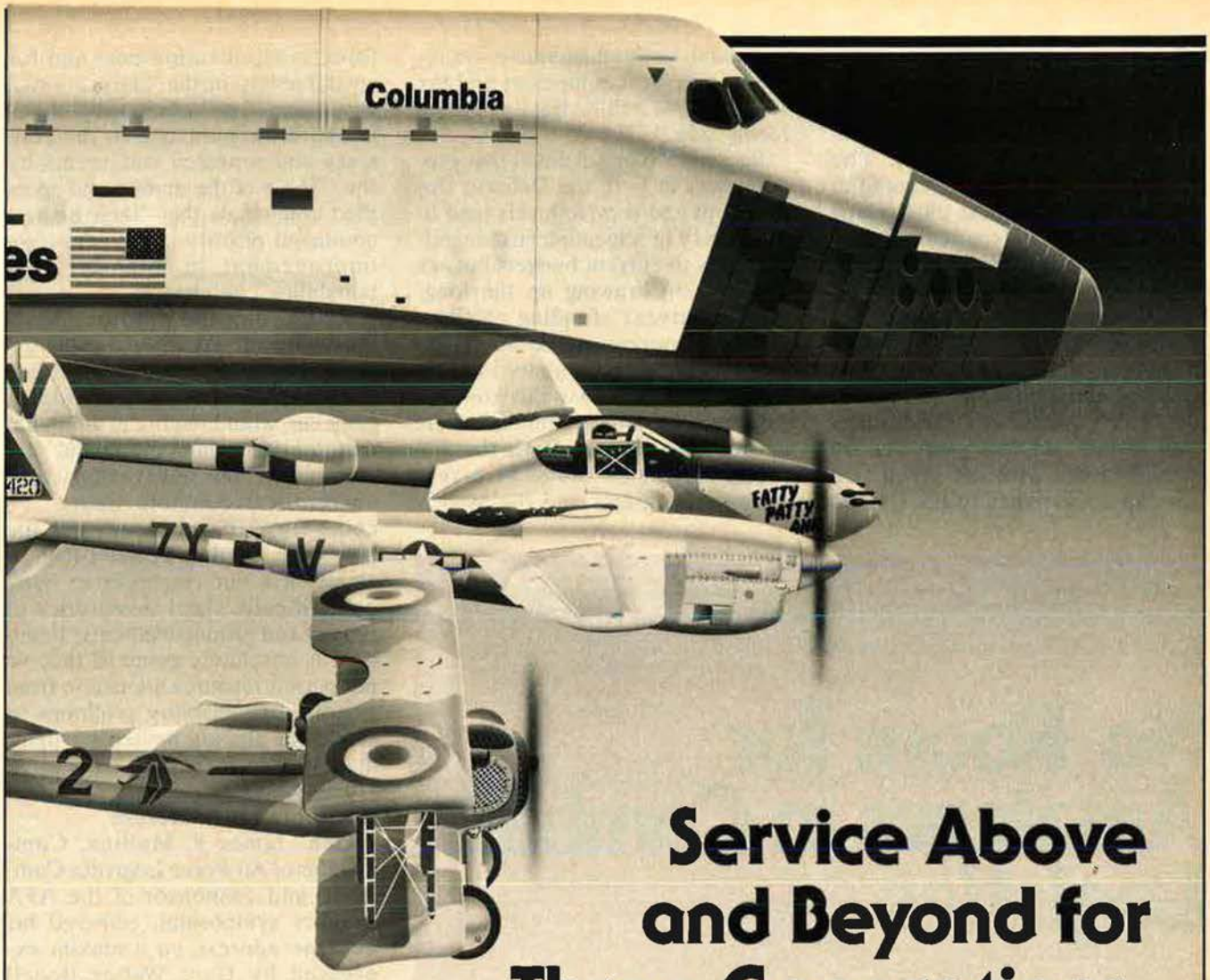
The absence of more complete consideration of these aspects of military living again suggests a failure to establish adequate parameters for those engaged in these studies. It also serves to emphasize even more strongly that the communications of civilian and military leaders relative to the importance of a strong retirement plan over the years have fallen on ears far deafer than they realized.

Two final questions stemming from this review of these portions of the overall Grace Commission's noteworthy endeavor come to mind. They are:

Is it within the realm of human capability for there to be a solid determination of how much *people* should be compensated for their direct in-service contribution to national security? And once that is done—presuming it can be—can there be sufficient restraint exercised for whatever plan is decided on to acquire stability, and, in turn, to attract and keep the best possible people for that role?

The message of these studies is that, despite the exemplary efforts of a highly dedicated body of unusually talented individuals, substitutes are being proposed for a basically *sound* system. These substitutes lack the breadth and depth to accomplish more economically and with equal effectiveness what the basic system has accomplished for a long period of time.

Another study—but one that takes into account *all* the factors and *all* the possible effects—might result in a system that is an improvement over the present system. That suggests one more try, but one for which proper parameters are clearly established. Unless and until that is done, both people and national security will be losers. ■



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Major changes in how the Air Force integrates and coordinates the acquisition of systems and logistics were announced at an important AFA symposium devoted to logistics management.

No Room for Amateurs in Combat Logistics

BY EDGAR ULSAMER
SENIOR EDITOR (POLICY & TECHNOLOGY)

ASSISTANT Secretary of Defense for Manpower, Reserve Affairs and Logistics Lawrence J. Korb described the theme of AFA's National Symposium "Logistics: The Long Pole in the Tent" as going to the heart of "the most challenging issue facing the defense community in the '80s—the balance between modernization and support in the DoD program."

Representing the Defense Department at the AFA meeting in Dayton, Ohio, October 7–8, Secretary Korb warned of a serious erosion in the "staying power" of the armed forces with the result that "the forces assigned to the Unified Commanders are not as sustainable as they should be, and [they] will not be for the foreseeable future." Defining this staying power as a "combination of war reserve inventories and post-D-Day production," he derided the current debate within the defense community over spending a larger share of available sustainability funds on strengthening the industrial base:

"Even the most responsive production base would do us little good . . . since our war reserves are well short of levels needed to sustain combat until expansion of that base is possible." He warned that "the hard facts are that the industrial base the nation once had is no longer there and production lead times are much longer. So future wars will be fought on a 'come as you are' basis and, without adequate war reserves, the best equipment and the finest people will be fighting on the losing side."

Secretary Korb claimed that programmers at both the Defense Department and service levels tend to be miserly in allocating sustainability funds to current budgets but are generous in drawing up the long-term, "outyear" funding profiles. Outyear increases, he asserted, "disappear as those years become budget years. Unless this trend is reversed, we will certainly fall short of our objectives." Both the FY '83–87 and the FY '84–88 Five-Year Defense Programs and the associated funding requests of the individual services, known as POMs (Program Objective Memorandum), exhibit this dichotomy between near-term and outyear funding.

The *Mañana* Approach

Demonstrating this *mañana* approach to logistics funding on the basis of the most recent "secondary war reserve" and ammunition funding requests by the services, he pointed out that the Air Force will create a funding "bow wave" by budgeting for FY '87 funding levels of war reserves seventy-eight percent greater than in FY '85 and FY '86. Similar jumps are scheduled in other sectors of readiness and sustainability funding, he said.

The inclination of the Air Force and the other services to pay for force modernization now and for sustainability in the "outyears that never come" persists in spite of Administration guidance to the contrary and repeated statements by the CINCs of the unified and specified commands that "their highest command priority is the near-term improvement in materiel sustainability," he charged.

Redressing the chronic short-changing of readiness and sustainability requirements, according to the Defense Department's top logistician, would require at minimum that "outyear ammunition and secondary item war reserve dollars for currently producible items . . . come forward to smooth out the bow wave. Further, I believe that we should use our resources to build our critically short inventories of proven and producible items. Finally, it is absolutely essential that we not permit resource allocation from existing sustainability programs to erode our already limited warfighting capabilities."

No Room for Amateurs

Gen. James P. Mullins, Commander of Air Force Logistics Command and cosponsor of the AFA logistics symposium, centered his keynote address on a maxim expressed by Gen. Walter Bedell Smith, Chief of Staff of the Allied Forces liberating Europe in World War II: "Any amateur can shove tanks, planes, and infantry around a map; the real business of war is getting gas, ammunition, and spare parts to the people that need them, where they need them."

He stressed that the increasing reliance on high technology systems combined with the "come-as-you-are" nature of modern warfare creates a circumstance where "the tail, in the form of logistics, will more and more wag the dog." As a result, "logistics will increasingly become the single greatest impediment to having real combat capability." Concomitantly, he said, "we'd better find a way to cope with this reality until we can ultimately remove this impediment—hopefully by removing the need for logistics itself."

The notion of building systems that "don't need logistics, except for consumables like fuel and munitions, . . . isn't pie in the sky. In

fact, to a great extent, we already have this technology. The 2,000-hour 'mean time between failure,' or MTBF, is not a fantasy of the future—it's a reality today."

Ring laser gyro guidance and navigation technology, he said, is moving toward MTBFs of between 15,000 and 40,000 hours. In the case of engines, General Mullins pointed out that "the Army's biggest complaint with the T700 engine in its Blackhawk helicopter centers on high reliability—Blackhawk mechanics are losing proficiency because the engine just doesn't seem to break." Hinting at the revolutionary impact on warfare of a "TAC fighter wing of tomorrow that could be deployed without the need for sophisticated maintenance, whole engines, spares, and repair parts," he said that "I believe we only need to make the commitment up front that we are going to do it—and it will get done."

The place to start, the AFLC Commander suggested, "is in the prime contractor's independent research and development [effort], for that's where much of the system's design is locked in. Get the primes thinking in terms of totally reliable systems, and the day won't be far off when we will have totally reliable systems."

Pointing out that the "new Air Force Acquisition Logistics Center is already working this problem," he explained that, under the joint direction of AFLC and the Air Force Systems Command, "this Center can now effectively overlay supportability concerns onto the acquisition process. Indeed, we now have much reason to hope for a future relatively unencumbered by the need for logistics."

New Acquisition Logistics Center

A palpable highlight of the AFA logistics symposium was the joint announcement by General Mullins and AFSC Commander Gen. Robert T. Marsh of the "disestablishment of AFLC's Air Force Acquisition Logistics Division and its replacement with the Joint Air Force Acquisition Logistics Center, or AFALC." As General Marsh told the some 400 industry and government executives attending the AFA meeting, a memorandum of agreement just signed by the heads of the two commands "institutionalizes cooperation between our commands, defines our responsibilities more completely, provides AFSC with the increased access to the skills of acquisition logisticians necessary to fulfill its responsibility, and creates a joint AFSC-AFLC organization to provide technical support for our acquisition logistics efforts."

He added that "under the terms of this agreement, AFSC is going to assume the lead in acquisition logistics policy and program surveillance—roles that will allow us to more effectively incorporate logistics requirements into the management of our programs." Both commands, he explained, will continue to assign acquisition logisticians, "those somewhat rare, specially qualified people," to AFSC's product divisions and systems program offices and to make them responsible for acquisition logistics concerns. Also, the two commands will exchange specialists of this type on a regular basis and, at the same time, enhance contact between AFSC and AFLC program managers, General Marsh said.

The new Air Force Acquisition Logistics Center, he explained, "will be jointly administered [and] manned by experts from both organizations." Key staff members will be selected on a cooperative basis. The Center, he announced, will be commanded by Maj. Gen. Monroe T. Smith and will be responsible for "logistics engineering, technical analyses, and other support to AFSC and AFLC organizations."

AFSC's growing concern with logistics support and sustainability of weapon systems has also led to the creation of "a new Deputy Chief of Staff for Acquisition Logistics within [AFSC] headquarters and each of our product divisions. We took the slots and the space for this new organization out of our hide. That's an indication of how important we think it is," General Marsh told the AFA symposium.

Numbers vs. Support

Because of the urgency of rebuilding the weapon systems inventory following the Vietnam War, he said that "we put our severely limited funds into capability and numbers—deferring support considerations until after our new systems were in operation or the funding picture improved." As a result, minimum essential funding for spares came in vogue and "program funding problems were solved by delaying support and logistics tasks in lieu of mission capability and numbers of systems." In addition, the responsibility for supporting weapon systems and ensuring their availability for combat and sustainability "was not explicitly assigned to any single organization in the Air Force," he said. AFSC's program managers often did not know the level of support funding for initial spares and for government-furnished spares and equipment. As a consequence, "they could not determine whether current funding would be sufficient to sustain initial operations, or for how long."

The change in AFSC's attitude toward support and logistics, General Marsh told the AFA meeting, has led to a change in how the command defines its mission: "We used to say that our job was to acquire capable and *supportable* weapons. Today, however, we describe our job as delivering capable and *supported* systems."

Air Force Systems Command's determination to deliver "supported" systems pivots on three distinct priorities, according to General Marsh.

First is that the "R&D and technology development effort [must aim] at enhancing durability and reliability to yield higher mean time between failure rates, reduced maintenance requirements, and reduced life-cycle costs. New engines with up to forty percent fewer parts and more durable turbine blades are examples of our activity in that area. In addition, our new very-high-speed integrated circuitry [VHSIC] technology offers opportunities for dramatic improvements in maintainability, weight reduction, and the integration of control, propulsion, and diagnostic systems. Also, we are significantly enhancing our logistics R&D efforts to improve the logistics system and infuse our systems with promising technologies at an early date."

Next are AFSC's "efforts to emphasize availability factors early in

the design of a weapon system. Included here are such things as designing systems for ease of maintenance—like using form/fit/function components to reduce the maintenance task; integrating new test and diagnostic capabilities like our modular automatic test equipment, which simplifies and speeds maintenance; and our insistence that equipment design emphasize testability." VHSIC technology provides vast opportunities for improvements in fault isolation techniques and integral diagnostic features, General Marsh said.

The third element of AFSC's supportability drive centers on "management emphasis on planning for the delivery of a supported weapon system, and executing the plan. This includes the actions necessary to ensure that all elements of support are funded, designed, developed, acquired, and deployed before the system is delivered to the user."

Baselining

Linked to this three-pronged approach to greater systems supportability is AFSC's concern with establishing "baselines for all of our major programs—fully coordinated with the using and supporting commands." This means that all agencies involved in a program—"the builder, tester, trainer, and maintainer"—must be in thorough agreement on such aspects of a weapon system as its schedule, performance requirements, and support details. This entails that "we'll all agree on training, on spares, on maintenance requirements, on tech data availability, and so forth. Then any change made to the baseline will require high-level approvals. This will help eliminate many of the changes that have historically caused program cost growth and delays, and caused support funds to be bled off for mission requirements."

AFSC and AFLC, General Marsh said, have charted a course to boost the availability of Air Force weapon systems by combining effective R&D programs with early consideration of acquisition logistics concerns. Backing up this "formula for success," he added, will be sufficient numbers of strategically placed acquisition logistics experts and an emphasis by management on the importance of "using acquisition logistics to improve the availability and readiness of systems we develop and acquire."

The "Spares" Challenge

In the area of spares, AFSC is working toward "more effective methods of accurately predicting life cycles for weapon system components and parts." In this context, he stressed the importance of properly defining "initial support" and of specifying on a system by system basis "how long a weapon system should be in the field before the logistics community is fully supporting it."

General Mullins followed up by suggesting that "calling and thinking of 'spares' as spares is misleading—for they really are 'essentials'—[meaning] they are really replenishment parts we know will wear out or break, and that we know we will have to have if our systems are to do the job they were designed and purchased to do."

Given the essential nature of spares, he stressed the importance of not only buying all that is needed but also of buying "the best quality

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Cooperative efforts are what's needed now to deal with the parts pricing problem.

Past Finger Pointing on Parts Pricing

A STAFF STUDY

A highlight of the Air Force Association's logistics symposium, "Logistics: The Long Pole in the Tent," held in Dayton, Ohio, last October 7–8, was an in-depth review of the spare parts problem by a panel of five ranking aerospace industry executives. In presenting industry's side of the issue, the panelists agreed, as O. C. Boileau, President of General Dynamics Corp., put it, that "something has to be done to correct the impression that there has been a systematic and widespread program by industry to rip off the taxpayers in the area of spare parts and logistics in general."

L. O. Kitchen, President of Lockheed Corp., suggested that the time has come to look at solutions rather than to seek to place blame since "the contractor is not trying to gouge the customer—he is following long-established and approved accounting policies and pricing formulas. The government buyer is not to blame—he is also following his procedures . . . buying only those amounts for which he has adequate funds and an established need."

Boeing's philosophy, according to Lionel D. Alford, President of the Military Airplane Co., is "If it's wrong, don't do it; if it's dumb, don't do it; if you have done something wrong or stupid, clear it up as soon as possible. I am not saying that we have done anything wrong, but possibly we have done some dumb things, and we need to clear them up."

The Executive Vice President of McDonnell Aircraft Co., Harold P. Altis, suggested only half facetiously that the "ideal solution to the spares problem is not to have any." Admitting that for the time being such a concept is utopian, he pointed out, however, that advancing technology permits the design of systems with sharply reduced spares requirements. Alluding to the symposium's title—"Logistics: The Long Pole in the Tent"—he predicted that "the long pole will get a lot shorter" over time.

T. S. Melvin, President of the Manufacturing Group of UTC's Pratt & Whitney Aircraft Group, suggested that at the heart of the spate of recent "horror stories" associated with spare parts is the news media's failure to allow for the effects of inflation and of small-quantity orders on spare parts pricing. Citing the case of Pratt & Whitney's sixty-seven-cent bolt that grew into a $17.59 media event, he explained that the low price was computed in 1964 and premised on a buy of 1,200 units; the higher price was calculated on a buy of eighty-seven units seventeen years later. Pointing out the pervasive effect of quantity on price, he said that if the government were to order 1,200 of these bolts right now in 1983, the "price would be $2.30"—or about three times what it was in 1964—reflecting the cumulative inflation of the intervening nineteen years.

There was consensus among the panelists that the spares orders most likely to cause the military-industry team to "shoot itself in the foot" involved apparent low-value items, infrequent purchases of small quantities, and out-of-production items. As Mr. Kitchen explained, "Existing cost and pricing practices, even though proper, inevitably result in prices charged for these orders which appear disproportionately high when compared to the intrinsic value of the particular part."

The panel of aerospace industry executives produced a wealth of ideas on how to do the job better. For one, government should order spare parts in larger quantities. Further, accounting meth-

at the lowest price, and in the most timely fashion. This, of course, requires . . . that the American people be convinced that we are buying only what we need in the most effective and efficient manner possible."

The means for doing so exist in the form of "our free enterprise system—the system that's been responsible for the largest amount of innovation, the strongest economy, and the greatest democracy man has ever known. But clearly, we have to use it more effectively than we have in recent years."

The central requirement underlying the spares challenge is that the Defense Department "stimulate the kind of competition in a healthy private sector that can give us what we need, when we need it, and at the right price. And to do that, we have to improve the way we do business, including the incentives and penalties we write into our contracts—and the timeliness and effectiveness of our management systems—and, across the board, the way we spend the taxpayer's money. For in doing so, we will not only acquire the combat capability we need, we will also avoid the danger of misapplying public resources and eroding public confidence."

The bottom line of combat capability, he stressed, "is really not so much the number and types of systems available; rather, it's the support cost, lead time, and pipeline logistics constraints placed on these systems. Hence the importance of having up front the resources we will need to fight and win—and this means having many of these assets readily available, even prepositioned if possible, because the fabric of weapon system support is very delicate indeed. One tear, and the whole thing might come undone."

Overcoming Overpricing

Secretary of the Air Force Verne Orr, speaking at the AFA symposium's formal luncheon, disclosed that he recently sent thirty-one letters to chief executive officers of aerospace companies on the subject of spares. In twenty-six of these letters, he said, "I included a part from that particular company which appeared to be substantially overpriced." To date, twenty-one of the chief executive officers have replied, with the answers falling into three groups.

"About a third of them said, 'We have resurveyed our costs on the particular part we sent you, and we find it entirely in line with regulations and your doctrine, and the price is therefore correct.' Now that's understandable. I didn't accuse any company of not following regulations or making a price that was illegal. I was simply pointing out that we and they have problems," according to Secretary Orr.

Another third of the companies acknowledged that the price they quoted appeared to be very high and suggested that "there are many problems within the Air Force and some within our corporation, and we are going to work with you to correct it."

The third group replied, "Yes, the price does appear to be extreme. Without acknowledging one way or another that we are at fault, we are refunding your money."

The important lesson, Secretary Orr told the AFA meeting, is "that two-thirds of these large manufacturers, the largest Air Force suppliers in the United States, indicat-

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ods should be reviewed. General Dynamics, for instance, is checking each division's spare parts pricing and accounting policies to weed out provisions that can cause unreasonable pricing. The panel agreed that a central pitfall is the tendency to load across-the-board costs disproportionately on low-value items, often in excess of the part's intrinsic value.

There were sound recommendations for coping with vexing low-value/low-quantity orders. General Dynamics plans to challenge small requests that lead to exorbitant unit costs. Lockheed plans to go even further and refuse all low-quantity/low-value orders on mature programs. If the customer still wants the part, Lockheed will "policy price," or offer it at what appears to be a reasonable price even though it is less than the actual cost to the company. This, of course, is meant only as an interim measure, since long-term losses are in nobody's best interest.

In looking toward long-term solutions, the panel urged the Defense Department to "clean up its act for small-quantity orders." Also, DoD should reexamine the need for tight military specifications to see if less-expensive commercial parts can be substituted under certain conditions. Further, industry ought to tell government when it could save money by buying directly from the true manufacturer, especially in cases where the prime contractor provides no "value-added" service, such as quality control.

In addition, the Pentagon should examine stringent packaging and shipping specifications, especially in cases where the shipping costs exceed the worth of the part. Finally, industry and government together should seek revisions of current regulations relating to pricing of low-value spare parts, even if that means changing existing defense acquisition regulations.

Competitive procurement, the accompanying "breakout"—or tracing in terms of origin—of individual items, and proprietary data release came in for intensive discussion. Competitive procurement obviously depends on finding sources that can manufacture the part cost-effectively and establish the degree of quality controls needed for a particular part. In some cases, proprietary data must be released by the prime contractor. (Proprietary data is information about an item for which a company claims exclusive rights.) Questions about what constitutes legitimate proprietary data, and for how long, are currently being examined by DoD and the defense industry.

But, as Boeing's Alford pointed out, there are limits. "We specifically try to use the data on our commercial products to benefit the Department of Defense. . . . It's a competitive world out there, and some of that [information] is of significance to us." That concern applies also to conceptual ideas that come out of the design and engineering departments of individual companies that provide them with a competitive edge.

The AFA meeting brought out the fact that General Dynamics has appointed a "spares czar" to develop and implement internal policies on spare parts and to serve as the focal point for outside inquiries. Similarly, Pratt & Whitney is establishing a competitive advocacy group to evaluate various spares policies.

Other suggestions for improving the pricing situation include such "up-front" measures as designing new aircraft and other systems with lower spare parts requirements. Setting up incentives as early as the RFP (Request for Proposal) phase of a weapon system to produce a more reliable and maintainable aircraft was deemed important.

Several panelists suggested changes in the government's procurement and funding approaches, including folding replenishment spare parts production into the production of the prime mission equipment. Another recommendation suggested negotiating spares prices during the competitive bidding phase of DoD programs.

The panel session was marked by expressions of deep concern over public reaction to the spare parts price flap.

"We need the support of Congress," said Mr. Boileau. "We need the support of our people in this country. And we can't get it with the apparent screw-ups that the press picks up."

"None of us—industry, DoD, or the nation—can afford any weakening of our resolve for a strong national defense. We must work together toward that end. It's a time for positive, cooperative action as displayed during this symposium, and not finger pointing," according to Lockheed President Kitchen.

ed their complete willingness to work with us in trying to solve our spare parts problem. Some of them went into considerable depth on how we might handle our problem."

Some of the corrective actions the Air Force plans to take may be controversial, according to Secretary Orr: "For instance, in all future contracts we are saying that we expect a manufacturer to give us no less of a guarantee on that product than that manufacturer gives to any other purchase." Also, in "our competitive bids, we are going to insert a clause that we expect proprietary rights to end five years from the delivery of the first production item." Because of the varied nature of proprietary rights, the Air Force will deal with this problem cautiously: "We will go industry by industry, product by product. Several corporations have written to me that, on review, they don't think they should even be in the business of providing these small parts they have stamped 'proprietary.' "

The Air Force, he said, believes that "we need more competition. Congress wants us in some cases to get more competition. Sometimes they don't. It all depends if they have the sole source in their district, in which case they are not as enthused about competition."

But competition, he warned, is not a panacea, since under certain circumstances—such as purchases of a small quantity of highly specialized items—sole source procurement saves money, time, and manpower. Explaining that while AFLC's staff will be increased somewhat to widen the margin for competitive spares procurement, he cautioned that the Department of Defense and the Air Force would not go overboard and start "so many competitions that it is utterly uneconomical from the government's standpoint to spend two or three days to buy a bolt which might have been provided through sole source at far less cost."

The Air Force is aware of the fact "that we have a logistics problem. We are the first to admit it. You won't find us ducking that issue; you will find us stepping up to it," Secretary Orr told AFA's logistics symposium. But he added that "we are trying to step up to it, with industry, off the front pages. . . . Our obligation is to put the same emphasis on modernization in logistics that we have in our weapon systems."

Joint Logistics

The readiness and sustainability of allied military forces are fast becoming as important to gaining US foreign policy objectives as the readiness and sustainability of US forces, Dr. William Schneider, Jr., Under Secretary of State for Security Assistance, Science and Technology, told the AFA meeting. A number of requirements ensue as a result, he suggested.

Because many US allies—especially underdeveloped nations—can't afford the high maintenance costs of US-furnished weapon systems, it is essential that this country try to come up with acquisition techniques that minimize support cost. At the same time, he said, it is important to find accurate means for predicting the support costs throughout the life cycle of a system. Foreign purchasers need to know from the moment a US system enters the inventory of their armed forces what its life-cycle costs are going to be so that these costs can be assimilated in the Security Assistance and Foreign Military Sales programs.

The current level of Security Assistance funding is about seventy-four percent above the level in effect at the end of the Carter Administration, Secretary Schneider said. When all forms of US Security Assistance are taken into account—grants, loans, and economic assistance—the total comes to about $9 billion. In addition, there are direct military sales without explicit US financial support that in the aggregate amount to roughly $20 billion. While these amounts are only a relatively small percentage of the US defense budget, they have a "catalytic" effect on this country's ability to support its national interest in various parts of the world, according to the State Department official.

The fact that the Soviets have increased the flow of technologically advanced weapons to their surrogates forces the US to upgrade the quality of weapons furnished to its allies. As a result, more and more of the equipment this country makes available to allied forces comes out of the inventory of the US armed forces. He explained that the surplus inventory of the US military is "quite empty," with the result that a crunch ensues, especially so far as logistics support is concerned.

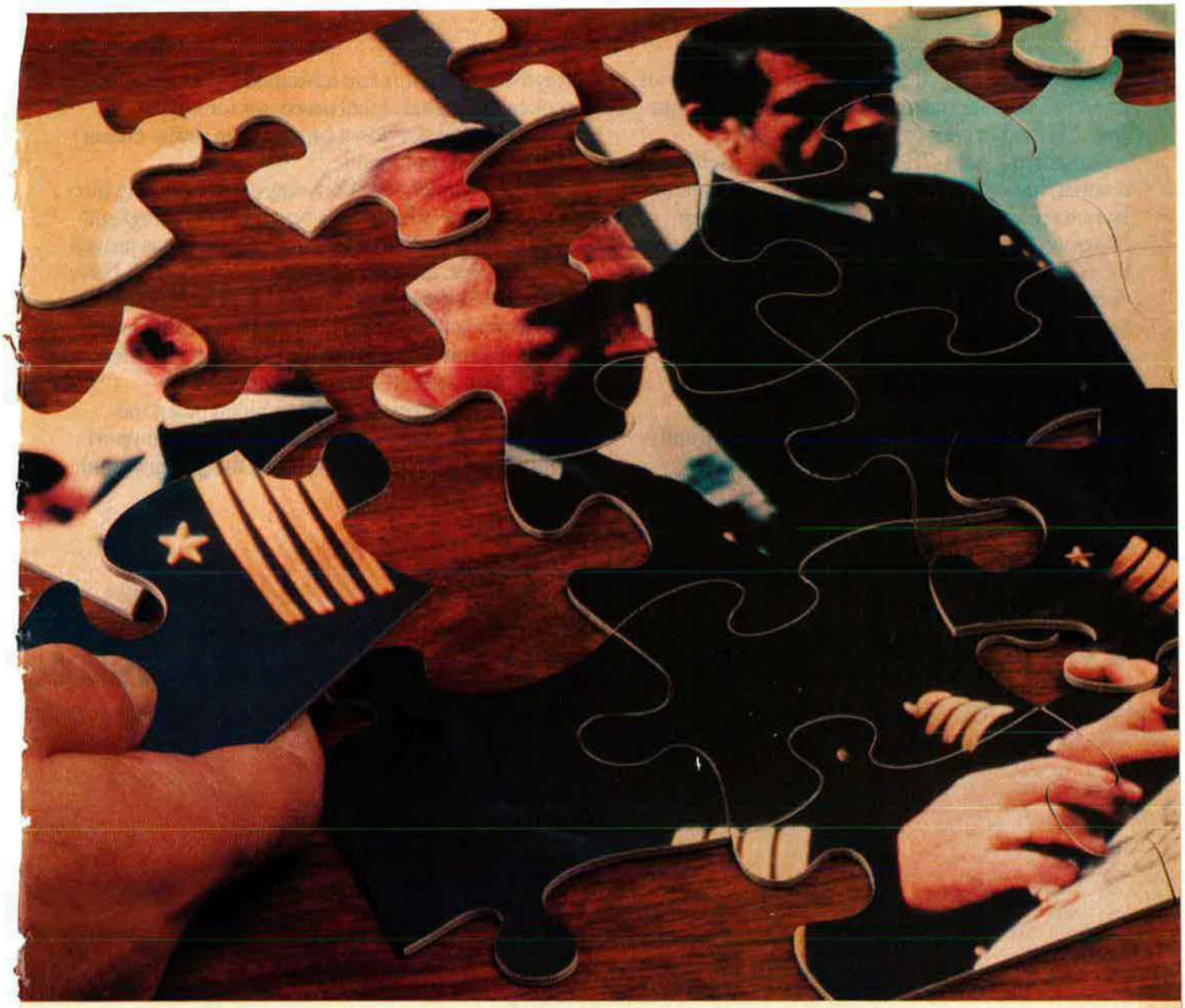
The Same Problems

As Third-World countries become more industrialized and subsequently enter more and more into coproduction arrangements, the "worldwide industrial base is being enlarged by technology transfers, with the result that our surge capability grows commensurately," Dr. Schneider pointed out.

Other symposium speakers also underscored the global logistics challenge confronting US and allied forces and the exacerbating effects of such factors as inadequate air- and sealift forces, inadequate bases and poor transportation networks in potential theaters of operation, and limited or no opportunity to preposition logistic supplies at or near prospective troublespots.

As US Central Command Deputy Commander in Chief Maj. Gen. Robert C. Taylor pointed out, it would take the fastest ships more than twenty-four days and air-refueled C-5As more than fourteen hours to reach Middle East troublespots from the US. Yet in the "early weeks" of serious conflict in that area the US would have to deliver over a distance greater than one half the circumference of the earth "a force with equipment and supplies equal in [weight and volume] to more than 188,000 full-size automobiles."

Lt. Gen. James R. Brickel, Deputy Commander in Chief of US Readiness Command, stressed in similar fashion that—from the perspectives of the Commanders in Chief of the Unified Commands and the Joint Deployment Agency—the logistics problems are "always the same: getting the right resources, in the right amounts, to the right places, at the right time, keeping in mind that we don't have enough logistics and enough lift." In the case of some CINCs, such as CINC CENTCOM, the available lift can provide only about fifty percent of what the commanders deem essential, he said. ■



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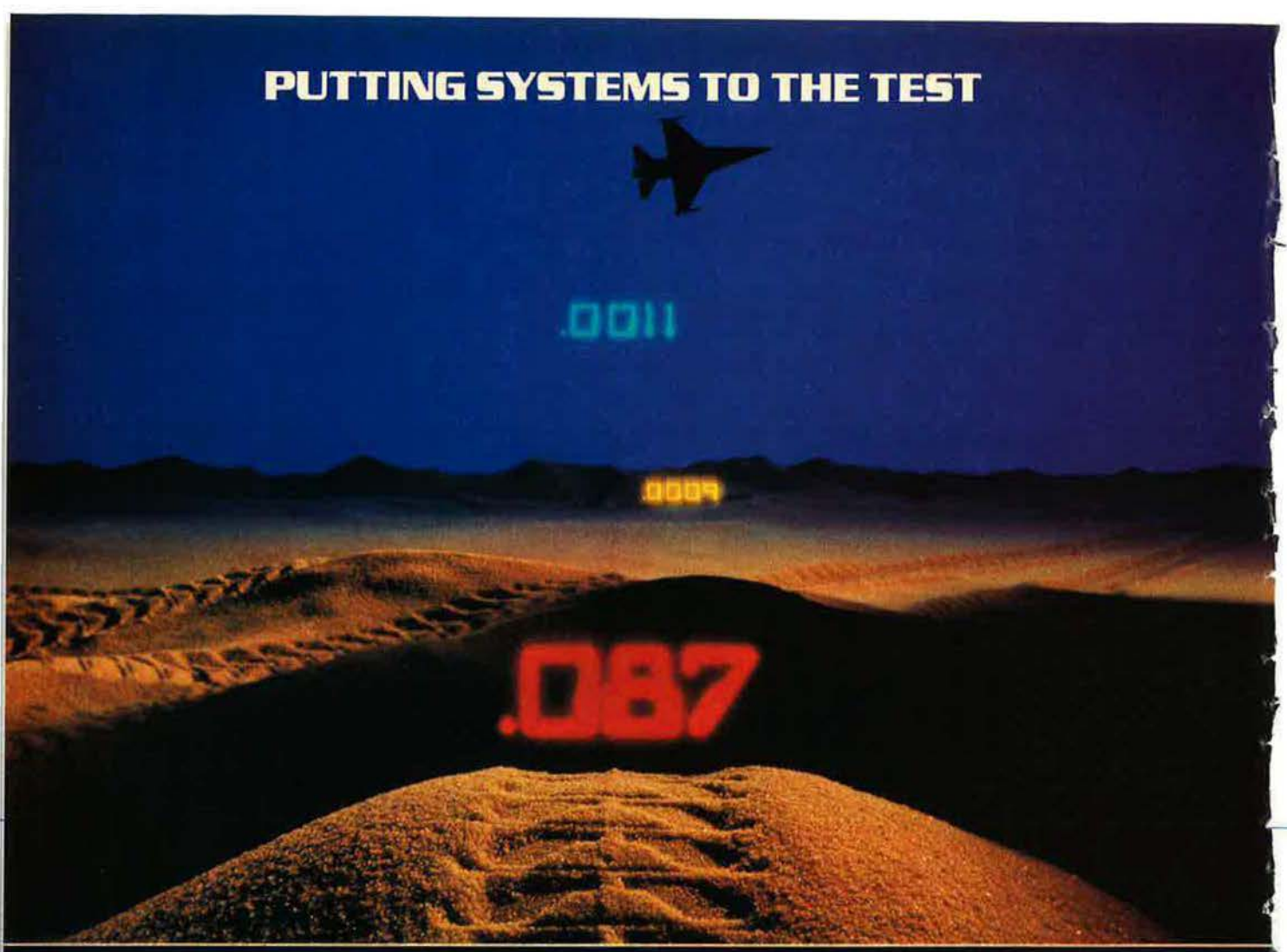

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THE MILITARY BALANCE 1983/84

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Something the compilation is not: It is not an assessment of the balance of power in the world, either globally or regionally. The document has been prepared by the Director of the London-based International Institute for Strategic Studies and his staff, who accept full responsibility for its contents. The contents cannot represent a consensus of the views of the IISS's worldwide membership, nor could they.

For this publication, AIR FORCE Magazine has added photos and captions, and we assume responsibility for them. As in the past, minor tabular material has been excluded from this reprint because of space limitations. Readers wishing the original volume may order it from The International Institute for Strategic Studies, 23 Tavistock St., London WC2E 7NQ, England.

The IISS report makes interesting distinctions with respect to worldwide military spending. It shows an increase of about ten percent in such spending between 1981 and 1982. But the upward trend was wholly attributable to the US, the Soviet Union, Latin America, and the Middle East, which has experienced a thirty-five percent increase since 1978, largely as a result of the Iran-Iraq war and the 1982 combat in Lebanon. In the rest of the world, military spending lost steam.

"Contrary to the popular view," the IISS reports, "it is impossible to find evidence . . . of a widespread arms race, at least in quantitative terms." Moreover: "In many cases, the downturn in [military] inventory is already becoming quite marked, and for most states the resources available for defense are now shrinking in real [inflation-discounted] terms."

NATO and Warsaw Pact spending trends make the point. Over the past five years, according to the IISS, NATO military spending rose by eleven to twelve percent in real terms and Warsaw Pact spending rose by four to six percent. But with US and Soviet spending excluded from the equations, NATO and Warsaw Pact defense expenditures have remained flat (NATO's spending may actually have decreased slightly) during that period.

Withal, the IISS concludes that the West continues to come up short: "The numerical balance over the last twenty years has slowly but steadily moved in favor of the East. At the same time the West has largely lost the technological edge which allowed NATO to believe that quality could substitute for numbers."

In the material that appears on the next sixty-five pages, AIR FORCE Magazine has retained the IISS's system of abbreviating military units and weapons, and its British spelling and usage (as in "programme"). A list of the various abbreviations used in the text appears on p. 70.

Where a $ sign is used, it refers to US dollars, unless otherwise stated. Defense expenditures are expressed in US dollars. For the USSR and China, defense expenditures are estimates. Explanatory notes are provided in the sections on those countries.

—THE EDITORS

ABBREVIATIONS

(	under 100 tons
–	part of unit is detached
+	unit reinforced
AA	anti-aircraft
AAM	air-to-air missile(s)
AB	airborne
ABM	anti-ballistic missile(s)
ac	aircraft
AD	air defence
AEW	airborne early warning
AFV	armoured fighting vehicle(s)
ALBM	air-launched ballistic missile(s)
ALCM	air-launched cruise missiles(s)
amph	amphibious
APC	armoured personnel carrier(s)
Arg	Argentinian
armd	armoured
arty	artillery
ASM	air-to-surface missile(s)
ASW	anti-submarine warfare
ATGW	anti-tank guided weapon(s)
ATK	anti-tank
Aus	Australian
AWACS	airborne warning and control system
bbr	bomber
bde	brigade
bn	battalion *or* billion(s)
Br	British
bty	battery
Cdn	Canadian
cav	cavalry
cdo	commando
Ch	Chinese (PRC)
comd	command
COIN	counter-insurgency
comms	communications
coy	company
CW	chemical warfare
def	defence
det	detachment
div	division
ECM	electronic counter-measures
ELINT	electronic intelligence
elm(s)	element(s)
engr	engineer
eqpt	equipment
est	estimated
EW	early warning
excl	excludes/excluding
exp	expenditure
FAC(G)	fast attack craft (gun)
FAC(M)	fast attack craft (missile)
FAC(P)	fast attack craft (patrol)
FAC(T)	fast attack craft (torpedo)
fd	field
FGA	fighter(s), ground-attack
flt	flight
FMA	foreign military assistance
Fr	French
FRG	Federal Republic of Germany
ftr	fighter (aircraft)
GDP	gross domestic product
GDR	German Democratic Republic
GLCM	ground-launched cruise missile(s)
GNP	gross national product
GP	general-purpose
gp	group
GW	guided weapon(s)
hel	helicopter(s)
how	howitzer(s)
hy	heavy
ICBM	inter-continental ballistic missile(s)
incl	includes/including
indep	independent
inf	infantry
IRBM	intermediate-range ballistic missile(s)
km	kilometres
KT	kiloton (1,000 tons TNT equivalent)
LCA	landing craft, assault
LCG	landing craft, gun
LCM	landing craft, medium/mechanized
LCT	landing craft, tank
LCU	landing craft, utility
LCVP	landing craft, vehicles and personnel
LHA	amphibious general assault ship(s)
log	logistic
LPD	landing platform(s), dock
LPH	landing platform(s), hel
LSD	landing ship(s), dock
LSM	landing ship(s), medium
LST	landing ship(s), tank
lt	light
m	million(s)
MARV	manoeuvrable re-entry vehicle(s)
MBT	main battle tank
MCM	mine counter-measures
mech	mechanized
med	medium
MICV	mechanized infantry combat vehicle(s)
MIRV	multiple independently-targetable re-entry vehicle(s)
misc	miscellaneous
Mk	mark (model number)
mod	modified/modification
mor	mortar(s)
mot	motorized
MR	maritime reconnaissance
MRBM	medium-range ballistic missile(s)
MRCA	multi-role combat aircraft
MRL	multiple rocket launcher(s)
MRV	multiple re-entry vehicle(s)
msl	missile
MT	megaton (1 million tons TNT equivalent)
n.a.	not available
Neth	Netherlands
nm	nautical miles
NMP	net material product
OCU	operational conversion unit(s)
org	organized/organization
para	parachute
pdr	pounder
Pol	Polish
Port	Portuguese
RCL	recoilless launcher(s)
recce	reconnaissance
regt	regiment
RL	rocket launcher(s)
RV	re-entry vehicle(s)
SAM	surface-to-air missile(s)
SAR	search and rescue
sigs	signals
SLBM	submarine-launched ballistic missile(s)
SLCM	sea-launched cruise missile(s)
Sov	Soviet
SP	self-propelled
spt	support
sqn	squadron
SRAM	short-range attack missile(s)
SRBM	short-range ballistic missile(s)
SS	diesel submarine(s)
SSBN	ballistic-missile nuclear submarine(s)
SSM	surface-to-surface missile(s)
SSN	submarine(s), nuclear
sub	submarine
TA	Territorial Army
tac	tactical
tk	tank
tp	troop
tpt	transport
trg	training
UNDOF	United Nations Disengagement Observation Force
UNFICYP	United Nations Force in Cyprus
UNIFIL	United Nations Interim Force in Lebanon
UNTSO	United Nations Truce Supervisory Organization
USGW	underwater-to-surface guided weapon
veh	vehicle(s)
VIP	very important person
V(/S)TOL	vertical (/short) take-off and landing
WP	Warsaw Pact
Yug	Yugoslav

The United States and The Soviet Union

The United States

Strategic Forces

The US has begun the slow retirement of the *Titan* ICBM. By 1 July seven of these were due to have been withdrawn, bringing the US ICBM inventory to its lowest point since 1966: 1,045. This withdrawal reduces the ICBM warhead total by 7, to 2,145, and the potential deliverable megatonnage by 63 (to 1,734 if all the *Minuteman* II warheads are assumed to be 2 MT, 1,284 if all are 1 MT).

In partial compensation, there are now three *Ohio*-class SSBN at sea, bringing the total of *Trident* C-4 missiles in the inventory to 264. This increases the SLBM warhead total by 384 to 5,152 and the estimated potential deliverable megatonnage at sea by 38.4 to 468.8.

The strategic bomber force has also been reduced by some 44 aircraft. The operational inventory of B-52D is now about 31 and falling; of the 151 B-52G, 61 have a non-nuclear role, and there is one training squadron. Two B-52G squadrons have been fitted with the AGM-86B Air-Launched Cruise Missile. The long-range TR-1A reconnaissance aircraft is being deployed; its role has been adjusted to include tactical reconnaissance. The conversion of the E-4A Airborne Command Post to E-4B standard continues; the conversion involves improvements to the avionics, provision for in-flight refuelling, and reinforcements to the specialist crews to cope with the longer flight duration and improved sensor capabilities.

The United States is building more *Ohio*-class SSBN, and plans to build 100 B-1B bombers while examining the merits of a future design, the so-called 'stealth' bomber. Under current plans 100 MX ICBM are to be deployed in *Minuteman* silos. Flight testing of this missile has begun. Development of the *Trident* D-5 missile is going forward.

Defensive strategic measures include a continuing programme of modernization. Such systems as the Pacific Radar Barrier and the Ground-based Electro-Optical Deep Space Surveillance System will enhance the early detection of events in space. Tests of the Over-the-Horizon-Backscatter systems have still not resolved some of the shortcomings which have to date prevented them from operating at full potential. Nevertheless, plans exist for the future development and deployment of this facility. Finally, steps are in hand to upgrade the detection and control capabilities of the DEW Line, the earliest of the warning systems. These measures will result in improved capability and reliability and should reduce the considerable demand for staffing and maintenance that now exists.

General-Purpose Forces

A bureaucratic reorganization resulted in the formation on 1 January 1983 of the US Central Command (CENTCOM) to control any US deployment in south-west Asia and the Indian Ocean, thus bridging the command gap between the Pacific and the Atlantic and European areas. It has taken over what was formerly known as the Rapid Deployment Joint Task Force (RDJTF) and could have some 292,000 personnel under command on full mobilization. These units and formations are in most cases also intended to reinforce Europe in the event of hostilities on the NATO Central Front, and it is far from clear how the conflicting requirements under this dual-tasking arrangement are being resolved. It is entirely possible that, if the United States chooses to maintain these dual commitments, pressure will yet be placed on the European Allies to assume a greater role on the Central Front.

Modernization of the US Army tank force continues, with a phasing out of some M-48 and the upgrading of the M-60 to A3 standard. The *Abrams* is now in full production and the strength this year is over four times its 1982 level. The *Bradley* MICV is now also in production, and deliveries are reported. The UH-1 helicopter is being withdrawn and significant deliveries of the AH-1 have taken place.

The US Navy has received six more *Los Angeles*-class SSN; one *Skate* SSN has retired. The overall strength of SSNs has therefore risen by five. The first *Ticonderoga*-class guided missile cruiser is now operational with *Harpoon* SSM and *Standard/ASROC* SAM/ASW. The older *Sherman* and *Hull* destroyers have now been withdrawn, and the escort role is increasingly being met by the *Perry*-class (FF-7) frigates. Perhaps the most publicized US warship is the battleship *New Jersey*, now refitted and rearmed as the only guided weapon-equipped battleship in commission in the world. A second battleship, the *Iowa*, is also undergoing modernization; the decision whether or not to refit the other two reserve battleships has not yet been reported.

The Air Force has been introducing the F-15 into its interceptor force and the F-16 into the tactical wings and the Air National Guard. This has resulted in the introduction of more combat capability in front-line service in Germany and Korea and in immediate support in Spain and Japan as well as in the Continental US.

Efforts are in hand to bolster all components of the Reserves, and strengths and equipment holdings are increasing.

While volume deliveries are difficult to quantify, reports suggest that there is now greater attention paid to the provision and distribution of spare parts and ancillary equipment, thereby achieving greater utilization of equipment and more efficient servicing. Also, the reliability of new aircraft is improving as the USAF gains experience in operating them.

Women comprise just over nine percent of the total US personnel strength. They are employed in a number of functions which, in the past ten years, have broadened into a number of non-traditional areas. In common with other nations, the US is experiencing a declining birthrate and hence a reduction in potential military manpower. Women, particularly those with educational and manual skills, seem likely to play an increasingly important part in the management and maintenance of sophisticated armed forces such as those of the US, and thereby release more men for combat duties.

THE UNITED STATES

Population: 234,516,000.
Military service: voluntary.
Total armed forces: 2,136,400 (198,700 women).
GDP 1981: $2,888.5 bn. 1982: 3,011.6 bn.
Est def exp 1982–3: $215.9 bn (national definition).[1]
GDP growth: 1.8% (1981), −1.8% (1982).
Inflation: 8.9% (1981), 3.9% (1982).

Strategic Nuclear Forces:[2]

OFFENSIVE:

(a) *Navy:* (21,000): 568 SLBM in 34 SSBN.
3 *Ohio* SSBN each with 24 *Trident* I/C-4 (72 msls).
31 SSBN: 19 *Lafayette*, 12 *Franklin:* 12 with 16 *Trident* I/C-4 (192 msls); 19 with 16 UGM-73A *Poseidon* C-3 (304 msls).
(On order: 7 *Ohio* SSBN; 168 *Trident* I/C-4 msls.)

(b) *Strategic Air Command* (SAC) (118,000): 2 Air Forces. 12 divs (1 trg/spt).
ICBM: 1,045. 9 strategic msl wings, 26 sqns.
3 wings (9 sqns) with 450 LGM-30F *Minuteman* II.
3 wings (11 sqns) with 550 LGM-30G *Minuteman* III (3 MIRV).
3 wings (6 sqns) with 45 *Titan* II (phasing out).
Aircraft: some 356 combat ac: 18 bomb wings (1 trg).
Long-range bombers: 272.
9 wings (7 sqns) with 151 B-52G, 4 sqns (61 ac) with conventional (non-nuc) role, 2 sqns with ALCM; 1 trg sqn with B-52G and 6 B-52H.
5 wings (5 sqns) with 90 B-52H.
2 wings (2 sqns) with some 31 B-52D (being retired).
Medium-range bombers: 56.
2 wings (5 sqns incl 1 trg) with 56 FB-111A.
Active reserve: a further 6 FB-111A, 22 B-52 (16 G, 6 H).
ASM: perhaps 1,140 AGM-69A SRAM, 200 AGM-86B ALCM.
Strategic recce and comd:
2 wings:
1 sqn with 9 SR-71A/B, T-38A.
1 sqn with 8 U-2CT/R.
1 sqn with 7 TR-1A (mainly tac role; 2 trg).
1 sqn with 2 E-4A (converting to B), 2 E-4B.
4 sqns: 16 RC-135, 21 EC-135A/C/G/L.
Tankers: 34 sqns (1 trg): 32 with 615 KC-135A/Q (incl 13 Air National Guard with 104 ac, 3 Air Force Reserve with 24 ac), 2 with 14 KC-10A.
(On order: 7 B-1B bombers (100 planned), 2 E-4B comd, 5 E-3A, 4 TR-1A recce (2 -1B trg), 46 KC-10A tankers, 1,500 AGM-86B ALCM.)

DEFENSIVE:

Space Command: HQ Colorado Springs; commands incl North American Aerospace Defense Command (NORAD) a joint US-Canadian organization (HQ Cheyenne Mountain, USA) with:
Aircraft: Interceptors: 261 (does not incl 54 Cdn CF-101).
(i) Regular: Air Defense (TAC), Alaskan Air Command (30 alert locations): 5 sqns; 4 with 72 F-106 (5 AAM) (F-15 replacing), 1 with 18 F-15 (8 AAM).
(ii) Air National Guard (ANG): 10 sqns; 5 with 90 F-4C/D (8 AAM), 5 with 81 F-106.
(iii) Tactical Air Force augmentation: ac on call from naval, marine, and air forces.
AAM: *Genie, Falcon, Super Falcon, Sidewinder, Sparrow.*
Warning Systems:
1. ICBM, SLBM, satellites:
(a) *Satellites* (Defense Support Program). TRW Block 647: 1 over Indian Ocean (eastern hemisphere); 2 in western hemisphere: infra-red surveillance and warning system. Control stations at Guam, Pine Gap, and Nurrungar (Australia).
(b) *Ballistic Missile Early Warning System* (BMEWS). USAF 474L system: 3 stations: Clear, Alaska (AN/FPS-49, FPS-50); Thule, Greenland (AN/FPS-50, FPS-92); Fylingdales Moor, England (AN/FPS-49 + other). 12 radars detect and track satellites, ICBM, and IRBM. 4,800-km range.
(c) *Space Detection and Tracking System* (SPADATS):
(i) *Space Defense Operations Center* (SPADOC). NORAD Combat Operation HQ, Cheyenne Mountain. Tracking, identification, and cataloguing of all space objects; command/control/communications to all space-associated commands and agencies.
(ii) *Cobra Dane* phased-array radar system at Shemya, Aleutians. Augments BMEWS in Alaska. (*Cobra Judy*, a Pacific-based, shipborne phased-array radar (AN/SPQ-11), supplements Shemya research programmes, but is not part of SPADATS and has no early-warning function.)
(iii) USAF 496L *Spacetrack*. FPS-17 detection, FPS-79 tracking radars at Pirinclik (Turkey); optical tracking systems in New Mexico, California, at St Margarets (NB, Canada), Pulmosan (S. Korea), San Vito (Italy), Maui (Hawaii), Mount John (New Zealand).
(iv) Pacific Radar Barrier (PACBAR). Detection and tracking radars. 1 site at San Miguel, Philippines, 1 at Kwajalein Atoll, third to be determined.
(d) *USN Space Surveillance System* (NAVSPASUR). 9 field stations in south-east US (3 transmitting, 6 receiving sites, and civilian agencies).
(e) *Perimeter Acquisition Radar Attack Characterization System* (PARCS). 1 north-facing phased-array, 130° arc, 2,800-km range system at Grand Forks, ND; identifies and tracks individual re-entry vehicles, incl SLBM, in Central US, Arctic Ocean areas. (Was Army *Safeguard* system support; to be enhanced.)
(f) *Miscellaneous radars.* US Army: Kwajalein Atoll (Pacific). USAF: Ascension Island (Atlantic), Antigua (Caribbean), Kaena Point (Hawaii); MIT Lincoln Laboratory, Westford, Mass.
(g) Under development: Ground-based Electro-Optical Deep Space Surveillance System (GEODSS). A planned five-station system: stations now exist in White Sands NM, Taegu (S. Korea), Maui (Hawaii); 2 will be mobile, one in Indian Ocean, one in South Atlantic.
2. SLBM:
(a) *Pave Paws* system: 1 phased-array radar (AN/FPS-115) each in Massachusetts and California; 5,500-km range. 2 more planned in Georgia and Texas.
(b) 1 FPS-85 and 1 AN/FSS-7 station in Florida. Alternate Space Defense Center. Linked to *Spacetrack* and NAVSPASUR through NORAD HQ. Also to identify and track fractional-orbit bombardment systems (FOBS).
3. Anti-Air (aircraft, cruise missile):
(a) *Over-the-Horizon-Backscatter* (OTH-B). 414L system, 3,900-km range. 2 sites in Maine (2 transmitters, 5 receivers), arcs and range still under development; 1 in Washington State planned. Another in southern US under consideration.
(b) *Distant Early Warning* (DEW) Line. 31 AN/FPS-19/-30 radars (21 in Canada, 2 in Iceland, 1 in Scotland), roughly along 70°N parallel from Point Lay, Alaska, through Greenland, detecting aircraft and cruise missiles to 12,000m at 320-km range.
(c) *CADIN/Pinetree Line:* 24 stations in Southern Canada.
(d) Tactical Air Command:
(i) *Semi-Automatic Ground Environment* (SAGE). 416L air weapons control and warning system at 6 locations (2 in Canada); combined with BUIC and Manual Control Center (MCC) in Alaska.
(ii) *Back-up Interceptor Control* (BUIC). All stations but 1 semi-active (AD command and control to support Joint Surveillance System (JSS) in tactical control of interceptor forces).
(SAGE, BUIC, and MCC will be replaced in 1983 by USAF/Federal Aviation Authority JSS, with 7 Region Operations Control Centers (ROCC): 4 in US (1 operational), 1 in Alaska, 2 in Canada. Will control 84 radars (46 in US, 14 in Alaska, 24 in Canada) for coordination/control of military and civil air traffic, surveillance and tracking of objects in high- and medium-altitude trans-polar flight.)
4. Intermittent programmed photographic recce satellites incl:
(a) USAF: KH-9 low-altitude, *Big Bird* med-altitude.
(b) CIA: KH-11.

Army: 780,800 (some 84,000 women).
4 Army HQ: 6 corps HQ (1 AB).
4 armd divs (5–6 tk, 4 mech inf bns).
6 mech divs (4 tk, 5 mech inf, 3–4 arty, 1 hel, 1 SAM bns, 1 armd cav sqn, spt units).[3]
4 inf divs (1 trials).[3]
1 air assault div.
1 AB div: 3 bdes (each 3 para bns, 1 arty bn), 1 armed hel bn, 1 armd cav sqn.
9 arty bdes.
5 AA arty bdes.
1 indep armd bde.
4 indep inf bdes.
1 indep air cav combat bde.
3 armd cav regts.
4 *Pershing* SSM bns (1 trg); 8 *Lance* SSM bns (in corps arty).
1 *Patriot* SAM bn forming (5 launchers, 60 msls); planned total 13½ bns.
1 Special Operations Cmd: 3 Special Forces Gps; 2 Ranger bns, misc units.
Army Aviation: 1 air assault bde, 6 aviation bdes, indep bns and dets, mixed types of eqpt, assigned to HQ for tactical, tpt, and medical duties.
Tks: 11,769, incl 1,703 M-48A5, 1,535 M-60, 4,207 M-60A1 (to be mod to -A3), 2,695 M-60A3, 1,229 M-1 *Abrams* MBT; 400 M-551 *Sheridan* lt tks with *Shillelagh* (330 trg).
AFV: some 18,000, incl 450 M-2, M-3 *Bradley* MICV; 3,100 M-577, 2,100 M-901 with *TOW*, 12,300 M-113 (some with *TOW*) APC.
Arty and Msls: about 2,000 105mm and 155mm towed guns/how; 3,140 155mm and 203mm SP how; 63 MLRS 227mm MRL; 3,200 81mm, 4,200 107mm mor; 1,000 90mm and 106mm RCL; 400 *Hellfire* ATGW, 6,000 *TOW*, 10,400 *Dragon* ATGW launchers; 108 *Pershing* and 72 *Lance* SSM launchers.
AD: 220 *Vulcan* towed, 380 M-163 SP 20mm AA guns; *Redeye*, FIM-92A *Stinger*, 400 *Chaparral*, 27 *Roland*, *Nike Hercules*, and *Improved HAWK* SAM (some being replaced by *Patriot*).
Aircraft/Hel: some 625 ac, incl 200 OV-1/-10, 200 RU-21, RC-12D, 92 C-12A, 6 UV-18A (DHC-6), 120 U-21; some 8,900 hel, incl 900 AH-1G/Q, 900 AH-1S, 3,700 UH-1 (being replaced), 350 UH-60A, 450 CH-47A/B/C/D, 24 CH-53E, 70 CH-54, 2,500 OH-6A/-58A.
AAM: MIM-92A *Stinger.*
Trainers incl about 50 T-42 ac; 250 TH-55A hel.
(On order: 2,695 M-60A3, 5,829 M-1 MBT; 350 M-901 *Improved TOW* (TOW-2) AFV; 2,500 M-3 *Bradley* MICV; 969 LAV-25 *Piranha* APC; 340 M-198 155mm towed, 232 M-109A2/A3 155mm, M-110A2 203mm SP how; 2,500 81mm mor; 121 MLRS MRL; 108 *Pershing* II SSM; 146 *Sgt York* DIVAD 40mm SP AA guns; 3,000 *Stinger*, 32 *Rapier*, 17 *Roland* (595 msls), 300 *Chaparral*, 795 *Improved HAWK*, 15 *Patriot* SAM launchers (60 msls); 515 AH-64A, 750 UH-60A, 436 CH-47D, 11 EH-60D *Quickfix* hel; 680 *Hellfire* ATGW (ASM), 11 GLCM launchers (120 msls).

DEPLOYMENT: *Continental United States* (incl Alaska, Hawaii, and Canal Zone):
Strategic reserve:
(i) US Readiness Command: 1 corps HQ, 1 mech, 1 AB, 1 air assault divs, 1 air cav bde. (see above).
(ii) Initial reinforcement, Europe: 2 armd, 3 mech, 2 inf divs, 1 inf bde, 1 armd cav regt.[4]
(iii) US Central Command (USCENTCOM; was Rapid Deployment Joint Task Force (RDJTF)): forces, incl naval and air, apportioned for planning purposes. Full deployment could involve some 292,000 (assigned from existing units and spt elms on mobilization).
HQ: 1 Army; 1 Army Corps (130,000): 1 mech (−), 1 AB, 1 air assault divs, 1 air cav bde, special forces, Rangers.
1 Naval Force (92,000 incl 50,000 Marines): 3 carrier battle gps; 1 surface action gp; 5 ASW patrol sqns; 1 amph ready gp; 17 pre-positioned spt ships; 1 Marine Amph Force (MAF) (1 div (+), 1 air wing, 1 Force service spt gp), 1 Marine Amph Bde (MAB), (1

[1]See p. 78 for footnotes.

regt landing team, 1 air gp, 1 bde service spt gp).
1 Air Force (30,000): 1 wing (2 sqns) B-52H, 7 tac fighter wings (11 sqns), 4 tac fighter gps, 1 airborne warning and control wing, tac airlift, recce, electronic combat sqns; 1 refuelling sqn (KC-135A).
(iv) Alaska: 1 inf bde.
(v) Panama: 1 inf bde.
(vi) Hawaii: 1 inf div less 1 bde.
(See also *Forces Abroad*, below.)

RESERVES: 660,000.
(i) Army National Guard: (417,000). 3,495 units; capable after mobilization of manning 2 armd, 1 mech, 5 inf divs, 22 indep bdes (4 armd, 8 mech, 10 inf), 4 bdes to complete regular army divs; 1 Guard mech div to form; 4 armd cav regts, 8 AD bns; plus HQ, reinforcements, and spt units to fill regular formations. 1 inf (Arctic recce) gp, 5 bns; 2 Special Forces gps, 6 bns. Indep bns: 5 tk, 2 mech, 50 arty, 4 ATK (*TOW*). 105 air units, 150 sections; 2,568 ac.
(ii) Army Reserve: (243,000); 49,000 a year do short active duty. 3,410 units; 12 trg divs; 1 mech, 2 inf indep combat bdes; 67 indep bns, incl 1 tk, 2 inf, 15 arty, 33 engr. 2 Special Forces gps: 6 bns; 130 indep air units and sections with 545 ac.

Navy: 569,000 (42,700 women): 95 attack subs, 187 principal surface combatants. A further 26 major surface combat ships are in active reserve and storage. Four Fleets.
Submarines, Attack: 95:
90 nuclear (SSN), 63 with *SUBROC*, to be fitted with *Harpoon* and *Tomahawk* SSM: 24 *Los Angeles* with *Harpoon* SSM; 1 *Lipscomb*, 1 *Narwhal*, 37 *Sturgeon*, 13 *Thresher;* 3 *Allen*, 2 *Washington* (converted SSBN); 5 *Skipjack*, 3 *Skate*, 1 *Tullibee*.
5 diesel (SS): 3 *Barbel*, 1 *Darter*, 1 *Tang*.
Aircraft carriers: 14 (1 trg).
4 nuclear (CVN): 3 *Nimitz* (91,400 tons), 1 *Enterprise* (89,600 tons).
10 conventional (CV): 2 *Kitty Hawk* (78/80,800 tons), 1 *America* (79,000 tons), 1 *Kennedy* (82,000 tons), 3 *Forrestal* (76/79,000 tons), 2 *Midway* (51/62,000 tons); 1 (*Lexington*) trg, no ac assigned.
12 normally carry 1 air wing (70–95 ac) of 2 fighter sqns (with 24 F-14A (incl 3 RF-14 recce) or 24 F-4N/S), 3 attack (2 lt with 24 A-7E, 1 med with 10 A-6E), 2 ASW (1 with 10 S-3A ac, 1 with 6 SH-3/D/H hel), 1 ECM with 4 EA-6B, 1 AEW with 4 E-2B/C; 4 KA-6D tankers, 1 lt tpt ac.
Other surface ships:
187 principal surface combatants:
1 battleship (BBG) with 4 × 4 *Harpoon*, 8 × 4 *Tomahawk* SSM.
9 nuclear-powered GW cruisers (CGN) with 2 × 4 *Harpoon* SSM: 4 *Virginia* with 2 × 2 *Standard/ASROC* SAM/ASW, 1 SH-2F hel; 2 *California* with 2 × 1 *Standard* SAM, 1 × 8 *ASROC* ASW; 1 *Truxtun* with 1 × 2 *Standard /ASROC*, 1 SH-2F hel; 1 *Long Beach* with 2 × 2 *Standard/Terrier* SAM, 1 × 8 *ASROC;* 1 *Bainbridge* with 2 × 2 *Standard*, 1 × 8 *ASROC*.
19 GW cruisers (CG): 1 *Ticonderoga* with 2 × 8 *Harpoon* SSM, 2 × 2 *Standard/ASROC*, 2 SH-2F hel; 18 with 2 × 4 *Harpoon*, 1 × 8 *ASROC*, 1 SH-2F hel (9 *Leahy* also have 2 × 2 *Standard/Terrier*, 9 *Belknap* have 1 × 2 *Standard/Terrier).*
37 GW destroyers (DDG): 23 with 2 × 4 *Harpoon:* 4 *Kidd* all with 2 × 2 *Standard /Tartar/ASROC*, 2 SH-2F hel; 8 of 10 *Farragut*, 11 of 23 *Adams*.
31 *Spruance* (DD-963) gun/ASW destroyers (DD): with 2 × 4 *Harpoon*, 1 × 8 *Sea Sparrow*, 1 × 8 *ASROC*, 1 SH-3 or 2 SH-3F hel.
37 GW frigates (FFG): 31 *Perry* with 1 *Harpoon/Standard*, 2 SH-2/-60 hel; 6 *Brooke* with 1 *Tartar/Standard*, 1 × 8 *ASROC*, 1 SH-2F hel.
53 gun frigates (FF) with 1 × 8 *ASROC;* 40 *Knox* (FF-1052) with 2 × 4 Harpoon SSM, 30 with *Sea Sparrow* Mk 5 BPDMS, 1 with *Sea Sparrow* Mk 29 SAM, 2 SH-2F hel, 10 *Garcia*, 1 *Glover*, 2 *Bronstein*.
Some 89 minor surface combatants:
6 *Pegasus* GW hydrofoils with 2 × 4 *Harpoon* SSM.
Some 80 inshore and river patrol craft (most in reserve).
MCM: 3 *Aggressive* ocean minesweepers.
62 amph warfare ships: 2 *Blue Ridge* comd (LCC); 5 *Tarawa* LHA (mix of AV-8A ac or 12 CH-46, 4 CH-53, 3 UH-1N, 4 AH-1T hel; 4 LCU); 7 *Iwo Jima* LPH (mix of 6 AV-8A, 4 OV-10 ac or 2 CH-46, 10 CH-53, 1 UH-1N hel); 11 *Austin*, 2 *Raleigh* LPD; 5 *Anchorage*, 8 *Thomaston* LSD, 18 *Newport* LST; 4 *Charleston* amph cargo ship (LKA).
59 LCU: 51 Type 1610, 8 Type 1466; many smaller amph craft; others with US Army.
137 principal auxiliary ships, incl: 13 ammunition, 11 stores ships, 14 oilers, 10 destroyers, 12 sub tenders, 4 repair ships, 9 salvage/rescue ships, 2 fleet flagships, 3 fleet auxiliaries, 8 fast sealift ships.
Military Sealift Command: 6 dry cargo, 18 oil, 3 gasoline, 3 fleet auxiliary, 8 fast sealift, 19 oceanographic research ships; Chartered: 20 cargo, 10 tanker, 6 research, 1 fleet service vessels.
19 oceanographic and missile instrumentation ships.
Anti-sub msls, nuclear: *ASROC, SUBROC*.
SSM: Standard (SM-1), *Harpoon, Tomahawk* (trials).
SAM: *Standard* (SA-1), *Aegis* (SM-2) (some nuclear), *Talos, Sea Sparrow, Tartar, Terrier.*
Ships in active reserve and storage: 6 CV, 3 battleships (1 being reactivated, 2 planned), 4 cruisers, 9 DD, 4 FF, 1 LCC, 5 LST, 5 LKA, 46 log spt, 41 tp ships, 22 ocean minesweepers. National Defense Reserve Fleet: Ready Reserve Force, 30 dry cargo ships, 165 other vessels (579 govt-owned cargo ships and tankers could be used for auxiliary sealift).
(Authorized and funded: 2 SSBN, 2 SSN, 2 CVN, 3 *Ticonderoga* CG, 2 FFG, 4 MCM, 1 LSD, 3 landing craft, 2 auxiliaries; 51 BGM-109 *Tomahawk*, 222 *Harpoon* SSM, 1,100 *Standard* SAM, 37 *Phalanx* AD systems.)
Aircraft: 12 attack carrier air wings; some 1,450 combat ac, some 160 combat hel.
24 ftr sqns: 20 with 240 F-14A, (30 configured for photo/infra-red recce); 4 with 48 F-4.
36 attack sqns: 12 med with 120 A-6E, 48 KA-6D tankers; 24 lt with 288 A-7E.
2 ELINT sqns with 12 EA-3, 12 EP-3.
24 land-based MR sqns with 45 P-3B, 171 P-3C.
11 ASW sqns with 110 S-3A *Viking*.
9 EW sqns with 36 EA-6B *Prowler*.
12 AEW sqns with 48 E-2C *Hawkeye*.
17 ASW hel sqns: 11 with 66 SH-3D/H, 6 lt with 60 SH-2F.
2 MCM hel sqns with 14 RH-53D.
2 aggressor trg sqns with 28 F-5E/F, A-4, T-38.
22 OCU: 5 fighter/strike trg (2 with 60 F-14, 1 with 18 TA-4F/J, 1 with 25 F-18, 1 with 21 F-4); 6 attack with 103 TA-7C, A-7E, A-6; 2 EW with EA-3; 2 MR with 40 P-3B/C; 2 AEW with E-2B/C; 1 ASW with S-3A; 4 hel with SH-2/-3.
17 misc spt sqns with 13 C-130F/LC-130F/R, 14 EC-130G/Q, 34 C-1A, 10 C-2A, 9 CT-39, 11 C-131, 4 C-117, 39 UC-12B ac; SH-3, CH/HH-46 hel.
16 trg sqns with T-2B/C/-28/-39D/-44, 210 T-34C ac; 112 TH-57A, TH/UH-1E hel.
AAM: *Sparrow*, AIM-54A, AIM-54C *Phoenix, Sidewinder.*
ASM: *Standard* ARM, *Shrike*, AGM-88A *HARM* (anti-radiation); *Walleye, Harpoon*.
(On order: 24 F-14, 84 F-18 ftrs, 82 A-6E, 18 AV-8B attack, 6 E-2C AEW, 6 P-3C MR, 6 EA-6B ECM, 39 C-2A tpt, 30 T-34C trg, 8 KA-6D tanker conversion ac; 18 SH-2F, 11 C/MH-53 MCM, 48 SH-60B hel; 108 AIM-54C AAM, 160 *HARM*, 108 *Harpoon* ASM.)

DEPLOYMENT AND BASES (average strengths of major combat ships):
Atlantic (Second Fleet): 31 SSBN, 41 attack subs, 5 carriers, 76 surface combatants, 27 amph. Norfolk (HQ), Mayport, Roosevelt Roads (Puerto Rico), Charleston, Jacksonville, Brunswick, New London, Newport, Boston, New Orleans, Bangor, Kings Bay.
Eastern Pacific (Third Fleet): 2 SSBN, 30 SSN, 3 carriers, 1 BBG, 44 other major surface combatants, 31 amph. Pearl Harbor (HQ), San Francisco, Whidbey Island, San Diego, Long Beach, Adak (Alaska).
(See also *Forces Abroad*, below.)

RESERVES: 87,900.
Ships in commission with the Reserve incl 3 DD, 6 FF, 18 ocean minesweepers, 2 LST, 1 amph cargo ship (LKA).
2 carrier wings: 18 sqns (6 attack with 60 A-7B; 4 fighter with 48 F-4N; 2 recce with 18 RF-8G; 2 AEW with 8 E-2B; 2 ECM with EA-6A, EKA-3B; 2 tanker with KA-3).
2 MR wings: 13 sqns with 110 P-3A/B.
1 tac spt wing: 12 sqns (2 composite with TA-4J; 1 tac EW with EA-6A; 9 spt with C-9, C-118, C-130).
1 hel wing: 7 sqns (4 ASW with 23 SH-3D, 2 lt attack with 16 HH-1K, 1 SAR with HH-3).
Naval Construction Bde: 9 regts, 17 bns.
2,126 specialist and spt units; 62 boats/patrol craft.

Marine Corps: 194,600 (8,100 women).
3 divs, each of 9 inf, 1 recce, 1 tk, 1 engr, 1 amph bns, 1 arty regt.
227 M-60A1 MBT; 700 LVTP-7 APC; 175mm SP guns; 84 105mm (being replaced), 126 M-198/M-14 155mm towed, 100 155mm, 203mm SP how; 216 81mm mor; *TOW, Dragon* ATGW: *Redeye, Stinger* SAM.
3 Air Wings: (35,600); some 436 combat ac, 102 armed hel.
12 ftr sqns: 9 with 108 F-4N/S (being replaced); 3 with 36 F-18.
13 FGA sqns: 3 lt with 45 AV-8A/C *Harrier* V/STOL; 5 lt with 95 A-4M; 5 med with 50 A-6E.
1 recce sqn with 21 RF-4B.
1 ECM sqn with 15 EA-6B.
2 observation sqns with 36 OV-10A.
2 command sqns with 30 OA-4M/TA-4F.
3 tanker sqns with 36 KC-130F/R.
29 hel sqns: 3 attack with 72 AH-1J/T (*TOW*); 3 lt with 72 UH-1E/N; 13 med with 180 CH-46F; 8 hy with 96 CH-53A/D, 32 CH-53E.
Other hel incl 167 CH-53D/E, 30 AH-1T/J.
7 trg sqns.
2 SAM bns with *Improved HAWK*.
AAM: *Sparrow, Sidewinder.*
ASM: *Maverick*.
(On order: 329 LVTP-7, 289 LAV-25 *Piranha* APC, 180 Mk-19 40mm grenade launchers, *Stinger* SAM, 3 hovercraft (LCAC), 80 F/A-18, 336 AV-8B ftrs, 4 KC-130T tanker ac, 12 CH-53E hel.)

RESERVES: 42,000
1 Marine div: 3 inf, 1 arty regts: 21 combat and spt bns.
1 Fleet Service Spt Gp: 6 bns.
1 air wing: 4 aviation, 1 service, 1 air control gps: 9 ac sqns (2 fighter with 24 F-4N, 4 attack with 72 A-4E/F/M, 1 EW with 4 EA-6A, 1 observation with 18 OV-10A/E, 1 tpt/tanker with 7 KC-130F); 6 hel sqns (1 attack with 8 AH-1J, 2 lt with 20 UH-1N, 2 med with 24 CH-46, 1 hy with 16 CH-53A/D). 1 SAM bn with *HAWK*. 32 spt units.

DEPLOYMENT:
Continental United States: 2 Marine Amphibious Forces (MAF) (1 East, 1 West coast) each with 1 div, 1 air wing, 1 spt gp.
Hawaii: 1 bde (from Japan-based MAF).
(See also *Forces Abroad*, below.)

Air Force: 592,000 (63,900 women); some 3,700 combat ac.[5]
26 combat wings, comprising 82 sqns: 23 with 528 F-4 (12 to be replaced with F-16); 16 with 376 F-15; 15 with 360 F-16; 5 *Wild Weasel* (1 trg) with 84 F-4G; 11 with 252 F-111A/D/E/F, 5 EF-111A; 12 with 288 A-10A.
6 tac recce sqns with 126 RF-4C.
3 AWACS sqns with 29 E-3A/B *Sentry*.
11 tac air control sqns; 6 with 96 OV-10/O-2A; 1 with 7 EC-130E; 1 with 11 EC-135K ac; 3 with 27 CH-3 hel.
7 special operations sqns: 3 with 13 MC-130 ac; 2 with 20 AC-130A/H ac; 1 with 6 CH-3E; 1 with 8 HH-53H, 5 UH-1N; 1 det with 4 UH-1H hel.
4 aggressor trg sqns with 72 F-5E, T-38.
18 OCU: 1 with 20 F-111A; 1 with 13 F-16; 7 with 130 F-4; 1 with 20 F-5; 2 with 40 F-15; 2 with 40 F-106; 3 with 60 A-10; 1 with 16 RF-4C.
14 tac airlift sqns with 218 C-130.
17 hy (strategic) tpt sqns; 4 with 70 C-5A, 13 with 252 C-141B.
Other tpts: 13 C-135, 5 C-137, 10 C-140A/B.
10 SAR sqns (incl SAC msl spt): 20 HC-130 ac, 45 C/HH-3/-53, 76H/T/UH-1, 5 UH-60 hel.
3 medical tpt sqns with 19 C-9.
3 weather recce sqns with 13 WC-130, 5 WC-135B.
Trials units: 14 F-16, 4 C-141A.
30 trg sqns: 8 F-16B, 120 T-33A, 619 T-37B, 620 T-38, 112 T-39, 50 T-41A/C, 13 T-43A, 4 C-5A, 28 C-130, 16 C-141B, 5 HC-130, 2 UV-18A (DHC-6) ac; 8 UH-60A, 8 HH-53, 8 C/HH-3, 10 U/TH-1 hel.
AAM: *Sidewinder, Sparrow.*
ASM: *Maverick; Standard* ARM, *Shrike, HARM* (anti-radiation, trials); GBU-15 glide bomb.
(On order: 120 F-16, 39 F-15 ftrs, 5 F-5 FGA, 7 E-3C, 12 EF-111A, 50 C-5B, 8 C-130H, EC-130H ac; 243 UH-60A/D hel; 40 ALCM, *HARM*.)

DEPLOYMENT:
(i) *Continental United States:*
(a) *Tactical Air Command* (incl NORAD-assigned ac and Iceland): (110,000): 2 Air Forces; 9 air divs; 28 wings: 36 sqns (30 fighter, 3 tac recce (converting to fighter/recce), 3 tac air spt).
(b) *Alaskan Air Command:* (7,300): incl 1 ftr wing (1 sqn with F-15, 1 with T-33), 1 composite wing (1 sqn with A-10, 1 with O-2A), 1 control (warning) gp, 2 combat spt gps, 1 strategic recce wing; air base: 1 gp, 2 sqns.
(c) *Military Airlift Command* (MAC): (77,000): 3 Air Forces; 4 air divs, 1 gp; 14 wings; 11 tac, 17 strategic airlift. 3 special operations sqns (audio-visual, weather, SAR). Ac deployed as required, worldwide.
(d) Support element comds: (171,500). Comms, log, systems, trg, electronic security.
(ii) *Pacific Air Forces* (Hawaii): 1 Air Force HQ: 1 Air div: 2 F-4 sqns (8 AAM, in AD role); 1 Base wing.
(See also *Forces Abroad*, below.)

RESERVES: 165,400; 41 wing equivalents.
(i) Air National Guard (ANG): (99,500); 24 wings (12 tactical), 73 gps, 91 sqns; 1,080 combat ac.
10 interceptor sqns (NORAD-assigned, see p. 72); 34 fighter/FGA sqns (1 with F-16, 1 with 20 F-4D, 12 (1 OCU) with 160 F-4C, 1 *Wild Weasel* with 12 F-105G, 14 (1 OCU) with 375 A-7D/K (getting 24 F-16). 5 with 90 A-10); 7 recce sqns with 107 RF-4C; 5 tac air spt sqns (3 with 50 OA-37B, 2 with 75 O-2A); 19 tac tpt sqns with 176 C-130; 13 tanker sqns with 104 KC-135A/Q (NORAD-assigned); 1 electronic combat sqn with 8 EC-130; 2 SAR sqns with 8 HC-130 ac, 10 HH-3E hel. Trg incl 40 T-33, 6 T-43A ac.
(ii) Air Force Reserve: (65,900); 17 wings, 55 sqns: some 188 combat ac, 5 combat hel.

10 fighter sqns (1 with 35 F-105G, 5 with 55 F-4D; 4 with 88 A-10, more forming); 15 tac tpt sqns (14 (1 trg) with 103 C-130, 3 C-123K; 1 with 17 C-7A (converting to C-130)); 3 tanker sqns with 24 KC-135; 2 special operations sqns (1 with 10 AC-130 ac, 1 with 5 CH-3 hel); 1 weather recce sqn with 6 WC-130; 4 SAR sqns with 14 HC-130H/N ac, 8 HH-3E, 9 H/UH-1 hel.

19 Reserve Associate sqns (personnel only); 4 for C-5A, 13 for C-141, 1 for KC-10A, 1 aero medical for C-9A.

137 non-flying spt units.

(iii) Civil Reserve Air Fleet: 330 long-range commercial ac (numbers fluctuate): 215 passenger (Boeing 747, L-1011, DC-8/-10), 115 cargo (Boeing 707/747, DC-8/-10); 16 short-range commercial (Boeing 727, DC-9).

Forces Abroad (543,400):

General:

Europe 355,600; *Pacific/Far East* 147,500; *Caribbean/Latin America* 15,500; *other areas* 24,800.

Army:

Europe: 221,300.

(i) Germany: (208,800). 1 Army, 2 corps HQ; 2 armd, 2 mech divs; 1 armd, 1 mech, 1 cav bdes; 2 armd cav regts; 30 AD btys with *HAWK;* 5,000 MBT.[6]

(ii) West Berlin: (4,300). HQ elms and 1 inf bde.

(iii) Greece: (440).

(iv) Italy: (3,800).

(v) Netherlands: (800).

(vi) Turkey: (1,100).

(vii) Other: (2,060).

Pacific (see also *Deployment,* above) (47,714):

(i) South Korea: 27,633. 1 inf div (13,900).

(ii) Japan: 2,425; base and spt personnel.

Navy:

Atlantic (Second Fleet): (see also *Deployment and Bases,* above): Guantánamo Bay (Cuba), Bermuda, Keflavik (Iceland), Holy Loch (Britain).

Mediterranean (32,500). Sixth Fleet: 41 vessels, typically incl 1–2 SSN, 1–2 carriers and carrier gps of surface combatants, spt ships. Gaeta (HQ), Naples, Sigonella, La Maddalena (Italy), Rota (Spain).

Western Pacific (33,000). Seventh Fleet: 45 vessels, SSN and SS: 3–4 carriers and carrier gps of surface combatants, spt ships. Yokosuka (Japan, HQ), Subic Bay (Philippines), Agana, Apra Harbor (Guam), Midway.

Indian Ocean Dets (from 7th Fleet): 1 carrier battle gp (some 6 surface combatants), 9 stores ships, Middle East Force (Persian Gulf): 1 comd ship, 2 destroyers.

Marines:

Caribbean: Cuba (Guantánamo) 420; 1 reinforced coy.

Middle East: Lebanon (multi-national peacekeeping force) 1,800; 1 MAU.[7]

Pacific (Japan/Okinawa): 1 MAF (1 div (–), 1 air wing, 1 log spt gp), MAU, 1 bn landing team.[7]

Indian Ocean: (1,800); 1 MAU deployed intermittently.

Air Force:

Europe: US Air Force, Europe (USAFE): (57,942); some 750 combat ac. Non-USAFE: 24,481. Total 82,423.

(i) *Britain* (18,965): 1 Air Force HQ: 4 combat wings: 294 ac in 15 sqns (7 with 150 F-111E/F, 6 with 108 A-10; 1 recce wing with 2 sqns: 1 with 18 RF-4C, 2 TR-1, 1 combat trg with 18 F-5E); 1 tpt wing with 16 C-130 (MAC); 29 KC-135 (SAC), 4 EC-135H.

(ii) *Germany* (26,737): 1 Air Force HQ: 5 combat wings: 12 sqns (3 with 72 F-16, 4 with 96 F-4E, 1 with 24 F-4G, 1 with 18 RF-4C, 3 with 72 F-15C/D); 1 special operations sqn with 4 MC-130E, 1 air control wing of 3 sqns (2 with 46 OV-10A ac, 1 with 8 CH-53C hel), 1 (MAC) tpt wing of 4 sqns (1 with 18 C-130E).

(iii) *Netherlands* (1,501): 1 sqn with 24 F-15C/D.

(iv) *Iceland:* 1 AD sqn with 24 F-4E.

(v) *Spain* (4,000): 1 Air Force HQ: 1 tac wing of 3 sqns with 72 F-16, 1 trg wing (no ac assigned), units in Italy, Greece (2,400), and Turkey; 1 strategic recce unit (SAC).

(vi) Other areas: Greece (1,116), Italy (2,625), Turkey (2,478), others (520).

1 tac fighter wing with F-4E in US on call as reinforcements.

Pacific: Pacific Air Forces (PACAF): (29,800).

(i) *Guam* (3,400): Dets from SAC: 1 strategic bomb wing with 1 sqn of B-52; 1 air refuelling wing with KC-135.

(ii) *Japan* (15,500): 1 Air Force HQ: 1 div: 1 wing (3 sqns) with 72 F-15C/D, 18 RF-4C, T-39A ac, UH-1E/F hel; det with 3 E-3A AWACS.

(iii) *Korea* (9,900): 1 div: 2 wings: 6 sqns (2 with 36 F-4E, 2 with 48 F-16, 1 with 18 A-10, 1 with 18 OV-10, being replaced by OA-37).

(iv) *Philippines* (1,000): 1 Air Force HQ: 1 wing, 2 fighter sqns (1 with F-4E, 1 with F-4E/G); 1 special operations sqn with 4 MC-130E; 1 tac airlift wing with 32 C-130 (MAC); 1 trg gp with 15 F-5E, T-33, T-39A).

Middle East (all services): Sinai (MFO) 1,100; Egypt 400; Saudi Arabia 600.

RESERVES (individuals, all services): Standby 49,175; Retired 383,882, of which 120,000 are still eligible for active duty.

Para-Military Forces:

Coast Guard (by law a branch of the Armed Forces; in peacetime under the Department of Transportation): 38,791 (1,800 women); 45 cutters (17 high-endurance (2,600–3,000 tons), 28 med-endurance (1,000 tons)), 6 icebreakers, 76 patrol craft, 2 hovercraft, 28 tugs, 88 other vessels; some 2,250 small craft; 611 shore installations; 41 ac (18 HU-25A, 16 HC-130B/E/H, 4 HC-131A, 1 VC-4A, 1 VC-11A, 1 HU-16E); 109 hel (37 HH-3F, 72 HH-52A (to be replaced by HH-65A (AS-365G *Dauphin* 2)). (In reserve/storage: 5 C-130, 3 HU-16, 2 HU-25.)

Coast Guard Reserve: 11,800; selected 6,500 2nd ready reserves; 192 port security units in 40 ports, 34 general spt units, 60 reserve gps, 90 small vessels.

Coast Guard Auxiliary: 36,000 civilian volunteer force; augment regular force in emergencies.

Civil Air Patrol: 65,000 (25,000 cadets); HQ, 8 geographical regions, 52 wings, 1,790 units, 572 ac plus 8,890 private ac. Assist in SAR, disaster relief, and emergency services.

The Soviet Union

Strategic Forces

There have been no major shifts in the Soviet strategic inventory. The replacement of SS-11 ICBM by SS-19 continues at a modest rate. Modification 4 to the SS-18 ICBM appears to have been introduced, but no details are available. The SLBM changes also are minor: one more D-III SSBN, one less Y-I, and three fewer H-II with their SALT-accountable SS-N-5. The *Typhoon* class (called *Sierra* in some sources) has been test-firing its SS-N-20; it is still not entirely clear if that missile is in full operational service. A second *Typhoon* is reported to be nearly ready for sea trials. The SS-20 IRBM deployments have continued, and the total is now some 360 launchers, with a marked reduction in the numbers of SS-4. Some 16 SS-5 remain in service.

The changes in the missile strengths may be summarized as follows. The ICBM launcher total remains at 1,398, but the ICBM warhead total has increased by 100 to 5,654; total potential deliverable megatonnage is up by 46 to 4,351.6. At sea, the retirement of additional SS-N-5 has resulted in a net reduction of nine launchers to 980. However, the replacement of the SS-N-6 by the SS-N-18 gives a net increase in warheads of 71, to 2,688, and in megatonnage of 7, to a total of 760.8. These figures do not include the SS-N-20. The SS-20 modernization programme reduces the total number of IRBM launchers by 7, to 599, increases the number of warheads by 83, to some 1,320, but gives a megatonnage decrease of 31.75, to 401. The overall missile total (long- and intermediate-range) is therefore 2,977; warheads total 9,661, and megatonnage 5,512.4. It must be emphasized that warhead and megatonnage totals shown depend entirely upon the estimates as to the number of missiles modified to which warhead configuration and yield. In this regard the SS-11 and SS-19 ICBM have a variable-range capability which means that they can target Europe and its approaches. There are 880 of these weapons.

The strategic bomber force has been reduced by some 90 of its older Tu-16 *Badger* G, some of which may be converting to other roles. They have not so far been replaced, the Tu-22M *Backfire* increment being only a modest 20, while the new *Blackjack* A bomber has not yet entered service.

General-Purpose Forces

For some time there have been rumours of organizational changes within the Soviet forces. Details have been scanty and remain so. It would appear, however, that the forces have been grouped into three 'Theatres', Western, Southern, and Far Eastern, with a Central Reserve area comprising the Moscow, Volga, and Ural Military Districts. The Western Theatre is further subdivided into Theatres of Military Operations (TVD) which control continental, oceanic, and inter-continental specialty forces (missile forces, SSBN, and bombers). Obviously the Western Theatre continues to be the strongest, with the most modern equipment, but reports persist of reinforcements to the Far East and the Caucasus as well. Reports also suggest that there has been a doctrinal change which may involve the establishment in wartime of Operational Manoeuvre Groups. These may be all-arms mobile forces intended to exploit any weakness in NATO defences and to penetrate rear areas as deeply and as quickly as possible. By so doing, these would disrupt communications, block the movement of reinforcements, and thus force NATO to fight behind its

main lines where its strength and combat capabilities are weakest.

The Soviet Air Force has also been reorganized and now comprises 20 Regional Commands and five Air Armies. Three of these Armies have taken over from what used to be the Long Range Air Force and perform the strategic and strategic/tactical roles. The *Voyska-PVO* (National Air Defence Troops) has taken over some of the former Frontal Aviation interceptor inventory, as well as that of the Air Defence Forces of the former *PVO-Strany* and the Army air defence troops. The 10 air defence districts have now been reduced to five. No major re-organization is reported within the peacetime Military District, but the *Voyska-PVO* and the Air Armies will now be co-ordinated at the Theatre HQ. In wartime, air and ground forces and air defence will be integrated at the TVD level, which should give a flexibility and control which formerly have been difficult to achieve. This improvement in command and control should enhance the fighting capability of the Soviet forces.

There have also been minor organizational changes within the ground forces. Tank regiments now have an artillery battalion, adding integral gunfire support where none previously existed. The T-80 MBT is now in service in Eastern Europe. Artillery regiments at the Army level are being equipped with the 240mm SP mortar. The towed 122mm gun/howitzer is in many cases being replaced by an amphibious SP version. The new 240mm BM-27 MRL is coming into service. The divisional reconnaissance battalion is now a formidable and highly mobile force with a platoon of medium tanks and mix of light combat vehicles, many with light guns or anti-tank missiles. The engineers already have good bridging equipment and ferries but replacements are being introduced, together with new mine-clearance equipment. Logistics support is a mix of large trucks and tankers, fuel pipelines, and palletized packaging. Air support, in East Germany at least, includes a helicopter brigade integral to each Army, with a total of about 400 helicopters, about half of which are Mi-24 *Hind* gunships. Battlefield support is also provided by the older *FROG*, *Scud*, and *Scaleboard*, being replaced respectively by SS-21, SS-23, and SS-22. The SS-22 has a range somewhat less than that of the *Pershing* II (about 950 km), but its 500-KT warhead has about twice the yield of its US counterpart.

The Navy has shown little development in its submarine fleet, but modernization of the surface fleet continues. A second O-class submarine will begin trials in 1983, and there is still some doubt over the new role for the 9 Y-I-class SSN whose SLBM were withdrawn. A third *Kiev*-class carrier, *Novorossisk*, is now in service; a fourth, perhaps named *Kharkov*, may be completed next year. The latest SSM/ASW cruiser, reported still under its NATO name of *Black-Com* 1, and occasionally as the *Krasina*, is at sea carrying SSM, SA-N-6 SAM, and possibly SS-N-14 ASW missiles. There is a second *Sovremenny* GW destroyer, and the amphibious component has been reinforced with a second *Ivan Rogov* LPD and two *Ropucha* LST. The Soviet Navy is thus an increasingly powerful force. Nevertheless, the NATO forces are both more numerous and, in a few cases, newer than their Soviet counterparts.

New Equipment

There have been a number of reports of the appearance of what may be two new Soviet ICBM. One, reported as the PL-4 (allegedly a variant of the SS-17), was test-launched in October 1982, and the PL-5 (originally reported as modified SS-13 mobile ICBM), was launched in December 1982. (The PL designation stands for the test area, Plesetsk, where these missiles were first observed.)

The Soviet Union is reported to be testing new cruise missiles. An air-launched version is said to have a range of 3,000 km and to be capable of being launched from *Bear, Backfire,* and the new *Blackjack* A bombers. The second, a ground-launched weapon, has been identified as the SSC-X-4. It is said to be quadruple-mounted and mobile, and also to have a range of perhaps 3,000 km. Finally a sea-launched cruise missile, recorded as the SS-NX-21, is said to be under development. No new aircraft types are reported in service, although the MiG-29 *Fulcrum* and Su-27 *Flanker* are expected to appear in the near future; the Su-25 *Frogfoot* ground support aircraft is in production. Airborne command and control is being upgraded, and the Il-76 *Mainstay*, which is to replace the present *Moss*, is reported to be in production. A modest increase in the aircraft inventory is reported over 1982.

In a broader context, the Soviet Union's population is ageing, and the manpower available to serve in the armed forces is therefore declining. What is not so clearly apparent is the ethnic shift in that population. By the end of the 1990s about one-third of Russia's soldiers will be non-Russian-speaking, most of them Moslem from Southern Central Asia. This factor may pose considerable problems in terms of command and control of forces and in the ability required for operating complex equipment.

Defence Expenditure

No single figure for Soviet expenditure can be given, since precision is not possible on the basis of present knowledge. The declared Soviet defence budget is thought to exclude a number of elements such as military R&D, stockpiling, and civil defence—indeed some contend that it covers only the operating and military construction costs of the armed forces. The problem of arriving at a current budgetary figure was discussed in previous editions of *The Military Balance*. The official defence budget for 1982 of 17.05 bn roubles equals about 4.8% of the total government expenditure, or about 3.4% of the NMP, according to Soviet data of the latter. Some western estimates of the burden of military expenditures on the GNP range from 10–20%.

Soviet pricing practices are quite different from those in the West. Objectives are set in real terms with no urgent requirements for money prices to coincide with the real costs of goods and services. The rouble costs of the defence effort may thus not reflect the real cost of alternative production forgone; and, in turn, a rouble value of defence, expressed as a percentage of NMP measured in roubles, does not reflect the true burden.

If rouble costs are converted into dollars to facilitate international comparisons, the difficulties are compounded. Ideally, the exchange rate should relate the purchasing power of a rouble in the USSR to that of a

dollar in the USA. The official exchange rate—$1 = 0.6993 (1981), 0.7299 (1982)—is considered inadequate for this purpose, and there is no consensus on an alternative.

An alternative approach—estimating how much it would cost to produce and man the equivalent of the Soviet defence effort in the USA, and by so doing to establish a common price base on which to make total cost comparisons—is also not entirely satisfactory. Incomplete and inaccurate data make such indexes unreliable. In practice this particular method is considered to overstate the USSR defence effort relative to the USA.

That the USSR, like other countries, faces mounting economic problems (*e.g.*, falling NMP/GDP growth rates, inflation, and ever-increasing military establishment costs) is indicated in an article by Prof. Maj.-Gen. Gurov (*Krasnaya Zvezda*, 9 December 1982):

> Under present-day conditions, the interrelationship between military matters and the economy has become unusually close, and demands on material provision for troops and naval forces have increased sharply. First, there has been an unprecedented increase in the volume and a substantial alteration in the structure of the military consumption of material facilities and resources. Second, armies and navies are now equipped with the most complex systems of weapons and military hardware, which, furthermore, are virtually renewed every 10–12 years, which requires a highly developed and dynamic economy and advanced scientific and technical potential. Third, there has been an increase in manpower costs and the cost of means of armed struggle. Fourth, substantially greater demands have been made on the moral-political qualities and general educational, technical, and professional training both of workers engaged in the military production sphere and of Armed Forces' personnel.

A sample of different estimates of Soviet defence expenditure, both in roubles and dollars, is given in the table, together with official figures for the defence budget published by the USSR. For a critique of the CIA estimates of Soviet defence expenditure, see Franklyn D. Holzmann, 'Soviet Military Spending: Assessing the Numbers Game', *International Security*, Spring 1982, pp. 78–101. For a critique of Steven Rosefielde, see D. F. Burton, 'Estimating Soviet Defense Spending', *Problems of Communism*, March–April 1983, pp. 85–93.

Soviet Defence Expenditure

Source	Price base	1970	1979	1980	1981	1982	% Annual growth rate 1970–80
Billions of Roubles							
USSR[a]	Current	17.90	17.20	17.10	17.054	17.05	–0.4%
CIA[b]	1970	44–53	59–75	62.79	70.75	—	3.7%
Britain[c]	Current	—	76–81	61–89	84–92	—	4.0%
Rosefielde[d]	1970	43.5	91	—	—	—	8.5%
Billions of Dollars							
USSR[e]	Current	—	—	—	—	23	—
Joint Chiefs of Staff[f]	1983	188	241	250	267	—	2.8%
Rosefielde[g]	1978	104.5	160.9	—	—	—	4.9%

[a] Official declared budget.
[b] For 1970–1980: Joint Economic Committee, Congress of the USA: *USSR: Measures of Economic Growth and Development, 1950–1980* (Washington DC: USGPO, 1982) p. 123; for 1981: Joint Economic Committee, *Allocation of Resources in the Soviet Union and China – 1982* (Washington DC: USGPO, 1983) p. 79.
[c] *Statement of Defence Estimates 1983* (London: HMSO, Cmnd. 8951–I).
[d] Steven Rosefielde: *False Science, Under-estimating the Soviet Arms Build-up* (New Brunswick NJ: Transnational Books, 1982) pp. 186–8.
[e] British Broadcasting Corporation, *Summary of World Broadcasts* (SU/7156/A1/4), 14 Oct. 1982.
[f] Organization of the Joint Chiefs of Staff, *Military Posture for FY 1983* (Washington DC: USGPO, 1982) p. 16 (figures taken from diagram).
[g] Rosefielde, *op. cit.*, pp. 184–5, note 3.

THE SOVIET UNION

Population: 271,800,000.
Military service: Army and Air Force 2 years, Navy and Border Guards 2–3 years.
Total armed forces: 5,050,000.[8]
Est NMP: r482.1 bn (1981), r501.0 bn (1982).
Est GNP range 1982: $1,350.0–1,600.0 bn.
NMP growth: 3.3% (1981), 2.6% (1982).
Inflation: 0.9% (1981).
Est def exp and exchange rate—see text above.

Strategic Nuclear Forces:

OFFENSIVE:

(a) *Navy:* 980 SLBM in 80 subs (941 SLBM and 62 subs within SALT Agreement, plus 39 SLBM and 18 subs outside it).
1 *Typhoon*-class SSBN: 20 SS-NX-20 (1 more to start trials in 1983) (20 msls).
14 D-III SSBN: each 16 SS-N-18 (224 msls).
4 D-II SSBN: each 16 SS-N-8 (64 msls).
18 D-I SSBN: each 12 SS-N-8 (216 msls).
1 Y-II SSBN: 12 SS-N-17 (12 msls).
24 Y-I SSBN: 16 SS-N-6 (384 msls).
1 H-III SSBN: 6 SS-N-8 (6 msls) } (msls (21)
3 H-II SSBN, each 3 SS-N-5 *Serb* (9 msls) } but not subs within
1 G-III SSB: 6 SS-N-8 (6 msls) } SALT)
13 G-II SSB: each 3 SS-N-5: (39 missiles; non-SALT).

(b) *Strategic Rocket Forces* (SRF): 325,000.[9] 6 operational rocket armies, org in divs, regts, bns, and btys; 1 msl launcher per bty; 300 launch control HQ, 3 msl test centres.
ICBM: 1,398.[10]
550 S-11 *Sego* (at 9 fields, some in SS-19 silos; may be modified to SS-19).[11]
60 SS-13 *Savage* (at 1 field).
150 SS-17 (at 2 fields; mod 1, 4 MIRV; mod 3 being deployed; in mod SS-11 silos).
308 SS-18 (at 6 fields, upgrading to mod 4 has begun).
330 SS-19 (at 4 fields; mostly mod 3, 6 MIRV; replacing some SS-11).
IRBM and MRBM: some 599 deployed (perhaps 400 in

Three Soviet carriers in the class of the 40,000-ton* Kiev, *shown here, are now at sea. Another is being built.

Western USSR, rest in central and eastern USSR).
16 SS-5 *Skean* IRBM.
360 SS-20 mobile IRBM; (5 fields; 108 Far East, 90 in Central Asia, 162 West of Urals).[12]
223 SS-4 *Sandal* MRBM (being retired).
Reserves: 520,000.

(c) *Aviation Armies of the Soviet Union:* 100,000. Some 722 combat ac: some 500 to 550 in Western USSR.
5 Armies.
Long-range bombers: 143.
100 Tu-95 *Bear* A/B/C, 43 Mya-4 *Bison* (some 70 *Bear* B/C have AS-3 or AS-4 ASM).
Medium-range bombers: 455.[13]
220 Tu-16 *Badger* G, 125 Tu-22 *Blinder* A/B, 110 Tu-22M *Backfire* B (AS-4 ASM).
Some 180 short-range (tactical) FGA, interceptors, and recce may also have been assigned to these new Army commands.
Recce: 34
4 Tu-95 *Bear* E, 15 Tu-16 *Badger* D/E/F/K, 15 Tu-22 *Blinder* C. (A long-range high altitude ac, 'Ram-M', reported under development.)
ECM: 90 Tu-16 *Badger* H/J.
Tankers: 30 Mya-4 *Bison* A, 18 Tu-16 *Badger*.
ASM: AS-3 *Kangaroo*, AS-4 *Kitchen*, AS-5 *Kelt*, AS-6 *Kingfish*.

DEFENSIVE:

National Air Defence Troops (*Voyska-PVO)* (incl Air Defence Troops of the Ground Forces): 500,000 (not incl ground forces' SAM and radar tps).[9] 5 Air Defence, 16 Military Districts, numerous AD regiments; 14 specialist schools.

ABM: 32 ABM-1B *Galosh;* range over 320 km, warheads nuclear, presumably MT range. 8 sites in 4 complexes around Moscow. New ABM being emplaced.

Aircraft: some 1,250; in regts and sqns.[14]
Interceptors: some 400 MiG-23 *Flogger* B/G (6 AAM), 240 MiG-25 *Foxbat* A/E (A being uprated to E) (4 AAM), 30 MiG-25M *Foxhound* A (8 AAM), 250 Su-15 *Flagon* E/F (3 AAM), 120 Tu-28P *Fiddler* B (4 AAM), 200 Yak-28P *Firebar* (2 AAM).
Airborne Warning and Control Aircraft: 10 modified Tu-126 *Moss;* Il-76 *Mainstay* now in production to replace *Moss*.
Trg ac incl 40 Su-11, 120 Su-15, 20 MiG-15, 60 MiG-17, 50 MiG-23, 50 MiG-25, 10 Yak-28.

AAM: AA-2 *Atoll*, AA-3 *Anab*, AA-5 *Ash*, AA-6 *Acrid*, AA-7 *Apex*, AA-8 *Aphid*, AA-9.

AA artillery: 9,000 23mm, 57mm, 85mm, 100mm, 130mm towed, ZSU-23-4, ZSU-30-6 (trials), and ZSU-57-2 SP guns.

SAM: About 10,000 launchers in some 1,400 fixed sites; some 13,000 launcher rails: SA-1 *Guild* (being replaced by SA-10); SA-2 *Guideline* (over 400 sites); SA-3 *Goa* (over 300 sites, low-altitude msl, multiple launcher rails); SA-5 *Gammon* (over 100 complexes, long-range intercept). Field: mobile systems: SA-4 *Ganef*, SA-6 *Gainful*, SA-7 *Grail* (manportable), SA-8 *Gecko*, SA-9 *Gaskin*, SA-11, SA-12, SA-13 (replacing SA-9).

Warning Systems: Some 7,000, incl satellites and EW and ground control intercept radars.
(i) *Satellites:* 9 with highly elliptical semisynchronous orbits (anti-ICBM/SLBM launch detection capability); 9 EW, 6 ELINT, 2–4 recce.
(ii) *Over-The-Horizon (Backscatter) radars:* 3: 2, near Minsk and Nikolayev (Caucasus), targeted on the US and polar areas; 1, near Nikolayev-na-Amur, on China.
(iii) *Long-range early-warning radars:*
(*a*) ABM-associated: mostly *Hen*-series (*e.g., Hen House*), range 6,000 km, covering approaches from the west and south-west, north-east and south-east and, partially, south. Linked to intermediate-range *Dog House* (range 2,800 km) and *Cat House* and *Try Add* missile control radar. (Large phased-array 10-site system, range 2,000 km, being built to supplement.)
(*b*) AD-associated: *Nysa C; Tall King*, range 600 km (SA-5); P-10 *Knife Rest*, 350 km (SA-2); P-12 *Spoon Rest*, 275 km (SA-2).
(iv) *Search, surveillance/target-acquisition radars:*
Long Track (SA-4, SA-6); P-15 *Flat Face*, 200 km (SA-3, SA-6); P-50 *Bar Lock*, 320 km (SA-5); *Clam Shell* (SA-11); *Gage* (SA-1); *Squint Eye* (SA-3); *Squat Eye*, 200 km (SA-3); *Land Roll* (SA-8).
(v) *Height finder radars:*
Thin Skin (SA-4, SA-6); *Cake*-series (*e.g., Rock Cake*), 200 km; *Side Net*, 180 km (SA-2, SA-3, SA-5); *Back Net* (SA-5).
(vi) *Missile control radars:*
Pat Hand (SA-4); *Straight Flush* (SA-6); *Square Pair* (SA-5); *Fan Song* (SA-2); *Low Blow* (SA-3); *Flap Lid* (SA-11); *Yo Yo* (SA-1); *Try Add (Galosh).*
(vii) *AA artillery fire control radars:*
Gun Dish (ZSU 23mm); *Fire Can* (57mm, 85mm); *Flap Wheel* (57mm, 130mm).
Plus civilian air control equipment.

Civil Defence: (150,000; 16,000,000 on mobilization) nationwide programme under Defence Ministry down to city/rural/industrial level includes some 75 comd posts within 120 km of Moscow, and shelter accommodation for at least 110,000 officials.

Army: 1,800,000 (perhaps 1,400,000 conscripts).
Five Theater HQ.
50 tk divs.
134 motor rifle divs.
7 AB divs (each 3 para, 1 arty regts, 1 AA bn).
Some 8 air assault bdes (each 3 rifle bns, spt tps).
Front and Army tps:
15 arty divs.
Indep Operational Manoeuvre Gps, tk regts, arty, SSM, ATK, engr bdes, CW regts, bns, spt services.

Tanks: Some 50,000: some 35,000 T-54/-55/-62; some 7,500 T-64, 7,500 -72/-80 MBT (most fitted for deep fording); PT-76 lt.

AFV: 62,000: BRDM scout cars; BMP and BMD MICV; BTR-50/-60/-70/-152 (-50/-60 being replaced by -70 and BMP-2), MT-LB APC.

Artillery: Some 24,000 122mm, 130mm, 152mm towed, 122mm and 152mm SP guns/how; 13,000 82mm, 120mm, 160mm, and 240mm (incl 240mm SP) mor; 6,000 122mm, 140mm, and 240mm (incl BM-27) MRL.

ATK: 40mm RPG-7, 64mm RPG-15, 73mm RPG-16 RL; 73mm SPG-9 RCL; 8,000 76mm, 85mm, 100mm towed and ASU-75/-85 SP ATK guns; AT-2 *Swatter*, AT-3 *Sagger*, AT-4 *Spigot*, AT-5 *Spandrel*, AT-6 *Spiral* ATGW.

SSM (nuclear-capable): about 1,500 launchers (units organic to formations), incl some 620 *FROG* (440 facing NATO area, some 180 in Far East), some 62 SS-21 (replacing *FROG*), 570 *Scud* A/B (470 NATO area, 100 Far East), perhaps 10 SS-23 (replacing *Scud*), 120 SS-12 (70 NATO area, 50 Far East; being replaced by SS-22 (100)).

Air: Mi-6 *Hook*, Mi-8 *Hip*, Mi-24 *Hind* armed and utility (being org as indep of Tactical Air); Mi-26 *Halo* tpt hel.

DEPLOYMENT:

Western Theatre:
Central and Eastern Europe (565,000): 30 divs (16 tk, 14 motor rifle) plus 1 arty, 10,500 MBT.[15] East Germany (380,000): 1 gp, 5 Army HQ; 10 tk, 9 motor rifle, plus 1 arty. Poland (40,000): 1 gp, 1 Army HQ; 2 tk. Hungary (65,000): 1 gp, 1 Army HQ; 2 tk, 2 motor rifle. Czechoslovakia (80,000): 1 gp, 2 Army HQ; 2 tk, 3 motor rifle.
European USSR Military Districts (MD): 65 divs (23 tk, 37 motor rifle, 5 AB), plus 8 arty. Baltic: 3 tk, 6 motor rifle, 2 AB, plus 2 arty. Belorussian: 10 tk, 2 motor rifle, 1 AB, plus 1 arty. Carpathian: 4 tk, 8 motor rifle, plus 2 arty. Kiev: 6 tk, 4 motor rifle, plus 1 arty. Leningrad: 8 motor rifle, 1 AB, plus 1 arty. Odessa: 7 motor rifle, 1 AB, plus 1 arty.
Central Strategic Reserve: 16 divs (3 tk, 12 motor rifle, 1 AB). Moscow: 2 tk, 5 motor rifle, 1 AB. Ural: 1 tk, 4 motor rifle. Volga: 3 motor rifle.
Southern Theatre: 28 divs (1 tk, 26 motor rifle, 1 AB) plus 2 arty. N. Caucasus: 1 tk, 7 motor rifle, plus 1 arty. Trans-Caucasus: 11 motor rifle, plus 1 arty. Turkestan: 5 motor rifle. Afghanistan: 3 motor rifle, 1 AB divs (see *Forces Abroad*, below).
Far Eastern Theatre: 52 divs (7 tk, 45 motor rifle), plus 4 arty. Central Asian: 1 tk, 6 motor rifle, plus 1 arty. Under High Command Far East (HQ Irkutsk): Siberian, 6 motor rifle, plus 1 arty; Transbaykal, 2 tk, 8 motor rifle, plus 1 arty; Far Eastern, 2 tk, 22 motor rifle, plus 1 arty; Mongolia, 2 tk, 3 motor rifle (see *Forces Abroad* below).

Soviet divs have three degrees of combat readiness: Category 1, 75–100% strength, with complete eqpt;

Category 2, 50–75% strength, complete with fighting vehicles; Category 3, below 50% strength, fighting vehicles possibly complete, but older models. This system may now be changing, with some units in a formation being at full strength, others at cadre only.

The 30 divs and 1 arty div in Eastern Europe and AB divs are Category 1. About 35% of the divs in European USSR and the Far East are in Category 1 or 2. Most of those in Central and Southern USSR are likely to be Category 3. Tk divs in Eastern Europe have up to 335 MBT, motor rifle divs up to 266, but elsewhere holdings may be lower.

Navy: 460,000 (some 75% conscripts), incl Naval Air Force, Naval Infantry, and Coastal Artillery and Rocket Troops; 276 cruise-missile and attack subs (119 nuclear (incl 9 mod Y-I), 157 diesel), 290 principal surface combatants. A further 95 attack subs and 25 principal surface combatants are in reserve.

Submarines, cruise-missile: 69:
- 49 nuclear (SSGN): 1 O-class (24 SS-N-19) (1 more to start trials in 1983); 1 P-class (10 msls; ?SS-N-9); 12 C-I, 6 C-II (8 SS-N-7 *Siren* each, some C-II may have SS-N-9); 29 E-II with 8 SS-N-3a each (some 5 may carry 8 SS-N-12).
- 20 diesel (SSG): 16 J-class (4 SS-N-3a each), 2 *W-Long Bin* (4 SS-N-3 each); 2 *W-Twin Cylinder* (2 SS-N-3 each) trg vessels.

Submarines, attack: 198+: (207 if *all* mod Y-I were SSN):
- 61+ nuclear (SSN); 6 A-, 12 N-, 16 V-I, 7 V-II, 15 V-III, 5 E-I-class. (9 Y-I SSBN have been converted to other roles, incl SSN.)
- 137 diesel (SS): 2 K-, 17 T-, 53 F-, 10 R-, 5 Z-, 50 W-class. (More modern A-, V- SSN, T-class SS may carry some SS-N-16 and/or SS-N-15 ASW msls.)

Subs, other roles: 3 G-I (comms conversion), 4 B-trg, 1 I-class rescue.

Surface Ships:

288 principal surface combatants:
- 3 *Kiev* carriers (37,000 tons) (1 more completing) with 4 × 2 SS-N-12 *Sandbox* SSM, 2 × 2 SA-N-3/-4 SAM, 1 × 2 SUW-N-1 ASW, 14 Yak-36 *Forger* A/B VTOL ac, 16 Ka-25 *Hormone* A/B hel.
- 2 *Moskva* ASW hel carriers with 2 × 2 SA-N-3 SAM, 1 × 2 SUW-N-1 ASW; 18 Ka-25 hel.
- 1 *Kirov* nuclear-powered GW cruiser (CGN) (1 more fitting out) with 20 SS-N-19 SSM, 12 SA-N-6, 1 × 2 SA-N-4 SAM, 2 × 2 SS-N-14 *Silex* ASW, 2–4 Ka-25 hel.
- 1 GW SSM and ASW *'Black-Com 1'* cruiser with 16 SSM (?SS-N-12) and 6–8 SA-N-6 SAM, 4 ASW (?SS-N-14).
- 17 GW ASW cruisers with 1 Ka-25 hel: 7 *Kara* with 2 × 4 SS-N-14 ASW, 2 × 2 SA-N-3, 2 × 2 SA-N-4 SAM; 10 *Kresta*-II with 2 × 4 SS-N-14, 2 × 2 SA-N-3.
- 8 GW cruisers: 4 *Kresta*-I with 2 × 2 SS-N-3b SSM, 2 × 2 SA-N-1 SAM, 1 Ka-25 hel; 4 *Kynda* with 2 × 4 SS-N-3b, 1 × 2 SA-N-1.
- 8 *Sverdlov* cruisers (2 with 1 × 2 SA-N-4, 1 hel).
- 40 GW destroyers (DDG): 8 SSM/SAM (2 *Sovremenny* with 2 × 4 SS-NX-22 SSM, 2 SA-NX-7 SAM; 6 mod *Kashin* with 4 SS-N-2C, 2 × 2 SA-N-1); 2 ASW/SAM *Udaloy* with 2 × 4 SS-N-14, 2 Ka-32 *Helix* hel; 1 SSM *Kildin* with 4 SS-N-1; 29 SAM (12 *Kashin* with 4 × 2 SA-N-1, 1 (trials) with SA-N-7; 8 *Kanin* with 2 × 2 SA-N-1; 8 SAM *Kotlin* with 2 × 2 SA-N-1).
- 25 gun destroyers (DD): 12 *Kotlin*, 10 *Skory*, 3 mod *Kildin*.
- 32 *Krivak*-I/-II GW frigates (FFG): with 1 × 4 SS-N-14, 2 × 2 SA-N-4.
- 151 gun frigates (FF): 1 *Koni*, 47 *Grisha*-I/-III (also with 2 × 2 SA-N-4 SAM), 7 *Grisha*-II (KGB), 18 *Mirka* I/II, 44 *Petya*, 34 *Riga*.

819 minor surface combatants:
- 26 GW corvettes: 1 *Tarantul* II with 2 × 2 SS-NX-22; 3 *Tarantul* I with 2 × 2 SS-N-2c; 22 *Nanuchka* I/III with 2 × 3 SS-N-9, 1 × 2 SA-N-4.
- 131 FAC(M): 16 hydrofoil (1 *Sarancha* with 2 × 2 SS-N-9, 1 × 2 SA-N-4; 15 *Matka* with 2 SS-N-2c); 70 *Osa*-I, 45 *Osa*-II with 4 SS-N-2.[16]
- 212 FAC(T): 8 *Pauk* with 1 × 4 SA-N-5, 60 *Poti*, 20 *Shershen*, 32 *Turya* hydrofoils. 90 *Stenka* (KGB). Trials: 1 *Slepen*, 1 *Babochka*.
- 78 patrol craft: 8 *Susanin* icebreakers (KGB; 6 armed), 30 SO-1 (some KGB), 14 T-43 (some KGB), 18 T-58 (some KGB), 2 T-58, 6 T-43/PFR radar pickets.
- 3 *Alesha* minelayers.
- 120 ocean minesweepers: 35 *Natya* I/II, 45 *Yurka*, 40 T-43.
- 175 coastal minesweepers: 2 *Andryusha*, 45 *Sonya*, 3 *Zhenya*, 8 *Sasha*, 72 *Vanya*, 45 *Evgenya*(.
- 74 minesweeping boats(: 10 *Ilyusha*, 4 *Olya*, 20 TR-40, 40 K-8.

82 amph ships:
- 2 *Ivan Rogov* LPD with 1 × 2 SA-N-4, 3 Ka-25 hel; 14 *Alligator*, 16 *Ropucha* LST; 50 *Polnocny*.[16]

105 amph craft:
- 45 LCU: 20 *Vydra*, 15 SMB-1, 10 *Ondatra*.
- 60 hovercraft: 13 *Aist*, 2 *Utenok*, 15 *Lebed*(, *30 Gus*(.

220 principal auxiliary ships:
- 28 replenishment ships, 30 spt tankers, 14 msl spt, 10 supply, and 83 cargo ships. 20 submarine tenders, 35 repair ships. Merchant fleet, 2,300 ships incl 55 ramp-fitted roll-on/off (RO/RO), could augment these.
- 60 intelligence collection vessels (AGI). 120 naval, 340 civilian oceanographic, space-associated, and hydrographic research vessels.
- *Additional ships in reserve:*
  - 10 F-, 5 Z-, 80 W-class subs; 2 *Sverdlov* cruisers (1 with 1 × 2 SA-N-2 SAM); 3 *Kotlin*, 10 *Skory* destroyers; 10 *Riga* frigates; 20 T-43 minesweepers; 1 G-V SSB in SLBM research role.
- (On order: *Typhoon*, D-III SSBN; O-class SSGN; A-, V-III-class SSN; K-, T-class SS; 1 nuclear, 1 *Kiev* carriers; 3 *Kirov* CGN; 2 *'Black-Com 1'* CG; 5 *Sovremenny*, 5 *Udaloy* DDG; *Krivak*, *Grisha* III frigates; *Tarantul*, *Nanuchka* GW corvettes; *Matka* hydrofoil FAC(M); *Pauk* FAC; *Ropucha* LST; *Aist*, *Utenok* hovercraft.)

NAVAL AIR FORCE: (68,000); some 775 combat ac, some 300 combat hel.

Four Fleet Air Forces; org in air divs, each with 2–3 regts of HQ elements and 2 sqns; recce, ASW, transport org in indep regts or sqns.

Strike bbrs: 100 Tu-22M *Backfire* B with AS-4 ASM.

Med bbrs: some 260: 220 Tu-16 *Badger* C/G with AS-5/-6 ASM, some 40 Tu-22 *Blinder* D.

FGA: 75: 40 Yak-36 *Forger* A/B VTOL, 35 Su-17 *Fitter* C/D.

ASW: 190 ac: some 50 Tu-142 *Bear* F, 50 Il-38 *May*, 90 Be-12 *Mail*. Some 240 hel: 90 Mi-14 *Haze*, 150 Ka-25 *Hormone* A, Ka-32 *Helix*.

MR/ECM: 150 ac: some 90 Tu-16 *Badger* D/E/F/H/J/K, 45 Tu-95 *Bear* D, 5 Tu-22 *Blinder* C, 10 An-12 *Cub* B ac; Ka-25 *Hormone* B, some Ka-32 *Helix* B hel.

MCM: 10 Mi-14 *Haze* B (mod Mi-8) and Mi-8 *Hip* C hel.

Tankers: 75 Tu-16 *Badger*.

Tpt/trg ac: 330 ac and hel, incl An-12 *Cub* A, An-26 *Curl*, Il-14 *Crate*, Il-18 *Coot*, An-24 *Coke* ac; Mi-6/-8 *Hook*/*Hip*, Ka-25 *Hormone* hel.

ASM: AS-4 *Kitchen*, AS-5 *Kelt*, AS-6 *Kingfish*, AS-7 *Kerry*. (*SSM:* SS-NX-21 SLCM under development.)

NAVAL INFANTRY (Marines): (14,500).

5 naval inf bdes/regts (each 3 inf, 1 tk bn), one each with Northern Baltic (Baltiysk) and Black Sea (Sevastopol) Fleets; 1 Marine div (of two regts) with Pacific Fleet (Vladivostok).

50 T-54/-55 MBT; PT-76 lt tks; BRDM-2 scout cars; BTR-60P/PA/PB APC; M-1974 122mm SP how; 82mm, 120mm mor; BM-21 122mm MRL; T-12 100mm ATK guns; AT-3/-5 ATGW; ZSU-23-4 SP AA guns; SA-7, SA-9 SAM.

COASTAL ARTILLERY AND ROCKET TROOPS: (10,000)

Hy coastal guns, perhaps 100 SS-C-1b *Sepal* SSM (similar to SS-N-3) to protect approaches to naval bases and major ports.

DEPLOYMENT AND BASES: (average strengths, excluding units in reserve):

Northern Fleet: 46 SSBN, 135 other subs, 76 principal, 120 minor surface combatants, 12 amph, 80 principal auxiliary/spt ships, 75 bombers. Severomorsk (HQ), Motovskij Gulf, Gremikha, Polyarny, Archangelsk. Some 10 subs serve in the Mediterranean.

Baltic Fleet: 30 subs (incl 6 G-II SSB), 40 principal, 285 minor surface combatants, 25 amph, 20 principal auxiliary spt ships, 95 bombers, 6 SSM bns. Baltiysk (HQ), Kronshtadt, Paldiski, Liepaja, Klaipeda, Riga.

Black Sea Fleet (incl Caspian Flotilla; Mediterranean sqn with some 12 surface combatants, 2 amph, 22 auxiliaries): 25 subs, 83 principal (incl 2 carriers, 2 ASW hel carriers), 189 minor surface combatants, 25 amph, 40 principal auxiliary spt ships, 70 bombers. Sevastopol (HQ), Poti, Odessa.

Pacific Fleet: 28 SSBN, 92 other subs, 89 principal (incl 1 carrier), 225 minor combatants, 20 amph, 80 major auxiliary spt ships, 330 combat ac (incl 120 bombers). Vladivostok (HQ), Petropavlovsk, Sovyetskaya Gavan. Detachments from this fleet (average 2–3 subs, 8 surface combatants, 2 amph, 12 spt ships) serve in the Indian Ocean; facilities also in Vietnam (Da Nang and Cam Ranh Bay), South Yemen (Aden, Socotra), and Ethiopia (Dahlak Is).

Air Force: 365,000.[17]

Tactical: (315,000); some 5,950 combat ac, some 2,300 combat hel.
- 20 Air commands of varying strengths, mostly org in divs of 3 sqns, totalling 45 ac; the regts' roles may differ within the div. A re-org to bring the Air more closely under control within the Operational Theatres is taking place. Some of these ac may be assigned to the 5 Air Armies for strategic tasks (see p. 77).
- *FGA:* some 2,425: some 100 MiG-21 *Fishbed*, 650 MiG-27 *Flogger* D/J, 150 Su-7 *Fitter* A, 650 Su-17 *Fitter* D/H, 800 Su-24 *Fencer* A/C, 75 Su-25 *Frogfoot*.
- *Fighters:* some 2,850: 500 Su-15 *Flagon* E/F, 500 MiG-21 *Fishbed* D to N (not H, M), 1,750 MiG-23 *Flogger* B/G (6 AAM), 60 MiG-25 B/D/M *Foxhound*; some MiG-29 *Fulcrum*, Su-27 *Flanker* (under development).
- *Recce:* 640: 150 MiG-25 *Foxbat* B/D, 130 MiG-21 *Fishbed* H, 200 Yak-28 *Brewer* D, 160 Su-17 *Fitter* H.
- *ECM:* 40 Yak-28 *Brewer* E.
- *Hel:* 3,450: 1 regt per ground army in GSFG, Sino-Soviet border: 700 Mi-1/-2 *Hare*/*Hoplite*, 50 Mi-4 *Hound* A, 400 Mi-6 *Hook*, 1,500 Mi-8 *Hip* C (armed tpt) and E (gunship), 800 Mi-24 *Hind* A/B/C/D/E/F (armed); Mi-26 *Halo* A (hy); Mi-29 *Hoop* ATK reported.
- *Trainers:* Some 1,000 ac; 700 hel.
- *AAM:* AA-2 *Atoll*, AA-7 *Apex*, AA-8 *Aphid*, AA-9.
- *ASM:* AS-7 *Kerry*, AS-10; hel-borne: AT-2 *Swatter*, AT-6 *Spiral*.

Military Transport Aviation (VTA): (50,000); some 600 ac. Org in regts. Incl some 375 An-12 *Cub* med, 175 Il-76 *Candid* (replacing *Cub*), 55 An-22 *Cock* hy. Some 200 *Cub* and *Candid* and 1,200 med- and long-range passenger ac of the civil *Aeroflot* fleet could augment military ac.

DEPLOYMENT:

1 HQ, 4 Tactical forces (2,000 ac) in Eastern Europe, 1 in all 16 MD in USSR.

RESERVES: (all services):

Soviet conscripts have a Reserve obligation to 50. Total Reserves could be 25,000,000, of which some 5,000,000 have served in last five years.

Forces Abroad:

Afghanistan: 105,000 (some 10,000 MVD, KGB).
- Army: 3 motor rifle, 1 AB divs, 1 air assault bde. Air: possibly 1 air div: 1 air, 1 hel regts, tpt ac.

Mongolia: 75,000: 2 tank, 2 motor rifle divisions.

Algeria, 1,000; Angola, 200; Cuba, 4,600 (1 bde, advisers, technicians, plus civilians); Ethiopia, 2,400; Iraq, 2,000; Kampuchea, 800; Laos, 500; Libya, 1,800; Mali, 200; Mozambique, 300; Syria, 7,000; Vietnam, 7,000; N. Yemen, 500; S. Yemen, 1,500; Africa (rest), 900.

Para-Military Forces: 450,000.

KGB 190,000: border tps, with tks, SP guns, AFV, ac, and ships (1 *Purga* frigate, 90 *Stenka* FAC(P), 12 *Pchela* hydrofoils, 30 *Zhuk*, some SO-1, T-58, T-43 patrol craft); Kremlin Guard; Special Guard; sigs unit.

MVD security tps 260,000, with tks and AFV. By law part of armed forces of USSR.

Part-time military training organization (DOSAAF); flight training, shooting, parachuting, and pre-military training of those aged 15 and over in schools, colleges, and workers' centres. Claimed active membership 80 million (of which 5 million are instructors and activists).

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[1]Revised outlay requested in President's last budget proposal: Total Obligational Authority for FY 1983 was $240.5 bn, and Budget Authority $239.4 bn.

[2] Manpower included in Army, Navy, and Air Force totals.

[3]One National Guard bde is incorporated in each of 2 mech and 2 inf divs.

[4]1 armd, 1 mech divs, 1 armd cav regt have hy eqpt stockpiled in FRG. Storage facilities for 2 more divs being built.

[5]Excluding ac in SAC and NORAD; incl ac in ANG and Air Force Reserve, and some 900 in active storage.

[6]Includes those stockpiled for the Strategic Reserve formations. The armd and mech bdes are from the divs in the US earmarked to reinforce 7th Army.

[7]Marine Amphibious Units (MAU) are embarked in Amphibious Ready Gps (ARG) comprising 4–7 amph ships with a reinforced inf bn gp, incl tks, arty, composite air sqn (incl hel), and log gp. Only 1 in Mediterranean and 1 in Pacific are regularly constituted. 1 Bn Landing Team (MAU less hel) also deployed in Pacific; 1 occasionally formed for the Atlantic.

[8]Excludes some 400,000 Border Guard, internal security, railroad, and construction troops, but includes some 1,500,000 command and general support troops not otherwise listed.

[9]The SRF and *Voyska-PVO*, separate services, have their own manpower.

[10]Figures may fluctuate slightly during conversion.

[11]There are 360 SS-19 silos. SS-11, SS-19 have variable range capability, enabling them to be used for theatre support.

[12]Usually in some 39 complexes with an average of 9 launchers. A reload capacity has been reported.

[13]There are also staging and dispersal points in the Arctic which could significantly increase aircraft ranges.

[14]Due to the recent reorganization, some 1,000 ac may have been reassigned to other subordination.

[15]Excluding from the area tks in reserve (replaced by new ones but not withdrawn).

[16]Some *Osa*, *Alligator*, and *Polnocny* have SA-N-5 SAM.

[17]Excluding bomber forces of the Aviation Armies.

The Warsaw Pact

Events in Poland continue to raise questions concerning the reliability of non-Soviet Pact forces. That the Soviet Union may have reservations about this (and so about the lines of communication to East Germany) is perhaps behind reports of attempts being made to establish alternative supply routes along the Baltic Coast and through Czechoslovakia. Given the difficulties involved, neither area is considered to offer an adequate replacement to the routes through Poland.

Developments within the Eastern European countries are difficult to assess accurately. Changes could merely reflect revisions to earlier reporting. Tentatively, therefore, changes over the year suggest a slight reorganization in the Bulgarian army, with reductions in active holdings of army and naval equipment. Czechoslovakia has introduced modest numbers of tanks, armoured cars, and artillery and new SA-9 SAM; East Germany has received BRDM and BMP MICV; Hungary has received a modest increment of T-72 tanks and BMP; some of the older Polish APC may now have been withdrawn; and an increase in the Romanian domestic M-77 tank inventory is reported.

East Germany has built three more *Parchim*-class corvettes. The ageing *Hai*-class patrol craft are beginning to be phased out. New also are five Mi-14 *Haze* ASW helicopters. Poland seems to have retired some of her older patrol craft.

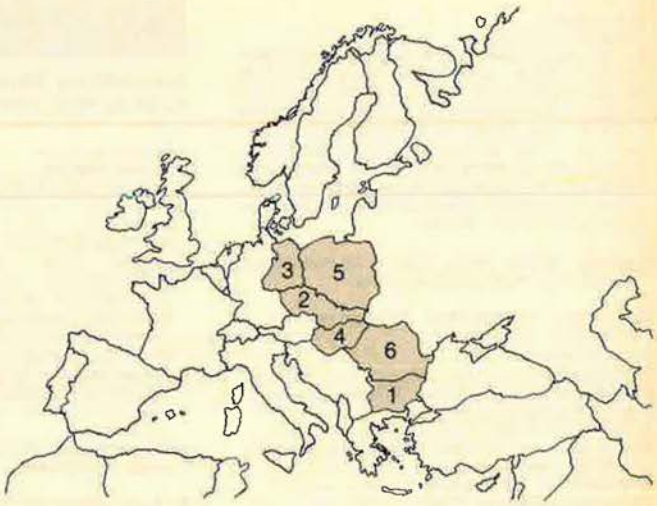
The only new aircraft noted is Romania's domestically-produced IAR-93 fighter/trainer, a small number of which have now been delivered.

There have been persistent reports of the deployment by the USSR of SA-5 *Gammon* long-range high-altitude point defence missiles in the East European air defences. Two sites are reported in East Germany, near Rostock and Rudolstadt, a third is reported near Plzen in western Czechoslovakia, and a fourth in western Hungary. The SA-5 is reported also to have a limited anti-missile capability, but it is too early to tell, at least from published reports, just what the programme will entail or its effects. It is probably part of the general upgrading of the Soviet Air Defence system rather than an enhancement of the defences of the host country. The SA-5 has also been deployed in Syria by the USSR—where its function may have as much a political as a military role.

Defence Economic and Readiness Data

The COMECON countries, with the exception of Hungary and Romania, are not IMF members. These two countries' IMF membership, although it has led to greater understanding of COMECON members national accounts, has at the same time made comparisons between COMECON/Warsaw Pact countries more difficult; the others have single, fixed exchange rates, and Hungary and Romania have several rates, but none necessarily represent market values and all are subject to arbitrary adjustment factors. GDP/GNP figures are calculated by various means on the basis of the relevant country's NMP statistics, which are taken from the UN Economic Commission for Europe's *Economic Survey of Europe in 1982* (New York: UN, 1983). Definitions of the defence budget vary within the Warsaw Pact, as do national accounting systems within NATO, and data on defence budget composition is in any case scanty. Calculations of GDP/GNP and defence expenditure in dollar terms are therefore subject to wide ranges of interpretation.

East European Warsaw Pact divisions are of three categories, with different manning (and hence readiness) levels. Cat. 1 formations are up to 75% of establishment strength; Cat. 2 up to 50%; Cat. 3 little more than cadres. The 'voluntary' para-military organizations correspond to the DOSAAF organization in the Soviet Union (see p. 78).



WARSAW PACT

1. Bulgaria
2. Czechoslovakia
3. German Democratic Republic (East Germany)
4. Hungary
5. Poland
6. Romania

BULGARIA

Population: 8,990,000.
Military service: Army and Air Force 2 years, Navy 3 years.
Total regular forces: 162,300 (94,000 conscripts).
NMP 1982: lev 22.9 bn.
Est GNP range 1982: $26.0–35.0 bn.
Def exp 1981: lev 859 m ($1.245 bn). 1982: 901 m ($1.287 bn). 1983: 932 m ($1.313 bn).
NMP growth: 5% (1981), 4% (1982).
Inflation: 0.5% (1981).
$1 = (1981): leva 0.93 (official), 0.69 (adjusted). (1982): 0.95 (off.), 0.70 (adj.). (1983): 0.97 (off.), 0.71 (adj.).

Army: 120,000 (73,000 conscripts).
3 Military Districts:
8 motor rifle divs (3 Cat. 3 (cadre)).
5 tk bdes.
3 SSM bdes with *Scud*.
4 arty regts.
3 AA arty regts.
2 SAM regts.
1 para regt.
Special commando coys.
300 T-34, 1,000 T-54/-55, some 60 T-72 MBT; some 60 BMP MICV; 250 BRDM-1/-2 scout cars; 1,000 BTR-50/-60, 35 OT-62, MT-LB APC; 25 76mm, 25 85mm, 100mm, 700 122mm, 130mm towed, 10 SU-100 SP guns; 100 152mm towed, 122mm SP how; 100 BM-21 122mm MRL; 39 *FROG*-7, 27 *Scud* SSM; 82mm, 350 120mm, 160mm mor; 90 76mm ATK guns; 150 SPG-9 73mm, 82mm RCL; *Sagger, Snapper* ATGW; 500 23mm, 37mm, 57mm, 85mm, 100mm towed, some 40 ZSU-23-4 SP AA guns; some 36 SA-4/-6/-7 SAM.

RESERVES: 150,000; 3 motor rifle divs on mobilization. 600,000 more have a Reserve liability.

Navy: 8,500 (3,000 conscripts); 3 combat hel.
2 ex-Sov R-class subs.
2 *Riga* frigates.
3 *Poti* corvettes.
5 FAC(M) with *Styx* SSM: 3 *Osa*-I, 2 *Osa*-II.
8 FAC(T): 6 *Shershen*, 2 P-4.
11 patrol craft: 6 SO-1, 5 *Zhuk* coastal(.
23 MCM vessels: 2 T-43 ocean, 4 *Vanya*, 1 *Sonya* coastal, 12 PO-2, 4 *Yevgenya*(inshore.
21 *Vydra* LCU, 9 MFP D-3 landing craft.
1 underway replenishment ship.
2 hel sqns: 1 ASW with 3 Mi-14 *Haze*; 1 SAR with 2 Mi-2, 6 Mi-4.
2 coastal arty regts (1,500): 20 btys; 100mm, 150mm guns.
3 Naval Guard Coys.

Bases: Varna, Burgas, Sozopol, Atiya.

RESERVES: 25,000.

Air Force: 33,800 (18,000 conscripts); some 248 combat ac, some 12 armed hel.
1 air division: 3 combat regts:
5 FGA sqns with 64 MiG-17.
8 interceptor sqns: 1 with some 20 MiG-23 *Flogger* B, 5 with 80 MiG-21; 2 with 60 MiG-17.
2 recce sqns with 24 MiG-17.
1 tpt regt: 10 Il-14, 4 An-24, 2 Tu-134, 9 An-2.
1 hel regt: 10 Mi-2, 40 Mi-4/-8, 12 Mi-24, 12 Ka-26.
Trg ac incl 80 L-29, Yak-11/-18, 30 MiG-15UTI.
AAM: AA-1 *Alkali*, AA-2 *Atoll*.
1 para regt.
1 AD div: 3 zones: 30 SAM sites; 280 SA-2/-3/-4.

RESERVES: 20,000.

Para-Military Forces: Ministry of Interior border guards: 15,000, 16 regts. Security police: 7,500. People's Territorial Militia: 150,000. 'Voluntary Organization for Co-operation in National Defence'.

CZECHOSLOVAKIA

Population: 15,500,000.
Military service: Army 2 years, Air Force 3 years.
Total regular forces: 204,500 (117,000 conscripts).
Est NMP: Kcs 472.0 bn (1981), 490.5 bn (1982).
Est GNP range 1982: $73.0–137.0 bn.
Def exp 1981: Kcs 23.10 bn ($3.632 bn). 1982: 24.156 bn ($3.774 bn).
NMP growth: −0.4% (1981), 0% (1982).
Inflation: 0.8% (1981), 4.0% (1982).
$1 = (1981): koruny 5.85 (off.), 6.36 (adj.). (1982): 6.03 (off.), 6.40 (adj.).

Army: 148,000 (100,000 conscripts).
2 Military Districts:

Exemplifying Warsaw Pact interoperability is the An-2, which the USSR has exported to all its Pact allies and also to a number of Third-World countries.

5 armd divs (1 Cat. 1, 2 each 2/3).
5 motor rifle divs.
1 arty div: 2 arty, 3 *Scud* SSM bdes, 2 ATK regts (6 bns).
1 AB bde.
5 engr bns.
Civil Defence Troops (10,000): 5 regts.
3,500 T-54/-55/-72 MBT; 1,000 BMP MICV; 1,250 OT-65 and BRDM scout cars; 2,700 OT-62/-64 APC; 100 100mm, 350 122mm, 75 130mm guns; 250 152mm how incl DANA (Tatra 813 truck-mounted) SP; 200 RM-70 122mm, 200 M-51 130mm MRL; 30 *FROG*, 27 *Scud* SSM; 81mm mor; 100 82mm RCL; 112 mm P-27 RL; 400 AT-3 *Sagger* and AT-4 *Spigot* ATGW; 600 57mm towed, ZSU-23-4, and M-53/59 30mm SP AA guns; SA-4/-6/-7/-9 SAM.

RESERVES: 200,000; 295,000 more with liability to age 50 (men) or 60 (officers).

Air Force: 56,500 (17,000 conscripts); 471 combat ac, some 12 armed hel.
2 air armies: 3 air divs: 15 combat regts:
13 FGA sqns: 6 with 80 Su-7BM/U; 1 with 12 MiG-23; 3 with 42 MiG-21/-21U; 3 with 30 MiG-15.
18 interceptor sqns with 252 MiG-21/-21U/-23.
3 recce sqns: 1 with 25 MiG-21RF; 2 with 30 L-39.
2 tpt regts with 6 An-24, 40 Il-14, 1 Tu-134, LET L-410M, Tu-154B.
1 hel regt, 3 indep hel sqns with 50 Mi-1, 20 Mi-2, 100 Mi-4, 30 Mi-8, 12 Mi-24.
Trg ac incl 24 L-39, Zlin 326.
AAM: AA-2 *Atoll*.
3 AD divs: 6 SAM regts: some 40 sites; 250 SA-2/-3.

RESERVES: 30,000.

Para-Military Forces: Border Troops 11,000: 7 bdes, AFV, ATK weapons. People's Militia 120,000. 'Association for Co-operation with the Army'.

GERMAN DEMOCRATIC REPUBLIC

Population: 16,760,000.
Military service: Army and Air Force 18 months; Navy (sea-going) 36 months.
Total regular forces: 167,000 (92,000 conscripts).
Est NMP: DMO 196.0 bn (1981), 201.8 bn (1982).[1]
Est GNP range 1981: $90.0–163.0 bn.
Def exp 1982: DMO 14.954 bn ($7.312 bn). 1983: 15.850 bn ($7.724 bn).[2]
NMP growth: 4.8% (1981), 3.0% (1982).
Inflation: 0.2% (1981).
$1 = (1982): ostmarks 2.4266 (off.), 2.045 (adj.). (1983): 2.500 (off.), 2.052 (adj.).

Army: 116,000 (69,000 conscripts).
2 Military Districts, 2 Army HQ:
2 tk divs (each 3 tk, 1 motor rifle regt).[3]
4 motor rifle divs (each 1 tk, 3 motor rifle regts).[3]
2 SSM bdes with *Scud*.
2 arty, 2 AA arty regts.
2 AD regts with SA-4 SAM.
3 sigs regts.
3 engr regts.
1 railway construction regt.
2 ATK bns.
1 AB bn.
About 1,500 T-54/-55, T-72 MBT (1,600 more in storage); 1,000 BMP MICV; 1,000 BRDM-1/-2 scout cars; 1,500 BTR-50P/-60P/-152, MT-LB APC; 400 122mm incl M-1974 SP, 72 130mm, 108 152mm towed, 54 M-1973 152mm SP guns/how; 125 RM-70 122mm MRL; 24 *FROG*-7, 18 *Scud* B SSM; 250 120mm mor; 120 100mm towed ATK guns; AT-3 *Sagger*, AT-4 *Spigot* ATGW; 96 ZSU-23-4 SP AA guns; SA-4/-6/-7/-9 SAM.

RESERVES: 330,000; up to 3 months call-up per year to total 24 months; 250,000 more have a Reserve commitment to 50 (men) or 60 (officers).

Navy: 14,000 incl Frontier Bde (8,000 conscripts); 5 combat hel.
2 *Rostock* frigates (ex-Sov *Koni*) with 1 × 2 SA-N-4 SAM.
9 *Parchim* corvettes with 2 SA-N-5 SAM.
15 *Osa*-I FAC(M) with 4 *Styx* SSM.
48 FAC(T): 18 *Shershen*, 30 *Libelle*(.
6 *Hai* large patrol craft.
45 coastal minesweepers: 18 *Kondor*-I, 27 -II.
12 *Frosch* LST.
2 *Kondor*-I intelligence collection vessels.
4 supply ships and 5 tankers, 2 mod *Frosch* lt tpts.
1 hel sqn with 13 Mi-8 (3 SAR), 5 Mi-14 *Haze* ASW.
Coastal Frontier Bde (2,750): 5 beach patrol bns, 2 afloat 'divs', 1 boat gp (recce); 34 vessels incl 18 *Kondor*-I above, 152mm guns, *Samlet* SSM.
(On order: 3 *Parchim* corvettes, for Frontier Bde.)

Bases: Peenemünde, Warnemünde, Dransk-Bug, Sassnitz, Wolgast, Tarnewitz, Barhöft.

RESERVES: 25,000.

Air Force: 37,000 (15,000 conscripts); 359 combat ac, 30 armed hel.
2 air divs:
6 AD regts: 18 sqns with 300 MiG-21F/MF/PF/U/-23.
4 FGA sqns: 3 with 35 MiG-17; 1 with 12 MiG-23.
1 recce sqn with 12 MiG-21.
7 SAM regts, some 30 sites with 200 SA-2/-3.
2 radar regts.
1 tpt regt: 3 sqns: 20 Il-14, 15 Tu-134, An-2/-14.
2 hel regts: 6 sqns with 60 Mi-2/-4, 45 Mi-8, 30 Mi-24.
Trg ac incl Yak-11, L-29/-39, Zlin 226, MiG-15UTI.
AAM: AA-2 *Atoll*.
ASM: AT-3 *Sagger* ATGW.

RESERVES: 30,000.

Forces Abroad: Algeria, 250; Angola, 450; Ethiopia, 550; Guinea, 125; Iraq, 160; Libya, 400; Mozambique, 100; S. Yemen, 75; Syria, 210.

Para-Military Forces: 74,000.
Ministry of Defence: Frontier Troops (48,000): 18 border, 2 indep, 1 special, 6 trg regts (some 66 bns), 1 boat section; 24 patrol craft. *Ministry for State Security:* 1 Guard regt (Berlin) (7,000): 6 motor rifle, 1 arty, 1 trg bns; PSZH-IV APC, 120mm mor, 85mm, 100mm ATK, ZU-23 AA guns, hel. *Ministry of Interior:* People's Police Alert Units (10,500): 21 bns; APC, 82mm mor. Transport Police (8,500): 16 coys; small arms, RPG-7 RL. *Workers' Militia:* 15,000 combat groups; AFV incl SK-1 APC, 82mm mor, 76mm ATK, 23mm, 37mm AA

[1]See p. 81 for footnotes.

guns. *Society for Sport and Technology* (450,000, 75% active): 1 central, 14 regional subordinate district gps, some 15,000 units; small arms. *Thälmann Pioneers:* School children, para-military trg.

HUNGARY

Population: 10,760,000.
Military service (incl Border Guard): 18 months; Air Force 24 months.
Total regular forces: 105,000 (58,000 conscripts).
NMP 1982: forints 681.9 bn.
Est GDP range 1982: $34.0–65.0 bn.
Def exp 1982: forints 20.260 bn ($1.318 bn). 1983: 21.070 bn ($1.22 bn).
NMP growth: 2.0% (1981), 1.5% (1982).
Inflation: 4.6% (1981), 6.9% (1982).
$1 = (1982): forints 36.631 (off.), 15.37 (adj.). (1983): 41.157 (off.), 17.26 (adj.).

Army: 84,000 (50,000 conscripts) incl Danube Flotilla.
1 tk div (Cat. 2).
5 motor rifle divs (2 Cat. 2, 3 Cat. 3).
1 arty bde, 1 SSM bde with *Scud.*
1 AA arty, 3 SAM regts.
1 AB bn.
About 1,200 T-54/-55, 60 T-72 MBT; 100 PT-76 lt tks; 175 BMP-1 MICV; about 300 BRDM and some 200 FUG-65 scout cars; 1,100 PSZH, MT-LB APC; 300 122mm, 25 M-1974 122mm SP how; 125 152mm towed and 20 M-1973 SP guns/how; 50 BM-21 122mm MRL; 24 *FROG* 7, 9 *Scud* SSM; 300 82mm, 100 120mm mor; 100 SPG-9 73mm RCL; 150 85mm, 100mm ATK guns; 100 *Sagger*, 100 *Spigot* ATGW; 100 57mm towed, 100 ZSU-23-4 SP AA guns; 30 SA-7, 60 SA-6, 450 SA-7, 100 SA-9 SAM.
Danube Flotilla (700); 10 100-ton patrol craft, river MCM, 5 small LCU, small tp tpts.

Air Force: 21,000 (8,000 conscripts); 140 combat ac, 20 armed hel.
1 air div:
2 AD fighter regts: 6 interceptor sqns with 120 MiG-21/F/PF/bis/U, 20 MiG-23.
1 tpt regt: 2 tpt sqns with 24 An-2/-24/-26, Il-14, 2 Tu-134.
1 hel regt: 3 hel sqns with 60 Mi-2/-8, 20 Mi-24, 25 Ka-26.
Trg ac incl L-29, MiG-15UTI.
AAM: AA-2 *Atoll.*
1 AD div: 3 SAM regts, some 20 sites; 150 SA-2/-3.

RESERVES: (all services): 143,000.

Para-Military Forces: Border guards 15,000 (11,000 conscripts); 11 districts. Part-time Worker's Militia 60,000. 'Sport Association for National Defence'.

POLAND

Population: 36,500,000.
Military service: Army, internal security forces, Air Force 2 years; Navy, special services 3 years.
Total regular forces: 340,000 (190,000 conscripts).
Est NMP 1980: zloty 1,986.6 bn. 1981: 2,154.7 bn.
Est GNP range 1981: $81.0–160.0 bn.
Def exp 1981: zloty 76.9 bn ($5.532 bn). 1982: 174.0 bn ($6.254 bn).
NMP growth: −12.1% (1981), −8.0% (1982).
Inflation: 35.0% (1981), 100.2% (1982).
$1 = (1981): zloty 3.44 (off.), 13.90 (adj.). 1982: 3.44 (off.), 27.82 (adj.).

Army: 230,000 (158,000 conscripts).
3 Military Districts:
5 armd divs (all Cat. 1).
8 mech divs (3 Cat. 1, 2 Cat. 2, 3 Cat. 3).
1 AB div (Cat. 1).
1 amph assault div (Cat. 1).
3 arty bdes, 1 arty regt.
3 ATK regts.
4 SSM bdes with *Scud.*
1 AD bde with SA-4, 5 AD regts with SA-6 SAM.
3,400 T-54/-55, 50 T-72 MBT; 100 PT-76 lt tks; 800 OT-65/FUG, 50 BRDM-1/-2 scout cars; 800 BMP-1, 2,500 SKOT/SKOT-2AP, TOPAS APC; 1,000 100mm, 200 122mm guns; 300 152mm guns/how; 250 BM-21 122mm, 130mm, 140mm, 240mm MRL; 51 *FROG*-3/-5/-7, 36 *Scud* B SSM; 750 82mm, 120mm mor; 450 85mm, 100mm towed ATK guns; 73mm, 82mm, 107mm RCL; *Snapper*, AT-4 *Spigot*, *Sagger* ATGW; 750 23mm, 37mm, 57mm, 85mm, and 100mm towed, 130 ZSU-23-4 SP AA guns; SA-4/-6/-9 SAM.

Navy: 22,000 (5,000 conscripts).
4 W-class subs.
1 SAM *Kotlin* destroyer with 1 × 2 SA-N-1 *Goa.*
13 *Osa*-I FAC(M) with 4 *Styx* SSM.
18 FAC(T): 8 *Pilica*, 10 *Wisla*(.
8 mod *Obluze* large patrol craft.
49 MCM: 12 *Krogulec*, 11 T-43 ocean, 1 *Notec* coastal minesweepers; 25 K-8 boats.
23 *Polnocny* LCT, 4 *Marabut* LCM, 15 *Eichstaden* LCA.
4 intelligence vessels (AGI): 1 B-10, 2 mod *Moma*, 1 T-43 radar picket.
1 Naval Aviation Div (2,000); 49 combat ac:
1 attack regt: 3 sqns with 39 MiG-17.
1 recce sqn with 5 Il-28, 5 MiG-17.
1 hel regt: 2 sqns with 10 Mi-2, 20 Mi-4, 5 Mi-8.
(On order: inshore minesweepers.)

Bases: Gydnia, Hel, Swinoujscie, Kolobrzeg, Ustka.

Air Force: 88,000 (27,000 conscripts); 705 combat ac, 12 armed hel.
4 air divs:
6 FGA regts: 18 sqns: 3 with 35 Su-7/-7U; 3 with 35 Su-20; 12 with 150 MiG-17.
11 AD regts: 33 sqns with some 430 MiG-17/-21/-21U.
6 recce sqns: 35 MiG-21RF, 5 Il-28, 15 LIM-6.
2 tpt regts: 9 An-2, An-12, 12 An-26, 12 Il-14.
1 comms/liaison sqn with 2 Tu-134A, 5 Yak-40, Il-18 ac; 4 Mi-8 hel.
3 hel regts with 250 Mi-1/-2, 12 Mi-4, 25 Mi-8, 12 Mi-24.
300 trg ac: TS-8/-11, MiG-15/-21UTI, Su-7U.
AAM: AA-1 *Alkali*, AA-2 *Atoll.*
AD divs: 9 SAM regts: some 50 sites; 425 SA-2/-3.

RESERVES: (all services): 500,000.

Forces Abroad: Syria (UNDOF): 131.

Para-Military Forces: 85,000. Ministry of Interior border troops (20,000): 12 bdes, some 42 patrol craft incl 5 *Obluze*, 5 *Pilica*, 3 KP-131, 1 *Oksywie*, 12 *Wisloka*, 21 K-8, 9 *Gdansk.* Internal defence troops (65,000): tks, AFV, ATK guns. Citizen's Militia 350,000. 'League for National Defence' (some 200,000 active).

ROMANIA

Population: 22,650,000.
Military service: Army, Air Force 16 months; Navy 30 months.
Total regular forces: 189,500 (109,000 conscripts).
Est NMP: lei 530.7 bn (1981), 627.9 bn (1982).
Est GNP range 1982: $79.0–125.0 bn.
Est def budget 1983: lei 11.725 bn ($1.413 bn).
NMP growth: 2.2% (1981), 2.6% (1982).
Inflation: 7.6% (1981), 18.0% (1982).
$1 = (1981/3) lei 4.47 (off.), 8.3 (adj.).

Army: 150,000 (95,500 conscripts).
4 Army Areas:
2 tk divs (1 Cat. 1, 1 Cat. 2).
8 motor rifle divs (1 Cat. 1, 3 Cat. 2, 4 Cat. 3).
3 mountain bdes.
2 arty, 2 AA bdes, 3 arty, 1 AA arty, 5 ATK regts.
2 *Scud* SSM bdes.
1 AB regt.
200 T-34, 1,000 T-54/-55, 30 T-72, 150 M-77 MBT; 400 BRDM-1/-2 scout cars; 2,600 BTR-50/-60, TAB-72 (BTR-60) APC; 50 76mm, 50 85mm, 100mm towed and 250 SU-76/-100 SP guns; 600 122mm, 150 152mm guns/how; 175 122mm, 150 130mm, MRL; 30 *FROG*, 20 *Scud* SSM; 700 82mm, 200 120mm mor; 57mm ATK guns; 73mm, 260 76mm and 82mm RCL; 120 *Sagger*, *Snapper* ATGW; 300 30mm, 37mm, 250 57mm, 85mm, 100mm towed, ZSU-23-4 SP AA guns; SA-6/-7 SAM.

RESERVES: 500,000 (300,000 with service in last 5 years).

Navy: 7,500 (3,500 conscripts).
Black Sea Fleet, Danube Sqn, Coastal Defence.
3 *Poti* corvettes.
5 *Osa*-I FAC(M) with 4 *Styx* SSM.
3 *Kronshtadt* large patrol craft.
19 Ch *Shanghai* FAC(G/P/ASW).
35 FAC(T): 19 Ch *Huchwan* hydrofoils, 6 ex-Sov P-4, 10 *Epitrop*(.
42 river patrol craft incl 18 VB-76 monitors.
16 minesweepers (4 ex-GDR M-40 coastal, 12 ex-Sov T-301 inshore); 8 ex-Pol TR-40, 20 VD-141 minesweeping boats(; 1 MCM spt ship.
4 Mi-4 SAR hel.
Coastal Defence (2,000); HQ Constanta, 4 sectors; 18 arty btys with some 110 130mm, 150mm, and 152mm guns, observer post tps, naval engineers. Would get 2 regts of naval inf on mobilization.
(On order: 2 *Epitrop* FAC(T) (delivery 1983).)

RESERVES: 20,000.

Bases: Mangalia, Constanta; Danube: Braila, Giurgiu, Sulina, Tulcea.

Air Force: 32,000 (10,000 conscripts); 315 combat ac.
2 air divs: 4 combat regts:
6 FGA sqns with 70 MiG-17, 3 IAR-93A.
12 interceptor sqns: 11 with 200 MiG-21F/PF/U, 1 with 24 MiG-23.
1 recce sqn with 18 Il-28.
1 tpt regt with 3 Il-14, 4 Il-18, 1 Il-62, 10 An-24, 6 An-26, 5 Li-2, 1 Boeing 707.
1 hel regt: 10 Mi-4, 25 Mi-8, 45 IAR-316B (*Alouette* III), 25 IAR-330 *(Puma).*
Trg ac: 50 L-29, 50 MiG-15UTI.
AAM: AA-2 *Atoll.*
1 AD div: some 20 SAM sites with 108 SA-2.
(On order: 20 IAR-93A, 165 IAR-93B FGA/trg ac.)

RESERVES: 45,000.

Para-Military Forces: 37,000. Border guards (17,000); 12 bdes. Ministry of Defence security troops (20,000); AFV, ATK guns. Local Defence: some 900,000 Patriotic Guard. Youth Homeland Defence: 650,000. 'Voluntary Sports Association'.

Massed firepower is the backbone of the Warsaw Pact's tactical battlefield strategy. Pictured above is a Czechoslovakian 122mm rocket launcher.

[1]1980 prices.

[2]Incl DMO 4,200 bn (1982), 4,400 bn (1983) for internal security forces.

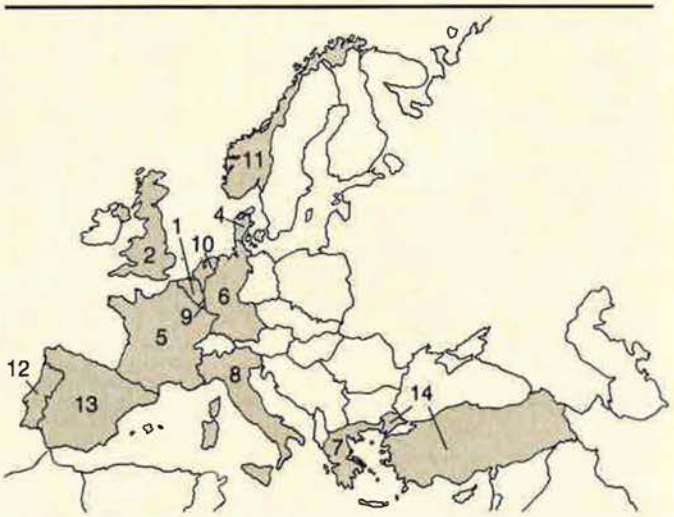
[3]All divs Cat. 1.

The North Atlantic Treaty

Two major issues dominated NATO during 1982/3: intermediate-range nuclear weapons and the debate over conventional or nuclear defence. Each impinges on the other; their financial and social implications bear upon both NATO unity and the credibility of its deterrent.

In 1979 NATO formally identified a Soviet threat from the SS-20 IRBM, then replacing the older SS-4/-5 missiles. NATO agreed that, if negotiations failed to persuade Moscow to reverse sufficiently its deployment of the new missiles, the US would assign to NATO, from December 1983, 108 *Pershing* II and 464 Ground-Launched Cruise Missiles (GLCM): all the *Pershing* IIs to be based in Germany; the GLCM in Britain (160), Italy (112), Belgium (48), Netherlands (48), and Germany (96). The deployment is to be completed by 1988.

At the same time, and as a way to reduce NATO's dependence on battlefield nuclear weapons, there has been much NATO interest in investing in conventional high technology to counter Soviet mass attacks. Because new conventional weapons may prove as effective as nuclear weapons for some important military missions, without the attendant risk of escalation, they seem to many to offer a more acceptable alternative. There is much argument as to detail. One popular doctrine calls for an in-depth strike against follow-up Soviet formations; the counter-argument questions the ability of existing NATO forces to contain an initial attack while diverting strength and resources to the deeper mission. Proponents of conventional defence admit that new equipment will add to defence costs, but claim that the increase required would only be about 1% on current levels of expenditure. What those costs have been over the past ten years is shown in the table on p. 138.



THE NORTH ATLANTIC TREATY ORGANIZATION

1. Belgium
2. Britain
3. Canada (not included in map)
4. Denmark
5. France
6. Germany: Federal Republic (West Germany)
7. Greece
8. Italy
9. Luxembourg
10. Netherlands
11. Norway
12. Portugal
13. Spain
14. Turkey

Joint Programmes

While by far the greatest proportion of equipment in NATO inventories is still of US origin, European cooperative production arrangements continue. German *Leopard* tanks equip eight armies, while the tri-national FH-70 artillery piece is in service with Britain, Germany, and Italy. A tri-national MCM ship (Belgium, France, Netherlands) and the German/Dutch *Bremen/Kortenaer* frigate programmes have given a lead for the new seven-nation NATO frigate project now under study. Recent exercises have again demonstrated shortcomings in inter-communication. British experience in the Falklands is being studied, with the most obvious emphasis on point defence anti-air systems for surface platforms. In several air forces the US F-16 and tri-national *Tornado* continue to replace older equipment.

There remains a significant imbalance in equipment—both in quality and in quantity—between the forces in the Centre and those on the Flanks of NATO. Political and budgetary constraints affect all the Flank Nations. Norway and Denmark have attempted to maintain modern inventories while operating the bulk of their forces under cadre systems. Though their Reserve Forces are arguably among the best in the world, it may be asked whether their standards of experience, physical fitness, and command would be equal to the demands of modern warfare. On the Southern Flank, the forces of Spain, Portugal, Greece, and Turkey are not short of manpower but lack modern material. Much of the equipment used in these countries comes from other NATO inventories.

The NATO Air Defence Ground Environment (NADGE) system is an outstanding example of NATO cooperation. Formed in 1960, as a joint project, funded by 14 nations (the US contributed 31.83% of the cost), it comprised some 47 radars and 37 computer centres deployed along the frontiers from northern Norway to eastern Turkey. It was originally capable of detecting air intruders to 100,000 feet but was vulnerable to outflanking and to low-altitude penetration. Subsequently, the separate British and Spanish systems were linked to it. The system, modernized by 1975, is being improved

again under the Air Defence Ground Environment Integration Segment which was begun in 1979. A component of the system is the Airborne Early Warning facility based on the E-3A *NATO Standard* AWACS and the British *Nimrod* AEW aircraft, the latter expected to enter service from 1984. Enhanced facilities have been introduced by the Netherlands (1976), Italy (1977), Belgium (1980), Norway (1981), Britain, and Germany. France, with her compatible *Strida* II system, contributes to the all-round NATO air defence coverage.

BELGIUM

Population: 9,900,000.
Military service: 8 or 10 months.[1]
Total armed forces: 94,717 (3,550 women; 32,160 conscripts).
Est GDP 1981: B fr 3,615 bn ($97.358 bn). 1982: 3,850 bn ($84.262 bn).
Est def exp 1982: B fr 89.836 bn ($1.966 bn); NATO definition $2.799 bn.[2] 1983: 93.764 bn ($1.901 bn); NATO definition n.a.
GNP growth: −2% (1981), −1.3% (1982).
Inflation: 6.6% (1981), 7.6% (1982).
$1 = francs 37.131 (1981), 45.691 (1982), 49.322 (1983).

Army: 69,667 (incl Medical Service; 27,525 conscripts).
1 corps HQ, 2 div HQ.
1 armd bde.
3 mech inf bdes.
1 para-cdo regt.
3 recce bns.
1 tk bn.
2 mot inf bns.
3 arty bns.
1 SSM bn with 5 *Lance*.
4 AD bns: 2 SAM with 36 *Improved HAWK*; 2 AA with *Gepard*.
5 engr bns (3 fd, 1 bridge, 1 eqpt).
4 lt aviation sqns.
334 *Leopard* MBT; 133 *Scorpion* lt tks; 153 *Scimitar* AFV, 1,365 APC (M-75, AMX-VCI, 10 M-113, 266 *Spartan*); 22 105mm, 14 203mm how; 96 M-108 105mm, 25 M-44, 41 M-109 155mm, 11 M-110 203mm SP how; 6 *Lance* SSM; 60 JPzK C-90mm SP ATK guns; 274 *Milan* ATGW; 43 *Striker* AFV with *Swingfire* ATGW; 115 20mm, 55 *Gepard* 35mm SP AA guns; 37 *Improved HAWK* SAM; 12 *Islander* ac, 67 *Alouette* II hel.
(On order 514 MICV, 515 M-113 APC; 124 M-109A2 155mm SP how, 746 *Milan* ATGW.).

RESERVES: 160,407 (incl 40,000 Medical Service), some on immediate recall status; 1 mech, 1 mot inf bdes; combat, combat spt, log spt tps. Territorial defence; 11 mot inf regts, 4 mot inf bns.

Navy: 4,550 (1,035 conscripts).
4 E-71 frigates with 4 *Exocet* SSM, 1 × 8 *Sea Sparrow* SAM.
7 US Type 498 ocean minehunters/minesweepers.
6 US Type 60 coastal MCM (4 in reserve).
14 *Herstal* inshore minesweepers.
2 log spt and comd ships (MCM).
6 river patrol boats.
3 *Alouette* III hel.
(On order: 10 MCM ships, SH-3D *Sea King* hel.)

Bases: Kallo, Ostend, Zeebrugge.

RESERVES: 4,500 (on immediate recall status).

Air Force: 20,500 (3,600 conscripts); 144 combat ac.
5 FGA sqns: 3 with 54 *Mirage* 5BA/5BD; 2 with 36 F-16A/B.
2 AD sqns with 36 F-16A/B.
1 recce sqn with 18 *Mirage* 5BR.
2 tpt sqns with 12 C-130H, 2 Boeing 727QC, 3 HS-748, 5 *Merlin* IIIA, 2 *Falcon* 20.
1 SAR hel sqn with 3 HSS-1, 5 *Sea King*.
Trg and liaison sqns ac incl 28 SF-260MB, 23 Fouga CM-170; 2 sqns with 32 *Alpha Jet*.
AAM: *Sidewinder*.
6 SAM sqns with 54 *Nike Hercules* (modernized).
1 NADGE command reporting centre, associated radar.
(On order: 44 F-16A ftr, 5 EMB-121 *Xingu* lt tpt ac; 200 AIM-9L *Sidewinder* AAM.)

RESERVES: 14,000.

Forces Abroad: Germany: 25,000; 1 corps HQ, 1 div HQ, 1 armd, 1 mech inf bdes; 3 recce, 1 tk, 3 arty, 1 SSM, 2 *HAWK* SAM, 2 AA, 3 engr bns; 3 aviation sqns, 6 *Nike* SAM sqns.

Para-Military Forces: Gendarmerie 16,200; 62 FN armd cars, 5 *Alouette* II, 3 *Puma* hel. (On order: 80 BDX *(Timoney)* APC.)

[1]See p. 91 for footnotes.

BRITAIN

Population: 55,965,000.
Military service: voluntary.
Total armed forces: 320,623 (incl 15,700 women and some 10,100 enlisted outside Britain).
Est GDP 1981: £248.40 bn ($503.725 bn). 1982: £270.42 bn ($473.424 bn).
Def exp 1982/3: £14.411 bn ($25.229 bn); NATO definition $24.200 bn. 1983/4: £15.987 bn[3] ($25.168 bn); NATO definition n.a.
GDP growth: −2.4% (1981), 1% (1982).
Inflation: 12% (1981), 5.4% (1982).
$1 = £0.4931 (1981), £0.5712 (1982), £0.6352 (1983).

Strategic Forces:
SLBM: 4 *Resolution* SSBN, each with 16 *Polaris* A3 msls with 3 MRV (being fitted with *Chevaline*).
Ballistic Missile Early Warning System (BMEWS) station at Fylingdales.

Army: 159,069 (incl some 6,000 women and 9,800 enlisted outside Britain, of which 8,500 are Gurkhas).
1 corps, 3 armd, 1 inf, 1 arty div, 22 bde, 1 Field Force HQ.
12 armd regts.
7 armd recce regts.
47 inf bns.
6 Gurkha inf bns.
3 para bns (1 in inf, 2 in para role).
1 special air service (SAS) regt.
1 msl regt with *Lance* SSM (4 btys, each 3 SSM).
3 AD regts with *Rapier* SAM (each of 3 btys with 12 fire units; 2 btys to be SP late 1983).
18 arty regts (2 hy, 14 fd (1 cdo), 1 GW, 1 locating), 4 indep ATK btys.
12 engr regts (incl 3 armd div, 1 armd, 1 amph, 1 Gurkha), 1 indep sqn.
4 army aviation regts; 15 sqns, 5 indep flts, trg unit.
AFV: some 70 *Challenger*, 900 *Chieftain* MBT (60 in reserve); 271 FV 101 *Scorpion* lt tks; 243 FV 601 *Saladin* armd cars; 290 FV 107 *Scimitar*, 1,429 *Ferret*, 200 *Fox* recce; 2,338 FV 432, 600 FV 603 *Saracen*, 60 FV 103 *Spartan*, 500 FV 1611 APC.
Arty: 4 5.5 in (140mm, trg) guns; 100 105mm lt, pack, 195 FH-70 155mm towed how; FV 433 *Abbot* 105mm, 101 M-109/-109A2/A3 155mm, 31 M-107 175mm, 16 M-110 203mm SP guns/how; 12 *Lance* SSM.
ATK: Carl Gustav 84mm, 120mm RCL; *Milan, Swingfire* ATGW.
AD: Blowpipe, 108 *Rapier* (some 10 SP) SAM.
Air: 9 *Beaver* AL-1, 22 *Chipmunk*, 2 Auster AOP-9 ac; 41 *Scout*; 8 *Alouette* II, 155 *Gazelle* AH-1, 80 *Lynx* AH-1 hel, some with *TOW*.
14 landing craft (2 tk, 12 med); 3 patrol craft, 2 hovercraft.
(On order: some 170 *Challenger* MBT; 1,900 MCV-80 MICV; 50 AT-105 *Saxon* APC; 18 M-109A2 SP how; 10 227mm *MLRS* MRL; *Law*-80 RL; *Milan, TOW* ATGW; some 74 *Rapier* incl SP, 48 *Blowpipe* SAM; 5 *Gazelle*, 24 *Lynx* hel (6 with *TOW*), 3 patrol craft.)

DEPLOYMENT (see also *Forces Abroad*, below):
United Kingdom Land Forces (UKLF): reinforcements for 1 Br Corps, Germany: 1 inf div HQ; 2 inf regular, 2 inf TA bdes; United Kingdom Mobile Force (UKMF): 1 inf bde and log spt gp; Allied Command Europe Mobile Force (Land) (AML): 1 inf bn, 1 armd recce, 1 sigs sqns, 1 arty bty, 1 log bn; 1 aviation flt; Home Defence: 6 inf bdes.
HQ Northern Ireland: (some 9,500); 2 inf bde HQ, 8 major units in inf role (6 resident inf bns), 1 SAS, 2 engr sqns, 2 army aviation sqns.

RESERVES: 217,950: Regular Reserves 137,700. Territorial Army (TA) 72,700 (to be 86,000 by 1990): 2 inf bdes, 5 armd recce regts, 35 inf bns, 2 SAS, 2 fd, 3 lt AD, 7 engr regts. Ulster Defence Regiment 7,150: 11 bns (internal security role in Northern Ireland only in peacetime). Home Service Force: (400) 4 coys; 2-year pilot scheme.

Navy: 71,727 (incl Fleet Air Arm, Royal Marines, 3,930 women and 300 enlisted outside Britain); 64 major surface combat vessels (incl 2 LPD).
Submarines, attack: 27.
12 SSN (1 *Trafalgar*, 6 *Swiftsure*, 3 *Churchill*, 2 *Valiant*); 15 SS (13 *Oberon*, 2 *Porpoise*).
Surface Ships:
3 ASW carriers with 5 *Sea Harrier* V/STOL ac, 9 *Sea King* hel: 2 *Invincible* with 1 × 2 *Sea Dart* SAM, *Phalanx* AD system; 1 (*Hermes*) with 2 × 4 *Seacat* SAM.
13 GW destroyers: 3 *County* with 1 × 2 *Seaslug*, 2 × 4 *Seacat* SAM, 4 *Exocet* SSM, 1 *Wessex* ASW hel; 1 Type 82 with 1 × 2 *Sea Dart* SAM, 1 *Ikara* ASW; 9 Type 82 with 1 × 2 *Sea Dart*, 1 *Lynx* ASW hel.
45 GP frigates: 4 Type 22 with 4 *Exocet* SSM, 2 × 6 *Sea Wolf* SAM, 1 *Lynx* hel; 6 Type 21 with 4 × 1 *Exocet* SSM, 1 × 4 *Seacat* SAM, 1 *Wasp/Lynx* ASW hel; 25 *Leander* (1 to be trg; 1 to retire by end 1983) with 1 *Wasp/Lynx* (7 with 4 *Exocet*, 3 × 4 *Seacat*; 8 with *Ikara* ASW, 2 × 4 *Seacat*; 5 converting to 1 × 4 *Exocet*, 1 × 6 *Sea Wolf*); 7 *Rothesay* (Type 12) with 1 × 4 *Seacat*, 1 *Wasp* hel; 3 *Tribal* (Type 81) with 2 × 4 *Seacat*, 1 *Wasp* hel.
1 *Whitby* (Type 12) ASW frigate (trg).
36 minesweepers/minehunters: 5 *Hunt*, 2 *Venturer* (Reserves), 29 *Ton* (9 reserves, 7 Fishery Patrol).
1 *Abdiel* MCM spt ship.
34 patrol craft: 7 *Island*, 2 *Castle*, 5 *Ton*, 4 *Bird* (2 trg), 2 *Loyal*, 3 *Falkland Islands*, 4 23-metre (trg); 2 *Ham*, 5 Fairey 20-metre.
2 assault ships (LPD) each with 4 LCM, 4 LCVP, 4 × 4 *Seacat* SAM.
Amph vessels incl: 5 landing ships (in Royal Fleet Auxiliary (RFA)), 16 LCM, 29 LCVP.
1 hel trg ship (RFA), 1 sub tender, 1 deep diving ship, 1 ice patrol, 1 Royal Yacht/hospital, 11 survey ships.
1 BH-7 hovercraft.
Included in above in refit or in reserve are: 1 SSBN, 2 SSN, 3 diesel subs, 8 frigates, 2 MCM.
(On order: 1 ASW carrier, 4 *Trafalgar* SSN, 3 Type 42 destroyers, 8 Type 22 frigates, 6 *Hunt*, 4 *Gem* MCM, 5 *Peacock* patrol craft (from mid-1983), 1 container ship (hel carrier auxillary), 1 fleet tender; 72 *Trident* II SLBM, 2 *Phalanx* 20mm AD systems; *Sea Eagle*, 350 *Harpoon* SSM; *Seawolf, Lightweight Seawolf* SAM.)

Bases: Devonport, Faslane, Portland, Portsmouth, Rosyth.

FLEET AIR ARM: 15 combat ac, 167 combat hel (incl some 43 in trg sqns).
3 ftr sqns with 15 *Sea Harrier* FRS-1 (afloat).
8 ASW hel sqns: 6 with 51 *Sea King* HAS-2/-5, 1 with 6 *Sea King* HAR-5 (ASW/SAR), (4 sqns embarked); 1 with 8 *Lynx* HAS-2; 2 *Sea King* AEW (mod HAS-2).
57 ASW hel flts (each 1 ac): 31 with *Lynx* HAS-2, 23 with *Wasp* HAS-1, 3 with *Wessex* HAS-3.
2 cdo assault sqns: 1 with 11 *Sea King* HU-4, 1 with 18 *Wessex* HU-5.
1 ac trg sqn with 4 *Sea Harrier* T-4.
6 hel trg sqns: 1 with 24 *Wessex* HU-5; 2 with 22 *Sea King* HAS-2/-5; 1 with 11 *Wasp* HAS-1; 1 with 10 *Lynx* HAS-2; 1 with 19 *Gazelle* HT-2.
3 hel flts with *Wasp* (hydrography/recce).
1 utility flt with 4 *Sea Heron* C-2, 1 *Sea Devon* C-20, 2 *Chipmunk* T-10.
1 observer trg sqn with 12 *Jetstream* T-2, 1 trg flt with 10 *Chipmunk* T-10.
1 fleet requirements sqn with *Wessex* HU-5 hel.
ASM: *Sea Skua*.
(On order: 14 *Sea Harrier* FRS-1, 3 *Hunter* T-8M, 2 *Jetstream* T-2 ac; 18 *Sea King* HAS-5, 8 *Sea King* HU-4, 13 *Lynx* HAS-3 hel.)

ROYAL MARINES: 7,754.
1 cdo bde with 3 cdo gps; 1 cdo arty regt, 2 cdo/engr sqns (army); 1 lt hel sqn, 1 log regt, spt units.
1 Special Boat and 2 Raiding sqns.
18 105mm lt guns; 318 81mm mor; *Milan* ATGW; *Blowpipe* SAM; 19 *Rigid Raider*, 10 *Gemini* assault boats; 15 *Gazelle* AH-1, 5 *Lynx* AH-1 hel.
(On order: 4 *Lynx*, 5 *Gazelle* hel.)

ROYAL FLEET AUXILIARY (RFA):
Naval Vessels, civilian crews (2,870).
14 tankers.
4 fleet replenishment ships.
2 civilian transports (charter).

RESERVES: Navy: Regular 24,800; Volunteer 5,600: 5 Regional Divisions. 11 MCM, 7 patrol vessels. Marines: Regular 1,170; Volunteer 1,100; 1 Raiding sqn.

Air Force: 89,827 (incl some 5,700 women); some 620 combat ac.
13 strike/attack sqns: 2 each with 13 *Tornado* GR-1, a third forming (6 ac) (6 more to form); 4 with 45 *Buccaneer* S-2A/B; 6 with 72 *Jaguar* GR-1.
3 close support sqns with 44 *Harrier* GR-3/T-4.
9 interceptor sqns: 2 with 24 *Lightning* F-6/F-3 (24 more ac in reserve); 7 with 87 *Phantom* (5 with FGR-2, 2 with

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The British Harrier jump jet performed admirably during the fighting last year on the Falkland Islands. Above, a Sea Harrier lifts off from a carrier deck.

FG-1); (72 *Hawk* T-1 to be armed for role).
2 recce sqns with 24 *Jaguar* GR-1, 1 flt with 3 *Canberra* PR-9.
1 AEW sqn with 6 *Shackleton* AEW-2 (5 in reserve); (5 *Nimrod* AEW-3 to be phased in).
4 MR sqns with 28 *Nimrod* MR-1/-1A/-2 *(Harpoon* ASM, *Sidewinder* AAM being fitted).
4 tanker sqns with 15 *Victor* K-2, 14 *Hercules* C-1P, 6 *Vulcan* K-2 (retiring end 1983; 9 VC-10 being phased in).
1 strategic tpt sqn with 11 VC-10Cl.
4 tac tpt sqns with 41 C-130H incl 6 C-130HC3.
4 comms sqns with 6 HS-125 CC1/2, 4 *Andover*, 6 *Pembroke*, 13 *Devon*, 1 BAe-146-100 ac; 1 *Gazelle* hel.
Queen's Flt with 3 *Andover* ac, 2 *Wessex* hel.
3 ECM/target facilities/calibration sqns with 32 *Canberra*, 3 *Nimrod* MR-1, 5 *Andover* E-3/C-1.
12 OCU: 1 NATO Trilateral Trg Establishment with 22 Br, 22 FRG, 7 It *Tornado* GR-1; 11 others with 22 *Tornado* GR-1, 10 *Buccaneer* Mk 2, 24 *Phantom* FGR-2, 22 *Jaguar* GR-1/T-2, 25 *Harrier* GR-3/T-4, 3 *Nimrod*, 4 *Canberra* B-2/T-4, 5 C-130, 3 *Victor* K-2 ac; 4 *Wessex* HC-2, 5 *Puma* HC-1, 2 *Sea King* HAR-3, 6 CH-47 *Chinook* hel.
2 tac weapons units with 6 *Hunter* F-6/GA-9/T-7, 74 *Hawk* T-1, 2 *Jet Provost*.
7 hel sqns: 5 tac tpt (1 with 20 *Wessex*, 2 with 26 *Puma* HC-1, 2 with 24 CH-47 *Chinook* HC-1), 9 SAR flts (5 with 18 *Wessex* HAR-2, 4 with 14 *Sea King* HAR-3).
Trg units with 50 *Hawk* T-1, 146 *Jet Provost*, 11 *Jetstream* T-1, 112 *Bulldog* T-1, 60 *Chipmunk* T-10, 19 *Dominie* T-1, 1 *Husky* T-1 ac; 5 *Whirlwind*, 14 *Wessex* HC-2, 23 *Gazelle* HT-3 hel.
AAM: *Sidewinder, Sparrow, Red Top, Firestreak, Sky Flash.*
ASM: *Martel, Harpoon.*
8 SAM sqns: 2 with 64 *Bloodhound* 2, 6 (RAF Regt) with 48 *Rapier.*
(On order: 4 *Harrier* GR-3, some T-4, 15 *Phantom* F Mk 3 (F-4J), 123 *Tornado* (out of 220 GR-1 FGA, 165 F-2 AD planned); 11 *Nimrod* AEW-3; 4 HS-125-700, 1 BAe-146-100 (VIP); 9 VC-10K-2/-3, 6 *Tristar* 500 tankers; 8 *Chinook* hel; AIM-9L *Sidewinder*, 12 *Rapier* SAM, *Sky Flash* AAM, *Sea Eagle* ASM; 6 AR-3D AD radar.)

ROYAL AIR FORCE REGIMENT:
4 wing HQ.
6 SAM sqns *(Rapier)* and 6 fd (armd) sqns.
36 *Scorpion* lt tks; 90 *Spartan* APC; SAM.

DEPLOYMENT:
Strike Command: operational home command responsible for UK Air Defence Region and Near and Far East; overseas command (RAF Germany, Belize, and the Falklands).
Support Command: training, supply, and maintenance support of other commands.

RESERVES: Regular 29,500. Volunteer about 600: 1 air movements sqn; 4 def sqns RAF Regt (2 more forming).

Forces Abroad:
Antarctica: Navy: 1 ice patrol ship.
Ascension Island: RAF: *Nimrod*, C-130 tpt, *Victor, Hercules* C-1P tanker dets.
Belize: 1,800. Army (1,400): 1 inf (para) bn, 1 armd recce tp, 1 arty bty, 1 lt AD (*Blowpipe*) tp, 1 engr sqn (part), 1 hel flt (4 *Gazelle* AH-1). Navy: 1 destroyer/frigate (guard ship), 1 spt ship. RAF (200): 1 flt; 4 *Harrier* GR-3 FGA, 4 *Puma* hel, 1 *Rapier* AD det (4 units) RAF Regt.
Brunei: Army: 1 Gurkha inf bn, det hel sqn.
Canada: Army: training and liaison team.
Cyprus: Army 3,500: UNFICYP (819): 1 inf bn less 2 coys, 1 armd recce sqn, 1 hel flt and log spt. Garrison: 1 inf bn plus 2 coys, 1 armd recce (8 tps), 1 engr spt sqns, 1 hel flt. RAF 1,400: 1 hel sqn (incl 1 flt (4 ac) with UNFICYP), periodic dets of other ac, 1 fd sqn RAF Regt.
Egypt (Sinai MFO): 35 technical and administrative personnel.
Falkland Islands: 4,000. Army: 1 bde HQ, 3 inf bns, armd recce sqn, 1 arty, 1 engr (4 fd, 1 spt sqns) regts, 1 sqn army air. Navy: 1 SSN, 1 ASW carrier, 4 escorts, spt and auxiliary ships. RAF: 1 *Phantom* sqn, 1 *Harrier*, 2 *Buccaneer* ac, 2 *Sea King* HAR-3, 1 *Chinook* hel dets, 1 *Rapier* SAM sqn. (Details may vary through the year.)
Germany: British Army of the Rhine (BAOR) 55,000: 1 corps HQ, 3 armd divs, 1 arty div, 8 armd bdes; 3 Army air regts. Berlin Inf Bde 3,100: 3 inf bns, one armd sqn. RAF 10,300; 12 ac sqns: 2 *Phantom* FGR-2; 2 *Buccaneer*, 5 *Jaguar* (1 recce); (to be replaced by 8 sqns of *Tornado*); 2 *Harrier*, 1 *Pembroke* (comms); 1 *Puma*, 1 *Chinook* (tpt); (RAF Regt) 3 *Rapier* SAM, 1 fd sqn.
Gibraltar: Army: 1 inf bn, 1 engr team, 1 arty surveillance, 1 SAM tp. Navy: 1 destroyer, 1 spt ship; Base (to close 1983). RAF 400: periodic ac dets.
Hong Kong: Army 6,650: Gurkha Field Force with 1 Br, 4 Gurkha inf bns, 1 each Gurkha engr, sigs, tpt regts, 1 hel sqn (–) with 12 *Scout* AH-1, spt units incl Hong Kong Military Service Coys (1,256). Navy 600: 5 *Ton* patrol craft, 1 Marine raiding sqn. RAF 250: 1 *Wessex* sqn.
Indian Ocean (intermittent): 1–2 destroyers/frigates, 2 spt ships; Diego Garcia, 1 naval det. Lebanon (multinational force) 87: 1 recce sqn.
Military Advisers: 660 in 26 countries, incl Bahrain, Brunei, Ghana, Kuwait, Mauritius, Nigeria, Oman, Qatar, Saudi Arabia, Sudan, Swaziland, UAE, Uganda, Zimbabwe (58).

CANADA

Population: 24,700,000.
Military service: voluntary.
Total armed forces: 82,858 (6,667 women).[4]
GDP 1981: $C342.76 bn ($US285.895 bn). 1982: $C362.57 bn ($US293.888 bn).
Def exp 1982/3: $C6.963 bn ($US5.644 bn); NATO definition 1982: $US5.989 bn. Est 1983/4: $C7.900 bn ($US6.430 bn); NATO definition n.a.
GNP growth: 3.1% (1981). –4.8% (1982).
Inflation: 12.1% (1981), 9.3% (1982).
$US1 = $C1.1989 (1981), 1.2337 (1982), 1.2287 (1983).

Army (Land Forces): 13,000.[4]
Mobile Command (about 16,000 land and air).[5]
2 bde gps, each comprising:
1 armd regt, 3 inf bns, 1 arty (2 close spt, 1 AD btys), 1 engr regts, spt units.
1 special service force (4,000) comprising:
1 armd regt, 1 inf bn, 1 AB, 1 arty, 1 engr regts, 1 spt unit.
1 mech bde gp (under command Canadian Forces, Europe) comprising:
1 armd regt, 2 mech inf bns, 1 med SP arty, 1 mech engr regts, 1 spt unit, 1 lt hel sqn.
114 *Leopard* C-1 MBT; 100 *Lynx*, 180 *Cougar* AFV, 955 M-113, 237 *Grizzly* APC; 12 105mm pack, 159 105mm towed, 50 M-109 155mm SP how; 633 *Carl Gustav* 84mm RCL; 108 *TOW* ATGW; 48 40mm AA guns; 122 *Blowpipe* SAM.

RESERVES: about 16,000 Militia; 131 combat arms units and spt units (all in Mobile Command), plus 1,560 in Communications Reserves. (Reserve strength (all components) to increase to 40,000 by end 1989.)

Navy (Maritime Forces): 5,500.[4]
Maritime Command (about 8,700)[5]
3 *Oberon* subs.
23 ASW destroyers: 4 DD-280, each with 2 *Sea King* hel, 2 × 4 *Sea Sparrow* SAM; 2 *Annapolis*, 6 *St Laurent* with 1 *Sea King* hel; 4 *Improved Restigouche*, 4 *Mackenzie* with *ASROC*, 3 *Restigouche* (in reserve).
3 replenishment spt ships, each with 3 *Sea King* hel.
6 coastal patrol ships (trg).
6 small patrol craft.

DEPLOYMENT AND BASES:
Atlantic: 3 subs, 13 destroyers (1 in reserve), 2 replenishment spt ships. Halifax.
Pacific: 10 destroyers (2 in reserve), 1 replenishment spt ship. Esquimalt.

RESERVES: about 3,250.

Air Forces: 15,300;[4] some 150 combat ac, 32 combat hel.
Air Command: (23,000).[5]
1 Air Group (1 CAG, Germany):
3 fighter sqns with 42 CF-104/-104D (to get 54 CF-188 (F-18)).
Fighter Group:
2 FGA sqns with 20 CF-116 (F-5A), 4 C-116D (F-5D) (NATO assigned).
1 trg sqn with 4 CF-116, 21 CF-116D.
1 trg sqn (forming: to get 8 CF-188 (F-18A), 15 CF-188D (F-18B); (10 CF-188 on inventory, mid-1983).
3 AD sqns with 38 CF-101 *Voodoo* (2 to get CF-188; trg sqns to augment).
1 ECM trg sqn with 3 CC-117 (*Falcon* 20, to be 5); 17 CT-133.
4 main, 17 auxiliary sites of Distant Early Warning (*DEW*) Line; Semi-Automatic Ground Environment (SAGE).
24 long-range radar sites (*CADIN/Pine Tree Line*).
1 space tracking and identification site.
10 Tactical Air Group (10 TAG):
6 hel sqns with 31 CH-135 (UH-1N), 36 CH-136, 7 CH-147 (*Chinook*).
Maritime Air Group:
3 maritime patrol sqns: 18 CP-140 *Aurora*.
1 MR, 1 reserve sqns: 15 CP-121 *Tracker* (4 in reserve).
2 ASW and 1 trg hel sqns: 32 CH-124 (*Sea King*).
2 utility sqns: 9 T-33, 3 CP-121 ac, 2 CH-135 hel.
Air Transport Group:
5 tpt sqns: 3 with 26 CC-130E/H; 1 with 5 CC-137 (Boeing 707); 1 with 7 CC-109 *Cosmopolitan*, 4 CC-117 *Falcon*, 2 CC-132 (DHC-7R) (getting 2 CC-144 *Challenger*).
4 tpt/SAR sqns with 11 CC-115 (DHC-5), 8 CC-138 (DHC-6) ac; 3 CH-113 *Labrador*, 7 CH-113A *Voyageur*, 3 CH-135 (UH-1N) hel.
1 SAR hel unit with 3 CH-113.
4 base hel flts with 9 CH-118 *Iroquois*, 2 CH-135.
Training Group:
3 schools: 1 with 18 CT-134 *Musketeer* ac, 14 CH-139 hel; 1 with 83 CT-114 *Tutor;* 1 with 2 CT-134, 17 CT-114; 2 CC-129 (C-47).
1 demonstration unit with 11 CT-114.
(On order: 138 CF-188 (113 F-18A, 25 -18B) *Hornet* fltrs; 2 CC-144 (Canadair *Challenger*).)

RESERVES: 950. Air Reserve Group; 2 wings with 16 CH-136 hel. Other ac incl 16 CF-104, 2 CF-104D, 3 CC-129.

Forces Abroad:
Europe: 6,700; HQ (1,440); 1 mech bde gp (3,200) with 59 *Leopard* 1 MBT, 375 M-113 APC/recce, 24 M-109 155mm SP how, 40 *TOW* ATGW, 50 40mm AA guns, 70 *Blowpipe* SAM, 11 CH-136 *Kiowa* hel. (Plus about 1,300 HQ and spt tps); 2,500 reinforcements in Canada.
1 Air Group (760): 3 fighter sqns with 42 CF-104/-104D (54 CF-188 to replace); 1 det with 2 CC-132 and 4 CT-133 liaison ac.
Cyprus (UNFICYP): 515.
Syria/Israel (UNDOF): 220.
Other Middle East (UNTSO): 20.

Para-Military Forces:
Coast Guard: 6,561 (civilian-manned): 19 icebreakers, 14 patrol craft, 2 DHC-7R ac, 35 hel, 3 SRN-5/-6 hovercraft.
Canadian Rangers: 1,300.

DENMARK

Population: 5,120,000.
Military service: 9 months.
Total armed forces: 30,700 (670 women; 9,400 conscripts).
GDP 1981: Kr 414.82 bn ($58.233 bn). 1982: 469.78 bn ($56.380 bn).
Def exp 1982: Kr 11.151 bn ($1.338 bn);[6] NATO definition $1.122 bn. 1983: 10.314 bn[7] ($1.171 bn); NATO definition: $1.221 bn.
GDP growth: −0.2% (1981), −2.5% (1982).
Inflation: 12% (1981), 9% (1982).
$1 = kroner 7.1234 (1981), 8.3324 (1982), 8.8072 (1983).

Army: 17,500 (6,600 conscripts).
2 div HQ.
5 mech inf bdes, each with 1 tk, 2 mech, 1 arty bns, 1 AD bty, 1 engr coy, spt units.
5 regimental combat teams, each with 2 inf, 1 arty bns, 1 ATK gp, indep recce bns.
1 Army aviation unit, some 8 platoons.
120 *Leopard* 1, 88 *Centurion* MBT; 48 M-41 lt tks; 650 M-113, 68 M-106 mor-armed APC; 24 155mm guns; 144 105mm, 96 155mm, 12 M-115 203mm towed, 72 M-109 155mm SP how; 81mm, 120mm mor; 400 *Carl Gustav* 84mm, 252 106mm RCL; *LAW* RL; 84 *TOW* ATGW; 36 L/60 40mm AA guns; *Hamlet (Redeye)* SAM; 8 Saab T-17 lt ac; 12 Hughes 500M hel.

RESERVES: Augmentation Force 6,000, subject to immediate recall; Field Army Reserve 35,000, comprising 15,000 Covering Force Reserve (to bring units to war strength and add 1 mech bn to each bde) and 20,000 to provide combat and log spt; Regional Defence Force 24,000 (being reorganized into 7 regimental combat teams) with 21 inf, 2 tk, 7 arty bns, ATK sqns, spt units; Army Home Guard 60,400 (8,400 women).

Navy: 5,800 (1,300 conscripts).
5 subs: 2 *Narhvalen*, 3 *Delfinen*.
5 frigates with 2 × 4 *Harpoon* SSM, *Sea Sparrow* SAM: 2 *Peder Skram*, 3 *Niels Juel*.
5 *Hvidbjørnen* fishery-protection frigates (4 with 1 *Lynx* hel).
10 *Willemoes* FAC(M) with *Harpoon* SSM.
6 *Søløven* FAC(T) (5 in reserve).
22 large patrol craft: 8 *Daphne*, 3 *Agdlek*, 2 *Maagen*, 9 *Barsø*.
5 *Botved* coastal patrol craft<.
7 minelayers: 4 *Falster*, 2 *Lindormen*, 1 *Langeland*.
6 US Type 60 coastal minesweepers.
Coastal defence unit: 2 coastal fortresses with 155mm guns.
Air: 7 *Lynx* hel (4 embarked).
(On order: 4 Type 210 subs, *Harpoon* SSM, *Sea Sparrow* SAM.)

Bases: Copenhagen, Korsør, Frederikshavn.

RESERVES: 3,800; Navy Home Guard 5,200 (1,500 women): 37 coastal patrol craft.

Air Force: 7,400 (1,500 conscripts); some 116 combat ac.
Tactical Air Command:
2 FGA sqns with 32 F-16A/B.
1 FGA/interceptor sqn with 16 F-35XD, 4 TF-35 *Draken*.
1 FGA/recce sqn with 16 RF-35XD, 4 TF-35 *Draken*.
2 interceptor sqns with 32 F-104G (converting; some 12 F-16A/B).
Air Materiel Command:
1 tpt sqn, 3 comms flts, with 3 C-130H, 3 *Gulfstream* III, 7 Saab T-17.
1 SAR sqn with 8 S-61A hel.
Flying School: 15 T-17.
AD gp: 1 SAM bn, 4 btys with 24 *Improved HAWK*.
AAM: *Sidewinder*.
ASM: *Bullpup*.
(On order: 10 F-16A/B ftrs, 200 AIM-9L *Sidewinder* AAM.)

RESERVES: 9,400; Air Force Home Guard 12,400 (1,800 women).

Forces Abroad:
Cyprus (UNIFICYP); 1 bn (326).

FRANCE

Population: 54,270,000.
Military service: 12 months; 18 months for overseas.
Total armed forces: 492,850[8] (12,320 women; 253,200 conscripts).
GDP 1981: F fr 3,087.5 bn ($568.119 bn). 1982: 3,531.7 bn ($537.353 bn).
Est def exp 1982: F fr 122.855 bn ($18.693 bn); NATO definition: $21.969 bn. 1983: 133.22 bn ($17.929 bn); NATO definition $21.381 bn.[9]
GDP growth: 0.4% (1981), 1.6% (1982).
Inflation: 11.8% (1981), 12.1% (1982).
$1 = francs 5.4346 (1981), 6.5724 (1982), 7.4301 (1983).

Strategic Nuclear Forces: (19,700; some 2,800 Army, 5,500 Navy, 10,600 Air Force, 800 *Gendarmerie*).
SLBM: 5 SSBN, each with 16 M-20 msls (1 more building) (M-4 msl to replace M-20), 1 diesel experimental/trials boat with 4 SLBM tubes.
IRBM: 18 SSBS S-3 msls in 2 sqns.
Aircraft:
Bombers: 6 sqns with 34 *Mirage* IVA (AN-22 nuclear bombs); 18 to convert to ASMP nuclear weapon.
3 trg sqns: 1 recce with 4 *Mirage* IVP; 1 with 13 *Mirage* IIIB/BRV; 1 with 5 *Noratlas* N-2501/SNB.
Tankers: 1 wing (3 sqns) with 11 KC-135F.
Reserve: 9 *Mirage* IVA (4 recce).
(On order: 1 SSBN, 16 M-4 SLBM, ASMP ASM.)

Army: 311,200, incl Army Aviation, 6,700 women (195,000 conscripts).
1 army HQ, 3 corps HQ.
8 armd divs.
4 motor rifle divs.
1 alpine div (9,100): 2 regts.
Quick Reaction Force (FAR): (23,000; 12,600 conscripts):
1 para div (13,700); 10 regts, 1 bn.
1 air portable marine div (8,500): 7 regts.
1 lt armd bde (overseas intervention; 2,700): 1 mot inf, 1 inf regts.
Berlin sector force (2,000): (1 armd, 1 inf regts).
Army corps regts: 5 recce, 2 drone, 3 motor rifle, 5 arty, 5 SSM with *Pluton*, 8 SAM (3 (11 btys) with 69 *HAWK*, 5 (each of 2 btys) with *Roland* I/II and twin 30mm AA guns), 7 engr, 10 sigs, 8 tpt.
3 log bdes.
Indep regts: 1 EW, 2 para, 4 engr.
AFV: 1,210 AMX-30, 30 -30B2 MBT; 1,010 AMX-13 lt tks; 189 AMX-10RC, 428 Panhard EBR hy, 680 AML lt armd cars; 774 AMX-10P/PC MICV; 1,170 AMX-13 VTT, 1,974 VAB, 42 VAB (*HOT*) APC.
Arty: 165 HM-2, 218 BF-50 155mm towed, 184 AU-50 105mm, 216 F-3 155mm SP how; 19 GCT 155mm SP guns; 46 *Pluton* SSM; 471 120mm mor.
ATK: 83 SS-11, 1,400 *Milan*, 156 *ENTAC* ATGW, 11,153 89mm RL.
AD: 180 20mm, 390 30mm and 40mm towed, 69 twin 30mm SP AA guns; 69 *HAWK*, 116 *Roland* SAM.
Air: 1 R-20, 7 CL-89 recce drones.

ARMY AVIATION (ALAT): (6,600).
6 combat hel regts: 7 lt gps, 2 schools. 206 *Alouette* II, 68 *Alouette* III with AS-11 ATGW; 134 SA-330 *Puma*, 175 SA-341F and 86 SA-342M *Gazelle* hel with *HOT*; 19 *Broussard*, 40 L-19 lt ac.
(On order: 800 AMX-30/B2 MBT; 110 ERC-90S armd cars; 830 AMX-10 MICV; 270 155mm GCT SP guns; 150 TR 155mm how; 330 *HOT* (VAB and *Gazelle*), 1,500 *Milan* ATGW; 780 20mm AA guns; 320 SA-341/-342 hel.)

RESERVES: 281,000 (13 inf divs, 3 formed from military schools; unit equivalents of 65 regts).

Navy: 68,000 incl Naval Air (800 women; 17,500 conscripts); 46 major surface combat vessels. 4 comds: 2 home (CECLANT, CECMED), 2 overseas.
18 attack subs: (1 *Rubis* SSN; 4 *Agosta*, 9 *Daphne*, 4 *Narval*).
2 *Clemenceau* carriers: 1 attack with 39 ac (2 flts with 24 *Super Etendard*, 1 with 8 F-8E, 1 with 3 *Alizé*, 1 det with 4 *Etendard* IVP), 2 hel; 1 ASW (LPH) with 40 hel.
1 hel carrier (capacity 8 *Lynx* hel) with 6 *Exocet* SSM (trg).
1 command cruiser with 4 *Exocet* SSM, 1 × 2 *Masurca* SAM.
20 destroyers: 5 AA (2 *Suffren* with 4 *Exocet*, 1 *Malafon* ASW/SSM, 1 × 2 *Masurca* SAM; 3 T-47 with 1 *Tartar* SAM); 15 ASW (4 C-70 with 4 *Exocet*, 1 × 8 *Crotale* SAM, 2 *Lynx* hel; 3 F-67 with 6 *Exocet*, 1 × 8 *Crotale*, 1 *Malafon*, 2 *Lynx;* 1 T-56 with 1 *Malafon*, 1 hel; 1 T-53 with 4 *Exocet*, 1 *Lynx;* 5 T-47 with 1 *Malafon;* 1 C-65 with 4 *Exocet*, 1 *Malafon*).
25 frigates: 9 *Rivière* (8 with 4 *Exocet*); 16 Type A-69 (4 with 2 *Exocet*, 5 with 4).
5 FAC(M): 4 *Patra;* 1 *La Combattante* I with 1 × 4 SS-12.
5 large patrol craft: 1 *Sirius*, 4 Cdn *La Dunkerquoise*.
1 *Eridan*, 5 *Circe* minehunters, 5 US *Aggressive* ocean minehunters.
10 coastal minesweepers; 5 *Berlaimont*, 5 Type D.
6 assault ships: 2 *Ouragan* (with 3/4 *Super Frelon* or 10/13 *Alouette* hel, 9 LCM or 2 LCT), 4 *Batral*.
5 LST, 11 LCT, 30 LCM.
6 ocean-going tankers, 6 maintenance/log ships.
Msls: SSM: MM-38, MM-40 *Exocet*, SS-12; SM-39 sub-launched to be introduced; ASW/SSM; *Malafon;* SAM: *Crotale, Masurca, Tartar*.

Bases: Cherbourg, Brest, Lorient, Toulon.

DEPLOYMENT: *Atlantic Fleet:* 5 SSBN, 9 other subs, 1 hel carrier, 22 surface combatants; *Mediterranean Fleet:* 1 SSN, 8 subs, 2 carriers, 14 surface combatants.
See also *Forces Abroad* below.

NAVAL AIR FORCE: (13,000); 167 combat ac, 41 combat hel.
3 strike sqns with 36 *Super Etendard* (AN-52 nuclear weapons; ASMP on order).
1 interceptor sqn with 15 F-8E (FN) *Crusader*.
2 ASW sqns with 16 *Alizé* (mod) (10 more to be modernized).
5 MR sqns with 34 *Atlantic*, 2 *Gardian*.
1 recce sqn with 8 *Etendard* IVP.
1 OCU with 12 *Etendard* IVM, 12 *Magister*, 5 *Alizé*.
3 ASW hel sqns with 19 *Lynx*.
2 assault hel sqns with 13 *Super Frelon*.
1 overseas section with 3 SP-2H *Neptune* MR, 1 det with 2 C-47D tpts.
4 comms sections: 1 with 5 *Paris* 8, 4 *Falcon* 10MER; 3 with 11 *Navajo*, 14 Nord 262, 2 *Falcon* 10MER.
2 comms/SAR/trg hel sections with 20 *Alouette* II/III.
1 trials unit with 3 *Alouette* II/III, 2 *Lynx*, 2 *Super Frelon*.
3 trg units: 1 with 3 Nord 262; 5 15C-47D, 2 Nord 262; 1 with 8 EMB-121 *Xingu*.
3 liaison/trg sections with 15 *Rallye* 100S, 6 CAP-10.
ASM: AM-39 *Exocet*, AS-11/-12/TT-30, AS-37 *Martel*.
AAM: R-530, *Sidewinder*, R-550 *Magic*.
(On order: 5 SSN, 5 C-70 destroyers (3 ASW, 2 AA), 3 A-69 frigates, 8 FAC(M), 12 minehunters, 8 P-400 patrol craft, 1 LCT, 10 LCM, 1 ocean tanker, 9 fishery protection vessels, 20 *Super Etendard* ftrs, 16 *Atlantic* NG, 3 *Gardian* MR, 5 *Xingu* tpt ac, 14 *Lynx* HAS-4 hel, 21 SM-39 *Exocet* sub-launched SSM, 14 *Crotale* 8B SAM.)

COMMANDOS: (590): 4 assault units (1 reserve), 1 sub spt unit.

NAVAL BASE DEFENCE FORCE: (3,100).

PUBLIC SERVICE FORCE: (FSMC): Naval personnel, general coastguard duties; 1 *Sterne*, 1 *Mercure* large patrol craft (9 more planned; 5 will be deployed abroad).

RESERVES: 64,000.

Air Force: 100,400 (5,000 women, 38,500 conscripts); 522 combat ac.
Air Defence Command (CAFDA): (10,700).
10 interceptor sqns: 2 with 29 *Mirage* IIIC (1 in Djibouti), 8 with 120 *Mirage* F-1C; 1 OCU with 15 *Mirage* F-1B.
4 liaison flts with 30 *Magister* and *Broussard*.
Air-defence system: automatic *STRIDA* II, 10 radar stations.
12 SAM (1 trg) sqns with 24 *Crotale* btys (48 fire, 24 radar units).
160 AA btys (20mm guns).
AAM: R-530, Super 530F, R-550 *Magic*, *Sidewinder*.
Tactical Air Force (FATAC): (15,000).
5 strike sqns: 3 with 45 *Jaguar*, 2 with 30 *Mirage* IIIE tactical (AN-52 nuclear weapons).
12 FGA sqns: 5 with 75 *Mirage* IIIE, 2 with 30 *Mirage* 5F, 5 with 75 *Jaguar* A (23 *Jaguar* A, 12 E in reserve).
3 recce sqns: 2 with 30 *Mirage* IIIR/RD; 1 with 15 *Mirage* F-1CR.
2 OCU: 1 with 21 *Mirage* IIIB/BE, 1 with 15 *Jaguar* A/E.
8 liaison flts with *Magister, Broussard*.
AAM: *Sidewinder*, R-550 *Magic*, R-530.
ASM: AS-30/-30L, AS-37 *Martel*.
Attached to COTAM:
1 AEW sqn with 8 *Noratlas*.
3 liaison sqns with *Magister, Broussard*.
1 hel sqn with 13 *Alouette* II/III.
Air Transport Command (COTAM): (7,000).
1 hy tpt sqn with 4 DC-8F.
6 tac tpt sqns: 4 with 48 Transall C-160, 13 C-160NG, 2 with 25 *Noratlas*.
14 lt tpt/liaison sqns with 140 ac, incl 24 Nord 262, 8 *Mystère* 20, 1 *Mystère* 50, 20 *Paris*, 23 *Broussard*, 10 DHC-6, 4 *Caravelle*.
1 OCU with 10 *Noratlas*.
5 hel sqns with 32 *Alouette* II, 23 *Alouette* III, 21 *Puma*.
1 hel OCU with 19 *Alouette* II, 10 *Alouette* III, 5 *Puma*.
Training Command (CEAA): (16,000).
Some 400 ac, incl some 120 *Alpha Jet*, 167 *Magister*, MD-312 *Flamant*, *Noratlas*, 16 EMB-121, 12 *Xingu* (replacing MD-312), 51 CAP-10B/-20.
Trials units: 1 sqn with *Mirage* III/F-1, *Jaguar;* 1 sqn with 4 *Noratlas*.
Base Defence Force: (6,900); 75 VAB APC.
(On order: 5 *Mirage* F-1B, 32 F-1C, 64 F-1CR, 78 *Mirage* 2000 ftrs; 25 *Alpha Jet* trg ac; 10 Transall C-160, 3 DHC-6-300 tpts; 13 *Xingu*, 150 *Epsilon* trg ac; 10 hel, 56 20mm AA guns; SATCP SAM.)

RESERVES: 56,000.

Forces Abroad:
Europe. *Germany:* 48,500; 3 armd divs. *Berlin:* 2,700; 1 armd regt, 1 inf regt.

Overseas Dependencies: 16,500; Army 9,800, Navy 2,000, Air 1,700, *Gendarmerie* 3,000. Four inter-service overseas commands: Antilles-Guyana (1 marine, 3 inf regts, 1 inf bn, 2 ships); South Indian Ocean (2,700; 1 para, 1 inf, 1 marine regts, 1 inf coy); New Caledonia (1 marine inf regt); Polynesia (1 marine, 1 inf regts). Two naval commands: Indian Ocean (ALINDIEN: 3,500, 8 ships), Pacific (ALPACI, 4 surface combatants, 5 amph ships).
Other Overseas: some 7,220 from all services (numbers vary according to local circumstances). Eqpt incl 120 AFV, 13 combat, 18 spt vessels, 25 combat and 25 tpt ac, 43 hel.
Deployed:
Central African Republic (1,100). Para, Legion marine units; armd cars, 120mm mor, *Milan* ATGW; 1 hel sqn with 7 *Puma*; 2 C-160 tpt ac.
Djibouti (3,250). 6 inf coys, 4 armd sqns, 2 arty (1 AA) btys; 1 sqn with 10 *Mirage* IIIC; naval elms.
Gabon (450). 1 marine inf bn; 4 *Jaguar*, 3 C-160, 1 *Atlantic* ac.
Ivory Coast (900). 1 marine inf bn.
Middle East. Lebanon. UNIFIL (911): 1 inf bn, engr coy, log unit. Multi-national Force (2,000): 1 para bde. Sinai MFO (72).
Saudi Arabia (80). Technical advisers.
Senegal (1,170). 1 marine inf bn.
Zaire (128). Trg team.

Para-Military Forces: Gendarmerie 85,000 (incl 605 women, 8,700 conscripts, 950 civilians); 3,676 territorial squads, 128 intervention units; 5 highway, 93 general traffic units, 20 sqns; 130 mobile sqns; 240 overseas units. 37 AMX-13/75 lt tks; 121 AML. 3 VBC-90 armd cars; 33 AMX-13 VTT, 155 VRBG APC; 284 81mm mor; 11 patrol boats; 6 Cessna 206C ac; 32 *Alouette* II/III, 6 *Ecureuil* hel. (On order: VBC-90 armd cars, hel.) *Service de Santé* 6,900 (230 conscripts).

GERMANY: FEDERAL REPUBLIC

Population: 61,600,000 (incl West Berlin).
Military service: 15 months.
Total armed forces: 495,000 (70 women, 236,000 conscripts);[10] on mobilization about 1,250,000.
GDP 1981: DM 1,543.9 bn ($683.142 bn). 1982: 1,599.5 bn ($659.153 bn).
Est def exp 1982: DM 44.373 bn ($18.286 bn); NATO definition $22.481 bn. 1983: 46.734 bn ($18.934 bn); NATO definition n.a.
GNP growth: −0.2% (1981), −1.1% (1982).
Inflation: 6.3% (1981), 4.6% (1982).
$1 = DM 2.2600 (1981), 2.4266 (1982), 2.4682 (1983).

Army: 335,500 (185,000 conscripts).
HQ Support Elements: 32,500: General Army Office subordinate echelon and spt tps, Federal Armed Forces Supreme Command.
Field Army: 265,000.
3 corps: 12 divs (6 armd, 4 armd inf, 1 mountain, 1 AB):
36 bdes: 17 armd (each with 3 tk, 1 armd inf, 1 armd arty bns), 15 armd inf (each with 1 tk, 3 armd inf, 1 armd arty bns), 1 mountain, 3 AB.
Total: 67 tk, 62 armd inf, 4 mountain, 9 para bns.
3 AD regts with *Roland* II SAM.
11 AA regts with *Gepard* 35mm SP guns.
4 SSM bns with *Lance*.
3 army aviation comds, each with 1 lt, 1 med tpt hel regt: 1 ATGW hel regt.
Territorial Army: 38,000.
3 Territorial Commands, 6 Military Districts:
6 Home Defence bdes (each with 2 tk, 2 inf, 1 arty bns, and manned average 65%).
6 Home Defence bdes (each with 1 tk, 2 inf, 1 fd arty bns): weapons storage units only in peacetime.
Security troops: 15 Home Defence Regiments (with 45 mot inf bns), 150 coys, 324 security platoons; defensive, comms, military police, and service units on mobilization.
AFV: 1,232 M-48A2/A2C/A2G2, 2,437 *Leopard* 1, 585 *Leopard* 2 MBT; 411 SPz-2 *Luchs*, 563 SPz 11-2, 2,136 *Marder* MICV; 510 TPZ-1, 4,016 M-113 APC.
Arty: 191 105mm, 216 FH-70, 586 M-109 155mm how, 31 M-107 175mm guns (being rebarrelled with 203mm), 195 M-110A2 203mm SP how; 987 120mm mor (500 SP); 209 *LARS* 110mm MRL; 26 *Lance* SSM.
ATK: 770 JPz 4-5 90mm SP ATK guns; 204 106mm RCL; 1,975 *Milan*, 346 *TOW* ATGW, 316 RJPz-*(HOT) Jaguar* 1 SP ATGW.
AD: 1,748 20mm towed, 426 *Gepard* 35mm SP AA guns; 800 *Redeye*, 100 *Roland* SAM.
Air: 190 UH-1D, 169 *Alouette* III, 132 PAH-1 (BO-105P with *HOT*), 64 BO-105M, 107 CH-53G hel.
(On order: 1,215 *Leopard* 2 MBT; 486 TPZ-1 APC; 2 227mm MLRS MRL; 162 RJPz-*(TOW) Jaguar* 2 ATGW veh; 50 *Roland* II SAM; 80 PAH-1, 36 BO-105M hel.)

Navy: 36,400, incl naval air (11,000 conscripts).
24 subs: 18 Type 206, 6 Type 205.
7 destroyers: 3 *Lutjens* (Type 103A) with 1 *Tartar* SSM and 8 *ASROC*; 4 *Hamburg* (Type 101A) with 2 × 2 *Exocet* SSM.
7 frigates: 3 *Bremen* (Type 122) with 2 × 4 *Harpoon* SSM, 1 × 8 *Sea Sparrow*, 2 *Stinger* SAM, 2 *Lynx* hel; 4 *Köln* (Type 120).
6 corvettes: 5 *Thetis*, 1 *Hans Bürkner* (trials ship).
33 FAC(M) with 4 *Exocet* SSM: 10 Type 143, 3 T-143A, 20 Type 148.
5 Type 142 FAC(T) (T-143A FAC(M) to replace).
18 *Lindau* MCM: 12 Type 331A coastal minehunters (MHC), 6 Type 351 *Troika* drone control minesweepers (MSCD), 18 F-1 drone vessels (MCD).
21 *Schütze* coastal minesweepers.
18 inshore minesweepers: 4 Type 393/394B, 14 Type 393/394A.
10 *Rhein* depot, 8 *Lüneberg* spt ships; 4 tpts, 9 tankers.
22 Type 520 LCU, 26 Type 521 LCM.
(On order: 3 Type 122 frigates, 7 Type 143A FAC(M), 126 RIM-7M *Sea Sparrow* SAM.)

Bases: Flensburg-Murwik, Wilhelmshaven, Kiel, Olpenitz, Eckernforde.

NAVAL AIR ARM: 123 combat ac; 12 combat hel.
3 attack sqns with 43 F/TF-104G, 34 *Tornado* (2 sqns converting).
1 recce sqn with 27 RF-104G.
2 MR sqns with 14 *Atlantic*, 5 ELINT *Atlantic*.
1 ASW hel sqn with 12 *Sea Lynx* Mk 88.
1 SAR hel sqn with 22 *Sea King* Mk 41.
1 utility sqn with 20 Do-28-2 ac.
ASM: AS-30, AS-34 *Kormoran*.
(On order: 78 *Tornado* MRCA.)

Air Force: 105,900 (40,000 conscripts); 501 combat ac.
Tactical Command (GAFTAC): 469 combat ac.
19 FGA sqns: 6 with 108 F-104G; 4 with 60 F-4F; 2 converting, 30 *Tornado*; 7 with 126 *Alpha Jet* (48 more in reserve).
4 interceptor sqns with 60 F-4F.
4 recce sqns with 60 RF-4E.
1 OCU with 18 *Tornado*, 7 HFB-320 *Hansa Jet* ECM trg.
8 SSM sqns with 72 *Pershing* 1A.
3 SAM regts (each 2 bns of 4 btys) with 216 *Nike Hercules* launchers.
3 SAM regts (each of 3 bns of 4 btys) with 216 *Improved HAWK* launchers.
4 aircraft control and warning regts.
AAM: *Sidewinder*.
Transport Command (GAFTC).
4 tpt sqns with 86 Transall C-160 (some in reserve).
5 hel sqns with 114 UH-1D.
1 special air mission wing with 4 Boeing 707-320C, 3 C-140 *Jetstar (Challenger* to replace), 6 HFB-320 *Hansa Jet*, 3 VFW-614, 6 Do-28-2 *Skyservant* ac, 4 UH-1D hel.
Training: 32 combat ac.
Trinational *Tornado* trg det (Cottesmore, Britain): 22 *Tornado*.
OCU (George Air Force Base, US): 10 F-4E.
Pilot trg wing (Sheppard Air Force Base, US): 35 T-37B, 41 T-38A.
Primary trg unit: 34 P-149D.
Miscellaneous liaison, range, and base flts with 92 Do-28D.
(On order: 140 *Tornado* FGA.)

RESERVES: 750,000 (all services).

Para-Military Forces: Border Police (Ministry of Interior): 20,000; FV-601(D) *(Saladin)* armd cars, MOWAG SW-1/-2 APC; 2 P-149D, 1 Do-27A-3 ac, BO-105M, 21 *Alouette* II hel.

GREECE

Population: 9,900,000.
Military service: Army 22, Navy 26, Air Force 24 months.
Total armed forces: 185,000 (834 women; 137,000 conscripts).
GDP 1981: dr 2,043.2 bn ($36.876 bn). 1982: 2,562.5 bn ($38.359 bn).
Est def exp 1982: dr 134.694 bn ($2.016 bn); NATO definition $2.574 bn. 1983: 151.80 bn ($1.805 bn); NATO definition n.a.
FMA 1982: $310 m.
GDP growth: −0.7% (1981), −1.3% (1982).
Inflation: 22.5% (1981), 19.1% (1982).
$1 = drachmas 55.408 (1981), 66.803 (1982), 84.087 (1983).

Army: 142,000 (110,000 conscripts) (being reduced).
3 Military Regions, 4 corps HQ.
1 armd div.
1 mech div.
11 inf divs.
1 para-cdo div (2 para, 1 cdo, and 1 marine regts, 3 cdo bns).
3 armd bdes.
13 fd arty bns.
7 AA arty bns.
2 SSM bns with 8 *Honest John*.
2 SAM bns with *Improved HAWK*.
2 army aviation bns.
4 indep aviation coys.
AFV: 350 M-47, 818 M-48, 285 AMX-30, some 10 *Leopard* 1A4 MBT; 190 M-24 lt tks; 180 M-8 armd cars; 240 AMX-10P MICV; 160 *Leonidas*, 120 M-2, 460 M-3 half-track, 460 M-59, 832 M-113 APC.
Arty: 600 25-pdr (88mm), 36 M-107 175mm guns; 108 75mm pack, M-56 105mm, 180 M-101 105mm, 270 M-114A1 155mm, 72 M-115 203mm towed, 126 M-52A1 105mm, 54 M-44, 60 M-109A2 155mm, 20 M-110 203mm SP how; 36 *Honest John* SSM; M-18 57mm, 200 M-20 75mm, M-67 90mm, 700 106mm RCL; 120mm mor.
ATK: 64 M-18, 32 *Kuerassier* 105mm SP ATK guns; SS-11, *Cobra*, *TOW*, *Milan* ATGW.
AD: RH-202 twin 20mm, 40mm, 57mm AA guns; 36 *Improved HAWK* (108 msls), *Redeye* SAM.
Air: 1 *Super King Air*, 2 Aero *Commander*, 50 U-17A ac; 5 CH-47C, 5 Bell 47G, 22 UH-1D, 50 AB-204B/-205 hel.
(On order: some 96 *Leopard* 1A3 MBT, 51 M-113A2, 48 M-109A2 155mm SP how, 350 90mm RCL.)

RESERVES: about 350,000, incl some 100,000 National Guard. 3 Territorial, 17 Sub-Commands: 12 indep inf bdes, some 100 Home Guard bns (mainly coastal defence); lt tks; M-20 armd cars; M-2, M-3 half-track APC; 75mm pack, 25-pdr (88mm), 105mm guns/how; M-18 57mm, 200 M-20 75mm, 106mm RCL; 40mm AA guns.

Navy: 19,500 (12,000 conscripts); 14 combat hel.
10 subs: 8 Type 209, 2 ex-US *Guppy* III/IIA.
14 US destroyers: 7 *Gearing* (5 with 1 × 8 *ASROC*, 1 with 1 *Alouette* III hel), 1 *Sumner*, 6 *Fletcher*.
7 frigates: 2 *Kortenaer* (8 *Harpoon* SSM, *Sea Sparrow* SAM, 2 AB-212 hel), 4 US *Cannon*, 1 *Rhein*.
16 FAC(M): 14 *La Combattante* II/III (8 with 4 *Exocet*, 6 with 6 *Penguin* SSM), 2 *Liesterel* with 2 *Penguin*.
11 FAC(T); 6 *Jaguar*, 5 *Nasty*<.
8 coastal patrol craft (6<).
2 coastal minelayers, 14 coastal minesweepers (9 MSC-294, 5 US *Adjutant*).
1 LSD, 7 LST, 5 LSM, 2 LCT, 8 LCU, 13 LCM, 14 LCA, 34 LCVP.
2 ASW hel sqns: 1 with 10 AB-212, 1 with 4 *Alouette* III.

Bases: Salamis, Suda Bay.

RESERVES: about 24,000.

Air Force: 23,500 (15,000 conscripts); 287 combat ac.
Tactical Air Force: 7 combat wings; 1 tpt wing.
6 FGA sqns: 3 with 52 A-7H, 6 TA-7H; 2 with 41 F/TF-104G; 1 (reserve) with 15 F-84F.
7 interceptor sqns: 3 with 53 F-4E; 2 with 40 F-5A/B; 2 with 36 *Mirage* F-1CG.
2 FGA/recce sqns: 1 with 15 RF-84F; 1 with 6 RF-4E, 15 RF-84F.
1 MR sqn with 8 HU-16B *Albatross* (with Navy).
3 tpt sqns with 12 C-130H, 6 YS-11, 7 C-47, 21 *Noratlas*, 1 *Gulfstream*, 7 CL-215.
9 base flts with 6 C-47, 48 T-33A ac, 8 AB-205A hel.
3 hel sqns with 6 AB-205A, 3 AB-206A, 10 Bell 47G, 8 UH-19D, 2 AB-212, 10 CH-47C.
Air Training Command:
4 sqns: 1 with 20 T-41A; 1 with 24 T-37B/C; 2 with 38 T-2E.
AAM: *Sparrow*, *Sidewinder*, *Super Sidewinder*, *Falcon*, R-550 *Magic*.
ASM: *Maverick*, *Bullpup*.
1 SAM wing: 1 gp with 36 *Nike Ajax*.
(On order: some 10 F-104G, 280 AIM-7M *Sparrow*, 300 *Super Sidewinder* AAM, 200 *Maverick* ASM, 40 *Skyguard* AD systems plus 4 extra twin 35mm AA guns.)

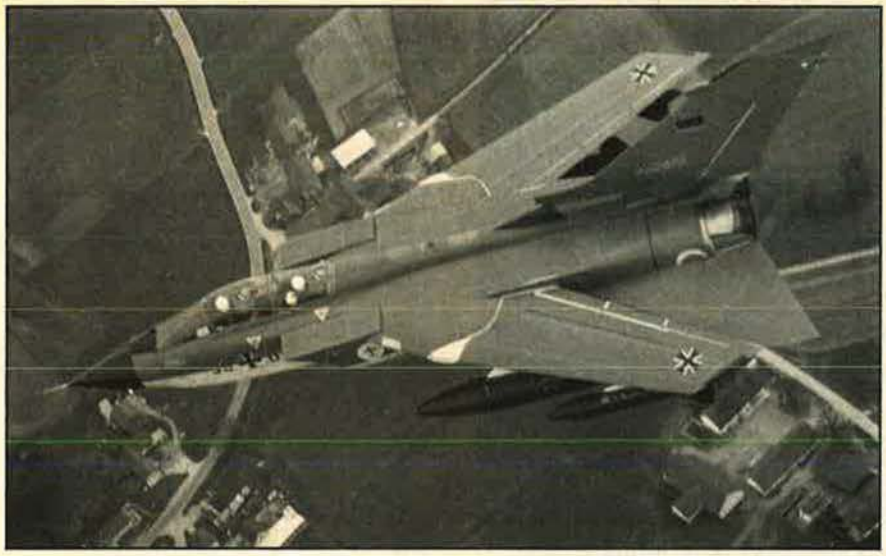
RESERVES: about 30,000.

Forces Abroad: Cyprus: 1,300 incl 350 cdos; 450 officers/NCOs seconded to Greek-Cypriot forces.

Para-Military Forces: Gendarmerie: 25,000; MOWAG *Roland*, 15 UR-416 APC. Coastguard and Customs: 4,000; some 100 patrol craft, 2 Cessna *Cutlass*.

ITALY

Population: 57,400,000.
Military service: Army and Air Force 12, Navy 18 months.
Total armed forces: 373,100 (239,000 conscripts).



The trinational Tornado multirole combat aircraft is an outstanding example of NATO cooperation. Pictured is a German Navy version above English countryside.

GDP 1981: L 401,300 bn ($353.008 bn). 1982: 469.797 bn ($347.355 bn).
Est def exp 1982: L 9,918 bn ($7.333 bn); NATO definition $8.924 bn. 1983: L 11,649 bn ($7.928 bn); NATO definition: $9.788 bn.
GDP growth: −0.2% (1981), −0.3% (1982).
Inflation: 17.6% (1981), 16.5% (1982).
$1 = lire 1,136.8 (1981), 1,352.5 (1982), 1,469.3 (1983).

Army: 258,000 (187,000 conscripts).
3 corps HQ.
1 armd div. (2 armd, 1 mech bdes).
3 mech divs (each of 1 armd, 2 mech bdes).
2 indep mech bdes.
4 indep mot bdes.
5 alpine bdes.
1 AB bde.
2 amph bns.
1 msl bde (1 *Lance* SSM, 3 *Improved HAWK* SAM bns).
550 M-47, 300 M-60A1, 920 *Leopard* 1 MBT; 4,200 M-106, M-113, M-548, and M-577, AMX-VCI APC; 1,116 how, incl 320 105mm pack, 724 155mm (incl 150 FH-70 towed, 220 M-109E SP), 36 175mm M-107 SP, 36 203mm; 81mm, 120mm mor; *Lance* SSM; 57mm, 106mm, RCL; *Cobra*, SS-11, *TOW*, *Milan* ATGW; 40 *Improved HAWK* SAM.

ARMY AVIATION:
4 wings (10 sqns, 29 flts); 10 indep sqns, (21 flts). Flt usually has 6 ac/hel.
19 lt ac and hel sqns: 8 with SM-1019; 9 with AB-206, 2 with AB-205A.
10 recce hel sqns with AB-206.
2 target acquisition sqns: 1 with SM 1019 ac, 1 with AB-206 hel.
17 multi-role hel sqns: 1 with AB-204B, 15 with AB-205A, 1 with AB-205B.
4 med tpt hel sqns with CH-47.
1 trg, 4 repair units.
76 SM-1019, 30 O-1E lt ac, 100 AB-205A, 140 AB-206A/A1, 24 CH-47C, 5 A-109 *Hirundo*, 18 AB-204B, 14 AB-212, 70 AB-47G/J hel.
(On order: 210 M-113 APC; 140 FH-70 155mm towed, SP-70, M-109 155mm SP how; 870 *TOW*, *Milan* ATGW; 60 A-129 *Mangusta* hel.)

RESERVES: 545,000.

Navy: 44,500, incl 1,500 air arm, 750 marines (23,700 conscripts).
10 subs: 4 *Sauro*, 4 *Toti*, 2 US *Tang*.
1 *Vittorio Veneto* hel carrier with 9 AB-212 ASW hel, 1 × 2 *Terrier*, 4 *Otomat* SAM.
2 *Andrea Doria* cruisers each with 4 AB-212 ASW hel, 1 × 2 *Terrier*.
4 GW destroyers: 2 *Audace* with 2 AB-212 ASW hel, 1 *Standard* SAM; 2 *Impavido* with 1 *Standard*.
11 frigates: 3 *Maestrale* with 4 *Otomat* SSM, 1 × 4 *Albatros/Aspide* SAM, 2 AB-212 hel; 4 *Lupo* with 8 *Otomat*, 1 × 8 *Sea Sparrow* SAM, 1 AB-212 hel; 2 *Alpino* with 2 AB-212 hel; 2 *Bergamini* with 1 hel.
8 corvettes: 4 *De Cristofaro*, 4 *Albatross*.
7 *Sparviero* hydrofoils with 2 *Otomat* SSM.
4 FAC: 2 *Freccia* (1 with 1 × 5 *Sea Killer* SSM), 2 *Lampo*.
4 US *Aggressive* ocean, 13 *Agave* coastal, 5 *Aragosta* inshore minesweepers; 1 *Lerici*, 1 *Agave* minehunters.
2 US *De Soto County* LST, 19 US LCM.
2 *Stromboli* replenishment tankers.
1 Marine inf gp with 30 VCC-1, 10 LVTP-7 APC, 16 81mm mor, 8 106mm RCL, 6 *Milan* ATGW.

Bases: La Spezia, Taranto, Ancona, Brindisi, Augusta, Messina, La Maddalena, Cagliari, Naples, Venice.

NAVAL AIR ARM: (1,500); 93 combat hel.
5 ASW hel sqns: 2 with 30 SH-3D; 1 with 10 AB-204AS; 2 with 53 AB-212.
(On order: 2 *Sauro* subs, 1 hel carrier, 2 *Audace* destroyers, 5 *Maestrale* frigates, 1 *Lericí* minehunter, 6 SH-3D, 9 AB-212 hel.)

RESERVES: 221,000.

Air Force: 70,600 (28,300 conscripts); 300 combat ac.
6 FGA sqns: 1 with 18 *Tornado* (second forming 1983), 3 with 54 F-104S, 2 with 35 G-91Y.
1 lt attack sqn with 15 MB-339.
3 lt attack/recce sqns with 36 G-91R/R1/R1A.
6 interceptor sqns with 72 F-104S.
2 recce sqns with 30 F/RF-104G.
2 MR sqns with 14 *Atlantic* (Navy assigned).
1 ECM/recce sqn with 2 G-222, 6 PD-808.
1 OCU with 18 TF-104G.
3 tpt sqns: 2 with 32 G-222, 1 with 10 C-130H.
4 comms sqns with 16 P-166M, 32 SIAI-208M, 8 PD-808, MB-326, 2 DC-9 ac; 2 SH-3D hel.
1 SAR sqn with 15 AB-204, 20 HH-3F hel.
1 combat trg det (Cottesmore, Britain) with 7 *Tornado*.
6 trg sqns with 60 G-91T, 70 MB-326/-339A, 25 SF-260M ac; 35 AB-47G2, 3 AB-204B hel.
1 *Spada* SAM bty forming.
AAM: AIM-7E *Sparrow*, AIM-9B/-9L *Sidewinder*.
ASM: *Kormoran*.
8 SAM groups with 96 *Nike Hercules*.
(On order: 74 *Tornado* MRCA, 187 AM-X FGA ac; 20 AB-412 *Grifon*, 21 AB-212 hel; 60 *Kormoran* ASM, 4 *Spada* SAM systems, *Aspide* AAM.)

RESERVES: 28,000; some additional ac.

Forces Abroad:
Egypt (Sinai MFO) (90); 3 minesweepers.
Lebanon. UNIFIL (40). Multi-national force (2,038); 1 mech inf, 1 para, 1 log bns, 1 Marine det, 1 counter-sabotage coy, 1 fd hospital.

Para-Military Forces: Carabinieri 90,000: 1 mech bde with 13 bns, 1 AB bn, 2 cav sqns; 37 M-47 MBT; Fiat 6616, 80 M-6, M-8 armd cars; 470 Fiat 242/18AD, 240 M-113 APC; 23 AB-47, 2 A-109, 5 AB-205, 23 AB-206 hel. Ministry of Interior: Public Security Guard 67,927: 11 mobile units; 40 Fiat 6614 APC; 3 P-64B ac; 1 AB-47Y3B-1, 6 A-109A, 12 AB-206A1, 4 AB-212 hel. Treasury Department: Finance Guards 48,691; 6 AB-47J, 69 NH-500M hel, 350 patrol craft<.
(On order: 3 AB-212, 1 A-109A hel.)

LUXEMBOURG

Population: 365,100.
Military service: voluntary, 3 years.
Total armed forces: 720.
Est GDP 1981: fr 144.344 bn ($3.887 bn). 1982: 154.250 bn ($3.376 bn).
Est def exp 1982: fr 1.44 bn ($31.516 m); NATO definition $41.430 m. 1983: 1.596 bn ($32.359 m); NATO definition: $42.577 m.
GDP growth: −1.5% (1981), −3.5% (1982).
Inflation: 8.1% (1981), 9.4% (1982).
$1 = francs 37.131 (1981), 45.691 (1982), 49.322 (1983).

Army: 720.
1 lt inf bn.
1 indep coy.
5 *Commando* APC; *LAW* RL; *TOW* ATGW.

[**Air:** Luxembourg has no air force of its own, but for legal purposes all NATO's AWACS ac will have Luxembourg registration.
1 sqn with 4 E-3A (*NATO standard*).
(On order: 14 E-3A.)]

Para-Military Forces: Gendarmerie 470.

NETHERLANDS

Population: 14,250,000.
Military service: Army 14–16, Navy and Air Force 14–17 months.
Total armed forces: 102,957 (1,450 women; 48,742 conscripts).
GDP 1981: gld 350.54 bn ($140.486 bn). 1982: 365.90 bn ($137.031 bn).
Est def exp 1982: gld 12.363 bn ($4.630 bn); NATO definition: $4.468 bn. 1983: 12.646 bn ($4.556 bn); NATO definition: n.a.
GDP growth: −1% (1981), −1% (1982).
Inflation: 7.2% (1981), 4.3% (1982).
$1 = guilders 2.4952 (1981), 2.6702 (1982), 2.7755 (1983).

Army: 67,000 (43,250 conscripts, though see Reserves).
2 armd bdes.
4 mech inf bdes.
1 SSM bn with *Lance*.
3 hel sqns (Air Force manned).
468 *Leopard* 1 (10 mod to 1A4), 105 *Leopard* 2, 343 *Centurion* MBT; 126 AMX-13 lt tks; 66 AMX-VCI, 752 M-113, 740 YP-408 (to retire), 1,146 YPR-765 APC; 44 105mm, 140 155mm, 28 203mm how (being phased out); 75 AMX 105mm (being phased out), 222 M-109 155mm, 15 M-107 175mm (being replaced by 203mm), 61 M-110 203mm SP guns/how; 6 *Lance* SSM; 81mm, 194 107mm, 153 120mm mor; *Carl Gustav* 84mm, 106mm RCL; *LAW* RL; 350 *Dragon*, *TOW* ATGW; 131 L-40/70 40mm towed, 95 *Gepard* 35mm SP AA guns; 67 *Alouette* III, 30 BO-105 hel (Air Force crews).
(On order: 340 *Leopard* 2 MBT; 850 YPR-765 APC; 486 *Stinger* SAM.)

RESERVES: 145,000, many on short leave, immediate recall. 1 armd, 2 mech inf bdes, corps troops, and 1 indep inf bde would be completed by call-up of reservists. A number of inf bdes could be mobilized for territorial defence.

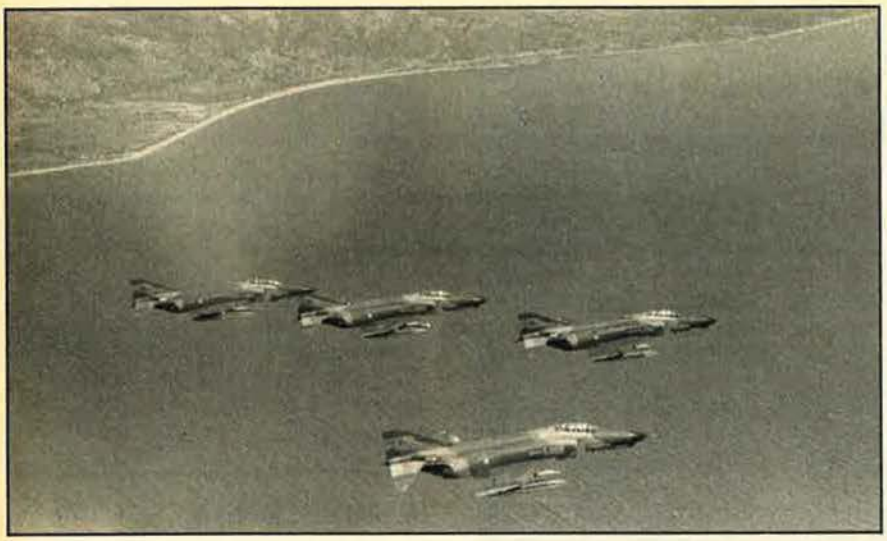
Navy: 17,350, incl naval air arm and marines (1,250 conscripts).
6 subs: 2 *Zwaardvis*, 2 *Potvis*, 2 *Dolfijn* (to reserve).
2 *Tromp* GW destroyers (flagships) with 8 *Harpoon* SSM, 1 *Standard*, 8 *Sea Sparrow* SAM, 1 *Lynx* hel.
15 frigates with 8 *Harpoon* SSM: 9 *Kortenaer* with *Sea Sparrow* SAM, 1–2 *Lynx* hel; 6 *Van Speijk* with 2 × 4 *Seacat* SAM, 1 *Lynx* hel.
6 *Wolf* corvettes.
5 *Balder* large patrol craft.
15 *Dokkum* coastal minehunters/sweepers; 2 *Alkmaar* minehunters.
2 *Poolster* fast combat spt ships.
10 LCA<.

Bases: Den Helder, Flushing.

NAVAL AIR ARM: (1,700); 15 combat ac, 17 combat hel.
3 MR sqns with 6 SP-13H *Atlantic* (to retire 1983), 7 P-3C *Orion*, 2 F-27MPA (used also by Air Force).
1 ASW hel sqn with 17 *Lynx* SH-14B/C.
1 SAR hel sqn with 6 *Lynx* UH-14A.

MARINES: (2,800).
2 amph combat gps.
1 mountain/arctic warfare coy.
(On order: 2 *Walrus* subs, 3 *Kortenaer*, 2 AD frigates, 13 *Alkmaar* minehunters, 2 LCVP, *Harpoon* SSM, 6 P-3C *Orion* II ASW ac.)

RESERVES: about 20,000; 9,000 on immediate recall.



Equipment inventories of NATO's Southern Flank members consist mainly of older models. A flight of Turkish Air Force F-4s is pictured above.

Air Force: 17,500 (3,900 conscripts); 182 combat ac.
4 FGA sqns: 3 with 54 NF-5A; 1 with 18 F-104G.
3 FGA/interceptor sqns with 54 F-16A/B.
1 recce sqn with 18 RF-104G.
3 OCU: 1 with 18 NF-5B; 1 with 8 TF-104G; 1 with 12 F-16B.
1 tpt sqn with 12 F-27.
1 SAR flt with 4 *Alouette* III.
AAM: AIM-9 *Sidewinder.*
11 SAM sqns with 66 *Improved HAWK* (8 in Germany).
3 SAM sqns with 27 *Nike Hercules.*
25 *Shorad/Flycatcher,* 40 L-70 AA systems.
(On order: 59 F-16A FGA, 14 F-16B.)

RESERVES: 11,500; 6,500 on immediate recall.

Inter-Service Organization: 1,107 (342 conscripts).

Forces Abroad:
Germany: 5,500; 1 armd bde, 1 recce, 1 engr bns, spt elms.
Lebanon (UNIFIL): 807; 1 mech inf bn.
Egypt (Sinai MFO): 105.
Netherlands Antilles (Curaçao): 1 frigate, 1 amph combat det, 1 MR det with 2 F-27MPA ac.

Para-Military Forces: 8,700. Royal Military Constabulary (*Koninklijke Marechaussee*): 3,900 regulars, 500 conscripts; 3 divisions comprising nine districts with 87 'brigades'. Home Guard: 4,300; 3 sectors; inf weapons. Civil Defence (*Corps Mobiele Colonnes*): 22,000 on mobilization under Army command.

NORWAY

Population: 4,100,000.
Military service: Army 12, Navy and Air Force 15 months.
Total armed forces: 43,170 (30,085 conscripts).
GDP 1981: N kr 327.97 bn ($57.143 bn); 1982: 364.222 bn ($56.434 bn).
Est def exp 1982: N kr 10.492 bn ($1.626 bn);[11] NATO definition: $1.680 bn. 1983: 12.062 bn ($1.696 bn); NATO definition: n.a.
GDP growth: 0.3% (1981), 0.0% (1982).
Inflation: 11.9% (1981), 11.7% (1982).
$1 = kroner 5.7395 (1981), 6.4540 (1982), 7.116 (1983).

Army: 24,175 (18,275 conscripts).
1 bde gp of 2 inf bns, 1 tk coy, 1 SP fd, 1 AA btys (North Norway), mobile force, border garrison.
1 all-arms gp: 1 inf bn, 1 tk coy, 1 SP fd, 1 AA btys (South Norway).
Indep armd sqns, inf bns, and arty regts.
78 *Leopard* 1, 38 M-48A5 MBT; 70 NM-116 (M-24/90) lt tks; NM-135 (20mm MICV); M-113 APC; 250 105mm and 155mm towed, 130 M-109 155mm SP how; 107mm mor; *Carl Gustav* 84mm, 106mm RCL; M-72 66mm RL; *ENTAC, TOW* ATGW; FK20-2 20mm, 40mm AA guns; RBS-70 SAM; 23 O-1E, 8 L-18 lt ac.
(On order: M-113 APC, 8 120mm coastal guns, 72 RBS-70 SAM.)

RESERVES: 122,000: 4 divs: 12 Regimental Combat Teams (bdes) of about 5,000 men each, spt units, and territorial forces; 21 days refresher training each 3rd/4th year. Home Guard 81,500 (90 days initial service).

Navy: 8,850, incl 1,600 coast artillery (6,150 conscripts).
14 Type 207 subs.
5 *Oslo* frigates with 6 *Penguin* SSM, 1 × 8 *Sea Sparrow* SAM.
2 *Sleipner* corvettes.
39 FAC(M) with *Penguin* SSM: 19 *Storm* (6 × 1), 14 *Hauk* (6 × 1), 6 *Snögg* (4 × 1).
1 *Vadsø* coastal patrol craft.
2 *Vidar* minelayers, 9 US MSC-60 minesweepers, 1 minehunter.
1 *Horten* depot ship, 7 coastal tpts.
7 LCT: 2 *Kvalsund,* 5 *Reinøysund.*
15 coast def fortresses: 40 arty, mine, and torpedo btys: 40mm, 75mm, 105mm, 120mm, 127mm, 150mm guns.
1 SAR/recce hel sqn with 6 *Lynx* (coastguard).
8 *Tjeld* FAC(T) in reserve.
(On order: 6 Type-210 subs.)

Bases: Horten, Bergen, Ramsund, Tromsø.

RESERVES: 16,000. Coastguard (352 incl 55 civilians): 6 patrol vessels incl 3 *Nordkapp* fitted for 6 × 1 *Penguin* II SSM, 6 *Lynx* hel (Air Force manned), 7 armed fishery protection vessels. Home Guard (6,000).

Air Force: 9,860 (5,660 conscripts); 115 combat ac.
5 FGA sqns: 2 with 36 F-5A; 1 converting to F-16; 2 with 34 F-16.
1 interceptor sqn with 15 F-16A.
1 recce flt with 6 RF-5A.
1 MR sqn with 7 P-3B.
1 OCU with 13 F-5B, 4 F-16B.
2 tpt sqns: 1 with 6 C-130H, 3 *Falcon* 20S; 1 with 4 DHC-6 ac, 8 UH-1B hel.
1 SAR hel sqn with 10 *Sea King* Mk 43.
2 utility hel sqns with 26 UH-1B (10 in storage).
16 *Safari* trg ac.
AAM: *Sidewinder.* ASM: *Bullpup.*
4 lt AA bns with 32 L-70 40mm guns.
1 SAM bn (4 btys) with 128 *Nike Hercules.*
(On order: 17 F-16A, 1 F-16B ftrs; 54 *HAWK* launchers and 162 msls (lease), *Penguin* III ASM.)

RESERVES: 20,000. 7 lt AA bns for airfield defence with 56 L/60 40mm guns. Home Guard 2,500.

Joint Services Orgs: 285.

Civil Defence: 53 Districts, 14 mobile columns. 108 local units. Permanent staff some 400; total mobilization strength 62,500 (planned).

Forces Abroad: Lebanon (UNIFIL): 839; 1 bn, 1 service, 1 medical coys, plus HQ personnel.

PORTUGAL

Population: 10,000,000.
Military service: Army 16, Navy 24, Air Force 21–24 months.
Total armed forces: 63,500 (38,700 conscripts; see Army).
GDP 1981: esc 1,453.1 bn ($23.610 bn).
Est def exp 1982: esc 50.10 bn ($630.403 m); NATO definition: $778.36 m. 1983: 60.60 bn ($612.548 m); NATO definition n.a.
GDP growth: 1.8% (1981), 3.0% (1982).
Inflation: 23.9% (1981), 18.9% (1982).
$1 = escudos 61.546 (1981), 79.473 (1982), 98.931 (1983).

Army: 41,000 (30,000 conscripts, 3 intakes a year, 4 months alternating service).
6 Territorial Commands (4 military regions, 2 island commands).
1 mixed bde.
2 cav regts.
12 inf regts, 3 indep inf bns.
1 cdo regt.
2 fd, 1 AA, 1 coast arty regts.
2 engr regts.
1 sigs regt.
1 Special Forces, 4 spt bns, 1 MP regt.
32 M-47, 23 M-484A5 MBT; 11 M-24 lt tks; 43 Panhard EBR/ETT hy, 63 AML lt armd, 32 *Ferret* Mk 4 scout cars; 104 M-113, 9 M-125 (81mm mor), 82 *Chaimite* APC; 30 5.5-in (140mm) guns; 56 M-101A1 105mm towed, 6 M-109A2 155mm SP how; 54 107mm, 81 120mm mor; 100 90mm, 127 106mm RCL; 45 *TOW* ATGW; 39 150mm, 152mm, 234mm coast arty; 18 Rh-202 20mm, 70 Bofors L-60 40mm AA guns.

Navy: 13,000 incl marines (5,200 conscripts).
3 *Albacora* (Fr *Daphne*) subs.
17 frigates: 4 *Andrade,* 6 *Coutinho,* 4 *Belo,* 3 *Silva.*
10 *Cacine* large patrol craft.
19 coastal patrol craft: 2 *Aleixo,* 14 *Albatroz,* 2 *Bonanca,* 1 river.
4 coastal minesweepers.
2 LCT, 11 LCM, 1 LCA.

Base: Lisbon (Alfeite).

MARINES: (2,687; 1,000 conscripts).
3 bns (2 inf, 1 police), spt units.
Chaimite APC, mor, amph craft.

Air Force: 9,500 incl 1,800 para (3,500 conscripts); 74 combat ac.
1 combat command, 5 administrative wings:
3 FGA sqns: 1 with 20 A-7P; 1 with 20 G-91R3, 8 G-91T3; 1 with 20 G-91R4, 2 G-91T3.
1 recce sqn with 4 C-212B.
1 OCU with 12 T-38.
2 tpt sqns: 1 with 5 C-130H; 1 with 12 C-212.
3 SAR sqns: 1 with 6 C-212 ac; 2 with 12 SA-330 *Puma* hel.
2 hel/utility sqns with 37 *Alouette* III.
2 liaison sqns with 32 Reims-Cessna FTB-337G.
3 trg sqns: 1 with 2 C-212A ac, 3 *Alouette* III hel; 1 with 24 T-37C; 1 with 30 *Chipmunk.*
1 para gp (1 bn, 2 coys).
(On order: 30 A-7 FGA (6 trg), 20 TA-4 *Skyhawk* trg ac; 12 A-109A hel (4 with *TOW*).)

RESERVES (all services): 90,000.

Para-Military Forces: National Republic Guard 14,600; *Commando* Mk III APC. Public Security Police 15,291. Fiscal Guard 7,385.

SPAIN

Population: 38,300,000.
Military service: 15 months.
Total armed forces: 347,000 (234,000 conscripts); (force reduction programme being introduced).
Est GDP 1981: pts 17,109 bn ($185.343 bn). 1982: 19,500 bn ($177.499 bn).
Est def exp 1982: pts 410.500 bn ($3.737 bn); NATO definition: $4.529 bn.[12]
GDP growth: 0.3% (1981); 1.3% (1982).
Inflation: 14.4% (1981), 14.0% (1982).
$1 = pesetas 92.31 (1981), 109.86 (1982), 137.71 (1983).

Army: 260,000 (190,000 conscripts).
Immediate Intervention Force:
1 corps HQ.
1 armd div, 1 mech div, 1 mot div } each with 2 bdes.
1 armd cav bde.
1 para bde (3 bns).
1 airportable bde.
1 arty bde.
1 locating, 1 fd rocket, 1 lt AA regts.
1 engr, 1 sigs regts.
1 chemical/nuclear defence regt.
Territorial Defence Force:
9 Military Regions, 4 overseas comds (see *Overseas Forces*).

2 mountain divs (each 1 bde and 1 cadre bde).
10 inf bdes (incl 1 Reserve bde).
1 mountain bde.
1 arty bde (incl 1 *HAWK* SAM gp, 1 *Nike Hercules* bty).
2 hy arty regts.
7 coast/AA arty regts.
General Reserve Force:
1 ATK inf regt.
1 engr regt.
2 railway engr regts.
1 sigs regt.
Independent Units:
Army HQ inf gp.
Royal Guard Regt (incl inf, naval, air force coys and escort cav sqn).
Overseas Forces:
2 Commands (Balearic, Canary Islands):
5 inf regts (1 cadre regt in Canaries).
1 Foreign Legion regt (2 bns, 1 lt cav gp).
5 coast/AA arty regts.
2 engr regts, 1 engr gp (2 bns), 1 engr bn.
2 armd cav regts, 2 lt cav gps.
4 *Regulares* inf gps.
2 cdo, 2 special sea coys.
Army Aviation (FAMET):
HQ with 1 hel, 1 spt, 1 trg sqn, 3 hel units.
1 attack bn.
1 tpt bn (1 med, 1 hy coys).
AFV: 300 AMX-30, 350 M-47E, 110 M-48 (105mm) MBT; 180 M-41 lt tks; 60 AML-60, 80 AML-90 armd cars; 200 BMR-600 *Pegaso* MICV; 500 M-113 APC.
Arty: 911 105mm (incl M-56 pack), 168 122mm, 84 M-114 155mm, 12 M-115 8-in (203mm) towed, 48 M-108 105mm, 24 M-44, 96 M-109A 155mm, 12 M-107 175mm, 4 M-110 203mm SP guns/how; 200 88mm, 200 6-in (152.4mm), 24 203mm, some 12 12-in (305mm), some 12 15-in (381mm) coast guns; 1,200 81mm, 107mm, 400 120mm mor.
ATK: 350 106mm RCL; 42 M-65 88.9mm RL; 50 *Milan*, 50 *Cobra*, 18 *Dragon*, *HOT*, 12 *TOW* ATGW.
AD: 64 35/90, 280 40/90, 120 90mm AA guns, 14 *Nike Hercules*, 24 *Improved HAWK* SAM.
Air: 73 HU-8/-10B (UH-1B/H), 3 HA-16 (*Alouette* III), 43 HA-15 (BO-105), 1 AB-206A, 4 AB-212, 15 HE-7B (OH-13), 12 HR-12B (OH-58A), 13 HT-17 (CH-47) hel.
(On order: 220 BMR-600 MICV, 176 M-113 APC; 540 *TOW* msls; 96 *Chaparral* SAM (1,760 msls); 28 *Skyguard* AD systems; 30 BO-105 (28 with *HOT* ATGW), 2 CH-47C, 18 OH-58A hel.)

DEPLOYMENT:
Balearic Islands: 5,800; 3 inf, 2 coast/AA regts, 1 engr bn, 1 lt cav gp, 1 cdo coy.
Canary Islands: 16,000; 3 inf, 1 Foreign Legion (incl 1 lt cav gp), 2 coast/AA regts, 1 engr gp (2 bns), 1 lt cav gp, 1 cdo coy.
Ceuta/Melilla: 19,000; 2 armd cav, 2 Foreign Legion, 2 coast/AA, 2 engr regts, 4 *Regulares* inf gps, 2 special sea coys.

Navy: 54,000, incl marines (14,000 conscripts).
9 Commands (Escort, Naval Air, Submarine, Mine Warfare, Marines, 4 Naval Region HQ).
5 subs: 1 *Agosta*, 4 *Daphne*.
1 US *Independence* carrier (9 AV-8A, 31 hel).
9 destroyers: 6 with 1 hel (1 *de Lauria*, 5 US *Gearing* with 1 *ASROC*), 3 US *Fletcher*.
15 frigates: 6 *Descubierta* (F-30) with 1 × 8 *Sea Sparrow/Aspide* SAM; 5 *Baleares* with 16 *Standard* SAM, 1 × 8 *ASROC*; 4 *Atrevida*.
12 FAC(P): 6 *Lazaga*, 6 *Barcelo*.
18 large patrol craft (3 ex-minesweepers).
26 coastal and 38 inshore patrol craft<.
4 US *Aggressive* ocean, 8 *Jucar* coastal MCM.
2 attack tpts.
1 LSD, 3 LST, 7 LCT, 2 LCU, 12 LCM.

NAVAL AIR: 11 combat ac, 40 combat hel.
1 attack sqn with 9 AV-8A *Matador*, 2 TAV-8A.
1 comms sqn with 4 *Commanche*, 2 *Citation*.
5 hel sqns (3 ASW); 1 with 11 AB-212 (4 ECM), 1 with 11 Hughes 500 HM, 1 with 14 SH-3D *Sea King*, 1 with 4 AH-1G (armed), 11 Bell 47G.

MARINES: (11,925).
1 marine regt (2 inf, 1 spt, 1 log bns).
5 marine garrison regts.
18 M-48S MBT; LVTP-7 amph APC; 8 Oto Melara 105mm towed, 8 M-52A1 105mm SP how; 81mm mor; M-72 66mm RL; 72 106mm RCL; *TOW*, *Dragon* ATGW.
(On order: 3 *Agosta* subs, 1 carrier, 5 FFG-7 frigates, 4 32.2-metre patrol craft, 20 15.9-metre patrol vessels, 12 *Bravo* (AV-8B) ac, 10 SH-60B hel, 12 RGM-84A *Harpoon* SSM.)

Bases: Ferrol (Galicia), Cadiz (San Fernando)/Rota, Cartagena.

Air Force: 33,000; 215 combat ac.
Air Combat Command (MACOM):
3 wings.
6 interceptor sqns: 2 with 36 F-4C, 4 RF-4C; 2 with 21 *Mirage* IIIEE, 6 IIIED; 2 with 46 *Mirage* F-1CE, 3 F-1CE/BE.
1 liaison flt with 1 Do-27.
Tactical Command (MATAC):
2 wings.
2 FGA sqns: 1 with 14 F-5A, 15 RF-5A, 6 F-5B.
1 recce sqn with 9 AR-10C (HA-220).
1 MR sqn with 6 P-3A.
1 liaison flt with 6 O-1E, 11 Do-27, Do-28.
AAM: *Sparrow*, *Sidewinder*, R-550 *Magic*.
Air Command, Canary Islands (MACAN):
1 FGA sqn with 24 *Mirage* F-1C.
1 SAR sqn with 3 F-27-400 MR ac, 8 AB-205 hel.
1 tpt sqn with 7 C-212, 2 Do-27.
Transport Command (MATRA):
3 wings.
5 sqns with 5 C-130H, 6 KC-130H, 6 CASA-207 *Azor*, 25 C-212 *Aviocar*, 12 DHC-4, 8 Do-27.
Training Command (MAPER):
2 OCU with 23 F-5A/B, 2 Do-27.
14 sqns with 6 *Aztec*, 29 F-33C *Bonanza*, 50 C-101, 14 C-212E, 1 *Navajo*, 49 T-33A, 45 T-6, 6 *King Air*, 3 *Baron*, BU-131A/CASA I-131.
2 hel sqns with 28 HE-7A (AB-47), AB-205, Hughes 300C, and UH-1H.
Air Force HQ Group (ACGA):
2 tpt sqns with 2 DC-8-52, 4 *Mystère* 20, 1 *Navajo*, 4 C-212.
3 spt sqns with 14 CL-215, 2 Do-27, 5 C-212, 2 DHC-4A, 8 C-7.
1 utility hel sqn with 5 *Puma*.
2 SAR sqns with 4 C-212, 4 Do-27 ac, 12 *Super Puma*, 9 AB-205, 4 AB-206, 3 AB-47, 3 *Alouette* III hel.
1 trg sqn with 4 C-101, 2 C-212.
(On order: 72 F-18 ftrs, 2 P-3C *Orion* MR; 4 C-212 SAR, 13 C-101 trg ac; 17 Hughes 300C hel; 96 *Improved Chaparral* SAM launchers (1,760 msls); *Super Sidewinder* AAM.)

RESERVES (all services): 1,085,000.

Para-Military Forces: Guardia Civil 65,000: 26 inf regts, 3 reserve mobile comds, 1 railway security, 1 traffic security gps, 1 anti-terrorist special gp (UAR). (On order: 20 BO-105, 4 BK-117 hel.) *Policia Nacional* 40,000: 26 inf bns, 2 cav sqn gps, 3 cav tps, 1 special ops cdo gp (GEO), civil security gps. Ministry of Transportation and Communications: *Maritime Surveillance Force;* some 54 patrol boats (10 320-ton, 4 32-metre, 16-metre), many armed.

TURKEY

Population: 47,000,000.
Military service: 20 months.
Total armed forces: 569,000 (480,000 conscripts).
Est GDP 1981: TL 6,415.5 bn ($57,683 bn). 1982: 8,578.0 bn ($52,771 bn).
Est def exp 1982:[13] TL 317.70 bn ($1,954 bn); NATO definition $2,755 bn. 1983: 450.0 bn ($2,265 bn); NATO definition n.a.
Est FMA 1982: $460 m.
GNP growth: 4.2% (1981), 4.4% (1982).
Inflation: 30.2% (1981), 33.0% (1982).
$1 = liras 111.22 (1981), 162.55 (1982), 198.64 (1983).

Army: 470,000 (420,000 conscripts).[14]
4 army HQ: 10 corps HQ.
2 mech inf divs.
14 inf divs.
6 armd bdes.
4 mech bdes.
11 inf bdes.
1 para bde, 1 cdo bde.
4 SSM bns with *Honest John*.
Indep units: 8 armd recce, 32 arty, 89 AA arty bns, fortress defence regts.
AFV: 77 *Leopard* 1A3, 500 M-47, 3,000 M-48 MBT; 2,000 M-113 APC.
Arty: 150 M-59 155mm towed, 36 M-107 175mm SP guns; 95 M-116A1 75mm pack, some 140 M-101A1 105mm, 400 M-114A1 155mm, 116 M-115 203mm towed, 400 M-7/M-108 105mm, M-44 155mm, 48 M-110 203mm SP how; 1,750 60mm, 81mm, 4.2-in (107mm) and 120mm mor; 18 *Honest John* SSM.
ATK: 1,200 57mm, 390 75mm, 800 106mm RCL; 85 *Cobra*, SS-11, *TOW* ATGW.
AA: 300 twin 20mm, 900 40mm, M-51 75mm, M-117/-118 90mm guns.
Air: 2 DHC-2, 18 U-17, 6 Cessna 206, 3 Cessna 421, 15 Do-27, 9 Do-28, 20 *Baron*, 5 T-42, 40 *Citabria* 150S trg ac; 156 AB-204/-205, 20 Bell 47G, 48 UH-1D, 30 TH-300C hel.
(On order: *TOW*, 2,500 *Milan* ATGW, 27 UH-1H hel.)

RESERVES: 700,000.

Navy: 46,000, incl marines (36,000 conscripts); 18 combat ac, 7 combat hel.
16 subs (2 in reserve): 5 Type 209, 10 US *Guppy*, 1 *Tang* (on loan).
15 US destroyers: 9 *Gearing* (3 leased, 5 with 1 × 8 *ASROC*), 2 *Fletcher*, 2 *Sumner*, 2 *Carpenter*.
2 *Berk* frigates, each with 1 hel.
13 FAC(M): 4 *Dogan* (Lürssen FPB-57) with 2 × 4 *Harpoon* SSM; 9 *Kartal* (Type 141 *Jaguar*) with 4 *Penguin* II SSM.
8 FAC(T): 7 FRG *Jaguar*, 1 *Girne*.
21 large patrol craft (incl 2 US *Asheville*, 6 PC-1638, 4 PGM-71).
4 83-ft coastal patrol craft<.
1 *Nusret*, 6 coastal minelayers.
26 minesweepers: 12 US *Adjutant*, 4 Cdn MCB, 6 FGR *Vegesack* coastal, 4 US *Cape* inshore.
5 LST (3 dual-purpose minelayers), 31 LCT, 16 LCU, 20 LCM.
56 auxiliary ships incl 1 US destroyer tender, 1 FRG depot ship (trg), 9 tankers (5 fleet).
1 ASW sqn: 18 S-2E ac; 3 AB-204B, 4 AB-212 ASW hel; (2 S-2A in reserve).
1 marine bde (5,000): HQ, 3 bns, 1 arty bn (18 guns), spt units.
(On order: 1 Type 209 sub, 4 *Meko*-200 frigates, 2 Lürssen FAC(M), 13 LCT, *Harpoon* SSM.)

Bases: Gölcuk, Istanbul, Izmir, Eregli, Iskenderun.

RESERVES: 70,000.

Air Force: 53,000 (33,000 conscripts); 340 combat ac.
2 tac, 1 admin, 1 air trg commands.
13 FGA sqns: 2 with 42 F-5A, 12 F-5B; 2 with 40 F-100C/D/F; 6 with 82 F-4E, 8 RF-4E; 3 with 50 F/TF-104G.
2 interceptor sqns with 30 F-104S.
1 recce sqn with 20 RF-5A/F-5B.
6 tpt sqns: 2 with 7 C-130E, 20 C-160D; 3 with 30 C-47A; 1 (VIP) with 3 *Viscount* 794, 2 *Islander* ac, 12 UH-1D/H, 5 UH-19D hel.
1 VIP flt with 2 C-47A.
9 base flts with 40 T-33A, 2 C-47A ac, 2 UH-1H hel.
OCUs with 36 F-100C/F, 20 F/TF-104.
3 trg sqns with 24 T-34A, 25 T-37B/C, 60 T-38A, 20 T-41D.
AAM: *Sidewinder*, 750 AIM-9P3 *Super Sidewinder*, *Sparrow*, *Falcon*, *Shafrir*.
ASM: AS-12, *Bullpup*, *Maverick*.
8 SAM sqns with 72 *Nike Hercules*.
(On order: 33 F-104G ac; UH-1H hel (10 SAR, 4 ECM). *Super Sidewinder*, *Sparrow* AAM.)

RESERVES: 66,000.

Forces Abroad: Cyprus: 1 corps of 2 inf divs (17,000); 150 M-47/-48 MBT; M-113 APC; 212 105mm, 155mm, 203mm guns/how; 40mm AA guns.

Para-Military Forces: Gendarmerie 125,000 (incl 3 mobile bdes with *Commando* APC), 30+ large patrol craft. (On order: 5 SAR-33 FAC.)

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[1]Conscripts serve 8 months if posted to Germany, 10 months if serving in Belgium.

[2]NATO budget content is standardized and may differ from national.

[3]Includes replacement costs for Falkland losses.

[4]The Canadian Armed Forces were unified in 1968. Of the total strength, some 49,000 are not identified by service.

[5]Mobile Command commands army combat forces, and Maritime Command all naval forces. Air Command commands all air forces, but Maritime Command has operational control of 10 TAG, HQ 4 ATAF in Europe has operational control of 1 CAG. There is also a Communications Command and a Canadian Forces Training System.

[6]At January 1982 price level.

[7]At January 1983 price level.

[8]Incl 10,250 on inter-service central staff and *Service de Santé*.

[9]A 5-year military development plan for 1983–8 totalling some F fr 830 bn has also been introduced.

[10]The military divisions of the Ministry of Defence, Central Military Agencies, and Central Medical Agencies comprise 11,200 military personnel. The overall strength of the armed forces includes 6,000 reserve duty training positions.

[11]Incl UNIFIL costs; kr 240 m ($37,186 m).

[12]An additional budget of pts 2.4 bn, plus $400 m per annum in US FMA for modernization of the armed forces, runs concurrently as of 1983.

[13]10-month budget.

[14]About half the divs and bdes are below strength.

Other European Countries

Albania: Albania joined the Warsaw Pact in 1955 but left it in 1968, moving into a closer relationship with China. After Chairman Mao's death in 1976, Chinese aid was progressively reduced. Since 1978 little military aid has been received from any source. The constitution precludes the establishment of foreign bases or the stationing of foreign troops in Albania.

Austria: The State Treaty of 1955, which re-established Austrian independence, prohibits Austria from acquiring 'nuclear weapons, long-range artillery, chemical and biological weapons, self-propelled missiles, submarines, assault craft, manned torpedoes, and sea mines'. Austria's constitution contains a declaration of permanent neutrality. A small indigenous arms industry supplies many of the needs of the armed forces and provides a few foreign sales.

Cyprus: Independent as a bi-national state in 1960, a constitutional dispute in 1963 led the Turkish community to withdraw from the central government. This has effectively produced two entities, each with its own small armed forces. Both Greece and Turkey are also entitled, under an associated Treaty of Alliance with the Republic of Cyprus, to maintain a contingent in the island. Britain—a signatory with Greece and Turkey of the 1959 Treaty of Guarantee which assures the independence, territorial integrity, and security of the Republic—maintains a garrison in two Sovereign Base Areas at Akrotiri and Dhekelia. The United States maintains a signals establishment. The United Nations has a peace-keeping force (UNFICYP) in the island.

Eire: Independent since 1922, Eire plays an active role in UN peacekeeping operations. With no significant arms industry, Eire has bought arms from many sources, *e.g.*, Britain, France, Sweden, and the US.

Finland: A 1948 Treaty of Friendship, Co-operation, and Mutual Assistance requires Finland to fight any aggression directed against the USSR across her territory. In case of need the Soviet Union will provide assistance or joint action. Finland has her own defense industry, but has tended to buy her major arms from the USSR and Sweden, together with some equipment from Britain, France, and the United States.

Malta: After independence in 1964, Malta had a defence agreement with Britain. The island was a NATO base from 1972 to 1979. In September 1980 Malta undertook to remain neutral, outside any alliances, and banned foreign troops and bases, including Soviet warship docking facilities. Italy agreed to consultation if Malta was attacked and to guarantee her independence. In December 1981 France and Algeria also agreed to support and guarantee her neutrality.

OTHER EUROPEAN COUNTRIES

1. Albania
2. Austria
3. Cyprus
4. Eire
5. Finland
6. Malta
7. Sweden
8. Switzerland
9. Yugoslavia

Sweden: Neutral in both World Wars. Sweden's permanent peacekeeping organization has provided personnel for UN duties since 1964. Her self-defence organization is largely supported by a domestic defence industry but some external purchases have been made, mainly from the United States.

Switzerland: Permanently neutral by decree since 1815, Switzerland belongs to no defence organization. Her small arms industry produces most of her equipment, but Austria, France, Britain, and the US have also supplied material.

Yugoslavia: Expelled from the Cominform in 1948, she has since been a leading force in the Non-Aligned Movement, maintaining a balanced relationship with each Bloc. She has no defence alliances, though a limited naval repair agreement exists with the USSR. She has her own defence industry but has bought most of her major military equipment from the USSR.

ALBANIA

Population: 2,800,000.

Military service: Army 2 years; Air Force, Navy, and special units 3 years.
Total armed forces: 40,400 (22,400 conscripts).
Est GNP 1981: lek 11,900 bn ($2,380 bn).
Est def exp 1981: lek 970 m ($194 m).
$1 = lek 5.0 (1981).

Army: 30,000 (20,000 conscripts).
1 tk bde.
5 inf bdes.
4 arty regts.
8 lt coastal arty bns.
70 T-34, 15 T-54, 15 T-59 MBT; 20 BA-64 armd, BRDM-1

scout cars; BTR-40/-50/-152, K-63 APC; 76mm (incl SU-76 SP), 85mm, 122mm, 152mm guns; 122mm, 152mm how; 82mm, 120mm, 160mm mor; Type-63 107mm MRL; T-21 82mm RCL; 45mm, 57mm, 85mm ATK guns; 37mm, 57mm, 85mm, 100mm AA guns.[1]

RESERVES: 150,000.

Navy: 3,200 (1,000 conscripts).[1]
3 Sov W-class subs.
3 Sov *Kronshtadt* large patrol craft.
32 Ch *Huchwan* hydrofoil<, 12 P-4 FAC(T).
6 Ch *Shanghai*-II FAC(G).
10 PO-2K patrol craft.
8 Sov minesweepers: 2 T-43 ocean, 6 T-301 (2 in reserve) inshore.

Bases: Durres, Valona, Sazan Island, Pasha Liman.

Air Force: 7,200 (1,400 conscripts); 100 combat ac.[1]
6 ftr sqns with 20 MiG-15/F-2, 30 MiG-17/F-4, 30 MiG-19/F-6, 20 MiG-21/F-7.
1 tpt sqn with 4 Il-14, 10 An-2.
2 hel sqns with 30 Mi-4.
1 trg sqn with 10 MiG-15UTI.
SAM: Some 5 SA-2 sites.

RESERVES: 5,000.

Para-Military Forces: 12,500. Internal security force 5,000; frontier guard 7,500.

AUSTRIA

Population: 7,584,100.
Military service: 6 months recruit trg; 60 days reservist refresher trg during 15 years, 30–90 days additional for specialists.
Total armed forces: 50,000 (32,000 conscripts); some 70,000 reservists on refresher trg.
GDP 1982: OS 1,143 bn ($67.003 bn).
Def exp 1982: OS 13.422 bn ($786.799 m); 1983: 13.857 bn ($797.388 m).
GDP growth: 0.0% (1981), 1.1% (1982).
Inflation: 6.4% (1981), 4.3% (1982).
$1 = schilling 17.059 (1982), 17.378 (1983).

Army: 45,400 (29,600 conscripts).
Army HQ.
Standing Alert Force:
1 mech div of 3 mech bdes (1 tk, 1 mech inf, 2 SP arty, 2 SP ATK bns), 1 comd, 1 AA, 1 engr, 1 sigs bns.
Standing Field Units:
1 HQ, 1 recce, 2 sigs bns (Army).
1 arty, 1 SP ATK, 2 AA, 1 engr bns (Corps).
1 air-mobile, 2 mountain, 1 guards bns (indep).
Cadre Force (full strength on mobilization):
2 Corps HQ.
Corps troops:
2 arty bns.
2 engr bns.
5 sigs bns.
3 log regts.
9 Regional (county) Comds, 8 mobile bde HQ:
Bde tps (45,000): 24 inf, 8 arty, 8 engr/ATK, 8 comd/spt bns.
Territorial tps (82,000): 28 *Landwehrstamm-regimente* (trg regts), 26 inf regts, 25 hy, 21 lt, 40 engr/ATK coys.
AFV: 50 M-60A3, 120 M-60A1 MBT; 467 Saurer 4K4F APC.
Arty: 300 M-68 105mm turret-mounted, 22 SFKM2 155mm fortress guns; 108 IFH 105mm, 24 FHM-1 155mm, 56 M-109 155mm SP how; 18 M-51 130mm MRL; 305 81mm, 100 M-2/M-30 107mm, 100 120mm mor; 482 20mm, 72 35mm towed, 60 L/70 40mm, 38 M-42 40mm SP AA guns.
ATK: LAW RL; 74mm, 84mm, 397 M-40 106mm RCL; 240 M-52/M-55 85mm towed, 189 *Kuerassier* JPz SK 105mm SP ATK guns.
(On order: 42 155mm SP how.)

RESERVES: 127,000; 970,000 have a reserve commitment.

Air Force:[2] 4,600 (2,400 conscripts); 32 combat ac.
1 Air Div HQ: 3 Air regts:
4 FGA sqns with 32 Saab 105OE.
6 hel sqns with 13 AB-206A, 23 AB-212, 23 *Alouette* III, 12 OH-58B *Kiowa*, 21 AB-204.
1 trg/liaison sqn with 2 *Skyvan*, 12 *Turbo-Porter*, 6 O-1E, 18 Saab 91D, 19 L-19.
3 AD bns with 36 20mm Oerlikon, 18 35mm AA guns; *Super-Bat* and *Skyguard* AD systems.

[1]See p. 94 for footnotes.

(On order: 6 PC-7 *Turbo-Trainer* ac.)

Forces Abroad: Cyprus (UNFICYP) 1 inf bn (299). Syria (UNDOF) 1 inf bn (530). Other Middle East (UNTSO) 13.

CYPRUS

Population: 650,000 (500,000 Greek, 150,000 Turkish Cypriots).

GREEK-CYPRIOT NATIONAL GUARD[3]
Military service: conscription, 26 months.
Total armed forces: 10,000.
Est GDP 1981: £C 871.1 m ($2.076 bn); 1982: 1.020 bn ($2.149 bn).
Est def exp 1982: £C 21.5 m ($45.311 m); 1983: 30.395 m ($59.342m).
$1 = £C 0.4196 (1981), 0.4745 (1982), 0.5122 (1983).

Army: 10,000.
1 armd bn.
2 recce/mech inf bns.
20 inf bns (under strength).
7 arty gps.
8 spt units.
10 T-34 MBT; 20 EE-9 *Cascavel*, 20 Marmon-Harrington armd cars; 17 BTR-50 APC; 130 100mm, 105mm, and 25-pdr (88mm) guns and 75mm how; 128mm MRL; M-55 20mm, 40mm, 3.7-in (94mm) AA guns; 1 30-ft patrol craft.
(On order: 20 EE-9 *Cascavel*.)

RESERVES: 30,000: 8,500 immediate; 21,500 second-line.

Para-Military Forces: 3,000 armed police; 1 patrol boat, 1 *Islander* lt tpt ac.

TURKISH-CYPRIOT SECURITY FORCES
Military service: conscription, 24 months.
Def exp 1982: TL 750 m ($4.98 m).
$1 = Turkish lira 150.56 (1982).

Militia: some 4,500.
Some 7 inf bns.
T-34 MBT.

RESERVES: 5,500 first-line, 10,000 second-line.

EIRE

Population: 3,443,000.
Military service: voluntary.
Total armed forces: 15,231.
Est GDP 1981: £E 10.389 bn ($16.797 bn). 1982: 12.0 bn ($17.067 bn).
Def exp 1982: £E 208.3 m ($296.259 m). 1983: 207.1m ($265.071 m).
GNP growth: 0.3% (1981), −0.5% (1982).
Inflation: 20.4% (1981), 17.1% (1982).
$1 = £E 0.6185 (1981), 0.7031 (1982); 0.7813 (1983).

Army: 13,431.
1 inf force (2 inf bns).
4 inf bdes: 3 with 2 inf bns, 1 fd arty regt (2 btys), 1 motor recce sqn, 1 engr coy; 1 with 2 inf bns, 1 armd recce sqn, 1 tk sqn, 1 fd arty bty, 1 AD regt, 1 Ranger coy.
Total units:
11 inf bns (3 with MICV coy; UNIFIL bn *ad hoc* – dets from other bns).
1 tk sqn.
1 armd sqn.
4 recce sqns.
3 fd arty regts (each of 2 btys); 1 indep bty.
1 AD regt (1 regular, 3 reserve btys).
3 fd engr coys.
1 Ranger coy.
12 *Scorpion* lt tks; 20 AML-90, 32 AML-60 armd cars; 60 Panhard VTT/M3, 10 *Timoney* APC; 48 25-pdr (88mm) gun/how; 12 105mm lt guns; 199 60mm, 250 81mm, 72 120mm mor; 446 *Carl Gustav* 84mm, 96 PV-1110 90mm RCL; 4 *Milan* ATGW; 24 L/60, 2 L/70 40mm AA guns; 4 RBS-70 SAM.
(On order: 81mm mor.)

RESERVES: 19,093 first-line, 18,416 second-line. 4 second-line Reserve Army Gps (garrisons): 2 Gps have 6 inf bns (1 Gp has 4, 1 has 2), 6 fd arty regts (2 Gps have 2; 2 have 1); 3 Gps have 1 motor sqn, 1 engr, 1 supply/tpt coy, 1 sigs coy.

Navy: 963 (to be increased to about 1,500).
4 patrol vessels.
2 Br *Ton* coastal MCM (fishery protection).
(On order: 1 P-31 offshore patrol vessel.)

Base: Cork.

RESERVES: 5 coys (320).

Air Force: 837; 15 combat ac.
3 wings (1 trg):
1 COIN sqn with 6 *Super Magister*.
1 COIN/trg sqn: 9 SF-260WU, 1 *Chipmunk* ac; 2 *Gazelle* hel.
1 liaison sqn with 8 Cessna 172H.
1 hel sqn with 8 *Alouette* III.
1 tpt/trg sqn with 3 *King Air*, 1 HS-125-700.
(On order: 5 AS-365F *Dauphin* II MR hel (2 for Navy).)

Forces Abroad: Cyprus (UNFICYP) 6. Lebanon (UNIFIL) 1 bn + (722); 4 AML-90 armd cars, 13 VTT/M3 APC. Other Middle East (UNTSO) 21.

FINLAND

Population: 4,840,000.
Military service: 8–11 months (11 months for officers and NCOs). Three entries per year.
Total armed forces: 40,400 (25,400 conscripts; total mobilizable strength about 700,000).
GDP 1981: m 207.73 bn ($48.138 bn). 1982: 229.32 bn ($47.573 bn).
Est def exp 1981: m 3.071 bn ($711.654 m). 1982: 3.899 bn ($808.854 m).
GDP growth: 1.4% (1981), 1.1% (1982).
Inflation: 9.9% (1981), 9.3% (1982).
$1 = markkaa 4.3153 (1981), 4.8204 (1982).

Army: 34,900 (incl Frontier Guard; 23,500 conscripts).
7 Military Areas; 25 Military Districts:
1 armd bde.
7 inf bdes.
2 fd arty regts.
2 coast arty regts.
7 indep inf bns.
2 indep fd arty bns.
3 coast arty bns (1 mobile).
1 AA arty regt (incl 1 SAM bn with SAM-79).
4 indep AA arty bns.
2 engr bns.
1 sigs regt, 1 bn.
T-54/-55 MBT; PT-76 lt tks; BMP-1 MICV; BTR-50P/-60 APC; 76mm, 105mm, 122mm, 130mm, 150mm, 152mm, 155mm guns/how; 81mm, 120mm mor; M-55 55mm, *Miniman* 74mm, 95mm RCL; SS-11 ATGW; 20mm, 23mm, 30mm, 35mm, 40mm, 57mm towed, ZSU-57-2 SP AA guns; SAM-79 (SA-3), SAM-78 (SA-7) SAM.
(On order: *TOW* ATGW.)

Navy: 2,500 (incl 600 Coast Guard, 1,500 conscripts).
2 *Turunmaa* corvettes.
6 FAC(M): 1 *Helsinki* with RBS-15SF MTO SSM; 4 *Tuima* (Sov *Osa*-II); 1 *Isku* (experimental with MTO-66 *(Styx)* SSM).
10 *Nuoli* FAC(G).
1 *Hurja* coastal patrol craft< (experimental).
5 R-class large patrol craft.
3 minelayers (1 trg), 6 *Kuha*, 1 *Kiiski* inshore minesweepers.
1 HQ/log ship.
25 small LCU/tpts, 3 *Pukkio* spt ships.
(On order: 3 *Helsinki* FAC(M), 6 *Kiiski* MCM; RBS-15SF SSM.)

Bases: Upinniemi (Helsinki), Turku.

Air Force: 3,000 (400 conscripts); 42 combat ac.
3 AD districts: 3 fighter wings.
2 ftr sqns with 21 MiG-21bis, 12 J-35S *Draken*.
1 OCU with 6 MiG-21U/UM, 3 J-35C.
1 tpt sqn: 5 C-47, 3 F-27-100, 3 *Learjet* 35A ac; 1 hel flt with 6 Mi-8, 2 Hughes 500.
Trainers incl 50 *Magister*, 24 *Hawk*, 30 *Vinka* (Leko 70).
Liaison ac: 9 *Cherokee Arrow*, 2 Cessna 402, 4 *Chieftain*.
AAM: AA-2 *Atoll*, RB-27, RB-28 *(Falcon)*.
(On order: 26 *Hawk* trg, 4 *Chieftain* liaison ac.)

RESERVES: (all services): some 700,000 (36,000 a year do conscript training; 40,000 reservists do 40–100 days refresher training between service and 50; officers to 60.) Org: bdes, bns to support the Regular Force and provide local territorial defence.

Forces Abroad: Cyprus (UNFICYP) 10. Syria (UNDOF) 1 bn (390). Lebanon (UNIFIL) 1 bn (493). Other Middle East (UNTSO) 22. Pakistan (UNMOGIP) 4.

Para-Military Forces: Ministry of Interior: Frontier Guards 3,500, four districts; Coast Guard 600, 3 districts; 4 large, 9 coastal, some 34 smaller patrol craft; ac and 2 Mi-8 hel.

MALTA

Population: 355,000.
Military service: voluntary.
Total armed forces: 800.
Est GNP 1981: £M436.4 m ($1.130 bn). 1982: 486.2 m ($1.181 bn).
Est def exp 1981: £M3.80 m ($9.839 m). 1982: 6.20 m ($15.056 m).
$1 = £M0.3862 (1981), 0.4118 (1982).

Army: 800.
1 inf bn (incl 1 arty coy, 6 40mm AA guns, RPG-7 RL).
1 task force.
1 marine section with 15 patrol craft<.
1 air section with 1 AB-206, 3 *Alouette* III, 4 AB-47G hel (serviceability questionable).

Para-Military Forces: Reserves *(Id Dejma)* some 800: voluntary general duties (500), women's service (280). Pioneers/labour corps, 3 bns; 1,000.

SWEDEN

Population: 8,330,000.
Military service: Army and Navy 7½–15 months, Air Force 8–12 months.
Total armed forces: 68,000 (50,100 conscripts;[4] mobilizable to about 800,000 in 72 hours, excl 500,000 auxiliary orgs).
GDP 1981: S kr 569.71 bn ($101.466 bn). 1982: 620.69 bn ($98.795 bn).
Est def exp 1982/3: S kr 19.110 bn ($3.042 bn). 1983/4: 20.488 bn ($2.734 bn).[5]
GDP growth: −0.7% (1981).
Inflation: 8.9% (1981), 9.8% (1982).
$1 = kronor 5.6148 (1981/2), 6.2826 (1982/3), 7.4938 (1983).

Army: 48,500 (38,500 conscripts).[4]
Peace establishment:
50 armd, cav, inf, arty, AA, engr, and sigs regts; (local defence, cadre for mobilization, basic conscript trg).
War establishment (700,000 on mobilization, incl 100,000 Home Guard):
4 armd bdes.
20 inf (1 mech forming), 4 *Norrland* bdes.
50 indep inf, arty, and AA arty bns.
1 army aviation bn (35 hel).
11 arty aviation platoons (66 ac).
26 Local Defence Districts with 100 indep bns, 400–500 indep coys, and Home Guard units.
340 Strv-101, Strv-102 *(Centurion),* 330 Strv-103B MBT; 200 Ikv-91 lt tks; Pbv-302 APC; 105mm, 150mm, 155mm how; 155mm SP guns; 81mm, 120mm mor; *Miniman* 74mm, *Carl Gustav* 84mm, PV-1110 90mm RCL; RB-53 *Bantam* ATGW; 20mm, 40mm AA guns; RB-69 *(Redeye),* RBS-70, RB-77 *(Improved HAWK)* SAM; 66 SK-61C *(Bulldog)* ac; 15 HKP-3 (AB-204B), 24HKP-6 *(Jet Ranger)* hel.
(On order: FH-77 155mm how, 2,000 *TOW* ATGW.)

Navy: 10,000, incl coast arty (6,600 conscripts),[4] 10 combat hel.
12 subs: 3 *Näcken,* 5 *Sjöormen,* 4 *Draken.*
28 FAC(M): 16 *Hugin* with 6 RB-12 *(Penguin),* 12 Spica R-131 with RBS-15 SSM.
6 *Spica* T-121 FAC(T).
4 *Hanö* large, 10 coastal patrol craft.
2 minelayers, 1 minelayer/trg ship.
9 coastal, 6 inshore minelayers.
10 *Arko* coastal, 10 inshore minesweepers.
9 LCM, 81 LCU, 54 LCA.
5 coast arty bdes; 15 bns: 12 mobile, 45 static btys with 75mm, 105mm, 120mm, 152mm guns; RB-08, RB-52 SSM; 30 barrage (arty/SSM/inf) bns and coys; coast rangers (coys); 17 60-class coastal patrol craft.
2 hel sqns with 10 HKP-4 (Vertol 107) ASW/MCM, 3 HKP-2 *(Alouette* II) utility, 10 KHP-6.
(On order: 4 A-17 subs, 2 *Stockholm* FAC(M), 4 *Skanör* coastal patrol craft, 5 minelayers, 2 *Landsort* minehunters, 8 tpts; 4 HKP-4 hel; RBS-15 SSM.)

Bases: Stockholm, Karlskrona, Goteborg (spt only), Farosund.

Air Force: 9,500 (5,000 conscripts);[4] 420 combat ac.
12 wings.
6 FGA sqns: 5 with 97 AJ-37 *Viggen,* 1 with 20 SK-60B/C (Saab 105).
13 AD sqns: 8 with 125 J-35F *Draken,* 3 with 54 J-35D, 2 with 36 JA-37 *Viggen.*
3 recce sqns with 54 SH/SF-37 *Viggen.*
2 OCU: 1 with 17 SK-37 *Viggen;* 1 with 17 SK-35C *Draken.*
2 tpt sqns with 8 C-130E/H, 2 *Caravelle,* 2 C-47.
5 comms sqns with 65 SK-60A.
Trainers incl 124 SK-60A/B/C, 57 SK-61, 24 J-32D *Lansen* (drone).
1 SAR sqn with 10 HKP-4 hel.
1 utility sqn with 9 HKP-2, 7 HKP-3 hel.
AAM: AIM-9J/P *Sidewinder,* RB-27 *(Falcon),* RB-28 *(Improved Falcon),* RB-71 *(Skyflash).*
ASM: RB-04E, RB-05A, RB-75 *(Maverick),* RBS-15F.
Semi-automatic control and surveillance system, *Stril* 60, coordinates all AD components.
(On order: 111 JA-37 *Viggen,* 30 JAS-39 *Gripen* multi-role ac, 10 HKP-5 (Hughes 300C) hel, *Skyflash* AAM, RBS-15G.)

RESERVES (all services): 735,500; voluntary auxiliary organizations 500,000.

Forces Abroad: Cyprus (UNFICYP) 1 inf bn (428). Lebanon (UNIFIL) HQ/log tps (142).

Para-Military Forces: Coast Guard (550): 2 TV-171 fishery protection vessels; (Air Arm) 2 Cessna 337G, 1 402C.

SWITZERLAND

Population: 6,468,000.
Military service: 17 weeks recruit training followed by reservist refresher training of 3 weeks for 8 out of 12 years for *Auszug* (20–32), 2 weeks for 3 years for *Landwehr* (33–42), 1 week for 2 years for *Landsturm* (43–50).
Total armed forces: about 1,500 regular and 18,500 recruits[6] (mobilizable to 625,000 in 48 hours).
GDP 1981: fr 185.6 bn ($94.491 bn). 1982: 196.1 bn ($96.587 bn).
Est def exp 1981: fr 3.756 bn ($1.912 bn); 1982: 4.134 bn ($2.036 bn).[7]
GDP growth: 2.0% (1981), −1.3% (1982).
Inflation: 6.6% (1981), 5.5% (1982).
$1 = francs 1.9642 (1981); 2.0303 (1982).

Army:
War establishment: 580,000 on mobilization.
3 fd corps, each of 1 mech, 2 inf divs.
1 mountain corps of 3 mountain inf divs.
Corps tps: 3 infantry, 3 cyclist, 1 mountain inf regts; 3 engr regts (3 bns); 3 sigs, 3 medical, 3 log, 3 traffic control bns; 3 hel sqns, 3 lt ac flts.
17 indep bdes (11 frontier, 3 fortress, 3 redoubt).
Indep units: 3 hy arty, 2 engr, 2 sigs regts, 1 armd car bn.
20 Fortress Guard companies.
325 Pz-55/57 *(Centurion),* 150 Pz-61, 340 Pz-68 MBT; 1,250 M-113 APC; 1,000 105mm Model 35 guns and Model 46 how; M-50 towed, 260 PzHb-66 (M-109U) 155mm SP how; 3,000 81mm, 120mm mor; 2,000 Model 50 and Model 57 90mm ATK guns; 106mm RCL; 20,000 83mm RL; 800 *Bantam, Dragon* ATGW; 700 20mm, 300 35mm AA guns.
(On order: 60 Pz-68 MBT, 4 MOWAG *Piranha,* 225 M-113 APC, 207 M-109 155mm SP how, *Dragon* ATGW.)

Air Force:[8] 45,000 on mobilization (maintenance by civilians); 321 combat ac.
3 air regts.
12 FGA sqns: 3 with 50 *Venom* FB-50 (to retire 1983); 9 with 147 *Hunter* F-58/T-68.
4 ftr sqns with 70 F-5E/F.
2 interceptor sqns with 31 *Mirage* IIIS/BS.
1 recce sqn with 16 *Mirage* IIIRS, *Venom* FB-54.
4 liaison/SAR sqns with 16 *Porter,* 24 *Turbo-Porter,* 6 Do-27, 3 *Twin Bonanza.*
4 hel sqns with 21 *Alouette* II, 76 *Alouette* III hel.
Trainers incl 47 Pilatus P-2, 68 P-3.
AAM: *Sidewinder,* AIM-26B *Falcon.* ASM: AS-30.
1 air force fd bde (3 fd regts, 1 para coy, 1 lt ac wing).
1 airbase bde with 3 AA arty regts, each with 4 batteries of 20mm and 35mm guns.
1 AD bde: 1 SAM regt (2 bns, each 2 btys; 64 *Bloodhound*), 7 AA arty regts (each 3 btys; 20mm and 35mm guns, *Skyguard* fire control).
3 comd and comms, 1 log regts.
(On order: 2 *Mirage* IIIB, 32 F-5E, 6 F-5F ftrs; 40 PC-7 *Turbo-Trainer* ac; 60 *Rapier* SAM launchers; 500 AGM-65 *Maverick* ASM.)

RESERVES (all services): 605,000.

YUGOSLAVIA

Population: 22,650,000.
Military service: 15 months.
Total armed forces: 239,700 (154,000 conscripts).
GMP[9] 1980: dinar 1,582.9 bn ($63.542 bn). 1981: 2,194.0 bn ($61.789 bn).
Est def exp 1982: dinar 119.0 bn ($2.319 bn). 1983: 150.58 bn ($1.774 bn).
GNP growth: 1.5% (1981), 0.0% (1982).
Inflation: 41% (1981), 33% (1982).
$1 = dinar 24.911 (1980), 35.508 (1981), 51.323 (1982), 84.858 (1983).

Army: 191,000 (140,000 conscripts).
7 Military Regions:
8 inf divs.
8 indep tk bdes.
17 indep inf bdes (incl mech, 3 lt).
1 mountain bde.
1 AB bde (bn strength in peacetime).
12 fd, 12 AA arty regts.
6 ATK regts.
3 SAM regts.
1,240 T-34/-54/-55, 60 M-47 MBT; PT-76 lt tks; M-3A1, M-8, BRDM-2 scout cars; M-980 MICV; 200 BTR-40/-50/-60/-152, some M-60 APC; 1,800 M-1955, SU-100 100mm SP, 122mm, M-46 130mm, and 152mm guns; M-48 76mm, 105mm incl SP, 122mm incl M-1974 SP, 155mm how; 82mm, 120mm mor; 128mm MRL; *FROG*-7 SSM; 57mm, PAK-40 75mm, T-12 100mm towed, ASU-57, 300 M-18 76mm, M-36B2 90mm SP ATK guns; 57mm, 75mm, 82mm, 105mm RCL; *Snapper, Sagger* ATGW; 20mm, 30mm, 37mm, 40mm, 57mm, 85mm, 88mm, 90mm, 94mm towed, ZSU-23-4, M-53/59, ZSU-57-2 SP AA guns; SA-6/-7/-9 SAM.
(On order: 500 M-980 MICV.)

RESERVES: 500,000; mobile bdes, bns with arty and AA guns. (T-34/-85, M-4 MBT, M-18 *Hellcat* 76mm, M-36B2 90mm SP ATK guns in store.)

Navy: 12,000 incl 1,500 marines (6,000 conscripts).
9 subs: 2 *Sava,* 3 *Heroj,* 2 *Sutjeska;* 2 *Mala* midget.
2 *Koni* frigates with 1 × 2 SA-N-4 SAM.
3 corvetes: 2 *Mornar,* 1 *Le Fougueux* (in reserve).
16 FAC(M) with *Styx* (6 *Rade Koncar,* 10 *Osa*-I).
15 Sov *Shershen* FAC(T).
20 large patrol craft: 10 *Kraljevica,* 8 Type 131, 2 *Mirna.*
31 minesweepers: 4 *Vukov Klanac* coastal, 10 inshore (4 *Ham,* 6 M-117), 13 river< (6 M-301, 7 *Nestin*).
12 DTM-211 LCU/minelayers, 24 601-type LCA.
1 ASW hel sqn with Ka-25, Mi-8, *Partizan* (*Gazelle*).
1 understrength marine bde (2 regts, each of 2 bns).
25 coast arty btys with M-44 85mm, Ger 88mm, M-37 122mm, M-54 130mm, 152mm guns.
(On order: 6 FAC(M), 4 *Mirna* patrol craft.)

Bases: Lora/Split, Pula, Sibenik, Kardeljevo, Kotor, Dubrovnik.

Air Force: 36,700 (8,000 conscripts); some 400 combat ac.
2 air divisions; 4 air regions.
12 FGA sqns with 25 *Kraguj,* 160 *Galeb/Jastreb,* some 10 *Orao,* some G-4 *Super Galeb.*
9 interceptor sqns with 130 MiG-21F/PF/M/bis; 20 MiG-21U.
2 recce sqns with 35 *Galeb/Jastreb.*
1 OCU with 30 *Jastreb.*
2 tpt sqns: 15 C-47, 6 Yak-40, 12 An-12, 10 An-26, 2 Boeing 727-200, 2 DC-6, 12 Il-14M, 2 *Mystère*-50, 4 CL-215.
Trainers incl 60 *Galeb/Jastreb,* 3 T-33, 30 UTVA-75 ac, 15 *Partizan* hel.
4 hel tpt sqns: 5 AB-205, 18 Mi-4, 75 Mi-8, 5 *Whirlwind,* 45 *Partizan,* 1 A-109 *Hirundo.*
AAM: AA-2 *Atoll.*
Air Defence Force: (Army personnel, eqpt, Air Force control):
24 AA regts.
8 SA-2, 6 SA-3 SAM bns.
(On order: *Super Galeb,* some 25 *Orao* FGA, *Turbo-Porter* tpt ac, some 94 SA-341-H *Partizan* hel.)

Para-Military Forces: Frontier Guards 15,000. Territorial Defence Force (Partisan) 1–3 million. Civil Defence 2 million on mobilization. Workers' Militia State Police with APC.

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[1]Spare parts are in short supply; some equipment may be unserviceable; 3 W-class subs, 12 P-4 FAC(T) have been reported as such.

[2]Austrian air units, an integral part of the Army, are listed separately for purposes of comparison.

[3]Mainly Cypriot conscripts, but some seconded Greek Army officers and NCOs.

[4]There are normally some 95,000 more conscripts (70,000 Army, 4,500 Navy, 6,000 Air Force) plus 15,000 officer and NCO reservists doing 11–40 days refresher training at some time in the year. Obligation is 5 times per reservist between ages 20 and 47.

[5]A defence development plan of some $14.3 bn (prevailing exchange rate) is in effect for 1982–7.

[6]Two recruit intakes a year (Jan/Jun) each of 17,000. Some 400,000 reservists a year do refresher training.

[7]Including civil defence outlays.

[8]Aviation Corps, an integral part of the Army.

[9]Gross Material Product.

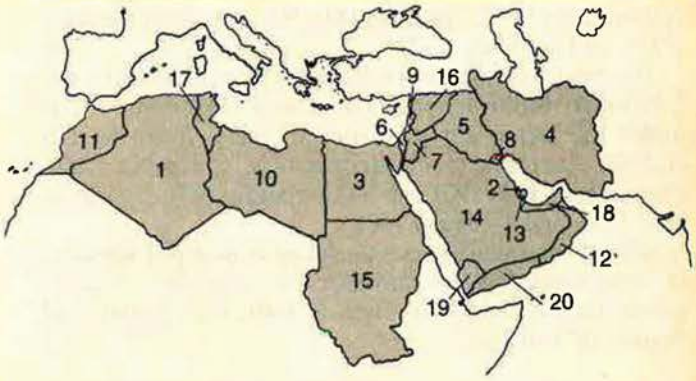
The Middle East and North Africa

Bilateral Agreements with External Powers

The Soviet Union signed a fifteen-year Treaty of Friendship and Co-operation with Iraq in April 1972, and a further agreement in December 1978. A similar treaty was signed with Syria on 8 October 1980, and Soviet air defence units are deployed in Syria under this treaty. A Treaty of Friendship and Co-operation, signed with South Yemen in October 1979, was ratified in February 1980, and an agreement of Joint Co-operation was signed in January 1983. Soviet naval units use Aden's facilities. All three countries have received significant Soviet arms deliveries. Despite this, Iraq has been seeking to broaden her contacts with the West, particularly with France and Italy. In November 1979 Iran unilaterally abrogated two paragraphs of a 1921 treaty under which Moscow reserves the right to intervene in Iran's internal affairs if a third country threatens to attack the USSR from Iranian territory. The Soviet Union has refused to accept this abrogation. Egypt signed a Treaty of Friendship and Co-operation with the Soviet Union in May 1971 and abrogated it in March 1976; the Soviet Union, formerly a major supplier, has delivered no significant arms supplies to Egypt since. Some supplies may be still coming from other Warsaw Pact nations but spare parts made by Western nations and the Chinese People's Republic, domestic manufacture, and modernization from Western suppliers are reducing the importance of this link.

The Defence Ministers of Bulgaria and the People's Democratic Republic of Yemen (South Yemen) signed a Protocol for Co-operation in April 1980 and a Treaty of Friendship and Co-operation on 14 November 1981. Similar agreements with Hungary were reported in April and November 1981. Libya signed treaties of Friendship and Co-operation with Bulgaria and Romania in January 1983. Sudan and Romania signed an agreement providing technical co-operation and training in November 1982.

The United States has varying types of security assistance programmes in the region. It concluded a mutual defence agreement with Israel in July 1952 and continues to provide Israel with large quantities of equipment. A similar agreement with Egypt (April 1952) may have been in abeyance between 1971 and 1975. A 1981 agreement enables the US to use Egyptian bases but with significant reservations on Egypt's part. The status of US fundings is in doubt. A similar agreement was reached with Morocco in May 1982. A 1959 mutual security agreement with Iran, though only an executive agreement, not a formally ratified treaty, has not been specifically abrogated. An agreement has been concluded with Oman to provide economic and military aid in exchange for permission to use Salalah and Masirah as staging bases. An agreement with Bahrain permits the US Navy to use port facilities. In November 1981 a strategic co-operation agreement was signed with Tunisia.



THE MIDDLE EAST AND NORTH AFRICA

1. Algeria
2. Bahrain
3. Egypt
4. Iran
5. Iraq
6. Israel
7. Jordan
8. Kuwait
9. Lebanon
10. Libya
11. Morocco
12. Oman
13. Qatar
14. Saudi Arabia
15. Sudan
16. Syria
17. Tunisia
18. United Arab Emirates (UAE)
19. Yemen Arab Republic (North)
20. Yemen: People's Democratic Republic (South)

North Korea and Libya signed a Treaty of Alliance or Friendship and Co-operation in November 1982 which permits exchanges of military data, specialists, and supplies.

Britain concluded treaties of friendship with Bahrain, Qatar, and the United Arab Emirates (UAE) in August 1971. It has supplied arms to Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Sudan, and the UAE. France has continuing arms supply arrangements with Egypt, Iraq, Lebanon, Libya, Morocco, Sudan, and Tunisia. West Germany will provide technical training assistance to Sudan.

China signed a Treaty of Friendship with North Yemen in 1964, under which minor arms were provided. Arms and spare parts were sent to Egypt under an agreement signed in 1978/9. Another agreement has been reported in April 1983. Arms supplies to Sudan and a military co-operation agreement signed in January 1982 suggest more will follow.

Peacekeeping Forces

The United Nations withdrew the 4,000-man United Nations Emergency Force (UNEF) from the Sinai on 24 July 1979; its duties were assumed by the United Nations Truce Supervisory Organization (UNTSO), 298 officers, which has been active in the region since 1949.

The United Nations also deploys in the Golan Heights the 1,279-man Disengagement Observer Force (UNDOF), made up of contingents from Austria (530), Canada (220), Finland (390), and Poland (131).

The United Nations Interim Force in Lebanon (UNIFIL) consists of some 6,285 men from Eire (722), France (911), Fiji (626), Finland (495), Ghana (702), Italy (40), Netherlands (807), Nigeria (444), Norway (839), Senegal (557), and Sweden (142).

The Egyptian/Israeli border in Sinai is patrolled by the 2,200-man Multi-national Force and Observers (MFO) under the Israeli-Egyptian peace treaty, from the US (1,200), Australia (110), Britain (35), Colombia (500), France (72), Italy (90), the Netherlands (105), New Zealand (35), and Uruguay (70).

A Multi-national Force was set up in Beirut, Lebanon, in September 1982, to monitor the cease-fire. It comprises Italian (2,038), French (1,100), US (2,000), and British (87) troops.

Arrangements within the Region

Algeria, Bahrain, Djibouti, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, the Palestine Liberation Organization (PLO), Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, and North and South Yemen are members of the League of Arab States (Egypt's membership was suspended in March 1979). Among its subsidiary bodies are the Arab Supreme Defence Council, comprising Foreign and Defence Ministers (set up in 1950), the Permanent Military Committee of army general staffs (1950), which is an advisory body, and the Unified Arab Command (1964).

Syrian and Palestine Liberation Army Forces, comprising the Arab Deterrent Force, remain in northern Lebanon as do Israeli forces in the south. Syria has reinforced its component with armour, artillery, and SAM. The Palestine Liberation Organization evicted from southern Lebanon between June and August 1982 also has some elements in the north.

Algeria and Libya signed a defence agreement in 1975. Egypt and Sudan signed another in 1977, which may have been the authority for the establishment of the Joint Defence Council and some joint training activity which took place. In October 1982 they signed an 'Integration Charter' combining, amongst others, military policy. This will be studied 'for 10 years'. Saudi Arabia has long supported Morocco against *Polisario* guerrillas; the two countries signed a security pact in February 1982. An understanding between Saudi Arabia and Iraq is believed to have been signed in 1979. Jordan and Iraq ratified a Defence agreement in March 1981. The Gulf Co-operative Council, created in May 1981 by Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE, is developing a mutual defence structure to include a joint strike force, air defence, transport, and procurement. It is being reinforced by internal security pacts between Saudi Arabia and Bahrain, Qatar, Oman, and the UAE. A draft Gulf security agreement is now circulating.

Libya, South Yemen, and Ethiopia formed the Aden Treaty Tripartite Alliance in 1981; it includes a joint defence commitment. North and South Yemen have agreed to a merger, the details of which are obscure. Jordan, Morocco, and North Yemen have announced the departure of unspecified numbers of volunteers to assist Iraq against Iran. Iraq has announced the presence of multi-national composite units but numbers, roles, and equipment are obscure. Sudan and Ethiopia agreed a regime of security, stability, and non-interference in each other's internal affairs in July 1982.

Arms movements in the region are complex. Egypt has supplied arms to Morocco, Sudan, and Iraq. Algeria and Libya have reportedly supplied arms to *Polisario*, and most countries have supplied arms to the Palestinian guerrillas. In some cases a third nation funds the recipient's foreign arms purchases. Iran has reportedly received arms supplies and spares from France, Israel, North Korea, and Eastern Europe. Iraq has apparently received arms from Egypt, the USSR, China, North Korea, France, Portugal, and Brazil.

In 1975 an Arab Organization for Industrialization (AOI) was set up in Egypt under the aegis of Saudi Arabia, Qatar, the UAE, and Sudan to encourage indigenous Arab arms production. The project was ended following Egypt's *rapprochement* with Israel. Egypt is attempting to continue it with British, French, and US support. To replace the AOI, Iraq, Kuwait, Qatar, Saudi Arabia, and the UAE agreed in 1979 to set up an $8-billion arms industry in the UAE. This proposal is now being studied by the Gulf Co-operative Council.

ALGERIA

Population: 20,600,000.
Military service: 6 months.
Total armed forces: 140,000.
GDP 1980: DA 159.1 bn ($41.459 bn). 1981: 180.0 bn ($41.707 bn).
Est defence operating budget 1982: DA 3.893 bn ($847.742 m).
GDP growth: 5.0% (1981), 2.5% (1982).
Inflation 14% (1981), 15% (1982).
$1 = dinar 3.8375 (1980), 4.3158 (1981), 4.5922 (1982).

Army: 120,000.
7 Military Regions:
- 3 armd bdes.
- 4 mech bdes.
- 6 mot inf bdes.
- 1 AB/special force bde.
- 3 indep tk bns.
- 20 indep inf bns.
- 2 para bns.
- 5 indep arty bns.
- 11 AD bns.
- 4 engr bns.
- 12 coys desert troops.

400 T-54/-55, 200 T-62, 30 T-72 MBT; 50 AML-60, 100 BRDM-2 armd cars; 500 BMP-1 MICV; 830 BTR-40/-50/-60/-152 APC; 100 85mm towed, 350 SU-100 SP, 122mm incl ISU-122, 152mm SP guns; 122mm incl M-1974 SP how, 152mm guns/how; 150 BM-21 122mm, 140mm, and 240mm MRL; 230 75mm, 76mm, and 85mm ATK guns; 180 120mm and 160mm mor; 20 *Sagger*, 18 *Milan* ATGW; 440 37mm, 57mm, 85mm, 100mm, 130mm towed, 100 ZSU-23-4 and ZSU-57-2 SP AA guns; SA-6/-7/-9 SAM.
(On order: 44 Panhard M-3 APC.)

RESERVES: up to 100,000.

Navy: 8,000.
1 Sov R-class sub (trg).
2 *Koni* frigates with 2 × 2 SA-N-4 SAM.
3 *Nanuchka* corvettes with 4 SS-N-2b SSM, 2 × 2 SA-N-4 SAM.
18 Sov FAC(M) with *Styx* SSM; 3 *Osa*-I, 9 *Osa*-II, 6 *Komar*(.
6 Sov SO-1 large patrol craft.
10 Sov P-6 FAC(T)((2 unarmed trg).
1 Sov *Zhuk* coastal patrol craft(.
2 Sov T-43 ocean minesweepers (in reserve).
1 Sov *Polnocny* LCT.
(On order: 4 FAC(M), 2 LST.)

Bases: Algiers, Annaba, Mers el Kebir.

Air Force: 12,000; some 306 combat ac, 37 combat hel.
1 lt bbr sqn with 12 Il-28.
7 FGA sqns: 2 with 20 Su-7BM; 2 with 60 MiG-17; 3 with some 40 MiG-23BM, some 12 Su-20 (*Fitter* C), 8 MiG-19.
4 interceptor sqns: 3 with 95 MiG-21MF/F; 1 with 18 MiG-25 *Foxbat* A.
1 recce sqn with 4 MiG-25R *Foxbat* B.
1 COIN sqn with 26 *Magister*.

1 MR sqn with 7 F-27 (Navy-assigned).
1 OCU with 4 MiG-15.
1 tpt sqn with 8 An-12, 8 C-130H, 6 H-30, 1 Il-18, 1 *Mystère-Falcon*, 3 *Caravelle*.
6 hel sqns with 4 Mi-6, 28 Mi-4, 12 Mi-8, 37 Mi-24, 5 *Puma*, 6 Hughes 269A, 4 *Alouette* II.
Other ac incl 6 *King Air*, 2 *Super King Air* T-200T (MR), 3 *Queen Air*.
Trainers incl MiG-15/-17/-21UTI, Su-7U, 2 MiG-23U, 3 MiG-25U, 6 T-34C.
1 SAM regt: 20 SA-2 (80 msls), some SA-3, 18 SA-6.
AAM: AA-2 *Atoll*.
(In store: 16 Il-28 bbrs.)

Para-Military Forces: Gendarmerie 24,000: 44 Panhard M-3 APC. Coastguard 550: 2 P-6 FAC(T)(15 Baglietto FAC(G)((6 Gemini 36, 9 Type 20), 1 fast patrol boat.

BAHRAIN

Population: 400,000.
Military service: voluntary.
Total armed forces: 2,700.
Est GDP 1980: BD 1.507 bn ($4.0 bn). 1981: 1.698 bn ($4.516 bn).
Est def exp 1981: BD 68.3 m ($181.649 m). 1982: 84.1 m ($223.670 m). 1983: 95.2 m ($253.191 m).
GDP growth 1981: 9%.
Inflation 1981: 11.0%.
$1 = dinar 0.3769 (1980), 0.3760 (1981/2/3).

Army: 2,300.
1 inf bn.
1 armd car sqn.
1 arty bty.
8 *Saladin*, 20 AML-90 armd, 8 *Ferret* scout cars; 110 M-3 APC; 8 105mm lt guns; 6 81mm mor; 6 120mm RCL; *TOW* ATGW; 6 RBS-70 SAM.
(On order: 7 M-198 155mm how; *TOW* ATGW.)

Navy: 300.
2 Lürssen 38-metre FAC(G).
(On order: 2 Lürssen 45-metre FAC(M) with 4 *Exocet* SSM.)

Air Force: 100.
1 hel sqn with 12 AB-212.
(On order: 12 F-4J *Phantom*, 4 F-20 *Tigershark* ftrs.)

Para-Military Forces: Coastguard: 180; 16 coastal patrol craft, 2 landing craft (1 *Loadmaster*, 1 60-ft). Police: 2,500; 2 Bell 412, 2 *Scout*, 3 BO-105, 2 Hughes 500D hel.

EGYPT

Population: 46,000,000.
Military service: 3 years (selective).
Total armed forces: 447,000 (255,000 conscripts).
GNP 1981: £E 20.727 bn ($29.614 bn).
Est def exp 1981–82: £E 1.470 bn ($2.100 bn). 1982/3: 1.746 bn ($2.495 bn). 1983/4: 2.130 bn ($3.043 bn).
Est FMA: $1 bn (1982), $1.5 bn (1983).
GDP growth: 6.5% (1981); 6% (1982).
Inflation: 10% (1981), 16% (1982).
$1 = £E 0.6999 (1981–3).

Army: 315,000 (180,000 conscripts).[1]
2 Army HQ.
3 armd divs (each with 1 armd, 2 mech bdes).
5 mech inf divs (each with 2 mech, 1 armd bdes).
3 inf divs (each with 2 inf, 1 mech bdes).
2 Republican Guard Brigades.
2 indep armd bdes.
9 indep inf bdes.
2 airmobile, 1 para bdes.
12 arty bdes.
2 hy mor bdes.
6 ATGW bdes.
7 cdo gps.
2 SSM regts (1 with *FROG*-7, 1 with *Scud* B).
AFV: 860 T-54/-55, 200 M-77, 600 T-62, 250 AM-60 (M-60A3) MBT; 30 PT-76 lt tks; 300 BRDM-1/-2 scout cars; 200 BMP-1 MICV; 2,500 OT-62, BTR-40/-50/-60/-152, *Walid*, 300 M-113A2 APC.
Arty: 1,500 85mm, 100mm (incl 200 SU-100 SP), 122mm, 130mm, 152mm (incl SU-152 SP) and 180mm guns; 122mm, 152mm how; 400 120mm, 160mm, and 240mm mor; about 300 122mm (incl *Saqr* 30), 132mm, 140mm, and 240mm MRL; 12 *FROG*-7, 12 *Scud* B SSM.
ATK: 900 57mm (incl SP), 76mm, and 100mm guns; 900 82mm and 107mm RCL; 1,000 *Sagger, Snapper, Swatter, Milan, Beeswing, Swingfire*, and *TOW* ATGW.
AD: 350 ZSU-23-4 and ZSU-57-2 SP AA guns; SA-7/-9, 16 *Crotale* SAM.
(On order: 189 M-60A3 MBT; 600 BMR-600, 750 M-113A2 APC; M-109A2 155mm SP how; JPz SK-105 SP ATK gun, 52 M-901 SP *TOW* ATGW AFV; 100 M-106A2 and M-125A2 mor carriers; 200 *TOW* launchers, 4,000 msls (incl 2,500 Improved *TOW*), 2,000 *Swingfire* ATGW, *Skyguard* AD twin 35mm/*Sparrow* SAM systems, 4 *Crotale* SAM.)

RESERVES: about 300,000.

Navy: 20,000 (15,000 conscripts).[1]
12 subs: 6 R-class (2 Ch), 6 Sov W-class.
5 destroyers: 4 Sov *Skory* (1 with 1 × 2 *Styx* SSM), 1 Br Z-class.
5 frigates: 2 Spanish F-30 *(Descubierta)*; 3 Br (1 *Black Swan*, 1 *Hunt*, 1 *River* (sub spt ship)).
24 FAC(M): 6 *Ramadan*(with 4 *Otomat* SSM; 6 *October*-6 (P-6)(with 2 *Otomat*; 8 Sov *Osa*-1 with SA-7 SAM, 4 *Styx* SSM; 4 *Komar*(.
12 Sov SO-1 large patrol craft: 6 with BM-21 MRL, some with SA-7 SAM.
16 Sov FAC(T): 2 *Shershen*, 10 P-6(, 4 P-4(.
14 Sov FAC(G): 4 *Shershen* with BM-21 MRL, SA-7 SAM; 10 P-6(.
12 Sov minesweepers: 10 ocean (6 T-43, 4 *Yurka*), 2 T-301 inshore.
3 SRN-6 hovercraft (may be minelayers).
3 Sov *Polnocny* LCT.
13 Sov LCU (9 *Vydra*, 4 SMB1).
1 ASW hel sqn with 6 *Sea King* Mk 47.
Coastal defence unit (Army manpower, Navy control): SSM-4-1 130mm guns, 30 *Otomat* and *Samlet* SSM.
(On order: 6 *Cormoran* FAC(M), 12 *Timsah* patrol boats, 14 SRN-6 hovercraft, *Otomat* SSM.)

Bases: Alexandria, Port Said, Mersa Matruh, Port Tewfig, Hurghada, Safaqa.

RESERVES: about 15,000.

Air Force: 27,000 (10,000 conscripts); 498 combat ac, 24 combat hel.[1]
1 bbr regt with 14 Tu-16 (some with AS-5 ASM).
5 FGA regts: 2 with 20 F-16, 44 Ch F-6; 2 with 50 MiG-17F, 36 Su-7BM; 1 with 53 *Mirage* 5SDE2.
2 recce sqns with 6 *Mirage* 5SDR, 12 MiG-21R/RF, 20 Su-7.
1 MR sqn with 5 Il-28.
ELINT ac: 2 EC-130H.
4 hel sqns with 52 *Gazelle* (24 with *HOT* ATGW).
1 tpt bde of 5 sqns with 21 C-130H, 18 Il-14, 10 An-12, 4 *Falcon* 20 (VIP), 10 DHC-5D *Buffalo*, 1 Boeing 707, 1 Boeing 737.
8 utility hel sqns with 20 Mi-4, 40 Mi-8, 52 SA-342H, 4 SA-342K *Gazelle*, 25 *Commando* (2 VIP), 15 CH-47C.
Trainers incl 15 MiG-15UTI, MiG-21U/US, 10 *Alpha Jet*, 60 L-29, 60 *Gomhouria*, 36 Yak-18, *Wilga* 35/80, 4 Ch FT-6, 6 *Mirage* 5SDD, 4 F-16B.
AAM: AA-2 *Atoll*, R-530, *Sparrow, Sidewinder*.
ASM: AS-1 *Kennel*, AS-5 *Kelt, Maverick, HOT*.
(Further ac in reserve incl up to 50 MiG-21, 17 MiG-23BN/U, 72 MiG-17, 67 Su-7, 40 Su-20, 43 F-8, 34 F-4 *Phantom*, 3 An-24 ac; 12 Mi-6 hel.)
(On order: 100 Ch F-7 (MiG-21-type), 20 F-16A/B, 20 *Mirage* 2000, 16 *Mirage* 5E2 ftrs; 35 *Alpha Jet* (15 -A FGA, 20 -E trg); 4 E-2C AEW; 6 C-130H tpt ac; 12 *Sea King* ASW, *Super Puma*, 24 *Cobra* with *TOW*, 15 CH-47, 18 UH-12E, 36 *Gazelle* (24 with *HOT* ATGW), 4 AS-61 hel; *Sparrow*, 300 *Sidewinder* AAM; AM-39 *Exocet, Maverick* ASM.)

RESERVES: about 20,000.

Air Defence Command: 85,000 (50,000 conscripts).
12 centres under construction.
2 AD divs: regional bdes.
100 msl and AA bns, radar bns; some 80 SA-2, 65 SA-3 sites. 360 SA-2, 200 SA-3, 75 SA-6, 6 *Improved HAWK*, 16 *Crotale* SAM; 2,500 20mm, 23mm, 37mm, 40mm, 57mm, 85mm, and 100mm AA guns; *Fan Song, Low Blow, Straight Flush* missile/gun and *Squint Eye, Long Track* EW radars.
3 interceptor bdes: 7 sqns with 142 MiG-21F/PFS/FL/PFM/M/MF; 2 forming with 40 F-16A, 54 *Mirage* 5 SDE1.
(On order: Ch CSA-1, *Spada*, LPD-20 search radar; 6 btys totalling 72 launchers, 216 *Improved HAWK* SAM.)

Forces Abroad: Iraq, Oman, Sudan (2,000), Somalia, Zaire.

Para-Military Forces: 139,000: National Guard, 60,000; Frontier Corps, 12,000; Defence and Security, 60,000; Coast Guard, 7,000: 3 *Nisr*, 6 *Crestitalia*, 6 *Bertram* patrol boats, 4 rescue launches.
(On order: 6 31-metre patrol boats.)

IRAN

Population: 41,500,000.
Military service: 24 months.
Total armed forces: up to 2,000,000 reported (incl active para-military).
Est GDP 1981: rial 9,534 bn ($121.719 bn).
Est def exp range 1982/3: rial 576.80–1,111.90 bn ($6.9–13.3 bn.).[2]
GDP growth: 5.6% (1981), 5.0% (1982).
Inflation 1981: 20% (1981), 23.0% (1982).
$1 = rial 78.328 (1981), 83.603 (1982).

Army: 150,000 (100,000 conscripts).
3 armd divs (each 3 bdes comprising: 4 armd, 5 mech bns, 1 div has 5 armd bns).
4 inf 'divs' (at least 2 are bde gps).
1 AB 'div' (bde).
4 SAM bns with *HAWK*.
Army Aviation Command.
190 T-54/-55/-62, 300 *Chieftain* Mk 3/5, 300 M-47/-48, 150 M-60A1 MBT; 100 *Scorpion* lt tks; EE-9 *Cascavel* armd cars; BMP MICV; about 220 M-113, 360 BTR-40/-50/-60/-152 APC; some 1,000 75mm pack, 85mm, M-101 105mm, 200 122mm, 130mm towed, M-107 175mm SP guns; M-114 towed, M-109A1 SP 155mm, M-115 towed, M-110 SP 203mm how; 65 BM-21 122mm MRL; 81mm, 4.2-in (107mm), 120mm mor; 57mm, 75mm, 106mm RCL; RPG-7 RL; *ENTAC*, SS-11/-12, *Dragon, TOW* ATGW; 1,800 ZU-23 towed, ZSU-23-4 SP 23mm, 37mm towed, ZSU-57-2 SP 57mm, 75mm, and 85mm towed AA guns; *HAWK/Improved HAWK*, SA-7 SAM.[3]
Ac incl 46 Cessna (40 185, 6 310), 10 O-2A, 2 F-27, 5 *Shrike Commander*, 2 *Falcon*.[3]
Hel incl 160 AH-1J, 270 Bell 214A, 35 AB-205A, 15 AB-206, 92 CH-47C.[3]
(Reports of 150 N. Korean MBT delivered.)

RESERVES: 400,000, ex-Service volunteers.

Revolutionary Guard Corps: *(Pasdaran)*: 150,000, org in bns, serve indep or in Army bdes; small arms, spt weapons from Army inventory. Naval element; some Air.

Navy: 20,000, incl naval air and marines.[3]
3 destroyers with 4 *Standard* SSM: 1 Br *Battle* with 1 × 4 *Seacat* SAM; 2 US *Sumner*.
4 *Saam* frigates with 1 × 5 *Seakiller* SSM, 1 × 3 *Seacat* SAM (1 probably non-operational).
4 US PF-103 corvettes (2 lost?).
12 *Kaman* (*La Combattante* II) FAC(M) with 4 *Harpoon* SSM (2 lost?).
7 large patrol craft: 3 Improved PGM-71, 4 *Cape*; (5 lost?).
3 US coastal, 2 inshore minesweepers; (2 lost?).
14 hovercraft: 8 SRN-6, 6 BH-7.
2 landing ships, 1 US LCU.
2 fleet supply ships.
3 Marine bns.
(On order: 1 replenishment ship.)

Bases: Bandar Lengeh, Bandar Abbas, Bushehr, Kharg Island, Bandar-e-Anzali, Bandar-e-Khomeini.

NAVAL AIR FORCE: 2 combat ac, 16 combat hel.[3]
1 MR sqn with 2 P-3F *Orion*.
1 ASW hel sqn with 10 SH-3D.
1 MCM hel sqn with 6 RH-53D.
1 tpt sqn with 4 *Shrike Commander*, 4 F-27, 1 *Mystère* 20.
Other hel incl 7 AB-212.

Air Force: 35,000; some 70 serviceable combat ac.[3]
10 FGA sqns with 90 F-4D/E (12 serviceable?).
8 FGA sqns with some 135 F-5E/F (50 serviceable?).
4 interceptor/FGA sqns with 77 F-14A (5 serviceable?).
1 recce sqn with 14 RF-4E (3 serviceable?).
2 tanker/tpt sqns with 12 Boeing 707, 7 Boeing 747.
5 tpt sqns: 4 with 52 C-130E/H; 1 with 18 F-27, 2 Aero *Commander* 690, 4 *Falcon* 20.
Hel: 10 HH-34F, 10 AB-206A, 5 AB-212, 39 Bell 214C, 10 CH-47 *Chinook*, 2 S-61A4.
Trainers incl 45 F-33A/C *Bonanza*, 9 T-33.
5 SAM sqns with *Rapier*, 25 *Tigercat*.
AAM: *Phoenix, Sidewinder, Sparrow*.
ASM: AS-12, *Maverick*.
(Reports of N. Korean MiG-19/-21, 100 Ch F-6 ftrs delivered.)

Forces Abroad: Lebanon; some 650 Revolutionary Guard.

Para-Military Forces: Bassej volunteers, mostly youths, small arms, ancillary to main field forces. Gendarmerie (5,000 incl border guard element); *Mostazafin* (Guards); *Hezbollahi* (Home Guard) 2,500,000; Border

[1] See p. 101 for footnotes.

Tribal Militia. Cessna 185/310 lt ac, AB-205/-206 hel, patrol boats.[3]

IRAQ

Population: 14,300,000.
Military service: basic 21–24 months, extended for war.
Total armed forces: 517,250 (mostly conscripts).[3]
Est GNP 1981: ID 9.4 bn ($31.832 bn).
Est def exp 1981: ID 1.4 bn ($4.741 bn). 1982: 2.4 bn ($7.722 bn).
Est FMA 1981–2: $25–35 bn.
GDP growth: −7.6% (1980), −20.0% (1981), −5% (1982).
Inflation: 19% (1981), 16% (1982).
$1 = dinar 0.2953 (1981), 0.3108 (1982).

Army: 475,000.
4 corps HQ.
6 armd divs.
4 mech divs.
6 mountain and inf divs (2 additional HQ may have formed to command Reserve or militia bdes).
2 Republican Guard armd bdes.
3 special forces bdes.
9 Reserve bdes.
15 Peoples Army/volunteer inf bdes.
AFV: 2,100 T-54/-55/-62/-72, 260 Ch T-69 MBT; 100 PT-76 lt tks; about 3,000 AFV, incl BRDM, FUG-70, ERC-90, MOWAG *Roland*, 200 EE-9 *Cascavel*, EE-3 *Jararaca* armd cars, BMP MICV, BTR-50/-60/-152, OT-62/-64, 100 VCRTH (with *HOT* ATGW), Panhard M-3, EE-11 *Urutu* APC.[3]
Arty: 800 85mm, 100mm incl SU-100 SP, 122mm incl ISU SP and 130mm guns; M-56 105mm pack, 122mm incl SP-74, 152mm incl SP-73 how; FGT 108-R 108mm, BM-21 122mm MRL; 19 *FROG*-7, 9 *Scud* B SSM; 120mm, 160mm mor.[3]
ATK: 107mm RCL; 75mm, 85mm, 100mm towed, 100 JPz SK-105 105mm SP guns; *Sagger*, SS-11, *Milan HOT*, *Swingfire* ATGW.[3]
AD: 1,200 23mm incl ZSU-23-4 SP, 37mm, 57mm incl ZSU-57-2 SP, 85mm, 100mm, and 130mm AA guns; SA-2/-3/-6/-7/-8/-9, 30 *Roland* SAM.[3]
(On order: T-62 MBT; 100 EE-9 *Cascavel*, EE-3 *Jararaca* armd cars; 80 EE-11 *Urutu* APC; 85 155 GCT 155mm SP guns; SP-73 152mm SP how; SS-11 ATGW; X-40, *Scud* B SSM; SAM.)
(Some captured Iranian eqpt, incl tks, AFV, arty, ATGW, has been taken into service.)[3]

RESERVES: 75,000.

Navy: 4,250.[3]
1 frigate (trg).
12 Sov *Osa* FAC(M) with 4 *Styx* SSM; (2–4 lost?).
5 Sov large patrol craft: SO-1, *Poluchat*(; (2 or 3 lost?).
12 Sov P-6 FAC(T)((7 lost?).
10 Sov coastal patrol craft: *Nyryat* II, PO-2, *Zhuk*(; (5 lost?).
5 minesweepers: Sov T-43 ocean, *Yevgenya*(inshore.
4 Sov *Polnocny* LCT (1 lost?).
(On order: 4 *Lupo* frigates, 6 Italian 650-ton corvettes, 1 spt ship.)

Bases: Basra, Umm Qasr.

Air Force: 38,000 incl 10,000 AD personnel; some 330 combat ac, some 60 combat hel.[3]
1 bbr sqn with 9 (7?) Tu-22.
1 lt bbr sqn with 8 (5?) Il-28.
11 FGA sqns: 4 with some 70 MiG-23BM; 6 with some 70 Su-7 and Su-20; 1 with 12 (2?) *Hunter* FB-59/FR-10.
5 interceptor sqns with some 14 MiG-25, 40 MiG-19/Ch F-6, some 70 MiG-21/Ch F-7, some 33 *Mirage* F-1EQ, 4 F-1BQ.
1 recce sqn with 8 MiG-25.
2 tpt sqns with 10 An-2, 10 An-12, 8 An-24, 2 An-26, 12 Il-76 (6 civilian), 2 Tu-124, 13 Il-14, 1 *Heron*.
11 hel sqns with 35 Mi-4, 15 Mi-6, 150 (10?) Mi-8, 41 (13?) Mi-24, 47 (6?) *Alouette* III (some with AS-12 ASM), 11 *Super Frelon* (some with AM-39 *Exocet* ASM), 50 (15?) *Gazelle* (some *HOT* ATK ASM), 13 *Puma*, 28 (5?) BO-105 (some with SS-11 ATGW), 7 *Wessex* Mk 52.
Trainers incl MiG-15/-21/-23U, Su-7U, *Hunter* T-69, 10 Yak-11, 40 L-29, 24 L-39, 48 AS-202/18A, 16 *Flamingo*, 5 PC-7 *Turbo-Trainer*.
AAM: AA-2 *Atoll*, *Magic* I.
ASM: 360 *HOT*, AS-11/-12, *Swatter* ATGW, AM-39 *Exocet*.
(On order: 150 MiG-23/-25/-27, 42 *Mirage* F-1 ftrs; 5 *Super Etendard* attack with *Exocet* ASM (lease). 42 PC-7 *Turbo-Trainer* ac: 3 *Super Frelon*, 10 *Gazelle*, *Lynx*, 26 *Puma*, Mi-24, 6 AS-61TS, 8 AB-212 (ASW) hel; MPS-1, 20 AM-39 *Exocet* ASM; *Super* 530 AAM.)

Para-Military Forces: security troops 4,800; People's Army 450,000; perhaps 10,000 volunteers from Arab countries.

ISRAEL

Population: 4,100,000.
Military service: men 39 months, women 24 months (Jews and Druze only; Christians may volunteer). Annual training for reservists thereafter up to age 54 for men, 34 (or marriage) for women.
Total armed forces: 172,000 (120,300 conscripts); mobilization to 500,000, of which 100,000 can report in about 24 hours.
GNP 1981: IS 245.614 bn ($21.487 bn). 1982: 528.30 bn ($21.770 bn).
Est def exp 1982: IS 200.0 bn ($8.242 bn). 1983: 280.0 bn ($6.461 bn).[4]
FMA 1982: some $1.5 bn.
GDP growth 4.2% (1981), −4.0% (1982).
Inflation 1982: 101.5% (1981), 131.5% (1982).
$1 = shekels 11.431 (1981), 24.267 (1982), 43.334 (1983).

Army: 135,000 (110,000 conscripts, male and female), 450,000 on mobilization, incl civil defence units.
11 armd divs.
33 armd bdes (3 tk, 1 mech inf bns).
10 mech inf bdes (5 para-trained).
12 territorial/border inf bdes with *Nahal* militia.
15 arty bdes (each 5 bns of 3 btys).
AFV: 3,600 MBT, incl 1,100 *Centurion*, 650 M-48, 1,010 M-60, 440 T-54/-55, 150 T-62, 250 *Merkava* I/II; about 4,000 AFV recce incl RBY *RAM*, BRDM-1/-2, *Shoet* Mk 2, M-2/-3, 4,000 M-113, OT-62, BTR-40/-50P/-60P/-152, *Walid* APC.[5]
Arty: 130mm, 140 M-107 175mm SP guns; 70 M-101 105mm, 100 122mm, M-68/-71 155mm towed, 300 155mm L-33 and M-50, Soltam M-72, 300 M-109 155mm, 48 M-110 203mm SP how; 122mm, 135mm, 240mm, 290mm MRL; *Lance* SSM; 900 81mm, 120mm, and 160mm mor (some SP).[5]
ATK: B-300 *Ze'ev (Wolf)* 82mm RL; 106mm RCL; *TOW*, *Cobra*, *Dragon*, *Picket*, *Milan* ATGW.
AD: 2 btys with 24 *Vulcan/Chaparral* 20mm gun/msl systems, 900 20mm, 30mm, and 40mm AA guns; *Redeye* SAM.[5]
(On order: 125 M-60 MBT; *Re'em* AFV; 800 M-113 APC; 200 M-109A1B SP 155mm how, M-107 175mm SP guns; *Lance* SSM; *TOW*, *Dragon* ATGW.)

Navy: 9,000 (3,300 conscripts), 10,000 on mobilization.
3 Type 206 subs.
2 *Aliya* (*Saar*-4.5) corvettes with 4 *Gabriel* and 2 *Harpoon* SSM, 1 Bell 206 ASW hel.
20 FAC(M): 8 *Reshef* (*Saar*-4) with 5 *Gabriel* and 4 *Harpoon* SSM; 6 *Saar*-2 with 6 *Gabriel*, 6 *Saar*-3 with 5–8 *Gabriel*.
2 *Flagstaff* 2 hydrofoil FAC(M) with 2 *Gabriel* and 2 *Harpoon* SSM.
45 coastal patrol craft(: 37 *Dabur*, 2 *Dvora*, 6 *Hawk*.
1 LST, 3 US LSM, 3 LCU.
4 *Seascan* 1124N MR ac.
AAM: *Gabriel* III (mod).
Naval cdo: (300).
(On order: 4 *Saar*-5 corvettes, 3 *Seascan* MR ac.)

Bases: Haifa, Ashdod, Eilat.

Air Force: 28,000 (2,000 conscripts, in AD), 37,000 on mobilization; some 550 combat ac (incl perhaps 90 in store), 42 combat hel.
15 FGA/interceptor sqns: 2 with 40 F/TF-15; 5 with 131 F-4E; 5 with 150 *Kfir*-C1/C2; 3 with 64 F-16A, 8 F-16B.
4 FGA sqns with 130 A-4N/J *Skyhawk*.
Recce: 13 RF-4E, 2 OV-1E; 4 E-2C AEW; 4 RU-21J, 2 C-130, 4 Boeing 707 ECM ac.
1 tpt wing: incl 7 Boeing 707 (2 tanker mods), 20 C-130E/H, 18 C-47, 2 KC-130H.
Liaison: 1 *Islander*, 5 Do-27, 14 Do-28D; 18 Cessna U-206C, 2 T-41D, 2 180; 12 *Queen Air* 80; 2 *Westwind*; 20 *Super Cub*.
Trainers incl 73 TA-4E/H, 50 *Kfir* (incl TC-2), 85 *Magister*/*Amit*.
Hel incl 8 *Super Frelon*, 33 CH-53D, 12 AH-1G/S, 2 S-65C, 25 Bell 206, 60 Bell 212, 17 UH-1D, 30 Hughes 500MD hel.
Drones: *Mastiff* 2, *Scout*, Teledyne Ryan 124R.
15 SAMS bns with *Improved HAWK*.
AAM: *Sidewinder*, AIM-7E/F *Sparrow*, *Shafrir*, *Python* III, *Gabriel* III (mod).
ASM: *Luz*, *Maverick*, *Shrike*, *Walleye*, *Bullpup*.
(On order: 11 F-15, 72 F-16, *Lavi* ftrs, 60 *Kfir* TC-2 trg ac; 200 *Improved HAWK* SAM; 200 *Sidewinder* AAM.)

RESERVES: (all services): 326,000.

Forces Abroad: Lebanon (20,000).

Para-Military Forces: Border Guards 4,500; BTR-152 APC. Arab Militia: small arms. Coastguard: 3 ex-US PBR, 3 other patrol craft(.

JORDAN

Population: 2,469,500 (excluding West Bank).
Military service: voluntary; People's Army (militia): conscription.
Total armed forces: 72,800.
Est GNP 1981: JD 1.119 bn ($3.439 bn). 1982: 1.366 bn ($3.678 bn).
Est def exp 1982: JD 155 m ($440.091 m). 1983: 168 m ($465.374 m).
Est FMA 1982: some $800 m.
GDP growth: 8% (1981), 9% (1982).
Inflation: 12.1% (1981), 8.0% (1982).
$1 = dinar 0.3254 (1981), 0.3522 (1982), 0.3610 (1983).

Army: 65,000.
5 armd bdes.
6 mech bdes.
2 inf bdes.
1 indep Royal Guards bde.
16 arty bns.
2 AA bdes.
3 AB bns.
350 M-47/-48/-60, 30 *Khalid*, 200 *Centurion* MBT; 140 *Ferret* scout cars; 850 M-113, 32 *Saracen* APC; 17 M-59 155mm guns; 30 M-102 105mm, 38 M-114 towed, 20 M-44, 40 M-109A2 SP 155mm, 22 M-115 towed, 27 M-110 SP 203mm guns/how; 350 81mm, 107mm, and 120mm mor; 240 106mm and 120mm RCL; 250 *TOW*, 310 *Dragon* ATGW; 100 M-163 *Vulcan* 20mm, 16 ZSU-23-4, 200 M-42 40mm SP AA guns; 200 *Redeye*, 20 SAM-8, *Improved HAWK* SAM.
(On order: 248 *Khalid*, 40 M-60A3 MBT; 78 M-113 APC; 200 GHN-45 155mm how.)

Navy: (coastguard): 300.
9 patrol craft(.
(On order: 3 patrol boats.)

Base: Aqaba.

Air Force: 7,500; 103 combat ac.
3 FGA sqns with 60 F-5E/F.
2 interceptor sqns with 23 *Mirage* F-1C/E.
2 OCU with 15 F-5A, 5 F-5B (14 more in store).
1 tpt sqn: 6 C-130B/H, 2 *Sabreliner* 75A, 3 C-212A.
1 VIP sqn: 1 Boeing 727, 3 *Falcon* 20, 1 T-39 ac, S-76 hel.
1 hel sqn: 15 *Alouette* III, 4 S-76.
Trainers: 12 T-37C, 15 *Bulldog*, 1 C-212 ac, 8 Hughes 500D hel.
AAM: *Sidewinder*.
14 AD btys: 112 *Improved HAWK* SAM.
(On order: 13 *Mirage* F-1, 20 F-5E/F ftrs; 24 AH-1Q *Cobra* hel with *TOW*; 6 *Maverick* ASM.)

RESERVES: (all services) 35,000.

Para-Military Forces: Civil Militia 7,500.

KUWAIT

Population: 1,450,000.
Military service: 18 months.
Total armed forces: 12,400.
Est GDP 1980/1: KD 6.764 bn ($25.496 bn); 1981/2: 5.737 bn ($20.215 bn).
Est def exp 1981/2: KD 443.10 m ($1.561 bn).
GDP growth: −9.3% (1981), −7.5% (1982).
Inflation: 7.4% (1981), 7.7% (1982).
$1 = dinar 0.2653 (1980/1), 0.2838 (1981/2).

Army: 10,000.
1 armd bde.
2 mech inf bdes.
1 SSM bn.
70 Vickers Mk 1, 10 *Centurion*, 160 *Chieftain* MBT; 100 *Saladin* armd, 80 *Ferret* scout cars; 175 M-113, 130 *Saracen* APC; 20 AMX Mk F-3 155mm SP how; *FROG*-7 SSM; 81mm mor; *HOT*, *TOW*, *Vigilant* ATGW; SA-7 SAM.
(On order: *Scorpion* lt tks, 188 M-113 APC, 56 M-113 SP *TOW* veh, 4,800 *Improved TOW* ATGW.)

Navy: 500 (coastguard).
47 coastal patrol craft((15 armed).
6 landing craft.
(On order: 6 Lürssen TNC-45, 2 FPB-57 FAC, 6 SRN-6 hovercraft; 12 harbour spt craft, 45 MM-38/-40 *Exocet* SSM.)

Air Force: 1,900;[6] 49 combat ac.
2 FB sqns with 30 A-4KU.
1 interceptor sqn with 17 *Mirage* F-1C, 2 F-1B.
Tpts: 2 DC-9, 1 L-100-20, 4 L-100-30.
3 hel sqns with 23 SA-342K *Gazelle*, 9 *Puma*.
Trainers incl 9 *Strikemaster*.
1 SAM bn with *Improved HAWK*.

AAM: R-550 *Magic, Sidewinder.*
ASM: *Super* 530, SS-11/-12.
(In store: 12 *Lightning*, 9 *Hunter.*)
(On order: 12 *Mirage* F-1C ftrs; 6 *Super Puma* hel; 12 AM-39 *Exocet* ASM.)

LEBANON

Population: 2,900,000.
Military service: conscription.
Total armed forces: 27,000.
Est GDP 1981: £L 17.0 bn ($3.941 bn).
Est def exp 1982: £L 770 m ($162.327 m); 1983: £L 2.0 bn ($481.661 m).[7]
FMA 1982: $120 m.
GDP growth: 2.0% (1981), −2.5% (1982).
Inflation: 20% (1981), 14% (1982).
$1 = £L 4.3139 (1981), 4.7435 (1982), 4.1523 (1983).

Army: 25,500.[8]
1 mech inf bde (1 armd recce, 3 inf bns).
(7 inf bdes forming.)
(1 armd bn forming.)
1 armed recce bn } below strength.
9 inf bns }
2 arty bns }
AA bns.
54 M-48 MBT; 13 AMX-13 lt tks; 100 *Saladin* armd cars; 400 M-113, *Saracen*, 5 VAB APC; 10 122mm, 36 155mm guns; 18 105mm how; 200 81mm, 83mm, RPG-7 85mm, 88mm RL; 106mm RCL; *ENTAC*, 18 *Milan*, *TOW* ATGW; 20mm, ZU-23 23mm, 30mm towed, M-42 40mm SP AA guns.
(On order: 150 M-113A2 APC, 12 155mm how.)

Navy: 250.
4 patrol craft(: 1 large, 3 *Byblos*-class coastal.

Air Force: 1,250; 8 combat ac, 4 combat hel.
1 sqn with 8 *Hunter* F-70.
1 hel sqn with 11 *Alouette* II/III, 11 AB-212, 6 *Puma*, 4 *Gazelle* (with SS-11/-12 ASM).
Trainers: 6 *Bulldog*, 5 *Magister.*
Tpts: 1 *Dove*, 1 *Turbo-Commander* 690A.
(On order: 6 *Gazelle* hel.)

RESERVES: (non-serviceable): 2 *Hunter* T-66, 9 *Mirage* IIIEL, 1 IIIBL ac, 5 *Alouette* hel, R-530 AAM.

Para-Military Forces: Internal Security Force 7,500: 30 *Chaimite* APC. Border Guard (forming, to be 20,000). Customs: 6 *Aztec*-class patrol craft.
Private militias (strengths are estimates only):
Maronite Christian:
Lebanese Forces Militia *(Phalange)* (10,000).
Marada Brigade (1,000).
National Liberation Party (few hundred).
Christian (some Shia):
Free Lebanese Militia (Haddad) (3,500).
Druze:
Popular Socialist Party (Jumblatt) (800).
Sunni:
Islamic Coalition (few hundred).
Mourabitoun Militia (underground, 1,500).
Shia:
Amal (2,000).

LIBYA

Population: 3,200,000.
Military service: selective conscription, term varies.
Total armed forces: 73,000.
Est GDP 1981: LD 9.786 bn ($33.05 bn).
Est def exp 1981: LD 165.0 m ($557.244 m), 1982: 210.0 m ($709.22 m).[9]
GDP growth: −10.5% (1981), −2% (1982).
Inflation: 4% (1981), 5% (1982).
$1 = dinar 0.2961 (1981/3).

Army: 58,000.
20 tk bns.
30 mech inf bns.
1 National Guard bn.
10 arty, 2 AA arty bns.
2 special forces gps.
2 SSM bns.
AFV: 2,600 T-54/-55/-62, 200 T-72, 100 OF-40 *(Lion)* MBT; 200 BRDM-2, 300 EE-9 *Cascavel* armd cars; 700 BMP MICV; 900 BTR-50/-60, OT-62/-64, 100 EE-11 *Urutu*, Fiat 6614, 160 M-113A1 APC.
Arty: 360 130mm guns; some 600 M-101 105mm, 122mm incl M-1974 SP, 152mm incl M-1973 SP, 12 *Palmaria*, 40 M-109 155mm SP how; 450 81mm, 120mm, 160mm, and 240mm mor; some 600 BM-11 107mm, BM-21/RM-70 122mm, and M-51 130mm MRL; 48 *FROG*-7, 70 *Scud* B SSM.
ATK: 200 106mm RCL; 3,000 *Vigilant*, *Milan*, and *Sagger* ATGW.
AD: 450 23mm incl ZSU-23-4 SP, 30mm incl M-53/59 SP, 57mm AA guns; SA-6/-7/-9 SAM.[10]
(On order: 100 *Lion*, 300 T-72 MBT; Fiat 6616, EE-9 armd cars; 100 *Urutu* APC; 188 *Palmaria* 155mm SP how; SA-9 SAM.)

Navy: 6,500.
6 Sov F-class subs.
2 Yug *Mala* midget subs.
1 Vosper Mk 7 frigate (under refit) with 4 *Otomat* SSM, 4 *Albatros*/*Aspide* SAM.
7 corvettes: 4 *Assad (Wadi)* with 4 *Otomat* SSM, 1 Vosper 440-ton, 2 ex-Sov *Nanuchka* II.
23 FAC(M): 12 Sov *Osa*-II with 4 *Styx* SSM; 3 *Susa* with 8 SS-12M SSM; 1 Lürssen-type with SSM/SAM, 7 *La Combattante* with 4 *Otomat* SSM.
9 large patrol craft: 4 *Garian*, 5 Thornycroft.
4 Sov *Natya* minesweepers.
1 LSD (log spt/HQ ship); 2 PS-700 LST; 3 *Polnocny*, 2 C-107 LCT.
1 Thornycroft repair ship.
(On order: 4 *Assad* corvettes, 3 *La Combattante* II FAC; 2 *Nanuchka* corvettes; 4 *Boxina*, 3 *Jihan* patrol craft; 12 C-107 LCT, *Otomat* SSM.)

Bases: Tarabulus, Benina, Darnah, Tubruq, Bandiyah.

Air Force: 8,500; some 533 combat ac, 30 combat hel.[10]
1 bbr sqn with 7 Tu-22 *Blinder* A.
3 interceptor sqns and 1 OCU: 26 *Mirage* F-1ED, 6 F-1BD, 143 MiG-23 *Flogger* E, 50 MiG-25 *Foxbat* A, 55 MiG-21, 5 MiG-25U.
5 FGA sqns and 1 OCU: 45 *Mirage* 5D/DE, 13 5DD, 14 *Mirage* F-1AD, 18 MiG-23BM *Flogger* F, 14 MiG-23U, some 100 Su-20/22 *Fitter* E/F/J.
1 COIN sqn with 30 J-1 *Jastreb*.
1 recce sqn with 7 *Mirage* 5DR.
2 tpt sqns: 8 C-130H, 1 Boeing 707, 8 G-222, 2 *Mystère-Falcon*, 4 C-140 *Jetstar*, 2 CL-44, 8 Il-76, 1 *Corvette* 200, 2 *King Air*, 8 F-27-600.
4 hel sqns: 10 *Alouette* III, 9 AB-47, 5 AB-206, 1 AS-61A, 2 AB-212, 8 *Super Frelon* (SAR), 19 CH-47C, 20 Mi-2, 2 Mi-8, 6 Mi-14, 25 Mi-24.
2 trg sqns with 61 *Galeb*.
Trainers incl 2 Tu-22 *Blinder* D, 100 L-39ZO, 12 *Magister*, 119 SF-260WL.
3 SAM bdes with 30 *Crotale* (60 systems), 300 SA-2/-3/-6.
AAM: AA-2 *Atoll*, R-550 *Magic*.
ASM: *Swatter* ATGW.
(On order: 50 MiG-25, 140 MiG-23, 40 *Mirage* F-1 ftrs; 12 G-222 (1983), 10 *Twin Otter* tpts; 25 EMB-121 *Xingu*, 70 SF-260 trg ac; *Gazelle*, 2 A-109 hel; Super 530 AAM.)

RESERVES: People's Militia, some 40,000.

Forces Abroad: Lebanon: inf bn (800), 'Volunteers' (500).

Para-Military Forces: Pan-African Legion some 10,000: 1 armd, 1 inf, 1 para/cdo bdes; some 75 T-54/-55, *Lion* MBT; EE-9 MICV; BTR-50/-60 APC (army inventory). Muslim Youth; Peoples' Cavalry Force parade unit.

MOROCCO

Population: 21,000,000.
Military service: 18 months.
Total armed forces: 144,000.
GNP 1981: MD 77.50 bn ($14.984 bn).
Est def exp 1982: MD 8.0 bn ($1.328 bn).
Est FMA 1981: $350 m.
GDP growth: −1.3% (1981), 6.8% (1982).
Inflation: 12.5% (1981), 10.6% (1982).
$1 = dirham 5.1723 (1981), 6.0230 (1982).

Army: 125,000.
4 mech inf bdes.
1 lt security bde.
1 para bde.
1 AA bde.
10 mech inf regts.
9 arty groups.
7 armd bns.
1 Royal Guard bn.
5 camel corps bns.
2 desert cav bns.
1 mountain bn.
3 cdo bns.
4 engr bns.
4 armd car sqns.
AFV: 120 M-48, 15 T-54 MBT; 80 AMX-13 lt tks; 1,000 armd cars, incl 20 EBR-75, 15 AMX-10RC, 162 AML-90, M-8, 240 RAM V1; 364 M-113, 400 VAB, 40 M-3 half-track, 50 OT-62/-64, 15 UR-416, 80 *Ratel*, 56 M-3, Steyr 4K-7FA APC.
Arty: 40 85mm, 20 100mm SU-100 SP, 20 M-101 105mm, 36 105mm lt, 52 Mk F-3, 35 AMX-13F-3 SP 155mm guns; 12 130mm, 152mm, 20 M-114 155mm towed, 24 Mk-61 105mm, 36 M-109 155mm SP how; 300 60mm, 600 81mm, 70 82mm, 320 120mm mor; 36 BM-21 122mm MRL.
ATK: 20 M-56 90mm, 121 *Kuerassier* 105mm SP ATK guns; 75mm, 106mm RCL; STRIM-89 RL, *Dragon*, *Milan*, *TOW* ATGW.
AD: 100 20mm, 37mm, 57mm, and 100mm towed, 40 M-163 *Vulcan* 20mm SP AA guns; SA-7, 30 *Chaparral*, *Crotale* SAM.
Air: 4 *Alouette* II, 3 *Gazelle*, 6 A-109 hel.
(On order: 108 M-60 MBT; AML-90, 76 AMX-10RC armd cars; 126 VAB APC.)

Navy: 6,000 incl naval infantry.
1 *Descubierta* frigate with 4 MM-40 *Exocet* SSM, 1 × 8 *Sea Sparrow* SAM.
4 *Cormoran* FAC(M) with 4 *Exocet* SSM.
2 PR-72 FAC(G).
4 large patrol craft.
9 coastal patrol craft.
1 minesweeper.
4 landing ships (3 *Batral*).
6 P-32 coastal patrol craft(.
1 naval inf bn (600).
(On order: 2 PR-72 FAC(G), *Aspide* SAM.)

Bases: Casablanca, Safi, Agadir, Kenitra, Tangier.

Air Force: 13,000; 102 combat ac.
5 FGA sqns: 3 with 23 *Mirage* F-1E, 18 F-1C; 2 with 5 F-5A, 16 F-5E, 5 RF-5A, 3 F-5B, 6 F-5F.
1 COIN/recce sqn with 22 *Magister*, 4 OV-10 *Bronco*.
1 tpt sqn with 12 C-130H, 3 KC-130H, 1 *Gulfstream*, 1 *Falcon* 50, 8 *King Air*, 3 Do-28D, 6 *Broussard*.
2 hel sqns with 33 AB-205A, 5 AB-206, 13 AB-212, 27 *Puma*, 4 HH-43B SAR, 11 CH-47C.
Trainers: 11 T-34C, 11 AS-201/18 *Bravo*, 28 SF-260M, 24 *Alpha Jet*.
AAM: *Sidewinder*, R-550 *Magic*.
(On order: 7 Do-28D, 1 C-130H tpt ac; 24 *Gazelle*, 19 AB-206 hel; 381 *Maverick* ASM.)

Forces Abroad: Equatorial Guinea: 400.

Para-Military Forces: 30,000 incl 11,000 *Sûreté Nationale*: 2 *Rallye* ac; 5 *Alouette* II/III, 3 *Lama*, 6 *Gazelle*, 6 *Puma* hel.

OMAN

Population: 970,000.
Military service: voluntary.
Total armed forces: 23,550.[11]
Est GDP 1980: RO 1.823 bn ($5.278 bn). 1981: 2.148 bn ($6.219 bn).
Est def exp 1982: RO 592 m ($1.714 bn). 1983: 612 m ($1.772 bn).
GDP growth: 9.5% (1981), 8.5% (1982).
Inflation: 5.0% (1981), 5.0% (1982).
$1 = rial 0.3454 (1981–3).

Army: 19,550.
2 bde HQ.
1 Royal Guard bde.
1 armd regt (3 armd car, 2 tk sqns).
1 recce regt.
3 arty regts (2 lt, 1 med).
8 inf bns.
1 special force.
1 sigs regt.
1 engr sqn.
1 para sqn.
6 M-60A1, 12 *Quayidalardh (Chieftain)* MBT; 36 *Saladin* armd cars; 18 25-pdr (88mm), 36 105mm, 12 130mm guns; 81mm, 4.2-in (107mm), 120mm mor; *TOW* ATGW; 4 ZU-23-2 AA guns; *Blowpipe* SAM.
(On order: 15 *Chieftain* MBT; *Palmaria* 155mm SP how.)

RESERVES: National Volunteer Reserve Force.

Navy: 2,000.
1 Royal Yacht.
3 FAC(M): 1 *Province* with 2 × 3 MM-40 *Exocet* SSM; 2 Brooke Marine with 2 MM-38 *Exocet*.
4 Brooke Marine FAC(G).
4 inshore patrol craft(.
1 log spt ship (amph).
6 LCU.
(On order: 2 *Province* FAC(M), 3 *Skima*-12 hovercraft, 1 log spt amph ship.)

Bases: Muscat, Raysut, Ghanam (Goat) Island; (Wadam Alwi, under construction).

Air Force: 2,000; 37 combat ac.

1 FGA sqn (second to form) with 19 *Jaguar* S(O) Mk 1, 2 T-2.
1 FGA/recce sqn with 12 *Hunter* FGA-6, 4 T-7.
1 COIN/trg sqn with 12 BAC-167.
3 tpt sqns: 1 DC-8, 1 with 3 BAC-111, 1 *Falcon* 20; 2 with 7 *Defender*, 15 *Skyvan*, 2 C-130H.
Royal flt with 1 *Gulfstream*, 1 VC-10 tpts; 2 AS-202 *Bravo* trainers; 4 AB-212 hel.
1 hel sqn with 15 AB-205, 2 AB-206, 5 AB-214B, 2 *Super Puma*.
2 AD sqns with 28 *Rapier* SAM.
(On order: 1 C-130H, 2 DHC-5D tpts; 6 Bell 214ST hel; AM-39 *Exocet* ASM; 28 *Blindfire* radars.)

Para-Military Forces: tribal Home Guard *(Firqats)* 3,500. Police Marine Wing: 17 coastal patrol craft(; 1 landing craft(. Air Wing: 1 *Learjet*, 2 *Turbo-Porter*, 2 *Merlin* IVA, 2 *Buffalo* ac; 5 AB-205, 3 AB-206 hel.

QATAR

Population: 260,000.
Military service: voluntary.
Total armed forces: 6,000.
Est GDP 1981: QR 24.888 bn ($6.839 bn).
Est def exp[12] 1981–3: QR 3.260 bn ($896 m).[13] 1983: 604 m ($165.98 m).
GDP growth: −17.0% (1981), −20.0% (1982).
Inflation: 9% (1981), 8% (1982).
$1 = rial 3.639 (1981–3).

Army: 5,000.
1 Royal Guard regt.
1 tk bn.
5 inf bns.
1 arty bty.
24 AMX-30 MBT; 10 *Ferret* scout cars; 30 AMX-10P MICV; 25 *Saracen*, 136 VAB APC; 8 25-pdr guns, 6 155mm how; 81mm mor.
(On order: 8 *Commando* Mk 3 APC.)

Navy: 700 incl Marine Police.
2 *La Combattante* FAC(M) with 8 MM-40 *Exocet* SSM.
6 Vosper Thornycroft large patrol craft.
36 coastal patrol craft((2 75-ft, 2 45-ft, 7 P-1200 type, 25 *Spear*).
2 *Interceptor* fast assault/SAR craft.
(On order: 1 *La Combattante* FAC(M), 3 *Exocet* coast defence systems.)

Base: Doha.

Air Force: 300; 11 combat ac.
2 *Hunter* FGA-6, 1 T-79, 8 *Alpha Jet* FGA/trg ac.
1 *Islander*, 1 Boeing 727, 2 707 tpt ac.
2 *Whirlwind*, 4 *Commando*, 3 *Lynx* hel.
SAM: *Tigercat*.
(On order: 14 *Mirage* F-1 ftrs, *Puma* hel.)

Para-Military Forces: Police: 3 *Lynx*, 2 *Gazelle* hel.

SAUDI ARABIA

Est population: 8–12,000,000.
Military service: conscription, males aged 18–35.
Total armed forces: 51,500.
Est GDP 1980/1: SR 527.030 bn ($158.068 bn). 1981/2: 520.0 bn ($152.207 bn).
Est def exp[14] 1982/83: SR 92.889 bn ($27.022 bn). 1983/4: 75.733 bn ($21.952 bn).
GDP growth: 5.3% (1981), −4.9% (1982).
Inflation: 3.3% (1981), 1.0% (1982).
$1 = rial 3.3342 (1980/1), 3.4164 (1981/2), 3.4375 (1982/3), 3.4500 (1983/4).

Army: 35,000.
2 armd bdes (1 forming).
2 mech bdes.
2 inf bdes (1 to be mech).
1 AB bde (2 para bns, 3 special forces coys).
1 Royal Guard Regt (3 bns).
5 arty bns.
18 AA arty btys.
18 SAM btys: 16 with *Improved HAWK*; 2 with 12 *Shahine* (48 msls).
300 AMX-30, 150 M-60A1 MBT; 200 AML-60/-90 armd cars; 350 AMX-10P (some with *HOT*), some 20 VCC-1 (with *TOW*) MICV; 800 M-113, Panhard M-3 APC; Model 56 105mm pack, M-101/-102 105mm, 18 M-198 towed and GCT 155mm SP how; 81mm, M-30 107mm mor; 75mm, 90mm, 106mm RCL; *TOW*, *Dragon*, *HOT* ATGW; M-163 *Vulcan* 20mm, AMX-30SA 30mm, 86 35mm, M-42 40mm SP AA guns; *Redeye*, *Shahine*, *Improved HAWK* SAM.
(On order: 150 M-60A3 conversion kits; 60 AMX-10P, some 180 VCC-1 *TOW* MICV; 200 FH-70 155mm how; some 400 JPz SK-105 SP ATK guns; *TOW* ATGW; *Shahine* SAM.)

Navy: 2,500.
2 Fleet HQ.
4 PCG-1 corvettes with 2 × 4 *Harpoon* SSM.
9 PGG-1 FAC(M) with 2 × 2 *Harpoon* SSM.
1 large patrol craft (ex-US coastguard cutter).
3 *Jaguar* FAC(T).
4 MSC-322 coastal minesweepers.
4 US LCU, 8 US LCM-6 LCM.
(On order: 4 F-2000 frigates; 2 log spt ships; 2 *Atlantic* II MR ac; 24 AS-365N *Dauphine* 2 hel (4 SAR, 20 with ASM); *Otomat* coast defence SSM, 200 AS-15TT ASM.)

Bases: Jiddah (Western Fleet), Al Qatif/Jubail (Eastern Fleet), Ras Tanura, Damman, Yanbu, Ras al Mishab.

Air Force: 14,000; 170 combat ac.
3 FGA sqns with 65 F-5E.
4 interceptor sqns: 1 with 15 *Lightning* F-53, 2 T-55; 3 (1 forming) with 42 F-15.
2 OCU with 24 F-5F, 16 F-5B, 6 TF-15D.
3 tpt sqns with 39 C-130E, 25 C-130H, 6 KC-130H, 2 *Jetstar*.
2 hel sqns with 12 AB-206B, 14 AB-205, 10 AB-212.
Other hel incl 2 *Alouette* III, 1 AB-204B, 14 AB-206B, 1 Bell 212, 10 KV-107IIA.
Trainers: 46 BAC-167, 12 Cessna 172G/H/L.
AAM: *Red Top*, *Firestreak*, *Sidewinder*, AIM-7F *Sparrow*.
ASM: *Maverick*.
(In reserve: 17 *Lightning* F-53/T-55.)
(On order: 9 F-15, 5 F-5E ftrs; 11 TF-15, 1 F-5F trainers: 10 RF-5E recce; 5 E-3A *Sentry* AWACS; 1 Boeing 747, 40 C-212-200 tpts; 6 Boeing KC-707 tankers, 2 ECM ac; 22 AB-212, 8 KV-107 hel; 1,000 AIM-7F *Sparrow*, 1,177 *Sidewinder* AAM; 916 *Maverick* ASM.)

Para-Military Forces:
National Guard (25,000): Bde HQ; 4 all-arms, 16 regular inf, 24 irregular inf bns, 1 ceremonial cav sqn, spt units: 240 V-150 *Commando* APC, M-102 105mm how, 81mm mor; 106mm RCL, *TOW* ATGW, 20mm *Vulcan*, 90mm AA guns.
(On order: 489 *Commando* incl V-300 APC, V-150 SP 20mm AA, SP *TOW*, 90mm-armed AFV.)
Foreign contract military personnel: 10,000.
Ministry of Interior:
Counter-terrorist unit with hel.
Frontier Force and Coastguard 8,500: 181 coastal, incl 12 SRN-6 hovercraft. 300 small patrol craft. (On order: 2 SRN).
General Civil Defence Administration units.

SUDAN

Population: 20,500,000.
Military service: voluntary; conscription legislated but not yet implemented.
Total armed forces: 58,000.
Est GDP 1981: £E 4,900 bn ($9,160 bn).
Est def exp 1982: £E 220 m ($234.50 m).
FMA 1982: $100 m.
GDP growth: 0.4% (1981), 2.0% (1982).
Inflation: 20% (1981), 15% (1982).
$1 = £E 0.5349 (1981), £E 0.9382 (1982).

Army: 53,000 (incl AD).
6 Regional Commands.
4 div HQ.
2 armd bdes.
7 inf bdes.
1 para bde.
3 arty regts.
1 engr regt.
Air Defence (3,000):
2 AA arty bdes.
1 SAM bde with SA-2.
AFV: 70 T-54, 53 T-55, 17 T-34, 20 M-60A3 MBT; 55 M-41, 27 Ch Type-62 lt tks; 6 AML-90, 48 *Saladin* armd, 20 BTR-40, 55 *Ferret*, BRDM-1/-2 scout cars; 100 Panhard M-3, 100 BTR-50/-152, 60 OT-62/-64, K-63, 49 *Saracen*, 45 V-150 *Commando*, 80 M-113, *Walid* APC.
Arty: 55 25-pdr (88mm), 40 100mm, 20 Ch 130mm guns; 20 M-101 105mm, 18 122mm, 12 M-114A1 towed, 11 F-3 SP 155mm how; 30 120mm mor.
ATK: 30 85mm ATK guns; *Swingfire* ATGW.
AD: 80 37mm, 80 40mm, 100mm towed, 24 M-163 *Vulcan* 20mm SP AA guns; 20 SA-2, SA-7 SAM.
(On order: M-163 *Vulcan* 20mm SP AA guns.)

Navy: 2,000.
6 Yug large patrol craft: 2 *Kraljevica*, 4 PBR.
6 Yug '101' FAC(G).
3 70-ton coastal patrol craft.
2 Yug DTK-221 LCT, 1 DTM-231 LCU(.

Base: Port Sudan.

Air Force: 3,000; 31 combat ac.
1 FGA/interceptor sqn: 4 F-5E, 8 MiG-21.
1 FGA sqn with 10 Ch F-5, 9 Ch F-6.
1 tpt sqn with 6 C-130H, 1 *Mystère-Falcon*, 4 DHC-5D, 8 *Turbo-Porter*, 6 EMB-110P2.
1 hel sqn with 3 *Puma*, 10 BO-105, 6 Bell 212.
Trainers incl 5 BAC-145, 4 *Jet Provost* Mk 55 (5 in storage), 3 MiG-15UTI, 2 MiG-21U, 2 Ch FT-5, 2 Ch FT-6.
AAM: AA-2 *Atoll*.
(On order: 6 F-5E ftrs; 2 C-130 tpts; 6 Bell 212 hel.)

Forces Abroad: Iraq: 1,500.

Para-Military Forces: 3,500: National Guard (500); Republican Guard (500); Border Guard (2,500).

SYRIA

Population: 9,200,000.
Military service: 30 months.
Total armed forces: 222,500 (some 140,000 conscripts).
Est GNP 1981: £S 63.422 bn ($16.158 bn).
Def exp 1982: £S 10.0 bn ($2.548 bn).[15]
Est FMA 1982: $3.1 bn.
GDP growth: 4.5% (1981), 3.0% (1982).
Inflation: 20% (1981), 18% (1982).
$1 = £S 3.9250 (1981–2).

Army: 170,000 (120,000 conscripts).
4 armd divs (each 2 armd, 1 mech bdes; 1 is Presidential Guard unit).
2 mech divs (each 1 armd, 2 mech bdes).
2 indep armd bdes.
4 indep mech bdes.
2 arty bdes.
5 cdo regts.
1 para regt.
2 SSM regts: 1 with *Scud*, 1 with *FROG*.
26 SAM btys with SA-2/-3/-6.
AFV: 2,200 T-54/-55, 1,100 T-62, 900 T-72 MBT; BRDM recce vehs; BMP MICV; 1,600 BTR-40/-50/-60/-152, OT-64 APC.
Arty: 2,600 122mm incl ISU-122 and M-1974 SP, 130mm, 152mm, and 180mm guns; 122mm, 152mm how; 122mm, 140mm, 240mm MRL; 24 *FROG*-7, 9 *Scud* SSM; 82mm, 120mm, 160mm, 240mm mor.
ATK: 57mm, 85mm, 100mm guns; 1,300 *Snapper*, *Sagger*, *Swatter*, *Spigot*, and *Milan* ATGW.
AD: 23mm, 37mm, 57mm, 85mm, 100mm towed, ZSU-23-4, ZSU-57-2 SP AA guns; SA-2/-3/-6/-7/-9 SAM.
(On order: BMP-1, BTR-60 APC; M-1974 122mm, M-1973 152mm SP how; *Spigot* ATGW; SA-6/-8 SAM; *Gazelle* hel.)

RESERVES: 100,000 (being reorganized).

Navy: 2,500.
2 Sov *Petya* I frigates.
18 Sov FAC(M) with *Styx* SSM; 6 *Osa*-I, 6 *Osa*-II; 6 *Komar*(.
8 Sov P-4 FAC(T)(.
1 Fr CH large patrol craft.
3 Sov minesweepers: 1 T-43 ocean, 2 *Vanya* coastal.
3 Sov *Zhuk* coastal patrol craft(.
(On order 1981: 4 *Nanuchka* II corvettes.)

Bases: Latakia, Tartus, Minet el-Baida.

RESERVES: 2,500.

Air Force: 50,000 (incl AD command); some 457 combat ac, some 34 combat hel.[16]
11 FGA sqns: 4 with 85 MiG-17; 1 with 18 Su-7; 2 with 40 Su-20; 4 with 70 MiG-23BM *Flogger* F.
12 interceptor sqns: 1 with 24 MiG-25 *Foxbat* A; 11 with 200 MiG-21PF/MF, 20 MiG-23 *Flogger* E.
2 tpt sqns with 3 An-24, 4 An-26, 4 Il-76, 8 Il-14, 4 Il-18, 2 *Mystère* 20F.
Trainers incl 40 L-39, 60 L-29, 10 MiG-15UTI, 50 MBB-223 *Flamingo*.
Hel incl 10 Mi-2, 75 Mi-8, 30 Mi-24, 4 Ka-25 (ASW), 49 *Gazelle*.
AAM: AA-2 *Atoll*.
ASM: AT-2 *Swatter* ATGW.
(On order: MiG-23 ftrs; 18 AB-212, 21 *Super Frelon* hel; AAM.)

AIR DEFENCE COMMAND: (40,000).[17]
54 SAM btys with SA-2/-3; 25 with SA-6; 8 with some 48 SA-5 (4 Soviet-manned sites); AA arty, and radar.

Forces Abroad: Lebanon: 40,000 (2 divs); 600 MBT.

Para-Military Forces: 9,800: Gendarmerie 8,000, Desert Guard (Frontier Force) 1,800. 2 Palestine Liberation Army Brigades of 6,000 with some Syrian officers (nominally under PLO); 90 T-54/-55 MBT; 105mm how; AT-3 *Sagger* ATGW; SAM. Workers Militia (People's Army).

TUNISIA

Population: 6,700,000.
Military service: 12 months selective.
Total armed forces: 28,500.
GDP 1981: TD 3.992 bn ($8.084 bn).
Est def exp 1982: TD 70.0 m ($118.503 m).
$1 = dinar 0.4938 (1981), 0.5907 (1982).

Army: 23,000.
2 combined arms bdes (each with 1 armd, 2 mech inf bns).
1 Sahara bde.
1 para-cdo bde.
1 armd recce regt.
3 fd, 2 AA arty regts.
1 engr regt.
14 M-48 MBT; 55 AMX-13, 20 M-41 lt tks; 20 *Saladin*, 30 EBR-75, 10 AML armd cars; 30 M-113A1, Steyr 4K-7FA, V-150 *Commando* APC; 6 25-pdr (88mm), 48 M-101A1 105mm towed, 12 M-109 155mm SP how; 60mm, 81mm, 82mm, 107mm mor; 54 JPz SK-105 105mm SP ATK guns; STRIM-89 RL; *TOW*, *Milan*, SS-11 ATGW; 45 37mm and 40mm AA guns; RBS-70, 62 MIM-72 *Chaparral* SAM; 1 Hughes 500MD hel.
(On order: 54 M-60A3 MBT; 18 EE-9 *Cascavel* armd cars; 24 EE-11 *Urutu*, 12 M-106A2 (with 4.2-in (107mm) mor), 20 M-113A2 (with *TOW*) APC; 800 *TOW* ATGW.)

Navy: 3,500 (500 conscripts).
1 US *Savage* frigate.
4 large patrol craft: 1 Fr *Le Fougeux*, 3 P-48 with 8 SS-12 SSM.
2 Vosper Thornycroft 103-ft FAC(P).
2 Ch *Shanghai*-II FAC(G).
2 US *Adjutant* coastal minesweepers.
12 coastal patrol boats(.
(On order: 3 *La Combattante* III FAC(M) with *Exocet* SSM; 2 23-metre FAC.)

Bases: Tunis, Susa.

Air Force: 2,000 (500 conscripts); 8 combat ac.
1 COIN sqn with 5 MB-326K, 3 MB-326L.
1 C-130H tpt.
Trainers: 17 SF-260, 7 MB-326B, 12 T-6, 12 *Safir*.
Liaison: 4 S-208M ac.
1 hel wing: 7 *Alouette* II, 5 *Alouette* III, 4 UH-1H, 1 *Puma*, 18 AB-205, 6 Bell 205-A1, 6 AS-350B *Ecureuil*.
(On order: 6 F-5E FGA, 6 F-5F trg, 1 C-130H tpt ac.)

Para-Military Forces: Gendarmerie 5,000: 3 bns; 110 Fiat 6614 APC. National Guard 3,500.

UNITED ARAB EMIRATES (UAE)

Population: 1,130,000.
Military service: voluntary.
Total armed forces: 49,000.[18]
GNP 1981: UD 119.711 bn ($32.610 bn).
Est def exp 1982: UD 10.70 bn ($2.915 bn).
GDP growth: −0.6% (1981), −7.0% (1982).
Inflation: 15% (1981), 10% (1982).
$1 = dirham 3.6710 (1981–2).

Army: 46,000.
1 Royal Guard 'bde'.
5 armd/armd car bns.
9 inf bns.
1 arty, 1 AD bde (each 3 bns).
100 AMX-30, 18 OF-40 Mk 1 *(Lion)* MBT; 60 *Scorpion* lt tks; 6 *Shorland*, *Saladin*, 90 AML-90, VBC-40 armd cars; AMX-10P MICV; 30 AMX VCI, VCRTT, 300 Panhard M-3, VAB APC; 50 105mm guns; M-56 105mm pack, 20 AMX 155mm SP how; 81mm mor; 84mm RCL: *Vigilant* ATGW; *Rapier*, *Crotale*, RBS-70 SAM.
(In store: 70 *Saladin* armd, 60 *Ferret* scout cars; 12 *Saracen* APC.)
(On order: 18 OF-40 Mk 2 MBT; 20 *Scorpion* lt tks; 54 *TOW* ATGW, 42 *Improved HAWK* SAM, 343 msls.)

Navy: 1,500.
6 Lürssen TNC-45 FAC(M) with 2 × 2 *Exocet* SSM.
6 Vosper Thornycroft large patrol craft.
3 Keith Nelson coastal patrol craft(.
2 Cheverton spt tenders(.

Base: Abu Dhabi.

Air Force: (Police Air Wing & Central Air Force): 1,500; 43 combat ac, 7 combat hel.
2 interceptor sqns with 25 *Mirage* 5AD, 3 5RAD, 2 5DAD.
1 FGA sqn with 3 *Alpha Jet*.
1 COIN sqn with 10 MB-326KD/LD.
Tpts incl 4 C-130H, 1 L-100-30, 1 Boeing 720-023B, 1 G-222, 4 C-212, 5 *Islander*, 3 DHC-4, 4 DHC-5D, 1 Cessna 182.
Hel incl 6 AB-205, 6 AB-206, 3 AB-212, 7 *Alouette* III with AS-11, 9 *Puma*, 4 AS-332F *Super Puma*, 13 *Gazelle*.
Trg ac: 14 Pilatus PC-7, 2 *Hawk*.
AAM: R-550 *Magic*.
ASM: AS-11/-12, AM-39 *Exocet*.
(On order: 36 *Mirage* 2000 ftrs (3 trg), 3 *Alpha Jet* FGA/trg, 1 G-222, 1 C-130H-30 tpts, 6 SF-260TP, 24 *Hawk* trg ac; 4 AS-332F *Super Puma*, *Lynx* hel; *Skyguard* AD system with twin 35mm guns.)

Para-Military Forces: Coastguard: 41 coastal patrol boats/craft. (On order: 6 patrol boats.)

YEMEN ARAB REPUBLIC (NORTH)

Population: 7,200,000.
Military service: conscription, 3 years.
Total armed forces: 21,550.
Est GDP 1981: YR 12.630 bn ($2.768 bn). 1982: 12.949 bn ($2.838 bn).
Est def exp 1981: YR 2.025 bn ($443.836 m). 1982: 2.404 bn ($526.904 m).
GDP growth: 3.8% (1981), 1.2% (1982).
Inflation: 7.0% (1981), 15.0% (1982).
$1 = rial 4.5625 (1981–2).

Army: 20,000.
5 armd 'bdes' (1 trg; regts).
1 mech, 9 inf bdes (1 reserve).
1 para bde.
1 central guard force.
3 arty bdes.
3 AA arty, 2 AD bns (1 with SA-2 SAM).
150 T-34, 500 T-54/-55, 64 M-60 MBT; 50 *Saladin* armd, *Ferret* scout cars; some BMP MICV; 90 M-113, 300 BTR-40/-60/-152 APC; 300 76mm, 105mm, 122mm, and 155mm towed, 30 SU-100 SP guns; 200 82mm and 120mm mor; 65 BM-21 122mm MRL; 75mm, 82mm RCL; *LAW* RL; 20 *Vigilant*, *TOW*, 24 *Dragon* ATGW; ZU-23 23mm, 37mm, 57mm, 85mm towed, 40 ZSU-23-4, 72 M-163 *Vulcan* 20mm (20 SP) AA guns; SA-2/-7 SAM.
(On order: 5 *Improved HAWK* SAM.)

Navy: 550.
2 *Osa* FAC(M) with 4 SS-N-2b *Styx* SSM.
4 Sov P-4 FAC(T)(.
6 patrol craft(: 3 US *Broadsword*, 3 Sov (2 *Zhuk*, 1 *Poluchat*).

Base: Hodeida.

Air Force: 1,000; 75 combat ac.[19]
5 ftr sqns: 2 with 40 MiG-21; 1 with 10 MiG-17F; 1 with 10 F-5E; 1 with 15 Su-22.
Tpts: 2 C-130H, 2 C-47, 2 *Skyvan*, 1 Il-14, 1 An-24, 3 An-26.
Trainers: 4 F-5B, 4 MiG-15UTI.
Hel: 20 Mi-8, 6 AB-206, 5 AB-212, 2 *Alouette*.
1 AD regt with 12 SA-2 SAM.
AAM: AA-2 *Atoll*, AIM-9 *Sidewinder*.

Para-Military Forces: Ministry of Naitonal Security Force 5,000; tribal levies at least 20,000.

YEMEN: PEOPLE'S DEMOCRATIC REPUBLIC (SOUTH)

Population: 2,000,000.
Military service: 2 years.
Total armed forces: 25,500 (18,000 conscripts).
GDP 1981: YD 364.4 m ($1.055 bn).
Def exp 1981: YD 56.044 m ($162.258 m); 1982: 55.06 m ($159.409 m).
GDP growth: 5.2% (1981), 4.5% (1982).
Inflation: 8.0% (1981), 10.0% (1982).
$1 = dinar 0.34539 (1981–2).

Army: 22,000.
1 armd bde (trg).
2 mech bdes.
9 inf bdes (some being mechanized).
1 arty bde.
1 rocket bde and 10 arty bns.
1 SSM bde with *FROG* and *Scud* B.
450 T-54/-55/-62 MBT; 10 *Saladin* armd, 10 *Ferret*, BRDM-2 scout cars; BMP MICV; 300 BTR-40/-60/-152 APC; 350 85mm, 100mm, and 130mm guns (incl coastal); 122mm how; BM-21 122mm MRL; 120mm, 160mm mor; 12 *FROG*-7, 6 *Scud* B SSM; 200 ZU-23-2 23mm, 37mm, 57mm towed, and ZSU-23-4 SP AA guns; SA-2/-7 SAM.[20]

A Libyan MiG-23, armed with four AA-2 Atoll air-to-air missiles, flies an intercept mission above the southern Mediterranean Sea during a 1981 US Navy exercise.

Navy: 1,000.
1 Sov corvette (converted T-58 minesweeper).
6 Sov *Osa* FAC(M) with 4 *Styx* SSM.
2 Sov SO-1.
2 Sov P-6 FAC(T)(.
2 Sov *Zhuk* FAC(P)(.
6 coastal patrol craft((with Public Security Force): 1 *Tracker* 2, 4 *Spear*, 1 *Interceptor*.
1 Sov *Ropucha* LST; 3 Sov *Polnocny* LCT; 3 Sov T-4 LCA.

Bases: Aden, Perim Island.

Air Force: 2,500; 113 combat ac, some 15 combat hel.[20]
1 lt bbr sqn with 10 Il-28.
4 FGA sqns: 2 with 30 MiG-17F; 1 with 12 MiG-21; 1 with 25 Su-20/-22.
3 interceptor sqns with 36 MiG-21F.
1 tpt sqn with 3 An-24.
1 hel sqn with 30 Mi-8, 15 Mi-24.
1 SAM regt with SA-2.
Trainers: 3 MiG-15UTI.
AAM: AA-2 *Atoll*.
ASM: AT-2 *Sagger*.

Para-Military Forces: People's Militia. Public Security Force: 30,000 (increasing).

[1]Spares for Soviet equipment are scarce: active holdings being reduced to ⅓ of listed total; replacement or reconstruction using Western material planned.

[2]Total war costs to end-1982 reported as some $100 bn.

[3]Losses make estimates very tentative.

[4]Total war costs reported as an additional $1.5–2 bn. High inflation rates and continued occupation costs make defence expenditure estimates highly unreliable.

[5]Does not include captured PLO equipment reported as some 120 T-34, T-54 APC, 130mm guns, BM-21 MRL, 2 SU-23-4 AA guns, SA-9 SAM.

[6]Excluding expatriate personnel.

[7]Plus £L3 bn ($955 m) spread over 10 years to rebuild the armed forces.

[8]To be increased to 60,000. 7,000 troops from 10 nations served in UNIFIL; 3,200 from four countries serve with the multi-national force.

[9]Costs of Libya's military involvement in Chad unknown.

[10]Some eqpt, incl 1,400 MBT, 450 combat ac (Tu-22, MiG-21/-23/-25, Su-22) in storage. Soviet, Pakistani, and Palestinian pilots also fly Libyan aircraft.

[11]Including some 3,700 foreign personnel.

[12]About half to two-thirds for military aid to Iraq.

[13]18-month transition budget between 1981 and 1983.

[14]Includes budget for National Guard.

[15]Additional def exp financed through supplementary support.

[16]Some aircraft believed to be in storage. Casualties and reinforcements of Lebanon from June 1982 are difficult to estimate.

[17]Under Army command, with Army and Air Force manpower.

[18]The Union Defence Force and the armed forces of the United Arab Emirates (Abu Dhabi, Dubai, Ras Al Khaimah, and Sharjah) were formally merged in 1976.

[19]Some 15 ac in storage.

[20]Some eqpt believed in storage; some ac believed flown by Soviet and Cuban crews.

Sub-Saharan Africa

Bilateral External Agreements

The US has had mutual defence and assistance agreements with Ethiopia (1975), Ghana (1972), Kenya (1980), Liberia (1972), Mali (1972), Niger (1962), Senegal (1962), and Zaire (1972); most may now be in abeyance. Agreements have been negotiated with Somalia and Kenya to allow limited US access to naval and air facilities; Somalia has received some arms.

The Soviet Union has Treaties of Friendship and Co-operation with Angola (October 1976), Mozambique (March 1977), and Ethiopia (November 1978, ratified April 1979). Relations with the Congo Republic are close but no such agreement is known to exist. Military aid has been given to Angola (under additional Military Co-operation Agreements, including one signed in May 1983), Ethiopia, Guinea, Guinea-Bissau, Mali, Mozambique, Nigeria, Somalia, Uganda, and Zambia (1980). The Soviet Navy uses facilities on Dahlak Island, Ethiopia.

China has military assistance agreements with Cameroon, Equatorial Guinea, Guinea, Mali, and Tanzania, and has given aid to Mozambique and Zaire (under a 1982 sales credit agreement).

Britain maintains overflying, training, and defence agreements with Kenya, is helping Zimbabwe form and train her forces, and heads a Commonwealth Training Team (Australia, Britain, Canada, Guyana, Jamaica, Kenya, Sierra Leone, and Tanzania) which is helping rebuild the Ugandan defence forces.

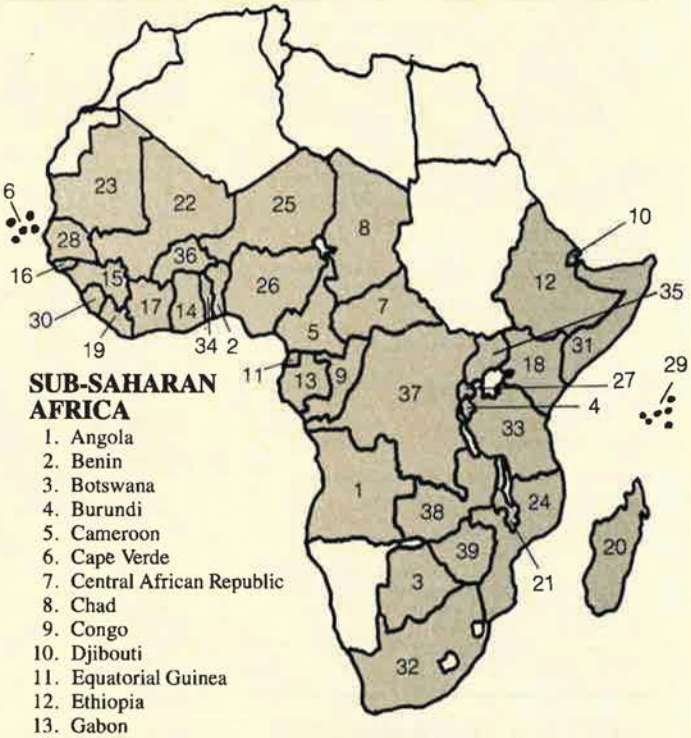
France signed defence and/or military co-operation agreements with Benin, Cameroon (February 1974), the Central African Republic, Chad, Congo, Gabon (1974), Ivory Coast, Madagascar, Mali (since terminated), Mauritania, Niger, Senegal (March 1974), Togo, Upper Volta, and Zaire. The agreement with the Central African Republic was suspended briefly (May–September 1979) before the change of government there. In 1977 France concluded an agreement with Djibouti which permits her to station forces.

Belgium has a military co-operation agreement with Zaire.

Spain has a military agreement with Equatorial Guinea (1981) and is providing training and some equipment.

Cuba has some 25,000 men in Angola, training the Angolan armed forces and assisting with internal security, and 11,000 in Ethiopia. Cuban, Soviet, and East German advisers are present in a number of other African countries.

Some military links exist between South Africa and Israel, and between Zaire and Israel; between both Mozambique and Angola on the one hand, and East Germany, Bulgaria, Romania (1982), and Yugoslavia (1982) on the other. Hungary signed a Friendship Treaty with Ethiopia and with Mozambique in September 1980. North Korea signed a Treaty of Friendship and Co-operation with Togo in October 1981; she also had a 100-man training team with Zimbabwe's elite armoured brigade and a smaller team in Uganda; Ethiopia signed a Treaty of Friendship with Libya and South Yemen in 1981.



SUB-SAHARAN AFRICA

1. Angola
2. Benin
3. Botswana
4. Burundi
5. Cameroon
6. Cape Verde
7. Central African Republic
8. Chad
9. Congo
10. Djibouti
11. Equatorial Guinea
12. Ethiopia
13. Gabon
14. Ghana
15. Guinea
16. Guinea-Bissau
17. Ivory Coast
18. Kenya
19. Liberia
20. Madagascar
21. Malawi
22. Mali
23. Mauritania
24. Mozambique
25. Niger
26. Nigeria
27. Rwanda
28. Senegambia
29. Seychelles
30. Sierra Leone
31. Somali Democratic Republic
32. South Africa
33. Tanzania
34. Togo
35. Uganda
36. Upper Volta
37. Zaire
38. Zambia
39. Zimbabwe

Multilateral Regional Agreements

The Organization of African Unity (OAU), constituted in May 1963 to include all internationally recognized independent African states except South Africa, has a Defence Commission—responsible for defence and se-

curity co-operation and the defence of the sovereignty, territorial integrity, and independence of its members. In 1979 this approved in principle an African Intervention Force and ordered planning for its formation, funding, and equipping. Little progress has been reported. It did agree in 1981 on an Inter-African Force for Chad, with troops from Nigeria, Senegal, and Zaire. OAU financing was inadequate; the Force was withdrawn in June 1982.

In 1961 the Central African Republic, Chad, the Congo, and Gabon formed the Defence Council of Equatorial Africa, with French help. Chad's present position in relation to the Council is unclear.

In May 1981 the Economic Community of Western African States (ECOWAS) adopted a Protocol on Mutual Assistance on Defence Matters calling for a joint Defence Commission, comprising Defence Ministers and their Chiefs of Defence Staff, and a Defence Council of the Heads of State. It is intended to create a joint force, using assigned units of the national armies, which could serve as an intervention or peacekeeping force. Of the then 16 ECOWAS members (Benin, Cape Verde, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo, and Upper Volta), 12 have signed, Cape Verde, Guinea-Bissau, and Mali declined, and Mauritania signed only after the Protocol was amended to call for the withdrawal of foreign troops once ECOWAS could guarantee mutual defence.

Bilateral Regional Arrangements

Kenya signed a defence agreement with Ethiopia in November 1963 and a Treaty of Friendship and Co-operation in January 1979; Kenya and Somalia agreed in 1981 to control border incursions. Sierra Leone and Guinea signed a Defence Agreement in 1971 and a Mutual Defence Pact in August 1981. In December 1981 Senegal and Gambia signed a confederation pact which united the two countries as Senegambia. Although they stated their intent to integrate their armed forces, the Protocols have not yet been signed. Djibouti signed a Friendship Treaty with Ethiopia and with the Somali Republic in early 1981. Nigeria and Benin signed a military co-operation agreement in January 1983 providing for joint exercises and unspecified 'other things'. Mozambique trains Tanzanian and Zimbabwe troops; the agreement providing this facility is unknown. Tanzania provides instructors for Uganda under a defence pact signed in August 1981.

The only country in the area with an indigenous arms industry is South Africa, which builds equipment under licence and some also of her own design.

ANGOLA

Population: 7,175,000.
Military service: 2 years.
Total armed forces: 37,500[1] (perhaps 20,000 conscripts).
Est def exp range 1981: K 20.720–48.347 bn ($0.75–1.75 bn).
$1 = kwanza 24.627 (1981).

Army: 35,000.
2 mot inf bdes (each of 1 tk, 2 inf bns).
17 inf bdes.
4 AA arty bdes.
175 T-34, 150 T-54 MBT; some 50 PT-76 lt tks; 200 BRDM-1/-2, AML armd cars; 150 BTR-60/-152 APC; 200 guns/how, incl 76mm, 85mm, 100mm SU-100 SP; 122mm, 130mm, 152mm; 460 82mm, 40 120mm mor; 50 BM-21 122mm MRL; 2,000 75mm, 82mm, and 107mm RCL; *Sagger* ATGW; ZPU-4 14.5mm, ZU-23 23mm, 37mm towed, ZSU-23-4, 40 ZSU-57-2 SP AA guns; SA-7 SAM.[2]

Navy: 1,000.
2 *Osa*-II FAC(M) with 4 SS-N-2 SSM.
6 Sov *Shershen* FAC(T).
5 Port *Argos* large patrol craft.
9 coastal patrol craft(: 3 Sov (1 *Zhuk*, 2 *Poluchat*), 6 Port (1 *Jupiter*, 5 *Bellatrix*).
4 LCT: 3 Sov *Polnocny*, 1 Port *Alfange*.
5 Sov T-4 LCM.

Bases: Luanda, Lobito, Moçâmedes.

Air Force: 1,500; 67 combat aircraft.[2]
2 FGA sqns with 39 MiG-21MF, 25 MiG-17F, 2 G-91R4 ftrs.
MR ac: 1 F-27MPA.
2 tpt sqns: 6 *Noratlas*, 2 L-100-20, 3 C-47, 6 An-2, 16 An-26, 4 *Turbo-Porter*, 8 *Islander*, 10 Do-27, 1 F-27-400M, 1 FH-227.
2 hel sqns: 35 Mi-8, 13 *Alouette* III, 3 *Dauphin*.
Trainers incl 1 MiG-15UTI, 6 Yak-11, 6 PC-7.
AAM: AA-2 *Atoll*.
SAM: 20 SA-3 *Goa*.
(On order: some 6 PC-7 *Turbo-Trainer* ac.)

Para-Military Forces: Militia 10,000; 11+ inf bns. 'Organization of Popular Defence' 500,000.

Opposition: UNITA, some 15,000; BM-21 122mm MRL, 82mm mor, 75mm RCL, 12.7mm hy machine guns.

CAMEROON

Est population: 9,200,000.
Total armed forces: 7,300.
Est GNP 1980/1: fr CFA 1,603.0 bn ($6.813 bn).
Est def exp 1981/2: fr CFA 22.898 bn ($77.181 m). 1982/3: 27.795 bn ($78.639 m).
$1 = francs CFA 235.27 (1980/1), 296.68 (1981/2), 353.45 (1982/3).

Army: 6,600.
1 armd car bn.
1 para/cdo bn.
4 inf bns.
1 engr bn.
1 fd, 6 AA arty btys.
Spt units.
M-8 armd, *Ferret* scout cars; some 27 *Commando*, M-3 half-track APC; 75mm pack, M-101 105mm how; 60mm, 20 81mm, 120mm mor; 13 57mm ATK guns; 89mm ACL-STRIM RL; 40 106mm RCL; *Milan* ATGW; 18 Type 58 14.5mm, 18 35mm, 18 Type-63 37mm, 18 40mm AA guns.
(On order: some 17 V-150 *Commando* APC.)

Navy: 350.
2 FAC(M): 1 *Combattante* III with 8 *Exocet* SSM, 1 PR-48 with 8 SS-12.
2 Ch *Shanghai*-II FAC(G).
10 coastal patrol craft(.
1 LCM, 5 LCVP, 6 lt assault craft.
(On order: 1 P-48S, 1 PR-48 large patrol craft, 1 LCVP.)

Bases: Douala, Port Gentil.

Air Force: 350; 12 combat ac, 2 combat hel.
1 mixed sqn.
1 Presidential flt.
6 *Alpha Jet* FGA; 4 *Magister* COIN; 3 C-130H, 3 C-47, 1 DHC-4, 4 DHC-5D, 2 Do-128-6 (MR), 7 *Broussard*, 1 Boeing 727-20 tpts; 1 *Puma*, 3 *Alouette* II/III, 4 *Gazelle* (2 with *HOT* ATGW) hel.

Para-Military Forces: 5,000. 7 Regional groups, 1 Presidential Guard group.

CONGO

Est population: 1,700,000.
Total armed forces: 8,700.
Est GDP 1981: fr CFA 366.835 bn ($1,350 m).
Est def exp 1981/2: fr CFA 40.759 bn ($150 m).
$1 = francs CFA 271.73 (1981).

Army: 8,000.
1 armd bn.
1 inf bn.
1 arty gp.
1 engr bn.
1 para/cdo bn.
14 Ch T-62, 3 PT-76 lt tks; 15 BRDM-1/-2 scout cars; M-3, 20 BTR-50, 2 BTR-60, 44 BTR-152 APC; 6 75mm, 10 100mm, 8 122mm how; 82mm, 10 120mm mor; 13 57mm, 76mm, 100mm ATK guns; 57mm RCL; 28 37mm AA guns.

Navy: 200.
1 Sov *Shershen* FAC(T).
3 Ch *Shanghai* FAC(G).
3 *Pirana* coastal, 4 *Yulin* river patrol craft(.
(On order: 3 13-m ARCOA Type 43, 2 11.4-m Type 38 patrol craft.)

Air Force: 500; 21 combat ac.
1 MiG-15, 20 MiG-17 FGA.
1 F-28, 5 An-24, 5 Il-14, 3 C-47, 1 *Frégate*, 2 *Broussard* tpts.
4 L-39 trg ac.
1 *Puma*, 4 *Alouette* II/III hel.

Para-Military Forces: 3,000.

ETHIOPIA

Est population: 31,500,000–40,000,000.
Military service: selective conscription, 30 months, incl police, border guard.
Total armed forces: 250,500.[3]
GDP 1980/1: EB 8.79 bn ($4.247 bn). 1981/2: 9.245 bn ($4.466 bn).
Est def 1981: EB 782 m ($377.778 m).
GNP growth: 3.3% (1981).
Inflation: 15–20% (1981).
$1 = birr 2.07 (official).

Army: (incl People's Militia): 244,500.
24 inf divs (3 mech/mot) with some 20 tk bns.
4 para/cdo bdes.
30 arty bns.
30 AD bns.
40 M-47, 150 T-34, 700 T-54/-55 MBT; 40 M-41 lt tks; 100 BRDM-1/-2 scout cars, 40 BMP-1 MICV; about 70 M-113, 600 BTR-40/-60/-152, V-150 *Commando* APC; some 700 guns/how, incl 75mm, 52 105mm, 250 122mm (incl SP), 130mm, 152mm, 12 155mm towed, 12 M-109 155mm SP; 60mm, 81mm, 82mm, 100 M-38 120mm, 280 M-2/-30 4.2-in (107mm), 120mm mor; BM-21 122mm MRL; *Sagger* ATGW; ZU-23 23mm, 37mm towed, ZSU-23-4, ZSU-57-2 SP AA guns; SA-2/-3/-7 SAM.[4]

Navy: 2,500.[4]

[1]See p. 109 for footnotes.

1 Sov *Petya* frigate.
7 Sov *Osa*-II FAC(M) with 4 SS-N-2b.
9 large patrol craft: 1 Yug *Kraljevica*, 4 US PGM, 4 Swiftship 105-ft.
1 Sov *Poluchat* coastal patrol craft.
1 Sov *Polnocny* LSM.

Bases: Massawa, Assab.

Air Force: 3,500; some 107 combat ac; 24 armed hel.[4]
6 FGA sqns: 1 with 10 MiG-17; 4 with 65 MiG-21; 1 with 20 MiG-23; 1 with 12 Sukhoi.
1 tpt regt with 14 An-12, 4 An-22, 2 An-26, 1 Il-14.
Trainers incl MiG-21U.
Hel incl 32 Mi-8, 24 Mi-24.
(F-5, T-28, C-47, C-54, C-119, *Dove*, DHC -3/-6, Do-28 ac; AB-204, *Alouette*, UH-1H hel in storage.)

RESERVES: (all services to age 50): 200,000.

Para-Military Forces: 169,000. Mobile emergency police force 9,000. Some national military training and 'civil defence' may have been instituted.

Opposition: Eritrean Liberation Front (ELF) some 6,500 (14 'bdes'); Eritrean Liberation Front-People's Liberation Forces (ELF-PLF) some 10,000; People's Liberation Front Revolutionary Guard (PLFRG) some 5,000; Eritrean People's Liberation Front (EPLF) some 12,000; Tigre People's Liberation Front (TPLF) 5,000. Captured eqpt incl T-54/-55 MBT; 76mm, 85mm, 120mm arty; 23mm, 37mm, 40mm AA guns.

GHANA

Population: 13,300,000.
Military service: voluntary.
Total armed forces: 12,600.
GDP 1980/81: C 29.425 bn ($10.699 bn).
Def exp 1980: C 426.0 m ($154.899 m).
Inflation: 130% (1981).
$1 = cedi 2.7502 (1981 official).

Army: 10,000.
2 bdes (6 inf bns and spt units).
1 recce bn.
1 mor bn.
1 fd engr bn.
1 sigs bn.
1 AB coy.
Saladin armd cars; 100 MOWAG *Piranha* APC; 81mm, 28 Tampella 120mm mor; 50 *Carl Gustav* 84mm RCL.

Forces Abroad: Lebanon (UNIFIL): 1 bn (702).

Navy: 1,200.
2 *Kromantse* ASW corvettes.
4 FAC(G): 2 FPB-57, 2 TNC-45.
2 *Dela*, 2 Br *Ford* large patrol craft.
4 *Spear* II coastal patrol craft.

Bases: Sekondi, Tema.

Air Force: 1,400; 10 combat ac.
1 COIN sqn with 10 MB-326F/KB.
2 tpt sqns with 8 *Islander*, 6 *Skyvan* 3M.
1 comms/liaison sqn with 5 F-27, 1 F-28.
Hel: 2 *Alouette* III, 2 Bell 212.
1 trg sqn with 11 *Bulldog*.
(On order: 8 SF-260TP COIN/trg ac.)

Para-Military Forces: Border Guard 5,000; 3 bns. People's Militia.

GUINEA

Est population: 5,450,000.
Total armed forces: 9,900.
Est GDP 1981: Sy 34.987 bn ($1.635 bn).
Def exp 1981: Sy 1.710 bn ($79.91 m).
$1 = sylis 21.339 (1981).

Army: 8,500.
1 armd bn.
5 inf bns.
1 arty bn.
1 engr bn.
1 cdo bn.
1 special force bn.
30 T-34/-54 MBT; 20 PT-76 lt tks; 25 BRDM-1/-2 armd cars; 40 BTR-40/-50/-60/-152 APC; 76mm, 85mm, 105mm, 122mm guns/how; 20 M-1938/43 120mm mor; 57mm ATK guns; 37mm, 57mm, 100mm AA guns.

Navy: 600.
6 Ch *Shanghai*-II FAC(G).
2 Sov *Shershen*, 4 P-6 FAC(T).
3 Sov *Poluchat*, 2 MO-6, 5 other coastal patrol craft.
1 T-58 minesweeper; 2 LCU.

Air Force: 800; 6 combat ac.
6 MiG-17F FGA.
4 Il-14, 4 An-14, 2 Il-18, 2 C-119, 1 Yak-40 tpts.
1 Reims F-337 lt ac.
Trg ac: 2 MiG-15UTI, 5 Yak-18, 3 L-29.
Hel: 1 Bell 47G, 1 *Puma*, 1 *Gazelle*, 1 UH-12B.

Para-Military Forces: 9,000; People's Militia: 7,000; Gendarmerie (1,000); Republican Guard 1,000.

GUINEA-BISSAU

Est population: 820,000.
Total armed forces: 6,050.
Est GDP 1981: pG 8.963 bn ($235 m).
Def exp 1981: pG 307.9 m ($8.073 m).
$1 = Guinean pesos 38.14 (1981).

Army: 5,700.
4 inf bns.
1 engr unit.
1 tk sqn.
10 T-34 MBT; BTR-40/-50/-60/-152 APC; 85mm, 105mm, 122mm guns; 8 120mm mor; 89mm RL; 75mm RCL; 23mm, 57mm AA guns; SA-7 SAM.

Navy: 275.
1 Sov *Shershen*, 1 P-6 FAC(T).
2 Sov *Poluchat*, 5 other coastal patrol craft.
2 T-4 LCVP; LCU.

Air Force: 75.
2 Do-27, 2 Yak-40 tpts, 1 Cessna 337 lt ac.
2 *Alouette* III, Mi-8 hel.

Para-Military Forces: 5,000.

KENYA

Population: 18,000,000.
Military service: voluntary.
Total armed forces: 16,000.
GDP 1981/2: K Sh 60.464 bn ($5.950 bn).
Est def exp range 1981/2: K Sh 1.577–2.900 bn ($155.186–285.377 m).
Est FMA 1982: $40 m.
GDP growth: 2.0% (1981).
Inflation: 13.3% (1982).
$1 = shillings 10.162 (1981/2).

Army: 13,000.
2 bde HQ.
2 armd, 1 armd recce bns.
5 inf bns.
2 arty bns.
1 indep air cav bn.
1 para bn.
2 engr bns.
72 Vickers Mk 3 MBT; 30 AML-60, 38 -90, 8 *Shorland* armd cars; 50 UR-416, 12 Panhard M-3 APC; 40 lt, 16 pack 105mm guns; M-109 155mm SP how; 20 81mm, 10 120mm mor; 50 *Carl Gustav* 84mm, *Wombat* 120mm RCL; *Milan*, 8 *Swingfire* ATGW; 32 Hughes 500MD hel (15 *Scout*, 15 with *TOW* ATGW, 2 trg).

Navy: 650.
4 Brooke Marine FAC(M): (1 37.5-metre, 3 32.6-metre), 2 with *Gabriel* SSM.
3 Vosper 31-metre *(Simba)* large patrol craft.
(On order: 5 patrol boats; *Gabriel* SSM.)

Base: Mombasa.

Air Force: 2,350; 28 combat ac.
1 FGA sqn with 9 F-5E, 2 F-5F.
1 COIN sqn with 5 BAC-167 *Strikemaster*, 12 *Hawk* T-52.
2 lt tpt sqns: 1 with 5 DHC-4 *Caribou*, 1 with 6 DHC-5D *Buffalo*, 7 Do-28D.
1 trg sqn with 14 *Bulldog* 103.
Other ac incl 1 *Nord* 262, 1 *Turbo Commander*, 1 *Navajo*.
Hel: 10 *Puma*, 2 Bell 47G.
AAM: *Sidewinder*.
ASM: *Maverick*.

Para-Military Forces: Police (General Service Unit) 1,800: Police Air Wing, 7 Cessna lt ac, 3 Bell hel.

MADAGASCAR

Population: 9,350,000.
Military service: 18 months.
Total armed forces: 21,100.
Est GDP 1981: FMG 725 bn ($2.688 bn).
Est def exp 1982: FMG 27.456 bn ($78.511 m).
GDP growth: −9.2% (1981).
$1 = Malagasy francs 271.73 (1981), 349.71 (1982).

Army: 20,000.
2 bn gps.
1 engr regt.
1 sigs regt.
1 service regt.
7 construction regts.
PT-76 lt tks; 8 M-8 armd, M-3A1, 10 *Ferret*, BRDM-2 scout cars; M-3A1 half-track APC; 12 ZIS-3 76mm guns; 122mm how; 81mm mor; 106mm RCL; 50 ZPU-4 14.5mm AA guns.

Navy: 600 (incl 150 marines).
1 Type-48 large patrol craft.
1 *Batram* landing craft with 8 SS-12 SSM.
7 LCM: 4 N. Korean *Nampo*, 3 US.
1 marine coy.

Air Force: 500; 12 combat ac.
1 FGA sqn with 4 MiG-17, 8 MiG-21FL.
1 tpt sqn with 1 HS-748 (VIP); 2 An-26, 2 Yak-40, 1 C-53D, 5 C-47, 1 *Defender*, An-12, 1 *Aztec*, 3 *Super Skymaster*, 5 lt ac.
1 hel sqn with 1 Bell 47, 3 *Alouette* I/III, 2 Mi-8.

Para-Military Forces: Gendarmerie 8,000, incl maritime police with 5 patrol craft.

MAURITANIA

Est population: 1,700,000.
Total armed forces: 8,470.
Est GDP 1981: OM 34.504 bn ($715 m).
Def exp 1982: OM 3.233 bn ($62.0 m).
$1 = Ouguiyas 48.258 (1981); 52.153 (1982).

Army: 8,000.
1 inf bn.
1 arty bn.
1 Camel Corps.
3 armd recce sqns.
1 AA bty.
1 engr coy.
1 para coy.
15 EBR-75 hy, 39 AML-60, 14 AML-90 armd cars; 40 M-3 half-track, 4 M-3 APC; 81mm, 120mm mor; 57mm, 75mm, 106mm RCL; 14.5mm, ZU-23-2, 37mm AA guns; SA-7 SAM.

Navy: 320.
8 patrol craft: 2 *Patra*, 3 *Barcelo*, 3(.

Air Force: 150; 7 combat ac.
5 *Defender*, 2 Cessna 227 COIN.
4 Piper *Cheyenne* MR.
2 DHC-5D, 1 *Caravelle*, 1 *Skyvan*, 1 *Islander* tpts.

Para-Military Forces: 2,500.

MOZAMBIQUE

Population: 12,650,000.
Military service: conscription (selective): 2 years (incl women).
Total armed forces: 12,650.[5]
Est GNP 1981: m 86.10 bn ($2.950 bn).
Est def exp 1982: m 6.128 bn ($200.918 m).
$1 = metiça 30.50 (1982), 29.19 (1981).

Army: 11,000 (perhaps 75% conscripts).
1 tk bde (Presidential Guard).
7 inf bdes (each 1 tk, 3 inf, 2 mech, 2 arty, 1 AD bns, spt units).
195 T-34, some T-54/-55 MBT; 35 BRDM-1/-2 scout cars; 200 BTR-60/-152 APC; 250 76mm, 85mm, 100mm, 122mm, and 130mm guns; M-101 105mm how; BM-21 122mm MRL; 325 60mm, 82mm, and 120mm mor; 75mm, 82mm RCL; *Sagger* ATGW; 300 20mm, ZU-23, 23mm, 37mm, 57mm towed, and ZSU-23-4 SP AA guns; 30 SA-3, SA-7 SAM.

Navy: 650.
14 coastal patrol craft(: 4 Sov (3 *Zhuk*, 1 *Poluchat)*, 6 ex-Port (1 *Antares*, 3 *Jupiter*, 2 *Bellatrix)*, 4 Neth.
1 Port *Albarda* LCT.

Bases: Maputo, Beira, Nacala, Pemba, Metangula.

Air Force: 1,000; 35 combat ac.
3 FGA sqns with 35 MiG-17.
1 hel sqn with 4 Mi-8.
1 tpt sqn with 1 Tu-134, 4 An-26, 6 *Noratlas*, 4 Cessna 182.
Trg ac: 7 Zlin.

Para-Military Forces: Border Guard 6,000: 4 bdes. Provincial, People's Militias, Local Militias (village self-defence force).

Opposition: National Resistance Movement of Mozambique (MNR): perhaps 10,000.

NIGERIA

Population: 82,000,000.
Military service: voluntary.

Total armed forces: 133,000.
Est GDP 1980: N 43.280 bn ($79.195 bn). 1981: 43.450 bn ($70.789 bn). 1982: 43.600 bn ($64.765 bn).
Est def exp range 1981: N 600–1,320 m ($0.977–2.150 bn). 1982: 450–1,214 m ($0.668–1.803 bn).
GDP growth: −2.4% (1981); −2.2% (1982).

Armed Forces of Other African States

Country	Est population (000)	Est GNP 1981 ($m)	Est def exp 1982 ($m)	Total armed forces	Army: Manpower and formations	Army: Equipment	Navy: Manpower and equipment	Air Force: Manpower and equipment	Para-military forces
Benin	**3,600**	**1,300**	**23.6** (1981)	**3,150**	**3,000** 3 inf bns 1 para/cdo bn 1 engr bn 1 service bn 1 armd sqn 1 arty bty	7 M-8, M-20 armd cars; BRDM-2 recce vehs; 4 M-101 105mm how; 60mm, 81mm mor	**50** 2 *Zhuk* patrol boats (2 P-6, 1 Fr, 3 more *Zhuk* inoperable)	**100** 2 C-47, 2 An-26, 1 F-27, 3 An-2, 1 *Falcon* 20, 1 Aero *Commander*, 1 *Corvette* 200, 2 *Broussard* tpts; 1 Cessna 337 lt ac; 1 Bell 47, 1 *Alouette* II hel	**1,100**
Botswana	**975**	**949** (1981)	**26.6** (1981)	**3,000***	**2,850*** 1 inf bn gp	*Shorland*, Cadillac Gage armd cars; 30 BTR-60 APC; 81mm, 10 120mm mor; 84mm *Carl Gustav* RCL; SA-7 SAM	—	**150*** 5 *Defender* COIN; 2 *Skyvan* tpts; 2 Cessna 152, 6 *Bulldog* lt ac	**1,260** (Police)
Burundi	**4,650**	**1,116** (GDP)	**40.0**	**5,200***	**5,000*** 2 inf bns 1 para bn 1 cdo bn 1 armd car coy	6 AML-60, 12 -90, *Shorland* armd cars; 9 M-3, 20 BTR-40, *Walid* APC; 15 75mm RCL; 83mm *Blindicide* RL; 18 82mm mor; 15 quad 14.5mm AA guns	**50*** 3 *Lambro* patrol boats (2 in reserve)	**150*** 3 SF-260W COIN; 3 DC-3, 2 Do-27 tpts; 3 *Alouette* III hel	**1,500**
Cape Verde	**293**	**100**	**3.5** (1981)	**1,100**	**1,000** 4 inf coys Spt elms	8 BRDM-2 recce vehs; mor; 3.5-in (89mm) RL	**75** 2 *Shershen* FAC; 1 *Zhuk* coast patrol craft	**25** 2 An-26 tpt ac	—
Central African Republic	**2,470**	**560**	**20.0** (1981)	**2,300**	**2,000** 1 regt HQ 1 mech bn (forming) 1 inf bn 1 engr coy 1 sigs coy 1 tpt coy	4 T-55 MBT; 4 BRDM-2, 10 *Ferret* scout cars; 4 BTR-152 APC; 81mm, 4 120mm mor; 14 106mm RCL; 9 river patrol craft	—	**300** 10 AL-60, 2 *Rallye Guerrier*, 1 DC-4, 4 DC-3/C-47, 1 *Caravelle*, 1 *Corvette*, 6 *Broussard*, 2 *Skymaster* tpts; 1 *Alouette* II, 4 H-34 hel	**1,500**
Chad[a]	**4,850**	**550**	**51.7**	**4,200**	**4,000** 3 inf bns (incl 5 para coys) 2 arty btys 1 recce coy	10 AML-60, 16 -90 armd cars; 90mm, 122mm guns; 81mm, 120mm mor; 68mm, 89mm ATK RL	—	**200** 10 AL-60, 3 C-54, 9 C-47, 1 *Noratlas*, 1 *Caravelle*, 1 F-27, 1 F-28, 2 PC-6, 2 *Broussard* tpts; 4 Cessna 337 lt ac; 11 *Alouette* II/III, 4 *Puma* hel	**6,000**
Djibouti	**315**	**357**	**2.9**	**2,700***	**2,600*** 1 inf regt 1 armd sqn 1 spt bn 1 border cdo bn 1 para coy	12 BRDM-2, 2 AML-60, 8 AML-90 armd cars; 12 BTR-60 APC; 105mm pack how; 81mm, 4 120mm mor; 89mm RL; 106mm RCL	**20*** 3 coast patrol boats	**80*** 1 *Rallye* 235; 1 *Mystère* 20, 2 *Noratlas* tpts; 1 Cessna 206G lt ac; 1 *Alouette* II hel	**2,100**
Equatorial Guinea	**270**	**140**	**2.5** (1981)	**1,550**	**1,400** 1 inf bn Spt unit	10 BRDM-2 recce vehs; 10 BTR-152 APC; 81mm mor	**100** 1 ex-Sov P-6 FAC; 1 *Poluchat*, 4 other patrol craft	**50** 2 MiG-17, 1 Reims Cessna 337, 2 C-212, 1 Yak 40 ac; 2 *Alouette* III hel	**2,000** (Police)
Gabon	**670**	**3,500**	**88.8**	**2,200**	**1,500** 1 bn gp 8 inf coys 1 engr coy 1 para coy 1 service coy	16 *Cascavel*, 15 AML-90 armd cars; 12 EE-11 *Urutu*, 6 *Commando*, M-3, 12 VXB-170 APC; 81mm, 120mm mor; 106mm RCL; 10 37mm, 2 40mm AA	**200** 1 FAC(M) with 4 SS-12 SSM; 4 FAC(G); 2 patrol craft; 1 LCM	**500** 7 *Mirage* 5G/DG FGA; 1 EMB-111P1 MR ac; 1 C-130H, 1 L-100-20, 3 -30, 3 C-47, 1 DC-8-63, 2 EMB-110, 2 EMB-110P1K, 1 *Gulfstream* III (VIP), 1 *Falcon*, 1 YS-11A, 3 Nord 262, 4 *Broussard* tpts; 2 Reims 337, 2 *Magister*, 4 T-34C lt ac; 4 *Puma*, 3 *Alouette* III hel	**2,800**

Armed Forces of Other African States (cont.)

Country	Est population (000)	Est GNP 1981 ($m)	Est def exp 1982 ($m)	Total armed forces	Army		Navy	Air Force	Para-military forces
					Manpower and formations	Equipment	Manpower and equipment	Manpower and equipment	
Ivory Coast	**8,750**	**10,800** (GDP)	**92.0** (1981)	**5,070**	**4,000** 3 inf bns 1 marine inf bn 1 armd sqn 1 arty bty 1 AA arty bty 1 engr coy 1 spt coy 1 para coy	5 AMX-13 lt tks; 7 ERC-90 armd cars; 13 VAB, 22 M-3 APC; 4 105mm how; 81mm, 16 120mm mor; 89mm STRIM RL; 6 M-3 VDA 20mm SP, 10 40mm towed AA guns	**500** 2 *Vigilant*, 4 *Patra* patrol boats (2 with 6 SS-12 SSM); 10 patrol craft; 1 *Batral* lt tpt, 2 amph boats; 10 landing craft, 1 trg ship	**570** 5 *AlphaJet* FGA; 2 C-130H, 3 F-27, 2 F-28, 6 F-33C, 1 *Merlin*, 2 Reims F-337, 1 Cessna 421, 1 *King Air*, 2 RC-150, 1 *Falcon*, 1 *Gulf-stream* tpts; *Rallye* 160 and 235 lt ac; 3 *Puma*, 3 *Alouette* II/III, 4 *Dauphin* hel	**3,000**
Liberia	**2,100**	**770** (GDP)	**51.0**[b]	**5,550**	**4,900** 1 Guard bn 5 inf bns 1 arty bn 1 engr bn 1 service bn	12 M-3A1 scout cars; 75mm pack, 8 105mm how; 20 60mm, 10 81mm, 4.2-in mor; 3.5-in RL; 57mm, 106mm RCL	**400** 3 50-ton, 2 38-ton, 1 11-ton Swiftships coastal patrol craft	**250** 2 C-47 tpts; 14 Cessna lt ac (2 172, 1 185, 1 207, 10 337)	**1,750**
Malawi	**6,400**	**1,000**	**20.0** (1981)	**4,650***	**4,500*** 3 inf bns 1 spt bn (incl 1 recce sqn)	10 *Fox*, BRDM-2 scout cars; 9 105mm guns; 81mm mor; 3.5-in RL; 57mm RCL; 14 *Blowpipe* SAM	**100*** 1 *Spear*, 3 lake patrol boats	**50*** 6 Do-27, 6 Do-28 tpts; 3 *Puma*, 1 *Alouette* III hel	**1,000**
Mali	**7,200**	**1,200**	**40.0** (1981)	**4,950**	**4,600** 4 inf bns 1 arty bn 1 engr bn 1 para bn 1 special force bn 1 tk coy 1 SAM bty	37 T-34 MBT, 12 Type-62 lt tks; 20 BRDM-2 recce; 30 BTR-40, 10 BTR-152, BTR-60 APC; 85mm, 100mm guns; 81mm, 30 120mm mor; 37mm, 57mm AA guns; SA-3 SAM	**50** 3 river patrol craft	**300** 5 MiG-17 FGA; 2 C-47, 3 An-2, 2 An-24, 1 *Corvette* 200 tpts; 1 MiG-15UTI, 6 Yak-11/-18 trg ac; 2 Mi-4, 1 Mi-8 hel	**5,000**
Niger	**6,000**	**2,850** (GDP)	**19.2** (1981)	**2,220**	**2,150** 2 armd recce sqns 4 inf coys 1 engr coy 1 para coy 1 log/spt coy	10 M-8, 30 ERC-60-20 armd cars; 14 M-3 APC; 60mm, 81mm, 15 120mm mor; 57mm, 75mm RCL; 10 M-3 VDA 20mm SP AA guns	—	**70** 1 C-54B, 2 C-47, 2 C-130H, 1 Boeing 737, 4 *Noratlas*, 3 Do-28D, 1 *Flamant*, 1 Aero *Commander* tpts; 2 Cessna 337 lt ac	**2,550**
Rwanda	**5,400**	**1,280** (GDP)	**24.3**	**5,150***	**5,000** 1 cdo bn 1 recce sqn 8 inf coys 1 engr coy	12 AML-60/-90 armd cars; M-3 APC; 6 57mm ATK guns; 8 81mm mor; 83mm *Blindicide* RL	—	**150** 2 *Defender* (COIN), 2 C-47, 1 *Islander* tpts; 3 AM-3C liaison, 1 *Magister* trg ac; 2 *Alouette* III hel	**1,200**
Seychelles	**67**	**144** (GNP 1980)	**8.0**[c]	**1,000***	**750*** 1 inf bn 1 arty tp Spt coy	6 BRDM-2, *Shorland* recce; 3 122mm guns; 6 82mm mor; RPG-7 RL; SA-7 SAM	**150*** 1 *Sirius*, 1 lt 42-metre, 2 *Zhuk* large patrol craft; 1 LCT	**100*** 1 *Defender*, 1 *Islander*, 2 *Rallye* ac; 2 *Alouette* III hel	**900**
Sierra Leone	**3,550**	**1,147** (GDP)	**22.0** (1981)	**3,100**	**3,000** 2 inf bns 2 arty btys 1 engr sqn	*Saladin* armd car; MOWAG *Piranha* APC; 10 25 pdr guns/how; 60mm, 81mm mor; M-20 3.5-in RL; *Carl Gustav* 84mm RCL; 1 BO-105 (VIP) hel	**100** (coastguard) 1 *Shanghai* II FAC; 1 *Tracker*, 2 coast patrol boats	—	**800**
Togo	**2,700**	**1,200** (1980)	**21.0**	**5,080***	**4,000*** 2 inf regts 1 Presidential Guard cdo 1 para cdo regt 1 fd, 2 AA arty btys 1 log/tpt engr bn	7 T-34, 2 -54/-55 MBT; 6 M-8, 3 M-20, 3 AML-60, 7 -90, 36 EE-9 *Cascavel* armd cars; 4 M-3A1, 30 UR-416 APC; 4 HM-2 105mm guns; 20 81/82mm mor; 5 ZIS-2 47mm, 12 T-52 75mm, 6 85mm RCL; 38 ZPU-34 14.5mm, 5 M-38/-39 37mm AA guns	**80*** 2 coastal patrol craft	**250*** 6 EMB-326GB COIN; 5 *AlphaJet* COIN/trg; 1 Boeing 727, 2 DHC-5D, 1 F-28 tpts; 5 *Magister* trg, 2 lt ac; 2 *Alouette* II, 1 *Puma*, 2 *Lama* hel	**750***

Armed Forces of Other African States (cont.)

Country	Est population (000)	Est GNP 1981 ($m)	Est def exp 1982 ($m)	Total armed forces	Army: Manpower and formations	Army: Equipment	Navy: Manpower and equipment	Air Force: Manpower and equipment	Para-military forces
Uganda	**13,900**	**810** (GDP)	**94.0**	**15,000**	**15,000** 3 bdes (9 inf bns)	10 T-34/-54/-55, 3 M-4 MBT; 150 BTR-40/-152, OT-64 and *Saracen* APC; 60 76mm, 20 122mm guns; 40 *Sagger* ATGW; 40 23mm, 40mm AA guns; SA-7 SAM[d]	—	—	**2,000**
Upper Volta	**6,500**	**1,300**	**32.1** (1981)	**3,775***	**3,700*** 3 inf regts 1 recce sqn 1 arty bty 1 para coy	15 AML-60/-90, 10 M-8, M-20 armd cars, 30 *Ferret* scout cars; M-3 APC; M-101, M-56 pack 105mm how; 60mm, 81mm mor; M-20 3.5-in RL; 75mm RCL	—	**75*** 2 C-47, 2 Nord 262, 2 HS-748, 1 Aero *Commander*, 3 *Broussard*, 2 *Super Skymaster*, 1 Cessna 172 tpts	**900**

* All services form part of the Army
[a] Politico-military conditions make data suspect. 50% of defence budget externally financed
[b] Including 'public order' budget
[c] Official budget title: 'Youth and Defence Ministry'
[d] Serviceability doubtful

Inflation: 20% (1981), 25% (1982).
$1 = naira 0.5465 (1980), 0.6138 (1981); 0.6732 (1982).

Army: 120,000.
1 armd div (4 armd, 1 mech bdes).
1 composite div (incl 1 AB, 1 air portable, 1 amph bdes).
2 mech divs (each 3 mech bdes).
1 Guards bde.
4 arty bdes, 4 engr bdes, 4 recce bns } Organic to divs (1 each).
65 T-55, Vickers Mk 3 MBT; 50 *Scorpion* lt tks; 20 *Saladin*, 90 AML-90 armd, 55 *Fox* scout cars; 10 *Saracen*, 6 M-3 VPC, 4 AMX VTT, 26 Steyr 4K-7FA APC; 76mm, 200 122mm guns; 200 M-56 105mm pack how; 200 81mm mor; 20mm, 40mm towed, 30 ZSU-23-4 SP AA guns; *Blowpipe*, 16 *Roland* SAM.
(On order: Vickers Mk 3 MBT; 70 4K-7FA, 57 MOWAG *Piranha* APC; 25 Bofors FH-77B 155mm, 25 *Palmaria* 155mm SP how; *Blowpipe*, 16 *Roland* SAM.)

Navy: 4,000.
2 ASW frigates: 1 *Meko* 360 with 2 × 4 *Otomat* SSM, 1 × 8 *Aspide* SAM, 1 hel; 1 *Nigeria* (trg).
4 corvettes: 1 Vosper Thornycroft Mk 9 *(Hippo)* with 2 × 3 *Seacat* SAM; 2 Mk 3.
6 FAC(M): 3 Lürssen Type-57 with 4 *Otomat* SSM; 3 *La Combattante* III with 2 × 2 *Exocet*.
8 large patrol craft: 4 Brook Marine, 4 Abeking & Rasmussen.
49 coastal patrol boats.
2 RoRo 1300 *(Crocodile)* LST.
(On order: 9 coastal patrol launches, 2 LCT, 3 *Lynx* hel.)

Bases: Apapa (Lagos; Western Command), Calabar (Eastern Command).

Air Force: 9,000; 30 combat ac.
3 FGA/interceptor sqns: 1 with 12 *Alpha Jet;* 2 with 18 MiG-21MF.
2 tpt sqns with 6 C-130H, 5 F-27, 1 F-28 (VIP), 1 *Gulfstream* II (VIP), 1 *Super King Air.*
1 SAR sqn with 20 BO-105C/D hel.
3 service sqns with 31 *Bulldog*, 14 Do-28.
Hel incl: 15 *Puma*, 10 *Alouette* II (in storage).
Trg: 1 MiG-15UTI, 1 MiG-21U, 20 L-29 ac; 15 Hughes 300 hel.
AAM: AA-2 *Atoll*.
(On order: 18 *Jaguar* FGA, 2 F-27MPA MR, 2 C-130H, 5 G-222 tpt, 12 MB-339 trg ac, 5 CH-47 *Chinook* hel.)

Forces Abroad: Lebanon (UNIFIL): 444.

Para-Military Forces: Coastguard (forming); 3 landing craft, 27 launches. Police: 18 launches, 7 hovercraft (5 AV *Tiger*).

SENEGAMBIA

(Senegal and Gambia signed and ratified a Confederation Pact in December, 1981. The pre-Confederation organizations and inventories are shown separately below; a Gambian Army has formed but the other Services are civilian-manned.)

SENEGAL
Est population: 6,000,000.
Military service: conscription; selective.
Total armed forces: 9,700.
Est GNP 1981/2: fr CFA 652.7 bn ($2.20 bn).
Est def exp 1981/2: fr CFA 16.04 bn ($53.930 m). 1982/3: 18.0 bn ($50.826 m).
$1 = francs CFA 296.68 (1981/2), 354.15 (1982/3).

Army: 8,500.
5 inf bns.
1 engr bn.
1 trg bn.
1 Presidential Guard (horsed).
1 recce sqn.
1 arty bty.
2 para coys.
3 construction coys.
10 M-8, M-20, 40 AML-60/-90 armd cars; 12 Panhard M-3, VXB-170, M-3 half-track APC; M-116 75mm pack, 6 M-101 105mm how; 8 81mm 8 120mm mor; STRIM-89 RL, *Milan* ATGW; 21 M-693 20mm, 40mm AA guns.

Navy: 700.
1 PR-72M, 3 P-48 large, 5 coastal patrol craft(.
1 LCT, 2 LCM.

Base: Dakar.

Air Force: 500; 2 combat ac.
1 EMB-111, 1 DHC-6 MR.
1 Boeing 727-200, 5 C-47, 6 F-27-400M, 1 *Caravelle*, 2 *Broussard* tpts.
2 *Rallye*, 1 Cessna 337 lt, 2 *Magister* trg ac.
1 *Gazelle*, 2 *Puma*, 2 *Alouette* II hel.

Forces Abroad: Lebanon (UNIFIL): 1 bn (557).

Para-Military Forces: 6,800; 12 VXB-170 APC.

The Soviet-built T-55 tank is currently in service with the armed forces of Ethiopia, Mozambique, Nigeria, the Somali Democratic Republic, and Zambia.

GAMBIA
Est population: 636,000.
Military service: voluntary.
Total armed forces: 475.
Est GDP 1980/1: d 417.90 m ($239.169 m). 1981/2: 491.40 m ($225.651 m).
$1 = dalasi 1.7473 (1980/1), 2.1777 (1981/2).

Army: (Field Force): 400.
1 coy.
8 *Ferret* scout cars; 4 M-20, 3.5-in RL.

Navy: (50).
1 31-ton *Tracker*, 1 17-ton *Lance* coastal patrol boats.

Base: Banjul.

Air Force: (25).
1 *Skyvan* 3M, 1 *Defender* tpts.

SOMALI DEMOCRATIC REPUBLIC

Est population: 4–6,000,000.
Military service: voluntary.
Total armed forces: 62,550.
GDP 1981: S Sh 11.035 bn ($1.753 bn).
Est def exp 1980: S Sh 588 m ($93.407 m). 1981: S Sh 823 m ($130.739 m). 1982: S Sh 1,937 m ($127.376 m).
Est FMA 1982: $25.4 m.
$1 = Somali shillings 6.295 (1980/1), 15.207 (1982).

Army: 60,000.
3 corps, 7 div HQ.
3 tk/mech bdes.
20 inf bdes.
1 cdo bde.
1 SAM bde.
13 fd, 10 AA arty bns.
100 T-34/-54/-55, 40 *Centurion* MBT; BRDM-2 recce, BTR-40/-50/-60, 100 BTR-152, V-150 *Commando*, 24 M-113A1 *(TOW)*, 300 Fiat 6614/6616 APC/AFV; about 150 76mm, 85mm, and 100mm, 60 122mm guns/how; 81mm, 250 120mm mor; 400 *STRIM*-89 RL; 106mm RCL; 100 *Milan* ATGW; 250 14.5mm, ZU-23 23mm, 37mm, 57mm, and 100mm towed, 12 *Vulcan* 20mm, 10 ZSU-23-4 SP AA guns; 30 SA-2/-3 SAM.[6]
(On order: 100 M-47 MBT.)

Navy: 550.[6]
2 Sov *Osa* II FAC(M) with *Styx* SSM.
8 Sov FAC(T): 4 *Mol*, 4 P-6(.
5 Sov *Poluchat* large patrol craft.
1 Sov *Polnocny* LCT, 4 Sov T-4 LCM(.

Bases: Berbera, Mogadishu, Kismayu.

Air Force: 2,000; 64 combat ac.[6]
3 FGA sqns with 9 MiG-17, 10 *Hunter* FGA-76, 2 T-77.
3 ftr sqns with 7 MiG-21MF, 30 ex-Ch F-6.
1 COIN sqn with 6 SF-260W.
1 tpt sqn with 5 *Islander*, 2 An-24/-26, 3 C-47, 4 G-222, 4 P-166-DL3 recce/tpt.
1 hel sqn with 4 Mi-4, 2 Mi-8, 1 AB-204, 4 AB-212 (2 VIP).
Trainers incl 6 P-148, 2 MiG-15UTI.
Other ac: 9 SF-260-W.
AAM: AA-2 *Atoll*.
(On order: SIAI S-211 COIN ac.)

Para-Military Forces: 29,500. Police (8,000), 2 Do-28 ac; Border Guards (1,500); People's Militia (20,000).

SOUTH AFRICA

Population: 26,100,000 (excluding homelands).
Military service: 24 months, 8 camps totalling up to 240 days then reserve commitment to age 65.
Total armed forces: 82,400 (53,100 conscripts; total mobilizable strength 404,500).
GDP 1981: R 70.422 bn ($75.739 bn). 1982: 79.415 bn ($71.668 bn).
Def exp 1981/2: R 2.865 bn ($3.081 bn). 1982/3: 3.068 bn ($2.769 bn).
GDP growth: 5.1% (1981), −0.9% (1982).
Inflation: 14% (1981), 15% (1982).
$1 = rand 0.9298 (1981/2), 1.1081 (1982/3).

Army: 67,400 (10,000 White, 5,400 Black and Coloured regulars, 2,000 women, 50,000 conscripts); 9 territorial commands.
2 div HQ (1 armd, 1 inf).
1 armd bde (2 tk, 1 MICV-borne inf bns).[7]
1 mech bde (1 tk, 3 MICV-borne inf bns).[7]
4 mot bdes (each 3 inf bns, 1 armd car bn).[7]
1 para bde (3 para bns).[7]
1 special recce regt.
9 fd, 4 med, 7 lt AA arty regts.[7]
1 AA missile regt (3 *Crotale*, 3 *Tigercat* btys).
15 fd engr sqns.[7]
3 sigs regts, 3 sigs sqns.
Some 250 *Centurion/Olifant* MBT; 1,400 *Eland* Mk IV armd cars; 1,200 *Ratel* MICV (20mm/60mm/90mm gun); 500 lt APC incl *Buffalo, Hippo, Rhino;* 65 25-pdr (88mm), 75 5.5-in (140mm) towed, 50 *Sexton* 25-pdr SP, 40 G-5 155mm towed, G-6 SP how; 127mm *Valkiri* SP MRL; 81mm, 200 120mm mor; 900 6-pdr (57mm) and 17-pdr (76mm), M-67 90mm ATK guns; 106mm RCL; SS-11, 120 *ENTAC* ATGW; 20mm, 55 K-63 twin 35mm, 25 L/70 40mm, 15 3.7-in (94mm) AA guns; 54 *Cactus (Crotale),* 54 *Tigercat* SAM.

RESERVES: Active Reserve 130,000. Reservists serve in the Citizen Force for 12 years, in which they spend 720 days in uniform. They then serve 5 years in the Citizen Force Reserve and may be allocated to the Commando Force, where they may serve 12 days a year up to age 55.

Navy: 5,000, incl 900 marines, 2,100 conscripts.
3 *Daphne* subs.
1 *President* (ex-Br *Whitby)* ASW frigate with 1 *Wasp* hel (trg).
8 *MOD (Minister of Defence) (Reshef*-type) FAC(M) with 6 *Skerpioen (Gabriel*-type) SSM.
3 FAC(M) with 2 *Skerpioen* SSM.
4 Br *Ford*, 2 mod *Ton* large patrol craft.
6 Br *Ton* minesweepers, 2 *Ton* minehunters.
1 fleet replenishment ship.
30 *Namacurra* armed harbour patrol craft.
1 ocean, 1 inshore hydrographic ships.
(On order: 4 *MOD*, 3 *Dvora*-type FAC(M).)

MARINES: (900; 600 conscripts); 9 local harbour defence units.

Bases: Simonstown, Durban.

RESERVES: 2,000 Citizen Force.

Air Force: 10,000 (1,000 conscripts); 313 combat ac (incl 96 with Citizen Force), at least 10 combat hel.
Main Threat Area Command:
2 lt bbr sqns: 1 with 5 *Canberra* B(I)12, 3 T-4; 1 with 6 *Buccaneer* S-50.
4 FGA sqns: 1 with 32 *Mirage* F-1AZ; 3 with 82 MB-326M/K *Impala* I/II.
2 FGA/interceptor/recce sqns: 1 with 22 *Mirage* IIICZ/EZ, 6 RZ/R2Z; 1 with 13 F-1CZ.
4 hel sqns with 5 *Super Frelon*, 35 *Puma*, 40 *Alouette* II.
3 tpt sqns; 1 with 7 C-130B, 9 Transall C-160Z; 1 with 7 DC-4, 12 C-47; 1 with 4 HS-125 *Mercurius*, 1 *Viscount* 781, 6 *Merlin* IVA (1 air ambulance).
3 liaison sqns with 15 AM-3C *Bosbok*, 25 C-4M *Kudu*.
Southern Air Command:
2 MR sqns: 1 with 5 *Shackleton* MR-3; 1 with 18 Piaggio P-166S.
2 attack sqns with 25 *Impala* I/II.
1 ASW hel sqn with 10 *Wasp* HAS-1.
2 utility hel sqns with 7 *Super Frelon*, 13 *Puma*, 27 *Alouette* III.
1 tpt sqn with 12 C-47B.
Western Air Command:
Namibia; no integral operational sqns.
Training Command:
6 trg schools with 100 T-6G *Harvard;* 60 *Impala* I/II; 26 *Mirage* III (some 10 EZ, some R2Z, some 10 D2Z); 12 C-47 ac; 30 *Alouette* II/III hel.
AAM: R-530, R-550 *Magic, Sidewinder, Kukri* V-3 *(Sidewinder*-type).
ASM: AS-20/-30.

RESERVES: Citizen Force 25,000. 96 *Impala* COIN ac. 15 L-100 *(Hercules)* in civil airline service.

South West Africa Territory Force (SWATF):
Formed 1 Aug 1980 as a separate force under South African control. Conscription: 24 months (all racial groups), selective. Four Area Commands, (Northern, Eastern, Central, and Southern) comprising 26 *Area Force* units organized similarly to the Commandos in South Africa, 1 engr, 1 sigs bns. Air element (one sqn) with lt ac manned by Citizen Force. Northern sector has six regular SWATF lt inf bns, one mounted Specialist Unit.
Mobile Reserve: 1 mot inf bde (3 mot inf bns, 1 armd car regt, 1 arty regt, spt units). 1 mot inf bn regulars, rest Citizen Force.
Para-military: Industrial Defence units.

Para-Military Forces: Commandos 90,000: inf bn-type protective units in formations of 5+; 12 months initial, 19 days annual trg. 13 Air Commando sqns with private ac. South African Police 35,500 (19,500 White, 16,000 Non-white), Police Reserves 20,000.

TANZANIA

Population: 20,500,000.
Military service: voluntary.
Total armed forces: 40,350.
GNP 1980/1: T Sh 43.231 bn ($5.264 bn).
Def exp 1980/1: T Sh 2.303 bn ($280.443 m). 1981/2: 2.745 bn ($315.662 m).
$1 = shillings 8.212 (1980/1), 8.696 (1981/2).

Army: 38,500.
2 div HQ.
8 inf bdes.
1 tk bn.
2 fd arty bns, 2 AA arty bns (6 btys).
2 mor bns.
1 SAM bn with 9 SA-3, SA-6.
2 ATK bns.
2 sigs bns.
30 Ch Type-59 MBT; 30 Ch Type-62, 36 *Scorpion* lt tks; 20 BRDM-2 scout cars; 50 BTR-40/-152 APC; 40 76mm, 200 122mm, 50 D-30 130mm guns; 350 82mm and 120mm mor; 540 M-20 75mm RCL; 50 BM-21 122mm

Angola, Ethiopia, Mozambique, the Somali Democratic Republic, Tanzania, and Zambia include the Soviet-built SA-3 in their SAM inventories.

MRL; 280 ZPU-2/-4 14.5mm, 40 ZU-23, 120 37mm AA guns; SA-3/-6/-7 SAM.

Forces Abroad: Mozambique: training team 200; Seychelles: 250.

Navy: 850.
10 FAC(G): 6 Ch *Shanghai* II, 4 GDR P-6(.
8 FAC(T)(: 4 Ch *Huchwan* hydrofoils, 4 Sov/GDR P-4.
13 coastal patrol craft(: 1 Sov *Poluchat*, 2 GDR *Schwalbe*, 2 GDR 50-ton, 4 Ch *Yulin;* 4 Vosper Thornycroft 75-ft in Zanzibar.
2 Ch LCM.

Bases: Dar es Salaam, Zanzibar.

Air Force: 1,000; 29 combat ac.
3 ftr sqns with 11 Ch F-7, 15 Ch F-6, 3 Ch F-4.
1 tpt sqn: 1 HS-125-700, 1 An-2, 3 HS-748, 6 DHC-5D.
Trainers: 2 MiG-15UTI, 6 *Cherokee*, 6 Cessna 310, 2 404.
Hel: 2 Bell 47G, 5 AB-205, 6 AB-206.
(On order: An-26, An-32 tpt ac.)

Para-Military Forces: Police Field Force 1,400; Police Marine Unit; Citizen's Militia 50,000.

ZAIRE

Population: 31,000,000.
Military service: voluntary.
Total armed forces: 26,000.
GNP 1981: zaires 23.090 bn ($5.267 bn).
Def exp 1980: zaires 419.0 m ($149.643 m).
GDP growth: 2% (1981).
Inflation: 50% (1981), 40% (1982).
$1 = zaires 2.800 (1980), 4.384 (1981).

Army: 22,000.
3 Military Regions.
1 div.
1 armd bde.
2 inf bdes (each 3 inf bns, 1 spt bn).
1 para bde (3 para bns, 1 spt bn).
1 special force (cdo) bde.
1 Presidential Guard bde.
60 Ch Type-62 lt tks; 95 AML-60, 60 AML-90 armd cars; 12 M-113, K-63, 60 M-3, BTR-152, M-3 half-track APC; 75mm pack, 122mm, 130mm guns/how; 82mm, 4.2-in (107mm), 120mm mor; 83mm *Blindicide*, 107mm RL; 57mm ATK guns; 57mm, 75mm, 106mm RCL; 37mm, 40mm AA guns.
(On order: 120mm mor.)

Navy: 1,500 incl marines.
4 Ch *Shanghai* II FAC(G).
51 patrol craft(: 4 *Huchwan* hydrofoils, 6 Sewart, 3 N. Korean P-4, 8 US, 30 others.

MARINES: (600).

Bases: Matadi, Kalemie, Kinshasa, Banana.

Air Force: 2,500; 19 combat ac.
1 ftr sqn with 7 *Mirage* 5M/5DM.
2 COIN sqns with 6 MB-326K, 6 AT-6G.
1 liaison sqn with 20 Reims Cessna FTB-337.
1 tpt wing with 6 C-130H, 2 DC-6, 2 DHC-4A, 3 *Buffalo*, 8 C-47, 4 C-54, 2 MU-2, 1 *Falcon* 20.
1 hel sqn: 3 *Alouette* III, 5 *Puma*, 1 *Super Frelon*.
Trg ac incl 27 Cessna (15 310, 12 150), 13 MB-326GB, 9 SF-260MC.
(On order: S-211 COIN/trg, 4 F-27-500 tpt ac.)

Para-Military Forces: Gendarmerie 22,000; 40 bns.

ZAMBIA

Population: 6,200,000.
Military service: voluntary.
Total armed forces: 14,300.
GNP 1981: K 3.069 bn ($3.519 bn).
GDP growth: – 1.8% (1981).
Inflation: 15% (1981).
$1 = kwacha 0.785 (1980), 0.872 (1981).

Army: 12,500.
1 armd regt (incl 1 armd recce bn).
6 inf bns.
3 arty btys, 2 AA arty btys.
1 engr, 2 sigs sqns.
4 T-34, 30 T-54/-55 and Type-59 MBT; 130 BRDM-1/-2 armd cars; 13 BTR-60 APC; 76mm, 35 130mm guns; 18 105mm pack, 25 122mm how; 50 BM-21 122mm MRL; M-18 57mm, *Carl Gustav* 84mm RCL; *Sagger* ATGW; 50 20mm, 40 37mm, 55 57mm, 16 85mm AA guns; SA-7 SAM.

The air force of the Sub-Saharan African nation of Zimbabwe employs seven British-built Hawk aircraft for pilot training.

Air Force: 1,800; 51 combat ac.
3 FGA sqns: 1 with 13 Ch F-6; 1 with 6 Yug *Jastreb;* 1 with 14 Sov MiG-21.
1 COIN/trg sqn with 18 MB-326GB.
2 tpt sqns: 1 with 3 Yak-40, 5 DHC-4, 5 DHC-5D, 1 HS-748; 1 with 10 Do-28, 2 C-54.
Trainers incl 8 SF-260MZ, 20 *Safari*, 6 DHC-2, 5 *Broussard*, 2 Ch BT-3, 6 *Galeb*.
1 hel sqn with 3 AB-205A, 3 AB-206, 2 AB-212, 2 Bell 47G, 11 Mi-8.
1 SAM unit with 12 *Rapier*, 3 *Tigercat*, SA-3 *Goa*.

Para-Military Forces: 1,200. Police Mobile Unit (PMU) 700; 1 bn of 4 coys. Police Para-Military Unit (PPMU) 500; 1 bn of 3 coys.

ZIMBABWE

Population: 8,000,000.
Military service: voluntary.
Total armed forces: 41,300.
Est GDP 1981/2: $Z 4.528 bn ($US 6.238 bn).
Def exp 1980/1: $Z 231.0 m ($US 356.867 m). 1981/2: 280.5 m ($US 386.417 m). 1982/3: 291.2 m ($US 336.531 m).
GDP growth: 12% (1981), 2% (1982).
Inflation: 14% (1981), 16% (1982).
$US 1 = $Z 0.6473 (1980/1), 0.7259 (1981/2), 0.8653 (1982/3).

Army: 40,000.
5 bde HQ (a 6th (Presidential Guard) forming).
1 armd regt.
35 inf bns.
1 arty regt.
1 cdo bn, 1 para bn.
7 engr, 6 sigs sqns.
10 T-34, 18 T-54 MBT; 28 AML-90 *Eland* armd, 15 *Ferret*, BRDM-2 scout cars; 20 BTR-152, UR-416, *Buffalo*, *Hippo*, *Hyena*, *Leopard*, *Crocodile* APC; 18 25-pdr (88mm), M-56 105mm pack, 8 122mm, 8 5.5-in (140mm) guns/how; 81mm mor; 106mm RCL; 8 SA-7 SAM.

Air Force: 1,300; some 30 combat ac.
1 lt bbr sqn with 5 *Canberra* B-2, 2 T-4.
1 FGA sqn: 1 with 7 *Hunter* FGA-9/T-7.
1 COIN/recce sqn with 9 Cessna 337 (O-2) *Lynx*, 6 AL-60FS *Trojan*.
2 trg/recce/liaison sqns with 17 SF-260W/C *Genet*, 7 *Hawk*.
1 tpt sqn with 12 C-47, 6 *Islander*.
2 hel sqns with 26 *Alouette* II/III, 10 Bell/AB-205A.
2 AA sqns with 14.5mm, 20mm, 23mm, 37mm AA guns.
2 security sqns.
(On order: 25 Ch F-7 ftrs, 10 SIAI S-211 COIN/trg, 6 C-212 tpt, 5 SF-260TP trg ac.)

Forces Abroad: Mozambique: 600.

Para-Military Forces: Zimbabwe Republic Police Force, incl Air Wing, 10,000. Police Support Unit 3,000. National Militia forming.

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[1]Some 25,000 Cuban and 450 E. German military operate ac and hy eqpt. There are also Portuguese and some 700 Soviet advisers and technicians.

[2]Eqpt totals and serviceability uncertain.

[3]Some 1,400 Soviet, 11,000 Cuban, and about 250 E. German technicians and advisers operate ac and hy eqpt. Some S. Yemeni troops may also serve.

[4]War situation makes equipment data suspect.

[5]Cuban, E. German, and Soviet advisers are reported.

[6]Spares are short and most equipment is unserviceable.

[7]Cadre formations completing the 2 divs when brought to full strength on mobilization of Citizen Force.

CHINA

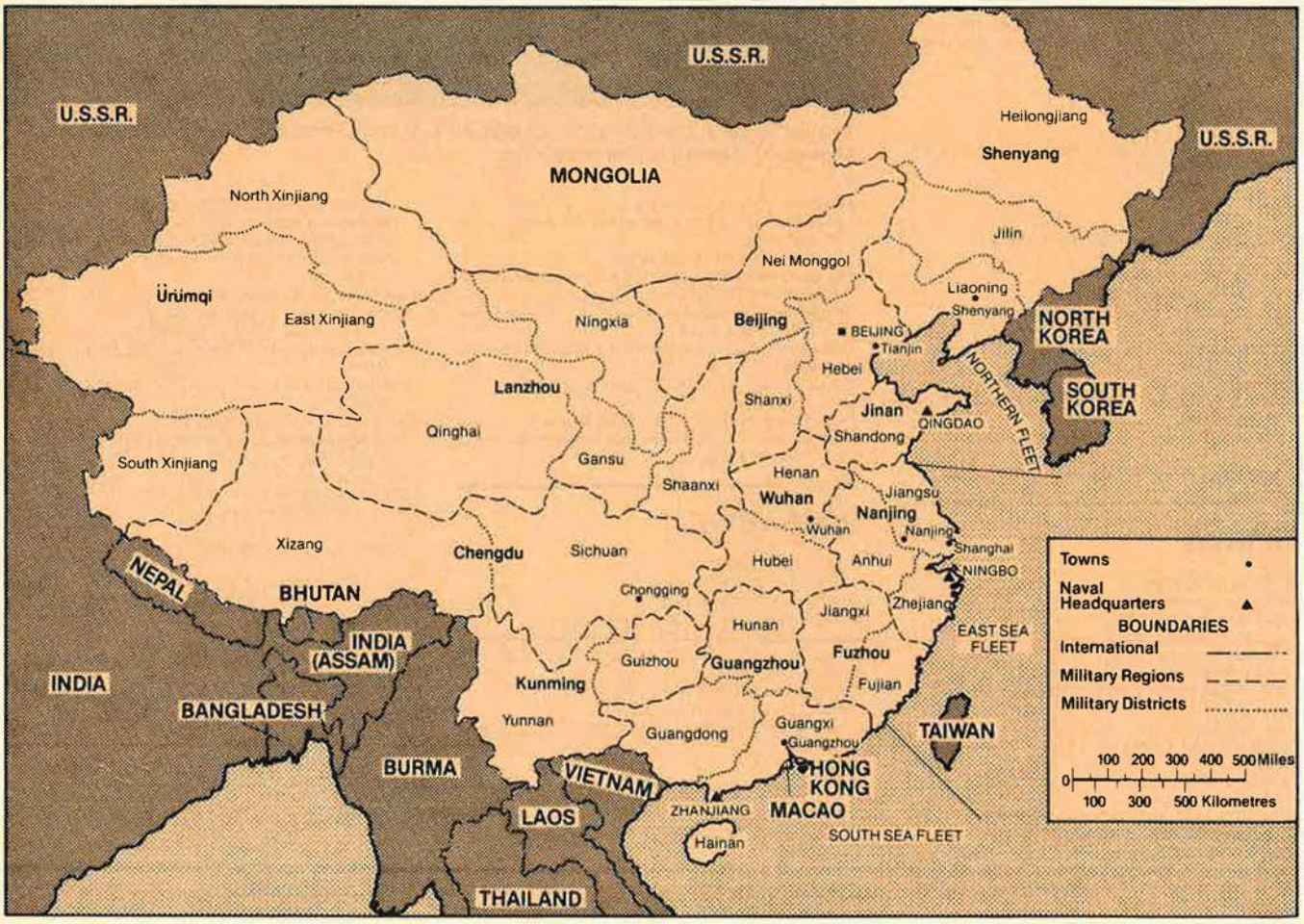
Chinese defence policy has long maintained a balance, at times uneasy, between two concepts: nuclear force to deter strategic attack and People's War—mass mobilization of the population to deter or repel conventional invasion. Despite changes in the political leadership, there remain many supporters of the strategic concept that mass manpower is still the primary deterrent. The need to modernize the forces has been recognized. Programmes to re-equip, reorganize, and enhance the military effectiveness of all components are being implemented.

The conventional arms inventory of the People's Liberation Army (PLA), technologically much less advanced than that of wealthier nations, is being gradually updated by replacing Soviet and Soviet-type equipment with indigenous designs and some Western technology. The United States has agreed in principle to sell logistic and dual-purpose equipment and technology. Under this arrangement the United States has sold computers and radars and is contemplating the sale of a much wider range of defensive and non-combat military equipment. Britain has sold aircraft engines, artillery, and fire control equipment and radar. France has sold helicopters and radar. But the current phase of economic readjustment has meant a succession of cuts in the defence budget, and the pace of modernization will be quite slow (see the note on defence expenditure on p. 111).

Nuclear Weapons

The research programme continues, but no nuclear test has been recorded since 1980. At least 26 tests have been made since 1964. A nuclear force capable of reaching large parts of the Soviet Union and Asia is operational. The stockpile of weapons, both fission and fu-

CHINESE MILITARY REGIONS AND DISTRICTS



sion, is believed to amount to several hundreds and will probably continue to grow slowly. Fighter aircraft could be used for tactical delivery, and for longer ranges there are some 90 B-6 medium bombers, with a radius of action up to 3,000 km. MRBM with a range of some 1,100 km are operational and are being augmented by operational IRBM with ranges from 2,700 to 5,600 km. The missile forces are controlled by the Second Artillery, the missile arm of the PLA.

A multi-stage ICBM with a limited range of 6,000–7,000 km was first tested in 1976 and some have been deployed. An ICBM thought to have a range of some 13,000 km has also been under development, and it is believed that it is now being deployed. No indication has been received of the deployment of multiple warheads, but a missile has been successfully used (and thus tested) as a launcher for three space research satellites. China's first SSBN—the *Xia*-class—is reported to be on trials; its SLBM is said to be the CSS-NX-4, a variant of the T-3 IRBM. Two *Han*-class nuclear-powered submarines with 6 missile tubes are now in service; the cruise missile they are said to carry has been tested to a reported range of 1,600 km. So far all ballistic missiles have been liquid-fuelled. Solid propellants being developed are reported to have powered the 1980 ICBM test vehicle and may power the new T-5 ICBM.

Conventional Forces

The PLA embraces all arms and services, including naval and air elements. Essentially a defensive force, the PLA lacks facilities and logistic support for protracted large-scale operations at any significant distance outside China. China is organized in 11 Military Regions (MR) with 28 Military Districts (MD). The field army's Main Force (MF) divisions are commanded by the Ministry of National Defence, although command is being transferred to the MR in which they are stationed and which are already responsible for their administration. They are available for operations in any region. Command of the Local Forces (LF), Border Defence, and Internal Defence and para-military units intended to defend their own Provinces may be vested in the MR. Artillery, engineer, and railway units are controlled by the Ministry of National Defence. Infantry units account for most of the ground-force manpower and 119 of the some 158 MF line divisions; there are only 12 armoured divisions.

The naval and air elements of the PLA have only about one-fifth of the total manpower, compared with about a quarter for their counterparts in the Soviet Union, but naval strength is increasing.

The naval force is organized in three fleets. The naval air arm is a shore-based force, and there is an independent Coast Defence Force. The air component is organized into 8 Regions and 3 minor geographic commands.

Major weapons systems include Type-59 MBT, Types-60/-63 amphibious and Type-62 light tanks, and K-63 APC; R- and W-class medium-range diesel submarines, SSM destroyers, frigates, fast patrol boats, amphibious transports, and landing craft; J-7/-8 and Q-5 fighters, SA-2-type SAM.

Bilateral Agreements

There is a mutual[1] defence agreement with North Korea, dating from 1961, and an agreement to provide free military aid. There are friendship and non-aggression pacts with Afghanistan, Burma, Nepal (1960), and Kampuchea *(Khmer Rouge)*. Chinese military equipment and logistic support have been offered to a number of countries. Major recipients include Albania, Egypt, Iraq, Pakistan, and Tanzania.

Gross National Product and Defence Expenditure

Official Chinese sources claim a GNP figure of 989.4 bn yuan for 1982, an increase of 9% over 1981. National income is reported by the IMF to be 388 bn yuan for 1981. (GNP figures include the service and other sectors.) Western estimates have varied greatly, and it is difficult to choose from a range of figures, variously defined and calculated.

GDP/GNP Estimates

		British	Commercial bank	CIA
1980	Yuan (bn)	450.0[a]	485.1	828.195
	$ (bn)	300.0	323.4	552.13[b]
1981	Yuan (bn)	452.0[a]	574.0	996.773
	$ (bn)	276.47	328.0	568.69[b]

Est GDP growth 1980: 4.0–7.1%. 1981: 3.0%.

Official exchange rates: $1 = 1.50 yuan (1980), 1.70 (1981).

[a] Constant 1980 yuan. [b] 1980 dollars.

The official Chinese defence expenditure figure (released in 1981 for the first time) of 20.170 bn yuan ($11.87 bn) was 20.7% of planned government expenditure. For 1982 the figure of 17.870 bn yuan (15.72% of government expenditure) was reported. For 1983 the same figure was reported, constituting 14.16% of the 1983 draft budget. These figures are not comparable to Western defence estimates, since they exclude a number of items, notably pay and allowances for the troops. Chinese pricing practices are not known in detail, but they are certainly different from those in the West. The official budget figure, in that it excludes a number of items normally included in defence budgets in Western countries, does not therefore provide an accurate indication of defence costs.

CHINA

Population: 1,008,175,300.
Military service: voluntary.
Total regular forces: 4,100,000 incl 300,000 railway troops (to be 3,988,000 by end 1983).
GNP and defence expediture: see above.

Strategic Forces:

OFFENSIVE:

(a) *Second Artillery:* (control: Ministry of National Defence).

ICBM: 4 T-5 (range 13,000 km), 5-MT warhead. (T-4 experimental only (10,000 km). 10-MT warhead tested.)
IRBM: 10 T-3 (range 4,800–5,600 km), 2–3 MT. 50 T-2 (range 2,700–3,200 km), 200 KT, 1 MT.
MRBM: Some 50 T-1 *Tong Feng (East Wind)* (range 1,100 km), 20 KT.

(b) *Submarines:*
1 *'Xia'* SSBN with 12 CSS-NX-4 (mod T-3, range perhaps 4,000 km) (trials).

DEFENSIVE:

(a) Tracking stations in Xinjiang (covers central Asia) and Shanxi (northern border) and a limited shipborne capability.

(b) Ballistic missile EW phased-array radar complex.

(c) Air Force AD system, capable of limited defence of key urban and industrial areas, military installations, and weapons complexes, with over 4,000 naval and air force fighters, about 100 *Honggi-2 (Red Flag;* SA-2-type) SAM units, and over 16,000 AA guns.

(d) A civil defence shelter and evacuation system in Beijing and other key cities.

Army[1]: 3,250,000.
Main Forces (Field Army);

[1]See p. 112 for footnotes.

The Q-5, the export version of which is referred to as A-5, is a Chinese-designed ground-attack fighter based on the MiG-19.

11 Military Regions, 27 Military Districts, 1 indep MD, 3 Garrison Commands.
Some 35 armies (average 46,300 men), each normally of 3 divs, 1 arty regt, and spt tps (some have 1 indep tk regt, some have 1 arty, 1 AA regts), comprising:
12 armd divs.
119 inf divs.
Some 17 field arty divs.
16 AA arty divs.
Some indep arty, ATK, AA regts.
Some 19 sigs, CW regts; 20 indep recce, engr, sigs, chemical bns (Army tps).
Some railway divisions.
50 indep engr regts.

Local Forces (29 provinces; being reorganized).
70 LF, 3 garrison divs.
100 indep regts.

AFV: 11,450 Sov IS-2 hy (trg), T-34, T-54, Ch Type-59 and T-69 (mod Type-59) MBT; 600 Type-60 (PT-76), Type-62 amph, and Type-63 lt tks; 4,800 K-63 and Type-55/-56 (BTR-40/-152) APC.

Arty: 12,800 guns/how (Type-56 85mm, Type-60 122mm, Type-59-1 130mm towed, ISU-122, ISU-152 SP guns; Type-66 152mm towed gun/how, Type-54 122mm and 152mm towed, K-63 122mm SP how); 3,900 Type-63-1 107mm, 132mm, 140mm (incl SP), and 320mm SP MRL; *FROG*-type SSM; 13,500 82mm, Type-55 120mm, and Type-56 160mm mor.

ATK: 40mm, 57mm, 90mm RL; 7,800 57mm, 75mm, and 82mm RCL; 57mm, Type-54 76mm guns; *HOT*, AT-3 *Sagger*/*Sagger*-type ATGW.

AA: 10,000: 37mm incl Type-63 SP, 57mm, 85mm, and 100mm guns.

DEPLOYMENT:

Excluding arty and engrs, MF and LF divs may be:

North-East: Shenyang MR (Heilongjiang, Jilin, Liaoning MD); 3 armd, 19 inf; 13 LF.[2]

North: Beijing MR (Beijing, Tienjiang Garrison Commands; Hebei, Nei Monggol, Shanxi MD): 4 armd, 26 inf; 11 LF.

North-West: Lanzhou MR (Gansu, Ningxia, Qinghai, Shaanxi MD): 1 armd, 8 inf; 2 LF.[2]

West: Ürümqi MR (North and South Xinjiang MD): 5 inf; 7 LF.[2]

South-West: Chengdu MR (Sichuan, Xizang MD): 8 inf; 4 LF.[2]

South: Kunming MR (Guizhou, Yunnan MD): 6 inf. Guangzhou MR (Guangdong, Guanxi MD, Hainan (an MD-equivalent)): 12 inf; 8 LF.[2]

Centre: Wuhan MR (Henan, Hubei MD): 2 armd, 10 inf, 3 AB (Air Force); 6 LF.

East: Jinan MR (Shandong MD: 1 armd, 9 inf; 6 LF. Nanjing MR (Shanghai Garrison Command; Anhui, Jiangsu, Zhejiang MD): 1 armd, 10 inf; 8 LF. Fuzhou MR (Fujian, Jiangxi MD): 6 inf; 5 LF.

Navy:[1] 360,000 incl 38,000 Naval Air Force and 38,000 Coast Defence Forces: 2 nuclear, 100 diesel attack subs; 35 major surface combat ships.

2 *'Han'* nuclear subs.

100 diesel subs (1 *'Golf'* missile (trials), 76 R-, 21 W-class, 2 *Ming* trg).

14 destroyers: 10 O-51 *'Lüda' (Kotlin*-type) with 2 × 3 *Hai Ying*-2 (HY; = *Sea Eagle; Styx*-type) SSM (4 more on trials/building); 4 *'Anshan'* (ex-Sov *Gordy)* with 2 × 2 HY-2.

21 frigates: 16 msl: (10 O-37 *'Jianghu'* (more building) with 2 × 2 HY-2, 2 *'Jiangdong'* with 2 × 2 SAM, 4 *'Chengdu'* (ex-Sov *Riga*) with 1 × 2 HY-2; 5 *'Jiangnan'* (*Riga*-type).

8 patrol escorts: 6 ex-Jap, 1 ex-Br, 1 ex-Aus.

215 FAC(M) with HY-2; 114 *Hola/Osa* (4 msls), 98 *Hoku(*, 2 *'Haidau'* (6 msls), 1 *'Homa'* hydrofoil (2 msls).

48 patrol craft: 28 *'Hainan'*, 20 *Kronshtadt*.

341 FAC(G): 10 *'Shanghai I'*, 295 *'Shanghai II/III/IV/V'*, 3 *'Haikou'*, 30 *'Swatow'*; 3 *'Shandong'* hydrofoils(.

290 FAC(T)(: 140 *'Huchwan I/II'* hydrofoils, 70 P-6, 80 P-4.

About 120 coastal and river patrol craft(.

23 T-43 ocean minesweepers.

18 LST incl ex-US 511-1152, 16 LSM, 6 inf landing ships, 320 LCU, 150 LCM; some 61-ton hovercraft.

5 sub, 6 other spt, 10 supply ships; 23 tankers.

Coastal Defence Forces: (38,000): indep arty regts deployed near naval bases, offshore islands, and other vulnerable points; 85mm, 100mm, 130mm guns; HY-2 ('CSSC-2') land-based SSM.

DEPLOYMENT AND BASES:

North Sea Fleet: about 500 vessels (over half (), incl 2 sub sqns; from the Yalu River to south of Lianyungang. Qingdao (HQ), Lüda, Lüshun, Hufudao, Weihai, Chengshan.

East Sea Fleet: about 750 vessels (about 400 (); from south of Lianyungang to Dongshan with air, AD, and coastal missile units. Ningbo (HQ), Zhoushan, Taohua Dao, Heimen, Wenzhou, Fuzhou.

South Sea Fleet: about 600 vessels (perhaps half (), incl 25 submarines, 200 FAC, amph vessels; from Dongshan to the Vietnamese frontier; Zhanjiang (HQ), Shantou, Guangzhou, Haikou, Yulin, Beihai.

Some 800 ocean-going vessels and several thousand junks could augment the existing limited sealift capacity.

NAVAL AIR FORCE: (38,000); about 800 shore-based combat aircraft, org in 3 bbr, 6 fighter divs, incl some H(Hong; = bomber)-6, about 100 H-5 torpedo-carrying and 50 Il-28 lt bbrs; some 600 fighters, incl J(Jian; = ftr)-5/-6/-7 interceptors; H-5 recce, 10 ex-Sov Be-6 MR ac; 40 Z(Zhi; = helicopter)-5, 12 *Super Frelon* hel; some 60 lt tpt ac. Naval fighters are integrated into the AD system.

Air Force:[1] 490,000, incl strategic forces and 220,000 AD personnel; some 5,300 combat ac.[3]

8 Military Air Regions, 3 minor regional commands, HQ Beijing; combat elms org in Armies of varied numbers of air divs each with 3 regts of 3 sqns of 3–4 flts of 4–5 ac, 1 maintenance unit, some tpt and trg ac. Tpt ac in regts only.

Med bbrs: 120 H-6.

Lt bbrs: some 550 H-5.

FGA: some 500 J-4 and Q(Qiang; = attack)-5.

Ftrs: some 4,000, incl 300 J-5, some 60 regts with about 3,000 J-6/A/B/C/Xn, 300 J-7, 30 F-8.

Recce: Some 130 JZ-6, HZ-5 ac.

Tpts: Some 550 fixed-wing, incl some 300 Y(Yun; = transport)-5/An-2, some Y-7 (An-24), Y-8 (An-12), some 75 ex-Sov Li-2, Il-14, Il-18 (to be retired), 18 *Trident*. (These could be supplemented by some 400 ac, incl some 150 hy tpts, from Civil Aviation Administration.)

Hel: 350: incl Z-5/-6; 50 Z-9 (Fr SA-365N *Dauphin)*.

Trainers: incl CJ-5/-6, MiG-15UTI, JJ-4/-5/-6, HJ-5.

AAM: AA-2 *Atoll/Atoll*-type.

Airborne tps: 1 corps of 3 divs, 1 indep div: 82mm, 120mm mor; 82mm RCL; 37mm AA guns.

20 AA arty divs, 28 indep AD regts (100 SAM units) with CSA-1 SAM, 16,000 57mm, 85mm, and 100mm guns.

Para-Military Forces: Some 12,000,000.

Militia. *Basic Militia:* some 4.3 million: men aged 16–40, women 16–35, who have had, or will have, military service, grouped in the Armed Militia; organized into about 75 cadre divisions and 2,000 regts. *Ordinary Militia:* up to 6 million (ages 17–48) including the Urban Militia receive some basic training but are generally unarmed. Some play a local AD role; all support the Security forces.

People's Armed Police Force (Ministry of Security): Ex-soldiers and personnel transferred from 4 LF divs, Internal Defence divs, and 30 indep regts; border security, patrol, and internal security duties; small arms only.

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[1]The term 'People's Liberation Army' comprises all services: the Ground, Naval, and Air components of the PLA are listed separately for purposes of comparison.

[2]There are 2–3 divs worth of border tps in these MR.

[3]Many Chinese aircraft designs stem from Soviet types. Using Chinese terms, H-5 = Il-28, H-6 = Tu-16; J-5 = MiG-17, J-6 = MiG-19, Q-5 = MiG-19, J-7 = MiG-21, J-8 = MiG-23; Y-5 = An-2, Y-7 = An-24, Y-8 = An-12 ac; Z-5 = Mi-4, Z-6 = Mi-8 hel. In export models the 'J' becomes 'F'

About 3,000 J-6s and variants make up a large part of the Chinese fighter force. The basic design is derived from that of the Soviet MiG-19.

Other Asian Countries And Australasia

Bilateral Agreements

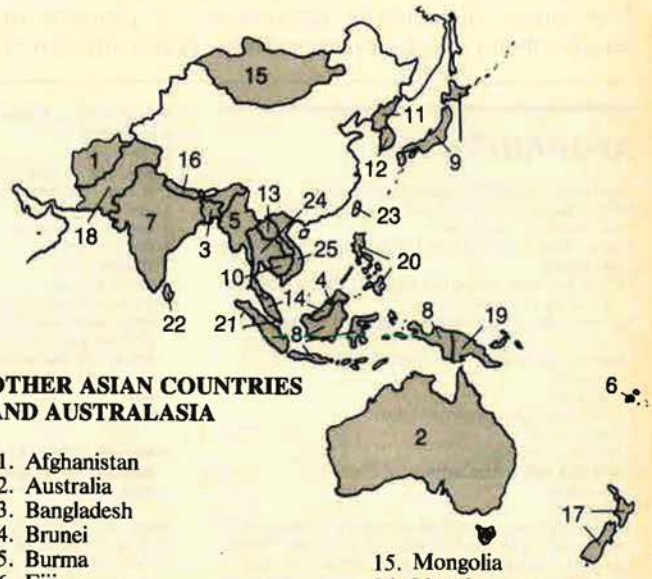
The United States has mutual co-operation and security treaties with Japan (1960), the Republic of Korea (1954), and the Philippines (1951); military co-operation agreements with Australia (1951, 1963, 1974, and 1980); and a military aid agreement with Thailand. That with Taiwan lapsed on 1 January 1980, although some arms supply and production arrangements continue under the 1979 Taiwan Relations Act. The United States also provides military aid on either grant or credit basis to Indonesia, South Korea, Malaysia, Pakistan, the Philippines, and Thailand. There are major US bases in Japan, South Korea, and the Philippines, and air (B-52) and naval refuelling facilities in north and west Australia.

In 1965 Britain purchased the Chagos Archipelago, which included Diego Garcia and three other islands, from Mauritius for $3m and established it as the British Indian Ocean Territory. A joint US/British base was constructed on Diego Garcia, and a small British naval contingent was deployed there. Agreements in 1966, 1972, and 1976 gave the US a 50-year tenure and provided for the development of a major US naval and air support facility. The three small islands have since been turned over to the Seychelles. Britain also has a Defence Agreement with Sri Lanka (1974).

The Soviet Union has Treaties of Friendship, Co-operation, and Mutual Assistance with Afghanistan (1978), India (1971), Mongolia (1966), North Korea (1961), and Vietnam (1978). It concluded a Stationing of Forces Agreement with Afghanistan in April 1980. An agreement with India in December 1982 provides for collaboration on design and manufacture of naval vessels. Bulgaria has Friendship Treaties with Cambodia (1960), Laos (1979), Mongolia (1967), and Vietnam (1979), as have Czechoslovakia with Laos and Vietnam (1980) and Afghanistan (1981), and East Germany with Vietnam (1977), Kampuchea (1980), and Afghanistan (1982).

Cuba and Vietnam signed a Treaty of Friendship and Co-operation on 5 October 1982. Libya and North Korea signed a Treaty of Alliance or Friendship and Co-operation in November 1982, which is to permit exchanges of military data, specialists, and supplies. North Korea and Tanzania also have an agreement covering some aspects of defence and security.

Australia has an agreement and subsidiary arrangements for the development of and assistance to the Papua New Guinea Defence force. Some 100 personnel are on loan to the force. Australia has supplied defence equipment to the Philippines, Malaysia, Singapore, Thailand, Indonesia, and most of the smaller Pacific island states under a number of arrangements.



OTHER ASIAN COUNTRIES AND AUSTRALASIA

1. Afghanistan
2. Australia
3. Bangladesh
4. Brunei
5. Burma
6. Fiji
7. India
8. Indonesia
9. Japan
10. Kampuchea/Cambodia
11. Korea: Democratic People's Republic (North)
12. Korea: Republic of (South)
13. Laos
14. Malaysia
15. Mongolia
16. Nepal
17. New Zealand
18. Pakistan
19. Papua New Guinea
20. Philippines
21. Singapore
22. Sri Lanka
23. Taiwan
24. Thailand
25. Vietnam

In July 1977 Vietnam and Laos signed a series of agreements which contained military provisions and a border pact, and may have covered the stationing of Vietnamese troops in Laos. A similar series of agreements seems to have been negotiated between Vietnam and the Heng Samrin regime in Kampuchea in February 1979, and in December 1982.

Multilateral Agreements

In 1951 Australia, New Zealand, and the United States signed a tripartite treaty (ANZUS), which came into effect on 29 April 1952 and is of indefinite duration. Each agrees to 'act to meet the common danger' in the event of attack on either metropolitan or island territory of any one of them, or on armed forces, public vessels, or aircraft in the Pacific.

The Manila Pact, signed on 8 September 1954 by Australia, Britain, France, New Zealand, Pakistan, the Philippines, Thailand, and the United States, remains in force, though France and Pakistan subsequently withdrew, and the South East Asia Treaty Organization

(SEATO), set up to implement it, was disbanded in 1977. The Pact calls for action by each Party to meet the common danger posed by armed aggression, and for consultation if any other threat is posed to the territory, sovereignty, or political independence of any Party. Since 1962 the US commitment to Thailand has been based on this Pact.

The Association of South East Asian Nations (ASEAN), set up in 1967 by Indonesia, Malaysia, Philippines, Singapore, and Thailand, is intended to foster regional economic development and not military cooperation. Under the rubric of the promotion of regional peace and security it has become concerned with the Vietnamese presence in Kampuchea. It supports the Kampuchean resistance movements politically, but reported arms transfers to the rebels are believed to be national initiatives rather than multilateral.

Five-Power Defence Arrangements (Australia, Malaysia, New Zealand, Singapore, and Britain), relating to the defence of Malaysia and Singapore, came into effect on 1 November 1971. 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 in March 1976, but New Zealand troops remain in Singapore, as do Australian air units in Malaysia and Singapore, with a small army component attached. Australian and New Zealand naval units visit Malaysia and Singapore regularly.

AFGHANISTAN

Population: 15,500,000 (including exiles).
Military service: conscription to age 39; 3 yrs+.
Total armed forces: 47,000.[1]
Est GNP 1980/1: Afs 135 bn ($2.668 bn). 1981/2: 121.44 bn ($2.40 bn).
Est def exp 1980: Afs 10.510 bn ($207.708 m). 1981: Afs 16.500 bn ($326.087 m).
Est FMA 1980/1: $300 m. $1 = afghanis 50.60 (1980/2).

Army: 40,000 (mostly conscripts).[1]
3 corps HQ.
11 inf divs.
3 armd divs (under strength bdes).
1 mech inf bde.
2 mountain inf regts.
1 arty bde with 3 arty regts.
2 cdo regts.
1 para bn.
50 T-34, 500 T-54/-55, 100 T-62 MBT; 60 PT-76 lt tks; BMP-1 MICV; 800 BTR-40/-50/-60/-152 APC; 900 76mm, M-1944 100mm guns and M-30 122mm, D-1 152mm how; 82mm, 100 120mm, 160mm mor; 50 BM-13-16 132mm MRL; 82mm RCL; 76mm, 100mm ATK guns, 350 23mm, 37mm, 57mm, 85mm, and 100mm towed, 20 ZSU-23-4 SP AA guns.

RESERVES: No formal reserve force identified; call-up from ex-servicemen, Youth League, and regional tribes from age 20 to age 40.

Air Force: 7,000 (includes Air Defence Command); perhaps 150 combat ac, some 30 combat hel.[1]
3 lt bbr sqns with 20 Il-28.
7 FGA sqns: 4 with some 50 MiG-17, 2 with 25 Su-7B *Fitter* A, 1 with 12 Su-17 *Fitter* C.
3 interceptor sqns with some 40 MiG-21.
2 tpt sqns with some 10 An-2, 15 An-26, 12 An-14, 2 Il-18D.
4 hel sqns with up to 12 Mi-4, 30 Mi-8, 30 Mi-24.
Trainers incl MiG-15/-17UTI/-21U, Il-28U, Yak-18, L-39C.
1 AD div: 2 SAM bdes (each 3 bns) with 120 SA-2, 115 SA-3; 1 AA bde (2 bns) with 37mm, 85mm, 100mm guns; 1 radar bde (3 bns).

Para-Military Forces: Gendarmerie 30,000. Border Force. Ministry of Interior: *Khad* (secret police); *Sarandoy* 'Defence of the Revolution' forces: largely ex-military to age 55 org in provincial regts; regional 'Revolution Defence Groups' (Civil Defence); Pioneers; Afghan Communist Party Guards; *Khalqi* Youth Militia; Pashtun Tribal Militia.

AUSTRALIA

Population: 15,438,000.
Military service: voluntary.
Total armed forces: 72,473.
GDP 1980/1: $A 139.60 bn ($US 162.099 bn). 1981/2: 155.48 bn ($US 163.062 bn).
Est def exp 1981/2: $A 4.264 bn ($US 4.472 bn). 1982/3: 4.787 bn ($US 4.497 bn).
GDP growth: 4.2% (1981), 1.5% (1982).
Inflation: 10% (1981), 12% (1982).
$US 1 = $A 0.8612 (1980/1), 0.9535 (1981/2), 1.0645 (1982/3).

Army: 32,850.
1 inf div with 3 bdes of 2 inf bns.
1 armd regt.
2 cav regts.
4 arty regts (1 med, 2 fd, 1 AD).
1 fd engr, 1 construction, 1 fd survey regts.
5 sigs regts.
1 Special Air Service regt.
1 aviation regt.
1 tpt regt.
1 tpt air spt regt.
103 *Leopard* 1A3 MBT; 790 M-113 APC, incl 63 MICV with 76mm gun (48 with *Scorpion*, 15 with *Saladin* turret); 34 5.5-in guns; 227 105mm how; 51 M-40 106mm RCL; *Redeye*, 20 *Rapier* SAM launchers; 16 *Porter*, 11 *Nomad* ac; 47 Bell 206B-1 hel; 37 watercraft, 87 LARC-5 amph veh.
(On order: 36 M-198 155mm how.)

RESERVES: 30,306 (with trg obligations); 2 inf div HQ, 4 bde HQ, 188 fd, spt, log, and trg units; 1 cdo bn, 1 regional surveillance force.

Navy: 17,146 (incl Fleet Air Arm).
6 *Oxley (Oberon)* submarines.
3 *Perth* (US *Adams)* ASW msl destroyers with *Standard* SAM, 2 *Ikara* ASW.
2 *Adelaide* (FFG-7) frigates with 1 *Harpoon* SSM, 1 *Standard* SAM, 2 hel.
6 *River* frigates with 1 × 4 *Seacat* SAM/SSM, 1 *Ikara* ASW.
9 PCF-420 *Freemantle*, 11 *Attack* large patrol craft.
2 mod Br *Ton* coastal MCM (1 minehunter, 1 minesweeper).
6 LCT (1 trg).
1 hy amph tpt ship; 1 destroyer tender with 1 hel; 2 training ships (1 *Daring* destroyer, 1 ex-ocean ferry); 1 fleet tanker.

FLEET AIR ARM: (1,650); 9 combat ac, 6 combat hel (fixed-wing ac to be phased out).
1 composite sqn with 7 S-2G, 2 HS-748 (ECM).
1 ASW hel sqn with 6 *Sea King* Mk 50.
1 utility/SAR hel sqn with 16 *Wessex* 31B, 4 Bell UH-1B, 4 Bell 206B.
1 trg sqn with 5 MB-326H, 2 TA-4G, 4 A-4G.
In storage: 10 S-2G, 3 MB-326H ac, 3 *Wessex* 31B hel.
(On order: 2 FFG-7 frigates (1 trials), 6 PCF-420 large patrol craft, 2 MCM catamarans; *Harpoon* SSM, 2 *Phalanx* 20mm AA systems; 6 AS-530 *Ecureuil*, 2 *Sea King* hel.)

Bases: Sydney, Melbourne, Jervis Bay, Brisbane, Cairns, Darwin, Cockburn Sound.

RESERVES: 1,200 (with trg obligations); 5 patrol craft, 1 LCT.

Air Force: 22,477; 131 combat aircraft.
2 FGA/recce sqns with 16 F-111C, 4 F-111A, 4 RF-111C.
3 interceptor/FGA sqns with 56 *Mirage* IIIO.
2 MR sqns: 1 with 10 P-3B *Orion;* 1 with 10 P-3C.
1 OCU with 15 *Mirage* IIIO/D, 10 MB-326H.
1 forward air controller flt with 6 CA-25 *Winjeel.*
5 tpt sqns: 2 with 24 C-130E/H, 1 flt with 4 Boeing 707-338C (to be tanker ac); 1 with 4 DHC-4 ac, 4 UH-1B hel; 1 with 15 DHC-4 (C-7A); 1 with 2 BAC-111, 2 HS-748, 3 *Mystère* 20.
1 med tpt hel sqn with 8 CH-47 *Chinook.*
2 utility hel sqns with 35 UH-1B/H *Iroquois.*
Trainers incl 64 MB-326H, 8 HS-748T2, 51 CT-4/4A *Airtrainer.*
AAM: *Sidewinder,* R-530.
(4 *Chinook* hel in reserve.)
(On order: 75 F/A-18 FGA/interceptor/trg, 10 P-3C MR ac; 12 AS-530 *Ecureuil* utility hel; R-550 *Magic* AAM; *Harpoon* ASM.)

RESERVES: 1,200 (with trg obligations) in 8 auxiliary sqns.

Forces Abroad: Egypt (Sinai MFO): 110; 8 UH-1H hel. Malaysia/Singapore: 2 sqns with *Mirage* IIIO (1 to withdraw), 1 flt with DHC-4 ac, UH-1H hel. Papua New Guinea: 133; 2 engr units, 106 advisers. Trg gps in Indonesia, Malaysia, Philippines, Singapore.

Para-Military Forces: Bureau of Customs: 10 *Searchmaster* MR ac.

BANGLADESH

Population: 95,500,000.
Military service: voluntary.
Total armed forces: 91,300.
GDP 1980/1: Tk 194.650 bn ($11.910 bn). 1981/2: 213.680 bn ($10.663 bn).
Est def exp 1981/2: Tk 3.065 bn ($152.944 m). 1982/3: 3.826 bn ($160.898 m).
GDP growth: 5.9% (1981), 0.9% (1982).
Inflation: 13.2% (1981), 10.5% (1982).
$1 = Taka 16.344 (1980/1), 20.040 (1981/2), 23.779 (1982/3).

Army: 73,000.
5 inf div HQ.
12 inf bdes (32 inf bns).
2 armd regts.
9 arty regts.
7 engr bns.
20 Ch Type-59, 30 T-54/-55 MBT; 6 M-24 *Chaffee* lt tks; 30 Model 56 pack, M-101 105mm, 5 25-pdr guns/how; 81mm, 50 120mm mor; 6-pdr (57mm) ATK guns; 30 106mm RCL.[2]

Navy: 5,300.[2]
3 Br frigates (1 Type 61, 2 Type 41).
8 Ch *Shanghai* II FAC(G).
4 large patrol craft (2 Yug *Kraljevica,* 2 Ind *Akshay).*
1 Ch *Hainan* FAC(P).
4 *Shamjala* FAC(G).
5 *Pabna* river patrol boats(.
1 trg ship.

Bases: Chittagong (HQ), Dacca, Khulna, Chalna.

Air Force: 3,000: 21 combat aircraft.[2]
2 FGA sqns with 18 Ch F-6.
1 interceptor sqn with 3 MiG-21MF.
1 tpt sqn with 1 An-24, 4 An-26.
1 hel sqn with 4 *Alouette* III, 7 Bell 212, 6 Mi-8, some Mi-4.
Trainers: 2 MiG-21U, 6 *Magister,* 16 Ch CJ-6.
AAM: AA-2 *Atoll.*

Para-Military Forces: 80,000: Bangladesh Rifles 30,000, Armed Police Reserve 36,000, Bangladesh *Ansans* (security guards) 14,000.

BRUNEI

Population: 233,000.
Military service: voluntary.
Total armed forces: 3,650.[3]
Est GDP 1981: $B 9.093 bn ($US 4.30 bn).
Def exp 1982: $B 429 m ($US 195 m).
$US 1 = $B 2.10 (1981), 2.20 (1982).

Army: 3,650.
2 inf bns (3rd forming).

[1]See p. 119 for footnotes.

1 armd recce sqn.
1 lt AA arty bty (forming).
1 engr sqn.
1 sigs sqn.
16 *Scorpion* lt tks; 24 Sankey AT-104 APC; 16 81mm mor; 12 *Rapier/Blindfire* SAM.

Navy:
3 *Waspada* FAC(M) with 2 *Exocet* SSM.
3 *Perwira* coastal, 3 Rotork river patrol craft(.
2 *Loadmaster* landing craft, 24 assault boats.
1 special boat sqn.

Base: Maura.

Air:
2 SF-260 COIN/trg ac.
2 Bell 206, 7 BO-105 (1 VIP) COIN, 11 Bell 212 (1 VIP), 1 HS-76 (VIP) hel.

Para-Military Forces: Royal Brunei Police elms; Gurkha Reserve Unit (600).

BURMA

Population: 36,000,000.
Military service: voluntary.
Total armed forces: 179,000.
Est GNP 1981/2: K 43.058 bn ($5.601 bn).
Est def exp 1981/2: K 1.341 bn ($174.428 m). 1982/3: 1.375 bn ($175.159 m).
GNP growth: 6.7% (1981).
Inflation: 5.2% (1981), 4.3% (1982).
$1 = kyat 7.688 (1981/2), 7.850 (1982/3).

Army: 163,000.
6 lt inf divs.
2 armd bns.
85 indep inf bns.
4 arty bns.
1 AA bty.
25 *Comet* MBT; 40 Humber armd, 45 *Ferret* scout cars; 50 25-pdr, 5.5-in guns/how; 120 76mm, 80 M-101 105mm how; 120mm mor; 50 6-pdr (57mm) ATK guns; 15 40mm AA guns.[4]

Navy: 7,000.[4]
1 Br *Algerine* frigate.
4 corvettes: 2 US (1 PCE-827, 1 *Admirable*), 2 *Nawarat*.
36 gunboats (15().
41 river patrol craft(.
1 US LCU, 8 US LCM.

Bases: Bassein, Mergui, Moulmein, Seikyi, Sinmalaik, Sittwe.

Air Force: 9,000; 16 combat aircraft.[4]
2 COIN sqns with 5 AT-33, 11 SF-260MB.
3 tpt sqns: 1 F-27, 4 FH-227, 7 Pilatus PC-6/-6A, 1 An-26, 6 Cessna 180.
4 hel sqns: 10 KB-47G, 2 KV-107/II, 7 HH-43B, 10 *Alouette* III, 14 UH-1.
Trainers incl 20 PC-7 *Turbo-Trainer*, 10 T-37C.
(On order: 9 SF-260MB, 6 Cessna 180, 12 PC-7.)

Para-Military Forces: 73,000. People's Police Force (38,000); People's Militia (35,000). Fishery Dept: 3 *Osprey*, 12 patrol boats(().

FIJI

Population: 645,000.
Military service: voluntary.
Total armed forces: 2,660.
Est GDP 1980: $F 989.0 m ($US 1,210 bn).
Est def exp 1982: $F 9.316 m ($US 10.0 m).
$US 1 = $F 0.8174 (1980), 0.9318 (1981/2).

Army: 2,500.
3 inf bns.
1 engr coy.
1 arty tp.
Spt units.
4 25-pdr guns/how; 10 81mm mor.

Navy: 160.
3 US *Bird* coastal minesweepers.
3 marine survey vessels.

Base: Suva.

Forces Abroad: 1,095, 2 inf bns. Lebanon (UNIFIL) (626); Egypt (Sinai MFO) (469).

INDIA

Population: 723,500,000.
Military service: voluntary.
Total armed forces: 1,120,000.
Est GDP 1980/1: Rs 1,281.9 bn ($162.416 bn). 1981/2: 1,423.5 bn ($160.635 bn).
Est def exp 1982/3: Rs 53.500 bn ($5.556 bn).
GDP growth: 4.8% (1981), 2.0% (1982).
Inflation: 12.7% (1981), 8% (1982).
$1 = rupees 7.8927 (1980/1), 8.8617 (1981/2), 9.6285 (1982/3).

Army: 960,000.
8 corps HQ.
2 armd divs.
1 mech div.
18 inf divs.
10 mountain divs.
5 indep armd bdes.
7 indep inf bdes.
1 para bde.
17 indep arty bdes, incl about 20 AA regts.
AFV: 800 T-54/-55, 200 T-72, 1,100 *Vijayanta* MBT; 100 BMP-1 MICV; 400 BTR-50/-60/-152, OT-62A/-64A APC.
Arty: Yug M-48 76mm, 25-pdr (retiring), 300 M-1944 100mm, 105mm, 550 M-46 130mm (some SP), 5.5-in (retiring), S-23 180mm guns; 75/24 mountain, 105mm (incl M-56 pack, *Abbot* SP) how; 81mm, 500 120mm, 20 160mm mor.
ATK: M-18 57mm *Carl Gustav* 84mm, M-40 106mm RCL; 57mm ATK guns; SS-11-B1, *Harpoon*, *Milan* ATGW.
AD: 20mm, 40mm, L/60mm, L/70mm, 500 3.7-in towed, ZSU-23-4 SP AA guns; SA-6, SA-7, SA-9, 40 *Tigercat* SAM.
(On order: BMP MICV, *Sagger*, *Milan* ATGW launchers, 3,700 msls.)

RESERVES: 200,000. Territorial Army 50,000.

Navy: 47,000, incl naval air force.
8 Sov F-class submarines.
1 Br *Majestic* aircraft carrier (capacity 18 attack, 4 ASW ac).
1 Br *Fiji* cruiser (trg).
2 Sov *Kashin* II destroyers with 4 *Styx* SSM, 2 × 2 SA-N-1 SAM, 1 Ka-25 hel.
21 frigates: 6 *Leander* with 2 × 4 *Seacat* SAM, 1 hel; 1 Br *Whitby* with 3 *Styx* SSM; 10 Sov *Petya* II; 3 Br *Leopard* (trg).
3 Sov *Nanuchka* corvettes with 4 SS-N-2 SSM, 1 SA-N-4 SAM.
8 Sov *Osa*-I (6 FAC(M), 2 FAC), 8 *Osa*-II with 4 *Styx* SSM.
1 *Abhay*, 6 SDB-2 large patrol craft.
6 Sov *Natya* ocean, 4 Br *Ton* coastal, 4 Br *Ham* inshore minesweepers.
6 Sov *Polnocny* LCT, 4 LCU.
(On order: 4 Type 1500 submarines, 3 *Kashin*-class destroyers, 6 *Godavari* (modified *Leander*) GW frigates, 2 *Nanuchka* corvettes, 6 *Polnocny* LCT.)

Bases: Western Fleet: Bombay, Goa. Southern Fleet: Cochin. Eastern Fleet: Vishakapatnam, Port Blair.

NAVAL AIR FORCE: (2,000); 36 combat ac, 26 combat hel.
2 attack sqns with 15 *Sea Hawk*, 8 *Sea Harrier* FRS Mk-51 (2 trg) (10 ac in carrier).
1 ASW sqn with 5 *Alizé* 1050 (4 in carrier).
2 MR sqns with 5 *Super Constellation*, 3 Il-38 *May*.
5 ASW hel sqns with 10 *Sea King*, 5 Ka-25 *Hormone* (on *Kashins*), 11 *Alouette* III.
1 SAR/liaison hel sqn with 10 *Alouette* III.
3 trg/comms sqns with 7 HJT-16 *Kiran*, 4 *Vampire* T-55, 10 *Islander* (some recce), 1 *Devon*, 2 *Sea Hawk* ac; 4 Hughes 300 hel.
(On order: 3 Il-38 MR ac; AM-39 *Exocet* ASM.)

Air Force: 113,000; 727 combat aircraft.
3 lt bbr sqns with 35 *Canberra* B(I)58, B(1)12 (to be replaced by *Jaguar* and MiG-25).
11 FGA sqns: 3 with 40 Su-7BM/KU; 1 with 10 *Hunter* F-56/-56A (to be replaced by *Jaguar*); 2 with 40 *Jaguar* GR-1, 6 T-2; 2 with 50 HF-24 *Marut* (being replaced by *Ajeet*); 3 with 90 MiG-23BN *Flogger* H.
20 AD sqns: 14 with 300 MiG-21/FL/PFMA/MF/bis/U; 2 with 40 MiG-23MF *Flogger* G; 4 with 100 *Ajeet* (mod *Gnat*).
2 recce sqns with 8 *Canberra* PR-57 (being replaced), 8 MiG-25.
4 hel sqns with some 60 *Chetah (Lama)*.
3 trg and conversion sqns with 12 *Canberra* T-4/-13/-67, 30 *Hunter* F-56/T-66, 40 MiG-21U.
10 tpt sqns: 5 with 90 An-32; 2 with 30 An-12; 2 with 20 DHC-3; 1 with 16 DHC-4, 2 Boeing 737-248 (leased).
1 comms sqn with 16 HS-748M.
2 liaison flts with 16 HS-748, 5 An-32.
5 tpt hel sqns with 60 Mi-8.
3 liaison hel sqns with 100 *Chetak (Alouette* III), some with 4 SS-11 ATGW.
Trainers incl *Jaguar*, 13 MiG-23UM *Flogger* C, 65 HT-2, 85 *Kiran* 1/1A, 15 *Marut* Mk 1T, some HPT-32 (replacing HT-2), 44 TS-4 *Iskra*, 27 HS-748 ac, *Chetak* hel.
AAM: AA-2 *Atoll*, R-550 *Magic*.
ASM: AS-30.
30 SAM sqns with 180 SA-2/-3.
(On order: 115 *Mirage* 2000 (75 to be locally assembled), 115 *Jaguar* (to be locally assembled), 48 MiG-23MF *Flogger* G, MiG-21bis, 40 *Ajeet* ftrs; 10 HS-748 tpts; 40 *Iskra*, 90 *Kiran* Mk 2, 140 HPT-32, 171 *Hawk* trg ac; Mi-8, Mi-24, 45 *Chetak* hel.)

Para-Military Forces: Border Security Force 85,000; 175,000 in other organizations. Coastguard 2,000: 2 ex-Br Type 14 frigates, 2 FAC(P), 5 *Poluchat* large patrol craft, 5 *Defender* ac, 4 *Chetak* hel.
(On order: 3 offshore, 9 inshore patrol vessels, 9 lt tpt ac, 6 hel.)

INDONESIA

Population: 160,000,000.
Military service: selective.
Total armed forces: 281,000.
GDP 1981/2: Rp 53,677 bn ($84.309 bn).
Est def exp 1982/3: Rp 1,935 bn ($2.926 bn).
GNP growth: 7.6% (1981), 6.0% (1982).
Inflation: 7.1% (1981), 9.7% (1982).
$1 = rupiahs 636.67 (1981), 661.42 (1982).

Army: 210,000.
1 armd cav bde (10 cav bns, spt units).
13 inf bdes (39 inf bns).
2 AB inf bdes (6 bns).
1 fd arty regt.
1 AA arty regt.
4 Special Warfare Gps.
14 indep fd arty bns.
10 indep AA arty bns.
2 construction engr regts (4 bns).
8 fd engr bns.
37 indep inf bns.
Marine transport.
Army Aviation:
1 composite sqn; 1 hel sqn.
93 AMX-13, 41 PT-76 lt tks; 75 *Saladin* armd, 60 *Ferret* scout cars; 200 AMX-VCI MICV; 60 *Saracen*, 60 V-150 *Commando*, BTR-40/-152 APC; 170 76mm, some 28 105mm (incl lt) guns/how; 480 80/81mm mor; 480 M-67 90mm, M-40 106mm RCL; 20 20mm, 90 M-1 40mm, 200 57mm AA guns; 2 Aero *Commander* 680, 1 Beech 18 ac; 6 Bell 205, 2 *Alouette* III, 16 BO-105 hel; 1 LST, 20 LCU, 14 small tpt ships.
(On order: Some 120 M-101A1 105mm how (replacing 76mm); 6 Bell 212, 26 *Super Puma* hel.)

RESERVES: National Strategic Command: HQ only to command Special Reserve forces in strategic operations. Incl army, KOSTRAD,[5] AB, naval forces incl marines, combat and tpt ac.

Navy: 42,000, incl naval air and marines.
3 submarines: 2 Type 209, 1 Sov W (trg).
9 frigates: 3 *Fatahilla* with 4 *Exocet* SSM, 1 with 1 *Wasp* hel; 4 US *Jones*; 2 Sov *Riga*.
14 large patrol craft: 3 Sov *Kronshtadt*, 4 Yug *Kraljevica*, 3 *Kelabang*, 3 *Attack*, 1 US PGM-39.
4 *Dagger* FAC(M) with 4 *Exocet* SSM.
2 Lürssen TNC-45 FAC(T).
1 Boeing hydrofoil.
8 coastal patrol craft(: 2 *Spear*, 6 Aus *Carpentaria*.
3 Sov T-43 ocean minesweepers, 2 minehunters.
1 comd/spt ship; 1 trg ship with 4 *Exocet*, 1 hel.
13 LST, 3 LCU, 38 LCM.
(Plus in reserve: 1 *Pattimura* frigate; 1 *Kronshtadt*, 1 *Kelabang*, 2 PGM-39, 2 *Attack* patrol craft; 1 R-class coastal minesweeper; 1 comd/spt ship.)

Bases: Jakarta (Tanjung Priok), Surabaya.

NAVAL AIR: (1,000); 8 combat ac, 10 combat hel.
1 ASW hel sqn with 10 *Wasp*.
2 MR sqns: 8 *Nomad* N-22B.
Other ac incl 6 C-47, 3 Aero *Commander* ac; 4 Bell 47G, 1 *Alouette* II, 4 BO-105 hel.

MARINES: (12,000).
2 inf regts (6 bns); 1 close spt, 1 admin spt, 1 trg regts.
30 PT-76 lt tks; 12 VPX-10 PAC 90 armd cars; 38 APC, incl 6 AMX-10P; 40mm AA guns.
(On order: 28 VPX-10/90 armd cars, 19 AMX-10P APC; 26 AS-332F *Super Puma* hel.)

Air Force: 29,000; 68 combat aircraft.[5]
2 FGA sqns with 27 A-4E, 4 TA-4H *Skyhawk*.
2 interceptor sqns with 11 F-5E, 4 F-5F.

1 COIN sqn with 15 OV-10F.
1 MR sqn with 1 C-130H-MP, 1 Boeing 737-200, 5 HU-16.
3 tpt sqns: 2 with 21 C-130H-30/-30B, 1 L-100-30; 1 with 1 C-140 *Jetstar*, 7 C-47, 1 SC-7 *Skyvan*, 8 F-27, 2 C-212, 1 Boeing 707.
1 liaison sqn with 12 Cessna 207/401/402.
1 hel sqn with 5 Bell 204B, 12 *Puma*, 12 Bell 47G, 12 Hughes 500, 6 BO-105.
1 trg sqn: 15 T-34C1, 8 *Hawk* T-53, 20 AS-202 *Bravo*.
(On order: 2 Boeing 737-200 MR, 32 CN-235 tpt, 9 T-34C1, 5 *Hawk* trg ac; 7 SA-330L *Puma*, U-412 hel.)

Para-Military Forces: Police mobile bde 12,000; 2 BO-105 hel. Militia, about 70,000. Coastguard: 7 patrol boats. Customs: 12 28-metre, 8 57-metre Lürssen patrol boats. Civil Defence Force (millions registered).

JAPAN

Population: 119,400,000.
Military service: voluntary.
Total armed forces: 241,000 (ceiling 270,184).
Est GNP 1981: yen 251,289 bn ($1,104,494 bn). 1982: 263,983 bn ($1,057.616 bn).
Est def exp 1981: yen 2,448.01 bn ($10.76 bn). 1982: yen 2,586.1 bn ($10.36 bn).
GNP growth 1981: 2.7%. 1982: 2.4%
Inflation 1981: 4.9%. 1982: 2.7%
$1 = yen 227.515 (1981), 249.602 (1982).

Army: 156,000.
5 Army HQ.
1 armd div.
12 inf divs (7,000 or 9,000 men each).
2 composite bdes.
1 AB bde.
1 arty bde, 2 arty gps; 8 SAM gps (each of 4 btys).
1 sigs bde.
5 engr bdes.
1 trg bde, 2 trg regts.
Army Aviation:
1 hel bde (2 bns) and 5 Gp HQ with 24 sqns/dets.
AFV: 560 Type 61, 390 Type 74 MBT; 425 Type 60, 115 Type 73 APC.
Arty: 380 105mm, 330 155mm incl Type 74 and 75 SP, 70 203mm guns/how; 50 Type 30 SSM; 800 81mm, 560 107mm mor (some SP); 40 Type 75 SP 130mm MRL.
ATK: 1,400 75mm, *Carl Gustav* 84mm, 106mm (incl Type 60 SP) RCL; 240 Type 64, 25 Type 79 ATGW.
AD: 170 35mm twin, 37mm, 40mm incl M-42 SP, 75mm AA guns; 2 Type 81 *Tan*, 144 *HAWK*, 84 *Improved HAWK* SAM.
Air: some 28 ac and 370 hel: 20 LR-1, 2 TL-1, 10 L-19 ac; 2 AH-1S, 56 KV-107, 80 UH-1H, 65 UH-1B, 36 TH-55, 139 OH-6J/D hel.
(On order: 84 Type 74 MBT; 9 Type 73 APC; 34 Type 75 155mm, 19 M-110A2 203mm SP how; 8 Type 75 130mm MRL; 9 Type 79, *MAT* ATGW; 221 84mm RCL; 49 *Stinger*, 8 Type 81 *Tan* launchers, 48 *Improved HAWK* SAM; 1 LR-1 ac; 6 OH-6D, 5 UH-1H, 12 *TOW*-armed AH-1S hel.)

RESERVES: 41,000.

Navy: 42,000 (including naval air).
14 submarines: 4 *Yushio*, 7 *Uzushio*, 3 *Asashio*.
31 destroyers: 2 *Shirane* with *Sea Sparrow* SAM, 1 × 8 *ASROC* ASW msl launcher, 3 ASW hel; 2 *Haruna* with 1 × 8 *ASROC*, 3 ASW hel; 2 *Hatsuyuki* with 2 × 4 *Harpoon* SSM, 1 *Sea Sparrow*, 1 × 8 *ASROC*, 1 ASW hel; 3 *Tachikaze* with *Tartar/Standard* SAM, 1 × 8 *ASROC*; 1 *Amatsukaze* with 1 *Standard* SAM, 1 × 8 *ASROC*; 4 *Takatsuki* with 1 × 8 *ASROC*; 6 *Yamagumo* with 1 × 8 *ASROC*; 3 *Minegumo* with 1 × 8 *ASROC*; 2 *Akizuki*; 3 *Murasame*; 3 *Ayanami*.
17 frigates: 1 *Yubari*; 1 *Ishikari* with 2 × 4 *Harpoon* SSM; 11 *Chikugo* with 1 × 8 *ASROC*; 4 *Isuzu*.
5 large patrol craft: 3 *Mizutori*, 2 *Umitaka*.
5 FAC(T).
9 coastal patrol craft(.
3 MCM spt ships, 31 coastal minesweepers (9 *Hatsushima*, 19 *Takami*, 3 *Kasado*), 6 *Nanago* MCM boats.
1 *Katori*, 2 *Ayanami* trg, 1 *Azuma* trg spt, 5 utility ships incl 1 *Harukaze*.
6 LST (3 *Miura*, 3 *Atsumi*); 2 LSU; 37 landing craft.

Bases: Yokosuka, Kure, Sasebo, Maizuru, Ominato.

NAVAL AIR ARM: (11,000); 93 combat ac, 62 combat hel.
6 Air Wings.
8 MR sqn with 6 P-3C, 58 P-2J, 13 S2F-1, 16 PS-1.
6 ASW hel sqns with 55 HSS-2.
1 MCM hel sqn with 7 KV-107.
1 tpt sqn with 4 YS-11M, 1 B-65.
1 utility sqn with 3 UP-2J.
1 test sqn with 2 P-3C, 2 P-2J, 2 P-2H, 1 UC-90 ac; 3 HSS-2A/B hel.
7 SAR flts with 8 US-1 ac, 6 S-61A, 8 S-62B hel.
5 trg sqns with 6 YS-11T, 15 TC-90, 14 B-65, 32 KM-2, 19 P-2J, 3 T-34A ac; 3 OH-6J, 6 Bell 47G, 11 HSS-2 hel.
(On order: 3 *Yushio* subs; 1 4,500-ton, 10 *Hatsuyuki* destroyers; 1 *Yubari* frigate; 2 *Hatsushima* MCM; 17 P-3C, 2 KM-2, 3 TC-90 ac; 14 HSS-2B, 5 S-61A, 20 H-6D hel; 24 *Harpoon* SSM, 3 Mk 15 *Phalanx* 20mm antiship msl defence systems.)

RESERVES: 600.

Air Force: 43,000; some 280 combat aircraft.
6 combat air wings; 1 combat air gp; 1 recce sqn.
3 FGA sqns with 56 F-1.
11 interceptor sqns: 1 with some 20 F-15J/DJ (2nd forming), 4 T-33A; 6 with 112 F-4EJ; 3 with 61 F-104J.
Air Recce Group: 1 recce sqn with 12 RF-4EJ.
1 aggressor trg sqn with 5 T-2, 2 T-33.
1 tactical tpt wing of 3 sqns with 25 C-1, 6 YS-11.
1 SAR wing (9 dets) with MU-2 ac; 29 KV-107 hel.
1 air test wing with 2 F-4EJ, 5 F-15J, F-104J/DJ, 2 T-1, 6 T-2, 2 T-3, T-33A, C-1, 2 E-2C, YS-11.
1 air traffic control and weather wing with YS-11, MU-2J, T-33A.
5 trg wings: 10 sqns with 40 T-1A/B, 59 T-2, 44 T-3, 50 T-33A.
AAM: *Sparrow, Falcon, Sidewinder.*
Air Defence:
3 aircraft control and warning wings and 1 group with 28 control and warning sites.
6 SAM gps: 19 sqns with 180 *Nike-J*.
(On order: 51 F-15J, 6 F-15DJ, 5 F-1 fighters, 4 C-130H tpt, 12 T-2 trg, 6 E-2C AEW ac; 1 V-107 hel; 5 Type 81 *Tan* SAM launchers.)

Para-Military Forces: Coast Guard: 42 large patrol vessels, 5 with 1 hel; 47 med, 19 small, 220 coastal patrol vessels (204(); 1 C-130HMP, 5 YS-11, 2 *Skyvan*, 2 *King Air* ac, 5 Bell 212 hel.
(On order: 1 large, 2 med, 1 coastal patrol craft.)

KAMPUCHEA/CAMBODIA

Population: 5,500,000.
Military service: conscription, term unknown.
Total armed forces: some 25,000.

Armed Forces: some 25,000.
4 inf divs (perhaps 3 bdes, 3 bns each).
Some 50 indep units incl cav (recce), arty, AD, pioneer.
Heavy weapons reported incl: T-54/-55 MBT; PT-76 lt tks; BTR-40/-60/-152 APC; M-1942 76mm, M-1938 122mm how; 82mm, 120mm mor; B-10 82mm, B-11 107mm RCL; M-1938 37mm, M-1950 57mm AA guns.
(On order: tks, arty, ships, ac, Mi-8 hel reported; details unknown.)

Para-Military Forces: Militia; Regional Armed Forces/Self Defence forces (org in coys); People's Police force.[6]

KOREA: DEMOCRATIC PEOPLE'S REPUBLIC (NORTH)

Population: 18,800,000.
Military service: Army, Navy 5 years; Air Force 3–4 years.
Total armed forces: 784,500.
Est GNP 1982: won 35.280 bn ($18.766 bn).
Est def exp 1983: won 3.602 bn ($1.916 bn).[7]
$1 = won 0.94 (1982/3 official), 1.88 (adj).

Army: 700,000.
9 corps HQ.
2 armd divs.
3 mot inf divs.
35 inf divs.
5 armd bdes.
4 inf bdes.
Special forces (100,000): 1 corps HQ: 26 bdes (incl 3 amph cdo), AB element.
2 indep tk, 5 indep inf regts.
250 arty bns.
82 MRL bns.
5 SSM bns with 54 *FROG*.
5 river crossing regts (13 bns).
AFV: 300 T-34, 2,200 T-34/-55/-62, 175 Type-59 MBT; 100 PT-76, 50 Type-62 lt tks; 140 BA-64 armd cars; BMP-1 MICV; 1,000 BTR-40/-50/-60/-152, Ch Type-531 APC.
Arty: 3,300 76mm, 85mm, 100mm, M-30 122mm, M-46 130mm towed, incl 800 SU-76, SU-100 SP guns; 122mm, ML-20 152mm how; 11,000 82mm, 120mm, 160mm, and 240mm mor; 2,000 107mm, 122mm, 140mm, 200mm, and 240mm MRL; 54 *FROG*-5/-7 SSM.
ATK: 1,500 B-10 82mm, B-11 107mm RCL; 45mm, 57mm, Type-52 75mm ATK guns; AT-3 *Sagger* ATGW.
AD: 8,000 23mm, 37mm, 57mm, 85mm, and 100mm towed, ZSU-23-4, ZSU-57-2 SP AA guns; SA-7 SAM.

RESERVES: 230,000, 23 divs (cadre).

Navy: 33,500.
21 subs (4 Sov W-, 4 Ch R-class, 13 local).
4 *Najin* frigates (2 may be in reserve).
18 Sov FAC(M) with *Styx* SSM: 8 *Osa*-I, 10 *Komar*(.
32 large patrol craft: 2 Sov *Tral*, 15 SO-1, 3 *Sariwan*, 6 Ch *Hainan*, 6 *Taechong*.
151 FAC(G): 20 Sov MO-IV(; 23 Ch (15 *Shanghai* II, 8 *Shantou*(), 4 *Chodo*, 4 K-48, 64 *Chaho*(, 36 *Chong-Jin*(.
182 FAC(T): 80 Sov (4 *Shershen*, 64 P-6(, 12 P-4(); 102((9 *Sinpo*, 15 *Iwon*, 6 *An Ju*, 72 *Ku Song/Sin Hung*).
30 coastal patrol craft((10 ex-Sov KM-4, 20 misc gunboats).
9 LCU, 15 LCM, 75 *Nampo* landing craft(.
2 coast defence msl regts with *Samlet* in 6 sites; SM-4-1 130mm guns.

RESERVES: 40,000.

Bases: Wonsan, Nampo.

Air Force: 51,000; some 740 combat aircraft.
3 lt bbr sqns with 70 Il-28.
13 FGA sqns: 1 with 20 Su-7; 9 with some 290 MiG-15/-17; 3 with some 100 MiG-19/Q-5.
12 interceptor sqns with 160 MiG-21, some 100 MiG-19.
Tpts incl 250 An-2, 10 An-24, 5 Il-14, 4 Il-18, 1 Tu-154.
Hel incl 40 Mi-4, 20 Mi-8.
Trainers incl 20 Yak-11, 70 Yak-18, 100 MiG-15UTI/-19UTI/-21U, Il-28, 30 CJ-6.
AAM: AA-2 *Atoll*.
4 SAM bdes (12 bns, 40 btys) with 250 SA-2, some SA-3, in 40 sites.

Forces Abroad: Iran 300; Madagascar 100; Uganda 40; Zimbabwe 130.

Para-Military Forces: security forces and border guards: 38,000. Workers-Farmers Youth Red Guard (civilian militia) 1,760,000: some with small arms, some AA arty.

KOREA: REPUBLIC OF (SOUTH)

Population: 39,400,000.
Military service: Army and Marines 30 months, Navy and Air Force 3 years.
Total armed forces: 622,000.
GDP 1982: won 50,023 bn ($68.419 bn).
Est def exp 1982: won 3,782 bn ($5.173 bn).[8]
GNP growth: 7.1% (1982).
Inflation: 20.5% (1981), 6% (1982).
$1 = won 731.13 (1982).

Army: 540,000.
3 Army, 6 corps HQ.
2 mech inf divs (each 3 bdes: 3 mech inf, 3 mot, 3 tk, 1 recce bns; 1 fd arty bde).
20 inf divs (each 3 inf regts, 1 recce, 1 tk, 1 engr bn, arty gp).
11 indep bdes incl 3 AB (4 AB, 1 recce, 1 hel bns, arty gp), 2 special forces, cdo, inf, 'Capital Command'.
2 AA arty bdes.
2 SSM bns with 12 *Honest John*.
2 SAM bdes: 3 *HAWK*, 2 *Nike Hercules* bns.
1 army aviation bde.
1,200 M-47-48 (incl A5) MBT; 500 M-113/-577, 350 Fiat 6614 APC; 2,500 M-53 155mm, M-107 175mm SP guns and M-101 105mm, M-114 155mm towed, M-115 towed, M-110 SP 203mm how; 130mm MRL; 5,300 81mm and 107mm mor; 12 *Honest John* SSM; 8 76mm, 50 90mm ATK guns; *LAW* RL; 57mm, 75mm, 106mm RCL; *TOW* ATGW; 66 *Vulcan* 20mm, 40 40mm AA guns; 110 *HAWK*, 100 *Nike Hercules* SAM; 14 O-2A ac; 100 UH-1B, 100 OH-6A, 25 Hughes 500MD *Defender* with *TOW*, 90 *Scout* hel.
(On order: 37 M-109A2 155mm SP how; *TOW* ATGW; *Stinger*, 56 OH-6A, 25 Hughes 500MD hel with *TOW*.)

RESERVES: Regular Army Reserves 1,400,000: 23 inf divs (cadre). Homeland Reserve Defence Force 3,300,000.

Navy: 49,000 incl marines.
11 US destroyers: 7 *Gearing* with 8 *Harpoon* SSM (2 with 1 *Alouette* III hel), 2 *Sumner*, 2 *Fletcher*.
8 frigates: 1 *Ulsan* with 8 *Harpoon*; 7 US (1 *Rudderow*, 6 *Lawrence/Crosley*).
3 US *Auk* corvettes.
11 FAC(M) with SSM: 9 with *Standard* (8 PSMM Mk 5, 1 US *Asheville*), 2 *Kist* with 2 *Exocet*.
8 US *Cape* large patrol craft.
28 coastal patrol craft(: 6 CPIC FAC(P); 13 Sewart (9 65-ft, 4 40-ft), 9 *Schoolboy* I/II.

8 MSC-268/-294 coastal minesweepers, 1 minesweeping boat(.
24 US landing ships (8 LST, 10 LSM, 6 LCU).

Bases: Chinhae, Cheju, Inchon, Mokpo, Pukpyong, Pohang, Pusan.

RESERVES: 25,000.

Marines: (20,000).
2 divs, 1 bde.
M-47 MBT; LVTP-7 APC.
(On order: 1 sub, 7 corvettes, 20 FAC(M) (7 types), 75 *Harpoon* SSM; 40 LVTP-7.)

RESERVES: 60,000.

Air Force: 33,000; some 450 combat ac, 10 combat hel.
7 combat, 2 tpt wings.
18 FGA sqns: 14 with 250 F-5A/B/E/F; 4 with 70 F-86F, 6 A-10.
4 AD sqns with 70 F-4D/E.
1 COIN sqn with 13 OV-10G, some A-37.
1 recce sqn with 10 RF-5A.
2 ASW sqns: 1 with 20 S-2A/F ac; 1 with 10 Hughes 500MD hel.
1 SAR hel sqn with 6 UH-1H, 20 UH-1B/H.
5 tpt sqns with 10 C-54, 16 C-123J/K, 2 HS-748, 6 C-130H, Aero *Commander.*
Trainers incl: 20 T-28D, 40 T-33A, 14 T-37C, 20 T-41D, 35 F-5B, 63 F-5F.
AAM: *Sidewinder, Sparrow.*
(On order: 30 F-16A, 6 F-16B, 36 F-5E, 30 F-5F, 6 F-4D ftrs; AIM-9Q *Sidewinder* AAM; *Maverick* ASM.)

RESERVES: 55,000.

Para-Military Forces: Civilian Defence Corps (to age 50) 4,400,000; Student Homeland Defence Corps (Schools) 1,820,000. Coastguard: 25 small craft, 9 Hughes 500D hel.

LAOS

Population: 3,200,000.
Military service: conscription, 18 months.
Total armed forces: 53,000.
Est GNP 1980: K 3 bn ($300 m).
Est def exp 1980: K 210 m ($21 m).[9]
Est FMA 1982: $100 m.
$1 = kip 10 (1980, official).

Army: 50,000.
4 inf divs.
1 arty div.
7 indep inf regts.
5 arty, 9 AA arty bns.
65 indep inf coys.
1 lt ac liaison flt.
25 PT-76 lt tks; 8 BTR-40, 40 BTR-152, M-113 APC; 80 M-116 75mm, 76mm, 105mm, D-30 122mm, 155mm how; 81mm, 82mm, 107mm, 4.2-in mor; 107mm RCL; M-1939 37mm, M-1950 57mm AA guns.[10]

Navy: 1,000.[10]
8 river patrol craft incl Sov *Shemel;* (Perhaps 25 more vessels, incl 7 LCM, 7 tpts(, in reserve).

Air Force: 2,000: 20 combat aircraft.[10]
1 FGA sqn with 20 MiG-21.
1 tpt sqn with 1 Yak-40, 1 C-47, 5 An-24, 2 An-26, 6 An-2, 2 DC-4.
1 hel sqn with 1 UH-34, 10 Mi-8, 2 Mi-6.
AAM: AA-2 *Atoll.*

Para-Military Forces: Militia, Self-Defence Forces.

MALAYSIA

Population: 14,500,000.
Military service: voluntary.
Total armed forces: 99,700.
Est GDP 1981: $R 56.785 bn ($US 24.645 bn). 1982: 60.570 bn ($US 25.936 bn).
Est def exp 1981: $R 3.333 bn ($US 1.447 bn). 1982: 4.850 bn ($2.077 bn).
GDP growth: 6.7% (1981), 4.6% (1982).
Inflation: 9.6% (1981), 6.5% (1982).
$1 = ringgits 2.3041 (1981), 2.3354 (1982).

Army: 80,000.
1 corps, 4 div HQ.
9 inf bdes, consisting of 36 inf bns, 3 cav, 4 fd arty, 1 APC regts, 2 AA arty btys, 1 special service regt, 5 engr, 5 sigs regts and administrative units.
140 AML armd, 60 *Ferret* scout cars; AT-105, 200 V-100/-150 *Commando, Condor* APC; 12 5.5-in (140mm) guns; 92 Model 56 105mm pack how; 81mm mor; M-20 89mm RL; 5 120mm RCL; SS-11 ATGW; 35 40mm AA guns.
(On order: 51 *Scorpion* lt tks; 162 SIBMAS AFV; 20 *Stormer,* 459 *Condor* APC.)

RESERVES: Malaysian Territorial Army 45,000; Local Defence Corps, some 15,000.

Navy: 8,700 (being expanded).
2 frigates: 1 *Yarrow* (1 × 4 *Seacat* SAM); 1 Type 41.
8 FAC(M) with 4 or 2 *Exocet* SSM: 4 *Handalan,* 4 *Perdana.*
8 *Jerong* FAC(G).
22 large patrol craft: 4 *Kedah,* 4 *Sabah,* 14 *Kris.*
2 Br *Ton* coastal minesweepers.
2 US 511-1152 LST.
1 spt ship.
(On order: 4 *Spica* FAC(M) with MM-40 *Exocet* SSM, 4 minehunters, 1 fleet ammunition ship.)

Bases: Woodlands (Singapore; being closed), Kuantan, Labuan, Lumut.

RESERVES: about 1,000.

Air Force: 11,000 (being expanded); some 32 combat aircraft.
2 FGA sqns with 14 F-5E, 4 F-5F.
2 COIN-trg sqns with 11 CL-41G *Tebuan* (to be replaced by A-4).
1 MR sqn with 3 PC-130H.
4 tpt-liaison sqns: 1 with 6 C-130H; 1 with 2 HS-125, 2 F-28, 12 Cessna 402B; 2 with 15 DHC-4A.
2 tpt hel sqns with 38 S-61A; 2 liaison sqns with 27 *Alouette* III.
2 trg sqns: 1 with 10 *Bulldog* 102, 6 PC-7 ac; 1 with 7 Bell 47, 3 UH-1H hel.
AAM: *Sidewinder.*
(On order: 34 A-4S FGA, 6 TA-4 trg (plus 20 more for spares), 12 MB-339 COIN/trg, 38 Pilatus PC-7 trg ac; *Super Sidewinder* AAM.)

Para-Military Forces: 90,000. Police Field Force 19,000; 21 bns (incl 2 Aboriginal), *Shorland* armd cars and SB-301 APC, 40 patrol boats; 1 C-130H, 1 HS-125M, 4 Cessna 206. Customs and Excise: (On order: 6 32-metre patrol craft). People's Volunteer Corps (RELA), over 350,000.

MONGOLIA

Population: 1,750,000.
Military service: 3 years.
Total armed forces: 25,100.
Est def exp 1982: tugriks 816.4 m[11] ($243.701 m).
Est FMA: $550 m (1981), $600 m (1982).
$1 = tugriks 3.35 (1982, official).

Army: 25,000.
2 inf divs.
1 inf bde (may be forming a div).
T-54/-55/-62 MBT; BMP MICV; 70 BTR-60 APC; 76mm, 100mm incl SU-100 SP, 122mm, 130mm guns; 152mm how; *Snapper* ATGW; 37mm, 57mm AA guns.

RESERVES: 40,000.

Air Force: 100 pilots only; Soviet technicians: 12 combat aircraft. (Operates civil air line.)
1 ftr sqn with 12 MiG-21.
At least 2 tpt sqns with 20 An-2, 19 An-24, 1 An-26.
1 hel sqn with 10 Mi-4.
Trainers: Yak-11/-18, 3 PZL-104 utility.

Para-Military Forces: Ministry of Public Security (15,000): Militia (Police), internal security troops, frontier guards.

NEPAL

Population: 15,000,000.
Military service: voluntary.
Total armed forces: 25,000.
GDP 1981: NR 29.073 bn ($2.352 bn). 1982: 32.573 bn ($2.459 bn).
Est def exp 1982/3: NR 402 m ($30.353 m).
$1 = rupees 12.359 (1981/2), 13.244 (1982/3).

Army: 25,000.
6 inf bdes (1 Palace Guard, incl 1 cav sqn, 1 garrison bn).
1 arty bn.
1 engr bn.
1 sigs bn.
1 para bn.
1 tpt bn.
1 air sqn (1 comms flt, 1 Army flt).
AMX-13 lt tks; 4 3.7-in (94mm) mountain how; 15 4.2-in (107mm), 18 120mm mor; 2 40mm AA guns; 2 *Skyvan,* 1 HS-748, 1 *Twin Otter* tpt ac; 3 *Alouette* III, 2 *Puma* hel.

Para-Military Forces: Police force 15,000.

NEW ZEALAND

Population: 3,230,000.
Military service: voluntary, supplemented by Territorial Army service: 12 weeks basic, 20 days per year.
Total armed forces: 12,943.
GDP 1980/1: $NZ 24.127 bn ($US 23.273 bn). 1981/2: 28.832 bn ($US 24.043 bn).
Est def exp 1981/2: $NZ 593.650 m ($US 495.038 m). 1982/3: 676.505 m ($US 493.475 m).[12]
GNP growth: −0.1% (1981), 3.2% (1982).
Inflation: 15% (1981), 16.3% (1982).
$US 1 = $NZ 1.0367 (1980/1), 1.1992 (1981/2), 1.3709 (1982/3).

Army: 5,675.
2 inf bns.
1 arty bty.
26 *Scorpion* lt tks; 72 M-113 APC; 10 5.5-in (140mm) guns; 44 105mm (incl pack) how; 23 106mm RCL.

RESERVES: 1,412 Regular, 6,346 Territorial. 6 Territorial inf bns, 4 fd, 1 med arty btys, 1 recce, 1 APC, 1 ATK sqns.

Navy: 2,843.
5 frigates: 3 *Leander* (1 × 4 *Seacat* SAM, 1 *Wasp* hel), 2 Type 12 (1 with 1 × 4 *Seacat,* 1 trg) (to retire).
4 *Lake* large patrol craft.
(On order: 1 *Leander* frigate, SAR hovercraft, 2 *Wasp* hel.)

Base: Auckland.

RESERVES: 958 Regular, 280 Territorial.

Air Force: 4,425; 33 combat ac.
1 FGA sqn with 9 A-4K, 3 TA-4K *Skyhawk.*
1 OCU with 16 BAC-167 *Strikemaster.*
1 MR sqn with 5 P-3B *Orion.*
2 med tpt sqns with 5 C-130H, 6 *Andover,* 2 Boeing 727-100C, 3 Cessna 421.
1 tpt hel sqn with 6 *Sioux,* 3 *Wasp,* 11 UH-1D/H.
1 comms sqn with 4 *Andover,* 3 Cessna 421C.
Trainers: 4 *Airtourer,* 15 CT-4, 3 F-27 ac; 3 *Sioux* hel.

RESERVES: 1,169 Regular, 208 Territorial.

Forces Abroad: Singapore: 1 inf bn with log spt; 1 spt hel unit (3 UH-1). Egypt (Sinai MFO): 35.

PAKISTAN

Population: 89,500,000 (Afghan refugees *not* included).
Military service: voluntary.
Total armed forces: 478,600.
Est GDP 1980/1: Rs 279.63 bn ($28.245 bn). 1981/2: 327.08 bn ($31.0 bn).
Est def exp 1981/2: Rs 19.593 bn ($1.857 bn). 1982/3: 22.878 bn ($1.801 bn).
GNP growth: 6.6% (1981), 6.6% (1982).
Inflation: 12.5% (1981), 11.5% (1982).
$1 = rupees 9.900 (1980/1), 10.551 (1981/2), 12.700 (1982/3).

Army: 450,000.
7 corps HQ; 1 Territorial command.
2 armd divs.
16 inf divs.
4 indep armd bdes.
5 indep inf bdes.
7 arty bdes.
2 AA arty bdes.
6 armd recce regts.
6 SAM btys with 6 *Crotale* (each 4 msls).
1 Special Services Group.
370 M-47/-48 (incl A5), 51 T-54/-55, 900 Type-59 MBT; 500 M-113, 50 UR-416 APC; some 1,000 25-pdr (88mm), 100mm, 130mm, 5.5-in (140mm), and 155mm guns and 75mm pack, 105mm incl pack, 12 M-7 SP, 155mm towed, M-109 SP, 203mm how; 122mm MRL; 107mm, 120mm mor; 75mm, 89mm/3.5-in RL; Type 52 75mm, 106mm RCL; *Cobra,* 200 *TOW* ATGW; 14.5mm, 37mm, 40mm, 57mm AA guns; 6 *Crotale* SAM.
Army Aviation:
1 liaison sqn with 45 *Supporter* lt ac; 4 hel sqns.
Indep army observation flts: 45 O-1E, Cessna 421, *Turbo Commander, Queen Air* ac; some Bell AH-1S, 16 Mi-8, 35 *Puma,* 23 *Alouette* III, 13 Bell 47G hel.

(On order: M-113 APC; 75 M-198 towed 155mm, 100 M-109A2 SP 155mm, 40 M-110 SP 203mm how; *TOW* ATGW launchers (incl 24 M-901 *Improved TOW* SP, 1,000 msls); some 10 AH-1S hel; 144 RBS-70 SAM launchers, 400 msls.)

RESERVES: 500,000.

Navy: 11,000.
11 subs: 2 *Agosta*, 4 *Daphne*, 5 SX-404 midget.
7 destroyers: 1 Br *County* with 1 *Sea Slug*, 2 × 4 *Seacat* SAM, 1 hel; 5 US *Gearing* with 1 × 8 *ASROC* ASW; 1 Br *Battle*.
4 Ch *Hainan* FAC(P), 1 *Town* patrol craft.
4 Ch *Hoku* FAC(M) (2 msls).
12 Ch *Shanghai*-II FAC(G).
12 Ch *Huchwan* hydrofoil FAC(T)(.
19 coastal patrol craft: 1 *Spear*, 18 MC-55 Type.
3 US *Adjutant* and MSC-268 coastal MCM.
1 US *Mission* underway replenishment tanker.
1 Br *Dido* cruiser (cadet trg/AA ship; non-operational).

NAVAL AIR: 3 combat ac, 6 combat hel.
1 ASW/MR sqn with 3 *Atlantic* with *Exocet* ASM.
2 ASW/SAR hel sqns with 6 *Sea King* ASW with AM-39, 4 *Alouette* III.
ASM: AM-39 *Exocet*.

Base: Karachi.

RESERVES: 5,000.

Air Force: 17,600; 259 combat aircraft.
1 lt bbr sqn with 11 B-57B (*Canberra*).
6 FGA sqns: 1 with 17 *Mirage* IIIEP; 4 with 62 *Mirage* 5PA3; 1 with 6 Q-5 (3 to form).
9 interceptor/FGA sqns with 144 Ch F-6 (1 converting to F-16).
1 recce sqn with 13 *Mirage* IIIRP.
1 OCU with 6 F-16.
2 tpt sqns: 1 with 13 C-130B/E, 1 L-100; 1 with 1 *Falcon* 20, 1 F-27-200 (with Navy), 1 *Super King Air*, 1 *Bonanza*.
1 SAR hel sqn with 6 HH-43B, 4 *Alouette* III.
1 utility hel sqn with 4 *Super Frelon*, 12 Bell 47G.
1 trg sqn with 20 T-33A, 4 MiG-15UTI.
Other trainers incl 2 *Mirage* 5DPA2, 3 *Mirage* IIIDP, 25 *Supporter*, 35 T-37C, 45 Ch FT-5 (MiG-17U), 12 CJ-6, 24 Reims FTB-337.
AAM: *Sidewinder*, R-530, R-550 *Magic*.
(On order: 34 F-16, 60 Ch Q-5 FGA.)

RESERVES: 8,000.

Forces Abroad: 30,000 contract personnel: Saudi Arabia (20,000); Jordan, Libya, Oman, UAE.

Para-Military Forces: 109,100; National Guard (22,000); Frontier Corps (65,000); Pakistan Rangers (15,000); Coast Guard (2,000); Frontier Constabulary (5,100).

PAPUA NEW GUINEA

Population: 3,200,000.
Military service: voluntary.
Total armed forces: 3,775 (all part of army).
Est GDP 1981: K 1.681 bn ($2.50 bn).
Est def exp 1981: K 23.5 m ($34.949 m). 1982: 22.4 m ($30.373 m).
Est FMA 1982: $15 m.
$1 = kina 0.6724 (1981), 0.7375 (1982).

Army: 3,400.
2 inf bns.
1 engr bn.
1 sigs bn.
Log units.

Navy: 300.
4 *Attack* large patrol craft.
2 310-ton landing craft.

Bases: Port Moresby, Lombrum.

Air Force: 75.
1 tpt sqn with 4 C-47, 6 *Nomad* MR ac.

Para-Military Forces: 400 Police.

PHILIPPINES

Population: 50,800,000.
Military service: voluntary.
Total armed forces: 104,800.
Est GDP 1981: P 304.77 bn ($38.580 bn). 1982: 338.51 bn ($39.638 bn).
Est def exp 1982: P 7.496 bn ($877.752 m).
GNP growth: 3.7% (1981), 2.6% (1982).
Inflation: 7.3% (1981), 12.7% (1982).
$1 = pesos 7.8997 (1981), 8.5400 (1982).

Army: 60,000.
5 inf divs.
1 special warfare bde.
(1 ranger regt (2 ranger, 1 mountain bns, 5 scout coys) being reactivated.)
2 engr bdes.
1 lt armd regt.
4 arty regts.
28 *Scorpion* lt tks; MICV; 80 M-113, 20 *Chaimite* APC; 200 105mm (incl pack), 12 M-114 155mm how; 81mm, 107mm mor; M-20 75mm, M-67 90mm, M-40 106mm RCL.
(On order: 12 UH-1H hel.)

RESERVES: 20,000, 18 bns; some 70,000 more have Reserve commitments.

Navy: 28,000 (9,600 marines, 2,000 Coast Guard).
7 US frigates: 4 *Casco*, 1 *Savage*, 2 *Cannon*.
10 US corvettes: 2 *Auk*, 7 PCE-827, 1 *Admirable*.
3 PSMM 5 FAC(M) with 4 *Exocet*.
16 large patrol craft incl 4 *Katapangan*, 5 PGM-39/-71, 2 ex-US PC-461.
59 coastal patrol craft.
31 US landing ships (3 spt, 24 LST, 4 LSM), 61 LCM, 7 LCVP, 3 LCU.
1 SAR sqn with 9 *Islander* ac, 5 BO-105 hel.
3 marine bdes (9 bns) with 30 LVTP-5, 55 LVTP-7 APC; 150 105mm how; 4.2-in (107mm) mor.
(On order: 3 PSMM 5 FAC(M), 12 LST, 1 trg ship.)

Bases: Sangley Point, Zamboanga, Cauite.

RESERVES: 12,000.

Air Force: 16,800; 92 combat ac.
1 FGA sqn with 24 F-8H.
1 AD sqn with 19 F-5A, 3 F-5B.
1 fighter/trg sqn with 10 T-34A.
3 COIN sqns: 1 with 16 SF-260WP; 2 with 20 T-28D.
1 hel wing with 50 UH-1H.
1 Presidential tpt sqn with 1 Boeing 707, 1 BAC-111, 1 YS-11 ac; 1 S-62A, 2 UH-1N, 1 *Puma* hel.
5 tpt sqns: 1 with 4 C-130H; 1 with 5 C-47, 8 F-27, 3 F-27MR; 1 with 12 *Nomad*; 1 with 12 *Islander* ac; 1 with 12 BO-105 hel.
1 liaison sqn with O-1E, 1 Cessna U-17A/B, 8 *Beaver* (being withdrawn).
3 trg sqns: 1 with 10 T/RT-33A; 1 with 12 T-41D; 1 with 30 SF-260MP.
1 weather sqn with 3 Cessna 210.
AAM: *Sidewinder*.
(On order: 16 Bell 412, 17 S-76, 2 S-70A5 (UH-60) hel.)

RESERVES: 16,000.

Para-Military Forces: (Ministry of Defence): Philippine Constabulary 43,500 (1 bde, 13 bns, 180 provincial coys); by law part of armed forces. Civil Home Defence Force 65,000.

SINGAPORE

Population: 2,500,000.
Military service: 24, officers/NCOs 30 months.
Total armed forces: 55,500 (34,800 conscripts).
Est GDP 1981/2: $S 27.280 bn ($US 12.901 bn). 1982/3: 32.300 bn ($US 15.125 bn).
Def exp 1982/3: $S 1.819 bn ($US 851.791 m).
GDP growth: 9.9% (1981), 6.0% (1982).
Inflation: 10.0% (1981), 4.5% (1982).
$US 1 = $S 2.1198 (1980/1), 2.1145 (1981/2), 2.1355 (1982/3).

Army: 45,000 (30,000 conscripts).
1 div HQ.
1 armd bde (1 recce, 1 tk, 2 APC bns).
3 inf bdes (each 3 inf bns).
6 arty bns.
1 cdo bn.
6 engr, 3 sigs bns.
273 AMX-13 lt tks; 720 M-113, 250 V-150/-200 *Commando* APC; 36 155mm how; 60mm, 81mm, 50 120mm mor; 89mm RL; 84mm *Carl Gustav*, 90 106mm RCL; 20mm Bofors 40/L-70 AA guns.

RESERVES: 150,000; 2 armd div, 6 inf bde HQ; 18 inf, 1 cdo, 9 arty, 6 engr, 2 sigs bns. Annual trg to age 40 for men; 50 for officers.

Navy: 4,500 (1,800 conscripts).
9 FAC(M) incl 6 TNC-45 each with 5 *Gabriel* II SSM.
6 Vosper A/B FAC(G).
3 large patrol craft (trg ships).
12 *Swift* coastal patrol craft.
2 US *Redwing* coastal minesweepers.
6 US 511-1152 LST (1 in reserve), 6 landing craft.
(On order: 3 *Sea Wolf* (TNC-45) FAC(M).)

Base: Paulau Brani (Singapore).

Air Force: 6,000 (3,000 conscripts); 106 combat aircraft.
2 FGA sqns with 41 A-4S/S1, 6 TA-4S *Skyhawk*.
2 FGA/recce sqns with 32 *Hunter* (21 FGA-74, 7 FR-74S, 4 T-75S).
1 AD sqn with 24 F-5E, 3 F-5F.
1 tpt/SAR sqn with 8 C-130B/H, 6 *Skyvan* (3 SAR).
2 hel sqns with 36 UH-1B/H, 3 AB-212, 6 AS-350B *Ecureuil*.
3 trg sqns: 1 with 18 BAC-167, 6 *Jet Provost* (most non-operational); 1 with 11 SF-260W, 12 SF-260MS; 1 with 20 T-33A.
4 SAM sqns: 1 with 28 *Bloodhound* 2; 1 with 10 *Rapier*, 1 with 6 *Improved HAWK*, 1 with Bofors RBS-70.
AAM: *Sidewinder*-9J/P.
(On order: 70 A-4SI (being rebuilt), *HAWK*, *Rapier*/*Blindfire* SAM; 200 AGM-65 *Maverick* ASM.)

Para-Military Forces: police/marine police 7,500: 10 patrol craft; Gurkha guard units; People's Defence Force, some 30,000.

SRI LANKA

Population: 15,500,000.
Military service: voluntary.
Total armed forces: 16,560.
Est GDP 1981: Rs 85.005 bn ($4.417 bn). 1982: 100.314 bn ($4.820 bn).
Est def exp 1982: Rs 847.8 m ($40.736 m).
GDP growth: 5.3% (1981), 5.6% (1982).
Inflation: 18% (1981), 11% (1982).
$1 = rupees 19.246 (1981), 20.812 (1982).

Army: 11,000.
5 inf bdes (each with 1 regular, 2 reserve bns).
1 recce regt (bn), 1 fd arty, 1 AA regts, 1 engr regt } (each with one regular and one reserve unit).
1 sigs bn.
Support services.
18 *Saladin* armd, 15 *Ferret* scout cars; 10 BTR-152 APC; 12 76mm, 12 85mm guns; 12 82mm, 12 4.2-in (107mm) mor; 24 40mm, 12 3.7-in (94mm) AA guns.

RESERVES: 14,000; 10 bns, plus supporting services and a Pioneer Corps.

Navy: 2,960.
7 *Sooraya* (Ch *Shanghai*-II), 1 Sov *Mol* FAC(G).
31 coastal patrol craft(.
(On order: 7 coastal patrol craft.)

Bases: Trincomalee, Karainagar, Colombo, Tangalla, Kalpitiya.

RESERVES: Naval Volunteer Force 582.

Air Force: 2,600.
1 tpt sqn with 1 HS-748, 2 DC-3, 3 Riley, 1 *Heron*, 3 Cessna 337, 1 206, 1 421C.
1 hel sqn with 7 Bell 206, 2 SA-365.
Trainers incl 4 Cessna 150/152, 7 *Chipmunk*, 3 *Dove*.
(In storage: 5 MiG-17F, 1 MiG-15UTI, 2 *Jet Provost* Mk 51 ac; 2 Ka-26 hel.)

RESERVES: 1,000; 3 sqns Air Force Regt, 1 sqn Airfield Construction Regt.

Para-Military Forces: Police Force 14,500. Volunteer Force 5,000. Home Guard.

TAIWAN

Population: 18,500,000.
Military service: 2 years.
Total armed forces: 464,000.
Est GNP 1980/1: $NT 1,566 bn ($US 43.50 bn). 1981/2: 1,725 bn ($US 46.0 bn).
Est def exp 1981/2:[13] $NT 135.0 bn ($US 3.60 bn). 1982/3: $NT 132.90 bn ($US 3.323 bn).
GNP growth: 5.0% (1981), 3.7% (1982).
Inflation: 12% (1981), 4% (1982).
$US 1 = $NT 36.0 (1980/1), 37.5 (1981/2), 40.0 (1982/3).

Army: 310,000.
3 Army, 6 corps HQ.
12 hy inf divs.
6 lt inf divs.
6 armd/inf bdes.
3 AB bdes.
4 tk gps.
20 fd arty bns.

5 SAM bns; 2 with *Nike Hercules*, 3 with *HAWK*.
6 army aviation sqns.
310 M-48 MBT; 325 M-24 (90mm gun), 795 M-41 lt tks; M-8 armd cars; M-3 half-track, 1,100 M-113, 150 V-150 *Commando* APC; 300 M-59 155mm guns/how; 350 M-116 75mm pack, 550 M-101 (T-64) 105mm, 90 M-114 (T-65) 155mm, 10 M-115 203mm towed, 225 M-108 105mm, 125 M-109 A-1 155mm, 75 M-110 203mm SP how; 81mm mor; *Kung Feng* (*Worker Bee*) towed and SP 127mm MRL; *Hsiung Feng* (*Drone Bee = Gabriel*-type) coastal defence SSM, *Ching Feng* (*Green Bee = Nike Hercules*-type) SSM/SAM; 150 M-18 76mm SP ATK guns; 500 106mm RCL; *Kun Wu* (*Fire God = TOW*-type) *TOW* (some SP) ATGW; 300 40mm AA guns (some M-42 SP); 400 *Nike Hercules*, 800 *HAWK*, 20 *Chaparral* SAM; 118 UH-1H, 2 KH-4, 7 CH-34 hel.
(On order: 164 M-113 APC (incl variants), 125 M-109 155mm, 75 M-110A 203mm SP how; 1,000 *TOW*, *Kun Wu* ATGW; 370 *Improved HAWK* SAM.)

DEPLOYMENT: *Quemoy:* 60,000; *Matsu:* 20,000.

RESERVES: 1,500,000: 9 divs; an additional 1.3 million have some Reserve obligation.

Navy: 38,000.
2 US *Guppy*-II submarines.
24 US destroyers: 11 *Gearing* with 1 hel (1 with 3 *Hsiung Feng* (*HF*) SSM, 9 with 1 × 8 *ASROC*); 1 *Gearing* radar picket with 3 *HF*; 8 *Sumner* (1 with 1 × 3, 2 with 2 × 3 *HF*); 4 *Fletcher* with 1 × 2 *Sea Chaparral* SAM.
9 US frigates: 8 *Lawrence*, 1 *Crosley*.
3 US *Auk* corvettes.
28 FAC(M) with *HF* SSM: 2 *Lung Chiang* with 4 × 1, 26 *Tzu Chiang* (*Dvora*) with 2 × 1.
5 FAC(T): 3 ex-US 71-ft/79-ft, 2 Japanese-built.
28 coastal patrol craft(.
13 US *Adjutant* and 268 coastal MCM.
2 LSD, 23 LST, 4 LSM, 22 LCU, some 400 small landing craft.
1 repair ship; 2 tpts; 7 tankers.
(On order: 2 *Zwaardvis* subs, 2 *Lung Chiang*, 4 *Tzu Chiang* FAC(M), *ASROC* ASW, 284 *Improved Sea Chaparral* SAM.)

Bases: Tsoying, Makung (Pescadores), Keelung.

RESERVES: 45,000.

Marines: 39,000.
3 divs.
LVT-4/-5 APC; 105mm, 155mm how; 106mm RCL.

RESERVES: 35,000.

Air Force: 77,000; 474 combat ac; 12 combat hel.
5 combat wings.
13 FGA sqns: 9 with 82 F-5A, 226 F-5E, 22 F-5F; 2 with 42 F-100A/D; 2 with 40 F-104G/D.
1 interceptor sqn with 19 F-104A.
1 recce sqn with 4 RF-104G.
1 MR sqn with 9 S-2A, 30 S-2E.
1 ASW hel sqn with 12 Hughes *Defender* 500MD.
1 SAR sqn with 8 HU-16B ac, 10 UH-1H hel.
6 tpt sqns with 30 C-47, 5 C-54, 1 C-118B, 59 C-119, 10 C-123, 1 Boeing 720B.
Trainers incl 55 PL-1B *Chien Shou*, 50 T-CH-1, 32 T-33, 30 T-28, F-5B/F, 68 F/TF-104G, 6 F-104D, F-100F.
2 hel sqns with 7 UH-19, 10 Bell 47G.
AAM: *Sidewinder*.
ASM: *Bullpup*.
(On order: 60 F-5E/F ftrs; 50 XAT-3 trg ac.)

RESERVES: 90,000.

Para-Military Forces: Taiwan Garrison Command, 25,000.

THAILAND

Population: 49,750,000.
Military service: 2 years.
Total armed forces: 235,300.
GDP 1982: baht 858.37 bn ($37.320 bn).
Def exp 1982: baht 33.050 bn ($1.437 bn). 1983: 35.927 bn ($1.562 bn).
Est FMA 1982: $85 m.
GNP growth: 6.3% (1981), 4.2% (1982).
Inflation: 12.7% (1981), 5.2% (1982).
$1 = baht 23.0 (1981/3).

Army: 160,000.
4 Regions.
1 cav div (2 cav, 1 arty regts).
1 armd div (1 tk, 1 cav, 1 mech regts).
7 inf divs (5 with 1 tk bn).
1 special forces div (second planned).
1 arty div, 1 AA div (2 AA arty regts).
11 engr bns.
8 indep inf bns.
4 recce coys.
55 M-48A5 MBT; 200 M-41, 144 *Scorpion*, M-24 lt tks; 32 *Shorland* Mk 3 recce; 340 M-113, M3A1 half-track, 120 V-150 *Commando*, 20 *Saracen* APC; 300 M-116 75mm pack, M-101 105mm, 80 M-114 155mm how; 81mm, 120mm mor; M-72 *LAW* RL; 57mm, M-20 75mm, 215 106mm RCL; *TOW*, *Dragon* ATGW; 80 40mm AA guns, incl M-42 SP; *Redeye* SAM.
Army Aviation:
3 airmobile coys, some hel flts.
4 C-47, 1 *King Air* tpt, 80 O-1, 13 U-17A, 1 Beech 99 lt, 23 T-41A trg ac; 76 UH-1B/H, 4 CH-47A, 15 OH-13H, 3 OH-58A, 11 TH-55A hel.
(On order: 100 M-48A5, 16 M-60A3 MBT; 56 *Cascavel* armd cars; 148 M-113 (incl variants), 164 V-150 APC; 34 M-114 155mm how; 24 M-167A1 20mm *Vulcan* AA; *Blowpipe* SAM; 47 *Fantrainer* trg ac; 4 UH-60A hel.)

RESERVES: 500,000.

Navy: 32,200, incl naval air and marines.
6 frigates: 1 *Yarrow*-type with 1 × 4 *Seacat* SAM; 2 PF-103; 2 US *Tacoma*; 1 *Cannon*.
6 FAC(M): 3 Breda BMB-230 with 4 *Exocet* SSM; 3 TNC-45 with 5 *Gabriel* SSM.
2 FAC(G).
21 US large patrol craft: 7 PC-461, 10 PGM-71, 4 *Cape*.
27 coastal, 40 river patrol craft(.
4 US *Bluebird* coastal minesweepers, 5 minesweeping boats(.
5 LST, 3 LSM, 2 LSIL-351, 1 LCG, 6 LCU, 25 LCM (all US), LCA, 8 LCVP.
3 trg ships: 2 Br (1 *Algerine*, 1 *Flower*), 1 *Maeklong*.

NAVAL AIR: some 15 combat ac.
1 MR/ASW sqn with 10 S-2F MR.
1 MR/SAR sqn with 3 F-27MPA, 2 HU-16B, 2 CL-215, 5 C-47.
1 trg/SAR hel sqn with 11 UH-1H/N.
1 observation sqn with 13 U-17, 10 O-1A, 7 O-2, 2 LA-4 ac.

MARINES: (13,000).
1 bde: 2 inf, 1 arty regts; 1 amph assault bn; 40 LVTP-7 amph APC, 24 M-68 155mm guns/how, support weapons.
(On order: 1 *Descubierta* frigate, 3 Breda, 4 PSMM5 FAC(M), 2 corvettes, 1 450-ton FAC(G), 4 large, 3 coastal patrol craft; *Harpoon* SSM; 10 MM-39 *Exocet* coast defence msls.)

Bases: Bangkok, Sattahip, Songkla, Phangnga.

Air Force: 43,100; 188 combat ac.
1 FGA sqn with 13 F-5A/B.
2 AD sqns with 34 F-5E, 5 F-5F.
10 COIN sqns: 1 with 22 T-28D; 2 with 25 OV-10C; 1 with 15 A-37B; 1 with 25 AU-23A *Peacemaker*; 1 with 14 AC-47, 2 *Nomad* N-22B; 1 with 15 T-33A, 3 RT-33.
1 recce sqn with 4 RF-5A, 6 RC-47D, 3 *Arava* 201, 1 *Queen Air* 65, 1 Cessna 340.
3 tpt sqns, incl Royal flt: with 11 C-47, 3 *Merlin* IVA; 2 with 17 C-123B, 3 C-130H; 3 HS-748.
3 liaison sqns with 4 U-10, 23 O-1.
2 hel sqns with 18 CH-34C, 27 UH-1H, 2 Bell 412.
Trainers incl 9 *Chipmunk*, 10 T-37B, 6 O-1A, 9 T-41A, 16 SF-260MT, 23 CT-4.
AAM: AIM-9 *Sidewinder*.
Airfield defence troops: 4 bns, *HAWK* SAM.
(On order: 18 *Nomad*, 6 HS-748, 1 C-130H-30 tpt ac; AIM-9P AAM; *Blowpipe* SAM.)

Para-Military Forces: Volunteer Defence Corps 33,000. Marine Police 1,700. Police Aviation 500. 3 *Skyvan*, 8 PC-6, 2 DHC-4, 1 Do-28, 2 Cessna 310, 1 *Airtourer*, 1 CT-4 ac; 27 Bell 205, 13 206, 1 S-62, 6 HH-12, 1 KH-4 hel. Border Patrol Police 20,000. Special Action Force 3,800. Rangers 13,000. Village Scouts. National Defence Volunteers. 20 V-150 *Commando* APC, 1 Coastguard cutter.
(On order: 20 *Nomad*.)

VIETNAM

Population: 57,200,000.
Military service: 3 years; specialists 4 years; some ethnic minorities 2 years.
Total armed forces: 1,220,500.
Est FMA 1982: $1 bn.
Est GNP 1981/2: estimates range from $6.0 bn to $16.0 bn.
$1 = dong 2.18 (1981/2).

Army: 1,200,000.
16 corps HQ.
1 armd div.
58 inf divs.[14]
10 marine bdes.
7 engr, 15 economic construction divs.
5 indep fd, 4 indep AA arty bdes.
4 indep engr bdes.
6 indep armd regts.
1,500 T-34/-54/-55/-62, Type-59, 400 M-48 MBT; 450 PT-76 and Type-60/-63, 150 M-41 lt tks; M-8, M-20 armd cars; BRDM-2 recce; 1,500 BTR-50/-60, Type-56, K-63, 800 M-113, V-100 *Commando* APC; 300 76mm, 85mm, 100mm, 122mm, 200 130mm, M-107 175mm guns; 75mm pack, M-101/-102 105mm, 122mm, 100 152mm, M-114 155mm how; 90 SU-76, SU-100, ISU-122, 200 M-109 155mm and M-110 203mm SP how; Type-63 107mm, BM-21 122mm, BM-14-16 140mm MRL; 82mm, 107mm, 120mm, 160mm mor; 75mm, 82mm, 107mm RCL; 4,000 23mm, 30mm, 37mm, 40mm, 57mm, 85mm, 100mm, and 130mm towed, Type-63 37mm, M-42 40mm, ZSU-23-4, ZSU-57-2 SP AA guns; SA-2/-3/-6/-7/-9 SAM.[15]

Navy: 8,000.[15]
4 frigates: 2 Sov *Petya*, 1 US *Barnegat*, 1 *Savage*.
8 Sov *Osa*-II FAC(M) with *Styx* SSM.
6 Sov SO-1, 6 large patrol craft.
8 *Shershen* FAC(T)(.
6 *Zhuk*, 3 PO-2 coastal patrol craft(.
3 510-1152, 3 *Polnocny* LST.
1 SAR hel sqn with 10 Mi-4.

Bases: Cam Ranh Bay, Danang, Kompong Som, Haiphong, Hanoi, Ha Tou, Ho Chi Minh City.

Air Force: 12,500; 287 combat ac, 36 combat hel (plus many in store).[15]
3 FGA sqns with 68 MiG-17/F-4, 43 Su-7/-20.
6 interceptor sqns with 176 MiG-21bis/F/PF.
Tpts incl 20 An-2 and Li-2, 9 An-24, 50 An-26, 2 An-30, 6 Tu-34, 11 Yak-40, 7 Il-14, 2 Il-18, 2 C-130, 1 DC-3, 4 DC-4, 2 DC-6, 2 Boeing 707, 7 U-17.
Hel incl 22 Mi-6, 38 Mi-8, 22 Mi-24, 14 Ka-25, 49 UH-1.
About 60 trainers incl L-29, L-39, MiG-17, MiG-21.
AAM: AA-2 *Atoll*.
Air Defence: 17 SAM regts with SA-2/-3.

Forces Abroad: (numbers fluctuate) Laos: 45,000 (3 inf divs and spt tps). Kampuchea/Cambodia: 170,000 (12 army divs plus spt tps, naval base, fighter ac incl MiG-21).

Para-Military Forces: Border Defence Forces 60,000; Militia about 1,500,000; incl draft age persons and ex-servicemen org in coys, platoons, and squads.

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[1]Actual strength suspect. Divs reported to average 2,500 (*i.e.*, about quarter strength). Desertion is common. The Soviet High Command in Afghanistan effectively controls the Afghan forces; one cannot differentiate between Soviet and Afghan holdings of identical equipment.

Resistance to the Soviet presence involves many among male population, and perhaps 90,000 guerrillas (possible 20,000 intermittently active) supported by some 15 exile political groups, six of them active. Equipment: mainly small arms, 60mm, 2-in, 82mm mor; RPG-7 RL; 75mm, 82mm RCL; 12.7mm, 14.5 AA machine guns, SA-7 SAM, and ATK mines.

[2]Spares are short; some equipment, incl 10 T-34, 1 DC-6, 4 DHC-3, 1 DHC-4, 2 F-27, 1 Yak-40, is unserviceable.

[3]All services form part of the Army.

[4]Spares are short; some equipment is unserviceable.

[5]KOSTRAD = Strategic Reserve Command: army command (16,500–19,000 men) under direct control of the Minister of Defence and Security. Incl ground combat command (1 armd, 3 inf bdes, 1 arty regt), air combat command (with 2 AB bdes). Other HQ are:

KOPKAMTIB (Operational Command for the Restoration of Law and Order): no forces assigned.

KOPPASSANDHA = Special Forces Command 4,000: 4 special para/cdo gps.

[6]Forces opposed to the regime: *Coalition of Democratic Kampuchea:* Democratic Kampuchea *(Khmer Rouge)*; some 30,000 org in bdes and bns; National Liberation Front *(Sereika)*, some 10,000 small arms, incl; mor, RCL; *Moulinaka*, perhaps 3,500. These forces are formally merged in the Coalition of Democratic Kampuchea, but appear to operate independently.

[7]It is uncertain whether this covers all defence expenditure, and there is no consensus on a suitable exchange rate for the dollar conversion.

[8]Excludes 1982–6 plans to purchase some $3.5 bn worth of new equipment from the US.

[9]Data unreliable.

[10]Equipment serviceability unknown, US types being replaced.

[11]Official figure.

[12]Voted budget.

[13]Estimates for each year run as high as $NT 165.0 bn ($4.4 bn).

[14]Inf div, strengths vary by geographic location between 5,000 and 15,000. Composition and roles also vary.

[15]Much ex-US eqpt is inoperable.

Latin America

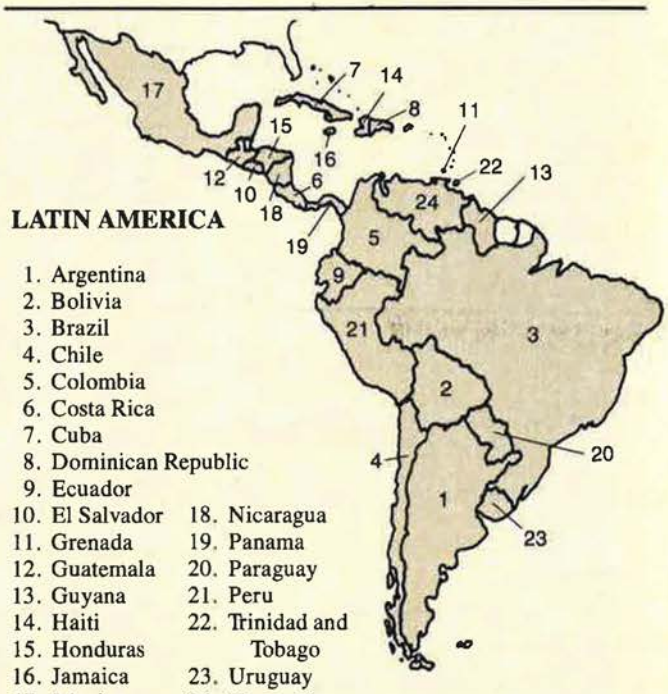
Continental Treaties and Agreements

The Act of Chapultepec. Signed by Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the US, Uruguay, and Venezuela in March and April 1945, this Act declares that if any aggression across boundaries established by treaty occurs, or threatens, the signatories will consult to agree upon measures up to and including the use of armed force to prevent or repel such aggression.

The Inter-American Treaty of Reciprocal Assistance (Treaty of Rio). Signed in September 1947 by all parties to the Act of Chapultepec plus El Salvador and Trinidad and Tobago but except Ecuador and Nicaragua, this Treaty expands the Act, constrains signatories to the peaceful settlement of disputes among themselves, and provides for collective self-defence should any member party be subject to external attack. Since coming into force on 3 December 1948, it has been invoked some 12 times. Cuba withdrew in March 1960.

The Charter of the Organization of American States (OAS). Dated April 1948, the Charter embraces declarations based upon the Treaty of Rio. The members of the OAS—the signatories to the Act of Chapultepec plus Antigua and Barbuda, Barbados, Dominica, El Salvador, Grenada, Jamaica, St Lucia, St Vincent, Surinam, 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. Amendments (Rio, 1965; Bogotá, 1966) reiterated the goal of peaceful settlement of disputes. In 1965–6 an Inter-American Peace Force was formed for service in the Dominican Republic. Subsequent attempts to create a permanent force have failed, but an Inter-American Defence Board has been formed to co-ordinate planning. Declarations condemning Communism in the Western Hemisphere, signed in Bogotá in 1948 by 17 nations (Brazil, Chile, the Dominican Republic, and the US abstaining), were reiterated at Caracas (1954, 1973), San José (1960), Punta del Este (1962), and Washington (1972). Cuba was excluded from 1962 to 1975.

Treaty for the Prohibition of Nuclear Weapons in Latin America (The Tlatelolco Treaty). This was signed in February 1967 by 25 Latin American countries, 24 of which have ratified it (Argentina has not). Brazil and Chile will not implement it until all other Latin American states have done so. Cuba and Guyana have not signed it. The Treaty therefore is not in force for those five countries. Britain and the Netherlands have ratified it for the territories within the Treaty area for which they are internationally responsible and, with France and the US, have signed Protocol I (which commits states outside the region to accept, for their territories within it, the Treaty restrictions regarding the emplacement or storage of nuclear weapons); Britain, China, France, the USSR, and the US have signed Protocol II (an undertaking not to use or threaten to use nuclear weapons against the parties to the Treaty). An Agency was set up to monitor compliance.



Other Agreements

The 1903 Treaty with the Republic of Panama, granting the United States virtual sovereign rights over the Canal Zone in perpetuity, was renegotiated, and the resulting 1977 Treaties came into force in October 1979. About 40% of the former Canal Zone will remain under US control until 31 December 1999. Panama received 11 of 14 US bases. Defence of the Canal will be the joint responsibility of both nations, with Panama assuming an increasing role until the total accession of the Canal to her sovereignty.

Belize (British Honduras) became independent on 21 September 1981. Britain agreed to leave troops as protection and to train the Belizean defence forces 'for an appropriate time'. The US is also providing aid and training. Under the 'Commonwealth Pact' Britain, Barbados, Bahamas, Canada, Guyana, Jamaica, and Trin-

idad and Tobago will meet and consult in the event of a threat to Belize's independence.

The July 1965 El Salvador, Guatemala, Honduras, and Nicaragua agreement to form a military bloc against possible Communist aggression must be assumed now to be in abeyance. In November 1981 El Salvador, Guatemala, and Honduras agreed to an informal alliance against Cuba, Nicaragua, and domestic guerrilla movements in each. The US has been providing assistance to Honduran-based rebels against Nicaragua, and to the Government against rebels in El Salvador. A similar regional grouping, *Communidad Democrática Centroamericana*—Costa Rica, Honduras, and El Salvador—agreed in January 1982 to provide mutual aid in case of external aggression. Colombia, Venezuela, and the US are 'observer' members. A military Pact between Argentina and Peru, details unknown, was reported in late 1982.

The United States has had a bilateral agreement with Cuba for jurisdiction and control over Guantánamo Bay since 1934. In 1960 the US stated that it could be modified or abrogated only by mutual agreement and that she had no intention of giving such an agreement. In 1941 she leased 2.3 square miles from Bermuda for a naval and air base. This lease continues.

The United States has bilateral military sales arrangements at varying levels with most countries of the region and concluded a status of forces agreement with Antigua in 1977/8. The Soviet Union has no formal defence agreements with any of the states in the area.

Cuba and Vietnam signed a 25-year Treaty of Friendship and Co-operation in October 1982. Cuba has also been reported to be supporting the new military forces in Grenada.

Argentina and Brazil are designing and manufacturing for export their own military equipment. Brazil has sold military equipment to the Middle East (Algeria, Iraq, Libya, Tunisia), Africa (Zambia), and to Belgium and Canada as well as to Latin America. Chile is assembling *Mirage* 50 aircraft and light AFV under licence.

ARGENTINA

Population: 29,000,000.
Military service: Army and Air Force 1 year, Navy 14 months.
Total armed forces: 153,000 (108,000 conscripts).
Est GNP 1981: pA 545,000 bn ($123.779 bn).
Est def exp range 1981:[1] pA 15,719–44,000 bn ($3.750–9.993 bn). 1982: 26,160–85,000 bn ($1.010–3.279 bn).
GDP growth: –5.0% (1981), –5.7% (1982).
Inflation: 132% (1981), 210% (1982).
$1 = pesos 4,403 (1981), 25,923 (1982).

Army: 100,000 (80,000 conscripts).
5 army corps.
2 armd cav bdes (each 2 armd cav, 1 tk regts; 1 arty bn).
3 mech, 2 inf bdes (each 3 regts, plus armd cav sqn, engr, arty bns).
2 mountain inf bdes.
2 jungle bdes.
1 AB bde (1 AB regt, 1 arty gp).
16 arty bns (2 SP; 12 with brigades).
1 Presidential Guard tk regt.
4 indep cav regts.
5 AD bns.
1 indep engr gp (regt), 5 indep engr bns.
1 aviation bn (5 dets).
AFV: 125 M-4 *Sherman*, 130 *TAM* MBT; 50 M-41, 60 AMX-13 lt tks; VBC-90 armd cars; AMX-VTP, some 150 *TAM* VCPT MICV; 85 M-3, 125 M-113, 80 MOWAG *Roland*, 5 BDX APC.
Arty: 18 M-59 155mm towed guns; 180 105mm incl pack, 70 M-114 155mm towed, 20 105mm, 24 Mk F3, 6 M-109 155mm SP how; 81mm, 170 120mm mor; 127 *Kuerassier* 105mm SP ATK guns; 75mm, 90mm, 105mm RCL; Rh 202 twin HSS-669 20mm, HS-83/4 30mm, K-63 35mm, 40mm, 88mm, 90mm (trg) AA guns.
Msls: SS-11/-12, *Bantam, Cobra, Mathogo, Mamba* ATGW; *Tigercat, Blowpipe, Roland*, SAM-7 SAM.
Air: 3 G-222, 3 DHC-6, 5 *Turbo-Commander* 690A, 2 *Turbo-Porter*, 5 *Merlin* IIIA, 2 *Queen Air*; 1 *Sabreliner*; 49 Cessna (15 182, 20 U-17A/B, 7 207, 2 *Citation*, 5 T-41) ac; 9 A-109; 31 Bell (7 206, 18 UH-1H, 2 47G, 4 212), 6 FH-1100, 1 CH-47C, 6 SA-315B *Lama*, 12 SA-330 *Puma* hel.
(On order: 85 *TAM* MBT; 198 *Kuerassier* SP ATK; 12 *Puma*, 9 A-109 hel.)

RESERVES: 250,000: National Guard, 200,000; Territorial Guard 50,000.

Navy: 36,000 (18,000 conscripts), incl naval air force and marines.
2 Type 209 subs.
1 Br *Colossus* aircraft carrier (up to 14 *Super Etendard*/A-4, 6 S-2 ac; 4 S-61 hel).
8 destroyers: 1 *Meko* 360H-2 with 2 × 4 *Exocet* SSM, 1 × 8 *Aspide* multi-role msls; 2 Type 42 with 4 *Exocet*, 1 × 2 *Sea Dart* SAM, 1 *Lynx* hel; 5 US (3 *Sumner*, 1 *Gearing* with 4 *Exocet*, 1 *Fletcher*).
3 Fr A-69 corvettes with 2 *Exocet* SSM.
5 patrol ships: 2 US *Cherokee*, 2 *King* (1 trg), 1 US *Sotoyomo*.
1 large patrol vessel.
2 TNC-45 FAC(G).
4 *Dabur* FAC(P).
2 US *Higgins* FAC(T)(.
6 Br *Ton* coastal minesweepers/hunters.
1 LSD, 2 LST, some LCVP, 4 LCM(.
1 14,000-ton fleet tanker, 1 fleet spt, 1 tpt ships.
(On order: 4 TR-1700, 2 TR-1400 subs, 3 *Meko* 360H-2 destroyers, 6 *Espora* (*Meko* 140) corvettes.)

Bases: Buenos Aires, Rio Santiago, Puerto Belgrano, Mar del Plata, Ushuaia.

NAVAL AIR FORCE: (3,000); 32 combat ac, 2 combat hel.
1 attack sqn with 6 A-4Q, 14 *Super Etendard*.
1 MR sqn with 6 S-2E, 6 SP-2H (3 L-188 converting to MR).
1 tpt sqn with 4 L-188 *Electra*, 1 HS-125, 3 F-28.
1 liaison sqn with 8 *Super King Air*, 5 *Queen Air*, 3 *Turbo-Porter*.
Hel incl 5 S-61D/NR, 1 *Alouette* A-103(III), 2 WG-13 (*Sea Lynx*).
3 trg sqns with 8 EMB-326GB, 11 T-34C, 12 T-28, 10 MB-339A.
ASM: 20 AM-39 *Exocet*.
(On order: 24 A-4E/H *Skyhawk* attack, 10 EMB-326 *Xavante* trg ac; 6 WG-13 hel.)

MARINES: (10,000).
2 Fleet Forces (each one weak bde), 1 amph spt force:
2 marine inf bdes with 5 marine bns.
2 cdo gps.
1 amph bn.
1 fd arty bn.
1 AD regt.
1 sigs bn.
1 service bn.
6 indep inf coys.
15 LVT-3/-4, 19 LVTP-7, 15 LARC-5, 6 MOWAG *Roland* APC; 40 105mm how; 81mm, 106mm mor; 75mm, 90mm, 105mm RCL; 20 *Bantam* ATGW; 20mm, 35mm AA guns; 7 *Tigercat* SAM.
(On order: 12 Panhard ERC-90 *Lynx* armd cars.)

Air Force: 17,000 (10,000 conscripts); 164 combat ac, 18 armed hel.
9 air bdes (1 more forming) (1 AD with ac, AD, and EW elms).
1 bbr sqn with 6 *Canberra* B-62, 2 T-64.
5 FGA sqns: 3 with 30 A-4P *Skyhawk*; 2 with 15 MS-760A *Paris* II.
4 FGA/interceptor sqns: 1 with 15 *Mirage* IIIEA, 1 IIIDA; 1 with 22 IIICJ; 1 with 10 5P; 1 with 32 *Dagger (Nesher)*.
2 COIN sqns with 31 IA-58A *Pucará*.
1 COIN hel sqn with 12 Hughes 500M (369HM), 6 UH-1H.
1 SAR hel sqn with 5 *Lama*.
5 tpt sqns with 4 Boeing 707, 8 C-130E/H, 1 KC-130H, 3 *Learjet* 35A, 4 C-47, 13 F-27, 5 F-28, 5 DHC-6, 15 IA-50 *Guaraní* II, 2 *Merlin* IVA ac; 2 S-58T (VIP) hel.
1 Antarctic sqn with 1 DHC-6, 1 LC-47 ac; 2 S-61R/NR, 4 UH-19, 2 CH-47C (SAR), 15 Bell (3 UH-1D, 4 47G, 8 212) hel.
1 comms sqn with 13 *Shrike Commander*.
Trg: 24 *Paris*, 48 T-34C, 35 Cessna 182.
AAM: R-530.
ASM: AS-11/-12, *Pescador (Kingfisher)*.
(On order: 11 IA-58 *Pucará* COIN, 2 C-130, 16 *Turbo-Commander* tpt, 4 EMB-326GB, 10 MB-339 trg ac, 3 *Puma* hel.)

Para-Military Forces: (Ministry of Defence): 21,000. Gendarmerie 12,000: *Shorland* armd cars, 40 M-113 APC, 23 lt ac, 3 hel, mainly for frontier duties. Argentine Naval Prefecture (coastguard) 9,000: 16 large (5 with 1 hel; 5 more on order), 18 coastal patrol craft; 5 SC-7 *Skyvan* ac, 6 Hughes 500M *Defender*, 3 *Puma* hel.

BOLIVIA

Population: 5,800,000.
Military service: 12 months, selective.
Total armed forces: 27,600.
Est GNP 1981: pB 181.37 bn ($7.399 bn).
Def exp 1981: pB 4.561 bn ($186.087 m).
GDP growth: –1.1% (1981), –9.2% (1982).
Inflation: 32.1% (1981), 40% (1982).
$1 = pesos 24.510 (1981).

Army: 20,000.
3 corps, 9 div HQ.
6 cav regts (horsed).
2 mech regts (each 2 bns).
18 inf regts (incl 1 Presidential Guard, 2 mountain), each with 2 bns.
3 arty regts.
2 ranger regts.
1 para regt.
2 armd ATK bns.
6 engr bns.
24 EE-9 *Cascavel* armd cars; 18 M-113, 15 V-100 *Commando*, 22 MOWAG *Roland*, 24 EE-11 *Urutu* APC; 26 75mm guns; 6 M-116 75mm pack, 6 M-101 105mm how; 60mm, 45 81mm mor; 36 JPz 105mm SP ATK guns; M1A1 37mm AA guns.

Navy: 3,600 (incl Marines).
1 lt cargo ship; 40 river tpts.
4 lake and river patrol craft.
1 Cessna U-206G ac.
1 marine bn.

Bases: Tiquina, Puerto Busch, Riberalta, Trinidad, Guayaramerín.

Air Force: 4,000; 22 combat ac.
1 ftr/trg sqn with 12 T-33A/N, 5 F-86F.
2 COIN sqns with 5 AT-6G.
1 SAR hel sqn with 5 SA-315B *Gavião (Lama)*.
1 tpt sqn: 1 *Electra*, 1 L-100-30, 1 C-130H, 1 *Sabreliner*, 2 *Learjet*, 2 *Arava*, 2 CV-440, 3 CV-580, 8 C-47, 3 *King Air*, 6 F-27, 2 U-3A.
Utility ac incl 1 *Turbo-Porter*; 28 Cessna (3 172K, 3 *Turbo-Centurion*, 9 185/U-17A, 9 U-206C/G, 2 414, 2 421).
Trg ac incl: 4 T-6G, 3 T-41D, 18 T-23 *Uirapuru*, 4 SF-260M, 25 PC-7 *Turbo-Trainer*.
1 para bn.
1 airbase defence regt (Bofors L/40mm AA guns).

[1]See p. 125 for footnotes.

BRAZIL

Population: 127,690,000.
Military service: 12 months.
Total armed forces: 277,100 (133,900 conscripts).
GDP 1981: Cr$ 26,833 bn ($288.124 bn).
Est def exp 1981: Cr$ 145.0 bn ($1.557 bn); 1982: 330.0 bn ($1.838 bn).
GDP growth: −3.5% (1981), 0% (1982).
Inflation: 95.2% (1981), 99.7% (1982).
$1 = cruzeiros 93.13 (1981), 179.51 (1982).

Army: 182,800 (132,000 conscripts).
4 army, 2 regional comd, 8 military region, 8 div HQ.
1 armd bde.
1 armd cav bde.
3 armd inf bdes.
5 mech cav bdes.
1 mech inf bde.
11 motor inf bdes.
1 mixed, 2 para bdes.
9 fd arty regts (2 hy, 1 AB).
8 coast arty gps.
10 AA arty gps (5 hy).
5 lt 'jungle' inf bns.
2 engr gps.
AFV: 75 M-4 MBT; some X-1A2, some 250 M-3A1, some 300 M-41B lt tks; 138 EE-9 *Cascavel*, 29 M-8 armd cars; some 120 EE-11 *Urutu*, 22 M-59, some 600 M-113 APC.
Arty: 500 M-116 75mm pack, 413 105mm, 150 M-114 155mm towed, some 60 M-7 and M-108 105mm SP how; some 240 57mm to 304.8mm (12-in) incl some 100 Mk 5 6-in (152mm) coast arty guns; 81mm, 4.2-in (107mm), 120mm mor; 5 SS-06 108mm, SS-40 180mm incl SP MRL.
ATK: 240 M-18A1 57mm M-20 75mm RCL; 3.5-in (89mm) RL; 106mm RCL; 300 *Cobra* ATGW.
AD: 30 35mm, 30 40mm, some 180 57mm, 90mm AA guns; 4 *Roland* II SAM.
(On order: 50 X-1A2 lt tks; SS-60 (FGT-X40) 300mm MRL.)

RESERVES: Trained first line 1,115,000: 400,000 subject to immediate recall. Second line (limited trg): state military police schools, centres: 225,000.

Navy: 49,000 incl naval air force, marines (1,900 conscripts).
8 subs: 3 *Oberon*, 5 ex-US *Guppy* II/III.
1 Br *Colossus* carrier (capacity 20 ac, incl 7 S-2A ASW ac; 4 *Sea King* hel).
10 US destroyers: 5 *Sumner* (1 with 1 × 4 *Seacat* SAM, 4 with 1 *Wasp* hel); 2 *Gearing* with *ASROC* ASW, 1 *Wasp* hel; 3 *Fletcher*.
6 *Niteroi* frigates all with 2 × 3 *Seacat* SAM, 1 *Lynx* hel, 2 with 2 × 2 *Exocet* SSM, 4 with *Ikara* ASW.
10 *Imperial Marinheiro* patrol vessels.
5 river patrol ships: 2 *Pedro Teixeira*, 3 *Roraima*.
1 river monitor with 1 × 3-in (76mm), 2 × 40mm, 2 × 47mm, 6 × 20mm guns.
6 *Piratini*-class large patrol craft.
6 *Schütze*-type coastal minesweepers.
2 US LST; 4 US 1610 LCU.
3 tp, 17 river tpts.
1 repair, 1 spt ships, 3 tankers, numerous auxiliaries.

Bases: Rio de Janeiro, Aratu (Salvador), Val-de-Caes (Belem), Natal, Ladario (Mato Grosso province), Rio Negro (Amazonas province).

NAVAL AIR FORCE: (100); 12 combat hel.
3 ASW hel sqns with 4 SH-3D *Sea King*, 8 *Lynx* Mk 89.
1 utility hel sqn with 5 *Wasp* HAS-1, 8 AB-206B, 9 AS-350M *Esquilo*.
1 hel trg sqn with 10 AB-206B.

MARINES: (14,500).
Fleet Force: 1 amph div (1 comd, 3 inf, 1 service bns, 1 arty gp).
1 Reinforcement Comd: 5 bns incl 1 engr, 1 special operations, supply.
Internal Security Force: 9 Regional Gps.
25 EE-9 *Cascavel* armd cars; LARC-5, 25 EE-11 *Urutu* APC; 8 M-102 105mm how; SS-06 108mm MRL.
(On order: 2 Type 209 subs, 4 corvettes, 1 trg ship; 12 *Exocet* SSM; 60 *Tigerfish* torpedoes; 4 SH-3H, 3 AS-330 *Puma* hel.)

Air Force: 45,300; 187 combat ac.
Air Defence Command: (16 combat ac).
1 interceptor gp (2 sqns) with 12 F-103E (*Mirage* IIIEBR), 4 F-103D (DBR).
Tactical Command: 8 gps (120 combat ac).
3 FGA sqns with 32 F-5E, 4 F-5B, 65 AT-26 *Xavante*.
2 recce sqns with 8 RC-95, 11 RT-26 *Xavante*.
4 liaison sqns: with 27 *Neiva* C/U/L-42, 2 EMB-810C (U-7A) *Seneca* ac, 23 UH-1H hel.
1 hel sqn with 2 UH-1H, 6 SA-330 *Puma*.
Maritime Command: 4 gps: (51 combat ac).
1 ASW sqn with 8 S-2E, 9 S-2A (7 in carrier).
3 MR sqns with 3 RC-130E, 19 EMB-110, 12 P-95 (EMB-111).
Transport Command: 6 gps (12 sqns), 6 indep sqns:
2 sqns with 9 C-130E/H, 1 with 2 KC-130H, 4 with 19 C-115 (DHC-5); 2 Boeing 737, 23 EMB-810C, 9 HS-125, 12 C-91 (HS-748), 41 EMB-110 *Bandeirante* (29 C-95, 8 C-95A, 4 -B), 6 EMB-121 (VU-9) *Xingu*, 5 C-47, 6 *Seneca* ac.
Training Command:
50 T-23 *Uirapuru* (being replaced by 100 YT-17), 86 T-25 *Universal* (being replaced), 5 T-27, 36 AT-26, some EMB-110, 5 *Neiva* U-42 ac; 16 Bell 47 (H-13J), 8 UH-1D hel.
1 calibration unit: 2 HS-125 (EC-93, U-93), 2 C-95A, 4 EC-95.
AAM: R-530, *Piranha*.
(On order: 88 AM-X, 12 EMB-120 *Brasilia* tpts, 100 YT-17 (A-123) *Tangara*, some 118 T-27 *Tucano* (EMB-312) trg ac.)

Para-Military Forces: Some 185,000 Public Security Forces in state, military police orgs (State Militias) under Army control and considered an Army Reserve.

CHILE

Population: 11,675,000.
Military service: 2 years (Army and Navy only).
Total armed forces: 96,000 (33,000 conscripts).
GDP 1981: pC 1,281.73 bn ($32.865 bn); 1982: pC 1,325.27 bn ($26.032 bn).
Est def exp 1980: pC 80.0 bn ($2.051 bn). 1981: 82.0 bn ($2.103 bn).
GDP growth: 5.3% (1981), −14% (1982).
Inflation: 20.7% (1981), 9.5% (1982).
$1 = pesos 39.00 (1980/1), 50.909 (1982).

Army: 53,000 (30,000 conscripts).
6 div HQ.
2 armd regts.
8 cav regts (3 mech, 5 mot).
24 inf regts (14 with 2 bns, 10 mountain with 1 bn each).
10 arty bns (6 fd, 3 mountain, 1 AA).
7 engr bns.
1 hel-borne ranger unit.
Army Aviation:
1 composite gp with 1 tac bn and spt unit.
150 M-4A3, 21 AMX-30 MBT; 25 M-3, 50 M-41 lt tks; 200 EE-9 *Cascavel* armd cars; 60 M-113, 300 EE-11 *Urutu*, 100 Cardoen/MOWAG *Piranha* APC; 124 105mm how; 12 Mk F3 155mm SP how; M-1 81mm, 120mm mor; M-18 57mm, 106mm RCL; *Milan*/*Mamba* ATGW; HS-639/665 20mm, 35mm AA guns.
Air: 6 C-212A10 tpts, 1 Cessna *Citation*, 8 Piper *Dakota* 236, 4 *Navajo*, 18 R-172 *Hawk* XP trg ac; 12 SA-330FL *Puma*, 1 AS-332 *Super Puma*, 10 SA-315B *Lama*, 2 AB-206B hel.
(On order: 100 *Piranha* APC.)

RESERVES: 240,000.

Navy: 28,000 (3,000 conscripts), incl naval air and marines.
2 *Oberon* subs.
3 cruisers: 1 Br *County* with 4 *Exocet* SSM, 1 × 2 *Seaslug*, 2 × 2 *Seacat* SAM; 1 Swed *Gota Lejon;* 1 US *Brooklyn* with 1 hel.
4 destroyers: 2 *Almirante* with 4 *Exocet* SSM, 2 × 4 *Seacat* SAM; 2 US *Sumner* with 1 hel.
2 *Leander* frigates with 4 *Exocet* SSM, 1 × 4 *Seacat* SAM, 1 hel.
2 *Reshef* FAC(M) with 6 *Gabriel* SSM.
4 Lürssen-type FAC(T).
4 US large patrol craft: 2 *Sotoyomo*, 1 *Cherokee*, 1 PC-1638.
18 coastal patrol craft(, incl 4 *Dvora*, 8 *Anchova*.
1 511-1152 LST, 1 *Batral* lt, 2 amph tpts, 3 LSM, 1 LCU.
2 tankers, 11 spt ships/tpts.
(On order: 2 Type 209 subs, 1 *County* cruiser.)

Bases: Talcahuano, Valparaiso, Puerto Montt, Punta Arenas, Puerto Williams, Iquique, Arica.

NAVAL AIR FORCE: (500); 5 combat ac.
1 composite sqn with 5 EMB-111A/N, 3 EMB-110C(N) *Bandeirante*, 3 C-212A, 10 *Pilatus* PC-7 ac; 9 *Alouette* III, 4 SH-57 (Bell 206A).

MARINES: (5,000).
5 bn gps, each with 1 inf bn +, coast AA arty elms.
MOWAG *Roland*, LVTP-5 APC; 16 105mm, 35 155mm how; 50 60mm, 50 81mm mor; 20 37mm AA guns.

Air Force: 15,000; 84 combat ac.
4 Air Bdes.
4 combat wings: 2 gps: each wing also has a comms flt with ac/hel.
4 FGA sqns with 16 *Hunter* F-71, 15 F-5E, 3 F-5F, 30 A-37B.
1 ftr/recce sqn with 13 *Mirage* 50FC, 3 C-101 *Aviojet*.
2 photo recce sqns with 2 Canberra PR-9, 2 *Learjet* 35-A.
1 tpt sqn with 1 Boeing 727, 1 707, 2 C-130H, 6 DC-6B, 9 Beech 99A, 1 *King Air* ac; 7 2 *Lama*, 1 Bell 47 hel.
Utility/liaison flts incl 17 DHC-6, 3 twin *Bonanza*, 10 T-25 ac, 3 S-55T, 4 *Lama* hel.
1 trg wing, 3 flying schools; 4 *Hunter* T-77, 30 T-34A, 25 T-37B/C, 8 T-41A, 4 Piper T-35 *Pillan*, 10 Cessna 180, 10 Piper *Dakota* 236 ac; 6 UH-1H, 3 Bell 212 hel.
AAM: *Sidewinder, Shafrir.*
ASM: AS-11/-12.
1 AA arty regt of 5 gps with GAI-CO1 twin 20mm, K-63 twin 35mm, M-1A1 37mm AA guns; 4 btys of 12 *Cactus* (*Crotale*) SAM.
(On order: 3 *Mirage* 50 fighters, 13 C-101BB, Piper *Dakota, Pillan* ac; 3 *Super Puma* hel.)

Para-Military Forces: 27,000 *Carabineros.*

COLOMBIA

Population: 27,372,000.
Military service: 2 years.
Total armed forces: 70,200 (28,500 conscripts).
GDP 1981: pC 2,033.9 bn ($37.325 bn).
Est def exp 1981: pC 20.371 bn ($373.841 m). 1982: 26.944 bn ($420.330 m).
GDP growth: −0.5 (1981), 1.3% (1982).
Inflation: 24.6% (1981), 40% (1982).
$1 = pesos 54.491 (1981), 64.102 (1982).

Army: 57,000 (28,500 conscripts).
10 inf bdes ('Regional Bdes'): 6 with 3, 4 with 2 inf, 1 arty, 1 engr gp, 1 mech or horsed cav gp.
1 trg bde, incl Presidential Guard.
1 indep mech gp.
1 Ranger, 1 para, 1 AA bns.
12 M-3A1 lt tks; 41 M-8, 200 EE-9 *Cascavel* armd cars; 15 EE-11 *Urutu*, 45 M-3A2 half-track, M-113A1 APC; 48 M-101 105mm how; 125 81mm, 148 107mm mor; 30 M1A1 40mm AA guns.

RESERVES: 70,000.

Navy: 9,000 (incl 5,000 marines).
2 Type 209 subs.
2 SX-506 midget subs (in reserve).
3 destroyers: 2 *Halland* (1 in reserve), 1 US *Sumner*.
1 US *Courtney* frigate.
3 US *Cherokee* large patrol craft.
6 gunboats: 2 *Ashville*, 3 *Arauca*, 1 *Barranquilla*.
2 coastal, 8 river patrol craft(.
2 marine bns; 3 indep coys, cdo units.
(On order: 4 FV-1500 corvettes (1 for delivery 1983).)

Bases: Cartagena, Buenaventura.

Air Force: 4,200; 28 combat ac, 10 armed hel.
Combat Command:
1 ftr sqn: 12 *Mirage* 5COA, 2 5COR, 2 5COD.
1 COIN sqn with 12 AT-33A (A-37D to replace).
1 recce hel sqn: 10 Hughes 500C (OH-6A).
Military Air Transport Command:
Tpt sqn: 1 C-130E, 4 C-54, 20 C-47, 3 HS-748, 3 *Arava*, 2 F-28, 10 DHC-2, 1 Aero *Commander* 560A.
Hel sqn: 19 UH-1B/H, 13 Bell 205A1, 20 SA-315B *Lama*.
Training and Spt Command:
11 T-37C, 27 T-41D, 3 RT-33, 12 T-33A, 25 T-34A/B, 10 A-37B ac; 8 Bell 47 (OH-13) hel.
AAM: R-530.
(On order: 12 *Kfir* C-2 FGA, 12 A-37D COIN, 14 EMB-326 *Xavante* trg ac; 12 UH-1H hel; AIM/RIM-7F *Sparrow* AAM; ASM.)

Forces Abroad: Egypt (Sinai MFO) 500.

Para-Military Forces: National Police Force 50,000; 1 HS-748 ac, 30 hel. Coastguard, 9 craft(.

CUBA

Population: 10,000,000.
Military service: 3 years.
Total armed forces: 153,000 (some 94,500 conscripts).
Est GNP 1981: pC 11.70 bn ($16 bn).[2]
Est def exp 1981: pC 930 m ($1.271 bn).[3]
Est FMA: $300 m (1981), $300 m (1982).
GNP growth: 12% (1981), 2.5% (1982).
$1 = pesos 0.7313 (1981).

Army: 125,000 (incl proportion of Ready Reserve) (some 75,000 conscripts).
2 Army, 4 corps HQ.
1 armd div.
3 mech divs.

6 inf divs.
1 AB assault bde; Special Force (3,500 men).
Some arty bdes.
AFV: 350 T-34, 250 T-54/-55, some 60 T-62 MBT; PT-76 lt tks; BRDM-1/-2 armd cars; some 100 BMP MICV; 400 BTR-40/-60/-152 APC.
Arty: 1,200 guns/how incl: 76mm, 85mm, 100 SU-100 SP, 122mm, 130mm, 152mm; BM-21 122mm, BM-14 140mm, BM-24 240mm MRL; 50 *FROG*-4 SSM; M-43 120mm mor.
ATK: 57mm guns; 57mm RCL: *Sagger, Snapper* ATGW.
AD: 1,500 AA guns incl: ZU-23, 37mm, 57mm, 85mm, 100mm towed; ZSU-23-4 23mm, 30mm M-53 (twin)/ BTR-60P, ZSU-57 57mm SP; SA-7 SAM.

RESERVES: Ready Reserves 190,000 (serve 45 days per year); to fill out Regular and 15 Reserve inf (some mech) divs.

Navy: 12,000 (8,500 conscripts).
3 subs: 2 Sov F-class; 1 W-class (non-operational; trg).
1 Sov *Koni* frigate.
11 Sov large patrol craft: 9 SO-1, 2 *Kronshtadt*.
26 Sov FAC(M): with *Styx* SSM: 5 *Osa*-I, 13 *Osa*-II, 8 *Komar*(.
26 Sov FAC(T): 8 *Turya*, 6 P-6(, 12 P-4(.
22 Sov *Zhuk* FAC(P)(; 12 coastal patrol craft(.
12 Sov minesweepers: 2 *Sonya*, 10 *Yevgenya*(.
2 *Polnocny* LSM, 7 T-4 LCM.

NAVAL INFANTRY: (some 350).

Bases: Cienfuegos, Cabanas, Havana, Mariel, Punta Ballenatos, Banes.

Air Force: 16,000, incl air defence forces (11,000 conscripts); 250 combat ac, some 38 combat hel.
4 FGA sqns: 1 with 15 MiG-17; 3 with 36 MiG-23BN *Flogger* F.
16 interceptor sqns: 2 with 30 MiG-21F; 3 with 34 -21PFM; 2 with 20 -21PFMA; 8 with 100 -21bis; 1 with 15 MiG-23 *Flogger* E.
4 tpt sqns: 16 Il-14, 35 An-2, 3 An-24, 22 An-26, 4 Yak-40.
8 hel sqns: 60 Mi-4, 40 Mi-8 (perhaps 20 armed), 18 Mi-24 *Hind* D.
Trainers incl 2 MiG-23U, 10 MiG-21U, some An-2, 30 Zlin 326, some L-39.
AAM: AA-1 *Alkali*, AA-2 *Atoll*, AA-8 *Aphid*.
28 SAM bns with 60 SA-2, 140 SA-3; 2 with 12 SA-6.
The Civil Airline has 9 Il-62, some 4 Tu-154, which are used as tp tpts.

Forces Abroad: Angola 25,000; Congo 750; Ethiopia 11,000; Mozambique 750; Other Africa 500; S. Yemen 300; Nicaragua 1,000; Grenada 30.

Para-Military Forces: Ministry of Interior: State Security 15,000; Frontier Guards 3,500; some 22 craft. Ministry of Defence: Youth Labour Army 100,000; Civil Defence Force 100,000; Territorial Militia 500,000.

DOMINICAN REPUBLIC

Population: 5,950,000.
Military service: voluntary.
Total armed forces: 23,000.
GNP 1980: $RD 6.625 bn ($US 6.625 bn). 1981: 7.226 bn ($US 7.226 bn).
Est def exp 1981: $RD 104.0 m ($US 104.0 m). 1982: 102.5 m ($US 102.5 m).
$1 = peso 1.00 (1980/2).

Army: 14,000.
3 inf bdes.
1 fd arty regt (2 bns).
1 AA arty bn.
1 mixed armd bn.
1 Presidential Guard bn.
1 engr bn.
20 AML armd cars; 6 V-150 *Commando*, 20 M-3A1 half-track APC; 20 M-101 105mm how; 24 120mm mor, 20 40mm AA guns.

Navy: 4,500, incl naval inf.
1 Cdn *River* frigate (trg).
5 US corvettes: 2 *Admirable* (ex-minesweepers), 3 *Cohoes*.
5 large patrol craft (3 US *Argo*, in reserve).
8 coastal patrol craft(.
1 LSM, 2 LCU.
1 naval inf bn; 1 cdo unit.
(On order: 3 PTF-23 patrol boats.)

Bases: Santo Domingo, Bani, Haina.

Air Force: 4,500; 19 combat aircraft.
1 ftr sqn with 8 F-51D *Mustang*, 11 T-34B *Mentor*.
1 tpt sqn with 5 C-47, 1 DHC-2, 1 Aero *Commander*.
1 hel sqn with 2 Bell 205A-1, 2 UH-12E, 6 OH-6A, 3 *Alouette* II/III, 2 H-19, 2 UH-1.
1 Presidential tpt flt with 1 SA-365 *Dauphin* 2.
Trg: 12 T-6G, 2 AT-11, 2 T-33A, 3 Cessna 170, 4 T-41D, T-34.
1 para gp.

Para-Military Forces: Gendarmerie 10,000.

ECUADOR

Population: 8,620,000.
Military service: 2 years, selective.
Total armed forces: 36,800.
GNP 1981: ES 346.98 bn ($13.879 bn). 1982: 408.88 bn ($12.334 bn).
Est def exp 1981: ES 6.193 bn ($247.72 m). 1982: 5.872 bn ($177.134 m).
GNP growth: 4.3% (1981).
Inflation: 25% (1982).
$1 = sucres 25.0 (1981), 33.150 (1982).

Army: 27,500.
6 div HQ.
1 armd bde.
7 inf bdes.
1 para bde.
45 M-3, 150 AMX-13 lt tks; 35 AML-245 armd cars; 20 M-113, 55 AMX-VCI APC; M-56 pack, 18 M-101 105mm towed, 10 Mk F3 155mm SP how; 12 120mm mor; 28 M-167 20mm, 30 40mm AA guns; 240 *Blowpipe* SAM; 3 *Turbo-Porter*, 1 *Learjet*, 3 DHC-5D, 2 *King Air*, 3 *Arava*, 6 Cessna (2 T-41D, 3 172G, 1 185D) tpt ac; 4 AS-332 *Puma*, 12 SA-341 *Gazelle*, 1 *Lama*, 1 *Alouette* III hel.

Navy: 4,500 incl some 700 marines.
2 Type 209 submarines.
2 US destroyers: 1 *Gearing*, 1 *Lawrence* (frigate).
2 *Esmeraldas* corvettes with 4 *Exocet* SSM, 1 × 4 *Albatros/Aspide* SAM, 1 AB-212 hel.
3 *Quito* FAC(M) with 4 *Exocet* SSM.
3 *Manta* FAC(M) with 4 *Gabriel* SSM.
2 US PGM-71 large, 7 coastal patrol craft(.
4 US LSM.
1 *Super King Air*, 3 T-34C, 1 *Arava*, 1 Cessna 320E ac; 2 *Alouette* III hel.
3 marine bns: 2 on garrison duties, 1 cdo.
(On order: 4 *Esmeraldas* corvettes, *Exocet* SSM.)

Bases: Guayaquil, San Lorenzo, Galápagos Islands.

Air Force: 4,800; 54 combat ac.
4 wings.
1 lt bbr sqn with 3 *Canberra* B-6.
1 interceptor sqn with 15 *Mirage* F-1JE, 2 F-1JB.
2 FGA sqns with 7 *Jaguar* S, 2 *Jaguar* B, 12 *Kfir* C-2.
1 COIN sqn with 7 A-37B.
1 COIN/trg sqn with 6 BAC-167 *Strikemaster*.
Military Air Transport Gp (incl civil/military airline): 1 Boeing 727-2T3, 1 737, 4 707, 3 720, 4 *Electra*, 1 C-130H, 2 DC-6B, 4 HS-748, 5 *Arava*.
Liaison/SAR flts: 1 *Navajo* ac; 2 SA-330 *Puma*, 6 SA-316 *Alouette* III, 2 Bell UH-1D hel.
Training aircraft incl 20 T-34C, 10 T-41, A-150, T-33A.
AAM: R-550 *Magic*.
1 para sqn.

EL SALVADOR

Population: 4,850,000.
Military service: conscription, selective, 1 year.
Total armed forces: 24,650 (being increased).
Est GDP 1981: C 8.786 bn ($3.514 bn); 1982: 9.157 bn ($3.663 bn).
Est def exp[4] 1982: C 347.5 m ($139.0 m). 1983: 393.75 m ($157.50 m).
Est FMA: $82 m (1982), $126 m (1983).
GDP growth: −9.5% (1981), −5.4% (1982).
Inflation: 12% (1981), 14% (1982).
$1 = colones 2.50 (1981–3).

Army: 22,000.
6 inf bdes.
1 mech cav regt.
1 arty bde (2 bns).
1 engr bn.
1 AA arty bn.
1 para bn.
1 special forces bn (2 gps).
12 AMX-13 lt tks; 18 AML-90 armd cars; 10 M-113, 20 UR-416 APC; 30 M-101, 6 M-56 105mm, 6 M-114 155mm how; 81mm, 8 UB-M52 120mm mor; 57mm, M-20 75mm RCL; *LAW* RL; 20mm, L/70 40mm AA guns.

RESERVES: 12 inf regts (bns).

Navy: 300.
10 patrol boats incl: 3 31-metre *Camcraft*, 1 20-metre *Sewart*, 2 US river(.

Air Force: 2,350 (incl AD and security gp); 36 combat ac, 19 combat hel.
2 FGA sqns: 1 with 4 *Ouragan*, 6 A-37.
1 lt COIN sqn with 7 *Magister*, 15 *Rallye*.
1 recce unit with 4 O-2.
1 tpt sqn with 5 C-47, 2 DC-6B, 5 *Arava*, 2 C-123.
2 hel sqns: 1 COIN with 19 UH-1H; 1 SAR/liaison with 3 *Lama*, 2 *Alouette* III, 1 FH-1100 hel.
Trg: 3 T-34, 8 T-6, 6 T-41, 9 Cessna (7 180, 1 182, 1 185).
(On order: tpt ac; hel.)

Para-Military Forces: National Guard 3,500; National Police 4,000; Treasury Police 2,000; *Orden* (territorial civil defence force) perhaps 70,000 (2,000 effective).

GUATEMALA

Population: 7,600,000.
Military service: conscription; 24–30 months.
Total armed forces: 21,560 (being increased).
Est GNP 1981: q 9.888 bn ($9.888 bn). 1982: 9.862 bn ($9.862 bn).
Est def exp 1982: q 92.0 m ($92.0 m).[5]
$1 = quetzal 1.00 (1981/2).

Army: 20,000.
5 Regional bde HQ.
1 Presidential Guard bde.
1 armd bn.
17 inf bns.
4 fd arty gps (12 btys).
1 AA arty gp (2 btys).
2 para/special forces bns.
1 engr bn.
4 recce sqns.
8 AMX-13, 7 M-3A1 lt tks; 8 M-8, 10 RBY-1, 6 M-3A1, 10 M-4A1/3 armd cars; 15 M-113, 7 V-150 *Commando* APC; 12 M-116 75mm pack, 36 M-101 105mm how; M-1 81mm, 12 M-30 4.2-in (107mm), 12 EC1A 120mm mor; 12 M/A1 40mm AA guns.

Navy: 960 incl 650 marines (4 coys).[6]
15 coastal patrol craft(.
1 LCM; 2 small tp carriers.
8 small craft; some armed.
12 *Zodiac*-type assault boats (marines).

Bases: Santo Tomás de Castillas, Sipacate.

Air Force: 600; 16 combat ac, 4 combat hel.[6]
1 COIN sqn: 10 A-37B, 6 PC-7 *Turbo-Trainer*.
1 tpt sqn: 1 DC-6B, 10 C-47, 11 *Arava*.
1 comms sqn with 17 Cessna: 4 170A/B, 8 172K, 2 180, 2 U-206C, 1 310.
1 hel sqn with 25 Bell: 9 UH-1D (4 armed), 1 Bell 212, 6 412, 5 206B, 4 206L-1.
1 Presidential flt with 1 *Super King Air* 200.
Trg: 5 PC-7 *Turbo-Trainer*, 5 T-33A, 3 T-37C, 12 T-41.

Para-Military Forces: National Police 9,500; Treasury Police 2,100; Territorial Militia (300,000) forming.

HONDURAS

Population: 4,150,000.
Military service: conscription; 18–24 months.
Total armed forces: 15,200 (10,250 conscripts).
GDP 1981: L 5.264 bn ($2.632 bn). 1982: 5.603 bn ($2.801 bn).
Est def exp 1981: L 90.3 m ($45.15 m). 1982: 120.0 m ($60.0 m).
Est FMA: $31.3 m (1982).
$1 = lempiras 2.00 (1981/2).

Army: 13,500 (10,000 conscripts).
3 inf bdes.
1 armd car regt.
11 inf bns (one AB).
3 arty bns.
1 engr bn.
1 special forces bn.
16 *Scorpion* lt tks; 12 RBY Mk 1 recce veh; M-1 81mm, M-2 4.2-in (107mm), 30 120mm mor; 57mm, 106mm RCL.

Navy: 500 (50 conscripts).
8 Swiftships patrol craft: 3 105-ft fast, 5 65-ft coastal(.

Bases: Puerto Cortes, Amapala.

Air Force: 1,200 (200 conscripts); 26 combat aircraft.
1 FGA sqn with 12 *Super Mystère* B2.
1 COIN sqn with 4 F-86E *Sabre*, 10 A-37B.

1 tpt sqn with 11 C-47, 2 *Arava*, 1 *Electra*, 1 *Westwind*.
1 spt sqn with 1 Beech *Baron*, 4 Cessna (2 180, 2 185), 1 Piper PA-31 *Cheyenne* ac; 2 S-76 hel.
1 hel sqn with 10 UH-1H (on loan), 5 UH-1B.
Trg: 12 T-28A, 7 T-41A.

Para-Military Forces: Public Security Forces (FUSEP) (national police) 4,500.

MEXICO

Population: 73,000,000.
Military service: voluntary, with part-time conscript militia.
Total armed forces: 120,000 regular, 250,000 part-time conscripts.
Est GDP 1981: pM 5,875 bn ($239.649 bn).
Est def exp range 1982: pM 32.764–43.70 bn ($595.872–794.762 m).[7]
GDP growth: 8.1% (1981), 0.2% (1982).
Inflation: 29% (1981), 99% (1982).
$1 = pesos 24.515 (1981), 54.985 (1982).

Army: 94,500 regular, 250,000 conscripts.
1 inf div HQ.
1 mech bde gp (Presidential Guard) (3 bns).
2 inf bde gps (each of 2 inf, 1 armd recce, 1 arty bns).
1 para bde (2 bns).
1 recce regt.
1 armd regt.
35 Zonal Garrisons incl:
28 indep cav (being mech), 3 arty regts, 64 indep inf bns.
AA, engr, and support units.
40 M-3A1, 20 M-5A1 lt tks; 70 M-3A1, 15 M-8, 40 Panhard ERC-90, 15 MAC-1 armd cars; 50 HWK-11, 3 M-3 APC; 18 M-116 75mm pack, 60 M-101 105mm towed, 6 M-8 75mm, M-7 105mm SP how; 1,600 60mm, 81mm, 4.2-in (107mm) and 60 120mm mor; 35 M-3 37mm ATK guns; 40 12.7mm AA guns.

Navy: 20,000, incl naval air force and marines.
4 US destroyers: 2 *Fletcher*, 2 *Gearing*.
6 frigates: 4 US *Lawrence/Crosley*, 1 *Durango*, 1 US *Edsall* (trg ship).
6 *Halcón*-class (B-119) corvettes with 1 hel.
34 US patrol ships: 18 *Auk*, 16 *Admirable* ex-minesweepers.
31 *Azteca* large patrol craft.
14 patrol craft(: 5 *Polimar*, 2 *Azueta*, 1 *Guanajuato* coastal, 6 river.
3 tpts incl 2 US 511-1152 LST; 1 repair ship.

Bases: Gulf: Vera Cruz, Tampico, Chetumal, Ciudad del Carmen, Yukalpetén. Pacific: Acapulco, Ensenada, La Paz, Puerto Cortés, Guaymas, Mazatlan, Manzanillo, Salina Cruz, Puerto Madero, Lázaro Cárdenas.

NAVAL AIR FORCE: (300); 8 combat ac.
1 MR sqn with 8 HU-16 *Albatross*.
1 liaison sqn with 1 *Learjet* 24D, 1 C-47[8], 3 F-27, 6 *Bonanza*, 2 *Baron*[8], 6 C-45[8], 13 Cessna (3 150J, 3 180, 3 310, 2 337, 2 402).[8]
1 hel sqn with 4 *Alouette* II, 4 *Alouette* III[8], 5 Bell 47G, 2 UH-1H[8], 5 BO-105.
Trg: 4 T-34B *Mentor*.

MARINES: (4,500).
3 bn HQ.
30 security coys.

Air Force: 5,500 (2,000 para bde); 85 combat ac.
1 interceptor sqn with 10 F-5E, 2 F-5F.
6 COIN sqns with 10 T-33, 55 *Pilatus*-7.
1 photo/recce sqn with 8 Aero *Commander* 500S.
2 SAR sqns: 1 with 8 *Arava* ac; 1 with 2 *Alouette* II/III, 1 Hiller 12E, 3 *Puma*, 1 Bell 47G, 5 206B, 1 212, 10 205A hel.
1 Presidential (tpt) sqn with 9 Boeing 727, 2 737, 1 F-27, 1 *Jetstar*, 1 *Electra*, 1 HS-125-400, 5 *Sabreliner*, 1 Cessna 310R ac; 1 Bell 212, 2 *Puma* hel.
4 tpt sqns with 3 DC-6/-7, 2 C-118, 5 C-54, 12 C-47, 3 *Skyvan*, 1 *Islander*, 6 CF-27, 2 DHC-5D, 1 Cessna 182, 2 U-206E.
Trg: some 12 T-28D, 1 *Baron*, 20 Beech F-33-9, 2 *King Air*, 34 *Musketeer*, 5 PC-7 *Turbo-Trainer*, 20 CAP-10B ac.
1 para bde (3 bns) (under Defence Secretary's control).

Para-Military Forces: Coastguard; 6 patrol craft.

NICARAGUA

Population: 2,800,000.
Military service: regulars, voluntary; emergency conscription for militia.
Total armed forces: 48,800.
Est GDP range 1981: $C 25.50–27.90 bn ($US 2.537–2.776 bn).
Est def exp range 1981: $C 0.945–1.6 bn ($US 94.03–159.204 m).
$1 = córdobas 10.050 (1981).

Army: 47,000 (incl 25,000 Reserves).
7 Military Regions.
3 armd bns.
10 inf bns (being reorganized).
1 fd arty gp (3 bns).
1 engr bn.
1 AA arty gp (9 btys; with Air Force).
3 M-4A3, 45 T-54/-55 MBT; BRDM-2, 20 *Staghound* armd cars; 12 BTR-60 APC; 12 105mm how; 12 D-30, some D-20 152mm gun/how; BM-21 122mm MRL; 24 120mm mor; 48 ZIS-2 57mm ATK guns.

Navy: 300.
4 *Dabur*, 1 *Sewart*, 8 other coastal patrol craft; 1 LCM.
(On order: 2 Fr patrol craft.)

Air Force: 1,500, incl Air Defence; 10 combat ac.
1 COIN sqn: 3 T-33A, 3 T-28D, 4 SF-260 *Warrior*.
1 tpt sqn: 1 C-212A, 1 *Arava*, 4 C-47.
1 hel sqn: 2 OH-6A, 2 *Alouette* III, 2 Mi-8 *Hip*.
AD (Army/Air Force): 138 ZPU-4 14.5mm, ZU-23 23mm, and 6 M-1939 37mm guns, SA-7 SAM.
(On order: 100 Matra LRF-2 68mm ASM pods.)

RESERVES: (all services): 50,000, 25,000 on duty in army.

Para-Military Forces: Border Guard, some 4,000 (under Army) 6 bns. Civilian Militia, perhaps 30,000. Ministry of Interior Troops.

PARAGUAY

Population: 3,100,000.
Military service: 18 months; Navy 2 years.
Total armed forces: 16,070 (10,900 conscripts).
GDP 1981: Pg 692.17 bn ($5.493 bn).
Def exp 1981: Pg 11.04 bn ($87.619 m).
GDP growth: 3.6% (1981), −2.5% (1982).
Inflation: 5% (1981), 7% (1982).
$1 = guaranies 126.00 (1981/2).

Army: 12,500 (9,000 conscripts).
3 corps HQ.
1 cav div (bde) (1 mech cav regt, 3 cav regts, 1 arty bty).
8 inf divs (bn gps).
1 indep inf bn.
1 Presidential Escort Regt.
1 spt comd with 1 arty regt, engr bns, sigs, 1 log comd.
6 M-4A3 MBT; 15 M-3A1 lt tks; 25 75mm, 10 M-101 105mm how; 24 20mm, 12 M-1A1 40mm AA guns.

RESERVES: some 25,000; 12 inf regts on mobilization.

Navy: 2,500 (1,200 conscripts).
2 *Humaita* river defence vessels.
3 corvettes (Arg *Bouchard* minesweepers).
13 patrol craft: 1 large, 12 coastal(.
1 US LSM (with hel deck), 2 LCU.
6 spt/cargo ships.
1 marine 'regt' (bn) (400).

NAVAL AIR FORCE (55):
Utility ac: 1 C-47, 5 Cessna (2 U-206, 2 150M).
Trg ac: 2 AT-6.
Hel: 2 OH-13, 2 UH-12E.

Bases: Asunción/Puerto Sajonia, Bahía Negra, Puerto Presidente Franco.

Air Force: 1,070 (700 conscripts); 20 combat ac.
1 COIN/trg sqn: 8 EMB-326 *Xavante;* 12 AT-6G *Texan;* 8 T-23, 5 Cessna (2 185, 1 337, 1 402, 1 U-3A), 5 T-41, 3 DHC-2, 1 DHC-3 ac; 3 Bell 47G/OH-13A, 2 UH-12, 1 FH-1100 hel.
1 tpt sqn with 3 DC-6B, 1 C-131, 25 C-47, 1 DHC-6 (VIP), 1 Convair 440.
Trg: 8 T-23 *Uirapuru*, 10 T-6, 8 Fokker S-11, 1 MS-760A.
1 para regt (bn).
(On order: *Xavante* COIN, *Uirapuru* trg ac.)

Para-Military Forces: internal security forces (1,500).

PERU

Population: 19,000,000.
Military service: 2 years, selective.
Total armed forces: 135,500 (some 71,000 conscripts).
GNP 1981: S 8,512.0 bn ($20.130 bn).
Est def exp range 1982: S 350.0–650.0 bn ($501.742–931.806 m).[9]
FMA 1982: $685 m.
GDP growth: 3.9% (1981), 0.7% (1982).
Inflation: 73.0% (1981), 100% (1982).
$1 = soles 422.85 (1981), 697.57 (1982).

Army: 75,000 (51,000 conscripts).
4 armd divs (bdes).
1 cav div; 3 horsed regts.
7 inf divs (bdes), each of 4 bns, 1 arty gp.
1 para-cdo div (bde; 1 para, 2 cdo bns).
1 jungle div (bde).
2 fd arty gps.
1 AA gp, 1 SAM gp.
2 indep inf gps.
4 engr bns.
3 armd recce regts.
2 air sqns: 1 liaison, 1 hel.
350 T-54/-55, 25 M-4A3 MBT; 110 AMX-13 lt tks; 60 M-20, 35 M-3A1, 20 Fiat 6616 scout cars; 150 M-113, 120 UR-416 APC; 10 M-56 pack, 170 M-101 105mm, 30 122mm incl SP, 30 130mm, 36 155mm guns/how; 300 120mm mor; 40 40mm, 76mm towed, ZSU-23-4 SP AA guns; SA-3/-7 SAM.
Air: 3 Helio H-391 ac; 29 Mi-8, 6 *Alouette* II hel.
(On order: 80 *TAM* lt tks; 100 SPz-12-3 MICV; 150 M-113 APC; 2 *Nomad* lt tpt ac.)

Navy: 20,500 (perhaps 7,000 conscripts) incl naval air, marines.
12 subs: 6 Type 209, 6 US (2 *Guppy* I, 4 *Abtao*).
2 cruisers: 2 Neth *De Ruyter* (1 with 4 *Exocet* SSM, 3 hel).
10 destroyers: 2 Br *Daring* with 8 *Exocet* SSM; 8 Neth (1 *Holland*, 7 *Friesland*).
2 *Carvajal* frigates with 8 *Otomat* SSM, 1 × 8 *Albatros*/*Aspide* SAM, 1 hel.
6 PR-72P FAC(M) with 4 *Exocet* SSM.
5 river gunboats.
3 river, 12 lake patrol craft(.
2 US LST, 2 US LSM.
2 tpts, 3 replenishment, 2 spt tankers.

NAVAL AIR FORCE: 9 combat ac; 10 combat hel.
1 ASW sqn with 7 S-2E *Tracker*.
1 ASW hel sqn with 4 SH-3D, 6 AB-212.
1 MR sqn with 2 F-27MPA.
1 utility hel sqn with 5 Bell 206B.
Tpts: 2 C-47, 1 *Aztec*.
Trg: 6 T-34A/C, 3 Beech B-200 ac; 4 Bell 47G hel.

MARINES: (2,000).
1 Marine bde (3 bns): amph veh, V-100 armd cars, 40 V-200 *Chaimite* APC, twin 20mm AA guns, 84mm RL.
3 coast defence btys: 18 155mm how.
(On order: 2 *Lupo* frigates, 3 EMB-111 MR ac.)

Bases: Callao, San Lorenzo Island, Talara, Iquitos (river), Puno (lake), Madre de Dios (river).

Air Force: 40,000 (some 13,000 conscripts); 106 combat ac.
2 lt bbr sqns with 12 *Canberra* B-2/B(I)-8.
6 FGA sqns: 2 with 16 *Mirage* 5P; 4 with 49 Su-22.
2 COIN sqns with 25 A-37B.
1 photo recce sqn with 2 *Queen Air* A-80, 2 *Learjet* 25B.
4 tpt sqns: 8 L-100-20, 2 DC-8-62CF, 16 An-26, 9 DHC-6, 14 DHC-5, 6 *Turbo-Porter*, 5 C-47.
2 hel sqns: 6 *Alouette* III, 6 Mi-6, 5 Mi-8, 3 BO-105, 25 Bell (9 206B, 16 212).
Presidential Flt: 1 F-28 ac.
4 trg sqns: 19 T-41D, 23 T-37B/C, 10 *Queen Air* A-80, some 16 MB-339A.
ASM: AS-30.
(On order: 26 *Mirage* 2000, some 50 MB-339 COIN/trg ac, 12 Bell 214 hel.)

Para-Military Forces: Guardia Civil, 26,500, with MOWAG *Roland* APC; Coastguard with 9 large, 15 other patrol craft. Republican Guard 5,000.

URUGUAY

Population: 3,100,000.
Military service: voluntary.
Total armed forces: 30,000.
GDP 1981: $UR 126.469 bn ($US 11.634 bn).
Est def exp 1980: $UR 2.40 bn ($US 262.009 m). 1981: 4.20 bn ($US 386.349 m).
GDP growth: 4.5% (1980), −1.3% (1981).
Inflation: 42% (1980), 30% (1981).
$1 = new pesos 9.160 (1980), 10.871 (1981).

Army: 22,300.
4 div HQ (regional).
3 cav bdes (2 mech, 4 horsed regts).
4 inf bdes, each with 3 bns.
5 arty gps: 4 fd, 1 AA.
3 indep horsed cav regts.
4 indep inf bns.
5 engr bns.
17 M-24, 29 M-3A1, 22 M-41 lt tks; FN-4-RM-62, 10 M-3A1

scout cars; 15 M-113 APC; 10 75mm guns; 21 M-101 105mm how.
(On order: 15 *Scorpion* lt tks.)

Navy: 4,700 incl naval air, naval infantry.
3 US frigates: 1 *Dealey*, 2 *Cannon*.
1 US *Auk* corvette.
4 large (1 *Adjutant*, 3 *Vigilante*), 3 coastal patrol craft(.
2 US LCM, 3 LCU.

NAVAL AIR FORCE: (390): 7 combat ac.
1 ASW flt with 6 S-2A/G.
1 MR flt with 1 *Super King Air* 200.
Tpts: 5 SNB-5 (C-45J).
Trg: 3 SNJ-4/5, 9 T-28, 1 T-34B ac.
Hel flt: 2 Bell 47G, 2 OH-13, 2 SH-34J, 1 Bell 222 SAR.
1 naval inf bn (450).
(On order: 1 US *Gearing* destroyer (late 1983).)

Base: Montevideo.

Air Force: 3,000; 24 combat ac.
1 COIN sqn with 4 AT-33A, 8 A-37B, 6 IA-58B *Pucará*.
1 recce/trg sqn with 6 T-6G.
1 SAR sqn: 8 U-17A ac; 2 Bell 212, 9 UH-1B/H hel.
3 tpt sqns with 5 C-212, 7 *Queen Air* 80, 1 *Learjet* (VIP), 6 EMB-110B/C; 2 F-27, 2 FH-227.
Trg: 6 T-41D, 34 T-34B.

Forces Abroad: Egypt (Sinai MFO), 70.

Para-Military Forces: Coastguard: 1,500; 6 coastal patrol craft(.

VENEZUELA

Population: 15,200,000.
Military service: 18 months, selective.
Total armed forces: 40,500 (some 10,000 conscripts).
GDP 1981: Bs 290.19 bn ($67.604 bn); 1982: Bs 298.28 bn ($69.489 bn).
Est def exp 1981: Bs 3.893 bn ($906.931 m). 1982: Bs 4.900 bn ($1.142 bn).
GNP growth: 1.0% (1981), 0.4% (1982).
Inflation: 11.3% (1981), 8.3% (1982).
$1 = bolívares 4.2925 (1981/2).

Army: 27,500.
5 div HQ (regional).
1 armd bde (3 med, 1 lt tk bns).
1 Ranger bde (2 para bns).
1 cav bn (horsed).
26 inf bns (2 mech, 11 hy, 13 lt (jungle)).
4 arty gps, 1 AA arty gp.
5 engr bns.
75 AMX-30 MBT; 40 AMX-13 lt tks; 10 AML-245, 12 M-8, 60 M-706E1 armd cars; 25 AMX-VCI, 100 V-100 APC; 40 75mm pack, 50 M-56 105mm pack, 35 M-101 105mm towed, 20 Mk F3 155mm SP how; 25 160mm SP MRL; 81mm, 120mm mor; 35 M-18 76mm SP ATK guns; 106mm RCL; SS-11, AS-11 ATGW; 50 40mm AA guns.
Army Aviation:
1 tpt sqn with 1 *Islander*, 2 *Queen Air*, 2 *King Air*.
1 hel sqn with 1 Bell 206B, 7 UH-1D/H.
(On order: 2 G-222 tpt ac.)

Navy: 8,500 incl naval air and marines.
3 subs: 2 Type 209, 1 US *Guppy* II.
6 *Sucre* (*Lupo*) frigates with 8 *Otomat* SSM, 1 × 8 *Albatros/Aspide* SAM, 1 hel.
3 Vosper Thornycroft FAC(M) with 2 *Otomat* SSM.
1 LST, 2 LSM, 12 LCVP (all US).
2 US transports.
(On order: 4 LST.)

NAVAL AIR FORCE: 6 combat hel.
1 ASW hel sqn (afloat) with 6 AB-212AS.
1 SAR sqn with 3 C-212/200 MR.
1 tpt sqn: 1 DHC-7, 1 HS-748, 1 *King Air*, 2 Cessna 310/310R, 2 402 ac, 6 Bell 47J hel.
(On order: 2 CASA C-212 *Aviocar* tpts; 6 AB-212 ASW hel.)

MARINES: (4,500).
3 bns.
1 AA coy.
1 amph coy.
LVTP-7 APC, M-42 SP 40mm AA guns.

COASTGUARD:
2 hy cutters (*Almirante Clemente* frigates).
3 Vosper Thornycroft FAC(G) '121-ft'.
1 sqn with 6 S-2E *Tracker* ac.

Bases: Caracas, Puerto Cabello, La Guaira, Puerto de Hierro, Falcón.

Air Force: 4,500; 79 combat ac.
2 lt bbr/recce sqns: 20 *Canberra* (12 B-82, 5 B(I)-82, 1 PR-83, 2 T-84).
1 FGA sqn: 12 *Mirage* (5 IIIEV, 5 5V, 2 5DV).
2 interceptor/FGA sqns: 1 with 14 CF-5A, 2 CF-5D; 1 with 10 *Mirage* IIIEV, 4 5V, 2 5DV.
1 COIN sqn with 15 OV-10E *Bronco*.
1 Presidential (tpt) sqn with 1 Boeing 737, 1 DC-9, 1 *Gulfstream* 2, 1 Cessna 500 ac; 2 Bell UH-1H hel.
2 tpt sqns with 5 C-130H, 5 C-47, 7 C-123A, 2 G-222.
2 utility/liaison/recce sqns with 3 *King Air*, 9 *Queen Air*, 8 Cessna 182N ac; 4 Bell 47G, 13 *Alouette* III hel.
1 hel sqn with 14 Bell (10 UH-1D/H, 2 214ST, 2 412).
Trg: 12 *Jet Provost*, 20 T-2D *Buckeye* (12 armed), 23 T-34 *Mentor*.
AAM: R-530 *Magic*.
1 para bn.
(On order: 18 F-16A, 15 CF-5A ftrs, 6 G-222 tpt, 4 CF-5B, 6 F-16B/D trg ac.)

Para-Military Forces: Fuerzas Armadas de Cooperación: 20,000: 25 UR-416 MICV; 15 *Shorland* APC; 120 60mm mor; 3 *Arava*, 1 *Islander*, 1 *King Air* ac; 3 *Agusta* 109A, 3 Bell (2 206B, 1 214ST) hel; 40 coastal patrol craft.

[1]High inflation and fluctuating exchange rates make these figures unreliable. The figures also apparently exclude foreign arms purchases (est $10 bn 1978–82).

[2]The Cuban economy is heavily subsidized through Soviet aid (est $3.0 bn in 1981).

[3]Official budget pC 228.40 m ($312.320 m).

[4]Including 'public security sector' budget.

[5]Excluding 'private-sector contributions' (some $60 m).

[6]National Armed Forces are combined; the Army provides logistic support to the Navy and Air Force.

[7]High inflation, fluctuating exchange rates, and economic difficulties make figures unreliable.

[8]Naval ac/hel assigned to coastguard.

[9]High inflation and fluctuating exchange rates make figures unreliable. Original budget reportedly reduced by 50%. New aircraft purchase (some $700 m) financed by long-term credit.

Armed Forces of Other Latin American States

Country	Est population (000)	Est GNP 1981 ($m)	Est def exp 1982 ($m)	Total armed forces	Army: Manpower and formations	Army: Equipment	Navy: Manpower and equipment	Air Force: Manpower and equipment	Para-military forces
Costa Rica*	**2,450**	**2,627** (GDP)	**11.2**	**7,000**		1 V-100 armd car	10 patrol craft, 1 armed tug	8 lt ac, 6 hel	**(2,500)**
Grenada	**115**	**160.0** (1982)	**6.73** (1982)	**2,180**	2 inf bns 1 arty bty 1 AA arty coy log units	6 BTR-60P APC; 6 85mm guns; 24 81mm mor; 12 12.7mm, 6 ZU-23-2 AA guns			**8,000**
Guyana	**890**	**511.6**	**25.0** (1981)	**7,000†**	**6,500** 3 inf bns 1 arty bty	EE-11 *Urutu*, 4 *Shorland* armd cars, 6 130mm guns; 12 81mm, 18 82mm, 20 Ch T-53 120mm mor; SA-7 SAM	**300** 1 large, 7 coastal patrol craft(	**200** 6 BN-2A, 2 DHC-6, 1 *Super King Air* 200, 1 Cessna U-206F tpts; 3 Bell 206B, 3 212 hel	**5,000**
Haiti	**6,130**	**1,547**	**15.4**	**6,800**	**6,300** Pres Guard (1 inf bn, 1 arty bty) 1 inf bn Garrison det	5 M-5A1 lt tks; 6 V-150 *Commando* APC; 2 75mm pack, 4 M-101 105mm how; 81mm mor; M-18 57mm RCL; M-3 37mm, M-1 57mm ATK guns	**300** (Coastguard) 15 coastal patrol craft(	**200** 8 A-37 COIN; 4 C-47, 2 DHC-2, 3 DHC-3, 1 *Baron*, 1 Cessna 310, 1 402 tpts; 3 Cessna 150, 1 172, 1 *Bonanza* trg ac; 6 S-58/CH-34C, 2 Hughes 269C, 2 369C hel	**14,900** (Police)
Jamaica	**2,300**	**2,763**	**35.0**	**9,220†**	**3,000** 2 inf bns 1 Reserve bn 1 spt bn	10 V-150 *Commando* APC; 12 81mm mor	**140** 1 large; 3 coastal patrol boats(	**80** 2 *Islander*, 1 *King Air*, 1 Cessna 337, 1 *Centurion* II ac; 4 Bell 206B, 3 212 hel	**6,000†**
Panama*	**2,050**	**440** (1982)	**n.a.**	**9,500**	**1,500** 7 lt inf coys	16 V-150 armd cars	**300** (coastguard) 6 patrol craft, 2 LSM, 3 LCM, 3 spt vessels	**200** 15 tpt, 12 lt ac, 20 hel	**(7,500)**
Trinidad and Tobago	**1,200**	**6,900**	**n.a.**	**800†**	**500** 1 inf bn 1 reserve bn 1 spt bn	6 81mm mor	**250** (Coastguard) 6 large, 7 coastal (1 armed) patrol craft	**50** 1 Cessna 402 ac; 2 *Gazelle*, 2 S-76 (SAR) hel	n.a.†

Smaller states in the area: Bahamas, Barbados, St Vincent have small para-military marine components. Belize and Bermuda have small infantry forces.

* Costa Rica and Panama maintain para-military forces only.

† All services form part of the Army.

The East–West Conventional Balance in Europe

Any assessment of the military balance between NATO and the Warsaw Pact involves comparison of the deployed strengths of both men and equipment and of reinforcement potential, consideration of qualitative characteristics, of factors such as geographical advantages, military technology, deployment, training, and logistic support, and of differences in national doctrine and philosophy. It must be set within the context of the strategic nuclear balance, of military forces worldwide, and, in particular, of the relative strengths of the navies and long-range air forces of both sides.

Certain elements in the equation change very little over time. Warsaw Pact equipment, doctrine, and procedures are standardized, whereas those of NATO are not, despite long-standing attempts to improve interoperability and encourage uniformity. The Pact's advantages in flexibility and logistic support will be obvious, as will the geographical advantages which permit it to reinforce any of its fronts on interior lines and, in almost every case, overland. The West has hitherto relied on its superior technology and—although there is evidence that the East has been catching up and, in some instances, overtaking it—some advantage still remains, though much smaller than it was.

The question of balance, as a practical calculation, begins by a comparison of the numerical strengths of each side (shown in the table on p. 128).

Manpower

The total numbers of men in uniform in the armed forces of the countries which comprise NATO and the Warsaw Pact are given in the table, as are the ground force figures. Yet much of this manpower will be employed elsewhere than in Europe—particularly in the case of the United States and the Soviet Union—and so figures are given for the ground forces in place in Europe (in the case of those within the USSR, the figures include only those in the Kola peninsula, facing Norway, and in the Trans-Caucasus, facing Turkey). However, in the event of hostilities erupting or threatening to erupt, two kinds of augmentation can take place: first, standing forces not in Europe can be moved there; second, reserve forces can be mobilized either for combat in place or in order to be moved to Europe by external powers. A *total* reserve figure can be assessed but, as with standing manpower, not all would be allocated to Europe—particularly those of non-European powers.

Formations

Totals for the numbers and types of divisions and division-equivalents in place and manned in time of peace are shown in the table. Estimates of the numbers of divisions existing in peacetime which are not in Europe but are presumed to be earmarked for it as reinforcements *prior* to mobilization, and of the number of divisions or division-equivalents on both sides which could be added to the order of battle on mobilization and earmarked for the European Theatre, are also listed.

Some qualifications and explanations are necessary. First, divisions on the two sides, and within the two sides, are very unequal both in strengths and equipment holdings. Second, the assumption is made that only European Military Districts in the Western and Southern Theatres of the Soviet Union *(see p. 77)* would in fact provide forces for the European Theatre. Third, territorial defence units have been excluded from the figures in the table. Fourth, rates of mobilization and of forward movement would not be equal. A Norwegian brigade mobilized in place should be ready for defence long before a Soviet division could be mobilized around Leningrad and moved to attack it. On the other hand, an

The AT-4 Spigot above is one of an array of antitank weapons that provide interoperability among Pact member nations.

American division based in the continental United States and without equipment prepositioned in Europe will in all likelihood be slower to move into action than a Soviet division from Belorussia. Fifth, Europe is divided into distinct areas of possible confrontation where local balances may look very different to the overall balance and where, particularly on the NATO side, communications between battlefronts will prove very difficult. As a simplification in this analysis, NATO has been divided into North and Central Europe, on the one hand, and Southern Europe (Italy, Greece, and Turkey), on the other. Finally, substantial combat elements are held outside divisional establishments and are not listed.

Equipment

Equipment holdings can be broken down into categories. The complicating factors are that total holdings of equipment do not necessarily match what is in divisional establishments (there are equipment reserves, non-divisional units, and stockpiles), and not all equipment will be in theatre at the outbreak of hostilities. In the case of Soviet formations moving from the Western USSR, they will be expected to take their full unit inventories. In the case of American reinforcing formations, some plan to equip themselves from stockpiles in Europe. For these reasons, the table includes for each side only the total holdings of equipment known or estimated to be in Europe. As a separate category, estimates of the *additional* equipment presumed to come with Soviet reinforcing divisions moved to Europe have also been included; these figures are shown with a + sign below the line for USSR and in Pact total figures. Two ratios for equipment are given: one without reinforcement and one after Soviet divisions have reinforced the Pact in Europe.

Naval Forces

The assessment lists the numbers of vessels presumed to be in the Atlantic, Channel, North Sea, and Mediterranean for NATO and, for the Warsaw Pact, the Soviet Northern, Baltic, and Black Sea Fleets, together with non-Soviet Pact vessels in the Baltic and Black Seas. Soviet naval forces in the Mediterranean are drawn from the Black Sea Fleet or, in the case of submarines, from the Northern Fleet. As with ground force equipment, there are great disparities within categories, both with respect to capability and age. In the case of naval or maritime aircraft, classification by type is necessarily somewhat arbitrary but conforms to the nomenclature used in the country entries. The figures include both land- and sea-based aircraft with a clear maritime role in the above sea areas.

Air Forces

Assessment of land attack aircraft and fighters (including armed helicopters) requires similar assumptions to those made in the case of ground forces. The figures for US aircraft are for those based in Europe and do not take account of possible reinforcements from the continental US; the Soviet figures show a possible augmentation of frontal aviation from the Western military districts as a result of reinforcement. These figures are necessarily estimated. In the case of bombers, in particular, the question of allocation to the nuclear role is important, and the figures given here are for all medium-range bombers, regardless of whether or not they might be reserved for nuclear delivery. It is necessary to stress the point that the increasing number of multi-role aircraft on both sides tends to make mission distinctions otiose. Aircraft intended primarily for ground attack often have at least a limited self-defence capability, but national terminology separates the standard air-superiority fighter and the interceptor, and this distinction has been applied.

Defining the Combat Zone

The Northern and Central European sectors are shown as one entity. Yet this is inevitably an incomplete notion. Norwegian defences, for example, are pulled in two directions. The land forces have as their main responsibility the protection of the northern approaches to the country and they have either deployed or plan to deploy virtually all their active field forces to the north because the Soviet formations in the northern Leningrad Military District pose a substantial potential threat. The Norwegian Navy must assign its larger vessels to support the coastal flank of the forces in Northern Norway; but the Soviet Baltic Fleet poses a threat to Southern Norway, forcing the Navy to attend also to that area. The Air Force has to be prepared to support both sectors. Schleswig-Holstein, although also part of NATO's Northern Command, must anticipate attack from East Germany and from the sea.

NATO's Southern Flank is even more divided. Italy must contest any Pact threat from Central Europe towards the central Mediterranean basin. Greece and Turkey must between them defend Thrace and the Aegean Sea and its airspace, while Turkey must also defend her border in the Caucasus. This means that NATO has to be prepared to fight here on three widely separated fronts, each with its own tactical challenges and each with its own peculiar supply requirements. Yet it is impossible, without making a number of assumptions, to forecast the size and composition of the forces on both sides which would be assigned to those three fronts during hostilities. Pact forces in the south-western sector and threatening Thrace and the Dardanelles would be based on the Southern Group of Forces—Hungary, Bulgaria, and Romania plus the Soviet formations—perhaps supported by formations from the Carpathian and Odessa Military Districts. The south-eastern sector, threatening Eastern Turkey, would be the responsibility of the Trans-Caucasus MD, and reserves for this front would most probably come from the North Caucasus MD. Trans-Caucasus MD is also responsible for the border with Iran.

Mobilization

The rate at which nations *can* mobilize will depend upon the system adopted, staff procedures and competence, distances, and the transport facilities available. The rate at which nations *will* mobilize will depend on the warning received, on the political will to mobilize, on the ability to make decisions and put them into effect, and on how far enemy action obstructs mobilization.

The Warsaw Pact has maintained a reserve based upon large numbers of conscripts who have completed their period of obligatory service. The Soviet Union in particular uses the Military District organization for

Comparison of NATO and Warsaw Pact Manpower and Equipment

		NATO (less US)				Ratios				
		N. Europe[a]	S. Europe	US	Total	*NATO Europe: Pact*	*Total NATO: Pact*	Total	USSR	Non-Soviet Pact
Manpower (000)										
Total manpower in uniform		1,664	1,191	2,136	4,991	*1 : 2.13*	*1:1.22*	6,068	5,050[b]	1,018
Reserves (all services)		2,266	2,124	955	5,345	*1 : 1.53*	*1:1.26*	6,718	5,000	1,718
Total ground forces		999	911	780	2,691	*1 : 1.38*	*1.02:1*	2,643	1,800	843
Total ground forces in Europe (USSR: Kola Peninsula and Trans Caucasus)		853	911	222	1,986	*1.03 : 1*	*1.16:1*	1,714	871*	843
Divisions[c]										
Divs in Europe and manned in peacetime	Tk	18	5	2⅓	25⅓	*1 : 1.35*	*1:1.22*	31	16	15
	Mech	13⅓	9⅓	2⅓	25	*1 : 2.29*	*1:2.08*	52	27	25
	Other	6⅔	32⅔	⅓	39⅔	*19.67 : 1*	*19.83:1*	2	0	2
Divs manned and available for immediate reinforcement	Tk	0	0	1⅔	1⅔	–	*1:5.82*	9⅔	8[d]	1⅔
	Mech	1⅔	0	2⅔	4⅓	*1 : 7.23*	*1:2.77*	12	12[d]	0
	Other	2⅓	0	2⅓	4⅔	*1 : 2.15*	*1:1.07*	5	5[d]	0
Extra divs available on mobilizing reserves	Tk	⅓	0	3⅓	3⅔	*1 : 48.5*	*1:4.37*	16	16[d]	0
	Mech	16	0	3⅔	19⅔	*1 : 2.69*	*1:2.19*	43	30[d]	13
	Other	11	4	8⅓	23⅓	–	–	0	0	0
Ground Force Equipment										
Main battle tanks		8,097	7,625	5,000	20,722	*1 : 1.62*	*1:1.23* *(1:2.16)*	25,490 (+19,200)	13,000* (+19,200*[d])	12,490
Arty, MRL		4,228	4,206	562	8,996	*1 : 1.40*	*1:1.32* *(1:2.43)*	11,830 (+10,000)	5,000* (+10,000*[d])	6,830
SSM launchers		96	60	144	300	*1 : 3.89*	*1:2.02* *(1:4.46)*	607 (+730)	272 (+730[d])	335
ATK guns		850	96	0	946	*1 : 2.04* *(1 : 3.88)*	– –	1,928 (+1,746)	678 (+1,746*[d])	1,250*
ATGW launchers (crew-served. Short range est. at 9 to 10 times these totals)		880*	500*	700*	2,080	*1 : 1.29*	*1.16:1* *(1:1.04)*	1,787 (+385)	287 (+385*[d])	1,500*
AA guns		4,355	1,587*	120	6,062	*1.49 : 1*	*1.52:1* *(1:1.14)*	3,986 (+2,900)	1,086*[e] (+2,900*[de])	2,900*
SAM launchers (crew-served)		1,571	352	180	2,103	*1 : 1.64*	*1:1.50* *(1:2.99)*	3,151 (+3,142)	1,751*[e] (+3,142*[de])	1,400*
Naval Units										
Submarines: cruise missile		0	0	0	0	–	–	45	45[d]	*0*
attack		97	39	46	182	*1 : 1.07*	*1.26:1*	145	139[d]	*6*
Carriers		6	1	6	13	*1.75 : 1*	*3.25:1*	4	4[d]	*0*
Cruisers		1	2	12*	15	*1 : 8.00*	*1:1.60*	24	24*[d]	0
Destroyers		42	33	35*	110	*1.50 : 1*	*2.20:1*	50	49*[d]	1
Frigates		112	37	27*	176	*1.16 : 1*	*1.38:1*	128	124*[d]	4
Corvettes/large patrol craft		80	39	0	119	*1.63 : 1*	–	73	30*[d]	43
FAC(M/T/P)		98	78	3	179	*1 : 2.59*	*1:2.55*	456	290*[d]	166
MCM[f]		164	68	3	235	*1 : 1.76*	*1:1.74*	408	275*[d]	133
Amphibious[g]		176	191	33	400	*2.43 : 1*	*2.65:1*	151	62*[d]	89
Naval and Maritime Aircraft										
Bombers		0	0	0	0	–	–	240	240	0
Attack		113	0	204*	317	*1.35 : 1*	*3.77:1*	84	45*	39
Fighters		30	0	126*	156	–	–	0	0	0
ASW		16	20	60*	96	*1 : 3.61*	*1:1.35*	130	130*	0
MR/ECM		119	28	84*	231	*1.18 : 1*	*1.85:1*	125	115*	10
ASW hel		199	150	36*	385	*1.91 : 1*	*2.10:1*	183	175*	8
Land Attack Aircraft and Fighters[h]										
Bombers		34	0	0	34	*1 : 13.38*	–	455	455	0
FGA		1,120	568	498	2,186	*1 : 1.00*	*1.30:1* *(1:1.18)*	1,685 (+900)	1,100* (+900*)	568
Fighters		116	0	96	212	*1 : 6.03*	*1:3.30* *(1:8.02)*	700 (+1,000)	700* (+1,000*)	0
Interceptors		416	231	0	647	*1 : 6.77*	–	4,382	2,880*	1,506
Reconnaissance[i]		190	98	66	354	*1 : 1.96*	*1:1.59* *(1:2.72)*	564 (+400)	400* (+400*)	164
Armed hel		805	60	330*	1,195	*1 : 1.10*	*1.52:1*	786	700	86

*** Estimated figures.**

[a] Includes French forces and Canadian forces in Europe, but not Spanish forces.

[b] Includes 1,500,000 command and general support troops not shown in previous years. Less these the total is 3,550,000.

[c] 'Tk' includes tank and armoured divs; 'Mech' includes mechanized, motorized and motor rifle; 'Other' includes airborne, airportable, mountain, amphibious and light infantry.

[d] From Western and Southern Theatres, less Turkestan MD.

[e] Field forces only; *Voyska-PVO* would provide additional AD equipment.

[f] Includes support craft and inshore boats.

[g] All types.

[h] OCU aircraft are not included in these totals. Reorganization of the Soviet Air Force may have altered these totals.

[i] Includes EW/ECM aircraft.

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recalling and placing reservists into skeleton formations for war. The limitations of Soviet internal communications might make it difficult to switch divisions from one part of the USSR to another, but the links between the central USSR and the borders are more than adequate for rapid movement towards potential battlefronts so long as they stay free from attack.

Within Europe many countries can mobilize in place, although very many distinctively different methods are adopted. In the case of Britain, movement to the mainland of Europe is less easy and is liable to interdiction. Those countries which must move reinforcements across the Atlantic clearly face the possibility of serious interruption. Finally, it must be noted that the United States, Britain, and Canada do not have a pool of trained reserve manpower comparable to that available to other nations which have universal conscription.

Commonality and Technology

The accompanying table shows that the Warsaw Pact enjoys numerical advantage in virtually all categories of weapons shown, the notable exception being crew-served anti-tank missiles, AA guns, some naval vessel types, and some naval aircraft. What is not shown by these figures is a primary advantage enjoyed by the Warsaw Pact, namely that the weapons in service, and the tactical doctrines for their use, are common throughout the Pact. NATO suffers from doctrines by no means identical and from a wide variety of everything from weapon systems to support vehicles, with consequent duplication of supply systems and some difficulties of interoperability.

The question of technological superiority is impossible to answer without the test of combat. In general, however, Soviet equipment is thought to be rugged, relatively immune to mishandling, and apparently reliable. However, crew comfort and safety standards are significantly lower than those demanded in the West. While these factors may not be detrimental to efficiency over the short term, under the stress of combat the accident rate could rise and efficiency decline rather severely.

Logistics

NATO's logistic system is based almost entirely on national supply lines, and the difficulties are compounded by lack of standardization between nations and by lack of central co-ordination. In these respects it is inferior to that of the Warsaw Pact. Certain NATO countries, too, still lack sufficient spares and ammunition. Some Pact nations may also suffer from shortages, but the fact that their equipment is standardized would enable them to restock more quickly. The Soviet logistic system, which uses a mix of rail, road, and pipeline, has been greatly improved in recent years.

Air Power

The Warsaw Pact has long contemplated the use of surface-to-surface missiles to deliver high-explosive, nuclear, and chemical warheads against targets deep in enemy rear areas. However, the Soviet Union is also increasing her inventory of modern fighter-bombers, and these pose an increasingly significant long-range threat. In terms of Pact defence against air attack, a large number of interceptors must be added to an impressive array of surface-to-air missiles and artillery pieces. It is clear that in war NATO air forces would face a formidable task in maintaining air support for the NATO ground forces on the European battlefield.

The Warsaw Pact continues to enjoy the benefits of standardized aircraft servicing and handling facilities. Although its aircraft cannot generally operate from unimproved runways, there are a very large number of modern airfields available with hardened aircraft shelters. NATO, on the other hand, still suffers from too few airfields and too many types of aircraft, although considerable improvements have been made in interoperability, in preparing airfields to receive aircraft from outside the theatre (the co-located operating base (COB) concept), and in hardening airfields. NATO probably still enjoys a measure of overall electronic superiority and may enjoy a somewhat greater flexibility in command and control in combat conditions, but electronic counter-measures are being emphasized by the Pact, and tend to negate NATO's advantage.

Summary

The numerical balance over the last 20 years has slowly but steadily moved in favour of the East. At the same time the West has largely lost the technological edge which allowed NATO to believe that quality could substitute for numbers. One cannot necessarily conclude that NATO would suffer defeat in war, not that the Warsaw Pact would see its advantage as being sufficient to risk an attack, but one can conclude that there has been sufficient danger in the trend to require remedies.

Assessing the balance between NATO and the Warsaw Pact based on comparisons of manpower, combat units, or equipment contains a large element of subjectivity. In the first place, the Pact has superiority in some areas and NATO in others, and there is no satisfactory way to compare these asymmetrical advantages. Tank superiority can be negated by combinations of many different kinds of anti-tank systems. Secondly, it is not possible to reduce to numbers such qualitative factors as training, morale, leadership, tactical initiative, terrain, weather, and geographical advantage, all of which are vitally significant in warfare. Thirdly, there is no agreement as to the form and scope that any hostilities which might break out would be likely to take or as to their duration. Such an assessment would have a vital bearing on the composition of the forces involved, resupply stocks, reinforcements, and many other considerations. The table which forms part of this presentation attempts to distinguish between forces in being and those which might be made available over the longer term. It can pass no judgements as to the reliability of the forces or the political will and cohesion of the two alliances.

Our conclusion remains that the overall balance continues to be such as to make military aggression a highly risky undertaking. Though tactical redeployments could certainly provide a local advantage in numbers sufficient to allow an attacker to believe that he might achieve limited tactical success, there would still appear to be insufficient overall strength on either side to guarantee victory. The consequences for an attacker would be unpredictable, and the risks, particularly of nuclear escalation, incalculable.

Economic Trends and Defence Expenditure

During recent years the international economy has achieved at best only a small rate of growth, and many individual economies have even suffered negative growth rates. Problems such as high population increase, inequitable allocation of resources, financial management, etc., are political in nature and have not been resolved by the nations of the world at large. Even within the two major economic blocs—the developed market economies and the centrally planned economies—there exists no consensus on how to face these problems.

Countries have tried through various policies to combat inflationary pressures and to increase labour productivity, hoping thereby to improve their trading positions. While many succeeded in some of these objectives, it was at the expense of declining real GDP growth rates. In real terms, GDP growth in the OECD area increased by only just over 1% in 1980 and 1981, and actually decreased in 1982. According to the World Bank the aggregate growth rate for all industrialized countries between 1980 and 1982 was 0.4%, compared with an average 2.5% growth between 1973 and 1980. OECD trade remained unchanged in 1981 and declined by 2–3% in 1982.

The centrally planned economies of the USSR and Eastern Europe have not had any better success. While the uncertainties about East European statistics do not allow for any precise comparison with the West, it has been estimated that East European and Soviet growth rates decelerated sharply, falling to an aggregate of about 2%, compared with about 5% in 1977–8. Indeed some Western economists have asserted that a zero *per capita* growth rate was reached in the USSR. Unlike the OECD members and other countries, the major problem facing these economies is the over-centralization of the planning process. which tends to be unable to meet the requirements of a modern industrial economy.

Because it is impossible to treat the 'developing countries' as one category, no single economic indicator for recent years' economic performance is possible. The major 'third-world' oil-producing states (principally in the Persian Gulf) cannot be classifed as 'developing' in the same sense as Indonesia or Mexico; nor can the 'newly industrialized' economies (such as South Korea or Brazil) be compared to really poor countries like Ghana, Afghanistan, or Bangladesh. According to the World Bank, the African low-income countries' growth rate, already low, declined from an average of 1.4% between 1973 and 1980 to 0.5% in 1980–82. And according to the same report, the next 10–15 years will see less growth than they enjoyed in the 1970s.

Poor economic performance and high energy import costs—coupled with high international interest rates—have already caused medium and long-term third-world debts (measured in current dollars) to double between 1977 and 1982. Countries such as Nigeria, Brazil, Mexico, and Yugoslavia (which until the late 1970s enjoyed relatively good economic performances) have during the past two years faced virtual financial disaster.

Even the oil-producing states in the Middle East have had to face major financial restrictions. During the 1970s they enjoyed an unprecedented economic expansion caused first by the price increases of 1973–74 and then by those of 1978–80. The resulting glut on the world market, however, led to a sharp fall in petroleum prices, amounting to about 25% between 1982 and 1983. While this benefited the oil importers in the short run (especially the developing countries), it caused serious strains for the budgets and development projects of many oil producers, even though some of them (such as Kuwait and Saudi Arabia) can draw on their large foreign reserves.

Despite a sharp decline in national income in most countries and cuts in spending in practically all public sectors, including social services, global military expenditure has continued to increase sharply. It appears to have risen by some 10% between 1981 and 1982, although global GDP growth amounted to only about 1.3–1.5%. In the period between 1978 and 1982, NATO military outlays (excluding those of the US) appear to have remained at the same level (in constant prices), and possibly even decreased. If the US is included in the NATO figures, however, defence expenditure increased by some 11–12% over the same period.

A similar trend is discernible in the Warsaw Pact. Excluding the USSR, and apart from Poland (which has suffered an inflation rate of over 100% during the past two years), Warsaw Pact countries appear to have maintained the same level of spending over the past five years (in constant terms), but if the Soviet defence expenditure is included the trend is similar to that in NATO: an average increase of 4–6% (according to some American sources). At present US defence expenditure as a percentage of GDP is the highest in NATO and, if the present trends continue, will reach the 10% mark within 3–4 years.

The highest growth rate is witnessed in the Middle East, where military expenditure has increased by over 35% over the past five years. Despite major cutbacks in development programmes, military purchases continue to increase. Much of the expenditure during the past three years is due to the continuing Iraq–Iran conflict and Israel's invasion of Lebanon.

Africa's serious economic situation, however, is reflected in the decline in military expenditure in all countries except the Republic of South Africa; over the past five years the military expenditure of Black African countries has fallen by some 20%, a decrease of some 4% per annum.

Surprisingly, although it too faces severe economic problems, Latin America has shown a general increase of 10–20% in the past five years.

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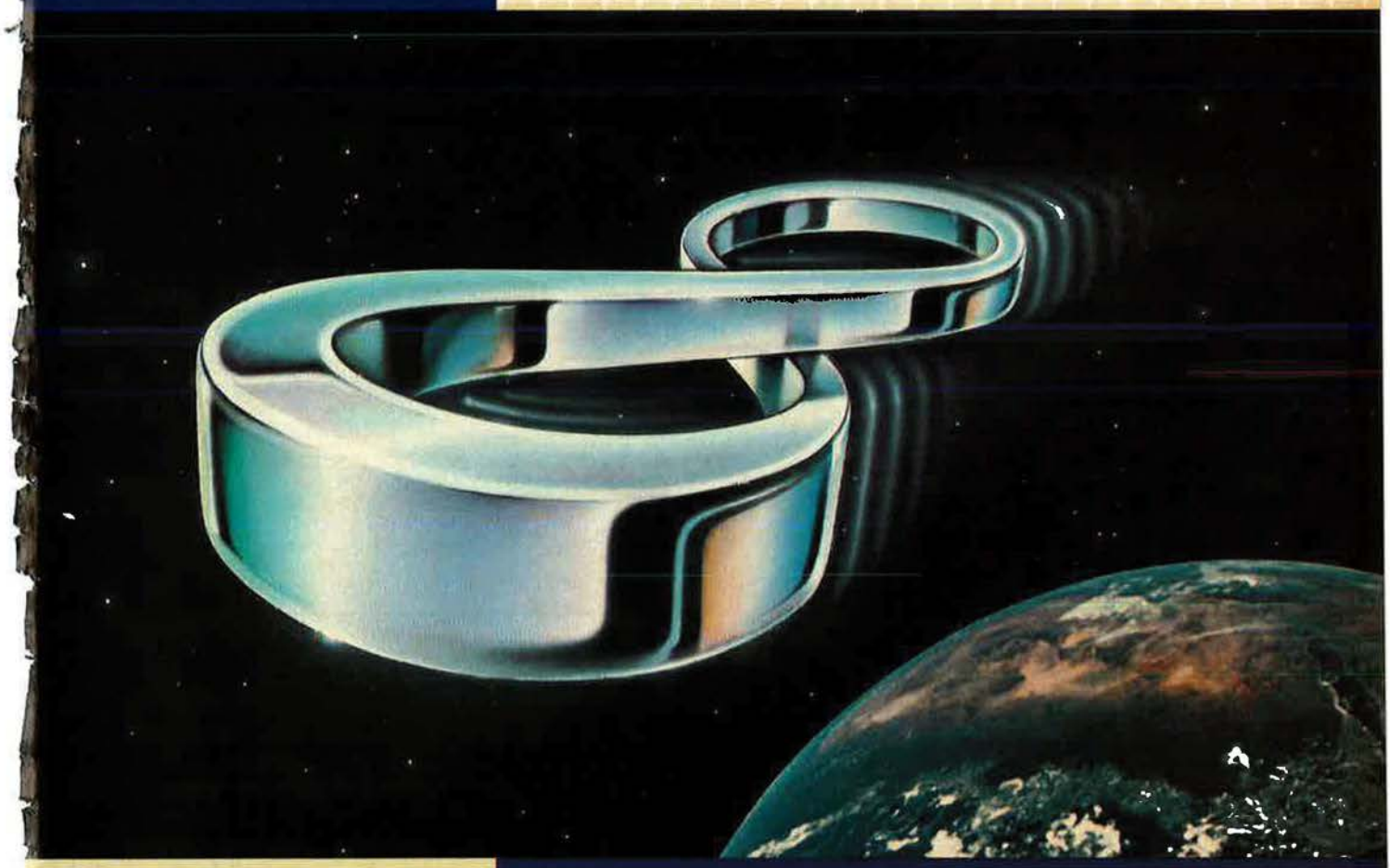

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Tables of Comparative Strengths

1. Nuclear Delivery Vehicles: Comparative Strengths and Characteristics

(A) United States and Soviet Union

(1) MISSILES AND ARTILLERY

United States

Category and type	Deployed: Total 7/83	Deployed: First year	Range (km)[a]	Throw-weight (000 lb)[b]	CEP (m)[c]	Warheads, max. yield[d] and notes
STRATEGIC						
Land-based *(ICBM)*[e]						
Titan II	45	1962	15,000	8.3	1,300	1 × 9 MT, General Electric Mk 6. Being phased out.
Minuteman II	450	1966	11,300	1.6	370	1 × 1–2 MT, Avco Type 11B/C.
Minuteman III	250	1970	13,000	2.4	280	3 × 170 KT W-62 warhead, GE Mk 12 penetrating vehicle (MIRV).
	300	n.a.	n.a.	n.a.	220	3 × 335 KT W-78 warhead, Mk 12A MIRV.
Sea-launched *(SLBM)*						
Poseidon C-3	304	1971	4,600	3.3	450	10 × 50 KT W-76 (MIRV) or 14 over reduced range.
Trident C-4	264	1980	7,400	2.9	450	8 × 100 KT W-76 warheads (14 RV over 4,600 km), Mk 4 MIRV.
INTERMEDIATE						
Land-based *(I/MRBM)*[e]						
Pershing II	(9)	(end-1983)	1,800	n.a.	30	1 × W-85 (selectable, 5 to 50+ or higher KT).
(GLCM)						
BGM-109A	(32)	(end-1983)	(some 2,250)	n.a.	n.a.	n.a.
TACTICAL[f]						
Land-based *(SRBM)*[e]						
Pershing IA	108	1962	160–720	n.a.	n.a.	Dual-capable, 1 × 60–400 KT.
Lance	36	1972	110	n.a.	50	Dual-capable, 1 × 50 KT W-70.

Soviet Union

Category and type		Deployed: Total 7/83	Deployed: First year	Range (km)[a]	Throw-weight (000 lb)[b]	CEP (m)[c]	Warheads, max. yield[d] and notes
STRATEGIC							
Land-based *(ICBM)*[e]							
SS-11 *Sego*	Mod 1	550(–)	1966	10,500	2	1,400	1 MT
	Mod 3	some	1973	8,800	2.5	1,100	3 × 100–300 KT MRV.
SS-13 *Savage*	Mod 1	60	1968	10,000	1	2,000	1 × 750 KT.
SS-17 (RS-16)	Mod 1	150(–)	1975	10,000	6	450	4 × 750 KT MIRV. In mod SS-11 silos.
(cold	Mod 2	few	1977	11,000	3.6	450	1 × 6 MT.
launch)	Mod 3	few	1982	10,000	n.a.	n.a.	4 × 2 KT MIRV
SS-18 (RS-20)	Mod 1	308	1975	12,000	16.5	450	1 × 20 MT.
(cold	Mod 2		1977	11,000	16.7	450	8 × 900 KT MIRV.
launch)	Mod 3		1979	10,500	16	350	1 × 20 MT.
	Mod 4		1982	11,000	16.7	300	10 × 500 KT MIRV.
	(Mod 5)		(1985)	(9,000)	(16)	(250)	(?10 × 750) KT MIRV.
SS-19 (RS-18)	Mod 1	–	1974	9,600	8	500	6 × 550 KT MIRV (out of service).
(hot	Mod 2	few	1979	10,000	7.5	300	1 × 5 MT. In mod SS-11 silos.
launch)	Mod 3	330(–)	1982	10,000	8	300	6 × 550 KT MIRV. In mod SS-11 silos.
Sea-launched *(SLBM)*							
SS-N-5 *Serb*		48	1964	1,400	n.a.	2,800	1 × 1 MT range. (Includes 39 non-SALT.)
SS-N-6	Mod 1	384	1968	2,400	1.5	900	1 × 1 MT Liquid fuel.
Sawfly	Mod 2		1973	3,000	n.a.	900	1 × 1 MT. Liquid fuel.
	Mod 3		1974	3,000	1.5	1,400	2 × 200 KT MRV. Liquid fuel.
SS-N-8	Mod 1	292	1972	7,800	1.5	1,300	1 × 1 MT.
	Mod 2		n.a.	9,100	8	900	1 × 800 KT
SS-N-17		12	1977	3,900	2.5	1,500	1 × MT. Solid-fuel.
SS-N-18	Mod 1	224	n.a.	6,500	5	1,400	3 × (?200) KT MIRV. Solid-fuel SS-N-8 successor.
	Mod 2		1978	8,000	n.a.	600	1 × 450 KT.
	Mod 3		n.a.	6,500	n.a.	600	7 × 200 KT MIRV.
SS-NX-20		20	(1981)	8,300	n.a.	n.a.	6–9 MIRV. Solid fuel (? now operational)
INTERMEDIATE							
Land-based *(I/MRBM)*[e]							
SS-4 *Sandal*		223[f]	1959	2,000	3	2,300	1 × 1 MT. Being withdrawn.
SS-5 *Skean*		16[f]	1961	4,100	3.5	1,100	1 × 1 MT. Being withdrawn.
SS-20	Mod 1	(360)[f]		5,000	n.a.	n.a.	1 × 1.5 MT.
	Mod 2		1977	5,000	n.a.	400	3 × 150 KT MIRV.
TACTICAL							
Land-based *(SRBM)*[e]							
SS-1b *Scud* A		440[f]	1957	150	n.a.	n.a.	1 × KT range. Being replaced by SS-23.
SS-1c *Scud* B		(570)[f]	1965	300			
FROG-7		440[f] (620)	1965	70	n.a.	400	1 × 200 KT. Being replaced by SS-21.
SS-12 *Scaleboard*		70[f] (120)[f]	1969	490–900	n.a.	900	1 × 200 KT. Being replaced by SS-22.
SS-21		(some 62)[f]	1978	120	n.a.	300	Dual-capable.
SS-22		(100)	1979	900	n.a.	300	500 KT.
SS-23		(some 10)[f]	1979–80	500	n.a.	n.a.	Dual-capable.
(GLCM)							
SS-C-1b *Sepal*		(some 100)	1962	450	n.a.	n.a.	1 × KT range. Similar to SS-N-3.

UNITED STATES

Category and type	Deployed Total 7/83	Deployed First year	Range (km)[a]	Throw-weight (000 lb)[b]	CEP (m)[c]	Warheads, max. yield[d] and notes
Sea-launched *(SLCM)*						
BGM-109 *Tomahawk*	44	1983 (Sept)	2,400	n.a.	n.a.	W-80. 1 × 200 KT and HE; SSN 665 *Guitarro* (12), BB62 *New Jersey* (32)
Air-launched						
ALCM						
AGM-86B	some 200	1982	2,400	2.8	100	W-80, 200 KT.
SRAM						
AGM-69A	1,140	1972	55–160	2.2	370	1 × 200 KT; B-52G/H (20) FB-111A (6). W-69 warhead.
Artillery[f]						
M-110 203mm SP how (mod)	200	1962	21	—	170	1 × M-422, W-79: 1 to 2 KT, 0.5 KT
M-109 155mm SP how	252	1964	18	—	n.a.	W-48, W-74. 1 × 2 KT, W-82. 0.5; 4–5 KT (under development)

SOVIET UNION

Category and type	Deployed Total 7/83	Deployed First year	Range (km)[a]	Throw-weight (000 lb)[b]	CEP (m)[c]	Warheads, max. yield[d] and notes
Sea-launched *(SLCM)*						
SS-N-3 *Shaddock*	316	1962	450	2	n.a.	1 × 350 KT/conventional.
SS-N-7 *Siren*	(144)	1968	45	1.2	n.a.	1 × 200 KT/conventional.
SS-N-9	(154)	1968/9	280	n.a.	n.a.	1 × 200 KT/conventional.
SS-N-12 *(Sandbox)*	80	1976 / n.a.	1,000 / 550	2.2 / n.a.	n.a. / n.a.	1 × 350 KT/conventional. SS-N-3 replacement.
SS-N-14 *(Silex)*	(288)	1974	55	n.a.	n.a.	KT range ASW.
SS-N-19	44	1980	460	n.a.	n.a.	
SS-NX-22	(20)	(1982)	n.a.	n.a.	n.a.	? improved SS-N-9, ? dual-capable
Air-launched						
ALCM[g]						
AS-2 *Kipper*	90	1961	200	2.2	n.a.	1 × KT range/conventional; *Badger* C (1)
AS-3 *Kangaroo*	(70)	1961	650	n.a.	n.a.	1 × MT range/conventional; *Bear* B/C (1).
AS-4 *Kitchen*	(up to 645)	1962	300	n.a.	n.a.	1 × 200 KT range/conventional; *Bear* B (2, no AS-3), *Blinder* B (1) *Backfire* B (1 or 2).
AS-6 *Kingfish*	(up to 880)	1977	250	n.a.	n.a.	200 KT/conventional; *Badger* C/G (2).
Artillery						
(new towed and SP 152mm reported)	n.a.	1982	n.a.	n.a.	n.a.	Dual-capable.
S-23 180mm towed gun	(168)	1950/55	30	0.2	n.a.	Dual-capable. 1 × KT range.
203mm SP how (reported)	n.a.	1979	18+	n.a.	n.a.	Dual-capable.
240mm SP mor (reported)	n.a.	1979	10	n.a.	n.a.	Dual-capable.

(II) AIRCRAFT

UNITED STATES

Category[h] and type	Deployed Total 7/83	Deployed First year	Range (km)[a]	Max. speed (Mach)	Weapons load (000 lb)
Bombers					
Long-range					
B-52D	31[i]	1956	9,900	0.95	60
B-52G	151[i]	1959	12,000	0.95	70
B-52H	90[i]	1962	16,000	0.95	70
Medium-range					
FB-111A	56[i]	1969	4,700	2.5	37.5
Strike aircraft[f]					
Land-based					
F-4E	96	1962	2,200	2.4	16
F-111/E/F	150	1967	4,700	2.2/2.5	28
F-16	144	1979	3,800	2+	20
Carrier-based					
A-6E	(60)	1963	3,200	0.9	18
A-7E	(144)	1966	2,800	0.9	20

(II) AIRCRAFT[h]

SOVIET UNION

Category[h] and type[g]	Deployed Total 7/83	Deployed First year	Range (km)[a]	Max. speed (Mach)	Weapons load (000 lb)
Bombers					
Long-range					
Tu-95 *Bear* B/C	100[k]	1956	12,800	0.78	40
Mya-4 *Bison*	43[k]	1956	11,200	0.87	20
Medium-range					
Tu-16 *Badger*	440[l]	1955	4,800	0.8	20
Tu-22 *Blinder*	165[l]	1962	4,000	1.5	12
Tu-22M *Backfire*	210[l]	1974	8,000	2.5	17.5
Strike aircraft[j]					
Land-based					
Su-7 *Fitter* A	150	1959	1,400	1.7	5.5
MiG-21 *Fishbed*	100	1970	1,100	2.2	2
MiG-27 *Flogger* D/J	650	1971	1,400	1.7	7.5
Su-17 *Fitter* D/H	650	1974	1,800	1.6	11
Su-24 *Fencer*	800	1974	4,000	2.3	8

(III) HISTORICAL CHANGES IN LAUNCHER STRENGTH (incl trg ac but not reserves)

	United States										
	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ICBM	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,052	1,052	1,045
SLBM	656	656	656	656	656	656	656	656	576	520	568
Long-range bombers	397	397	397	387	373	366	365	338	316	316	272

	Soviet Union										
	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ICBM	1,575	1,618	1,527	1,477	1,350	1,400	1,398	1,398	1,398	1,398	1,398
SLBM	628	720	784	845	909	1,028	1,028	1,028	989	989	980
Long-range bombers	140	140	135	135	135	135	156	156	150	150	143

(B) Other NATO and Warsaw Pact Countries

(I) MISSILES AND ARTILLERY

NATO (excluding USA)

Category and type[m]	Deployed: Total 7/83	Deployed: First year	Range (km)[a]	Warheads and max. yield[c]	CEP (m)[c]	Countries equipped
Land-based						
IRBM[e]						
SSBS S-3	18	1980	3,500	1 × 1 MT	n.a.	France.
SRBM[e]						
Honest John	54	1953	40	1 × KT range	n.a.	Greece, Turkey.[n]
Pershing IA	72	1962	720	1 × KT range	n.a.	FRG (in Air Force).[n]
Pluton	42	1974	120	1 × 10 KT	n.a.	France.
Lance	56	1976	110	1 × KT range	n.a.	Belgium, Britain, FRG, Italy, Netherlands.[n]
Sea-launched						
SLBM						
Polaris A-3	64	1967	4,600	3 × 200 KT (MRV)	900	Britain. *Chevaline* (? 6 MRV warheads) being fitted.
MSBS M-20	80	1977	3,000	1 × 1 MT	n.a.	France. M-4 to replace.
Artillery (dual-capable)						
M-110 203mm SP how	387	1962	16	1 × 1 KT range.	170	Belgium, Britain, FRG, Greece, Italy Netherlands, Turkey.[n]
M-109 155mm SP how	1,488	1964	18	1 × 2 KT range.	n.a.	Belgium, Britain, Canada, Denmark FRG, Greece, Italy, Netherlands Norway, Portugal, Turkey.[n]

Warsaw Pact (excluding USSR)

Category and type[m]	Deployed: Total 7/83	Deployed: First year	Range (km)[a]	Warheads and max. yield[c]	(CEP) (m)[c]	Countries equipped
Land-based						
SRBM (dual-capable)[c]						
Scud B/C	137	1965	160–450	1 × KT range.	n.a.	All.[o]
FROG-3/-5/-7	198	1957–65	40–60	1 × 200 KT range.	380	All.[o]
Sea-launched						
Artillery						

(II) AIRCRAFT[h]

NATO (excluding USA)

Category and type[g]	Deployed Total 7/83	Deployed First year	Range (km)[a]	Max Speed (Mach)	Weapons load (000 lb)	Countries equipped
Strike aircraft						
Land-based						
F-104	261	1958	2,400	2.2	4	FRG, Greece, Italy, Netherlands, Turkey.
F-4	142	1962	2,200	2.4	16	FRG, Greece, Turkey.
F-16	90	1982	3,800	2+	20	Belgium (36), Netherlands (54)
Buccaneer	45	1962	3,700	0.95	12	Britain. *Tornado* to replace.
Mirage IVA	34	1964	3,200	2.2	16	France. 1 × AN-22 60-KT.
Mirage IIIE	30	1964	2,400	1.8	19	France. (2) × AN-52 15-KT.
Jaguar	117	1974	1,600	1.4	10	Britain, France.
Tornado	80	1981	2,800	0.95	16	Britain GR-1 (32), FRG (30), Italy (18)
Carrier-based						
Super Etendard	36	1980	1,500	1.0	2	France. (2) × AN-52 15-KT.

WARSAW PACT (excluding USSR)

Category and type[g]	Deployed Total 7/83	Deployed First year	Range (km)[a]	Max Speed (Mach)	Weapons load (000 lb)	Countries equipped
Strike aircraft						
Land-based						
Su-7 *Fitter* A	115	1959	1,400	1.7	5.5	Czechoslovakia, Poland.[o,p]
Su-20 *Fitter* C	35	1974	1,800	1.6	4.0	Poland.[o,p]

[a] Ranges given in km; for nautical miles, divide by 1.852. Use of maximum payload may reduce a missile's operational range by up to 25% of figures shown. Figures for aircraft are theoretical maximum unrefuelled range at optimum altitude and speed. Higher speeds, lower altitudes and full weapons loads reduce range, especially with strike ac; for instance an A-6, at operational height and speed and with typical weapons load, has a combat *radius* of some 1,500km, compared with a maximum ferry *range* of 4,700km.

[b] Throw-weight is the weight of post-boost vehicle (warheads, guidance systems, penetration aids) deliverable over a given range. Throw-weight will be less than shown for maximum ranges.

[c] CEP (circular error probable) = the radius of the circle around a target within which there is a 50% probability that a weapon aimed at that target will fall.

[d] Warhead yields vary greatly; figures given are estimated maxima. KT range = under 1 MT; MT range = over 1 MT. Yield figures for dual-capable weapons (which can deliver conventional or nuclear warheads) refer to nuclear warheads only.

[e] ICBM = range of over 5,500 km; IRBM = 2,400–5,500 km; MRBM = 800–2,400 km; SRBM = 800 km or less.

[f] Deployment figures for systems in Europe and European USSR; National totals in brackets. Carrier-based ac figures assume 6 carriers in European area (Atlantic and Mediterranean fleets). Estimated two-thirds of SS-20 within range of Europe.

[g] Names of Soviet missiles and aircraft (e.g. *Sego, Bear*) are of NATO origin. Numerical designations of Soviet missiles (but not aircraft) are of US origin.

[h] Long-range = over 9,000km; medium-range = 5,600–9,000km; bomber = aircraft primarily designed for bombing missions.

[i] Excluding 28 ac in storage or reserve. B-52D being retired. B-52G/H being modified for cruise missile launch.

[j] All the types listed are dual-capable, but some in the strike categories are not presently configured for the nuclear role.

[k] Excluding tankers (AASU: 30 Mya-4, 18 Tu-16; Naval Air: 75 Tu-16).

[l] Including Naval Air Force bombers (some 220 Tu-16, 40 Tu-22, 100 Tu-22M).

[m] All NATO missiles of US origin, except SSBS, *Pluton* and MSBS (French). All WP vehicles of Soviet origin.

[n] Nuclear warheads held in American custody. No nuclear warheads held on Danish or Norwegian soil. In few cases is the M-109 likely to have a nuclear role.

[o] Nuclear warheads held in Soviet custody.

[p] *Buccaneer* of British origin; F-104, F-4 and F-16 American; *Mirage* and *Super Etendard* French; *Jaguar* Anglo-French; *Tornado* British–German–Italian. All Warsaw Pact aircraft of Soviet origin. It is uncertain how many are nuclear capable.

2. Warsaw Pact and NATO Defence Expenditures 1971–81

(millions of local currency units and US$)

		1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1981 at 1975 prices	Change 1975–81
Warsaw Pact[a]														
Bulgaria	leva			422	483	548	645		518	649	790	859		
	$			410	488	596	725		617	791	878	1,011		
Czechoslovakia	koruny	15,000	15,920	16,700	17,300	19,280	20,400	18,240	19,450	20,290	22,400	23,100		
	$	1,803	1,951	2,085	2,246	2,835	3,096	3,097	3,430	3,743	4,392	4,812		
GDR[b]	ostmarks	7,200	7,800	8,328	8,900	9,564	10,223	11,020		13,060	13,100	14,100		
	$	2,892	3,197	3,544	4,083	4,665	5,163	5,770		7,637	8,137	9,338		
Hungary	forints	8,900	9,717		10,510	11,258	12,275	13,150	14,416	16,000	16,560	19,060		
	$	587	632		735	805	844	929	1,036	1,146	1,240	1,444		
Poland	zloty	37,400		39,210	45,200	47,300	52,928	57,280	58,800	65,300	70,400	76,900		
	$	2,469		2,483	2,850	3,270	3,367	3,672	3,886	4,466	4,996	5,696		
Romania	lei	7,500	7,710	7,900	8,640	9,710	10,570	11,300	12,000	11,960	12,500	10,400		
	$	721	763	792	916	1,093	1,280	1,370	1,517	1,561	1,715	1,509		
USSR		*see pages 75–76*												
NATO[c]														
Belgium	francs	40,654	45,183	50,533	57,739	70,899	81,444	89,480	99,726	106,472	115,754	125,689	86,325	21.8%
	$	832	1,027	1,297	1,482	1,928	2,110	2,496	3,167	3,632	3,958	3,385		
Britain	£	2,815	3,258	3,512	4,160	5,165	6,132	6,810	7,616	9,029	11,510	12,154	5,550	7.5%
	$	6,854	8,151	8,612	9,731	11,478	11,077	11,887	14,621	19,158	23,356	24,648		
Canada	$C	2,131	2,238	2,405	2,862	3,127	3,589	4,124	4,662	4,825	5,499	6,289	3,680	17.7%
	$US	2,110	2,261	2,405	2,926	3,074	3,640	3,878	4,087	4,119	4,703	5,246		
Denmark	kroner	3,195	3,386	3,520	4,439	5,281	5,680	6,343	7,250	7,990	9,061	10,250	5,590	5.9%
	$	431	487	582	728	919	940	1,057	1,315	1,519	1,608	1,439		
France	francs	34,907	37,992	42,284	47,878	55,872	65,899	73,779	85,175	96,439	111,672	129,708	69,740	24.8%
	$	6,298	7,532	9,494	9,954	13,035	13,788	15,016	18,874	22,668	26,425	23,867		
FRG[d]	DM	25,450	28,720	31,908	55,644	37,389	38,922	40,184	43,019	45,415	48,518	52,193	40,400	8.1%
	$	7,291	9,007	11,939	21,502	15,197	15,458	17,304	21,417	24,778	40,850	23,094		
Greece	drachma	15,534	16,809	19,991	31,449	45,936	56,963	67,738	77,861	89,791	96,975	142,865	53,990	17.5%
	$	518	560	675	1,048	1,423	1,560	1,839	2,119	2,424	2,276	2,578		
Italy	lire (bn)	1,852	2,162	2,392	2,852	3,104	3,608	4,533	5,301	6,468	8,203	9,868	3,930	26.6%
	$ (m)	2,987	3,707	4,103	4,385	4,755	4,335	5,137	6,246	7,785	9,578	8,681		
Luxembourg	francs	442	517	601	710	836	983	1,029	1,154	1,242	1,534	1,715	1,180	41.1%
	$	9	12	15	18	23	26	29	37	42	53	46		
Netherlands	guilders	4,394	4,886	5,360	6,144	7,119	7,662	9,098	9,146	10,106	10,476	11,296	7,910	11.1%
	$	1,255	1,522	1,917	2,285	2,815	2,898	3,707	4,227	5,038	5,269	4,527		
Norway	kroner	3,022	3,239	3,505	3,938	4,771	5,333	5,934	6,854	7,362	8,242	9,468	5,570	16.7%
	$	431	492	608	711	913	977	1,115	1,307	1,454	1,669	1,650		
Portugal	escudos	14,699	16,046	16,736	25,108	19,898	18,845	22,082	27,354	34,343	43,440	51,917	15,880	–20.2%
	$	519	594	678	988	779	624	577	623	702	868	844		
Turkey	liras	8,487	9,961	12,192	15,831	30,200	40,691	49,790	66,239	93,268	185,656	313,067	29,890	–1.0%
	$	569	704	862	1,137	2,091	2,535	2,766	2,728	3,004	2,442	2,815		
USA	$	74,862	77,639	78,358	85,906	90,948	91,013	100,925	109,247	122,279	145,974	170,033	100,611	10.6%

[a] Warsaw Pact figures must be treated with great caution, since they only represent published statistics or (as in the case of Bulgaria) estimates. Imprecise data on inflation rates make constant-price time series unreliable also. Dollar conversions use implicit rates.

[b] Includes budget for internal security forces.

[c] Based on official NATO figures for the NATO definition of defence expenditure.

[d] Excluding aid to West Berlin, for which see Table 4.

3. Average Strength of Major Military Formations (in thousands)

	Division					Brigade				Squadron
	Armoured		Mechanized		Airborne	Armoured		Mechanized		Fighter aircraft
	Men	Tanks	Men	Tanks	Men	Men	Tanks	Men	Tanks	
United States	18,300	324	18,500	216	16,800	4,500	108	4,800	54	18–24
Soviet Union	11,000	335[a]	14,000	266[a]	7,000	1,300[b]	95[b]	2,300[b]	40[b]	12–15
China	9,200	270	12,700[c]	30[c]	9,000	1,200[b]	90[b]	2,000	—	9–10
Britain[d]	8,500	148	—	—	—	—	—	—	—	8–15
Germany	17,000	300	17,500	250	8–9,000	4,500[e]	110	5,000[e]	54	15–21
India	15,000	200	17,500[c]	—	—	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

[a] These tank strengths are for Soviet divisions in Eastern Europe; other Soviet divisions have fewer.

[b] Strength of a regiment, which is the equivalent formation in the Soviet and Chinese command structures. (The term 'regiment' may also describe a battalion-size unit, particularly in West European countries. The term 'group', often used in Latin American countries, is imprecise and may apply to a reinforced battalion or understrength brigade with AFV and/or artillery.)

[c] Infantry division.

[d] Britain has reintroduced the brigade organization, but combat formations are battle groups based on an armoured regiment or mechanized battalion. Armoured division strength will rise to 11,500 on mobilization.

[e] Manpower levels currently under review.

4. Comparisons of Defence Expenditure and Military Manpower 1978–83[a]

Country	Defence Expenditure: $ million[b] 1978	1981	1982	$ per capita 1978	1981	1982	% of government spending[c] 1978	1981	1982	% of GDP/GNP[d] 1978	1982	Numbers in armed forces (000) 1978	1982	1983	Est. reservists[e] (000) 1983	Para-military (000) 1983
Warsaw Pact[f]																
Bulgaria	432	1,245	1,287	49	140	144	6.2	5.6	5.7	2.3–3.0	2.2–2.9	150.0	148.0	162.3	795.0	172.5
Czechoslovakia	1,869	3,632	3,774	124	237	243	7.1	7.4	7.7	3.4–3.9	2.8–5.2	186.0	196.5	204.5	230.0	131.0
GDR	5,974	6,246	6,163	357	372	368	7.9	8.4	8.4	5.0–8.1	3.7–6.5	157.0	166.0	167.0	385.0	411.5
Hungary	790	1,237	1,318	74	115	123	3.8	3.9	4.0	2.4	2.4	114.0	106.0	105.0	143.0	75.0
Poland	3,369	5,532	6,254	96	153	173	8.6	5.2	7.1	3.0	n.a	306.5	317.0	340.0	500.0	635.0
Romania	1,301	1,254	1,297	60	56	57	3.9	3.8	4.1	2.1	1.6	180.5	181.0	189.5	565.0	1.59m
Soviet Union					*see pages 75–76*							3,638.0	3,705.0	5,050.0[g]	5,000.0[g]	80.45m
NATO[h]																
Belgium	3,166	3,342	2,799	319	337	283	8.6	8.7	8.1	3.3	3.3	87.1	93.5	94.7	178.9	16.2
Britain	14,621	24,223	24,200	262	433	432	11.6	11.4	11.9	4.6	5.1	313.3	327.6	320.6	280.7	–
Canada	4,087	4,919	5,989	174	202	247	9.1	8.7	9.2	2.0	2.0	80.0	82.9	82.9	21.8	1.3
Denmark	1,315	1,434	1,122	256	279	219	6.4	7.0	5.5	2.3	2.0	34.0	31.2	30.7	156.2	–
France	18,874	23,545	21,969	354	438	408	18.6	18.9	17.5	4.0	4.1	502.8	492.9	492.3	457.0	93.1
FRG[i]	26,851	29,047	28,453	438	471	461	27.4	28.2	27.9	4.2	4.3	489.9	495.0	495.0	750.0	20.0
Greece	2,119	2,273	2,574	228	237	265	27.3	21.4	23.5	6.7	6.7	190.1	206.5	185.0	404.0	29.0
Italy	6,246	8,681	8,924	110	152	156	6.6	6.4	5.6	2.5	2.6	362.0	370.0	373.1	794.0	206.6
Luxembourg	37	46	41	101	126	114	2.9	3.1	3.2	0.8	1.2	0.7	0.7	0.7	–	0.5
Netherlands	4,227	4,717	4,468	302	333	315	8.7	8.3	7.8	3.3	3.3	109.7	104.0	103.0	176.5	8.7
Norway	1,307	1,646	1,680	322	401	410	9.4	6.7	6.7	3.2	3.0	39.0	42.1	43.2	248.0	–
Portugal	623	840	778	64	83	79	n.a.	8.6	10.8	3.5	3.3	63.5	66.4	63.5	90.0	37.3
Spain	3,208	4,576	4,529	87	121	116	15.0	13.6	12.1	2.2	2.6	315.5	347.0	347.0	1,085.0	105.0
Turkey	2,728	2,306	2,755	63	50	59	20.2	20.7	21.7	5.2	5.2	485.0	569.0	569.0	836.0	125.0
USA	109,247	171,000	215,900	491	759	938	23.7	24.6	29.2	5.1	7.2	2,068.8	2,116.8	2,136.4	955.3	158.3
Other Europe																
Austria	737	768	787	93	102	105	4.0	3.9	3.9	1.3	1.2	37.0	49.4	50.0	1,097.0	–
Eire	196	276	296	61	80	86	3.5	2.8	2.7	1.6	1.8	14.6	16.4	15.2	37.4	–
Finland	485	712	809	102	149	168	6.0	5.3	5.7	1.5	1.7	39.9	36.9	40.4	700.0	4.1
Sweden	2,980	3,431	3,042	359	412	365	8.3	6.9	6.9	3.3	3.1	65.7	64.5	68.0	735.0	500.5
Switzerland	1,762	1,912	2,036	274	303	320	20.4	21.3	21.4	2.1	2.1	18.5	20.0	20.0	605.0	–
Yugoslavia	2,328	2,870	2,319	106	127	102	21.9	n.a.	n.a.	4.8[j]	n.a.	267.0	250.0	239.7	500.0	3–5m
Middle East																
Algeria	628	814	848	35	42	42	7.8	5.1	4.6	2.4	1.9	78.8	168.0	140.0	100.0	24.6
Egypt	1,586	2,100	2,495	40	48	56	n.a.	12.0	12.0	11.3	7.4	395.0	452.0	447.0	335.0	139.0
Iran[g]	9,938	4,468	7–13bn	280	114	173–329[g]	24	n.a.	16.5–31.8[g]	13.7	n.a.	413.0	235.0	n.a.	400.0	2,505
Iraq	1,988	4,741	7,722	159	343	568	14	n.a.	n.a.	9.8	n.a.	212.0	342.0	517.3	75.0	154.8
Israel	3,318	6,780	8,242	897	1,695	2,060	36.1	34.8	40.7	24.4	37.9	164.0	174.0	172.0	326.0	4.5
Jordan	310	424	440	107	137	139	30.3	21.3	21.5	16.5	11.3	67.9	72.8	72.8	35.0	7.5
Kuwait	1,018	1,561	n.a.	848	1,115	n.a.	17.4	8.4	n.a.	6.7	n.a.	12.0	12.4	12.4	–	–
Lebanon	n.a.	152	162	n.a.	49	52	n.a.	n.a.	9.0	n.a.	n.a.	7.8	23.8	27.0	n.a.	7.5
Libya	439	557	709	163	178	218	20.0	20.6	n.a.	2.3	n.a.	37.0	65.0	73.0	40.0	10.0
Morocco	773	1,102	1,328	39	54	63	17.0	19.0	18.0	5.8	n.a.	89.0	141.0	144.0	–	30.0
Oman	767	1,511	1,714	852	1,625	1,808	53.1	44.4	42.5	29.6	n.a.	19.2	18.0	23.6	n.a.	3.5
Qatar	n.a.	896[g]	n.a.	n.a.	3,896	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4.0	6.0	6.0	–	–
Saudi Arabia	10,355	24,148	27,022	1,259	2,591	2,780	27.1	27.7	n.a.	15.7	n.a.	58.5	52.2	51.5	–	43.5[g]
Sudan	201	311	234	11	16	12	13.6	10.9	11.6	2.6	n.a.	52.1	58.0	58.0	–	3.5
Syria	1,214	2,389	2,548	152	278	286	45.3	30.8	30.0	14.6	n.a.	227.5	222.5	262.5	102.5	9.8
Tunisia	185	211	119	30	32	18	8.9	8.9	4.8	3.1	n.a.	22.2	28.6	28.5	–	8.5
UAE	780	n.a.	2,915	1,097	n.a.	2,803	44.3	n.a.	48.0	5.0	n.a.	25.9	48.5	49.0	–	–
North Yemen	144	444	527	25	75	87	29.9	26.5	28.3	8.0	18.6	38.0	32.1	21.6	–	25.0
South Yemen	87	162	159	48	83	81	48.9	15.4	n.a.	10.7	n.a.	20.9	26.0	25.5	–	30.0
Africa																
Cameroon	61	77	79	8	9	9	n.a.	n.a.	n.a.	1.7	n.a.	6.1	7.3	7.3	–	5.0
Ethiopia	167	378	n.a.	6	12	n.a.	n.a.	n.a.	n.a.	4.8	n.a.	93.5	250.5	250.5	200.0	169.0
Ghana	202	n.a.	n.a.	18	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	17.7	14.6	12.6	–	5.0
Ivory Coast	88	92	91	12	11	11	n.a.	6.6	n.a.	1.1	n.a.	4.9	5.1	5.1	–	3.0
Kenya	12	n.a.[g]	n.a.[g]	0.8	9–17[g]	n.a.	n.a.	n.a.	n.a.	0.2	n.a.	9.1	16.7	16.0	–	1.8
Nigeria[g]	1,794	n.a.	n.a.	25	12–27	8–23	n.a.	n.a.	4.1–11.1[g]	4.0	1.0–2.8[g]	231.5	138.0	133.0	–	n.a.
South Africa	2,621	3,081	2,769	95	106	94	n.a.	21.1	18.7	5.7	3.9	65.5	81.4	82.4	157.0	145.5
Tanzania	302	316	n.a.	17	17	n.a.	n.a.	n.a.	n.a.	6.9	n.a.	26.7	40.4	40.4	–	51.4
Zaire	179	n.a.	n.a.	7	n.a.	n.a.	6.5	n.a.	n.a.	2.7	n.a.	33.4	26.0	26.0	–	22.0
Zambia	252	n.a.	n.a.	46	n.a.	n.a.	n.a.	n.a.	n.a.	9.3	n.a.	14.3	14.3	14.3	–	1.2
Zimbabwe	194	386	337	28	53	45	n.a.	n.a.	10.2	6.4	n.a.	10.8	63.0	41.3	–	13.0
Asia																
Australia	2,975	4,472	4,497	209	303	299	7.2	10.3	10.2	2.6	3.1	70.1	73.2	72.4	32.7	–
Bangladesh	113	153	161	1	2	2	n.a.	10.2	10.9	1.3	n.a.	73.5	77.0	81.3	–	–
Burma	189	174	175	6	5	5	n.a.	33.5	33.5	4.1	n.a.	170.0	179.0	179.0	–	–
China					*see page 111*							4,325.0	4,000.0	4,100.0	4,300.0	7,700.0
India	3,784	5,304	5,556	6	8	8	25.7	17.7	17.8	3.2	n.a.	1,096.0	1,104.0	1,120.0	200.0	262.0
Indonesia	2,036	2,692	2,926	14	17	19	n.a.	12.3	12.4	4.0	n.a.	247.0	269.0	281.0	n.a.	82.0
Japan	9,033	10,760	10,361	79	92	87	5.8	5.0	5.5	0.9	1.0	240.0	245.0	241.0	41.0	–
North Korea	1,034	1,682	1,916	61	92	103	14.2	14.8	16.2	9.8	10.2	512.0	784.0	784.5	270.0	1,798.0
South Korea	2,603	4,336	5,173	70	112	132	33.3	31.8	35.0	5.5	7.6	642.0	601.6	622.0	1,540.0	6,220.0
Malaysia	712	1,447	2,077	53	108	151	n.a.	12.4	15.2	4.5	8.0	64.5	99.1	99.7	61.0	459.0
New Zealand	315	495	493	98	157	156	4.4	6.3	6.2	1.7	n.a.	12.6	12.9	12.9	10.2	–
Pakistan	1,034	1,857	1,801	13	21	20	n.a.	36.7	n.a.	5.9	7.0	429.0	478.6	478.6	513.0	109.1
Philippines	794	835	878	17	17	17	17.9	12.0	12.5	3.3	2.2	99.0	112.8	104.8	118.0	108.5
Singapore	444	718	852	187	299	355	n.a.	15.8	17.0	5.7	5.6	36.0	42.0	55.5	150.0	37.5
Taiwan	1,872	3,600	3,323	109	198	183	n.a.	41.7	39.4	7.9	n.a.	–	464.0	464.0	2,970.0	25.0
Thailand	794	1,255	1,437	17	26	29	20.0	22.0	21.7	3.4	3.9	212.0	233.1	235.3	500.0	72.0
Latin America																
Argentina[g]	1,490			56			11.8		n.a.	2.3		132.9	180.5	153.0	250.0	42.0
Bolivia	91	186	n.a.	17	31	n.a.	16.0	16.7	n.a.	2.4	n.a.	22.5	26.6	28.0	–	–
Brazil	1,904	1,557	1,838	16	12	15	10.0	6.7	13.3	0.9	n.a.	273.8	272.9	277.1	1,115.0	185.0
Chile	714	2,103	n.a.	67	188	n.a.	14.6	21.5	n.a.	4.6	n.a.	85.0	97.0	96.0	24.0	27.0
Colombia	168	374	420	7	14	16	6.2	8.2	8.5	0.7	n.a.	75.5	67.8	70.2	70.0	50.0
Cuba	n.a.	1,271	n.a.	n.a.	130	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	159.0	127.5	153.0	190.0	718.0
Dominican Republic	50	104	103	10	18	17	6.6	9.6	9.9	1.0	n.a.	18.5	24.5	23.0	–	10.0
Ecuador	184	248	177	24	30	21	n.a.	9.9	n.a.	2.4	1.4	25.3	38.8	36.8	–	–
El Salvador	50	116	139	11	23	29	10.6	18.4	n.a.	1.6	3.8	7.1	16.0	24.7	n.a.	79.5
Guatemala	65	91	92	10	13	13	8.9	6.2	7.3	n.a.	0.9	14.3	18.6	21.6	–	11.6
Mexico[g]	556	1,403		9	20		3.4	n.a.		0.5		97.0	119.5	120.5	–	n.a.
Paraguay	41	88	n.a.	14	27	n.a.	13.8	23.8	n.a.	1.6	n.a.	17.0	16.0	16.0	25.0	1.5
Peru[g]	576	903		34	50		n.a.	20.6		5.4		89.0	135.5	135.5	n.a.	31.5
Uruguay	131	386	n.a.	46	131	n.a.	11.3	n.a.	n.a.	2.6	n.a.	27.0	29.7	30.5	–	1.5
Venezuela	615	907	142	47	63	78	5.7	n.a.	n.a.	1.5	1.6	44.0	40.8	40.5	–	20.0

[a] Statistical data is constantly under review. Differences between figures given in this issue of *The Military Balance* and those shown in previous issues may be due as much to re-evaluation as to new information.

[b] Current US dollars. These figures are subject to exchange rate fluctuations. Some military expenses (e.g., research, paramilitary forces) may be included in other ministry budgets. 1982 figures are preliminary.

[c] This series is designed to show national trends only. International comparisons may be invalidated by differences in the scope of government sector and in budgetary definitions.

[d] Based on local currency. See country entries. GDP figures are principally used (especially for NATO); or, in their absence, GNP figures. For Warsaw Pact countries GNP figures derived from NMP are given. Commercial bank estimates have been used where official GDP/GNP figures were not available.

[e] Reservists with recent training.

[f] The difficulty of calculating suitable exchange rates makes conversion to dollars and international comparisons imprecise. See also Table 2.

[g] See country entry.

[h] Defence expenditures are based on NATO definitions.

[i] Includes aid to West Berlin.

[j] Derived from Gross Material Product.

VIEWPOINT

Setup for Nuclear Blackmail

By Gen. T. R. Milton, USAF (Ret.), CONTRIBUTING EDITOR

Peace marchers forget it's possible to be neither red nor dead—just resolute.

The downing of KAL 007, otherwise known as Air Defense Amateur Night, untracked the peace offensive, but only momentarily. European polls, which showed a brief shift in public sentiment toward the US, are now back where they were. American policy toward the Soviets, along with Mr. Reagan's defense budget, are seen by a discouraging number of Europeans as the greater threat, and never mind such irrelevancies as the daily slaughter of Afghans. The scheduled deployment this December of the first Pershing IIs and cruise missiles is serving as the catalyst for demonstrations, but the trouble lies deeper than that. Basically, the very existence of NATO is at stake, threatened by a revival of Bertrand Russell's ideology, presumably conceived in his senility, that red is better than dead.

NATO, of course, was founded on the belief that it is possible to be neither red nor dead, just resolute. When the Alliance came into being in 1949, Europe had just passed through the chilling experience of the Berlin blockade, the Soviets' first confident move toward European hegemony. A disarmed and battered West Germany could only watch. The rest of Europe was scarcely better off and certainly in no shape to offer the Soviets any resistance. When the Berlin Airlift succeeded in ending the blockade, the writing on the wall was clear enough: European security lay in an alliance with the United States. The threat has never diminished since 1949, only changed in character.

In the 1970s, with SALT negotiations going on out of their hearing, the allies began to worry about the depth of America's commitment to Europe's defense. Finally, with Germany's Helmut Schmidt leading the way, NATO decided on a program of nuclear modernization. Except for those weapons belonging to Britain and France, NATO's nukes are US property, so the meaning of this decision was plain enough: The allies wanted reassurance the United States was still deeply involved. For all its nice sound, the NATO strategy of flexible response still means the United States takes on the Russians if there is any invasion of Europe.

> Any retreat by NATO on deploying the Pershing IIs and GLCMs would signal a weakening of the Alliance.

When the decision to modernize the European nuclear weapons inventory was taken in 1979, the Soviets had about ninety SS-20s aimed at Western Europe. In the four years since that decision, they have added 160 SS-20s, and NATO has now only just begun. The governments of the United Kingdom and the Federal Republic are steadfast despite well-orchestrated disarmament movements. Italy is also holding firm, helped by a decision to put its share of 112 cruise missiles in remote and economically depressed Sicily. The Netherlands, with a disarmament faction that has gained a decisive voice in government policy, is still procrastinating. So is Belgium, where the eternal divisive conflict between the Flemish and the Walloons is affecting the government's ability to carry out its agreed commitments.

Accompanying all this furor over the missile deployment is a disturbing undertone of anti-Americanism. A generation of Europeans has grown up blissfully unaware of war and all too aware of an American military presence. The Soviets, meanwhile, remain out of sight—cloistered, even—in their East German compounds. Except for those who can see the hideous Berlin Wall and the guard towers and death strips that mark the boundaries between the two Germanys, there is no evidence the Soviets are any cause for alarm. As for the conspicuous American presence, we all know what familiarity breeds.

While it has become one of the more tiresome clichés to say that NATO is facing a critical time—well-informed people have been saying that for thirty years or more—there can be no doubt it is now true. The Soviets, evidently sensing a peace-at-any-price attitude, have made ominous, unspecific threats to deter NATO from going ahead with the missile deployments.

The American television industry, this time ABC, has helped things along with a skillfully staged and grisly depiction of what a nuclear weapon would do to Lawrence, Kan. And while ABC disclaims any political motive—just the facts, ma'am—the original scenario thoughtfully caused Lawrence to be nuked because of provocation by the Pershing IIs in Europe. Perhaps bowing to criticism, the producers agreed to drop the Pershing II reference for the nationwide broadcast this past November 20. The unexpurgated bootleg copies, however, are already making the rounds. So far as I have been able to find out, there are no plans to show *The Day After* on Moscow television.

Nuclear warfare would be the supreme human idiocy, of that there can be no doubt. Nuclear blackmail is another matter—unprincipled, maybe, but not idiotic. If the disarmament crowd gets its way, the West is going to be a setup for nuclear blackmail.

Beyond that, any backing off on the decision to deploy Pershing IIs and cruise missiles will be the first clear indication of the dissolution of NATO. Without any question, if the deployment is halted, it will be seen as a clear surrender by the allies to Soviet threats. And if NATO can't stand up to a little verbal abuse, what good is it as a military alliance? ■

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT

DECEMBER 1983

The A-5 export version of the Nanchang Q-5 twin-jet attack aircraft

NANCHANG

STATE AIRCRAFT FACTORY, Nanchang, Jiangxi Province, People's Republic of China

NANCHANG Q-5

Chinese name: Qiangjiji-5 (Attack aircraft 5) or Qiang-5
Export designation: A-5
NATO reporting name: Fantan-A

This twin-jet attack aircraft, derived from the J-6/MiG-19 built in China, was at first referred to, incorrectly, by the Westernised designations F-9 and F-6*bis*. Its correct designation was first indicated by Chinese officials in 1980 when discussing the aircraft with visiting members of the US aerospace industry. According to Chinese spokesmen the design was then about ten years old. Information received recently from official Chinese sources now permits a much more detailed and accurate description than has previously been possible of this important Chinese aircraft, which continues in production.

As was already known, the airframe of the Q-5 is based substantially on that of the J-6, but with a number of significant changes. The main wing structure is basically unchanged, and retains the four external attachment points and large boundary layer fences, but the underwing spoilers are omitted and the flaps have undergone some redesign. There are more extensive changes to the centre and front of the fuselage, which is nearly 25% longer than that of the J-6. It is understood that the original purpose of these changes was to make room for an internal weapons bay, but the size of this was somewhat limited, and aircraft now in service do not use this area for carrying weapons. Instead, fuselage fuel tank capacity has been increased by approx 70% compared with that carried internally by the J-6. The 'solid' ogival nose probably provides space for a ranging radar, although aircraft in service in China are not known to carry this equipment.

Cockpit canopy opening differs from that on the J-6, and the spine fairing behind it leads to a smaller dorsal fin and larger main fin. The J-6 power plant is retained, but with twin lateral intakes instead of the single divided nose intake of the Soviet design. Early production Q-5s retained also the various louvres and airscoops associated with this installation, but many of these have disappeared from the cleaner-looking current production version, which also has a relocated tail braking parachute installation similar to that seen on recent production versions of the J-6. Like the J-6, the Q-5 has two wing mounted cannon (23 mm instead of 30 mm); these occupy the revised wing root position outboard of the engine air intake trunks.

According to one report, at least 210 'Fantan-As' were in service with the Chinese Air Force by 1979, serving with tactical attack squadrons of the People's Liberation Army. A 1980 report declared that the aircraft had been built in "relatively large numbers", and it is known to serve also in an air defence role with the Aviation of the People's Navy. The total number in Chinese service is now probably in the region of 400–500. Deliveries of 42 export A-5s to the Pakistan Air Force, to equip three attack

squadrons, began in February 1983. The first PAF unit is No. 16 Squadron at Rafiqui Shorkot.

TYPE: Single-seat close air support and ground attack aircraft, with capability also for air-to-air combat.

WINGS: Cantilever all-metal mid-wing monoplane, of low aspect ratio, with 4° anhedral from roots. Sweepback at quarter-chord 52° 30'. Multi-spar basic structure with ribs and stressed skin, essentially similar in construction to that of J-6/MiG-19 (see 1982–83 *Jane's*), with three-point attachment to fuselage. Deep, full chord boundary layer fence on each upper surface at mid span. Inboard of each fence is a hydraulically actuated Gouge flap, the inner end of which is angled to give a trailing-edge perpendicular to side of fuselage. Hydraulically actuated internally balanced aileron outboard of each fence. Electrically operated inset trim tab at inboard end of each aileron.

FUSELAGE: Conventional all-metal structure of longerons, stringers, and stressed skin, built in forward and rear portions which are detachable aft of wing trailing-edge to provide access to engines. Air intake on each side of fuselage, abreast of cockpit; twin jetpipes side by side at rear. Top and bottom 'pen nib' fairings aft of nozzles. Centre-fuselage is 'waisted' in accordance with area rule. Dorsal spine fairing between rear of cockpit and leading-edge of fin. Forward hinged, hydraulically actuated door type airbrake under centre of fuselage, forward of bomb attachment points. Shallow ventral strake under each jetpipe.

TAIL UNIT: Cantilever all-metal stressed skin structure, with sweepback on all surfaces; of generally similar configuration to that of J-6, but with taller main fin and smaller dorsal fin. Mechanically actuated mass balanced rudder, with electrically operated inset trim tab. One-piece hydraulically actuated all-moving tailplane, with anti-flutter weight projecting forward from each tip. Tail warning antenna in tip of fin.

LANDING GEAR: Hydraulically retractable wide-track tricycle type, with single wheel and oleo-pneumatic shock absorber on each unit. Main units retract inward into wings, nosewheel forward into fuselage. Mainwheel tyre size 830 × 205-1. Tail braking parachute in bullet fairing at root of vertical tail trailing-edge beneath rudder (or in tailcone of early production aircraft).

POWER PLANT: Two Shenyang Wopen-6 (WP-6) turbojet engines (Chinese version of Tumansky/Mikulin R-9BF-811), each rated at 25.50 kN (5,732 lb st) dry and 31.87 kN (7,165 lb st) with afterburning, mounted side by side in rear of fuselage. Lateral air intake, with small splitter plate, for each engine. Hydraulically actuated nozzles. Internal fuel in three forward and two rear fuselage tanks with combined capacity of 3,720 litres (982.5 US gallons; 818.5 Imp gallons). Provision for carrying a 760 litre (200.75 US gallon; 167 Imp gallon) drop tank on each inboard underwing pylon, to give max internal/external fuel capacity of 5,240 litres (1,384 US gallons; 1,153 Imp gallons). When inboard wing stations are occupied by bombs, a 400 litre (105.5 US gallon; 88 Imp gallon) drop tank can be carried instead on each outboard underwing pylon.

ACCOMMODATION: Pilot only, in pressurised cockpit under one-piece jettisonable canopy which is hinged at rear and opens upward. Downward view over nose, in level flight, is 13° 30'. Low-speed seat allows for safe ejection within speed range of 135–458 knots (250–850 km/h; 155–528 mph) at zero height or above. Armour plating in some areas of cockpit to protect pilot from anti-aircraft gunfire.

SYSTEMS: Cockpit air-conditioning and pressurisation system. Two independent hydraulic systems, each operating at pressure of 207 bars (3,000 lb/sq in). Primary system actuates landing gear extension and retraction, flaps, airbrake, and afterburner nozzles; auxiliary system supplies power for aileron and all-moving tailplane boosters, and emergency actuation of main landing gear. Electrical system powered by two engine driven starter/generators.

Little of its MiG-19 origin is evident in this head-on view of China's A-5 derivative

AVIONICS AND EQUIPMENT: Known to include VHF com radio, radio compass, low altitude radio altimeter, horizon gyro, IFF, and tail warning radar. Unconfirmed press reports have suggested that these may be based on, or similar to, the RSIU-4 VHF radio, ARK-5 radio compass, RV-UM radio altimeter, and SRO-2 IFF (NATO 'Odd Rods'); an MRP-48P or similar marker beacon receiver is also said to be fitted. Space provision in nose and centre-fuselage for additional or updated avionics, including a range-only radar. Landing light under fuselage, forward of nosewheel bay and offset to port; taxying light on nosewheel leg.

ARMAMENT AND OPERATIONAL EQUIPMENT: Original fuselage weapons bay area now occupied by fuel tanks and/or avionics. Internal armament consists of one 23 mm cannon (Chinese 23-2), with 100 rds, in each wing root. Eight attachment points for external stores: two pairs in tandem under centre of fuselage, and two under each wing (inboard and outboard of mainwheel leg). Fuselage stations can each carry a 250 kg bomb (Chinese 250-2, US Mk 82 or Snakeye, French Durandal, or similar). Inboard wing stations can carry any of these; a 500 or 750 lb bomb; a BL-755 600 lb cluster bomb; or 6 kg or 25 lb practice bombs. Normal bomb carrying capacity is 1,000 kg (2,205 lb), max capacity 2,000 kg (4,410 lb). Instead of bombs, the inboard wing stations can each carry a 760 litre drop tank (see 'Power Plant' paragraph) or a launcher for 57 mm (eight Chinese 57-1), 68 mm, or 90 mm (nine Chinese 90-1) rockets. The outboard wing stations can each be occupied by a 400 litre drop tank (when the larger tank is not carried inboard) or, with suitable modification, by air-to-air missiles such as the AIM-9 Sidewinder and Matra R.550 Magic. Within the overall max T-O weight, all weapons mentioned can be carried provided that CG shift remains within the allowable operating range of 31.5 to 38% of mean aerodynamic chord. The aircraft carries an SH-1J optical sight for level and dive bombing, or for air-to-ground rocket launching. Aircraft in Chinese service can carry a single 5–20 kT nuclear bomb.

DIMENSIONS, EXTERNAL:

Wing span	9.70 m (31 ft 10 in)
Wing chord (mean aerodynamic)	3.097 m (10 ft 2 in)
Wing aspect ratio	3.37
Length overall:	
incl nose probe	16.727 m (54 ft 10½ in)
excl nose probe	15.65 m (51 ft 4⅛ in)
Height overall	4.51 m (14 ft 9½ in)
Wheel track	approx 4.70 m (15 ft 5 in)
Wheelbase	approx 4.00 m (13 ft 1½ in)

AREAS:

Wings, gross	27.95 m² (300.85 sq ft)
Vertical tail surfaces (total)	4.64 m² (49.94 sq ft)
Horizontal tail surfaces:	
movable	5.00 m² (53.82 sq ft)
total, incl projected fuselage area	8.62 m² (92.78 sq ft)

WEIGHTS AND LOADINGS:

Weight empty	6,494 kg (14,317 lb)
Fuel: max internal	2,883 kg (6,356 lb)
two 400 litre drop tanks	620 kg (1,367 lb)
two 760 litre drop tanks	1,178 kg (2,597 lb)
max internal/external	4,061 kg (8,953 lb)
Max external stores load	2,000 kg (4,410 lb)
Max T-O weight: 'clean'	9,530 kg (21,010 lb)
with max external stores	12,000 kg (26,455 lb)
Max wing loading:	
'clean'	341 kg/m² (69.9 lb/sq ft)
with max external stores	429 kg/m² (87.9 lb/sq ft)
Max power loading:	
'clean'	149.5 kg/kN (1.47 lb/lb st)
with max external stores	188.3 kg/kN (1.85 lb/lb st)

PERFORMANCE (at max 'clean' T-O weight, with afterburning, except where indicated):

Max limiting Mach number (VNE)	Mach 1.5
Max level speed:	
at 11,000 m (36,000 ft)	Mach 1.12 (643 knots; 1,190 km/h; 740 mph)
at S/L	653 knots (1,210 km/h; 752 mph)
T-O speed:	
'clean', 15° flap	162 knots (300 km/h; 186 mph)
with max external stores, 25° flap	178 knots (330 km/h; 205 mph)
*Landing speed:	
25° flap, afterburners off, brake-chute deployed	150–165 knots (278–307 km/h; 172–191 mph)
*Max rate of climb at 5,000 m (16,400 ft)	4,980–6,180 m (16,340–20,275 ft)/min
Service ceiling	16,000 m (52,500 ft)
T-O run:	
* 'clean', 15° flap	700–750 m (2,300–2,460 ft)
with max external stores, 25° flap	1,250 m (4,100 ft)
Landing run:	
25° flap, afterburners off, brake-chute deployed	1,060 m (3,480 ft)
Combat radius with max external stores, afterburners off:	
lo-lo-lo (500 m; 1,640 ft)	216 nm (400 km; 248 miles)
hi-lo-hi (8,000/500/8,000 m; 26,250/1,640/26,250 ft)	324 nm (600 km; 373 miles)
Range at 11,000 m (36,000 ft) with max internal and external fuel, afterburners off	nearly 1,080 nm (2,000 km; 1,243 miles)
g limits:	
with full load of bombs and/or drop tanks	5.0
with drop tanks empty	6.5
'clean'	7.5

*depending upon airfield altitude and temperature

Gulfstream Aerospace Peregrine Business Jet is a third generation member of the Hustler/ Peregrine family *(Brian M. Service)*

GULFSTREAM AEROSPACE

GULFSTREAM AEROSPACE CORPORATION, PO Box 2206, Savannah, Georgia 31402, USA

GULFSTREAM AEROSPACE PEREGRINE BUSINESS JET

The Peregrine Business Jet is a turbofan powered six/eight-seat executive aircraft derived from the original Hustler programme via the Gulfstream Aerospace Peregrine military trainer design. The prototype (N9881S), flown for the first time on January 14, 1983, has a single internally mounted Pratt & Whitney Aircraft of Canada JT15D-1 engine. This will be replaced eventually by a more powerful JT15D-5, which is also specified for initial production Peregrine Business Jets. Orders and options for these were being accepted at the 1983 Paris Air Show, with deliveries scheduled to begin approximately 33 months after the start of production.

An alternative version, with two Williams turbofans, may be offered in due course. The following description applies to the initial production version:

TYPE: Turbofan powered six/eight-seat executive transport.

WINGS: Cantilever low/mid-wing monoplane. Proprietary wing section derived from NASA LS-(2). Dihedral from roots, with small winglet below each wingtip. Sweepback 10° at quarter-chord. Light alloy two-spar riveted structure. Almost entire trailing-edge of each wing made up of long span flap and cable actuated aileron with inset trim tab. Small leading-edge fence on each wing. Wing leading-edge de-icing standard.

FUSELAGE: Conventional light alloy pressurised structure of circular section.

TAIL UNIT: Cantilever light alloy structure with sweptback vertical surfaces. Horizontal surfaces mounted on fairing aft of engine air intake trunk. Rudder and elevators cable actuated and horn balanced. Trim tab in rudder.

LANDING GEAR: Hydraulically retractable tricycle type, with single wheel on each unit. Nosewheel retracts rearward, main units inward into wings. Oleo-pneumatic shock absorbers. Disc brakes on mainwheels.

POWER PLANT: One Pratt & Whitney Aircraft of Canada JT15D-5 turbofan engine, rated at 12.89 kN (2,900 lb st), mounted in rear fuselage with air intake duct above rear fuselage. Two independent fuel systems with integral tank in each wing and one tank in rear fuselage, with total usable capacity of 1,655 litres (437 US gallons).

ACCOMMODATION: Crew of two side by side on flight deck, with full dual controls; but will be certificated for operation by one or two pilots. Standard seating for six passengers in main cabin section, with folding tables, refreshment centre, and enclosed toilet compartment. Baggage compartment to rear of passenger accommodation, accessible in flight. Wide variety of optional cabin accessories and seating arrangements. Downward opening airstair door at front of cabin on port side. Emergency exit over wing on starboard side. All accommodation fully pressurised and air-conditioned.

SYSTEMS: Pressurisation system utilises engine bleed air, max differential 0.52 bars (7.5 lb/sq in). Hydraulic system, pressure 103.5 bars (1,500 lb/sq in), to actuate landing gear and main landing gear wheel doors. Backup hydraulic accumulator for emergency power. Electrical system includes 28V 400A starter/generator and 24V 41Ah lead-acid battery. Emergency oxygen system provides diluter-demand crew masks and automatic drop-out mask at each passenger station. Anti-icing/de-icing of pitot tubes, pitot static ports, windscreens, engine inlet, wing leading-edges, and stall warning switch standard.

AVIONICS AND EQUIPMENT: Standard avionics package provides full day, night, VFR, IFR capability, and includes dual VHF com, VOR with RMI, localiser and glideslope indicators, slaved compass systems, audio systems, and 250VA inverters; single ADF, flight director and fully coupled autopilot, HSI, DME, transponder with altitude encoder, weather radar, radio altimeter, encoding altimeter, and digital clock. Wide range of optional avionics available. Complete exterior and interior lighting standard.

DIMENSIONS, EXTERNAL:

Wing span	11.94 m (39 ft 2 in)
Wing aspect ratio	7.76
Length overall	12.84 m (42 ft 1½ in)
Height overall	5.17 m (16 ft 11¼ in)
Tailplane span	5.18 m (17 ft 0 in)
Wheel track	3.94 m (12 ft 11 in)
Wheelbase	5.79 m (18 ft 11¼ in)

DIMENSIONS, INTERNAL:

Cabin, between forward and rear pressure bulkheads:

Length	5.78 m (18 ft 11½ in)
Max width	1.39 m (4 ft 7 in)
Max height	1.28 m (4 ft 2½ in)

WEIGHTS:

Weight empty, equipped	2,322 kg (5,120 lb)
Max fuel	1,329 kg (2,930 lb)
Max ramp weight	4,028 kg (8,880 lb)
Max T-O and landing weight	3,992 kg (8,800 lb)
Max zero-fuel weight	2,957 kg (6,520 lb)

PERFORMANCE (estimated at max T-O weight, except where indicated):

Max cruising speed at 10,670 m (35,000 ft) at intermediate cruise weight of 3,175 kg (7,000 lb)	331 knots (613 km/h; 381 mph)
Econ cruising speed at 10,670 m (35,000 ft)	293 knots (542 km/h; 337 mph)
Stalling speed	81 knots (150 km/h; 93 mph) CAS
Max rate of climb at S/L	877 m (2,877 ft)/min
Time to 7,620 m (25,000 ft)	12 min 30 s
Time to 10,670 m (35,000 ft)	24 min 0 s
Operating ceiling	10,670 m (35,000 ft)
T-O to 15 m (50 ft)	769 m (2,522 ft)
Landing from 15 m (50 ft)	884 m (2,900 ft)
Range with pilot and three passengers, max fuel, at average speed of 327 knots (605 km/h; 376 mph) at 10,670 m (35,000 ft), 45 min reserves	1,300 nm (2,407 km; 1,496 miles)
Range, as above, at econ cruising speed	1,390 nm (2,574 km; 1,600 miles)

OPERATIONAL NOISE LEVELS: Peregrine Business Jet will be certificated to meet or be within FAR Pt 36 amendment 7 standards.

IAI

ISRAEL AIRCRAFT INDUSTRIES LTD; Ben-Gurion International Airport, 70100 Lydda (Lod), Israel

IAI LAVI (YOUNG LION)

In the 1990s the Lavi is expected to become the workhorse of the Israeli Air Force, which is understood to have a requirement for at least 300, including about 60 combat-capable two-seat trainers. Emphasis will be on the close air support and interdiction roles, with a secondary capability for air-to-air self-defence to and from the target. Design characteristics include high-speed penetration, high manoeuvrability, first-pass bombing accuracy, and battle damage tolerance for safe recovery.

Now in the final design stages, the Lavi will be slightly smaller than the General Dynamics F-16, and will have delta main wings and canard surfaces, incorporating proven state of the art technology. Approximately 20% of the structure, by weight, will be built of composite materials. This will include

Flight deck of the Peregrine Business Jet

many components made from graphite epoxy (carbonfibre), such as wing skins and substructure, the vertical tail, the all-moving foreplanes, control surfaces, and various doors and panels. In most cases, development and initial production of such advanced technology components will take place in the USA, before series manufacture is transferred to Israel.

Deliveries of the Lavi are planned to begin in 1990, initially to replace the Israeli Air Force's A-4 Skyhawks and later the Kfir-C2/C7. The two-seat version will replace Skyhawks and F-4 Phantoms at present used in the training role. Series production is intended to be at the initial rate of one per month, increasing to 30–36 per year by the mid-1990s.

Prototype construction was authorised by the Israeli government in early 1982. Five development aircraft are reportedly to be built, including three two-seaters; first flight is expected in early 1986.

The following details apply to the single-seat Lavi:

TYPE: Single-seat close air support and interdiction aircraft, with secondary capability for air defence.

WINGS AND FOREPLANES: Cantilever low-wing monoplane. Close coupled 'swept delta' main wings, plus all-moving foreplanes of similar planform. Leading-edge flaps over outer half of each wing. Substructure and skins of carbonfibre. First 20 ship-sets of wings being designed, developed, and produced by Grumman Aerospace Corporation.

FUSELAGE: Conventional semi-monocoque structure, incorporating composite materials as well as metal.

TAIL UNIT: Sweptback fin and rudder; Grumman producing first 20 carbonfibre fins. No horizontal tail surfaces.

LANDING GEAR: Retractable tricycle type, with single wheel on each unit.

POWER PLANT: One 91.7 kN (20,620 lb st) Pratt & Whitney PW1120 afterburning turbofan engine, most of which is expected to be manufactured under licence by Bet-Shemesh Engines Ltd. Ventral 'chin' intake based on that of General Dynamics F-16. Max fuel capacity 3,330 litres (732 Imp gallons; 880 US gallons) internally; 5,095 litres (1,121 Imp gallons; 1,346 US gallons) externally.

ACCOMMODATION: Pilot only, on ejection seat, under 'teardrop' cockpit canopy.

AVIONICS: Electronic warfare self-protection system, by Elta Electronics, to provide rapid threat identification and flexible response. This computer-based, fully automatic system will use active and passive countermeasures, including internal and externally podded power-managed noise and deception jammers. Wide-angle diffractive optics head-up display, plus three head-down CRT displays, one of which will be in colour. Lear-Siegler/Mabat quadruple-redundant digital fly-by-wire flight control system, with limited analog backup. New Elta multi-mode pulse-Doppler radar, developed from the EL/M-2021B, will include automatic target acquisition and track-while-scan in the air-to-air mode, and beam-sharpened ground mapping/terrain avoidance and sea search in the air-to-surface mode. The radar's coherent transmitter and stable multi-channel receiver will ensure reliable look-down performance over a broad band of frequencies, as well as high resolution mapping. Its programmable signal processor, backed by a network of distributed, embedded computers, will provide optimum allocation of computer power and considerable flexibility for algorithm updating and system growth. Advanced inertial navigation system and weapons delivery system.

ARMAMENT: Four underwing hardpoints for air-to-surface missiles, bombs, rockets, and other stores; inboard pair 'wet' for carriage of auxiliary fuel tanks. Underfuselage attachments for up to six Mk 80 series bombs. Infra-red air-to-air missile at each wingtip.

DIMENSIONS, EXTERNAL:

Wing span	8.71 m (28 ft 7 in)
Wing area, gross	32.5 m² (349.8 sq ft)
Length overall	14.39 m (47 ft 2½ in)
Height overall	5.28 m (17 ft 4 in)
Wheel track	2.31 m (7 ft 7 in)
Wheelbase	3.86 m (12 ft 8 in)

WEIGHTS AND LOADING:

Max fuel:	
internal	2,721 kg (6,000 lb)
external	4,164 kg (9,180 lb)
Max ordnance (excl air-to-air missiles)	2,721 kg (6,000 lb)
Max external load	7,257 kg (16,000 lb)
T-O weight:	
basic	9,664 kg (21,305 lb)
max	17,010 kg (37,500 lb)
Max wing loading	523 kg/m² (107 lb/sq ft)
Thrust/weight ratio	1.1

PERFORMANCE (estimated):

Max level speed above 11,000 m (36,000 ft)
Mach 1.85 (1,060 knots; 1,964 km/h; 1,221 mph)
Low-altitude penetration speed:
two infra-red missiles and eight 750 lb Mk 117 bombs 538 knots (997 km/h; 619 mph)
two infra-red missiles and two 2,000 lb Mk 84 bombs 597 knots (1,106 km/h; 1,274 mph)

Air turning rate at Mach 0.8 at 4,575 m (15,000 ft):	
sustained	13.2°/s
max	24.3°/s
Combat radius at low altitude with eight 750 lb bombs and two air-to-air missiles	244 nm (452 km; 281 miles)
g limit	+ 9.0

All available details follow and, for ease of reference, are collated under the normal *Jane's* headings:

WINGS: A new outer wing/winglet combination has been designed to reduce lift-induced drag by 2.5%. New outer wing panels of revised aerofoil section. Lower weight wing structure resulting from use of lighter weight light alloy upper-surface skins and stringers, and by selective use of composite materials for components. Winglets of composite construction, at each wingtip, comprise an upper winglet 2.13 m (7 ft) in length, canted outward 15°, and a lower winglet 0.76 m (2 ft 6 in) in length, canted outward 36°. The inboard ailerons will be drooped 13° when the flaps are lowered. This will result in improved take-off capability, lower approach speeds, and lower noise levels during take-off and landing. When used in this manner, they can still be operated differentially for roll control. Composite construction introduced also for outboard ailerons, spoilers, pylon fairings, access doors, and wing fillets.

FUSELAGE: Generally similar construction to that of DC-10, but composite materials introduced for access doors, floor panels, and interior components.

TAIL UNIT: New tailcone is designed to smooth airflow at the rear of the aircraft, an area with a high potential for drag. Otherwise generally similar to that of DC-10, but composite materials used for construction of elevators, rudder, interior components, tailcone, access doors, and tail fillets.

LANDING GEAR: Generally similar to that of DC-10-10 (MD-100 Series 10) or DC-10-30 (MD-100 Series 20), but carbon brakes offer a weight saving of 544 kg (1,200 lb) per aircraft.

POWER PLANT: Three turbofan engines in the 213 to 249 kN (48,000 to 56,000 lb st) class. Candidate engines are the Pratt & Whitney 4000 series, General Electric CF6-80C2, and Rolls-Royce RB211-600 series, which are expected to contribute 14% of the total 23% fuel saving. Composite materials are to be introduced for engine nacelles, cowlings, and thrust reversers. Fuel system pumps and valves will be controlled automatically by a computer, eliminating need for manual operation by the flight crew. Fuel capacity (Series 10) 116,072 litres (30,664 US gallons); (Series 20) 138,738 litres (36,652 US gallons).

ACCOMMODATION: Two-crew forward-facing flight deck is designed to allow the flight crew to operate the aircraft using only instrument panel and glareshield displays and controls throughout much of the flight. It also adopts a 'dark cockpit' concept, reducing the number of lights that must be monitored, so minimising distractions for the crew at critical phases of flight. The passenger cabin will introduce a centralised galley system, and enlarged restyled overhead stowage compartments. Accommodation for 220 to 340 passengers, with standard accommodation for 270 in first class and coach configuration (Series 10), and 280 to 410 passengers, with standard seating for 333 in first class and coach configuration (Se-

Artist's impression of the new McDonnell Douglas MD-100 three-engined wide-body airliner for 220/340 passengers

MCDONNELL DOUGLAS

MCDONNELL DOUGLAS CORPORATION, Box 516, St Louis, Missouri 63166, USA

MCDONNELL DOUGLAS MD-100

On November 24, 1982, McDonnell Douglas made two simultaneous announcements. The first referred to the adoption of a new designation system for the company's future commercial aircraft, under which the prefix letters MD are followed by a number, starting with 100, to identify a particular type. The other concerned the first aircraft to be classified under this designation system, the MD-100 three-engined wide-body airliner. This is being offered in two long-range versions: the **Series 10**, seating 270 passengers in a standard first class and coach configuration; and a lengthened fuselage **Series 20**, seating 333. Subject to the receipt of sufficient orders, the manufacturing programme for the MD-100 could begin at once, with the two versions entering service in 1987 and 1988 respectively.

Of basically similar configuration and construction to the company's current DC-10, the MD-100 would introduce an advanced technology power plant, aerodynamic refinements including winglets, and a new-generation two-crew forward facing flight deck. It would demonstrate fuel efficiency approximately 23% better than current long-range tri-jets. Significant weight savings would result from the substitution of composite materials in the aircraft's structure, by the use of new lighter-weight aluminium alloys for upper surface wing skins and stringers, and by the introduction of carbon brakes. The collective weight saving from these sources, by comparison with the structure of the DC-10, is estimated to be some 1,769 kg (3,900 lb).

ries 20), with baggage/cargo capacity of 121.8 m³ (4,302 cu ft) and 166.6 m³ (5,882 cu ft) respectively.

SYSTEMS: Electrical, hydraulic, and pneumatic systems will, so far as is possible, be computer controlled in a similar manner to the aircraft's fuel system.

AVIONICS AND EQUIPMENT: The flight deck features second-generation CRT technology, automatic systems control, a flight management system, and an integrated radio management system. The primary flight display shows, in addition to the normal attitude, bank, pitch, and ILS/GS information, airspeed and airspeed prediction, altitude and altitude prediction, decision height, Mach number, radio altitude, and vertical speed. It will also display selected altitude and speed indications, as well as the functions that the flight guidance system is performing. The navigation display depicts the aircraft's location and direction of flight in a map format, showing heading, course and deviation, and wind speed and direction. Radio navigation stations, waypoints, distances to selected landmarks, and radio frequencies being used can also be displayed. The colour weather radar display can be superimposed over the other data. Either of two multifunction displays can be used to depict aircraft engine or system data, but one is used normally to display engine status, including all thrust rating information. The other CRT displays alert messages, checklists, and key procedures. The data for individual aircraft systems, such as electrical, fuel, hydraulic, and pneumatic, can be called up for display by the crew. There is also an alternative display on the instrument panel for engine data in case one of the multi-function CRTs should fail. The automatic flight control system, with a control panel in the centre of the glareshield, makes it easy to set altitude, heading, speed, and vertical speed. It also allows selection of flight management system guidance to allow the crew to fly the most efficient flight profiles and routes, and the selection of a variety of landing guidance modes, including full autoland. The integrated radio management system provides head-up glareshield controls for com/nav radios. Two different frequencies can be set up on each radio, with frequency switching and microphone selection done on the glareshield controls. All selected frequencies are displayed on dual radio management control panels on the pedestal between the pilots. Also on the glareshield is the control panel for the electronic flight instrument system, which allows the setting up of the different modes on the navigational display.

DIMENSIONS, EXTERNAL
(A: Series 10; B: Series 20):

Wing span: A, B	51.51 m (169 ft 0 in)
Wing area: A, B	338.8 m² (3,647.0 sq ft)
Length overall:	
A	53.34 m (175 ft 0 in)
B	61.57 m (202 ft 0 in)
Height overall: A, B	17.68 m (58 ft 0 in)
Wheel track: A, B	10.67 m (35 ft 0 in)
Wheelbase:	
A	20.42 m (67 ft 0 in)
B	25.60 m (84 ft 0 in)

WEIGHTS (estimated):

Operating weight empty:	
A	114,759 kg (253,000 lb)
B	128,820 kg (284,000 lb)
Max ramp weight:	
A	228,157 kg (503,000 lb)
B	264,444 kg (583,000 lb)
Max T-O weight:	
A	226,796 kg (500,000 lb)
B	263,083 kg (580,000 lb)
Max zero-fuel weight:	
A	156,489 kg (345,000 lb)
B	181,437 kg (400,000 lb)
Max landing weight:	
A	167,829 kg (370,000 lb)
B	195,045 kg (430,000 lb)

PERFORMANCE (estimated, A with weight limited payload of 41,731 kg; 92,000 lb, and engines of 213 kN; 48,000 lb st; B with weight limited payload of 52,617 kg; 116,000 lb, and engines of 249 kN; 56,000 lb st):

Cruising Mach No: A, B	0.82
T-O field length:	
A	2,652 m (8,700 ft)
B	3,018 m (9,900 ft)
Landing field length:	
A	1,768 m (5,800 ft)
B	1,951 m (6,400 ft)

Range, A with 270 passengers and baggage, B with 333 passengers and baggage
5,644 nm (10,460 km; 6,500 miles)

BRITISH AEROSPACE

BRITISH AEROSPACE AIRCRAFT GROUP, SCOTTISH DIVISION: Prestwick International Airport, Ayrshire KA9 2RW, Scotland

BAe JETSTREAM 31

The decision to proceed with development of this new version of the Jetstream was announced by British Aerospace on December 5, 1978. A development aircraft (G-JSSD), converted from a Jetstream 1 built by Handley Page, flew for the first time on March 28, 1980, and a production go-ahead was given in January 1981. The first production Jetstream 31 (G-TALL) made its first flight on March 18, 1982. It was followed by the second production aircraft on May 26, and on June 29, 1982, the Jetstream 31 was certificated to BCAR Section D in the UK. US certification under SFAR 41C followed on November 30, 1982. First deliveries to customers in Germany and the UK took place in December 1982.

The following versions are available:

Commuter. Basic version, designed to carry 18/19 passengers. Able to operate over a 630 nm (1,167 km; 725 mile) stage length, without refuelling, with 18 passengers, baggage, and full IFR reserves; or seven typical commuter sectors of 110 nm (203 km; 126 miles) with 60% load factor.

Corporate. Executive version, designed for eight to ten passengers, and able to carry nine passengers and baggage for 1,150 nm (2,131 km; 1,324 miles) with full IFR reserves. Typical interior has six fully reclining and swivelling chairs, a three-place divan, galley for hot and cold meal service, cocktail cabinet, wardrobe, and washroom/toilet. Conversion to Commuter or Executive standard takes less than two hours, with optional provisions for conversion to cargo and ambulance configurations.

Executive. Intended for the large company, shuttling its personnel between factories. With typical layout for 12 passengers, this version has a range of 950 nm (1,760 km; 1,094 miles) with full IFR reserves.

Special. Intended for military communications, casualty evacuation, multi-engine training and cargo operations, and for specialist roles such as airfield calibration, resources survey, and protection.

EZ. Proposed patrol version for exclusive economic zones (*i.e.*, offshore patrol and surveillance), with underbelly 360° scan radar, increased fuel, observation windows, and searchlight.

All of the first batch of ten aircraft had flown by early March 1983, and a further two batches, totalling 20 aircraft, are under construction. A fourth batch of 15 aircraft has been authorised, and further batches will follow. Production rate for the Jetstream 31 is being increased to a minimum of 25 aircraft a year by 1984.

By June 1, 1983, firm orders for 12 Jetstream 31s had been received, with reservations and deposits for a further 12 aircraft. Firm orders were from Contactair of Stuttgart (two), Partnair of Norway (one), Peregrine Air Services of Aberdeen (two), Birmingham Executive Airways of the UK (two); Atlantis Airlines of Florence, S. C. (three), and McAlpine Aviation of Luton, England (two).

TYPE: Light commuter/executive transport.

WINGS: Cantilever low-wing monoplane. Wing section NACA 63A418 at root, NACA 63A412 at tip. Dihedral 7° from roots. Incidence 2° at root, 0° at tip. Sweepback 0° 34′ at quarter-chord. Aluminium alloy fail-safe structure. Aluminium alloy manually operated Frise ailerons. Hydraulically

British Aerospace Jetstream 31 can be configured for a variety of civil or military roles

Second British Aerospace Jetstream 31 for Atlantis Airlines of Florence, South Carolina

operated aluminium alloy double-slotted flaps. No slats or leading-edge flaps. Trim tab in each aileron. Goodrich pneumatic rubber boot de-icing system for leading-edges.

FUSELAGE: Conventional aluminium alloy semi-monocoque fail-safe structure, with chemically milled skin panels. Fully pressurised.

TAIL UNIT: Cantilever two-spar aluminium alloy structure. Fixed incidence tailplane. Manually operated control surfaces. Trim tabs in rudder and each elevator. Goodrich pneumatic rubber boot de-icing system for leading-edges.

LANDING GEAR: Retractable tricycle type, with nosewheel steering. Hydraulic retraction, mainwheels inward into wings, twin nosewheels forward. British Aerospace oleo-pneumatic shock absorbers in all units. Dunlop wheels and tyres: mainwheel tyres size 28 × 9.00-12, pressure 3.93 bars (57 lb/sq in); nosewheel tyres size 6.00-6, pressure 2.34 bars (34 lb/sq in). No brake cooling. Anti-skid units.

POWER PLANT: Two 671 kW (900 shp) Garrett TPE331-10 turboprop engines, each driving a Dowty Rotol four-blade variable- and reversible-pitch fully feathering metal propeller. Fuel in integral tank in each wing, total capacity 1,745 litres (384 Imp gallons; 461 US gallons). Refuelling point on top of each outer wing.

ACCOMMODATION: Two seats side by side on flight deck, with provision for dual controls, though aircraft can be approved (subject to local regulations) for single pilot operation. Main cabin can be furnished in commuter layout for up to 18 passengers at 81 cm (32 in) pitch, or with executive interior for 8/10 passengers, but optional layouts are available, including a QC (quick change) option enabling an operator to change from an 18-seat layout to 12-seat executive configuration in around 1¼ hours. Downward opening passenger door, with integral airstairs, at rear of cabin on port side. Emergency exit over wing on starboard side. Baggage compartment in rear of cabin, aft of main door. Entire accommodation pressurised, heated, ventilated, and air-conditioned. Toilet standard; galley and bar optional.

SYSTEMS: Air-conditioning system with cabin pressurisation at max differential of 0.38 bars (5.5 lb/sq in), providing a 2,440 m (8,000 ft) cabin altitude at 7,620 m (25,000 ft). Single hydraulic system, pressure 138 bars (2,000 lb/sq in), with dual engine driven pumps, for actuation of flaps, landing gear, brakes, and nosewheel steering. APU optional.

DIMENSIONS, EXTERNAL:

Wing span	15.85 m (52 ft 0 in)
Wing chord:	
at root	2.19 m (7 ft 2½ in)
at tip	0.80 m (2 ft 7¼ in)
Wing aspect ratio	10
Length overall	14.37 m (47 ft 1½ in)
Length of fuselage	13.40 m (43 ft 11½ in)
Height overall	5.32 m (17 ft 5½ in)
Fuselage: Max diameter	1.98 m (6 ft 6 in)
Tailplane span	6.60 m (21 ft 8 in)
Wheel track	5.94 m (19 ft 6 in)
Wheelbase	4.60 m (15 ft 1 in)
Propeller diameter	2.69 m (8 ft 10 in)
Passenger door:	
Height	1.42 m (4 ft 8 in)
Width	0.86 m (2 ft 10 in)
Emergency exit:	
Height	0.91 m (3 ft 0 in)
Width	0.56 m (1 ft 10 in)

DIMENSIONS, INTERNAL:

Cabin, excl flight deck:	
Length	7.39 m (24 ft 3 in)
Max width	1.85 m (6 ft 1 in)
Max height	1.80 m (5 ft 11 in)
Floor area	8.35 m² (90 sq ft)
Volume (trimmed aircraft)	16.92 m³ (598 cu ft)
Baggage compartment volume (according to layout)	1.94–2.53 m³ (68.5–89.5 cu ft)

AREAS:

Wings, gross	25.08 m² (270 sq ft)
Ailerons, aft of hinge line (total)	1.52 m² (16.4 sq ft)
Trailing-edge flaps (total)	3.25 m² (35.0 sq ft)
Vertical tail surfaces (total)	7.72 m² (83.1 sq ft)
Horizontal tail surfaces (total)	7.80 m² (84.0 sq ft)

WEIGHTS AND LOADINGS:

Operating weight empty	4,103 kg (9,046 lb)
Max fuel	1,393 kg (3,072 lb)
Max T-O and landing weight	6,600 kg (14,550 lb)
Max ramp weight	6,650 kg (14,661 lb)
Max zero-fuel weight	6,000 kg (13,228 lb)
Max wing loading	263.1 kg/m² (53.89 lb/sq ft)
Max power loading	4.92 kg/kW (8.08 lb/shp)

PERFORMANCE (at max T-O weight, except where indicated):

Max cruising speed at 6,100 m (20,000 ft):	
max continuous power	263 knots (488 km/h; 303 mph)
max cruise power	253 knots (469 km/h; 291 mph)
Econ cruising speed at 7,620 m (25,000 ft)	230 knots (426 km/h; 264 mph)
Stalling speed, flaps down	96 knots (179 km/h; 111 mph)
Max rate of climb at S/L	680 m (2,230 ft)/min
Rate of climb at S/L, one engine out	163 m (535 ft)/min
Service ceiling	9,630 m (31,600 ft)
Service ceiling, one engine out	4,665 m (15,300 ft)
T-O field length:	
BCAR Section D	1,326 m (4,350 ft)
SFAR 41C	912 m (2,990 ft)
Landing field length, at max landing weight:	
BCAR Section D	1,229 m (4,030 ft)
SFAR 41C	1,125 m (3,690 ft)
Accelerate/stop distance:	
SFAR 41C	1,271 m (4,170 ft)
Range	see individual model listings

EHI

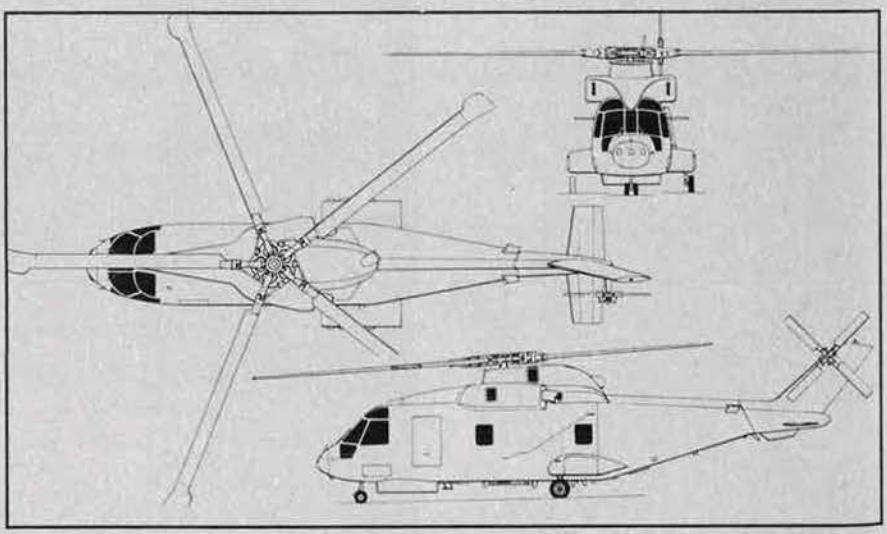
EH INDUSTRIES LIMITED; Granville House, 132-135 Sloane Street, London SW1X 9BB, England

This company was formed in June 1980 by Westland Helicopters Ltd of the UK and Costruzioni Aeronautiche Giovanni Agusta SpA of Italy to undertake the joint development, production, and marketing of an SKR (Sea King Replacement) helicopter, for which the Royal Navy and Italian Navy both have a requirement. Such a programme was initiated by Westland in 1977 in response to Naval Staff Requirement 6646, leading to the WG 34 helicopter design described under that company's heading in the 1979–80 *Jane's*. This has been superseded by the joint Westland/Agusta EH 101, which is now being developed to meet the detailed requirements of both navies, and for other civil, military, and naval roles. British and Italian government approval for the nine-month project definition phase was given on June 12, 1981. The programme is being handled on behalf of both governments by the British Ministry of Defence. Technical responsibility rests with Westland Helicopters and Agusta, each of which has a 50% interest in EHI. Subcontractors include Fiat Aviazione, which will develop the main transmission system.

EH INDUSTRIES EH 101

In the Spring of 1977 the British MoD (Navy) completed a series of feasibility studies to examine how an SKR (Sea King Replacement) would operate, and what sensors and performance standards it would require.

Westland's WG 34 design, marginally smaller than the Sea King but with substantially more payload capability, was selected by the MoD (Navy) for development in the late Summer of 1978. The Ital-



EH Industries EH 101 multi-role helicopter (three General Electric T700-GE-401 turboshaft engines) *(Pilot Press)*

EH 101 Sea King Replacement as it will appear in Italian Navy insignia

ian Navy, although it would place emphasis more on shore-based than shipboard operation, has a requirement broadly similar to that of the Royal Navy, and in 1980 Westland and Agusta decided to combine forces in a joint design, the EH 101, to meet the requirements of both services and for other military and civil applications. Development of this helicopter is now proceeding in three basic versions: naval, commercial transport, and utility. The commercial version is expected to enter service first, followed shortly afterwards by the naval version.

The EH 101 will have three engines, and will incorporate composite materials, plus the latest available electronics and data handling systems. The physical dimensions of the helicopter are limited by frigate hangar size. Fortuitously, this also matches the requirement for civil use, especially for the offshore support role, and systems developed for operation to and from the pitching deck of a frigate at sea are equally valid for the pitching deck of an offshore platform.

The naval EH 101 is designed for fully autonomous all-weather day and night operations, and will operate from land bases, large and small vessels (including merchant ships), and oil rigs. It will be capable of launch and recovery from a frigate of 3,445 tonnes (3,500 tons), in sea state 6, with the ship on any heading and in wind speeds, from any direction, of up to 50 knots (93 km/h; 57 mph).

Primary roles of the maritime version will be anti-submarine warfare, anti-ship surveillance and tracking, anti-surface-vessel, amphibious operations, and search and rescue. Other roles include airborne early warning, vertical replenishment, and electronic countermeasures (deception, jamming, and missile seduction). For the Royal Navy, the EH 101 has been specified as equipment for its Type 23 general purpose frigates; it has also been announced that the EH 101 will operate from *Invincible* class aircraft carriers, Royal Fleet Auxiliaries, and other ships, as well as from land bases.

It is envisaged that a civil EH 101 would be operated by a crew of three, including a steward, and carry 30 passengers. The utility version, in a logistic transport configuration, would incorporate a rear loading ramp for the direct in-loading of vehicles and cargo, and would be able to airlift a payload of almost six tons; alternatively, a total of 28 troops could be carried.

Ten pre-production aircraft are planned, one of which will be used for ground tests. Of the other nine, four (PP1, 2, 4, and 7) will be used to qualify the basic aircraft, the first one being scheduled to make its initial flight in mid-1986. A fifth EH 101 (PP3) will be used by Westland to speed the award of civil certification, which is planned for late 1989. Aircraft PP5 and PP6 will be devoted respectively to development of the Royal Navy and Italian Navy versions; PP8 and PP9 will be used for reliability proving and will serve as demonstrators for the civil and utility versions. All nine are expected to fly within about two years of the first flight. First deliveries of the civil version are planned for late 1989, and first naval deliveries for 1990. Final work split has yet to be decided, but aircraft will be produced by single source manufacture of components, with a final assembly line in each country. Major design responsibilities at present include Westland for the front fuselage and main rotor blades; Agusta for the rear fuselage, rotor head, hydraulic system, and part of the electrical system; and Fiat for the main gearbox.

TYPE: Multi-role helicopter.

ROTOR SYSTEM: Five-blade main rotor, hub of which is designed on multiple load path concept, incorporating fail-safe principles, and is formed from composite materials surrounding a metal core. Blades, also of composite construction, have an advanced aerofoil section, special high-speed tips resulting from British Experimental Rotor Programme (BERP), and are attached to hub by multi-path loading including elastomeric bearings. Naval version has fully automatic powered folding of main rotor blades (optional on other versions) and tail rotor pylon, with manual system for emergency backup. Electric de-icing of rotor blades standard on naval version, optional on other versions. Four-blade tail rotor, mounted on port side of tail pylon.

ROTOR DRIVE: Front drive directly into main gearbox from all three engines, with all gears straddle mounted for greater rigidity. External driveshaft to tail rotor gearbox. Main transmission system, being developed under subcontract by Fiat Aviazione, is rated at 3,400 kW (4,560 shp). Provision for APU for main engine starting, and to drive accessory gearbox for electric and hydraulic power without running main engines.

FUSELAGE AND TAIL UNIT: For general appearance, see accompanying illustrations. Metal skinned front and centre fuselage common to all three versions. Modified rear fuselage and slimmer tailboom on utility version, to accommodate rear loading ramp/door in underside. Tailcone and tail rotor pylon of composite construction; on naval version, this folds forward and downward so that starboard half of tailplane passes underneath rear fuselage. Small ventral fin under tailcone.

LANDING GEAR: Fully retractable tricycle type, with single mainwheels and twin-wheel nose unit. Main units retract into fairings on sides of fuselage.

POWER PLANT: Three General Electric T700-GE-401 turboshaft engines in pre-production aircraft, currently rated at 1,289 kW (1,729 shp) max contingency, 1,262 kW (1,693 shp) intermediate, and 1,071 kW (1,437 shp) max continuous. Engine rating for commercial version not yet decided, but reportedly will be approx 20% higher. Computerised fuel management system.

ACCOMMODATION: One or two pilots on flight deck (aircraft will be certificated for single pilot operation). ASW version will normally also carry observer and acoustic systems operator. Commercial version able to accommodate 30 passengers, at approx seat pitch of 76 cm (30 in), plus cabin attendant, with toilet, galley, and baggage facilities (including overhead bins). Utility version can accommodate up to 28 combat-equipped troops or equivalent cargo.

SYSTEMS: Three independent hydraulic systems, providing first and second failure survival for main flying controls. Primary electrical system is 115/200V three-phase AC, powered by two 20/45kVA brushless, oilspray-cooled generators driven by accessory gearbox.

AVIONICS: Avionics system is based on two MIL-STD-1553B multiplex data buses which link the basic aircraft management and mission systems. Main processing element of the management system is a dual redundant aircraft management computer, which carries out navigation, control and display management, performance, 'health', and usage monitoring computation; it also controls the basic bus. Other basic aircraft system elements are the dual duplex digital AFCS; a complex military communications subsystem; and Doppler, inertial, global positioning, and other navigation sensors. Advanced flight deck makes extensive use of colour CRTs for flight navigation and systems display, and features multi-function keyboard control. Main processing element of the naval version mission system is the dual redundant mission computer, which carries out tracking, sensor management, control and display management, and controls the mission bus. AFCS will include electronic ADI and HSI. All avionics will wherever possible conform to ARINC 700 and 429 standards.

ARMAMENT AND OPERATIONAL EQUIPMENT (naval and military utility versions): Naval version able to carry up to four homing torpedoes (probably Marconi Stingray in RN version) or other weapons externally. ASW version will have 360° search radar (probably Ferranti Blue Kestrel in

RN aircraft) in a 'chin' radome, plus dipping sonar, two sonobuoy dispensers, advanced sonobuoy processing equipment, and an external rescue hoist. ASST (anti-ship surveillance and tracking) version will carry equipment for tactical surveillance and OTH (over the horizon) targeting, to locate and relay to a co-operating frigate the position of a target vessel, and for midcourse guidance of the frigate's missiles. On missions involving the patrol of an exclusive economic zone it can also, with suitable radar, monitor every hour all surface contacts within an area of 77,700 km² (30,000 sq miles); can patrol an EEZ 400 × 200 nm (740 × 370 km; 460 × 230 miles) twice in one sortie; and can effect boarding and inspection of surface vessels during fishery protection and anti-smuggling missions. ASV version is designed to carry air-to-surface missiles and other weapons, for missions ranging from strikes against major units using sea-skimming anti-ship missiles to small-arms deterrence of smugglers. Various duties in amphibious operations could include personnel/stores transportation (*e.g.*, 24 combat-equipped troops and their stores over a 200 nm; 370 km; 230 mile radius), casualty evacuation, surveillance over the beachhead, and logistic support. In logistic support the EH 101 can carry internal loads or up to 4,536 kg (10,000 lb) on an external sling.

DIMENSIONS, EXTERNAL:

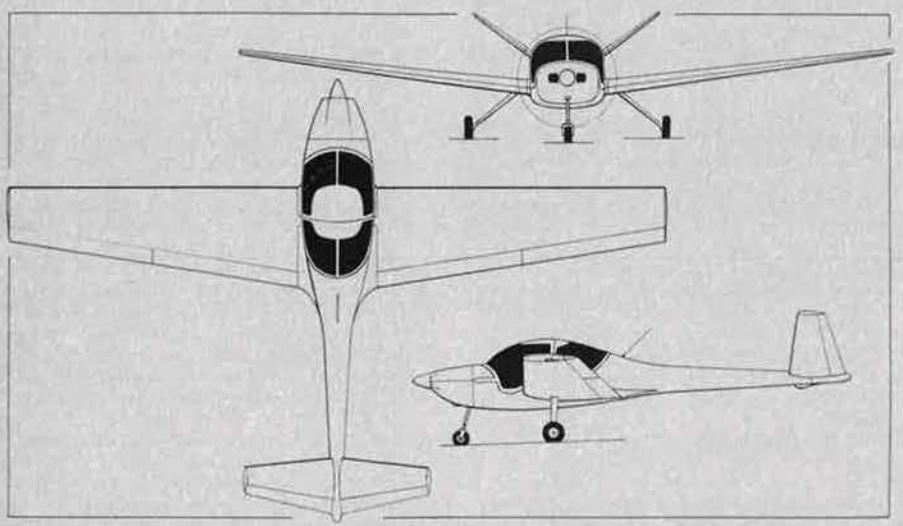
Main rotor diameter	18.59 m (61 ft 0 in)
Tail rotor diameter	4.00 m (13 ft 1½ in)
Main rotor disc area	271.72 m² (2,924.8 sq ft)
Tail rotor disc area	12.57 m² (135.3 sq ft)
Length overall, both rotors turning	22.90 m (75 ft 1½ in)
Length, main rotor and tail pylon folded	15.85 m (52 ft 0 in)
Width, main rotor and tail pylon folded	5.49 m (18 ft 0 in)
Height overall, both rotors turning	6.50 m (21 ft 4 in)
Height, main rotor and tail pylon folded	5.18 m (17 ft 0 in)

DIMENSIONS, INTERNAL:

Cabin:	
Length	6.50 m (21 ft 4 in)
Max width	2.50 m (8 ft 2½ in)
Width at floor	2.39 m (7 ft 10 in)
Max height	1.82 m (5 ft 11½ in)

WEIGHTS (A: naval version, B: commercial version):

Basic weight empty	approx 7,031 kg (15,500 lb)
Operating weight empty	8,618 kg (19,000 lb)
Max fuel weight (internal tanks only):	
B	3,855 kg (8,500 lb)
Disposable load: A	6,083 kg (13,410 lb)
Max T-O weight:	
A	13,000 kg (28,660 lb)
B	14,175 kg (31,250 lb)



Robin ATL personal and club aircraft (JPX PAL 1300 three-cylinder two-stroke engine) *(Pilot Press)*

Robin's prototype ATL typifies European efforts to produce a very lightweight low-cost two-seater *(Brian M. Service)*

PERFORMANCE (estimated):

Never-exceed speed	180 knots (333 km/h; 207 mph)
Normal operating limit speed	160 knots (296 km/h; 184 mph)
Max cruising speed, ISA	150 knots (278 km/h; 173 mph)
Still air range, with reserves:	
B, 30 passengers	550 nm (1,020 km; 633 miles)
B, 20 passengers	750 nm (1,390 km; 863 miles)
Ferry range	1,000 nm (1,850 km; 1,150 miles)
Endurance on station for dunking cycle with full weapon and mission load: A	5 h

ROBIN

AVIONS PIERRE ROBIN, BP 87, Aérodrome de Dijon Val-Suzon Darois, 21121 Fontaine-les-Dijon Cédex, France

ROBIN ATL

Avions Pierre Robin began design of the ATL (*avion très léger*) in March 1981, to meet the requirement of French flying clubs for a very lightweight two-seat monoplane that would, in the tradition of the veteran Jodel D.112, be economical to buy, probably in kit form, and to operate. Construction of the prototype (F-WFNA) was started in February 1982; an engine to power it was specially developed in only ten months, in collaboration with M Jacques Buchoux of the JPX company. This enabled the ATL prototype to be exhibited at the 1983 Paris Air Show, and to fly immediately afterwards, on June 17. Certification will be to FAR Pt 23 Normal category standards.

TYPE: Two-seat very light personal and club aircraft.

WINGS: Cantilever mid-wing monoplane. Wing section NACA 43015. Dihedral 6° from roots. Incidence 3°. Conventional wood structure, with Dacron covering. Ailerons and electrically actuated flaps of light alloy along entire trailing-edges. No tabs.

FUSELAGE: Pod and boom configuration, made of glassfibre/epoxy/Tubus honeycomb.

TAIL UNIT: Cantilever V structure, with fixed surfaces of Dacron-covered wood, and horn balanced light alloy control surfaces. No tabs. Small ventral fin containing tiedown ring.

LANDING GEAR: Non-retractable tricycle type. Cantilever main legs. Nosewheel steerable via rudder pedals. Brakes on mainwheels. Parking brake.

POWER PLANT: One 35 kW (47 hp) JPX PAL 1300 three-cylinder aircooled radial two-stroke engine, driving a Hoffmann two-blade wooden propeller through an extension shaft. No reduction gear. Electric starter. Fuel tank in each wing root, total capacity 50 litres (11 Imp gallons).

ACCOMMODATION: Two seats side by side under large transparent canopy, the front portion of which hinges upward and forward. 'Solid' top to canopy provides shade from overhead sun. Dual controls standard.

AVIONICS: Prototype has VHF radio, VOR, and ADF.

DIMENSIONS, EXTERNAL:

Wing span	10.24 m (33 ft 7¼ in)
Wing chord:	
at root	1.50 m (4 ft 11 in)
at tip	0.80 m (2 ft 7½ in)
Length overall	6.80 m (22 ft 3¾ in)
Fuselage: Max width	1.10 m (3 ft 7¼ in)
Height overall	1.90 m (6 ft 3 in)
Wheel track	3.00 m (9 ft 10 in)
Propeller diameter	1.50 m (4 ft 11 in)

WEIGHTS AND LOADINGS:

Weight empty	200 kg (441 lb)
Max T-O weight	420 kg (926 lb)
Max wing loading	approx 35.0 kg/m² (7.18 lb/sq ft)
Max power loading	12.0 kg/kW (19.7 lb/hp)

PERFORMANCE (at max T-O weight):

Max level speed	97 knots (180 km/h; 112 mph)
Max cruising speed (75% power) at 2,135 m (7,000 ft)	89 knots (166 km/h; 103 mph)
Econ cruising speed (50% power) at 2,135 m (7,000 ft)	73 knots (136 km/h; 84 mph)
Approach speed	46 knots (85 km/h; 53 mph)
Stalling speed, flaps down	36 knots (66 km/h; 41 mph)
Max rate of climb at S/L	174 m (570 ft)/min
Service ceiling	4,115 m (13,500 ft)
T-O to 15 m (50 ft):	
on hard runway	220 m (722 ft)
on grass	325 m (1,066 ft)
Landing from 15 m (50 ft)	240 m (788 ft)
Landing run	90 m (296 ft)
Range with max fuel at econ cruising speed, no reserves	432 nm (800 km; 497 miles)

When Push Came to Shove

Deep over North Korea, Robbie Risner's wingman was hit by flak that disabled his F-86. Getting him to safety called for heroic measures.

BY JOHN L. FRISBEE

BRIG. Gen. Robinson Risner's heroism during seven and a half years of imprisonment and torture in North Vietnam is legendary. Less known is the fact that he was a jet ace in Korea with eight confirmed victories. Few are aware, at least in detail, of an incredible feat of flying performed over North Korea by Robbie Risner in an attempt to save the life of another pilot. That courageous act is dismissed with a couple of sentences in Risner's book *The Passing of the Night*.

Risner's career as a fighter pilot began in Panama, where he whiled away the World War II years. When peace came, he joined the Oklahoma Air Guard. His squadron was called to active duty during Korea and began transitioning from P-51s to F-80s, but with no immediate prospects of getting into the war. With the bare required minimum of 100 hours of jet time, Risner volunteered for combat duty as a photo-recce pilot, arriving in Korea on May 10, 1952. Three weeks later, he wangled his way into the famous 4th Fighter Wing at Kimpo, and into F-86s, the world's best fighter at that time. On September 21, the fast-learning Captain Risner became our twentieth jet ace.

A few weeks later while escorting fighter-bombers in an attack on a chemical plant along the Yalu River, Risner tangled with what he describes as the finest fighter pilot he ever encountered. From 30,000 feet to the deck they went, with Risner scoring several solid hits, then across the Yalu into forbidden territory and down the runway of a Chinese airfield where the damaged MiG-15 crashed. All the while, Robbie's wingman, Lt. Joe Logan, stayed with the fight, protecting his leader.

As they climbed back across the Yalu near Antung, Logan's F-86 took a burst of flak. Fuel and hydraulic fluid poured out the belly of his aircraft. With only five minutes' fuel left, he would, it seemed, have to bail out in enemy territory. But Robbie Risner was not about to lose a fine wingman who was also a close friend.

"A typical fighter pilot," says General Risner, "thinks less about risk than about his objective," and Risner's objective was to keep Joe Logan out of enemy hands. Jet ace Risner immediately embarked on an undeniably high-risk venture to achieve that objective. The Air Force had a rescue detachment at Cho Do Island, about sixty miles to the south—and with plenty of flak en route. Risner decided to try something that, to his knowledge, had never been done successfully before. He would push the damaged F-86 to Cho Do, where Joe Logan could bail out safely.

Risner, then a captain, became a jet ace in Korea. Even more dramatic adventures lay in his future.

Risner told Logan to shut down his engine, now almost out of fuel. Then he gently inserted the upper lip of his air intake into the tailpipe of Logan's F-86. "It stayed sort of locked there as long as we both maintained stable flight, but the turbulence created by Joe's aircraft made stable flight for me very difficult. There was a point at which I was between the updraft and the downdraft. A change of a few inches ejected me either up or down," Risner, now retired and living in Austin, Tex., recalls.

Each time Risner reestablished contact between the battered nose of his F-86 and Logan's aircraft was a potential disaster that was made even more likely by the film of hydraulic fluid and jet fuel that covered his windscreen and obscured his vision. It was, one imagines, something like pushing a car at eighty miles an hour down a corduroy road in a heavy fog.

Miraculously, Risner nudged Joe Logan's F-86 all the way to Cho Do, maintaining an airspeed of 190 knots and enough altitude to stay out of range of automatic weapons. Near the island, Logan bailed out, landing in the water near shore. Ironically, Robbie Risner's heroic effort ended in tragedy. Although Logan was a strong swimmer, he became tangled in his chute lines and drowned before rescuers could reach him. But the measure of a heroic act lies not in success. It lies in the doing.

After Korea, Robbie Risner's Air Force career continued to be marked by acts of physical and moral courage, culminating in his leadership of American POWs during those long years in Hanoi's prisons.

The standards of valor, loyalty, and dedication he set for himself, and met superbly throughout his years in uniform, have established a goal to be sought by generations of airmen yet to come. ■

AIRMAN'S BOOKSHELF

Aerial Circumnavigations

Round-the-World Flights, by Carroll V. Glines. Van Nostrand Reinhold, New York, N. Y., 1982. 288 pages with index, bibliography, and photos. $25.50.

I really thought I would not learn anything new in a book about round-the-world flights; how wrong I was. Veteran pilot, author, and editor C. V. Glines has done it again, presenting in a series of vivid vignettes the wide variety of globe-girdling flights that range from those of the Douglas World Cruisers to the stunning successes of the Space Shuttle.

The challenge of circumnavigating the world has stirred mankind since the time of Magellan. The airplane had just come to maturity in 1924 when the four Douglas biplanes lifted off from Sand Point, near Seattle. They took 175 days in all, of which sixteen were airborne, to cover the 26,345-mile journey. In comparison, the Orbiter *Columbia* circled the world thirty-six times in fifty-four hours, twenty minutes, and fifty-two seconds. The World Cruisers rarely operated above 5,000 feet, except when absolutely necessary; *Columbia* reached as high as 130 miles.

Yet the beauty of Glines's book is the way he brings out the essential human common denominator that unites the disparate technological achievements. One can sense that the men who crewed the World Cruisers would not have been out of their depths in the *Columbia*, and vice versa. The machinery changes over time, but the quality of the crews is constant.

Similarly, the assortment of aircraft completing global flights all had in common the same brilliance, tenacity, and adaptability of the human spirit. Some pilots flew at the leading edge of technology, as when Wiley Post combined experience and daring with the new "robot pilot" to fly his beloved *Winnie Mae* solo around the world.

A few, like Dr. Hugo von Eckner, mastered the venture in improbably fragile craft. When one considers how he shepherded the extremely vulnerable hydrogen-filled *Graf Zeppelin* globally, with only the most tentative of weather reports, it becomes apparent that he was an aviator of the first order. And very lucky.

Round-the-world flights seemed to have reached their amateur apogee with Howard Hughes's well-prepared and -executed flight in a Lockheed 14—*Miss World Fair*—in 1939. The next record-breaking global flight would be accomplished by US Air Force professionals, first in 1949 in a B-50A, *Lucky Lady II*, and then in 1957 with three almost brand-new B-52s.

Yet there has been a blossoming of flights of individuals in aircraft as disparate as Clifford Evans's and George Truman's Piper Cruisers, Don Taylor's homebuilt Thorpe T-18, Jerry Mock's Cessna 180, or Arnie Palmer's Learjet 36.

Elgen Long did the task comprehensively, flying solo over both poles and the equator at the zero-degree and 180-degree meridians. We've even reached the point where global flying is nostalgic, as with Ann Pellagrano's 1967 tribute to Amelia Earhart, in which she completed, in a Lockheed 10A, the flight Earhart intended. Ross Perot, Jr., and Jay Coburn completed the trip in thirty days in a helicopter, the first time a rotary-wing aircraft circled the globe.

The author manages to treat each of the adventurers as an individual and peppers the text with intriguing and lively anecdotes. There is an account of Wiley Post's first parachute jump, Bill Odom's miraculous nap while circling among some very rock-filled clouds, and the imperturbability of the *Graf Zeppelin* passengers enthusiastically observing an intense lightning storm.

The book is highly recommended.

—Reviewed by Walter J. Boyne, Director, National Air and Space Museum.

USSR: A Paper Tiger?

The Threat: Inside the Soviet Military Machine, by Andrew Cockburn. Random House, New York, N. Y., 1983. 338 pages with notes and index. $16.95.

The author's intent is to inform the American public that our Soviet adversaries are not a Goliath-sized threat but are, rather, bureaucratically stifled midgets, not to be feared.

He argues that the US defense establishment—uniformed military, civilian officials, defense-oriented journals such as this, think-tank contractors, and the arms industry—has consciously and mendaciously inflated the Soviet threat to feather its own nest.

"For the sake of argument," Mr. Cockburn asserts, let us "assume that the Soviets are indeed bent on world domination through forcible means. . . . The important question is . . . their capabilities. Could they do it?" His answer is a resounding "no."

While the author admits that the USSR has a huge military, he insists that its officers are corrupt and dull-witted. The enlisted force is worse—permanently disaffected, inadequately trained, armed with miserably designed and maintained weapons, and sure to be inept at anything except keeping their restive populations enthralled.

These assertions, however, seem to be based on biased or flawed evidence and marred by sloppy scholarship. The book has no footnotes, and proofs for many of his most interesting points are either absent or taken from secondary sources written by such nonexperts as James Fallows. For example, Mr. Cockburn argues without documentation that the US has relinquished "partial" operational control of its nuclear weapons to NATO allies.

The author also contends that the ZSU-23-4 antiaircraft gun is "almost entirely useless against a maneuvering target" and even in the "most favorable conditions" is "100 times worse than the Pentagon has chosen to believe." US aircrews who flew in Southeast Asia know better.

The author interviews or quotes only émigrés who scoff at the strength

of the Soviet forces while ignoring those with opposite views. For example, over the years defecting KGB and military officers, including a number from the satellite nations, have painted a different picture.

The author also disregards the fact that the world is dealing with a dangerous and paranoid state that makes military secrecy a fetish and has an iron grip on its own citizens as well as on millions of its Eastern European neighbors.

Mr. Cockburn is obviously less worried about the Soviets than he is about the consequences of deliberately inflating the threat. He believes that threat-inflation leads to militarism, a philosophy destructive to such Western ideals as free speech.

Paradoxically, the book is based on a series the author produced for public television. This is a strong indication, as illustrated by the success of the popular antiwar TV series *M*A*S*H,* that "militarism" has anything but stifled free speech in America.

Finally, Mr. Cockburn labels those in the West who support his stand as "judicious," while opponents are termed "hawks" fostering a "demonology."

In short, the book is an antimilitary diatribe that barely acknowledges the fundamental nature of the Soviet menace.

—Reviewed by Col. Alan L. Gropman, Deputy Director of Air Force Plans for Conceptual Development and Planning Integration in the Pentagon.

Mass Escape, France, 1944

And the Walls Came Tumbling Down, by Jack Fishman. Macmillan Publishing Co., Inc., New York, N. Y., 1982. 422 pages with bibliography, index, and photos. $17.95.

At noon on February 18, 1944, one of the most daring and largest jailbreaks in history occurred when more than 700 men and women escaped from Amiens prison in Nazi-occupied northern France.

What made it possible was the Allied Air Forces' destruction of the prison walls in a low-level attack by Mosquito bombers. The mission was risky and, indeed, almost a hundred prisoners and many German guards were killed.

The reason for this audacious raid, the meticulousness of its planning, the gripping tales of many of the prison inmates, and the adventures of the hundreds set free by the raid constitute a true-life thriller. Central to the story are the many-faceted Resistance organizations of French men and women who daily risked their freedom and their lives.

By 1943, the Gestapo—aided by French traitors and opportunistic criminals—had penetrated and decimated many of the Allied intelligence and Resistance organizations. Hundreds were imprisoned and many subsequently executed.

The dearth of behind-the-lines espionage and sabotage to aid in both preinvasion plans and during the initial days of the invasion concerned General Eisenhower and his planners.

To counter this vacuum, a plan evolved among Allen Dulles in Bern, "Wild Bill" Donovan in Washington, a French Colonel "Gilbert" in Geneva, and a man called "C" in London. Additional collaboration came from several Resistance leaders within Amiens prison itself.

The idea was to bomb the prison's massive walls to allow the escape of the inmates.

Learning about these characters is an exciting experience. Especially stirring are the tales that unfold in the aftermath of the raid as the escapees struggle to remain alive in the deep snow of a French winter.

Imagine, if you can, a story line that embraces such characters as Resistance leaders, US and British agents, captured Allied airmen, counterfeiters, forgers, prostitutes, and shoplifters.

Though most prisoners formed small groups to try their luck in the great escape, there was one who made his way alone. He was a top Resistance leader with crucial information about Allied invasion plans, and his arrest four days before the raid lent urgency to his escape. With a breakout that reads like fiction, Raymond Vivant made good his getaway. In later years he became Charles de Gaulle's Minister of Finance.

This book is a fascinating yarn—often nearly incredible and never boring. It captures an outstanding moment in wartime history involving legions of courageous, uncommon, and just ordinary people caught up in the maelstrom of war.

—Reviewed by Lt. Gen. Andrew B. Anderson, USAF (Ret.), Deputy Executive Director of the Air Force Association and Deputy Publisher of AIR FORCE *Magazine.*

New Books in Brief

Big Friend, Little Friend, by Lt. Col.

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AIRMAN'S BOOKSHELF

Richard E. Turner, USAF (Ret.). The problem with many war stories is not with the stories but with the storytellers—the kind who can hold them spellbound over drinks in the O Club but who can't write a simple declarative sentence. Fortunately, Colonel Turner does not suffer from this malady. A Mustang pilot with the 356th Fighter Squadron in the ETO during World War II, his account of bomber escort and fighter sweep missions is vibrant and unforced and makes for a quick, enjoyable read. His memoir also touches briefly on his combat adventures flying F-86s in Korea. With photos and illustrations by the author (and a cover illustration by Bob Stevens), and index. Published by the Champlin Fighter Museum Press, Mesa, Ariz., 1983. 176 pages. $8.95.

The Command and Control of Nuclear Forces, by Paul Bracken. In this penetrating and often disturbing study of nuclear force management, author Bracken warns that "the superpowers have institutionalized a major nuclear showdown. They have built the most complex technological apparatus ever conceived, without thinking through its purpose or how to control it." His basic thesis is that a shooting nuclear war is quite apt to devolve rapidly from centralized political control to fragmented military direction. If this is so, then war is no longer "politics by other means," and any meaningful result—and, perhaps, even the termination of the war itself—becomes extremely difficult, if not impossible. The author concludes with a suggested "new direction" in arms control that focuses on operational issues rather than on achieving quantitative reductions. With figures and index. Yale University Press, New Haven, Conn., 1983. 252 pages. $19.95.

The Profession of Arms, by General Sir John Hackett. This book, based on a series of lectures delivered by General Hackett at Cambridge University, examines in sweeping but scholarly fashion the development of a professional ethic in the art of soldiering. Tracing the history of organized warfare from Sparta to Vietnam, the book abounds with insight into the evolution of what General Hackett calls "the ordered application of force in the resolution of a social problem." The complex role of the military professional in society and society's multifaceted perceptions of the man-at-arms are also considered. This handsomely illustrated book is the basis for a forthcoming television series to be narrated by General Hackett. With notes and index. Macmillan Publishing Co., New York, N. Y., 1983. 239 pages. $24.95.

The X-Planes: X-1 to X-29, by Jay Miller. This book is a trove of information that provides, for the first time ever, a complete listing of all the X-designated experimental research aircraft developed by NASA and the Air Force. Designed as a reference work, each entry contains such basic data as manufacturer, mission, number built, history, flights, specifications, and so on. Each X-plane is illustrated by a three-view drawing and by many black-and-white close-up and operational photos. Also included is a foreword by famed test pilot Brig. Gen. Charles E. Yeager, USAF (Ret.). This book would be a valuable addition to any airman's bookshelf. With references and index. Published by Specialty Press, available from Motorbooks International, P. O. Box 2, 729 Prospect Ave., Osceola, Wis. 54020, 1983. 192 pages. $29.95.

Yuri Andropov: A Secret Passage into the Kremlin, by Vladimir Solovyov and Elena Klepikova. Judging from their chilling portrait of an ambitious and shameless Machiavellian, Soviet husband and wife émigrés Solovyov and Klepikova certainly give no credence to reports that Mr. Andropov is really a closet pro-Western liberal who has a taste for good Scotch and Glenn Miller records. The authors maintain that a ruthless Andropov has finally wrested supreme power from the Party and has stripped the Soviet government of its last vestigial reliance on ideology as a justification for rule. They point also to evidence that Andropov is moving fast (he is ailing and going blind) to re-Stalinize the Soviet Union completely in order to address the USSR's many problems by reliance on raw police power and to ensure a free hand to expand the empire. Though readers have no independent means of judging the veracity of the authors' many surprising claims, they are sure to be fascinated all the same by this exposé of the "world's most dangerous man." With photos, notes, and index. Macmillan Publishing Co., New York, N. Y., 1983. 320 pages. $15.95.

—Reviewed by Hugh Winkler, Assistant Managing Editor.

THE BULLETIN BOARD

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

Medical Nuisance Fee Proposed

Like a bad penny, the idea of imposing a fee on nonactive-duty CHAMPUS beneficiaries using military health-care facilities has surfaced again. AIR FORCE Magazine has learned that such a proposal has been put forward by Sen. Daniel K. Inouye (D-Hawaii) during the mark-up discussion on the Senate Armed Forces Appropriations Bill. Senator Inouye attempted to include such language in last year's bill.

At Beale AFB, Calif., Gavin Mandery addresses a gathering at the NCO Club after being presented the Air Force Exceptional Service Award by Gen. Jerome F. O'Malley, former Air Force Vice Chief of Staff and current Commander in Chief of Pacific Air Forces. The award recognizes voluntary public services performed out of patriotic motivation with no thought of personal gain. As founder and cochairman of the Sacramento Valley Military Liaison Committee and founder of the David J. Price/Beale Chapter of AFA, Mr. Mandery is known as the leading civilian spokesman for Air Force programs in northern California. (Photo courtesy of the Appeal-Democrat, *Marysville, Calif.)*

Briefly, the proposal would require a $10 fee for each outpatient visit up to $100 per year for each beneficiary. Knowledgeable Air Force staffers note that such action, if approved, would undoubtedly have the following unsavory effects:

- It could well drive even more people to use CHAMPUS, which most agree is more expensive to the government.
- Members geographically separated from their families due to TDY or remote overseas tours would have no assurance that dependents could afford needed health care. The spouse might opt to trade "bread on the table" for a trip to the doctor, with possible adverse consequences both for the health of the patient and the peace of mind of the absent military member.
- Those hit hardest by the fee would be approximately 400,000 dependents of junior enlisted members in the lowest four pay grades. This aggravates past pay caps and adds to the nagging unease of blue-suiters that their benefits are being eroded.

AFA's current Defense Manpower Issues Policy Paper, adopted unanimously by delegates to the recent National Convention, unequivocally opposes the imposition of such a fee for outpatient visits to military treatment facilities. At press time there is no word as to what is happening to this proposal. By the time you read this, in fact, it may have been defeated—we hope. AFA intends to watch it carefully. It's a bad idea and should be dismissed out of hand.

Retirement System Explained

Calling the military retirement system the "number one retention incentive" and the "most stable and enduring incentive for a military career," the Air Force's Deputy Chief of Staff for Manpower and Personnel, Lt. Gen. Kenneth L. Peek, Jr., recently presented an eloquent explanation of the system to Congress.

In testimony before the House Subcommittee on Military Personnel and Compensation, General Peek emphasized that the prime purpose of the retirement system is to "ensure the readiness of our armed forces in peace and war." He reminded the group that, prior to World War II, an aging and stagnant officer corps impaired our ability to field an effective force quickly. Conversely, today's retirement system—providing, as it does, a smooth-flowing career progression structure—ensures a vigorous and experienced force.

His statement stressed that the retired force is an important resource and a key element of mobilization plans. "The services must be able—and plan—to involuntarily call to active duty thousands of retired officers and enlisted personnel," he said. This ability to call on trained manpower at relatively small cost would be impossible without an effective retirement system, he indicated.

"Finally," he told the lawmakers, "the military retirement system provides the foundation for a strong system of institutional supports which partially offsets the unusual conditions experienced during a military career. Military service places extraordinary demands on its members and their families and as a result differs significantly from civilian employment."

Citing the necessity for short-notice and frequent moves that usually result in out-of-pocket costs to the member of hundreds of dollars, the adverse effects of family separation, and, of course, the acceptance by the career military person of physical risk, General Peek stressed that the retirement system is an integral part of the government's bargain with the member for service rendered. Underscoring the latter point he cited the statistic that approximately eighty-five percent of the Air Force people who retired in 1982 have received hostile fire pay at some point in their careers.

In his presentation, he outlined for the congressmen the adverse changes—since 1972, more than a dozen—that have eroded the retirement benefit and shared with them

the comments and impressions of blue-suiters he had heard during recent visits to bases around the world. He said that the "prevailing feeling among our people is that the rug is about to be pulled out from under them, that the country is defaulting on its obligation to them for the many faithful and difficult years of military service."

This hearing is one of many hearings, investigations, surveys, studies, evaluations, and so on being made of the military retirement system at this time. It is a "hot issue" on Capitol Hill and elsewhere.

AFA also feels strongly about it. Our current Defense Manpower Issues Policy Paper reflects our concern. The Policy Paper highlights our belief that the current retirement system is essential to our national defense and that change, if it comes, should only be undertaken after a "thoughtful, deliberate, and thorough study of the system that takes into account the impact of changes on military force effectiveness."

As General Peek summed up on Capitol Hill, "Our military retirement system has served the unique requirements of the military well. It will continue to do so as long as it remains stable, providing our people and their families the entitlement they have earned, and fulfills the commitment made to them in return for the many sacrifices they are called upon to make for their country. The military retirement system is integral to ensuring we have military forces capable of meeting our defense responsibilities."

CAP Flies Unusual Mission

Former Air Force staff sergeant and Vietnam veteran Bert Gilmore is a quadriplegic as a result of an industrial accident that occurred some eight years ago. His dream for many years has been to visit the Air Force Museum at Wright-Patterson AFB, Ohio. Even though he has a specially designed van, the long ride to Ohio from his nursing home in Pennsylvania has long thwarted realization of his dream.

However, thanks to a lot of concerned and caring people, including CAP and AFA's Airport Number One Chapter in Coraopolis, Pa. (Lee W. Niehaus is Chapter President), Mr. Gilmore's dream has come true. Pennsylvania's CAP Wing donated the use of an aircraft, and one of its pilots, CAP Capt. Paul Falavolito, volunteered to fly the mission. The AFA Chapter raised funds to cover the cost of fuel and other expenses. The nursing home director provided a nurse and nurse's aide to accompany Mr. Gilmore. The Public Affairs Officer at the Museum arranged the tour itinerary.

The tour went smoothly, aided by the fact that Col. Richard Uppstrom, Museum Commander, served as tour guide. He took special care to ensure that Mr. Gilmore was able to see an F-5, the aircraft he had worked on while in the Air Force. The trip was counted by all as a success and, as one participant summed it up in a salute to the many good and wonderful people who contributed to this trip, "Perhaps God put out his hand and touched Bert Gilmore and all those who helped make his dream come true."

THE BULLETIN BOARD

CHAMPUS News

Two special categories of claimants have been given specified claims processors for CHAMPUS reimbursement. All claims for dental work related to medical conditions—the only type of dental work that CHAMPUS will cost-share—should now be sent to CHAMPUS/CHAMPVA Div., Blue Cross-Blue Shield of South Carolina, P. O. Box 6150, Columbia, S. C. 29260. The telephone number is (803) 788-3860, ext. 2735. There is no toll-free number specifically for dental claims.

Also, Blue Cross and Blue Shield of Rhode Island has been designated as the processor for worldwide claims for Christian Science practitioners. The address is P. O. Box 1715, Providence, R. I. 02901, and the toll-free number is (1-800) 622-3131.

In other CHAMPUS news, Air Force SMSgt. Walter A. Kane III has been named as Ombudsman for the CHAMPUS program.

Sergeant Kane is designated as the advocate for all CHAMPUS beneficiaries, regardless of service or grade, who feel they need assistance not available elsewhere within the program. Kane stressed, "The Ombudsman isn't a replacement for the health benefits advisor at local military facilities. Nor," he notes, "can he take the place of the CHAMPUS claims processor." CHAMPUS beneficiaries who have questions or problems with coverage should *first* contact the health benefits advisor or the claims processor.

However, the Ombudsman *is* there, he says, "to serve the beneficiary, especially the military family with no one else to turn to." Before taking on the job, he was Chief of Management for the CHAMPUS Liaison Branch at the headquarters in Aurora, Colo. Before moving to CHAMPUS, Sergeant Kane served as Superintendent of Biometrics and Patient Affairs for the Air Force Surgeon General in Europe.

CHAMPUS beneficiaries who need his help—and have exhausted other sources of assistance—can reach Sergeant Kane at (303) 361-3984, or AUTOVON 943-3984. His address is CHAMPUS/DO, Ombudsman, Aurora, Colo. 80045. He's also available to speak to your group.

Air Force Continues Winning Ways

There is no longer any question that the Air Force has emerged as the preeminent competitor in interservice sports and games. Confirmation of this can be found, for example, in the results of the 1983 women's interservice softball championship recently held at Fort Indiantown Gap, Pa. The Air Force won the championship for the fifth year in a row. The Marines, Army, and Navy—in that order—were this year's runners-up.

Then at Memphis NAS, Tenn., the Air Force captured the 1983 interservice golf competition. The combined team score of 2,413 strokes was far and away better than second-place finisher Navy, with 2,456, last year's champion Army, with 2,458, and the Marines, who were last with 2,489.

Meanwhile, the Air Force chess team walked away with service and individual honors in the twenty-fourth annual Armed Forces Chess Championship Tournament held at the American Legion Hall of Flags in Washington, D. C. For the second year in a row, the Air Force team overwhelmed its opponents, accruing forty-eight points. The best that runner-up Army could do was 33.50, while the sea services (Navy, Marines, and Coast Guard) totaled only 26.50.

SrA. Emory A. Tate, Jr., who is stationed in the UK, won individual honors with ten wins, one loss, and one draw to garner 10.50 points. He placed second last year.

Second this year was Air Force SSgt. Chester Richey of Vandenberg AFB, Calif., who racked up eight wins, three losses, and a tie for a total of 8.50 points. Third was another blue-suiter, Lt. Paul J. Waldowski, Offutt AFB, Neb., who also scored 8.50 points but who had one less win with a record of seven wins, two losses, and three draws.

The first other-service member to

appear on the winning roster was Army SSgt. Michael E. Emerson, who had 7.50 points. The Air Force has produced the individual champion in fifteen of the twenty-four tournaments. Since team scoring began twenty-two years ago, the Air Force has won ten times.

These latest three sports and games competitions thus continue to add to the Air Force record. All told in 1983 sports and game competition, the Air Force has won an amazing seven interservice titles out of nine competitions.

VA Establishes Women's Panel

The VA Administrator, Harry N. Walters, has appointed an eighteen-member advisory committee to counsel him concerning the special needs of women veterans. Walters, who has used this technique frequently in an attempt to reach out to the many diverse constituent groups among the VA's customers, said the committee would be useful to him "in planning for the increased number of women veterans who will use the services of the Veterans Administration in the future."

He emphasized that the committee members were recommended by veterans organizations, womens groups, professional associations, and government agencies. Selectees represent a broad geographical distribution.

There are about 742,000 female veterans today, or about 2.5 percent of all living veterans. The US has both a greater number and a greater percentage of women serving in the military than any other country. As the estimated number of female veterans rises in the years ahead, the VA service requirement will rise accordingly. According to Rep. Marvin Leath (D-Tex.), a fervent advocate of the establishment of this advisory group, "female veterans must be reassured that the Veterans Administration will take necessary actions to provide that they have equal access to all VA benefits, especially in the areas of hospital and medical care."

The chairman of the panel is Col. Lorraine Rossi, USA (Ret.). The majority of the group of women are veterans from World War II, Korea, and Vietnam. Two other retirees in the group are Maj. Gen. Jeanne Holm, former WAF director, and Brig. Gen. Sarah Wells, former Chief of the USAF Nurse Corps.

USAF Chaplain Named Bishop

In a first for the Air Force, Pope John Paul II has selected Air Force Chaplain Col. Angelo T. Acerra for ordination as a bishop of the Roman Catholic Church.

Chaplain Acerra, who is completing twenty years' service and who was assigned to recruitment of chaplains in the Office of the Air Force Chief of Chaplains, was invested with his new responsibilities last month. He will be assigned by his church to an office in New York as an auxiliary bishop for the military. In this capacity he will be responsible for the spiritual well-being of 2,000,000 military personnel worldwide, as well as for overseas embassy personnel.

The Benedictine monk is a native of Memphis, Tenn. He told AIR FORCE Magazine, "Obviously I am honored to be selected as a bishop—but I think that this is also a tribute to the chaplains of the US Air Force that one of us was selected." While three chaplains each from both the Army and the Navy have been tapped for bishop over the years, this is the first time that a Pope has selected an active-duty Air Force chaplain for this recognition.

Short Bursts

The Air Force Aid Society reminds all **eligibles for AFAS student loans**—which includes all active-duty, retired,

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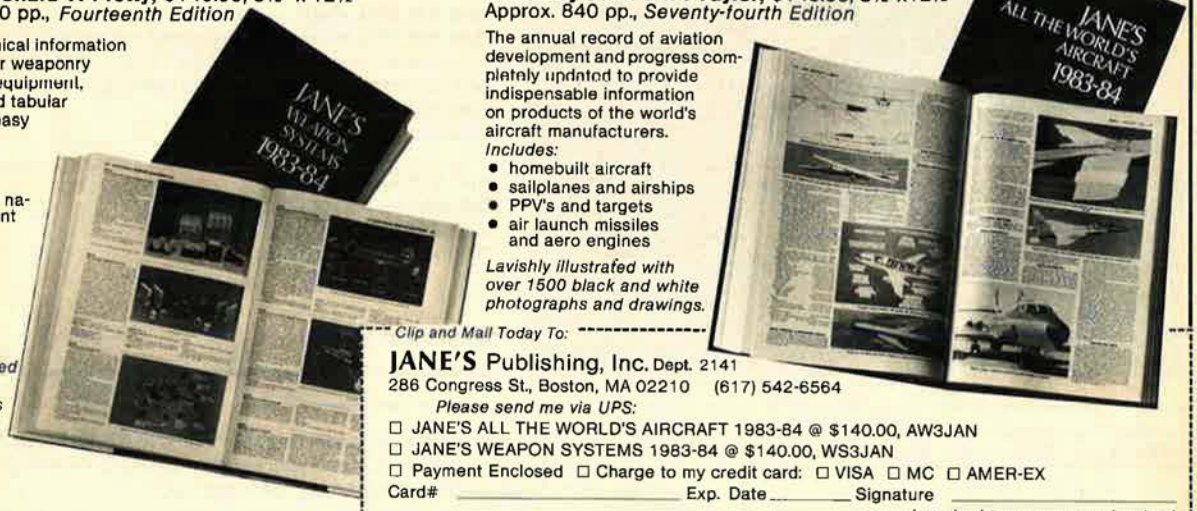

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selected Reserve, and National Guard members and their families—that a recent Supreme Court ruling reinstates the law requiring recipients of federal education assistance to **register with the Selective Service.**

DoD is continuing to push absentee voting, especially as the 1984 Presidential election draws near. More than ninety percent of military voters use the absentee process and, in the 1980 elections, more voters cast their ballots by absentee means than ever before. Each military unit has a voting officer to provide assistance.

Rep. Mary Rose Oakar (D-Ohio) wants to **eliminate the fees** the government charges financial institutions that receive **payroll deductions from Stateside federal employees.** Active and retired military people and DoD overseas civilians can send their checks to the bank electronically with no service fees either to them or the banks. Her bill would extend this privilege to all federal workers.

Do it by mail! Blue-suiters can now **review their master personnel records without traveling** to the central files in Texas. Send your request to HQ AFMPC/MPCDOM2A, Attn: Review-by-Mail Program, Randolph AFB, Tex. 78150. Include your name, rank, Social Security number, authorizing signature, and return address. You'll get back a microfiche and a fact sheet explaining the record.

DoD has received the first annual **Blacks in Government (BIG) Federal Agency Achievement Award** for the promotion of career employment of black Americans. BIG is a nonprofit organization devoted to the advancement of black Americans at all levels of government. Black Americans make up about 13.5 percent of the DoD civilian work force, and approximately 19.6 percent of the armed forces. This compares with only 9.9 percent of the national civilian labor force.

The **Vietnam Veterans Memorial** in Washington, D. C., **is undergoing construction** to install lighting and to widen the granite walks in front of the site. The improvements are aimed at providing better safety and security for the large number of visitors—more than 2,000,000 this past year—who come to view it almost twenty-four hours a day.

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Commissaries at Eglin AFB, Fla., and Aviano AB, Italy, have been named **"Best in the Air Force"** for 1983 in Stateside and overseas categories, thus capturing the L. Mendel Rivers Award. Meanwhile, Vandenberg AFB, Calif., has won the 1983 **General Curtis E. LeMay Award** recognizing the Air Force's **best Morale, Welfare, and Recreation Program.**

Retired **CMSAF Donald L. Harlow will retire** again this month from his post as **Executive Director of the Air Force Sergeants Association.** Honored by AFA in 1967 as the Air Force's Outstanding Airman, Don has been a popular and effective spokesman on Capitol Hill for enlisted blue-suit benefits since 1971. His many friends wish him all the best.

Senior Staff Changes

RETIREMENTS: B/G Allen K. **Rachel;** M/G James **Taylor,** Jr.

CHANGE: B/G Cecil W. Powell, from IG, Hq. USAFE, Ramstein AB, Germany, to Ass't DCS/Ops., Hq. USAFE, Ramstein AB, Germany, replacing B/G Marcus A. Anderson. ■

AFA Intercom

Season's Greetings

from the Staffs of the Air Force Association and the Aerospace Education Foundation

We want to wish every member, patron, and supporter of the Air Force Association and their families a joyous and cheerful Holiday Season and a prosperous and healthy New Year.

We are taking this opportunity to send a personal Holiday greeting from us to each of you; and to assure you that we of the staff are dedicated to AFA's professional concern for and support of the people and the technology that provide our nation's aerospace power — power that serves to keep our nation strong, the world at peace, and our fellow Americans free.

Joreen Aharonian, Andy Anderson, George Baglin, Dottie Barnes, Pam Beatty, Bill Belanger, Jancy Bell, Pamela Braithwaite, Jim Bridgeforth, Jim Brown, Jeanne Buffalino, Gilbert Burgess, Jim Canan, Ben Catlin, Sara Ciccoli, Donna Coffey, John Correll, Betsy Corvin, Charles Cruze, Russ Dougherty, Pearlie Draughn, Bill Farrell, Dottie Flanagan, Bill Ford, Ann Gardner, Margaret Glover, John Gray, Rolla Gray, Joanne Greene, Nancy Hallock, Frank Henry, Janet Hensler, Joan Herzberg, Laura Ingle, Barbara Jerry, Alan Johnson, Max Keeney, Pat Kenney, Debbie Kinback, Jana Knoska, Doreatha Kornegay, Jean Kund, Jim Lacy, Grace Lizzio, Jeff Lohr, Linda Mathieson, Kathleen McAuliffe, Ed McBride, Jim McDonnell, Barbara McGolrick, Katie McIntyre, Karen McReynolds, Bonnie Meyers, Paul Montalbano, Pat Muncy, Fred Musi, Millie Neider, By Nicholas, Mike Nisos, Dave Noerr, Gill Norton, Rosemary Pacenta, Clarine Penewell, Teri Pepper, Corinna Petrella, Harold Rafuse, Pat Rogers, Bill Schlitz, Bob Shaughness, Dick Skinner, Carol Smith, John Smith, Kathy Snodgrass, Pat Teevan, Charlie Tippett, Alice Turner, Edgar Ulsamer, Barbara Vest, Ed Walker, Don Whetstone, Pat Whipp, Kathleen White, Robin Whittle, Hugh Winkler, Maria Winter, Ann Wood-Gray.

AFA Intercom

AFA's Thunderbird Chapter's Foundation for Resource Gains through Engineering (FORGE) and the Arrowhead Chapter of the American Institute of Aeronautics and Astronautics recently cosponsored a dinner to raise funds for the construction of a school of engineering and computer sciences at the University of Nevada, Las Vegas. Attendees included, from left, AIAA President Dr. Michael I. Yarymovych, AFA National Director Ed Stearn, Nevada State AFA President William J. Becker, Special Assistant to the President and former Air Force Secretary Thomas C. Reed, and UNLV President Dr. Leonard Goodall. See item.

AFA's Austin Chapter "Super-Recruiter" Comes Through Again

Capt. Fred Stoessel, USAF, of Bergstrom AFB, Tex., and AFA's Austin Chapter, has solidified his reputation as a "super-recruiter" of AFA Life Members. At the conclusion of last year's membership drive Captain Stoessel commented that he had "laid the basis . . . for the *big* drive next year." Not one to make hollow claims, this year Captain Stoessel went out and recruited 124 new AFA Life Members, almost tripling last year's total of forty-three.

Through the dedicated efforts of Captain Stoessel and many other AFAers across the nation and overseas, the idea of AFA Life Membership has not only caught on, it has practically caught fire.

As recently as 1976, there were only 975 Life Members of AFA. In the past seven years that figure has increased by more than 1,200 percent. At the time of AFA's 1983 National Convention there were 12,556 Life Members of the Association.

Among the benefits of Life Membership is a never-ending subscription to AIR FORCE Magazine. In addition, a membership that is always current is particularly helpful to those enrolled in one or more of AFA's group insurance programs, since membership is a requirement for continued coverage.

AFA's Thunderbird Chapter Assists Las Vegas and the Nation

The scarcity of engineering students and the lack of qualified teachers and adequate facilities for technical instruction are grave problems facing this nation. AFA's affiliate, the Aerospace Education Foundation, dealt with these problems at its recent symposium, "Improving the Scientific and Technological Literacy of America's Youth."

Now AFA's Thunderbird Chapter in Nevada is doing more than its share to address what Nevada State AFA President William J. Becker termed "perhaps the most serious defense need of the next decade—engineers."

In looking for ways to become more directly involved in defense issues while at the same time assisting the people of Las Vegas, the Thunderbird Chapter discovered that it could take a leadership position in the quest to upgrade Nevada's technical education system. This quest took the form of the Foundation for Resource Gains through Engineering (FORGE), founded this past summer by the Chapter's Board of Directors.

Shortly after its formation, FORGE linked up with the Arrowhead Chapter of the American Institute of Aeronautics and Astronautics to plan a dinner to raise funds for the construction of a school of engineering and computer sciences at the University of Nevada, Las Vegas (UNLV).

As a result of the fund-raising dinner more than $30,000 was donated to UNLV, but, more importantly, a handful of dedicated AFAers made the con-

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): **Jim Patterson,** 802 Brickell Rd., N.W., Huntsville, Ala. 35805 (phone 205-837-5087).

ALASKA (Anchorage, Fairbanks): **William M. Mack,** 2620 Karluk St., Anchorage, Alaska 99504 (phone 907-279-3270).

ARIZONA (Phoenix, Sedona, Sun City, Tucson): **Thomas W. Henderson,** 4820 N. Camino Real, Tucson, Ariz. 85718 (phone 602-299-6467).

ARKANSAS (Blytheville, Fayetteville, Fort Smith, Little Rock): **Aaron E. Dickerson,** 710 S. 12th, Rogers, Ark. 72756 (phone 501-636-7460).

CALIFORNIA (Apple Valley, Edwards, Fairfield, Fresno, Hermosa Beach, Los Angeles, Merced, Monterey, Novato, Orange County, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Jose, Santa Barbara, Santa Monica, Sunnyvale, Vandenberg AFB, Yuba City): **David Graham,** 29611 Vista Plaza Drive, Laguna Niguel, Calif. 92677 (phone 714-495-4622).

COLORADO (Aurora, Boulder, Colorado Springs, Denver, Fort Collins, Grand Junction, Greeley, Littleton, Pueblo, Walerton): **William R. Morris,** 5521 S. Telluride Court, Aurora, Colo. 80015 (phone 303-693-4464).

CONNECTICUT (East Hartford, North Haven, Storrs, Stratford, Westport, Windsor Locks): **Raymond E. Choquette,** 16 Tonica Springs Trail, Manchester, Conn. 06040 (phone 203-646-4818).

DELAWARE (Dover, Wilmington): **Joseph H. Allen, Jr.,** 537 Roberta Ave., Dover, Del. 19901 (phone 302-674-3472).

DISTRICT OF COLUMBIA (Washington, D. C.): **A. B. Outlaw,** 1750 Pa. Ave., N. W., Suite 400, Washington, D. C. 20006 (phone 202-637-3346).

FLORIDA (Brandon, Cape Coral, Daytona Beach, Fort Walton Beach, Gainesville, Jacksonville, Leesburg, Naples, New Port Richey, Orlando, Panama City, Patrick AFB, Redington Beach, Sarasota, Tallahassee, Tampa, West Palm Beach, Winter Haven): **Morgan S. Tyler, Jr.,** 1776 6th St., N. W., Apt. 606, Winter Haven, Fla. 33880 (phone 813-299-2773).

GEORGIA (Athens, Atlanta, Columbus, Rome, Savannah, St. Simons Island, Valdosta, Warner Robins): **Thomas E. Farr,** 92 Brandon Ridge Drive, Atlanta, Ga. 30328 (phone 404-255-5213).

GUAM (Agana): **Joe Gyulavics,** P. O. Box 21543, Guam 96921 (phone 671-734-2369).

HAWAII (Honolulu): **Don J. Daley,** P. O. Box 3200, Honolulu, Hawaii 96847 (phone 808-525-6296).

IDAHO (Boise, Mountain Home, Twin Falls): **John W. Logan,** 3131 Malad St., Boise, Idaho 83705 (phone 208-385-5475).

ILLINOIS (Belleville, Champaign, Chicago, Decatur, Elmhurst, Peoria): **Kyle Robeson,** 125 W. Church St., Champaign, Ill. 61820 (phone 217-352-3936).

INDIANA (Bloomfield, Fort Wayne, Indianapolis, Lafayette, Logansport, Marion, Mentone, South Bend): **John Kagel,** 1029 Riverside Drive, South Bend, Ind. 46616 (phone 219-234-8855).

IOWA (Des Moines): **Carl B. Zimmerman,** 608 Waterloo Bldg., Waterloo, Iowa 50701 (phone 319-232-2650).

KANSAS (Topeka, Wichita): **Cletus J. Pottebaum,** 6503 E. Murdock, Wichita, Kan. 67206 (phone 316-683-3963).

KENTUCKY (Lexington, Louisville): **Elmo C. Burgess,** 116 S. 5th St., Louisville, Ky. 40202 (phone 502-585-5169).

LOUISIANA (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Shreveport): **James P. LeBlanc,** 5905 Flagler St., Metairie, La. 70003 (phone 504-887-8524).

MAINE (Bangor, Limestone, N. Berwick): **Arley McQueen, Jr.,** Route 1, Box 215, Wells, Me. 04090 (phone 207-676-9511, ext. 2354).

MARYLAND (Andrews AFB area, Baltimore): **William L. Ryon, Jr.,** 8711 Liberty Lane, Potomac, Md. 20854 (phone 301-299-8717).

MASSACHUSETTS (Bedford, Boston, Falmouth, Florence, Hanscom AFB, Lexington, Taunton, Worcester): **Zaven Kaprielian,** 428 Mt. Auburn St., Watertown, Mass. 02172 (phone 617-924-5010).

MICHIGAN (Battle Creek, Detroit, Kalamazoo, Marquette, Mount Clemens, Oscoda, Petoskey, Southfield): **Robert J. Schaetzl,** 42247 Trotwood Court, Canton, Mich. 48187 (phone 313-552-3280).

MINNESOTA (Duluth, Minneapolis-St. Paul): **Edward A. Orman,** 368 Pike Lake, Duluth, Minn. 55811 (phone 218-727-8381).

MISSISSIPPI (Biloxi, Columbus, Jackson): **Clarence Ball, Jr.,** 5813 David Davis Pl., Ocean Springs, Miss. 39564 (phone 601-875-5883).

MISSOURI (Kansas City, Knob Noster, Springfield, St. Louis): **James R. Hopkins,** 316 Hillcrest Drive, Warrensburg, Mo. 64093 (phone 816-747-6087).

MONTANA (Great Falls): **Al Lovington,** P. O. Box 1569, Great Falls, Mont. 59403 (phone 406-453-1118).

NEBRASKA (Lincoln, Omaha): **Edward A. Crouchley,** 1314 Douglas On the Mall, Omaha, Neb. 68102 (phone 402-633-2125).

NEVADA (Las Vegas, Reno): **William J. Becker,** 1709 Valmora, Las Vegas, Nev. 89102 (phone 702-873-5945).

NEW HAMPSHIRE (Manchester, Pease AFB): **Robert N. McChesney,** Scruton Pond Rd., Barrington, N. H. 03825 (phone 603-664-5090).

NEW JERSEY (Andover, Atlantic City, Belleville, Camden, Chatham, Cherry Hill, E. Rutherford, Forked River, Fort Monmouth, Jersey City, McGuire AFB, Middlesex County, Newark, Old Bridge, Trenton, Wallington, West Orange, Whitehouse Station): **Frank Kula,** 264 Edgewood Drive, Toms River, N. J. 08753 (phone 201-244-2491).

NEW MEXICO (Alamogordo, Albuquerque, Clovis): **Louie T. Evers,** P. O. Box 1946, Clovis, N. M. 88101 (phone 505-762-1798).

NEW YORK (Albany, Brooklyn, Buffalo, Chautauqua, Garden City, Hempstead, Hudson Valley, New York City, Niagara Falls, Plattsburgh, Queens, Rochester, Rome/Utica, Southern Tier, Staten Island, Suffolk County, Syosset, Syracuse, Westchester): **Robert E. Holland,** 750-75A Lido Blvd., Lido Beach, N. Y. 11561 (phone 516-889-1571).

NORTH CAROLINA (Asheville, Charlotte, Fayetteville, Goldsboro, Greensboro, Kitty Hawk, Raleigh): **Hal Davis,** 1034 Manchester Drive, Cary, N. C. 27511 (phone 919-467-6511).

NORTH DAKOTA (Concrete, Fargo, Grand Forks, Minot): **James M. Crawford,** 1720 9th St., S. W., Minot, N. D. 58701.

OHIO (Akron, Cincinnati, Cleveland, Columbus, Dayton, Newark, Youngstown): **Charles B. Spencer,** 333 West 1st St., Suite 252, Dayton, Ohio 45402 (phone 513-228-1175).

OKLAHOMA (Altus, Enid, Oklahoma City, Tulsa): **Aaron C. Burleson,** P. O. Box 757, Altus, Okla. 73522 (phone 405-482-0005).

OREGON (Eugene, Portland): **Phil Saxton,** 16346 NE Tillamook St., Portland, Ore. 97230 (phone 503-255-7872).

PENNSYLVANIA (Allentown, Beaver Falls, Drexel Hill, Dormont, Erie, Harrisburg, Homestead, Johnstown, Lewistown, Philadelphia, Pittsburgh, Scranton, State College, Washington, Willow Grove, York): **Tillie Metzger,** 2285 Valera Ave., Pittsburgh, Pa. 15210 (phone 412-881-1991).

PUERTO RICO (San Juan): **Fred Brown,** 1991 Jose F. Diaz, Rio Piedras, P. R. 00928 (phone 809-790-5288).

RHODE ISLAND (Warwick): **King Odell,** 413 Atlantic Ave., Warwick, R. I. 02888 (phone 401-941-5472).

SOUTH CAROLINA (Charleston, Clemson, Columbia, Myrtle Beach, Sumter): **James Catington,** 2122 Gin Branch Rd., Sumter, S. C. 29150 (phone 803-481-2634).

SOUTH DAKOTA (Rapid City, Sioux Falls): **Duane L. Corning,** Box 901 RR 4, Rapid City, S. D. 57701.

TENNESSEE (Chattanooga, Knoxville, Memphis, Nashville, Tri-Cities Area, Tullahoma): **Arthur MacFadden,** 4501 Amnicola Highway, Chattanooga, Tenn. 37406 (phone 615-622-6262).

TEXAS (Abilene, Amarillo, Austin, Big Spring, College Station, Commerce, Corpus Christi, Dallas, Del Rio, Denton, El Paso, Fort Worth, Harlingen, Houston, Kerrville, Laredo, Lubbock, San Angelo, San Antonio, Waco, Wichita Falls): **Bryan L. Murphy, Jr.,** 118 Broadway, Suite 234, San Antonio, Tex. 78205 (phone 817-777-4231).

UTAH (Brigham City, Clearfield, Ogden, Provo, Salt Lake City): **Bruce Hampel,** 1445 27th St., Ogden, Utah 84403 (phone 801-393-1257).

VERMONT (Burlington): **John D. Navin,** 350 Spear St., Unit 64, South Burlington, Vt. 05401 (phone 802-863-1510).

VIRGINIA (Arlington, Danville, Harrisonburg, Langley AFB, Lynchburg, Norfolk, Petersburg, Richmond, Roanoke): **C. W. Scott,** 6368 Brampton Court, Alexandria, Va. 22304 (phone 703-370-2702).

WASHINGTON (Bellingham, Seattle, Spokane, Tacoma, Yakima): **Walter P. Lepski,** 722 Villard St., Cheney, Wash. 99004 (phone 509-235-6178).

WEST VIRGINIA (Huntington): **David Bush,** 2317 S. Walnut Drive, St. Albans, W. Va. 25177 (phone 304-722-3583).

WISCONSIN (Madison, Milwaukee): **Charles Marotske,** 7945 S. Verdev Drive, Oak Creek, Wis. 53154 (phone 414-762-4383).

WYOMING (Cheyenne): **Al Guidotti,** P. O. Box 811, Cheyenne, Wyo. 82001 (phone 307-638-3361).

AFA's Wright Memorial Chapter's annual Air Force Birthday Ball was held this past September at Wright-Patterson AFB, Ohio. Teaming up to cut the birthday cake were, from left, Lt. Gen. James T. Stewart, USAF (Ret.), recently retired Gen. James P. Mullins, USAF, and Chapter President Robert Eisenhart. (Photo by N. C. Heilman)

Arthur L. "Bud" Andrews, immediate past CMSAF and a current AFA National Director, recently became southeast military sales manager for Anheuser-Busch, Inc.

struction of the school a high-profile political issue in Nevada.

"The money we raised was only a secondary benefit to our primary goal, which was to raise awareness in Nevada that an expanded school of engineering at UNLV is a critical element in the plans to economically diversify the state," said one Chapter member. Through this program the Thunderbird Chapter is making its mark at the local, state, and national level.

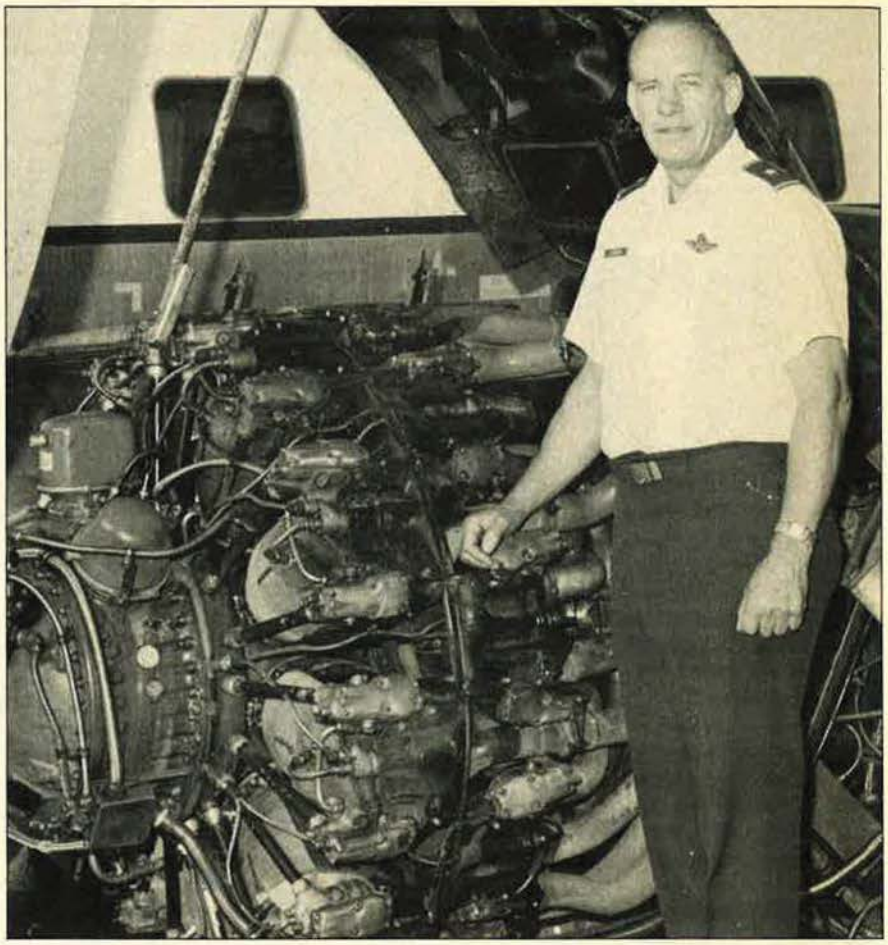
Birthday celebrations were the order of the day during this year's California State AFA Convention. Pictured, from right, are Space Division Commander Lt. Gen. Forrest S. McCartney, USAF, celebrating SPACECOM's first anniversary; NASA Deputy Administrator Dr. Hans Mark, celebrating the space agency's twenty-fifth anniversary; recently retired Lt. Gen. John J. Murphy, USAF, celebrating his own birthday; and then California State AFA President Scott Norwood. (Photo by Dan Evans)

AFA's Lincoln Chapter President Has an R-2800 "Love Affair"

No, the R-2800 is not a character from *Star Wars*. It's the model number of a Pratt & Whitney engine that powers the Nebraska ANG's C-131 support aircraft.

Recently retired Brig. Gen. Lloyd L. Johnson, NebANG, is the President of AFA's Lincoln Chapter and, while Chief of Staff of the Nebraska Air Guard, flew the organization's C-131s. General Johnson obviously felt quite comfortable with the craft because he and the C-131's engines are old friends.

Texas State AFA Past President John "Connie" Sparks, left, recently presented an AFA Citation to Capt. Stan Gorenc, ATC's 1983 Instructor Pilot of the Year. Captain Gorenc serves with the 80th FTW at Sheppard AFB, Tex.



Lloyd L. Johnson, President of AFA's Lincoln Chapter in Nebraska, has had a forty-year "love affair" with the aircraft engine to his right. The Pratt & Whitney R-2800, which powers the Nebraska ANG's C-131s, was also the powerplant of the P-47 Thunderbolt. A "Jug" pilot during World War II, he flew C-131s while Nebraska ANG Chief of Staff. Many of his more than 9,000 hours of military flying have been spent with R-2800s. See item.

During this year's Missouri State AFA Convention, held at Whiteman AFB, Mo., SAC Commander in Chief Gen. Bennie L. Davis, USAF, center, was presented an AFA plaque by Missouri State AFA President James Hopkins. At right is Col. Roger Smith, USAF, Commander of the 351st Strategic Missile Wing based at Whiteman AFB.

Announcing the 1984 Aviation Week Calendar

The Roaring Twenties and Thirties

The Birth of Air Transport

1 Barnstorming, trans-Atlantic flight, instrument navigation, polar exploration and the birth of air transportation; Lindbergh, Fokker, Byrd, Balbo, Sikorsky, Earhart and Douglas "Wrong-Way" Corrigan. What an era!

2 It's all captured in *The Roaring Twenties and Thirties,* Aviation Week's 1984 calendar, our fifth annual salute to "Memorable Eras in Aviation." Twelve magnificent paintings, created exclusively for Aviation Week by the noted French aviation artist Paul Lengelle, recreate the excitement of that historic time—and they can be yours to enjoy all through next year, and to keep forever.

3 Suitable for framing, these 14½ by 11½-inch prints are a handsome addition to any collection of aviation history and memorabilia, and make a perfect gift for all your aviation-minded friends this holiday season.

4 SPECIAL OFFER: *Limited* quantities of our last three calendars are also available: *The Contributions of Some Nearly Forgotten Pioneers* (1981); *World War I—The End of the Beginning* (1982), and *Famous Fighters of World War II* (1983). You may use the handy coupon below to order any of these, as well as your 1984 calendar.

5 BULK RATE OFFER: The 1984 Aviation Week calendar is a great gift idea for so many friends on your personal or business holiday gift list! Call Calendar Sales at 212/997-2123 for bulk rate (25 or more) prices and information.

PLEASE SEND ME _____ copies of the full-color 1984 AW&ST Calendar: *The Roaring Twenties and Thirties,* at $10.95 each (postage and handling included).

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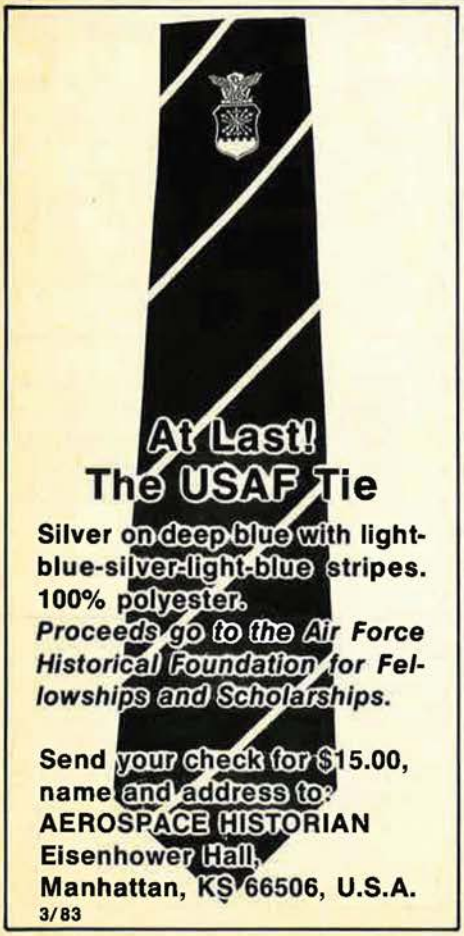

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Eisenhower Hall,
Manhattan, KS 66506, U.S.A.
3/83

AFA Intercom

To increase the educational prospects of young people from local high school JROTC units and from the Travis AFB Civil Air Patrol squadron, AFA's General Robert F. Travis Chapter, Calif., awards three $1,000 scholarships annually. The 1983 recipients are, from left, Shelly Zuehlke, Paul Brodeur, and Roxann Lynch. Shelly Zuehlke is the third member of her family to earn one of the Travis scholarships and the third to attend the Air Force Academy.

The "love affair" dates back more than forty years to a time when then-Lieutenant Johnson flew Republic P-47s with the 50th Fighter Group in Europe during World War II. The powerplant of the famed "Jug" was also a P&W R-2800.

The bond between man and machine has not weakened over the years. According to General Johnson, the R-2800 "has been a cost-effective and reliable engine for the military for many years."

The "love affair" finally came to an end this past October when General Johnson retired after more than thirty-four years of service with the Nebraska ANG.

Unit Reunions

Eglin AFB Test Operations
Officers assigned to the 3247th Test Squadron (formerly 3246th Test Wing/Test Operations) are invited to the twelfth annual reunion/Christmas party on December 17, 1983. **Contact:** Capt. Bruce E. Stofferahn, USAF, 3247th Test Squadron (AFSC), Eglin AFB, Fla. 32542. Phone: (904) 882-2133. Capt. Mike McClendon, USAF, 3247th Test Squadron (AFSC), Eglin AFB, Fla. 32542. Phone: (904) 882-3915.

7th Combat Cargo Squadron
The 7th Combat Cargo Squadron will hold a reunion on March 8–11, 1984, in San Antonio, Tex. **Contact:** Curtis Krogh, 601 Indiana St., Racine, Wis. 53405. Phone: (414) 633-4373.

F-105 Thunderchiefs
The F-105 Thunderchief is being retired from the Air Force inventory, and the last flight will take place on February 25, 1984, from Hill AFB, Utah, to Davis-Monthan AFB, Ariz. A farewell ceremony/dinner will be held on February 25, and all former Thud drivers and maintainers, as well as Thud enthusiasts, are invited to attend. **Contact:** Maj. Tom "Waldo" King, 466th Tactical Fighter Squadron, Hill AFB, Utah 84056. Phone: (801) 777-2524/27. AUTOVON: 458-2524.

308th Fighter Squadron
Members of the 308th Fighter Squadron, 31st Fighter Group, will hold a reunion on May 3–5, 1984, in Orlando, Fla. Veterans of the 307th and 309th Squadrons and Hq. 31st Fighter Group are welcome. **Contact:** Herbert W. Beumer, Rte. 6, Box 176, Dothan, Ala. 36303.

454th Bomb Squadron
Members of the 454th Bomb Squadron Association (B-26 White-Tailed Marauders of World War II) will hold their ninth reunion on April 10–15, 1984, in Charleston, S. C. **Contact:** Joe Havrilla, 1208 Margaret St., Munhall, Pa. 15120. Phone: (412) 461-6373.

Class 41-F
I would like to hear from former members of Class 41-F (Stockton Field, Calif.) for the purpose of planning a reunion.
Please contact the address below.
Bertrand J. Duesing
17 Wilderness Park
Kerrville, Tex. 78028
Phone: (512) 896-6318

Class 44-F
I would like to hear from all former members of Pilot Class 44-F, Pampa Army Airfield, Pampa, Tex., for the purpose of holding a fortieth-year reunion sometime in 1984.
Please contact the address below.
Fred C. Burlingame, Jr.
126 E. Bald Eagle St.
Lock Haven, Pa. 17745

441st Troop Carrier Group
I am looking for former members of the 441st Troop Carrier Group or 100th Troop Carrier Squadron who are interested in a reunion or who know whether or not plans for such a reunion are under way.
Please contact the address below.
Stuart M. Dean
RD 2, Box 108
Altamont, N. Y. 12009
Phone: (518) 861-8350

461st & 484th Bomb Groups Assoc.
The 461st and 484th Bomb Groups Association seeks former personnel who served with these groups in Italy during World War II (1944–45) in order to advise them of plans for a 1984 reunion. Contact one of the addresses below:
Jim Nostramo
Box 1659
Jackson Hole, Wyo. 83001
or
Bill Harrison
6681 N. W. 6th Ct.
Margate, Fla. 33063

902d Troop Carrier Group
I am trying to contact former members of the 902d Troop Carrier Group or the 81st Troop Carrier Squadron who were stationed at Grenier Field, N. H. (1955–65), for the purpose of holding a reunion in mid-1984.
Please contact the address below.
John L. Whenal
36 Mill Rd.
North Hampton, N. H. 03862

Tom Ratterree, President of AFA's Colorado Springs/Lance P. Sijan Chapter, and Charlie O'Neal inspect one of nine college examination books the Chapter recently donated to the Peterson AFB Library. Through Mr. O'Neal's efforts as chairman of the Chapter's Education Committee, two $300 scholarships were also awarded to Amn. Cass E. Cunningham, stationed at the Air Force Academy, and SrA. William E. Davis, serving at NORAD's Cheyenne Mountain Complex. (Photo by Mary E. Kilgore)

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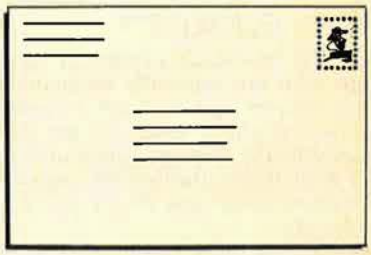


Mailing Lists

AFA occasionally makes its list of member names and addresses available to carefully screened companies and organizations whose products, activities, or service might be of interest to you. If you prefer not to receive such mailings, please copy your mailing label *exactly* and mail it to:

Air Force Association
Mail Preference Service
1750 Pennsylvania Ave., N.W.
Washington, D.C. 20006

AFA CHAMPLUS® .... Strong Protection

When a Single Accident or Illness Could Cost *You* Thousands of Dollars, You Need AFA CHAMPLUS®. . . for *Strong* Protection against Costs CHAMPUS Doesn't Cover!

For military retirees and their dependents . . . and dependents of active-duty personnel . . . more and more medical care is being provided through the government CHAMPUS program.

And, of course CHAMPUS pays 75% of allowable charges.

But today's soaring hospital costs—*up to $500 a day* in some major metropolitan medical centers—can run up a $20,000 bill for even a moderately serious accident or illness.

Your 25% of $20,000 is no joke!

AFA CHAMPLUS® protects you against that kind of financial catastrophe *and* covers most of your share of routine medical expenses as well.

HOW AFA CHAMPLUS® WORKS FOR YOU!

WHO IS ELIGIBLE?

1) All AFA members under 65 years of age who are currently receiving military retired pay and are eligible for benefits under Public Law 89-614 (CHAMPUS), their spouses under age 65 and their unmarried dependent children under age 21 (or age 23 if in college).
2) All eligible dependents of AFA members on active duty. Eligible dependents are spouses under age 65 and unmarried dependent children under age 21 (or age 23 if in college).

EXCEPTIONAL BENEFIT PLAN

(See chart at right)

FOUR YEAR BASIC BENEFIT. Benefits for most injuries or illnesses may be paid for up to a four-year period.

PLUS THESE SPECIAL BENEFITS . . .

1) Up to 45 consecutive days of in-hospital care for mental, nervous, or emotional disorders. Outpatient care may include up to 20 visits of a physician or $500 per insured person each year.
2) Up to 30 days care per insured per year in a Skilled Nursing Facility.
3) Up to 30 days care per insured per year and up to 60 days lifetime in a CHAMPUS-approved Residential Treatment Center.
4) Up to 30 days care per insured per year and up to 60 days lifetime in a CHAMPUS-approved Special Treatment Facility.
5) Up to 5 visits per insured per year to Marriage and Family Counselors under conditions defined by CHAMPUS.

YOUR INSURANCE IS NON-CANCELLABLE

As long as you are a member of the Air Force Association, pay your premiums on time, and the master contract remains in force, your insurance cannot be cancelled.

ADMINISTERED BY YOUR ASSOCIATION . . . UNDERWRITTEN BY MUTUAL OF OMAHA

AFA CHAMPLUS® insurance is administered by trained insurance professionals on your Association staff. You get prompt, reliable, courteous service from people who know your needs and know every detail of your coverage. Your insurance is underwritten by Mutual of Omaha, the largest individual and family health insurance company in the world.

AFA OFFERS YOU HOSPITAL BENEFITS AFTER AGE 65

Once you reach Age 65 and are covered under Medicare, AFA offers you protection against hospital expenses not covered by Medicare through the *Senior Age Benefit Plan* of AFA Hospital Indemnity Insurance. Members enrolled in AFA CHAMPLUS® will automatically receive full information about AFA's Medicare supplement program upon attainment of Age 65 so there will be no lapse in coverage.

AFA CHAMPLUS® BENEFIT SCHEDULE

Care	*CHAMPUS Pays*	*AFA CHAMPLUS® Pays*
	For Military Retirees Under Age 65 and Their Dependents	
Inpatient civilian hospital care	CHAMPUS pays 75% of allowable charges.	CHAMPLUS® pays the 25% of allowable charges not covered by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $6.55 per day subsistence fee, not covered by CHAMPUS.	CHAMPLUS® pays the $6.55 per day subsistence fee.
Outpatient care	CHAMPUS COVERS 75% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS® pays the 25% of allowable charges not covered by CHAMPUS after the deductible has been satisfied.
	For Dependents of Active-Duty Military Personnel	
Inpatient civilian hospital care	CHAMPUS pays all covered services and supplies furnished by a hospital less $25 or $6.55 per day, whichever is greater.	CHAMPLUS® pays the greater of $6.55 per day or $25 of the reasonable hospital charges not covered by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $6.55 per day fee, not covered by CHAMPUS.	CHAMPLUS® pays the $6.55 per day subsistence fee.
Outpatient care	CHAMPUS covers 80% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS® pays the 20% of allowable charges not covered by CHAMPUS after the deductible has been satisfied.

NOTE: Outpatient benefits cover emergency room treatment, doctor bills, pharmaceuticals, and other professional services.

There are some reasonable limitations and exclusions for both inpatient and outpatient coverage. Please note these elsewhere in the plan description.

Against Costs CHAMPUS Doesn't Cover

APPLY TODAY!
JUST FOLLOW THESE STEPS

Choose either AFA CHAMPLUS® Inpatient coverage or combined Inpatient and Outpatient coverage for yourself. Determine the coverage you want for dependent members of your family. Complete the enclosed application form in full. Total the premium for the coverage you select from the premium tables on this page. Mail the application with your check or money order for your initial premium payment, payable to AFA.

AFA's CHAMPLUS®

LIMITATIONS

Coverage will not be provided for conditions for which treatment has been received during the 12-month period prior to the effective date of insurance until the expiration of 12 consecutive months of insurance coverage without further treatment. *After coverage has been in force for 24 consecutive months, pre-existing* conditions will be covered regardless of prior treatment.

EXCLUSIONS

This plan does not cover and no payment shall be made for:

a) routine physical examinations or immunizations

b) domiciliary or custodial care

c) dental care (except as required as a necessary adjunct to medical or surgical treatment)

d) routine care of the newborn or well-baby care

e) injuries or sickness resulting from declared or undeclared war or any act thereof

f) injuries or sickness due to acts of intentional self-destruction or attempted suicide, while sane or insane

g) treatment for prevention or cure of alcoholism or drug addiction

h) eye refraction examinations

i) Prosthetic devices (other than artificial limbs and artificial eyes), hearing aids, orthopedic footwear, eyeglasses and contact lenses

j) expenses for which benefits are or may be payable under Public Law 89-614 (CHAMPUS)

PREMIUM SCHEDULE

Plan 1—For military retirees and dependents (Quarterly Premiums)

Inpatient Benefits

Member's Attained Age	Member	Spouse	Each Child
Under 50	$19.03	$23.30	$14.85
50–54	$26.16	$32.01	$14.85
55–59	$36.16	$44.28	$14.85
60–64	$43.62	$53.41	$14.85

Inpatient and Outpatient Benefits

Under 50	$26.80	$31.05	$37.13
50–54	$36.83	$42.68	$37.13
55–59	$50.92	$59.02	$37.13
60–64	$61.41	$71.20	$37.13

Plan 2—For dependents of active-duty personnel (Annual Premiums)

Inpatient Only	None	$ 9.68	$ 5.94
Inpatient and Outpatient	None	$38.72	$29.70

APPLICATION FOR AFA CHAMPLUS®

Group Policy GMG-FC70
Mutual of Omaha 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 _____ Current Age ____ Height ____ Weight ____ Soc. Sec. No. _____
Month/Day/Year

This insurance coverage may only be issued to AFA members. Please check the appropriate box below:

☐ I am currently an AFA Member.

☐ I enclose $15 for annual AFA membership dues (includes subscription ($14) to AIR FORCE Magazine).

PLAN & TYPE OF COVERAGE REQUESTED

Plan Requested (Check One)
☐ AFA CHAMPLUS® PLAN I (for military retirees & dependents)
☐ AFA CHAMPLUS® PLAN II (for dependents of active-duty personnel)

Coverage Requested (Check One)
☐ Inpatient Benefits Only
☐ Inpatient and Outpatient Benefits

Person(s) to be insured (Check One)
☐ Member Only
☐ Spouse Only
☐ Member & Spouse
☐ Member & Children
☐ Spouse & Children
☐ Member, Spouse & Children

PREMIUM CALCULATION

All premiums are based on the attained age of the AFA member applying for this coverage. Plan I premium payments are normally paid on a quarterly basis but, if desired, they may be made on either a semi-annual (multiply by 2), or annual (multiply by 4) basis.

Quarterly (annual) premium for member (age ____) $_____

Quarterly (annual) premium for spouse (based on member's age) $_____

Quarterly (annual) premium for ____ children @ $ $_____

Total premium enclosed $_____

If this application requests coverage for your spouse and/or eligible children, please complete the following information for each person for whom you are requesting coverage.

Names of Dependents to be Insured	Relationship to Member	Date of Birth (Month/Day/Year)

(To list additional dependents, please use a separate sheet.)

In applying for this coverage, I understand and agree that (a) coverage shall become effective on the last day of the calendar month during which my application together with the proper amount is mailed to AFA, (b) only hospital confinements (both inpatient and outpatient) or other CHAMPUS-approved services commencing after the effective date of insurance are covered and (c) any conditions for which I or my eligible dependents received medical treatment or advice or have taken prescribed drugs or medicine within 12 months prior to the effective date of this insurance coverage will not be covered until the expiration of 12 consecutive months of insurance coverage without medical treatment or advice or having taken prescribed drugs or medicine for such conditions. I also understand and agree that all such pre-existing conditions will be covered after this insurance has been in effect for 24 consecutive months.

Date _____, 19 ____ _____
Member's Signature

12/83

NOTE: Application must be accompanied by check or money order.
Send remittance to:
Insurance Division, AFA, 1750 Pennsylvania Ave., NW, Washington, D.C. 20006.

Form 6173GH App.

Bob Stevens'

"There I was..."

...AT NELLIS AFB, NEVADA." HOME OF THE FIGHTER PILOT." THIS IS TAC's FIGHTER WEAPONS CENTER. BESIDES TESTING & EVALUATING STAR WARS WEAPONS, COMBAT-READY PILOTS HONE THEIR SKILLS IN SUCH REALISTIC CONDITIONS YOU EXPECT TO HEAR "DA" *and* "NYET" OVER THE R/T! OH, *and* THE THUNDER-BIRDS NEST HERE-A NATURAL HABITAT!

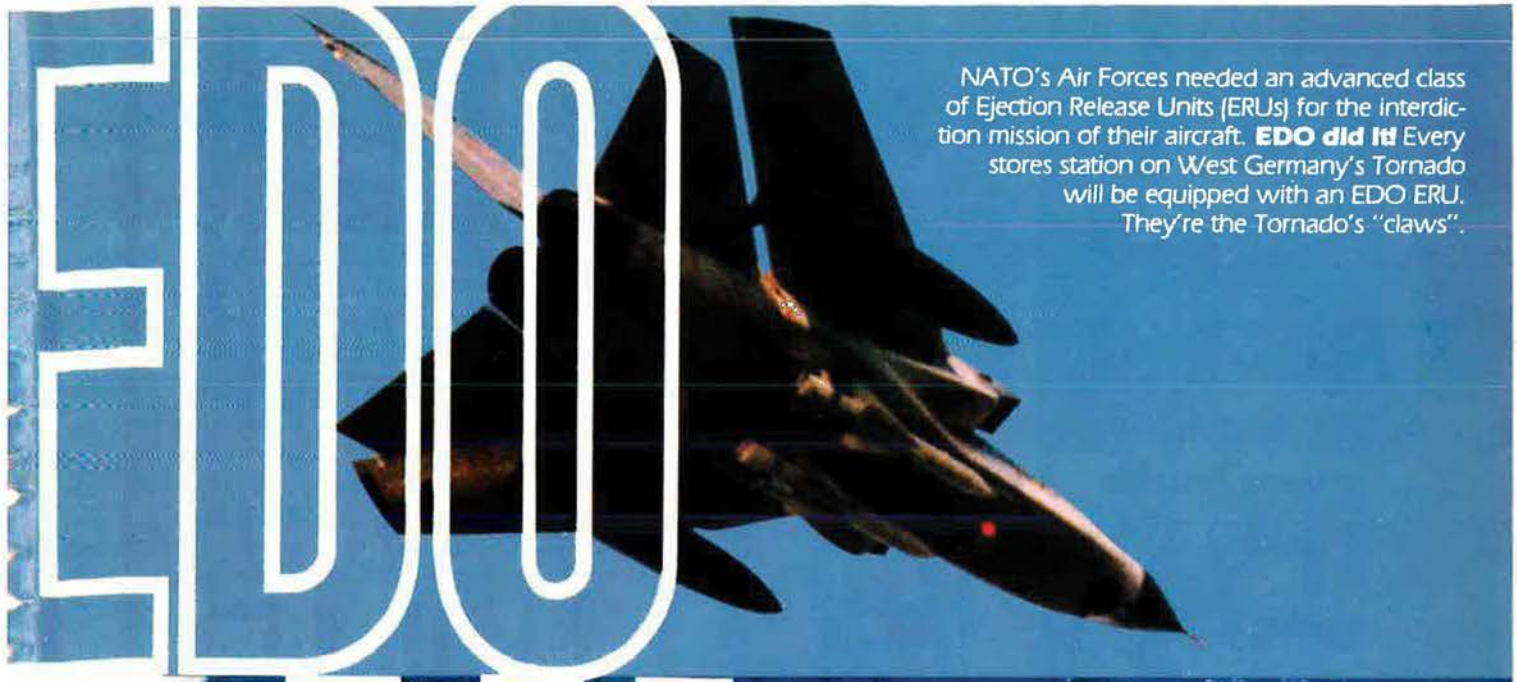
WE LANDED RIGHT IN THE MIDDLE OF A RED FLAG (SIMULATED COMBAT) EXER-CISE. THE GOOD GUYS & AGGRESSORS WERE PLAYIN' HIGH NOON.

BRIEFINGS ARE JUST LIKE IN THE BIG ONE. HANDS ARE AN ES-SENTIAL TRAINING AID.

SOPHISTICATED COMPUTERS *and* VISUAL DISPLAYS RECAP THE DAY'S EVENTS, BUT THE O CLUB's GAME ROOM VENTS STEAM-

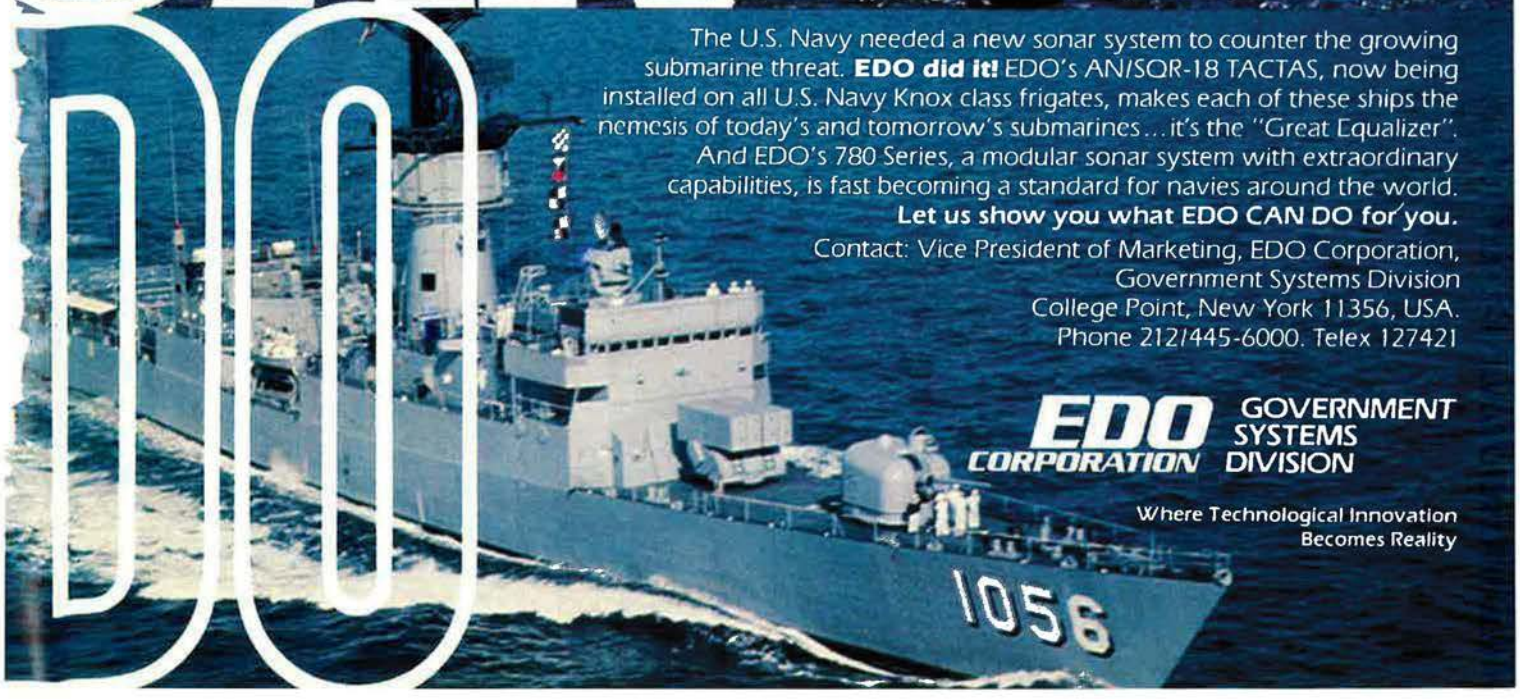
ALL KINDS OF BIRDS FLOCK TO THE SIMULATED TARGET RANGE-

EDO CAN DO



NATO's Air Forces needed an advanced class of Ejection Release Units (ERUs) for the interdiction mission of their aircraft. **EDO did it!** Every stores station on West Germany's Tornado will be equipped with an EDO ERU. They're the Tornado's "claws".

The U.S. Navy needed a helicopter-towed and -controlled magnetic minesweeping system that's effective at high speeds in tough ocean environments. **EDO did it!** EDO's MK 105 system swept Haiphong harbor, cleared the Suez Canal, and stands ready today for deployment anywhere in the world. And now the AN/ALQ-166, under development, is being readied to meet the challenge of the '80's and beyond.



The U.S. Navy needed a new sonar system to counter the growing submarine threat. **EDO did it!** EDO's AN/SQR-18 TACTAS, now being installed on all U.S. Navy Knox class frigates, makes each of these ships the nemesis of today's and tomorrow's submarines... it's the "Great Equalizer". And EDO's 780 Series, a modular sonar system with extraordinary capabilities, is fast becoming a standard for navies around the world.

Let us show you what EDO CAN DO for you.

Contact: Vice President of Marketing, EDO Corporation,
Government Systems Division
College Point, New York 11356, USA.
Phone 212/445-6000. Telex 127421

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F-15 EAGLE

NOTHING ELSE WILL DO.

THE FULLY LOADED FIGHTER THAT WON'T GET CAUGHT IN DEAD MAN'S CURVE.

When a bomb-carrying fighter tries to turn hard at high speed, the weight of its payload can pull it into a wide arc. It's a dead man's curve that costs speed and maneuverability, exposing the plane to the enemy longer and making it a more vulnerable target.

The exception: The F-15 Eagle. With its powerful twin engines and proven airframe, a fully loaded Eagle can maneuver better than any other fighter. It can accelerate even through a six-G climbing turn. Whether the Eagle is in its air-to-air or air-to-ground mode, maneuverability helps make the F-15 the most capable and survivable fighter in the world.

The Eagle is as potent as it is versatile. It can carry more than its own weight in fuel and weapons. It can accommodate all types of ground attack armament and deliver them at supersonic speeds.

The Eagle's electronic countermeasures let it penetrate in secrecy. The photographic quality of its radar has been demonstrated. It will enable the flight crew to identify and destroy not only secluded and hidden targets but also mobile armor.

The F-15 Eagle. It brings more might to the fight. And it has the performance to survive. Nothing else will do.

MCDONNELL DOUGLAS