

DECEMBER 1973 / \$2

# AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE



## THE MILITARY BALANCE 1973/74

The three-dimensional chessboard suggests the magnitude and complexity of the world's power equations.



**Once a  
hunter.**

**Now the  
hunted.**

The F-102 Delta Dagger... delivered to the Air Force in the early '50s... an excellent record as an all-weather interceptor.

Today, 20 years later, Sperry is breathing new life into the old bird. Teaching it a few new tricks. Instead of being the hunter, now it's the hunted.

So new aircraft like the F-15 can be tested in actual air-to-air combat with a full sized aircraft as a target, Sperry is developing the PQM-102 remotely piloted vehicle for the USAF Armament Development and Test Center (ADTC).

Drawing on experience in converting the F-80, F-86, and F-104 for RPV roles, Sperry is making it possible for a ground-based pilot to "fly" the PQM-102 through programmed evasive maneuvers he could not physically subject himself to in the cockpit.

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PHOENIX, ARIZONA 85036





# The A-10's massive firepower is aimed at saving the lives of ground troops.

The A-10 is the only plane in the world designed specifically for close air support. On a CAS mission, it can deliver up to 8 tons of ordnance. This is firepower directed to a purpose—the support and protection of friendly ground troops.

The largest Gatling gun ever put into an American fighter, the GAU-8/A is a 30mm tank-killer. Only the A-10 is capable of mounting this lethal weapon and delivering up to 1,350 rounds of its armor-piercing or high explosive shells.



**M-61**  
.22 LBS.



**GAU-8**  
.78 LBS.

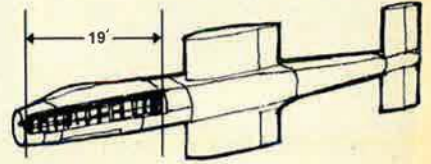
The GAU-8/A cannon delivers 7 times the total energy per round as conventional 20mm guns. It is effective against medium and heavy tanks where the 20mm weapon has no kill probability.

The 30mm cannon is, as you can

see, a lot of weapon. It is essential to the CAS mission. Unlike interdiction against fixed targets, CAS demands getting into eyeball contact; visually acquiring, tracking and destroying hostile forces and mobile targets—tanks, transport vehicles and armored personnel carriers. The GAU-8/A and the A-10 were designed to provide the lethality necessary to support and thus minimize combat losses of friendly ground forces. And the A-10 delivers that firepower with accuracy unattainable with stand-off systems.

The A-10's fuselage was designed to carry the 30mm gun. With a systems weight of more than 4,000 pounds, no other aircraft in the world can carry this weapon without major structural redesign. The firing barrel of the gun is on the exact

center line, insuring accuracy and directing the reaction forces through the airplane's center of gravity. The

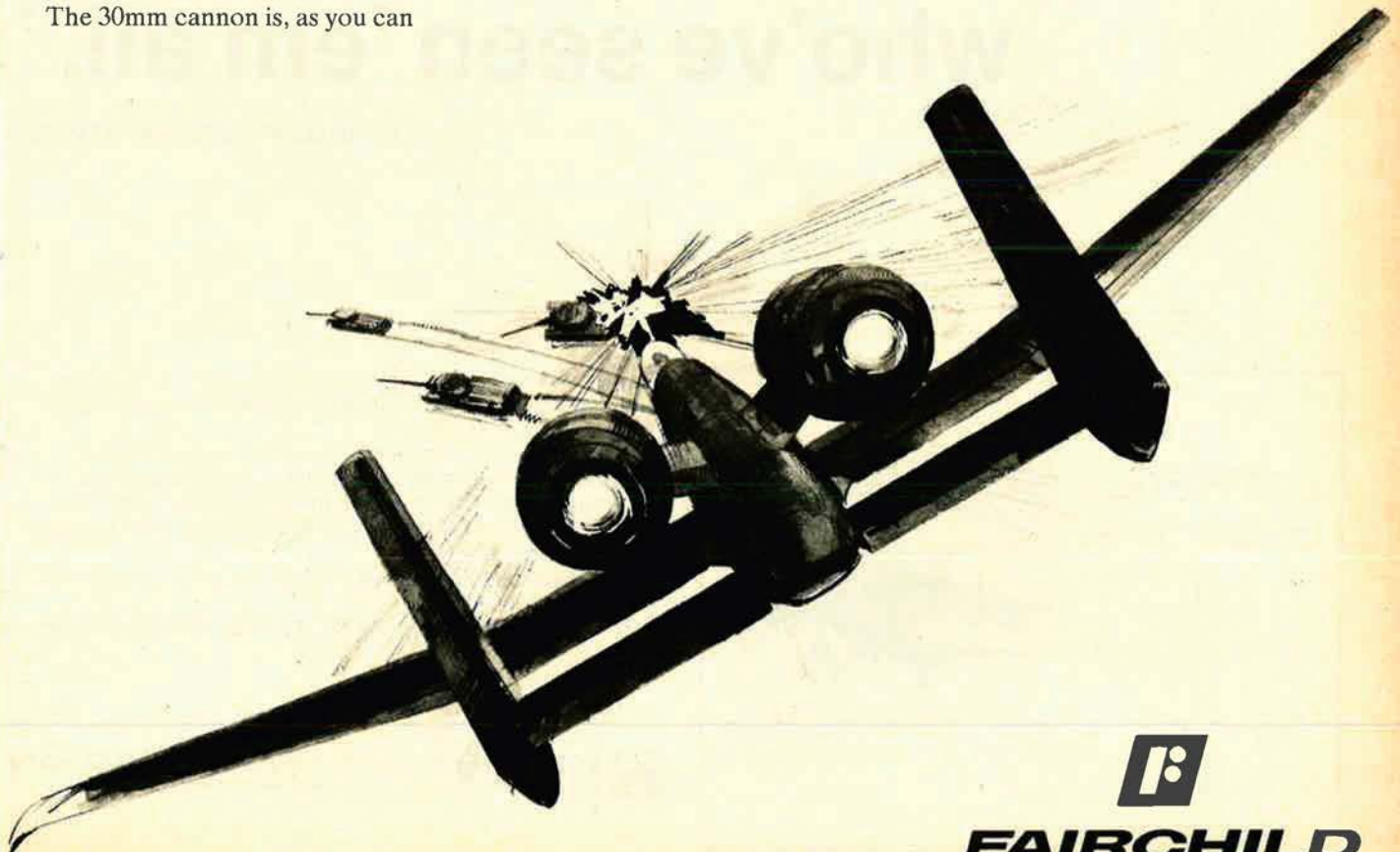


A-10 and its firepower are *not* separate entities; the two are an integrated weapon system rather than an aircraft to which a gun was added.

The A-10 is massive firepower aimed at saving the lives of ground troops.

It was also aimed at saving dollars. **The A-10 was designed to cost—the lowest cost of any front-line aircraft in the Tactical Air Command inventory.**

For CAS combat effectiveness, there simply is no other contender.



**FAIRCHILD**  
INDUSTRIES



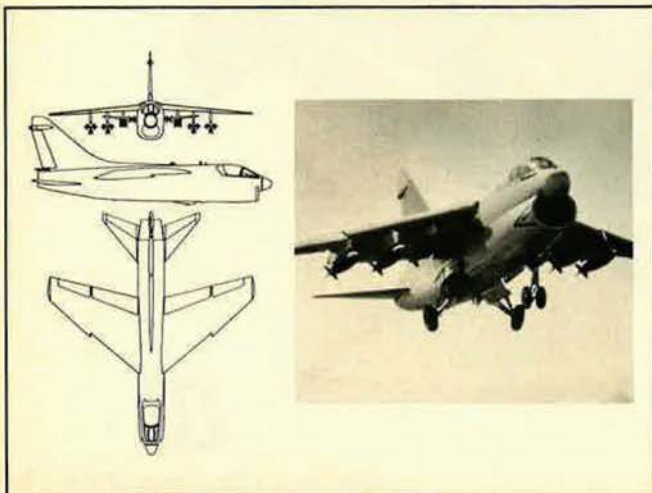
**“The A-7 is the most**



**accurate and  
effective  
tactical air  
weapon  
system in the**

**air today. And this is the  
humble opinion of the  
Forward Air Controllers  
who've seen 'em all.”**

*...QUOTE FROM OPERATIONAL REPORT.*



Today's A-7 has earned its reputation under fire. From the pilots who fly it. And the Forward Air Controllers who call in strikes and assess hits.

It's equipped with the most advanced navigation and weapon delivery systems in service. These systems are integrated and programmed to insure that the A-7 delivers a devastating load of ordnance right on target. With better than 10-mil accuracy.

In the tactical role of close support, the A-7 is singled out for the toughest sorties.

*The results are making the A-7 a classic aircraft in its own time.*



**VOUGHT SYSTEMS DIVISION**  
LTV AEROSPACE CORPORATION



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A Publication of The International Institute for Strategic Studies, London

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The three-dimensional chessboard suggests confrontation and relative strength in a three-dimensional world and symbolizes "The Military Balance," starting on p. 57 of this issue. Photo by Will Rogers.



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# BELL & HOWELL IS TWICE THE LINE IT USED TO BE.

## You liked us in the lab. You'll love us in hostile environments.

We're known for our reliable, lab-grade tape recorders/reproducers. Always have been. And now that Astro-Science has joined us, we've added a broad *new* line of compact, state-of-the-art data acquisition recorders for land, sea and airborne applications. The result? *Twice* the line, *twice* the selection of reliable tape recorders/reproducers. The *largest* line in the industry.

## Concentric reel and dual capstan design means lighter, more compact recorders.

Our MARS series features "basic dual capstan design and concentric reel mechanism". That's a longwinded way of saying "slimmer and trimmer". The dual capstans are driven at different speeds and hence develop constant dynamic tension within the closed loop of tape across the magnetic heads. A tape wrap angle of more than 226 degrees around the capstans develops the necessary forces to transmit positive drive power from the capstans to the tape. The large wrap angle effectively clamps the tape to the capstans and isolates the reels from the capstan drive without need for pinch rollers, thus doing away with a primary source of dynamic skew and flutter when operating in severe environments. The reels are mounted in a concentric arrangement, one on top of the other, to conserve space and ensure minimum size and weight.

Talk about rugged. These MARS series airborne modular recorder systems operate in the severest of environments:  $\pm 10G$  Vibration, 15G shock, with 30G crash safety;  $-55^{\circ}C.$  at  $+55^{\circ}C.$  temperature range. Sea level to 75,000 feet altitude. They fly where the flying is rough.

Take our svelte MARS 1400. It's the smallest and lightest multi-speed, lowest power consumption, 14-inch wideband 1 MHz airborne recorder in the field. But our MARS 1000 is slimmer and trimmer still! Both operate at 6 electrically-switchable tape speeds (1 $\frac{1}{8}$  through 60 ips);

14-28 channels with 1 MHz at 60 ips wideband direct recording capability; or 42 tracks with 250 kHz at 60 ips. Digital and FM capability are also available.

Another bantamweight is the MARS 2000. It's a multiband recorder designed for airborne environments typically encountered in high-performance air-



craft. It features up to 14 channels for recording Direct and FM signals on 10 $\frac{1}{2}$  inch NAB-type reels, either intermediate band or wideband. Six electrically-switchable speeds from 1 $\frac{1}{8}$  through 60 ips. Absolute tape speed accuracy: only  $\pm 0.20\%$  of nominal tape speed at any constant temperature or humidity. *And* a record and reproduce capabilities for Direct and FM analog signals. Weighing in at just 32 pounds, it's the *smallest* multi-band recorder available.

## Our M-14E and M-14G: light in pounds. Heavy in performance

The M-14E is something special. For use in aircraft,

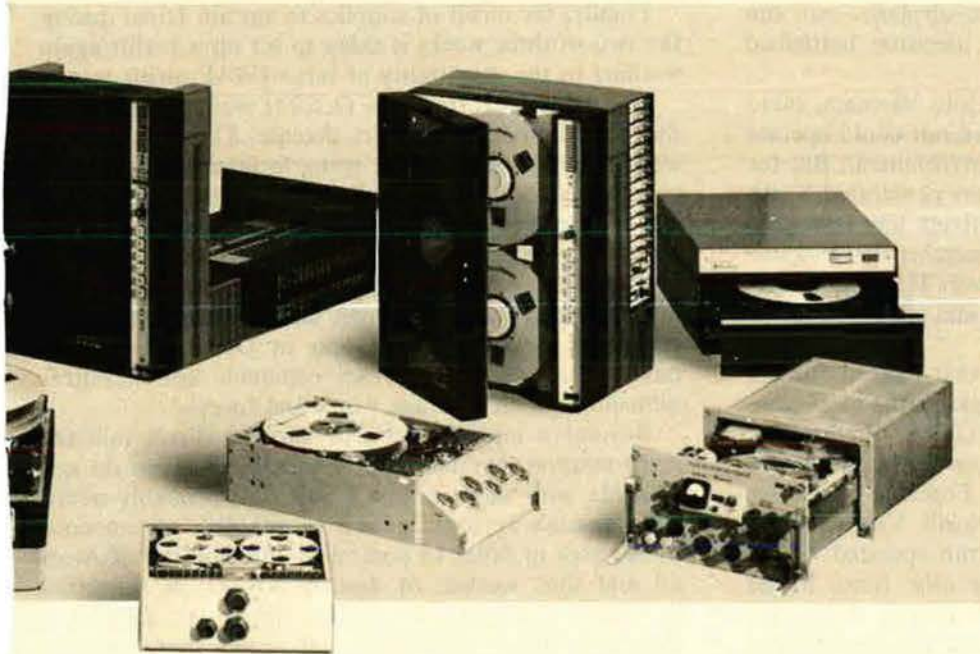


board ships, on field vans or other hostile environments, it's the smallest and lightest wideband 2 MHz system available which handles 1-inch tape on 14-inch NAB reels. It is lightweight, state-of-the-art, compact, reliable and easy to maintain.

Its reliable kin, our M-14G, is a wideband 2 MHz portable recorder/reproducer designed for tight spots. Its rack-mountable field enclosure includes all local controls and record-reproduce functions for total performance. The M-14G offers full 14-channel, 6-speed reproduce capability for data analysis in Direct or FM modes of operation.

Designed to military specifications, the M-14G provides full front accessibility and modularity to permit complete service and maintenance without removing the unit from its rack.

**Our CPR-4010 and 4040 bring the lab into the field.** The rough and ready



CPR-4010 provides laboratory-caliber performance in the field. This reliable unit has up to 7 channels on 1/2-inch tape. Up to 14 on 1-inch tape! Seven speeds ranging from 15/16 to 60 ips are standard. It's a standout in ease of maintenance and repair, offering a hinged back panel for complete accessibility of all components and plug-in modules which can easily be changed.

Our newest entry into the wideband recorder field is the CPR-4040. It's a winner in the cost-to-performance ratio. This co-planar, portable reel-to-reel gem has 7 electrically-switchable bi-directional tape speeds ranging from 15/16 to 60 ips. Plus direct signal electronics which provide response to 1 MHz at 60 ips. And the same ease of maintenance and repair as the CPR-4010.

**The VR-3700B gives you more channels to choose from.**

Our VR-3700B is a real laboratory problem-solver. Yet it offers simplicity of design and reliability unmatched by any machine in its class.

It operates within a wide range of speeds and frequencies. With 7, 14, 28 and 42 channels of record/reproduce.

For ease of setup, each amplifier assembly contains 7 record and 7 reproduce channels. All electronics are modular, electrically-switchable and capable of operating at any of 8 speeds in Direct or FM modes. It's easy to maintain with proven reliability. Low cost. (High-density PCM/DHDR signal electronics available on order.) Its data packing density of 33,000 bits per inch per track of tape is the highest in the industry. Coupled with the lowest error rate around—one in 10 million bits—the VR-3700B is the only reproducer in its class with this capability.

**Bell & Howell is now Data Acquisition and Analysis Center U.S.A.**

Now, no matter what your requirements, Bell & Howell has it. Up. Down. On the ground. Portable or stationary. Bell & Howell probably has the data acquisition and analysis unit to fit your requirements. When you've got it, you needn't flaunt it. But the fact is, we've got it.

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Please send me your latest information on  Data Acquisition  Data Analysis  Magnetic Tape Recorders. My specific interest is \_\_\_\_\_

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**BELL & HOWELL**



# The Middle East: Retrospect and Prospect

By John L. Frisbee, EXECUTIVE EDITOR, AIR FORCE MAGAZINE

**A**S THIS is written, three weeks after the October 22 cease-fire ended large-scale fighting in the Middle East, it obviously is too early to deduce any new lessons from that most recent Arab-Israeli war. Much remains obscured by the fogs of battle, censorship, and conflicting claims.

But it is not too early to conclude that the continuing validity of some previously learned lessons was confirmed. Foremost among these, the airplane—not the surface-to-air missile—is still the decisive battlefield weapon in conventional warfare.

We learned that in Vietnam. Before Vietnam, there had been considerable doubt that aircraft could operate at acceptable loss rates in a SAM environment. But for nearly eight years, US tactical fighters penetrated North Vietnam's SAM defenses with relatively low losses. In the final, decisive campaign of December 1972—Linebacker II—B-52 combat attrition over Hanoi and Haiphong was about two percent, and fighter-bomber losses were even lower.

The October war again showed that tactical fighters can survive and do their job even against the most complex SAM defenses outside the USSR. Predictably, since the Israelis lacked our advanced ECM equipment and standoff missiles, Israeli Air Force (IAF) losses were much higher than ours in North Vietnam. Another factor was the ratio of Arab-operated SAMs to IAF fighters, which was about nine times higher than that of North Vietnamese SAMs to US strike aircraft in Southeast Asia, though the concentration of SAMs was not as high around Hanoi and Haiphong.

Beyond that, the IAF faced two new SAMs—the Soviet SA-3 and SA-6—which had not been used in Southeast Asia. As in the case of all new weapons, losses will be high until means of countering them are devised. And they will be countered.

Despite heavy odds, the IAF provided almost the entire defense of its country for the first three days of the war, until mobilization could be completed. On the Syrian front, Israeli airmen blunted an attack by 1,000 Syrian tanks and some 50,000 troops, losing forty-five aircraft to all causes while destroying more than seventy Syrian MiGs. After the northern front had been stabilized, the IAF supported the Israeli Army in the Suez Canal crossing—one of the most brilliant air-ground operations of history. Arab SAMs made the IAF's job a lot tougher—a lot more costly—but the tactical fighter has not seen its twilight in the Middle East or in any other theater.

In air-to-air combat, Israeli pilots ran up a kill ratio of about 100 to one. This remarkable record was partly a reflection of the F-4's superiority over the MiG-21, as pointed out elsewhere in this issue (*see p. 51*). It also demonstrated something our legislators cannot forget in their deliberations on force levels and personnel benefits—the incomparable value of carefully selected, thoroughly trained, combat-experienced airmen.

Finally, the airlift of supplies to sustain Israel during the two to three weeks it takes to set up a sealift again testified to the essentiality of large USAF airlift forces.

On the political front, the October war revealed again the limitations of US-Soviet détente. The Soviets were aware that the Arabs were going to attack and actively encouraged other Middle East countries to join with Egypt and Syria. What US-Soviet cooperation there was—arranging a cease-fire and agreeing to a peace-keeping force—was a result of imminent Arab defeat and the impact of our largest current foreign aid program, the \$800 million a year in US credits that is bailing the USSR out of her economic and technical difficulties. That leverage won't last forever.

Beyond a mutual desire to avoid a direct military confrontation, our interests in the Middle East do not coincide with those of the USSR and probably never will. Russia's apparent goal is to establish preeminence in the area in order to control the distribution of Arab oil and thus weaken or destroy NATO, as suggested by Senior Editor Claude Witze on p. 16. That is a long-term threat of monumental proportions, one not likely to fade in the weakening light of détente.

Up to this point, everyone involved either directly or indirectly in the Mideast war has been a loser. The Arabs took another shellacking; Israel sustained crushing casualties, in relation to its population equivalent to nearly three times the US casualties in our eight-year Vietnam involvement; the US further alienated Arab oil producers and got no support from our NATO allies, now referred to as "the Europeans."

If there was a winner, it was the USSR, but even that is doubtful. Soviet actions, revealing the shallow one-sidedness of détente, have shattered the illusions of many Americans, including quite a few in Congress. And the more even-handed policy we appear to have adopted in the Mideast may make it more difficult for the USSR to retain her influence there.

We must now set about picking up the pieces, in a more realistic mood, but with no joy in our hearts.

October was a very bad month. ■



# Hercules is helping build 32 nations. One of them is ours.

Hercules is helping build our nation's economy by bringing in more than \$1 billion in foreign payments.

So far, over 1200 Hercules have been sold to the U.S. and other countries. They buy Hercules because it can do a lot of things other planes can't.



Like land on runways as short as 2100 feet. In fact, it can land on runways that aren't even runways, like sand strips, dirt clearings or gravel fields.

Once it lands, Hercules needs no fancy ground-handling equipment to unload. Its huge rear doors (9' x 10') open

and a rear ramp lowers to the ground. So bulldozers, trucks and tractors can be rolled out intact and go right to work.

Hercules can carry 60-foot-long oil pipes. Cargo loads up to 45,000 lbs. Some models even carry 55,000 lbs.

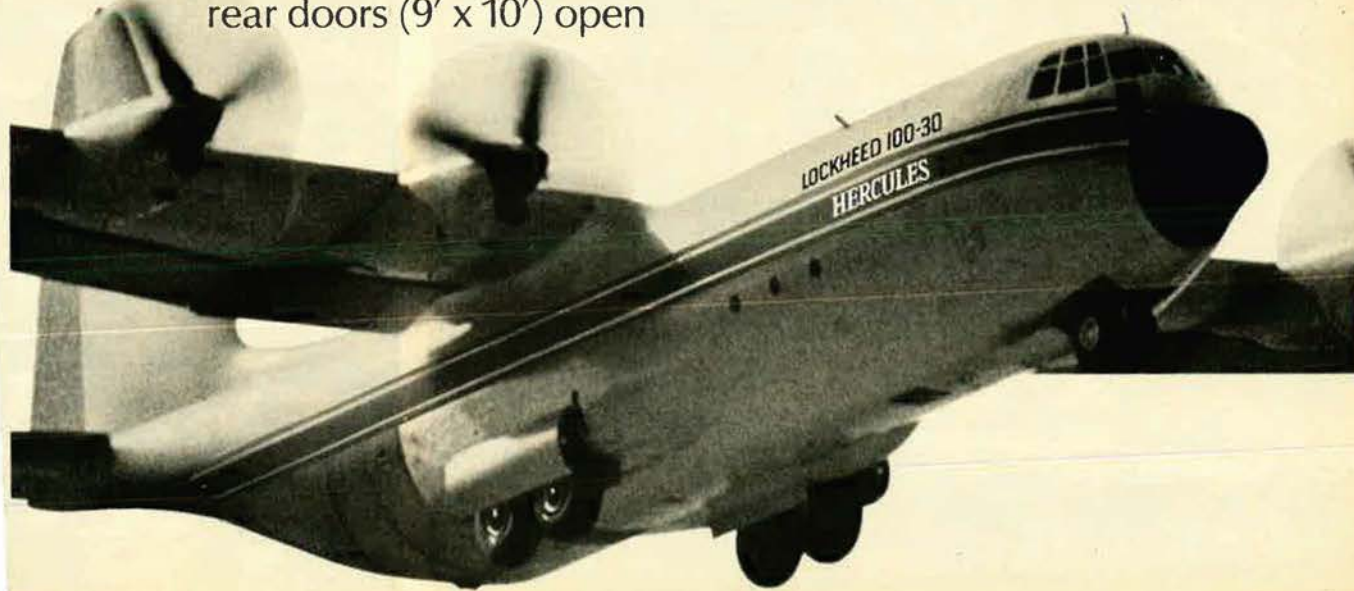
There are 45 models of Hercules and improved versions continue to roll off the Lockheed assembly lines in Georgia.



Hercules: helping build 31 foreign nations, while it's helping build our nation's economy.

## **LOCKHEED-GEORGIA**

A Division of Lockheed Aircraft Corporation,  
Marietta, Georgia.





# Six of the world's most advanced military airfields.

With every military airfield in the world known and targeted, a nation's strategic freedom is severely limited. Its strike force is vulnerable. Its defence system weakened.

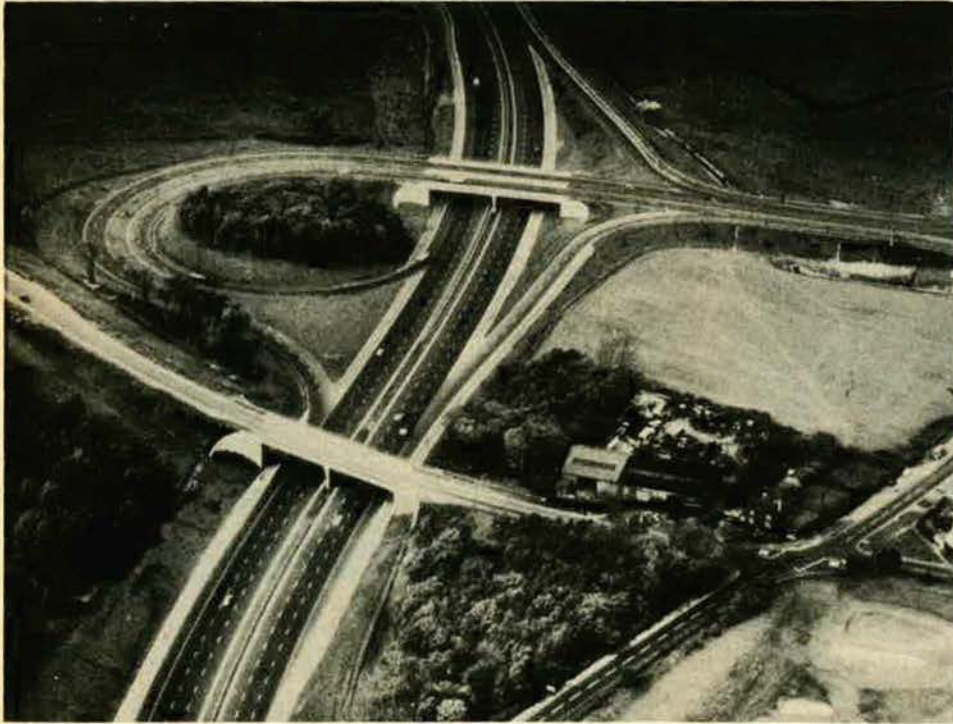
Harrier changes all that.

Its unique V/STOL capability frees it from overt, conventional bases. Harrier doesn't need runways or sophisticated airfield strips.

It can be quickly and easily despatched into any one of a number of pre-selected dispersed sites with minimum advance notice.

It can operate effectively from either unprepared strips or V/STOL sites, whether they're woods, field, farm or park.

The sites need no air defence, minimum support and are virtually undetectable from the air.

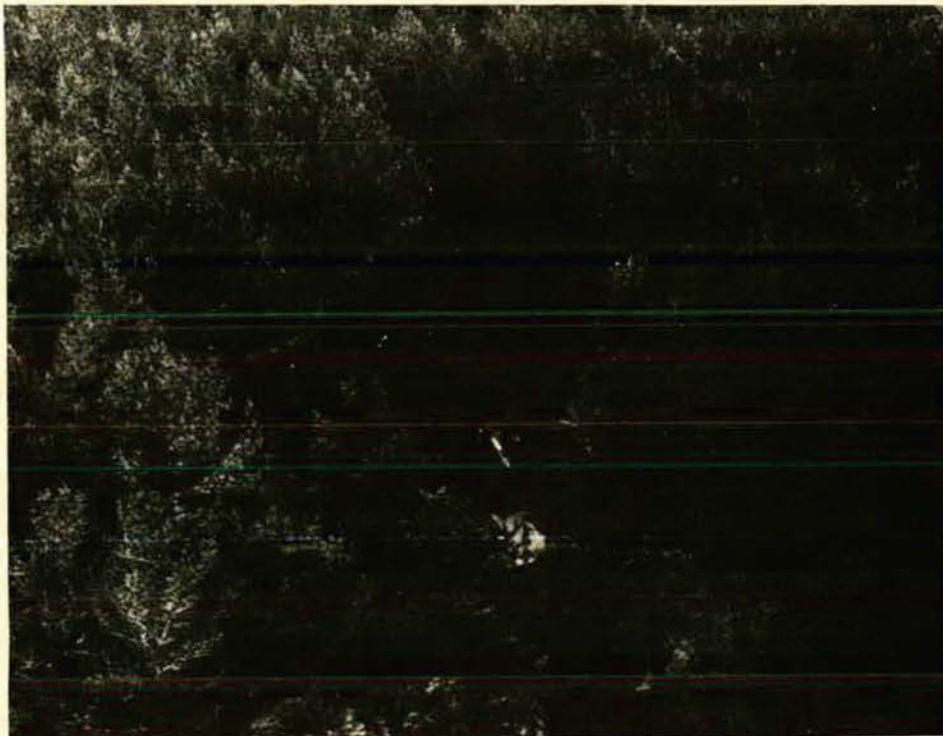




For an opposing battle commander, Harrier presents problems. His tactical knowledge, built on fixed, static sites, is of little use. His enemy now is elusive and unseen.

Harrier strikes from out of nowhere, when and as it wants. And the opposing commander has to disperse his force to search for it. The attacker becomes the attacked.

The Harrier is an important breakthrough. It alters the traditional concept of airpower and its function. And it's already in fully operational service with both the Royal Air Force and US Marine Corps. **Harrier. It changes everything.**



 **HAWKER SIDDELEY AVIATION**

Kingston upon Thames, Surrey, England

Hawker Siddeley Group supplies mechanical, electrical and aerospace equipment with world-wide sales and service.



## New Education Program

*Gentlemen:* Please accept our thanks for the excellent reportorial work represented by Ed Gates's article on the "New Airman Education and Commissioning Program" in the October issue of AIR FORCE Magazine. Not only was it completely accurate in all details, but it crystallized much of the philosophy behind the new program and should go far toward answering the doubts of many Base Education Officers as to its effects on commissioning opportunity for our airmen. The article was easily the best statement of the new program that has been published to date, and those of us who are responsible for administering the program for AFIT could not let this pass without conveying to you our appreciation. . . .

Col. Robert H. Kelley  
Dir., Civilian Institutions  
AF Institute of Technology (AU)  
Wright-Patterson AFB, Ohio

## Low Cost—High Performance

*Gentlemen:* I would like to express my appreciation and admiration for Ed Ulsamer's fine handling of a complicated subject in his article on the YF-17 in the October issue of AIR FORCE Magazine ["Northrop's YF-17—The Lightweight Fighter Halts the Cost Spiral"].

The intricacies of that program and its relationship to our Cobra program often make it difficult even for our own people to clarify these points in a briefing. But he certainly managed to bring it all together clearly and concisely in the article. . . .

Thomas V. Jones  
President and Chairman  
Northrop Corp.  
Los Angeles, Calif.

## Airlift Initiator

*Gentlemen:* In your September issue you carried an article by Gen. T. R. Milton ["USAF—A Look Back"]. General Milton was my chosen deputy during the Berlin Airlift. He left the Airlift before it was terminated and was permitted to return home because of family problems. In his article, he stated that General LeMay started and

conceived the Berlin Airlift. I must state that General LeMay did neither.

The Airlift was conceived by Lt. Gen. Albert Wedemeyer, Chief of Operations, and Lt. Gen. Henry S. Aurand, Chief of Logistics of the Department of the Army in 1948. They visited Germany and Gen. Lucius D. Clay in the latter part of the spring of 1948 to determine the problems and answers to the Russian blockade of Berlin.

On return to the US, they convinced President Truman that an airlift—instead of some more drastic measure—might be the best way to handle the problem. With a final approval by President Truman, General Clay initiated the Airlift by calling his subordinate, General LeMay, then Commander of US Air Forces in Europe, and asked him if he could carry coal to Berlin. LeMay gave the obvious answer. Clay then ordered it to be done, and LeMay ordered his subordinate, Brig. Gen. Joseph Smith, to start the flying.

LeMay carried out his orders. He did not start it. If anyone started it in Germany, then General Clay did. Just recently, General Clay was recognized by the German government, in a ceremony at the Waldorf Astoria Hotel in New York, as the "Father of the Berlin Airlift." LeMay was not mentioned.

I was appointed by General Vandenberg a few weeks after the flying started to go to Germany and take over, organize, and to command the American portion of the Airlift. Then, a few months later, in October, I was appointed as Commander of the British and American Airlifts, to be known as the "Combined Airlift Task Force," and this job continued until September of the next year. . . .

Lt. Gen. William H. Tunner,  
USAF (Ret.)  
Ware Neck, Va.

## Congressional Blunder

*Gentlemen:* As a Command Pilot graduating in Class 43J and one who was affected by the congressional curb on flight pay, I thank you for the very fine editorial in the September issue of AIR FORCE Magazine. Not much more can be

said about this issue than has already been put before the Congress.

I sincerely hope that for the benefit of our country, the Congress will see fit to recognize the arbitrary cutoff as a costly blunder and rectify the situation before any of us can say, "I told you so."

Col. John L. Susott  
FPO San Francisco

## Flight Pay and Hazardous Duty

*Gentlemen:* Reference "The Bulletin Board" item (August '73, p. 74) and your editorial (September '73, p. 4) on flight pay. I would like to expand on the "underlying factors" that you emphasized.

"Military flying . . . is hazardous." The soldier has but one enemy to fear, and him only during war. The airman has several more: the environment, the machine, the mission, and all those "other personnel" mentioned from time to time in accident reports. On the average, these enemies kill off more airmen than combat does; and if you don't believe it, just try buying insurance. All the actuaries will tell you the average officer candidate will outlive the average aviation cadet, and they will tell you by how many years. Many of them will not even take your wager.

"Hazardous duty pay?" Yes, sir. But to what extent is it really related to hazardous duty? Or to the consequences thereof? Example: A young Naval officer, nursing an F-4U with a sick engine back to base, is unable to jettison the drop tank (full) due to a misrigged cable. The engine dies a half mile short of the runway . . . no ejection seat back then, remember. There's the hazard. Now here are the consequences: sixty-five percent third-degree burns, followed by five years of plastic surgery. Now guess what this guy's entitlement is for hazardous-duty pay? That's right—three months. It was the time I spent in hospital with this officer twenty-two years ago that provided the proximate motivation for my joining AFA in the first place, for it was AFA that put together the flight pay insurance program.





## **Bell's UH-1N. Keeps routine missions routine. Even when the weather isn't.**

Take a missile crew awaiting rotation. Or base supplies waiting to be moved in. Multiply critical requirements like these by the number of silo sites that must be reached. Now cover the area with a thick blanket of fog or snow. And schedules go out the window!

Visualize Bell's twin engine UH-1N on the job. The doubly dependable helicopter

which can be readily qualified for IFR weather flying. That means it could get in safely, through the thickest fog. Delivering supplies. Bringing in men. Providing maximum readiness...even in minimum weather...with twin engine reliability. Bell's UH-1H. In the Air Force inventory since 1970.

**peacekeepers  
the world over  
depend on**  
**Bell**  
HELICOPTER



# Conversation Pieces

Technically intriguing items  
from TRW, guaranteed to add luster to your  
conversation and amaze your friends.

**H**ow Many Days in a Year? A year is the time it takes for a planet to make one complete revolution around the Sun. Our own planet earth, for example, completes its orbit every 365.24199 days, a time which doesn't divide nicely into 52 seven-day weeks. Responding to this knotty situation, Julius Caesar devised a calendar in which he picked up an extra quarter day by having 365 days in the first three years and 366 in the fourth (leap year). While an improvement on the existing system, the Julian calendar was just over eleven minutes longer than the true solar year, so that every 128 years it gained a full day on the Sun.

Pope Gregory narrowed the discrepancy by ruling that years ending in 00 were not to be leap years unless they were divisible by 400. This saved three days every 400 years and put the Gregorian calendar (which we presently use) within 25 seconds of the true solar year.

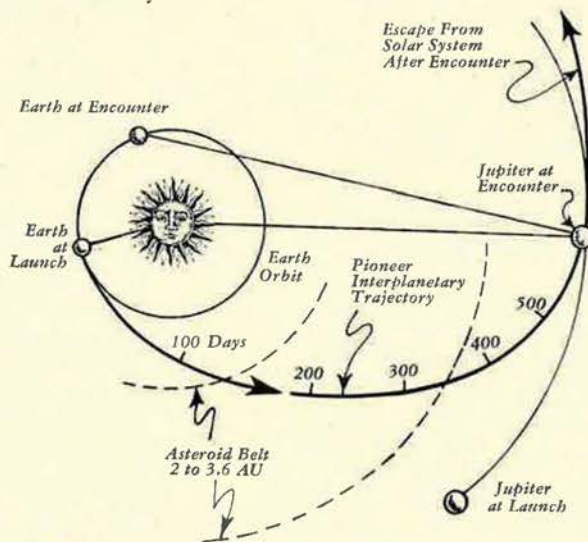
The year on the planet Jupiter is informatively different. Its great distance from the Sun (half a billion miles compared with the earth's 93,000,000) means that it takes Jupiter 11.86 earth years to complete one of its vast orbits. Unlike the earth (which rotates on its axis once every 24 hours), giant Jupiter rotates once every 9 hours and 51 minutes. Thus its day is less than half as long as ours. The combination of short days and long years on Jupiter means that there are more than 10,500 days in the Jovian year. Like everything else about Jupiter, its calendar is big and bulky. In fact, its immense size has caused one astronomer to remark that the solar system is made up of "the Sun, Jupiter, and some debris."

On December 3 of this year, a historic event involving the earth and Jupiter will take place. The Pioneer 10 spacecraft, built by TRW for the NASA-Ames Research Center, will fly past Jupiter. For 21 months, Pioneer has been streaking toward its target at speeds ranging from 30,000 to 80,000 miles per hour. Jupiter is so

far from earth that a signal sent to Pioneer at encounter will take 45 minutes to get there, even though it travels at the speed of light (186,000 miles per second).

Pioneer's onboard experiments, which have already provided space information enroute to Jupiter, are designed to yield useful data as far away as 20 astronomical units—about 2 billion miles.

Early next year when the Pioneer data has been examined and analyzed, we'll have some first-hand information for you on this giant of the solar system.



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## Airmail

"Air forces are effective only when led . . . by experienced airmen." How right you are! And for "experienced" I read "currently proficient and mission-qualified." . . .

"It is cheaper to retain an experienced pilot than it is to train a replacement." Well, we won't do either unless we get to the heart of what flight pay is really all about. It isn't "hazardous duty pay." . . . For that purpose it can (and perhaps should) be replaced by supplementary insurance. It isn't "incentive pay." . . . The guy who is really motivated to fly will do it for nothing (he'll even pay for it, like I do now); and we don't want the guy who needs a \$2,940 "incentive." What flight pay really is is *Premium Pay*, just like the surgeons get. We pay it to hire the exceptional man, the man whom the surgeons describe as PQAA: "Physically qualified and aeronautically adapted for duty involving flying." . . .

Finally, let's face *this*: The only way any nation can constitute an Air Force is to recruit and retain the top cut of its young people. If we pursue policies that retain less than the best . . . we will have hurt not just our people and our services but our country's readiness to fight. And let no one nurse the delusion that *that* will not be noticed!

Col. John M. Verdi,  
USMCR (Ret.)  
Santa Ana, Calif.

### Back When . . .

*Gentlemen*: The September issue was a most interesting one and Sam Boghosian's article on "Buzz" Wagner rolled back my memory to the days when the 1st Pursuit Group at Selfridge consisted of the 17th, 27th, and 94th Pursuit Squadrons (and we must not forget Hq. and Hq. Squadron).

When I first joined the Group, the 17th was flying P-26s. Not long thereafter, the P-35 replaced them, and the P-26s were then relegated to the Philippines. No one thought much about that until October of 1940, when the 17th was transferred out of the 1st Group to become part of the 24th Group in the Philippines. Upon arrival, some of the crew

chiefs found they were crewing the same P-26 they had been crewing at Selfridge! Don't know if that strange coincidence is widely known or not. The reason I know is that some of the crew chiefs wrote back to those of us they had left at Selfridge relating the incident. . . .

Incidentally, there was another fine first lieutenant who went out with the 17th when the October 1940 transfer occurred. He was a young man named Paul Wurtsmith, who was informally known as "Squeeze." May the Lord rest all their souls.

Lt. Col. Fred K. Durni,  
USAF (Ret.)  
(Formerly M/Sgt., USA)  
Fullerton, Calif.

### Martin Marauder

*Gentlemen*: Re "On the Graveyard Shift," AIR FORCE, September '73: When did the A-26 become the B-26—and whatever happened to the Martin Marauder we WW II types knew as the B-26, alias "The Flying Prostitute" (no visible means of support)?

Richard D. Raymond  
Yardley, Pa.

• *The Douglas A-26 Invader was redesignated B-26 in June 1948, when the Attack category was temporarily abandoned, according to the second edition of the book United States Military Aircraft Since 1908, by Gordon Swanborough and Peter M. Bowers (Putnam & Co. Ltd., London, 1972). The Martin Marauder, which had been designated B-26 during World War II, was not used in operational units after that war and was declared obsolete in 1948.—THE EDITORS*

### P-38 Lightning

*Gentlemen*: Your "Airmail" column can contribute immensely to a project aimed at assisting students of history and the survivors of history by publishing this plea for cooperation and assistance.

Several books and a multitude of magazine articles have been written on the subject of the Lockheed P-38 Lightning, but careful analysis will reveal a continuing expansion of errors. As a long-time employee of Lockheed and former supervisor of Polaris missile publications, I gained access to a great deal of privileged information about the P-38. This led to some comprehensive interviews with men closely associated with the subject. Among

these was a most enjoyable interview with the man responsible for the P-38—C. L. "Kelly" Johnson.

The November issue of *Airpower*, now reaching newsstands, features an article that I prepared on the YP-38 series of aircraft.

My purpose in contacting you stems from a desire to guarantee that the book from which the YP-38 article was abstracted will become the reference book on the subject of the P-38. The manuscript for this book is in the works, and Mr. Garry Pape has now joined me in its development. . . .

We wish to contact former pilots and ground personnel who had close association with the P-38 in WW II. While our source data is vast and we have hundreds of excellent photographs, some of the best seems to be appearing just now. This leads us to believe that some of the best sources may be yet untapped. . . .

Warren M. Bodie  
124 Whitworth Street  
Thousand Oaks, Calif. 91360

### Samurai Swords

*Gentlemen*: I am interested in collecting data on Samurai swords in the United States. If you have a Samurai sword in your possession and would like to know something of its history, drop me a card. I will be glad to send you instructions on how to make a tang rubbing by means of which I may be able to determine such data as date of manufacture, name of swordmaker, geographical area of origin, and quality of workmanship.

It will not be necessary to send your sword through the mail.

Lt. Col. Frank V. Holan,  
USAF (Ret.)  
RFD No. 3  
Putney, Vt. 05346

### Flying Saucers

*Gentlemen*: As an AFA member and the only space scientist in the country known to be spending full time on UFOs or Flying Saucers, I am writing to request UFO sighting reports from readers of AIR FORCE Magazine.

Because I have presented an illustrated lecture, "Flying Saucers Are Real," to hundreds of college audiences in thirty-nine states, I have been told of many otherwise unreported UFO sightings. Many of the best reports have come from former Air Force personnel. I will not use witness names without ex-



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AF-90

## Airmail

PLICIT permission and have no desire to expose anyone to ridicule or embarrassment, though the "laughter curtain" is slowly being lifted as more scientists and fewer kooks speak out on UFOs.

For those whose sightings were classified at the time they occurred, I can only quote from a letter from Sen. Frank E. Moss: "The Air Force also advises that all Project Blue Book information and more specifically all information relative to unidentified flying objects is now unclassified." I can vouch for the Blue Book declassification after having spent three days at the USAF Historical Archives at Maxwell AFB and examining many formerly classified Blue Book UFO sighting reports.

Please send as much information as can be recalled about the sighting. All letters will be acknowledged.

Stanton T. Friedman  
Nuclear Physicist-Lecturer  
2420 Grant Ave.  
Redondo Beach, Calif. 90278

### Wartime B-29 Crewmen

*Gentlemen:* In the September issue of your fine magazine, you had a note on the whereabouts of two World War II B-29 crewmen. These two were Maj. Richard M. McGlinn and TSgt. Charles H. Robson.

In our local paper, there have been several articles on this subject. Major McGlinn died some years ago, of a heart attack in 1962. His sister-in-law, who lives in a nearby community, has now heard from the Russian survey engineer who found and helped rescue McGlinn and Robson after parachuting into Siberia back in 1944.

Harrison W. Rued  
Santa Rosa, Calif.

### 1st Scout Force

*Gentlemen:* I am currently in the process of writing an article for the American Aviation Historical Society concerning the activities of the 1st Scout Force. This was a unit of the Eighth Air Force, 1st Air Division, during World War II, originally on detached service from the 364th Fighter Group and later given squadron status as the 857th Bom-

bardment Squadron (H), after March 12, 1945.

Anyone with information on the unit's missions, anecdotal material, and photographs of any activities of the 1st Scout Force are urged to contact me. Thank you very much.

Michael Rivkin  
67-38C 190th Lane  
Fresh Meadows, N. Y. 11365

### Eagle Squadron Patch

*Gentlemen:* Since 1942, I have tried to get an Eagle Squadron patch to complete my Air Force collection of patches. In 1939 some of our men joined the RAF but had their own Eagle Squadron patch. Can any of your readers help me? I would greatly appreciate their help.

Paul J. Desmond (Ret.)  
1970 McNab Ave.  
Long Beach, Calif. 90815

### 92d Airdrome Sqdn.

*Gentlemen:* I am interested in communicating with former members of the 92d Airdrome Sqdn., V Bomber Command, Fifth AF, World War II.

Joseph "Doc" Montuore  
AFSC/PPOA  
Andrews AFB  
Washington, D. C. 20334

## UNIT REUNIONS

### Victorville Flying School

The reunion of the Victorville Flying School members has been set for February 15-17, 1974. All WW II and Korean War vets who were stationed there are invited. Please get in touch with

MSgt. Bill Young, USAF  
34237 1/2 Avenue F  
Yucaipa, Calif. 92399

Phone: (714) 795-4039

### 1st Triple S

The 1st Triple S is planning a reunion in El Paso, Tex. For further information contact

Joe H. Tytus  
732 S. Jefferson  
Napa, Calif. 94558

Phone: (707) 224-6709

### 20th AF Association

The 20th Air Force Association has arranged two reunion tours for 1974. All former members and families are eligible at greatly reduced rates. Feb. 2: a 13-day cruise of the Caribbean, departing Norfolk, Va., with stops at Aruba, LaGuaira, Cartagena, Panama, and Montego Bay. Aug. 10: a 24-day tour of the Pacific and Asia departing Los Angeles, visiting Guam, Saipan, Tinian, Hong Kong, Bali, Brisbane, Australia, Auckland, New Zealand, and Tahiti. Full details from

20th Air Force Association  
Box 5534  
Washington, D. C. 20016



An additional 4,000 TV-guided Maverick missiles have been ordered from Hughes by the U.S. Air Force, bringing the total order to 11,000. Maverick, which carries a miniature television camera in its nose to guide it to its target, has shown high accuracy against tanks, vehicles, missile sites, and field fortresses. It has been fired from F-4 Phantom and A-7 Corsair aircraft and from remotely piloted vehicles.

A polyurethane foam retainer to lubricate ball bearings for spacecraft was described by Hughes engineers at a recent symposium. The circular ring device serves as a lubricant reservoir as well as a retainer and separator for the bearing balls. The tough polyurethane material is chemically inert to hydrocarbons, stores 60 times more oil than the commercially produced cotton phenolic now widely used for bearing retainers, and shows virtually no wear after a year's operation. The new retainer may have applications in the aircraft, automobile, and machinery equipment industries.

A laser rangefinder for the U.S. Army's XM1 battle tank prototype will be developed by Hughes under contract to Chrysler Corporation. Chrysler and General Motors Corporation will each build a prototype, a mobility test vehicle, and a chassis and turret for ballistic testing. Following a competitive evaluation, a single contractor is expected to be selected for full engineering development.

A unique air defense computer program -- which recognizes return patterns from multiple radars, automatically detects aircraft and initiates tracking -- has been developed by Hughes for the Royal Netherlands Air Force to extend the coverage of its Nieuw Milligan air defense control center. New program, which permits RNAF to install a second 3-D radar at a remote site, will work with the center's original computer program, which Hughes is upgrading to provide greater automatic tracking accuracy. Research and development at Hughes in multiple radar integration and tracking has resulted in computer programs that will accept information simultaneously from as many as 15 remotely located radars.

Only the information an aircraft pilot requires at the moment is presented on the cockpit TV screen of a computer-controlled electronic map display developed by Hughes in a company-funded project. It stores data digitally, eliminating printed and microfilmed graphics. The map shows aircraft position and course and is updated every two seconds. It can be oriented "north up" or "heading up". The pilot has a choice of five scales, from one to 40 nautical miles to the inch. The EMD's magnetic tape unit can store up to 15 million bits of data (enough to cover the continental U.S.). A civilian version has been delivered to the FAA for testing; a military version has been developed for Air Force and Navy flight test programs.

A twin radome-covered antenna test range to measure radiation patterns of communication satellite antennas during development and manufacturing is now in operation on the roof of the 12-story Hughes Space & Communications Group building in El Segundo, Calif. The 30-foot-diameter radomes enable space engineers to test antennas on a daily basis despite high winds or adverse weather. The new test facility includes a penthouse laboratory housing data-recording electronics and remote control equipment.

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# Airpower in the News

By Claude Witze

SENIOR EDITOR, AIR FORCE MAGAZINE

## Johnny, Get Your Gun

WASHINGTON, D. C., NOVEMBER 5

Last month, in this space, we discussed the problem American liberals are having with the concept of détente with Russia. Senate consideration of the Fiscal 1974 authorization bill for Pentagon weaponry was tempered, the debate made clear, by the growing realization that Moscow does not define détente the same way we would like to define it. The unilateral disarmament camp is not doing well in Washington.

In fact, their problem is bigger than ever. Flying over the Middle East, doves are changing their feathers and becoming hawks. In more than two decades covering military affairs, this reporter never has seen an international conflict that produced as many paradoxes as the Israeli-Arab war now under way. We have had a military alert, and the only querulous comments came, not from critics of the military-industrial complex, but from the wallowers in Watergate. This despite the fact that the heavy hand of Russia, so clearly discernible in the Middle East, can be stayed only by military deterrence, not by a cleanup at the White House.

The same people who deplored the high cost of the Lockheed C-5A and tried to kill the transport program now wish we had more of them. What was viewed as a military boondoggle turned out to be a vehicle that can carry a couple of tanks to Israel—and quickly. Some of the same senators who wailed in 1972 that we were supporting a dictatorship in Portugal through the agreement that gives us the use of Lajes Air Base in the Azores—Edward M. Kennedy was one of them—now are glad we have the base. Both the airlift and the ferrying of fighters to Tel Aviv are made easier by the services at Lajes. And there are those who demonstrated in protest against the type of weapons used by the US against the North Vietnamese. Now they cheer as the identical bombs are shipped off for use against Arabs. Russian anti-aircraft missiles used against the Israeli Air Force bring cries of protest from some Americans who never were distressed by Moscow's supply of the same missiles for use against our Air Force and Navy, in Indochina.

When the war broke out, members of the House and Senate Armed Services Committees were in conference to settle differences on the bill to authorize defense procurement for Fiscal 1974. The figures tell what happened while tanks were fighting in the desert:

The Pentagon requested \$21,959 million.

The House voted to grant \$20,445 million.

The Senate voted to grant \$20,948 million.

The conferees, by this time watching Russia and détente more closely, recommended \$21,299 million.

As we go to press, the House, after a delay and wrangle over procedures, has accepted the report, and it awaits Senate action. The Appropriations Committees will be the next to move, many of their anticipated obstacles brushed aside by the roar of Soviet missiles fired at Israeli airplanes.

The conference report contained these key changes of importance to the Air Force:

- Of \$100 million deleted from the B-1 bomber request by the Senate, \$75 million was restored.

- The full amount of \$918.5 million for seventy-seven F-15 air-superiority fighters was approved. The House had attempted to cut the order to thirty-nine.

- A Senate cut of \$20 million in R&D funding for the A-10 close-support airplane was reduced to a \$5 million cut. A request for \$30 million for long lead-time procurement was denied. The \$15 million restored will fund six R&D aircraft instead of the ten requested.

- The Senate had deleted a \$22 million authorization for the Subsonic Cruise Armed Decoy—SCAD—after it was approved by the House. The conference restored \$11 million for the project.

- The full amount requested, \$46.5 million, was approved for the lightweight fighter. The House had cut this to \$40 million.

- Full R&D funding—\$155.8 million—was approved for the Airborne Warning and Control System (AWACS).

- The conferees agreed with the Senate proposal to add \$70.1 million for twenty-four A-7D aircraft for the Air National Guard. The funding was not requested.

- The conferees agreed to authorize \$158.8 million for twelve F-111F aircraft.

The final authorization approved by the conferees and the House of Representatives was \$351 million above the amount passed by the Senate and \$854 million above the House figure. It was \$659.6 million below the Defense Department's request for Fiscal 1974 and \$355.6 million more than the Fiscal 1973 appropriation for weapons procurement and research. The cut this year, thanks to Russian activity in the Middle East, is less than it was a year ago. Already there is talk that the Fiscal 1975 request, now in early preparation, will reflect increased requirements, increased costs, and increased understanding that national security no longer can be the underdog of our priorities.

What has transpired in the US Senate and House of Representatives has received scant press coverage. There are voices of distress and those that counsel extreme caution, but it is hard for them to overcome the widespread demand for more support to Israel. Indignation over the role played by Russia is universal. But there are few who discern the peril of the growing alienation of our allies in Europe that results from US policy. Destruction of the NATO alliance has been a goal of the Soviet Union ever since NATO was formed. In the Middle East, we have the Russians again fighting a war by proxy and, in this case, cracking the NATO front. The indecency of the Berlin Wall still stands, meanwhile, as accepted as the great one in China.

One congressman, John R. Rarick of Louisiana, questions the logic of the "new peacehawks who find this a moral war." Says he:

"Our State Department's 'commitment to foreign



policy' by supplying planes, tanks, and other weapons to Israel, has so alienated many of our NATO and European allies that they have refused to allow the US bases in their countries to be used for staging grounds for US involvement in the Middle East. Apparently, our allies have more foresight into the dangers of choosing up sides in the conflict than our own foreign policy makers."

Mr. Rarick thinks we should have learned our lessons in Korea and Vietnam. He opposed entering both those wars and has not changed his position.

Congressman Joseph J. Maraziti, of New Jersey, also fears another Vietnam. He does not object to the sale of war equipment to Israel, but deplores the use of American planes and personnel to transport and unload the equipment in a war zone.

Rep. H. R. Gross, of Iowa, denounced President Nixon's appeal for \$2.2 billion to finance what the congressman called "his intervention in the Middle East war."

Sen. William L. Scott, of Virginia, took the floor to protest our role. "I am concerned about Americans flying airplanes to Israel with war material of all kinds," he declared. "Apparently, the purpose is to replenish the supply of equipment and materiel Israel has lost in the war so far. But it is also my understanding that no other nation will even permit our planes to land to refuel and that, except for a field in the Azores [Lajes], we have to fly nonstop to Israel. This reinforces the belief that whatever action we are taking is being done without any support from other nations within the free world."

Mr. Scott is a member of the Armed Services Committee.

Another word of caution came from Congressman Philip E. Ruppe, of Michigan. He said the US has a responsibility to help protect the security of Israel, but also a growing dependence on the Arab nations for oil. One of his colleagues, Rep. James P. Johnson, of Colorado, declared that Congress is "acquiescing in our aggressive acts against the Arabs" in spite of its own effort to restrain the President's war-making powers. He pointed out there has been no declaration of war in the Middle East and that there is no treaty with Israel providing for our support.

The most unusual approach was made by Sen. James A. McClure, of Idaho. After a group of sixty-seven senators, led by Hubert Humphrey, introduced a resolution calling for a policy of supplying equipment to Israel, Mr. McClure proposed going a step further. He suggested amending the resolution, with the same language used by Senator Humphrey, to make the policy include a pledge of support to South Vietnam. (See texts on this page.)

There is no evidence that the gentleman from Idaho had tongue in cheek. With what appears to be a recognition of the potential damage being done to the NATO alliance, Mr. McClure warned that the course the US is taking "can only help the Soviet Union."

He said that the United States, "in a generous but misguided response to the events in the Middle East, is contributing to precisely that polarization which it has officially denounced for so long. The emotion is good, but the logic is bad." His proposed parallel resolution, he said, applies "the same thinking in the same terminology to the situation in South Vietnam," as the Humphrey resolution applies to Israel.

Mr. McClure then defined the problem:

"Those who are most confident in the policies of détente have failed to recognize that the real cause of war in the Middle East is the Soviet buildup by air and sea of the Arab military machine.

"The only way to defeat this Soviet strategy is to achieve peace. Otherwise, we fall into a very obvious trap. The ironic fact is that Israel and the Arab nations are merely cynically used pawns in the plans of a country which has the best interests of neither at heart. . . ."

Most outspoken critic of our policy is Sen. J. W. Fulbright, chairman of the Foreign Relations Committee. He says the Israelis can count on seventy-five to eighty votes "on anything . . . [they] are interested in in the Senate." Center for this power, according to *Congressional Quarterly*, is the American Israel Public Affairs Committee (AIPAC). The *Quarterly* quotes the

### For Israel, Read South Vietnam

On October 18, a group of sixty-seven senators, led by Humphrey, Jackson, Ribicoff, and Javits, introduced Senate Resolution 189, as follows:

"Resolution to urge the continued transfer to Israel of Phantom aircraft and other equipment:

"Whereas the President is supporting a strong and secure Israel as essential to the interests of the United States; and

"Whereas the armed forces of Egypt and Syria launched an unprovoked attack against Israel shattering the 1967 cease-fire; and

"Whereas Israel refrained from acting preemptively in its own defense; and

"Whereas the Soviet Union, having heavily armed the Arab countries with the equipment needed to start this war, is continuing a massive airlift of sophisticated military equipment to Egypt and Syria; and

"Whereas Public Law 91-441, as extended, authorizes the President to transfer to Israel by credit sale whatever arms may be needed to enable Israel to defend itself: Now, therefore, be it

*Resolved*, That it is the sense of the Senate that the announced policy of the United States Government to maintain Israel's deterrent strength be implemented by continuing to transfer to Israel, by whatsoever means necessary, Phantom aircraft and other equipment in the quantities needed by Israel to repel the aggressors."

Also on October 18, Sen. James A. McClure, of Idaho, suggested that the Humphrey - Jackson - Ribicoff - Javits resolution was incomplete. He proposed this addition:

"Sec. 2. Whereas the President is supporting a strong and secure South Vietnam as essential to the interests of the United States; and

"Whereas the armed forces of North Vietnam launched an unprovoked attack against South Vietnam shattering the 1964 cease-fire; and

"Whereas South Vietnam refrained from acting preemptively in its own defense; and

"Whereas the Soviet Union, having heavily armed North Vietnam with the equipment needed to start this war, is continuing a massive airlift of sophisticated military equipment to North Vietnam; and

"Whereas the Gulf of Tonkin resolution authorized the President to transfer to South Vietnam whatever arms may be needed to enable South Vietnam to defend itself: Now, therefore, be it

*Resolved*, That it is the sense of the Senate that the announced policy of the United States Government to maintain South Vietnam's deterrent strength be implemented by continuing to transfer to South Vietnam, by whatever means necessary, Phantom aircraft and other equipment in the quantities needed by South Vietnam to repel the aggressors."



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## Airpower in the News

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AIPAC chairman, Si Kenen, as saying, "I rarely go to the Hill. There is so much support for Israel that I don't have to."

At one point, Rep. Robert F. Drinan, of Massachusetts, made a speech on the House floor in which he lamented the fact that the US has tried to win friends in the Arab world, considering such nations as Jordan and Saudi Arabia as our friends. Israel, he charged, "has received only one-seventh of all of the vast amount of American money extended to the enemies of Israel." When AIR FORCE Magazine called Mr. Drinan's office to find out the authority for this figure, we were referred to AIPAC, which is known to draft speeches and conduct "research" for members of Congress.

One committee, the Subcommittee on the Near East and South Asia of the House Committee on Foreign Affairs, has held a public hearing on the Middle East war. J. C. Hurewitz, a professor from Columbia University, testified that Russia does not need Arabian oil, but it is using the war to unite the Arab states so that

it can control the oil. Why? It is a simple way to promote disagreement between Free Europe and the US.

The outlook for peace, Professor Hurewitz says, is poor. He says the United States is not being realistic; peace can come about only through the application of pressure. Otherwise, the decision-makers in the Kremlin "will engage in dirty competition in the Middle East, while we try to uphold the détente. So long as such diplomacy works in the favor of the Soviet Union and its Middle East friends, they leave anxiety about the fate of détente to us. But the moment their diplomacy becomes counterproductive, they, too, become firm advocates of the application of the détente to the Middle East."

The outlook is not good. The Russians can be expected to push their advantage. The most ominous possibility was suggested by Walt W. Rostow, a former aide to President Johnson, now a professor at the University of Texas. Writing in the *New York Times*, here's Mr. Rostow on the grim prospects:

"They [some Arabs] may feel that in one, two, or three more rounds, they may be able to impose unbearable attrition on Israel.

"Some Israelis may feel the only response to this prospect is to invoke nuclear weapons, a capability within their grasp."

It is something for all of us, including the liberal faction that has been deprecating military power in a world without peace, to think about. ■

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## The Wayward Press

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After a few years of bellyaching by war correspondents covering the front in Vietnam, where they got the best cooperation reporters have ever had in any war, it is almost amusing to learn that they are finding no bed of journalistic roses in the Middle East.

One reporter complains, in a dispatch from Israel, that "newsmen have only the official communiqués issued several times a day and a nightly briefing provided in Tel Aviv by a reserve colonel from the army spokesman's office." And:

"The credibility of Israeli information in the past was generally regarded as high by most of the newsmen here. But in this war, the feeling is that it has diminished." He then quoted another reporter as charging that the Israelis "mislead by leaving things out, not by lying."

Television reports on the networks regularly carry a subtitle that says: "Film cleared by Israel censors." And a newsman blocked from the front by border guards was quoted as saying, "Never have so many known so little about so much."

The contrast between covering this

war and the one in Southeast Asia is striking, but it has brought no moans about the "Five O'clock Follies," which was the name given to a US briefing in Saigon that sounds to us much like the one in Tel Aviv. There has been no furor about censorship or the release of overoptimistic news, such as we heard regularly from Vietnam.

It is too early to pass judgment on the standards of accuracy being shown by the press, but also no reason to believe it has improved. On October 9, a reporter named Dean Brelis, who works for CBS, told the Walter Cronkite news audience that he personally witnessed an Israeli air attack on Damascus. He said he saw bombs hit the Russian embassy and destroy it. He said he was told thirty Russians were killed in the attack. It was a cultural center that was hit, and one person was killed. If a sports reporter watching a horse race came back with an error of that magnitude, he would be fired.

"However, bankers [in London] noted that the Soviet Union was demanding American dollars for delivery of arms

to the Arabs. . . ."—By Terry Robards, in the *New York Times*, of October 20, 1973.

"Moscow is trading more and more sophisticated arms for Arab oil. . . ."—By James Reston, in the *New York Times*, of October 31, 1973.

Which edition of the *New York Times* d'ya read? \* \* \*


Orr Kelly, a reporter for the *Washington Star-News*, recently was moved to a new assignment after six years on the Pentagon beat. His conclusion is news:

"Despite its size, the Defense Department probably is the best-managed agency in the government. This is true in spite of all the talk about cost overruns and inefficiency.

"The fact that most Americans, most congressmen, and many Pentagon officials do not believe the department is well managed is a problem in itself. There is a pervasive—but false—belief that all of the Pentagon's problems would be solved if it were simply managed better. This is simply not true."

Mr. Kelly's six years would appear to have been well spent.





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is being collected, sorted and analyzed by IBM.

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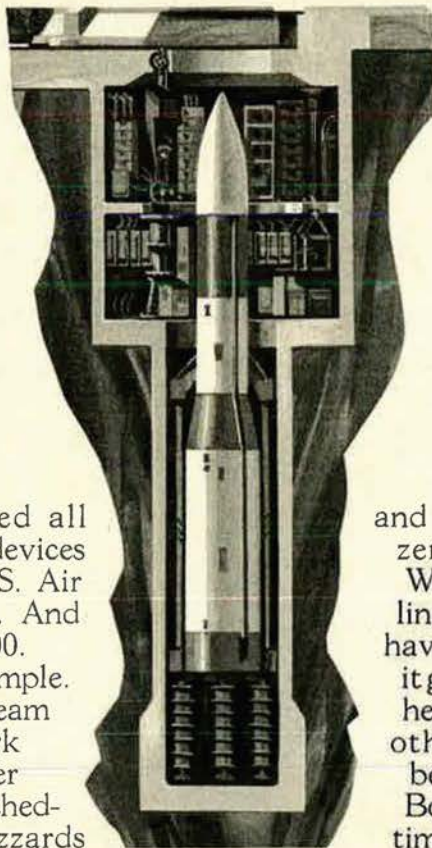


**“Time is the  
most valuable thing  
a man can spend.”**

*Theophrastus.*



# Minuteman. On time, every time, for 11 straight years.



Last year, Boeing delivered all Minuteman missiles, training devices and other equipment to the U.S. Air Force on or ahead of schedule. And underran the program \$4,515,000.

That's not just one isolated example. In 1971, the Boeing-Air Force team finished its Minuteman III work in North Dakota \$7,000,000 under target and 45 days ahead of schedule. This, despite periods of blizzards

and temperatures of 45 degrees below zero.

We've been meeting Minuteman deadlines like this for over a decade. Changes have been made to the missile, giving it greater range, improved accuracy and heavier payloads. From time to time, other changes in Minuteman might be necessary. If so, you can count on Boeing being on time, every time.

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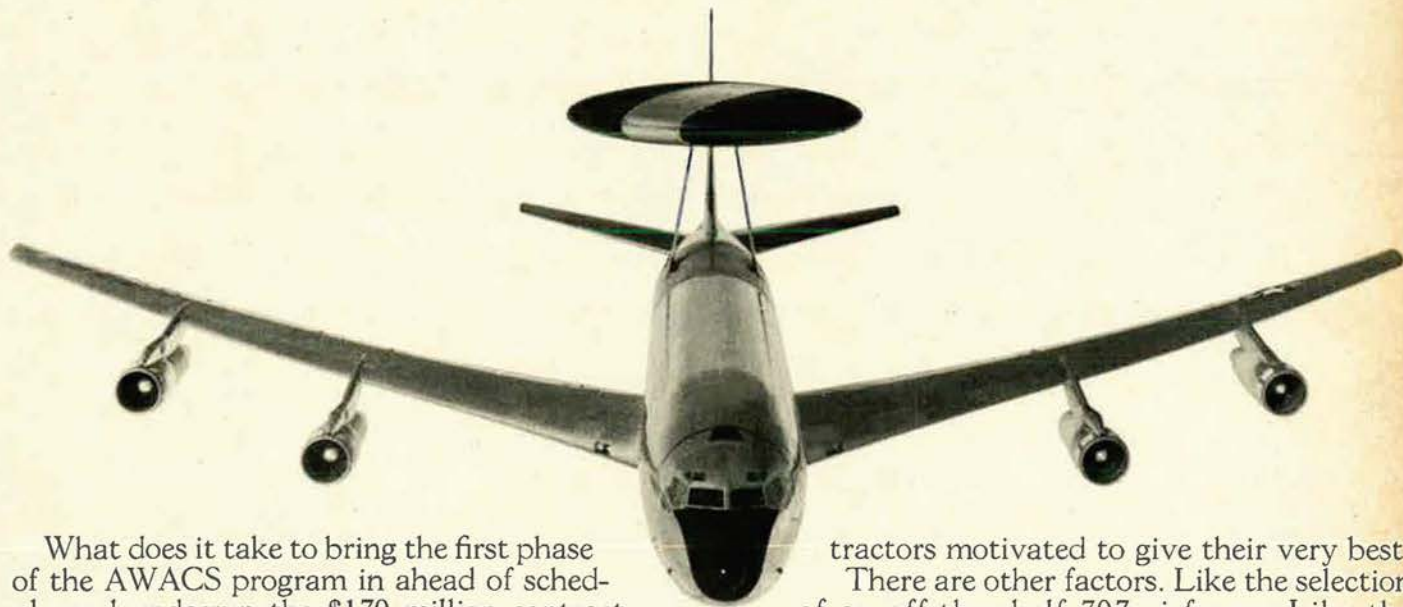


**“There can be  
no economy where there  
is no efficiency.”**

*Disraeli.*



# AWACS. 90 days ahead of schedule and \$3.6 million under budget.



What does it take to bring the first phase of the AWACS program in ahead of schedule and underrun the \$170 million contract by \$3.6 million?

Teamwork. And plenty of it.

It takes a team of Boeing people who can anticipate problems, adapt quickly to necessary changes and always keep the job on target. It takes an Air Force customer who understands the needs of the fast moving project. And it takes talented subcon-

tractors motivated to give their very best.

There are other factors. Like the selection of an off-the-shelf 707 airframe. Like the before-flight "hot" mock-up integration of the test instrumentation, software and radar. And the DOD contracting method.

We think this is the efficient way to handle high-technology business. It's responsive to the American taxpayer. To the responsible agency. And to corporate pride. **BOEING**



**“Lost time is never  
found again.”**

*John H. Aughey.*



**SRAM.**  
**666 missiles to the**  
**U.S. Air Force.**  
**And every one on time.**



Boeing turned over the first Short Range Attack Missile to the Air Force on March 1, 1972.

Twenty-one months later the Air Force had received 666 SRAMs. Every one of the missiles has been completed on or ahead of schedule. And Boeing is now targeting production schedules to meet the authorized order of 1500 missiles.

SRAM deployment to B-52s and FB-111s of the Strategic Air Command also is right on schedule.

Teamwork is making this project work so well. Much of the success is also attributable to the professional guidance the U.S. Air Force Aeronautical Systems Division gave our engineers.

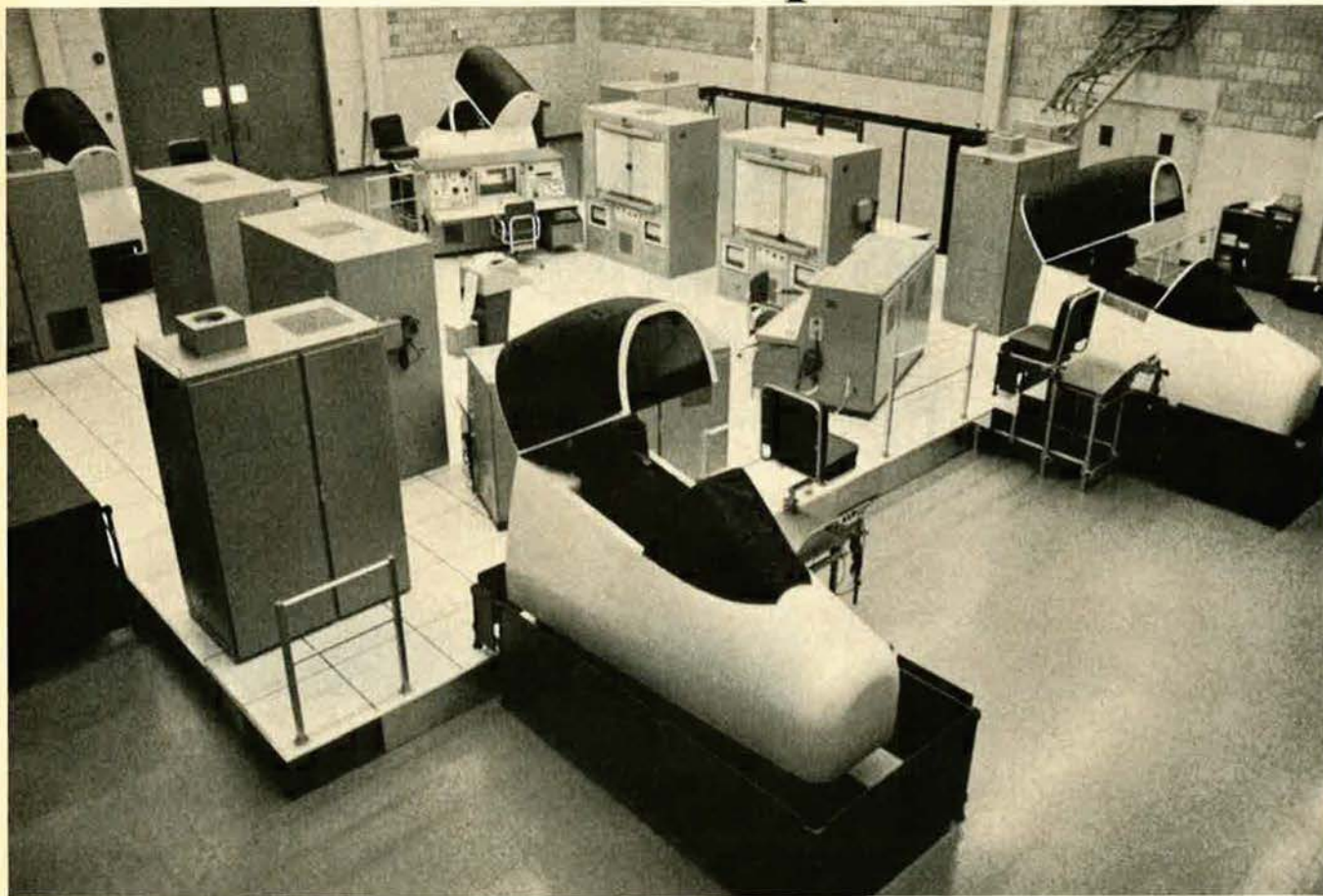
SRAM is just one example of being on time. Our most consistent on-time record is 11 straight years with Minuteman. Our latest Minuteman assignment came in \$4,515,000 under cost target.

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Currently, we are developing and building simulators to train pilots for the Air Force F-15A air superiority fighter.

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# MIA/POW Action Report

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

## Journey to Laos

A group of fifty-three League of Families members flew into the Laotian capital city of Vientiane early in October in quest of additional information about the more than 300 American servicemen still listed as missing in Laos.

The group's hopes had been buoyed by September's protocol between the insurgent Pathet Lao and the Laotian government that set the stage for the establishment of a provisional government. As far as the League was concerned, an essential element of the protocol was an agreement by the two parties to exchange lists of prisoners. A slender chance existed that the Pathet Lao list might contain the names of missing Americans who had perhaps been held in back areas.

(One American civilian pilot—Emmet Kay—is known to be in Pathet Lao hands. During a flight of his small aircraft in May 1973, he had wandered off course and had been forced to set down on an airstrip controlled by the wrong side. His release had already been agreed upon, and his family awaited him in Vientiane.)

The League members' mission in Laos was generally twofold: To create "a sort of family vigil" subsequent to the exchange of the prisoner lists and, while in Vientiane, to press Laotian and Pathet Lao officials to undertake an accounting of the MIAs. A similar appeal also was tendered directly to the Laotian people.

But despite the help of the International Control Commission, the International Red Cross, and US embassy personnel, all of whom had labored to arrange meetings between the respective groups, the visiting League members were frustrated on almost all counts.

In the first instance, the expected lists of captives were not forthcoming. This and the refusal of Pathet Lao leaders to meet with League members were blamed on the chaotic state of officialdom in Vientiane, struggling to form a workable provisional government.

It was not until most of the League group had already departed Vientiane that a meeting between three remaining League members and a senior Pathet Lao representative—Soth Pethrasi—was held.

But the official offered small hope. He told the League members that there was only a "remote chance" that some Americans may be prisoners in Laos.

"He allowed for the remote possibility that men may have been captured and held by tribesmen in areas he has not been able to reach," League Vice Chairman George Brooks related later. Pethrasi promised that, after the coalition government is formed, "the Pathet Lao would be responsible for the release of any Americans still in the country and provide information where possible on the deaths of those now listed as missing."

More to the point, Pethrasi was asked about the 158 Americans he himself in November 1969 claimed

to be held by the Pathet Lao. (At the time, US officials were skeptical that that many Americans could possibly be Pathet Lao captives. But even if this were the case and only a fraction of that number were POWs, what had happened to them?)

According to the three League members present, Pethrasi's reply was to the effect that the American POWs in Pathet Lao hands in years past had long since been turned over to North Vietnam or released. As for the possibility of others, all effort must await the establishment of a coalition government in Laos, he said. This, of course, is marginal comfort to the families of the American servicemen missing there.

In its plea to the Laotian people, the League said in part, "Our group is the first of a large number of groups that will be coming to Laos to find out the fate of their missing men. We will continue until we know what has happened to them. We, of course, believe that some may still be alive. We ask your assistance in helping us to account for these men. We have heard that the Lao have deep family ties, and are sympathetic toward other families who have lost a family member. We humbly ask your help."

Also while in Southeast Asia, the League members were guests at the Joint Casualty Resolution Center in Thailand, where they were briefed on current operations. Again, scant encouragement was offered by Center personnel because search teams are denied entry into large areas of Southeast Asia still being contested in the fighting.

League members also had the opportunity to talk with refugees from Laotian areas where US aircraft were known to have gone down. Again, hard facts were lacking. Village chieftains told League members that, indeed, many had seen parachutes in the sky or crashed airplanes. But civilian witnesses to the capture of Americans were taken away and were not seen again. Another frightening factor in an already incomprehensible and frustrating situation. ■

## THANKS—BOTH WAYS

Earlier this year, AFA had copies of the May Almanac Issue of AIR FORCE Magazine specially bound in hard-cover form. The bound copies, with the help of the Air Force, were distributed to all returned USAF POWs. The Almanac Issue, with its contents of reports from the major commands and separate operating agencies, gallery of USAF weapons, and much other information, seemed just the ticket to help bring the returned Air Force POWs up to speed on the current status of USAF. Since then, we have received many letters from the former prisoners thanking AFA, not only for the gift of the Almanac Issue, but for the Association's continuing support during the years of the POWs' confinement and in the months since their return. Their gracious words are much appreciated but, in our considered opinion, it is we who should be thanking them. And we do.

—THE EDITORS



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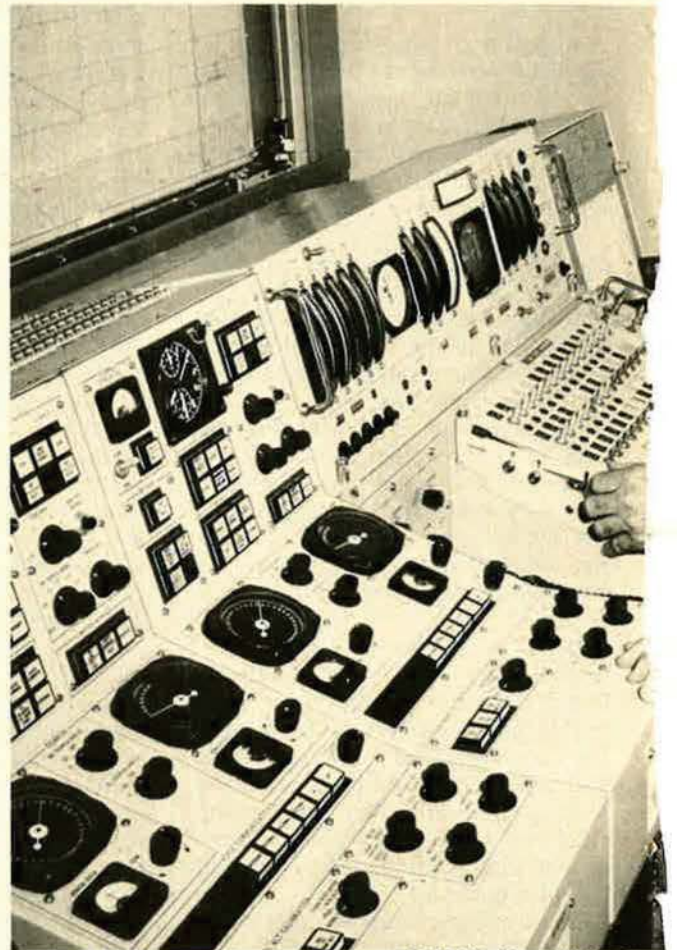
Now there's something new. You can get less and pay less. The first generation of the Integrated Target Control System (ITCS) line has been delivered. These stations offer the latest in drone control, tracking and telemetry. But some target drone missions do not require that degree of sophistication. So now we can scale these designs down and configure a more simplified system to meet limited range requirements. Ask about it...or tell us exactly what your needs are and we'll put together a station with only the specific functions required on your range.

For ground control requirements pick and choose hardware from the short range Foxcart system to the long range, full capability multiple drone control AN/TSW-10 station or anything in between. Or for airborne control our capabilities range from simple chase plane units to complete multi-drone airborne stations.

You'll get proven components, sub-assemblies, sub-systems and systems. You'll also get an ITCS system with lots of growth capability...the fastest data rate around...and a console any ITCS controller can handle without familiarization. You'll get a system that's more sophisticated than anything except a more expensive ITCS.



For multiple drone control, a production model of Motorola's versatile Totalscope II display can replace plotting boards. This digital display is fully computer-interactive—you can use your mainline computer or the display's internal 16-bit arithmetic register controller—for overlaying real-time sensor data on computer-derived alpha-numerics and graphics.



The fully integrated state-of-the-art AN/TSW-10 multiple drone

And, there are enough options available to gladden a car dealer's heart. But this is not purely kindness on our part. Because in time we expect to update the system designed for today's needs as those needs change. Without band-aiding. Without a big hassle if you want options, or without high cost when you want to change.

### **Some people thought ITCS was too expensive for drone retrofitting.**

We now have an airborne package that eliminates hassle or need for a big budget. One man can make an early model BQM-34A or MQM-34D compatible with ITCS overnight. With the drone staying home for its face-lifting. And the package cost is under \$10,000. The same package with a little tinkering before we send it to you works on an MQM-74A, BQM-34E/F or QJ 33. It replaces the DRW-29 and TM4-31A, without it



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interface units. This new unit is now in fabrication. It's just the first of a series. Tell us your needs and we'll give you the operational excellence you need for today and for a decade from today at a price that's surprisingly reasonable.

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We're working with each ITCS customer to customize systems to meet his needs. For example, one range thinks our system is too simple. But we built growth capability into ITCS while it was still on paper, so moving up is easy.

And that's why you can do things with our systems that other people only dream about. You'll be able to fly formation and group flights with one plane flown

by a ground controller while a computer makes the rest follow the leader. Preprogrammed flights will be as simple as flicking a switch. Simultaneous control of multiple drone flights is something only ITCS has actually done. And with ITCS you'll even be able to make repeatable flights for weapons evaluation. MICATS, our mini-drone system, fits into four footlocker size suitcases. Even though it's the only integrated system specifically designed for mini-drones with a C-band TV link.

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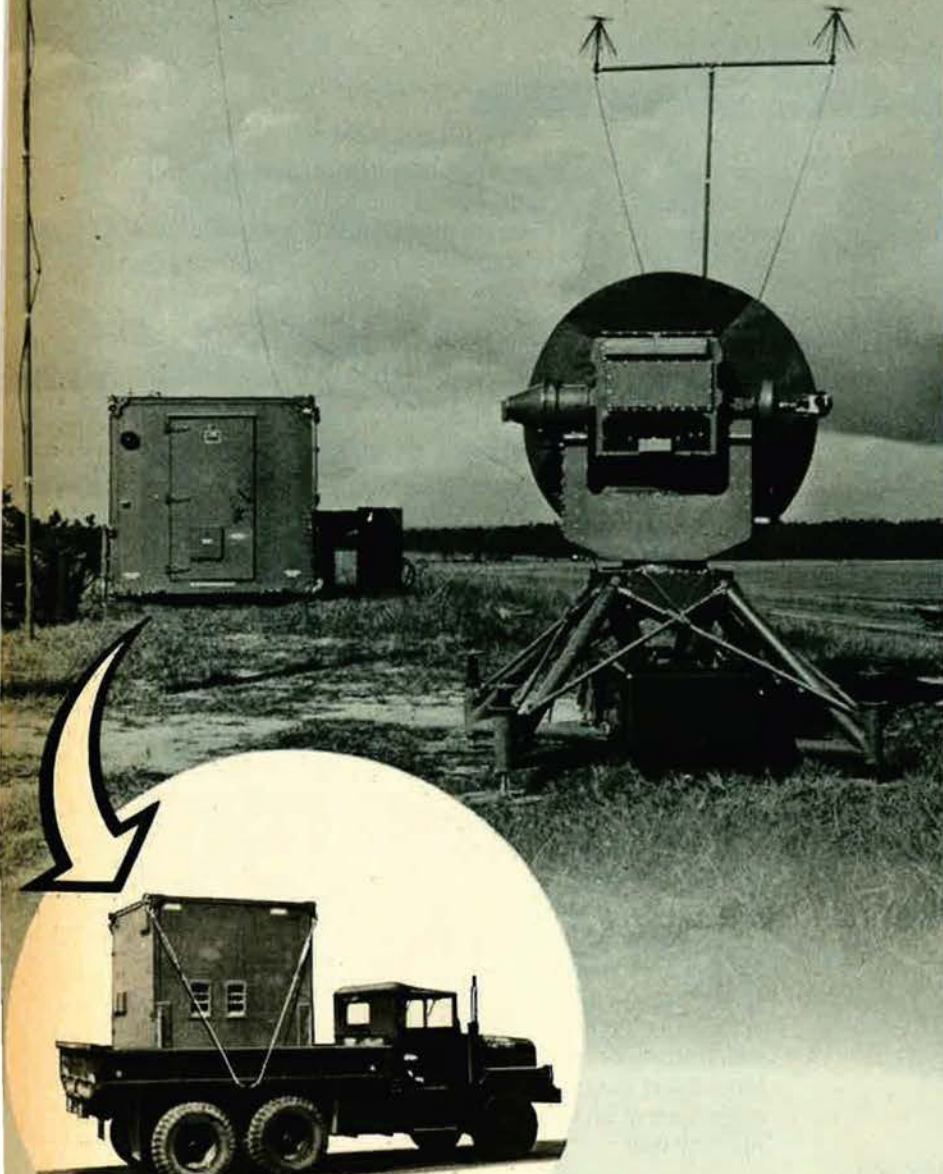


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FIGHTER/BOMBER OPERATIONS



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RESCUE OPERATIONS



By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

WASHINGTON, D. C., NOV. 6

In the direct aftermath of the Mideast's October war, no definitive analysis of the fighting is possible, and may not be for quite some time, according to Defense Department officials.

*(For a brief but descriptive run-down on the war, and some tentative conclusions, see article beginning on p. 51.)*

What is apparent, however, is that continuing attention must be focused on research and development and tactical application of ECM—electronic countermeasures. That ground-to-air missile defenses can be penetrated was proved in Southeast Asia, but the latest Arab/Israeli conflict has demonstrated the increased difficulty of operating in an air-defense environment made up of SAM defenses: Several different SAM systems, coordinated with anti-aircraft artillery, as contrasted to one SAM weapon—the SA-2—used by North Vietnam.

Another crucial factor that was proved in Southeast Asia and again reinforced in the October Mideast conflict is the absolute necessity for adequate airlift, for resupply as well as worldwide strategic mobility.

What remains in the wake of the Mideast fighting is plenty of latitude for speculation about what the pivotal elements in this short but bloody rematch between the belligerents may mean in terms of future warfare, in other terrain and under other conditions.



For its part, the US Army is now in the second year of a five-year program to develop an advanced ground-to-air defense system for use against high-performance aircraft.

Its contender—called SAM-D—is planned as a replacement for the Army's Nike-Hercules and Hawk missile systems, currently deployed around the world.

In the most recent test shot, a SAM-D was successfully launched from its sealed canister. Martin Marietta Aerospace conducted the firing at its Orlando Division test range in Florida.

The "fly-out" testing is significant because it is essential in verifying the missile's unusual canister and launch system designs. The SAM-D "certified-round" concept "requires each missile to be packaged at the factory in its individual shipping-launching canister," the company said. These canisters "will provide complete environmental protection during transport, storage, and handling, and serve as a launch tube for firing." No small matters.

In this latest test shot, a prototype launcher was used, with "missile, launcher, and canister all full-scale configurations designed to completely duplicate the operational launch environment." (In this case, however, a short-burn motor provided thrust.)



At Lod Airport, Tel Aviv, Israel's Prime Minister Golda Meir chats with a US airman during the airlift of vital military supplies to the embattled nation. October's Mideast war again demonstrated the necessity of adequate USAF worldwide airlift capability, a vital element of the Nixon Doctrine.



On alert during the Mideast crisis, men of the 147th Fighter Interceptor Group, Texas ANG, are briefed at their unit's home station, Ellington AFB. The immediate threat of Soviet intervention passed, and, other than airlift crews and technicians, US forces stood down.

—Wide World Photos



## Aerospace World

Other tests in the future will nail down what specialized materials will form the canister's forward closure.

Under US Army Materiel Command supervision, Raytheon Co. is prime contractor for the SAM-D.



A major breakthrough has come in the US's Space Shuttle program. In what will entail an unprecedented international cooperative enterprise, nine European countries plan to design, build, and deliver a mini-spacelab for transport into orbit in the cargo bay of the Shuttle system's airliner-like Orbiter.

The spacelab, to be built under the sponsorship of the European Space Research Organization (ESRO), will consist of two units: a pressurized manned lab that will provide a shirt-sleeve environment, and an instrument platform to support experimentation in direct space exposure.

Attached to and supported by the Orbiter, the spacelab will conduct missions with an anticipated duration of from seven to thirty days.

Once the Orbiter returns to make its runway landing, the lab can be removed and renovated for its next mission.

*A US Army SAM-D missile blasts through canister end cover in first test of prototype launch system. Missile, launcher, and canister are all full scale, to duplicate operational environment. Note four-canister configuration on the new air-defense system's mobile launcher.*



The Shuttle spacelab concept has many attractive features, as far as the US and NASA are concerned. First off, cost of the lab—some \$300 to \$400 million—is to be borne by the nine participating ESRO nations—Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Switzerland, and the United Kingdom.

According to NASA, the lab "provides the timely availability of a supporting system, important to realizing the full potential of the Shuttle; it will also facilitate joint-use programs, many entailing the activities of US and European astronauts."

The Shuttle's first operational flight is scheduled for late 1979. To permit time for systems integration,

the spacelab is to be delivered about a year earlier.

The Shuttle is being touted as the "basic building block" in the nation's—and considering Europe's interest, perhaps the world's—utilization of near space for scientific exploration in many fields.

With it may come several new breeds of space explorer, from the airline-pilot-like specialist who flies it, to experts in each scientific field to man it and related orbital systems. This will certainly mean the passing of that generalist *par excellence*—the test pilot-engineer-scientist astronaut—who, alas, like Renaissance man, will take his well-earned place in history.

In a related matter, and as reported in the November '73 issue, p. 30, the ladies are being sized up for space travel. Having wound up five weeks of experiments conducted with the cooperation of twelve Air Force flight nurses into whether women have what it takes for space missions, the preliminary finding is positive.



Twenty-three Air Force Medical Personnel Recruiting teams have spread out across the US to enlist people in the six specialties that comprise USAF's health care: medical, dental, veterinary, nurse, biomedical sciences, and medical sciences.

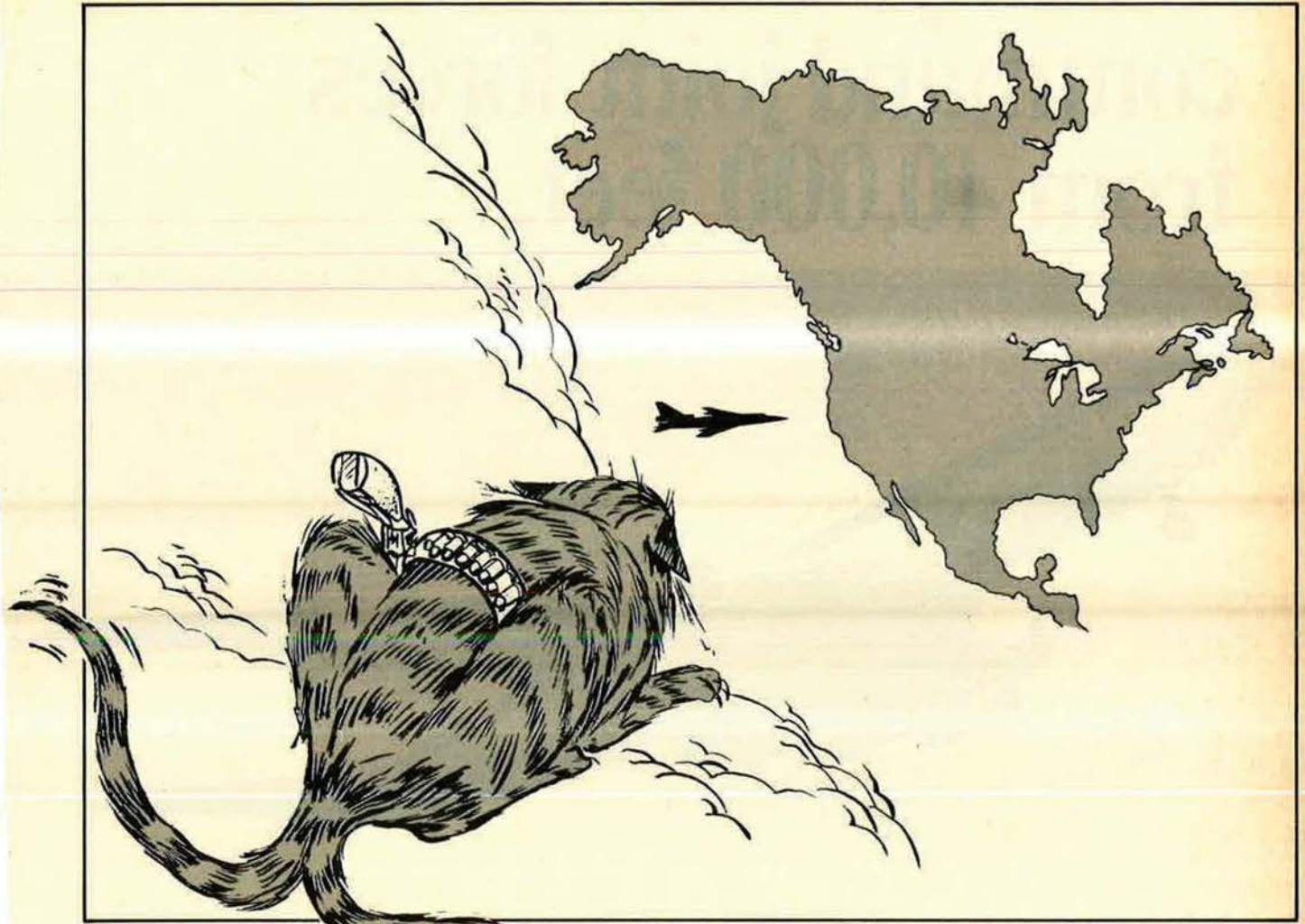
"Recruiting fully qualified medical personnel will be the teams' most challenging goal," said Col. Charles C. Beale, in charge of signing up USAF medical personnel. "Attracting fully qualified physicians for immediate active duty will be

*Gen. Paul K. Carlton, MAC Commander, discusses one of twenty military awards presented to Lt. Col. Leo K. Thorsness during the Colonel's recent retirement ceremonies at Scott AFB, Ill. Colonel Thorsness, a former POW, had previously received the Medal of Honor from the President (see p. 137).*





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## Aerospace World

our most difficult task." In this, obviously, competition from civilian pay levels is a key factor.

In a bid to sign up future health pros, the Air Force teams will visit medical schools, where they are at liberty to offer scholarships to student applicants.

Under the Armed Forces Health Professions Scholarship Program, qualified students in the health professions are paid \$400 per month and educational expenses including tuition, fees, books, and necessary equipment. Selected students may also be commissioned second lieutenants in the Air Reserve and remain in a student status until graduation.

During the summer, the scholarship students put in forty-five days' active duty at extra pay, and may perform limited clinical and professional services compatible with their medical training.

Under the program, the students, upon graduation, must serve one year of active duty as commissioned officers for each year of scholarship help, with a two-year minimum.

In another recruitment effort, Air Force reports that its emphasis on the recruitment of rated officers from among the nation's minority populations is paying off, "with a steadily increasing number" of such officers entering active service.

Despite stiff competition for highly qualified young minority members from the other services and such civilian segments as private industry, USAF views its chances of meeting its minority-group recruitment goals as good for Fiscal Year 1974; its overall long-term goal in this respect is eleven percent.

In the recruitment drive, aimed at the eventual objective of true racial equality and equal opportunity in all positions and levels, Air Force Recruiting Service has set up seven minority officer recruitment teams. Composed of an officer and two senior NCOs, the teams will be assigned to each of Recruiting Service's seven recruiting groups around the country.

As an adjunct, recruitment advertising is being focused on the three primary sources of Air Force officers: the Air Academy, AFROTC, and the School of Military Sciences, Officer, each of which has

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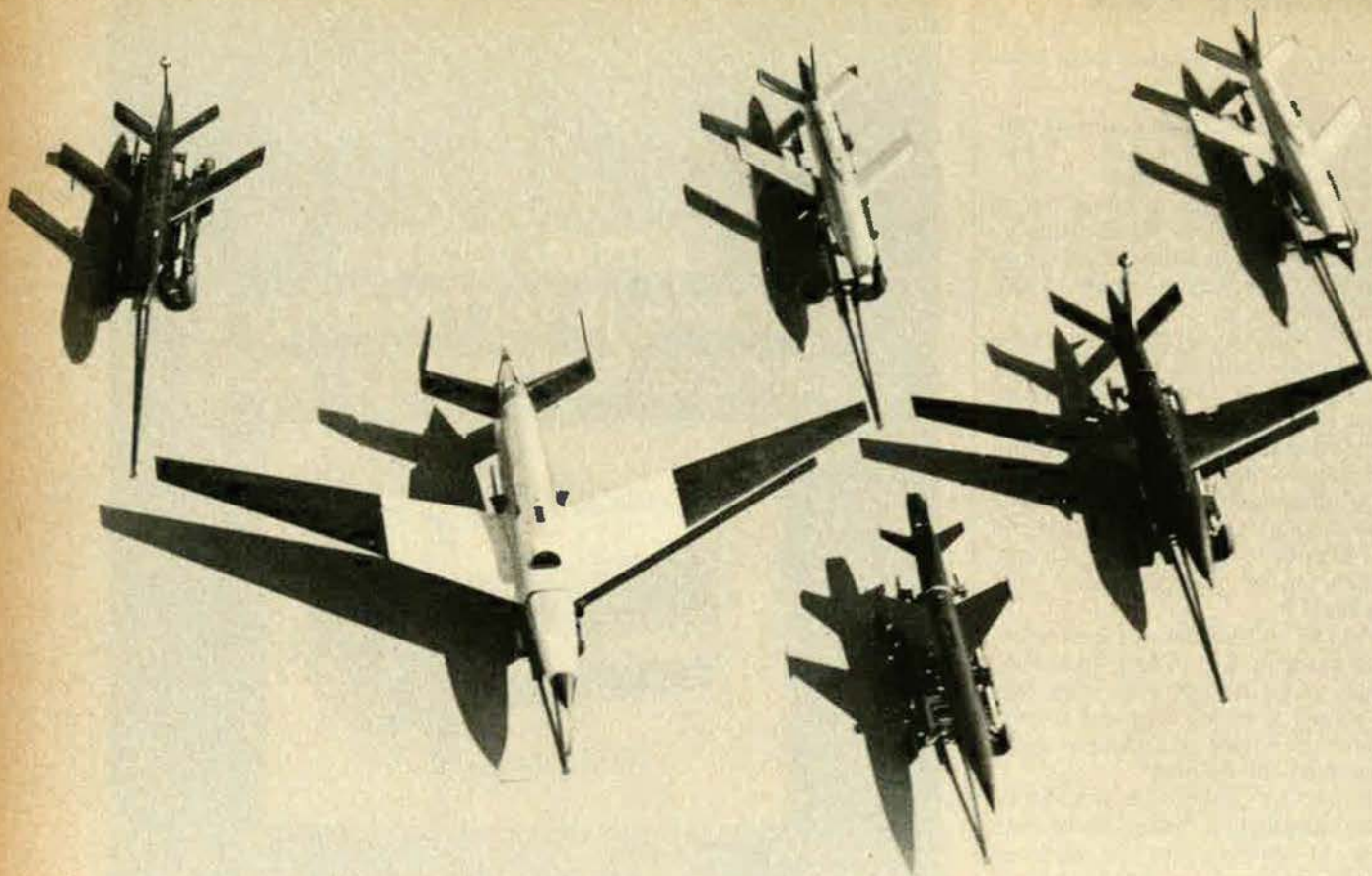
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## Aerospace World

assigned people to work specifically on minority recruiting.



NASA's Flight Research Center, Edwards AFB, Calif., in mid-October, was the scene of the first flight of a Remotely Piloted Research Vehicle (RPRV) being researched by NASA.

Benefits of the new system are a more economical method of flight-testing experimental planes and spacecraft, and a less hazardous way to conduct spin testing and other tricky maneuvers.

The first flight involved a three-eighths scale model of the high-performance F-15 fighter, currently under development by McDonnell Douglas Corp. for the Air Force.

The company supplied the twenty-three-foot model, while NASA installed the control surfaces and instrumentation.

Besides checking out the RPRV's conduct in relatively high angles of attack, the vehicle will also be flown through stall and spin maneuvers, among other tests.

Released from a B-52 at 45,000 feet, the RPRV was then controlled from a ground station by NASA research pilot Einar K. Enevoldson, who observed performance via instrumentation and a TV screen.

After an eleven-minute flight, the vehicle descended by parachute to an airborne helicopter recovery.

The Research Center at Edwards also is conducting a series of test flights of a USAF F-111 modified with a supercritical wing airfoil shape. Aim of the joint NASA/USAF Transonic Aircraft Technology (TACT) program is to study the marriage of supercritical wing technology to highly maneuverable aircraft in the transonic speed range.

At these speeds, where aerial combat often takes place, the supercritical wing might provide all-important, improved maneuvering capabilities, buffet suppression, and better high-altitude performance.

The new supercritical wing has a shape almost the opposite of that of a conventional airfoil. It has a flat top with the rear portion of the bottom side curved upwards.



Related to the Remotely Piloted Vehicle program and to RPRVs, the

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## Aerospace World

Air Force has established a new organization at Wright-Patterson AFB, Ohio, to look into the use of "mini-RPVs" for such diverse missions as strike, reconnaissance, and electronic warfare.

A big selling point in any subsequent development of the small RPVs would be their modest cost, as compared to aircraft and the small RPV's bigger brothers.

Air Force, in forming the new research organization, will be responsible for total DoD needs in the area of mini-RPVs.



In mid-December, four more of America's recognized aerospace pioneers will be enshrined in the Aviation Hall of Fame at Dayton, Ohio.

They will join forty-nine aviation greats previously honored by the congressionally chartered Hall of Fame during its eleven-year history.

The new members:

- **Brig. Gen. Charles "Chuck" Yeager, USAF**, a double ace in World War II, is most notable for his achievements in supersonic flight, having been test pilot of the US's first rocket-powered aircraft—the Bell XS-1—becoming the first man to fly faster than sound, in October 1947. He was awarded the Harmon International Trophy for his 1953 feat of flying the Bell X-1A at 1,625 mph—twice the speed of sound.

General Yeager today serves as Director of Aerospace Safety at USAF's Inspection and Safety Center, Norton AFB, Calif.

- **Dr. Elmer A. Sperry, Sr.**, is considered a giant among America's aerospace inventors, having applied the gyroscope to a host of early aeronautical advancements—from instrumentation to aerial torpedo performance. His work, among other significant achievements, led to the introduction in 1930 of the automatic pilot.

- **Col. Bernt Balchen, USAF (Ret.)**, who died early in October, established a number of firsts in polar aviation. A naturalized citizen born in Norway, he became the first man to pilot a plane over both the North and South Poles. Colonel Balchen served with US Army Air Forces during World War II and is best remembered for setting up

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## Aerospace World

"Bluie West 8," an air base in Greenland—through which armadas of US aircraft passed en route to England during the war. In the latter stages of his Air Force career, he commanded the 10th Rescue Squadron in Alaska and is credited with participating in more than 1,100 Arctic rescue missions.

• **Howard Hughes**, one of the world's wealthiest and most mysterious figures, is credited with a number of contributions to aeronautical science and commercial aviation. His interests have ranged from early motion pictures depicting aviation, to setting speed records in aircraft he designed himself. Mr. Hughes, among other things, was also involved in the design of the famous Lockheed Constellation, originally built for TWA, a commercial airline he then owned.

Milton Caniff, a member of the 102-man Hall of Fame Board of Nominations, has once again contributed his sketches of the enshrinees (see this page).



It is with regret that the Editors of AIR FORCE Magazine mark the passing of the following:

• **Brig. Gen. Bonner Fellers, USA (Ret.)**, died in Washington, D. C., in October. A West Point graduate, he served in North Africa and as one of Gen. Douglas MacArthur's key aides prior to and during World War II. He was the author of *Wings for Peace*, a book about national defense, and contributed several articles to AIR FORCE Magazine.

• **Air Force Reserve Col. Thomas W. Barbour**, a former Air Force information officer and, prior to his death, an executive of American Airlines, died in San Francisco in October. Colonel Barbour in 1957 commanded AFA's San Francisco Squadron (now the Golden Gate Chapter). He served with the Army Air Forces in the Pacific during World War II.

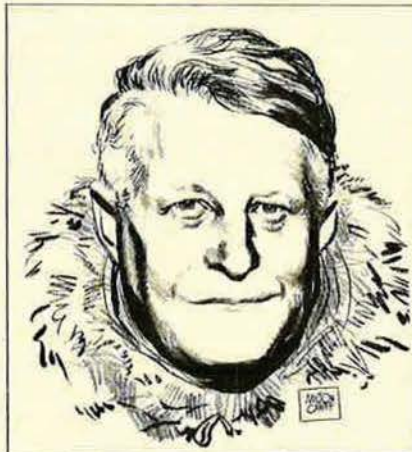
• **Burton E. English**, a former Air Force officer and long-time Director of Special Projects for the Aerospace Industries Association, died in Washington, D. C., in October. A decorated paratrooper during World War II, Mr. English served



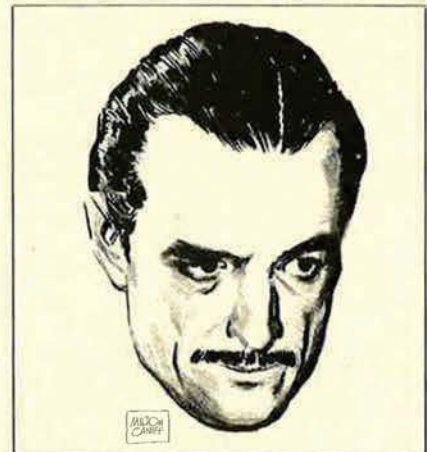
Brig. Gen. Charles "Chuck" Yeager, USAF



Dr. Elmer A. Sperry, Sr.



Col. Bernt Balchen, USAF (Ret.)



Howard Hughes

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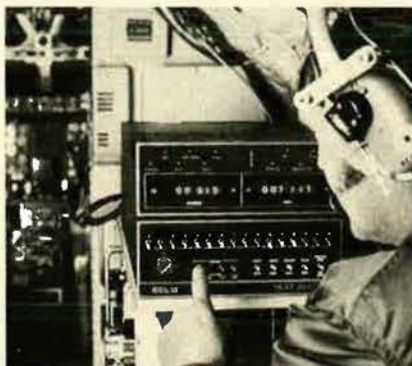
Your prime contractor will have no problem interfacing the 1602 to almost any kind of device. Rolm makes available a wide selection of general purpose I/O interfaces for the 1602. These range

from serial and parallel digital interfaces to communication interfaces to D/A and A/D converters . . . all the way to NTDS interfaces. Because we have over 30 general purpose interfaces in production, your interfacing costs and delivery time should be substantially reduced.

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We typically get our package to your prime in 60 to 90 days to give him more time to do a better job with your program, and still make his delivery date. We've even delivered a system with a DX rating in 14 days.



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If you or your prime would like more information on the 1602, give us a call—We'll get all the facts and figures out to you today . . . with no problems.

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# HIGHLIGHTS

## 1974

### MAY AIR FORCE MAGAZINE

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### DECEMBER AIR FORCE MAGAZINE

"The Military Balance"—The major report from the International Institute for Strategic Studies, London, England, which documents, country by country, the world's military forces and equipment. A desk-top reference sought after and referred to by military decision makers in the U.S. Air Force, DoD, NASA, the Congress, and other military services.

**AIR FORCE**  
PUBLISHED BY THE AIR FORCE ASSOCIATION  
MAGAZINE



# Aerospace World

during his Air Force career as security review chief in the Office of the Secretary of the Air Force and

during the Korean War in developing news censorship procedures.



**NEWS NOTES—Dr. Alan M. Lovelace**, currently Director of Science and Technology, Air Force Systems Command, has been named **Principal Deputy Assistant Secretary of the Air Force (R&D)**.



Peggy M. Crowl

**Peggy M. Crowl**  
1918 1973

*This magazine lost one of its most dedicated staff members and AFA one of its most loyal boosters November 10 when Peggy Crowl, a long-time Editorial Assistant, died of cancer. She'd joined the staff in March 1956. Her passion for accuracy and eye for detail quickly made her a wheelhorse on the magazine staff, where she was fondly known as "Mother Crowl." A tireless worker, she'll be remembered for the hours she logged in AFA Newsrooms during numerous AFA Conventions and at such meetings as the Jet Age Conferences and the World Congress of Flight, which AFA held in the 1950s and the 1960s.—R.M.S.*

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The central component of US nuclear deterrence is the Strategic Air Command and its some 160,000 members who man the aircraft, missiles, and reconnaissance vehicles with which the Command performs its global mission. AIR FORCE Magazine recently interviewed the World War II fighter ace who is now SAC's Commander in Chief. Here are his views on the shifting balance of strategic power and the steps deemed crucial by SAC if we are to retain a condition of parity in the face of steep increases in Soviet strategic capabilities . . .



Gen. John C. Meyer,  
Commander in Chief,  
Strategic Air Command

## SAC'S COMMANDER LOOKS AT OUR STRATEGIC NEEDS

By Edgar Ulsamer

SENIOR EDITOR, AIR FORCE MAGAZINE

**I**N THE view of the US military leader most directly concerned with nuclear deterrence, recent and ominous Soviet advances in strategic weapons technology will not unduly impair this nation's retaliatory capabilities, *provided* planned improvements of the US strategic arsenal are approved and funded. Gen. John C. Meyer, Commander in Chief of the Strategic Air Command and Director of the Joint Strategic Target Planning Staff (JSTPS), told AIR FORCE Magazine that this means increasing the approved number of Minuteman III missiles in the force, improving the effectiveness of that weapon's MIRVed warheads, and introducing the B-1 strategic bomber into the operational inventory as expeditiously as possible.

(The Air Force recently got DoD approval to acquire a limited number of additional Minuteman III missiles for test purposes, thereby keeping the production open; otherwise, the line would have to be closed down by 1975. At present, the Minuteman force is programmed to consist of 450 older Minuteman IIs and 550 Minuteman IIIs. More than 330 of the latter are already in place, and the remainder will be within two years. Restarting the production line after shutdown would be costly in money and in time.)

These measures are in addition to the Minuteman improvement program now in progress, which increases silo and reentry vehicle hardness and retargeting speed and flexibility.

These actions—the B-1 and more improved Minuteman IIIs—General Meyer told this writer, can greatly assist the US in retaining the present strategic balance even if the Soviets put into operation the new offensive strategic weapons that have been observed recently in flight test. These include four new ballistic missiles, MIRVing, and a new launch technology whereby missiles are catapulted out of their silos prior to ignition of their rocket motors (see "Soviet Developments," November '73 issue of AIR FORCE Magazine).

SAC's Commander in Chief stated that a MIRVed Soviet ICBM force, on the basis of current Air Force studies, "will make some but not a great deal of difference so far as the survivability of our ICBM force is concerned." The reason for a relatively small gain in attack capability, General Meyer explained, is "that Soviet planners will be restricted by interference [of one warhead with another] and timing constraints. Even though MIRVing gives them more weapons, they would not be able to lay them down much faster than they could at



present. The Soviets are more or less forced to adopt the most effective timing sequence possible, and, as a result, we would be provided with categorical warning before the vast majority of our missile fields could be hit."

### SAC Opts for OBL

The US, in General Meyer's view, should proceed with a proposed Air Force project, known as OBL, or operational base launch, regardless of whether or not the Soviets bring new, MIRVed missile systems into their operational inventory. At present, US ICBMs are test-fired only from specially modified silos at Vandenberg AFB, Calif., and not from the operational silos in which they are actually housed. Many in the defense community believe that the credibility of US deterrence should be strengthened by a limited number of test firings from Minuteman silos, a practice that is routine with the Soviet ICBMs as well as, to a more limited degree, with the US Navy's SLBMs.

While Air Force and other DoD planners familiar with the Minuteman system are thoroughly convinced of its high reliability and responsiveness, there is no hard evidence that the Soviets share this opinion. General Meyer said that "a limited number of operational

base launches—I think we would need five or so to achieve statistical validity—are desirable because they would demonstrate to the Soviets and others the reliability of this weapon system. It is the nature of deterrence that it works best if its capabilities are clearly understood by a potential aggressor."

### The Need for the B-1

General Meyer termed the B-1 strategic bomber "SAC's most pressing requirement. This weapon system is so important to the deterrence capabilities of the United States for the 1980s because the manned bomber provides a major, combat-proven capability to deliver warheads with extreme accuracy on a powerful, technologically advanced enemy. The B-1, at the same time, provides us with a critically important modernization of a key element of the Triad, the bomber force. In an operational sense, this translates into flexibility, the ability to launch on warning under positive control, and the assurance of penetrating such a sophisticated defense environment as the Soviets have been building up."

General Meyer expressed "absolute confidence in the B-1's ability to penetrate hostile airspace in the 1980s and beyond. We have the same high confidence in the B-52's ability at present—and the experience of Linebacker II [the eleven-day air campaign against North Vietnam in December 1972] proved it—but, as we move into the next decade, that confidence begins to lessen. That is why the B-1 is so important."

## AEC'S STATUS REPORT ON NUCLEAR WEAPONS TECHNOLOGY

The improvement of nuclear weapons, alluded to by General Meyer, as well as their fabrication and development are, by statute, the responsibility of the Atomic Energy Commission. Information about these activities is usually limited to AEC's annual report. The following is excerpted from the recently released 1973 Financial Report of the United States Atomic Energy Commission.

"The cost of the AEC program for designing, developing, testing, and producing nuclear weapons in support of defense requirements approved by the President was \$976 million for 1973 or an increase of \$14 million over the 1972 level. The increase in development and production of nuclear weapons was offset in part by a decrease in weapons testing.

"The research and development effort generates creative ideas from which promising concepts for weapons designs emerge and evaluates these concepts for feasibility. It also provides the basis for warhead options that assist in determining system cost tradeoffs and optimization of military characteristics.

"The research and development program also supports the promising technology of laser-induced fusion for military application and civilian power. This effort is

in its early investigative stages. The laser-fusion operating program increased by \$8 million over 1972 to a level of about \$24 million in 1973. The expanded program will exploit concepts to achieve laser-induced fusion by very high compression of small deuterium-tritium pellets. Noteworthy progress is being made in developing high-energy, short-pulse lasers, in conducting laser-plasma interaction experiments with available lasers, and in developing the theory of laser fusion.

"AEC conducts the nuclear weapons testing program as an essential element of its research and development efforts and responsibilities. The tests can be considered as an extension of laboratory experiments which prove or disprove the theoretical designs originated in the laboratories. In conducting these tests, AEC complies with the requirements of the limited test ban treaty and the safeguards that were adopted to assure that United States interests are protected.

"Weapons production basically represents replacement of existing systems in stockpile rather than major additions to the stockpile. The new weapons being produced are highly sophisticated and complex and incorporate the latest technology. The production of warheads for Minuteman III and the Poseidon missiles was a major portion of the production effort in 1973."



The "publicized high price" of the B-1 bomber, General Meyer said, has caused misunderstandings about its basic cost-effectiveness. "In relative terms, it is not an expensive weapon system measured in pure effectiveness—that is, the capability of delivering weapons accurately against more difficult enemy targets." General Meyer expressed doubts that a subsonic standoff bomber would be more cost-effective than the B-1, which is designed as a penetrator.

General Meyer rejected speculation that the

on at present. For example, we are equipping some of our B-52s—the G and H models—with EVS [electro-optical visual system], FLIR [Forward Looking Infrared system], LLLTV [low-light-level TV], and multimode displays, all of which aid in low-altitude penetration under all-weather conditions."

According to present plans, SAC will retain in its active inventory some 300 B-52G and H models. Eighty B-52Ds are also planned to be retained in the inventory. In addition to its strategic nuclear role, the B-52D's capabilities make it well suited for conventional warfare, ocean surveillance, and some other naval support missions.

### What About Southeast Asia?

So far as SAC's ability to resume support of military operations in Southeast Asia is concerned, General Meyer explained, "from bases in the United States, we can be back over there in full operation within seventy-two hours," if so ordered by the President.

Admiral Noel Gayler, Commander in Chief, Pacific, told this reporter that Seventh Air Force tactical aircraft in the theater could be back in operation within hours from the time the order was given; the carrier-based aircraft in the Western Pacific would need about the same time; additional aircraft carriers from the Pacific would require a couple of days, depending on their position; and, "SAC, of course, has amply demonstrated its ability to move out in a hurry."

One of the key lessons SAC learned during the command's seven-year involvement in the Southeast Asia war "is in the pervasive importance of our tanker fleet to all air operations. Between 1965 and 1972, the KC-135s offloaded a grand total of nine billion pounds of fuel—they flew more than 1,300 sorties during Linebacker II alone—without any losses to themselves or the aircraft they refueled." In order to meet future requirements, and to replace the KC-135s as they wear out, SAC's Commander in Chief foresees the future development and acquisition of a new tanker derived from one of the wide-bodied commercial superjets, such as the 747, DC-10, or L-1011 type.

"We should eventually get about 150 large new tankers and retain some of the KC-135s for as long as we can keep them flying," he said, adding that such a supertanker might be configured to provide both aerial refueling and the bulk transport of fuel to boost basic air mobility of tactical forces.

KC-135s were also used by SAC during Linebacker II to rush reconnaissance pictures from Southeast Asia to the National Command Authority in Washington, with the result that pictorial intelligence reached the decision-makers within twenty hours from the time the pictures were taken.

Air Force was less than enthusiastic about the SCAD (Subsonic Cruise Armed Decoy) program, which the Department of Defense recently placed in limbo by merging it with a Navy research effort. "SCAD most certainly would have enhanced the B-52's utility and effectiveness quite significantly. At the same time, SCAD's price per copy reached about the point where it simply became too costly for what it contributed."

General Meyer saw only a limited need for a bomber defense missile now, but favored continued research in this area. "For the time being, I think we should put our money, so far as support of bombers is concerned, into ECM and related improvements. Some of this is going



SAC's Commander in Chief, Gen. John C. Meyer, left, during the change of command ceremony at headquarters of SAC's Eighth Air Force at Andersen AFB, Guam. Standing next to General Meyer are the outgoing Commander of the Eighth Air Force, Lt. Gen. Gerald W. Johnson, now the Air Force's IG, and the incoming Commander, Lt. Gen. George H. McKee.



Strategic planners looking beyond the present generation of land-based ICBMs are frequently drawn to the concept of mobile systems. The Air Force is pursuing this technology in the form of a special study effort bearing the designation M-X, for Missile System X. Thought is being given to experimental air launches of an ICBM. "Mobile basing," General Meyer told this reporter, "must be studied thoroughly and considered carefully because it offers several



*Adm. Noel Gayler, Commander in Chief, Pacific (CINCPAC), who has direct unified command responsibility for Southeast Asia, believes South Vietnam is now capable of defending itself in case of another invasion by Hanoi.*

### THE THREAT OF MAIN FORCE ACTION BY HANOI

"There is all sorts of evidence that the North Vietnamese are maintaining options to resume main force action," Adm. Noel Gayler, Commander in Chief, Pacific (CINCPAC), replied to a question by AIR FORCE Magazine about the likelihood of a full-fledged offensive by Hanoi. Admiral Gayler, a much-decorated World War II fighter ace, explained that the North Vietnamese "are improving their lines of communications, particularly down through the panhandle [of Vietnam]. They have stockpiled considerable amounts of military as well as civilian infrastructure materiel in Military Region I [the area abutting the DMZ], and they have opened at least a limited or lightering operation to bring seaborne supplies up the Cua Viet River. Also, they have set up a perimeter, a sort of enclave, around Khe Sanh, which is heavily defended by surface-to-air missiles, and extended the runway."

These actions, Admiral Gayler told AIR FORCE Magazine, "are definite violations of the [cease-fire] understanding," adding that the same applied to efforts by the North Vietnamese to "in every other way place themselves into a position to jump off." Admiral Gayler, who has direct, unified command responsibility for Southeast Asia, pointed out, however, that the North Vietnamese appear to "follow a two-track strategy by also continuing to exert indirect military pressures through the Viet Cong, a little terrorism and assassinations to see how far this gets them."

The US and its allies, Admiral Gayler said, have no positive way of establishing whether the flood of new supplies entering South Vietnam is of either Soviet or Red Chinese origin, nor "can we tell with precision whether we are dealing with new stuff [delivered to the North Vietnamese after the cease-fire] or material that the North Vietnamese had squirreled away up north."

In spite of the massive stockpiling, which, according to other AIR FORCE Magazine sources, exceeds the level of preparedness that existed at the time the North Vietnamese launched the 1972 Easter offensive, Admiral Gayler expressed confidence that the South Vietnamese appear capable of blunting future aggression by their northern neighbor. "I realize, of course, the fact that this war is littered with the bones of prophets, but I would say that I can't see any reason why the South Vietnamese should not do very well [in case of a North Vietnamese offensive], provided we continue a reasonable logistics support."

Since the end of the US involvement in the war in

Vietnam and the congressionally directed bombing halt of August 15 of this year, Admiral Gayler said, US military operations in Southeast Asia have been confined to "considerable logistics and supply operations in South Vietnam and Cambodia and a limited one in Thailand. We also have some intelligence operations going on, mostly flights offshore, but including some flights of a photographic kind over areas where protocol does not prohibit them."

Assessing the military situation in Cambodia, Admiral Gayler admitted that at the time of the cessation of US air support last August, "we were concerned [about its effect] on morale and, at the same time, hoped for some stiffening of the Cambodian Army's performance. I think we can now say that all the sinews of combat for a successful defense are there, they have enough people, they have enough munitions, and they have the internal supply lines. The outcome of any major fighting after the dry season starts will be mainly driven by Cambodian morale and organization. It will depend on their ability to keep a cohesive military and political organization going."

Regarding Thailand, Admiral Gayler said, "I don't see any clear and present danger. But the Thais are worried about the road the Chinese have built across northern Laos to their border, and they are concerned about the sub rosa Chinese support of insurgents, particularly in the northeast of Thailand." Admiral Gayler foresaw no problems connected with maintaining strong US forces in Thailand because "they and we look at the problems in about the same way. They and we are interested in deterring further adventurism by the North Vietnamese; they and we are, of course, interested in maintaining the integrity of Thailand itself; and they and we recognize—in the event that these conditions are satisfied—the advantages of a considerable numerical withdrawal of US forces in a phased, deliberate way."

US forces in Thailand, mainly elements of PACAF's Seventh Air Force, are stationed at four major bases—Korat, Ubon, Udorn, and Takhli—and include the following aircraft types: F-4s, A-7s, AC-130s, F-111s, RF-4Cs, EB-66 ELINT aircraft, and EC-121 airborne warning aircraft.

These aircraft, along with carrier-based air and SAC's strong B-52 force at Guam and U-Tapao in Thailand, Admiral Gayler told AIR FORCE Magazine, represent an effective force that is almost instantly deployable, if so ordered by the President and the Congress.



distinct military advantages. However, there are also some practical problems that would have to be solved." While there has been speculation about accuracy problems associated with air-launched ballistic missiles, SAC's Commander in Chief said that, on the basis of recent technological progress, "I believe the accuracy problem for this type missile can be licked. A principal hurdle would be fiscal in nature and revolve around the number of missiles that could be hauled around by the number of aircraft operating from the number of bases that could be accommodated within a reasonably sized budget." Formidable, in General Meyer's view, might be "the real-estate problem and the matter of operational procedures, in case we decide on a land-mobile system."

General Meyer advocated "careful pacing" for development of the M-X system and viewed it in part as a hedge against unexpected technological breakthroughs by the Soviets.

Recent Soviet experimental test flights of cold-launched ICBMs have not persuaded SAC leaders that the US should acquire the same kind of capability for its own strategic forces. In theory, catapulting ICBMs from their silos has two principal advantages: larger missiles with greater throw weight can be accommodated, and the silos can be reloaded and refired. "We don't yet clearly understand what the technical advantages, compared to costs, are for a cold-launch system. We are, of course, aware of the advantages that such a capability is alleged to have, but we have no idea as yet what it would cost. My guess is that it would be very expensive for what we gain. My guess would also be that if we were to build new missile fields then we should get very serious about whether or not we want to put this capability in our silos. On the other hand, as a retrofit program, such a system might well be too expensive for serious consideration."

(Department of Defense, Air Force, and industry planners have studied the potential of a so-called full-silo missile, a fully encapsulated, cold-launched missile, which would occupy all available volume of the present Minuteman silo. According to tentative calculations, such a full-silo missile could deliver more than ten RVs of Minuteman III size over intercontinental distances.)

SAC, General Meyer stated, continues to view the retention of the fifty-four Titan ICBMs in the active inventory as "absolutely essential because of their unique throw-weight capabilities."

#### **Penetration Aids and Maneuverable Warheads**

While the permanent portion of the SALT I accord limits both the US and the USSR to two ABM complexes each, "the fact that one Soviet site is fully developed and defends both their

national command authority and the city of Moscow makes it a significant factor in the balance of strategic power," General Meyer said. "Of course, the Soviet ABM capability is nothing like what it might have been without SALT, but it still is formidable, and we must, I think, counter it by advancing our penetration aid technology. There is a second reason for doing so: We must protect ourselves against the unexpected."

In addition to the sophisticated penails capabilities such as decoys, radar-blinding chaff, and ECM in the Minuteman III system, even more evolved systems are under study to defeat intercept by ABM, including maneuverable or evading warheads. This program, General Meyer said, was initiated prior to SALT I in order to counter the then rapidly increasing Soviet ABM effort "and should be kept going as a low-level research effort."

#### **Air- and Spaceborne Command and Control**

DoD and Air Force programs to enhance the nation's command and control capability and survivability with respect to its strategic forces are, according to General Meyer, "thorough and, if carried forward in terms of funding, fully capable of meeting our needs in the next decade. I would not recommend any changes, one way or the other. We are improving our communications, our retargeting capability, and providing for rapid tie-in between our warning systems and our display systems aboard a larger airborne command post."

(The Air Force is currently developing a 747-based Advanced Airborne Command Post tailored to function in a nuclear environment. These seven aircraft, upon completion of the program, will serve both the National Command Authority—the President and the Secretary of Defense—and SAC. (See January '73 issue of AIR FORCE Magazine, "Nuclear-Proof Flying Command Post.")

Many of the publicly expressed fears about the vulnerabilities of US space-based warning and control systems are unrealistic and exaggerated, in General Meyer's view. "I am not recommending that we precipitately draw down on other warning systems and gamble our destiny on just one approach. We need to keep up redundancy."

(A large portion of the US military space systems is in geosynchronous orbit, at altitudes of 22,300 nautical miles, which provides formidable protection since it would take an attacker several hours to reach them.)

While SAC's Commander in Chief expressed general confidence in the state of the US strategic deterrent, he was less optimistic about the condition of US airpower in general: "I believe it is essential," he said, "that the force modernization programs proposed by the Air Force are implemented." ■



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## THE MIDEAST WAR

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A British military analyst examines the strategies of both sides in the October Middle East war, discusses the impact of new weapons on tactics, and points up provisional lessons that may apply to warfare in different geographical environments in this critique of . . .

# THE ARAB-ISRAELI WAR

## Some Tentative Conclusions

By Brigadier Kenneth Hunt, British Army (Ret.)

DEPUTY DIRECTOR, THE INTERNATIONAL INSTITUTE FOR STRATEGIC STUDIES

LONDON, Nov. 5

**T**HE War of the Day of Atonement took a very different course from the Six Day War of 1967. It was evident from the outset that this would be so because the conditions were very different. In particular, Israeli airpower, completely dominant in 1967, was challenged with some success. Some military lessons have emerged from the fighting, albeit only provisional at this stage.

The Six Day War started after a long period of tension, with both sides fully prepared. The Israeli Air Force struck preemptively, and within minutes had effectively destroyed the Egyptian Air Force. The Egyptian Army was left to fight in the open desert with no air cover and was routed. This time it was the Arabs who struck first. Israel was surprised, with its ground defenses weak. The Egyptian surface-to-air missile (SAM) complex, an uncer-

—Wide World Photos



*The Israeli Air Force, evenly balanced between attack aircraft and fighter-bombers—like this IAF F-4—capable of air-to-air combat, again proved its superiority to the Arab air forces. While there was little air-to-air fighting, IAF kill ratios were overwhelming.*

—Wide World Photos



*An Israeli tank's big gun points menacingly toward Egyptian positions near the Suez Canal, as the tank force moves through the Sinai.*



*Some of the largest tank battles of history were fought in the Sinai area east of Suez, where this Israeli tank is moving out.*



tain quantity before the war, established air cover over the Egyptian forces on the Canal, and Israel lost heavily in early attempts to breach it. Israel had to fight on two fronts and mobilize at the same time. The Syrian attack posed the more urgent problem, since it directly threatened Israeli territory. It was plain that it would take many days before Israel could muster the strength to take major initiatives in the Sinai.

### The Strategies

The Egyptian strategy initially was probably a limited one: to cross the Canal with forces that would heavily outnumber Israel's Bar-Lev defenses, establish a bridgehead under SAM cover, and then consolidate under that cover to avoid being a sitting target for Israeli aircraft. To hold the east bank and defeat the Israeli Army there would be a real achievement. If the battle went well, they could move forward, with their SAM cover. A battle of attrition would favor them, with their larger numbers, rather than Israel. The Egyptian Air Force would be kept largely in reserve, since to commit it against the Israeli Air Force would risk losing it. It could be used later against the Israeli Army in hit-and-run raids and perhaps in strength as the Israeli Air Force grew weaker.

Israel's land strategy in the Sinai would be to try to save or reinforce the Bar-Lev garrison, if possible push back Egyptian forces before they could consolidate, or contain the bridgehead while probing for weak points. From the air, the bridges and SAM defenses would be destroyed as a prelude to a later ground offensive.

Though Jordan did not attack, her potential threat tied down Israeli forces and denied Israel the use of Jordanian airspace for attacks on Syria. With little air cover, Jordan's

—Wide World Photos



*Egyptian soldiers examine the wreckage of an Israeli helicopter downed on the Sinai front. Although the Israelis used helicopters in the Suez Canal crossing, the author reports that the choppers were of limited use in the lethal air defense environment of the war.*

forces would have had an acutely difficult task attacking over the River Jordan and up the high, stony ground toward Jerusalem. The Arab cause was probably better served by Jordan sending forces to Syria but not involving her own territory and risking a debacle.

The Egyptian strategy had its weaknesses. The forces were confined

within the limits of their air cover and had to defend along the whole length of the Canal. Their deployment was, in effect, dictated by the power of the Israeli Air Force, even though this itself was partly neutralized by the SAMs. The Israeli Army, however, could move because the Egyptian Air Force was not strong enough to stop it. Egypt,



and the SAMs north of the Israeli breakthrough seemed to have remained in action.

### Some Lessons

It is early to draw lessons, since good information is still scarce. Some conclusions, however, both strategic and tactical, seem to suggest themselves, often with an application wider than the Mideast.

- **The Arab Achievement.** Though the Arab forces did not achieve

may grow. The Arab negotiating position, despite their military losses, has thus improved.

- **Israel's Frontiers.** The need for Israel to have defensible frontiers will have been sharply reinforced in many minds, but the Canal as a defense line has been shown to have limitations. It was always clear that Egypt could, at any time, muster forces to attack the Canal in large

encouraged by its early successes, probably left too few soldiers on the west bank. It was obvious that Israel would have to strike across the Canal to take out the SAMs that it was unable to destroy from the air, and Egypt should have been prepared for this.

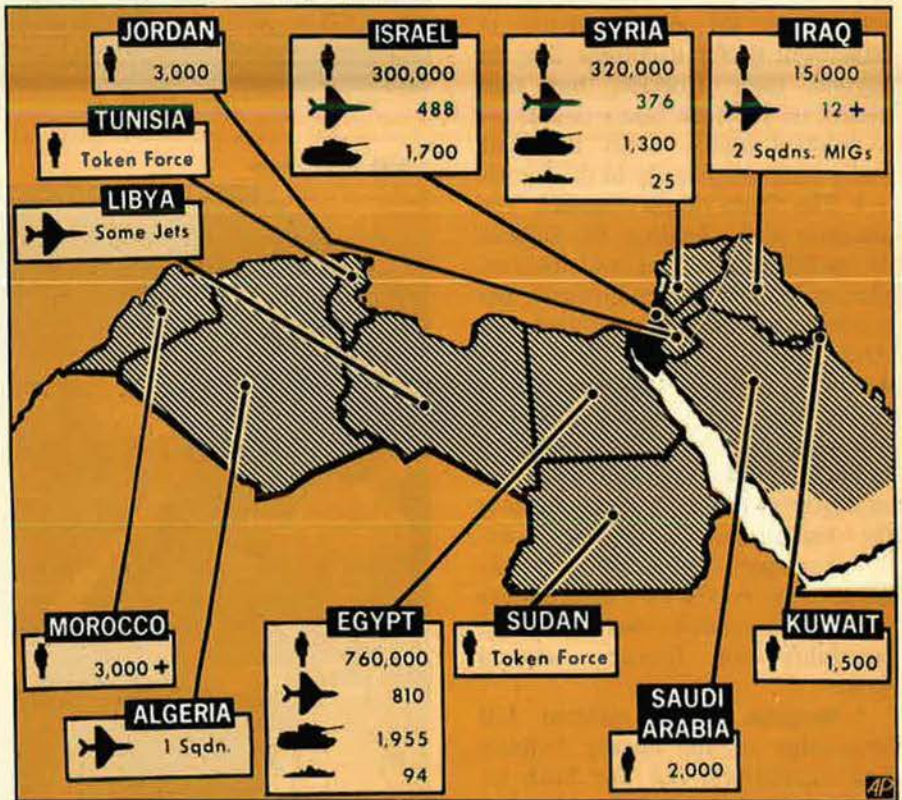
### The Fighting

The war produced early Arab successes, and then Israel seized the initiative. In a most impressive performance, Israelis attacked and got back the Golan Heights positions they had lost in the initial Syrian assault. Syrian forces were quickly thrown back beyond the 1967 cease-fire line, but thereafter generally contained Israeli pressure, itself lessened by the claims of the now urgent Sinai battles. The Syrian SAMs were less effective than those on the Canal, but, nonetheless, Israel lost a considerable number of aircraft, almost all from ground fire. Israeli tank losses were very heavy, largely from antitank missiles.

In the Sinai, heavy tank battles took place once Israel had mobilized, and, though both sides had some hundreds of tanks, neither could break through. Tank losses were huge, those of Israel largely caused by antitank missiles, those of Egypt by tank gunnery. Israel still could not knock out or neutralize the SAMs, despite receiving American supplies that may have included missiles or ECM equipment designed to do just this.

The Israeli Army then succeeded in crossing the Canal in the center of the front and destroying the SAM defenses there, thus allowing the Israeli Air Force to provide close air support. This would have been a critical factor in the enlargement of their bridgehead on the west bank, which led to the eventual cease-fire. The positions on the east bank remained more or less static,

*This chart shows the estimated commitment of troops and hardware by combatants in the Middle East war. What portion of the troops and equipment was actually committed to battle is not known in detail, but potentially, Israel was outnumbered in troops by three to one, in tanks by two to one, and in aircraft by 2.5 to one.*



—Wide World Photos

what they set out to do, they certainly made the point that they are much improved and are expensive to defeat. Already, they must have forced Israel to think about the price of a reliance on military superiority. The cost in human life is hard for Israel, a tiny country, to bear now, let alone to contemplate every few years. And Arab power

numbers. That left Israel with the alternatives of defending it strongly, which required continuous high mobilization, or to defend it weakly and accept the risks.

With Egyptian SAM defenses effective, the Israeli Air Force faces severe problems in making the Egyptian position untenable. For Israel to hold a covering position on the



## THE MIDEAST WAR

east bank as well would demand even more men and be very difficult to maintain in an area containing a hostile population. A demilitarized zone between Israel and Egypt, which an attacking force cannot cross without giving warning, seems militarily preferable, if it can be negotiated. This could apply to the Golan Heights, in the same way. Of course, many in Israel will prefer a defense line far beyond their frontier, but that means in someone else's country—a political luxury costly this time and perhaps too costly in the future.

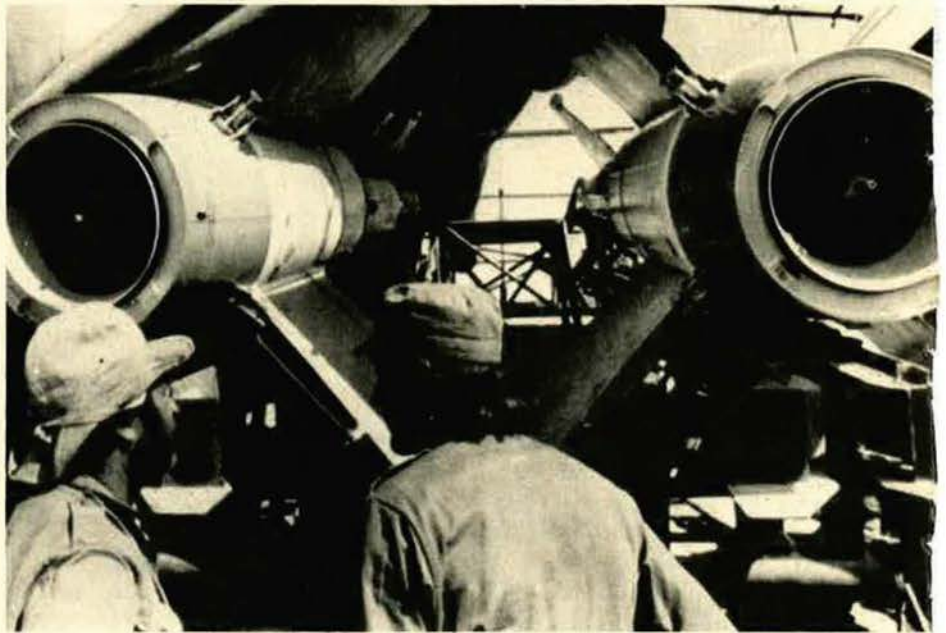
• **The Scale of the Conflict.** The intensity of the fighting, the amount of equipment involved, and its complexity left both sides critically dependent on outside supplies—the Arab countries completely so. This dependence has given the Soviet Union and the United States a mortgage on their clients. Neither Egypt nor Israel now dares embark on a war of this scale again without the reassurance of complete external support. The scope for political leverage by the two superpowers is much increased—but so is the possibility for friction between them.

• **Surprise.** Israel claimed full knowledge of the enemy buildup and capabilities, but the Arab intentions were misread. Despite this, Israel was able to mobilize for an attack and, at the same time, defend herself. But the lesson has a wider application. In Europe, Soviet capabilities can be seen, but their intentions can also be misread. So here, too, there must be sufficient forces on the ground in peacetime to hold while reinforcements arrive. The balance between standing defenses and ready reinforcements must be right.

*A column of Israeli tanks passing the remains of a Syrian tank in the Golan Heights during the early days of the war.*



—Wide World Photos



*Israeli soldiers with a captured Soviet-made SAM-3 missile launcher near Suez City. Although North Vietnam received SAM-3s toward the end of the Vietnam War, no SAM-3s were used against US aircraft there.*

• **Tank and Antitank.** Few Israeli tank casualties were caused by air attack because Arab air operations were limited. Some were caused by tank gunnery, but the guns on the Soviet-built T-55 and T-62 tanks were outranged by the 105-mm guns

on the British and American tanks that Israel was using. Most were hit by antitank missiles, the Soviet-built Snapper, Swatter, and Sagger. These are all wire-guided, with a range of some 2,300 meters, mounted on armored fighting vehicles. As sys-



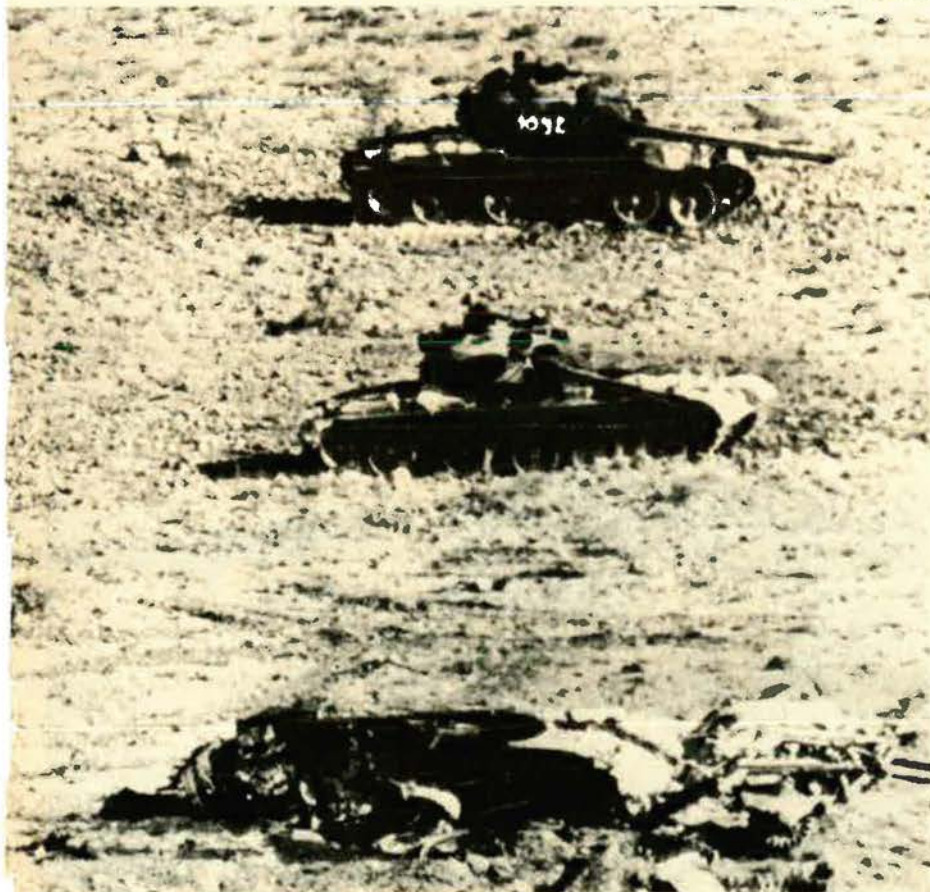
—Wide World Photos

—Wide World Photos



*Israeli artillery in action against Syrian forces somewhere north of the Golan Heights during the second week of the war.*

—Wide World Photos



*A line of Syrian tanks knocked out by the Israelis during an attack on Israeli armored forces south of the Syrian town of Sasa. Absence of bomb craters indicates that these tanks were hit by gunfire or antitank missiles, but many were destroyed by IAF A-4s.*

tems, they are probably inferior to the US Army's TOW (which Israel urgently asked for at the height of the battle and presumably got), or the British Swingfire, but they did their job. (TOW stands for tube-launched, optically-tracked, wire-guided.)

The antitank missile has thus made its first real mark on the battlefield, and infantry now has, for the first time, a weapon effective at both short and long ranges against the heaviest tank.

This does not, of course, mean that the day of the tank is ended. This missile is a defensive weapon, and a tank is still needed for offensive operations. But the balance has swung against the tank, which has dominated the battlefield since World War II. What is needed now is a mixture of missiles and tanks (with some missiles mounted on tanks), according to tactical requirements. If the emphasis is on defense, then more missiles will be procured; if on offense, then more tanks. But cost is a factor. The inventory in Europe must be examined afresh in the light of Israel's experience.

• **Air and Air Defense.** The air situation in the Middle East has been a special case. Israel, through sheer expertise and the performance of its aircraft and armaments, has long outmatched the Arab air forces, and thus strongly influenced the whole of Arab strategy. The SAM defenses—themselves a response to earlier deep-strike operations by Israel—were the Arab counter, and they were remarkably effective. As far as can be judged from the little information as yet released, Israel was neither able to destroy them nor suppress them from the air. In air-to-air operations, she retained her decisive superiority throughout, the MiG-21 proving no match for the F-4. Helicopters seemed of limited use in



## THE MIDEAST WAR

forward zones; the environment was too lethal.

The Canal air defense complex contained the static SA-2, the vehicle-mounted SA-3 and SA-6, and the man-portable SA-7, plus mobile 23-mm and 57-mm guns. The radar signature of the SA-2s may have been known, since they were used widely in Vietnam and examples were captured in 1967. Perhaps this was so for the low-level SA-3, too, but the SA-6, with a performance from low level to 50,000 feet, had not been used before. It has the capacity to fire optically and thus can operate despite ECM. Whether the ECM or antiradar and other air-to-ground missiles used by Israel were as good as might be used in Europe (ignoring precision-guided munitions, of which more in a moment) is not clear. What they did use was not good enough. Israel suffered very heavy aircraft losses in the first days attacking SAMs, notably of A-4s, the workhorse of the Israeli Air Force.

The balance, therefore, shifted in this particular war against the fighter-bombers, though their threat forced the Egyptian Army to stay under their SAM umbrella, and so inhibited their action. Is there a general lesson here? Well, precision-guided munitions, with their overwhelming advantage of accuracy and consequent reduction of sortie rates, do not seem to have been used. Nor were surface-to-surface missiles (SSM), which would be widely available in Europe, used against SAMs, only long-range artillery (US 175-mm guns) being employed. But the task of the fighter-bomber is obviously now more difficult, which may suggest more targeting, in the face of dense SAM cover, by SSM and artillery. The introduction of precision guidance for SSM and artillery may cut into the role of the fighter-bomber in a European battlefield.

• **Weapon Systems.** On the whole, Western weapons performed better than their Soviet-built counterparts. Israeli aircraft (even allowing for better pilots and tactics) were better. The Centurion tank, which outgunned the Soviet T-55s and T-62s, was discarded by Britain some years ago in favor of the vastly better Chieftain. Soviet antitank missiles, while effective, are probably less good than their NATO counterparts.

The SAM equation may be different. The SA-6 is clearly formidable, and the concept of providing an air umbrella for land forces has—within the limited confines of this particular battlefield—been shown to be practical.

The war began with Israel surprised, but ended with her militarily superior. It saw, however, a period when, according to Washington sources, Israel was on the brink of defeat through lack of supplies. The Arab countries were politically far more cohesive than before and their forces much more effective, particularly in the well-rehearsed initial offensive and in static defense. They are perhaps less able to improvise or, as yet, fight mobile battles in the open desert, partly because their air support is simply not equal to that of Israel. Reliance on SAMs has tied them to a more defensive concept.

The lesson of the improved performance of the Arabs will not, however, go unlearned. They have shown a readiness to seek in modern technology—and some proficiency in using it—some of the answers to their military problems. ■

—Wide World Photos



An airlift of US supplies to replace unexpectedly heavy Israeli losses began during the second week of the war. About 10,000 tons of supplies and equipment had been delivered by the time of the cease-fire, on October 22, much of it by USAF C-5s like this one, seen loading at Dover AFB, Del.



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# THE MILITARY BALANCE 1973/74

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A PUBLICATION OF THE INTERNATIONAL  
INSTITUTE FOR STRATEGIC  
STUDIES, LONDON



## FOREWORD

BY THE EDITORS OF AIR FORCE MAGAZINE

For the third successive year, AIR FORCE Magazine is privileged to present "The Military Balance" as an exclusive feature of its December issue.

"The Military Balance," compiled by The International Institute for Strategic Studies, London, is an annual, quantitative assessment of the military power and defense expenditures of countries throughout the world.

The International Institute for Strategic Studies was founded in 1958 as a center for research and discussion in defense, arms control, disarmament, and related areas. It has earned worldwide recognition as *the* authority in its field.

As in the past, "The Balance" is arranged with national entries grouped geographically, with special reference to the principal defense pacts and alignments. Included in the section on the US and USSR is an assessment of the strategic nuclear balance between the two superpowers. There also is a separate section on the European theater balance between NATO and the Warsaw Pact.

In preparing "The Military Balance 1973/74" for our use, the staff of AIR FORCE Magazine has retained the Institute's system of abbreviating military weapons and units as well as British spelling and usage. A list of the abbreviations used in the text appears immediately after this introduction. Because of space limitations, some tabular material on defense expenditures



of NATO countries, their expenditures by functional categories, comparison of divisional establishments, and military assistance agreements negotiated since the last issue of "The Balance" have been excluded, as has an appendix, "The Statistics of Mutual Force Reductions."

"The Military Balance" examines the facts of military power as they existed in July 1973 (before the October Middle East war). No projections of force levels or weapons beyond 1973 have been provided, except where explicitly stated. The result should not be regarded as a comprehensive guide to the balance of military power; in particular, the study does not reflect the facts of geography, vulnerability, or efficiency, except where these are touched on in the essays on balances.

Figures for defense expenditures are the latest available. GNP figures given are usually at market prices. In addition to the estimates of current defense expenditure and GNP in the individual country entries, similar information on the principal countries covered, for this year and previous years, is collected in tables beginning on p. 116. Because estimates of defense expenditure and GNP have been amended in the case of certain countries, figures will not in all cases be directly comparable with those in previous editions of "The Military Balance." Where a \$ sign appears, it refers, unless otherwise stated, to United States dollars.

In order to make comparison easier, national currency figures were converted by the Institute into United States dollars at the rate prevailing on July 1, 1973, generally as reported to the International Monetary Fund (IMF). An exception is the Soviet Net Material Product, which has been converted to dollars at the rate of 0.72 roubles = \$1. (*See p. 67 for more detail on Soviet defense expenditures.*) Further exceptions are certain East European countries that are not members of the IMF and Rumania (which is), for which conversion rates used are taken from US Arms Control and Disarmament Agency publication ACDA/E-207, December 1971. In all cases, the conversion rates used are shown in the country entry, but may not always be applicable to commercial transactions.

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

Equipment figures in the country entries cover total holdings, with the exception of combat aircraft, where frontline squadron strengths are normally shown. Except where the contrary is made clear, naval vessels of less than 100 tons structural displacement have been excluded. The term "combat aircraft" used in the country entries comprises only bomber, fighter-bomber, strike, interceptor, reconnaissance, counter-insurgency, and armed trainer aircraft (*i.e.*, aircraft normally equipped and configured to deliver ordnance).

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

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

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

—THE EDITORS



## ABBREVIATIONS

AA	Anti-aircraft	FGA	Fighter, ground attack	MR	Maritime reconnaissance
AAM	Air-to-air missile(s)	FPB	Fast patrol boat(s)	MRBM	Medium-range ballistic missile(s)
AB	Airborne	GM	Guided missile	MRV	Multiple re-entry vehicle(s)
ABM	Anti-ballistic missile	GNP	Gross national product	Msl	Missile
Ac	Aircraft	GP	General purpose	MT	Megaton (1 million tons TNT equivalent)
AD	Air Defence	Gp	Group	MTB	Motor torpedo boat(s)
AEW	Airborne early warning	GW	Guided weapon	NATO	North Atlantic Treaty Organization
AFV	Armoured fighting vehicle(s)	Hel	Helicopter(s)	Para	Parachute
APC	Armoured personnel carrier(s)	How	Howitzer(s)	Pdr	Pounder
Armd	Armoured	HQ	Headquarters	Recce	Reconnaissance
Arty	Artillery	Hy	Heavy	Regt	Regiment
ASM	Air-to-surface missile(s)	ICBM	Inter-continental ballistic missile(s)	Rkt	Rocket
ASW	Anti-submarine warfare	Incl	Including	RL	Rocket launcher(s)
ATGW	Anti-tank guided weapon(s)	Indep	Independent	SACEUR	Supreme Allied Commander, Europe
ATk	Anti-tank	Inf	Infantry	SAM	Surface-to-air missile(s)
AWX	All-weather fighter	IRBM	Intermediate-range ballistic missile(s)	SAR	Search and rescue
Bbr	Bomber	KT	Kiloton (1,000 tons TNT equivalent)	SEATO	South-East Asia Treaty Organization
Bde	Brigade	LCT	Landing craft, tank	SHAPE	Supreme Headquarters, Allied Powers in Europe
Bn	Battalion	Log	Logistic	Sig	Signal
Bty	Battery	LPH	Landing platform, helicopter	SLBM	Submarine-launched ballistic missile(s)
Cav	Cavalry	LST	Landing ship, tank	SP	Self-propelled
Cdo	Commando	Lt	Light	Sqn	Squadron
CENTO	Central Treaty Organization	MCM	Mine counter-measures	SRBM	Short-range ballistic missile(s)
COIN	Counter-insurgency	Mech	Mechanized	SSBN	Ballistic missile submarine(s), nuclear
Comm	Communication	Med	Medium	SSM	Surface-to-surface missile(s)
Coy	Company	MIRV	Multiple independently-targetable re-entry vehicle(s)	SSN	Submarine(s), nuclear
DDG	Destroyer, guided missile	Misc	Miscellaneous	S/VTOL	Short/vertical take-off or landing
DEG	Destroyer, escort, guided missile	Mk	Mark	Tk	Tank
Det	Detachment	Mob	Mobile	Tp	Troop
Div	Division	Mor	Mortar(s)	Tpt	Transport
DLG	Destroyer/leader, guided missile	Mot	Motorized	Trg	Training
Engr	Engineer				
Eqpt	Equipment				
Excl	Excluding				
FB	Fighter-bomber				

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# The United States And the Soviet Union



The year after the May 1972 Soviet-American Interim Agreement on the limitation of offensive missiles provided little evidence of super-power restraint in that field. Both governments seemed determined to reach the limits set by their Agreement as soon as possible, while also obtaining the maximum qualitative capability.

The United States has deployed 350 *Minuteman 3* ICBM, each with three MIRV, and is now moving towards completing that programme, involving 550 *Minuteman 3* with up to 1,650 warheads by 1975. Meanwhile, all the 1,000 *Minuteman* silos are being substantially strengthened ('hardened') against nuclear attack and a new Command Data Buffer system is being installed to provide rapid ICBM retargeting. At sea, about 320 *Poseidon* SLBM, each with 10-14 MIRV, have been deployed in some 20 submarines. Conversion of another 11 submarines to *Poseidon* is in train and will be complete by 1975-76, at which time only 10 submarines with *Polaris A3* SLBM will remain in service. Thereafter, the *Trident 1* SLBM, with a 4,600-mile range, could become operational in late 1978, either in *Poseidon* submarines or in the new *Trident* boats, probably with 24 missile tubes each, which are being developed to enter service, apparently in the Pacific, in the same year. By using the freedom allowed by the Interim Agreement to replace *Titan 2* ICBM with *Trident* SLBM, the United States could thus have 1,000 ICBM and 710 SLBM, carrying well over 8,000 warheads, by the end of the 1970s.

The Soviet Union has also shown every sign of reaching the Interim Agreement's limits. On land, where 1,527 Soviet ICBM are already deployed, development has continued of three new ICBM types: the SS-16 (an improved version of the solid-fuel SS-13), the SS-17 (an improved SS-11), and the SS-18 (an improved SS-9). The last two have both been tested with re-entry systems of three MRV, and are reportedly being prepared to carry full MIRV systems at a later stage. The SS-18, tests of which began in 1968, is an obvious candidate for installation in the 25 large silos started in 1970 but still incomplete, thus bringing the Soviet total of 'heavy' ICBM to the 313 permitted by the Interim Agreement. The SS-17, which has been fired over a range of

some 4,500 miles, may equip the remaining 66 incomplete silos, raising the overall ICBM total to the permitted ceiling of 1,618. At sea, the ceilings of 62 'modern' ballistic-missile submarines and 950 'modern' SLBM are further away. Some 31 Y-class submarines, each with 16 SS-N-6 SLBM (1,500-1,750 mile range), have been launched, as have about 3 of the new D-class boats, each with 12 SS-N-8 SLBM (4,600 mile range). Only these count against the submarine ceiling, although another 30 SLBM in older nuclear-powered submarines bring the current number of missiles relevant to the SLBM ceiling to about 560. Even if the Soviet Union decides to exercise her option to replace SS-7 and SS-8 ICBM with new SLBM, it thus seems likely, at expected building rates, to be at least 1977 before she could reach the two ceilings now established. No Soviet SLBM has as yet been tested with MRV.

Soviet and American determination to build ABM systems up to the limits in the ABM Treaty of May 1972 is less certain. The United States is completing her one permitted *Safeguard* site for defence of ICBM silos at Grand Forks Air Force Base, North Dakota, to be operational in late 1974, and has also continued research on what is now known as the *Site Defense* (formerly *Hard Site*) ABM system for the more economical defence of ICBM silos with short-range missiles alone, but she has not yet taken any substantial step towards deploying ABM launchers around Washington, D. C. The Soviet Union has continued to develop a more effective ABM missile to replace the *Galosh* in the defence of the Moscow area, and has also showed signs of expanding that defence from 64 to 100 launchers, but there is no clear evidence that she has yet decided to construct the second permitted site for ICBM defence.

In one of the areas still unconstrained by SALT, strategic bomber aircraft, the emphasis has been largely on development rather than deployment. The American force is actually to be reduced during 1973-74, from 30 squadrons to 28 (24 of B-52s and 4 of FB-111s), while the Soviet force is expected to remain at little more than a quarter of that strength. The United States, however, is pressing ahead with the B-1 programme,



which should bring that new supersonic bomber into service from 1978, while the Soviet Union has been actively testing her *Backfire* prototypes which, although not fully 'inter-continental', have a range comparable to that of the FB-111. The United States is also greatly increasing the striking power of her existing bombers by equipping them with the Short-Range Attack Missile (SRAM), a nuclear air-to-ground missile with a range of 35-100 miles. SRAM entered operational service in August 1972 and should be fully deployed, with 1,500 missiles in 21 bomber squadrons, by 1974-75. Meanwhile, air defence forces on both sides are also subjects for qualitative improvement. The American F-14 and F-15 fighters are moving towards full operational deployment, possibly to be followed in the early 1980s by a new Improved Manned Interceptor (IMI), while the Soviet Union is already introducing new types, including the MiG-25 *Foxbat* and the variable geometry MiG-23 *Flogger* into her fighter forces. Both countries are also seeking to improve static and mobile radar coverage, with equipment such as the American Over-the-Horizon Backscatter (OTH-B) radar and Airborne Warning and Control System (AWACS) aircraft.

Qualitative improvement is, in fact, the keynote in all non-strategic forces. The United States, in particular, having ended her combat role in Vietnam in 1972, is moving towards all-volunteer armed forces by mid-1975 (when the last conscript will be released) amid doubts about her ability thereafter to maintain more than about 1.8 million men under arms: a prospect which demands qualitative excellence, something which the

Soviet Union will, for its own reasons, clearly wish to match. In addition to new aircraft, development programmes for new armoured equipment, tactical missiles, and naval vessels all show signs of acceleration. The Soviet Union has launched her first conventional aircraft carrier of 40,000 tons and is actively deploying new *Kara*-class cruisers, *Krivak*-class GM destroyers, and C-class cruise-missile and V-class attack submarines. The United States has committed funds to her fourth nuclear-powered aircraft carrier, to 37 new DD-963 destroyers, and to the first 28 688-class nuclear-powered hunter/killer submarines. Both are developing a range of new battlefield equipment, including new battle tanks: the Soviet M-1970 and the American XM-1. Further ahead, more exotic technical possibilities appear. Just as precision-guided munitions, such as 'smart' bombs and remotely piloted vehicles (RPV), may change the calculus of tactical air/land warfare in the later 1970s, so, in the 1980s, laser weapons may begin to influence aerial combat. In the first year of strategic arms limitation, it was thus also possible to identify many of the elements which could figure in a continued strategic and tactical arms race if political constraints should prove inadequate.

## UNITED STATES

Population: 210,900,000.

Military service: voluntary (from 1 July 1973).

Total armed forces: 2,252,900.

Estimated GNP 1972: \$1,151.8 billion.

Defence budget 1973-74: \$85.2 billion (Budget Authority [NOA]; expected outlay is \$79.0 billion).

### Strategic Nuclear Forces.

#### Offensive:

(A) Navy: 656 SLBM in 41 submarines.

20 SSBN each with 16 *Poseidon*.

21 SSBN each with 16 *Polaris A2* or *A3*.

(B) Strategic Air Command:

ICBM: 1,054.

140 *Minuteman 1*.

510 *Minuteman 2*.

350 *Minuteman 3*.

54 *Titan 2*.

#### Aircraft:

Bombers: 516. (Two B-52 and 1 KC-135 sqn-equivalents are rotated for duty in South-East Asia.)

66 FB-111A in 4 sqns } some with  
240 B-52G/H in 16 sqns } SRAM.

142 B-52D in 9 sqns (to be reduced to 117 by the disbandment of 2 sqns in late 1973).

15 B-52F in 1 sqn.

Aircraft in active storage or reserve include 8 FB-111A and 45 B-52D/F/G/H.

Tankers: 615 KC-135A in 38 sqns, plus 130 in reserve.

Strategic Reconnaissance: SR-71A; 2 sqns.

#### Defensive:

North American Air Defense Command (NORAD):

—HQ Colorado Springs—is a joint American-Canadian organization. US forces under NORAD are Aerospace Defense Command (ADC) and Army Air Defense Command (ARADCOM), with a combined strength of 80,000.

Aircraft (excluding Canadian):

Interceptors: 585.

(i) Regular: 7 sqns with F-106A.

(ii) Air National Guard: 6 sqns with F-101B; 10 sqns with F-102A; 4 sqns with F-106A.

AEW aircraft: 3 sqns with EC-121.

SAM: 481.

(i) Regular: 21 *Nike-Hercules* batteries.

(ii) Army National Guard: 27 *Nike-Hercules* batteries.

#### Warning Systems:

(i) *Satellite early warning system*: capable of giving virtually immediate warning of launchings from SLBM, ICBM, and Fractional Orbital Bombardment System (FOBS) launch areas.

(ii) *Distant Early Warning (DEW) Line*: 31 stations, roughly along the 70° N parallel.

(iii) *Ballistic Missile Early Warning System (BMEWS)*: 3 stations in Alaska, Greenland, and England.

(iv) *Pinetree Line*: 23 stations in central Canada.

(v) *Over-the-Horizon, Forward Scatter (OTH)*: radar system with 9 sites capable of detecting, but not tracking, ICBM very early in flight.

(vi) *474N*: SLBM detection and warning net of 8 stations on the East, Gulf,

and West coasts of the United States; long-range radars have been added to the east coast net.

(vii) USAF *Spacetrack* (7 sites) and USN *SPASUR* systems; Space Defense Centre (NORAD): satellite tracking, identification, and cataloguing control.

(viii) *Back-Up Interceptor Control (BUIC)*: system for air defence command and control (all stations except one now on semi-active status).

(ix) *Semi-Automatic Ground Environment (SAGE)* system for co-ordinating all surveillance and tracking of objects in North American airspace; 14 locations; combined with BUIC.

(x) *Ground radar stations*: some 55 stations manned by Air National Guard; augmented by the Federal Aviation Administration stations.

Army: 801,500 (16,000 women).

3 armoured divisions.

1 experimental (TRICAP) division.

4 mechanized infantry divisions.

3 infantry divisions.

1 airborne division.

1 airborne division.

3 armoured cavalry regiments.

1 brigade in Berlin.

1 school brigade.

2 special mission brigades in Alaska and Panama.

30 SSM batteries with *Honest John*, *Pershing*, and *Sergeant SSM* (*Lance* is being introduced to replace *Honest John* and *Sergeant*).

M-48, M-60, and M-60A1/A2 (*Shillelagh*) med tks; M-41, M-551 *Sheridan* lt tks with *Shillelagh* ATGW; M-114, M-113



APC; M-107 175mm SP guns; M-108 105mm, M-109 155mm, and M-110 203mm SP how; M-56 90mm SP ATK guns; *TOW* and *Dragon* ATGW; *Chaparral/Vulcan* 20mm AA msl/gun system; *Redeye* and *HAWK* SAM.

Army Aviation; about 10,000 hel and 1,000 fixed-wing ac.

**Deployment:**

**Continental United States:**

- (i) Strategic Reserve: 1 TRICAP div; 1 inf div; 1 airmobile div; 1 AB div; 1 inf bde.
- (ii) To reinforce 7th Army in Europe: 1 armd div (with equipment stockpiled in West Germany); 1 mech div (less 1 bde) (this division has two dual-based brigades whose heavy equipment is stored in West Germany); 1 mech div (with equipment stockpiled in West Germany); 1 armd cav regt.

**Europe:**

- (i) Germany: 7th Army: 2 corps incl 2 armd divs, 2 mech inf divs, 1 mech inf bde, and 2 armd cav regts; 190,000; 2,100 medium tanks (this figure includes those stockpiled for the dual-based brigades and Strategic Reserve divisions).
- (ii) West Berlin: HQ elements and 1 inf bde of 3,900 men.
- (iii) Italy: Task force of HQ elements and 1 SSM bn.

**Pacific:**

- (i) South Korea: 1 inf div; 20,000.
- (ii) Hawaii: 1 inf div.

**Reserves:** Authorized strength 663,600, actual strength 621,900.

- (i) Army National Guard: authorized 402,300, actual 386,700; capable some time after mobilization of manning 2 armd, 1 mech, and 5 inf divs and 18 indep bdes plus reinforcements and support units to fill regular formations; 27 SAM btys (ARADCOM).
- (ii) Army Reserves: authorized 261,300, actual 235,200; organized in 13 divs and 3 indep bdes; 48,000 a year undergo short active duty tours.

**Marine Corps:** 196,000.

- 3 divs (each of 19,000 men), each supported by 1 tk bn.
- 2 *HAWK* SAM bns.
- M-48 and M-103A2 tks; LVTP-5 and -7 APC; 175mm guns; 105mm SP how; 105 and 155mm how; M-50 SP multiple 106mm recoilless rifles; 36 *HAWK* SAM.
- 3 Air Wings; 550 combat aircraft.
- 12 fighter sqns with F-4B/J (with *Sparrow* and *Sidewinder* AAM).

- 11 attack sqns with A-4E/F/M and A-6A.
- 2 close-support sqns with 36 AV-8A *Harrier*.
- 3 recce sqns with RF-4B/C and EA-6A.
- 3 observation sqns with OV-10A and AH-1G.
- 6 heavy hel sqns with CH-53D.
- 9 med assault hel sqns with CH-46A.
- 3 assault tpt/tanker sqns with 46 KC-130F.

**Deployment:**

- (i) Continental United States: 2 divs/air wings.
- (ii) Pacific Area: 1 div/air wing.

**Reserves:** Authorized strength 45,000, actual strength 39,100.

- 1 div and 1 air wing: 4 fighter sqns with F-8J; 5 attack sqns with A-4E/L; 1 recce sqn with RF-4; 1 observation sqn with OV-10A and AH-1G; 1 tpt sqn with C-119G; 2 hy, 2 med, 1 lt hel sqn with CH-53, CH-46, UH-1E, and AH-1; 1 *HAWK* SAM bn.

**Navy:** 564,400 (9,000 women); 221 major combat surface ships, 84 attack submarines.

**Submarines, attack:** 60 nuclear, 24 diesel.

**Aircraft carriers:**

- (i) Attack: 15.
- 1 nuclear-powered (USS *Enterprise* 76,000 tons); a second will be commissioned in 1973-74.
- 8 *Forrestal/Kitty Hawk*-class (60,000 tons).
- 3 *Midway*-class (52,000 tons).
- 3 *Hancock*-class (33,000 tons).

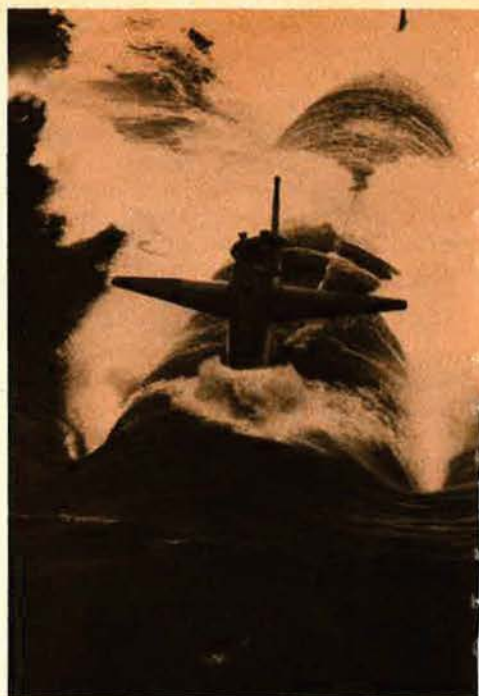
The larger carriers have a normal complement of 80-90 aircraft, and the smaller ones between 70-80. These are organized as an air wing of 2 fighter sqns with F-4 (F-8 in the *Hancock*-class), 2 lt attack all weather attack sqns with A-4 or A-7; RA-5C or RF-8 recce; S-2E, SH-3A/G/H, ASW helicopters; E-1B, E-2A AEW; EKA-3B tankers.

(ii) Training: 1.

- 1 *Hancock*-class.

**Other surface ships:**

- 1 SAM cruiser (nuclear).
- 3 SAM cruisers.
- 1 gun cruiser.
- 4 SAM light cruisers.
- 3 SAM frigates (nuclear).
- 25 SAM frigates.
- 29 SAM destroyers.
- 71 gun/ASW/radar picket destroyers.



US Navy has forty-one missile-carrying, nuclear-powered subs.

- 6 SAM destroyer escorts.
- 62 gun/radar picket escorts.
- 65 amphibious warfare ships.
- 10 MCM ships (plus numerous small craft).
- 150 logistics and operations support ships.
- Missiles include *Standard*, *Tartar*, *Talos*, *Terrier*, *Sea Sparrow* SAM, *ASROC* and *SUBROC* ASW.

**Aircraft:**

- 70 fighter/attack sqns with F-14A, F-4, F-8, A-4, A-6, A-7.
- 10 recce sqns with RA-5C, RF-8.
- 24 maritime patrol sqns with 216 P-3.
- 20 ASW sqns with S-2E, SH-3A/G/H hel.
- 5 helicopter sqns with UH-1J, AH-1J, RH-53D.
- 34 other sqns with C-1, C-2, 5 C-9B, C-54, and C-130.

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

**Second Fleet** (Atlantic): 4 carriers, 63 surface combatants, 1 amphibious ready gp.\*

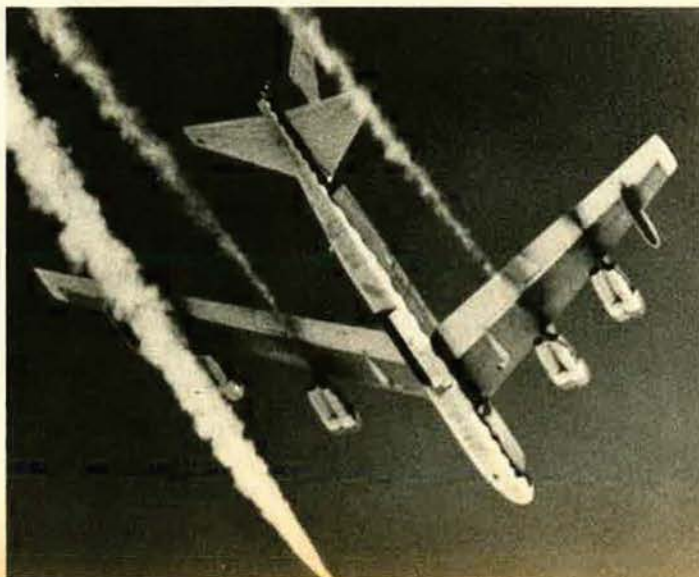
**Third Fleet** (Eastern Pacific): 7 carriers, 52 surface combatants, 4 amphibious ready gps.\*

**Sixth Fleet** (Mediterranean): 2 carriers, 17 surface combatants, 1 amphibious ready gp.\*

**Seventh Fleet** (Western Pacific): 3 carriers, 29 surface combatants, 2 amphibious ready gps.\*

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

**Reserves:** Authorized strength 129,000, actual strength 131,800; 3,500 a year un-



A B-52H launches a SRAM missile. B-52s proved their ability to penetrate heavy surface-to-air missile defenses during *Linebacker II*, last December.

\*Amphibious ready groups are 3-5 amphibious ships with a Marine battalion embarked. Only those in the Mediterranean and two in the Pacific are actually constituted.



dergo short active duty tours. Ships in commission with the Reserve include 30 destroyers, 4 destroyer escorts, and 20 MCM ships.

**Aircraft:**

- 2 Reserve Air Wings: 9 fighter/attack sqns with F-8 and A-7; 24 MR sqns with P-2 and P-3A/B; 25 ASW sqns with S-2.
- 2 ASW groups: 12 patrol sqns with S-2, P-3.

**Ships in reserve:**

- 8 submarines.
- 6 aircraft carriers.
- 4 battleships.
- 12 heavy cruisers.
- 2 SAM light cruisers.
- 43 destroyers.
- 2 frigates.
- 33 destroyer escorts (all classes).
- 8 rocket ships.
- 74 amphibious warfare ships.
- 82 MCM ships craft.
- 75 logistics support ships.

**Air Force:** 691,000 (17,000 women); about 5,750 combat aircraft.

- 72 fighter/attack sqns with F-4, F-105, and F-111; A-7D.
- 13 tactical recce sqns with RF-4C.
- 17 tactical airlift sqns with C-130E.
- 11 special purpose sqns with A-1E, A-37, AC-47, AC-119, AC-130, EA-6B, EB-66, EB-57, EC-47, C-7, and C-123.
- 17 hy tpt sqns, 4 with 72 C-5A, 13 with C-141.
- 24 medical tpt, weather recce, and SAR sqns.

**Deployment:**

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

- (i) Tactical Air Command: 124,000; 2,200 combat aircraft. 9th, 12th, and 19th Air Forces.
- (ii) Military Airlift Command (MAC): 90,000.

**Europe, US Air Forces Europe (USAFE):** 50,000.

3rd Air Force (Britain), 16th Air Force (Spain), 17th Air Force (West Germany), and a logistics group in Turkey.

21 fighter sqns (plus 4 in the US on call) with 420 F-4C/D/E and 72 F-111E.

5 tactical recce sqns with 85 RF-4C.

**Pacific, Pacific Air Forces (PACAF):** 120,000.

5th Air Force in Japan, Korea, Okinawa. 7th Air Force in Thailand.

13th Air Force in the Philippines, Taiwan, Thailand.

**Reserves:**

- (i) Air National Guard: Authorized strength 87,600, actual 90,000; about 650 combat aircraft. 20 fighter-interceptor sqns (ADC); 30 fighter sqns (21 with F-100C/D, 4 with F-105B/D, 1 with F-104, 1 with F-4C, 2 with A-37B, 1 with B-57); 7 recce sqns (4 with RF-101, 3 with RF-4C); 3 strategic tpt sqns with C-124C; 13 tactical tpt sqns (11 with C-130 (A/B/E), 1 with C-123J, 1 with C-7); 9 tanker gps with KC-97L; 1 electronic warfare gp with EC-121 (ADC); 3 special operations gps with C-119/U-10 and 5 tactical air support gps with O-2A.

- (ii) Air Force Reserve: Authorized strength 51,300, actual strength 44,600; about 120 combat aircraft. 4 fighter sqns with F-100, 3 with F-105D; 24 tactical tpt sqns (18 with C-130A/B, 4 with C-123K, 2 with C-7); 1 electronic warfare gp with EC-121; 4 special operations gps with A-37B; 5 SAR gps, 2 with HC-130, 3 with HH-34; and 1 medical tpt gp with C-9A.



The US Army is developing a new tank, the XM-1, as a replacement for the M-60A1 Main Battle Tank, shown here armed with a 105mm gun.

## THE SOVIET UNION

Population: 250,500,000.

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

Total armed forces: 3,425,000.

Estimated NMP 1972: \$439 billion. NMP (Net Material Product) is used because of the difficulty of arriving at an estimate for GNP; it has been converted at the rate of 0.72 roubles=\$1.

Defence budget 1973: See below.

**Strategic Nuclear Forces:**

**Offensive:**

- (A) Navy: 628 SLBM in 66 submarines.
- 3 SSBN (D-class) each with 12 SS-N-8 missiles.
- 31 SSBN (Y-class) each with 16 SS-N-6 missiles.
- 10 SSBN (H-II-class) and 10 diesel (G-II-class) each with 3 SS-N-5 Serb missiles.
- 12 diesel (G-I-class) each with 3 SS-N-4 Sark missiles.

(B) **Strategic Rocket Forces (SRF):** 350,000. (The Strategic Rocket Forces are a separate service with their own manpower.)

**ICBM:** 1,527.

- 209 SS-7 Saddler and SS-8 Sasin.
- 288 SS-9 Scarp.
- 970 SS-11 (including about 100 with variable-range capability sited within IRBM/MRBM fields).
- 60 SS-13 Savage.

**IRBM and MRBM:** about 600.

- 100 SS-5 Skean IRBM.
  - 500 SS-4 Sandal MRBM.
- (The majority are sited near the western border of the USSR, the remainder east of the Urals.)

(C) **Air Force.**

**Long Range Air Force (LRAF):** 840 combat aircraft. (About 75 per cent is based in the European USSR, with most of the remainder in the Far East; in addition it has staging and dispersal points in the Arctic.)

Long-range bombers: 140.

100 Tu-95 Bear and 40 Mya-4 Bison. Tankers: 50 Mya-4 Bison. Medium-range bombers: 700. 500 Tu-16 Badger and 200 Tu-22 Blinder.

**Defensive:**

**Air Defence Forces (PVO-Strany)** form a separate command, comprising an early warning and control system, fighter-interceptor squadrons, and SAM units. Air Defence Forces have a total strength of 500,000, manpower being provided by the Army and Air Force.

**Aircraft:** about 2,900.

**Interceptors:** include about 950 MiG-17, MiG-19, and Yak-25; 800 Su-9; 1,150 Yak-28P Firebar, Tu-28P Fiddler, Su-11 Flagon A, and MiG-25 Foxbat.

**AEW aircraft:** 10 modified Tu-114 Moss.

**Anti-Ballistic Missiles (ABM):**

64 Galosh long-range missile launchers are deployed in four sites around Moscow, each with Try Add engagement radars (another radar of this type is under construction). Target acquisition and tracking is by a phased-array Dog House radar, and early warning is given by phased-array Hen House radar on the Soviet borders. The range of Galosh is believed to be over 200 miles, and its warheads are nuclear, presumably in the megaton range. Work has been resumed on previously uncompleted complexes in the Moscow area. A follow-on long-range ABM system is believed to be under development.

**SAM:** 10,000 launchers at about 1,600 sites.

**SA-2 Guideline:** about 5,000; track-while-scan Fan Song radar; high-explosive warhead; slant range (launcher to target) about 25 miles; effective between 1,000 and 80,000 feet.

**SA-3 Goa:** Two-stage, short-range, low-level missile; slant range about 15 miles.

**SA-4 Ganef:** Twin-mounted (on tracked carrier), air-transportable, long-range missile with solid fuel boosters and ram-jet sustainer.

**SA-5 Griffon:** Two-stage, boosted AA missile; slant range about 50 miles, with a capability against ASM.





The SA-6 Gainful was the most effective of the Soviet-supplied SAMs used against the Israeli Air Force in October.



This Mi-12 helicopter, designed to carry missiles and other bulky cargo, is now in service with the Soviet Air Force.

—Tass Photo

—Tass Photo



The MiG-21, shown here, is among the high-performance fighters of the Soviets' 4,500 tactical aircraft. US pilots who flew against it in SEA rate it highly as an air-superiority fighter.

SA-6 Gainful: Triple-mounted (on tracked carrier), low-level missile. Anti-Aircraft Artillery: 14.5mm, 23mm, 57mm towed guns and ZSU-57-2 57mm twin-barrelled and ZSU-23-4 23mm four-barrelled tracked SP guns; 85mm, 100mm, and 130mm guns.

Army: 2,050,000. 107 motorized rifle divisions. 50 tank divisions. 7 airborne divisions. SSM: (nuclear capable); about 900 (units are organic to formations), including: (1) FROG-1-7, range 10-45 miles. (2) Scud A, range 50 miles. (3) Scud B, range 185 miles. (4) Scaleboard, range 500 miles. SAM: SA-2, SA-4, SA-6, and possibly SA-7 Grail (man-portable).

Tanks: JS 2/3 hy; T-62 and T-54/55 med; PT-76 amphibious recce lt (most Soviet tanks are equipped for amphibious crossing by deep wading, and many carry infra-red night-fighting equipment). At full strength, tank divisions have 316 medium tanks and motorized rifle divisions 188. Production has begun on a new medium tank, the M-1970, and a light tank. AFV: BTR-152, -60, -50P series; BMP APC; BRDM scout car.

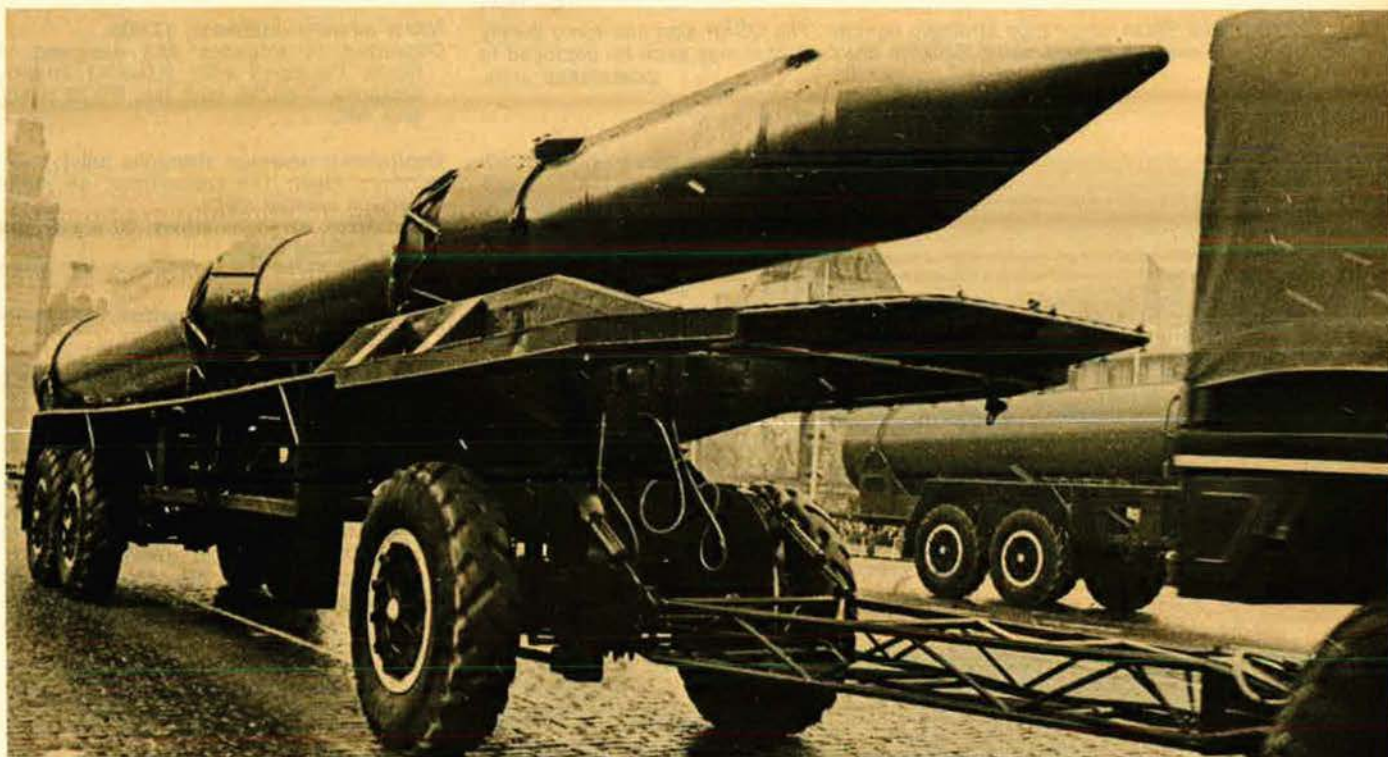
Artillery: 100mm, 122mm, 130mm, 152mm, and 203mm field guns; 12.2mm to 25mm multiple RL; 140mm RL; ASU-57 and ASU-85 SP and 85mm and 100mm ATK guns; Sagger, Snapper, Swatter ATGW; AA guns.

Deployment and Strength: Central and Eastern Europe: 31 divs; 20 divs (10 tank) in East Germany; 2 tank divs in Poland; 4 divs (2 tank) in Hungary; and 5 divs (2 tank) in Czechoslo-





In addition to its sixty-six missile-carrying submarines, the USSR has a large surface navy, including at least forty guided-missile destroyers similar to this Krupny-class vessel.



Russian Strategic Rocket Forces have 970 of these SS-11 ICBMs. Two MIRVed follow-on missiles have been tested this year.

vakia; 7,850 medium tanks. (These are the tanks held in the divisions; there are known to be, in addition, some 1,000 T-54/55 tanks in reserve which have been replaced by T-62 but which have not yet been withdrawn.)

**European USSR:** 60 divs (about 20 tank).

**Central USSR** (between the Volga and Lake Baikal): 5 divs (2 tank).

**Southern USSR** (Caucasus and West Turkistan): 23 divs (4 tank).

**Sino-Soviet border area:** 45 divs, incl 2 in Mongolia (about 8 tank).

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

31 divs in Eastern Europe are Category 1, as are about a third of those in the European USSR and the Far East and a few in the Southern USSR. The remaining divisions in European USSR, Southern USSR, and the Far East are probably evenly divided between Categories 2 and 3. The divisions in Central USSR are likely to be in Category 3.

**Outside the Warsaw Pact area:**

Instructors and advisers: Algeria 1,000, Cuba 1,000, Egypt 1,000, Iraq 1,500, North Vietnam 1,000, Somali Republic 1,000, Syria 2-3,000, Yemen Arab Republic 500, People's Democratic Republic of South Yemen 200.

**Navy:** 475,000 (incl Naval Air Force, 75,000, and Naval Infantry, 17,000); 212 major surface combat ships, 285 attack and cruise missile submarines.

**Submarines:**

**Attack:** 35 nuclear (C-, V-, N-classes), 195 diesel (B-, F-, R-, Q-, Z-, W-classes).

**Long-range cruise missile:** 30 nuclear-powered (E-class) and 25 diesel (J-, W-classes) with 2-8 450-mile range SS-N-3 missiles.

**Surface ships:**

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

2 Kara-class cruisers with SSM and SAM.

4 Kresta I-class cruisers with SSM and SAM.

5 Kresta II-class cruisers with SSM and SAM.

4 Kynda-class cruisers with SSM and SAM.

11 Sverdlov-class (1 with SAM) and 4 older cruisers.

4 Krivak-class destroyers with SSM and SAM.

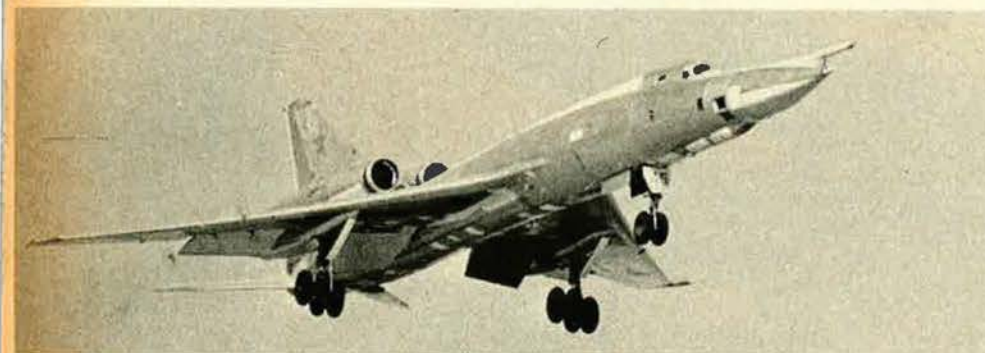
5 Kanin-class destroyers with SAM.





—Tass Photo

The Bison long-range strategic bomber. The USSR also has some twenty long-range supersonic Backfire bombers that may soon be deployed to operational units.



—Tass Photo

About 200 of these medium-range, supersonic Tu-22 Blinder bombers supplement the long-range Bears and Bisons.



The MiG-23 Flogger, a Mach 2 variable-geometry fighter, has been in Soviet operational units for more than a year.

- 3 Krupny-class destroyers with SSM.
- 4 Kildin-class destroyers with SSM.
- 18 Kashin-class destroyers with SAM.
- 6 modified Kotlin-class destroyers with SAM.
- 37 Kotlin- and Skory-class destroyers.
- 103 other ocean-going escorts.
- 250 coastal escorts and submarine chasers.
- 6 Nanuchka-class coastal escorts with SSM and SAM.
- 117 Osa- and 10 Komar-class FPB with Styx SSM.
- 200 torpedo boats.
- 170 fleet minesweepers.

- 125 coastal minesweepers.
- 102 amphibious ships.
- 131 landing craft.
- 6 air cushion vehicles.
- (1 40,000-ton aircraft carrier has been launched, apparently designed to operate V/STOL aircraft and helicopters; a second may be building.)

Some trawlers are used for electronic intelligence. All submarines and the larger surface vessels not fitted with SSM are equipped for minelaying. A proportion of the destroyers and smaller vessels may not be fully manned.

Coasts are covered by a coast watch radar and visual reporting system. Approaches to naval bases and major ports are protected by SS-N-3 Shaddock coast defence missiles and heavy guns under naval command.

- Shore-based aircraft:** about 670 combat aircraft (most based near the north-west and Black Sea coasts of the USSR).
- 300 Tu-16 Badger with one Kipper or two Kelt ASM.
- 60 Tu-22 Blinder strike and reconnaissance.
- 40 Il-28 Beagle torpedo-equipped light bombers.
- 50 Tu-95 Bear long-range naval reconnaissance.
- 150 Tu-16 Badger reconnaissance and tanker.
- 80 Be-2 Mail ASW amphibians.
- 40 Il-38 May ASW aircraft.
- 240 Mi-4 and Ka-25 ASW helicopters.
- 200 miscellaneous transports.

**Naval Infantry (marines):** 17,000. Organized in brigades and assigned to fleets. Equipped with standard infantry weapons, T-54/55 med tks, PT-76 lt tks, and APC.

- Deployment (average strengths only):**
- Northern Fleet:** 170 submarines, 45 major surface combat ships.
- Baltic Fleet:** 43 submarines, 52 major surface combat ships.
- Black Sea Fleet:** 31 submarines, 63 major surface combat ships.
- Pacific Fleet:** 107 submarines, 52 major surface combat ships.

- Air Force:** 550,000; about 8,250 combat aircraft.
- (i) Long Range Air Force (see above).
- (ii) Tactical Air Force: about 4,500 aircraft, incl medium and light bombers and fighter-bombers, fighters, helicopters, transport, and recon aircraft. Some obsolescent MiG-17, MiG-19, and Il-28 are still in service. The most notable high-performance aircraft are the MiG-21MF Fishbed J and MiG-23 Flogger fighters, the ground attack Su-7 Fitter, and the Yak-28 Brewer light bomber.
- (iii) Air Defence Forces (see above).
- (iv) Air Transport Force: about 1,700 aircraft. Il-14, An-8, An-24, some 800 An-12 and Il-18 medium tpts, and 15 An-22 heavy tpts.
- 1,750 hel (about 800 Mi-6, Mi-8, Mi-10, and Mi-12).

**Deployment:** About half the Tactical Air Force is oriented towards Western Europe and a quarter towards China. Some 1,250 aircraft are actually deployed in Eastern Europe.

**Reserves:** about 3,000,000 (500,000 with recent training earmarked for divisional reinforcements).

**Para-Military Forces:** 300,000. 125,000 security troops; 175,000 KGB border troops. There are also about 1.5 million members of the part-time military training organization (DOSAAF) who take part in such recreational activities as athletics, shooting, and parachuting, but reservist training and refresher courses seem to be haphazard and irregular. However, DOSAAF assists in pre-military training given in schools, colleges, and workers' centres to those of 15 and over.



## Soviet Defence Expenditure

No single figure of Soviet defence expenditure in dollar terms can be given, as precision is not possible on present knowledge.

Budgetary information is lacking. The Soviet defence budget, which has remained implausibly static at just under 18 billion roubles a year since 1969, excludes a number of items: 'military R&D, stockpiling, civil defence, foreign military aid, as well as space and nuclear energy programs';<sup>1</sup> and also frontier guards and other security troops.<sup>2</sup> The largest of these missing items is military R&D, much of which is thought to be financed out of the growing votes for science. The All-Union science budget has grown at a rate of 9 per cent per year since 1969, equivalent to doubling over eight years, to reach an estimated level of 8.4 billion roubles in 1973. Between 1950 and 1957, a period for which detailed statistics were available, 56-75 per cent of the All-Union science budget was unidentified.<sup>3</sup> Becker assumed all these unidentified items to be defence-related, justifying this on the grounds that even if this were an overstatement it would compensate for other defence-related R&D in the unidentified residuals of the budgets for Higher Education Institutions and Enterprises; he suggests that 25-75 per cent of such residuals might be defence-related. Anderson and Lee estimate that 50-80 per cent of Enterprises 'own funds' and 70-80 per cent of the All-Union science budget are defence-related.<sup>4</sup> Cohn gives a much wider range of 50-100 per cent of the All-Union science budget as being defence-related.<sup>5</sup>

An alternative method, which gives an insight into Soviet expenditure on defence equipment in particular, has been attempted by both Becker and Boretsky.<sup>6</sup> They have each attempted to estimate the proportion of Soviet machine building which is defence-related and then to find a rouble exchange rate which, when applied to the rouble estimate of defence-related machine production, results in a dollar estimate of what it would cost to produce the equivalent machines in the United States. Such an estimate, in conjunction with an allowance for manpower costs, produces an impression of Soviet defence spending. Unfortunately most published data still relates to 1955, and it is difficult to up-date this. In particular Soviet prices are known to have been revised, notably in 1967. A controversy has centred on Boretsky's rouble estimate of defence-related machine production, as well as on his exchange rate for converting the rouble value of machinery into dollars (0.32 roubles = \$1).<sup>7</sup>

The overall defence rouble exchange rate, as opposed to that for defence equipment, has ranged from 0.40 to 0.50 roubles to \$1. Bornstein suggests 0.40 roubles to \$1 in 1955;<sup>8</sup> Benoit and Lubell give 0.42 roubles to \$1 in 1962,<sup>9</sup> and Lee presents a set of rising ranges which reaches 0.45-0.50 roubles to \$1 by 1965.<sup>10</sup> Lee's implicit growth rate of 1-2 per cent would suggest a range of 0.50-0.55 roubles to \$1 by 1973. His rising trend was based on the belief that development costs for the Soviet Union were rising more rapidly than in the United States, but overall inflation in the United States (the wholesale price index has risen at the annual rate of 3 per cent since 1965) may have offset such a trend, if not actually reversed it. Lee himself acknowledges two schools of thought on this matter. There exists, therefore, a degree of uncertainty over the correct defence rouble exchange rate.

An example will illustrate the cumulative impact of the several uncertainties. If the Cohn assumption (50-100 per cent of the All-Union science budget) is taken for 1973 and added to the official Soviet defence budget, it produces a range of 22.1-26.3 billion roubles, which gives a + or - variation of 9 per cent around the mid-point. The range is widened still further when a rouble exchange rate range of 0.40 to 0.55

roubles to \$1 is taken. This gives a maximum range of \$40.2-\$65.8 billion, which gives a 24 per cent + or - variation around the mid-point. The defence expenditure figure at once becomes more speculative when converted into dollar terms.

The Institute's own inclination is to base an estimate on a more precise allowance for manpower costs. For FY 1973 United States military manpower-related costs amount to 40 per cent of total Department of Defense outlays<sup>11</sup> and National Guard, Reserves, and Civilians ('others') accounted for an additional 16 per cent. Assuming the same percentages for FY 1974 this would give for the calendar year 1973 a military manpower cost of \$30.8 billion and a total for 'others' of \$12.3 billion. In mid-1973 there were 2,288,000 servicemen and 1,982,000 others,<sup>12</sup> giving an average cost per serviceman of \$13,444 and an average cost per head of other personnel of \$6,208. Soviet military manpower in mid-1973 is estimated at 3,425,000. Security and border guards number around 300,000, and, in addition, there are reserves and some civilians. Though the organization and training of reserves in the Soviet Union differs from that in the United States, a figure of 700,000 would cover the number of reserves of comparable preparedness to those in the United States, as well as civilians. Using these figures the equivalent dollar costs of Soviet military manpower are \$46.0 billion and of other personnel \$6.2 billion.

It has been asserted that 30-35 per cent of the Soviet defence budget is personnel-related.<sup>13</sup> To the remainder may be added 70-80 per cent of the All-Union science budget, assumed to cover defence-related R&D, producing a non-manpower cost range of 17.5-19.2 billion roubles. If this is converted at the rate of 0.5 roubles to \$1 it gives \$35.0-\$38.4 billion. When this is added to the dollar manpower costs arrived at above a total range of \$87.2-\$90.6 billion results. If 'others' were excluded from the calculation the range would be \$81.0-\$84.4 billion. This would suggest that the equivalent dollar costs of Soviet resources devoted to defence may well be comparable to American spending and perhaps well above it. It must be borne in mind, however, that this method uses United States price weightings. The relationships could be very different if Soviet prices were used as weights instead.

<sup>1</sup> A. S. Becker, *Soviet Military Outlays Since 1955* (Santa Monica, Calif.: RAND Corporation, July 1964), p. v.

<sup>2</sup> *The Military Balance 1970-71*, p. 11.

<sup>3</sup> Nancy Nimitz, *Soviet Expenditure on Scientific Research* (Santa Monica, Calif.: RAND Corporation, January 1963), p. 45.

<sup>4</sup> S. Anderson and W. Lee, *Probable Trends and Magnitude of Soviet Expenditure for National Security Purposes* (Stanford, Calif.: Stanford Research Institute, February 1969).

<sup>5</sup> Stanley H. Cohn, 'Economic Burden of Soviet Defense Expenditure', in *Economic Performance and the Military Burden in the Soviet Union* (Washington, D.C.: Congress of the United States, 1970), pp. 166-88.

<sup>6</sup> Michael Boretsky, 'The Technological Base of Soviet Military Power' in *Economic Performance and the Military Burden in the Soviet Union*, op. cit., pp. 189-231.

<sup>7</sup> *Survival*, October 1971; July/August 1972.

<sup>8</sup> Morris Bornstein, 'A Comparison of Soviet and United States National Product', in *Sub-Committee on Economic Statistics of the Joint Economic Committee* (Washington, D.C., 1960), pp. 377-95.

<sup>9</sup> Emile Benoit and Harold Lubell, 'The World Burden of National Defense' in Emile Benoit, ed., *Disarmament and World Economic Interdependence* (New York and London: Columbia University Press, 1967).

<sup>10</sup> W. T. Lee, 'Calculating Soviet National Security Expenditures', in *Sub-Committee in Government of the Joint Economic Committee, The Military Budget and National Economic Priorities, Part 3* (Washington, D.C., June 1969), pp. 932-33.

<sup>11</sup> *Military Manpower Requirements Report for FY 1973* (Washington, D.C.: Department of Defense, February 1972), p. 101.

<sup>12</sup> This is the total budgeted for; see *Statement of Secretary of Defense Elliot L. Richardson FY 1974 Defense Budget and FY 1974-78 Program* (Washington, D.C.: The House Armed Services Committee, March 1973); see country entry for actual total.

<sup>13</sup> *Secretary of Defense Melvin R. Laird's Annual Defense Department Report FY 1973* (Washington, D.C.: The House Armed Services Committee, February 1972).



# The Warsaw Pact



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## TREATIES

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

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

## ORGANIZATION

The Political Consultative Committee consists, in full session, of the First Secretaries of the Communist Party, Heads of Government, and the Foreign and Defence Ministers of the member countries. The Committee has a joint Secretariat, headed by a Soviet official, consisting of a specially appointed representative from each country, and a Permanent Commission, whose task it is to make recommendations on general questions of foreign policy for Pact members. Both these bodies are located in Moscow. Since the 1969 re-organization of the Pact the non-Soviet Ministers of Defence are no longer directly subordinate to the Commander-in-Chief of the Pact, but form, together with the Soviet Minister, the

Council of Defence Ministers, which is the highest military body in the Pact.

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

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

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



## BULGARIA

Population: 8,660,000.

Military service: Army and Air Force, 2 years; Navy, 3 years.

Total regular forces: 152,000.

Estimated GNP 1972: \$11.1 billion.

Defence budget 1973: 422 million leva (\$301 million).

1.4 leva=\$1.

**Army:** 120,000.

(East European Warsaw Pact formations are not all manned at the same level. They can be regarded as being in two categories: Category 1 formations up to three-quarters of establishment strength; Category 2 (shown here and throughout this section as cadre); unlikely to be at more than a quarter of establishment strength.)

8 motorized rifle divisions (3 cadre).

5 tank brigades.

Some hy tks; about 2,000 med tks mainly T-54, with some T-34 and T-55; PT-76 lt tks; BRDM scout cars; BTR-50, BTR-60, and BTR-152 APC; 85mm, 100mm, 122mm, 130mm, and 152mm guns; SU-100 SP guns; FROG and Scud SSM; 57mm and 85mm ATK guns; Sagger and Snapper ATGW; 37mm and 57mm AA guns.

Reserves: 250,000.

**Navy:** 10,000.

2 W-class submarines.

2 Riga-class escorts.

8 SOI- and Kronstadt-type coastal escorts.

20 MCM ships.

5 Osa-class patrol boats with Styx SSM.

20 coastal patrol boats.

15 motor torpedo boats (8 less than 100 tons).

20 landing craft.

6 Mi-4 helicopters.

Reserves: 10,000.

**Air Force:** 22,000; 252 combat aircraft.

6 fighter-bomber squadrons with MiG-17.

3 interceptor squadrons with MiG-21.

3 interceptor squadrons with MiG-19.

6 interceptor squadrons with MiG-17.

1 reconnaissance squadron with Il-28.

2 recce sqns with MiG-15, MiG-17, and MiG-21.

(12 aircraft in a combat squadron.)

4 Li-2, 6 An-2, and 10 Il-14 transports.

About 40 Mi-4 helicopters.

SA-2 SAM.

1 parachute regiment.

Reserves: 20,000.

**Para-Military Forces:** 17,000, including border guards; security police; a volunteer People's Militia of 150,000.

## CZECHOSLOVAKIA

Population: 14,600,000.

Military service: Army 24 months; Air Force 27 months.

Total regular forces: 190,000.

Estimated GNP 1972: \$32.9 billion.

Defence budget 1973: 16.7 billion koruny (\$1,336 million).

12.5 koruny=\$1.

**Army:** 150,000.

5 tank divisions.

5 motorized rifle divisions (2 cadre).

1 airborne brigade.

Some hy tanks; about 3,400 med tks, mostly T-55 and T-62 with some T-54 and T-34; OT-65 scout cars; OT-62 and OT-64 APC; SU-100, SU-122, and JSU-152 SP guns; 122mm how; 82mm and 120mm mor; FROG and Scud SSM; 57mm, 85mm, and 100mm ATK guns; Sagger, Snapper, and Swatter ATGW; 23mm and 57mm AA guns.

About 200 Mi-1 and Mi-4 hel.

Reserves: 300,000.

**Air Force:** 40,000; 504 combat aircraft.

12 FGA sqns with Su-7, MiG-15, and MiG-17.

18 interceptor squadrons with MiG-19 and MiG-21.

6 recce sqns with MiG-21, Il-28, and L-29. (14 aircraft in a combat squadron.)

About 50 An-24, Il-14, and Il-18 transports.

About 90 Mi-1, Mi-4, and Mi-8 helicopters. SA-2 SAM.

Reserves: 50,000.

**Para-Military Forces:** Border troops (*Pohranicki straz*), 35,000 (subordinate to the Ministry of the Interior). A part-time People's Militia of about 120,000 is being increased to 250,000.

## GERMAN DEMOCRATIC REPUBLIC

Population: 17,000,000.

Military service: 18 months.

Total regular forces: 132,000.

Estimated GNP 1972: \$35.3 billion.

Defence budget 1973: 8,328 million Ostmarks (\$2,031 million).

4.1 Ostmarks=\$1.

**Army:** 90,000.

2 tank divisions.

4 motorized rifle divisions.

Some hy tks; about 2,000 med tks, T-54, T-55, and T-62; several hundred PT-76 lt tks; BRDM scout cars; BTR-50P, BTR-60P, and BTR-152 APC; SU-100 SP guns; 85mm, 122mm, 130mm, and 152mm guns; FROG 7 and Scud B SSM; 57mm and 100mm ATK guns; Sagger, Snapper, and Swatter ATGW; 23mm and 57mm SP AA guns and 100mm AA guns.

Reserves: 200,000.

**Navy:** 17,000.

2 Riga-type escorts.

25 coastal escorts.

12 Osa-class patrol boats with Styx SSM.

26 SOI- and Hai-type submarine chasers.

12 fleet and 45 medium minesweepers.

63 motor torpedo boats (45 less than 100 tons).

18 landing ships and craft.

8 Mi-4 helicopters.

Reserves: 20,000.

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

2 interceptor squadrons with MiG-17.

18 interceptor squadrons with MiG-21.

(16 aircraft in a combat squadron.)

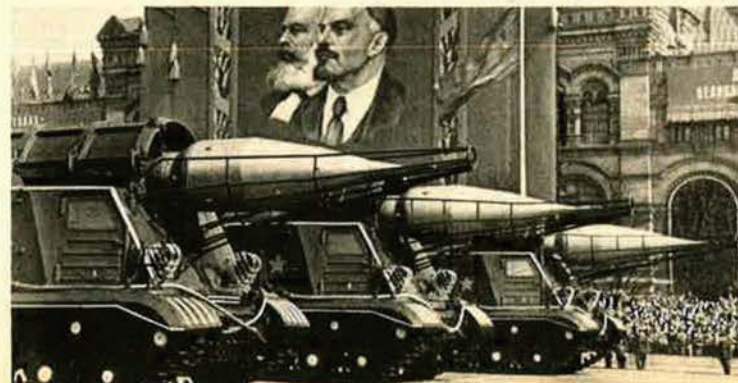
30 transports, including An-2, Il-14, and Il-18.

40 Mi-1, Mi-4, and Mi-8 helicopters.

1 AD div of 9,000 (5 regiments), with about 120 57mm and 100mm AA guns and SA-2 SAM.



Warsaw Pact countries are armed almost completely with Soviet-made or -designed equipment. This Il-18 is an example of Soviet-supplied support equipment.



All Pact forces have Frog and Scud surface-to-surface missiles. The Frog, shown here, has a range of about thirty miles; the Scud, about eighty miles. Egypt also has been provided Soviet surface-to-surface missiles.





The Polish-designed Iskra jet trainer, developed in the early 1960s, set four international speed records in its class in September 1964.



More than 2,500 of these Czech-built Delfin trainers are in use in the USSR, Warsaw Pact countries, and Middle East and African air forces.

Reserves: 30,000.

**Para-Military Forces:** 80,000.

46,000 Border Guards (*Grenzschutztruppen*) including a Border Command separate from the regular army. 24,000 security troops plus 400,000 in armed workers' organizations (*Kampfgruppen der Arbeiterklasse*).

## HUNGARY

Population: 10,450,000.

Military service: 2 years.

Total regular forces: 103,000.

Estimated GNP 1972: \$15.3 billion.

Defence budget 1973: 16,117 million forints (\$695 million).

23.2 forints=\$1.

**Army:** 90,000.

1 tank division.

4 motorized rifle divisions (2 cadre).

Some hy tks; about 1,500 med tks, mainly T-55 and T-54; some T-34 for training; 50 PT-76 lt tks; FUG-M and OT-65 scout cars; FUG-M-1970, OT-64, and BTR-152 APC; 76mm, 85mm, and 122mm guns; 122mm and 152mm how; FROG and Scud SSM; 57mm ATK guns; Sagger, Snapper, and Swatter ATGW; 57mm twin SP AA guns.

Reserves: 150,000.

**Navy:** 500.

Danube River Guard of small patrol craft.

**Air Force:** 12,500; 108 combat aircraft.

9 interceptor sqns with 108 MiG-17 and MiG-21.

About 25 An-2, Il-4, and Li-2 transport aircraft.

About 15 Mi-1, Mi-4, and Mi-8 helicopters. 2 SAM battalions with SA-2.

Reserves: 13,000.

**Para-Military Forces:** 27,000 security and border guard troops; 250,000 workers' militia.

## POLAND

Population: 33,725,000.

Military service: Army and Air Force, 2 years; Navy and special services, 3 years; internal security forces, 27 months.

Total regular forces: 280,000.

Estimated GNP 1972: \$44.5 billion.

Defence budget 1973: 39.21 billion zloty (\$1,799 million).

21.8 zloty=\$1.

**Army:** 200,000.

5 tank divisions.

8 motorized rifle divisions (2 cadre).

1 airborne division.

1 amphibious assault division.

Some hy tks; 3,400 med tks, T-54, T-55, and some T-62; some T-34 for training; about 250 PT-76 lt tks; FUG and BRDM scout cars; OT-62, OT-64, and BTR-152 APC; ASU-57 and ASU-85 AB assault guns; 122mm guns, 122mm how, and 152mm gun/how; FROG and Scud SSM; 57mm, 85mm, and 100mm ATK guns; Sagger, Snapper, and Swatter ATGW; 23mm and 57mm SP AA guns.

Reserves: 500,000.

**Navy:** 25,000 (including 1,000 marines).

5 W-class submarines.

4 destroyers (1 *Kotlin*-class with SA-N-1).

30 coastal escorts/submarine chasers. 24 fleet and 25 inshore minesweepers. 12 Osa-class patrol boats with Styx SSM. 20 torpedo boats. 38 fast patrol boats. 16 landing ships. 55 naval aircraft, mostly MiG-17, with a few Il-28 lt bomber/recce and some helicopters.

Reserves: 40,000.

**Air Force:** 55,000; 696 combat aircraft.

4 light bomber squadrons with Il-28.

12 fighter-bomber sqns with MiG-17 and Su-7.

36 interceptor squadrons with MiG-15, MiG-17, MiG-19, and MiG-21.

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

(12 aircraft in a combat squadron.)

About 45 An-2, An-12, An-24, Il-12, Il-14, Il-18, and Li-2 transports.

40 helicopters, including Mi-1, Mi-4, and Mi-8.

SA-2 SAM.

Reserves: 60,000.

**Para-Military Forces:** 73,000 security and border troops, including armoured brigades of the Territorial Defence Force; 20 small patrol boats are operated.

## RUMANIA

Population: 20,900,000.

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

Total regular forces: 170,000.

Estimated GNP 1972: \$26.5 billion.

Defence budget 1973: 7.92 billion lei (\$528 million).

15.0 lei=\$1.

**Army:** 141,000.

2 tank divisions.

7 motorized rifle divisions.

1 mountain brigade.

1 airborne regiment.

Some hy tks; 1,700 T-34, T-54, T-55, and T-62 med tks; BTR-40, BTR-50P, and BTR-152 APC; SU-100 SP guns; 76mm, 122mm, and 152mm guns; FROG and Scud SSM; 57mm, 85mm, and 100mm ATK guns; Sagger, Snapper, and Swatter ATGW; 37mm, 57mm, and 100mm AA guns.

Reserves: 250,000.

**Navy:** 8,000.

6 Poti- and Kronstadt-class coastal escorts.

5 Osa-class patrol boats with Styx SSM.

24 MCM ships.

12 motor torpedo boats.

4 Mi-4 helicopters.

Reserves: 10,000.

**Air Force:** 21,000; 252 combat aircraft.

20 interceptor squadrons with MiG-17, MiG-19, and MiG-21.

1 reconnaissance squadron with Il-28.

(12 aircraft in a combat squadron.)

1 transport squadron with Il-14 and Li-2.

10 Mi-4 helicopters.

SA-2 SAM.

Reserves: 25,000.

**Para-Military Forces:** 40,000 including border troops; militia of about 500,000.



# The North Atlantic Treaty



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## TREATIES

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

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

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

## ORGANIZATION

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

In 1966, France left the integrated military organization and the 14-nation Defence Planning Committee (DPC), on which France does not sit, was formed. It meets at the same levels as the Council and deals

with questions related to NATO's integrated military planning and other matters in which France does not participate. The Secretary-General and an international staff advise on the politico-military, financial, economic, and scientific aspects of defence planning.

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

The second, the Nuclear Planning Group (NPG), derived from and subordinate to the NDAC, has seven or eight members, and is intended to go further into the details of topics raised there. The composition consists, in practice, of Britain, Germany, Italy, and the United States, plus three or four other member countries serving in rotation each for a term of 18 months. On 1 July 1973, there were four such members: Canada, Greece, the Netherlands, and Norway. The Secretary-General also chairs the NPG.

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

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



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

The Supreme Allied Commander Europe (SACEUR) and the Supreme Allied Commander Atlantic (SACLANT) have always been American officers; and the Commander-in-Chief Channel (CINCCHAN) and Deputy SACEUR and Deputy SACLANT British. SACEUR is also Commander-in-Chief of the United States Forces in Europe.

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

The European Command has some 7,000 tactical nuclear warheads in its area. The number of delivery vehicles (aircraft, missiles, and howitzers) is over 2,000, spread among all countries, excluding Luxembourg. The nuclear explosives themselves, however, are maintained, with the exception of certain British weapons, in American custody. (There are additionally French nuclear weapons in France.) Tactical nuclear bombs and missile warheads are all fission. There is a very wide range in the kiloton spectrum, but the average yield of the bombs stockpiled in Europe for the use of NATO tactical aircraft is about 100 kilotons, and of the missile warheads, 20 kilotons.

About 60 division equivalents are available to SACEUR in peacetime. The Command has some 2,750 tactical aircraft, based on about 150 standard NATO airfields and backed up by a system of jointly financed storage depots, fuel pipelines, and signal communications. The majority of the land and air forces stationed in the Command are assigned to SACEUR, while the naval forces are normally earmarked.

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

The ACE Mobile Force (AMF) has been formed as a NATO force with particular reference to the northern and south-eastern flanks. Formed by eight countries, it comprises eight infantry battalion groups, an armoured reconnaissance squadron, and ground-support fighter squadrons, but has no air transport of its own.

The following Commands are subordinate to Allied Command Europe:

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

The forces of the Central European Command include 22 divisions, assigned by Belgium, Britain, Canada, West Germany, the Netherlands, and the United States, and about 1,600 tactical aircraft.

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

(b) *Allied Forces Northern Europe* (AFNORTH) has its headquarters at Kolsaas, Norway, and is responsible for the defence of Denmark, Norway, Schleswig-Holstein, and the Baltic Approaches. The commander has always been a British general. Most of the Danish and Norwegian land, sea, and tactical air forces are earmarked for it, and most of their active reserves assigned to it. Germany has assigned one division, two combat air wings, and her Baltic fleet. Apart from exercises and some small units, US naval forces do not normally operate in this area.

(c) *Allied Forces Southern Europe* (AFSOUTH) has its headquarters at Naples, and its commander (CINC SOUTH) has always been an American admiral. It is responsible for the defence of Italy, Greece, and Turkey, and for safeguarding communications in the Mediterranean and the Turkish territorial waters of the Black Sea. The formations available include 17 divisions from Turkey, 8 from Greece, and 11 from Italy, as well as the tactical air forces of these countries. Other formations from these three countries have been earmarked for AFSOUTH, as have the United States 6th Fleet and naval forces from Greece, Italy, Turkey, and Britain. The ground-defence system is based on two separate commands: Southern, comprising Italy and the approaches to it, under an Italian commander, and South-Eastern, comprising Greece and Turkey, under an American commander. There is, however, an overall air command and there is a single naval command (NAVSOUTH), responsible to AFSOUTH with headquarters in Naples.

A special air surveillance unit, Maritime Air Forces Mediterranean (MARAIMED), is now operating Italian, British, and American patrol aircraft from bases in Greece, Turkey, Sicily, and Italy; French aircraft are participating in these operations. Its commander, an American rear-admiral, is immediately responsible to CINC SOUTH.

The Allied On-Call Naval Force for the Mediterranean (NAVOCFORMED) has consisted of at least three destroyers, contributed by Italy, Britain, and the United States, and three smaller ships provided by other Mediterranean countries, depending upon the area of operation.

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

In the event of war, its duties are to participate in the strategic strike and to protect sea communications. There are no forces assigned to the command in peacetime except Standing Naval Force Atlantic (STANAVFORLANT), which normally consists, at any one



time, of four destroyer-type ships. However, for training purposes and in the event of war, forces which are predominantly naval are earmarked for assignment by Britain, Canada, Denmark, Netherlands, Portugal, and the United States. There are arrangements for co-operation between French naval forces and those of SACLANT. There are five subordinate commands; Western Atlantic Command, Eastern Atlantic Command, Iberian Atlantic Command, Striking Fleet Atlantic, and Submarine Command. The nucleus of the Striking Fleet Atlantic has been provided by the American 2nd Fleet with up to six attack carriers; carrier-based aircraft share the nuclear strike role with missile-firing submarines.

(iii) ALLIED COMMAND CHANNEL (ACCHAN) has its headquarters at Northwood, near London. The wartime role of Channel Command is to exercise control of the English Channel and the southern North Sea. Many of the smaller warships of Belgium, Britain, and the Netherlands are earmarked for this Command, as are some maritime aircraft. There are arrangements for co-operation with French naval forces. The commander is a British admiral. A Standing Naval Force, Channel (STANAVFORCHAN) was formed on 2 May 1973, to consist of mine counter-measures ships from Belgium, the Netherlands, and Britain; other interested nations might participate on a temporary basis. Its operational command is vested in the Commander-in-Chief, Channel Command.

## POLICY

Political guidelines agreed between NATO members in 1967 include the concept of political warning time in a crisis and the possibility of distinguishing between an enemy's military capabilities and his political intentions. The strategic doctrine defined by the DPC in December 1967 envisaged that NATO would meet attacks on its territory with whatever force levels were appropriate, including nuclear weapons.

In June 1968, at the Ministerial Meeting at Reykjavik, the Council called on the countries of the Warsaw Pact to join in discussions of mutual force reductions, reciprocal and balanced in scope and timing. Preliminary talks on negotiating procedures and agendas took place in the first half of 1973 and further negotiations, for which guidelines but no agenda have been agreed, were to begin in Vienna on 30 October 1973. The aim is to secure practical arrangements that will ensure undiminished security for all parties at lower levels of forces in Central Europe.

## BELGIUM

Population: 9,800,000.  
 Military service: 12-15 months. (Conscripts serve 12 months if posted to Germany, 15 months if serving only in Belgium. A reduction to 10 and 12 months respectively is being studied.)  
 Total armed forces: 89,600.  
 Estimated GNP 1972: \$35.5 billion.  
 Defence budget 1973: 35,648 million francs (\$990 million).  
 43.8 francs=\$1 1 July 1972.  
 35.99 francs=\$1 1 July 1973.

**Army:** 65,000.  
 1 armoured brigade.  
 3 mechanized infantry brigades.  
 3 reconnaissance battalions.  
 3 motorized infantry battalions.  
 1 para-commando regiment.  
 3 artillery battalions.  
 3 combat engineer battalions.  
 2 SSM battalions with 8 *Honest John* launchers.  
 2 SAM battalions with 24 *HAWK* launchers.  
 4 air sqns with 75 *Alouette II* hel and 11 *Do-27*.  
 334 *Leopard* and 148 *M-47* med tks; 90 *M-41* lt tks; 1,000 *M-75* and *AMX APC* (there is a programme for procurement of 700 light armoured vehicles, including *Scorpion* lt tks); 106 *M-108* 105mm, *M-44* and *M-109* 155mm, and *M-110* 203mm SP how; 203mm how; *Honest John* SSM (being replaced by *Lance*); *HAWK* SAM.

**Deployment:**  
 Germany: 2 div HQ, 1 armed bde, and 3 mech inf bdes.

**Reserves:** 8,000 trained: 1 mech inf bde and one inf bde.

**Navy:** 4,600.  
 7 ocean minesweepers/minehunters.  
 9 coastal minesweepers/minehunters.  
 12 inshore minesweepers.  
 2 support ships.  
 2 *S-58* and 3 *Alouette III* helicopters.

**Reserves:** 7,600 trained.

**Air Force:** 20,000; 144 combat aircraft.  
 2 fighter-bomber squadrons with *F-104G*.  
 3 fighter-bomber squadrons with *Mirage-VBA*.  
 2 *AWX* squadrons with *F-104G*.  
 1 reconnaissance squadron with *Mirage-VBR*.  
 (A combat squadron normally has 18 aircraft.)  
 2 tpt sqns with 12 *C-130 Hercules*, 4 *DC-3*, 12 *Pembroke*, and 4 *DC-6*.  
 5 *HSS-1* and 6 *S-58* hel.  
 8 SAM squadrons with 16 *Nike-Hercules*.

**Para-Military Forces:** 15,000 Gendarmerie.

## BRITAIN

Population: 56,250,000.  
 Military service: voluntary.  
 Total armed forces: 361,500 (including 9,300 enlisted outside Britain).  
 Estimated GNP 1972: \$151 billion.  
 Defence budget 1973-74: £3,365 million (\$8,673 million).  
 £0.413=\$1 1 July 1972.  
 £0.388=\$1 1 July 1973.

**Strategic Forces:**  
**SLBM:** 4 SSBN each with 16 *Polaris A3*

missiles. Ballistic Missile Early Warning System (BMEWS) station located at Flyingdales.

**Army:** 177,000 (incl 7,900 enlisted outside Britain).  
 13 armoured regiments.  
 5 armoured reconnaissance regiments.  
 47 infantry battalions.  
 3 parachute battalions.  
 5 Gurkha battalions.  
 1 special air service (SAS) regiment.  
 2 regts with *Honest John* SSM launchers and 203mm SP how.  
 23 other artillery regiments.  
 1 SAM regiment with 12 *Thunderbird* launchers.  
 14 engineer regiments.  
 59 of the above units are organized in 5 armd, 10 mech or inf, 1 para, and 1 Gurkha bdes.  
 900 *Chieftain* and *Centurion* med tks; *Scorpion* lt tks; *Saladin* armd cars; *Ferret* scout cars; *FV 432*, *Saracen* APC; 105mm *Abbot* and *M-107* 175mm SP guns; *M-109* SP how; 12 *M-110* 203mm SP how; *Model 56*-105mm pack how; *Honest John* SSM (*Lance* on order); *Carl Gustav*, *Vigilant*, and *Swingfire* ATGW; *L-40/70* AA guns; *Thunderbird* SAM (*Rapier* on order); 2 *SRN-6*, 2 *CC-7* hovercraft.  
 2 Army Aviation wings of 17 sqns and 8 indep flights with 24 *Beaver* lt ac; 120 *Scout*, 12 *Alouette AH-2*, 175 *Sioux* hel (150 *Lynx*, 30 *Gazelle* on order).

**Deployment:**  
 United Kingdom: Land element of United Kingdom Mobile Force (UKMF) (1 div, 4 bdes, and 1 para bde); 1 SAS regt, 1 Gurkha inf bn. HQ Northern Ireland with 3 bde HQ, 1 armd recce regt, 3 armd



recec sqns, 3 field engr sqns, 17 units, and 4 army aviation sqns.

**Germany:** British Army of the Rhine (BAOR), of 54,900 includes 1 corps HQ, 3 div HQ, 5 armd bdes, 1 mech bde, 2 arty bdes (incl the *Thunderbird* SAM regt), and 2 armd recce regts. In Berlin there is one 3,000-strong inf bde. (Some units from BAOR are serving on short tours in Northern Ireland, being away from Germany for up to six months. Numbers involved averaged 3,500.)

**Singapore:** 1 inf bn group (part of the ANZUK force).

**Brunei:** 1 Gurkha bn.

**Hong Kong:** 2 bdes with 2 British and 3 Gurkha inf bns; 1 arty regt.

**Cyprus:** 1 inf bn and 1 air-portable recce sqn with UN force (UNFICYP); 1 inf bn and 1 armd recce sqn in garrison at Sovereign Base Areas.

**Gibraltar:** 1 inf bn.

**British Honduras:** 1 bn HQ and 2 inf coys.

**Reserves:** 300,000 regular reserves, 59,300 volunteer reserves; 9,200 Ulster Defence Regiment.

**Navy:** 81,000 (including Fleet Air Arm, Royal Marines, and 800 enlisted outside Britain); 78 major surface combat vessels.

**Submarines, attack:**

6 nuclear (1 more to come into service in 1973, a second in 1974); 22 diesel.

**Surface ships:**

1 aircraft carrier.

2 commando carriers.

2 assault ships.

2 cruisers with *Seacat* SAM.

9 destroyers (8 with *Seaslug I* and *Seacat II* SAM, 1 with *Sea Dart* SAM and *Ikara* ASW msls), each with 1 ASW hel.

35 general purpose frigates (12 with *Seacat*, 1 with *Ikara*), each with 1 ASW hel.

20 ASW frigates (9 with *Seacat* and 1 ASW hel).

3 AA and 4 aircraft direction frigates.

38 coastal minesweepers/minehunters.

6 inshore minesweepers.

5 coastal patrol vessels.

6 patrol/seaward defence boats.

(Included in the above are the following ships in reserve or undergoing refit or conversion: 6 diesel submarines, 1 destroyer, 10 frigates, 2 minesweepers.)

**The Fleet Air Arm:** 30 combat aircraft.

1 strike squadron with 12 *Buccaneer* S2 with *Martel* ASM.

1 air defence squadron with 12 F-4K.

1 AEW sqn with 6 *Gannet*.

8 hel sqns with *Wessex*.

3 hel sqns with *Sea King*.

3 hel sqns with *Wasp* and *Whirlwind*.

(100 *Lynx* hel on order.)

**The Royal Marines:** 8,000.

1 commando bde with 3 commandos; SRN 6 Mk. 5 hovercraft.

**Deployment:**

**Malta:** 1 commando.

**Falkland Islands:** 1 detachment.

**Gibraltar:** 1 detachment.

**Reserves** (naval and marines): 27,500 regular and 7,000 volunteers.

**Air Force:** 103,500 (incl 600 enlisted outside Britain); about 500 combat aircraft. 6 medium bomber squadrons with *Vulcan* B2.

3 strike squadrons with *Buccaneer*.

1 FGA squadron with *Hunter* (a second forming).

7 strike/attack/recce sqns with F-4M.

4 close support squadrons with *Harrier*.

8 air defence squadrons with *Lightning*.

1 air defence squadron with F-4K.

1 recce squadron with 15 *Victor* SR2.

4 recce squadrons with *Canberra*.

1 AEW squadron with *Shackleton*.

6 maritime patrol squadrons with *Nimrod*.

(Combat squadrons have 6-18 aircraft.)

3 tanker squadrons with total of 56 *Victor* K1/K1A/K2.

4 strategic transport squadrons with 14 VC-10, 10 *Belfast*, and 15 *Britannia*.

7 tactical tpt sqns with C-130 *Hercules*.

2 light communication squadrons with HS-125.

7 hel sqns with 60 *Wessex*, 75 *Whirlwind*, and 40 SA-330 *Puma*.

There are 11 ground defence and air defence squadrons of the Royal Air Force Regiment, some with *Bloodhound* and *Tigercat* SAM, and L40/70 AA guns (*Rapier* SAM on order).

**Deployment:** The Royal Air Force includes one operational home command—Strike Command—and two smaller overseas commands—RAF Germany (8,600), and Near East Air Force. Squadrons are deployed overseas as follows:

**Germany:** 4 F-4; 2 *Buccaneer*; 2 *Lightning*; 3 *Harrier*; 1 *Wessex*; 2 sqns RAF Regt.

**Gibraltar:** *Hunter* detachment.

**Near East:** (a) Cyprus: 2 *Vulcan*; 1 *Lightning*; 1 *Hercules*; 1 *Whirlwind*; 2 sqns RAF Regt.

(b) Malta: 1 *Nimrod*; 1 *Canberra*.

**Singapore:** detachments *Nimrod* and *Wessex* hel (in ANZUK force).

**Hong Kong:** hel and RAF Regt detachments.

**British Honduras:** RAF Regt detachment.

**Reserves:** 31,800 regular; about 200 volunteer.

## CANADA

Population: 22,300,000.

Military service: voluntary.

Total armed forces: 83,000.

Estimated GNP 1972: \$102.9 billion.

Defence expenditure 1973-74: \$Can. 2.13 billion (\$US 2,141 million).

\$Can. 1 = \$US 1 1 July 1972.

\$Can. 0.995 = \$US 1 1 July 1973.

**Army (Land):** 33,000.

(The Canadian Armed Forces have been unified since February 1968. The strengths shown here for Army, Navy, and Air Force are only approximate.)

**In Canada:** Mobile Command (about 20,000).

1 airborne regiment.

3 combat groups each comprising:

3 infantry battalions.

1 reconnaissance regiment.



The RAF has about 500 combat aircraft, including four squadrons of VTOL Harriers, some of which—like this GR.Mk 3 model—are based in Germany.



An AMX-30 medium tank from one of five French mechanized divisions. Since 1966, French forces have not been part of NATO's integrated command.



1 reduced light artillery regiment (of 2 batteries).  
Support units.  
M-113 APC, Ferret arm'd cars; Model 56 105mm pack how; 106mm recoilless rifles.

One group is intended for operations in Europe; part of it, an air transportable bn gp, for use with the AMF. The other groups contribute to North American ground defence and UN commitments.

*In Europe:* One mech battle group of 2,800 men, with 32 Centurion med tks, 375 M-113 APC, and 18 M-109 155mm SP how.

*In Cyprus (UNFICYP):* 580 men.

*Reserves:* about 19,000.

**Navy (Maritime):** 14,000.  
4 submarines.

10 ASW hel destroyer escorts, 4 with Sea Sparrow SAM (2 hel destroyers under construction).

11 ASW destroyer escorts.

3 support ships with Sea Sparrow SAM and 2 CHSS-2 hel.

The Maritime Air Element consists of:

4 maritime patrol squadrons with Argus.

1 maritime patrol squadron with S-2 Tracker.

1 ASW squadron with SH-3 Sea King helicopters.

*Reserves:* about 2,900.

**Air Force (Aii):** 30,000; 162 combat aircraft.

*In Canada:*

Mobile Command:

2 CF-5 tactical fighter sqns (for use with AMF).

6 helicopter squadrons.

Air Defence Command (Canadian component of NORAD).

3 interceptor squadrons with F-101C.

28 surveillance and control radar squadrons.

1 SAGE control centre.

1 CF-100 electronic warfare training squadron.

Air Transport Command:

1 sqn with 5 Boeing 707-320C transport/ tankers.

2 sqns with C-130E Hercules.

4 sqns with CC-115 Buffalo, CC-138 Twin Otter, and CH-113 Labrador SAR hel.

1 sqn with CC-109 Cosmopolitan; Falcon and Dakota.

*In Europe:*

Germany: 2,300; 3 attack sqns with CF-104.

*Reserves:* 1,300.

## DENMARK

Population: 5,000,000.

Military service: 12 months (to be reduced to 9 months from October 1973).

**Total armed forces: 39,800.** (Planned defence cuts include a reduction of army manpower to 13,000, of the navy by 5 ships, and of combat aircraft by 1 squadron.)

Estimated GNP 1972: \$20.3 billion.

Defence budget 1973-74: 3,196 million kroner (\$568 million).

7.0 kr=\$1 1 July 1972.

5.63 kr=\$1 1 July 1973.

**Army:** 24,000.

4 brigades each of 2 mechanized infantry battalions, 1 tank battalion, 1 artillery battalion and support units.

1 battalion group.

1 artillery battalion.

250 Centurion med tks; M-41 lt tks; M-113 APC, M-109 155mm SP how; 203mm how; Honest John SSM (all three are dual-capable, but there are no nuclear warheads on Danish soil); 12 Hughes 500M (OH-6A) hel.

*Reserves:* 80,000, including 2 mech inf bdes and support units to be formed from reservists within 72 hours; local defence units form 15 inf bn gps and 15 arty btys. Volunteer Home Guard 51,500.

**Navy:** 6,300.

6 coastal submarines.

2 destroyers.

4 frigates.

4 coastal escorts (corvettes).

9 seaward defence craft.

12 fast patrol boats.

6 coastal minelayers.

12 minesweepers (4 inshore).

8 Alouette III helicopters.

*Reserves:* 4,000. Volunteer Home Guard 4,300 with small patrol boats.

**Air Force:** 9,500; 112 combat aircraft.

1 fighter-bomber sqn with 16 F-35XD Draken.

2 fighter-bomber squadrons with 32 F-100D/F.

2 interceptor squadrons with 32 F-104G.

1 interceptor squadron with 16 Hunter.

1 recce sqn with 16 RF-35XD Draken.

1 transport squadron with 8 C-47 and 5 C-54. (3 C-130 on order.)

1 SAR squadron with 8 S-61 helicopters.

4 SAM squadrons with Nike-Hercules launchers.

4 SAM squadrons with HAWK launchers.

*Reserves:* 7,000. Volunteer Home Guard 11,500.

## FRANCE

Population: 52,000,000.

Military service: 12 months.

Total armed forces: 503,600 (conscripts 271,200).

Estimated GNP 1972: \$202 billion.

Defence budget 1973: 34,800 million francs (\$8,488 million).

5.00 francs=\$1 1 July 1972.

4.10 francs=\$1 1 July 1973.

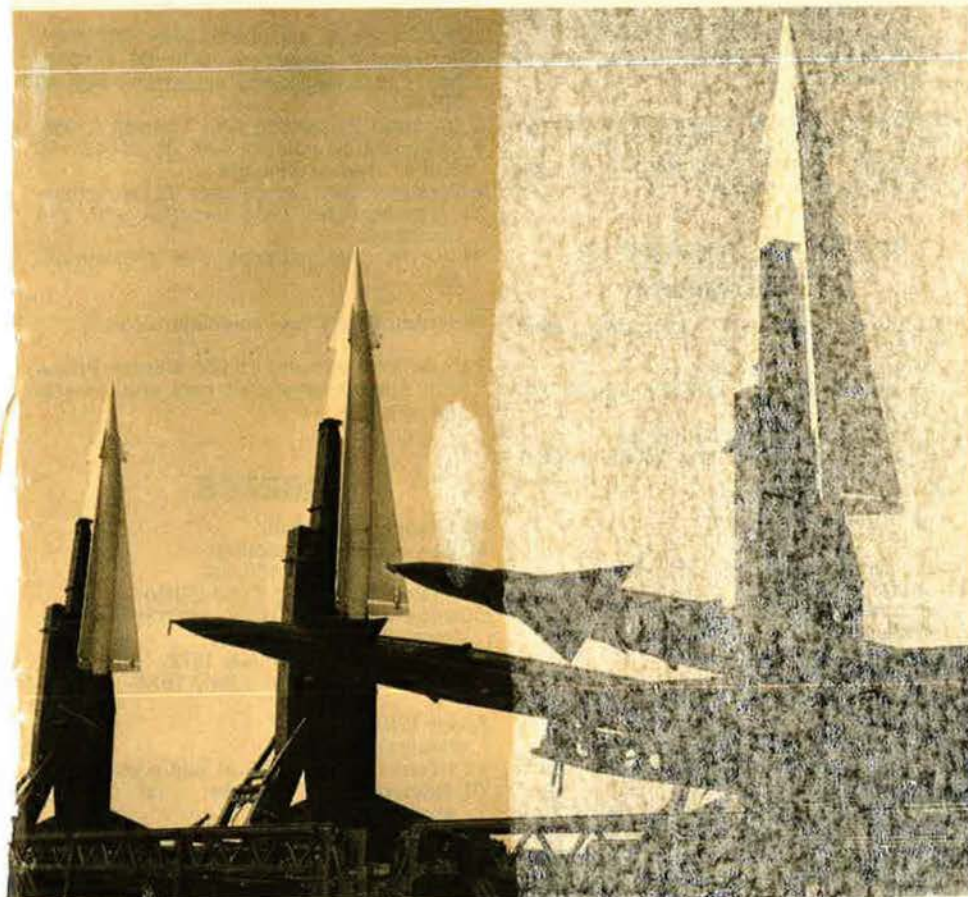
**Strategic Forces:**

**SLBM:** 2 SSBN each with 16 MSBS M-1 msls (a third scheduled to become operational in 1974; five are due to be built in all).

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

**Aircraft:**

9 squadrons with 36 Mirage IVA bombers.



The majority of NATO air forces have Nike-Hercules surface-to-air missiles with a slant range of about eighty miles. The missiles shown here are part of Germany's twenty-four-battery Nike-Hercules force.



3 squadrons with 12 KC-135F tankers.  
20 *Mirage IVA* bombers are in reserve.

**Army:** 332,400 (conscripts 216,000) (including Aviation).

5 mechanized divisions.  
1 airborne division (2 brigades).  
1 air-portable motorized brigade.  
2 alpine brigades.  
9 armoured car regiments.  
2 motorized infantry regiments.  
1 parachute battalion.  
21 infantry battalions.  
5 SSM battalions with 20 *Honest John* launchers. (The nuclear warheads held under double-key arrangements with the United States were withdrawn in 1966. The tactical nuclear SSM *Pluton* is due to enter service in 1973-74.)  
3 SAM regiments with 54 *HAWK* launchers.  
820 AMX-30 med tks; AMX-13 lt tks; Panther EBR hy and AML lt armd cars; AMX APC; AMX SP 105mm guns and 155mm how; Model 56 105mm pack how; 30mm twin SP AA guns; SS-11/Harpon ATGW; *Honest John* SSM and *HAWK* SAM.

**Army Aviation (ALAT):** 4,500.

70 Bell, 175 *Alouette II*, 60 *Alouette III*, and 80 SA-330 *Puma* hel (30 *Puma*, 50 *Gazelle* on order).  
150 light fixed-wing aircraft.

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

**Strategic Reserve (Force d'Intervention):**  
2 airborne and 1 air-portable motorized brigades.

**Manoeuvre Forces (Force de Manoeuvre):**  
First Army: 2 mech divs and 4 SSM bns in Germany; 58,000; 3 mech divs in support in France. About 2,000 men in Berlin.

**French Territory of the Afars and Issas:** 2 battalions.

**Elsewhere in Africa:** about 4,000.

**Malagasy (until Sept 1973):** 3,000; 2 battalions, 2 minesweepers, 2 FGA squadrons, 6 tpt ac.

**Pacific Territories:** 2 battalions.

**Caribbean:** 1 battalion.

The remaining troops are stationed in France for territorial defence (*Défense Operationnelle du Territoire*—DOT). Their strength is about 52,000 including two alpine bdes, 21 inf bns, 3 armd cav regts, and one arty regt. Mobilization of reserves would bring the force up to a total of 80 bns.

**Reserves:** about 450,000.

**Navy:** 69,000 (conscripts 16,500) (including Naval Air Force); 47 major surface combat vessels.

19 attack submarines (diesel).  
2 aircraft carriers.  
1 helicopter carrier.  
2 cruisers (1 SAM, 1 hel).  
17 destroyers (2 with *Masurca* SAM and *Malafon* ASW msls. 4 with *Tartar* SAM, 6 ASW, 4 aircraft direction, 1 command).  
25 frigates.  
7 fleet minesweepers.  
42 coastal minesweepers.  
4 inshore minesweepers.  
14 patrol vessels.  
7 landing ships.  
13 landing craft.

**Naval Air Force:** 12,000; 150 combat aircraft.

2 fighter-bomber sqns with *Etendard IV-M*.  
2 interceptor sqns with F-8F *Crusaders*.  
2 ASW sqns with *Alizé*.  
5 maritime recce sqns with *Atlantic* and P-2.  
1 reconnaissance sqn with *Etendard IV-P*.  
1 ASW helicopter sqn with *Super Frelon*.  
2 helicopter sqns with HSS-1.

**Reserves:** about 90,000.

**Air Force:** 102,000; 500 combat aircraft.

**Air Defence Command (CAFDA):**

3 interceptor sqns with *Mirage IIIC*.  
2 AWX sqns with 30 *Vautour IIN*. (*Mirage F-1* being delivered.)  
3 interceptor sqns with *Super Mystère B-2*.  
(Automatic *STRIDA II* air defence system.)

**Tactical Air Force (FATAC**—divided into 1st and 2nd *CATAC*):

8 fighter-bomber squadrons with *Mirage IIIE*.  
2 fighter-bomber squadrons with *Mirage V*.  
1 fighter-bomber squadron with *Mirage IIIB*.  
4 fighter-bomber squadrons with F-100D.  
2 fighter-bomber squadrons with *Mystère IVA* and *Jaguar*.  
2 light bomber sqns with 30 *Vautour II-IB*.  
3 recce sqns with *Mirage IIIR/RD*.

**Air Transport Command (COTAM):**

7 tactical transport sqns; 3 with 40 C-160F *Transall* and 4 with 130 Nord 2501 *Noratlant*.  
1 heavy transport sqn with 4 DV-6B.  
1 heavy transport squadron with 3 DC-8.  
1 tpt sqn with 5 DC-6 and 2 Br 763.  
4 helicopter tpt sqns with H-34 and *Alouette II*.

**Para-Military Forces:** Gendarmerie 70,000; CRS (*Compagnies Républicaines de Sécurité*) 15,000 (subordinate to the Ministry of the Interior).

## FEDERAL REPUBLIC OF GERMANY

**Population:** 60,100,000 (excluding West Berlin).

**Military service:** 15 months.

**Total armed forces:** 475,000 (conscripts 228,000).

**Estimated GNP 1972:** \$259 billion.

**Defence budget 1973:** DM 26,600 million (\$11,083 million).

DM 3.2=\$1 1 July 1972.

DM 2.40=\$1 1 July 1973.

**Army:** 334,000 (conscripts 183,500).

13 armoured brigades.  
12 armoured infantry brigades.  
3 motorized infantry brigades.  
2 mountain brigades.  
3 airborne brigades.  
(The above are organized in 12 divisions.)

2 tank regts (a third being formed).  
11 SSM battalions with *Honest John* launchers.

4 SSM battalions with *Sergeant* launchers.  
**Territorial Army:** organized into 9 geographical commands for home defence, communications, engineers, police, and service support units; also contains units for expansion on mobilization.

1,050 M-48A2 *Patton* and 2,200 *Leopard* med tks; 750 HS-30, 1,300 *Marder*, 1,800

*Hotchkiss* and 3,170 M-113 APC; 1,100 tank destroyers; 280 105mm how, 70 155mm, and 75 203mm how; 580 155mm, 150 175mm SP guns; 200 multiple RL; 500 40mm SP AA guns; ATGW; 86 *Honest John*, 19 *Sergeant* SSM (to be replaced by *Lance*); 200 UH-1D *Iroquois*, 30 CH-53G, and 235 *Alouette II* hel, and 18 Do-27 lt ac.

**Reserves:** 510,000 on immediate recall.

**Navy:** 37,000 (including 9,500 conscripts) (including Naval Air Arm).

8 coastal submarines.  
11 destroyers (3 with *Tartar* SAM).  
6 fast frigates.  
5 fleet utility vessels.  
12 fast combat support ships.  
61 minesweepers.  
38 fast patrol boats.  
2 landing ships.  
22 landing craft.

**Naval Air Arm:** 6,000; 84 combat aircraft.  
4 fighter-bomber/recce squadrons with 72 F-104G.

2 MR squadrons with 12 Br-1150 *Atlantic*.  
23 S-58 SAR helicopters (being replaced by 20 SH-3D *Sea King* Mk 41).  
20 Do-28 liaison aircraft.

**Reserves:** 35,000 on immediate recall.

**Air Force:** 104,000 (conscripts 35,000); 456 combat aircraft.

6 fighter-bomber squadrons with 108 F-104G.  
4 fighter-bomber/interceptor sqns with 60 F-104G.  
8 lt FGA/recce squadrons with 168 G-91.  
4 interceptor squadrons with 60 F-104G.  
4 heavy reconnaissance squadrons with 60 RF-4E.  
4 transport squadrons with *Transall C-160*.  
4 helicopter squadrons with 80 UH-1D, 50 Bell 47, and 54 *Alouette II*.  
2 *Pershing* SSM wings with 72 launchers.  
24 *Nike-Hercules* SAM batteries with 216 launchers.  
36 *HAWK* SAM batteries with 216 launchers.

**Reserves:** 80,000 on immediate recall.

**Para-Military Forces:** 20,000 Border Police with *Saladin* armoured cars and coastal patrol boats.

## GREECE

**Population:** 8,900,000.

**Military service:** 24 months.

**Total armed forces:** 160,000.

**Estimated GNP 1972:** \$12.2 billion.

**Defence budget 1973:** 17,366 million drachmas (\$580 million).

30 drachmas=\$1 1 July 1972.

29.94 drachmas=\$1 1 July 1973.

**Army:** 120,000.

1 armoured division.  
11 infantry divisions (8 at cadre strength).  
10 independent brigades (at cadre strength).  
1 commando brigade.  
2 SSM battalions with 8 *Honest John* launchers.  
1 SAM battalion with 12 *HAWK* launchers.  
300 M-47, 320 M-48, and 30 AMX-30 med tks (20 more AMX-30 on order); M-24, M-26, and M-41 lt tks; M-8 and M-20





The Anglo/French Jaguar S.07, a supersonic tactical support aircraft, is now in service with the French Air Force. It can operate from short fields.

armed cars; M-2, M-3, M-59, and M-113 APC; 175mm SP guns; 25-pdr, 105mm, 155mm, and 203mm how; 40mm, 75mm, and 90mm AA guns; *Honest John* SSM; *HAWK* SAM; Bell 47G hel.

Reserves: about 160,000.

Navy: 18,000.

- 7 submarines.
- 9 destroyers.
- 4 destroyer escorts.
- 7 coastal patrol vessels.
- 2 minelayers.
- 14 coastal minesweepers.
- 13 fast torpedo boats (less than 100 tons).
- 4 fast missile patrol boats with *Exocet* SSM.
- 8 tank landing ships.
- 5 medium landing ships.
- 1 dock landing ship.
- 8 landing craft.

Reserves: about 20,000.

- Air Force:** 22,000; 225 combat aircraft.
- 5 fighter-bomber squadrons with F-84F.
  - 2 fighter-bomber squadrons with F-104G.
  - 3 interceptor squadrons with F-5A.
  - 1 interceptor squadron with F-102A.
  - 1 recce sqn with RF-84F (40 F-4 on order).
  - 1 maritime recce squadron of 12 Hu-16.
  - (A combat squadron has up to 18 aircraft.)
  - 3 tpt sqns of 27 C-47 and 30 *Noratlans*.
  - 1 helicopter squadron with 14 H-19 and 6 AB-205.
  - 1 helicopter squadron with 10 Bell 47G.
  - 1 SAM battalion with *Nike-Hercules*.

Reserves: about 25,000.

Para-Military Forces: 30,000 Gendarmerie; 69,000 National Guard.

## ITALY

Population: 54,400,000.  
 Military service: Army and Air Force, 15 months; Navy, 24 months.  
 Total armed forces: 427,500 (excluding Carabinieri).  
 Estimated GNP 1972: \$118.1 billion.  
 Defence budget 1973: 2,294.5 billion lire (\$3,964 million).  
 582 lire=\$1 1 July 1972.  
 579 lire=\$1 1 July 1973.

Army: 306,500.  
 2 armoured divisions.



The German Navy has more than 165 vessels in service. This is the destroyer Schleswig-Holstein during sea maneuvers.



One of the Italian Navy's Agusta-Sikorsky SH-3D Sea King ASW helicopters with AN/APN-195 search radar.





France's small nuclear-capable strategic force includes two nuclear submarines, two squadrons of IRBMs, and thirty-six Mirage IVA bombers.



The Norwegian Air Force, with 135 combat aircraft, has five squadrons of tactical fighters, each operating sixteen Northrop F-5A aircraft.

5 infantry divisions.  
 1 independent cavalry brigade.  
 4 independent infantry brigades.  
 5 alpine brigades.  
 1 airborne brigade.  
 1 amphibious regiment.  
 1 SSM brigade with 2 bns of *Honest John* launchers and 2 bns of 203mm SP how.  
 4 SAM battalions with *HAWK* launchers.  
 800 M-47, 200 M-60, and 200 *Leopard* med tks (600 more *Leopard* on order); 3,300 M-113, some LVT-4 APC; 155mm guns; M-107 175mm SP guns; Model 56 105mm pack how; 105mm, 155mm how; M-44 155mm, M-109 155mm, M-55 203mm SP how; M-42 40mm SP AA guns; *Mosquito*, *Cobra*, SS-11 ATGW (TOW on order); 8 *Honest John* (to be replaced by *Lance*); 68 *HAWK* SAM.

**Army Aviation:** 21 units with 50 Piper L-18, L-19, L-21B, some SM.1019 It ac (100 SM.1019, 20 AM-3C on order); over 250 hel, incl 125 AB-47G/J, 49 AB-204B, 29 AB-205A, 60 AB-206A/B-1, and 6 CH-47C (20 more CH-47C, 12 *Agusta* 101G, 30 more AB 206 on order).

**Reserves:** 450,000.

**Navy:** 44,500 (incl air arm and marines).  
 9 submarines.  
 3 cruisers each with *Terrier* SAM and 4 ASW hel (1 ship with ASROC ASW msls).  
 3 destroyers with *Tartar* SAM and ASW hel.  
 5 ASW destroyers.  
 10 frigates.  
 8 corvettes.  
 4 ocean minesweepers.  
 37 coastal and 20 inshore minesweepers.  
 7 torpedo boats.

5 motor gunboats.  
 4 amphibious transports.  
 4 landing ships, tank.  
 1 marine infantry battalion.

**Naval Air Arm:**  
 3 MR sqns, 2 with 20 S-2 *Tracker*, 1 with 6 *Atlantic*.  
 24 SH-3D, 30 AB-204B and A-106 hel.

**Reserves:** 65,000.

**Air Force:** 76,500; 330 combat aircraft.  
 2 fighter-bomber squadrons with F-104G.  
 2 fighter-bomber squadrons with F-104S.  
 2 fighter-bomber squadrons with G-91Y.  
 3 light attack squadrons with G-91R.  
 1 AWX squadron with 15 F-86K.  
 5 AWX squadrons with F-104S.  
 3 recce squadrons with RF-104G. (A combat squadron has 12-18 aircraft.)  
 3 tpt sqns with 25 C-119 (to be replaced by 32 of 44 G.222 on order) and 14 C-130E *Hercules*.  
 2 tpt sqns with Convair 440 and DC-6.  
 12 SAM groups with 96 *Nike-Hercules* launchers.  
 2 SAR sqns with 12 HU-16 ac and 15 AB-204 hel.  
 Helicopters include 60 AB-204B, 90 AB-205, 2 AB-206A, and some AB-47G/J.

**Reserves:** 30,000.

**Para-Military Forces:** 80,700 *Carabinieri*.

## LUXEMBOURG

Population: 345,000.  
 Military service: voluntary.  
 Total armed forces: 550.  
 Estimated GNP 1972: \$1.3 billion.

Defence budget 1973: 529 million francs (\$15 million).  
 43.8 francs=\$1 1 July 1972.  
 35.99 francs=\$1 1 July 1973.

**Army:** 550.  
 1 light infantry battalion.  
 1 independent company.  
 106mm recoilless rifles and mortars.

**Para-Military Forces:** 350 *Gendarmerie*.

## NETHERLANDS

Population: 13,500,000.  
 Military service: Army, 16-18 months; Navy and Air Force, 18-21 months.  
 Total armed forces: 112,200.  
 Estimated GNP 1972: \$44.8 billion.  
 Defence budget 1973; 5,465 million guilders (\$2,102 million).  
 3.19 guilders=\$1 1 July 1972.  
 2.60 guilders=\$1 1 July 1973.

**Army:** 70,000.  
 2 armoured brigades.  
 4 mechanized infantry brigades.  
 2 SSM battalions with *Honest John*.  
 400 *Centurion* and 485 *Leopard* med tks; 700 YP-408, M-106, M-113, and M-577 (amphibious) APC; M-107 175mm SP guns; AMX 105mm, M-109 155mm, and M-110 203mm SP how; 8 *Honest John* SSM (TOW on order).

**Deployment:**  
 Germany: 1 mech bde, 1 recce bn.

**Reserves:** about 300,000, of which 40,000 are on immediate recall. 1 inf div and corps troops, incl 1 indep inf bde, would be completed by call-up of



reservists. A number of infantry brigades could be mobilized, if needed for territorial defence.

**Navy:** 20,000 (including 2,800 marines and 2,000 naval air arm).  
6 submarines.  
6 frigates with *Seacat* SAM; 1 It ASW hel.  
12 destroyers.  
6 corvettes.  
3 MCM support ships.  
5 patrol vessels.  
26 coastal minesweepers.  
16 inshore minesweepers.  
1 fast combat support ship.  
2 marine commandos.

**Naval Air Arm:** 2,000; 44 combat aircraft.  
3 MR sqns; 2 with 9 BR-1150 *Atlantic* and 17 P-2 *Neptune* and 1 with 18 S-2N.  
6 Sikorsky H-34J, 7 AB-204B, and 11 *Wasp* hel (1 *Wasp* on order).

**Deployment:**

**Surinam:** 1 destroyer; 1 marine commando.

**Reserves:** about 20,000, 9,000 on immediate recall; 6 frigates; one hel sqn.

**Air Force:** 22,200; 144 combat aircraft.  
2 fighter-bomber squadrons with 36 F-104G.  
3 fighter-bomber squadrons with 54 NF-5A.  
2 interceptor squadrons with 36 F-104G.  
1 reconnaissance squadron with 18 RF-104G.  
1 transport squadron with 12 F-27.  
30 NF-5B trainers.  
3 observation and communication squadrons (under Army command) with 70 *Alouette III* hel; 60 Piper L-21 and 9 DHC-2 *Beaver* It ac.  
8 SAM squadrons with 32 *Nike-Hercules*.  
11 SAM squadrons with 66 HAWK.

**Reserves:** about 20,000.

**Para-Military Forces:** 3,200 Gendarmerie.

## NORWAY

**Population:** 4,000,000.  
**Military service:** Army, 12 months; Navy and Air Force, 15 months.  
**Total armed forces:** 35,400.  
**Estimated GNP 1972:** \$15.1 billion.  
**Defence budget 1973:** 3,485 million kroner (\$665 million).  
6.51 kroner=\$1 1 July 1972.  
5.24 kroner=\$1 1 July 1973.

**Army:** 18,000.

The peacetime establishment includes 1 brigade group in North Norway, independent battalions, and supporting elements and training units.  
78 *Leopard* and 80 M-48 med tks; 45 M-24 It tks; M-8 armd cars; M-113 and BV-202 APC; M-109 155mm SP how; Bofors L-40/70 AA guns; L-18 and L-19 It aircraft.

**Reserves:** mobilization would produce 11 Regimental Combat Teams (brigades) of 5,000 men each, supporting units and territorial forces totalling 135,000.

**Navy:** 8,000 (incl 1,600 coastal artillery).  
15 coastal submarines.  
5 frigates.  
2 coastal escorts.

10 coastal minesweepers.  
5 minelayers.  
20 fast patrol boats (with *Penguin* SSM).  
20 torpedo boats (6 with *Penguin* SSM).  
2 support ships.  
7 landing craft.  
A number of coastal artillery batteries.

**Reserves:** 12,000.

**Air Force:** 9,400; 135 combat aircraft.  
5 FGA squadrons each with 16 F-5A.  
1 AWX fighter squadron with 16 F-104G.  
1 interceptor squadron with 13 CF-104G.  
1 reconnaissance squadron with 16 RF-5A.  
1 MR squadron with 5 P-3B; some HU-16.  
1 transport squadron with 6 C-130 and 4 C-47.  
2 hel sqns with 32 UH-1B and 10 *Sea King*.  
4 SAM batteries with *Nike-Hercules*.

**Reserves:** 10,600, providing 12 airfield defence It AA bns. Home Guard (all services), 80,000.

## PORTUGAL

**Population:** 9,200,000.  
**Military service:** Army, 24 months; Air Force, 36 months; Navy, 48 months.  
**Total armed forces:** 204,000.  
**Estimated GNP 1972:** \$8.3 billion.  
**Defence budget 1972:** 11,468.7 million escudos (\$425 million).  
27 escudos=\$1 1 July 1972.  
22.77 escudos=\$1 1 July 1973.

**Army:** 170,000.

2 tank regiments.  
8 cavalry regiments.  
25 infantry regiments.  
13 artillery regiments.  
1 coastal artillery regiment.  
3 AA artillery regiments.  
8 engineer battalions.  
8 signals battalions.  
M-47 and M-4 med tks; M-41 It tks; Humber Mark IV and EBR-75 armd cars; AML-60 scout cars; FV-1609 and M-16 half-track APC; 105mm and 140mm how; coast and AA arty.

**Deployment:** some of the above units form 2 infantry divisions, at or below half-strength, in Portugal. About 25 infantry battalions and supporting units are located in the African provinces. (The numbers of all armed forces in each province, including locally enlisted, are: *Angola:* 55,000.  
*Mozambique:* 55,000.  
*Portuguese Guinea:* 27,000.)

**Reserves:** 306,000.

**Navy:** 18,000 (including 3,300 marines).  
4 submarines.  
8 frigates.  
6 corvettes.  
25 coastal patrol vessels.  
4 ocean and 12 coastal minesweepers.  
24 patrol launches (less than 100 tons).  
66 landing craft.

**Reserves:** 12,000.

**Air Force:** 16,000; 152 combat aircraft.  
2 It bbr sqns with 6 B-26 *Invader* and 10 PV-2.  
1 fighter-bomber squadron with 20 F-84G.  
2 FGA squadrons with 40 G-91.

2 interceptor squadrons with 40 F-86F.  
6 COIN flights with 24 armed T-6K.  
1 maritime patrol squadron with 12 P-2V5.  
24 *Noratlant*, 20 C-47, 10 DC-6, and 15 C-45 tpts.  
13 T-33, 25 T-37, and 35 T-6 recce/trainers.  
Other aircraft include 11 Do-27 and about 100 *Alouette II/III* and 12 SA-330 *Puma* helicopters.  
1 parachute regiment of 4,000.

**Para-Military Forces:** 9,700 National Republican Guard.

## TURKEY

**Population:** 37,900,000.  
**Military service:** 20 months.  
**Total armed forces:** 455,000.  
**Estimated GNP 1972:** \$15.8 billion.  
**Defence budget 1973-74:** 11,100 million liras (\$812 million).  
14.17 liras=\$1 1 July 1972.  
13.67 liras=\$1 1 July 1973.

**Army:** 365,000.

1 armoured division.  
2 mechanized infantry divisions.  
11 infantry divisions.  
4 armoured brigades.  
3 mechanized infantry brigades.  
3 infantry brigades.  
1 parachute brigade.  
1 armoured cavalry regiment.  
2 SSM battalions with *Honest John*.  
1,400 M-47 and M-48 med tks; M-24, M-26, and M-41 It tks; M-36 tank destroyers; M-8 armd cars; M-59 and M-113 APC; 105mm and 155mm SP guns; 105mm, 155mm, and 203mm how; SS-11 and *Cobra* ATGW; 40mm, 75mm, and 90mm AA guns; 8 *Honest John* SSM; Do-27, Do-28D-1 *Sky Servant*, and U-1 *Beaver* It ac; 20 AB-206 and 20 Bell 47G hel. (250 M-48 med tks on order.)

**Reserves:** 750,000.

**Navy:** 40,000.

15 submarines.  
14 destroyers.  
8 coastal escorts.  
11 motor torpedo boats (2 less than 100 tons).  
14 fast patrol boats.  
20 minesweepers.  
7 minelayers.  
A number of landing craft.  
3 AB-205A ASW helicopters.

**Reserves:** 50,000.

**Air Force:** 50,000; 288 combat aircraft.  
2 fighter-bomber squadrons with F-104G.  
5 fighter-bomber squadrons with F-100D.  
2 fighter-bomber squadrons with F-5A.  
2 interceptor squadrons with F-5A.  
2 AWX squadrons with F-102A.  
3 recce squadrons with RF-84F and RF-5A.  
(40 F-4 on order.)  
(A combat squadron has an average of 18 aircraft.)  
3 tpt sqns with 14 C-47, 10 C-130, and 20 Transall.  
10 Bell UH-1D, 10 Sikorsky UH-19D, and some AB-204B hel.  
2 SAM battalions (8 batteries) with *Nike-Hercules*.

**Para-Military Forces:** 75,000 Gendarmerie (including 3 mobile brigades).



# The Theatre Balance Between NATO and the Warsaw Pact

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Any assessment of the military balance between NATO and the Warsaw Pact involves comparison of the strengths of both men and equipment, consideration of qualitative characteristics such as geographical advantages, deployment, training and logistic support, and differences in doctrine and philosophy.

Certain qualitative factors are of special importance. For a variety of reasons the Soviet Union is likely to have within the theatre, or nearby, forces which closely reflect her doctrine and strategy; on the other hand NATO, bound as it is by a multi-national political process and by public pressures that do not exist in the Soviet Union, has tended to compromise on its military requirements. Warsaw Pact equipment is, though much of it might not meet NATO qualitative standards, standardized whereas that of NATO is not, imposing limits on interchange and flexibility. There is little depth in the NATO central area and this presents problems in its defence.

The appraisal which follows should be regarded as primarily a quantitative guide since there are difficulties in giving values, in so short a space, to qualitative factors and deciding on their relevance. It is military only and thus one-dimensional. Furthermore the situation is not a static one: any single presentation must have inadequacies. The comparisons necessarily over-simplify what is by its nature a complex problem.

## LAND AND AIR FORCES

The three major NATO subordinate commands, Northern, Central, and Southern Europe, at first seem to offer a convenient basis for making a direct comparison with the opposing forces of the Warsaw Pact, but there are problems. The Northern European Command covers not only Norway but also the Baltic area, including Denmark, Schleswig-Holstein, and the Baltic Approaches. It is not possible to make precise calculations as to the Soviet or Warsaw Pact formations that would be committed to the Baltic area rather than towards the NATO Central European Command, since in both land and air forces there is a considerable degree of flexibility to do either. For the Warsaw Pact this sector is a coherent front though a number of Soviet divisions, notably in the Leningrad area and in the Kola Peninsula, would undoubtedly be directed towards Norway. Northern and Central Europe are therefore grouped together in the tables which follow, and Southern Europe is shown separately.

## COMPARISON OF GROUND FORMATIONS

A traditional basis of comparison is the number of combat divisions that the two sides have. This is far from an adequate guide by itself, since not only do divisions vary greatly in their organization, size, and equipment, but there are a number of combat units outside divisions as well. As a broad indication of



the front-line combat resources available it has some utility, taken in conjunction with the various tables which follow it, but to read too much into this divisional count could be misleading.

Category	Northern and Central Europe			Southern Europe		
	NATO	Warsaw Pact	(of which USSR)	NATO	Warsaw Pact	(of which USSR)
Ground forces available to commanders in peacetime (in division equivalents)						
—armoured	10	33	21	6	7	3
—infantry, mechanized, and airborne	14	35	20	31	21	4

In this table (and the ones that follow in this section), the portion headed "Northern and Central Europe" includes (on the NATO side) the commands for which AFCENT and AFNORTH commanders have responsibility. France is not included, nor are any allied ground forces in Portugal or Britain. On the Warsaw Pact side it includes the command for which the Pact High Commander has responsibility, but excludes the armed forces of Bulgaria, Hungary, and Rumania. Certain Soviet units normally stationed in western USSR and such troops as might be committed to the Baltic and Norwegian theatre of operations have, however, been included on the Warsaw Pact side.

The entries under the heading "Southern Europe" include, on the NATO side, the Italian, Greek, and Turkish land forces (including those in Asian Turkey) and such American and British units as would be committed to the Mediterranean theatre of operations, and on the Warsaw Pact side, the land forces of Bulgaria, Hungary, and Rumania and such Soviet units normally stationed in Hungary and southern USSR as might be committed to the Mediterranean theatre.

French formations are not in the above figures; if included they would add two mechanized divisions to the NATO totals. These are the two divisions stationed in Germany. There are four more in France, outside the NATO area. Though these divisions are stationed in Germany and there has been some joint planning with NATO military commanders, they are not committed to NATO and there has been no agreement on the military strategy under which they might be employed. On the other hand, all the appropriate forces of the Warsaw Pact countries are included, though the military value of some of them might be suspect for political reasons, dependent on circumstances. Offsetting advantages to NATO are the facts that most of the NATO strength is in West Germany, where it is wanted, while about a third of the Soviet divisions shown here are some distance away in the western military district of the Soviet Union. The figures show, therefore, from a NATO viewpoint, what is the worst case.

The table conceals a marked imbalance in North Norway. In Norway there are only Norwegian forces in peacetime, a brigade group being located in the north. The Soviet forces facing them, or which could be brought against them from north-western Russia, probably amount to at least four divisions. This wide disparity highlights the problem of the defence of North Norway against surprise attack. To meet this difficulty a system of self-defence, based on a powerful Home Guard and rapid mobilization, has been designed to take maximum advantage of the ruggedness of the country and the poor road and rail communications, but it is clear that defence against attack of any size depends on timely external assistance.

Two further imbalances are worth noting. The first, a legacy from the post-war occupation zones, is a certain maldeployment in the NATO Central European Command, where the well-equipped and strong American formations are stationed in the southern part of the front, an area which geographically lends itself to defence, while in the north German plain, across which the routes to allied capitals run, where there is little depth and few major obstacles, certain of the forces are less powerful. The second is that the whole of the Italian land



forces, which are included in the table under Southern Europe, are stationed in Italy and thus are at some distance from the areas of potential confrontation both in the South-East and the Centre.

## COMPARISON OF MANPOWER

A comparison of front-line manpower deployed on the ground in normal circumstances, that is, before any reinforcement, fills out the picture further. The figures shown reflect the variations in divisional establishments mentioned above but also include combat troops in formations higher than divisions and those men who directly support them. They take account of under-manning as well—many NATO and Warsaw Pact divisions are kept well below strength in peacetime. Figures calculated on this basis can only be approximate. They give the following comparison (figures are in thousands):

Category	Northern and Central Europe			Southern Europe		
	NATO	Warsaw Pact	(of which USSR)	NATO	Warsaw Pact	(of which USSR)
Combat and direct support troops available . . . . .	600	900	600	530	320	90

The figures do not include French forces; if those stationed in Germany are counted, the NATO figure for Northern and Central Europe might be increased by perhaps 50,000.

The table still reveals an advantage to the Warsaw Pact in Northern and Central Europe (subject to the caveat above about the value to be placed on the forces of the East European Pact countries). It does not, of course, include the men in the American dual-based brigades, because they are not physically present in Europe, but does include on the Warsaw Pact side some 200,000 in divisions in the western Soviet Union, since these formations are clearly designed for operations in Central Europe, though they are at some distance in time and space from the area.

In Southern Europe the figures favour NATO but conceal the fact that the forces are widely separated, with Italian troops deployed at a very considerable distance from those of Greece and Turkey.

## THE MOVEMENT OF REINFORCEMENTS

The movement of reinforcements to the theatre and the mobilization of first-line reserves would materially alter the above figures. NATO might get its earliest reinforcements from West Germany and Britain, but these would be designed mainly to increase manning strengths rather than to increase materially the number of formations. The three mechanized divisions in eastern France might also be made available, but NATO would rely principally on the United States for major reinforcement with extra divisions. There are in the United States the two dual-based brigades and a further two divisions specially earmarked for Europe, all with their equipment stockpiled in Germany. The personnel of these formations could be moved very quickly, using the very considerable airlift which exists. There are then a further 4 divisions in the active army and two in the Marines in the Strategic Reserve in the United States but, although they might be available very early, some of their equipment would have to be moved by sea. This would also be the case with the 8 divisions and some 18 independent brigades in the National Guard that could nominally be ready for movement some five weeks after mobilization but might need further training (as might Soviet reinforcements).

Warsaw Pact reinforcement plans follow a rather different pattern. Soviet divisions are kept at three different manning levels and other Warsaw Pact formations at two. Reinforcement depends on filling out these divisions by mobilization and then on moving them forward. As far as can be judged, mobilization by the Soviet Union in particular could be very speedy, since many of the formations likely to be used in Central Europe are kept at the higher manning



levels. It has been estimated that the 27 Soviet divisions in Eastern Europe could be increased to perhaps 70 in about a month—if mobilization were unimpeded. (This 70 includes the divisions in the western USSR already counted in the Ground Formation table.) Of course it might not be. If hostilities had already started, movement by rail and road could be interdicted and the build-up be slowed down considerably. Nonetheless, the Soviet Union, a European power operating on interior lines, should be able in the early weeks to move reinforcements with heavy equipment faster overland than the United States could by sea. American ability to bring back the men of the dual-based brigades in days by air has been demonstrated on exercises, and for the two divisions with equipment in Germany the airlift of personnel would be a matter of another week or so. As with Soviet forces, this would depend on movement not being hindered, on a secure air environment and safe airfields to fly into; and quick dispersal from airfields could be difficult once fighting had started. The increase of manpower strengths in combatant units could take place rapidly, both from the United States and from the European NATO countries, but the real problem for a fast build-up lies in the inevitable time lag there would be before the American follow-up formations, dependent for their heavy weapons on sealift, could be ready for operations.

Implicit in Western defence plans is the concept of political warning time, that there will be sufficient warning of a possible attack to enable NATO forces to be brought to a higher state of readiness and for reinforcement and mobilization to take place. This does, of course, assume the willingness—this applies to both sides—to reinforce in a crisis situation at the risk of heightening tension by doing so. Advantage here will generally lie with an attacker, who can start mobilization first, hope to conceal his intentions, and finally achieve some degree of tactical surprise. The point of attack can be chosen and a significant local superiority built up. The defender is likely to start more slowly and will have to remain on guard at all points.

A fair summary of the reinforcement position might be that the Warsaw Pact is intrinsically capable of a faster build-up of formations in the early weeks, particularly if local surprise is achieved; that NATO can only match such an initial build-up if it has, and takes advantage of, sufficient warning time; that the subsequent rate of build-up favours the Warsaw Pact unless the crisis develops slowly enough to permit full reinforcement; in this last case the West could eventually reach an advantageous position. Alliance countries maintain more men under arms than the Warsaw Pact. For Army/Marines the figures (in thousands) are: NATO 3,025 (including France 3,357); Warsaw Pact 2,859. And the Soviet Union has a large proportion of her forces not available for Europe but on her border with China.

## COMPARISON OF EQUIPMENT

In a comparison of equipment one point stands out: the Warsaw Pact is armed almost completely with Soviet or Soviet-designed material and enjoys the flexibility, simplicity of training, and economy that standardization brings. NATO forces have a wide variety of everything from weapons systems to vehicles, with consequent duplication of supply systems and some difficulties of inter-operability; they do, however, have many weapons qualitatively superior. As to numbers of weapons, there are some notable differences of which that in tanks is perhaps the most significant. The relative strengths are:

Category	Northern and Central Europe			Southern Europe		
	NATO	Warsaw Pact	(of which USSR)	NATO	Warsaw Pact	(of which USSR)
Main battle tanks in operational service —in peacetime ..	6,500	17,000	10,000	2,150	6,200	1,700

These are tanks with formations, or which are earmarked for the use of dual-based or immediate reinforcing formations (some 750). They do not include those in reserve, or to replace tanks damaged or destroyed. In this latter cate-



gory NATO has perhaps 1,500 tanks in Europe. The Soviet Union has recently replaced about 1,000 T-54/55 tanks with T-62s in its divisions in East Germany but has not withdrawn the older ones. These extra tanks are not included above. There may perhaps be other tanks in reserve in the Warsaw Pact area, but in general in the Pact reinforcement system the tanks in formations form the reserves.

Again, French forces are not included in the above figures. If the two divisions stationed in Germany are taken into account, 325 should be added to the NATO total; if the three divisions in eastern France are counted, the NATO figures go up by a further 485.

It will be seen that in Northern and Central Europe NATO has little more than a third as many operational tanks as the Warsaw Pact, though NATO tanks are generally superior (even to the T-62, now increasingly coming into service in the Pact forces). This numerical weakness in tanks (and in other armoured fighting vehicles) reflects NATO's essentially defensive role and is offset to some extent by a superiority in anti-tank weapons, a field in which new missiles coming into service may increasingly give more strength to the defence. NATO probably also has more effective airborne anti-tank weapons carried by fighter aircraft and helicopters. In conventional artillery the Warsaw Pact is stronger, though this advantage is partly redressed by the greater lethality of NATO ammunition and its greater logistic capability to sustain higher rates of fire. This capability stems from a significantly higher transport lift, about half as high again in a NATO division as compared with a Warsaw Pact one. NATO has, however, an inflexible logistic system, based almost entirely on national supply lines with little central co-ordination. It cannot now use French territory, and has many lines of communication running north to south near the area of forward deployment. Certain NATO countries are, furthermore, short of supplies for sustained combat, but Warsaw Pact countries may be no better off.

## NUMBERS OF AIRCRAFT

If NATO ground formations are to be able to exploit, by day as well as by night, the mobility they possess, they must have a greater degree of air cover over the battlefield than they now have. Such cover is provided by a combination of rapid warning communications systems, surface-to-air weapons, and fighter aircraft. In much of this ground-air environment NATO is well prepared; in numbers of aircraft it is inferior. NATO has, however, a higher proportion of multi-purpose aircraft of good performance over their full mission profiles, especially in range and payload; considerable power can be deployed in the ground attack role in particular. Both sides are modernizing their inventories, and the US forces in Europe in particular can now be assumed to have available the very advanced air-delivered weapons, such as the laser-guided bombs and other precision-guided munitions, of the types used in South-East Asia. The two air forces have rather different roles: long range and payload have lower priority for the Warsaw Pact. NATO, for example, has maintained a long-range deep-strike tactical aircraft capability; the Soviet Union has chosen to build a MRBM force which could, under certain circumstances, perform analogous missions, though not in a conventional phase of any battle.

Categories	Northern and Central Europe			Southern Europe		
	NATO	Warsaw Pact	(of which USSR)	NATO	Warsaw Pact	(of which USSR)
Tactical aircraft in operational service						
—light bombers ..	140	250	200	6	30	30
—fighter/ground attack	1,100	1,400	1,110	450	125	50
—interceptors ..	350	2,100	1,110	275	950	450
—reconnaissance ..	300	550	400	125	90	40

In this table, the area covered for "Northern and Central Europe" is slightly wider than for ground troops as described in the earlier tables. Many aircraft have a long-range capability and in any case can be re-deployed very



quickly. Accordingly, the figures here include the appropriate British and American aircraft in Britain, American aircraft in Spain, and Soviet aircraft in western USSR. They do not, however, include the American dual-based squadrons, which would add about 100 fighter-type aircraft to the NATO totals, nor French squadrons with perhaps another 500 fighters. Carrier-borne aircraft of the US Navy are excluded but so, on the other hand, are the medium bombers in the Soviet Air Force, which could operate in a tactical role.

The Warsaw Pact enjoys the advantage of interior lines of communication, which makes for ease of command and control and logistics. It has a relatively high capability to operate from dispersed natural airfields serviced by mobile systems, far more airfields with more shelters, and the great advantage of standard ground support equipment which stems from having only Soviet-designed aircraft. These factors make for greater flexibility than NATO has, with its wide variety of aircraft and support equipment. NATO undoubtedly has superiority in sophistication of equipment, the capability of its air crews, which have in general higher training standards and fly more hours, and the versatility of its aircraft, which give operational flexibility of a different kind. NATO's real advantage, however, is that it has more reinforcement aircraft. Since squadrons can be moved quickly the NATO numerical inferiority shown above could rapidly be turned into superiority if enough airfields are available. The total American tactical aircraft inventory, for example (excluding training or home air defence), is 5,100; that for the Soviet Union is 4,500.

## **THEATRE NUCLEAR WEAPONS**

NATO has some 7,000 nuclear warheads, deliverable by a variety of vehicles, over 2,000 in all, aircraft, short-range missiles, and artillery of the types listed in Table 1 in the "Tables of Comparative Strengths" section elsewhere in this issue. These nuclear weapons are in general designed for use against targets within the battlefield area or directly connected with the manoeuvre of combatant forces, which could be described as a 'tactical' use. The figure of 7,000 warheads includes, however, a substantial number carried out by, for example, aircraft such as the F-4 or F-104, which could be delivered on targets outside the battlefield area or unconnected with the manoeuvre of combatant forces and thus put to 'strategic' use. There is inevitably some overlap when describing delivery vehicles, aircraft and missiles, capable of delivering conventional or nuclear warheads as 'tactical' or 'strategic'. The total of 7,000 also includes nuclear warheads for certain air-defence missiles. There are also nuclear mines. Yields are variable but are mainly in the low kiloton range. The ground-based missile launchers and guns are in formations down to divisions and are operated both by American and allied troops, but in the latter case warheads are under double key. The figure for Soviet warheads is probably about 3,500, similarly delivered by aircraft and missile systems (again, see Table 1). Soviet warheads are thought to be somewhat larger, on average, than those of NATO. Some of the delivery vehicles, but not the warheads, are in the hands of non-Soviet Warsaw Pact forces.

This comparison of nuclear warheads must not be looked at in quite the same light as the conventional comparisons preceding it, since on the NATO side the strategic doctrine is not, and cannot be, based on the use of such weapons on this sort of scale. These numbers were accumulated to implement an earlier, predominantly nuclear, strategy and an inventory of this size now has the chief merit of affording a wide range of choice of weapons, yield, and delivery system if controlled escalation has to be contemplated. A point that does emerge from the comparison, however, is that the Soviet Union has the ability to launch a battlefield nuclear offensive on a massive scale if she should choose, or to match any NATO escalation with broadly similar options.

## **CHANGES OVER TIME**

The comparisons above are not very different from those of a few years ago, but over a longer period the effect of small and slow changes can be marked, and the balance can alter. In 1962 the American land, sea, and air forces in Europe totalled 434,000; now the figure is around 300,000. There were 26 Soviet divisions in Eastern Europe in 1967; now there are 31. The numerical pattern over the years so far has been a gradual shift in favour of the East; qualitatively NATO has more than held its own. In future the advent of new weapon systems, particularly precision-guided munitions and anti-tank and air defence missiles, may cut into the Warsaw Pact's advantage in tank and aircraft numbers. The extent to which negotiated force reductions may change the balance also remains to be seen.



# Other European Countries



## ALBANIA

Population: 2,400,000.  
 Military service: Army 2 years; Air Force, Navy, and special units 3 years.  
 Total regular forces: 38,000.  
 Estimated GNP 1971: \$1.04 billion.  
 Defence budget 1973: 589 million leks (\$118 million).  
 5 leks=\$1.

**Army:** 30,000.  
 1 tank brigade.  
 6 infantry brigades.  
 Some light coastal batteries.  
 70 T-34, 15 T-54 and T-59 med tks; T-62 lt tks; 20 BA-64, BTR-40, and BTR-152 APC; SU-76 SP guns; 122mm and 152mm gun/how; 45mm, 57mm, 76mm, and 85mm ATK guns; 37mm, 57mm, and 85mm AA guns.

**Navy:** 3,000.  
 4 submarines (ex-Soviet W-class).  
 4 coastal escorts.  
 40 MTB and patrol boats.  
 8 MCM ships (2 ex-Soviet T-43, 6 T-301 class).  
 Coastal defence SSM deployed around Durazzo and Valona.

**Air Force:** 5,000; 96 combat aircraft.  
 2 FB squadrons with 24 MiG-17/F-4 (Chinese).  
 2 fighter squadrons with 24 MiG-15/F-2 (Chinese).  
 2 interceptor squadrons with 36 MiG-19 and 12 MiG-21 (Chinese).  
 1 transport squadron with 3 An-2 and 3 Il-14.  
 2 squadrons with 20 Mi-1 and Mi-4 helicopters.  
 SA-2 SAM.

*Para-Military Forces:* 15,000: Internal security force 5,000; frontier force 10,000.

## AUSTRIA

Population: 7,500,000.  
 Military service: 6 months, followed by 60 days' reservist training.

Total armed forces: 12,000 regular, 40,000 conscript (total mobilizable strength 150,000).  
 Estimated GNP 1972: \$20.4 billion.  
 Defence budget 1973: 5,080 million schilling (\$291 million).  
 23 schilling=\$1 1 July 1972.  
 17.46 schilling=\$1 1 July 1973.

**Army:** 10,250 regulars, 38,050 conscripts.  
 3 armoured brigades.  
 7 infantry brigades.  
 16 territorial regiments.  
 3 independent air defence battalions.  
 153 M-47, 120 M-60 med tks; 100 *Kuerassier* tk destroyers; 470 Saurer APC; 108 105mm, 38 M-109 155mm, and 31 SFK M-2 155mm SP how; 18 130mm Praga V3S multiple RL; 301 80mm med mortars; 107 107mm and 82 120mm heavy mortars; 299 20mm Oerlikon, 44 35mm *Super Bat* and 60 40mm Bofors AA guns.

*Deployment:* 1 400-man battalion and 1 field hospital in Cyprus (UNFICYP).

*Reserves:* 100,000 *Landwehr*, Frontier Guard, and area militia.

**Air Force:** 1,750 regulars, 1,950 conscripts; 38 combat aircraft. (Austrian air units are an integral part of the army, but have been listed separately for purposes of comparison.)  
 3 fighter-bomber sqns with 38 SAAB 105ÖE.  
 1 sqn SAAB 105ÖE and 1 sqn SAAB *Safir* trainers.  
 1 tpt sqn with 19 Cessna L-19, 3 *Beaver* L-20, 2 *Skyvan*.  
 6 hel sqns with 23 AB-204B, 18 AB-206A and H-13, 22 *Alouette III/III*, and 2 S-65-Oe.

*Para-Military Forces:* 11,250 Gendarmerie.

## EIRE

Population: 3,000,000.  
 Military service: voluntary.  
 Total armed forces: 10,570.

Estimated GNP 1972: \$5.62 billion.  
 Defence budget 1973: £34.2 million (\$88 million).  
 £0.413=\$1 1 July 1972.  
 £0.388=\$1 1 July 1973.

**Army:** 9,600.  
 7 infantry battalions (one coy in UNFICYP).  
 1 tank squadron.  
 1 recce squadron.  
 6 field artillery batteries.  
 1 AA battery.  
 8 *Comet*, 3 *Churchill* med tks; 20 Panhard arm cars (incl 4 AML-90); 17 *Unimog* and 13 Panhard AML APC; 48 25-pdr guns; 447 84mm *Carl Gustav* and 96 90mm IIO ATGW; 72 120mm mortars; 26 40mm Bofors AA guns.

*Reserves:* 19,800: Regular Reserve 1,500; Territorial Army; 18,300.

**Navy:** 400.  
 1 corvette.  
 3 coastal minesweepers.

**Air Force:** 570; 7 combat aircraft.  
 3 *Vampire*, 4 BAC *Provost*, 8 *Chipmunk*, and 8 Cessna F-172; 2 *Dove* lt tpt; 6 *Alouette III* hel.

## FINLAND

Population: 4,710,000.  
 Military service: 8-11 months.  
 Total armed forces: 39,500.  
 Estimated GNP 1972: \$12.6 billion.  
 Defence budget 1973: 843.2 million markkaa (\$231 million).  
 4.1 markkaa=\$1 1 July 1972.  
 3.65 markkaa=\$1 1 July 1973.

**Army:** 34,000.  
 1 armoured brigade (at about half strength).  
 6 infantry brigades (at about 35 per cent strength).  
 7 independent infantry battalions.  
 3 field artillery regiments.  
 4 independent field artillery batteries.  
 7 coastal artillery battalions.





Yugoslavia produces its own jet trainer, the G-2-A Galeb (Seagull), with a more advanced version—the G-3—being developed for support and recce roles.



The Spanish Air Force, largely equipped with F-4s, F-5As, and Mirage IIIs, also has two fighter-bomber squadrons of locally designed and built Saeta HA-200s.



Switzerland's small but efficient air force of 285 combat aircraft includes seventy-five Hawker F-58 ground-attack fighters with thirty more on order. The subsonic Hunter was developed in the late 1950s.

4 anti-aircraft battalions.

T-54, T-55, and *Charioteer* med tks; PT-76 lt tks; BTR-50P APC; 105mm, 122mm, and 130mm guns; 122mm and 152mm how; *Vigilant* and SS-11 ATGW; ZSU-57-2, ZU-23-2, 35mm Oerlikon and 40mm Bofors AA guns.

Navy: 2,500.

3 frigates (one used as training ship).  
2 gunboats.  
1 patrol boat with SSM (training ship).  
15 fast patrol boats (less than 100 tons).  
2 coastal minelayers.  
5 inshore minesweepers.

Air Force: 3,000; 47 combat aircraft.

3 fighter sqns with MiG-21F, 12 SAAB J-35BS *Draken*, and *Fouga Magister*.

About 10 DC-3 transports.

60 *Magister*, 30 *Safir*, and 4 MiG-15/21 UTI trainers.

3 Mi-4, 1 *Alouette II*, and 1 AB-204B hel.

Reserves: 685,000.

Para-Military Forces: 4,000 frontier guards.

## SPAIN

Population: 34,700,000.

Military service: 18 months.

Total armed forces: 293,000.

Estimated GNP 1972: \$46.2 billion.

Defence budget 1973: 65.7 billion pesetas (\$1,132 million).

63 pesetas=\$1 1 July 1972.

58.06 pesetas=\$1 1 July 1973.

Army: 210,000.

1 armoured division.

1 mechanized infantry division.

1 motorized infantry division.

2 mountain divisions.

1 armoured cavalry brigade.

12 independent infantry brigades.

(All above are about 70% strength.)

1 mountain brigade.

1 airportable brigade.

1 parachute brigade.

2 artillery brigades (1 coast artillery).

1 SAM battalion with *HAWK*.

20 AMX-30, 350 M-47 and M-48 med tks; 250 M-24 and M-41 lt tks; *Greyhound* armd cars; AML-60/90 and M-3 scout

cars; 50 M-113 APC; 130 105mm, and 175mm SP guns; 200 105mm, 155mm, and 203mm how; 90mm SP ATK guns; 40mm L/70 and 90mm AA guns; 88mm coastal guns; Cessna O-1E, CASA 127 lt ac; 6 Bell 47G, 12 UH-1B, 16 UH-1H, and 16 AB-206A hel (6 CH-47C tpts on order); *HAWK* SAM.

Navy: 44,000 (incl 8,000 marines).

6 submarines (4 *Daphne*-class on order).

1 helicopter carrier.

1 cruiser.

19 destroyers/fast frigates (5 more on order).

5 frigates.

5 corvettes.

3 ASW launches.

3 torpedo boats.

26 minesweepers.

14 landing ships/craft.

3 ASW hel and 1 lt hel sqns with 6 SH-30,

12 AB-204B, 9 H-19, 5 Hughes 500, 16

Bell 47H-1G, Bell 212, and Sikorsky

CH-47.

Air Force: 39,000; 151 combat aircraft.

2 fighter-bomber sqns with 36 F-4C.

2 fighter-bomber sqns with 24 *Mirage*

*IIIEE*.

2 fighter-bomber sqns with 36 F-5A.

2 fighter-bomber sqns with 44 HA-200

*Saeta*.

1 ASW sqn with 11 SA-16.

Tpt ac include C-47, DC-4, CASA 207

*Azor*, *Caribou*; KC-137 tankers.

Trainers include 6 *Mirage IIIBE* and 6 F-

5B.

Hel include AB-205 and AB-47.

(15 *Mirage* F-1, 4 C-130H, up to 20 C-212

*Aviocar*, 8 *Chinook*, and 8 *Cobra* on

order.)

Para-Military Forces: 65,000 Guardia Civil.

Deployment (outside mainland Spain):

41,000.

Balearic Islands: 6,000.

Canary Islands: 8,000.

Ceuta: 8,000, incl 1 regt of Foreign

Legion.

Melilla: 9,000, incl 1 regt of Foreign

Legion.

Spanish Sahara: 10,000, incl 2 regts of

Foreign Legion.

## SWEDEN

Population: 8,200,000.

Military service: Army and Navy, 7½–15

months; Air Force, 9–14 months.

Total armed forces: 20,500 regulars,

18,300 reservists, and 54,300 conscripts,

plus 99,600 conscripts on annual

refresher training. (Total mobilizable

strength 750,000.)

Estimated GNP 1972: \$42.3 billion.

Defence budget 1973–74: 7,550 million

kroner (\$1,883 million).

4.72 kroner=\$1 1 July 1972.

4.01 kroner=\$1 1 July 1973.

Army: 10,700 regulars, 13,400 reservists,

and 40,500 conscripts, plus 83,000

conscripts on 18–40 days' annual refresher

training.

6 armoured brigades.

20 infantry brigades.

4 *Norrlands* winter brigades.

50 independent battalions.

23 Local Defence Districts with 100 inde-

pendent battalions and 400–500 inde-

pendent companies.





Sweden's SAAB AJ-37 Viggen is a Mach 2.0 multimission fighter that can be equipped for attack, intercept, reconnaissance, or training roles.

49 non-operational armoured, infantry, and artillery training units to provide basic arms training for conscripts.

Strv 101, 102 (*Centurion*), and 103B med tks; Strv 74 lt tks (Ikv 91 on order); Pbv 301, 302A, SKPF APC; Ikv 102, Ikv 103 105mm and Bk 1A (L/50) and other 155mm SP guns; 75mm, 105mm, and 155mm how; 75mm SP and 90mm ATK guns; SS-11, *Bantam*, *Carl Gustav*, and *Miniman* ATGW: 20mm, 40mm, and 57mm AA guns; *Redeye* and *HAWK* SAM; 20 Sk 61 (*Bulldog*), 18 Fpl 51 (*Piper Super Cub*), 4 Fpl 53 (*Do.27*) lt ac; Hkp-3 (AB-204B), 22 Hkp-6 (*Jet-Ranger*) hel.

**Navy:** 4,400 regulars, 2,900 reservists, and 7,500 conscripts, plus 12,000 conscripts on annual refresher training.

22 submarines.

8 destroyers, 2 with Rb-08 SSM, 4 with *Seacat* SAM.

5 fast ASW frigates.

19 heavy torpedo boats.

25 motor torpedo boats (less than 100 tons).

1 fast patrol boat.

2 minelayer/submarine depot ships.

18 coastal minesweepers.

20 inshore minesweepers (8 less than 100 tons).

20 mobile and 45 static coastal artillery batteries with 75mm, 105mm, 120mm, 152mm, and 210mm guns and Rb-08 and Rb-52 (SS-11) SSM.

7 Hkp-2 (*Alouette II*), 3 Hkp-4B (Vertol 107), 7 Hkp-4C (Kawasaki-Vertol 107/II), and 10 Hkp-6 (*JetRanger*) hel.

**Air Force:** 5,400 regulars, 2,000 reservists, and 6,300 conscripts, plus 4,600 conscripts on annual refresher training; 600 combat aircraft.

9 attack sqns with A-32A *Lansen* (with Rb-04E ASM) and AJ-37 *Viggen* (replacement of *Lansen* by *Viggen* started in 1971).

1 FGA sqn with SAAB S/T-60B.

13 AWX sqns with J-35 *Draken F*.

6 AWX sqns with J-35 *Draken A/D*.

2 recce-fighter sqns with S-32C.

3 recce/day fighter sqns with S-35E.

(A combat sqn has up to 18 aircraft.)

2 tpt sqns with 2 C-130E and 7 C-47, *Norseman*, and BAC *Pembroke*.

5 comm sqns with 110 SAAB 105 and 78 Sk 61 (*Bulldog*) (suitable for light ground attack duties).

5 hel groups (up to 3-4 aircraft each) with 1 Hkp-2 (*Alouette II*), 6 Hkp-3 (AB-204B), and 4 Hkp-4B (Vertol 107).

6 SAM sqns with *Bloodhound 2*.

There is a fully computerized, fully automatic control and air surveillance system, *Stril 60*, co-ordinating all air defence components.

**Reserves:** Voluntary defence organizations, 500,000.

## SWITZERLAND

**Population:** 6,500,000.

**Military service:** 4 months initial training, followed by refresher training of three weeks a year for 8 years, two weeks for 3 years, and one week for 2 years.

**Total armed forces:** 3,500 regulars and 30,000 conscripts (total mobilizable strength 600,000; militia can be fully mobilized within 48 hours).

**Estimated GNP 1972:** \$30.6 billion.

**Defence budget 1973:** 2,309 million francs (\$799 million).

3.75 francs=\$1 1 July 1972.

2.89 francs=\$1 1 July 1973.

**Army:** 1,500 regular cadre (including Air Defence troops); 27,500 conscripts; 526,500 militia.

1 corps (Alpine defence) of 3 mountain divisions.

3 corps, each of an armoured division and 2 infantry divisions.

17 frontier, fortress or 'redoubt' brigades. 300 *Centurion* and 260 Pz-61/68 med tks; 200 AMX-13 lt tks; 1,250 M-113 APC; 150 155mm SP how; 900 105mm guns and how.

**Air Force:** 2,000 regular; 2,500 conscripts; 40,000 militia (maintenance is by civilians); 285 combat aircraft. (Swiss Air Force and Air Defence Troops are an integral part of the army, but are listed separately for purposes of comparison.)

11 FB squadrons with 165 *Venom* FB 50. 2 interceptor squadrons with 30 *Mirage IIIS*.

5 FGA squadrons with 75 *Hunter* F-58 (with *Sidewinder* AAM). (30 more *Hunters* on order.)

1 reconnaissance squadron with 15 *Mirage IIIRS*.

28 transport aircraft.

100 *Alouette III/III* hel.

2 SAM battalions with *Bloodhound 2*.

45 AA batteries with Oerlikon twin 35mm cannon.

**Reserves:** 566,500.

## YUGOSLAVIA

**Population:** 21,000,000.

**Military service:** Army and Air Force, 15 months; Navy, 18 months.

**Total armed forces:** 240,000.

**Estimated GNP 1972:** \$12.83 billion.

**Defence budget 1973:** 12.8 billion dinars (\$826 million).

16.5 dinars=\$1 1 July 1972.

15.5 dinars=\$1 1 July 1973.

**Army:** 200,000.

1 tank division.

10 infantry divisions.

9 armoured brigades.

24 independent infantry brigades.

1 airborne brigade.

Several hundred T-54/55, T-34, and M-47, and about 650 M-4 med tks; some PT-76 lt tks; M-3, BTR-50P, BTR-60P, BTR-152, and M-590 APC; SU-100 SP guns; 105mm and 155mm how; 50mm, 57mm, 75mm, and 76mm ATK guns; ZSU-57-2 SP AA guns; SA-2 SAM.

**Navy:** 20,000.

5 submarines.

1 destroyer.

19 coastal escorts.

30 MCM ships.

10 *Osa*-class patrol boats with *Styx* SSM.

80 patrol torpedo boats (55 less than 100 tons).

30 landing craft.

1 marine infantry brigade.

25 coastal artillery batteries.

**Air Force:** 20,000; 342 combat aircraft.

12 FGA sqns with F-84, *Kraguj*, and *Jastreb*.

8 fighter sqns with 50 F-86D/E and 82 MiG-21.

2 reconnaissance sqns with RT-33.

(A combat squadron has about 15 aircraft.)

25 Li-2, *Beaver*, and C-47 and 13 Il-14 tpts.

60 *Galeb* trainers.

15 *Whirlwind*, 18 Mi-4 and Mi-8, and 5 *Alouette III* helicopters (130 SA-341 *Gazelle* on order).

8 SAM batteries with SA-2.

**Para-Military Forces:** 19,000 Frontier Guards; 1,000,000 Territorial defence force (planned to increase to 3,000,000).



# The Middle East and The Mediterranean



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## BILATERAL AGREEMENTS WITH EXTERNAL POWERS

The Soviet Union has military assistance agreements and a 15-year treaty of friendship and co-operation, signed in May 1971, with Egypt. A similar treaty, though with less comprehensive defence provisions, was concluded with Iraq in April 1972. Important military assistance has also been provided to Algeria, Sudan, Syria, and the People's Democratic Republic of Yemen.

The United States has varying types of security assistance agreements and provides significant military aid on either a grant or credit basis to Greece, Turkey, Portugal, Spain, Morocco, Tunisia, Lebanon, Jordan, Saudi Arabia, and Israel. She provides, in addition, a significant amount of military equipment on a cash sales basis to many countries, notably Spain, Israel, Iran, and Jordan. For grant military aid purposes Turkey is considered a forward defence area, and Spain is considered a base rights country under a basing agreement concluded in August 1970. A naval facilities agreement was signed with Bahrain in late 1971. Communications bases are maintained in Morocco under informal arrangements.

Britain has defence commitments to Cyprus and is responsible for the defence of Gibraltar. A new seven-year agreement with Malta, signed on 26 March 1972, permits Britain to base forces on the island for British and NATO purposes. Britain concluded treaties of friendship with Bahrain, Qatar, and the United Arab Emirates in August 1971 and is also an important arms supplier for Iran, Kuwait, Bahrain, Qatar, United Arab Emirates, Saudi Arabia, Oman, and Jordan.

The People's Republic of China has supplied arms to Albania and the People's Democratic Republic of Yemen.

France has a pilot-training agreement with Morocco and supplies arms to a number of countries, particularly Libya.

## MULTILATERAL AGREEMENTS INCLUDING EXTERNAL POWERS

The members of the Central Treaty Organization (CENTO) are Britain, Iran, Pakistan, and Turkey, with the United States as an associate. All sit on the Military, Economic, and Counter-Subversion Committees and on the Permanent Military Deputies Group. The Treaty provides for mutual co-operation for security and defence but has no central command structure nor forces allocated to it. For the local powers, the economic organization of Regional Co-operation for Development (RCD), which has evolved independently out of CENTO, could become more important.

## ARRANGEMENTS WITHIN THE REGION (BETWEEN ARAB STATES)

Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen Arab Republic, and the People's Democratic Republic of Yemen are members of the League of Arab States. Among its subsidiary bodies are the Arab Defence Council, set up in 1950, and the Unified Arab Command, organized in 1964.

Defence agreements were concluded by Egypt with Syria in November 1966 and Jordan in May 1967, to which Iraq later acceded. These arrangements provided for the establishment of a Defence Council and a Joint Command. The loosely associated Eastern Front Command, comprising Iraq, Jordan, the Palestine Liberation



Army, and Syria, was reorganized in December 1970 into separate Jordanian and Syrian commands. Iraq and Syria concluded defence pacts in May 1968 and July 1969. The Federation of Arab Republics formed by Libya, Syria, and Egypt in April 1971, provides for a common defence policy and a Federal Defence Council. The proposed union between Egypt and Libya, announced in August 1972 and to be effective in September 1973, could, if it takes place, presumably affect existing defence arrangements.

*Changes in the armed forces of Middle East countries, resulting from the October war, took place after "The Military Balance 1973/74" was completed and are not reflected in this study. A special report on the war, prepared by Brigadier Kenneth Hunt, British Army (Ret.), Deputy Director of The International Institute for Strategic Studies, begins on p. 51 of this issue.*

—THE EDITORS

## ALGERIA

Population: 15,700,000.  
 Military service: voluntary.  
 Total armed forces: 63,000.  
 Estimated GNP 1972: \$5.5 billion.  
 Estimated defence expenditure 1972: 450 million dinars (\$100 million).  
 4.5 dinars=\$1 1 July 1972.  
 3.72 dinars=\$1 1 July 1973.

**Army:** 55,000.  
 1 armoured brigade.  
 4 motorized infantry brigades.  
 3 independent tank battalions.  
 50 independent infantry battalions.  
 1 parachute battalion.  
 12 companies of desert troops.  
 5 independent artillery battalions.  
 5 AA battalions.  
 3 engineer battalions.  
 100 T-34, 300 T-54/55 med tks; 50 AMX-13 lt tks; 350 BTR-152 APC; 85 SU-100 and 15 JSU-152 SP guns; 85mm guns; 122mm and 152mm how; 140mm and 240mm RL; 57mm, 85mm, and 100mm AA guns.

*Reserves:* 50,000.

**Navy:** 3,500.  
 6 SOI submarine chasers.  
 2 fleet minesweepers.  
 1 coastal minesweeper.  
 6 Komar- and 3 Osa-class FPB with Styx SSM.  
 12 P-6 torpedo boats.

*Reserves:* 9,000.

**Air Force:** 4,500; 206 combat aircraft.  
 2 lt bomber sqns with 30 Il-28.  
 2 interceptor sqns with 35 MiG-21.  
 1 FGA sqn with 20 Su-7.  
 4 FGA sqns with 70 MiG-17.  
 2 FGA sqns with 25 MiG-15.  
 2 COIN sqns with 26 Magister.  
 1 transport sqn with 8 An-12 and 5 Il-18.  
 4 hel sqns with 4 Mi-1, 42 Mi-4, 6 Hughes 269A, and 5 SA-330.  
 1 SAM battalion with SA-2.

*Reserves:* 3,000.

**Para-Military Forces:** 10,000 Gendarmerie with 50 AML armoured cars.

## EGYPT

Population: 35,700,000.  
 Military service: 3 years.  
 Total armed forces: 298,000.  
 Estimated GNP 1972: \$7.5 billion.

Defence budget 1973-74; £E 700 million (\$1,737 million).  
 £E 0.43=\$1 1 July 1972.  
 £E 0.403=\$1 1 July 1973.

**Army:** 260,000.  
 2 armoured divisions.  
 3 mechanized infantry divisions.  
 5 infantry divisions.  
 2 independent armoured brigades.  
 2 independent infantry brigades.  
 1 airborne brigade.  
 1 parachute brigade.  
 6 artillery brigades.  
 26 commando battalions.  
 30 JS-3 hy tks; 1,650 T-54/55, 100 T-62, and 100 T-34 med tks; 75 PT-76 lt tks; 2,000 BTR-40, BTR-50P, BTR-60P, OT-64, and BTR-152 APC; about 150 SU-100 and JSU-152 SP guns; about 750 122mm, 130mm, and 152mm guns and how; 40 203mm how; about 900 57mm, 85mm, and 100mm ATK guns; *Snapper*

ATGW; 24 FROG-3, some FROG-7 and 100 Samlet SSM; ZSU-23-4 and ZSU-57-2 SP AA guns; SA-7 Strela SAM.

*Reserves:* about 500,000.

**Navy:** 15,000 (including coastguard).  
 12 submarines (6 W- and 6 R-class—ex-Soviet).  
 5 destroyers (including 4 ex-Soviet Skory-class).  
 4 escorts (ex-British).  
 1 corvette (ex-Soviet).  
 12 SOI submarine chasers (ex-Soviet).  
 10 fleet minesweepers.  
 2 inshore minesweepers.  
 12 Osa- and 7 Komar-class patrol boats with Styx SSM.  
 36 motor torpedo boats (most less than 100 tons).  
 14 landing craft.

*Reserves:* about 14,000.



*At the outbreak of the October war, about a third of Israel's 488 combat aircraft were McDonnell Douglas A-4s, shown here with Israeli markings.*



**Air Force:** 23,000; 620 combat aircraft (including 200 aircraft estimated to be in storage).

25 Tu-16 *Badger* medium bombers.  
5 Il-28 *Beagle* light bombers.  
210 MiG-21 *Fishbed* interceptors.  
80 Su-7 *Fitter* fighter-bombers.  
100 MiG-17 *Fresco* fighter-bombers.  
200 MiG, Yak, and L-29 trainers.  
About 50 Il-14 It and 20 An-12 med tpts.  
190 Mi-1, Mi-4, Mi-6, and Mi-8 helicopters.  
Air defence is provided by 130 SAM sites, each of 6 SA-2, SA-3, and some SA-6 launchers; 20mm, 23mm, 37mm, 57mm, 85mm, and 100mm AA guns; all integrated, through a warning and command network, with 9 Air Force squadrons of MiG-21MF interceptors.

**Reserves:** about 20,000.

**Para-Military Forces:** about 100,000 National Guard, including Frontier Corps, Defence, and Security.

## IRAN

**Population:** 30,805,000.  
**Military service:** 2 years.  
**Total armed forces:** 211,500.  
**Estimated GNP 1972:** \$15.09 billion.  
**Defence budget 1973:** 136,340 million rials (\$2,010 million).  
76.6 rials=\$1 1 July 1972.  
67.83 rials=\$1 1 July 1973.

**Army:** 160,000.  
3 armoured divisions.  
2 infantry divisions.  
4 indep bdes (2 inf, 1 AB, 1 special force).  
1 SAM battalion with *HAWK*.  
60 *Chieftain*, 400 M-47, and 460 M-60A1 med tks; about 2,000 M-113, BTR-50, and BTR-60 APC; 130mm and 155mm

guns; 75mm, 105mm, and 155mm how; 40mm, 57mm, and 85mm AA guns; SS-11, SS-12, TOW ATGW; *HAWK* SAM (740 *Chieftain* tks; 155mm, 175mm SP guns and 203mm how on order).

About 30 It ac, incl C-45 Li-8, Cessna 185, O-2A.

20 *Huskie*, 59 AB-206A, and 3 CH-47C hel (46 AB-205A on order).

**Reserves:** 300,000.

**Navy:** 11,500.  
3 destroyers.  
4 frigates with *Seakiller* SSM and *Seacat* SAM.  
4 corvettes (2 in reserve).  
10 patrol boats.  
4 coastal minesweepers.  
2 inshore minesweepers.  
4 landing craft.  
8 SRN-6 and 2 BH-7 *Wellington* hovercraft.  
1 sqn with 4 AB-205A, 6 AB-212, and 6 SH-3D hel.  
(6 P-3C Orion MR ac, 202 AH-1J hel, and 4 BH-7 hovercraft on order.)

**Air Force:** 40,000; 159 combat aircraft.  
2 FB sqns with 64 F-4D/E with *Sidewinder* and *Sparrow* AAM (70 more F-4E on order).  
6 FB sqns with 80 F-5A (141 F-5E on order).  
1 recce sqn with 15 RT-33.  
1 med tpt sqn with 35 C-130E. (20 C-130H, 4 F.28, and 6 Boeing 707-320C tankers on order.)  
2 It tpt sqns with 12 F-27 and 6 DHC-2 *Beaver*.  
12 *Huskie*, 5 AB-206A, 5 AB-212, and 4 CH-47C hel (287 UH-1H/214A *Huey Plus* on order).

**Reserves:** 15,000.

**Para-Military Forces:** 70,000 Gendarmerie with armoured cars, light aircraft, and helicopters; one naval battalion with 40 patrol boats.

## IRAQ

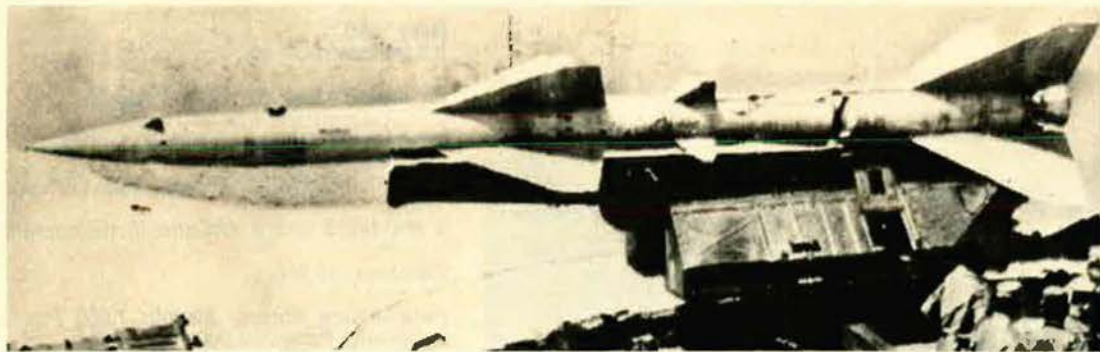
**Population:** 10,142,000.  
**Military service:** 2 years.  
**Total armed forces:** 101,800.  
**Estimated GNP 1972:** \$3.5 billion.  
**Estimated defence expenditure 1972:** 102 million dinars (\$309 million).  
0.33 dinars=\$1 1 July 1972.  
0.302 dinars=\$1 1 July 1973.

**Army:** 90,000.  
1 armoured division of 2 armd bdes and 1 mech bde.  
2 inf divs, each of 1 mech and 3 inf bdes.  
1 Republican Guard mech bde.  
2 special forces bdes.  
900 T-54/55 and 90 T-34 med tks; 45 PT-76, 30 M-24 lt tks; about 1,300 APC, incl 600 BTR-152; 700 75mm, 85mm, 100mm, 120mm, 130mm, and 152mm guns; 23mm, 37mm, 57mm, 85mm, 100mm AA guns.

**Reserves:** 250,000.

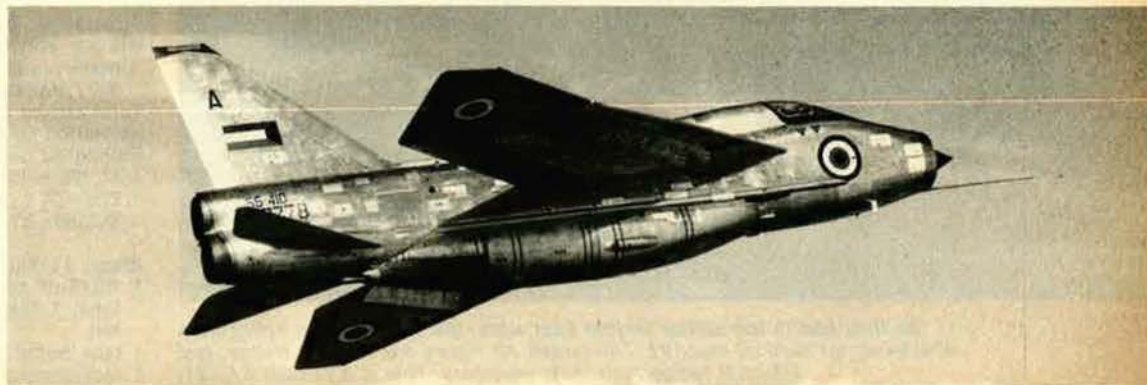
**Navy:** 2,000.  
3 SOI submarine chasers.  
2 minesweepers.  
3 *Osa-class* patrol boats with Styx SSM.  
12 P-6 torpedo boats.  
10 patrol boats (less than 100 tons).

**Air Force:** 9,800; 224 combat aircraft.  
1 bomber sqn with 8 Tu-16.  
3 fighter-bomber sqns with 60 Su-7.  
2 FGA sqns with 36 *Hunter*.  
5 interceptor sqns with 90 MiG-21.



—Wide World Photos

Surface-to-air missiles, like this Soviet-built SA-2 supplied to Egypt, figured prominently in the October war. The USSR has provided Algeria, Egypt, Iraq, and Syria with a variety of SAMs, including the SA-2, -3, -6, and -7. The SA-3 and -6 had not been used previously in combat.



The British Aircraft Corp. BAC 167 light tactical fighter, which is well adapted to counter-insurgency operations, is used by the air forces of Kuwait, Oman, Saudi Arabia, and South Yemen.



3 fighter sqns with 30 MiG-17.  
 2 tpt sqns with 27 An-2, An-12, An-24, Il-14, Tu-124, and *Heron*.  
 35 Mi-4, 29 Mi-8, and 5 *Alouette III* hel. SA-2 and SA-3 SAM.

Reserves: 18,000.

Para-Military Forces: 10,000 National Guard, 4,800 security troops, and 4-5,000 others.

## ISRAEL

Population: 3,180,000.

Military service: men 36 months, women 20 months (Jews and Druse only; Moslem and Christian may volunteer). Annual training for reservists thereafter to age limits.

Total armed forces: 30,000 regular, 85,000 conscripts (mobilization to about 300,000 in 72 hours).

Estimated GNP 1972: \$6.85 billion.

Defence budget 1973-74: 6,180 million Israeli pounds (\$1,474 million).

4.25 Israeli pounds=\$1 1 July 1972.

4.19 Israeli pounds=\$1 1 July 1973.

Army: 11,500 regular, 83,000 conscripts (including 12,000 women); 275,000 on mobilization.

10 armoured brigades (2 at full strength; 1 at about 50%; 7 at cadre strength).

9 mechanized brigades (4 at about 50% strength; 5 at cadre strength).

9 infantry brigades (3 at full strength; 6 at cadre strength).

5 parachute brigades (2 at full strength; 3 at cadre strength).

3 artillery brigades.

About 1,700 med tks, incl 400 M-48 (with 105mm guns), 250 *Ben Gurion* (*Centurion* with French 105mm gun), 600 *Centurion*, 200 *Isherman* (with 105mm gun) and *Super Sherman*, 100 TI-67 (T-54/55 with 105mm gun), and some 150 M-60 med tks; about 3,000 AFV, incl AML-60, 15 AML-90, and some *Staghound* armd cars; about 1,000 M-2 and M-3 half-tracks, and 450 M-113 APCs; 350 105mm and 155mm, and some 175mm SP how; 155mm how on *Sherman* chassis; 900 120mm and 160mm mortars on AMX chassis; 122mm guns and how; 130mm guns; 240mm RL (captured equipment); about 50 90mm SP ATK guns and 106mm jeep-mounted recoilless rifles; *Cobra*, and weapons-carrier-mounted SS-10/11 ATGW; about 300 20mm, 30mm, and 40mm AA guns.

(The 280-mile range MD-660 *Jericho* SSM is believed to be in production, but has not yet been reported deployed operationally.)

Reserves: 180,000.

Navy: 3,500 regular, 1,000 conscripts; 5,000 on mobilization.

3 submarines (2 in reserve, 3 more on order).

1 destroyer (plus 1 awaiting disposal).

1 *Reshef*-class FPB (with *Gabriel* SSM).

12 *Saar*-class FPB (with *Gabriel* SSM).

9 motor torpedo boats.

23 small patrol boats (less than 100 tons).

9 landing craft (3 less than 100 tons).

Naval commandos: 300.

Air Force: 15,000 regular, 1,000 conscripts; 20,000 on mobilization; 488 combat aircraft.

12 *Vautour* light bombers (in storage).  
 95 F-4E fighter-bomber/interceptors.  
 35 *Mirage IIIB/C* fighter-bomber/interceptors (some with R530 AAM).  
 160 A-4E/H *Skyhawk* fighter-bombers.  
 24 *Barak* fighters.  
 18 *Super Mystère B.2* interceptors.  
 6 RF-4E reconnaissance aircraft.  
 23 *Mystère IV A* fighter bombers (in reserve).  
 30 *Ouragan* FB (used mainly for training).  
 85 *Magister* trainers (limited FGA capability).  
 10 *Stratocruiser* transports (incl 2 tankers).  
 20 *Noratlas*, 10 C-47, 2 C-130E transports.  
 12 *Super Frelon*, 12 CH-53G, 20 AB-205A, 25 UH-1D *Iroquois*, and 5 *Alouette II* helicopters.  
 10 SAM batteries with 60 *HAWK*.

Para-Military Forces: 4,000 Border Guards and 5,000 *Nahal* militia.

## JORDAN

Population: 2,560,000.

Military service: voluntary.

Total armed forces: 72,850.

Estimated GNP 1972: \$686 million.

Defence budget 1972: 42.9 million dinars (\$119.2 million).

0.36 dinar=\$1 1 July 1972.

0.32 dinar=\$1 1 July 1973.

Army: 68,000.

2 armoured divisions.

1 mechanized division.

2 infantry divisions.

1 independent infantry brigade.

1 special forces battalion.

3 artillery regiments.

200 M-47, M-48, and M-60 and 220 *Centurion* med tks; 130 *Saladin* armd cars; 140 *Ferret* scout cars; 280 M-113 and 120 *Saracen* APC; 110 25-pdr, 50 105mm, and 155mm how; 10 155mm guns; 350 81mm mor; 200 M-42 40mm SP AA guns.

Navy: 250.

8 small patrol craft.

Air Force: 4,600; 52 combat aircraft.

2 FGA squadrons with 32 *Hunter*.

1 interceptor squadron with 20 F-104A.

(36 F-5E on order.)

4 C-47, 2 *Dove*, 2 *Packet*, and 1 *Falcon* tpts.

3 *Whirlwind* and 6 *Alouette III* helicopters.

Reserves: 20,000.

Para-Military Forces: 22,000; 7,000 Public Security Force; 15,000 Civil Militia.

## LEBANON

Population: 3,009,000.

Military service: voluntary (proposals have been made to introduce compulsory military training).

Total armed forces: 15,250.

Estimated GNP 1972: \$1.88 billion.

Estimated defence expenditure 1972:

£L225 million (\$75 million).

£L3=\$1 1 July 1972.

£L2.38=\$1 1 July 1973.

Army: 14,000.

1 infantry brigade with 3 infantry battalions, 1 tank battalion, 1 artillery battalion.

1 tank battalion.

2 reconnaissance battalions.



As they had in the earlier Middle East wars, the Israelis used helicopters effectively for tactical mobility. The Israeli Air Force has French, Italian, and US-built helicopters in its inventory. This is a French SA-321.



1 commando battalion.  
 6 infantry battalions.  
 2 artillery battalions.  
 1 AA battalion.  
 60 *Charioteer* med tks; 40 AMX-13 and 20 M-41 lt tks; about 100 M-706, M-6, and AEC Mk 3 armd cars; 20 M-113, some M-59 APC; 6 75mm guns; 24 122mm, 20 155mm how; 80 81mm, 25 120mm mor; 15 M-42 40mm SP AA guns.

**Navy:** 250.  
 1 patrol vessel.  
 4 small inshore patrol craft.  
 1 landing craft.

**Air Force:** 1,000; 18 combat aircraft.  
 1 FGA sqn with 8 *Hunter*.  
 1 interceptor squadron with 10 *Mirage IIID* with R-530 AAM.  
 1 hel sqn with 4 *Alouette II* and 10 *Alouette III*.  
 Some French early warning/ground control radars.

*Para-Military Forces:* 5,000 Gendarmerie.

## LIBYA

**Population:** 2,160,000.  
**Military service:** voluntary.  
**Total armed forces:** 25,000.  
**Estimated GNP 1972:** \$4.59 billion.  
**Defence budget 1973:** 43 million Libyan dinars (\$145 million).  
 0.33 Libyan dinar=\$1 1 July 1972.  
 0.296 Libyan dinar=\$1 1 July 1973.

**Army:** 20,000.  
 1 armoured brigade.  
 2 mechanized infantry brigades.  
 1 National Guard brigade.  
 1 commando battalion.  
 3 artillery battalions.  
 2 anti-aircraft artillery battalions.  
 6 *Centurion* Mk 5, 200 T-54/55, and 15 T-34 med tks; 40 *Saladin* armed cars; *Shorland* and *Ferret* scout cars; BTR-60, *Saracen* and 170 M-113A1 APC; 70 122mm, 75 105mm, and 30 155mm how; 300 *Vigilant* ATGW; L40/70 Bofors AA guns.  
 5 AB-206, 7 OH-13, and 4 *Alouette III* helicopters.

**Navy:** 2,000.  
 1 frigate.  
 1 corvette.  
 3 FPB each with 8 SS-12 (M) SSM.  
 2 inshore minesweepers.  
 8 patrol craft.  
 1 logistics support ship.

**Air Force:** 3,000; 44 combat aircraft.  
 1 interceptor squadron with 9 F-5A.  
 2 fighter squadrons with 35 *Mirage IIIB/E*.  
 8 C-130E and 9 C-47 medium transports.  
 3 T-33 trainers.  
 2 AB-206 3 OH-13, 10 *Alouette III*, and 9 *Super Frelon* helicopters.  
 (About 65 of a total order of 110 *Mirage IIIB/E/R* and V have been delivered.)

## MOROCCO

**Population:** 16,300,000.  
**Military service:** 18 months.  
**Total armed forces:** 56,000.  
**Estimated GNP 1972:** \$4.46 billion.  
**Defence budget 1972:** 568 million dirham (\$123.5 million).

4.6 dirham=\$1 1 July 1972.  
 3.9 dirham=\$1 1 July 1973.

**Army:** 50,000.  
 1 armoured brigade.  
 3 motorized infantry brigades.  
 1 light security brigade.  
 1 parachute brigade.  
 9 independent infantry battalions.  
 1 Royal Guards battalion.  
 5 camel corps battalions.  
 3 desert cavalry battalions.  
 5 artillery groups.  
 2 engineer battalions.  
 120 T-54 med tks; 120 AMX-13 lt tks; 36 EBR-75, 50 AML-245, and M-8 armd cars; 40 M-3 half-track and 95 Czech APC; 25 SU-100, AMX-105, and 50 M-56 90mm SP guns; 100 76mm, 85mm, and 105mm guns; 75mm and 105mm how; 82mm and 120mm mortars; 50 37mm and 100mm AA guns; 3 *Alouette III* hel.

*Deployment:* Syria: armd bde elements.

**Navy:** 2,000 (including 500 marines).  
 1 frigate.  
 2 coastal escorts.  
 1 patrol boat.  
 12 patrol boats (less than 100 tons).  
 1 landing craft.

**Air Force:** 4,000; 48 combat aircraft.  
 2 interceptor sqns with 20 F-5A and 4 F-5B.  
 2 FGA sqns with 24 *Magister*.  
 2 transport sqns with 10 C-47 and 11 C-119.  
 35 T-6 and 25 T-28 trainers.  
 12 AB-205A, 4 HH-43B, and 4 *Alouette III* hel.

(12 MiG-17 fighter-bombers are in storage.)

*Para-Military Forces:* 23,000: 8,000 Gendarmerie, including 2 mobile security battalions; 15,000 Auxiliaries.

## OMAN

**Population:** 710,000.  
**Military service:** voluntary.  
**Total armed forces:** 9,600 (including some 600 expatriate personnel of several nationalities serving on contract or on secondment).  
**Defence budget 1973:** 25.5 million rial saidi (\$77.5 million).  
 0.413 rial saidi=\$1 1 July 1972.  
 0.329 rial saidi=\$1 1 July 1973.

**Army:** 9,000.  
 4 infantry battalions.  
 1 frontier force battalion.  
 1 armoured cavalry squadron.  
 1 artillery regiment.  
*Saladin* armoured cars; 75mm pack how; 25-pdr and 5.5 inch guns.



Most numerous of Israel's supersonic tactical fighter/interceptors are its McDonnell Douglas F-4Es, of which IAF had 95 at the start of the war.



Although the MiG-17 dates back to 1953, it is still widely used as a ground-attack aircraft by several North African and Middle East air forces, among them Algeria, Egypt, Iraq, and Syria.

—Tass Photo





A C-130 of the Saudi Arabian Air Force. Saudi Arabia is replacing its obsolete fighters with US-built F-4s and F-5s, which were on order prior to the October war.

- 2 FGA sqns with 20 BAC-167 (10 more on order).
- 2 interceptor sqns with 35 F-52/F-53 Lightning.
- 2 tpt sqns with 10 C-130 and 2 C-140B (4 C-130E on order).
- 2 hel sqns with 1 *Alouette III*, 1 AB-204, 8 AB-205, and 20 AB-206.
- 1 T-33 trainer, 1 Cessna 310K, and 6 172G It ac.
- 37 *Thunderbird Mk 1 SAM*.

**Para-Military Forces:** 3,500 National Guard (formerly known as the 'White Army'), organized into regular and semi-regular battalions; 6,500 Coastguard and Frontier Force.

**Navy:** 200.

- 1 fast patrol boat (2 more to be delivered in 1973).
- 3 armed motorized dhows.
- 1 patrol vessel (yacht).

**Air Force:** 400 (including 160 contract personnel); 12 combat aircraft.

- 1 FGA squadron with 12 BAC-167.
- 1 air support squadron with 3 *Caribou* and 10 *Skyvan* (2 more *Skyvan* on order).
- 1 hel sqn with 8 AB-205 and 4 AB-206A (3 more AB-205A on loan from Iran).
- 1 transport flight with 3 *Viscount*.

**Para-Military Forces:** 2,000; about 900 gendarmerie; about 1,000 irregulars.

## SAUDI ARABIA

Population: 8,400,000.  
 Military service: voluntary.  
 Total armed forces: 42,500.  
 Estimated GNP 1972: \$5.2 billion.  
 Defence budget 1973-74: Saudi riyals 3,990 million (\$1,090 million).  
 4.2 riyals=\$1 1 July 1972.  
 3.66 riyals=\$1 1 July 1973.

**Army:** 36,000.

- 4 infantry brigades.
- 1 armoured battalion.
- 1 reconnaissance battalion.
- 1 parachute battalion.
- 1 Royal Guard battalion.
- 3 artillery battalions.
- 3 AA battalions.
- 10 SAM batteries with *HAWK*.
- 25 M-47 med tks; 60 M-41 It tks; 200 AML-60 and AML-90, some *Staghound* and *Greyhound* armd cars; *Ferret* scout cars; field guns; AA guns; *HAWK SAM*. (30 AMX-30 tks on order.)

**Deployment:** 4,000 in Jordan.

**Navy:** 1,000.

- 2 torpedo boats.
- 1 motor gunboat.
- 2 utility craft.
- 9 patrol boats (coastguard).
- 8 SRN-6 hovercraft (coastguard).

**Air Force:** 5,500; 70 combat aircraft.

- 2 FB sqns with 15 F-86F (140 F-5 and 30 F-4 on order).

## SUDAN

Population: 17,000,000.  
 Military service: voluntary.  
 Total armed forces: 38,600.  
 Estimated GNP 1972: \$1.9 billion.  
 Defence budget 1971-72: £ Sudan 50 million (\$143 million).  
 £ Sudan 0.35=\$1 1 July 1971.  
 £ Sudan 0.35=\$1 1 July 1972.

**Army:** 37,000.

- 1 armoured brigade.
- 7 infantry brigades.
- 1 parachute brigade.
- 3 artillery regiments.
- 3 air defence artillery regiments.
- 1 engineer regiment.
- 20 T-34/85, 60 T-54, 50 T-55, and some T-59 med tks; 16 T-62 It tks (Chinese); 50 *Saladin* and 45 *Commando* armd cars; 60 *Ferret* scout cars; 50 BTR-50 and 50 BTR-152, 49 *Saracen*, and 60 OT-64 APC; 55 25-pounder, 40 105mm, and some 122mm guns and how; 30 120-mm mortars; some 85mm ATK guns; 80 Bofors 40mm and some Soviet 37mm and 85mm AA guns.

**Navy:** 600.

- 6 coastal patrol boats } (ex-Yugoslav).
- 2 landing craft }

**Air Force:** 1,000; 50 combat aircraft.

- 20 MiG-21 interceptors.
- 17 MiG-17 fighter-bombers (ex-Chinese).
- 5 BAC-145 Mk 5 and 8 *Jet Provost* Mk 52 light attack aircraft.
- 3 *Pembroke* and 5 An-24 transports.
- 10 Mi-8 helicopters.

**Para-Military Forces:** 5,000: 500 National Guard; 4,500 Border Guard.

## SYRIA

Population: 6,775,000.  
 Military service: 30 months.  
 Total armed forces: 132,000.

Estimated GNP 1972: \$1.93 billion.  
 Defence budget 1973: £Syr 800 million (\$216 million).  
 £ Syrian 4.32=\$1 1 July 1972.  
 £ Syrian 3.71=\$1 1 July 1973.

**Army:** 120,000.

- 2 armoured divisions.
- 3 infantry divisions.
- 1 armoured brigade.
- 1 mechanized brigade.
- 1 infantry brigade.
- 2 commando brigades.
- 1 reconnaissance battalion.
- 3 parachute battalions.
- 7 artillery regiments.
- 12 SAM batteries with SA-2 and SA-3.
- About 30 JS-3 hy tks; 240 T-34 and 900 T-54/55 med tks; 100 PT-76 It tks; 75 SU-100 SP guns; 1,000 BTR-50/60, BTR-152 APC; 122mm, 130mm, and 152mm guns; ATGW; 37mm, 57mm, 85mm, and 100mm AA guns; SA-2, SA-3, and SA-7 *Strela SAM*.

**Reserves:** 200,000.

**Navy:** 2,000.

- 3 minesweepers (ex-Soviet T-43 class).
- 2 submarine chasers (ex-French CH-class).
- 2 coastal patrol vessels.
- 6 *Komar-* and *Osa-*class FPB with *Styx SSM*.
- 12 motor torpedo boats (less than 100 tons).
- (1 destroyer, 2 submarines, and some torpedo and patrol boats to be delivered.)

**Reserves:** 3,500.

**Air Force:** 10,000 men; 326 combat aircraft.

- Some Il-28 It bombers.
- 80 MiG-17 day fighter/ground attack aircraft.
- 30 Su-7 fighter-bombers (some in storage).
- 200 MiG-21 interceptors (some in storage).
- 8 Il-14 and 3 C-47 transports.
- About 50 hel, including 4 Mi-1, 8 Mi-4, and 22 Mi-8.

**Para-Military Forces:** 9,500: 8,000 Gendarmerie; 1,500 Desert Guard (Frontier Force).

## TUNISIA

Population: 5,500,000.  
 Military service: 1 year (selective).  
 Total armed forces: 24,000.  
 Estimated GNP 1972: \$2.08 billion.  
 Defence budget 1972: 13.8 million dinars. (\$28.7 million).  
 0.48 dinars=\$1 1 July 1972.  
 0.386 dinars=\$1 1 July 1973.

**Army:** 20,000.

- 1 armoured battalion.
- 5 infantry battalions.
- 1 commando battalion.
- 1 Sahara battalion.
- 1 artillery battalion.
- 1 engineer battalion.
- About 30 AMX-13 and 20 M-41 It tks; 20 *Saladin* and some M-8 armd cars; 10 105mm SP and 10 155mm guns; 60mm and 81mm mortars; 40mm Bofors AA guns.

**Navy:** 2,000.

- 1 corvette.
- 3 coastal escorts.
- 4 patrol boats with SS-12 (M) SSM.
- 8 patrol boats (less than 100 tons).

**Air Force:** 2,000; 12 combat aircraft.



1 fighter sqn with 12 F-86.  
 3 *Fiamant* light transports.  
 8 MB-326, 12 T-6, and 12 SAAB 91D trainers.  
 6 *Alouette II* and 8 *Alouette III* hel.

**Para-Military Forces:** 10,000; 5,000 Gendarmerie organized in 6 battalions; 5,000 National Guard.

## YEMEN ARAB REPUBLIC (NORTH)

Population: 7,000,000.  
 Military service: 3 years.  
 Total regular forces: 20,900.  
 Estimated GNP 1970: \$460 million.  
 Estimated defence expenditure 1970: 16.3 million riyals (\$13 million).  
 1.25 riyal=\$1 1 July 1970.

**Army:** 20,000.  
 6 infantry brigades.  
 1 parachute brigade.  
 1 commando brigade.  
 2 armoured battalions.

1 Republican Guard battalion.  
 2 artillery battalions.  
 1 AA battalion.  
 30 T-34 med tks; 70 BTR-40 APC; 50 76mm guns; 50 SU-100 SP guns; 100 AA guns.

**Navy:** 300.  
 5 P-4 class FPB (ex-Soviet).  
 2 landing craft.

**Air Force:** 600; 28 combat aircraft.  
 1 fighter sqn with 12 MiG-17.  
 1 light bomber sqn with 16 Il-28.  
 1 tpt sqn with C-47, Il-14.  
 1 hel sqn with Mi-4.

**Para-Military Forces:** 20,000 tribal levies.

## YEMEN—PEOPLE'S DEMOCRATIC REPUBLIC (SOUTH)

Population: 1,560,000.  
 Military service: conscription, term unknown.

Total armed forces: 9,500.  
 Estimated GNP 1970: \$140 million.  
 Estimated defence expenditure 1971: 6.5 million South Yemeni dinar (\$15.5 million).  
 SYD 0.417=\$1 1 July 1970.  
 SYD 0.417=\$1 1 July 1971.

**Army:** 8,800.  
 6 infantry brigades, each of 3 battalions.  
 1 armoured battalion.  
 1 artillery brigade.  
 1 signals unit.  
 1 training battalion.  
 50 T-34, T-54 med tks; some artillery.

**Navy:** 200 (subordinate to Army).  
 2 submarine chasers (ex-Soviet *SOI*-class).  
 2 minesweepers.  
 3 landing craft (medium).

**Air Force:** 500; about 20 combat aircraft.  
 1 fighter-bomber sqn with 15 MiG-17.  
 1 COIN sqn with 4 BAC-167 and 8 *Jet Provost*.  
 1 tpt sqn with 4 C-47 and 4 DHC *Beaver*.  
 1 hel sqn with 6 Bell 47G.  
 (12 MiG-21 on order.)

## ARMED FORCES OF OTHER MIDDLE EAST STATES

Country	Estimated population (000s)	Estimated GNP \$m	Total armed forces	Army		Navy	Air Force
				Manpower and formations	Equipment	Manpower and equipment	Manpower and equipment
Bahrain	233	n.a.	1,100	1,100 1 inf bn 1 armd car sqn	8 <i>Saladin</i> armd cars; 8 <i>Ferret</i> scout cars; 6 <i>Mobat</i> ATK guns; 6 81mm mortars	Some patrol launches (police)	Some hel (police)
Kuwait	957	3,650	10,000	8,000 1 armd bde 2 composite bdes (armd/inf/arty) 1,500 para-military	50 <i>Vickers</i> and 50 <i>Centurion</i> med tks; 250 <i>Saladin</i> , <i>Saracen</i> and <i>Ferret</i> armd cars 10 25-pdr guns; 20 155mm how	200 (Coastguard) 8 patrol boats (under 50 tons); 2 landing craft	2,000 12 <i>Lightning</i> 8 <i>Hunter</i> 10 BAC-167 4 <i>Jet Provost</i> 2 med and 3 lt tpts 5 AB-205 hel
Qatar	89	280 (1971)	2,200	1,600 1 Guards inf regt 1 mobile regt	30 <i>Saladin</i> , 8 <i>Saracen</i> armd cars; 10 <i>Ferret</i> scout cars; 4 25-pdr guns; 81mm mortars	4 armed launches	4 <i>Hunter</i> ; <i>Tigercat</i> SAM
UNITED ARAB EMIRATES							
Abu Dhabi	48.4	24.2 (1971)	8,000	7,500 1 armd regt 2 inf bns 1 arty regt	75 <i>Saladin</i> armd cars; 15 <i>Ferret</i> scout cars; 25-pdr guns; <i>Vigilant</i> ATGW	150 9 patrol craft (under 50 tons)	350 12 <i>Hunter</i> FGA; 6 tpts 8 hel
Dubai	59	n.a.	1,000	1 armd car sqn 3 inf sqns	Some <i>Saladin</i> / <i>Ferret</i> armd cars 81mm mortars	—	2 AB-206 hel
Ras Al Khaimah	24.4	n.a.	300	mobile force	6 <i>Ferret</i> scout cars; 81mm mortars	4 powered dinghies	—
Sharjah	32	n.a.	250	inf coy armd car platoon	6 <i>Land Rovers</i>	—	—
Union Defence Force	—	—	1,600	5 squadrons	<i>Land Rovers</i> ; 81mm mortars	2 dhows (6 patrol boats on order)	—

n.a. = not available.



# Sub-Saharan Africa



## MULTILATERAL AGREEMENTS

The Organization of African Unity (OAU), constituted in May 1963, includes all internationally recognized independent African states except South Africa. It has a Defence Commission responsible for defence and security co-operation, and the defence of the sovereignty, territorial integrity, and independence of its members, but this has rarely met.

There is a regional defence pact between France, Congo (Brazzaville), the Central African Republic, and Chad, and a five-party defence agreement between France, Dahomey, Ivory Coast, Niger, and Upper Volta which has set up the *Conseil de défense de l'Afrique équatoriale*.

## BILATERAL AGREEMENTS

The United States has varying types of security assistance agreements and provides significant military aid on either a grant or credit basis to Ethiopia and Zaire. For grant military assistance purposes, Ethiopia, where the United States has a large communications centre, is considered a base rights country.

Though the Soviet Union is not known to have

defence agreements with countries in the area, Soviet military assistance has been given to Guinea, Mali, Mauritania, Nigeria, and the Somali Republic.

China has a military assistance agreement with Congo (Brazzaville) and may have formal arrangements covering military assistance and training with Tanzania.

Britain maintains defence agreements with Kenya and Mauritius, and an agreement with South Africa covering the use of the Simonstown naval base. France has defence agreements with Cameroon, Gabon, Malagasy Republic, Senegal, and Togo; technical military assistance agreements with Cameroon, the Central African Republic, Chad, Congo (Brazzaville), Dahomey, Gabon, Ivory Coast, Malagasy Republic, Mauritania, Niger, Senegal, Togo, and Upper Volta; and mutual facilities agreements with Dahomey, Gabon, Ivory Coast, Mauritania, and Niger.

Portugal directly assures the defence of Angola, Mozambique, and Portuguese Guinea, and Spain of Spanish Sahara, Ceuta, and Melilla. All of these are administratively regarded as overseas provinces except Ceuta and Melilla, which are treated as integral parts of Spain.

## ETHIOPIA

Population: 26,500,000.  
Military service: voluntary.  
Total armed forces: 44,570.  
Estimated GNP 1972: \$US 2.07 billion.  
Defence budget 1971-72: \$E 93 million (\$US 40.5 million).  
\$E 2.5=\$1 1 July 1971.  
\$E 2.3=\$1 1 July 1972.

**Army:** 40,940.  
4 infantry divisions of 8,000 men each (incl Imperial Guard).  
1 tank battalion.

1 airborne infantry battalion.  
4 armoured car squadrons.  
4 artillery battalions.  
5 air defence batteries.  
2 engineer battalions.  
50 M-41 med tks; 20 M-24 lt tks; about 40 APC; 30 M-9, M-20, and 56 AML-245 armd cars; 146 M-30 4.2-inch mortars; 36 75mm pack how; 52 105mm, 12 155mm guns; 6 Bell UH-1H hel.

**Navy:** 1,380.  
1 coastal minesweeper.  
1 training ship (ex-seaplane tender).  
5 patrol boats.

4 harbour defence craft (less than 100 tons).  
4 landing craft (less than 100 tons).

**Air Force:** 2,250; 37 combat aircraft.  
1 bomber squadron with 4 Canberra B-2.  
1 fighter-bomber squadron with 12 F-86F.  
1 COIN squadron with 6 T-28A.  
1 fighter squadron with 15 F-5A.  
1 tpt sqn with 6 C-47, 2 C-54, 5 C-119G, and 3 Dove.  
3 trg sqns with 20 Saflr, 15 T-28A, and 11 T-33A.  
5 Alouette II, 2 Mi-6, 2 Mi-8, and 5 AB-204B helicopters.



**Para-Military Forces:** 20,400. Territorial Army active strength, 9,200; mobile emergency police force 6,800; frontier guards 1,200; commando force 3,200.

## GHANA

Population: 9,086,000.  
 Military service: voluntary.  
 Total armed forces: 18,900.  
 Estimated GNP 1972: \$2.97 billion.  
 Defence budget 1971-72: 39.5 million cedi (\$30.4 million).  
 1.02 cedi=\$1 1 July 1971.  
 1.3 cedi=\$1 1 July 1972.

### Army: 16,000.

2 brigades comprising 7 inf bns and support units.  
 1 mortar regt.  
 2 reconnaissance squadrons.  
*Saladin* armd cars; *Ferret* scout cars; 76mm guns; heavy mortars.

### Navy: 1,300.

2 corvettes.  
 1 coastal minesweeper.  
 2 inshore minesweepers.  
 2 seaward defence vessels.  
 3 P-20 class (Soviet-built) patrol boats (less than 100 tons).  
 (There is a substantial shortage of spares for all naval craft.)

### Air Force: 1,600; 6 combat aircraft.

1 fighter sqn with 6 MB-326.  
 1 transport squadron with 7 *Otter*.  
 1 transport squadron with 8 *Caribou* and 3 *Heron*.  
 1 comms and liaison squadron with 11 *Beaver*.  
 1 hel sqn with 5 *Whirlwind*, 2 *Wessex*, 3 *Sikorsky* H-19, and 3 *Hughes* 269A.  
 9 *Chipmunk* trainers.

**Para-Military Forces:** 3,000; 3 Border Guard bns.

## NIGERIA

Population: 59,400,000.  
 Military service: voluntary.  
 Total armed forces: 157,000.  
 Estimated GNP 1972: \$7.6 billion.  
 Defence budget 1971-72: £N 87 million (\$242 million).  
 £N 0.36=\$1 1 July 1971.  
 £N 0.33=\$1 1 July 1972.

### Army: 150,000.

3 infantry divisions, including 3 reconnaissance regiments, 3 artillery regiments, and support units.  
*Saladin* and 20 AML-60/90 armd cars; *Ferret* scout cars; *Saracen* APC; 25-pdr, 76mm, 105mm, and 122mm guns.

**Reserves:** 100,000.

### Navy: 3,000.

1 ASW frigate.  
 2 corvettes.  
 5 seaward defence boats.  
 1 landing craft.

**Reserves:** 2,000.

### Air Force: 4,000; 38 combat aircraft.

6 Il-28 medium bombers.  
 12 MiG-17 fighter-bombers.



*Nigeria's combat aircraft are supplied by the USSR or Pact countries as are most of those of Somalia, Uganda, and Zaire. This Nigerian Fokker F-27 transport is a product of Netherlands Aircraft Factories.*

10 L-29 *Delfin* and 10 P-149D armed trainers.  
 2 MiG-15 UTI trainers (20 *Bulldog* on order).  
 6 C-47, 6 Fokker F-27 *Friendship* med tpts; 20 Do-27/28 comms aircraft.  
 8 *Whirlwind* and *Alouette II* hel.

## RHODESIA

Population: 5,900,000 (260,000 white population).  
 Military service: 12 months (white population).  
 Total armed forces: 4,700.  
 Estimated GNP 1972: \$US 1.57 billion.  
 Defence budget 1972-73: \$R 25,917,000 (\$US 32 million).  
 \$R 0.81=\$1 1 July 1972.  
 \$R 0.672=\$1 1 July 1973.

### Army: 3,500 Regular; 10,000 Territorial Force.

2 infantry battalions (one has *Ferret* scout cars).  
 2 Special Air Service squadrons.  
 1 artillery battery.  
 1 engineer squadron.  
 20 *Ferret* scout cars; 25-pdr gun/how, Model 56 105mm pack how.  
 There is an establishment for three brigades, two based on regular infantry battalions, which would be brought up to strength by mobilizing the Territorial Force.

### Air Force: 1,200; 45 combat aircraft.

1 light bomber sqn with 10 *Canberra* B-2.  
 1 FGA sqn with 12 *Hunter* FGA-9.  
 1 FGA sqn with 11 *Vampire* FB-9.  
 1 recce sqn with 12 T-52 *Jet Provost*.  
 1 COIN sqn with 7 AL-60F5 and 7 AM-3C.  
 1 transport sqn with 4 C-47 and 1 Beech 55 *Baron*.  
 3 *Canberra* T-4 trainers.  
 1 helicopter sqn with 8 *Alouette III*.

**Reserves:** 10,000 Territorial Force.

The white population completing conscript service is assigned for three years' part-time training to territorial units, which include active territorial battalions based on the cities and reserve terri-

torial battalions based on country districts.

Army Reserves: eight infantry battalions, one field artillery regiment, and one engineer squadron.

Ground personnel servicing regular Air Force units are reservists or non-white civilians.

**Para-Military Forces:** The British South African Police (BSAP) 8,000 active; 35,000 reservists. The white population forms only about a third of the active strength but nearly three-quarters of the Police Reserves.

## SOMALI DEMOCRATIC REPUBLIC

Population: 3,000,000.  
 Military service: voluntary.  
 Total armed forces: 17,300.  
 Estimated GNP 1970: \$182 million.  
 Defence budget 1971: 81.3 million shillings (\$11.4 million).  
 7.14 Somali shillings=\$1 1 July 1970.  
 7.14 Somali shillings=\$1 1 July 1971.

### Army: 15,000.

4 tank battalions.  
 9 mechanized infantry battalions.  
 1 commando battalion.  
 2 field arty battalions.  
 5 AA arty battalions.  
 About 150 T-34 med tks; 60 BTR-40 and 250 BTR-152 APC; 76mm and 100mm guns; 122mm how; 14.5mm, 37mm, and 100mm AA guns. (Spares are short and not all equipment is serviceable.)

### Navy: 300.

4 P-6 and 6 P-4 MTB (ex-Soviet).  
 (Spares are short and not all equipment is serviceable.)

### Air Force: 2,000; 21 combat aircraft.

Some Il-28 light bombers.  
 2 MiG-15 and 19 MiG-17 fighters.  
 Tpts include 1 C-45, 3 C-47, 3 An-2, and 1 An-24, 2 MiG-15/17, 10 Piaggio P-148, and Yak trainers.  
 (Spares are short and not all equipment is serviceable.)



Para-Military Forces: 3,500; 500 border guards; 3,000 People's Militia.

## SOUTH AFRICA

Population: 23,000,000 (4,000,000 white population).  
Military service: 9-12 months in Citizen Force.  
Total armed forces: 18,000 regular; 92,000 Citizen Force.  
Estimated GNP 1972: \$21.4 billion.  
Defence budget: 1973-74: 481 million rand (\$716 million).  
0.81 rand=\$1 1 July 1972.  
0.672 rand=\$1 1 July 1973.

**Army:** 10,000 regular.  
100 *Centurion* Mark 5, 20 *Comet* med tks; 800 AML-60 and AML-90 and 50

1 fighter sqn with 16 *Mirage III*EZ and 4 *IIIDZ*.  
1 fighter/recce sqn with 16 *Mirage IIICZ*, 4 *IIIBZ*, and 4 *IIIRZ*.  
2 MR sqns with 7 *Shackleton* MR3, 9 Piaggio P-166S *Albatross* (9 more P-166S on order).  
4 tpt sqns with 7 C-130B, 9 Transall C-160Z, 23 C-47, 5 C-54, 1 *Viscount* 781 medium, and 4 HS-125 *Mercurius*.  
4 hel sqns: two with 20 *Alouette III* each; one with 20 SA-330 *Puma*; one with 15 SA-321L *Super Frelon*. One flight of 5 *Wasp* (naval-assigned).  
1 Lt ac sqn (army-assigned) with Cessna 185A/D and A185E (AM-3C will replace).  
Trainers incl *Harvard*; MB-326M *Impala* (some armed in a COIN role; *Vampire* FB Mk 6, Mk 9, T Mk 55; C-47 and *Alouette III/III*).

**Navy:** 600.  
6 patrol boats (ex-Chinese P-6 and Swatow-class).

**Air Force:** 1,000; no combat aircraft.  
1 An-2, and 12 DHC-4 *Caribou* transports.  
7 Piaggio P-149D trainers.  
(1 sqn of 12 MiG-17 to be delivered in 1973.)

Para-Military Forces: A police marine unit.

## UGANDA

Population: 10,750,000.  
Military service: voluntary.  
Total armed forces: 12,600.  
Estimated GNP 1972: \$1.44 billion.  
Estimated defence expenditure 1971-73: 187,255,000 shillings (\$26.4 million).  
7.1 shillings=\$1 1 July 1972.  
7.02 shillings=\$1 1 July 1973.

**Army:** 12,000.  
2 brigades each of 3 infantry battalions.  
1 border guard battalion.  
1 mechanized battalion.  
2 parachute/commando battalions.  
1 artillery regiment.  
12 M-4 med tanks; 15 *Ferret* scout cars; 20 BTR-40, BTR-152, 36 OT-64B APC (perhaps half are operational).

**Air Force:** 600; 21 combat aircraft.  
1 fighter squadron with 7 MiG-15 and MiG-17.  
14 *Magister* armed trainers.  
1 *Caribou* transport; P-149D and 12 L-29 *Delphin* trainers; 10 Piper light aircraft.  
2 AB-206 and 2 *Scout* helicopters.

## ZAIRE REPUBLIC

Population: 24,400,000.  
Military service: voluntary.  
Total armed forces: 50,000.  
Estimated GNP 1972: \$2.3 billion.  
Estimated defence expenditure 1970: 42 million zaires (\$84 million).  
0.5 zaires=\$1 1 July 1970.  
0.5 zaires=\$1 1 July 1972.

**Army:** 49,000.  
1 armoured car regiment.  
1 mechanized battalion.  
14 infantry battalions.  
7 parachute battalions.  
4 other battalions.  
The above, together with support units, form 1 parachute division and 7 brigade groups.  
60 AML armed cars; M-3 and 30 *Ferret* scout cars (less than half operational).

**Coast, River, and Lake Guard:** 200.

1 river boat.  
1 patrol boat.  
6 patrol craft.

**Air Force:** 800; 28 combat aircraft.  
1 fighter wing with 15 MB-326GB, 8 AT-6G, and 5 T-28 armed trainers.  
1 logistics wing with 9 C-47, 4 C-54, 3 C-130, and some *Caribou* transports.  
1 training wing with 8 T-6 and 12 SF-260MC (12 more SF-260MC on order).  
1 helicopter sqn with 7 Bell 47-G, 8 *Alouette III*, and 7 SA-330 *Puma* (23 *Puma* being delivered).

Para-Military Forces: 8 National Guard and 6 Gendarmerie battalions.

## TANZANIA

Population: 14,380,000.  
Military service: voluntary.  
Total armed forces: 11,600.  
Estimated GNP 1972: \$1.51 billion.  
Defence budget 1973: 361 million shillings (\$51.4 million).  
7.1 shillings=\$1 1 July 1972.  
7.02 shillings=\$1 1 July 1973.

**Army:** 10,000.  
3 infantry battalions.  
20 Chinese T-59 med tks; 14 Chinese T-62 Lt tks; some BTR-40 and -152 APC; Chinese mortars; 6 ex-Soviet 76mm guns; 8 122mm how.  
(Spares are short and not all equipment is serviceable.)

M-3 armed cars; 50 *Ferret* scout cars; 250 *Saracen* APC.  
3 batteries of *Cactus (Crotale)* short-range SAM system may now be operational.

Reserves: 80,000 Citizen Force, in 9 territorial commands.

**Navy:** 2,500 regular.  
3 submarines.  
2 destroyers with *Wasp* ASW helicopters.  
6 ASW frigates (3 with *Wasp* ASW helicopters).  
1 escort minesweeper.  
10 coastal minesweepers.  
5 seaward defence boats.  
1 fleet replenishment tanker.

Reserves: 9,000 trained reserves in Citizen Force (with 2 frigates and 7 minesweepers).

**Air Force:** 5,500 regular; 100 combat aircraft.  
1 bomber sqn with 6 *Canberra* B(l) Mk 12, 3 T Mk 4.  
1 Lt bomber sqn with 13 *Buccaneer* S Mk 50.  
1 fighter sqn with 18 CL-13B *Sabre* Mk 6 (being replaced by *Mirage*).

The South African Air Force, largest in the Sub-Sahara area, has about 100 combat aircraft, including a squadron of these Hawker Siddeley Buccaneers.





## ARMED FORCES OF OTHER AFRICAN STATES\*

Country	Estimated population (000s)	Estimated GNP (\$m)	Total armed forces	Army		Navy	Air Force	Para-military forces
				Manpower and formations	Equipment	Manpower and equipment	Manpower and equipment	
Cameroon	6,182	1,357 (1972)	4,450	4,000 4 inf bns 1 armd car sqn 1 para coy engineer and support coys	8 <i>Ferret</i> scout cars; 57mm, 75mm and 105mm guns; some mortars	200 3 patrol boats (less than 100 tons)	250 3 C-47 med tpts and 4 lt tpts; 2 <i>Alouette II</i> hel	5,000
Chad	3,980	195.3 (1971)	3,700	3,500 4 inf bns 1 para coy camel corps	60mm and 81mm mortars	—	200 3 C-47 med tpts and 3 lt tpts; 1 <i>Alouette II</i> hel	4,000
Congo	1,000	194 (1971)	2,300	2,000 1 inf bn 1 para-cdo bn 1 recce sqn 1 arty group	BTR-152 APC; mortars	150 small patrol boats	150 2 C-47, 2 AN-24 med tpts; 3 lt tpts; 2 hel	4,800
Dahomey	2,900	218 (1971)	2,250	2,100 2 inf bns 1 para-cdo coy 1 recce sqn 1 arty bty	Some armd cars and APC; 60mm and 81mm mortars; 105mm guns	—	150 1 C-47 med tpt and 3 lt tpts; 1 <i>Alouette II</i> hel	1,200
Guinea	4,188	717 (1971)	6,000	5,000 1 armd bn 4 inf bns 3 engr coys	20 T-34 med tks; 20 BTR-152 APC; 85mm and 105mm guns	200 6 P-6 MTB; 2 patrol boats 2 small landing craft	800 8 MiG-17; 4 An-14, 2 Il-18 and 4 Il-14 tpts; 7 Yak-18, L-29 MiG-15 trainers;	7,700
Ivory Coast	4,635	2,000 (1972)	3,500	3,100 3 inf bns 1 armd sqn 1 para coy 2 arty btys	5 AMX-13 lt tks; 10 lt armd cars; scout cars; 105mm guns; 40mm AA guns	100 2 motor gunboats; 2 landing craft (all less than 100 tons)	300 2 C-47 med tpts; 9 lt tpts; 4 <i>Alouette II/III</i> and 1 <i>Puma</i> hel	3,000
Kenya	12,430	1,880 (1972)	6,730	6,000 4 inf bns 1 support bn with para coy	<i>Saladin</i> armd cars; 20 <i>Ferret</i> ; 120mm recoilless rifles; 81mm and 120mm mortars	250 4 patrol craft	480 6 BAC-167; 5 <i>Bulldog</i> armed trainers; 10 <i>Beaver</i> lt tpts; 2 Bell 47G hel	1,800
Liberia	1,675	436 (1972)	5,150	5,000 1 recce unit 5 inf bns 1 engr bn	M-3A1 scout cars; some field guns; 60mm and 81mm mortars	150 2 motor gunboats; 2 patrol boats; small landing craft	5 lt tpt ac	1,300
Malagasy Republic	7,400 (1971)	1,134 (1972)	4,250	3,700 2 inf bns 1 armd sqn 1 engr bn 1 para coy 1 arty bty	n.a.	250 3 patrol vessels; 1 marine coy	300 3 C-47 med and 8 lt tpts; 1 <i>Alouette III</i> hel	4,00
Mali	5,361	278 (1971)	3,650	3,500 3 inf bns 1 para coy 1 engr coy	about 10 T-34 med tks; BTR-40 APC; armd cars; 81mm and 100mm guns; 81mm and 120mm mortars	50 3 patrol craft	150 6 MiG-17; 2 C-47 and 2 Il-14 med tpts; 2 Mi-4 hel	1,500
Niger	4,352	489 (1972)	2,100	2,000 1 recce sqn 4 mot inf coys 1 para coy 1 camel corps	about 10 M-8 and M-20 armd cars; 60mm and 81mm mortars; 2 patrol boats	—	100 4 <i>Noratlans</i> , 1 C-47 med tpt; 4 lt tpts	1,400
Rwanda	4,052	233 (1971)	2,750	2 inf bns 1 recce sqn	AML-245 armd cars	—	2 C-47 med tpts; 1 <i>Alouette II</i> hel	400
Senegal	4,217	860 (1972)	5,900	5,500 3 inf bns 1 recce sqn 2 para coys 2 cdo coys 1 arty bty 1 engr bn	AML-245 armd cars; lt arty; 81mm mortars	200 3 patrol craft (2 less than 100 tons); 2 landing craft	200 4 C-47 med tpts; 4 lt tpts; 2 Bell 47 and 1 <i>Alouette III</i> hel	1,600
Zambia	4,526	1,100 (1972)	6,000	5,000 1 inf bde 1 recce sqn 2 arty btys 1 SAM bty 1 engr sqn 1 sigs sqn	<i>Ferret</i> scout cars; 105mm guns; <i>Rapier</i> SAM	—	1,000 2 <i>Galeb</i> , 4 <i>Jastreb</i> , 6 MB-326 FGA; 3 med and 10 lt tpts; 3 AB-205, 2 AB-47 and 1 AB-212 hel	2,000

\* For many of the developing nations, particularly the smaller ones, maintenance facilities and skills pose problems and spare parts may not be readily available. The amount of military equipment shown may not necessarily be that which can be used.



# China



Chinese defence policy operates at the two extremes of nuclear deterrence and People's War. The former aims to deter strategic attack and the latter, by mass-mobilization of the country's population, to deter or repel any conventional land invasion.

### NUCLEAR WEAPONS

The build-up of the Chinese nuclear force continued during the year. One nuclear test, in the MT range, was carried out in June, the first recorded since March 1972 and the 15th since tests started in 1964. The production of fissionable materials was expanded; there may now be sufficient for more than 200 fusion and fission weapons, and the stockpile could grow rapidly in the next few years. A variety of delivery systems, aircraft and missiles, are available. For tactical missions the F-9 fighter would be suitable and for longer ranges there are some 100 Tu-16 medium bombers with a radius of action of about 1,600 miles. MRBM and IRBM have been deployed operationally in at least four locations at soft sites above ground, though some are reported to be in silos or caves. A multi-stage IRBM with a longer range, perhaps 3,500 miles (sufficient to reach Moscow and most parts of Asia), has been produced and may be ready for operational deployment. A small missile force is now thought to be under the control of the Second Artillery, which appears to be the PLA's missile arm. An ICBM capable of reaching most major targets in the United States is also being developed. Its testing at full range would require impact areas in the Indian or Pacific Oceans and an instrumentation ship which could be used for monitoring such a test has been built. China has one G-class diesel-powered submarine with ballistic missile launching tubes, but does not appear to have missiles for it. All the present missiles are liquid-fuelled. Work has been going on on the development of solid fuel missiles, but these are unlikely to be available for deployment before 1975.

### CONVENTIONAL FORCES

China's 3 million regular forces, the People's Liberation Army (PLA), are generally equipped and trained for the environment of People's War, but increasing effort is being made to arm a proportion of the formations with modern weapons, now becoming available from the growing armament industry. Infantry units account for most of the manpower and 120 of the 150 divisions; there are only 5 armoured divisions. The naval and air elements of the PLA have only about one-seventh of the total manpower compared with over a third for their counterparts in the Soviet Union, but their influence is increasing as more new equipment reaches them. The PLA is essentially a defensive force and lacks the facilities and logistic support for protracted large-scale military operations outside China. It is, however, gradually acquiring greater logistic capacity.

Major weapons systems in series production include the Tu-16 medium bomber, the MiG-19, -21, and F-9 fighters (the latter Chinese designed); type-59 medium, type-62 light, type-60 amphibious tanks and APCs (the last three also being Chinese designed). R-class medium-range diesel submarines in some numbers, together with a new class of submarines, SSM destroyers, and fast patrol boats are being produced for the navy. A nuclear-powered attack submarine (armed with conventional torpedoes) has been under test for two years.

### DEPLOYMENT AND COMMAND

The PLA is organized in 11 Military Regions, but is not deployed evenly throughout them. The major concentrations are in the coastal provinces, in the Yangtse and the Yellow River basins, and in the North-East (Peking and Manchuria). Some shift of forces northward toward the Sino-Soviet frontier occurred in 1969-70, following the border incidents, and it is likely that further re-alignment of Chinese forces in the same



## CHINA

*China's 2,500,000-man army has 120 infantry and five armored divisions. These troops are equipped with Soviet-designed T-34 tanks.*



—Wide World Photos

direction took place in the past year. From 20,000 to 30,000 construction troops and engineers are reported still to be in the northern border regions of Laos and North Vietnam.

Although the PLA continues to have a wide range of administrative and other non-military duties, its active role in provincial government appears to have declined somewhat in the past year. The Public Security System, which came under the PLA during the Cultural Revolution, seems in particular to have re-established some degree of autonomy.

No Defence Minister was officially designated during the year to succeed Lin Piao and the PLA remained without a Chief of Staff or Air Force Commander.

### BILATERAL AGREEMENTS

China has a 30-year Treaty of Alliance and Friendship with the Soviet Union, signed in 1950, which contains mutual defence obligations, but this may no longer be in force. There is a mutual defence agreement with North Korea, dating from 1961, and an agreement to provide free military aid. There is probably a well-defined, though unpublicized, defence commitment to North Vietnam, and certainly a long-standing and recently renewed agreement to give military aid. There are non-aggression pacts with Afghanistan, Burma, and Cambodia (though this latter does not apply to the newly-established Khmer Republic; China has given military aid to the forces supporting Prince Sihanouk against the government of Prime Minister Lon Nol). Chinese military equipment and logistic support has been offered to an increasing number of countries, particularly in Africa. Major recipients of arms in recent years have been Albania, Pakistan, and Tanzania.

Population: 750–850,000,000.  
Military service: Army, 2 years; Air Force, 3 years; Navy, 4 years.  
Total regular forces: 2,900,000 (including construction engineer troops).  
GNP and defence expenditure—see note on following page.  
2.27 yuan=\$1 1 July 1972.  
1.88 yuan=\$1 1 July 1973.

#### Strategic Forces

IRBM: 15–20.  
MRBM: about 50.  
Aircraft: about 100 Tu-16 medium bombers.

**Army:** 2,500,000 (including construction engr tps).  
5 armoured divisions.  
120 infantry divisions.  
3 cavalry divisions.  
2 airborne divisions.  
About 20 artillery divisions.  
These are supported by signals, engineer, railway, and motor transport units.  
Heavy equipment consists of Soviet items supplied up to 1960 including JS-2 tks and 152mm and 203mm artillery; Soviet T-34 and T-54, and Chinese T-59 (version of T-54) med tks; T-60 (PT-76 type) amphibious tks; T-62 lt tks and APC; SP arty incl SU-76, SU-100, and JSU-122.

#### Deployment:

China is divided into 11 Military Regions (MR) in turn divided into Military Districts (MD), with usually two or three Districts to a Region.

It is believed that basically one Army is assigned to each MD, with a total of about 30 Armies. An Army generally consists of three infantry divisions, three artillery regiments, and, in some cases three armoured regiments. Of the five armoured divisions in the PLA, two or three are probably kept in the Peking and Shenyang Regions.

The geographical distribution of the divisions (excluding artillery) is believed to be:

*North and North-East China* (Shenyang\* and Peking\* MR): 45 divisions.

*East and South-East China* (Tsinan, Nanking, and Foochow MR): 20 divisions.

*South-Central China* (Canton, including Hainan Island, and Wuhan MR): 20 divisions.

*Mid-West China* (Lanchow MR): 15 divisions.

*West and South-West China* (Sinkiang,\* Chengtu,\* and Kunming\* MR): 30 divisions.

*Laos and North Vietnam (northern border regions):* Some construction engineer troops and supporting elements, in all 20–30,000 men.

\*There are, in addition, two or three divisions of border troops in each of these MR.



China's nuclear delivery systems include MRBMs and IRBMs and about 100 of these Soviet-designed Tu-16 Badger bombers with a range of 3,200 miles.



## China's Gross National Product and Defence Expenditure

### Gross National Product

Estimates of China's GNP have varied greatly. The Chinese Prime Minister mentioned a figure of \$120 billion in 1970, as the gross value of industrial, transport, and agricultural production, but this is not the same as gross national product, since it excludes certain items and probably includes some double-counting. A Japanese estimate in 1971 was \$75 billion. This appears to have been calculated from a yuan figure, converted at the official rate of exchange, which is perhaps not the most suitable, and would seem to be on the low side. Another more recent estimate placed the net domestic product in 1971—which is a little less than the GNP—at 182.5 billion yuan in 1952 yuan. Converting this figure also at the official exchange rate for 1971, which assumes no inflation between 1952 and 1971, a figure of \$74 billion is reached. A paper presented to the Joint Economic Committee of the Congress of the United States gave a GNP figure for 1971 of \$128 billion in 1970 dollars. It is difficult to choose from this wide range of economic indicators, so variously defined and calculated.

### Defence Expenditure

China has not made public any budget figures since 1960, and there is no general agreement on the resources that are devoted to defence. Such estimates as there have been are only speculative. An Australian estimate suggests a range of \$4–\$5 billion, whilst British estimates have been in the region of \$10–\$12 billion.

**Navy:** 180,000 (including Naval Air Force and 28,000 Marines).  
 1 G-class submarine (with ballistic missile tubes). (China is not known to have any missiles for this boat.)  
 39 fleet submarines. (Also about 6 older, training vessels.)  
 3 coastal submarines.  
 6 SSM destroyers.  
 9 destroyer escorts.  
 11 patrol escorts.  
 20 submarine chasers.  
 25 Osa- and Komar-type FPB with Styx SAM.  
 27 minesweepers.  
 40 landing ships.  
 45 auxiliary minesweepers.  
 220 MTB and hydrofoils (less than 100 tons).  
 320 motor gunboats  
 530 landing ships/landing craft } many less than 100 tons.

### Deployment:

**North Sea Fleet:** 240 vessels. The main bases are at Tsingtao and Lushun; deployed along the coast from the mouth of the Yalu River in the north to Lienyunkang in the south.

**East Sea Fleet:** 700 vessels. Bases are at Shanghai and Chou Shan; deployed along the coast from Lienyunkang in the north to Chaoan Wan in the south.

**South Sea Fleet:** 300 vessels. Bases are at Huangpu and Chanchiang; deployed from Chaoan Wan in the north to the North Vietnamese frontier in the south.

**Naval Air Force:** 25,000, over 500 shore-based combat aircraft, including about 100 Il-28 torpedo-carrying and some Tu-2 light bombers and some 400 fighters including MiG-15, MiG-17, and MiG-19. Though under Navy command, the fighters are fully integrated into the air defence system.

**Air Force:** 220,000 (including strategic forces and 85,000 air defence personnel); about 3,800 combat aircraft.

About 100 Tu-16 and a few Tu-4 medium bombers.

200 Il-28 and 100 Tu-2 light bombers.

About 1,700 MiG-15 and MiG-17; at least 1,000 MiG-19, 75 MiG-21, and up to 300 F-9 fighters.

About 400 transport aircraft and 300 helicopters, including some An-2, Il-14, and Il-18 transports and Mi-4 helicopters (these could be supplemented by about 350 aircraft of the Civil Air Bureau).

There is an air-defence system, initially developed to defend the eastern seaboard of China and now greatly expanded, based on early warning/control radar, interceptor aircraft, and several hundred SA-2 SAM deployed in up to 50 sites.

### Para-Military Forces:

About 300,000 security and border troops, including 19 infantry-type divisions and 30 independent regiments stationed in the frontier areas; the public security force and a civilian militia with an effective element of probably not more than 5 million; production and construction corps in a number of Military Regions, including those adjoining the northern frontier.



# Other Asian Countries and Australasia



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## BILATERAL AGREEMENTS

The United States has bilateral defence treaties with Japan, the Republic of China (Taiwan), the Republic of Korea, and the Philippines. She has a number of military arrangements with other countries of the region. She provides military aid on either a grant or credit basis to Taiwan, the Khmer Republic (Cambodia), Indonesia, the Republic of Korea, Laos, Malaysia, the Philippines, Thailand, and South Vietnam. She sells military equipment to many countries, notably Australia, Taiwan, and Japan. For grant military assistance purposes, the Khmer Republic, the Republic of Korea, and Taiwan are considered forward defence areas. Laos, the Khmer Republic, Thailand, and South Vietnam receive grant military aid assistance direct from the US Department of Defense budget, the only countries in the world to do so. There are military facilities agreements with Australia, Japan, the Republic of Korea, and the Philippines. There is a major base at Guam. A new communications station is being constructed on Diego Garcia Island in the Chagos Archipelago under exchanges of notes signed with Britain in 1966 and 1972.

The Soviet Union has treaties of friendship, co-operation, and mutual assistance with India, Bangladesh, Mongolia, and the Democratic People's Republic of Korea. Military assistance agreements exist with Sri Lanka (Ceylon) and the People's Democratic Republic of Vietnam. Important Soviet military aid is also given to Nepal and Afghanistan.

Australia has supplied a small amount of defence equipment to Malaysia and Singapore and is giving defence equipment and assistance to Indonesia, including the provision of training facilities.

## MULTILATERAL AGREEMENTS

In 1954 the United States, Australia, Britain, France, New Zealand, Pakistan, the Philippines, and Thailand signed the South-East Asia Collective Defence Treaty, which came into force in 1955 and brought SEATO into being. They committed themselves to consult with a view to joint defence in the event of direct or indirect aggression against a member country or against the so-called 'protocol states' of Cambodia, Laos, and South Vietnam. However, since 1955 and 1956 respectively, Cambodia and Laos have not accepted the protection of SEATO. The treaty area is the general area of South-East Asia and the South-West Pacific, below latitude 21°30' North. SEATO has no central command structure and forces remain under national control. In 1969 Britain ceased to declare ground forces to the contingency plans for SEATO. France has no forces declared and has recently announced her intention of withdrawing from all financial commitments by 1974. New Zealand has said that, while she will remain a member, she is phasing down her participation in SEATO activities to a much lower level, particularly on the military side. Australia has recently given indications of taking a similar attitude. Pakistan had already announced her progressive disengagement before the Indo-Pakistan War of December 1971, as a result of which Bangladesh became an independent state, and withdrew from membership in July 1972.

Australia, New Zealand, and the United States are the members of a tripartite treaty known as ANZUS, which was signed in 1951 and is of indefinite duration. Under this treaty each agrees to 'act to meet the common danger' in the event of armed attack on either



metropolitan or island territory of any one of them, or on armed forces, public vessels, or aircraft in the Pacific.

Australia, Malaysia, New Zealand, Singapore, and Britain have agreed five-power defence arrangements relating to the defence of Malaysia and Singapore, which came into effect on 1 November 1971. These arrangements, which replaced the Anglo-Malaysian Defence Agreement of 1957, state that, in the event of any

armed attack or threat of attack externally organized or supported against Malaysia or Singapore, the five governments would consult together for the purpose of deciding what measures should be taken, jointly or separately. Britain, Australia, and New Zealand maintain land, air, and naval forces in Singapore (the ANZUK force) and Australia air forces in Malaysia (part of the integrated air defence system).

## AFGHANISTAN

Population: 18,300,000.  
Military service: 2 years.  
Total armed forces: 84,000.  
Estimated GNP 1970: \$1.5 billion.  
Estimated defence expenditure 1971: 1,600 million afghanis (\$35.5 million).  
45 afghanis=\$1.

**Army:** 78,000.  
2 armoured divisions.  
4 infantry divisions.  
1 infantry brigade group.  
200 T-34 and T-54 med tks; PT-76 lt tks;  
144 lt and med guns; *Snapper* ATGW;  
AA guns.

**Reserves:** 200,000.

**Air Force:** 6,000; 112 combat aircraft.  
3 light bomber squadrons with 10 Il-28.  
2 fighter-bomber squadrons with 24 Su-7.  
4 fighter-bomber squadrons with 48 MiG-15/17.  
3 interceptor squadrons with 30 MiG-21.  
2 transport squadrons with Yak 12, An-2, Il-14.  
1 helicopter squadron with Mi-1 and Mi-4.  
SA-2 SAM.

**Reserves:** 12,000.

**Para-Military Forces:** 21,000 Gendarmerie;  
200,000 tribal levies.

## AUSTRALIA

Population: 13,000,000.  
Military service: voluntary.  
Total armed forces: 73,330.  
Estimated GNP 1972: \$US 43.46 billion.  
Defence budget 1972: \$A 1,323 million (\$US 1,575 million).  
\$A 0.84=\$US 1 1 July 1972.  
\$A 0.706=\$US 1 1 July 1973.

**Army:** 33,100.  
1 infantry division HQ.  
1 tank regiment.  
3 cavalry regiments.  
9 infantry battalions.  
2 battalions of the Pacific Islands Regiment (PIR).  
1 Special Air Service (SAS) regiment.  
1 medium artillery regiment.  
3 field artillery regiments.  
1 light anti-aircraft regiment.  
1 aviation regiment.  
6 signals regiments.

3 field engineer regiments.  
7 construction and field survey squadrons.  
1 logistic support force.  
143 *Centurion* med tks; 265 *Ferret* scout cars; 758 M-113 APC; 254 105mm how including M-56 105mm pack how; 47 *Sioux* and *Kiowa* hel; 25 light aircraft; 57 watercraft.

**Deployment:** Singapore: 1 bn gp, 1 sig regt, and logistic units; Papua, New Guinea: 2 PIR bns.

**Reserves:** 24,500. The Citizen Military Force of 24,000 is intended to form 24 infantry battalions with supporting arms and services; Emergency Reserve 500.

**Navy:** 17,460.  
4 *Oberon*-class submarines.  
1 aircraft carrier.  
3 ASW destroyers with *Tartar* SAM and *Ikara* ASW msls.  
4 destroyers (2 training).  
6 destroyer escorts with *Ikara*.  
4 coastal minesweepers.  
2 minehunters.  
20 patrol boats.  
1 fast troop transport (ex-aircraft carrier).  
1 destroyer tender.  
5 landing craft (3 more on order).

**Fleet Air Arm**  
1 fighter-bomber sqn with A-4G *Skyhawk*.  
1 ASW sqn with S-2E *Tracker* and C-47 *Dakota*.  
2 ASW helicopter sqns with *Wessex* 31B.  
1 helicopter sqn with *Iroquois* and *Scout*.  
1 training sqn with Aermacchi MB-326H, TA-4G, and A-4G.  
(10 *Sea King* ASW hel on order.)

**Reserves:** 6,625. Navy Citizen Military Force: 5,525; Emergency Reserve 1,100.

**Air Force:** 22,770; 210 combat aircraft.  
1 bomber squadron with *Canberra* B-20.  
1 fighter squadron with 6 F-111C (18 more to be delivered by end of 1973).  
4 interceptor/FGA squadrons with *Mirage III*.  
1 MR squadron with 10 P-3B *Orion* and 1 MR squadron with 12 SP-2H *Neptune*.  
80 MB-326 and 41 CA-25 *Winjeel* trainers.  
2 tpt sqns with 24 C-130, 1 tpt sqn with 2 BAC-111, 10 HS-748, and 3 *Mystère* 20 and 2 tpt sqns with 24 *Caribou* and 23 *Dakota*.  
2 helicopter squadrons with *Iroquois*.

**Deployment:** 2 sqns of *Mirage III* in Malaysia/Singapore.

**Reserves:** 1,215. Citizen Air Force 570; Emergency Reserve 645.



The Australian Air Force is integrating the F-111C into its operational forces. The "C" has a slightly longer wing than USAF F-111s.



## BANGLADESH

Population: 76,000,000.  
Military service: voluntary.  
Total regular forces: 17,900.  
Estimated GNP 1972: \$3.5 billion.  
Defence budget 1973: Taka 470 million (\$US 65 million).  
Taka 7.3=\$1 1 July 1972.  
Taka 7.24=\$1 1 July 1973.

**Army:** 17,000.  
5 inf bdes with 17 inf bns.  
1 artillery brigade.  
1 engineer group.  
1 signals battalion.

**Navy:** 500.  
3 patrol boats.  
1 seaward defence boat.

**Air Force:** 400; 13 combat aircraft.  
1 fighter sqn with 8 MiG-21.  
5 F-86 Sabre.  
1 DHC-4 Caribou, 1 DC-6, and 2 F-27 tpts.  
2 MiG-21 UTI trainers.  
3 Alouette III.  
(2 Wessex hel on order.)

**Para-Military Forces:** 13,000 Bangladesh militia/Rakhi Bahini.

## BURMA

Population: 29,150,000.  
Military service: 2 years.  
Total armed forces: 149,000.  
Defence budget 1971-72: 490 million kyat (\$91 million).  
5.4 kyat=\$1 1 July 1972.  
4.7 kyat=\$1 1 July 1973.

**Army:** 135,000.  
6 regional commands comprising approximately 70 infantry battalions.  
3 infantry divisions.  
The forces as a whole consist of 5 armoured, 112 infantry, 5 artillery, and 1 engineer battalions, and are organized chiefly for counter-insurgency and internal security duties.  
Comet med tks; Humber armd cars; Ferret scout cars; 25-pdr guns; 75mm, 105mm, 155mm how.

**Navy:** 7,000 (including 800 marines).  
1 frigate.  
1 escort minesweeper.  
2 coastal escorts.  
5 motor torpedo boats (less than 100 tons).  
34 river and patrol gunboats.  
7 motor gunboats (less than 100 tons).  
About 100 river craft.

**Air Force:** 7,000; 10 combat aircraft.  
2 COIN sqns with 18 AT-33 and 1 Vampire.  
18 C-47, 8 Otter, 6 Beech-18, and 5 Cessna tpts.  
5 Sioux, 9 Huskie, 6 Alouette III, 10 Shawnee, and 3 KV 107-II helicopters.

**Para-Military Forces:** 25,000 armed village defence and militia.

## CHINA, REPUBLIC OF (TAIWAN)

Population: 15,135,000.  
Military service: 2 years.  
Total armed forces: 503,000.

Estimated GNP 1972: \$9.7 billion.  
Estimated defence expenditure 1972-73: 28 billion new Taiwan dollars (\$700 million).  
\$NT 40=\$1 1 July 1972.  
\$NT 38=\$1 1 July 1973.

**Army:** 350,000.  
2 armoured divisions.  
12 infantry divisions.  
6 light divisions.  
1 armoured cavalry regiment.  
2 airborne brigades.  
4 special forces groups.  
1 SSM battalion with *Honest John*.  
1 SAM battalion with *HAWK*.  
1 SAM bn and 1 SAM bty with *Nike-Hercules*.  
M-47 and M-48 med tks; 500 M-24 and M-41 lt tks; M-18 tk destroyers; LVT-4 and M-113 APC; 105mm and 155mm guns; AA guns; *Honest John* SSM; *HAWK*, *Nike SAM*; 15 UH-1H, 7 H-34, 2 KH-4 hel (59 UH-1H on order).

**Deployment:** Quemoy: 60,000; Matsu: 20,000.

**Reserves:** 750,000.

**Navy:** 38,000.  
1 submarine (training).  
14 destroyers.  
16 destroyer escorts.  
6 torpedo boats.  
3 patrol vessels.  
1 minelayer.  
14 coastal minesweepers.  
9 minesweeping launches.  
21 tank landing ships.  
4 medium landing ships.  
21 landing craft.

**Reserves:** 60,000.

**Marines:** 35,000.  
2 divisions.

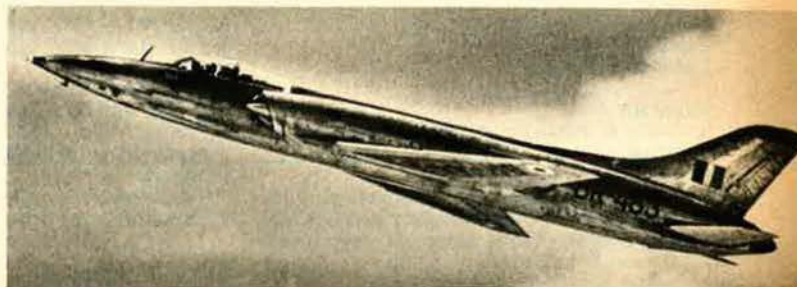
**Reserves:** 65,000.

**Air Force:** 80,000; 210 combat aircraft.  
6 fighter-bomber sqns with 90 F-100A/D.  
2 fighter sqns with 30 F-5A (40 F-5E on order).  
4 interceptor sqns with 63 F-104A/G.  
1 recce sqn with 8 RF-104G and 4 RF-101C.  
1 SAR sqn with 9 S-2A and 6 HU-16B.  
40 C-46, 30 C-47, 50 C-119, and 10 C-123 tpts.  
100 trainers.  
6 Hughes 500, 7 UH-19, and 10 Bell 47G hel (24 UH-1H on order).

**Reserves:** 130,000.

**Para-Military Forces:** 175,000 militia.

The Indian Air Force, with a variety of British, French, US, and Soviet-designed aircraft, also has two squadrons of these HF-24 Marut fighter-bombers, designed and built in India.



## INDIA

Population: 578,000,000.  
Military service: voluntary.  
Total armed forces: 948,000.  
Estimated GNP 1972: \$61.53 billion.  
Defence budget 1973-74: 17,296 million rupees (\$2,386 million).  
7.75 rupees=\$1 1 July 1972.  
7.25 rupees=\$1 1 July 1973.

**Army:** 826,000.  
1 armoured division (a second is being formed).  
5 independent armoured brigades.  
14 infantry divisions.  
11 mountain divisions.  
6 independent infantry brigades.  
1 parachute brigade.  
About 20 AA artillery units.  
200 Centurion Mk 5/7, 1,000 T-54 and T-55, and 500 Vijayanta med tks; 150 PT-76 and 140 AMX-13 lt tks; OT-62 and Mk 2/4A APC; about 3,000 guns, mostly towed and SP 25-pounders, but incl Model 56 105mm pack how, Abbott 105mm SP, and about 350 100mm and 350 130mm guns; RL; SS-11 and Entac ATGW; AA guns; 40 Tigercat SAM.

**Reserves:** 100,000. Territorial Army 45,000; Reserves 55,000.

**Navy:** 30,000 (including naval air).  
1 16,000-ton aircraft carrier.  
4 submarines (ex-Soviet F-class).  
2 cruisers.  
1 destroyer.  
8 destroyer escorts (incl 7 ex-Soviet Petya-class).  
9 frigates (2 GP with Seacat SAM, 3 AA, 4 ASW).  
8 Osa-class patrol boats with Styx SSM.  
9 patrol boats (4 less than 100 tons).  
8 minesweepers (4 inshore).  
1 landing ship.  
3 landing craft.  
10 seaward defence boats (6 less than 100 tons).

**Naval Air Force:** 1,500.  
35 Sea Hawk attack, 11 Alizé MR ac; 2 Sea King, 18 Alouette III, 2 Alouette II, and 10 Hughes 269 hel. 10 Sea Hawk, 5 Alizé, and 2 Alouette can be carried in the aircraft carrier at any one time. (17 HS 748 MR ac and 3 Sea King are on order.)

**Air Force:** 92,000; 842 combat aircraft.  
4 light bomber squadrons with 80 Canberra.  
6 fighter-bomber squadrons with 96 Su-7.  
2 fighter-bomber sqns with 50 HF-24 Marut 1A.  
7 fighter-bomber squadrons with 150 Hunter F-56.



2 fighter-bomber squadrons with 30 *Mystère IV*.  
 8 interceptor squadrons with 220 MiG-21PFM.  
 8 interceptor squadrons with 200 *Gnat* F.1.  
 1 reconnaissance squadron with 8 *Camberra* PR-57.  
 1 maritime recce sqn of 8 L-1049 *Super Constellation*.  
 13 tpt sqns with 55 C-47, 60 C-119G, 20 Il-14, 34 An-12, 30 *Otter*, 27 HS-748, and 20 *Caribou*.  
 About 12 sqns with Mi-4, *Alouette III*, 16 Mi-8, SA 315 *Cheetah*, S-62, and Bell 47 hel.  
 About 20 SA-2 SAM sites.

**Para-Military Forces:** About 100,000, in Border Security Force (not on Defence budget).

## INDONESIA

**Population:** 132,400,000.  
**Military service:** selective.  
**Total armed forces:** 322,000.  
**Estimated GNP 1972:** \$10.73 billion.  
**Estimated defence expenditure 1971:** 119 billion rupiahs (\$286.7 million).  
 378 rupiahs=\$1 1 July 1971.  
 415 rupiahs=\$1 1 July 1972.

**Army:** 250,000.  
 15 inf bdes, with over 100 inf bns and some para and armd units.  
 8 armoured battalions.  
 1 paracommando regiment (RPKAD).  
 The KOSTRAD (Strategic Reserve Command) consists of about six bdes and includes paratroops and armour. About one-third of the army is engaged in civil and administrative duties.  
*Stuart*, AMX-13 and PT-76 lt tks; *Saladin* armd cars; *Ferret* scout cars; *Saracen* and BTR-40 APC; artillery includes 76mm, 105mm, and 25-pdr; Soviet 57mm AA guns and associated radar; *Alouette III* hel.

**Navy:** 39,000 (incl naval air and 14,000 Marines). (Only a very small part of the navy is operational.)  
 10 submarines (ex-Soviet W-class).  
 1 cruiser (ex-Soviet *Sverdlov*-class, being sold).  
 4 destroyers (ex-Soviet *Skory*-class).  
 8 frigates (including 4 ex-Soviet *Riga*-class).  
 18 coastal escorts (14 ex-Soviet, 4 ex-USA).  
 12 *Komar*-class patrol boats with Styx SSM.  
 9 patrol boats (8 more being delivered).  
 21 motor torpedo boats (14 ex-Soviet P-6-class).  
 6 fleet minesweepers (ex-Soviet T-43-class).  
 20 coastal minesweepers (6 ex-USA).  
 18 motor gunboats (ex-Soviet BK-class).  
 25 seaward defence boats (less than 100 tons).  
 9 landing ships (8 ex-US LST).  
 9 landing craft.  
 2 Marine brigades.

**Naval Air Arm:**  
 6 C-47; 3 *Alouette III* hel (4 MR ac on order).

**Air Force:** 33,000; 89 combat aircraft. (Most of the Soviet-supplied combat aircraft and the SA-2 have not been used for some years. Few of these aircraft can be regarded as operational.)

22 Tu-16 and 10 Il-28 bombers.  
 5 B-25 *Mitchell* and 4 B-26 *Invader* light bombers.  
 5 F-51D *Mustang* fighter-bombers.  
 16 F-86 *Sabre* (CA-27) fighters.  
 4 MiG-15, 8 MiG-17, and 15 MiG-21 interceptors (mostly in storage).  
 60 tpts, incl 10 Il-14, 8 C-130B, C-47, and *Skyvan*.  
 3 hel sqns with 16 Mi-4, 6 Mi-6, and 4 Bell 47G, 2 AB-204B and 10 *Alouette II/III*.  
 At least 3 SA-2 sites (non-operational).

**Para-Military Forces:** A police Mobile Brigade of about 20,000; about 100,000 Militia.

## JAPAN

**Population:** 107,000,000.  
**Military service:** voluntary.  
**Total armed forces:** 266,000.  
**Estimated GNP 1972:** \$316.8 billion.  
**Defence budget 1973-74:** 935.5 billion yen (\$3,530 million).  
 301 yen=\$1 1 July 1972.  
 265 yen=\$1 1 July 1973.

**Army:** 180,000.  
 1 mechanized division.  
 12 infantry divisions (7,000-9,000 men each).  
 1 airborne brigade.  
 1 artillery brigade.  
 1 signal and 5 engineer brigades.  
 1 helicopter brigade.  
 1 mixed brigade.  
 6 SAM groups with *HAWK* (160 launchers).  
 520 Type 61 med tks; 30 M-24 and 140 M-41 lt tks; 440 Type 60 APC; 30 M-52 105mm and 10 M-44 155mm SP how; 203mm how; Type 30 SSM; Type 60 twin 106mm SP recoilless rifles; Type 64 ATGW; 120 L-19, LM1, LR1, T-34 lt ac; 230 UH-1B, KV 107, H-19, KH OH-6J, Hughes TA-55J, and H-13KH hel.

**Reserves:** 39,000.

**Navy:** 41,400.  
 13 submarines.  
 1 SAM destroyer with *Tartar*.  
 28 destroyers.  
 14 destroyer escorts/frigates.  
 20 submarine chasers.  
 3 minelayers.  
 42 coastal minesweepers.  
 5 motor torpedo boats (2 less than 100 tons).  
 4 tank landing ships.  
 1 medium landing ship.  
 6 landing craft.  
 42 small landing craft (less than 100 tons).

**Naval Air:** 110 combat aircraft.  
 7 MR sqns with P2V-7, P2-J, S2F-1, and PS-1.  
 60 hel incl S-61A, KV 107A, HSS-1N, and HSS-2.

**Reserves:** 300.

**Air Force:** 44,600; 386 combat aircraft.  
 4 FGA sqns with 120 F-86F (F-4EJ being introduced).  
 10 interceptor sqns with 150 F-104J, 20 F-4EJ, and 80 F-86F.  
 1 recce sqn with 16 RF-86F (being replaced by RF-4EJ in 1973; 14 are on order).  
 (18-25 aircraft in a combat squadron.)  
 2 transport sqns with 20 C-46 and 10 YS-11.  
 360 T-1, T-33, T-34, and F-104DJ trainers.  
 5 SAM bns with *Nike-J*.

A Base Air Defence Ground Environment with 28 control and warning units.

## THE KHMER REPUBLIC (CAMBODIA)

**Population:** 7,500,000.  
**Military service:** voluntary; conscription authorized, but not yet in force.  
**Total armed forces:** 187,200.  
**Estimated GNP 1971:** \$1.5 billion.  
**Defence budget 1973:** 17,800 million riels (\$98 million).  
 55.5 riels=\$1 1 July 1971.  
 182 riels=\$1 1 July 1973.

**Army:** 180,000.  
 9 static and 3 mobile divs (each of 3 bdes of 4 bns).  
 300 inf and cdo 'battalions' (companies).  
 1 tank regiment.  
 1 armoured car battalion.  
 3 parachute battalions.  
 12 field artillery batteries.  
 20 M-24 and 40 AMX-13 lt tks; 20 M-8 and M-20 armd cars; M-3 scout cars; BTR-40, BTR-152 APC; M-109 105mm SP how and Soviet 76mm and 122mm guns; 40mm, 57mm, 85mm, and 100mm AA guns; Cessna O-1 lt ac.

**Navy:** 3,400 (including marines).  
 2 coastal escort vessels.  
 2 support gunboats.  
 2 motor torpedo boats (less than 100 tons).  
 6 patrol boats (less than 100 tons).  
 3 landing craft.

**Air Force:** 3,800; 40 combat aircraft.  
 40 T-28 *Trojan* ground-attack aircraft.  
 20 C-47 and 1 C-54 transport aircraft.  
 2 *Alouette II* and 30 UH-1 helicopters.

**Para-Military Forces:** 150,000.

## KOREA—DEMOCRATIC PEOPLE'S REPUBLIC (NORTH)

**Population:** 15,000,000.  
**Military service:** Army 3 years, Navy and Air Force 4 years.  
**Total armed forces:** 470,000.  
**Estimated GNP 1972-73:** \$3.5 billion.  
**Defence budget 1973:** 1,282 million won (\$625 million).  
 2.05 won=\$1.

**Army:** 408,000.  
 3 armoured divisions.  
 21 infantry divisions.  
 4 independent infantry brigades.  
 7 independent armoured regiments.  
 20 SAM battalions with SA-2 (50 sites).  
 380 T-34, 650 T-54/55 med tks; 150 PT-76 lt tks; 200 BA-64, BTR-40, and BTR-152 APC; 200 SU-76 and SU-100 SP guns; 6,000 guns and mor up to 152mm; 24 *FROG-5/7* SSM; 2,000 AA guns, incl ZSU-57; SA-2 SAM.

**Reserves:** 750,000.

**Navy:** 17,000.  
 3 submarines (ex-Soviet W-class).  
 10 *Komar*- and 8 *Osa*-class FPB with Styx SSM.  
 80 torpedo boats (some less than 100 tons).  
 2 fleet minesweepers.  
 35 patrol vessels (some ex-Soviet SOI-class).





The Mitsubishi XT-2 jet trainer and light attack aircraft is Japan's first domestically designed supersonic plane, capable of Mach 1.6 speed.

60 motor gunboats.  
Samlet SSM (6 sites).

Reserves: 15,000.

**Air Force:** 45,000; 598 combat aircraft.  
70 Il-28 light bombers.  
28 Su-7 fighter-bombers.  
300 MiG-15 and MiG-17 fighter-bombers.  
130 MiG-21 and 50 MiG-19 interceptors.  
20 Il-28 and MiG-17 recon aircraft.  
About 60 An-2, 15 Li-2, Il-12, and 4 Il-14 tpts.  
20 Mi-4 helicopters.  
70 Yak-11, Yak-18, MiG-15, and Il-28 trainers.

Reserves: 40,000.

**Para-Military Forces:** 50,000 security forces and border guards; a civilian militia with a claimed strength of 1,450,000.

## KOREA—REPUBLIC OF KOREA (SOUTH)

Population: 32,665,000.  
Military service: Army/Marines, 2½ years; Navy and Air Force, 3 years.  
Total armed forces: 633,500.  
Estimated GNP 1972: \$9.3 billion.  
Defence budget 1973: 184.8 billion won (\$476 million).  
400 won=\$1 1 July 1972.  
388 won=\$1 1 July 1973.

**Army:** 560,000.  
29 infantry divisions (10 cadre only).  
2 armoured brigades.  
80 artillery battalions.  
1 SSM battalion with *Honest John*.  
2 SAM bns with *HAWK* and 1 with *Nike-Hercules*.  
750 M-47, M-48, and M-60 med tks; *Stuart* and M-24 lt tks; M-10 and M-36 tk destroyers; M-8 armd cars and M-113 APC; 1,000 guns up to 203mm; *Honest John* SSM; *HAWK* and *Nike SAM*.

Reserves: 1,000,000.

**Navy:** 18,900.  
5 destroyers.  
3 destroyer escorts.  
4 frigates.  
15 coastal escorts.  
21 patrol boats.  
6 coastal minesweepers.  
6 escort transports.  
20 landing ships.

Reserves: 30,000.

**Marines:** 29,600.  
1 division.

Reserves: 60,000.

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**Air Force:** 25,000; 195 combat aircraft.  
2 fighter-bomber sqns with 18 F-4D.  
5 fighter-bomber sqns with 110 F-86F.  
3 fighter-bomber sqns with 37 F-5A (about 40 F-5E on order).  
1 AWX sqn with 20 F-86D (with *Sidewinder* AAM).  
1 recon sqn with 10 RF-86F.  
35 transports including C-46, C-47, and C-54.  
Hel incl 6 H-19, 2 Bell 212, 5 UH-1D, and 2 KH-4.

Reserves: 35,000.

**Para-Military Forces:** A local defence militia, Homeland Reserve Defence Force, 2,000,000.

## LAOS

Population: 3,150,000.  
Estimated GNP 1972: \$211 million.  
500 kip=\$1 1 July 1972.  
600 kip=\$1 1 July 1973.

1. Royal Lao Forces  
Military service: conscription, term unknown.  
Total strength: 74,200.  
Defence budget 1973: 10.29 billion kip (\$17 million).

**Army:** 72,000.  
24 mobile infantry battalions.  
33 garrison infantry battalions.  
1 parachute battalion.  
1 artillery regt of 4 bns.  
M-24 and PT-76 lt tks; M-8 armd cars; M-3 scout cars; BTR-40 and M-113 APC; 85mm guns and 75mm, 105mm, and 155mm how.

**Navy:** about 500.  
4 river squadrons consisting of:  
22 patrol craft; 26 landing craft/transports (all under 100 tons, most not operational).

**Air Force:** 1,700; about 73 combat aircraft.  
63 T-28A/D light attack aircraft.  
10 AC-47 gunships.  
20 C-47, 1 *Aero Commander* transports.  
About 18 UH-34D and 6 *Alouette II/III* hel.

**Para-Military Forces and Irregulars:** 40,000.

2. *Pathet Lao Forces*  
Total strength about 40,000 men (incl dissident neutralists).  
PT-76 lt tks; BTR-40 armd cars; 105mm how.  
The *Pathet Lao* are believed to be integrated with about 60,000 regular North Vietnamese combat and logistics troops and have received arms and ammunition of Soviet and Chinese origin. The

*Pathet Lao* and North Vietnamese control all the eastern half of Laos, and most of the north.

## MALAYSIA

Population: 11,500,000.  
Military service: voluntary.  
Total armed forces: 56,000.  
Estimated GNP 1972: \$US 4.64 billion.  
Defence budget 1973: \$M 680.1 million (\$US 287 million).  
\$M 2.78=\$US 1 1 July 1972.  
\$M 2.37=\$US 1 1 July 1973.

**Army:** 46,500.  
8 infantry brigades, consisting of:  
28 infantry battalions.  
3 reconnaissance regiments.  
3 artillery regiments.  
1 special service unit.  
3 signals regiments.  
Engineer and administrative units.  
*Ferret* scout cars; 100 *Commando* APC; 105mm how; 40mm AA guns.

Reserves: about 50,000.

**Navy:** 4,800.  
1 ASW frigate with *Seacat* SAM.  
1 training frigate.  
6 coastal minesweepers.  
8 FPB; 4 with SS-11/12 and 4 with *Exocet* SSM.  
24 patrol craft (less than 100 tons).  
1 landing ship.

Reserves: 600.

**Air Force:** 4,700; 38 combat aircraft.  
2 fighter-bomber sqns with 18 CA-27 *Sabre*.  
2 COIN sqns with 20 CL-41G *Tebuan*.  
4 transport and liaison sqns, incl 12 DHC-4A *Caribou*, 10 *Herald* 401, 5 *Dove*, and 2 *Heron*.  
4 hel sqns with 16 S-61A and 25 *Alouette III*.  
1 training sqn with 16 SA *Bulldog*.  
(16 F-5B and E and 14 DHC-4 on order.)

**Para-Military Forces:** 54,000; 10 bns field police.

## MONGOLIA

Population: 1,300,000.  
Military service: 2 years.  
Total armed forces: 29,000.  
Estimated GNP 1971: \$0.84 billion.  
Estimated defence expenditure 1971: 170 million tugrik (\$42.5 million).  
4 tugrik=\$1.

**Army:** 28,000.  
2 infantry divisions.  
40 T-34 and 100 T-54/55 med tks; 10 SU-100 SP guns; 40 BTR-60 and 50 BTR-152 APC; 100mm and 130mm guns; 152mm gun/how; *Snapper* ATGW; 37mm and 57mm AA guns.

Reserves: 30,000.

**Air Force:** 1,000 men; 10 combat aircraft.  
1 FGA sqn with 10 MiG-15.  
30 An-2, Il-14, and An-24 transports.  
Yak-11 and Yak-18 trainers.  
10 Mi-1 and Mi-4 helicopters.  
1 SAM battalion with SA-2.

**Para-Military Forces:** about 18,000 frontier guards and security police.



## NEW ZEALAND

Population: 2,961,869.

Military service: voluntary, supplemented by Territorial service of 12 weeks for the Army.

Total armed forces: 12,789.

Estimated GNP 1972: \$US 8.50 billion.

Defence budget 1973-74: \$NZ 132 million (\$US 175 million).

\$NZ 0.84=\$US 1 1 July 1972.

\$NZ 0.754=\$US 1 1 July 1973.

**Army:** 5,498.

1 infantry battalion.

1 artillery battery.

Regular troops also form the nucleus of a combat brigade group, a logistic group, and a reserve brigade group. These units would be completed by the mobilization of Territorials.

10 M-41 lt tks; 9 *Ferret* scout cars; 59 M-113 APC; 16 25-pdr guns; 10 5.5-inch med guns; 28 105mm how.

**Deployment:** Singapore: 1 inf bn (less 1 coy).

**Reserves:** 6,708 Regular, 3,155 Territorial.

**Navy:** 2,972.

4 frigates with *Seacat* SAM (2 with *Wasp* hel).

2 escort minesweepers.

1 survey ship.

1 research ship.

10 patrol craft (less than 100 tons).

**Reserves:** 2,191 Regular, 209 Territorial.

**Air Force:** 4,319; 29 combat aircraft.

1 FB sqn with 10 A-4K and 4 TA-4K *Skyhawk*.

1 FB sqn with 10 BAC 167.

1 MR sqn with 5 P-3B.

4 med tpt sqns with 5 C-130H, 9 Bristol *Freighter*, 6 *Dakota*, and *Devon*.

13 UH-1D/H *Iroquois* and 11 OH-13H *Sioux* hel.

**Deployment:** Singapore: 1 transport squadron (Bristol *Freighter* tpts and *Iroquois* hel).

## PAKISTAN

Population: 64,800,000.

Military service: 2 years selective.

Total armed forces: 402,000, including some 75,000 military POW (army 55,000).

Estimated GNP 1972: \$4.7 billion.

Defence budget 1973-74: 4,230 million rupees (\$433 million).

11 rupees=\$1 1 July 1972.

9.77 rupees=\$1 1 July 1973.

**Army:** 300,000 (including 25,000 Azad Kashmir troops).

2 armoured divisions.

12 infantry divisions.

1 independent armoured brigade.

1 air defence brigade.

3 sqns army aviation.

300 M-47/48; 50 T-55 and 500 T-59 med tks; 140 M-24, 50 M-41, and 20 PT-76 lt



South Vietnam's Air Force, with 450 combat aircraft in service or storage, is the largest in SEA. About half the force is made up of A-37Bs like this.

tks; 250 M-113 APC; about 900 guns incl 25-pounder, 105mm and 155mm how and 130mm guns; *Cobra* ATGW; Cessna O-1E lt ac; 12 Mi-8, 15 *Sioux*, and 8 *Alouette III* hel.

**Reserves:** 500,000.

**Navy:** 10,000.

3 submarines.

1 light cruiser/training ship.

4 destroyers.

2 fast frigates.

7 coastal minesweepers.

7 patrol boats.

2 UH-19 SAR hel (6 *Sea King* on order).

**Reserves:** 5,000.

**Air Force:** 17,000; 248 combat aircraft.

2 light bomber squadrons with 10 B-57B.

2 fighter-bomber squadrons with 20 *Mirage III*EP.

6 fighter-bomber/interceptor sqns with 90 F-86.

7 FGA sqns with 112 MiG-19/F-6.

1 interceptor squadron with 6 F-104A/B.

1 recce squadron with 4 RT-33A, 2 RB-57, and 4 F-104B.

Transports include 4 C-130B, 1 C-46, and 1 F-27.

10 *Huskie*, *Alouette III*, and UH-19 hel.

**Reserves:** 8,000.

## PHILIPPINES

Population: 40,200,000.

Military service: selective.

Total armed forces: 42,700.

Estimated GNP 1972: \$8.2 billion.

Defence budget 1972-73: 648 million pesos (\$95 million).

6.8 pesos=\$1 1 July 1972.

6.79 pesos=\$1 1 July 1973.

**Army:** 19,300.

2 light infantry divisions (under strength).

5 independent infantry brigades (under strength).

1 artillery group.

13 engineer construction battalions.

1 *HAWK* battalion.

M-4 med tks; M-24 and M-41 lt tks; M-113 APC; 105mm and 155mm guns; *HAWK* SAM.

**Navy:** 12,200 (incl marines and naval engineers).

1 destroyer escort.

11 patrol vessels.

9 patrol gunboats.

4 hydrofoil patrol vessels.

18 patrol boats (less than 100 tons).

2 coastal minesweepers.

9 landing ships.

1 marine brigade.

2 engineer construction battalions.

**Air Force:** 11,200; 62 combat aircraft.

1 FGA sqn with 16 F-5A/B.

1 fighter sqn with 24 F-86F.

2 COIN sqns with 12 T-28 and 10 T-33.

2 transport sqns with 27 C-47, 8 F-27, and 4 YS-11.

12 UH-1D, 2 MS-62A, and 2 H-34 hel.

(31 SF-260 MX trainers on order.)

**Reserves:** 218,500.

**Para-Military Forces:** 27,180 Philippine Constabulary, organized in 7 bns and 1 bn combat group, deployed to 68 provincial centres; 20,000 in armed civilian self-defence units; 37,000 security forces.

## SINGAPORE

Population: 2,200,000.

Military service: 24-36 months.

Total armed forces: 20,600.

Estimated GNP 1972: \$US 2.64 billion.

Defence budget 1972-73: \$S 693 million (\$US 249.3 million).

\$S 2.78=\$1 1 July 1972.

\$S 2.36=\$1 1 July 1973.

**Army:** 19,000.

1 armoured brigade (3 armoured regiments).

3 infantry bdes, incl 7 infantry, 3 artillery, 3 engineer, and 1 signals bns.

75 AMX-13 tks; V-200 *Commando* APC; 25-pdr guns; 32 106mm recoilless rifles; 120mm mor.

**Reserves:** 30,000.

**Navy:** 1,000.

6 fast patrol boats.

1 seaward defence boat.

1 landing ship.



2 landing craft.  
(*Gabriel* SSM on order.)

**Air Force:** 600; 48 combat aircraft.  
1 FGA/recce squadron with 16 *Hunter* (a further 12 and 40 A-4 *Skyhawk* on order).  
1 COIN sqn with 16 BAC-167 and 16 SF-260.  
1 tpt/liason sqn with 8 Cessna-170 and 2 *Airtourer* (6 *Skyvan*, incl 3 SAR, on order).  
1 helicopter SAR sqn with 8 *Alouette III*. Trainers include *Hunter* T-7, *Provost*, 6 WA-7, 4 *Airtourer*, and 16 SF-260MS.  
28 *Bloodhound* SAM launchers (*Rapier* on order).

**Para-Military Forces:** 2 police companies; 9,000 People's Defence Force.

## SRI LANKA (CEYLON)

Population: 13,300,000.  
Military service: voluntary.  
Total armed forces: 12,500.  
Estimated GNP 1972: \$2.07 billion.  
Defence budget 1970-71: 170 million rupees (\$29 million).  
5.9 rupees=\$1 1 July 1970.  
6.4 rupees=\$1 1 July 1972.

**Army:** 8,500.  
2 brigades, each of 3 battalions.  
6 *Saladin* armed cars; 12 *Ferret* scout cars.

**Reserves:** 12,000.

**Navy:** 2,300.  
1 frigate.  
29 small patrol craft.  
1 hydrofoil.

**Air Force:** 1,700; 5 combat aircraft.  
1 fighter sqn with 5 MiG-17.  
1 trg sqn with 1 MiG-15 UTI and 6 *Jet Provost*.  
4 hel sqns with 7 Bell 206, 6 Bell 47G, and 2 KA-26.

**Para-Military Forces:** 16,000.

## THAILAND

Population: 36,714,000.  
Military service: 2 years.  
Total armed forces: 180,000.  
Estimated GNP 1972: \$7.3 billion.  
Defence budget 1972-73: 6,158.4 million baht (\$293 million).  
21.1 baht=\$1 1 July 1972.  
20.48 baht=\$1 1 July 1973.

**Army:** 125,000.  
4 infantry divisions (including 4 tank battalions).  
1 regimental combat team.  
1 SAM battalion with 40 *HAWK*.  
M-24 and M-41 lt tks; M-8 armd cars; M-3A1 scout cars; M-2, M-16, and about 200 M-113 APC; 200 105mm and 155mm how; *HAWK* SAM; 16 FH-1100, 3 *Jet-Ranger*, 14 UH-1H, 2 CH-47, and 6 OH-23F hel.

**Reserves:** 300,000.

**Navy:** 20,000 (including 6,500 marines).  
1 destroyer escort.  
3 frigates (1 more on order).  
1 escort minesweeper.  
17 patrol vessels.

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4 coastal minesweepers.  
2 coastal minelayers.  
11 gunboats (1 less than 100 tons).  
15 patrol boats.  
8 landing ships.  
8 landing craft.  
1 MR sqn with 2 HU-16B and 5 S-2.

**Air Force:** 35,000; 160 combat aircraft.  
1 fighter-bomber sqn with 11 F-5A and F-5B.  
1 fighter sqn with 20 F-86F.  
2 RT-33A reconnaissance aircraft.  
6 COIN sqns with 55 T-28D, 40 T-6, and 32 OV-10.  
2 tpt sqns with 25 C-47 and 13 C-123B.  
2 hel sqns with 35 CH-34 and 23 UH-1H.  
4 battalions of airfield defence troops.  
(30 A-4, 44 COIN ac, and 25 hel on order.)

**Para-Military Forces:** 10,000 Volunteer Defence Corps; 8,000 Border Police; Village Militia. The Border Police control 45 hel, incl 11 Bell 205, 10 204B, and 13 FH-1100.

## VIETNAM—DEMOCRATIC REPUBLIC (NORTH)

Population: 22,000,000.  
Military service: 2 years minimum.  
Total armed forces: 578,000.  
Estimated defence expenditure 1970: 2,150 million dong (\$584 million).  
3.68 dong=\$1 1 July 1970.  
3.6 dong=\$1 1 July 1972.

**Army:** 564,750.  
15 infantry divisions plus an additional 2 training divisions. (Infantry divisions normally total about 12,000 men, including 3 infantry regiments and 1 support regiment.)  
1 artillery division (of 10 regiments).  
3 armoured regiments.  
About 20 independent infantry regiments.  
46 SAM battalions (each with 6 SA-2 launchers).  
12 AA artillery regiments.  
T-34 and T-54 med tks; PT-76 Type 60 lt tks; BTR-40 APC; SU-76 and JSU-122 SP guns; 75mm, 105mm, 122mm, 175 130mm and 152mm guns; 57mm, 75mm, 82mm, and 107mm recoilless rifles; 82mm, 100mm, 107mm, 120mm, and 160mm mortars; 107mm, 122mm, and 140mm RL; *Sagger* ATGW; 6,000 12.7mm, 14.5mm, 37mm, 57mm, KS-12 85mm, and KS-19 100mm AA guns and ZSU-57-2 SP AA guns; SA-2, SA-3, and SA-7 *Strela* SAM, *Firecan* AA radar.

**Deployment:** About 145,000 in South Vietnam, 60,000 in Laos and 40,000 in Cambodia.

**Navy:** 3,250.  
3 coastal escorts (ex-Soviet *SOI* type).  
28 ex-Chinese motor gunboats (less than 100 tons).  
13 motor torpedo boats (1 Chinese P-6, 12 Soviet P-4).  
About 12 small patrol boats (less than 100 tons).  
Some landing craft.  
10 Mi-4 SAR helicopters.

**Air Force:** 10,000; 178 combat aircraft.  
1 light bomber sqn with 8 Il-28.  
4 interceptor sqns with 40 MiG-21F/PF with *Atoll* AAM.  
2 interceptor sqns with 30 MiG-19 (ex-Chinese).

7 fighter-bomber sqns with 100 MiG-15/17. 20 An-2, 4 An-24, 12 Il-14, and 20 Li-2 transports.  
12 Mi-4 and 5 Mi-6 helicopters.  
About 50 training aircraft.

**Para-Military Forces:** 20,000 Frontier, Coast Security, and People's Armed Security Forces; about 425,000 Regional Armed Militia.

## VIETNAM—REPUBLIC OF VIETNAM (SOUTH)

Population: 20,000,000.  
Military service: 2 years minimum.  
Total armed forces: 572,000.  
Estimated GNP 1972: \$2.5 billion.  
Defence budget 1973: 189.4 billion piastres (\$379 million).  
420 piastres=\$1 1 July 1972.  
500 piastres=\$1 1 July 1973.

**Army:** 460,000.  
11 infantry divisions.  
1 airborne division (3 brigades).  
7 independent armoured cavalry regiments.  
3 independent infantry regiments.  
27 ranger battalions.  
1 special forces group.  
35 artillery battalions.  
450 M-47 and M-48 med tks; M-24, M-41, and AMX-13 lt tks; *Commando* and *Greyhound* armd cars; M-3 scout cars; M-59 and M-113 APC; 1,500 105mm and 155mm guns; 155mm SP guns; 175mm how; AA guns; TOW ATGW.

**Navy:** 45,000.  
9 frigates (2 radar picket).  
9 patrol vessels.  
46 patrol gunboats.  
2 coastal minesweepers.  
21 landing ships.  
19 landing craft, utility.  
800 riverine craft; inshore patrol, patrol boats, assault support patrol boats, monitors (105mm how), armoured troop carriers, command and control boats, minesweepers, and support ships.  
About 250 diesel junks.

**Marines:** 17,000.  
1 division.

**Air Force:** 50,000; 309 combat aircraft.  
1 FGA sqn with 18 F-5A (plus 90 in storage).  
7 FB sqns with 168 A-37B (plus 60 in storage).  
3 FB sqns with 60 A-1H/J.  
1 recce sqn with 10 RC-47 and 7 RF-5A.  
1 gunship sqn with 16 AC-47.  
2 gunship sqns with 30 AC-119G.  
8 tpt sqns with 40 C-47, 43 C-119, 56 C-123, and 32 C-130E.  
9 lt tpt sqns with 53 C-7, 10 U-6A, and 80 U-17A/B.  
8 lt observation sqns with 248 O-1.  
18 hel sqns with 625 Bell UH-1 and 60 CH-47.  
250 miscellaneous training aircraft.

**Para-Military Forces:**  
Regional Forces—285,000, forming about 1,700 rifle companies, at the disposal of the provincial governors.  
Popular Forces—250,000, a home guard of about 7,500 platoons, with light arms.  
People's Self Defence Force—1,400,000; part-time village militia.  
Police Field Force—35,000, including special internal security units with armoured vehicles and helicopters.



# Latin America



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## CONTINENTAL TREATIES AND AGREEMENTS

In March and April 1945, the Act of Chapultepec was signed by Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the United States, Uruguay, and Venezuela. This Act declared that any attack upon a member-party would be considered an attack upon all, and provided for the collective use of armed force to prevent or repel such aggression.

In September 1947 all the parties to the Chapultepec Act—except Ecuador and Nicaragua—signed the Inter-American Treaty of Reciprocal Assistance, otherwise known as the Treaty of Rio (Cuba withdrew from the Treaty in March 1960). This Treaty constrained signatories to the peaceful settlement of disputes between themselves, and provided for collective self-defence should any member-party be subject to external attack.

The Charter of the Organization of American States (OAS), drawn up in 1948, embraced declarations based upon the Treaty of Rio. The member-parties—the signatories to the Act of Chapultepec plus Barbados, El Salvador, Jamaica, and Trinidad and Tobago—are bound to peaceful settlement of internal disputes, and to collective action in the event of external attack upon one or more signatory states. (Legally, Cuba is a member of the OAS, but has been excluded—by a decision of OAS Foreign Ministers—since January 1962. Barbados and Trinidad and Tobago signed the Charter in 1967.)

The United States is also a party to two multilateral defence treaties: the Act of Havana, 1940, signed by representatives of all the then 21 American Republics, which provides for the collective trusteeship, by American nations, of European colonies and possessions in the Americas, should any attempt be made to transfer the sovereignty of these colonies from one non-American power to another; and the Havana Convention, which corresponds with the Act of Havana, signed in 1940 by the same states, with the exception of Bolivia, Chile, Cuba, and Uruguay.

A Treaty for the Prohibition of Nuclear Weapons in Latin America (The Tlatelolco Treaty) was signed in February 1967 by 22 Latin American countries; 20 countries have now ratified or acceded to it. An Agency has been set up by the contracting parties to ensure compliance with the treaty.

## OTHER AGREEMENTS

In July 1965, El Salvador, Guatemala, Honduras, and Nicaragua agreed to form a military bloc for the co-ordination of all resistance against possible Communist aggression.

The United States has bilateral military assistance agreements with Argentina, Bolivia, Brazil, Chile, Colombia, the Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela. She also has a bilateral agreement with Cuba, for jurisdiction and control over Guantanamo Bay. (This agreement was confirmed in 1934. In 1960 the United States stated that it could be modified or abrogated only by agreement between the parties, and that she had no intention of agreeing to modification or abrogation.)

The Soviet Union has no defence agreements with any of the states in this area, although in recent years she has supplied military equipment to Cuba.

Britain assures the defence of Belize, France of French Guiana, and the Netherlands of Surinam (Dutch Guiana).



## ARGENTINA

Population: 24,300,000.  
Military service: Army and Air Force, 1 year; Navy, 14 months.  
Total armed forces: 135,000.  
Estimated GNP 1971: \$46.8 billion.  
Defence budget 1973: 4.434 billion pesos (\$889 million).  
5 pesos=\$1 1 July 1972.  
4.99 pesos=\$1 1 July 1973.

**Army:** 85,000.  
2 armoured brigades.  
1 horsed cavalry brigade.  
2 mechanized infantry brigades.  
1 infantry brigade.  
3 mountain brigades.  
1 airborne brigade.  
10 artillery regiments.  
5 anti-aircraft artillery regiments.  
120 M-4 *Sherman* medium tks; 120 AMX-13 lt tks; 250 M-113 APC; 105mm and 155mm guns; 105mm pack how and 24 French Mk F3 and 155mm SP how; recoilless rifles; *Cobra* ATGW; *Tiger* SAM; 3 DHC-6 *Twin Otter*; 7 Bell UH-7H and 7 FH-1100 hel.

**Reserves:** 250,000; 200,000 National Guard and 50,000 Territorial Guard.

**Navy:** 33,000 (including the Naval Air Force and Marines).  
1 aircraft carrier.  
4 submarines (2 more under construction).  
3 cruisers.  
10 destroyers (2 more under construction).  
2 patrol vessels.  
6 coastal minesweepers/minehunters.  
2 torpedo boats.  
2 fast patrol boats.  
1 landing ship.  
4 LST.

**Naval Air Force:** 3,000; 35 combat aircraft.  
15 A-4Q *Skyhawk* fighter-bombers.  
7 MB-326GB armed trainers.  
7 S-2A *Tracker*, 6 P-2V5 *Neptune* MR aircraft.  
3 HU-16B *Albatross* SAR aircraft.  
3 *Alouette III* and 4 *Sea King* ASW/SAR hel.  
7 C-47 and C-54 transport aircraft.  
32 T-28 *Fennec* trainers.  
Some Beech B-80 (*Queen Air*), C-45; HS-125, PC-6, and DHC-6 general purpose aircraft.  
(2 Westland *Sea Lynx* on order.)

**Marines:** 4,800.  
4 marine battalions.  
1 field artillery battalion (105mm how).  
1 AA battalion.  
20 LUT P-7 and 15 LARC 5 APC; 105mm, 155mm how; recoilless rifles; *Bantam* ATGW; *Tiger* SAM; 30mm AA guns.

**Air Force:** 17,000; 91 combat aircraft.  
10 B-62 and 2 T.Mk 64 *Canberra* bombers.  
47 A-4P *Skyhawk* fighter-bombers.  
12 *Mirage III*E and *II*B fighters.  
20 F-86F *Sabre* fighters.  
40 MS-760 and 60 T-34 trainers.  
5 C-130E, 5 DHC-6 *Twin Otter*, 11 F-27 Mk 400/600, 10 C-47, 6 C-45, and 4 DC-6 med tpts; 20 *Dove*, 16 *Dinfa Guarani II*, 14 *Aero Commander*, *Beaver*, and *Huanquero* lt tpts.

14 Hughes 500M; 6 Bell UH-1H; 4 UH-1D; 6 UH-19 and 4 Bell 47 hel.  
(50 IA-58 *Purcará* COIN ac on order.)

**Para-Military Forces:** 19,000. Gendarmerie: 11,000 men, 10 hel, under Army command, mainly for frontier duties; the National Maritime Prefecture: 8,000, 1 frigate, 8 hel, 5 *Skyvan*, subordinate to the Navy, performs coastguard duties.

2 cruisers.  
12 destroyers (1 with *Seacat* SAM).  
5 destroyer escorts.  
10 corvettes (rescue ships).  
4 coastal minesweepers.  
6 coastal patrol gunboats.  
2 river patrol boats (3 more on order).  
2 LST.  
(6 frigates on order; 2 with twin *Exocet* SSM, 4 with *Ikara* ASW).

## BOLIVIA

Population: 5,340,000.  
Military service: 12 months' selective.  
Total armed forces: 21,800.  
Estimated GNP 1972: \$1.32 billion.  
Defence expenditure 1972: 307 million pesos (\$25.8 million).  
11.88 pesos=\$1 1 July 1972.

**Army:** 20,000.  
12 infantry regiments.  
2 motorized regiments.  
3 ranger battalions.  
1 paratroop regiment.  
3 artillery regiments.  
5 engineer battalions.  
VM-706 and M-113 APC; light mor and arty.

**Navy:** Some lake patrol craft.

**Air Force:** 1,800; 29 combat aircraft.  
1 fighter sqn with 10 F-51D *Mustang*.  
1 COIN sqn with 13 AT-6D and 6 T-28A armed trainers.  
20 tpts, incl C-47, 1 C-54, and 6 CV-440.  
6 Cessna 172, 7 PT-19, 8 Fokker T-21, and 7 Cessna 185 communication aircraft.  
13 T-33A trainers.  
12 Hughes 500M and Hiller OH-23C/D helicopters.

**Para-Military Forces:** About 5,000 armed police and frontier guards.

## BRAZIL

Population: 100,760,000.  
Military service: 1 year.  
Total armed forces: 208,000.  
Estimated GNP 1972: \$50.4 billion.  
Defence budget 1972: 6.517 billion cruzeiros (\$1,105 million).  
5.9 cruzeiros=\$1 1 July 1972.  
6.05 cruzeiros=\$1 1 July 1973.

**Army:** 130,000.  
1 armoured division.  
4 mechanized divisions.  
7 infantry divisions.  
(Some of these divisions are being re-organized into 'independence' brigades.)  
1 airborne division.  
150 M-4 *Sherman* and 40 M-47 *Patton* med tks; M-3 *Stuart* and 100 M-41 *Walker Bulldog* lt tks; 120 *Veteli* Al Cutia APC/armd car; 40 M-113 and M-59 APC; M-7 105mm SP how; *HAWK* SAM (4 *Roland* SAM on order).

**Navy:** 43,000 (including Naval Air Force, Marines, and Auxiliary Corps).  
4 submarines (3 more on order).  
1 ASW aircraft carrier.

**Naval Air Force:**  
3 SH-3D, 4 SH-1-5-58 (Sikorsky S-58), 3 UH-2 (Westland *Wasp*), 4 UH-4 (Hiller FH-1100), 5 UH-5 (Westland *Whirlwind*), 10 IH-2A (Hughes 200), and 1 IH-2B (Hughes 300).

**Air Force:** 35,000; 216 combat aircraft.  
1 lt bomber sqn with 15 B-26K *Invader*.  
1 interceptor sqn with 16 *Mirage III*EBR.  
6 COIN sqns with 90 AT-6G, 40 AT-37C (112 AF-26 *Xavante* on order) (operate with Army).  
13 *Tracker*, 12 *Neptune*, 13 *Albatross*, 8 *PBY-5 Catalina*, and 9 RC-130E *Hercules* MR aircraft.  
40 L-42 *Regente*, O-1 *Bird Dog*, and L-6 *Paulistinha* observation/liaison aircraft (with Army).  
About 180 transports, incl 56 C-47, DC-6B, 4 C-118, 12 C-119F, 10 C-130E, 5 HS-125, 6 HS-748, 2 BAC-111, 24 DHC-5, and 5 *Pilatus Porter*. (C-45 and C-47 being replaced by 80 C-95 *Bandeirante*; 12 Fokker F27/F28 on order.)  
70 T-23 *Uirapuru*, 150 T-25 *Universal*, 63 Cessna T-37C, 7 *Magister*, and Fokker S-11/12 trainers.  
43 H-13J, 16 UH-1D, and 6 OH-4A/5A hel. (48 F-5E, 30 *Gazelle*, and 22 UH-1H on order.)

**Para-Military Forces:** Various public security forces total about 150,000. There are State militias in addition.

## CHILE

Population: 9,200,000.  
Military service: 1 year.  
Total armed forces: 60,000.  
Estimated GNP 1972: \$7.07 billion.  
Defence budget 1973: 8,000 million escudos (\$174 million).  
28 escudos=\$1 1 July 1972.  
46 escudos=\$1 1 July 1973.

**Army:** 32,000.  
5 divisions incl:  
6 cavalry regiments (2 armoured, 4 horsed).  
16 infantry regiments (incl 10 motorized).  
5 artillery regiments.  
Some anti-aircraft and support detachments.  
76 M-4 *Sherman* med tks; 10 M-3 *Stuart* lt tks; some APC; Model 56 105mm pack how; AA arty.

**Reserves:** 200,000.

**Navy:** 18,000.  
2 submarines.  
3 cruisers.  
4 destroyers.  
3 destroyer escorts.



Argentina's Air Force has on order fifty of these IA-58 Pucará counterinsurgency aircraft, designed and developed by Argentinian engineers.



Brazil's AF-26 Xavante trainer, of Italian design and manufacture, is assembled in Brazil.



Several Latin American countries have bought Mirage fighters, similar to this Colombian Mirage V.



Cuba's Air Force, the most powerful in Latin America, is entirely equipped with Soviet aircraft, among them eighty of these Mach 2 MiG-21s.



DeHavilland light transports are found in several Latin American air forces. This DHC-5 Buffalo wears Peruvian Air Force markings.



This C-95 light transport was developed by the Brazilian Ministry of Aeronautics.



## CUBA

Population: 8,850,000.  
 Military service: 3 years.  
 Total armed forces: 108,500.  
 Estimated GNP 1970: \$4.5 billion.  
 Estimated defence expenditure 1971: 290 million pesos (\$290 million).  
 1 peso = \$1 1 July 1970.  
 1 peso = \$1 1 July 1971.

**Army:** 90,000.  
 15 infantry 'divisions' (brigades).  
 2 armoured brigades.  
 8 independent 'brigades' (battalion groups).  
 Over 600 tks including hy tks, T-34 and T-54/55 med tks and PT-76 lt tks; 200 BTR-40, BTR-60, and BTR-152 APC; 100 SU-100 assault guns; 122mm and 152mm guns; 30 FROG-4 and 20 Salish SSM; 57mm, 76mm, and 85mm ATK guns; Snapper ATGW.

**Reserves:** 90,000.

**Navy:** 6,500.  
 2 frigates (ex-US).  
 2 escort patrol vessels (ex-US).  
 18 submarine chasers (ex-Soviet *SOI, Kronstadt*).  
 2 *Osa-* and 18 *Komar*-class FPB with Styx SSM.  
 24 MTB (ex-Soviet P-4 and P-6).  
 18 Mi-4 hel.  
 50 *Samlet* coastal defence SSM.

**Air Force:** 12,000 (including the Air Defence Forces); 215 combat aircraft.  
 1 fighter-bomber sqn with 20 MiG-15.  
 5 interceptor sqns with 80 MiG-21.  
 2 interceptor sqns with 40 MiG-19.  
 4 interceptor sqns with 75 MiG-17.  
 About 70 Il-14, An-24, and An-2 tpt ac.  
 Trainers include 30 MiG-15 UTI and Zlin-326.  
 About 24 Mi-4 and 30 Mi-1 helicopters.  
 24 SAM bns with 144 SA-2.

**Para-Military Forces:** 10,000 State Security troops; 3,000 border guards; 200,000 People's Militia.

## DOMINICAN REPUBLIC

Population: 4,400,000.  
 Military service: selective.  
 Total armed forces: 15,800.  
 Estimated GNP 1972: \$1.85 billion.  
 Estimated defence expenditure 1972: 33 million pesos (\$33 million).  
 1 peso = \$1 1 July 1972.  
 1 peso = \$1 1 July 1973.

**Army:** 9,000.  
 3 infantry brigades.  
 1 artillery regiment.  
 1 anti-aircraft regiment.  
 Reconnaissance, engineer, and signals units.  
 20 AMX-13 lt tks; some APCs, armd cars, and light artillery.

**Navy:** 3,800.  
 3 frigates.  
 2 corvettes.  
 2 fleet minesweepers.  
 3 patrol vessels.  
 1 landing ship.  
 2 landing craft.

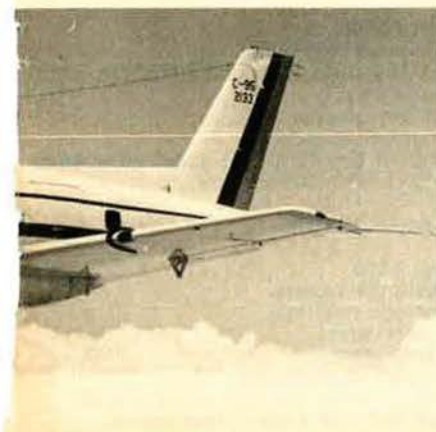
**Air Force:** 3,000; 35 combat aircraft.  
 3 B-26 *Invader* light bombers.  
 1 fighter-bomber sqn with 10 *Vampire* Mark I.  
 1 fighter-bomber sqn with 20 F-51D *Mustang*.



World War II aircraft, like this Dominican Mustang, are in many Caribbean air forces.



—Tass Photo



4 motor torpedo boats.  
 1 patrol vessel.  
 5 landing ships.  
 (2 Oberon-class submarines and 2 *Leander*-class frigates with *Seacat* SAM are on order.)  
 1 HU-16C *Albatross*.  
 5 C-45 and 5 C-47 tpts; 4 *JetRanger* helicopters.

**Air Force:** 10,000; 41 combat aircraft.  
 1 lt bomber sqn with 12 B-26 *Invader*.  
 2 fighter sqns with 18 *Hunter* F-71 and 11 F-80C.  
 About 90 transports, including 20 C-45, 8 DHC-6 *Twin Otter*, 9 Beechcraft 99A, 25 C-47, 4 C-118, 4 DC-6, and 2 C-130E *Hercules*.  
 5 *Twin Bonanza*, 10 Cessna 180, 4 Cessna O-1, and 20 T-6 liaison aircraft.  
 45 T-34, 10 T-37B, 8 T-33A, and 5 *Vampire* trainers.  
 30 helicopters, including 7 Bell OH-13H, 2 Sikorsky UH-19, 16 Hiller OH-23G, and 2 Bell UH-1D.

**Para-Military Forces:** *Carabineros* 30,000.

## COLOMBIA

Population: 23,200,000.  
 Military service: 1 year.  
 Total armed forces: 63,200.  
 Estimated GNP 1972: \$7.59 billion.  
 Estimated defence expenditure 1973: 2,035 million pesos (\$92 million).  
 22 pesos = \$1 1 July 1972.  
 22 pesos = \$1 1 July 1973.

**Army:** 50,000 (300,000 on full mobilization).  
 8 infantry brigades.  
 1 Presidential Guard anti-guerrilla battalion.  
 Motorized infantry, artillery, and engineer units.  
 M-3A1 *Stuart* light tanks; M-8 armoured cars; 105mm how; mortars.

**Reserves:** 250,000.

**Navy:** 7,200.  
 2 submarines.  
 5 destroyers.  
 4 destroyer/transports.  
 8 coastal patrol vessels.  
 5 river gunboats.  
 14 patrol motor launches (less than 100 tons).

**Air Force:** 6,000; 18 combat aircraft.  
 14 *Mirage V* and 4 *Mirage IIIR/D*. (F-5 on order.)  
 About 50 transport aircraft incl 2 C-130, C-47, C-54, DHC-2 *Beaver*, DHC-3 *Otter*, *Aero Commander*, 1 Fokker F-28, and 4 HS-748.  
 About 50 trainers incl 10 A-37, 30 T-41D, some AT-33, and Beech T-34.  
 16 Bell 47, 12 Hughes OH-6A, 6 Kaman *Huskie*, 6 TH-55, 1 Bell UH-1B, and 4 Hiller H-23.

**Para-Military Forces:** 35,000 National Police Force.



2 PBY-5A *Catalina* maritime patrol aircraft.  
 1 tpt sqn with 6 C-46, 6 C-47, 3 DHC-2 *Beaver*, and 3 Cessna 170.  
 30 trainers, including T-6 *Texan*, T-11 *Kansan*, BT-13 *Valiant*, and PT-17 *Kaydet*.  
 2 Bell OH-13, 2 Sikorsky H-19, 2 Hiller UH-12, 7 Hughes OH-6A, and 3 *Alouette II/III* hel.

Para-Military Forces: 10,000 Gendarmerie.

## ECUADOR

Population: 6,600,000.  
 Military service: selective for 2 years.  
 Total armed forces: 22,200.  
 Estimated GNP 1972: \$1.83 billion.  
 Estimated defence budget 1973: 1,221 million sucres (\$49 million).  
 25 sucres=\$1 1 July 1972.  
 24.71 sucres=\$1 1 July 1973.

**Army:** 15,000.  
 11 infantry battalions.  
 1 parachute battalion.  
 3 reconnaissance squadrons.  
 4 horsed cavalry squadrons.  
 10 independent inf coys.  
 3 artillery groups.  
 1 anti-aircraft battalion.  
 2 engineer battalions.  
 15 M-3 *Stuart* and M-41 *Bulldog* and 41 AMX-13 lt tks; *Panhard* AML-245 armd cars; some APC incl amphibians.  
 1 *Skyvan*, 1 Cessna T-41, and 3 *Piper Cub*.

**Navy:** 3,700.  
 3 destroyer escorts.  
 2 coastal escorts.  
 2 motor gunboats.  
 3 motor torpedo boats.  
 6 patrol craft.  
 2 landing ships.

**Air Force:** 3,500; 15 combat aircraft.  
 5 *Canberra* bombers.  
 8 *Meteor* FR-9 interceptors.  
 2 PBY-5 *Catalina* maritime patrol aircraft.  
 1 tpt sqn with 6 C-45, 8 C-47, 4 DC-6B, 1 *Skyvan* 3M, and 3 HS-748.  
 25 trainers including T-28, T-33, and 12 T-41.  
 3 Bell 47G and 1 FH-1100 hel.  
 (8 BAC-167 fighters and 6 *Alouette III* hel on order.)

Para-Military Forces: 5,800.

## MEXICO

Population: 53,450,000.  
 Military service: voluntary, with part-time conscript militia.  
 Total armed forces: 71,000 regulars; 250,000 conscripts.  
 Estimated GNP 1972: \$39.45 billion.  
 Defence budget 1973: 4,409 million pesos (\$352 million).  
 12.5 pesos=\$1 1 July 1972.  
 12.52 pesos=\$1 1 July 1973.

**Army:** 54,000, plus 250,000 part-time conscripts.  
 1 mechanized brigade group (Presidential Guard).  
 1 infantry brigade group.

1 parachute brigade.  
 Zonal Garrisons including:  
 21 independent cavalry regiments.  
 50 independent infantry battalions.  
 2 artillery battalions.  
 Anti-aircraft, engineer, and support units.  
 M-3 *Stuart* lt tks; APCs; 100 armd cars; 75mm and 105mm how.

**Navy:** 11,000 (including Naval Air Force and Marines).  
 2 destroyers.  
 8 frigates.  
 2 gunboats.  
 15 escort and fleet minesweepers.  
 10 patrol boats.  
 1 troop transport.

Naval Air Force: 336; 5 combat aircraft.  
 5 PBY-5 *Catalina* MR; 4 Bell 47G, 1 Bell 47J, and 4 *Alouette III* hel.

Marines: 1,900 men; organized in 16 companies.

**Air Force:** 6,000; 27 combat aircraft.  
 1 fighter-bomber sqn with 12 *Vampire*.  
 1 COIN sqn with 15 T-33A.  
 1 SAR sqn with 18 LASA-60 lt ac.  
 130 trainers, including 45 T-6 *Texan*, 13 AT-11 *Kansan*, 32 T-28 *Trojan*, and 10 T-34 *Mentor*. (The T-6, AT-11, T-28, and T-34 aircraft can be used for ground support.)  
 About 50 transports, including 6 C-47, 5 C-54, 20 C-45, 2 C-118, 3 *Islander*, and 1 *Jetstar*.  
 About 30 helicopters; 14 Bell 47, 1 Bell 212, 3 *Puma*, 5 *JetRanger*, 6 *Alouette III*, and 1 Hiller UH-12E. 1 parachute battalion.

## PARAGUAY

Population: 2,520,000.  
 Military service: 2 years.  
 Total armed forces: 14,900.  
 Estimated GNP 1972: \$708 million.  
 Defence budget 1973: 2,335.9 million guaranies (\$19 million).  
 130 guaranies=\$1 1 July 1972.  
 125 guaranies=\$1 1 July 1973.

**Army:** 11,000.  
 1 cavalry brigade.  
 6 infantry regiments.  
 5 motorized engineer battalions.  
 3 artillery batteries.  
 9 M-4 *Sherman* med tks; APCs; 75mm and 105mm how.

**Navy:** 1,900 (including marines).  
 1 support ship (LSM) with 2 UH-13 hel.  
 2 river gunboats.  
 3 patrol boats.  
 2 patrol launches.  
 3 river patrol boats.

**Air Force:** 2,000; 6 combat aircraft.  
 About 20 trainers incl 6 T-6 *Texan* (some fitted for bombs), PT-17 *Kaydet*, and MS-760.  
 10 C-47, C-54, and 1 DHC-6 *Twin Otter* tpts.  
 20 helicopters, including 4 Bell 47C, 3 Hiller UH-12E, and 12 Bell UH-13.

Para-Military Forces: 8,500 security forces.

## PERU

Population: 14,900,000.  
 Military service: 2 years.  
 Total armed forces: 54,000.  
 Estimated GNP 1972: \$7.11 billion.

Defence budget 1973: 10,193 million soles (\$240 million). (Peru now uses a biennial defence budget system. This estimate represents the 1973 portion of a total 20,125 million soles budget for 1 Jan. 1972-31 Dec. 1974.)  
 45.5 soles=\$1 1 July 1972.  
 42.44 soles=\$1 1 July 1973.

**Army:** 39,000.  
 1 armoured brigade.  
 7 infantry brigades.  
 1 commando brigade.  
 Mountain, parachute, artillery, and engineer battalions.  
 60 M-4 *Sherman* med tks; 100 AMX-13 lt tks; 50 M-3A1 *White* scout cars; some 105mm and 155mm guns. 8 Bell 47G hel.

**Navy:** 8,000.  
 4 submarines.  
 3 light cruisers (1 more being delivered).  
 4 destroyers.  
 3 destroyer escorts.  
 2 submarine chasers.  
 6 fast patrol craft.  
 2 coastal minesweepers.  
 3 patrol boats.  
 4 landing ships.  
 2 Bell 47G and 2 *Alouette III* helicopters.

**Air Force:** 7,000; 85 combat aircraft.  
 15 *Canberra* light bombers.  
 14 *Mirage V* fighters (more on order).  
 10 F-86F and 6 *Hunter* F-52 fighters.  
 20 T-33A armed trainers.  
 (The above aircraft form three combat groups of two or three squadrons each.)  
 1 photo-recce squadron with 10 C-60.  
 1 maritime recce squadron with 6 PV-2 *Harpoon*.  
 4 HU-16A *Albatross* maritime patrol aircraft.  
 Tpt and comms aircraft, incl 9 C-130, 4 C-54, 6 DC-6, 19 C-47, 12 DHC-6 *Twin Otter*, 21 *Beech Queen Air*, and 16 DHC-5 *Buffalo*.  
 Trainers incl 2 *Hunter* T-62, 2 *Mirage IIIB*, 8 T-33, 26 T-37B, and 19 Cessna T-41A.  
 Helicopters include 4 Bell 47G, 10 *Alouette III*, 4 Mi-8, 2 Bell 212, 13 UH-1H, 9 UH-1D, and 2 Hiller UH-12B.

Para-Military Forces: 20,000 *Guardia Civil*.

## URUGUAY

Population: 3,000,000.  
 Military service: voluntary.  
 Total armed forces: 21,000.  
 Estimated GNP 1972: \$2.36 billion.  
 Defence budget 1972: 43,964 million pesos (\$77 million).  
 570 pesos=\$1 1 July 1972.  
 895 pesos=\$1 1 July 1973.

**Army:** 16,000.  
 2 armoured regiments.  
 5 infantry regiments (of 3 battalions each).  
 9 cavalry sqns.  
 4 artillery groups.  
 5 engineer battalions.  
 8 M-24 lt tks; 10 M-3A1 scout cars; 18 M-113A1 APC; 105mm how.

Reserves: 100,000.

**Navy:** 3,000.  
 2 destroyer escorts.  
 1 corvette (training).  
 1 escort vessel.  
 2 patrol vessels.  
 1 coastal minesweeper.  
 3 S-2A *Tracker* maritime patrol aircraft.  
 2 Bell 47G and 4 UH-12 helicopters.

AIR FORCE Magazine / December 1973



**Air Force:** 2,000; 10 combat aircraft.  
About 30 trainers incl 20 T-6 *Texan* and 6 T-33A (some of which are armed).  
Tpt ac incl 14 C-47, 2 Fokker F-27, 1 DHC-2 *Beaver*, 2 Beech *Queen Air*, and 2 F-227.  
2 Bell UH-1H and 2 Hiller UH-12 hel.

**Para-Military Forces:** 22,000.

## VENEZUELA

Population: 11,500,000.  
Military service: 2 years.  
Total armed forces: 37,500.  
Estimated GNP 1972: \$11.97 billion.  
Defence budget 1973: 1,396 million bolivares (\$325 million).  
4.4 bolivares=\$1 1 July 1972

4.30 bolivares=\$1 1 July 1973.

**Army:** 24,000.  
1 armoured brigade.  
1 cavalry regiment.  
1 tank battalion group.  
13 infantry battalions.  
11 ranger battalions.  
6 artillery groups.  
5 engineer and anti-aircraft battalions.  
16 AMX-30 med tks; AMX-13 lt tks; M-18 tank destroyers and some armd cars (161 AMX-30 and 20 AMX-155 SP guns on order).

**Navy:** 7,500 (including 4,000 marines).  
3 submarines.  
4 destroyers.  
6 destroyer escorts.  
10 submarine chasers.

4 landing ships.  
(6 FPB with *Otomat* SSM are on order.)

**Air Force:** 6,000; 129 combat aircraft.  
30 B-2 *Canberra* bombers.  
15 B-25 *Mitchell* light bombers.  
18 CF-5A fighters.  
50 F-86F/K fighters.  
16 OV-10A COIN aircraft.  
47 tpt ac incl 12 C-47, 18 C-123B, and 4 C-130H.  
38 trainers incl 2 *Mirage IIID*, T-34 *Mentor*, T-52 *Jet Provost*, and HS-748.  
24 hel include *Alouette III* and UH-1D.  
(F-5 and 16 *Mirage III* fighters on order.)

**Para-Military Forces:** The National Guard, a volunteer force with a total strength of 10,000, employed chiefly on internal security duties.

## ARMED FORCES OF OTHER LATIN AMERICAN COUNTRIES\*

Country	Estimated population (000s)	Estimated GNP 1972 \$m	Total armed forces	Army		Navy	Air Force	Para-military forces
				Manpower and formations	Equipment	Manpower and equipment	Manpower and equipment	
El Salvador	3,920	1,113	5,630	4,500 1 cav regt 5 inf bns 2 arty bns 1 AA bn 1 para coy		130 2 patrol boats	1,000 4 F-4U fighters; 6 F-51D FGA; 4 C-47 tpts 30 trainers	3,000
Guatemala	5,690	2,130	11,200	10,000 6 inf bns 1 para bn 1 engr bn 1 arty bty 1 armd car coy.	10 M-4 med tks; 10 M-3A1 lt tks; some M-113 APC; M-8 armd cars; 105mm how	200 1 gunboat 6 patrol craft	1,000 4 B-26 lt bbrs; 6 F-51D FGA; 8 A-37B COIN; 4 RT-33A; 11 tpts (4 C-47); 10 hel	3,000
Guyana	780	283	2,200	2,200 2 inf bns	4 APC; mortars	3 patrol launches	2 BN-2A lt tpts; 2 Helio 269 lt ac (under Army)	2,250
Haiti	5,200	514 (1971)	6,550	6,000 1 inf bn several small combat teams	9 lt tks; some APC; 37mm, 75mm and 105 mm guns; 57mm ATK guns	300 4 patrol craft, 1 landing craft	250 3 C-47, 2 C-45 tpts (6 hel on order)	14,900
Honduras	2,890	781	5,735	4,500 3 inf bns 20 inf coys 2 arty btys 1 engr bn	some lt tks; 75mm how	35 3 patrol craft	1,200 6 F-4U fighters; 3 RT-33A; 4 C-47, 1 C-54 tpts; 3 H-19 hel	2,500
Nicaragua	2,200	955	7,100	5,400 up to 20 inf coys mot det 1 AA bty 1 engr bn	some lt tks; APC; armd cars; lt AA guns; 2 Cessna U-17A lt ac	200 (coastguard) 4 patrol vessels	1,500 4 B-26 lt bbrs; 6 T-33A COIN; 16 tpts (3 C-47); 15 trainers (6 T-28A); 5 hel	4,000

\* Costa Rica and Panama maintain para-military forces, numbering 5,000 and 11,000 respectively. Neither has regular armed forces.



# Tables of Comparative Strengths

## 1. NUCLEAR DELIVERY VEHICLES: COMPARATIVE STRENGTHS AND CHARACTERISTICS

### (A) UNITED STATES AND SOVIET UNION

#### (i) Missiles and Artillery

Category <sup>a</sup>	United States					Soviet Union					
	Type	Max. range <sup>b</sup> (statute miles)	Estimated warhead yield <sup>c</sup>	First deployed	Number de-ployed (July 1973)	Type <sup>d</sup>	Max. range <sup>b</sup> (statute miles)	Estimated warhead yield <sup>c</sup>	First de-ployed	Number de-ployed (July 1973)	
Land-based missiles	ICBM	LGM-25C <i>Titan 2</i>	7,250	5-10 MT	1962	54	SS-7 <i>Saddler</i>	6,900	5 MT	1961	} 209 } 288 <sup>f</sup> } 970 <sup>g</sup> } 60
		LGM-30B <i>Minuteman 1</i>	7,500	1 MT	1962	140	SS-8 <i>Sasin</i>	6,900	5 MT	1963	
		LGM-30F <i>Minuteman 2</i>	8,000	1-2 MT	1966	510	SS-9 <i>Scarp</i>	7,500	20-25 MT <sup>e</sup>	1965	
		LGM-30G <i>Minuteman 3</i>	8,000	3 x 200 KT	1970	350	SS-11 <sup>h</sup>	6,500	1-2 MT <sup>h</sup>	1966	
								SS-13 <i>Savage</i> <sup>g</sup>	5,000	1 MT	
	IRBM						SS-5 <i>Skean</i> <sup>h</sup>	2,300	1 MT	1961	100
MRBM						SS-4 <i>Sandal</i> <sup>h</sup>	1,200	1 MT	1959	500	
SRBM	MGM-29A <i>Sergeant</i> <sup>l,m</sup>	85	KT range	1962	(500)	SS-1b <i>Scud A</i> <sup>l</sup>	50	KT range	1957	} (300)	
	MGM-31A <i>Pershing</i>	450	KT range	1962	(250)	SS-1c <i>Scud B</i> <sup>l</sup>	185	KT range	1965		
						SS-12 <i>Scaleboard</i>	500	MT range	1969		
Long-range cruise missiles						SS-N-3 <i>Shaddock</i>	450	KT range	1962	(100)	
Unguided rockets	MGR-1B <i>Honest John</i> <sup>l,m</sup>	25	KT range	1953	n.a.	FROG 1-7 <sup>l</sup>	10-45	KT range	1957-65	(600)	
Sea-based missiles	SLBM (nuclear subs)	UGM-27B <i>Polaris A2</i>	1,750	800 KT	1962	} 336 } 320	SS-N-5 <i>Serb</i>	750	MT range	1964	30
		UGM-27C <i>Polaris A3</i> <sup>n</sup>	2,880	1 MT or 3 x 200 KT	1964		SS-N-6	1,750	MT range	1969	496
		UGM-73A <i>Poseidon</i>	2,880	10 x 50 KT	1971		SS-N-8	4,000	MT range	1972	36
	SLBM (diesel subs)						SS-N-4 <i>Sark</i>	350	MT range	1961	36
							SS-N-5 <i>Serb</i>	750	MT range	1964	30
Long-range cruise missiles (subs)						SS-N-3 <i>Shaddock</i>	450	KT range	1962	338	
Long-range cruise missiles (surface vessels)						SS-N-3 <i>Shaddock</i>	450	KT range	1962	48	
Artillery	Self-propelled	M-110 203mm (8in) how <sup>l</sup>	10	KT range	1962	102					
		M-109 155mm how <sup>l</sup>	10	2 KT	1964	306					
	Towed	M-115 203mm (8in) how <sup>l</sup>	10	KT range	1950s	n.a.	M-55 203mm gun/how <sup>l</sup>	18	KT range	1950s	n.a.



(ii) Aircraft<sup>o</sup>

Category <sup>p</sup>	United States						Soviet Union					
	Type	Max. range <sup>q</sup> (statute miles)	Max. speed (Mach no.) <sup>r</sup>	Max. weapons load (lb)	First deployed	Number deployed (July 1973)	Type <sup>s</sup>	Max. range <sup>q</sup> (statute miles)	Max. speed (Mach no.) <sup>r</sup>	Max. weapons load (lb)	First deployed	Number deployed (July 1973)
Long-range bombers	B-52 D-F	11,500	0.95	60,000	1956	} 442 <sup>t</sup>	Tu-95 <i>Bear</i>	7,800	0.78	40,000	1956	} 100
	B-52 G/H	12,500	0.95	75,000	1959		Mya-4 <i>Bison</i>	6,050	0.87	20,000	1956	
Medium-range bombers	FB-111A	3,800	2.5	37,500	1969	74 <sup>t</sup>	Tu-16 <i>Badger</i>	4,000	0.8	20,000	1955	800 <sup>v</sup>
Strike aircraft (incl short-range bombers): land-based	F-105D	2,100	2.25	16,500	1960	} (1,300) <sup>w</sup>	Il-28 <i>Beagle</i>	2,500	0.81	4,850	1950	} (1300) <sup>w</sup>
	F-4	2,300	2.4	16,000	1962		Su-7 <i>Fitter</i>	900	1.7	4,500	1959	
	F-111 A/E	3,800	2.2/2.5	25,000	1967		Tu-22 <i>Blinder</i>	1,400	1.5	12,000	1962	
	A-7D	3,400	0.9	15,000	1968		Yak-28 <i>Brewer</i>	1,750	1.1	4,400	1962	
								MiG-21MF	1,150	2.2	2,000	
							<i>Fishbed J</i>					
							MiG-23 <i>Flogger</i>	1,800	2.5	n.a.	1971	
Strike aircraft: carrier-based	A-4	2,055	0.9	10,000	1956	} (1,300) <sup>w</sup>						
	A-6A	3,225	0.9	18,000	1963							
	A-7A/B/E	3,400	0.9	15,000	1966							
	F-4	1,997	2.4	1,600	1962							

## (iii) Historical Changes of Strength, 1963-73 (mid-years)

		1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
USA	ICBM	424	834	854	904	1,054	1,054	1,054	1,054	1,054	1,054	1,054
	SLBM	224	416	496	592	656	656	656	656	656	656	656
	Long-range bombers <sup>p</sup>	630	630	630	630	600	545	560	550	505	455	442
USSR	ICBM	100	200	270	300	460	800	1,050	1,300	1,510 <sup>f</sup>	1,527 <sup>f</sup>	1,527 <sup>f</sup>
	SLBM	100	120	120	125	130	130	160	280	440	560	628
	Long-range bombers <sup>p</sup>	190	190	190	200	210	150	150	150	140	140	140

## NOTES

<sup>o</sup> ICBM = inter-continental ballistic missile (range 4,000+ miles); IRBM = intermediate-range ballistic missile (range 1,500-4,000 miles); MRBM = medium-range ballistic missile (range 500-1,500 miles); SRBM = short-range ballistic missile (range under 500 miles); SLBM = submarine-launched ballistic missile. Long-range cruise missile = range over 250 miles.

<sup>p</sup> Operation range depends upon the payload carried; use of maximum payload may reduce missile range by up to 25 per cent.

<sup>q</sup> MT = megaton = million tons of TNT equivalent (MT range = 1 MT or over); KT = kiloton = thousand tons of TNT equivalent (KT range = less than 1 MT); figures given are estimated maxima.

<sup>r</sup> Numerical designations of Soviet missiles (e.g. SS-7) are of US origin; names (e.g., *Saddler*) are of NATO origin.

<sup>s</sup> SS-9 missiles have also been tested with (i) three warheads of 4-5 MT each, (ii) a modified payload for use as a depressed trajectory ICBM (DICBM) or fractional orbit bombardment system (FOBS).

<sup>t</sup> There are also 25 large silos under construction, possibly to receive SS-18 missiles, an improved version of the SS-9, fitted with MRV.

<sup>u</sup> There are also 66 smaller silos under construction, which are expected to receive SS-16 missiles, an improved version of the SS-13; or SS-17 missiles, an improved version of the SS-11, with MRV.

<sup>v</sup> SS-11 missiles have also been tested with three smaller warheads.

<sup>w</sup> Including those deployed within IRBM/MRBM fields.

<sup>x</sup> A mobile IRBM (SS-XZ *Scooge*) has been displayed and tested but is not known to be deployed operationally.

<sup>y</sup> A mobile missile (SS-14 *Scapegoat*), apparently with MRBM range, has been displayed and tested but is not known to be deployed operationally.

<sup>z</sup> Dual capable (i.e., capable of delivering conventional explosives or nuclear warheads).

<sup>aa</sup> To be replaced by *Lance*, an SRBM with a maximum range of 70 miles and a warhead in the KT range.

<sup>ab</sup> Most *Polaris A3* missiles have been modified to carry three warheads.

<sup>ac</sup> All aircraft listed are dual-capable and many, especially in the categories of strike aircraft, would be more likely to carry conventional than nuclear weapons.

<sup>ad</sup> Long-range bomber = maximum range over 6,000 miles; medium-range bomber = maximum range 3,500-6,000 miles, primarily designed for bombing missions.

<sup>ae</sup> Theoretical maximum range, with internal fuel only, at optimum altitude and speed. Ranges for strike aircraft assume no weapons load. Especially in the case of strike aircraft, therefore, range falls sharply for flights at lower altitude, at higher speed or with full weapons load (e.g., the combat radius of A-7 at operational height and speed, with typical weapons load, is approximately 620 miles).

<sup>af</sup> Mach 1 (M = 1.0 = speed of sound).

<sup>ag</sup> Names of Soviet aircraft (e.g., *Bear*) are of NATO origin.

<sup>ah</sup> Including approximately 8 FB-111A and 45 B-52 aircraft in active storage.

<sup>ai</sup> Excluding approximately 50 Mya-4 aircraft configured as tankers.

<sup>aj</sup> Including approximately 300 Tu-16 aircraft in the Naval Air Force, configured for attacks on shipping, which could, in theory, deliver nuclear weapons.

<sup>ak</sup> These aircraft are nuclear-capable but may not necessarily have a nuclear role.



(B) OTHER NATO AND WARSAW PACT COUNTRIES

(i) Missiles and Artillery

Category <sup>a</sup>	NATO (excluding USA)							Warsaw Pact (excluding USSR)						
	Type <sup>b</sup>	Operated by <sup>c</sup>	Max. range <sup>d</sup> (statute miles)	Estimated warhead yield <sup>e</sup>	First deployed	Number deployed (July 1973)	Type <sup>f</sup>	Operated by <sup>c</sup>	Max. range <sup>d</sup> (statute miles)	Estimated warhead yield <sup>e</sup>	First deployed	Number deployed (July 1973)		
Land-based missiles	IRBM	SSBS S-2	FR	1,875	150 KT	1971	18							
	SRBM	MGM-29A <i>Sergeant</i> <sup>g</sup>	GE	85	KT range	1962	19	SS-1b <i>Scud A</i> <sup>h</sup> SS-1c <i>Scud B</i> <sup>h</sup>	BU CZ EG PO	50	KT range	1957	n.a.	
		MGM-31A <i>Pershing</i> <sup>g</sup>	GE	450	KT range	1962	72							
Unguided rockets	MGR-1B <i>Honest John</i>		25	KT range	1953	(150)	FROG 1-7 <sup>h</sup>	All	10-45	KT range	1957-65	n.a.		
SLBM	SLBM	UGM-27C <i>Polaris A3</i>	BR	2,880	3 x 200 KT	1967	64							
		MSBS M-1	FR	1,380	500 KT	1972	32							
Artillery	Self-propelled	M-110 203mm (8in) how M-109 155mm how	<sup>j</sup> <sup>k</sup>	10 10	KT range 2 KT	1962 1964	n.a. n.a.							
	Towed	M-115 203mm (8in) how	<sup>j</sup>	10	KT range	1950s	n.a.							

NOTES

<sup>a</sup> IRBM = intermediate-range ballistic missile (range 1,500-4,000 miles); SRBM = short-range ballistic missile (range under 500 miles); SLBM = submarine-launched ballistic missile.

<sup>b</sup> All NATO vehicles are of American origin, with the exception of the SSBS

<sup>c</sup> KT = kiloton = thousand tons of TNT equivalent (KT range = less than 1 MT.) figures given are estimated maxima.

<sup>d</sup> All Warsaw Pact vehicles are of Soviet origin. Numerical designations (e.g., SS-1b) are of American origin; names (e.g., *Scud A*) are of NATO origin.

<sup>e</sup> These SRBM are operated by West Germany but the nuclear warheads for them are in American custody. *Sergeant* is dual-capable (i.e., capable of delivering conventional or nuclear weapons).

<sup>f</sup> These dual-capable systems are operated by the countries shown but nuclear warheads for them are in Soviet custody.

<sup>g</sup> *Honest John* is dual-capable and is operated by Belgium, Britain, Denmark, West Germany, Greece, Italy, the Netherlands and Turkey, but with the nuclear warheads held in American custody. In the case of Denmark, there are no nuclear

IRBM and the MSBS SLBM, which are of French origin.

<sup>h</sup> BR = Britain, FR = France, GE = West Germany, BU = Bulgaria, CZ = Czechoslovakia, EG = East Germany, PO = Poland.

<sup>i</sup> Operational range depends upon the payload carried; use of maximum payload may reduce missile range by up to 25 per cent.

warheads held on Danish soil. France also operates *Honest John* but the nuclear warheads for it were withdrawn in 1966 and its nuclear role is to be taken over by the French SRBM *Pluton*, which will have a French nuclear warhead.

<sup>j</sup> The 203mm how is dual-capable and is operated by Belgium, Britain, Denmark, West Germany, the Netherlands, Italy and Turkey but any nuclear warheads for it are in American custody.

<sup>k</sup> The 155mm how is primarily a conventional artillery weapon but is dual-capable. It is operated by Belgium, Britain, Canada, Denmark, West Germany, Greece, Italy, the Netherlands, Norway and Turkey but in very few cases is it likely to have a nuclear role, certainly not in the case of Canada. Any nuclear warheads would be in American custody, none on Danish or Norwegian soil.

(ii) Aircraft<sup>a</sup>

Category <sup>b</sup>	NATO (excluding USA)							Warsaw Pact (excluding USSR)						
	Type <sup>c</sup>	Operated by <sup>d</sup>	Max. range <sup>e</sup> (statute miles)	Max. speed (Mach no.) <sup>f</sup>	Max. weapons load (lb)	First deployed	No. deployed (July 1973)	Type <sup>g</sup>	Operated by <sup>d</sup>	Max. range (statute miles)	Max. speed (Mach no.) <sup>f</sup>	Max. weapons load (lb)	First deployed	No. deployed (July 1973)
Medium-range bombers	<i>Vulcan B2</i>	BR	4,000	0.95	21,000	1960	56							
Strike aircraft (incl short-range bombers)	F-104	<sup>h</sup>	1,300	2.2	4,000	1958	n.a. <sup>i</sup>	Il-28 <i>Beagle</i> <sup>i</sup>	BU PO RU	2,500	0.81	4,850	1950	n.a. <sup>i</sup>
	F-4	BR GE BR	1,600	2.4	16,000	1962	n.a. <sup>i</sup>							
	<i>Buccaneer S2</i> <i>Mirage IYA</i>		FR	2,000	0.95	8,000	1962	n.a. <sup>i</sup>						
			2,000	2.2	8,000	1964	58							

NOTES

<sup>a</sup> All aircraft listed are dual-capable and many would be more likely to carry conventional than nuclear weapons.

<sup>b</sup> Medium-range bomber = maximum range 3,500-6,000 miles, primarily designed for bombing missions.

<sup>c</sup> *Vulcan* and *Buccaneer* are of British origin; F-104 and F-4 are of American origin; *Mirage* is of French origin.

<sup>d</sup> BR = Britain, FR = France, GE = West Germany, BU = Bulgaria, CZ = Czechoslovakia, PO = Poland, RU = Rumania.

<sup>e</sup> Theoretical maximum range, with internal fuel only, at optimum altitude and speed. Ranges for strike aircraft assume no weapons load. Especially in the case of strike aircraft, therefore, range falls sharply for flights at lower altitude, at

higher speed or with full weapons load (e.g., combat radius of F-104, at operational height and speed, with typical weapons load, is approximately 420 miles).

<sup>f</sup> Mach 1 (M = 1.0 = speed of sound).

<sup>g</sup> All Warsaw Pact aircraft are of Soviet origin. Names (e.g., *Beagle*) are of NATO origin.

<sup>h</sup> The dual-capable F-104 is operated by Belgium, Canada, Denmark, West Germany, Greece, Italy, the Netherlands, Norway and Turkey, but the Canadian aircraft no longer have a nuclear role. The warheads of these aircraft are held in American custody.

<sup>i</sup> Nuclear warheads for these dual-capable aircraft are held in Soviet custody.

<sup>j</sup> The absence of figures here reflects the uncertainty as to how many of these nuclear-capable aircraft actually have a nuclear role.



## 2. DEFENCE EXPENDITURE AND NATIONAL ECONOMIES

Country	GNP <sup>a</sup>	Defence Expenditure or Budget							
		\$ billion	\$ million		Per capita \$	As a percentage of GNP <sup>b</sup>			
			1972	1973		1969	1970	1971	1972
United States ..	976.4	83,400	85,165	399	8.4	7.4	7.5	7.2	
Soviet Union <sup>c</sup> ..	402.6	32,970	33,580	132	8.4	7.9	7.6	7.5	
<b>WARSAW PACT</b>									
Bulgaria .. ..	9.7	n.a.	301	n.a.	2.2	2.4	n.a.	n.a.	
Czechoslovakia ..	30.5	1,274	1,336	87	3.7	3.6	3.8	4.1	
Germany, East ..	33.5	1,854	2,031	116	5.0	5.1	5.2	5.3	
Hungary .. ..	14.3	419	695	40	2.5	2.7	2.7	2.7	
Poland .. ..	39.4	1,770	1,799	54	3.9	4.1	4.1	4.0	
Rumania .. ..	22.4	453	528	22	1.8	2.1	2.0	1.7	
<b>NATO</b>									
Belgium .. ..	26.1	723	990	74	2.8	2.6	2.1	2.0	
Britain .. ..	121.5	6,968	8,673	125	5.0	4.9	4.5	4.6	
Canada .. ..	82.6	1,966	2,141	90	2.4	2.4	2.0	1.9	
Denmark .. ..	15.4	441	568	88	2.5	2.4	2.4	2.2	
France .. ..	148.6	6,238	8,488	121	3.5	3.3	3.2	3.1	
Germany, West <sup>d</sup> ..	188.8	7,668	11,083	124	3.5	3.3	2.9	2.9	
Greece .. ..	9.5	495	580	56	4.9	4.7	3.1	4.1	
Italy .. ..	92.6	3,251	3,964	60	2.9	2.8	2.6	2.7	
Luxembourg .. ..	1.0	10	15	29	0.9	0.8	0.9	0.8	
Netherlands ..	31.4	1,568	2,102	117	3.8	3.5	3.5	3.5	
Norway .. ..	11.3	462	665	118	3.8	3.3	3.3	3.2	
Portugal .. ..	6.4	425	n.a.	47	5.9	5.6	5.4	5.1	
Turkey .. ..	15.5	568	812	15	3.6	3.6	3.7	3.6	
<b>OTHER EUROPEAN COUNTRIES</b>									
Austria .. ..	14.4	201	291	27	1.1	1.1	1.0	1.0	
Finland .. ..	10.3	193	231	39	1.4	1.4	1.4	1.5	
Spain .. ..	32.3	851	1,132	25	2.0	1.8	1.9	1.8	
Sweden .. ..	32.7	1,505	1,883	184	3.8	3.4	3.4	3.6	
Switzerland ..	20.6	557	799	87	2.2	2.0	1.9	1.8	
Yugoslavia ..	10.7	654	826	32	6.0	6.2	5.1	5.3	
<b>MIDDLE EAST AND THE MEDITERRANEAN</b>									
Algeria .. ..	4.4	100	n.a.	15	4.4	n.a.	2.3	2.0	
Egypt .. ..	6.7	1,493	1,737	43	13.2	18.9	21.4	20.2	
Iran .. ..	10.6	926	2,010	30	5.4	7.4	8.0	6.2	
Iraq .. ..	2.9	310	n.a.	31	10.4	8.3	n.a.	8.8	
Israel .. ..	5.4	1,262	1,474	404	18.0	19.9	22.3	18.2	
Jordan .. ..	0.6	119	n.a.	49	19.4	18.6	13.6	17.4	
Libya .. ..	3.1	120	145	59	1.5	n.a.	2.3	2.6	
Morocco .. ..	3.4	124	n.a.	8	2.9	2.8	2.6	2.8	
Sudan .. ..	1.9	n.a.	n.a.	n.a.	5.2	7.6	7.9	n.a.	
Syria .. ..	1.7	251	216	38	12.3	10.4	n.a.	11.5	
<b>AFRICA</b>									
Ethiopia .. ..	1.8	n.a.	n.a.	n.a.	2.2	1.9	2.0	n.a.	
Rhodesia .. ..	1.5	32	n.a.	5	0.8	1.7	n.a.	2.0	
South Africa ..	16.5	358	716	21	2.5	2.2	2.4	2.5	
<b>ASIA AND AUSTRALASIA</b>									
Australia .. ..	32.8	1,575	n.a.	121	4.2	3.9	3.9	3.6	
China (Taiwan) ..	5.4	700	n.a.	48	9.2	8.8	9.8	7.2	
India .. ..	52.4	1,813	2,386	3	3.0	3.0	3.4	3.0	
Indonesia .. ..	8.4	n.a.	n.a.	n.a.	3.1	3.2	3.4	n.a.	
Japan .. ..	197.9	2,728	3,530	26	0.8	0.8	0.9	0.9	
Korea, South ..	8.2	428	476	13	4.0	4.0	4.2	4.6	
Malaysia .. ..	3.8	306	287	28	3.7	6.9	4.7	6.8	
New Zealand ..	6.1	153	175	53	1.9	1.8	1.8	1.8	
Pakistan <sup>e</sup> .. ..	16.1	405	433	7	3.3	3.6	7.9	8.6	
Philippines ..	6.6	95	n.a.	2	1.4	1.7	1.8	1.2	
Singapore .. ..	1.8 <sup>f</sup>	249	n.a.	113	5.6	5.8	7.5	9.4	
Thailand .. ..	6.5	293	n.a.	8	3.3	3.6	3.6	4.0	
Vietnam, South ..	5.6	446	379	23	9.9	20.0	18.6	17.4	
<b>LATIN AMERICA</b>									
Argentina .. ..	23.5	834	889	35	n.a.	1.9	1.9	1.8	
Brazil .. ..	38.0	1,105	n.a.	11	n.a.	1.5	2.8	2.2	
Chile .. ..	6.5	324	174	36	2.9	1.8	4.4	4.6	
Colombia .. ..	6.9	98	92	4	1.3	1.3	n.a.	1.3	
Mexico .. ..	32.7	281	352	5	n.a.	0.6	n.a.	0.7	
Peru .. ..	5.4	208	240	14	3.0	3.2	3.6	3.2	
Uruguay .. ..	2.4	77	n.a.	26	1.9	2.1	3.0	3.3	
Venezuela .. ..	9.8	284	325	25	2.5	2.8	n.a.	2.4	

**NOTES**

<sup>a</sup> GNP figures are given for 1970, since this is the latest year in which there is wide coverage of official standardized statistics, permitting comparison of the size of national economies.

<sup>b</sup> Percentages have been calculated in local currency. Where official figures for GNP are not available estimates have been made.

<sup>c</sup> For the Soviet Union Net Material Product (NMP) is used instead of GNP. Defence expenditures have been derived by adding 75% of the All-Union science budget to the defence budget; they are then expressed as a percentage of NMP. Conversion of NMP and defence expenditure into \$ is at a constant rate of 0.72 roubles=\$1. This method of calculation and conversion is used here simply to enable a trend to be discerned; for a note on Soviet defence expenditure, see box in the US-USSR section elsewhere in this issue.

<sup>d</sup> Excluding financial assistance to West Berlin which, included, would make the entry read:

188.8	9,531	13,758	154
4.0	3.8	3.4	3.6

<sup>e</sup> Percentages for 1969 and 1970 include the former East Pakistan.

<sup>f</sup> Gross Domestic Product at factor cost, not GNP.

n.a. = Not Available.



### 3. COMPARISONS OF MILITARY MANPOWER 1973\*

Country	Total armed forces (regulars & conscripts)	Para-Military forces	Estimated number of trained reservists	Estimated total men of military age (i.e. 18-45)	Percentage of total armed forces to men of military age
<i>Europe</i>					
Belgium .. ..	89,600	15,000	15,600	1,900,000	4.7
Bulgaria .. ..	152,000	17,000	280,000	1,800,000	8.4
Britain .. ..	361,500	—	435,000	10,800,000	3.3
Czechoslovakia ..	190,000	35,000	350,000	3,000,000	6.3
Denmark .. ..	39,800	—	91,000	1,000,000	4.1
France .. ..	503,600	85,000	540,000	10,000,000	5.0
Germany, East ..	132,000	80,000	250,000	3,200,000	4.1
Germany, West ..	475,000	20,000	625,000	11,900,000	4.0
Greece .. ..	160,000	99,000	205,000	1,800,000	8.9
Hungary .. ..	103,000	27,000	163,000	2,100,000	4.9
Italy .. ..	427,500	80,700	545,000	11,000,000	3.9
Netherlands ..	112,200	3,200	340,000	2,700,000	4.2
Norway .. ..	35,900	—	179,600	700,000	5.1
Poland .. ..	280,000	73,000	600,000	7,100,000	3.9
Portugal .. ..	204,000	9,700	318,000	1,800,000	12.1
Rumania .. ..	170,000	40,000	285,000	4,300,000	4.0
Sweden .. ..	93,100	—	557,000 <sup>a</sup>	1,600,000	5.8
Turkey .. ..	455,000	75,000	800,000	7,700,000	5.9
Soviet Union ..	3,425,000	300,000	3,000,000	50,100,000	6.8
<i>Middle East</i>					
Egypt .. ..	298,000	100,000	534,000	7,000,000	4.3
Iran .. ..	211,500	70,000	315,000	5,400,000	3.9
Israel .. ..	115,000	9,000	180,000 <sup>b</sup>	600,000	18.3
<i>Asia and Australasia</i>					
Australia .. ..	73,330	—	32,300	2,600,000	2.8
China .. ..	2,900,000	300,000	n.a.	170,000,000	1.7
India .. ..	948,000	100,000	n.a.	116,500,000	0.8
Indonesia .. ..	322,000	120,000	n.a.	20,600,000	1.6
Japan .. ..	266,000	—	39,300	24,900,000	1.1
<i>Africa</i>					
South Africa ..	17,300	75,000	92,000	800,000 <sup>c</sup>	2.2
<i>Latin America</i>					
Argentina .. ..	135,000	19,000	250,000	5,200,000	2.6
Brazil .. ..	208,000	150,000	n.a.	17,200,000	1.2
Mexico .. ..	71,000	—	n.a.	9,200,000	0.8
<i>North America</i>					
Canada .. ..	83,000	—	23,200	4,500,000	1.8
United States ..	2,252,900	—	927,400	38,700,000	5.8

NOTES: \*Figures are not comparable between countries mainly because reserve structures are not the same.  
<sup>a</sup> Total mobilizable strength: 750,000. <sup>b</sup> Total mobilizable strength: 300,000. <sup>c</sup> White population only

### 4. COMPARATIVE DEFENCE EXPENDITURE, GROSS NATIONAL PRODUCT AND MANPOWER FIGURES, 1952-1972

#### DEFENCE EXPENDITURES<sup>a</sup>

Year	USA <sup>b</sup>	Japan		West Germany <sup>b</sup>		France <sup>b</sup>		Britain <sup>b</sup>		USSR <sup>c</sup>
	\$m	Ybn	\$m	DMm	\$m	Frm	\$m	£m	\$m	Rm
1952	47,598	183	508	—	—	12,531	3,580	1,561	4,387	11,330
1953	49,377	126	350	6,195	1,475	13,865	3,961	1,681	4,727	11,270
1954	42,786	135	375	6,287	1,497	11,710	3,346	1,571	4,376	11,250
1955	40,371	135	375	7,383	1,752	11,020	3,149	1,567	4,365	11,320
1956	41,513	143	397	7,211	1,717	14,690	4,197	1,615	4,499	10,470
1957	44,159	144	400	8,962	2,133	15,600	3,184	1,574	4,423	10,520
1958	45,096	149	414	6,853	1,640	16,569	3,381	1,591	4,460	10,670
1959	45,833	156	433	11,087	2,654	17,926	3,658	1,589	4,472	10,900
1960	45,380	160	444	12,115	2,905	18,940	3,865	1,655	4,641	11,060
1961	47,807	184	511	13,175	3,297	19,932	4,068	1,709	4,800	13,610
1962	52,381	214	594	17,233	4,310	21,460	4,380	1,814	5,085	14,860
1963	52,295	248	689	19,924	5,012	22,849	4,663	1,870	5,231	16,500
1964	51,213	281	781	19,553	4,917	24,280	4,955	2,000	5,581	16,280
1965	51,827	305	847	19,915	4,975	25,300	5,163	2,091	5,839	16,000
1966	63,572	345	958	20,254	5,093	26,732	5,456	2,153	6,007	16,780
1967	75,448	387	1,075	21,408	5,353	28,912	5,900	2,276	5,462	18,180
1968	80,732	422	1,172	19,310	4,828	30,200	6,163	2,332	5,560	20,840
1969	81,443	495	1,375	21,577	5,847	31,700	5,703	2,303	5,529	22,110
1970	77,854	590	1,639	22,573	6,217	33,200	6,014	2,444	5,850	22,810
1971	74,862	694	1,928	25,450	7,278	35,000	6,342	2,810	6,799	23,170
1972	79,528	821	2,718	28,987	9,185	36,800	7,357	3,079	7,525	23,740

<sup>a</sup> Expenditure figures are presented in local currency, so as to permit a comparison over time, and then in dollars at the exchange rates ruling in each year (except for USSR), to permit a comparison between countries.

<sup>b</sup> NATO definition of defence expenditure. NATO forecasts for 1972.

<sup>c</sup> Soviet expenditure is derived in this table by adding 75% of the All-Union Science budget to the defence budget and has not been converted to \$ because of the difficulty of establishing a suitable conversion rate. This method of arriving at defence expenditure is adopted here purely for the purpose of showing a trend. For a fuller discussion of the problems of establishing a figure for Soviet defence expenditure and the dollar equivalent see box in US-USSR section.



## TOTAL ARMED FORCES

(in thousands)

Year	USA	Japan	West Germany	France	Britain <sup>a</sup>	USSR
1952	3,550	114 <sup>a</sup>	—	645	890	4,600
1953	3,480	119 <sup>b</sup>	—	695	902	4,750
1954	3,350	146 <sup>c</sup>	15	600	840	4,750
1955	3,049	178	20	568	800	5,000
1956	2,857	188	66	785	760	4,500
1957	2,800	202	122	836	700	4,200
1958	2,637	214	175	797	615	4,000
1959	2,552	215	249	770	565	3,900
1960	2,514	206	270	781	520	3,623
1961	2,572	209	325	778	455	3,800
1962	2,827	216	389	742	445	3,600
1963	2,737	213	403	632	430	3,300
1964	2,687	216	435	555	425	3,300
1965	2,723	225	441	510	424	3,150
1966	3,123	227	455	500	418	3,165
1967	3,446	231	452	500	417	3,220
1968	3,547	235	440	505	405	3,220
1969	3,454	236	465	503	383	3,300
1970	3,066	259	466	506	373	3,305
1971	2,699	259	467	502	365	3,375
1972	2,253	266	475	503	352	3,425

<sup>a</sup> National Police Reserve.

<sup>b</sup> Security Force.

<sup>c</sup> Self-Defence Forces.

<sup>d</sup> Excluding forces enlisted outside Britain.

## GROSS NATIONAL PRODUCTS

(at current market prices and exchange rates (\$ billion))

Year	USA	Japan	West Germany	France	Britain	USSR <sup>a</sup>
1952	350	16	32	29	44	113
1953	370	19	35	31	48	119
1954	365	20	37	32	50	128
1955	399	23	43	35	54	136
1956	420	25	47	39	58	145
1957	444	28	51	43	62	156
1958	455	32	56	50	65	178
1959	484	33	60	54	67	189
1960	511	39	71	60	72	201
1961	520	51	81	65	77	213
1962	560	59	89	74	81	229
1963	590	68	94	83	86	235
1964	632	80	103	93	93	251
1965	685	88	115	99	100	269
1966	748	102	123	108	107	288
1967	794	120	124	116	110	314
1968	865	142	135	127	103	339
1969	931	166	151	142	110	364
1970	976	198	189	149	121	403
1971	1,050	221	217	164	135	422
1972	1,152	317	259	202	151	439

<sup>a</sup>The UN accounts definition of Net Material Product (NMP), converted at a constant exchange rate of 0.72 roubles=\$1, has been used. This consists of: individual and collective consumption, net fixed capital formation and net exports of goods and productive services.

## STRENGTH OF MILITARY FORMATIONS

Country	Division (in men)			Mechanized brigade (in men)	Squadron (in aircraft)		
	Mechanized	Armoured	Airborne		Bomber/ fighter-bomber	Fighter	Transport
United States ..	15,400 <sup>a</sup>	15,400	15,000	4-5,000	12-18	18-24	16
Soviet Union ..	10,750	9,000	7,000	2,000 <sup>b</sup>	9-12	12	8-10
China .. ..	12-14,000	10,000	6,000	3,000 <sup>b</sup>	9-10	10-12	8-10
Britain .. ..	12,500	12,500	—	4-5,000	8-12	12	9-12
France .. ..	17,000	—	14,000	5,000	4-12	12-15	16
Germany (West)	15,500	14,500	8-9,000	4-5,000	15-21	15-21	12-18
India .. ..	17,500	12,000	—	4,500	12-15	20	12
Israel .. ..	—	—	—	3,500	10-12	20-24	12
UAR (Egypt) ..	11,800	11,200	—	3,500	10-12	20	8-10
Vietnam (South) ..	10,000	7,000	7,000	3,000	12-18	18-24	16

<sup>a</sup> Army divisions only; a Marine Corps division has 19,000 men.

<sup>b</sup> Strength of a regiment, which is the equivalent formation in the Soviet and Chinese command structure. (The term 'regiment' is however often employed, particularly in West European countries, to describe a battalion-size unit, and it is so used in *The Military Balance*.)



# JANE'S ALL THE WORLD'S AIRCRAFT 1973-74

Edited by John W. R. Taylor F.R.HistS., A.F.R.AeS., F.S.L.A.E.T.



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# JANIE'S

## ALL THE WORLD'S AIRCRAFT SUPPLEMENT



Artist's impression of the HS 146 (four Avco Lycoming ALF 502-H turbofan engines)

**HAWKER SIDDELEY**  
*HAWKER SIDDELEY AVIATION LTD;*  
*Head Office: Richmond Road, Kingston*  
*upon Thames, Surrey KT2 5QS, England*

#### **HAWKER SIDDELEY 146**

Announcement of government support for the HS 146 four-turbofan quiet-operating transport aircraft was made in August 1973, and the prototype aircraft is expected to

fly for the first time during the year 1975.

The basic aims of the HS 146 are to provide a passenger seating standard comparable with present wide-bodied transports, combined with competitive operating costs, good airfield performance, and low operating noise levels.

Two versions have been projected so far: the standard 70/90-passenger **HS 146-100**, and a stretched version, the **HS 146-200**,

which, by the insertion of an additional four frame pitches in the fuselage, will be able to carry up to 102 passengers.

The following description applies to the HS 146-100:

**TYPE:** Four-turbofan short-range transport aircraft.

**WINGS:** Cantilever high-wing monoplane. Anhedral 3° at trailing-edge. Sweepback 15° at quarter-chord. All-metal fail-safe





Artist's impression of the HS 146. Prototype is expected to fly in 1975

structure. Single-section tabbed Fowler flaps on each trailing-edge. Mechanically-actuated balanced ailerons, with hydraulically-operated power boost spoilers on upper surfaces. Trim and spring tab in each aileron. No leading-edge lift devices. Hot-air anti-icing of leading-edges.

**FUSELAGE:** Conventional all-metal fail-safe pressurised semi-monocoque structure. Petal-type airbrakes form tailcone when closed.

**TAIL UNIT:** Cantilever sweptback T-tail, of all-metal construction. Fixed-incidence tailplane. Balanced elevators, each with trim and spring tab. Powered rudder. Hot-air anti-icing of tailplane leading-edges.

**LANDING GEAR:** Retractable tricycle type, with twin wheels on each unit. Hydraulic actuation. Main units retract inward into fairings on fuselage sides; nose unit retracts forward.

**POWER PLANT:** Four Avco Lycoming ALF 502-H turbofan engines, each rated at 6,500 lb (2,948 kg) st, installed in pylon-mounted underwing pods. All fuel in two integral wing tanks, with optional centre-section tank.

**ACCOMMODATION:** Crew of two pilots on flight deck, and two or three cabin staff. Accommodation in main cabin for 70-90 passengers (102 in HS 146-200). One outward-opening passenger door forward and one aft. Emergency exit/servicing doors on starboard side, one forward and one aft, opposite passenger doors. Freight and baggage holds under cabin floor, forward and aft of wing, with doors on starboard side. Optional overfloor freight door at front on port side. All accommodation air-conditioned.

**SYSTEMS AND EQUIPMENT:** Cabin air-conditioning system, max pressure differential 6.5 lb/sq in (0.46 kg/cm<sup>2</sup>). Hydraulic system for landing gear, brakes, flaps, rudder, and spoiler actuation. APU optional. Blind-flying instrumentation standard.

**DIMENSIONS, EXTERNAL:**

Wing span	86 ft 6 in (26.37 m)
Wing aspect ratio	9
Length overall	85 ft 10 in (26.16 m)
Length of fuselage	78 ft 9 in (24.00 m)
Height overall	27 ft 11 in (8.51 m)
Tailplane span	36 ft 4 in (11.07 m)
Wheel track	15 ft 6 in (4.72 m)
Wheelbase	34 ft 4 in (10.46 m)

Passenger doors (port, fwd and rear):	
Height	6 ft 3 in (1.91 m)
Width	2 ft 8 in (0.81 m)
Height to sill	6 ft 4 in (1.93 m)
Underfloor freight hold door (stbd, fwd):	
Height	3 ft 6 in (1.07 m)
Width	4 ft 0 in (1.22 m)
Height to sill	6 ft 4 in (1.93 m)
Underfloor freight hold door (stbd, rear):	
Height	3 ft 6 in (1.07 m)
Width	3 ft 0 in (0.91 m)
Height to sill	3 ft 1 in (0.94 m)
Emergency exit/servicing doors (stbd, fwd and rear):	
Height	5 ft 3 in (1.60 m)
Width	2 ft 8 in (0.81 m)

**DIMENSIONS, INTERNAL:**

Cabin (excluding flight deck, including galleys and toilets):	
Max width	11 ft 1 in (3.38 m)
Max height	6 ft 8½ in (2.04 m)
Baggage/freight holds, underfloor:	
fwd	258 cu ft (7.30 m <sup>3</sup> )
rear	242 cu ft (6.85 m <sup>3</sup> )

**AREA:**

Wings, gross	832 sq ft (77.295 m <sup>2</sup> )
--------------	------------------------------------

**WEIGHTS AND LOADING:**

Max payload	18,500 lb (8,391 kg)
Max T-O weight	73,400 lb (33,293 kg)
Max ramp weight	73,900 lb (33,520 kg)
Max landing weight	71,400 lb (32,386 kg)

**Max wing loading**

88.2 lb/sq ft (430.4 kg/m<sup>2</sup>)

**PERFORMANCE** (estimated, at max T-O weight except where stated):

Max cruising speed at 22,000 ft (6,700 m)	425 knots (489 mph; 787 km/h)
Service ceiling, one engine out, at typical operating weight	25,000 ft (7,620 m)
T-O balanced field length, and landing from 35 ft (10.7 m)	3,650 ft (1,112 m)
Range with max standard fuel, reserves for 45 min hold at 5,000 ft (1,525 m) and 150 nm (173 mile; 278 km) diversion	1,345 nm (1,550 miles; 2,492 km)
Range with max optional fuel, reserves as above	1,560 nm (1,800 miles; 2,895 km)
Range with max payload, reserves as above	600 nm (690 miles; 1,112 km)

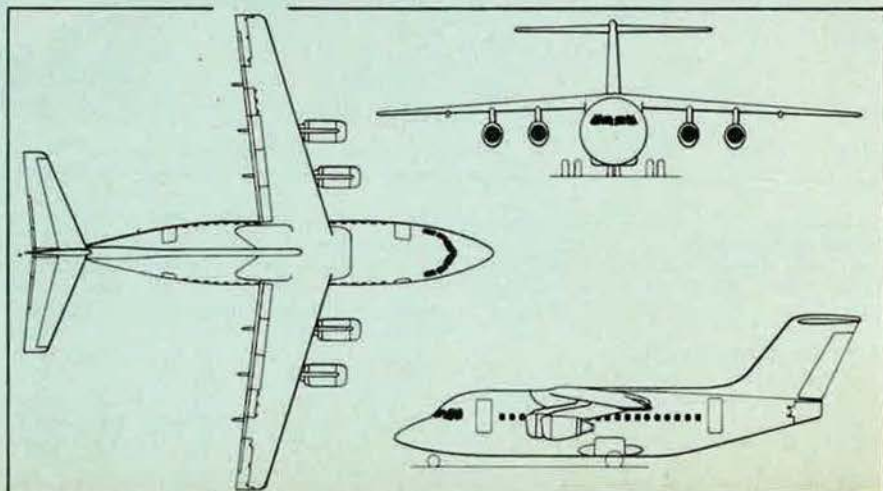
**AERMACCHI**

AERONAUTICA MACCHI SpA; Head Office: Corso Vittorio Emanuele 15, Milan, Italy

**AERMACCHI M.B. 326L**

This version of the M.B. 326 family, first announced in 1973, combines the modified airframe of the single-seat M.B. 326K with the standard two-seat cockpit installation,

Hawker Siddeley 146 four-turbofan short-range transport aircraft (Roy J. Grainger)





and is intended primarily for the advanced training role.

The description of the M.B. 326GB/GC (1973-74 *Jane's*) applies also to the M.B. 326L, except in the following respects:

**TYPE:** Two-seat jet advanced trainer and tactical ground attack aircraft.

**WINGS:** As M.B. 326K, including servo-powered ailerons and increased flap extension speed.

**FUSELAGE AND TAIL UNIT:** As M.B. 326GB/GC.

**LANDING GEAR:** As M.B. 326K, including more powerful wheel brakes.

**POWER PLANT:** As M.B. 326K.

**ACCOMMODATION:** As M.B. 326GB/GC, except for cockpit pressure differential of 3.5 lb/sq in (0.25 kg/cm<sup>2</sup>).

**ELECTRONICS AND EQUIPMENT:** As M.B. 326GB/GC, with options at customer's choice. Side cockpit consoles widened to provide space for additional equipment.

**ARMAMENT, AND DIMENSIONS, EXTERNAL:** As M.B. 326GB/GC.

**WEIGHTS:**

Weight empty, equipped

6,470 lb (2,934 kg)

T-O weight, training configuration

9,285 lb (4,211 kg)

Max T-O weight

12,000 lb (5,443 kg)

**PERFORMANCE (at training T-O weight):**

Max level speed at S/L

485 knots (558 mph; 898 km/h)

Max level-flight Mach number at 36,000 ft

(11,000 m) Mach 0.77

Rate of climb at S/L

7,000 ft (2,134 m)/min

T-O run

1,360 ft (415 m)

T-O to 50 ft (15 m)

1,830 ft (558 m)

#### ALPHA JET

**AIRFRAME PRIME CONTRACTORS:** AVIONS MARCEL DASSAULT/BREGUET AVIATION, BP 32, 92420-Vaucresson, France; and DORNIER GmbH, Postfach 317, 7990 Friedrichshafen, German Federal Republic

On 22 July 1969 the French and German governments announced a joint requirement

for a new subsonic basic and advanced training aircraft to enter service with the French and German armed forces in the mid-1970s. Each government has a potential requirement for about 200 such aircraft to replace Magister and Lockheed T-33A trainers in service, and two designs were studied during the first half of 1970. These were the Aérospatiale/MBB E 650 Euro-trainer and the Dassault-Breguet/Dornier Alpha Jet.

On 24 July 1970, it was announced that the Alpha Jet design had been selected for development to meet the requirement. The aircraft is also to have a capacity for close air support and battlefield reconnaissance duties, to meet Luftwaffe requirements. On 13 September 1973 it was announced that Belgium was to order 33 Alpha Jets as its next military trainers.

#### DASSAULT-BREGUET/DORNIER ALPHA JET

The Dassault-Breguet group of France and Dornier of Germany are jointly developing the Alpha Jet, with Dassault-Breguet as main contractor and Dornier as industrial collaborator, the total work load being shared equally between the two groups.

On 15 February 1971, the project definition phase of the Alpha Jet was completed, and design work for the development phase was begun in the Autumn of 1971. This received joint Franco-German government approval in late 1972. Four prototypes are being built, the first and third assembled in France and the second and fourth in Germany.

Flight testing will be carried out predominantly in France, by both French and German pilots, although each prototype will make its first few test flights in the country where it is assembled. Prototypes 01 and 02 will be used to finalise systems installations and for flight and performance evaluation, including external loads, of both versions; the 03 will be representative of the production close-support version, and the 04 of the trainer version. The 01 had been completed at St Cloud by mid-June 1973, and the first functional test (of the fuel system) was made on 26 July 1973. This

prototype made its first flight, at Istres, on 26 October 1973. The three remaining prototypes are due to fly during 1974, followed by the first flight and first deliveries of production aircraft in mid-1976.

The French and German versions will be identical as regards airframe, power plant, landing gear, and standard equipment, and assembly lines for production Alpha Jets will be set up in each country. The outer wings, tail unit, rear fuselage, and cold-flow exhaust will be manufactured in Germany; the forward and centre fuselage (with integrated wing centre-section) will be manufactured in France. French- and German-built sections of the fuselage will be assembled in France. The power plant prime contractors are Turboméca and SNECMA in France, and MTU and KHD in Germany; and, for the landing gear, Messier-Hispano in France and Liebherr Technik in Germany.

**TYPE:** Tandem two-seat basic, low-altitude and advanced jet trainer and close-support aircraft.

**WINGS:** Cantilever shoulder-wing monoplane, with 6° anhedral from roots. Thickness/chord ratio 10.2% at root, 8.6% at tip. Sweepback 28° at quarter-chord. All-metal numerically- or chemically-milled structure, consisting of two outer wings bolted to a centre frame. Two-section hydraulically-actuated double-slotted flaps on each trailing-edge. Ailerons actuated by double-body hydraulic servo, with trimmable artificial feel system.

**FUSELAGE:** All-metal semi-monocoque structure, numerically or chemically milled, of basically oval cross-section. Built in three sections: nose (including cockpit), centre-section (including engine air intake trunks and main landing gear housings), and rear (including engine mounts and tail assembly). Electrically-controlled, hydraulically-actuated airbrake on each side of rear upper fuselage, possibly of carbon-fibre-reinforced epoxy resin construction.

**TAIL UNIT:** Cantilever all-metal type, of similar construction to wings, with 45° sweepback on fin leading-edge. Dorsal spine fairing between cockpit and fin.

First prototype of the Dassault-Breguet/Dornier Alpha Jet training and close-support aircraft





All-flying tailplane, with trimmable and IAS-controlled artificial feel system. Double-body hydraulic servo-actuated rudder, with trimmable artificial feel system.

**LANDING GEAR:** Forward-retracting tricycle type, of Liebherr/Messier-Hispano design. All units retract hydraulically, main units into underside of engine air intake trunks. Single wheel and low-pressure tyre (approx 57 lb/sq in; 4.0 kg/cm<sup>2</sup> at normal T-O weight) on each unit. Steel disc brakes and anti-skid units on main gear. Emergency braking system. Hydraulic nosewheel steering and arrester hook on German version. Nosewheel offset to starboard to permit ground firing from gun pod.

**POWER PLANT:** Two Turboméca-SNECMA Larzac 04 turbofan engines, each rated at 2,976 lb (1,350 kg) st, mounted on sides of fuselage. Splitter plate in front of each intake. Fuel in two integral tanks in outer wings, one in centre-section, and three fuselage tanks. Internal fuel capacity 303.5 Imp gallons (1,380 litres) in French basic trainer version; 413.5 Imp gallons (1,880 litres) in French low-altitude trainer and German close-support versions. Provision for 68.2 Imp gallon (310 litre) capacity drop-tank on each outer wing pylon. Pressure refuelling standard for all tanks, including drop-tanks. Gravity system optional for fuselage tanks and drop-tanks. Pressure refuelling point near starboard engine air intake. Fuel system incorporates provision for short periods of inverted flying.

**ACCOMMODATION:** Two persons in tandem, in pressurised cockpit under individual sideways-opening clamshell canopies. Rear seat (for instructor in trainer versions) is elevated. Prototypes fitted with Martin-Baker Mk 4 ejection seats, operable (including ejection through canopy if necessary) at zero height and speeds down to 90 knots (103 mph; 166 km/h). Cockpits and canopies suitable for installation of Stencel SIII or Martin-Baker Mk 10 zero-zero ejection seats.

**SYSTEMS:** Cockpit air-conditioning and demisting system. Two independent hydraulic systems, pressure 3,000 lb/sq in (210 kg/cm<sup>2</sup>), one with electric pump, for actuating control surfaces, landing gear, brakes, flaps, airbrakes, and (when fitted) nosewheel steering. Pneumatic system, for cockpit pressurisation and air-conditioning, occupants' pressure suits, and fuel tank pressurisation, is supplied by compressed air from engines. Main electrical power supplied by two 9kW starter/generators, one on each engine. Circuit includes a 36Ah nickel-cadmium battery and two static inverters for supplying AC current to auxiliary systems. An external ground DC power receptacle is fitted. Hydraulic and electrical systems can be sustained by either engine in the event of the other engine becoming inoperative. Oxygen mask and bottle for each occupant, supplied by liquid oxygen converter of 2.2 Imp gallons (10 litres) capacity.

**ELECTRONICS AND EQUIPMENT:** Dual controls standard. Large electronics bay in rear fuselage, containing most of the radio and navigation equipment. Standard equipment includes VHF and UHF transceivers (optionally, UHF and emergency UHF, respectively), IFF/SIF, VOR/ILS, and intercom. Optional equipment includes Dornier crash recorder, VOR/ILS with marker, TACAN, navigation computer, and radio altimeter.

**ARMAMENT AND OPERATIONAL EQUIPMENT:** For armament training and light close-support missions, the Alpha Jet can be equipped with an under-fuselage detachable pod containing a 30 mm DEFA



The Alpha Jet made its maiden flight October 26 at the Flight Test Centre, Istres

cannon with 150 rds, or a pod with two 0.50 in machine-guns and 250 rds/gun. Provision also for one or two hardpoints under each wing, with non-jettisonable pylons, on which can be carried, within the load capacity for each station, pods of thirty-six 2.75 in rockets; HE or incendiary bombs of 50, 125, 250, or 400 kg; practice launchers for bombs or rockets; or drop-tanks. Provision also for carrying a reconnaissance pod. Max permissible load for all five stations is 4,850 lb (2,200 kg). Fire control system for air-to-air or air-to-ground firing, dive bombing, and low-level bombing. Firing by a trainee pilot (in front seat) is governed by a safety interlock system controlled by the instructor, which energises the forward station trigger circuit and illuminates a "fire clearance" indicator in the trainee's cockpit.

**DIMENSIONS, EXTERNAL:**

Wing span 29 ft 11 in (9.12 m)  
Wing aspect ratio 4.8  
Length overall (excl nose-probe) 40 ft 3 3/4 in (12.29 m)  
Height overall (at normal T-O weight) 13 ft 9 in (4.19 m)  
Tailplane span 14 ft 2 3/4 in (4.34 m)  
Wheel track 8 ft 10 3/4 in (2.71 m)  
Wheelbase 15 ft 5 3/4 in (4.716 m)

**AREAS:**

Wings, gross 188.4 sq ft (17.50 m<sup>2</sup>)  
Ailerons (total) 11.19 sq ft (1.04 m<sup>2</sup>)  
Trailing-edge flaps (total) 30.78 sq ft (2.86 m<sup>2</sup>)  
Airbrakes (total) 7.97 sq ft (0.74 m<sup>2</sup>)  
Fin 31.97 sq ft (2.97 m<sup>2</sup>)  
Rudder 6.67 sq ft (0.62 m<sup>2</sup>)  
Horizontal tail surfaces (total) 42.41 sq ft (3.94 m<sup>2</sup>)

**WEIGHTS AND LOADINGS:**

Weight empty, equipped 6,944 lb (3,150 kg)  
Normal T-O weights:  
trainer, clean 9,920 lb (4,500 kg)  
weapon training or close support 13,227 lb (6,000 kg)  
Max T-O weight (exceptional) 15,432 lb (7,000 kg)  
Combat wing loading (clean) 47.1 lb/sq ft (230 kg/m<sup>2</sup>)  
Combat power loading (clean) 1.5 lb/lb st (1.5 kg/kg st)

**PERFORMANCE** (estimated, at normal T-O weight, clean, except where indicated):

Max level speed at high altitude Mach 0.85

Max level speed at low altitude more than 500 knots (576 mph; 927 km/h)  
Landing speed at normal landing weight less than 100 knots (115 mph; 185 km/h)  
Rate of climb at S/L, one engine out, at 10,542 lb (4,782 kg) AUV, in landing configuration 984 ft (300 m)/min  
Time to 39,375 ft (12,000 m) less than 10 min  
Service ceiling 49,200 ft (15,000 m)  
T-O run at 9,920 lb (4,500 kg) AUV 1,280 ft (390 m)  
T-O to 50 ft (15 m) less than 2,297 ft (700 m)  
Landing run at 7,716 lb (3,500 kg) AUV 1,310 ft (400 m)  
Endurance, typical low-altitude navigation training mission 1 hr 40 min  
Max endurance 2 hr 35 min  
Ferry range 1,078 nm (1,242 miles; 2,000 km)  
g limits (ultimate) +12; -6.4

**YAKOVLEV**

Alexander Sergievich Yakovlev; USSR

One of the most interesting new projects unveiled to the small party of US journalists which visited the USSR in the Summer of 1973 was a hitherto-unknown three-turbofan transport under development by the Yakovlev design bureau.

According to Alexander Yakovlev, the basic design objectives were simple construction, reliability in operation, economy, and the ability to operate in remote areas with widely differing climatic conditions. Up to 2,000 aircraft in this category are needed, for use particularly on feederline services extending north and south from the main east-west trans-Siberian trunk routes.

**YAKOVLEV YAK-42**

On the basis of experience with the Yak-40, the Yakovlev bureau is developing for Aeroflot this larger civil airliner with a similar three-engine layout. A full-scale mock-up exists in the bureau's prototype hangar in Moscow; but the design has not yet been finalised.

As envisaged in mid-1973, the Yak-42 will have standard accommodation for 120 passengers in six-abreast seats at a pitch of 31.5 in (80 cm). Replacement of the front ten rows by four-abreast first class



seats will offer an alternative mixed-class version for 100 passengers. Access to the cabin will be by airstair doors under the rear fuselage and at the front of the cabin on the port side, making the aircraft independent of airport ground equipment. Immediately inside each lobby will be carry-on baggage and coat compartments for use by the passengers.

A flight crew of two will be normal, with provision for a high degree of automation, including an area navigation system. Control surfaces will be actuated hydraulically, and high-lift devices will include wing leading-edge slats. To cater for rough-field operations, a heavy-duty tricycle landing gear will be fitted, with twin wheels on the nose unit.

The Yak-42 is expected to be powered by three D-36 high by-pass ratio (5.34:1) turbofan engines, designed under the leadership of Vladimir Lotarev at the Zaporozhye engine works. Take-off rating of each engine will be 14,200 lb (6,440 kg) st and, unlike the Yak-40, the Yak-42 is intended to use all three engines at cruise power during flight. Special care has been taken during design to ensure that the D-36 will conform with national and international limits on smoke and noise; and the Yak-42 is intended to operate in temperatures ranging from  $-50^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ .

Three prototypes of the Yak-42 have been ordered initially, with the first flight scheduled for 1976-77. The following data should be regarded as provisional:

**DIMENSIONS, EXTERNAL:**

Wing span 114 ft 10 in (35.00 m)  
Length overall 114 ft 10 in (35.00 m)

**DIMENSION, INTERNAL:**

Cabin: Max width 12 ft 6 in (3.80 m)

**WEIGHTS:**

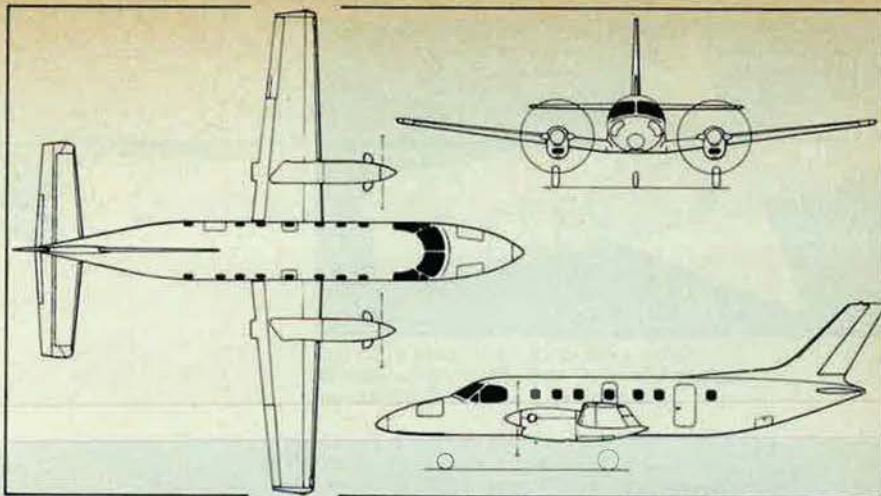
Max payload 30,850 lb (14,000 kg)  
Max T-O weight 110,230 lb (50,000 kg)

**PERFORMANCE (estimated):**

Cruising speed at 26,250 ft (8,000 m)  
431 knots (497 mph; 800 km/h)  
T-O run 2,625 ft (800 m)  
Range with max payload  
970 nm (1,118 miles; 1,800 km)  
Range with max fuel  
1,510 nm (1,740 miles; 2,800 km)

**EMBRAER**

**EMPRESA BRASILEIRA DE AERONAUTICA SA; Head Office and Works: Av Brig Faria Lima, Caixa Postal 343, São José dos Campos, São Paulo State, Brazil**



EMBRAER EMB-120 twelve/sixteen-passenger pressurised transport (Roy J. Grainge)

Deliveries of production EMB-110 Bandeirante twin-turboprop transport aircraft (see 1973-74 *Jane's*) to the Brazilian Air Force and to Transbrasil began in early 1973. Commercial services were inaugurated by Transbrasil on 16 April 1973, and the aircraft averaged 12 hours per day in service during the first month of operation. Three of the six Bandeirantes ordered by this airline had been delivered by mid-1973.

Details were also received during 1973 of three new developed versions of the Bandeirante, of which details follow:

**EMBRAER EMB-111**

This designation has been given to a shore-based patrol aircraft, based on the EMB-110 Bandeirante, which EMBRAER has designed to meet specifications issued by the Comando Costeiro, the Brazilian Air Force's Coastal Command. It is powered by two 750 shp Pratt & Whitney (UACL) PT6A-34 turboprop engines, and carries 134 Imp gallons (610 litres) of additional fuel in wingtip tanks. The main external difference in this version is the large nose radome, which houses an RCA AVQ-30X radar having a maximum range of 300 nm (345 miles; 555 km). Other electronics and equipment include a Collins INS-61B inertial navigation system, Collins VIR-30A

VOR/ILS marker beacon receiver, Collins DF-301E VHF/DF, RCA AVQ-75 DME, two Bendix DFA-73-A-1 ADF, Collins ALT-50 radio altimeter, and Collins PN-101 gyro-magnetic compass. There is no provision for armament, as the missions intended for the EMB-111 would include only reconnaissance and target detection. A ventrally-mounted searchlight of 10 million candlepower is fitted for night operations. For target marking, six Brazilian-built Mk 6 smoke grenades are carried, as well as a Motorola SST-121 transponder. Flares of 1 million candlepower are also available for illumination of targets at night.

**DIMENSIONS, EXTERNAL:**

As EMB-110, except:

Wing span over tip-tanks

51 ft 5 3/4 in (15.69 m)  
Length overall 48 ft 3 3/4 in (14.71 m)  
Length of fuselage 46 ft 7 3/4 in (14.22 m)  
Height overall 15 ft 6 1/4 in (4.73 m)

**WEIGHTS:**

Basic operating weight with 6 crew  
9,259 lb (4,200 kg)  
Max T-O weight 13,558 lb (6,150 kg)  
Max landing weight 11,905 lb (5,400 kg)

**EMBRAER EMB-120**

The project definition phase of this version of the Bandeirante was completed in March 1973, and a prototype is scheduled to fly in October 1974. The EMB-120 will be powered by two 850 shp Pratt & Whitney (UACL) PT6A-41 turboprop engines, and will have two-abreast seating for 12-16 passengers. The cabin will have a circular cross-section of 6 ft 1 1/4 in (1.86 m) diameter, and will have a pressure differential of 6 lb/sq in (0.42 kg/cm<sup>2</sup>), giving a cabin pressure level equivalent to flight at 5,000 ft (1,525 m) when the aircraft is flying at 25,000 ft (7,620 m), and 9,000 ft (2,750 m) when it is flying at 30,000 ft (9,150 m).

**DIMENSIONS, EXTERNAL:**

Wing span 51 ft 3 in (15.62 m)  
Length overall 54 ft 8 1/2 in (16.675 m)  
Height overall 18 ft 0 1/2 in (5.50 m)  
Tailplane span 22 ft 10 3/4 in (6.98 m)  
Wheel track 17 ft 9 1/2 in (5.42 m)  
Wheelbase 17 ft 6 1/4 in (5.34 m)

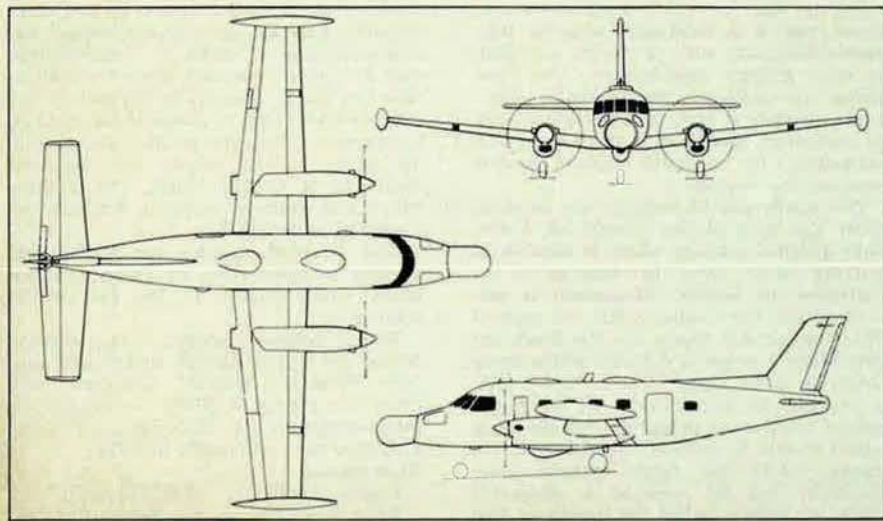
**WEIGHTS:**

Max T-O weight 13,448 lb (6,100 kg)  
Max landing weight 12,345 lb (5,600 kg)

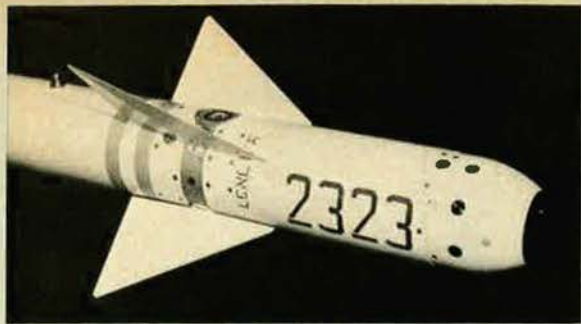
**PERFORMANCE (estimated):**

Cruising speed at 14,425 ft (4,400 m)  
280 knots (323 mph; 520 km/h)  
Limiting Mach number Mach 0.46  
T-O to 30 ft (10 m) at max T-O weight,  
zero wind 2,297 ft (700 m)

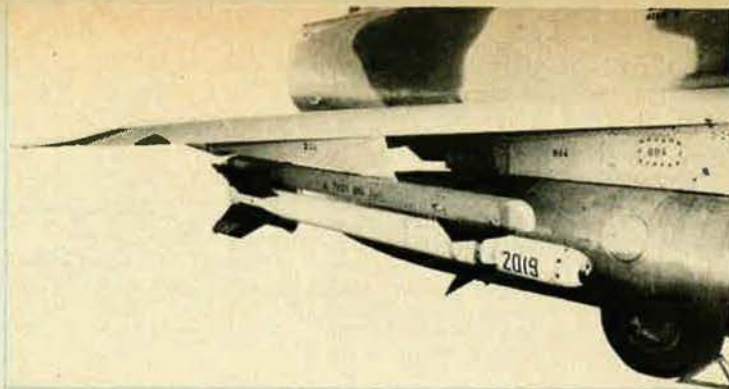
EMBRAER EMB-111 shore-based patrol version of the Bandeirante (Roy J. Grainge)







Above, close-up of seeker head of Shafrir dogfight missile. At right, Shafrir on underwing launcher of Israeli Air Force Mirage



Twin launcher for HSD SRAAM short-range air-to-air missile

Range with 12 passengers at 26,250 ft (8,000 m), 60% power, 45 min reserves 1,338 nm (1,540 miles; 2,480 km)  
Ferry range, 45 min reserves 1,559 nm (1,795 miles; 2,890 km)

#### EMBRAER EMB-130

This designation has been given to a twin-turbofan light transport aircraft, a prototype of which should be flying by the end of 1975. It utilises the pressurised fuselage of the EMB-120 but has an entirely new swept-back wing and sweptback cruciform tail surfaces. Power plant will be two turbofan engines in the 4,500 lb (2,040 kg) thrust class, mounted on the rear fuselage; and an APU will be fitted as standard. New twin-wheel main landing gear units will be fitted, with the same nose-gear unit as that in the EMB-110 and EMB-120. Operating speeds will be in excess of Mach 0.8.

#### DOGFIGHT MISSILES

Combat experience in Vietnam and other war theatres has emphasised the urgent need for an air-to-air missile that can intercept highly manoeuvring targets against which other types of armament are ineffective. Details of three such "dogfight" missiles follow:

#### RAFAEL

**RAFAEL ARMAMENT DEVELOPMENT AUTHORITY; Address: Ministry of Defence, POB 2082, Haifa, Israel**

The duty of Rafael Armament Development Authority is to develop and supply advanced weapons and weapon systems for use by the Israeli Defence Forces. As well as meeting urgent requirements for complete weapons, it is responsible for research, development, and manufacture of propellants, aircraft armament, fuses, explosives, small computers, electronic systems, communications systems, and other products. To make this possible, it possesses a variety of

structural testing, environmental testing, and other laboratories and facilities.

One of the weapon systems developed and manufactured by Rafael is the Shafrir air-to-air missile.

#### SHAFRIR (DRAGONFLY)

Shafrir is a short-range air-to-air dogfight missile developed for use against aircraft at heights up to 60,000 ft (18,000 m). Its development was completed by the late 'sixties and production was then started. Many rounds have been fired in air combat against enemy aircraft since 1969, with considerable success.

Relatively small in size and simple in conception, Shafrir bears a marked resemblance to the earlier US Sidewinder. It has a slim cylindrical body, with an infra-red seeker head and cruciform canard control surfaces indexed in line with cruciform fixed wings mounted at the tail. A rolleron is inset in the tip of each wing to help stabilise the missile in flight by means of signals passed to the internal gyros.

Shafrir has a solid-propellant rocket motor and is a solid-state weapon, fully transistorised and with all components built to strict military specifications. The foreplanes are actuated pneumatically. Electronic circuitry is kept to a minimum, with no computers. Guidance is by proportional navigation, for optimum results against manoeuvring targets.

The missile and its launcher are mounted under the wing of the aircraft on a specially-designed adapter which is capable of carrying other types of weapon as an alternative to Shafrir. Attachment is mechanical and the missile requires no support from the aircraft except for the firing circuit. When a target is detected within firing range, an audio signal is heard and a light is switched on automatically on the pilot's control panel as an indication that the firing button should be pressed. After launch, the missile tracks the target entirely automatically, and the warhead is detonated either on impact or by the proximity fuse

within optimum distance of the target.

#### DIMENSION:

Length overall 8 ft 2½ in (2.50 m)

#### WEIGHTS:

Warhead 24.25 lb (11 kg)  
Launching weight 205 lb (93 kg)

#### PERFORMANCE:

Max range 2.7 nm (3.1 miles; 5 km)

#### HSD

**HAWKER SIDDELEY DYNAMICS LTD; Headquarters: Manor Road, Hatfield, Herts, England**

#### HSD SRAAM

Known originally as Taildog, SRAAM (Short Range Air-to-Air Missile) is intended as a dogfight weapon that will complement medium-range missiles such as the HSD Red Top. It is described as a third-generation solid-propellant infra-red missile, embodying experience gained from the development and deployment of Firestreak and Red Top.

SRAAM is being designed from the outset for high reliability, low cost, and compatibility with any type of interceptor, air-superiority fighter, strike or reconnaissance aircraft without requiring aircraft modification. Few details may yet be released, except that SRAAM utilises thrust-vector control, by means of semaphores that project into the efflux. It has folding fins for tube launching, is visually aimed, and is fitted with a high-explosive warhead, detonated by proximity or contact fuse.

Two SRAAM missiles are carried side by side in launch-tubes on a single launch beam, which houses all the fire control equipment.

Project definition studies have continued during 1973, with British government support. Mock-up SRAAM launchers were fitted to a Harrier V/STOL combat aircraft demonstrated at the 1973 Paris Air Show. Prototype tests will begin in 1974.

#### DIMENSIONS:

Length overall 8 ft 11¼ in (2.73 m)  
Body diameter 6½ in (0.168 m)



## NWC

NAVAL WEAPONS CENTER; Headquarters: China Lake, California 93555, USA

## AGILE

Development of this close-range dog-fight missile was initiated by the Naval Weapons Center to arm the Grumman F-14 Tomcat fighter. It is now expected to be carried also by the USAF's McDonnell Douglas F-15 Eagle. The US Navy awarded Hughes Aircraft Co a \$2.2 million contract in early 1973 to provide assistance to the NWC over an eight-month period. Hughes was selected at the same time as the source for Agile's guidance subsystem, system integration, and engineering support. The solid-propellant rocket motor is supplied by Thiokol.

Agile will utilise a thrust-vector control system, to ensure optimum manoeuvrability in flight against high-speed manoeuvring targets, and an infra-red seeker head able to home on the target from any direction. A development round tested from an F-4 in mid-1973 was basically cigarette-shape, 8 in (20 cm) in diameter, with a ring of eight short-span folding fins near the tail for roll control. Its seeker was housed inside a short cylinder, 5½ in (14 cm) in diameter, with a hemispherical glass nose cap and a tapered fairing to connect it to the missile body. Overall length was about 8 ft (2.45 m).

US Navy requests for continued R&D funding of Agile totalled \$26 million in FY 1973 and \$21.7 million in FY 1974.

## HUGHES HELICOPTERS

HUGHES HELICOPTERS; Head Office and Works: Culver City, California 90230, USA

## HUGHES ADVANCED ATTACK HELICOPTER

On 22 June 1973 the US Army announced that it had awarded to Hughes Helicopters and Hughes Aircraft Co of Culver City, California, a \$70.3 million contract to build two flight test and one ground test prototype helicopters for competitive evaluation against Bell Helicopter's submission for the Advanced Attack Helicopter (AAH) programme. Bell's contract is valued at \$44.7 million, the disparity being explained by the fact that Hughes had done less preliminary development work and that final unit costs are more important than



Full-scale mock-up of the Hughes Advanced Attack Helicopter

those for prototype development. This factor was emphasised in mid-July when the Defense Department authorised the Army to proceed with the validation phase of the programme, but insisted that the recurring fly-away cost per unit must remain within a target figure of \$1.6 million.

Development and testing of the AAH contenders are expected to extend over at least a five-year period, with extensive fly-off trials lasting three years. Selection of the winning design is not anticipated before 1979; it is believed that production contracts might eventually total \$1 billion.

Hughes' programme director has stated that his company is teamed with Teledyne Ryan Aeronautical of San Diego, California, as a major subcontractor. Ryan will build the fuselage structure, which will undergo systems installation at the Hughes plant.

Primary role of the AAH is that of a tank killer, but it will be equipped also with armament to provide close support for ground combat troops. Hughes believes that its specialisation in aircraft weapon systems will offer considerable advantages in the competition. The forward-mounted 30 mm chain gun developed by Hughes has weight, cost, and drag criteria about half those of the General Electric XM-188 Gatling-type gun that was to be fitted initially, and has a potential rate of fire of approximately 1,000 rds/min.

Drawing upon combat experience with the OH-6A Cayuse, which accumulated over 2

million flight hours in Vietnam, the company's approach to the AAH is one of straightforward functional design, using sheet metal in lieu of expensive composite materials in construction of the airframe, with emphasis on ease of maintenance in the field.

TYPE: Prototype armed helicopter.

ROTOR SYSTEM: Wide-chord, four-blade main rotor, with a strap retention system similar to that of the OH-6A. Blades constructed of laminated stainless steel.

Four-blade tail rotor mounted on port side of pylon/fin structure, with blades not at 90° to each other.

FUSELAGE: Conventional semi-monocoque metal structure. Tail folds to port to reduce overall length for storage and transport.

WINGS: Cantilever mid-wing monoplane of short span, mounted aft of the cockpit. Underwing pylons for the carriage of mixed ordnance. Wings are removable, and attach to sides of cabin, for transport and storage.

TAIL UNIT: Fixed fin and cantilever horizontal stabiliser.

LANDING GEAR: Tailwheel type, with single wheel on each unit. Main legs fold rearward to reduce overall height for storage and transport.

POWER PLANT: Two turboshaft engines, possibly General Electric T700-GE-700s each of approximately 1,500 shp, de-rated for normal operations to provide reserve power for combat emergencies. Engines mounted on each side of fuselage, above stub wings.

ACCOMMODATION: Crew of two in tandem, with pilot aft on an elevated seat, co-pilot/gunner forward. Large transparent cockpit enclosure for optimum visibility.

ARMAMENT: Hughes-developed 30 mm chain gun with 800 rounds of ammunition. Up to eight Hughes BGM-71A tube-launched optically-tracked wire-guided (TOW) anti-tank missiles, housed in re-designed streamlined pods carried on underwing pylons. TOW missiles can be carried in addition to rockets, or a total of 76 rockets without TOW missiles.

DIMENSION, EXTERNAL:

Main rotor diameter 48 ft 0 in (14.63 m)

AREA:

Main rotor disc 1,809 sq ft (168.06 m<sup>2</sup>)

WEIGHTS (estimated):

Weight empty 9,500 lb (4,309 kg)

Primary gross weight 13,600 lb (6,169 kg)

PERFORMANCE (estimated at 13,600 lb; 6,169 kg AUV):

Rate of climb at S/L under "hot day" conditions 1,140 ft (347 m)/min

Endurance at 4,000 ft (1,220 m) at temperature of 95°F (35°C) 1.9 hr

An F-4 Phantom takes off with Agile missile mock-ups aboard







Ryson STP-1 Swallow two-seat cruise/soar aircraft (76 hp CE-2200 Barker-converted Volkswagen engine)

**RYSON AVIATION CORPORATION;**  
Address: 548 San Fernando Street, San Diego, California 92106, USA

Ryson Aviation Corporation was founded by T. Claude Ryan, until 1969 Chairman and Chief Executive Officer of the Ryan Aeronautical Company. Other members of the Corporation include Mr Jerome D. (Jerry) Ryan, son of T. Claude Ryan, and Mr Peter F. Girard, a veteran test pilot of the former Ryan Company and an advanced design engineer. The aim of the new Corporation is to develop aeronautical products and make them available for manufacture by other companies.

First new design to emanate from the Ryson company is a two-seat powered cruising sailplane designated the STP-1 Swallow.

#### RYSON STP-1 SWALLOW

Design of the STP-1 was started in 1970 and construction of the prototype was completed during 1971. Flight testing was carried out during 1972, and by the Spring of 1973 a total of more than 80 flying hours had been accumulated.

A flying test-bed rather than a production prototype, the Swallow derives its name from the distinctive tail unit. The pusher

propeller, located between the twin fins and rudders, is driven by an engine mounted in the centre fuselage, via a 5 ft (1.52 m) long tubular shaft. Cooling for the engine is provided by an exhaust ejector system and a shaft-driven fan. A retractable air scoop mounted on the upper surface of the aft fuselage provides for temperature regulation.

To simplify construction, as well as save time, Schweizer SGS 2-32 sailplane wings and cockpit section were used for the basic structure. Meanwhile, a new wing of advanced aerodynamic and structural design has been evolved and was to be fitted during 1973.

The STP-1's high aspect ratio, low-drag configuration offers impressive performance and handling qualities, and its 28½ : 1 power-off glide ratio gives a 34.5-43 nm (40-50 mile; 64-80.5 km) gliding range from an altitude of 10,000 ft (3,050 m).

TYPE: Two-seat cruise/soar aircraft.

WINGS: Cantilever mid-wing monoplane. Wing section NACA 63-618 at root, NACA 43012A at tip. Dihedral 3° 30'. All-metal single-spar structure with metal covering. Spoiler/airbrakes on upper and lower surfaces.

FUSELAGE: Forward section is all-metal monocoque structure. Aft portion is a

welded steel-tube structure with glassfibre covering.

TAIL UNIT: Cantilever all-metal fixed surfaces, the tailplane almost flush with the upper surface of the fuselage. Tailplane swept 45°, with endplate fin and rudder at each tip. Elevators and rudders of light alloy construction, fabric-covered.

LANDING GEAR: Bicycle type, with wingtip outriggers. Manually-retractable and steerable nosewheel. Main wheel is partially buried in fuselage and is not retractable. Main-wheel tyre size 6.00-6. Nosewheel tyre size 5.00-5. Hydraulic disc brake on main wheel. Outrigger with single wheel beneath each wingtip.

POWER PLANT: One 76 hp CE-2200 Barker-converted Volkswagen motor car engine, driving a two-blade variable-pitch and fully-feathering pusher propeller. Fuel capacity 11 US gallons (41.5 litres).

ACCOMMODATION: Two seats in tandem beneath bubble canopy.

#### DIMENSIONS, EXTERNAL:

Wing span	57 ft 1 in (17.40 m)
Wing chord at root	4 ft 9 in (1.45 m)
Wing chord at tip	1 ft 7 in (0.48 m)
Wing aspect ratio	18.05
Length overall	24 ft 4 in (7.42 m)
Tailplane span	12 ft 0 in (3.66 m)

#### DIMENSION, INTERNAL:

Cockpit:	
Max width	2 ft 8 in (0.81 m)

#### AREAS:

Wings, gross	180 sq ft (16.70 m <sup>2</sup> )
Ailerons (total)	14.74 sq ft (1.37 m <sup>2</sup> )
Spoiler/airbrakes (total)	7.4 sq ft (0.69 m <sup>2</sup> )

#### WEIGHTS AND LOADINGS:

Weight empty	1,388 lb (629 kg)
Max T-O weight	1,864 lb (845 kg)
Max wing loading	10.3 lb/sq ft (50.3 kg/m <sup>2</sup> )

Max power loading	24.5 lb/hp (11.11 kg/hp)
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#### PERFORMANCE (at 1,700 lb; 771 kg AUW):

Max level speed at S/L	108 knots (124 mph; 200 km/h)
Max cruising speed	87 knots (100 mph; 161 km/h)
Econ cruising speed	49.5 knots (57 mph; 92 km/h)
Stalling speed	43.5 knots (50 mph; 80.5 km/h)
Power-off min sinking speed at 49 knots (56 mph; 90 km/h)	3.02 ft (0.92 m)/sec
Max rate of climb at S/L	590 ft (180 m)/min
Max range with max fuel, and reserve	over 347 nm (400 miles; 644 km)
Endurance with max fuel, and reserve	over 6 hr

Ryson STP-1 Swallow. The flying test-bed had accumulated more than 80 flying hours by last Spring





**T**HE Air Force has avoided a large-scale officer reduction in force (RIF) for another year. Thus, *most* of the career-minded non-Regular officers can breathe easier for the moment.

But not all of them. Because of new manpower cuts ordered by Congress, a modest involuntary force-out of about 1,000 USAF officers now looms on the horizon. It is expected to occur next spring.

To prepare for the RIF—Air Force calls it “contingency planning”—a special board was convened in late October to identify force-out contenders. The board established lists based on performance. Pink slips would be issued in the numbers required, starting with those judged least effective.

The RIF action would be Air Force’s first involuntary reduction (outside of promotion-passover ousters) since 1958, when some 2,000 officers got the axe because of manpower overages the service could not eliminate through early outs and other administrative moves.

RIF talk, always devastating to morale, has circulated almost annually throughout the services. It’s been more prevalent the past three years as personnel strength plunged. The most chilling event occurred recently when the Army, in two equal increments, involuntarily released nearly 10,000 officers who had been rendered surplus by shrinking manpower levels.

Army’s enormous RIF ended at the same time the Senate voted to reduce total military personnel strength this fiscal year by 156,000 below the Administration’s manpower figures.

USAF’s share of the Senate whack would have triggered an Air Force RIF of 5,000 to 6,000 officers by next June, Hq. USAF officials declared.

Fortunately, conferees from the House and Senate reduced the 156,000 figure to 43,000, to be spread among the services. Air Force’s share of that cut was placed at about 11,000 airmen and officers.

Air Force hopes to meet its lower FY ’74 officer strength ceiling via a combination of voluntary exit moves. In late October, however, authorities estimated that around 1,000 officers probably would have to be RIFed. Voluntary programs would be insufficient.

Enlisted RIFs are not in the offing. Airmen cuts that USAF is taking this year may total 30,000, but authorities are confident they all can be made through voluntary exit programs and reduced new intake. And USAF is also determined to avoid airmen RIFs for another reason: There’s no separation pay authority for them.

The officer situation is more complex. The board that screened active-duty Reserve officers in October looked at all those who have total active federal commission service

*Unlike the US Army, which has suffered several major bloodlettings in recent times, the Air Force has managed to contain its RIFs (reductions in force) to the relatively small one due next spring. With leaner and meaner budgets a certainty . . .*

## Is a Big RIF Inevitable?

By  
**Ed Gates,**  
CONTRIBUTING EDITOR,  
AIR FORCE  
MAGAZINE

dates between July 1, 1956, and June 30, 1971. That includes sixteen year groups. Nearly 21,000 officers are involved.

A few persons were excluded from consideration, such as POW/MIAs, temporary major selectees, and medical and dental officers.

The large majority of those earmarked for involuntary release, officials said, will come from the 1963–71 year groups.

By holding the board in October, Air Force will assure the unlucky ones several months, advance notification. Most exits are slated for April–June 1974, the final quarter of this fiscal year.

Rated as well as nonrated officers in the sixteen affected year groups were screened, Hq. USAF authorities said, and some flyers are **expected to appear on the list. But Regular officers are exempt, a ruling likely to draw some flak.** The Army, meantime, has been pushing the case for putting Regulars, as well as non-Regular officers, through the RIF wringer.

Also likely to stir up considerable fuss is the fact that RIF selectees from the two youngest year groups examined by the USAF board will not receive readjustment pay. They won’t have the necessary five years’ service to draw it.

### Impact of Past RIFs

Off and on for years, the Air Force has been plagued by overages, brought on by force cuts, that carried officer RIF implications. And the service, well aware of the turmoil accompanying even a suggestion of forced reductions, has maneuvered at great length to avoid them.

It’s been a successful effort, as attested to by the nearly sixteen RIF-free years that have passed since the axe last fell, in early 1958.



### Projected USAF Officer Gains and Losses in FY 1974

<b>Beginning Strength:</b>	115,122
<b>Gains</b>	
Regulars from Academies	825
Officer Training School	2,558
Call to active duty (mostly AFROTC)	4,397
Other accessions (physicians, nurses, JAGs, etc.)	2,584
<b>Total gains:</b>	<b>10,364</b>
<b>Losses</b>	
Obligation termination	3,655
Reduction in Force	1,000
Early releases	200*
Separation of career Reservists	956
Retirements (over 20 years)	3,129**
Normal attrition	800
Promotion passovers	325***
Separation of medical, dental, other components	2,528
<b>Total losses:</b>	<b>12,593</b>
<b>Fiscal Year-End Strength:</b>	<b>112,893</b>

\*More recent estimate: 1,000  
 \*\*Retirements averaged 4,500 in FY '72 and '73  
 \*\*\*Passovers RIFed 564 in FY '72, 320 in '73

*Less than two and a half years ago, Air Force had nearly 126,000 officers. Losses exceeded gains by 6,250 officers in FY 1973. The additional force cuts Congress recently ordered are slated to reduce Air Force's end-FY 1974 officer strength to below 112,000. The estimate of 1,000 RIFs was expected to remain intact.*

Some 2,200 non-Regular career officers got it then.

Earlier, there were RIFs in 1950 and in 1953.

A total of nearly 10,000 non-Regular officers, mostly company graders and nonrateds, but many with more than ten years' service, were sacked in those three actions. Many times that number endured long periods of worry while they sweated out the possibility of the roof falling on them.

The January 1950 RIF was probably the most ruthless. About 2,500 exit slips went out to nonrated non-Regulars in late 1949, while at the same time 1,400 rated officers received an option: accept grounding or separate.

The exits took place about two months later, and most of those hit received no severance pay.

(Ironically, in mid-1950, the Korean War broke out and Air Force promptly launched a mighty buildup that, within two years, increased personnel strength from 408,000 to nearly 1,000,000 members. Had the war begun just five months earlier, the January 1950 RIF would not have taken place.)

In 1953, Air Force again found itself with a whopping officer overage—16,500 out of a total force exceeding 130,000 officers were to be dropped, via voluntary and involuntary actions. There was apprehension galore, as the announced number to be forcibly exited was altered several times.

Finally, the force-outs were scaled back to about 4,500, and many thousands of others left via the volunteer route. Yet the uncertainties, changing rules, and the lack of planning necessary to properly manage such a large, sensitive project, torpedoed the morale of a sizable portion of the officer force.

A complicating factor in the 1953 RIF was how to digest a record-breaking AFROTC production of 9,500 new lieutenants in a force already overloaded with officers.

The RIF of 1958 took place within an Air Force officer force exceeding 132,000 members. The service involuntarily released 2,200 non-Regulars short of retirement, including numerous field graders. Several hundred others took early retirement, and 5,000 more departed under an early release project.

The readjustment pay law was enacted in 1956, but only for officers involuntarily separated with at least five years of service. Yet many in the 1958 RIF lacked the required time and went home empty-handed. Most RIFed officers, provided the five-year service requirement is met, draw the maximum \$15,000 readjustment pay.

### Reducing RIF Trauma

USAF's concern over the trauma and turmoil that large-scale RIFs can create has been particularly noticeable during the past four or five years. The official thrust has been to go all-out with voluntary exit programs, so as to preclude forced ousters.

Meantime, individual involuntary actions, such as "36-2" firings (show-cause actions) and promotion passover releases, have increased since the RIF days of the 1950s. Some officials feel these individual administrative ploys are sufficient to rid the officer force of less effective members.

Firings for promotion failure have been averaging about 400 a year, though with Air Force preparing to build more selectivity into promotions to captain, this exit rate may increase slightly, officials say.

Hq. USAF is currently pushing half a dozen projects designed to reduce strength voluntarily and thus curb, or eliminate, the officer RIF threat. These include voluntary waiver of service commitments for promotion to colonel and lieutenant colonel, thus paving the way for early retirement. Instead of serving two years following promotion, only six months is required. This is one way of trimming excesses in the higher grades, authorities noted.



Early out for young officers has been a continuing method of cutting personnel strength without firing people outright. Air Force early-released 5,400 officers during the past two fiscal years. But this source is not endless, and authorities now forecast that officer early releases this fiscal year may not exceed 1,000.

The service, meanwhile, continues to curtail procurement of new officers and airmen recruiting. Only 2,500 OTS graduates are slated to enter active service this fiscal year, down 800 from last year. Meanwhile, numerous AFROTC graduates are accepting Air Force's offer of a Reserve unit assignment (following only three months of active duty for training) in lieu of a normal five-year active-duty hitch.

The largest single bite in active-duty Air Force strength this year occurs in airmen recruiting, where only 65,400 nonprior-service males are being enlisted. This compares with the FY '73 intake of 90,000.

Palace Chase, under which airmen and officers may transfer from the active force to Reserve or Air Guard units, is helping those components fill critical slots. And it also plays a major role in the active force's reduction effort. Transferees must agree to serve in the Reserve Forces for double the length of their unfulfilled active-duty commitment.

Since Palace Chase began in March 1972, more than 3,800 USAFers have switched to Reserve units and 4,800 to the Air Guard. Most are airmen. Several thousand additional transfers are slated in the months ahead.

### The Down-Hill Run

Yet, all such involuntary actions may be insufficient to ward off forced exits indefinitely, if government-imposed personnel cuts slash too deeply. As long as the Air Force has existed,

its personnel strength level has been on a yo-yo, though during the past several years it has been all downhill.

USAF manpower during the Vietnam period peaked at 908,000 in mid-1968. The decline began shortly thereafter with the start of US troop withdrawals from Southeast Asia, and Air Force encountered no serious overage problems for the first couple of years.

USAF's personnel strength dipped to 790,000 by the middle of 1970, and then the crunch developed. A series of heavy slices the following three years had reduced personnel to fewer than 680,000 by early fall of 1973. That figure included 113,850 officers.

The Administration's FY '73 budget contains a further cut, to 666,357 Air Force members, including only 112,893 officers, by June 1974. And Congress' recent decision to strip the services of 43,000 additional people was expected to translate into a 10,000- to 11,000-member reduction for the Air Force, leaving a mid-1974 total force of about 656,000. This would include 111,000 to 112,000 officers.

It all adds up to a net reduction of a quarter of a million USAF members in only six years, including an officer force cut of about 25,000. But apparently this is not the end; with Congress applying the pressure, further personnel reductions loom ahead next year.

The government's steady chipping away at troop strength is, perhaps, a convenient method of holding down military expenditures, though hardly a responsible one. Many lawmakers and doubtless some policy-makers in the executive branch of government have discovered that rising costs for military pay and other personnel requirements can be substantially offset by sustained force reductions.

The drawdown of the war in SEA did indeed dictate sizable cuts in US military per-

## WHY NEXT SEPTEMBER 30 IS A CRUCIAL DATE

An off-again, on-again officer RIF threat linked with Air Force's grade-ceiling problem is definitely on. The crucial date is September 30, 1974, when USAF's current temporary field-grade promotion relief measure expires.

If Congress has not enacted new relief, or extended the temporary measure by then, officer promotions would stop and demotions and RIFs probably would follow, the Air Force has indicated. This nearly happened in the fall of 1972, but at the eleventh hour, Congress extended the then-expiring promotion relief bill for two years.

The lawmakers are unlikely to agree to another temporary extension, however. A permanent solution to the grade-ceiling dilemma is embodied in the Pentagon's proposed Defense Officer Personnel Management System (DOPMS), but its chances of approval are uncertain.

(At its annual National Convention in September, the Air Force Association passed a resolution urging "the Department of Defense [to] approve and submit legislation which will provide a permanent Defense Officer Personnel Management System; and [urging] the Congress to enact this legislation before expiration of the current temporary Air Force authorization on September 30, 1974.")

The tension figures to mount as next September 30 nears.



sonnel strength. But surely this has been accomplished. Are we not nearing the dismantling stage?

The Army, of course, has suffered the deepest manpower cuts. Five years ago that service counted nearly 1,600,000 soldiers; it's now down to less than 800,000 and falling.

The Army has conducted early-release programs and made enormous slashes in ROTC and OCS production since the pullback in SEA began. Its OCS, for instance, is being retained only as an incentive for a few advancement-minded enlisted men (500 will enroll, 350 graduate annually, Army says).

Such actions, however, have not come close to reducing Army officer strength to the required post-Vietnam levels. Accordingly, in 1972, the Army RIFed 5,000 commissioned and warrant officers and followed that up late this year with a second forced ouster of 4,900 officers.

This one-two haymaker adds up to perhaps the most devastating personnel force-out action in recent US military history. Hit primarily were captains, though numerous first lieutenants and warrant officers also were fired. The nearly 10,000 soldiers RIFed included 4,000 aviators.

### Unsolved Issues

Meanwhile, a string of separate problems emerges with the services' personnel strength overages and force-reduction efforts. They include:

- **The issue of Regular officer RIF eligibility.** Regulars enjoy almost iron-clad tenure and are exempt from RIF, leaving non-Regulars to shoulder the full burden. Some quarters consider this discriminatory and call for changes.

The Senate, in fact, recently amended the FY '74 military authorization bill to authorize the outright RIF of Regulars along with non-Regulars. But the provision didn't survive a House-Senate conference, and, even if it had been adopted, USAF wouldn't have used the authority, Headquarters officials said later.

While Air Force opposes stripping young Regulars of their tenure protection, Army has endorsed the idea. That service, as it moved through its RIF screenings, found itself running out of logical contenders among its non-Regulars, and advanced a plan to get at Regulars too. But Congress, at least for the time being, has shot it down.

- **RIF pay.** Most officers who are RIFed receive the \$15,000 maximum authorized by the ancient readjustment pay act. But this may be inadequate for officers with lengthy service, and a new review is indicated.

The Defense Department, meantime, has a new RIF pay proposition to cover enlisteds as well as officers, but Congress has ignored the proposal. One problem is that the plan is

woven into Defense's proposed overhaul of the military retirement system. And that package, castigated by service members generally and lacking congressional support, is dead, for all practical purposes. Needed, therefore, is a separate modernized RIF pay measure covering all active-duty groups.

- **RIF pay for young year groups.** Does the fact that no RIF money now goes to officers with under five years' service mean that the USAF screening board picked heavily from the two youngest year groups under consideration for economic reasons? After all, personnel money is tight; each ousted officer not entitled to RIF pay saves the service \$15,000.

USAF officials denied any such suggestion. They said all sixteen year groups were examined with "no conscious effort made to concentrate RIF selectees in no-pay year groups."

- **Liberalizing early outs.** Officers who were subsidized through ROTC with government-paid scholarships are not given the early-release opportunity. Critics of this rule hold that it makes more sense to allow an ROTC scholarship officer who is disgruntled, or merely disinterested, to leave early and keep an enthusiastic career-minded person who otherwise would be sacked.

Some quarters would go further and permit an unhappy Academy graduate to depart early in lieu of RIFing a contented, productive non-Regular, despite the fact that the taxpayers anted up more than \$60,000 to put the first man through the Academy. A controversial issue, for sure.

Indeed, it seems clear that almost any policy suggestion or new move linked with a RIF or RIF threat will stir controversy. That's because the overall subject of RIF is so distressing to individuals affected and worrisome to personnel managers and commanders.

It is surprising that Uncle Sam has done so little to protect against RIFs.

The Army's monster force-out, and the near RIFs and continual threats in the Air Force and the other services, combine to make life difficult for tens of thousands of non-Regular careerists.

Considering the problems involved, Air Force has done an excellent job in reducing overages it did not create, with a minimum of turmoil for officers in the vulnerable groups.

Yet the numerous administrative steps USAF has taken can't solve the basic problem. Early outs, reduced intake, and so on, are in the nature of patch-up and "fire-fighting" operations.

Needed, it would seem, is better planning and more resolve by the Department of Defense and the White House to resist further force-cut pressures. It is also imperative that the Administration and Congress get together to ease threats of RIF and to modernize the RIF pay rules. ■

*The author, Edmond N. "Ed" Gates, joined AIR FORCE Magazine as a Contributing Editor earlier this year upon his retirement as Editor of Air Force Times. Since then, he has commented regularly on USAF developments in his specialty field of Air Force personnel matters.*



## "EXTRAORDINARY HEROISM"

*In a ceremony this fall at the White House, an F-105 pilot, who is a former POW, received the nation's highest honor for heroism in Southeast Asia, becoming the ninth Air Force man to be awarded the Medal for action in the Vietnam War . . .*

### For Leo K. Thorsness, the Medal of Honor



Leo K. Thorsness

**A**N F-105 pilot who risked his life for his fellow pilots in combat in Southeast Asia on April 19, 1967, and who later became a POW, spending nearly six years in prison camps in North Vietnam, now is the ninth USAF man to win the Medal of Honor for action during the Vietnam War.

Lt. Col. Leo K. Thorsness received his medal from President Nixon in a ceremony at the White House on October 15 of this year. Eight other Vietnam veterans—six from the Army, one Navy man, and a Marine—also received Medals of Honor at the same time. President Nixon hung the beribboned Medals around each man's neck as members of their families stood by. Noting that a total of 143 Medals of Honor had been presented during the last four years for heroism in Southeast Asia, Mr. Nixon pointed out that this was the first time the Medal had been presented "when the United States is at peace with every nation in the world."

Colonel Thorsness, who was shot down over North Vietnam in 1967 and released nearly six years later, on March 4, 1973, received a particularly warm handshake from the President. Colonel Thorsness is still on crutches, as a result of wounds he received when he was shot down.

Colonel Thorsness won his Medal of Honor for a mission as an F-105 pilot on April 19, 1967. His Citation read:

Lieutenant Colonel (then Major) Thorsness was on a surface-to-air missile-suppression mission over North Vietnam. On that date, Lieutenant Colonel Thorsness and his wingman attacked and silenced a surface-to-air missile site with air-to-ground missiles, and then destroyed a second surface-to-air missile site with bombs. In the attack on the second missile site, Lieutenant Colonel Thorsness' wingman was shot down by intense antiaircraft fire, and the two crew members were forced to abandon their aircraft. Lieutenant Colonel Thorsness circled the descending parachutes to keep the crew members in sight and relay their position to the Search and Rescue Center. During this maneuver, a MiG-17 was sighted in the area. Lieutenant Colonel Thorsness immediately initiated an attack and destroyed the MiG. Because his aircraft was low on fuel, he was forced to depart the area in search of a tanker. Upon being advised that two helicopters were orbiting over the downed crew's position and that there were hostile MiGs in the area posing a serious threat to the helicopters, Lieutenant Colonel Thorsness, despite his low fuel condition, decided to return alone through a hostile environment of surface-to-air missile and antiaircraft defenses to the downed crew's position. As he approached the area, he spotted four MiG-17 aircraft and immediately initiated an attack on the MiGs, damaging one and driving the others away from the rescue scene. When it became apparent that an aircraft in the area was critically low on fuel and the crew would have to abandon the aircraft unless they could reach a tanker, Lieutenant Colonel Thorsness, although critically short on fuel himself, helped to avert further possible loss of life and a friendly aircraft by recovering at a forward operating base, thus allowing the aircraft in emergency fuel condition to refuel safely. Lieutenant Colonel Thorsness' extraordinary heroism, self-sacrifice, and personal bravery involving conspicuous risk of life were in the highest traditions of the military service, and have reflected great credit upon himself and the United States Air Force.

A native of Willard, Ohio, Colonel Thorsness retired on October 25 and planned to make his home in Sioux Falls, S. D. He is married to the former Gaylee A. Anderson, and the couple has one daughter, Dawn.

Colonel Thorsness becomes the fifty-fifth Air Force man in history to win the Medal—there were four winners in World War I, thirty-eight in World War II, four in Korea, and these eight men before Colonel Thorsness for action in Southeast Asia:

Maj. Merlyn H. Dethlefsen, Maj. Bernard F. Fisher, 1st Lt. James P. Fleming, Lt. Col. Joe M. Jackson, Lt. Col. William A. Jones, III, A1C John L. Lcvitow, Capt. Hilliard A. Wilbanks, and Capt. Gerald O. Young. ■



# The Bulletin Board

By Capt. Don Carson, USAF

CONTRIBUTING EDITOR, AIR FORCE MAGAZINE

## Hotline at MPC

The Military Personnel Center, Randolph AFB, Tex., is now offering twenty-four-hour-a-day career information service. Incoming calls are recorded and answers are provided by return call or letter. The Center has received more than 100,000 calls to career advisers this year. This service will be in addition to MPC's regular telephone calls, letters, and walk-in services. The Autovon number for the around-the-clock service is 487-5800. If you cannot get an answer to questions at your local CBPO, try MPC's new service. This is part of an expanding program to meet the needs of today's Air Force personnel.

## Equal Opportunity

Thirty-nine Air Force Reserve general officers have been invited to attend seminars at the Air Reserve Personnel Center, Denver, and at the Pentagon during November. The seminars will focus attention on how top-level managers can help the Air Force Reserve achieve its equal opportunity goals while working toward elimination of racial tension. Eighteen Reserve general officers previously attended active-duty race-relations seminars.

## Direct Line

Col. James Macia, Chief of Staff of the Air Force Security Service, has been interviewed by SMSgt. Bob Strickland at Kelly AFB, Tex., for an episode of the "Direct Line" television series. "Direct Line" is a new venture of USAF's Internal Information Division, designed to provide timely interviews with USAF newsmakers. The programs are aired primarily over American Forces Radio and Television outlets. Colonel Macia was the last active-duty member of World War II's famed "Doolittle Raiders." The Colonel observed that while "flying was a lot more fun in those days, the people in the USAF are essentially the same as those who were

there when I was a young flyer. I think their attitudes are about the same. They are ready to do their job now just as we were then."

## Junior Officers

The latest Junior Officer Council report from MPC confirms that JOCs are playing a vital role in today's "people-oriented Air Force." According to the report, these lieutenants and captains have been pace setters in improving and implementing many mission-oriented programs in the USAF. The "new JOC" is actively involved in problems that affect the day-to-day operational effectiveness of their units. In addition to helping solve operational problems, JOCs continue to provide valuable social and humanitarian programs to their local communities.

The recent 20th Air Division/NORAD Region Junior Officer Conference was typical of the new direction taken by JOCs. The opening address was given by Brig. Gen. James Fogle, Commander of the 20th NORAD Region. He stressed the challenges facing the JOC and pledged his full support of their efforts.

Capt. John Pronsky, Chairman of AFA's Junior Officer Advisory

Council, also addressed the Conference and provided guidance during the two-day meeting. Problems concerning enlisted manning, operational training, and quality standards of performance were addressed. The conference also studied methods of increasing operational cost efficiency in mission accomplishment. This is in response to the Chief of Staff's emphasis on saving money.

## AFIT Symposium

The fifteenth Annual Education With Industry (EWI) Symposium was held at Treasure Island NAS during October. Maj. Gen. Frank J. Simokaitis, AFIT Commandant, attended the three-day meeting along with ninety EWI students and thirty industry representatives. Also represented were senior officers from Systems Command, Logistics Command, Air University, MPC, and Hq. USAF. The Symposium was held to orient the officers entering this year's EWI program.

The officers were briefed on the goals and plans for the year-long program and given a tour of Lockheed's Space and Missile complex.

The EWI program places qualified officers with major US industries for intensive study. The



Bob Knotts, at the podium, representing Lockheed Missiles and Space Co., Sunnyvale, Calif., served as the moderator for a panel discussion of questions offered by the Air Force Institute of Technology Education With Industry (EWI) students during the EWI Symposium visit to Lockheed. The panel members were, from left, Col. Lou Lawrence, SAMS0, and Lockheed corporate heads Jim Plummer, Derald Stuart, and Potter Kerfoot.



officers are absorbed into the management structure of the companies and oriented in the corporate decision-making processes. The program is designed to keep the USAF up to date with the latest industrial management and production techniques.

### RSO Program

The Reserve Supplement Officer (RSO) program will add a new dimension to the Air Force Reserve's mobilization augmentee effort. RSOs through the grade of lieutenant colonel will fill manpower shortages created in times of national emergency by the recall to full-time flying of active-duty rated officers.

During peacetime, a significant

number of active-duty officers are assigned to positions not requiring primary flying duties. These flyers can be expected to return to full-time flying in emergencies. RSOs will be immediately available to fill the positions vacated by the active-duty flyers.

USAF has set an initial requirement of 508 RSOs. They will be trained in personnel, administration, intelligence, engineering, and procurement fields. Reservists will serve in Category "B" pay and training status, which provides twenty-four annual inactive-duty training periods and a two-week active-duty training tour each year.

In a departure from previous mobilization augmentee programs, RSOs will train at an Air Force installation near their home, rather

than being assigned against vacancies at distant locations. During emergencies, RSOs will be mobilized and assigned by the Military Personnel Center to whatever bases require replacements for withdrawn rated officers.

### Scholarships for Airmen

Air Force enlisted personnel are authorized to compete for AFROTC scholarships. The length of the scholarship is dependent upon the college credit required by the applicant to obtain a degree. Selections for the Airman Scholarship program are made by a central selection board at Maxwell AFB, Ala. A total of 307 applications was received during the first months of this program. Of these,

## Senior Staff Changes

**PROMOTIONS:** To **Lieutenant General:** Ernest C. Hardin, Jr.; Robert E. Huyser; Felix M. Rogers.

**RETIREMENT:** B/G Billy F. Rogers.

**CHANGES:** M/G James R. Allen, from DCS/Ops, to C/S, Hq. SAC, Offutt AFB, Neb. . . . B/G John W. Burkhardt, from Cmdr., 19th Air Div., SAC, Carswell AFB, Tex., to Asst. DCS/Plans, Hq. SAC, Offutt AFB, Neb., replacing M/G Harry M. Darmstandler . . . B/G Harry M. Chapman, from C/S, Defense Intelligence Agency, Washington, D. C., to Dep. Dir., J-3 (Recon.), Jt. Staff, OJCS, replacing B/G Raymond L. Haupt . . . Col. (B/G selectee) Richard G. Collins, from Cmdr., 401st TFW, USAF, Torrejon AB, Spain, to C/S, Defense Intelligence Agency, Washington, D. C., replacing B/G Harry M. Chapman . . . M/G Ernest T. Cragg, from V/C, 2d AF, SAC, Barksdale AFB, La., to Dep. IG for Insp. & Safety, OTIG, Hq. USAF, and Cmdr., AF Insp. & Safety Ctr., Norton AFB, Calif., replacing M/G (L/G selectee) Ernest C. Hardin, Jr.

M/G Harry M. Darmstandler, from Asst. DCS/Plans, to DCS/Plans, Hq. SAC, Offutt AFB, Neb., replacing M/G Ray B. Sitton . . . B/G Robert H. Gaughan, from Asst. DCS/Logistics, Hq. SAC, Offutt AFB, Neb., to V/C, 8th AF, SAC, Andersen AFB, Guam . . . M/G Colin C. Hamilton, Jr., from Dep. Dir., Command and Control, J-3, USEUCOM, Vaihingen, Germany, to C/S, Combined Military Planning Staff, CENTO, Ankara, Turkey . . . M/G (L/G selectee) Ernest C. Hardin, Jr., from Dep. IG for Insp. & Safety, OTIG, Hq. USAF, and Cmdr., AF Insp. & Safety Ctr., Norton AFB, Calif., to Dep. CinC, US Readiness Command, MacDill AFB, Fla., replacing L/G Timothy F. O'Keefe . . . B/G Raymond L. Haupt, from Dep. Dir., J-3 (Recon.), Jt. Staff, OJCS, to Cmdr., 12th Air Div., SAC, Davis-Monthan AFB, Ariz., replacing B/G James S. Murphy.

B/G Richard C. Henry, from IG, to DCS/Requirements, Hq. TAC, Langley AFB, Va., replacing B/G Walter P. Paluch, Jr. . . . M/G James E. Hill, from

Cmdr., 3d AF, USAF, RAF Mildenhall, England, to Asst. DCS/P&O, Hq. USAF, replacing M/G Robert E. Huyser . . . M/G Robert E. Huyser, from Asst. DCS/P&O, to DCS/P&O, Hq. USAF, and promoted to L/G, replacing L/G Joseph G. Wilson . . . B/G Kermit S. Kaericher, from Cmdr., 44th Strat. Missile Wg., SAC, Ellsworth AFB, S. D., to Dep. Asst. Dir., Plans and Analysis Bureau, US Arms Control & Disarmament Agency, Washington, D. C. . . . B/G Paul Krause, from Dep. Dir., J-3 (NMCC), Jt. Staff, OJCS, to Dep. Dir., Command and Control, J-3, USEUCOM, Vaihingen, Germany, replacing M/G Colin C. Hamilton, Jr. . . . M/G Frank M. Madsen, Jr., from DCS/Tech. Tng., to V/C, Hq. ATC, Randolph AFB, Tex., replacing M/G Felix M. Rogers.

B/G Robert T. Marsh, from DCS/Development Plans, to DCS/Systems, Hq. AFSC, Andrews AFB, Md. . . . B/G James S. Murphy, from Cmdr., 12th Air Div., SAC, Davis-Monthan AFB, Ariz., to Cmdr., 17th Air Div. (Prov.), SAC, U-Tapao Airfield, Thailand, replacing B/G (M/G selectee) Billy J. Ellis . . . B/G William C. Norris, from Cmdr., 20th TFW, USAF, RAF Upper Heyford, England, to DCS/Plans, USAF, Ramstein AB, Germany, replacing M/G Evan W. Rosencrans . . . B/G Walter P. Paluch, Jr., from DCS/Requirements, Hq. TAC, Langley AFB, Va., to V/C, 12th AF, TAC, Bergstrom AFB, Tex., replacing M/G Edward P. McNeff . . . M/G Felix M. Rogers, from V/C, Hq. ATC, Randolph AFB, Tex., to Cmdr., AU, Maxwell AFB, Ala., and promoted to L/G, replacing L/G Alvan C. Gillem, II . . . M/G Evan W. Rosencrans, from DCS/Plans, USAF, Ramstein AB, Germany, to Cmdr., 3d AF, USAF, RAF Mildenhall, England, replacing M/G James E. Hill . . . Col. (B/G selectee) Malcolm E. Ryan, Jr., from Cmdr., 12th FTW, ATC, Randolph AFB, Tex., to IG, Hq. TAC, Langley AFB, Va., replacing B/G Richard C. Henry . . . M/G Ray B. Sitton, from DCS/Plans, to DCS/Ops, Hq. SAC, Offutt AFB, Neb., replacing M/G James R. Allen.

—Compiled by Catherine L. Bratz



## The Bulletin Board

186 airmen were awarded scholarships and will enroll in college this year. Your base education officer has information on this program.

### Goodies for the Gals

The recent Frontiero vs. Richardson Supreme Court decision changed the ruling on certain sections of the United States Code (USC) pertaining to dependency criteria. A female member of the military services may now receive a Basic Allowance for Quarters (BAQ) and medical benefits for her civilian husband without proof that he depends upon her for more than half of his support. This led to the

revision of several other key areas of entitlements by the Comptroller General. The following is a summary of the key items affected:

**For women members with civilian husbands and/or dependent children:** Establishes entitlements to dependent travel allowance for PCS moves, dislocation allowance, overseas station allowances, family separation allowance, and inclusion of BAQ in payment for leave.

**For service couples** (both members of military): Provides for BAQ at the single rate for both members when assigned to the same or adjacent stations and not assigned family quarters. When not assigned together, availability of quarters will determine entitlement to BAQ.

The Supreme Court's decision will be retroactive. Claims arising as a result of this decision are subject to the ten-year Statute of Limitations as determined by the JAG or GAO. For further information, contact your base legal office.

### Volunteer Forces

The Air Force appears to be faring better than the Army in the Volunteer Service program. However, Secretary of the Army Howard H. Callaway recently asserted that the all-volunteer Army is working and that today's Army is better, and better prepared for combat, than it was at the end of the draft.

He cited improved combat readiness and morale, higher quality of new personnel, and better discipline as areas in which the new Army is excelling. Secretary Callaway said the Army is achieving about eighty-four percent of its accession objectives. He emphasized that the shortfall is not serious and the Army's overall strength is high. The quality of new volunteers also helped compensate for the shortfall. There has recently been less criticism in Congress of the All-Volunteer Services and a

## NEWLY ELECTED AEROSPACE EDUCATION FOUNDATION GOVERNING BODY

At the September 19, 1973, annual meeting of the Aerospace Education Foundation Board of Trustees, held in conjunction with the AFA National Convention, the following officers and trustees were elected to serve for the coming year:



**President**  
Dr. Wayne O. Reed



**Chairman of the Board**  
George D. Hardy

**Secretary**  
Dr. Charles H. Boehm

**Treasurer**  
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The above newly elected officials join the following National Directors of the Air Force Association who have been elected to serve as Trustees of the Foundation:

John R. Allison  
Joseph E. Assaf  
John G. Brosky  
James H. Doolittle  
George M. Douglas  
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Jack Withers



new attitude of "Let's make it work."

### Palace Flicks

If you are preparing for an overseas assignment, you should see Palace Flick No. 87. This film contains information on concurrent

and invitational travel orders for dependents, and the USAF policy to allow dependents to accompany members overseas when possible.

Palace Flick No. 86 tells you the facts if you are considering retirement in lieu of PCS assignment. This film report is of special interest to career airmen who are

tabbed for assignment and who are eligible or nearing eligibility for retirement. Areas covered include options available, eligibility criteria, and time limits for making the retirement election. These and all other Palace Flicks are available for your viewing through local CBPO Customer Service Centers. ■

## Ed Gates . . . Speaking of People

### Base Closings and Retiree Benefits

Two decades ago, the Air Force counted only 155,000 persons on its retired rolls. The active-duty establishment, flourishing with a broad installation network, nearly 1,000,000 members, and solid financing, comfortably provided retirees a wide range of services.

Facilities were not crowded. The regular Air Force was ready, willing, and able to accommodate the retired members and their families in many ways. There was ample room for them at most military medical facilities, in the clubs, and on the golf courses. They hardly made a ripple in the traffic at the commissaries.

And, because a widespread installation structure existed, facilities were within reach of a large section of the retired population. Things have been changing.

That 155,000-member retired force has soared to 350,000 persons, more than a sixfold increase. The million-member mark is just around the corner, and further growth is projected. Several years will pass before retiree attrition equals or surpasses new additions to the rolls.

The active establishment, meanwhile, has been going the opposite way. Instead of 950,000 members on board, as there were twenty years ago, USAF troop strength today is down to 690,000 and will drop considerably further.

Cutting personnel strength leads to closing bases and trimming activities. Some of this is occurring; much more is scheduled, throughout all of the services. Each is suffering heavy manpower slashes imposed by Congress.

The services, as a result, have one large-sized base closing and consolidation project under way and another in the making. The latter, slated to be announced early next year, "will not be insignificant," one high Pentagon official said. Troop cuts, followed by facilities' reductions, have a heavy impact on the retiree force; in effect, many retirees find themselves further removed from the military scene.

The growing number of retirees (and their dependents) have caused a considerable crunch at numerous military hospitals. Yet thirteen such facilities are on the current base close-down list. Their removal compounds the already decreased availability of military medicine for the retired community.

At some large bases that won't close, but are located in popular retirement states, overcrowding of facilities is critical. MacDill AFB, Fla., is a good example. Over 100,000 retirees and their dependents live within commuting range. Yet many of them shy away from the base because the facilities are just too jammed.

MacDill, incidentally, is the only major military site in the entire western half of Florida below the panhandle.

And Florida is the second most popular state for military retirees. According to recent Defense Department statistics, some 77,000 retired members (29,500 USAF

people included) called Florida home. This was a net increase of about 4,000 over the previous year, testimony to the fact that the growing shortage of available military facilities is no deterrent to settling in that state.

California leads the number of military installations and, therefore, has the most facilities retired families might use. But the number of people entitled to use them has skyrocketed: some 162,000 retirees (including 42,300 USAF) reside in the big state. More will doubtless join them.

Currently closing in California are George AFB, the Alameda Naval Air Station, and Navy's Long Beach complex. A casualty at the latter site is a 200-bed hospital. The Hamilton AFB hospital also is folding—the base has reverted to Reserve control—which means that the state's twenty military hospitals are reduced to eighteen.

Almost certainly—with the active force shrinking so rapidly—more installations and facilities in California will be closed.

Similar patterns prevail elsewhere. In Virginia, now the fourth most popular military retirement state (9,000 USAF; 41,000 other services), new retirees are flocking to the Tidewater area (southeastern section). This places new work loads on the already overtaxed facilities of the several military installations in that area. Some retirees in the Old Dominion state will tell you they're using service facilities less and less. Too crowded.

The New England states, before too long, may be almost stripped of military installations. Recently ordered closures in Massachusetts, New Hampshire, and Rhode Island will wipe out facilities—and some nostalgic connections—for many of the 43,300 retired service members (including 10,000 USAF) residing in New England.

The closing of the huge Valley Forge military hospital (1,419 beds) in Pennsylvania will send some of the 28,000 military retirees (6,550 USAF among them) living in that state to CHAMPUS and/or other civilianized medical care programs. And more links with the military establishment will be severed.

The situation, of course, is not all black. Many military sites can still accommodate, some comfortably, retirees and their families. Interestingly enough, one such area appears to be Travis AFB in otherwise crowded California. The Travis vicinity is a popular retirement area, but overcrowding is not apparent.

Overall, however, the contracting military services are becoming less able to accommodate the sharply expanding retired population.

It's unfortunate for the individual retiree—his benefits are eroded. And the services lose, too. They may not be able to continue the same relationship with retired members that a closely linked retired community has provided.



## War Record of the B-24

*Log of the Liberators*, by Steve Birdsall. Doubleday, New York, N. Y., 1973. 340 pages. \$12.95.

Production records account for 18,482 Liberators off the lines between 1939 and 1945; most were B-24s, but also were ones designated PB4Y-2 Privateer, F-7, and C-109. What Steve Birdsall has done—his earlier writings include *The B-17 Flying Fortress* and the *A-1 Skyraider*—is to fashion a sort of cumulative combat log, detailing the exploits and ordeals of the Consolidated bomber during the years of World War II. He has, by necessity, been selective in his choice of material, but never has he been dull.

Inevitably, perhaps, Birdsall's account of the August 1943 raid against Ploesti stands out; here he tells, often in fascinating detail, much about the hazards and the foul-ups that afflicted this daring onslaught against the Romanian oil fields. Regrettably, little is said about how high the stakes were—approximately one-third of all German liquid-fuel production was centered on Ploesti—or the extent of our costs in the context of those critical days—more than 500 US airmen dead, prisoners, missing, or interned, and over fifty bombers lost. Even so, enough is told to make of this harrowing incident a splendid example of the implacable determination with which the air war was pressed against the enemy.

How the Liberators were employed elsewhere around the world—against Fortress Europa from England and Italy; against Japan from the Aleutians; and in the South Pacific, over the Hump, and across China—and how they fared are described in flashing, episodic fashion. Sometimes Birdsall needs pages to recount an incident or make a point; often he is content to tell his story with a single picture and its caption. His choice of pictures, it should be noted, is superb, and the pictures used are richly complemented by the exquisite detail of John Preston's paintings.

Veterans from nearly every bomb group of the Army Air Forces that had Liberators have contributed to the *Log*, and the index contains the names of many of the air war heroes who flew them. Birdsall says that in accomplishing what he hoped would be an acceptable history of the type, he had set out to write "a kind of diary and photo album for those who were associated with it." In this effort, most surely, he has succeeded.

—Reviewed by Walter T. Bonney, former Director of Information for NASA and for Aerospace Corp.

## Cutting West Point on the Bias

*West Point, America's Power Fraternity*, by K. Bruce Galloway and Robert Bowie Johnson. Simon & Schuster, New York, N. Y., 1973. 488 pages. \$10.00.

This book, with its self-explanatory title, is a painfully researched, long, dull polemic against the US Military Academy. It is written in a style reminiscent of the late Drew Pearson on an off day, and, in all probability, it will not be much read. Why, then, must we bother with it?

Well, in the first place, because Simon & Schuster published it, and because the *New York Times* reviewed it. Thus, this rather hapless attack on West Point deserves some attention. It is, besides, a fair example of the sort of problem we in the military face in reestablishing our public image. For, if times were different, it is hard to imagine any publisher—at least, any publisher with a commercial motive—going to press with this one.

But, since this is, at least superficially, a book review, let's run briefly through the book.

It begins with a foreword by the controversial Anthony Herbert, whose own charges against the Army have so far only proved that he may have one of the livelier imaginations among current military writers.

The book goes on to describe the place, the system, the customs,

and the general conservatism of the institution and its alumni. All accurately enough, I suppose, in a technical sense, but done with such unrelieved and heavy-handed cant. They really do hate the place, these two.

There is, for example, the tale of the two recent graduates who, having left the Army for other causes and having become fashionably dirty and long-haired, returned to a West Point June Week. They were made to feel unwelcome in this gathering of cadets and old grads. And that, say Messrs. Galloway and Johnson, just goes to show you.

It goes on and on. The basic theme of the book is that West Point is a breeding ground of power. For proof, just look around.

Well, it is an interesting thesis, but it will not stand a very close look. It is true that during the depression years of the thirties, a free West Point education was a powerful attraction to a lot of young men who might otherwise have gone somewhere else. The fact that they succeeded in the military or in business is not the result of a conspiracy, but more exactly, a result of the times we have recently passed through. At any rate, if there has been a conspiracy—even a tacit one—no one has told me.

If the authors had been up to it, they could have had some fun with this book. West Point does lend itself to being made fun of here and there. They have tried, but they are not, shall we say, gifted humorists.

But to get back to the question of why Simon & Schuster chose to publish—and publicize—this unimportant and essentially pointless polemic. The authors are clearly unknown and, on the basis of this effort, are destined to remain so. It was published, in my judgment, because it was either the best, or perhaps the only, new attack on the military institution available at the time. Last year, it was the sex manuals that paid the bonuses. This year, we work on the military.

And let's start, someone says, by turning off the young: to destroy, by ridicule and innuendo, the de-



sire of young men to enter the service academies. While this book will not do that job, it will do a little harm just by its existence. No one read *Mein Kampf* either.

It appears, from the jacket, that the authors live in Annapolis. Stand by for the sequel having to do with the alarming number of senior naval officers who have graduated from the Naval Academy.

—Reviewed by Gen. T. R. Milton, US Representative, NATO Military Committee.

## Airborne Drug Traffic

*Contrabandista!*, by Evert Clark and Nicholas Horrock. Praeger, New York, N. Y., 1973. 231 pages. \$6.95.

Last March, the White House honored a group of federal agents for dissolving a South American smuggling ring that had brought an estimated 2,000 pounds of uncut heroin into the United States. The manhunt, over a period of more than two years, ended with the prison sentence of the ringleader, August Joseph Ricord. A diminutive, sixty-year-old French Corsican, Ricord began his criminal career as a youth in the back streets of Marseilles and emerged in the 1960s in Paraguay as a powerful figure in international narcotics smuggling.

The authors, who covered the story for *Newsweek* Magazine, have produced a book that is more than lucky fallout from a reporting assignment. It is an absorbing tale of the shadow world of the *contrabandistas*—competent pilots who share their ethics and contract their skills to transport bootleg cargoes across international borders for criminal employers.

While Clark and Horrock may lack the John O'Hara flair for authentic-sounding dialogue, they serve the reader well as trained observers. We learn, for example, that the narcotics trade has revolutionized smuggling. Once, cargoes of tobacco, whisky, Levi jeans, wigs, and stereos moved only south. Almost daily, flights leaving airstrips in the southern United States carried goods to isolated fields in South America. Drug smugglers quickly realized the possibilities of empty northbound flights, and in a short time, South America became a drug gateway.

Most of the South American airfields used by smugglers are on property leased from owners of large country estates or owned by

government officials. Political protection is assured, and management is like that of legitimate airfields. Pilots pay landing fees, and their planes may be seized for nonpayment or failure to meet other financial obligations.

There are ample details of the methods, risks, and payoffs of pilots who fly contraband shipments. They are an independent group who discuss their activities in code to avert suspicion, but are truly the financial innocents of the smuggling system. Often they receive only modest sums for carrying multimillion dollar cargoes at great risk of physical danger or arrest by federal agents.

The criminal masterminds who direct the shipments employ not only pilots but "idea men" who devise new methods of hiding illegal items and "bribers" who smooth the way by payments to key officials. In some cases, these payments have acquired the regularity and security of an informal retirement fund.

The book offers insight into business operations of a highly efficient breed of criminals who reap unimaginable profits from smuggling. It pays a well deserved tribute to the persistent agents who bring them to court.

—Reviewed by Marjorie Ulsamer, Deputy Director, Publications Division, HUD.

## New Books in Brief

*Airshow! Pictorial*, by Bill Johnson. The author, an aviation photographer, has put together more than 350 new photos (fifty-four in color) that capture the excitement of modern air-show action. He has included Abbotsford International Airshow, Canada; Reno National Air Races, Nevada; jet demonstration teams (Thunderbirds, Blue Angels, and the late Golden Centennaires). Superior Publishing Co., Seattle, Wash., 1971. 190 pages with index. \$17.95.

*Arctic War Birds: Alaska Aviation of World War II*, by Stephen E. Mills. A pictorial history of bush flying with the military in the defense of Alaska and America. Stephen E. Mills, a former B-52 pilot and World War II POW in Germany's Stalag Luft III, is also coauthor of *Sourdough Sky: Bush Pilots of Alaska Interior* (Superior). Superior Publishing Co., Seattle, Wash., 1971. 191 pages with index. \$12.95.

*Flying The Midnight Sun: The*

*Exploration of Antarctica by Air*, by Al Muenchen. Antarctica is the only continent that has been explored almost exclusively by air, and it is the "Peace Continent," where nations large and small have learned to cooperate to get a job done. The author—an artist who went to "The Ice" on assignment with a US Air Force art program—in a blending of words and pictures, transports his readers to The Ice, where they share the hardships and thrills of discovery, and experience with a special breed of air explorers their days of glory and "moments of stark terror." David McKay, New York, N. Y., 1973. 164 pages with index. \$6.95.

*The Great Gamble: The Boeing 747*, by Gen. Laurence S. Kuter, USAF (Ret.). General Kuter—Executive Vice President of Pan American World Airways during the period discussed—relates the inside story of how the Boeing 747 came to be built. He takes the reader from executive suite to the production line to test flight of the Boeing-Pan Am venture. His book is an account of decision making (and decision changing) in the production and introduction of the 747 by the two corporations over a period of five years. The University of Alabama Press, University, Ala., 1973. 134 pages. \$6.50.

*Military Rule in Latin America: Function, Consequences and Perspectives*, edited by Philippe C. Schmitter. This third volume of the War, Revolution, and Peacekeeping Series is a collection of papers that was first presented at a conference sponsored by the Arms Control and Foreign Policy Seminar of the Center for Policy Study and held at the University of Chicago, on May 26–27, 1972. The essays cover three broad areas of inquiry: the political function of direct military rule, the policy consequences of internal military intervention and external military aid, and the prospective impact of both on regional and global political systems. Sage, Beverly Hills, Calif., 1973. 322 pages. \$12.50 hardback, \$7.50 paperback.

Two recent releases in Ballantine's Illustrated History of the Violent Century Series are: *Condor Legion*, by Peter Elstob; *Heydrich*, by Alan Wykes. Ballantine Books, New York, N. Y., 1973. Each volume 160 pages. \$1.50.

—By Catherine Bratz





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35-39	40,000	12,500	10.00	6,000	2,000	2.50
40-44	25,000	12,500	10.00	5,250	2,000	2.50
45-49	15,000	12,500	10.00	4,050	2,000	2.50
50-59	10,000	12,500	10.00	3,000	2,000	2.50
60-64	7,500	12,500	10.00	2,250	2,000	2.50
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40-44	37,500	12,500	15.00	5,250	2,000	2.50
45-49	22,500	12,500	15.00	4,050	2,000	2.50
50-59	15,000	12,500	15.00	3,000	2,000	2.50
60-64	11,250	12,500	15.00	2,250	2,000	2.50
65-69	6,000	12,500	15.00	1,200	2,000	2.50
70-75	3,750	12,500	15.00	750	2,000	2.50

\* In the event of an accidental death occurring within 13 weeks of the accident, the AFA plan pays a lump sum benefit of \$12,500 in addition to the benefit, except as noted under AVIATION DEATH BENEFIT, above.

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The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minneapolis as trustee of the Air Force Association Group Insurance Trust. However, because of certain limitations on group insurance coverage in those states, nonactive-duty members who reside in Ohio, Texas, Florida, and New Jersey are not eligible for AFA group life insurance coverage.

### EFFECTIVE DATE OF YOUR COVERAGE

All certificates are dated and take effect on the last day of the month in which your application for coverage is approved. Coverage runs concurrently with AFA membership. AFA Military Group Life Insurance is written in conformity with the Insurance Regulations of the State of Minnesota.

Yes, now the Air Force Association offers members of the United States Air Force their choice of two great new life insurance plans, both designed to meet the special requirements of Air Force personnel.

### Planned for You

Both plans have been specifically designed to fill your particular needs. This is full-time, worldwide protection. There are no war clauses—no hazardous-duty restrictions, or geographical limitations on AFA life insurance protection. At AFA, our policy is to provide the broadest possible protection to our members, including those in combat zones.

### Low Group Rates

And, as a member of AFA, you are able to secure this outstanding protection at low group rates. What's more, there's no increase in premiums for flying personnel. In fact, in most cases, flying personnel are entitled to full death benefits. Only when death is caused by an aircraft accident in which the insured was serving as pilot or crew member does the special Aviation Death Benefit take effect.

### Higher Benefits for Young Families

The higher benefits for younger members make both plans particularly outstanding buys for the young family. The young family breadwinner can make a substantial addition to his life insurance estate at a time when his family is growing up—when his financial obligation to his family is at its greatest!

**CHOOSE EITHER OF THESE GREAT PLANS! MAIL THIS APPLICATION TO AFA TODAY!**







# 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, Tuscaloosa): **Cecil Brendle**, 3463 Cloverdale Rd., Montgomery, Ala. 36111 (phone 269-7252).

**ALASKA** (Anchorage, Fairbanks, Kenai): **Charles W. Lafferty**, 1045 Pedro St., Fairbanks, Alaska 99701 (phone 456-5167).

**ARIZONA** (Phoenix, Tucson): **H. J. Bills**, 50 S. 45th Ave., Phoenix, Ariz. 85031 (phone 272-3272).

**ARKANSAS** (Blytheville, Fort Smith, Little Rock): **Frank A. Bailey**, 605 Ivory Dr., Little Rock, Ark. 72205 (phone 988-3432).

**CALIFORNIA** (Apple Valley, Burbank, Edwards, Fairfield, Fresno, Harbor City, Hawthorne, Long Beach, Los Angeles, Merced, Monterey, Novato, Orange County, Palo Alto, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, Santa Barbara, Santa Clara County, Santa Monica, Tahoe City, Vandenberg AFB, Van Nuys, Ventura): **Ben F. Snell**, 11 Sharon Dr., Salinas, Calif. 93940 (phone 422-7571).

**COLORADO** (Boulder, Colorado Springs, Denver, Ft. Collins, Pueblo): **James C. Hall**, P. O. Box 30033, Lowry AFB Station, Denver, Colo. 80230 (phone 366-5363, ext. 459).

**CONNECTICUT** (East Hartford, Torrington): **John McCaffery**, 117 Bridge St., Groton, Conn. 06340 (phone 739-7922).

**DELAWARE** (Dover, Wilmington): **Franklin R. Welch**, Greater Wilmington Airport, Bldg. 1504, Wilmington, Del. 19720.

**DISTRICT OF COLUMBIA** (Washington, D. C.): **George G. Troutman**, 1025 Connecticut Ave., N. W., Washington, D. C. 20002 (phone 659-3900).

**FLORIDA** (Bartow, Broward, Daytona Beach, Ft. Walton Beach, Gainesville, Homestead, Jacksonville, Key West, Miami, Orlando, Panama City, Patrick AFB, Redington Beach, Sarasota, Tallahassee, Tampa, West Palm Beach): **A. W. Haymon**, 1421 S.E. 3d Ave., Ft. Lauderdale, Fla. 33316 (phone 525-4161).

**GEORGIA** (Athens, Atlanta, Savannah, St. Simons Island, Valdosta, Warner Robins): **Donald L. Devlin**, 1651 McKinnon Dr., Savannah, Ga. 31404 (phone 234-0109).

**HAWAII** (Honolulu): **Campbell Palfrey, Jr.**, E. F. Hutton Co., Inc., 700 Bishop St., Honolulu, Hawaii 96813 (phone 521-2961).

**IDAHO** (Boise, Burley, Pocatello, Twin Falls): **Clarence E. Hall**, 3531 Winsdor Dr., Boise, Idaho 83705 (phone 344-7283).

**ILLINOIS** (Belleville, Champaign, Chicago, Deerfield, Elmhurst, O'Hare Field): **William A. Johnston**, 302 Harvard Dr., O'Fallon, Ill. 62269 (phone 632-2021).

**INDIANA** (Indianapolis, Lafayette, Logansport): **Oliver K. Loer**, 268 S. 800 W., Swayzee, Ind. 46986 (phone 922-7136).

**IOWA** (Des Moines): **Ric Jorgensen**, P. O. Box 4, Des Moines, Iowa 50301 (phone 255-7656).

**KANSAS** (Topeka, Wichita): **Don C. Ross**, 10 Linwood, Eastborough, Wichita, Kan. 67201 (phone 686-6409).

**LOUISIANA** (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Ruston, Shreveport): **Louis Kaposta**, 2808 Stonewall, Shreveport, La. 71109 (phone 635-8168).

**MAINE** (Limestone): **Alban E. Cyr**, P. O. Box 160, Caribou, Me. 04736.

**MARYLAND** (Baltimore): **James W. Poultney**, P. O. Box 31, Garrison, Md. 21055 (phone 363-0795).

**MASSACHUSETTS** (Boston, Falmouth, Florence, Lexington, L. G. Hanscom Fld., Taunton, Worcester): **Arthur D. Marcotti**, 215 Laurel St., Melrose, Mass. 02146 (phone 665-5057).

**MICHIGAN** (Dearborn, Detroit, Kalamazoo, Lansing, Marquette, Mount Clemens, Oscoda, Sault Ste. Marie): **Stewart Greer**, 18690 Marlowe Ave., Detroit, Mich. 48235 (phone 273-5115).

**MINNESOTA** (Duluth, Minneapolis, St. Paul): **Victor Vacanti**, 8941 10th Ave., Minneapolis, Minn. 55420 (phone 854-3456).

**MISSISSIPPI** (Biloxi, Columbus, Jackson): **Wm. Browne**, P. O. Box 2042, Jackson, Miss. 39205 (phone 352-5077).

**MISSOURI** (Kansas City, Knob Noster, Springfield, St. Louis): **Robert E. Combs**, 2003 W. 91st St., Leawood, Kan. 66206 (phone 649-1863).

**MONTANA** (Great Falls): **George Page**, P. O. Box 3005, Great Falls, Mont. 59401 (phone 453-7689).

**NEBRASKA** (Lincoln, Omaha): **Lyle O. Remde**, 4911 S. 25th St., Omaha, Neb. 68107 (phone 731-4747).

**NEVADA** (Las Vegas, Reno): **Floyd White**, 3578 Algonquin Dr., Las Vegas, Nev. 89109 (phone 384-8077).

**NEW HAMPSHIRE** (Manchester, Pease AFB): **R. L. Devoucoux**, 270 McKinley Rd., Portsmouth, N. H. 03801 (phone 669-7500).

**NEW JERSEY** (Andover, Atlantic City, Belleville, Camden, Chatham, E. Rutherford, Fort Monmouth, Jersey City, McGuire AFB, Newark, Trenton, Wallington, West Orange): **Amos L. Chalif**, 162 Lafayette, Chatham, N. J. 07928 (phone 635-8082).

**NEW MEXICO** (Alamogordo, Albuquerque, Clovis): **John J. Dishuk**, 8204 Harwood Ave., N.E., Albuquerque, N.M. 87110 (phone 298-0788).

**NEW YORK** (Albany, Bethpage, Binghamton, Buffalo, Chautauqua, Elmira, Griffiss AFB, Hartsdale, Ithaca, Long Island, New York City, Niagara Falls, Patchogue, Plattsburgh, Riverdale, Rochester, Staten Island, Syracuse): **Gerald V. Hasler**, P. O. Box 11, Johnson City, N. Y. 13760 (phone 754-3435).

**NORTH CAROLINA** (Charlotte, Fayetteville, Goldsboro, Greensboro, Raleigh): **Monroe E. Evans**, 607 Tokay Drive, Fayetteville, N. C. 28301 (phone 488-6008).

**NORTH DAKOTA** (Grand Forks, Minot): **Kenneth A. Smith**, 511 34th Ave., So., Grand Forks, N. D. 58201 (phone 722-3969).

**OHIO** (Akron, Cincinnati, Cleveland, Columbus, Dayton, Newark, Toledo, Youngstown): **Robert L. Hunter**, 2811 Locust Dr., Springfield, Ohio 45504 (phone 255-5304).

**OKLAHOMA** (Altus, Enid, Oklahoma City, Tulsa): **Edward McFarland**, Atlas Life Bldg., Suite 808, 414 So. Boston, Tulsa, Okla. 74103 (phone 743-4118).

**OREGON** (Corvallis, Eugene, Portland): **John G. Nelson**, 901 S. E. Oak St., Portland, Ore. 97214 (phone 233-7101).

**PENNSYLVANIA** (Allentown, Beaver Falls, Chester, Erie, Homestead, Horsham, Lewistown, New Cumberland, Philadelphia, Pittsburgh, Washington, Willow Grove, York): **Frank E. Nowicki**, 280 County Lane Rd., Wayne, Pa. 19087 (phone 672-4300, ext. 62).

**RHODE ISLAND** (Warwick): **Matthew Puchalski**, 143 Sog Riag, Warwick, R. I. 02886 (phone 737-2100, ext. 27).

**SOUTH CAROLINA** (Charleston, Columbia, Greenville, Myrtle Beach Smer): **Burnet H. Maybank**, P. O. Box 126, Charleston, S. C. 29402 (phone 722-4735).

**SOUTH DAKOTA** (Rapid City): **Kenneth Roberts**, P. O. Box 191, Rapid City, S. D. 57701 (phone 342-0191).

**TENNESSEE** (Chattanooga, Knoxville, Memphis, Nashville, Tullahoma): **James W. Carter**, 314 Williamsburg Rd., Brentwood, Tenn. 37027 (phone 834-2008).

**TEXAS** (Abilene, Austin, Big Spring, Corpus Christi, Dallas, Del Rio, El Paso, Fort Worth, Houston, Laredo, Lubbock, San Angelo, San Antonio, Sherman, Waco, Wichita Falls): **Stanley L. Campbell**, 119 Bluehill, San Antonio, Tex. 78229 (phone 342-0006).

**UTAH** (Brigham City, Clearfield, Ogden, Provo, Salt Lake City): **Verl G. Williams**, P. O. Box 486, Clearfield, Utah 84015 (phone 777-5370).

**VERMONT** (Burlington): **R. F. Wissinger**, P. O. Box 2182, S. Burlington, Vt. 05401 (phone 863-4494).

**VIRGINIA** (Arlington, Danville, Harrisonburg, Langley AFB, Lynchburg, Norfolk, Petersburg, Richmond, Roanoke): **Orland J. Wages**, 210 W. Bank St., Bridgewater, Va. 22812 (phone 828-2501, ext. 91).

**WASHINGTON** (Bellevue, Port Angeles, Seattle, Spokane, Tacoma): **V. Lee Gomes**, P. O. Box 88850, Seattle, Wash. 98188 (phone 543-3860).

**WISCONSIN** (Madison, Milwaukee): **Kenneth Kuenn**, 3239 N. 81st St., Milwaukee, Wis. 53222 (phone 757-5324).

**WYOMING** (Cheyenne): **Elmer F. Garrett**, 109 E. 19th St., Cheyenne, Wyo. 82001 (phone 632-9314).



# AFA's Committees For The Coming Year

AFA's Committees, Advisory Councils, and Advisers in specialized areas of interest, serve as an invaluable source of counsel to the Association President. Pictured on this page are the members of the Committees for the current year. (Photographs of Council members and Special Advisers will appear next month.) Except as noted, the chairman and members are appointed annually by the President, who serves as an ex-officio member of all the Committees and Advisory Councils.

## EXECUTIVE COMMITTEE

Composed of the President (who also acts as Chairman), Secretary, Treasurer, and five additional members of the National Board of Directors, the Committee acts on behalf of the Board of Directors between meetings of the Board. The Executive Committee also functions as the Resolutions Committee. Members are Joe L. Shosid, Chairman, Fort Worth,

Tex.; Dan Callahan, M. D., Warner Robins, Ga.; George M. Douglas, Denver, Colo.; Jack B. Gross, Harrisburg, Pa.; Gerald V. Hasler, Endwell, N. Y.; Martin H. Harris, Winter Park, Fla.; Howard T. Markey, Washington, D. C.; Martin M. Ostrow, Beverly Hills, Calif.



Shosid



Callahan



Douglas



Gross



Hasler



Harris



Markey



Ostrow



Gross



Hardy



Harris



Keith



Ostrow

## FINANCE COMMITTEE

Composed of the Treasurer and four other members appointed by the President, the Committee is responsible for recommending fiscal policy to the AFA President. Members are Jack B. Gross, Chairman, Harrisburg, Pa.; George D. Hardy, Hyattsville, Md.; Martin H. Harris, Winter Park, Fla.; Sam E. Keith, Jr., Fort Worth, Tex.; Martin M. Ostrow, Beverly Hills, Calif.

## MEMBERSHIP COMMITTEE

One of the oldest standing committees of AFA, its function is to promote membership in the Association and to advise the President on ways and means of doing so. Members are Gen. John D. Ryan, USAF (Ret.), Chairman, San Antonio, Tex.; Paul W. Airey, CMSgt. of the Air Force (Ret.), Panama City, Fla.; Cecil G. Brendle, Montgomery, Ala.; Dan Callahan, M. D., Warner Robins, Ga.; Maj. Gen. Daniel F. Callahan,

USAF (Ret.), Nashville, Tenn.; Earl D. Clark, Jr., Kansas City, Kan.; George M. Douglas, Denver, Colo.; Paul W. Gaillard, Omaha, Neb.; James Hall, Denver, Colo.; George D. Hardy, Hyattsville, Md.; Joe Higgins, North Hollywood, Calif.; J. Gilbert Nettleton, Jr., New York, N. Y.; Gwynn Robinson, Beverly Hills, Calif.; Ed Stearn, San Bernardino, Calif.; A. A. West, Newport News, Va.; Jack Withers, Dayton, Ohio.



Ryan



Airey



Brendle



Callahan, D.



Callahan, D. F.



Clark



Douglas



Gaillard



Hall



Hardy



Higgins



Nettleton



Robinson



Stearn



West



Withers

## CONSTITUTION COMMITTEE

This Committee is responsible for a continuing review of the Association's Constitution and By-laws and for recommending to the President amendments and updating. Members are Howard T. Markey, Chairman, Washington, D. C.; John G. Brosky, Pittsburgh, Pa.; Nathan H. Mazer, Roy, Utah.



Markey



Brosky



Mazer



Shosid



Ostrow



Gross

## CONVENTION SITE COMMITTEE

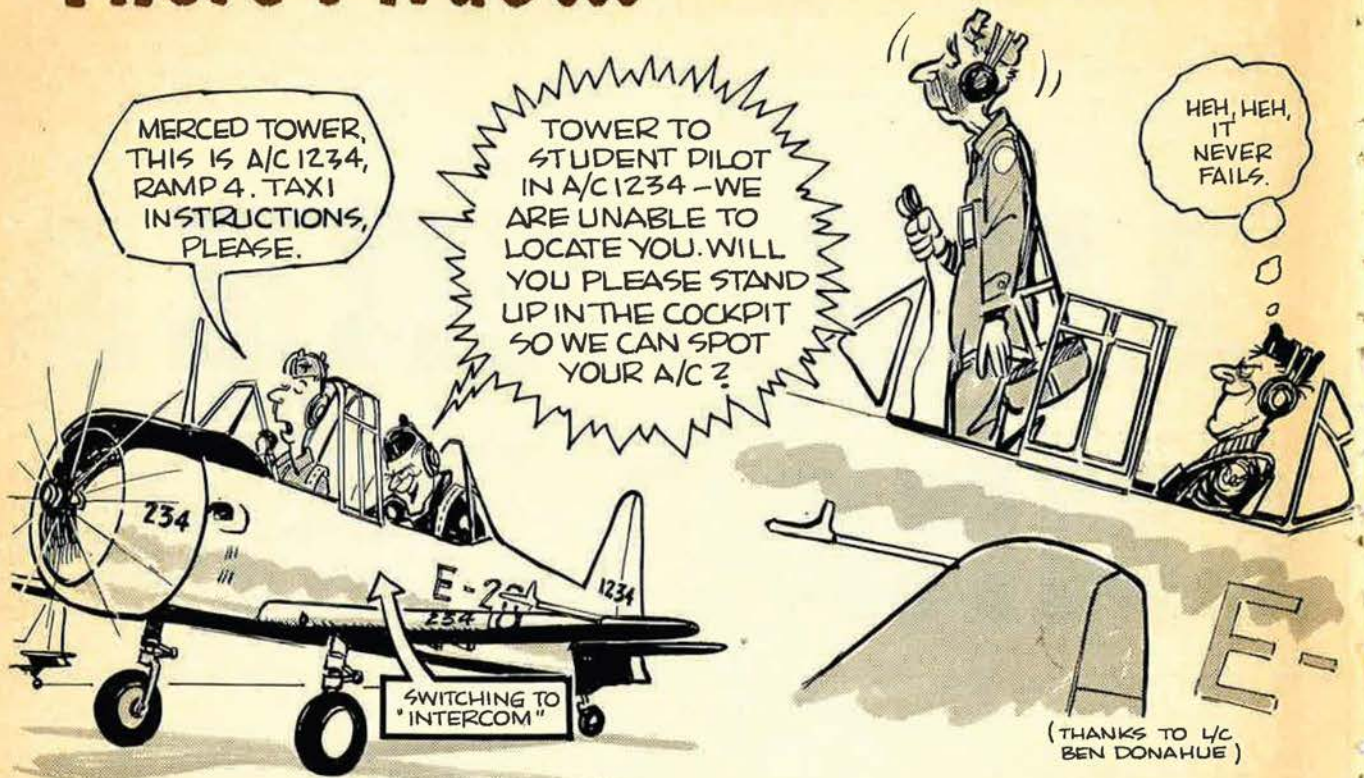
Responsible for recommending to the President suitable sites for a National Convention. Members are Joe L. Shosid, Chairman, Fort Worth, Tex.; Martin M. Ostrow, Beverly Hills, Calif.; Jack B. Gross, Harrisburg, Pa.



Bob Stevens'

# "There I was..."

Both of these stories are true, my friend, And Merced Field was the place. We yearn to be a dumbjohn again— Our motto? "Each man an Ace!"



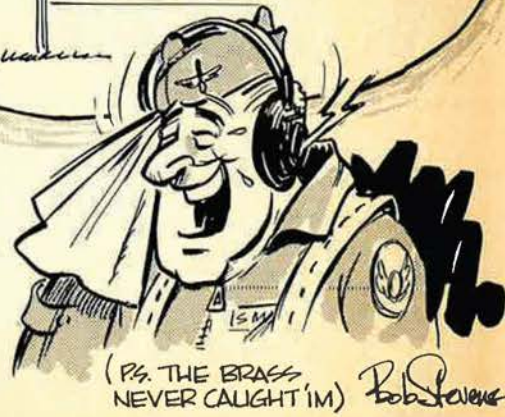
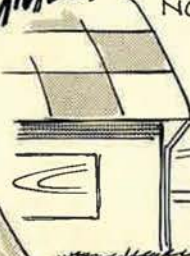
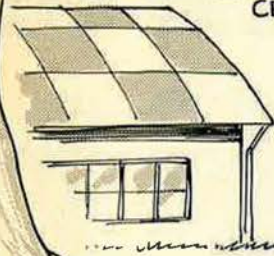
(THANKS TO LC BEN DONAHUE)

THEN THERE WAS 'DER INSTRUKTOR' (A CADET) WHO ENTERTAINED CLASS 43E - VIA RADIO :

GUTE AFTERNOON, STUDENTS - TODAY VE ARE GOING TO PRACTICE FLYING THROUGH DER HANGAR... ON DER INSTRUMENTS, YET! VIRST, APPROACH MIT DER NEEDLE UND BALL CENTERED.....

ACH HIMMEL!

SOME DUMMKOPF HAS CLOSED DER BACKDOOR / VELL, MACHT NICHTS. VE SIMPLY MAKE DER SINGLE NEEDLE VIDTH 180 DER GREE TURN TO DER RIGHT. NOW VATCH DER AIRSPEED, KEEP DER NOSE UP, ETC. ETC.



(P.S. THE BRASS NEVER CAUGHT 'IM) Bob Stevens



**Look down,  
look out, look over.  
AWACS broadens our  
defense horizons.**

Westinghouse has built 31,000 airborne radars since 1941. Now we've designed the heart of AWACS—a new radar system for extended low-level surveillance over both land and water. Able to scan an area from Florida to the Great Lakes, it will dramatically extend air-space intelligence and permit creative air-operations management. You can be sure if it's Westinghouse

AA-6-73



**Westinghouse  
helps make it happen**





## The USAF F-15 Eagle: The Fighter Pilot's Fighter.



F-15 test pilots are finding they have an airplane that's built to win.

It has a versatile mix of air-to-air armament combined with performance and staying power to engage and beat any adversary. It has the acquisition systems needed

to find and sort out targets. It has the maneuverability and acceleration to gain the advantage in the air battle arena. It has the warning systems needed to evade enemy defenses.

Test flights are proving that the F-15 can acquire,

identify, engage, and defeat any type of enemy aircraft, in any weather—not only in the projected combat environment of the theorist but in the real world where the fighter pilot must do his job.

**MCDONNELL DOUGLAS**

