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**Center for Strategic and International Studies  
1800 K Street N.W.  
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(202) 775-3270  
Access Web: [ww.csis.org](http://www.csis.org)  
Contact the Author: [Acordesman@aol.com](mailto:Acordesman@aol.com)**

# **The North African Military Balance:**

## **Force Developments in the Maghreb**

**Anthony H. Cordesman  
Center for Strategic and International Studies**

**With the Assistance of Khalid Al-Rodhan**

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Please note that this document is a working draft and will be revised regularly. To comment, or to provide suggestions and corrections, please e-mail the author at [acordesman@aol.com](mailto:acordesman@aol.com).

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# I. Introduction

There is no military balance in North Africa in the classic sense of the term. While there are still rivalries and tensions between Algeria, Libya, Morocco, and Tunisia, no state in the Maghreb now actively prepares for war with its neighbors, and the prospects of such conflict are limited at best. Several countries have had border clashes in the past, but none have approached the point of serious conflicts with each other since achieving independence. The Maghreb states only project token forces outside the Maghreb.

While several states have sent token forces to past Arab-Israeli forces, such forces were only deployed at levels approaching “token” contributions, and had no real military significance. This does not mean, however, that the region has been peaceful. Libya has had major regional ambitions in the past, and fought a war with Chad on its southern border, but its military adventures largely failed. Libya made mass arms purchases in the 1970s and 1980s, but never developed the manpower and support base to use them effectively and has been unable to sustain its arms buys because of economic problems and sanctions.

Morocco has had minor border clashes with Algeria in the past, but none had major military significance. It has long fought a war to annex the former Spanish Sahara, fighting with local forces called the Polisario. This has been a low intensity conflict, although Algeria has provided the Polisario with sanctuary and support.

The bloodiest war in the region since independence has been a civil conflict: The Algerian Civil War has now gone on for well over a decade. This war has pitted a corrupt military junta, which has ruled behind the façade of an elected government, against Islamists that effectively won a popular election in the early 1990s, and were then deprived of power. When civil war broke out, violent extremist elements among these Islamists quickly came to dominate the fighting, while the military increasingly relied on equally violent repression. This civil war consumed so many resources that it led to major cuts in Algerian military modernization, although arms purchase have risen as the military have been able to sharply reduce the Islamist threat.

Today, the military balance in North Africa consists largely of efforts to create military forces that can defend a nation’s borders, maintain internal security, and serve the purposes of national prestige. The states of North Africa have also had to adapt to the threats posed by terrorism, asymmetric warfare, and proliferation. These are not new challenges. Libya has supported terrorist and extremist movements in the past, and has been guilty of state terrorism. It has largely ended such efforts in recent years, however, and is currently making a major effort to be seen as a moderate and pragmatic regime that is primarily interested in economic development and better relations with the West. It is struggling with its own Islamic extremists. Morocco and Tunisia have never supported terrorism or extremism, and Algeria’s ruling military junta has had to fight Islamic extremists and terrorists for more than a decade.

Proliferation has been a problem. Algeria made contingency plans to acquire nuclear weapons in the late 1980s, and has examined options for acquiring long-range missiles. There is no current evidence, however, that Algeria has implemented major programs to actually acquire such capabilities or to deploy such forces. Libya has sought chemical and nuclear weapons and long-range missiles, and has some 80 Scud B missile launchers and up to 350-500 missiles. It may have examined options for acquiring biological weapons. It stated in 2003, however, that it would cease all such efforts, and opened up its nuclear facilities to inspection by the US and International Atomic Energy Agency (IAEA).

## Resources and Force Trends

The patterns in the North African military balance have been erratic at best. The newly independent Maghreb states followed the same pattern of rapid military build-up that characterized virtually all of the newly independent states in the Near East and Southwest Asia. They embarked on a wasteful military build-up and increased their military forces sharply after the Arab-Israeli conflict in 1973. This eventually led them to spend more than their national incomes could sustain. In the mid-1980s, military spending began a moderate decline, followed by a sharper decline after the collapse of the Soviet Union. Spending rose again in the late-1990s, but has not approached the levels of real spending that occurred in the 1970s.

- **Figure 1.1** provides a summary comparison of the present strength of Algerian, Libyan, Moroccan and Tunisian military forces.

- **Figure 1.2** shows the trends in military expenditures and arms imports in constant dollars. The massive decline in spending after the mid-1980s is clearly apparent, as is the fact that arms imports dropped far more quickly than military expenditures. The rise in military expenditures in the late 1990s was driven largely by the Algerian civil war, and low intensity conflict between Morocco and the Polisario. This helps explain why arms imports remained comparatively low, and it is clear that military modernization has been badly undercapitalized for more than a decade.
- **Figure 1.3** shows the same trends in terms of military effort as a percentage of GNP, central government expenditures, and arms imports as a percent of total imports. While North African states failed to properly capitalize their military forces, they did significantly reduce the impact of military spending on their economies, national budgets, and imports.
- **Figure 1.4** shows the more recent trends in military expenditures in current US dollars, drawn from a different source. Algeria clearly dominates regional military spending, driven in part by civil war and partly by the ambitions and bureaucratic momentum of its ruling military junta, and fueled by its oil and gas exports. Morocco has maintained high spending levels, largely because of the continuing cost of its war with the Polisario. Libyan military spending has continued to decline because of its impact of its economic problems and US and UN sanctions. Tunisia has never attempted to build-up major military forces.
- **Figure 1.5** shows how the regional trends in North African arms imports compared with those in other regions between 1985 and 1999. It is clear that North Africa was never a significant part of the world arms trade in spite of the ambitions of several regional states.
- **Figure 1.6** highlights the sharp decline in arms imports as a percent of total imports. One the one hand this reveals a significant drop in the impact of arms imports on local economies. On the other hand, it illustrates just how sharply North African states – none of which has significant domestic military industries – have undercapitalized the modernization of their military forces.
- **Figure 1.7** provides more current data on new arms orders and deliveries. They show that recent Algerian new orders have not declined consistently and that significant arms deliveries took place between 1995 and 2002. Libya exhibits a consistent, precipitous decline in arms orders and deliveries. Morocco shows a less steep decline, and Tunisia shows an increase in deliveries during 1995-1998 – although the amounts involved are so small that they scarcely constitute a military build-up.
- **Figure 1.8** shows recent arms imports by supplier country. Morocco and Tunisia are the only countries to have received US arms, and there have been no recent orders. Morocco has depended largely on Europe for its arms, although again new orders dropped sharply between 1987 and 2002. Libya has only placed limited orders, and has not placed significant orders with any country capable of supplying it with the most advanced weapons. It did step up its new orders during 1999-2002, however, reflecting an easing of UN sanctions and the ability to import arms from developing countries that are less careful about UN sanctions. Algeria has relied largely on Russia and East Europe, and placed significant new orders during 1995-1998.
- **Figure 1.9** highlights just how serious the decline in Libyan military efforts were between the mid-1980s and 2000, revealing a sharp imbalance between continued military spending and inadequate arms imports during most of the 1990s.
- **Figures 1.10 and 1.11** reveal other imbalances in North African military efforts. Most countries maintained larger manpower and equipment pools than they could afford to sustain. All of the Maghreb states except Tunisia bought more military equipment during the 1970s and 1980s than they can now adequately support. Like many less developed countries, the Maghreb states confused weapons numbers and the "glitter factor" of buying advanced weapons technology with military effectiveness. Algeria, Libya, and Morocco saturated their military forces with weaponry between 1972 and 1985 without buying proper support, sustainability, and C<sup>4</sup>I equipment. They created teeth-to-tail ratios about two to three times the proper ratio for military effectiveness.
- **Figure 1.12** shows the most recent data on how North Africa military manpower by service. It should be noted that the training and equipment levels for almost all reserve forces in Maghreb countries are so low that manpower numbers have little real military value. Algeria's force structure reflects a heavy emphasis on the paramilitary forces needed to fight its civil war. Morocco's large army reflects the need to maintain large forces to protect the south from Polisario attack. As later figures show, Libya has very low manning

levels for its total equipment holdings. Tunisia's distribution of military manpower is what might be expected of a small and defensive military power.

The cumulative message of these Figures is that the force structures of Algeria, Libya, and Morocco grew to the point where their economies no longer could provide the funding for the equipment, manpower, training, logistics, infrastructure, and sustainability necessary to make these force structures effective. This over-expansion of the total force structure was particularly severe in the case of Libya, which sized its forces based on its peak oil revenues in 1981 and 1982, when it spent over 12% of its GNP on its military forces. Libya has never been able to find the resources or manpower to use more than half of the equipment it bought, and cut military spending to around 5-6% of its GNP after 1993.<sup>1</sup> This resulted in substantial waste, and many purchases were rendered nearly useless by the lack of proper support. As arms spending decreases, nations often let portions of their older equipment become inoperable or obsolete. Algeria and Libya are only spending a small fraction of their military budget on the modernization that is necessary to recapitalize their forces.

The Maghreb states have seen conscription, and the expansion of military manpower, as a useful means of providing employment and ensuring the loyalty of their youth. These efforts at nation building have complemented a similar expansion of national civil service and employment in the state sector of the economy. This approach to nation-building helped lead to over-expansion of their forces during the early 1980s and the creation of large armies filled with poorly trained men. The cost of maintaining large pools of military manpower helped to diminish economic growth during the early and mid-1980s, and this situation has continued ever since in spite of cuts in total manning after that date.

The military value of such an approach to military manpower is dubious for other reasons. Conscript service is often touted as a form of education and nation building. In practice, it has helped disguise unemployment, but the training conscripts actually receive has little value in training and educating young men. Conscript service has also proven to do little to win the loyalty of young men, aid in internal stability, and serve the cause of "nation-building". It has often been either a source of added alienation or a schooling in propaganda and repression.

Like most developing countries, the Maghreb states have long under funded advanced training and the other aspects of manpower quality for their full-time and career forces. None of the Maghreb states have maintained average military expenditures per man in uniform high enough to maintain effective manpower quality and retain technically trained manpower. Morocco and Tunisia have done better than the others. All the Maghreb states have had serious problems in adapting their military organization and discipline to take into account the need for far more skilled junior officers and non-commissioned officers (NCOs). The Maghreb states have also demonstrated poor management of military personnel and career structures.

Several detailed national trends that helped shape the trends in the previous **Figures 1.1 to 1.12** are worth noting:

- Algeria has a force structure of over six active division equivalents with a total Army manpower of only 110,000 men, 75,000 of which are poorly trained conscripts. In addition, it has six military regions that require military manpower. This force structure has sharply over-stretched its army and made effective force planning impossible. Things have been made worse by rampant corruption at the highest levels of the Algerian officer corps.
- Algeria did a relatively good job of buying armor before its civil war began in the late 1980s, but it spent too much on artillery quantity and too little on artillery and infantry mobility and quality. It bought a poor mix of relatively low quality anti-tank weapons and air defense systems. Since that time, it has increased its paramilitary forces to over 181,200 men to deal with its civil war – compounding all of its military planning, force structure, and force modernization problems.
- The Algerian Air Force has only bought a limited number of modern air defense fighters for a force with a total of 175 combat aircraft and 91 armed helicopters, and has bought only 10 modern Su-24 attack aircraft. It has long sought to buy aircraft like the MiG-29 and Su-24, but has not had the money. Its surface-to-air missile defenses are early to late 1970s technology and are now vulnerable to commercially available electronic warfare capabilities and any force with modern anti-radiation missiles.
- Until the late 1980s, Algeria gave its more advanced units with heavy armor and advanced aircraft adequate funding, but sharply under funded its overall manpower and support structure. Since the late 1980's it has had to concentrate its resources on fighting a steadily intensifying civil war and this meant it had to sharply under fund its equipment modernization..

- Tunisia has provided reasonable wages for its career officers, but has done little to turn its many 12-month conscripts into effective soldiers.
- Libya has invested in equipment and facilities rather than a sound manpower, infrastructure, and support base. Its poorly trained conscripts and "volunteers" suffered a decisive defeat in Chad at the hands of lightly armed Chadian forces. Its forces have since declined in quality.
- Libya's military equipment purchases have been chaotic. During the Cold War and the period before Libya was placed under UN sanctions, its arms buys involved incredible waste and over-expenditure on equipment. They were made without regard to providing adequate manpower and support forces, and they did not reflect a clear concept of force development or combined arms.
- Libya's adventures in trying to influence events in other states, and its disastrous military intervention in Chad, involved comparatively little actual use of Libya's total forces. Libya did, however, have a powerful catalytic effect on the military build-up of other states in the region. As bad as Libya's military forces were, no neighbor could ignore the build-up of a vast pool of military equipment and Libya's large numbers of Soviet bloc advisors.
- Libya has to keep many of its aircraft and over 1,000 of its tanks in storage. Its other army equipment purchases require far more manpower than its small active army and low quality reserves can provide. Its overall ratio of weapons to manpower is militarily absurd, and Libya has compounded its problems by buying a wide diversity of equipment types that make it impossible to create an effective training and support base.
- Morocco's continuing low-level tensions with Algeria and Mauritania, and its nearly two decade long war with the Polisario over the control of the Western Sahara, are the key factors shaping its force trends. It is interesting to note, however, that Morocco's arms purchases were not particularly well suited to dealing with a low-level guerrilla threat until 1982-1983. As late as 1992, Morocco's combat engineering efforts reflected a sounder pattern of purchases for dealing with the Polisario than did its weapons buys. These problems were partly the result of the fact that the Moroccan army was still focusing on a possible confrontation with Algeria, rather than on the conflict with the Polisario.
- Morocco then spent much of its money on maintaining a force of 100,000-150,000 men in the Spanish Sahara. This force became relatively effective by the early 1990s, and has effectively defeated its opposition. Morocco still is unable to fund adequate force modernization, however, and has bought so many different types of major land weapons over the years that that it finds it difficult to keep its support costs at reasonable levels, to provide proper training, and to maintain suitable C<sup>4</sup>I battle management capability.
- Morocco has maintained a higher real average of spending per man in its career forces than the other Maghreb states, but it still under funds and under-trains its conscripts and enlisted men.
- The Moroccan Air Force has a better balance of equipment type than its armed forces or naval forces. Nevertheless, Morocco still relies on obsolescent F-5s and Mirages F-1s, and its purchase of both French and U.S. types of combat aircraft has increased its training and support problems. Morocco also has no meaningful surface-to-air missile defenses.
- Tunisia began to acquire modern armor and fighter aircraft in 1985, but still has bought only limited numbers of weapons. It has done a reasonably good job of expanding its army and air force, but its force size and equipment holdings are inadequate for combat with either of its larger neighbors. They also include too many types of equipment to allow for effective organization and support.
- Money still severely limits the size and modernization of the Tunisian force structure. In early 2005, it had only 35,000 actives, of which 22,400 were conscripts. Its only modern armored consisted of 54 M-60A3 and 30 older M-60A1 tanks and its 140 M-113 armored personnel carriers. It had no self-propelled artillery, and its most modern aircraft consisted of 12 aging F-E/Fs. It had no modern attack helicopters and no major surface-to-air missiles.



**Figure 1.1****Algerian, Libyan, Moroccan, and Tunisian Forces in 2005**

<b>Category/Weapon</b>	<b>Algeria</b>	<b>Libya</b>	<b>Morocco</b>	<b>Tunisia</b>
<u>Manpower</u>				
Total Active	127,500	76,000	196,300	35,000
(Conscript)	75,000	38,000	100,000	23,400
Total Regular	-	76,000	196,300	35,000
Royal/Special Guard and Other	0	?	1,500	-
Total Reserve	150,000	40,000	150,000	-
Total Active and Reserve	277,500	116,000	346,300	35,000
Paramilitary	181,200	?	50,000	12,000
<u>Land Forces</u>				
Active Manpower	110,000	45,000	175,000	27,000
(Conscripts)	75,000	25,000	100,000	22,000
Reserve Manpower	150,000	-	150,000	-
Total Active and Reserve Manpower	260,000	45,000	325,000	27,000
Main Battle Tanks	1,000	800(1,040)	520(224)	84
AIFVs/Armored Cars/Lt. Tanks	989	1,000	215	54
APCs/Recce/Scouts/Half-Tracks	903	1,065	1,064	327
ATGM Launchers	-	3,000	720	600
SP Artillery	185	444	227	-
Towed Artillery	406	647	185	117
MRLs	144	830	40	-
Mortars	330+	500	1,470	191
SSM Launchers	-	125	0	0
AA Guns	899	600	425	115
Lt. SAM Launchers	1,000+	2,500+*	107	74
<u>Air &amp; Air Defense Forces</u>				
Active Manpower	10,000	23,000	13,500	3,500
(Air Defense Only)	NA	?	-	-
Reserve Manpower	-	-	-	-
(Air Defense Only)	NA	?	-	-
<u>Aircraft</u>				
Total Fighter/FGA/Recce	175	380	95	29
Bomber	0	6	0	0
Fighter	83	235	15	0
FGA/Fighter	66	172	54	12
Other Combat Unit (OCU)	-	-	-	5
Recce	12	11	6	0
Airborne Early Warning (AEW/EW)	0	0	4	0
Maritime Reconnaissance (MR)	15	0	0	0
Combat Capable Trainer	10	23	24	-
Tanker	0	0	3	0
Transport	27	83	33	16
<u>Helicopters</u>				
Attack/Armed/ASW	91	60	24	15
Other	50	90	88	43
Total	141	150	112	58
<u>SAM Forces</u>				
Batteries	9	39	-	-
Heavy Launchers	43	236	-	-
Medium Launchers	-	-	-	-
AA guns	-	4+	-	-

Naval Forces

Active Manpower	7,500	8,000	7,800	4,500
Regular Navy	7,500	8,000	6,300	4,500
Naval Guards	-	-	-	-
Marines	-	-	1,500	-
Reserve Manpower	-	-	-	-
Total Active & Reserve Manpower	7,500	8,000	7,800	4,500
Submarines	2	1(4)	0	0
Destroyers/Frigates/Corvettes	9	2	2	0
Missile	6	2	2	0
Other	3	0	0	0
Missile Patrol	9(2)	8(22)	4	6
Coastal/Inshore Patrol	10	-	23	13
Mine	0	2	0	0
Amphibious Ships	3	3(2)	4	0
Landing Craft/Light Support	3	12	4	2
MPA/ASW/Combat Helicopter	0	7	2	0

\* Extensive, but unknown amounts inoperable or in storage.

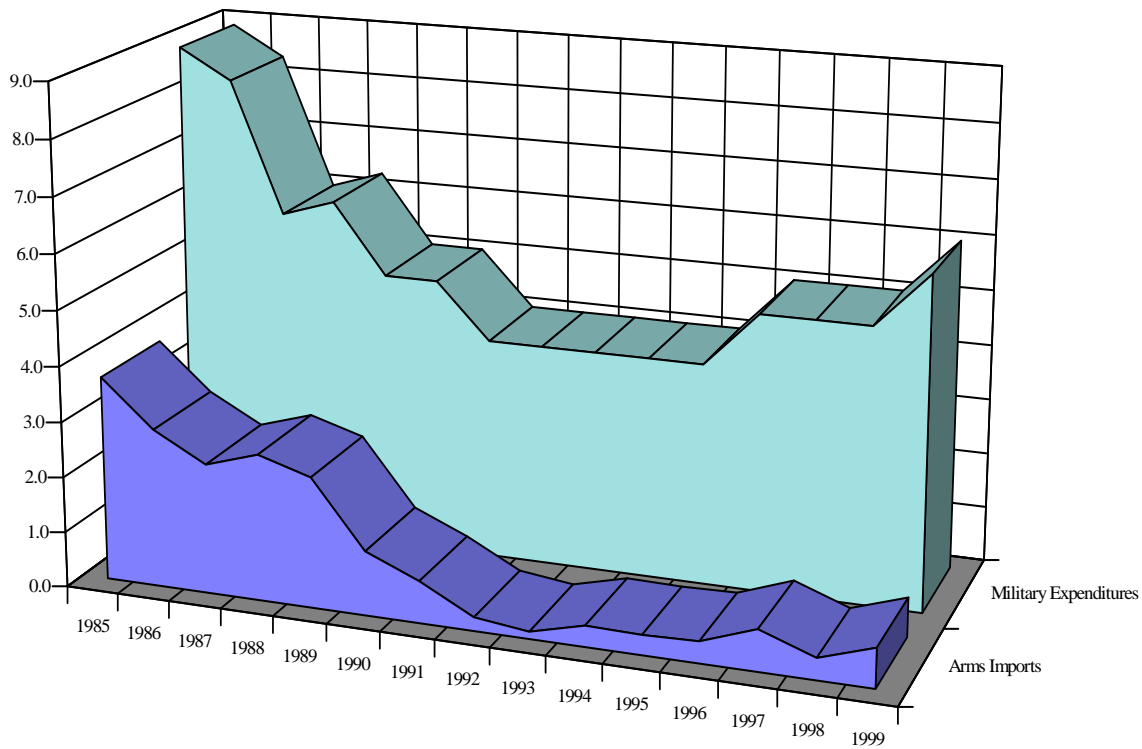
Note: Figures in parenthesis are additional equipment in storage. Total equipment holdings for the Iranian land forces include 470 tanks, 620 other armored vehicles, 360 artillery weapons, 40 rocket launchers, and 140 anti-aircraft weapons with the land units of the Revolutionary Guards. Iranian & Iraqi attack helicopters are in the army. Only about 60% of the US supplied fixed wing combat aircraft in Iran are operational and 80% of the Chinese supplied aircraft.

Source: Adapted by Anthony H. Cordesman from data provided by US experts, and the IISS, Military Balance, 2003-2004, 2004-2005.

**Figure 1.2**

**North African Military Expenditures and Arms Transfers in Constant Dollars Have Dropped to Low Levels by Global Standards**

(Algerian, Libyan, Moroccan, and Tunisian spending in Constant \$US 1999 Billions)

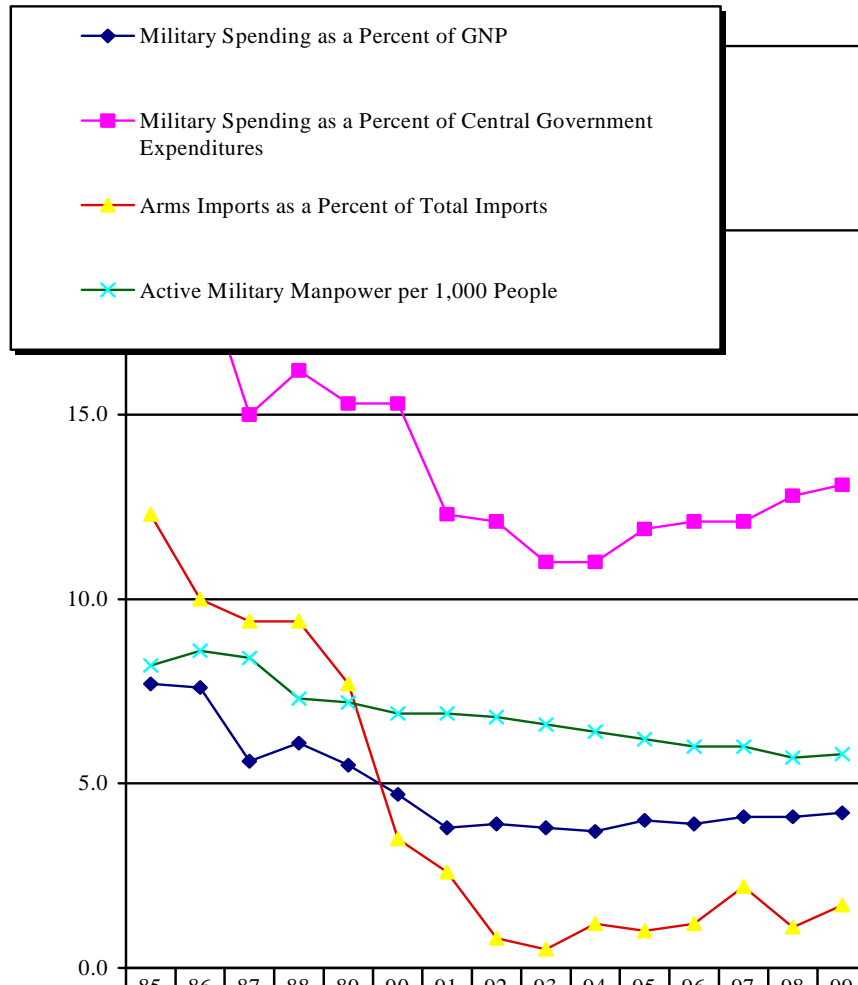


	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
■ Arms Imports	3.7	2.9	2.3	2.6	2.4	1.2	0.8	0.3	0.1	0.4	0.4	0.4	0.7	0.4	0.7
■ Military Expenditures	8.9	8.3	6.0	6.3	5.0	5.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	6.0

Source: Adapted by Anthony H. Cordesman from Bureau of Arms Control in the US State Department (formerly US State Department, Bureau of Arms Control), World Military Expenditures and Arms Transfers, various editions.

**Figure 1.3**

**North African Military Efforts Declined Sharply as a Percent of GNP, Government Expenditures, Imports, and Total Population: 1985-1999**



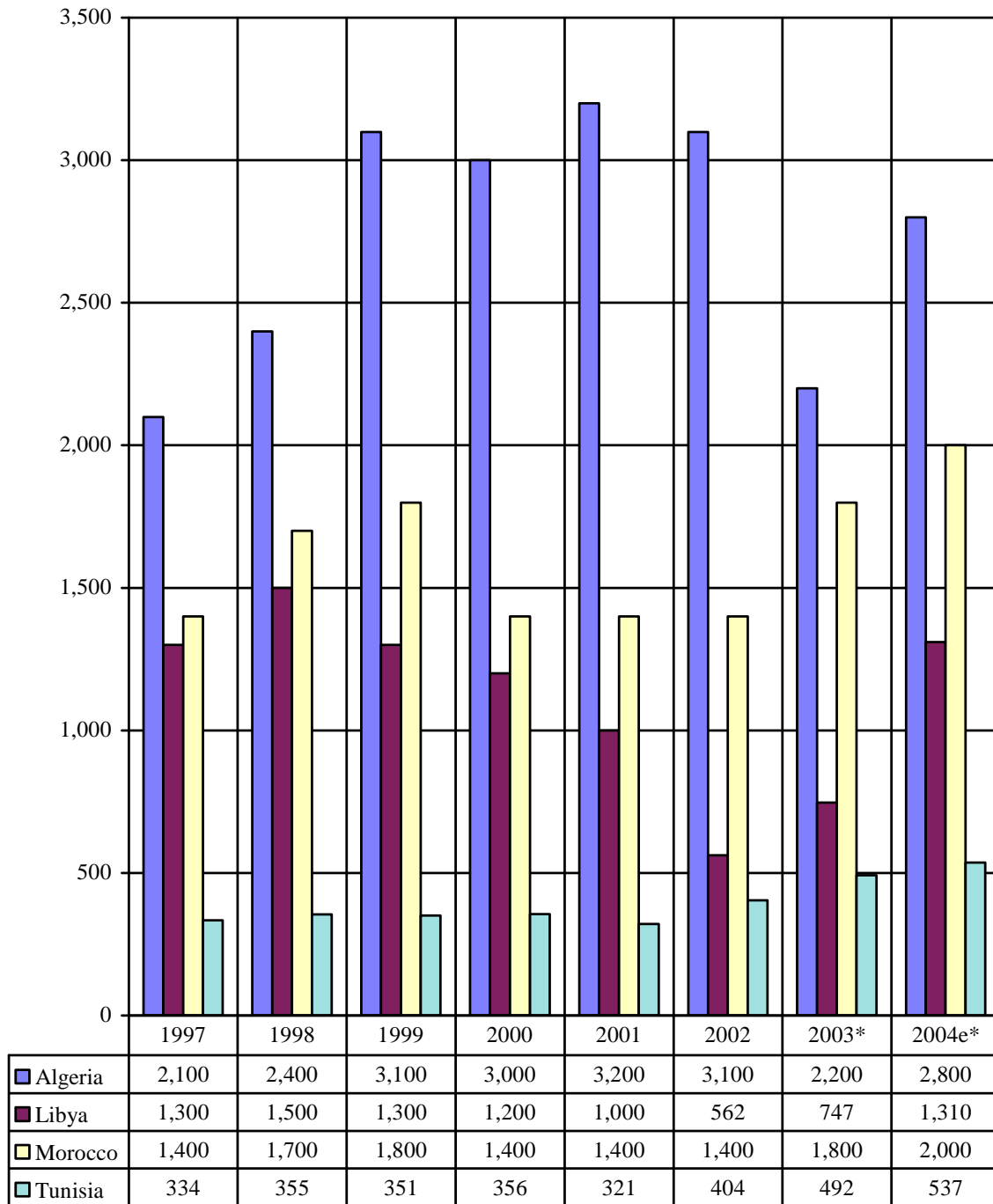
	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
◆ Military Spending as a Percent of GNP	7.7	7.6	5.6	6.1	5.5	4.7	3.8	3.9	3.8	3.7	4.0	3.9	4.1	4.1	4.2
■ Military Spending as a Percent of Central Government Expenditures	19.5	19.1	15.0	16.2	15.3	15.3	12.3	12.1	11.0	11.0	11.9	12.1	12.1	12.8	13.1
▲ Arms Imports as a Percent of Total Imports	12.3	10.0	9.4	9.4	7.7	3.5	2.6	0.8	0.5	1.2	1.0	1.2	2.2	1.1	1.7
× Active Military Manpower per 1,000 People	8.2	8.6	8.4	7.3	7.2	6.9	6.9	6.8	6.6	6.4	6.2	6.0	6.0	5.7	5.8

Source:

Adapted by Anthony H. Cordesman from US State Department, World Military Expenditures and Arms Transfers, various editions, GPO, Washington. Middle East does not include North African states other than Egypt.

**Figure 1.4**

**North African Military Expenditures by Country: 1997-2004**  
(in \$US Current Millions)

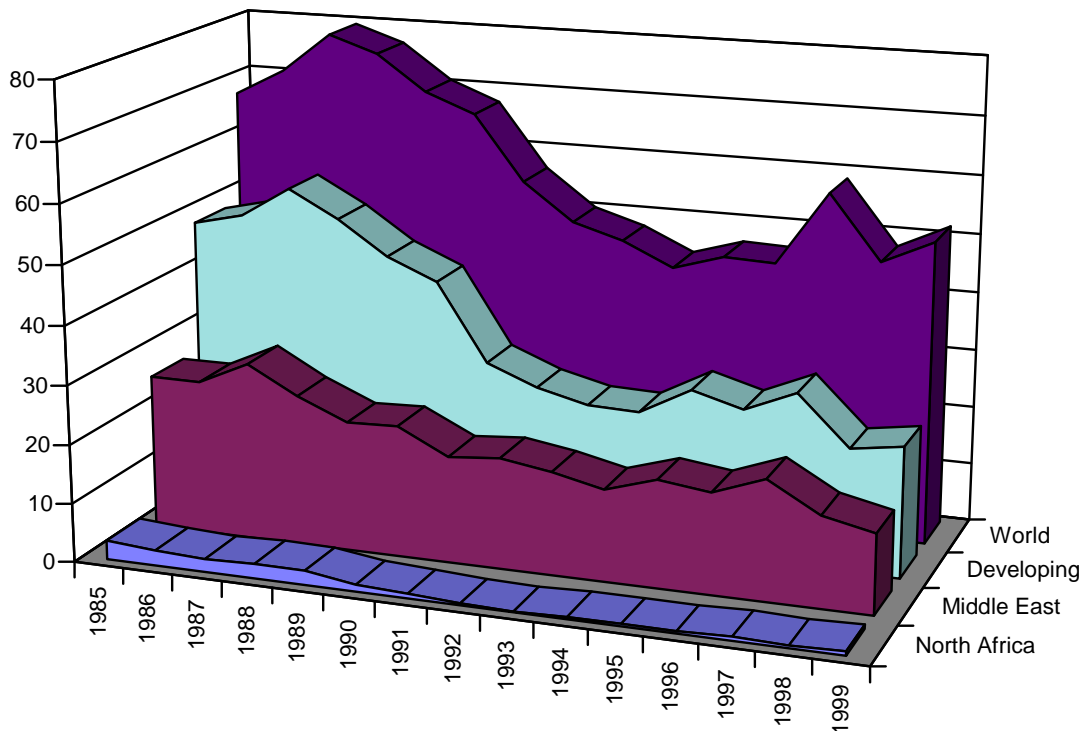


Source: Adapted by Anthony Cordesman from the ISS, Military Balance, various editions. \* Note that the ISS does not report military expenditures, but they report military budget, which does not included any procurement costs.

**Figure 1.5**

**North African Arms Deliveries Are Declining, and Are a Minor Portion of the World Market: 1985-1999**

(Arms Deliveries in Constant \$US 1999 Billions)

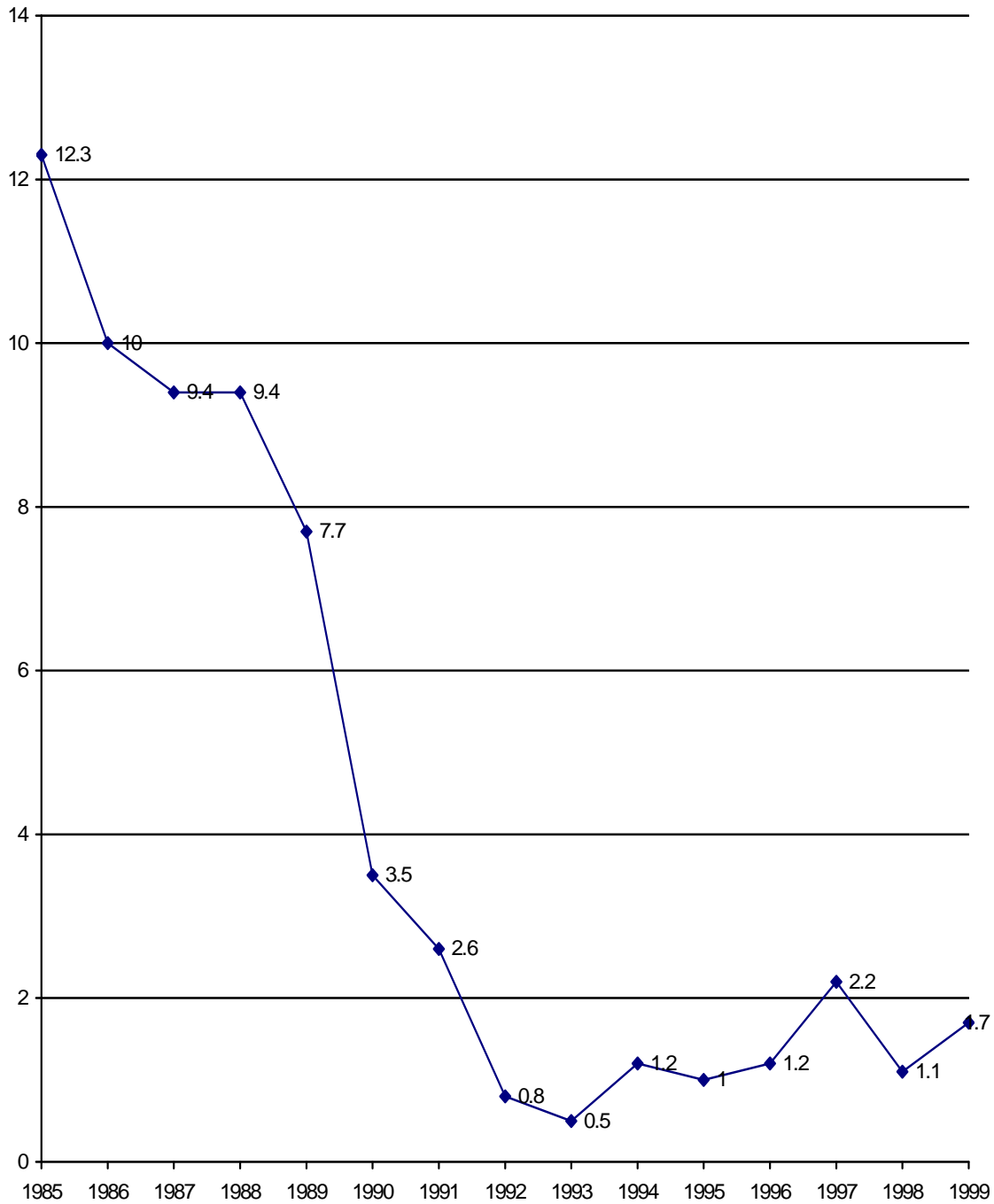


	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
■ North Africa	3.2	2.6	2.2	2.5	2.4	1.2	0.8	0.3	0.1	0.4	0.4	0.4	0.7	0.4	0.7
■ Middle East	26.2	26.2	30.2	25.6	22	22.3	18.1	18.8	17.5	15.5	18.2	17.1	20.3	15.4	13.5
■ Developing	48.7	50.7	56	51.5	45.8	42.2	29.1	25.7	23.6	23.3	28	25.6	29.3	20.9	22.2
■ World	67.9	72.5	79.3	76.5	70.5	67.2	56.2	49.9	47.4	43.5	46.1	45.8	58.4	47.5	51.6

Source: Adapted by Anthony H. Cordesman from Bureau of Arms Control in the US State Department, World Military Expenditures and Arms Transfers, various editions. Middle East does not include North African states other than Egypt.

**Figure 1.6**

**North African Arms Imports as a Percent of Total Imports: 1985-1999**

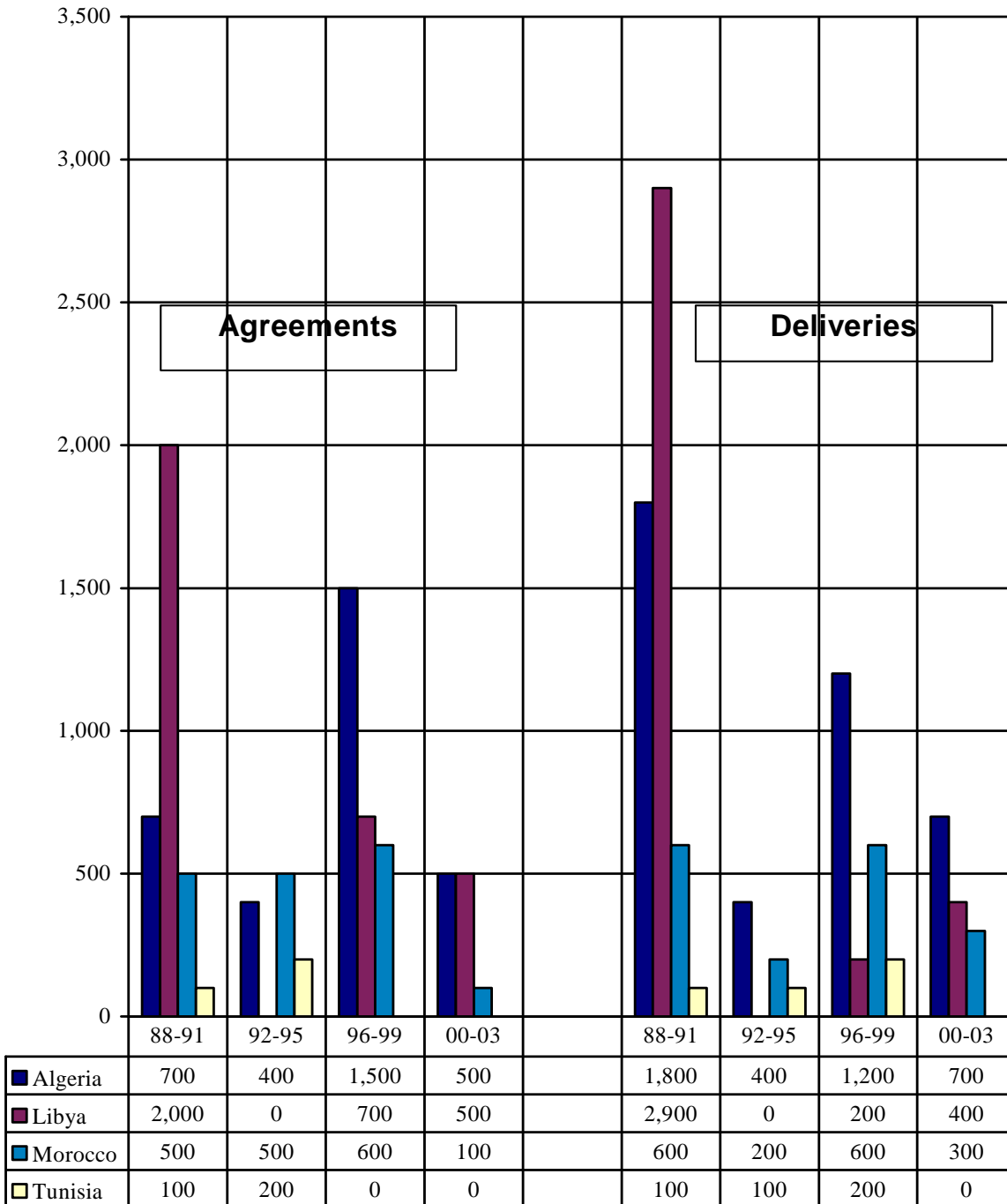


Source: Adapted by Anthony H. Cordesman from Bureau of Arms Control in the US State Department, World Military Expenditures and Arms Transfers, various editions. North Africa does not include Egypt.

**Figure 1.7**

**North African New Arms Agreements and Deliveries by Country: 1988-2003**

(in \$US Current Millions)



0 =

Data less than \$50 million or nil. All data rounded to the nearest \$100 million.

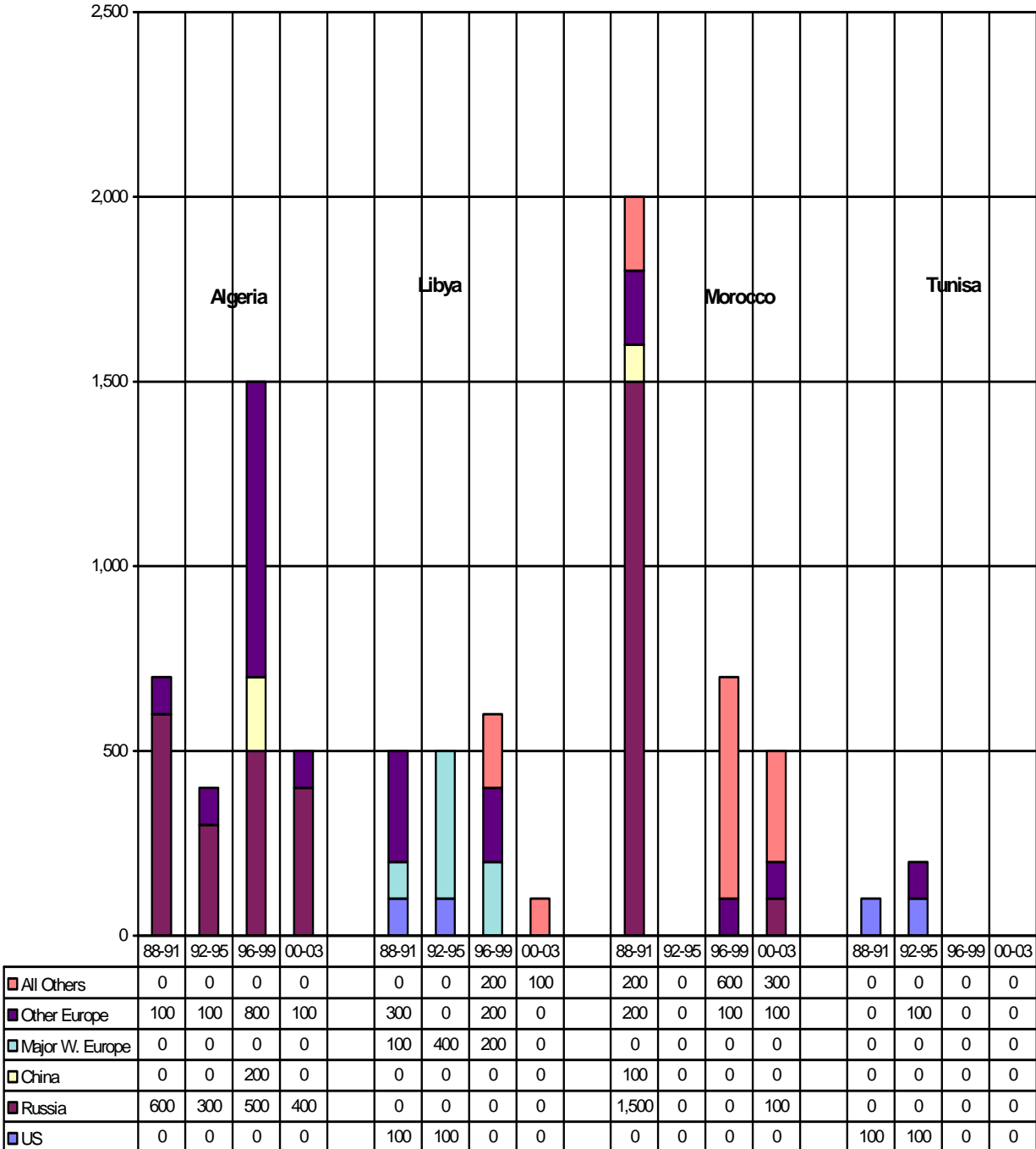
Source: Richard F. Grimmett, Conventional Arms Transfers to the Developing Nations, Congressional Research Service, various editions.



**Figure 1.8**

**New North African Arms Orders by Supplier Country: 1988-2003**

(Arms Agreements in \$US Current Millions)



0 = less than \$50 million or nil, and all data rounded to the nearest \$100 million.

Source: Adapted by Anthony H. Cordesman, CSIS, from Richard F. Grimmett, Conventional Arms Transfers to the Developing Nations, Congressional Research Service, various editions.

**Figure 1.9**

**The Decline in Libyan Spending and Arms Imports: 1986-1999**

(Constant \$US 1999 Millions)

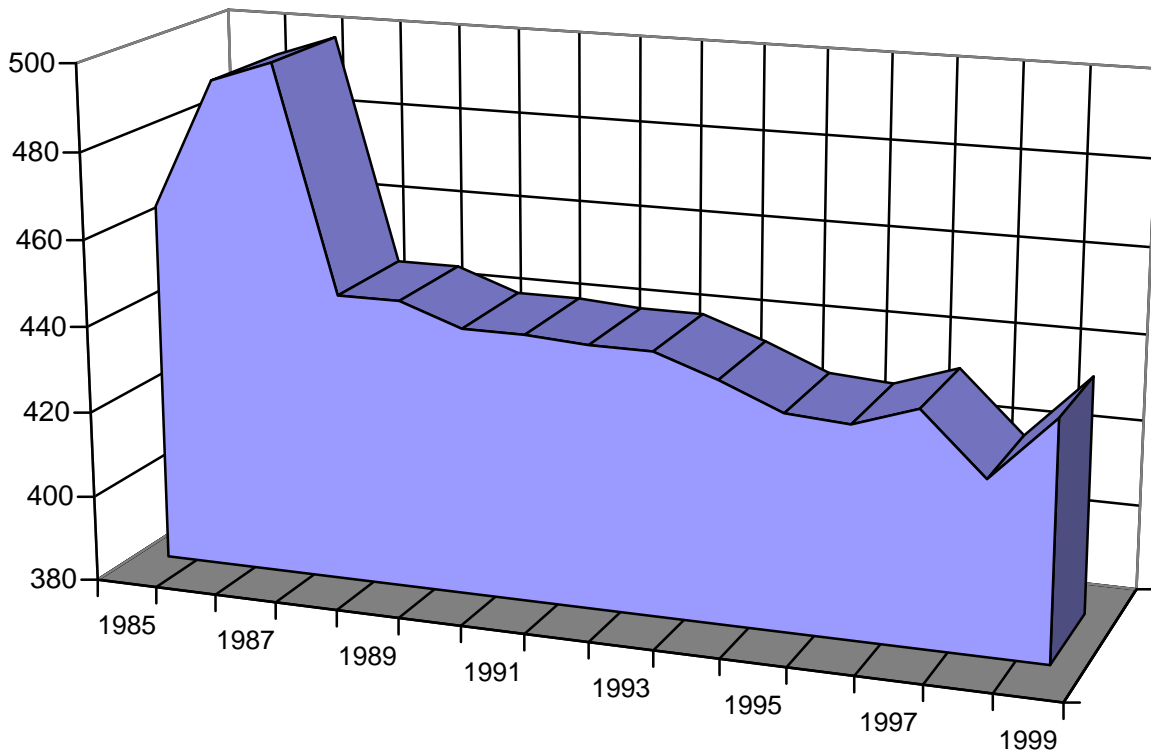


Source: Adapted by Anthony H. Cordesman from US State Department, *World Military Expenditures and Arms Transfers*, GPO, Washington, various editions. Some data adjusted or estimated by author.

**Figure 1.10**

**Trends in North African Military Manpower**

(Algerian, Libyan, Moroccan, and Tunisian Military Manpower in Thousands)

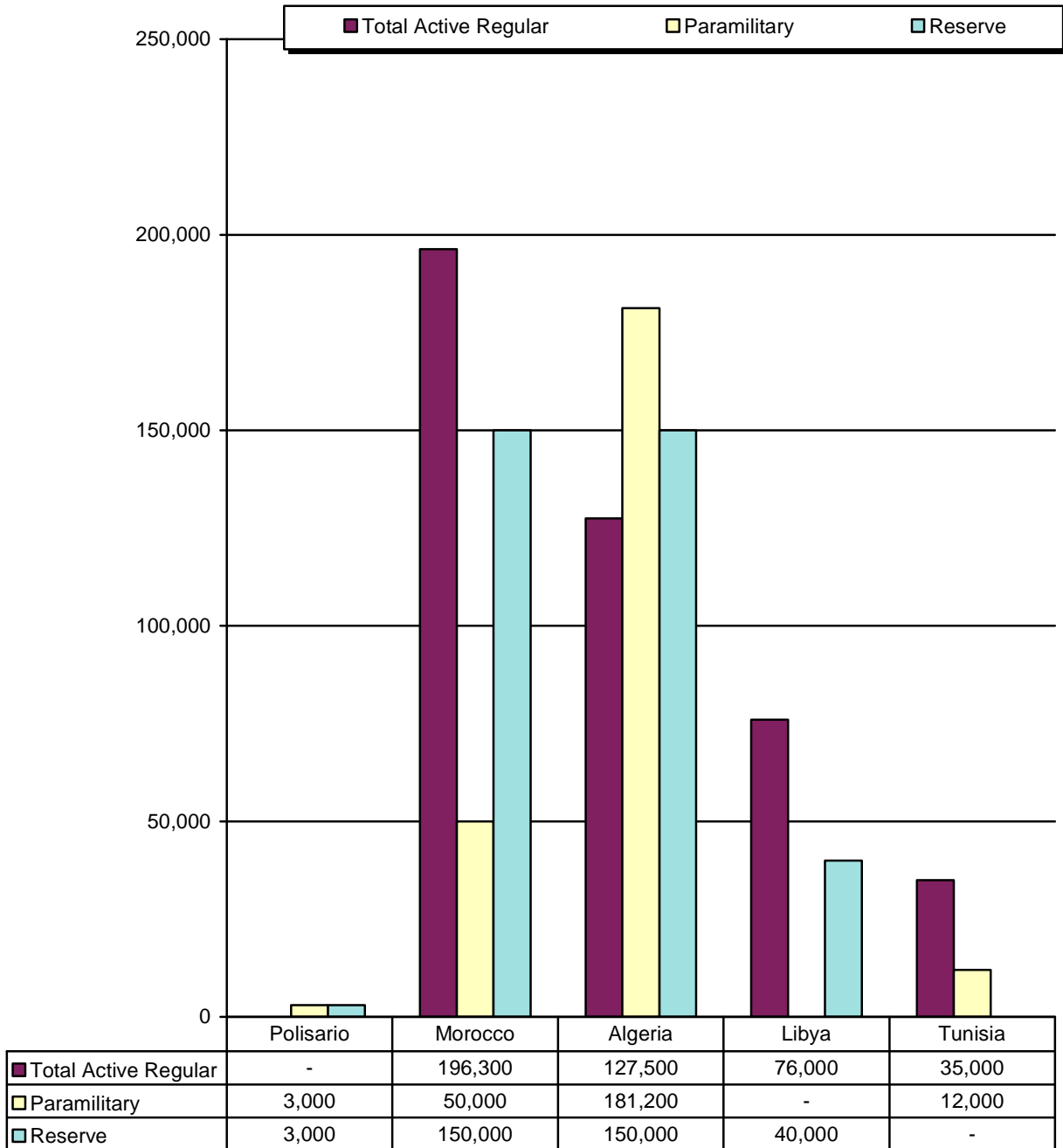


	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
■ Manpower	464	494	499	447	447	442	442	441	441	436	430	429	434	420	435

Source: Adapted by Anthony H. Cordesman from the US State Department, World Military Expenditures and Arms Transfers, various editions. Middle East does not include North African states other than Egypt.

**Figure 1.11**

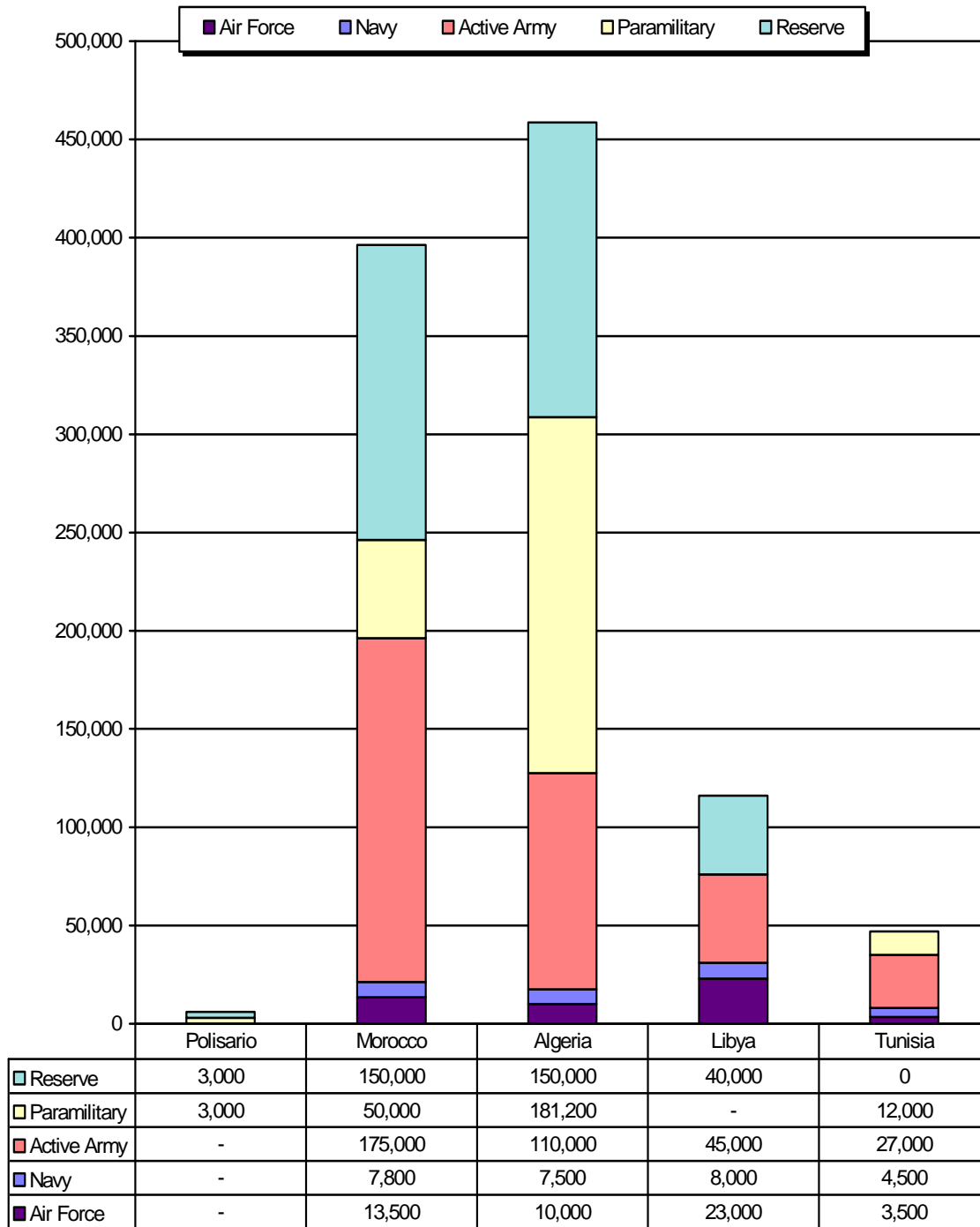
**Total Manpower in North African Military Forces in 2005**



Source: Adapted by Anthony H. Cordesman from IISS, *The Military Balance*, various editions.

**Figure 1.12**

**Total Regular Military Manpower in North African Forces by Service in 2005**



Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, and JCSS, *Military Balance in the Middle East*, various editions.

## II. National Military Forces

Each of the nations of North Africa has taken a different approach to developing its military forces. These national patterns may be summarized as follows:

### The Military Forces of Morocco

Morocco's only major external threat is Algeria, which no longer presents a significant risk. Its military spending is driven largely by its war with Polisario for control of the Western Sahara, and by factors like bureaucratic momentum, regional rivalries with Algeria and Spain, and the search for status and prestige. This spending consumes some 4-5% of Morocco's GNP, and 13-14% of its national budget. This is not high by regional standards, but Morocco has a sharply rising population, massive unemployment, and desperately needs resources for economic development. Military spending and the war in the Western Sahara are a major burden on the country.

The trends in Moroccan military forces are shown in **Figure 2.1**. Morocco's military forces and budget has increased steadily since 1975, with a large jump in expenditures between 1985 and 1990, during its war with the Polisario. Morocco's total manpower and land forces shot up during that period as well. Total manpower increased from 149,000 in 1985 to 192,500 in 1990. Its land forces rose from 130,000 men to 175,000 men in that period. Since 1990, there have been only limited changes in total force size.

In 2005, Morocco had a total of 196,300 actives, with 150,000 army reserves. Its land forces had an inventory of 744 main battle tanks, 559 armored infantry fighting vehicles (AIFVs), 785 armored personnel carriers (APCs), 255 self-propelled (SP) artillery, 190 towed artillery, and 39 multiple rocket launchers (MRLs). Its air forces had a total of 95 combat aircraft and 24 attack helicopters. Its navy possessed one major surface ship, four missile patrol craft, 23 other patrol craft, and 4 amphibious ships.

### Moroccan Army

The 175,000-man Moroccan army is the only force in the Maghreb that has recently had to train and organize for serious combat, although this combat has consisted largely of guerrilla warfare. The army is organized into two major commands: Northern Zone (Rabat) and Southern Zone (Agadir). The Northern Zone deals largely with defense of the Algerian border and internal security. The Southern Zone is organized to fight the Polisario. The order of battle alters to deploy the forces necessary to deal with the threat in the Western Sahara at any given time.

The Army has three mechanized infantry brigade headquarters, one light security brigade, two paratroop brigades, and eight mechanized/motorized infantry regiments (2-3 battalions each). It also has an exceptionally large number of small independent units. These include 11 armored battalions, 39 infantry battalions, three motorized (camel corps) battalions, one mountain battalion, two cavalry battalions, 9-12 artillery battalions, one air defense group, seven engineering battalions, 4-7 commando units, and two airborne battalions.

The Moroccan army has a significant number of conscripts, but also has a strong cadre of experienced regulars. Morocco's large population and low per capita income have led many poorer Moroccans to make the army a career. The pay and benefits are adequate, and living conditions are acceptable, even in the camps and strong points in the south. Training, however, is still erratic and much of it is conducted at the unit level. This leads to very different levels of effectiveness, depending upon the particular unit involved.

A 50,000-man reserve exists on paper, but – as is the case with virtually all reserve forces in the Middle East -- most of this manpower serves little real purpose. There is little reserve training, and there are few combat ready officers, other ranks, and specialists with the kind of current warfighting skills the army would need in war. The only combat effective reserves would be men called back to units they had recently left. The paramilitary Force Auxillaire is probably more effective. It is a 30,000-man force designed to reinforce the army in a campaign against Algeria, and would provide service support and rear area security. It also includes a 5,000 man Mobile Intervention Force that is fully equipped with light armored vehicles and Land Rovers, and with automatic and crew-served weapons. The Force Auxillaire has also been used successfully in rear area security operations against the Polisario.

The Gendarmerie Royal is a 15,000-20,000-man support force that includes a wide range of state security functions. It is headquartered in Rabat and has heavy elements that can deal with major internal security threats. Its order of battle includes a Special Brigade, Mobile Group South, Mobile Group North, Air Squadron, and Coastguard Support elements.

The army is deployed to concentrate Morocco's armored forces in the North and a large anti-guerrilla force in the south. This reflects its long-standing emphasis on deterring Algeria, while fighting the Polisario. There is one Royal Guard battalion, a mountain battalion, an armored squadron, a mechanized squadron, a cavalry squadron, and an artillery group in the Northwest Atlas. The border is defended by two mechanized infantry regiments, three infantry battalions, one camel corps battalion, two armored squadrons, and one artillery group.

There normally are three mechanized infantry brigades, nine mechanized infantry regiments, 25 infantry battalions, two paratroop battalions, two camel corps battalions, four armored squadrons (with UR-416 APCs), and seven artillery groups in the south. Morocco also plays a significant peace keeping role. One additional Moroccan battalion with 360 men is deployed in Equatorial Guinea, Moroccan troops are with the UN force in Angola, and Morocco deployed 5,000 men in the UAE during the Gulf war, including a 700-man paratroop unit. In addition, Morocco has deployed 800 soldiers in one motorized infantry brigade to aid the UN peacekeeping efforts in Bosnia.

Morocco's purchases of 224 M-48A5, 300 M-60A1, 120 M-60A3, and 100 T-72 main battle tanks have given the army adequate heavy armor. However, most of the M-48A5s remain in storage. Morocco also had an additional 100 SK-105 Kuerassier light tanks, but these are obsolescent. Overall levels of tank training are limited to adequate, and Morocco only conducts limited maneuver and large unit training.

Reports differ as to the strength and types of other fighting vehicles in Moroccan forces, but its armored reconnaissance strength seems to include 16 EBR-75, 80 AMX-10RCs, 190 AML-90s, 38 AML-60-7s, and 20 M-113s. It also had 30 Ratel 20, 30 Ratel 90, 45 VAB-VCI, and ten AMX-10P employed as AIFVs. Its APC include 420 M-113s and 320 VAB-VTTs. It may also have 45 OT-62 and OT-64 APCs. This diverse mix of armored fighting vehicles and APCs is often of mediocre quality and readiness, and lacks effective standardization. Morocco's emphasis on armored infantry fighting vehicles and armored personnel carriers does, however, reflect a response to the special needs imposed by its terrain and to its experience in fighting the Polisario. While Algeria poses a somewhat theoretical threat of armored warfare, Morocco has had to fight the Polisario largely using mechanized and light infantry.

Morocco is well equipped with artillery. In early 2004, it had 190 towed weapons. These included 30-35 L-118, 20 M-101, and 36 M-1950 105-mm weapons, 18 M-46 130-mm weapons, and 35 FH-70, 20 M-114, and 26 M-198 155-mm weapons. It had 222 self-propelled weapons: five Mk 61 105-mm howitzers, 98 AMX-F3, 20 M-44, 44 M-109/109A1 155-mm howitzers, and 60 203-mm M-110 howitzers. It also had 26 BM-21 and 14 M-1979 122-mm multiple rocket launchers, and some 1,500 81mm and 120mm mortars. Roughly 600 of the mortars were 120-mm weapons, 20 of which were mounted on VAB armored vehicles. This artillery strength does not match Algeria's, but it includes a large number of modern self-propelled weapons. Morocco seems to be able to operate most of its artillery weapons effectively as individual units, but has problems with combined arms, artillery maneuver, and beyond visual range targeting.

Morocco's holdings of anti-tank weapons include 440 M-47 Dragon, 80 Milan, 150 BGM-71A TOW and 50 AT-3 anti-tank guided missile launchers. Roughly 80 of the TOWs were mounted on M-901 armored vehicles. Its other anti-tank weapons include 150 3.5in M-20. The army also has some 350 M-40A1 106mm recoilless rifles. Morocco has some 425 anti-aircraft guns, including 200 ZPU-2 and 20 ZPU-4 14.5mm guns, 40 M-167 and 60 M-163 Vulcan SP 20mm guns, 90 ZU-23-2s 23mm guns, and 15 KS-19 towed 100mm guns. It also has 37 M-54 Chaparral self-propelled surface-to-air missile launchers, and 70 SA-7s.

The army's war fighting effectiveness is mixed. It is most experienced in dealing with light infantry and guerilla forces like the Polisario, and the Moroccan army is best trained and organized for defense against this kind of warfare. While Morocco has some outstanding battalion-sized elements, most of its heavy armor lacks proper support equipment, technical manpower, and spares. Morocco does not conduct serious large unit armored maneuver training, and lacks the service support and sustaining capability it needs to fight a prolonged conflict with Algeria. Its artillery is effective against infantry and slow moving forces, but lacks proficiency in combined arms and armored maneuver speed. Logistic support, however, is adequate and Morocco has shown that it can maintain an adequate supply line over considerable distances.

### **Moroccan Navy**

The 7,800-man Moroccan navy is a relatively large force by local standards, although it scarcely makes Morocco a major Mediterranean or Atlantic naval power. It has two frigates, four missile fast attack craft, 17 large coastal patrol craft, six inshore patrol craft, four amphibious landing craft, four support ships, and 40 customs and coast

guard vessels. 1,500 men are organized in a marine naval infantry battalion. The navy is based in Casablanca, Agadir, Al Hoceima, Dakhla, and Tangier. Casablanca is its headquarters and the key port. Dakhla and Agadir are the main secondary bases on the Atlantic, and Al Hociema is the key secondary base on the Mediterranean. The Ministry of Fisheries also operates 11 Pilatus Britten-Norman Defender Maritime Surveillance Aircraft.<sup>ii</sup>

The Navy had two new French-made Mohammed V-class frigates (French Floreal-class): The Mohammed V and Hassan II, commissioned in 2002 and 2003. Each had four Exocet ship-to-ship missiles, two Matra Simbad surface-to-air missile launchers, a 76mm gun, 2X3 Mk 46 torpedos, and two 375mm anti-ship marine mortars. They also had electronic support measures, and have chaff and IR flare launchers. They had modern Thompson air/surface search radars and can carry one Panther helicopter. Their ASW sonar capabilities were unclear.

The navy also had one 1,480-ton modified Descubierta-class guided-missile frigate, named the Lt. Colonel Errhamani, commissioned in 1983, and refitted in Spain in 1996. The ship had with 4 MM38 Exocet launchers (sea-skimming missiles with semi active radar guidance, a range of 42 kilometers, and a 165 kilogram warhead), an octuple Aspide launcher (semi-active radar homing to 13 kilometers at Mach 2.5), one 76mm gun, six 324mm torpedo tubes, and anti-submarine mortars. The navy rarely loaded Exocets, or exercised missile firings, on its guided-missile frigate, and its air search radar was removed in 1998. The ability to fight the ship effectively in combat against a force equipped with modern sensors and countermeasures was uncertain, as was its ability to operate effectively with other ships in fleet operations.

The navy had four Lazaga-class 425-ton fast attack craft -- all of which were equipped with four M-38 Exocets and one 76mm gun. The missile ships were generally considerably better-manned and equipped than Morocco's other vessels. Individual officer training for these ships ranged from adequate to good, and crew training ranged from mediocre to adequate. The navy had six 425-ton Lazaga class missile patrol craft with four MM 38 Exocet missiles each, one 76-mm gun, 20 and 40 mm anti-aircraft guns, and fire control and surface search radars. These ships dated back to the early 1980s. One had its 76-mm gun removed in 1998. It had six 425-ton Cormoran-class large patrol craft with 40mm and 20mm guns. The navy also had five 580-tons Rais Bargach-class patrol craft commissioned in the mid-to-late 1990s. These were French-made craft with 20-mm and 40-mm guns and surface search radars. It had four 475-ton Osprey Mark II-class large patrol craft with one 40mm and two 20mm guns each. These were equipped with surface search radars, and were commissioned in the late 1980s and 1990. Some were assigned to the Customs Service.

It had two Okba-class 445-ton large patrol craft with one 76mm gun each, and with surface search radars. These French-supplied patrol craft dated back to the mid-1980s. It had four El Hahiq (Osprey II) class, 475-ton large patrol craft with 40mm and 20mm guns. The navy also had six 89-ton El Wacil-class coastal/inshore patrol craft with 20-mm guns and surface search radars. The training and crew proficiency of these ships was suitable largely for commercial patrol purposes.

The navy had one Newport-class Landing Ship Tank (LST), displacing 8,450 tons fully loaded, and with the capacity to carry 400 troops 500 tons of vehicles, 3 LCVPs and 1 LCPL. The ship has experienced repeated maintenance and operating problems. It carried three Batral-class 1,409-ton LSTs, and had the capacity to carry 140 troops or 12 vehicles, one 670-ton LCT, and up to 26 LCMs. Support craft included two small 1,500-ton transports and one Ro-Ro Ferry converted to be a troop transport ship. The navy also had three 1,409-ton Batral-class landing ship (tank) or LSTs, which could carry 140 troops and 12 vehicles or 300 tons of cargo, and one Edic-class 670-ton landing craft (tank) which could carry up to 11 vehicles.

The Customs and Coast guard have four P-32 coastal patrol craft, 18 Arcor-class coastal patrol craft, 3 Sar craft, and 15 Arcor 53-class inshore patrol craft.

The Moroccan navy has shown it can operate these fast attack craft, patrol craft, transport and amphibious ships reasonably well. It is capable of patrolling local waters, but has limited ability to operate in the Atlantic, and training is said to be mediocre. Its capabilities for anti-air and anti-ship missile warfare are limited. It would not be capable of successfully engaging Spanish naval forces, and would experience serious problems in any engagement with Algeria.

Morocco has limited repair and at-sea replenishment capability, although it does have two logistic support ships, and most of its ships have limited endurance. Morocco is scarcely the possessor of a "blue water" navy that can play a role in the Atlantic or in controlling the entrance to the Mediterranean. The Moroccan navy is adequate for coastal defense most practical mission requirements, and probably represents the largest and most effective naval force that



Morocco can support given its limited defense budget and the need to concentrate on the defense of the western border and south.

### **Moroccan Air Force**

In 2004, the 13,500-man Moroccan Air Force had 95 combat aircraft and 24 armed helicopters. There were major air bases in Kenitra, Marrakesh-Menara, Meknes-Mezergues, Rabat-Sale and Sidi Slimane, as well as three to four operating bases in the south.

Morocco's forces included fighter ground-attack squadron consisting of 8 F-5As, 3 F-5Bs, 24 F-5Es, 4 F-5Fs, and 14 Mirage F-1EHs; plus one air defense squadron with 15 Mirage F-1CHs. It also had a reconnaissance squadron with 4 OV-10s and 2 CH-130s with side looking radar; and 2 C-130 and 2 Falcon 20 electronic intelligence and warfare planes. It had 51 training aircraft, including 23 Alphajets with dual capability in light attack missions.

Morocco had relatively modern air munitions, including some AIM-9B/D/Js, R-530s, R-550 Magics, and 125 AGM-65B Mavericks for F-5Es. All of its combat aircraft are aging, however, and Morocco needs to fund more modern fighters during the next decade.

Its transport forces were relatively large and included 12 C-130H, 7 CN-235, 2 Do-28, and 2 Falcon 20, plus 1 Falcon 50, 2 Gulfstream, 4 King Air 100 and 3 King Air 200. Morocco is one of the few air forces with tanker and mid-air refueling assets; it has 1 B-707 and 2 KC-130H transport/tanker aircraft. Morocco makes extensive use of air transport and supply in its operations against the Polisario.

Morocco had 24 SA-342 armed helicopters, 12 with HOT anti-guided missiles and 12 with cannon. These armed helicopters do not have advanced sensors and avionics, but are adequate for day combat. It has seven CH-47 heavy transport helicopters, 58 medium transport helicopters, and 23 light helicopters. Helicopter mobility and readiness are good by regional standards.

The Moroccan air force is one of the few regional air forces without a major land-based air defense component. Morocco has no medium and heavy surface-to-air missile units and does not have the radars and battlement management systems to support them.

The Moroccan Air Force experienced considerable political instability in the early 1970s, and then had problems in the war with the Polisario. It lost a considerable number of aircraft to Polisario SA-6s and SA-7s in the early and mid-1980s, and often aborted missions or dropped bombs where they had limited effect. Since that time, however, it has gradually corrected many of its past training, maintenance, and leadership problems. It has achieved a reasonable level of proficiency in using its Mirage F-1s, F-5E/Fs, and Alphajets in basic attack and support missions.

The air force is also effective in using its attack and reconnaissance aircraft, and its CH-130s with SLAR have proven to be of considerable value in monitoring the defensive wall in the Western Sahara and locating and targeting Polisario movements with vehicles. It seems able to make effective use of its two C-130 and two Falcon 20 ELINT aircraft, and is one of the few regional air forces with such an electronic intelligence capability. It acquired a Westinghouse air defense system in the early 1980s, and has moderately effective warning and combat air control capability.

The air force cannot, however, properly operate all of its Mirage F-1 fighters, which constitute 29 aircraft out of a total combat strength of 95 aircraft. There are 14 Mirage F-1EHs in the attack role and 15 Mirage F-1CHs assigned to the air defense role. It is unclear whether Morocco's problems in operating the Mirage F-1 stem from problems in maintaining the aircraft or from a failure or inability to fund the spare parts and equipment it needs. Its 13 F-5A/Bs and 29 F-5E/Fs are adequate for missions against the Polisario, but are aging aircraft that lack modern avionics. They are not adequate to engage modern fighters with beyond-visual-range radars and air-to-air missiles, and lack the avionics and sensors to use modern air-to-surface guided weapons at long ranges.

Morocco does not have a significant land-based air defense system. It has upgraded its Northrop Grumman tactical radar system (TPS-63) with new solid-state transmitters and digital signal processors (AN/TPS-63). This upgrade increases detection range by 250 percent and improves reliability, maintainability and supportability. It has reasonably good warning and air control capability, but no airborne air control and warning assets and only limited surveillance and electronic warfare capabilities.

The air force's other limitations include its lack of advanced or airborne sensors and AC&W capability, its lack of advanced combat training capability, continuing maintenance problems and dependence on foreign technicians, and its limited C<sup>4</sup>I battle management capability in the event of a major Algerian attack. Some of these problems may be solved over the next few years as a result of a 1991 contract that Morocco signed with Westinghouse to modernize its communications, entire air defense system, and air traffic system.

### **Moroccan Paramilitary and Security Forces**

Like all Maghreb states, Morocco's military, paramilitary, and security forces play a major role in internal security and in safeguarding the power of the regime. Morocco's paramilitary forces total roughly 42,000 men, most of which can act as land forces. These include 12,000 men in the Gendarmerie Royale, which is organized into one brigade, four mobile groups, one air squadron, one paratroop squadron, and a coast guard unit. The Gendarmerie has 18 patrol boats, two light aircraft, and 22 helicopters.

The Border Police, the National Security Police, and the Judicial Police are all departments of the Ministry of Interior, while the Royal Gendarmerie reports directly to the Palace. Its activities are focused primarily on Islamic extremists, student and labor unrest, and the Sahrawis in the Western Sahara.

Until recently, the Moroccan security apparatus has been repressive, and the security services have often acted a power in their own right, as well as a key source of support for the monarchy. This rule by the security forces, or "makhzen," has been controlled by the Minister of the Interior, which commands several overlapping police and paramilitary organizations. The Ministry of the Interior has also exerted power through the fact that it determined eligibility for some aspects of welfare and free medical care, and supervises the state and public committees dealing with investment and businesses in Morocco's sixteen provinces.

The Ministry of the Interior has been responsible for the conduct of elections, cooperation with the United Nations in the referendum on the Western Sahara, the appointment and training of many local officials, the allocation of local and regional budgets, the oversight of university campuses, and the licensing of associations and political parties. The Ministry has also exerted substantial influence over the judicial system.

### **The Military Forces of Algeria**

Algeria has long been dominated by a corrupt and inefficient military junta, sometimes called "the Power," which has ruled the country behind the façade of an elected government. Since the early 1990s, Algeria has been involved in a violent civil war with Islamic extremists, after more moderate Islamic political factions were denied power following their victory in an election. This civil war has been vicious on both sides, often involving large-scale atrocities. The armed forces have largely won, but the fight continues.

Algeria has changed its force posture over time to reflect the state of its improving relations with Morocco, the decline in any threat from Libya, Algeria's economic problems, and its need to focus on its civil war. The trends in Algerian military forces are shown in **Figure 2.2**. Algerian regular military manpower peaked at around 170,000 in the mid 1980s, but declined to around 150,000 in 1990. It dropped to less than 122,000 in 1995, but has since increase slowly. Algeria had 127,000-128,000 actives in 2005, including 75,000-85,000 conscripts. It had a paper reserve strength of some 150,000, with little or no real-world readiness and war fighting capability.

Algeria's civil war has led it however, to increase its paramilitary forces that rose from around 30,000 men in 1986 to some 181,200 in 2004, with 60,000 in the army-controlled gendarmerie, 20,000 in the Directorate of National Security Forces, 1,200 in the Republican Guard, and around 100,000 in the "Legitimate Defense Groups." To put these figures in perspective, they compare with a peak threat of only about 2,000-3,000 full-time regulars in the Group Islamique Armee (GIA), operating in small groups of 50-100. The Armed Front for Islamic Jihad (FIDA) and Islamic League for the Call and Jihad (LIDD) probably have peaked at less than 1,000 actives each.

Algeria has a large pool of major weapons systems. Its forces have 1,000 main battle tanks, 124-173 armored reconnaissance vehicles, 989 AIFV's, 730 APCs, 185 self-propelled (SP) artillery, 406 towed artillery, and 144 multiple rocket launchers (MRLs). Its air force consisted of 175 combat aircraft and 93 attack helicopters. Its naval forces included 2 submarines, 8 major surface ships, 12 patrol craft, and 3 amphibious ships.

### **Algerian Army**

Algeria's military forces are called the National Popular Army or ANP. The Algerian Army is by far the largest element of the ANP and is currently organized into six military regions. Like Morocco and Libya, Algeria has

gradually built up a network of roads and facilities in its border areas that are designed to allow its forces to deploy and fight against either Morocco or Libya. Many of its units are not deployed in the border area, however, and the Algerian army is scarcely on a wartime footing. The army has major bases at Algeris, Annaba, Batna, Becher, Biskra, Blida, Constantine, Djanet, Ghardaia, El Golea, Oran, Ouargla, Reggane, In Salah, Skikda, Tamanrasset, Tarat, Timimoun, Tindouf, and Touggourt.

At the top of the chain of command is the Higher Council of State to the General Staff, followed by the Army Commander, Navy Commander, and Air Force and Air Defense Commander. The organization of the armed forces has been streamlined since 1996, and but still has a highly bureaucratic and grossly over-manned and over-ranked headquarters and support structure. It would probably be more efficient with one-third less manpower. The army is under the command of the Chief of the General Staff, who has a separate Inspector General, and exercises a direct line of command to the major combat units.

In the mid-1980s, the army reorganized its divisions into something approaching a modern regimental structure, added armored forces, and attempted to modernize its command structure. The army is now organized into two armored divisions, each consisting of three tank regiments (95 T-62s or T-72s and 30 BMP-1s or BMP-2s each). Each also has one mechanized regiment (30 T-62s or T-72s, 30 BMP-1s or BMP-2s, and 60 BTR-60s each), an artillery group with 120 guns, a reconnaissance battalion, an air defense battalion, and engineer and logistic elements.

The army has two mechanized divisions, each consisting of three mechanized regiments and an artillery group with 120 guns, a reconnaissance battalion, an air defense battalion, and engineer and logistic elements. The army also has one airborne division with five airborne regiments, plus one independent armored brigade, one tank regiment, four or five independent motorized/mechanized infantry brigades, and one anti-tank battalion. Depending on the source, it has two to seven artillery battalions, and five to seven air defense battalions – one a surface-to-air missile unit. Most of these latter battalions support a given division and are effectively part of its force structure.

Algeria also has large paramilitary forces, which have carried out most of the fighting in the civil war. The Ministry of the Interior has a 16,000-20,000 man National Security Force used as anti-terrorist and security force in desert and mountain areas. The Republican Guard Brigade is a 1,200-man force with armored reconnaissance vehicles that aids in border surveillance and anti-terrorist operations in desert areas. There is a 50,000-man police force and 50,000-60,000man gendarmerie used for security and anti-terrorists, as well as police functions. These latter forces are controlled by the Ministry of the Interior.

In 2005, the regular army had about 110,000 full-time actives, about 75,000-85,000 were conscripts. Conscripts serve for 18 months and generally receive inadequate basic training, in both unit training and field training. Algeria also has a large army reserve on paper, but it has little real structure and only limited and highly selective call-up training. It would take weeks to retrain most reserves to serve basic military functions, and months to create effective reserve units.

The Algerian Army had roughly 1,000 tanks, including 320 T-54/55s, 330 T-62s and 350 T-72s – 55 of which were delivered during 1999-2000. It had 124 BDRM-2 reconnaissance vehicles (64 with AT-3 Sagger), and possibly 49 Saladins. It had 989 armored infantry fighting vehicles, including 700 BMP-1s and 289 BMP-2s. Continuing deliveries of BMP-2s took place during 1999 and 2000. It had some 730 armored personnel carriers, including 100 Fahds, 30 BTR-50/OT-62s, 400 BTR-60/OT-64s, and 200 BTR-80s. The overall readiness of Algerian armor was limited by significant obsolescence and maintenance problems, little large unit training, and poor to mediocre training in rapid maneuver, night warfare, support and logistics, and aggressive offensive combat.

The army had 406 major towed artillery weapons, including 28 D-74, 100 M-1931/37, 60 M-30, and 198 D-30 122-mm weapons, 10 M-46 130 mm weapons, and 10 M-1937 152-mm weapons. It also had 185 self-propelled artillery weapons, including 150 122-mm 2S1s and 35 2S3 152-mm weapons. Its multiple rocket launcher strength included 48 122-mm BM-21s, 48 140mm BM-14 and BM-16s, 30 BM-24 240mm weapons, and 18 new long-range Smerch 9A52s. It had 120 120-mm, 150 82-mm and 60 160-mm mortars. This artillery strength included far more self-propelled weapons than Algeria had in the mid-1980s, and the army has moderate capabilities for mass fire against static or area targets. It has little training in artillery maneuver, however, and poor capabilities for combined arms, counter-battery fire, switching fire, and beyond visual range targeting.

The Algerian Army had 156 towed 57mm and 85 anti-tank guns, plus 3 T-12 and 50 Su-100 100-mm self-propelled weapons in storage. Other anti-tank weapons included AT-2 Swatter and AT-3 Sagger anti-tank guided weapons (ATGWs). An unknown number of modern AT-4 Spigot and AT-5 Spandrel ATGWs have been delivered and

further deliveries are planned. The Army had 178 recoilless rifles. Some of the Sagers are mounted on BRDM-2s. About 156 of the towed anti-tank guns are obsolete 57mm weapons, and 80 more are obsolescent 85mm D-44 with limited anti-armor capability against modern tanks. Few crews have realistic combat training in killing tanks or other armor.

The army had some 770 air defense guns, including 219 self-propelled, radar-guided ZSU-23-4s. It also had large numbers of manportable SA-7s, SA-14s, and SA-16s; and 20 SA-8 and 20 SA-9 light surface-to-air missile launchers. While most of its air defense weapons have limited lethality, and most crews have limited training, Algeria has enough modern weapons and sheer weapons strength to provide a considerable "curtain fire" capability against low flying aircraft.

These weapons holdings show that Algeria is relatively well equipped in terms of equipment numbers for a 110,000-man army. However, much of Algeria's equipment is 10-20 years old, and some is no longer fully operational. This includes many BTR combat vehicles, and a few of Algeria's towed artillery weapons. Algeria needs more self-propelled artillery weapons and more modern short-range air defenses. It needs far more third and fourth generation anti-tank guided missiles. It also needs modern artillery counter-battery radars and fire control equipment, and improved command, control, and communications systems. It would have to be extensively re-equipped for effective night combat and beyond visual range targeting.

The Algerian Army has had no meaningful combat experience against a regular army since its border clashes with Morocco in 1963. The army is heavily politicized, it is corrupt and nepotistic and this affects promotion at the higher levels of command. It spends far more time on internal security problems than developing its warfighting capability.

Training tends to be over-rigid and repetitive. Combined arms, combined operations, and maneuver training are poor. Leadership is weak at every level, there is considerable corruption and favoritism in promotion and command assignments, and the army has serious organizational, training, logistic, and combat and service support problems. Technical training and maintenance standards are weak. The army often buys new equipment more quickly than it can effectively absorb it. It then fails to follow-up with effective training, maintenance, and logistic subsystems.

The military "culture" of the army is also an awkward mix of Algerian ideology and long-outdated and relatively slow-moving Soviet tactics and doctrine. The army relies on mass and attrition, not maneuver and technology. Its leadership has never fully converted from an ideological focus on the army as a popular or revolutionary force to one that is fully capable of modern armored and maneuver combat. Many units lack adequate manning and readiness, and large-scale exercise training is poor. Algeria's internal security problems, and the high degree of politicization and bureaucratization of its forces, may well make it impossible to change this situation during the next decade. High level positions are highly political and so is promotion; there is massive internal corruption among the top leadership.

It is striking that it is the paramilitary forces and militias that have done so much of the actual fighting in the Algerian civil war, and not the regular army – which has drained so many resources out of the nation for so long a period. The National Security Force, Republican Guard Brigade, police force, and gendarmerie have performed most security anti-terrorist functions. Much of the responsibility for security has also been turned over to the extensive regional militia forces, and the roughly 100,000 men in what are called the Legitimate Defense Groups. Where Morocco painfully learned how to fight a guerrilla war, the Algerian army largely stood aside and let proxies do much of the fighting.

The relatively small size of the organized military forces of the Islamic opposition is also striking. The Group Islamique Armee (GIA) is estimated to have small groups of 50-100 men, with a total of less than 3,000 actives. The Armed Front for Islamic Jihad (FIDA) is estimated to have small groups of 50-100 men, and now estimate of total active strength is available. The same is true of the Islamic League for the Call and Jihad (LDD).<sup>iii</sup>

### **Algerian Air Force**

Algeria's air force had roughly 10,000 actives in 2004. It emerged as a modern force as the result of an expansion that took place in the mid-1970s after the clashes between Algerian forces and Morocco and those of Morocco. It had 175 combat aircraft, and 91 armed helicopters. The air force organized along Soviet lines, although Pakistan provided advisors and pilots and Egypt provided air training. Its main missions are the defense of Algerian cities, and conducting air defense and attack operations in the event of a conflict with Morocco or Libya. It has bases in central Algeria at Ain Oussera, Blida, Boufarik, and Bou Sfer; near the Moroccan border at Bechar/Oukda,

Mecheira, Oran and Tindouf; and near the Libyan border at Biskra. There are also dispersal bases at Ozukar and Sidid bei Abbas.

The combat strength of the Algerian air force is organized into regiments. In 2004, it had three fighter ground-attack regiments, one with 28 Su-24s and two with 28 MiG-23BNs. Algeria is reported to have ordered 22 Su-24s from Russia in October 2000. Deliveries were to start in November, 2000 and all were to be delivered and in service by late 2001. The Su-24s were to be the same SU-24M (Fencer D) model already in service in Algeria, and were to be taken from Russia's operational inventory, with some upgrading and reconditioning.

The air force had five fighter regiments, one with 20+ MiG-29C/UB, one with 10 MiG-25s, one with 30 MiG-23B/Es, and two with 30 MiG-21MFs. The air force had two reconnaissance squadrons, one with 6 MiG-25Rs and one with 6 Su-24Es. Some reports indicate Algeria also had four Su-24 MR (Fencer E) reconnaissance aircraft.<sup>iv</sup>

With the exception of Algeria's 48 Su-24s and MiG-29s, whose design dates back to the 1980s, Algeria's 175 combat aircraft are now badly dated. The Su-24s and MiG-29s are the only aircraft with modern avionics, the capability to fight effectively in night, all-weather, and beyond-visual range air-to-air combat, or the ability to use air-to-ground ordnance with high effectiveness. Algeria's attack aircraft lack the avionics, sensors, all-weather navigation aids, and computers to take advantage of modern precision-guided weapons.

There were two maritime reconnaissance squadrons in, with 15 Super King Air B-200Ts, but it is unclear that all these aircraft are operational. Algeria had a large numbers of training aircraft, some of which are part of its combat strength. They included three MiG-21Us, five MiG-23Us, and three MiG-25Us.

Unless it receives additional modern aircraft, Algeria faces serious long-term modernization problems. Many U.S. and French experts also seriously question the merit of past Algerian attempts to try to reconfigure its aging Soviet systems to use Western technology. These experts feel that re-engineering Soviet fighters and trying to upgrade Soviet electronics and avionics would raise the life cycle cost of such equipment above the cost of new Russian or Western equipment.

There were a total of 65 attack helicopters, organized into a regiment. They included 30 Mi-17Js, 30 Mi-24s and 30 aging Mi-8s and Mi-17s. Russia delivered six Mi-171 upgraded helicopters employing the Geofizika night-vision technology, with 36 more to follow.<sup>v</sup> The air force had 63 heavy transport helicopters, including two Mi-4s, five Mi-6s, 46 Mi-8/17s, and ten AS 355s. Algeria had an extensive supply of fixed wing transport and VIP aircraft, including ten C-130Hs, six C-130H-30s, nine IL-76s, two Falcon 900s, three Gulfstream IIIs, and two F-27s.

Algeria's surface-to-air missile forces are organized into three surface-to-air missile regiments. In 2004, there were two major regiments with a total of 30-35 SA-3 and 50-60 SA-6 launchers and one with a total of 30-35 SA-8 launchers. It had three brigades of air defense artillery units with unguided 85-mm, 100-mm, and 130-mm weapons. The Algerian air defense C<sup>4</sup>I, air defense and warning system, and radar sensor net is now obsolescent and lacks modern battle management and electronic warfare capability.

The Algerian air force has no real combat experience, and training is outdated and poorly organized for large-scale attack or air defense operations. Reconnaissance, electronic warfare, and countermeasure capabilities range from poor to mediocre. Maintenance standards are poor and some aircraft are virtually in storage because of a lack of trained manpower and support capability.

The Algerian air force also suffers from limited and obsolescent C<sup>3</sup>I/BM capability as well as serious problems in the quality and modernization of its air control and warning capability. Its SA-3, SA-6, and SA-8 units, and air defense brigades, have low readiness and operational capability, and poor aircraft and munitions operability and technology. Algeria seems to have poor to mediocre electronic warfare and countermeasure capability and does not seem to have received the level of technical support and upgrading that the USSR provided to Libya.

## **Algerian Navy**

The 7,500-man Algerian navy is based at Mers el Kebir (2<sup>nd</sup> Region), Algiers (1<sup>st</sup> Region), Annaba (GG headquarters), and Jijel (5<sup>th</sup> Region). It is under the command of a general-major and headquartered at Algiers. In addition to the navy, Algeria has 600 naval infantry and 500 men in its Coast Guard. The navy has a strength of two submarines, three frigates, six corvettes, nine missile fast attack craft, 10 fast attack craft, and three amphibious ships. The navy has one survey ship, one major auxiliary ship, and several tug and support vessels. It has two Kebir-class fast attack craft in construction. The coastal defense force has four truck-mounted batteries of SS-C-3 Styx

coastal anti-ship defense missiles that are based at Algiers, Mers-el-Kebir, and Jijel, and linked by coastal surveillance radars.<sup>vi</sup>

The Algerian navy's two 2,325-ton Kilo-class (type 877E) submarines are equipped with six 533mm torpedo tubes, long-range torpedoes with active/passive homing, and pattern active/passive homing torpedoes and mines. These submarines, refitted in 1995 and 1996, are active, but still seem to have little operational training. Algeria used to have two additional Romeo-class submarines, but these left the fleet in 1989, and are now restricted to training. As a result, Algeria has sought to acquire up to two more Kilos. The purpose and mission of Algeria's submarine force is unclear. Its operating standards are as low as those of most Third World navies. Algeria could not use these submarines effectively against a modern Western navy, and it is unclear how they would be used against Libya or Morocco.

The Algerian navy's major surface ships are more capable. The navy has three Mourad Rais class, 1,900-ton ASW frigates (ex-Soviet Koni-class), armed with four 76-mm and four 30-mm guns, twin launcher SA-N-4 Gecko surface-to-air missiles (with a maximum range of 15 kilometers or eight nautical miles and speed of Mach 0.9). There are also ASW rocket launchers, mine rails, and depth charges. The ships date back to the early and mid-1980s. The ships have relatively modern air/surface radars and fire control systems, but they only have decoys and chaff launchers as countermeasures and do not have torpedo tubes. They are all active, but one ship is used for training purposes. One ship was refitted in Russia during 1997-2000, and has returned to service a second ship is to be refitted, but no date has been announced.

There are three 660-ton Burya-class missile corvettes (ex- Soviet Nanuchka-class) armed with SS-N-2Cs (active radar or IR homing to 46 kilometers or 25 nautical miles), twin launcher SA-N-4 surface-to-air missiles, and two 57-mm guns. There were delivered as new ships during 1980-1982. One completed a refit in 1998-2000, and a second is scheduled to be refitted, but no date has been announced.

There are two 540-tons Chinese-designed Type 802 or Djebel Chinoise-class coastal patrol corvettes each armed with one 76mm gun, two twin 40-mm guns, and twin 23-mm guns. They lack effective fire control systems but do have a surface search radar. The ships were delivered in 1985 and 1990, and the second ship ran into financing problems and is not fitted with a main gun. Neither seems fully combat operational.

The navy also has nine Osa I and II 210-245-ton missile fast attack craft, plus two non-operational 210-ton Osa-I class attack craft. They are each armed with four SS-N-2A anti-ship missiles with infrared and radar homing, and four 30-mm guns. The SS-N-2A is an aging system vulnerable to countermeasures, but has a maximum speed of Mach 0.9 and range of 46-kilometers (25 nautical miles) with semi-active radar or IR homing. These ships are rarely seen at sea, and it is unclear whether more than 6 Osa II-class craft and their weapons systems are fully operational. They were delivered in the late 1970s and early 1980s, and need refitting and re-engining.

Algeria has at least 12 active 200-ton Kebir-Class (Brooke Marine) patrol boats with one 76-mm gun each, plus two twin 25-mm guns and two twin 14.5-mm guns, and the navy has ordered 15 – although financing problems have delayed construction and delivery of the additional ships. Six have been transferred to the Coast Guard. These boats have surface search radars, but do not have modern countermeasures or serious aid defense capabilities.

The Navy's amphibious strength is large enough to give Algeria a potential capability to conduct landings against Morocco or Libya. It includes two British-made 2,450-ton LSLs (capacity 240 troops, seven tanks, one helicopter) and one 834-ton Polnochny B-class LSM (capacity 180 troops, six tanks).

The Navy also operates one survey ship, two support ships, 11 ocean-going minesweepers, a number of tugs, 12 fishery protection craft, SSC-3 coastal defense missiles, and two Beechcraft Super Knight 200T aircraft with weather radars. These aircraft are only capable of visual reconnaissance. The 500-man coast guard is under navy command. It has 29 small ships and two more are under construction. In addition to the Kebir-class ships, it has seven El Mouderrib-class 388-ton patrol craft with twin 14.5-mm guns; five Baglietto-class 44-ton patrol craft with 20-mm guns, and four El Mounkid-class patrol craft used for search and rescue missions.

The Algerian Navy has reasonable ship strength, and a number of modern combat surface ships that have considerable anti-ship missile capability be regional standard and may have or be acquiring SS-N-25 missiles. Its air defenses and countermeasure capabilities are more limited, however, and a number of its ships are obsolescent and poorly equipped in terms of their sensors and weaponry. It has poor operational performance, overall readiness, training, and equipment quality. It could not defend itself adequately against Western strike aircraft or anti-ship missile attacks, but would probably be able to defeat either the Moroccan or Libyan navies.

## Algerian Paramilitary Forces and Internal Security

Part of Algeria's military weakness is explained by the fact that it faces far more serious internal threats than foreign ones. Beginning in 1992, Algeria has had to actively fight a bitter civil war with horrible abuses and atrocities on both sides. At present, the main function of its military and paramilitary forces is to fight this civil war and maintain the power of the regime. No quarter is given on either side, and much of the government's internal security forces, including virtually all of the 100,000 man Legitimate Self-Defense Force, are little more than an armed rabble. The Legitimate Self-Defense Force is a force of poorly-trained and organized local militias that have sometimes carried out massacres and bloody reprisals of their own.

The government's formal paramilitary forces and security apparatus is composed of the army, air force, navy, and the national gendarmerie (the national police). The less formal elements include the communal guards (a local police), and local self-defense forces. The US State Department reports that all of these elements are involved in counterinsurgency and counter-terrorism operations and are under the control of the government. All have been responsible for numerous serious human rights abuses.

The best-organized paramilitary forces include the 1,200-man Republican Guard, which is a small elite security force with AML-60s and M-3s. They also include the Gendarmerie, which is a force of 25,000 men. This force is assigned to the Ministry of Defense and has 44 AML-60 and M-3 armored vehicles, 200 Fahd armored personnel carriers, and 28 Mi-2 helicopters. It is reasonably well-trained, organized along military lines, and has played a major role in the government's efforts to assert control over the FIS and in its armed clashes with Islamic fundamentalists. The 20,000-man National Security Forces have mediocre training and are equipped largely with small arms.

## The Military Forces of Libya

Libya has sought to shed its image as an extremist state and supporter of terrorism in recent years. It seems to have reached a settlement over its terrorist attacks on UTA and Pan Am passenger aircraft, and to have halted most support for terrorist groups. It agreed in late 2003 to give up its efforts to acquire and deploy weapons of mass destruction and allow inspection by the International Atomic Energy Agency (IAEA). Libya did so partly because of years of frustration and failure in various political and military adventures, and partly because of the impact of UN and US sanctions, and growing economic problems, and the need to deal with a low-level Islamic extremist insurgent threat.

The Libyan armed forces have, however, been sharply affected by Qadhafi's eccentricities and his past efforts to eliminate military ranks and create a people's army. They are divided into an army, navy, and air force, but there are large numbers of both men and women who have at least a paper assignment to paramilitary forces like the People's Militia, Revolutionary Guards Corps, and People's Cavalry Force. The army operates Libya's surface-to-surface missile forces, the National Air Defense Command is part of the Air Force, and the Navy controls the Coast Guard.

The trends in Libyan military forces are shown in **Figure 2.3**. On paper, Libya still retains large military assets. Libya's land forces have a total of 2,025 tanks 1,130 AIFVs, 990 APC's, 444 SP artillery, 647 towed artillery, and 830 MRLs. Its air forces consist of 400 combat aircraft and 41 attack helicopters. Its naval forces have one submarine, 2 major surface ships, 8 missile patrol craft, 2 mine warfare ships, and 3 amphibious ships. These totals are impressive for a relatively small country, but much of this force is in storage or non-operational, combat readiness is exceptionally low, and modernization rates are very poor.

The true result of Libya's military build-up during the 1970's and 1980's is a vast weapons inventory that has turned Libya into the world's largest military parking lot, and Libya's military capabilities are unlikely to evolve much beyond the parking lot stage in the foreseeable future. Libya does not have modern military forces; it has a modern military farce. Bad as Libya's forces are, however, Libya's neighbors cannot count on the permanence of the "parking lot syndrome," and ignore the sheer mass of Libya's arms holdings. Libya can engage in costly and prolonged confrontations and clashes in the border area with its other neighbors.

## Libyan Army

The Libyan Army has a total active strength of only 45,000 men, including 25,000 badly trained conscripts. While the Libyan army is sometimes reported to have some 40,000 men in its People's Militia, this force is more a symbol of Qadhafi's ever changing ideology than a military force. The Revolutionary Guards Corps is at most a brigade-sized force with about 3,000 men and equipped with tanks, armored personnel carriers, anti-tank guided weapons,

air defense weapons, and helicopters. The People's Cavalry Force is a largely token force. The Libyan army seems to lack anything approaching an effective and well-trained reserve system.

Reports differ sharply over the organization of Libya forces. The IISS seems to be the most credible source and reports it is organized into 11 Border Defense and Four Security Zones, and has 1 elite regime security brigade, 10 tank battalions, 10 mechanized infantry battalions, 18 infantry battalions, 6 paratroop/commando battalions, 4 surface-to-surface missile brigades, 22 artillery battalions, and 7 air defense artillery battalions. Another source indicates that the Libyan Army is organized into two to three tank divisions, two to four mechanized infantry divisions, two independent tank brigades, and two independent mechanized brigades. It also has three independent tank battalions, eight mechanized infantry battalions, a Republican Guard brigade, 12-13 paracommando battalions, seven surface-to-surface missile brigades, three surface-to-air missile brigades, 41 artillery battalions, and two AA gun battalions.

Regardless of the exact totals, Libya only has about 25-33% of the manpower needed to man its strength of combat units, and total equipment pool – a factor which explain why so much of its major combat equipment is in storage. Even its best combat units are under strength and have severe training and leadership problems. These manpower problems are compounded by tight political control, promotion based on political favoritism, and training which is often limited to erratic small unit training. As has been noted earlier, Qadhafi also rotates officers arbitrarily to prevent coup attempts, and restricts some forms of training because he regards them as a threat to his security.

In 2004, the Libyan Army had some 2,020 main battle tanks. Its operational holdings, however, only included some 800 tanks: 145-200 T-72s, 100 T-62s, and 500 T- T-55s. The other 1,225 tanks, were in storage, including some 1,040 T-55s, 70 T-62s, and 115 T-72s. Many of both the operational and stored tanks had significant maintenance problems, and Libya was actively negotiating with Russia and the Ukraine in 2000 for modernization and overhaul contracts for these tanks, as well as for its other armor and much of its artillery.

The army had some 130 armored reconnaissance vehicles, including 50 BDRMs and 70 EE-9 Cascavals – a small portion of the number Libya had originally purchased. There were 1,000 aging BMP-1 armored infantry fighting vehicles, and about 990 APCs, including 750 BTR-50s and BTR-60s, 100 OT-62s and OT-64s, 40 M-113s, and 100 EE-11 Urutus. These holdings represented far too many types of APCs to allow for effective support and maintenance. Their armament and armor were dated and often of low quality and many were worn. Like Libya's tanks, many of its other armored vehicles were in storage or had serious maintenance problems. Only a few battalion-sized elements of Libyan armor had even moderate effectiveness in offensive and maneuver operations.

Libya's artillery strength included some 647 major towed artillery weapons, 444 self-propelled artillery weapons, and 830 multiple rocket launchers – many not operational. The towed weapons included 42 105-mm M-101s, 190 D-30 and 60 D-74 122-mm weapons, 330 130-mm M-46 weapons, and 25 M-1937 152mm weapons. The self-propelled artillery included 130 2S1 122-mm weapons, 160 Palmaria and 14 M-109 155-mm weapons, and 60 2S3 and 80 DANA 152-mm weapons. Libya's multiple rocket launchers included 300 Type 63 107-mm weapons; 200 BM-11, 230 BM-21 and 100 RM-70 122-mm weapons. Libya also had over 500 82mm and 120mm mortars, and some M-160 160mm mortars. Libya also had some 45 FROG-7 and 80 Scud B surface-to-surface missile launchers. (Some reports indicate an additional 450-500 North Korean No dong missiles, but are not confirmed.)

This artillery strength was numerically impressive, but once again, much of it was in storage or not operational. Libya had poor standardization in terms of weapon and ammunition types. It also lacked the training, organization, and sensors and C<sup>4</sup> (command, control, communications, and computers) equipment to conduct combined arms operations, maneuver effectively, switch fires rapidly, target beyond visual range, and conduct efficient counter-battery operations.

Libya's anti-tank weapons included roughly 3,000 ATGW launchers, with Milans, AT-3 Sagers (some mounted on BDRMs), AT-4 Spigots, and AT-5 Spandrels. These anti-tank guided weapons are effective against any tank other than the M-1A and possibly T-80, but Libya does not normally provide effective live-fire training under realistic conditions. The army also had at least 220 M-40A1 106mm recoilless rifles, and large numbers of anti-tank rocket launchers.

Nothing approaching an accurate count of Libya's operational light air defense weapons is available. Some estimates indicate that the army had an inventory of about 600 air defense guns, including large numbers of radar-guided ZSU-23-4 SP and ZU-23 23mm weapons, M-53 and M-59 30mm weapons, L/70 40mm weapons, and 92 S-60 57mm weapons. Libya also had large numbers of SA-7, SA-9, SA-13, and Crotale light surface-to-air missiles. Many of these weapons are also stored or have limited operational readiness. The overall air defense training of



Libyan army forces is poor. The Army had O1-E liaison aircraft and the Libyan air force could support it with 34 transport and liaison helicopters. These included 18 CH-47s and 34 Mi8/Mi-17 transport helicopters and 5 AB-206s, and 11 SA-316s.

Libya's combat support, service support, and logistics units and system are capable of little more than sustaining peacetime garrison operations and occasional set-piece exercises. They would break down quickly in the event of war. The army seems to have no real training using support and logistics capabilities at even the major combat unit level.

In summary, Libya's army and paramilitary forces have little military effectiveness. While a few regular army brigades and some independent elements may have moderate effectiveness, Libya can do comparatively little to make use of its massive inventory of land weapons. Training and readiness are very poor. Libya's erratic equipment purchases make logistics, support, and maintenance a military nightmare. Some purchases seem to be made with no regard to whether the equipment will have any military utility or can be absorbed into Libya's force structure. Nearly half the army's equipment is in storage or has limited operational availability, and overall leadership and organization are poor. Even Libya's better units would have difficulty fighting anything other than static defensive battles.

### **Libyan Navy**

The Libyan navy and coast guard have a nominal strength of 8,000 men, but may only have 4,000-4,100 actives. The navy has significant combat ship strength, but little real-world warfighting capability for anything more than surprise or hit and run missions. Maintenance and manpower readiness are poor. It has little ability to operate outside of coastal waters, and its sea training and patrol activity are far below the level needed for high military proficiency. It cannot count on significant air support in an encounter with a Western navy, and has negligible offensive capability beyond launching a few missiles.<sup>vii</sup>

*Jane's* reports the Navy has its headquarters at Surt, naval bases at Al Khums and Tobruq, a submarine base at Ras Hilal, a naval air station at Al Girdabiyah, a naval infantry battalion at Sidi Bilal, and working ports at Tripoli, Derna, and Benghazi. The IISS reports main naval bases at Tripoli, Benghazi, Derna, Tobruk, Sidi Bilal, and Al Khums.

The Libyan Navy's main combat forces consist of two aging Foxtrot class fleet submarines (six were delivered, but five are non-operational), three missile corvettes, two guided missile frigates, two guided missile corvettes. 14 missile patrol craft (a number in semi non-operational reserve), and five ocean minesweepers. Libya also had five landing ships (two in reserve), three LCTs, one training ship, one support ship, one diving ship, ten transport ships, one salvage ship, two floating docks, and seven coastal tugs. According to IISS, Libya's operational strength included two submarines, two frigates, three corvettes, 13 missile patrol boats, six mine countermeasure vessels, four amphibious vessels, and nine support ships.

Libya has done a poor job of creating operational naval forces. Libya once had six 1,950-ton ex-Soviet Foxtrot-class submarines that were delivered between 1976 and 1982. These were export versions of the submarine from a reactivated production line and were obsolescent when delivered. They were armed with ten 533-mm torpedo tubes and had Soviet Type 53 active/passive and SEAT-60 passive homing torpedoes (15-kilometer range) homing torpedoes. They were only fully operational as long as the crews were FSU trained and supported, and the ships were maintained by the FSU. This does not seem to have been the case since 1984, and there have been no regular undersea patrols since that time. One submarine sank in 1993. It was raised, but was not returned to service. Libya was seeking to overhaul and modernize its remaining submarines when UN sanctions were imposed, but its remaining ships are now so obsolete that there is little point in such modernization. Only two of its submarines are now operational, and only one – the Al Khybedr – makes occasional surface patrols.

Libya retains two missile frigates: 1,900-ton ex-Soviet Koni-class vessels, delivered in 1986 and 1987. They each were armed with four SS-N-2C Styx missiles (83 kilometers range), four 76mm guns, four twin 30mm guns, SA-N-4 Gecko surface-to-air missile launchers, and four 406mm torpedo tubes. They could fire Soviet Type 40 active/passive anti-submarine torpedoes. These two frigates lack some of the sensors and electronics of Soviet ships but are relatively modern. Both ships are active, but have not had any significant modernization since they were delivered in the late 1980s. Libya's capability to fully operate these two ships in combat is uncertain.

Libya has two 660-ton Soviet Nanuchka II-class corvettes with four SS-N-2C missiles (83 kilometers range), SA-N-4 Gecko surface-to-air missile launchers, and two twin 57mm guns. It originally had four. One was sunk by the US

navy on March 24, 1986. Another, the *Tariq Ibn Ziyad* (formerly the *Ean Mara*), was severely damaged by the US navy on March 25, 1986, but was repaired in the FSU and returned to service. It and *Ean Zara* – seem to be quasi-operational. Another, the *Ean Al Gzala* has not been at sea for four years and may have been stripped for parts.

Libya has eight 311-ton Combattante IIG-class missile patrol boats, delivered in 1982-1983. Each has with four Otomat Mark I/II launchers (60-80 kilometers) and 12 76mm guns. Only some of these ships are crewed and operational. Libya's missile patrol craft also include six 245-ton OSA-II class boats, delivered during 1976-1980, each with four SS-N-2C Styx anti-ship missile launchers (83 kilometers) and two twin 30mm guns. It is uncertain that their anti-ship missiles are fully operational.

Libya still has other patrol craft in its navy, including one 100-ton Poluchat-class torpedo recovery vessel, four Garian-class large patrol craft, and three Benina-class large patrol crafts. It is not clear that any of these craft are now truly operational.

The navy still has five 804-ton Soviet Natya-class ocean-going mine sweepers in inventory. These represent a moderate threat because they can lay mines with little warning, though Libya has already used commercial cargo ships to lay mines in the Red Sea, and this kind of asymmetric warfare does not require combat ships. At least five are operational, and possibly six. They are used for coastal patrols and training, and have never been observed in minesweeping exercises.

The Libyan Navy has five amphibious ships and three LCTs in inventory. These ships include two 2,800-ton PS-700 class landing ship-tanks (240 troops and eleven tanks each). Both have not been modernized since the late 1970s, but are operational. One, however, may have been transferred to commercial service. There are three Turkish-made 600-ton landing craft-tanks (100 troops and five tanks each.), but their operational status is doubtful. Libya has a number of training and support ships. They include one 500-ton training ship, one support ship, a salvage ship, a diving tender, seven tugs, and 10 2,412-ton transport ships. These latter transport ships are now in commercial service, and can be used to either move heavy equipment and troops or lay mines.

The navy has the support of two air force squadrons with a total of 32 armed helicopters, including 25 Mi-14 Haze ASW helicopters, and seven SA-321 Frelon and SA-341 Super Frelon ASW and SAR helicopters. They are worn and obsolete and most are not operational. They can carry AM-39 Exocets but do not seem to do so. The operational status of the Hazes is unclear. There were five SA-316B support helicopters assigned to support the police and customs, but none now seem to be operational. The air force also provides support in the naval reconnaissance and surface support roles. In addition, the navy had several shore batteries, including some with Otomat, SSC-3 and SS-N-2d missiles (95 kilometers). Libya also has some kind of coastal radar and surveillance system, and may be using part of its popular militia in a coast watch mission.<sup>viii</sup>

The Libyan navy's overall training and readiness levels were never high, and declined sharply after the mid-1980s, possibly because of decreased funding and a resulting drop in support from the FSU. The Navy suffered badly from UN sanctions, but acquired some Ukrainian technical support in 1995 and received more parts deliveries and repairs after 1998. Some individual ship crews have moderate capability, but overall training, readiness, and command standards are low, and weapons systems and combat electronics are rarely exercised. Libya cannot operate as an effective fleet. Maintenance seems to be as badly organized as most aspects of Libyan military activity.

### **Libyan Air Force**

In early 2004, Libya's air force and air defense command had a nominal strength of 23,000 men, although some estimates put the total below 18,000. They had approximately 380 combat aircraft and 60 armed helicopters. It has at least 10 large air bases with shelters and land-based anti-aircraft defenses. It has major air bases at Umm Aitqah, Banghazi-Banina, El Adem (General Abdel Nasser), Tripoli (Okba Ibn Nafa), Bengazi, and Zawiyat-El Bayda. Libya's forces are concentrated at bases in Tripoli and Benghazi. There are dispersal bases at Ghat, Sebha, and Tobruk.

Libya's air force includes some advanced aircraft types, but much of it is obsolete or ineffective. The Libyan Air Force still has one bomber regiment with six Tu-22 Blinders. The USSR transferred 12 long-range Tu-22 bombers in April 1979, and five to six may still be marginally operational.<sup>ix</sup> These aircraft are obsolete medium altitude bombers that are very vulnerable to both air-to-air and surface-to-air missile defenses.

Libya's air force has 7 fighter ground attack squadrons (down from a peak of 13), 9 fighter squadrons, two reconnaissance squadrons, an attack helicopter squadron, and numerous fixed and rotary wing helicopter units. Its

squadrons are organized into regiments, some of which have both defense and attack missions, but which are normally either strike/attack or air defense regiments.

The only Libyan air force unit with advanced combat aircraft was a single Su-24 strike/attack squadron with only six aircraft. Soviet transfers of six to ten Su-24Ds 1989 gave Libya a more serious long-range strike fighter, which was then one of the most advanced aircraft in Soviet inventory. The Su-24 is a twin seat swing-wing aircraft that is roughly equivalent in terms of weight to the F-111, although it has nearly twice the thrust loading, and about one-third more wing loading. It is deployed in five variants. Although it is not clear which variant Libya has received, it seems likely that it is the expert version of the Su-24D.

Although its avionics are now a decade old, the SU-24D has a sophisticated radar warning receiver, an improved electronic warfare suite, an improved terrain avoidance radar, a beam, satellite communications, an aerial refueling probe, and can deliver electro-optical, laser, and radar-guided bombs and missiles. The Su-24 can carry payloads of nearly 25,000 pounds, and can operate missions with a 1,300-kilometer radius when carrying 6,600 pounds of fuel. With a more typical 8,818 pound (4,000-kilogram) combat load, it has a mission radius of about 790 kilometers in the LO-LO-LO profile, and 1,600-kilometers in the LO-HI-LO profile. With extended-range fuel tanks and airborne refueling, the Su-24 can reach Italy, Egypt, Chad, and even Israel, although the latter mission would be demanding, would have to be flown out of an eastern base like Benghazi, and would allow only a limited time over the target.<sup>x</sup> The Su-24 can carry up to three AS-7 Kerry radio command guided missiles (5-kilometers range), one AS-9 These can include a mix of Kyle anti-radiation missile with passive radar guidance and an active radar fuse (90-kilometers range), three AS-10 Karen passive laser guided missiles with an active laser fuse (10-kilometers range), and three AS-11 Kilter anti-radiation missiles with passive radar guidance and an active radar fuse (50-kilometers range). It also can carry up to three AS-12 Kegler anti-radiation missiles with passive radar guidance and an active radar fuse (35-kilometers range), three AS-13 Kingposts, and three AS-14 Kedge semi-active laser guided missiles with a active laser fuse (12-kilometers range). The Su-24 also can carry demolition bombs, retarded bombs, cluster bombs, fuel air bombs, and chemical bombs.

Libya has acquired a limited long-range refueling capability in order to ease many of the problems that it would face in conducting such strikes. While Libya did not get the modified IL-76 that it had originally sought from the USSR for refueling its Su-24s, it did get the technology that it needed to convert one of its C-130s into a tanker for airborne refueling from West German firms. Libya has experimentally refueled its Mirage F-1s, and is seeking a modifiable cargo jet so that it will be able to refuel at higher speeds and without the maneuver problems inherent in trying to refuel a jet fighter from a propeller aircraft.

Libya's six additional fighter ground-attack units had a total of 40 MiG-23BNs, 15 MiG-23Us, 30 Mirage 5D/DEs, 14 Mirage 5DDs, 14 Mirage F-1ADs, and 53 Su20/-22s. Some sources indicate there also was still a COIN squadron with 30 J-1 Jastrebs. Libyan attack aircraft performed poorly in close air support and interdiction missions in Chad, and there are no reports that Libya has since developed effective training systems and facilities, or has practiced meaningful exercises in low altitude combat, air defense evasion, countermeasure penetration, or combined arms with the Libyan army. Libya did, however, have relatively modern AS-7, AS-9, and AS-11 Soviet air-to-surface missiles and some anti-radiation missiles. It had large stocks of unguided bombs, including napalm, and seems to have had some laser-guided bombs.

The Libyan Air force had nine fighter squadrons, equipped with a total of 15 Mirage F-1ED/BDs, 45 MiG-21s, 70 MiG-23 Flogger Es, 94 MiG-25s, and three MiG-25Us. These air defense fighters had aging avionics with limited capability, but advanced air-to-air missiles like the AA-6 Acrid, AA-7 Apex, AA-8 Aphid, R-530, and R-550 Magic. Only the Mirage F-1s and some MiG-25s had more than very limited long range intercept, and look-down shoot-down capabilities, and Libya had major pilot training problems and had lost a number of aircraft to accidents.

Libyan air-to-air training levels and air combat tactics have remained far inferior to those of U.S. pilots and well-trained Middle Eastern pilots like those of Egypt and Saudi Arabia. Libya seems to have had a serious shortage of even mediocre combat pilots, and may be dependent on Soviet and other foreign officers and technicians for effective ground-controlled intercepts. It still does not seem to be able to conduct effective electronic warfare.

Libya had two reconnaissance squadrons with four Mirage-5DRs and seven MiG-25Rs. If the MiG-25R is similar to Soviet versions, it has infrared, side-looking radar, and ESM capabilities. Libya also has some remotely piloted vehicles. This gives Libya a reasonable mix of basic reconnaissance capabilities, but it seems doubtful that it has organized to use them effectively. It may well rely on the slow daylight photography system of most Third World nations.<sup>xi</sup>

Libya had an attack helicopter squadron with 29 Mi-25s and 31 Mi-35s. Some of these helicopter forces seemed to have had moderate training, but the helicopters were equipped with obsolescent avionics and with AT-2 Swatter air-to-ground missiles. Readiness was poor and some aircraft had been lost to accidents.

Other air units included seven transport squadrons, transport helicopters, and training aircraft. The transport squadrons had 23 An-26, seven CH-130s, two L-100-20s, three L-100-30s, 6 G-222s, 25 IL-76s, and 15 L-410s. There was a heavy transport helicopter squadron with 17 CH-47Cs, a medium transport squadron with 34 Mi-8s and Mi-17s, and a light unit with 11 SA-316s, and five AB-206s. The transport forces seemed to be the most effective element of the Libyan air force.

These holdings are impressive in terms of sheer numbers, but the air force still has severe shortages of competent pilots, and training levels and quality were poor. The overall readiness of Libyan aircraft is poor, and most Libyan aircraft are now dated or obsolescent in terms of avionics and upgrades. The operational sustainability of even Libya's most combat-ready aircraft is limited, and most bases can evidently only support limited numbers of types of aircraft. The air force seems to be dependent on foreign technicians for training, maintenance, and sometimes even combat missions. Overhaul and combat repair capability is limited, and combat sustainability is poor. Maintenance is mediocre, and an over-centralized and politicized command structure limits air defense proficiency and makes it difficult to effectively plan coherent air attacks and sustain significant numbers of sorties. In 2004, up to half of Libya's aircraft were in storage or of negligible operational value, and the air force still seemed to rely heavily on Syrian, FSU, North Korean, and Pakistani "instructors" to fly actual missions.

### **Libyan Land-Based Air Defenses**

Libya's land-based air defenses are badly dated and are largely obsolete or obsolescent. They are, however, among the largest such defenses in the Middle East. In 2005, Libya's air defense forces included four SA-5 brigades, each with two battalions of six launchers (48 total), four air defense gun batteries, and a radar company. According to some reports, these SA-5 units were partly manned by some Russian personnel.

There were five regional surface-to-air missile commands, each with five to six brigades with 18 SA-2 launchers each (160-180 launchers total); two to three brigades with 12 SA-3 launchers each (100 to 110 launchers total); and three brigades with 20-24 SA-6s (130-150 launchers) and some SA-8s each. These missile units were loosely integrated by Libya's Senezh air defense and command system. Both the SAM units and command system of the Air Defense Command were heavily dependent on expatriate support personnel, who sometimes seem to act as operators. Overall capability is low, except for those forces with direct foreign "supervision".

Libya's major surface-to-air missile forces were first placed under an Air Defense Command, which was formed in 1973, the year of the October War. This command was merged and reorganized in the late 1980s after the U.S. air strikes on Libya. The Air Defense Command seemed to be somewhat more effective than the air force. In 2000, it was reasonably well-deployed and provided overlapping coverage by a range of different missiles along the coastal areas. The network of radars was badly dated, however, as were its electronic warfare and command and control assets.

If British reports are correct, Libya still uses a modification of the same kind of Central Command Center and regional Sector Operations Centers that the Former Soviet Union set up in Algeria, Syria, Iraq, and many other countries dependent on FSU arms and aid. The Libyan system, however, was upgraded more than Algeria's before the breakup of the Soviet Union. Soviet high capacity communications systems have been installed, and extensive use is made of buried land lines to reduce the electronic and physical vulnerability of the system. The Air Defense Command also seems to have been upgraded with relatively modern early warning radars, and electronic warfare equipment.

These problems led Libya to make the acquisition of new surface-to-air missiles a key priority once sanctions were suspended in April 1999. Libya sought a new air defense system from Russia based on the S-300PMU1 and S-300PMU2 air defense missiles and their supporting radars and C<sup>4</sup> systems. Price was still a major issue during the Russian-Libyan negotiations in 2000, however, and Libya evidently looked at Belarus and Ukrainian versions of the same system.<sup>xii</sup>

The obsolescence of Libya's aging Soviet-supplied surface-to-air missiles is scarcely its only problem. Operator training and proficiency remains low. The system is over-centralized and has relatively slow data process and limited automated analysis capability. Ergonomics and data interfaces are poor and the system is vulnerable to electronic warfare and anti-radiation missiles. Overall alert rates are poor to mediocre, and Libyan operators have

not fully adapted to the use of Soviet automated systems. It is also unlikely that Libya's electronic warfare assets give it much protection against the level of jamming and countermeasure technology that the U.S. deployed in Operation Desert Storm and Desert Fox.

### **Libyan Paramilitary and Security Forces**

Like most North African states, Libya is better at internal repression than at dealing with foreign threats. Libya has a number of paramilitary forces and security services. They act as a means of controlling the power of the regular military and providing Qadhafi with security.

The data on such forces is uncertain and sources report very different details. There seems to be a 3,000-man Revolutionary Guard Corps (Liwa Haris Al-Jamahirya) to guard Qadhafi with T-54/55/62 tanks, armored cars, APCs, multiple rocket launchers, and ZSU-23-4s and SA-8s, which are taken from the army inventory. There also seem to be up to 2,500 men in the Islamic Pan African Legion, which may have one armored, one infantry, and one paracommando brigade, although its total manpower strength could only man less than one brigade slice. The Islamic Pan African Legion has at least 75 T-54s and T-55s and some EE-9 MICVs. Roughly 700-1,000 men from the Islamic Pan African Legion were believed to be in the Sudan in 1988, but current deployments are unknown. There is also a People's Cavalry Force that acts largely as a parade unit, and a people's militia with a nominal strength of about 40,000 men.

As is the case with other North African states, there are comparatively little reliable data on the operations of the government's security forces. The best unclassified reporting comes from the US State Department, and much of this reporting provides reliable insights into the operations of the security forces. The US State Department reports that Libya maintains an extensive security apparatus, consisting of several elite military units, including Qadhafi's personal bodyguards, local Revolutionary Committees, and People's Committees, as well as the "Purification" Committees, which were formed in 1996. The result is a multi-layered, pervasive surveillance system that monitors and controls the activities of individuals.

### **The Military Forces of Tunisia**

Tunisia has always been a defensive military power. Until recently, its major threat has been Libya. At this point, it faces no serious external threat. Its armed forces are designed largely for border defense, internal security, and protection of key economic facilities. Tunisia lacks the active force and equipment strength necessary to deploy significant strength on either border in peacetime, and keeps most of its units near urban centers. It does, however, have special units in the Sahara brigade that cover the border and provide a light screen of security forces.

The armed forces have a conventional organization and command structure, with a Minister of Defense and an Army Chief of Staff, and an army, national guard, navy and air force. The trends in Tunisian military forces are shown in **Figure 2.4**. Tunisia had total force with only some 35,000 men in 2004, including 23,400 conscripts. Its land forces had a total of 84 tanks, 149 AIFV's, 268 APC's, and 117 pieces of towed artillery. Its air force possessed 29 combat aircraft and 7 attack helicopters. Its naval forces had 6 missile craft and 13 patrol boats. These small equipment holdings make Tunisia an exception to the "militarism" of most North African states. They are force levels that are far closer in size to Tunisia's real strategic needs than the force levels of any of its neighbors, but vulnerability is the price of moderation.

#### **Tunisian Army**

The Tunisian army has a total of 27,000 men, of which some 22,000 are conscripts with limited experience and training. Officer and career other ranks training and proficiency are good by Third World standards. Conscripts are selected to ensure they have a good basic education, but only serve for 12 months. Overall training standards are physically rigorous, but conscripts gain little proficiency in combined arms and maneuver warfare. The total strength of Tunisia's organized reserves is currently unknown. There is little indication that they are well trained or organized, or would be combat effective without months of reorganization and training.

The army was reorganized in the early 1990s to create three mechanized brigades, and the chain of command now flows down from the Army Chief of staff to the First, Second, and Third Mechanized Brigades, the Saharan Brigade, and a Special Forces Brigade. The major Tunisian army base is in Tunis. The army is now organized into three mechanized brigades (each with one armored regiment, two mechanized infantry regiments, one artillery regiment, and one air defense regiment). One report indicates that a typical mechanized brigades is supposed to have a tank battalion with 42 main battle tanks, a mechanized battalion with 45 armored personnel carriers, a motorized rifle

battalion with 34 light armored vehicles, an artillery battalions with 18 guns, an anti-tank guided weapons battery with 12 fire units, an anti-aircraft battalion, an engineer battalion, a reconnaissance company, and logistic, transport, and supply elements. The army also has one reinforced Sahara brigade, one Special Forces brigade, and one engineer regiment. These formations are generally relatively small. A Tunisian brigade generally has only about 5,000 men, and a regiment of only 1,000 to 1,500 men.

The army has slowly acquired 84 main battle tanks (30 M-60A1s and 54 M-60A3s). It has 54 obsolescent Steyr SK-105 Kuerassier light tanks, and 69 relatively low-grade armored reconnaissance vehicles, including 24 Saladins and 45 AML-90s. It has about 268 APCs, including 140 M-113 A-1/2s, 18 EE-11 Urutus, and 110 Fiat F-6614s.

Tunisia is learning how to use modern armor, but is, at best, capable of largely static defense in the event of a major attack by Libya or Algeria. Its armor is poorly standardized, and many items are aging or obsolete. Overall, Tunisian armored forces have continuing maintenance and standardization problems. They are trained well enough for light defensive operations, but have limited maneuver and offensive capability.

The army has made improvements in its artillery strength in recent years, and most Tunisian artillery battalions now seem to have a full complement of weapons. Total strength has risen from 80 artillery pieces in 1988, to about 117 weapons in 1998, and 123 weapons, but this strength is all in towed weapons that cannot maneuver with armor. Tunisia has 48 M-101A1/A2 105mm towed weapons, 12 M-114A1 155mm towed weapons, and 57 M-198 155mm towed weapons. It also has 95 81mm mortars and 66 4.2-inch and 107mm mortars. It has been able to employ these weapons defensively in small batteries, but has limited maneuver, command and control, counter battery, and beyond visual range targeting capability.

The anti-tank weapons strength of the Tunisian army is limited, although it includes some modern types like the Milan and TOW. In 1998, Tunisia had a mix of 500 Milan and 100 MGM-71A TOW anti-tank guided missile launchers, including 35 TOW anti-tank guided missile launchers mounted on M-901 armored vehicles. It had 140 57mm M-18 recoilless rifles and 70 M-40A1 106mm recoilless rifles. It also had 300 M-20 3.5" and 300 LRAC-89 89mm anti-tank rocket launchers. Few anti-tank crews have high readiness or realistic training against mobile armor.

The air defense weapons of the Tunisian army include 48 aging RBS-70 and 25 M-48 Chaparral surface-to-air missile fire units. Tunisia also has 100 M-55 20mm and 15 M-1939/Type 55/-65 37mm AA guns. These weapons are capable of providing limited low altitude point defense. Tunisia has no heavy surface-to-air missile systems in either the army or the air force.

Tunisia is only beginning to acquire the elements of modern armored warfare training, and faces massive problems in rationalizing its diverse inventory, which now consists of far too many erratic small buys of incompatible or hard-to-support equipment. The Tunisian army badly needs to improve its manpower management, emphasis on professionalism and career incentives, and support and logistic capabilities. At present, most units cannot operate effectively for any length of time unless they are near their peacetime depots and casernes, and even then, the logistic and service support system is not particularly effective.

## **Tunisian Navy**

The 4,500-man Tunisian navy is based at Bizerte, Sfax, LaGoulette and Keliba. It has nearly 700 conscripts, but ship crews tend to be relatively professional. In early 2001, its holdings included three missile fast attack craft, three missile patrol craft, two regular fast attack craft, five large patrol craft, 21 coastal patrol craft, 14 small patrol craft, and five training/survey ships. Two more regular fast attack craft were on order, and a number of its patrol craft were not truly operational or were laid-up.

The navy had three Combattante III-class 425-ton missile guided fast attack craft, each with two quad MM-40 Exocet anti-ship missile launchers, The Exocet missiles have active radar homing and a maximum range of 70-kilometers (40-miles). They also have one 76mm gun, and two twin 40mm Breda guns. There is an air/surface search radar, but there are no surface-to-air missile launchers. These ships were all delivered in the mid-1980s and need modernization and refits. Tunisia also had three Bizerte-class 250-ton missile patrol craft with eight Aerospatiale SS12M and four 37mm guns. The SS-12M is a very short-range missile (5.5 kilometers or 3 nautical miles) with a small warhead. These Bizerte-class ships are all operational but are badly in need of refits.

Other combat ships included three 120-ton Haizhui-class ex-PRC fast attack craft, each with four 25mm guns. These ships were delivered in the mid-1990s, and are all operational. They included three 250-ton Bizerte-class large patrol craft with 20mm guns that date back to the late 1970s, but have had their guns updated and are operational. The

Navy had ten coastal patrol craft. These included four Istiklal-class 80-ton coastal patrol craft with twin 20mm guns and surface search radars; and six 38-ton coastal patrol craft with 20mm guns. The remaining vessels include five Kondor-class 377-ton patrol craft with twin 25-mm guns, and five Bremse-class 42-ton patrol craft with twin 14.5-mm guns, operated by the Coast Guard, plus eleven 32-ton coastal patrol craft operated by customs, 4 Gabes-class 18-ton patrol boats, and six training/survey ships.

While Tunisia is capable of operating most of its individual ships, it does not seem to be organized for any kind of fleet or combined arms operations. The Tunisian Navy is adequate for patrol missions in local waters, but is not capable of engaging the navies of any of Tunisia's neighbors. It is not strong enough to survive an attack by the Libyan or Algerian navies. Overall logistic and maintenance capabilities seem to be limited. At the same time, Tunisia can probably count on European, US and/or Egyptian naval support in the event of any offensive attack by its neighbors – none of whom can risk confronting these naval powers.

### **Tunisian Air Force**

The 3,500-man Tunisian Air Force (TAF) has some 700 conscripts. It has slowly developed relatively effective manpower policies and is gradually developing the capability to train and retain competent pilots and air crews. It is expanding steadily, and had 29 combat aircraft and 15 attack helicopters in early 2004. Its main bases are in Bizerte-Sidi Ahmed, Bizerte-La Karouba, and Sfax-El Maou. Its forces are organized largely along squadron lines with air defense, counterinsurgency (COIN), and attack training.

The TAF has done a good job of absorbing and operating its 12 F-5E/Fs in the fighter ground-attack role, and has gradually developed a limited capability for daytime air-to-air combat. It is unclear whether Tunisia still suffers from a shortage of trained F-5 pilots. It also had five MB-326s in the COIN role. Some of its 5 MB-326B and 12 L-59 training aircraft seem to have limited combat capability.

These aircraft are reasonably effective in attack missions against troops that are not equipped with modern manportable or short range guided missiles -- a limitation that may present serious problems if the Tunisian Air Force must deal with regular Libyan or Syrian forces. None of its combat aircraft have advanced air defense or attack capabilities, however, and Tunisia needs 12-24 more modern combat aircraft during the next 5-8 years. Given potential threats, it needs a modern all-weather air defense fighter with beyond visual range air-to-air intercept capabilities.

The air force has two S-208M liaison aircraft, and a training wing with 18 combat capable SF-260s, five MB-326s, and 12 L-59s. It also has a wing with 43 helicopters, including six SA-313s, three SA-316s, 15 AB-205s, 12 UH-1s, six AS-350Bs, and one AS-365F. These helicopters give Tunisia's armed forces considerable tactical air mobility for a force of their size.

In broad terms, Tunisia has a primitive air control and warning system, and limited sensor coverage of Tunisian air space. It is not organized to fight at the air force level, as distinguished from the formation or squadron level. It has the same problems in terms of retaining and training good personnel as does the army, and is heavily reliant upon foreign contractors for logistics and maintenance. Some effort has been made to give the Tunisian air force a combined operations capability based on U.S. doctrine and training concepts, but success is evidently still very limited.

### **Tunisian Paramilitary Forces and Internal Security**

Tunisia's paramilitary forces consist of a National Guard with 10,000-12,000 men. It has a naval element with some 13 patrol craft and an aerial element with five P-6B aircraft and eight SA-318 and SA-319 helicopters. The National Guard shares responsibility for internal security with the police. The police operate in the capital and a few other cities. In outlying areas, their duties are shared with, or ceded to, the National Guard. Both forces are under the control of the Minister of Interior and the President.

As is the case with other North African states, there is comparatively little reliable detailed data on the operations of the government's security forces. The best unclassified reporting comes from the US State Department, and much of this reporting provides reliable insights into the operations of the security forces.

**Figure 2.1****Moroccan Force Developments 1980-2005**

<b>Category/Weapon</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2005</b>
<u>Defense Budget</u> (\$Current Billions)	0.676	0.504	1.36	1.23	1.8	1.5	2.0	?
<u>Mobilization Base</u>								
Men Ages 13-17	-	-	1,437,000	1,599,600	1,690,000	1,780,000	1,780,000	?
Men Ages 18-22	-	-	1,343,000	1,439,000	1,526,000	1,612,000	1,612,000	?
<u>Manpower</u>								
Active (Conscript)	116,500	149,000	192,500	195,500	196,300	198,500	196,300	196,300
Reserve	-	-	100,000	150,000	-	150,000	150,000	150,000
Total	-	-	292,500	249,500	-	348,500	346,300	346,300
Paramilitary	30,000	33,000	40,000	42,000	42,000	48,000	50,000	50,000
<u>Land Forces</u>								
Active Manpower (Conscripts)	105,000	130,000	175,000	175,000	175,000	175,000	175,000	175,000
Reserve Manpower	-	-	-	150,000	-	150,000	150,000	150,000
Total Manpower	-	-	-	325,000	-	325,000	325,000	325,000
Main Battle Tanks	170	190	284	524	524	744	520	520
AIFVs/Arm. Cars/Lt. Tanks	740	612	474	559	559	539	215	215
APCs/Recce/Scouts/Half-Tracks	644	806	879	785	785	1,109	1,064	1,064
ATGM Launchers	-	-	850	720	720	720	720	720
SP Artillery/SP Anti-tank guns	217	174?	230	175	167	227	227	227
Towed Artillery	132	174	144	164	190	185	185	185
MRLs	36	20	40	39	39	26	40	40
Mortars-	-	1,290	680+	1,700	1,700	1,470	1,470	1,470
SSM Launchers	-	-	-	-	0	0	0	0
AA Guns	-	140	427	-	425	425	425	460
Lt. SAM Launchers	-	-	-	107	107	107	107	107
<u>Air &amp; Air Defense Forces</u>								
Active Manpower	7,000	13,000	13,500	13,500	13,500	13,500	13,500	13,500
Reserve Manpower	-	-	-	-	-	-	-	-
<u>Aircraft</u>								
Total Fighter/FGA/Recce	90	105	93	99	89	74	95	95
Bomber	0	0	0	0	0	0	0	0
Fighter	0	0	15	15	15	15	15	15
FGA/Fighter	68	77	0	0	0	0	0	0
FGA	0	0	31	34	47	53	54	54
Recce	0	0	6	2	6	6	6	6
COIN/OCU	22	28	46	50	0	0	0	0
Airborne Early Warning (AEW)	0	0	0	0	0	0	0	0
Electronic Warfare (EW)	0	0	3	3	3	3	4	4
Maritime Reconnaissance (MR)	0	0	0	0	0	0	0	0
Combat Capable Trainer	35	52	-	12	23	23	24	24
Tanker	0	0	4	3	3	3	3	3
Transport	29	33	33	35	36	33	33	33
<u>Helicopters</u>								



Attack/Armed/ASW	0	18	50	24	24	24	24	24
Other	117	90	24	89	88	89	88	88
Total	117	108	74	113	112	113	112	112
<b>SAM Forces</b>								
Batteries	0	0	0	0	0	0	0	0
Heavy Launchers	0	0	0	0	0	0	0	0
<b>Naval Forces</b>								
Active Manpower	4,500	6,000	7,000	7,000	7,800	10,000	7,800	7,800
Reserve Manpower	-	-	-	-	-	-	-	-
Total Manpower	-	-	-	-	-	10,000	7,800	7,800
<b>Submarines</b>								
Destroyers/Frigates/Corvettes	0	1	1	3	1	1	2	2
Missile	0	1	1	3	1	1	2	2
Other	0	0	0	0	0	0	0	0
Missile Patrol	2	6	4	4	4	4	4	4
Coastal/Inshore Patrol	15	17	21	23	23	23	23	23
Mine	0	0	0	0	0	0	0	0
Amphibious Ships	4	4	3	4	4	4	4	4
Landing Craft/Light Support	-	-	-	-	4	4	4	4
ASW/Combat Helicopter	0	-	-	-	0	0	2	2

Source: Adapted by Anthony H. Cordesman from data provided by US experts, and the IISS, Military Balance, various editions.

**Figure 2.2****Algerian Force Trends 1980-2005**

<b>Category/Weapon</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2005</b>
<u>Defense Budget</u> (In 96-97, \$Current Billions)	0.705	0.938	1.01	1.36	1.9	2.1	2.8	?
<u>Mobilization Base</u>								
Men Ages 13-17	-	-	1,535,000	1,796,000	1,891,000	1,986,000	1,986,000	?
Men Ages 18-22	-	-	1,328,000	1,551,800	1,693,000	1,934,000	1,834,000	
<u>Manpower</u>								
Total Active (Conscript)	101,000 -	170,000 100,000	125,000 70,000	121,700 90,000	122,000 75,000	124,000 75,000	127,500 75,000	127,500 75,000
Total Reserve	100,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Total	201,000	320,000	275,000	271,700	272,000	274,000	277,500	277,500
Paramilitary	10,000	30,550	23,000	105,000	146,200	181,200	181,200	181,200
<u>Land Forces</u>								
Active Manpower (Conscripts)	90,000 -	150,000 100,000	107,000 70,000	105,000 90,000	105,000 75,000	107,000 75,000	110,000 75,000	110,000 75,000
Reserve Manpower	-	-	150,000	150,000	-	150,000	150,000	150,000
Total Manpower	-	-	257,000	255,000	-	257,000	260,000	260,000
Main Battle Tanks	600	700	900	960	951	1,089	1,000	1,000
AIFVs/Armored Cars/Lt. Tanks	250	800	1,055	1,035	1,000	1,174	989	989
APCs/Recce/Scouts/Half-Tracks	830	550	860	460	680+	945	903	903
ATGM Launchers	-	-	-	-	-	-	-	-
SP Artillery	140	100	120	185	185	185	185	185
Towed Artillery	340	550	390	405	416	418	406	406
MRLs	85	170	78	126	126	96	144	144
Mortars	180	180	-	330	330	330+	330+	330+
SSM Launchers	50	-	-	-	-	-	-	-
AA Guns	540	280+	855	895	895	980	899	899
Lt. SAM Launchers	-	-	-	-	1,000+	1,000+	1,000+	1,000+
<u>Air &amp; Air Defense Forces</u>								
Active Manpower	7,000	12,000	12,000	10,000	10,000	10,000	10,000	10,000
Reserve Manpower	-	-	-	-	-	-	-	-
<u>Aircraft</u>								
Total Fighter/FGA/Recce	278	332	257	170	181	166	175	175
Bomber	24	0	0	0	0	0	0	0
Fighter	90	110	146	100	110	114	83	83
FGA/Fighter	0	0	0	0	0	0	0	0
FGA	110	150	47	50	50	48	66	66
COIN/OCU	44	0	18	0	0	0	0	0
Recce	10	6	3	9	10	10	12	12
Airborne Early Warning (AEW)	0	0	0	0	0	0	0	0
Electronic Warfare (EW)	0	0	0	0	0	0	0	0
Maritime Reconnaissance (MR)	0	8	2	2	15	15	15	15
Combat Capable Trainer	18	39	60	11	8	10	10	10
Tanker	0	0	0	0	0	0	0	0

Transport	20	29	26	26	27	27	27	27
<b>Helicopters</b>								
Attack/Armed/ASW	20	35	38	60	65	63	93	91
Other	37	72	91	53	63	50	50	50
Total	57	107	129	113	138	138	143	142
<b>SAM Forces</b>								
Batteries	1	5	9	9	9	9	9	9
Heavy Launchers	18	44	51	51	43	43	43	43
<b>Naval Forces</b>								
Active Manpower	4,000	8,000	6,500	6,700	7,000	7,000	7,500	7,500
Reserve Manpower	-	-	-	-	-	-	-	-
Total Manpower	-	-	-	-	-	-	-	-
<b>Submarines</b>								
Destroyers/Frigates/Corvettes	0	7	6	6	6	8	9	9
Missile	0	4	3	3	3	5	6	6
Other	0	3	3	3	3	3	3	3
Missile Patrol	17	8	11	11	11	9(2)	9(2)	9(2)
Coastal/Inshore Patrol	12	-	11	8	5	3	10	10
Mine	2	1	1	1	1	0	0	0
Amphibious Ships	1	3	3	3	3	3	3	3
Landing Craft/Light Support	-	-	-	-	3	3	3	3
ASW/Combat Helicopter	-	-	-	-	0	0	0	0

Source: Adapted by Anthony H. Cordesman from data provided by US experts, and the IISS, Military Balance various editions.

**Figure 2.3****Libyan Force Trends 1980-2005**

<b>Category/Weapon</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2005</b>
<u>Defense Budget</u> (\$Current Billions)	0.448	0.709	1.39	0.967	1.3	1.21	1.31	?
<u>Mobilization Base</u>								
Men Ages 13-17	-	-	262,000	312,400	350,000	387,000	387,000	?
Men Ages 18-22	-	-	216,000	262,200	291,000	320,000	320,000	?
<u>Manpower</u>								
Total Active	53,000	73,000	85,000	80,000	65,000	76,000	76,000	76,000
(Conscript)	-	-	-	-	-	40,000	38,000	38,000
Total Reserve	-	-	40,000	40,000	40,000	40,000	40,000	40,000
Total Active + Reserve	-	-	125,000	120,000	105,000	116,000	116,000	116,000
Paramilitary	-	7,000	5,500	-	-	-	-	-
<u>Land Forces</u>								
Active Manpower	45,000	58,000	55,000	50,000	35,000	45,000	45,000	45,000
(Conscripts)	-	-	-	25,000	25,000	25,000	25,000	25,000
Reserve Manpower	-	-	-	-	-	-	-	-
Total Manpower	-	-	-	-	-	-	-	-
Main Battle Tanks	2,400	2,800	2,300	2,210	2,025	985(1,040)	800(1,040)	800(1,040)
AIFVs/Armored Cars/Lt. Tanks	990	1,200	1,635	1,640	1,630	1,438	1,000	1,000
APCs/Recce/Scouts/Half-Tracks	900	1,160	950	900	990	1,381	1,065	1,065
ATGM Launchers	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
SP Artillery	18	218	370	450	450	265	444	444
Towed Artillery	590	930	720	720	720	647	647	647
MRLs	250	600	650	700	700	564	830	830
Mortars	450	450	-	-	-	-	500	500
SSM Launchers	2	48	120	120	120	120	120	125
AA Guns	450	350+	600+	600	600	600	600	600
Lt. SAM Launchers	-	-	-	-	1,000+	1,000+	2,500+	2,500+
<u>Air &amp; Air Defense Forces</u>								
Active Manpower	4,000	8,500	22,000	22,000	22,000	23,000	23,000	23,000
Reserve Manpower				-	-	-	-	-
Aircraft								
Total Fighter/FGA/Recce	287	535	513	417	420	360	400	380
Bomber	17	7	4	6	6	6	6	6
Fighter	105	285	284	209	212	177	209	189
FGA/Fighter	0	0	0	0	0	0	0	0
FGA	140	204	206	164	194	172	172	172
Recce	25	7	13	12	11	11	11	11
COIN/CU	0	30	30	30	0	0	0	0
Airborne Early Warning (AEW)	0	0	0	0	0	0	0	0
Electronic Warfare (EW)	0	0	0	0	0	0	0	0
Maritime Reconnaissance (MR)	0	0	0	0	0	0	0	0
Combat Capable Trainer	25	14	-	-	21	-	23	23

Tanker	0	0	0	0	0	0	0	0
Transport	47	62	82	78	75	81	83	83
Helicopters								
Attack/Armed/ASW	26	42	35	52	52	41	41	60
Other	62	55	89	98	98	112	90	90
Total	88	97	124	150	150	153	131	131
<b>SAM Forces</b>								
Batteries	12	12	33	39	39	39	39	39
Heavy Launchers	300	76?	150?	236	236	236	236	236
<b>Naval Forces</b>								
Active Manpower	4,000	6,500	8,000	8,000	8,000	8,000	8,000	8,000
Reserve Manpower	-	-	-	-	-	-	-	-
Total Manpower	4,000	6,500	8,000	8,000	8,000	8,000	8,000	8,000
Submarines	3	6	6	4	2	2	1(4)	1(4)
Destroyers/Frigates/Corvettes	2	10	10	6	7	5	2	2
Missile	1	10	10	6	7	3	2	2
Other	1	0	0	0	0	2	0	0
Missile Patrol	14	25	24	24	21	13(8)	8(22)	8(22)
Coastal/Inshore Patrol	11	5	23	8	8	-	-	-
Mine	0	7	8	8	8	6	2	2
Amphibious Ships	5	3	5	5	5	4(1)	3(2)	3(2)
Landing Craft/Light Support	1	-	4+	10	10	12	12	12
ASW/Combat Helicopter	0	-	31	30	32	7	7	7

Source: Adapted by Anthony H. Cordesman from data provided by US experts, and the IISS, Military Balance, 2001-2002, 2003-2004.

**Figure 2.4****Tunisian Force Trends 1980-2005**

<b>Category/Weapon</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2005</b>
<u>Defense Budget</u> (\$Current Billions)	0.114	0.437	0.388	0.262	0.340	0.332	0.537	?
<u>Mobilization Base</u>								
Men Ages 13-17	-	-	459,000	499,000	514,000	529,000	529,000	?
Men Ages 18-22	-	-	430,000	450,400	478,000	505,000	505,000	?
<u>Manpower</u>								
Total Active (Conscript)	28,600	35,100	38,000	35,500	35,000	35,000	35,000	35,000
Total Reserve	-	-	-	-	-	-	-	-
Total	28,600	35,100	38,000	35,500	35,000	35,000	35,000	35,000
Paramilitary	2,500	9,500	13,500	23,000	12,000	12,000	12,000	12,000
<u>Land Forces</u>								
Active Manpower (Conscripts)	24,000	30,000	30,000	27,000	27,000	27,000	27,000	27,000
Reserve Manpower	-	-	-	-	-	-	-	-
Total Manpower	-	-	-	-	-	-	-	-
Main Battle Tanks	0	68	98	84	84	84	84	84
AIFVs/Armored Cars/Lt. Tanks	85	110	139	114	114	123	54	54
APCs/Recce/Scouts/Half-Tracks	80	68	208	268	268	337	327	327
ATGM Launchers	-	-	-	565	565	600	600	600
SP Artillery	45	54	28	0	0	0	0	0
Towed Artillery	50	83	123	117	117	117	117	117
MRLs	0	0	0	0	0	0	0	0
Mortars	-	-	-	135	161	155	191	191
SSM Launchers	-	-	0	0	0	0	0	0
AA Guns	45	-	-	115	115	115	115	115
Lt. SAM Launchers	-	-	-	73+	73+	73+	74	74
<u>Air &amp; Air Defense Forces</u>								
Active Manpower	2,000	2,500	3,500	3,500	3,500	3,500	3,500	3,500
Reserve Manpower	-	-	-	-	-	-	-	-
<u>Aircraft</u>								
Total Fighter/FGA/Recce	14	20	50	32	44	51	29	29
Bomber	0	0	0	0	0	0	0	0
Fighter	0	0	0	0	0	0	0	0
FGA/Fighter	0	0	0	0	0	0	0	0
FGA	0	12	19	15	15	15	12	12
Recce	0	0	0	0	0	0	0	0
COIN/OCU	14	8	11	5	5	5	5	5
Airborne Early Warning (AEW)	0	0	0	0	0	0	0	0
Electronic Warfare (EW)	0	0	0	0	0	0	0	0
Maritime Reconnaissance (MR)	0	0	0	0	0	0	0	0
Combat Capable Trainer	12	7	-	23	25	24	0	0
Tanker	0	0	0	0	0	0	0	0
Transport	4	6	4	7	11	13	16	16
<u>Helicopters</u>								
Attack/Armed/ASW	1	1	0	7	7	7	15	15

Other	31	49	0	35	37	38	43	43
Total	32	50	41	42	44	45	58	58
<b>SAM Forces</b>								
Batteries	0	0	0	0	0	0	0	0
Heavy Launchers	0	0	0	0	0	0	0	0
<b>Naval Forces</b>								
Active Manpower	2,600	2,600	4,500	5,000	4,500	4,500	4,500	4,500
Reserve Manpower	-	-	-	-	-	-	-	-
Total Manpower	-	-	-	-	-	-	-	-
-								
Submarines	0	0	0	0	0	0	0	0
Destroyers/Frigates/Corvettes	1	1	1	0	0	0	0	0
Missile	0	0	0	0	0	0	0	0
Other	1	1	1	0	0	0	0	0
Missile Patrol	2	2	6	6	6	6	6	6
Coastal/Inshore Patrol	18	17	14	17	14	13	13	13
Mine	2	-	0	0	0	0	0	0
Amphibious Ships	0	-	0	0	0	0	0	0
Landing Craft/Light Support	-	-	-	-	3	2	2	2
ASW/Combat Helicopter	-	-	0	0	0	0	0	0

Source: Adapted by Anthony H. Cordesman from data provided by US experts, and the IISS, Military Balance, various editions.

### III. Future Patterns in Military Development

The irony behind the region's problems in military effectiveness is that it is not clear that they really matter all that much to the nations concerned. They have no real foreign enemies, and the future patterns of security in the Maghreb depend more on internal stability and the health of each economy than on strategic goals, military doctrine, and force plans. These helps explain several at the most probable trends in the military developments in both the region and each country within it:

- The Maghreb states are likely to expand their internal security forces and modernize some of their major weapons, in spite of diminished military requirements. This expansion will largely be the result of continuing internal and external political tension, bureaucratic momentum, and demographic pressure. Once the expansion of military forces takes place in a less developed country, it has a powerful "ratchet effect" that has nothing to do with local threats or military requirements. The lack of alternative employment and career paths, coupled with the role of the military in the nation's power structure and the sheer momentum of global military expansion and technological change, leads to military expansion almost regardless of local political conditions.
- Morocco's forces should be able to limit the Polisario threat to militarily, politically, and economically acceptable levels. Morocco should also be able to maintain adequate relations with Algeria so that both states can avoid an arms race. There is no guarantee that this will happen, however, and it is impossible to rule out a long-term return to some form of arms race, or conflict, between Algeria and Morocco.
- Libya will continue its failure to properly man and modernize its military forces, in spite of the suspension of UN sanctions in 1999. As the analysis later in this book shows, it will continue to seek weapons of mass destruction. These Libyan efforts will pressure the other states in the region to maintain higher levels of military spending than they desire.
- Libya and Algeria will experience steadily growing problems with obsolescence. Much of their equipment is worn, aging, improperly maintained, and hard to support. The end result will be a steady decline in the operational readiness of older types of equipment and growing problems in supporting the overall force mix in combat. Given Algeria's and Libya's limited revenues, both states are likely to drop in net military effectiveness, even though they may acquire enough equipment to have an apparent increase in force strength.
- The internal tensions within each country's military forces will make military politics more important than military effectiveness. In Algeria, the army does not serve the country—it owns it. The army suspended elections in 1992 in order to deny Islamic fundamentalists political control of the country. Since that time, Algeria has been engaged in a confusing, bloody internal conflict between the military government and Islamic extremists. Morocco's war with the Polisario now ties down its military, and has led to significant economic strains. A civil regime has taken over power from Bourguiba in Tunisia, but the incompetence and profiteering of the civil authorities may lay the groundwork for an eventual military or radical Islamic takeover. Qadhafi has reportedly purged the Libyan military, but it is virtually the only body that could replace him. Qadhafi has endured numerous coup attempts.
- The end of the Cold War has effectively ended the threat of Communism and Soviet penetration into the region's military forces. Islamic fundamentalism now represents the greatest threat of instability and is the rival of the secular and regular military forces in Algeria, Tunisia, and Egypt.
- Creeping proliferation is likely to remain a problem. Algeria and Libya have taken some steps to acquire weapons of mass destruction, and Libya has chemical weapons. This proliferation, however, is now severely limited by funding problems and access to technology.

#### Major Trends in Mahgreb Military Forces

The trends in the strength of Mahgreb military forces become clearer when they are examined by major category of military strength. The data on manpower have already been discussed.

- **Figures 3.1** through **3.2** display the trends in armor, tanks, and artillery in the Mahgreb. As **Figure 3.1** shows, Libya possesses over 4,600 armored vehicles (although some 1,040 tanks are in storage and



useless), Algeria has over 2,600, Morocco has over 1,800, and Tunisia has over 400. These inventory figures provide a rough indication of the amount of armor any given force can bring to bear, although Libya can operate only a comparatively small portion of the armor it holds, other nations hold an unknown amount of this armor in storage, and North African armies are not organized to deploy and support massed armored forces.

- **Figures 3.2 through 3.4** show the number and type of tanks in each country. Algeria and Libya have the largest holdings, but the disparities in operational tanks are not as great as the total inventory data might indicate. Algeria and Libya have rough parity in operational tanks. Morocco has about half as many tanks, and Tunisia less than 100. Egypt has about four times more operational tanks than the largest North African power, and these include 1,300 M-60A3 and 555 M-1A1 tanks. Morocco has a comparatively large percentage of relatively modern M-60A3s, but a total of only 240. The 350 T-72s in Algerian forces, and 145 in Libyan forces, are roughly comparable to the M-60A3 in quality. However, the export version proved to be far more vulnerable in the Gulf War than many experts had previously estimated and suffer from a lack of modern fire control systems.
- **Figure 3.5** compares the number of armored fighting vehicles. Morocco has large holdings, but also has large numbers of different types that are difficult to support. Algeria and Libya also have large holdings, and reflect better standardization of equipment types, but also have large holdings of BMP-1s. The BMP-1 has also proved to be more vulnerable than was initially estimated, and to have poor warfighting ergonomics.
- **Figures 3.6 through 3.7** indicate that Libya owns over 1800 pieces of artillery, Algeria has over 700, Morocco has just under 400, and Tunisia has over 100. Egypt's totals reflect considerably less emphasis on artillery than on armor. The totals for self-propelled weapons provide a rough indication of the capability to carry out combined arms maneuver, and rapidly deploy artillery to a new sector of a front. Algeria and Morocco have moderate to good self-propelled artillery strength relative to their armor. The figures for Libya reflect total inventories. Once again, many of these holdings are in storage and Libya only has the manpower and support capabilities to fight a fraction of its total holdings.
- **Figures 3.8 through 3.11** display data on combat aircraft, armed helicopters, and electronic warfare aircraft. Libya has 420 fixed wing aircraft and 52 armed helicopters. Algeria has 181 fixed wing aircraft and 65 armed helicopters, Morocco 89 and 24, and Tunisia 44 and 7. As **Figure 3.4** shows, however, that the Mahgreb countries have limited numbers of modern combat aircraft and relatively few reconnaissance, air control and warning, and electronic warfare aircraft. Algeria is the only nation now actively modernizing this portion of its military forces.

Morocco and Tunisia have no true high-performance combat aircraft. Libya has a token force of 6 Su-24s, but the rest of its holdings are aging 1970s and 1980s designs, and many are inactive or in storage. Egypt, in contrast, has a force of 143 modern F-16CDs, plus 35 F-16A/Bs and 18 Mirage 2000s. It is the only power neighboring the region with airborne battle management assets and anything approaching modern electronic air warfare capabilities. The large air orders of battle of Algeria and Libya conceal what is becoming a technological museum.

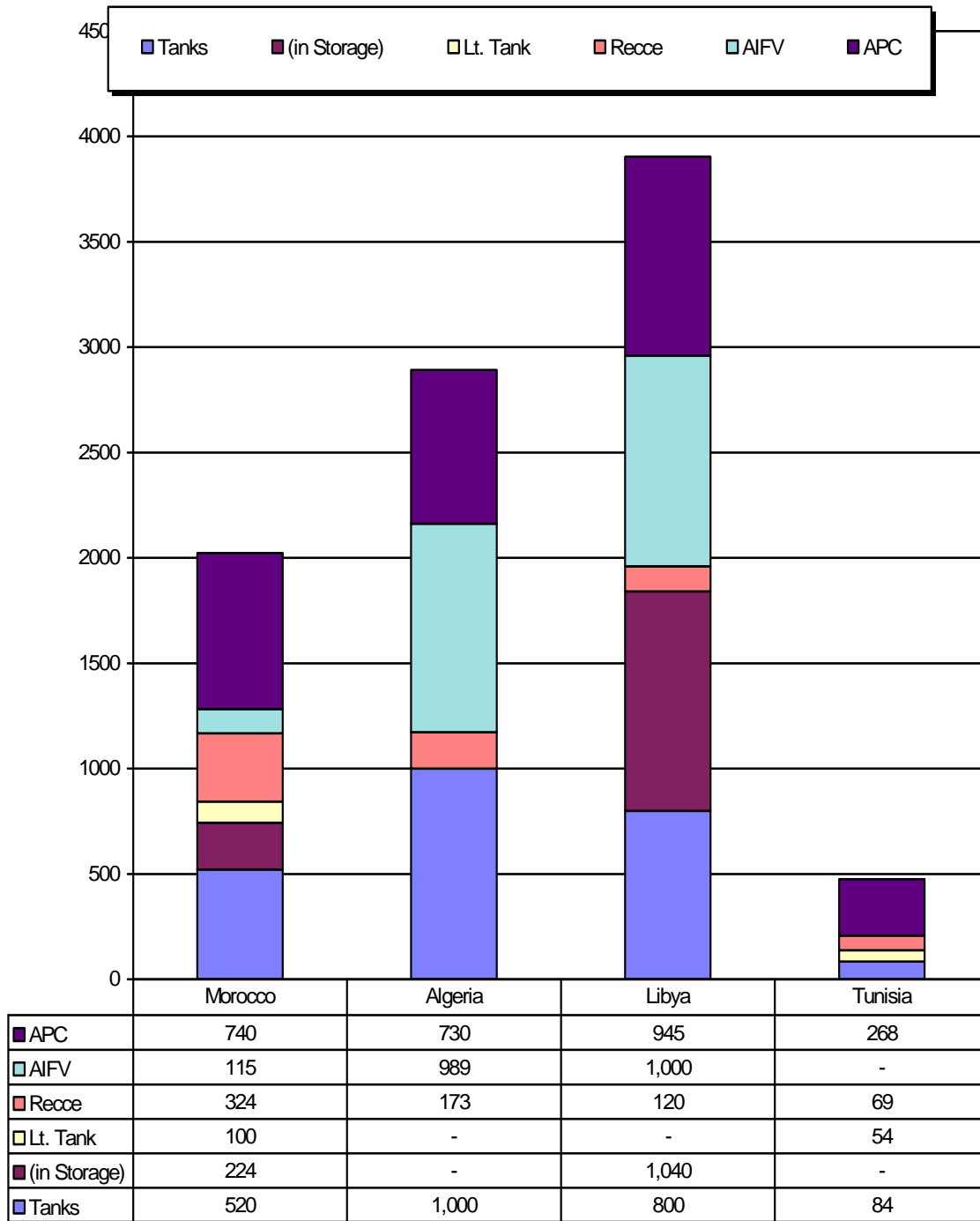
- **Figure 3.12** shows the strength of land-based air defense forces. Libya has a large quantity of major and light SAM launchers and 600 AA guns. Algeria has SA-6 and SA-3 major SAMs and 895 AA guns. Morocco and Tunisia have significantly smaller amounts of SAMs and AA guns. Almost all of these weapons systems are obsolescent or obsolete, however, and no North African state has a modern system of sensors, battle management systems, airborne early warning, and integrated air/land-based command and control systems to operate and support its surface-to-air missile systems.
- **Figures 3.13 through 3.14** display the total naval ship strength in North African forces. The number of ships in inventory, however, provides only a limited picture of comparative ship quality and war fighting capability. The country-by-country analyses that follow show that many ships are poorly modernization and weaponized, and have uncertain operational status or are inactive. Libya, in particular, has many ships that are in reserve to the point where it is questionable whether they will ever be active again, or are actually little more than hulks. Most North African combat ships have had little modernization, their air defense capabilities are weak, and their anti-ship missile defenses are very poor. No North African navies can operate as coherent fleets or task forces, or in effective joint operations.

- **Figure 3.15** shows the strength of the Polisario forces challenging Morocco in the Western Sahara. These forces are small compared to the totals for Morocco. At the same time, Morocco cannot attack them systematically in their relative sanctuary in southern Algeria and must defend a vast territory. This presents a military challenge in spite of an extensive barrier defense system and Morocco's massive advantage in force numbers.

Taken together, these figures and tables provide a good picture of the overall military balance in the region, to the extent that such a balance exists. The figures dealing with equipment types also show the massive obsolescence of much of the Maghreb's military forces. As is discussed in detail in the chapters that follow, these Tables and Figures also show the end result of a failed military build-up in Algeria and Libya and of decades of war in Morocco. As the country analyses in each chapter reveal, only Tunisia has been relatively immune to the region's tragedy of arms.

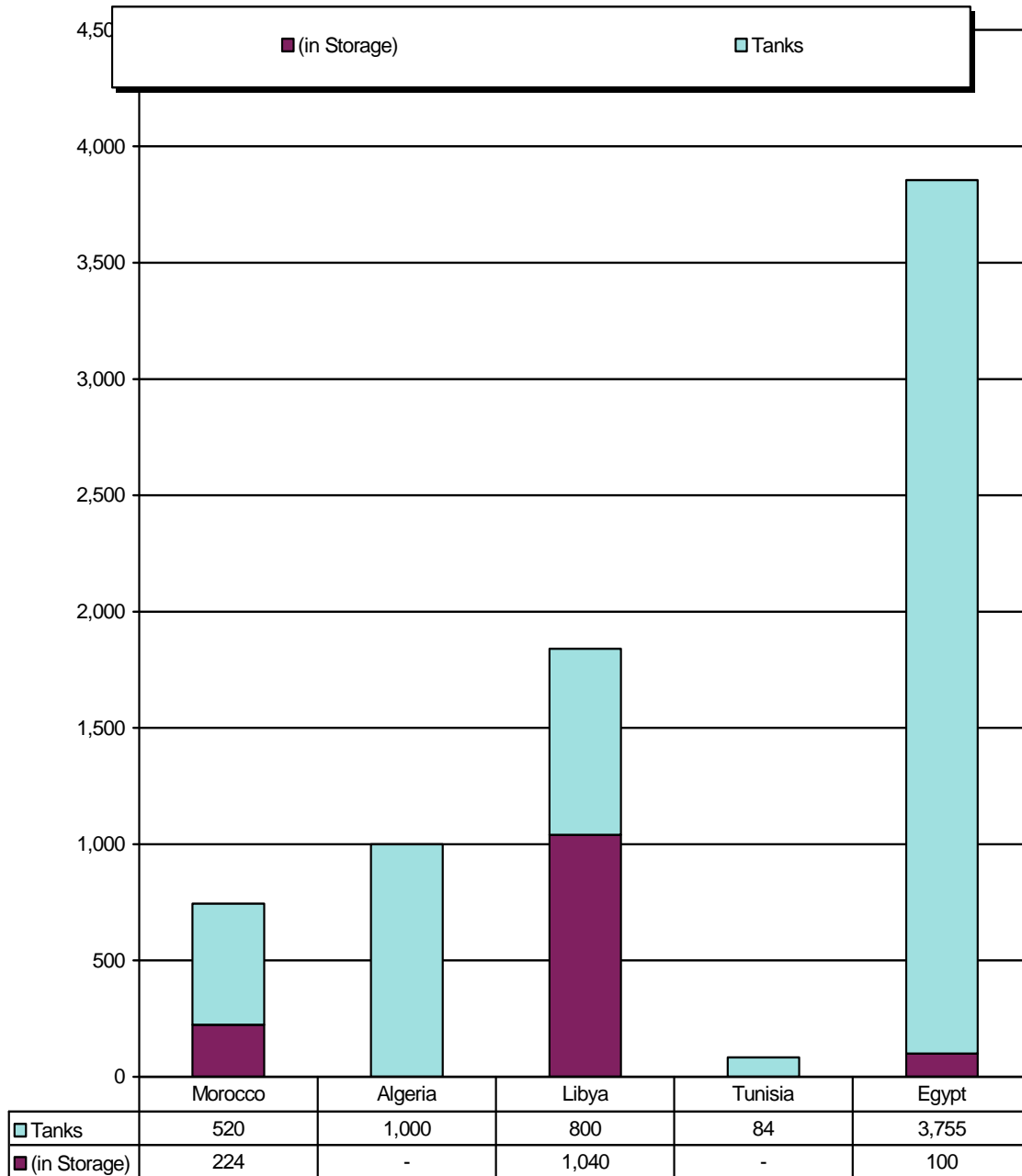
**Figure 3.1**

**Total North African Armor in 2004-2005**



Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, and JCSS, *Military Balance in the Middle East*, various editions.

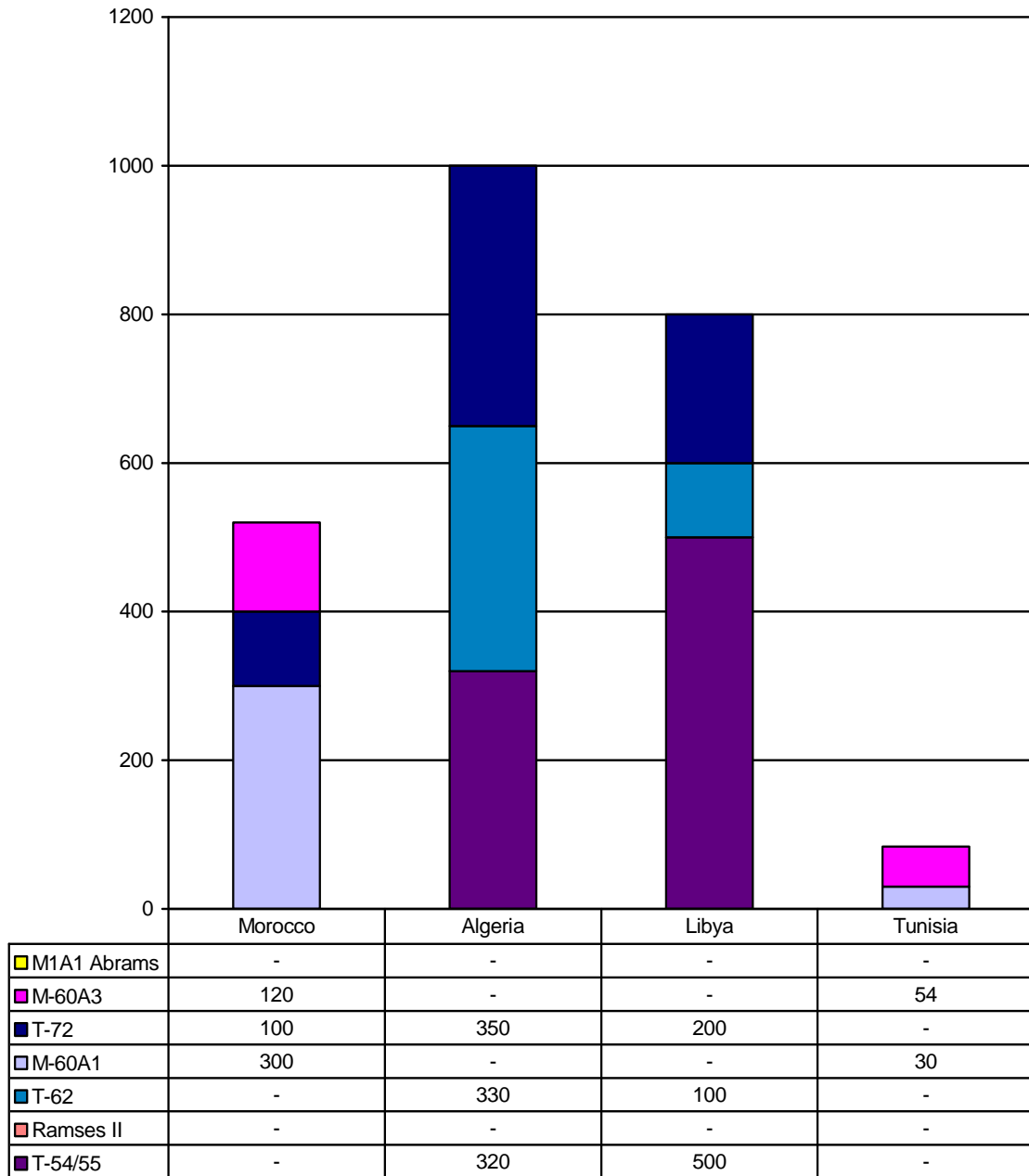
**Figure 3.2**  
**Total North African Main Battle Tanks in 2005**



Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, various editions.

**Figure 3.3**

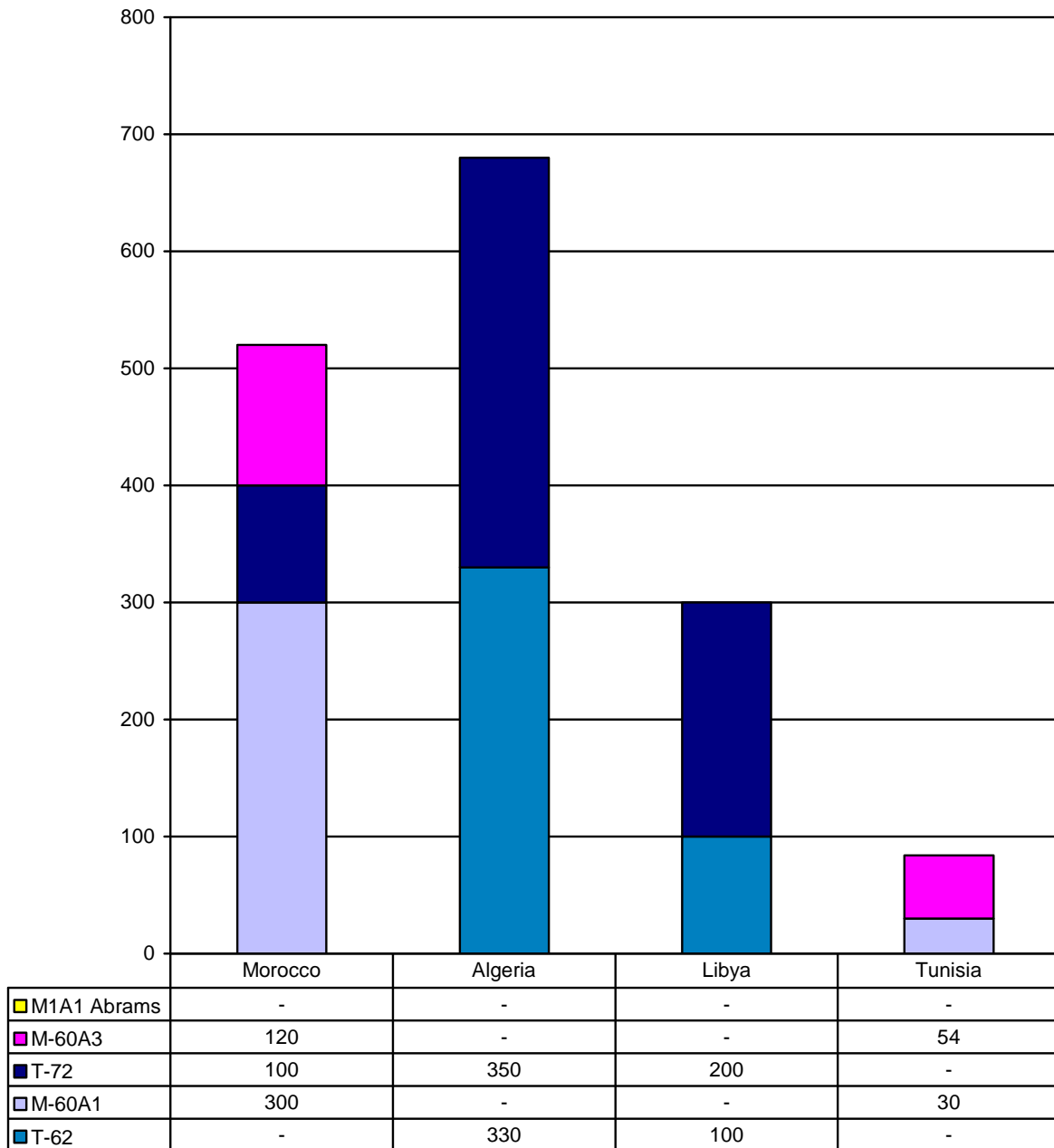
**Total North African Medium Active Main Battle Tanks by Type in 2005**



Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, various editions.

**Figure 3.4**

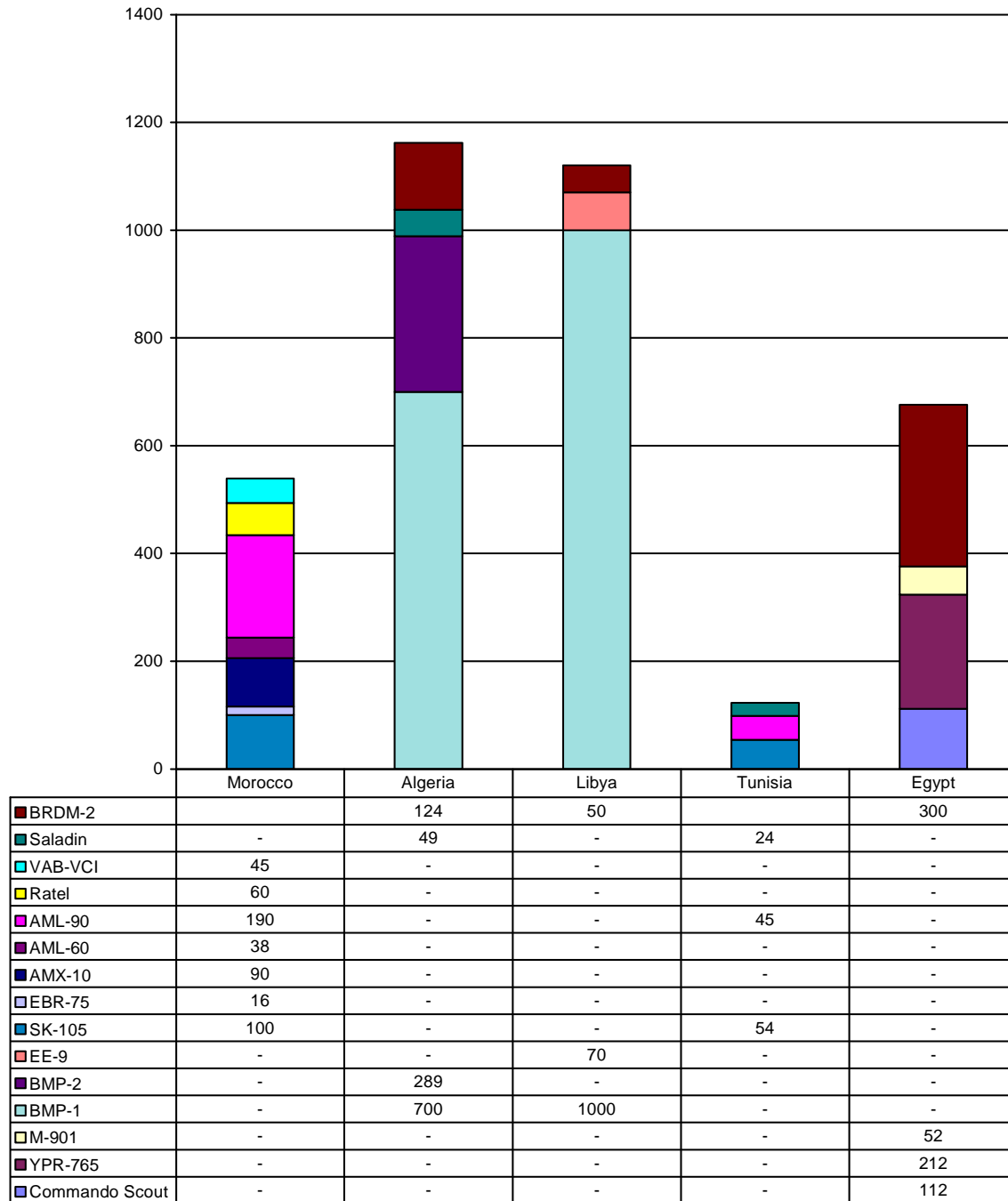
**Total North African Medium Quality and Modern Active Main Battle Tanks in 2005**



Source: Adapted by Anthony H. Cordesman from the IISS, The Military Balance, various editions.

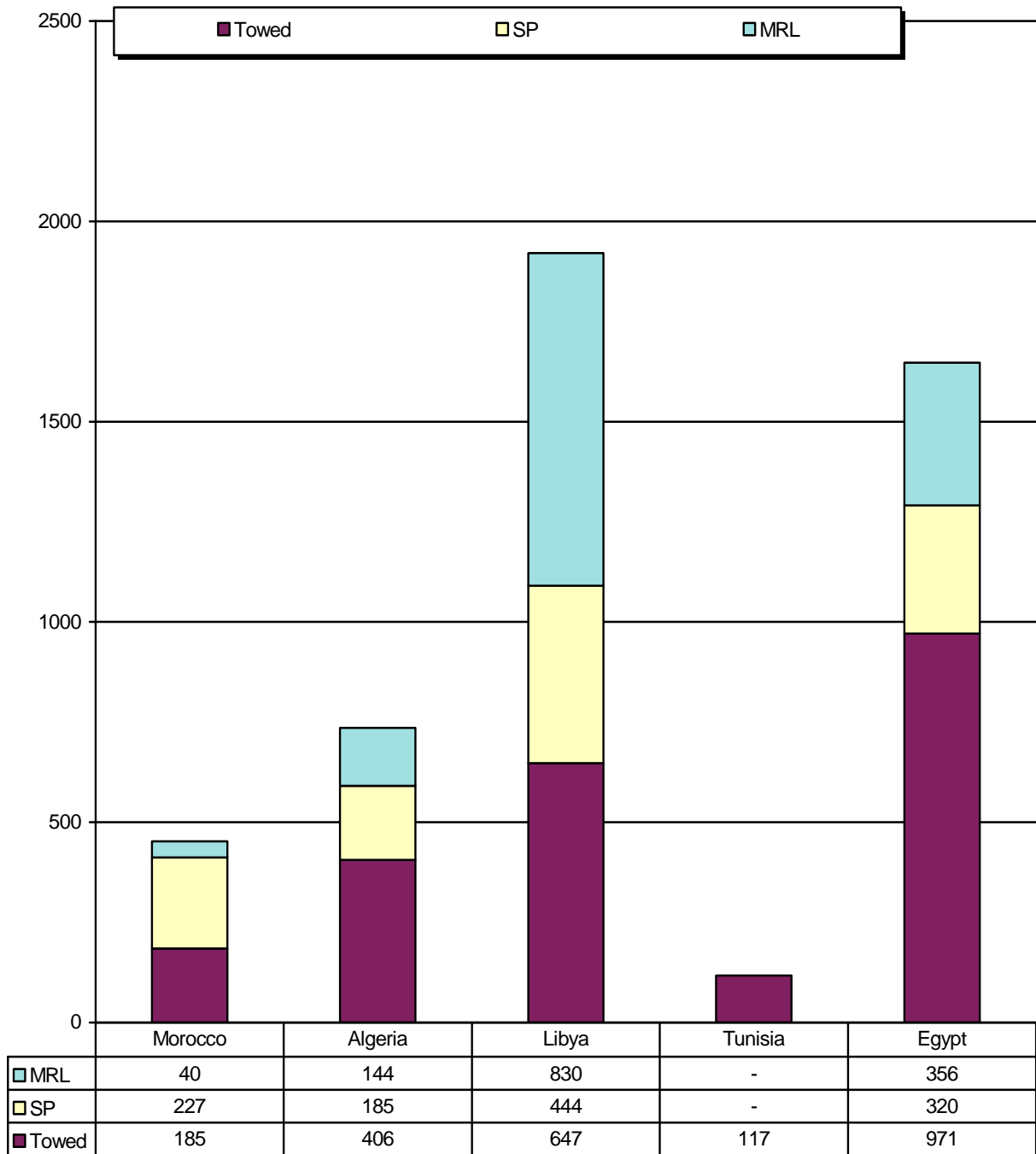
**Figure 3.5**

**Total North African Medium Quality & Modern Other Armored Fighting Vehicles in 2005  
(Less APCs)**



Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, various editions.

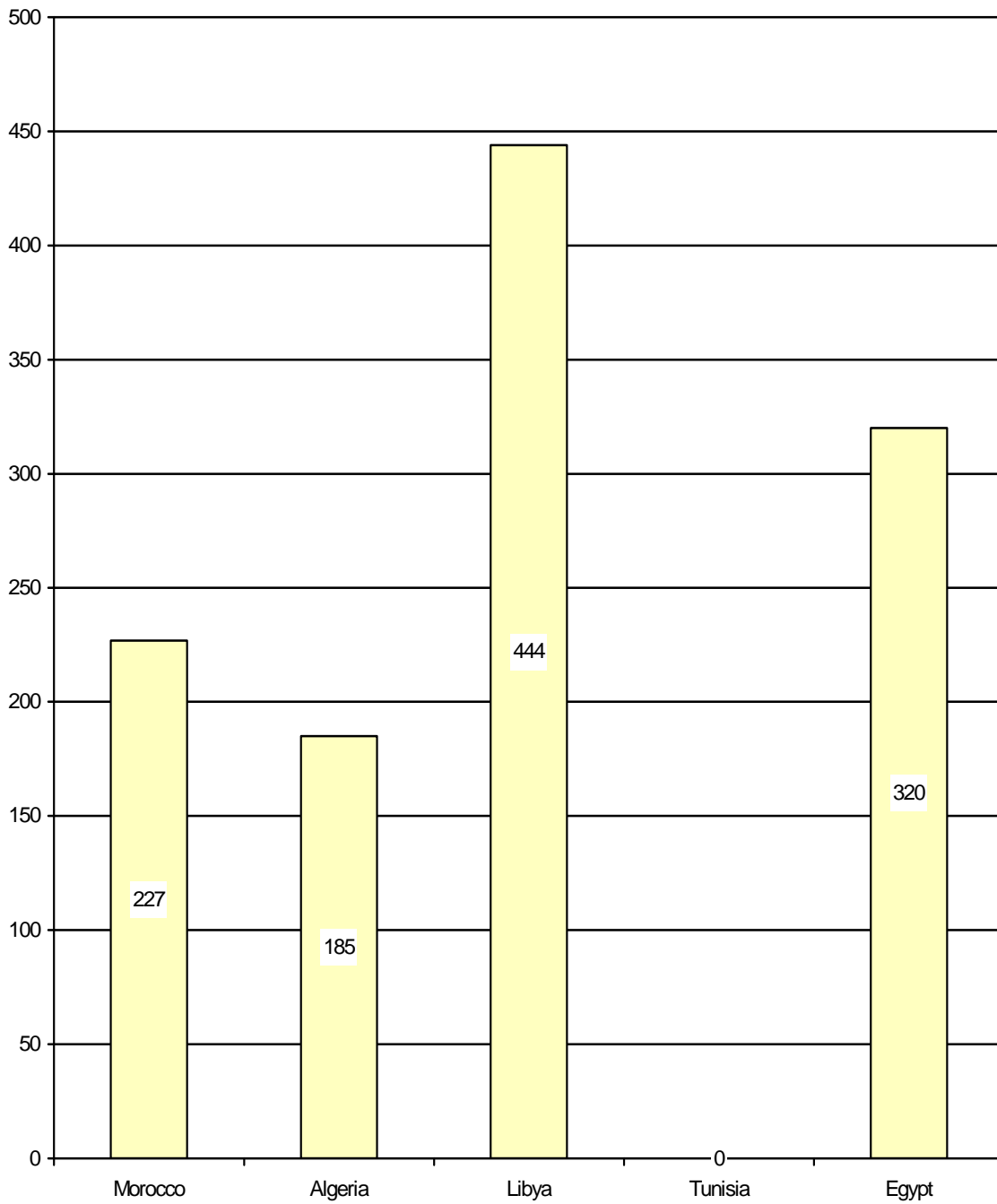
**Figure 3.6**  
**Total North African Artillery in 2005**



Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, various editions.



**Figure 3.7**  
**North African Self-Propelled Artillery in 2005**

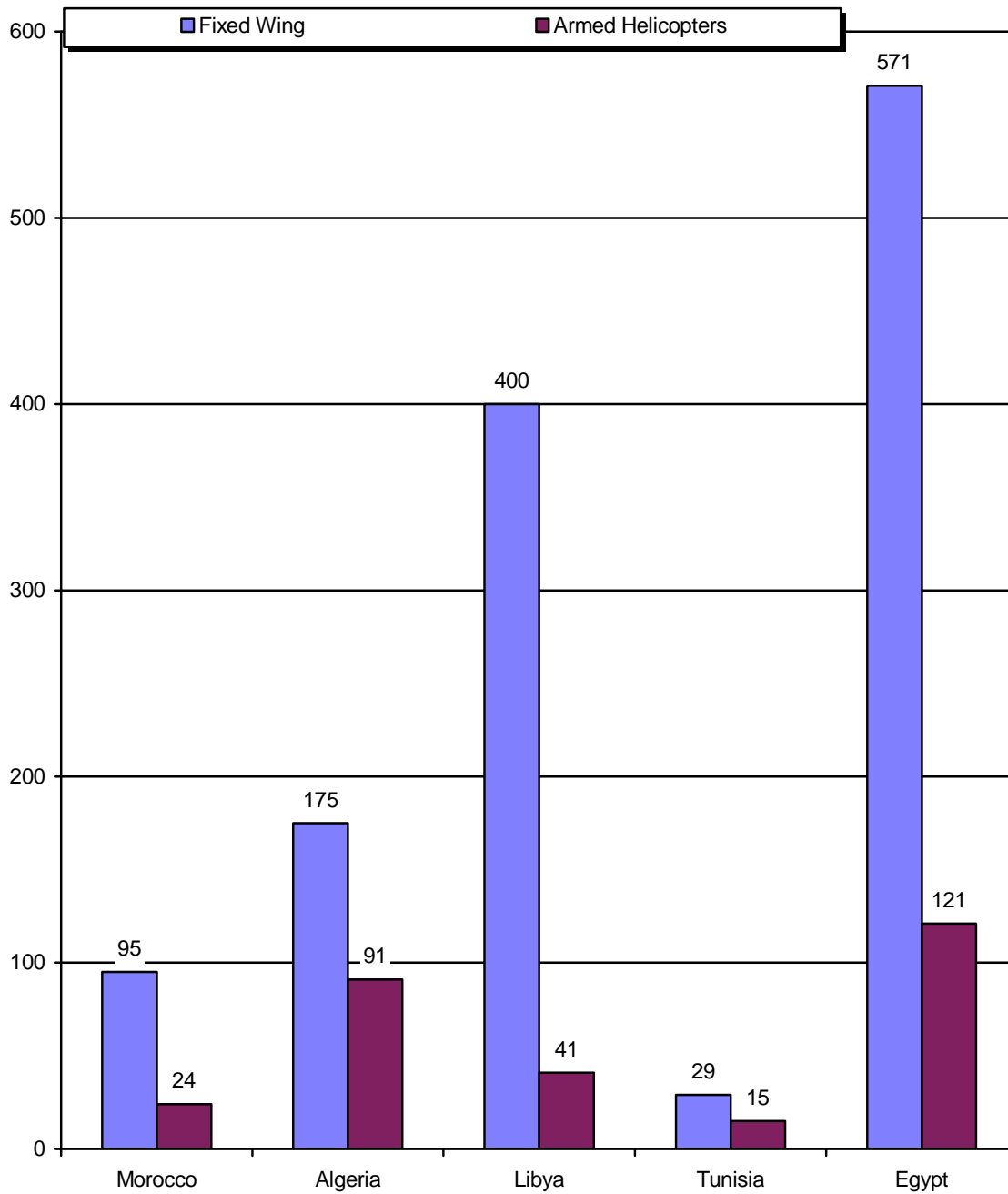


Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, various editions.

**Figure 3.8**

**North Africa: Total Fixed Combat Aircraft and Armed Helicopters in 2005**

(Totals include all combat-capable, fixed-wing aircraft)

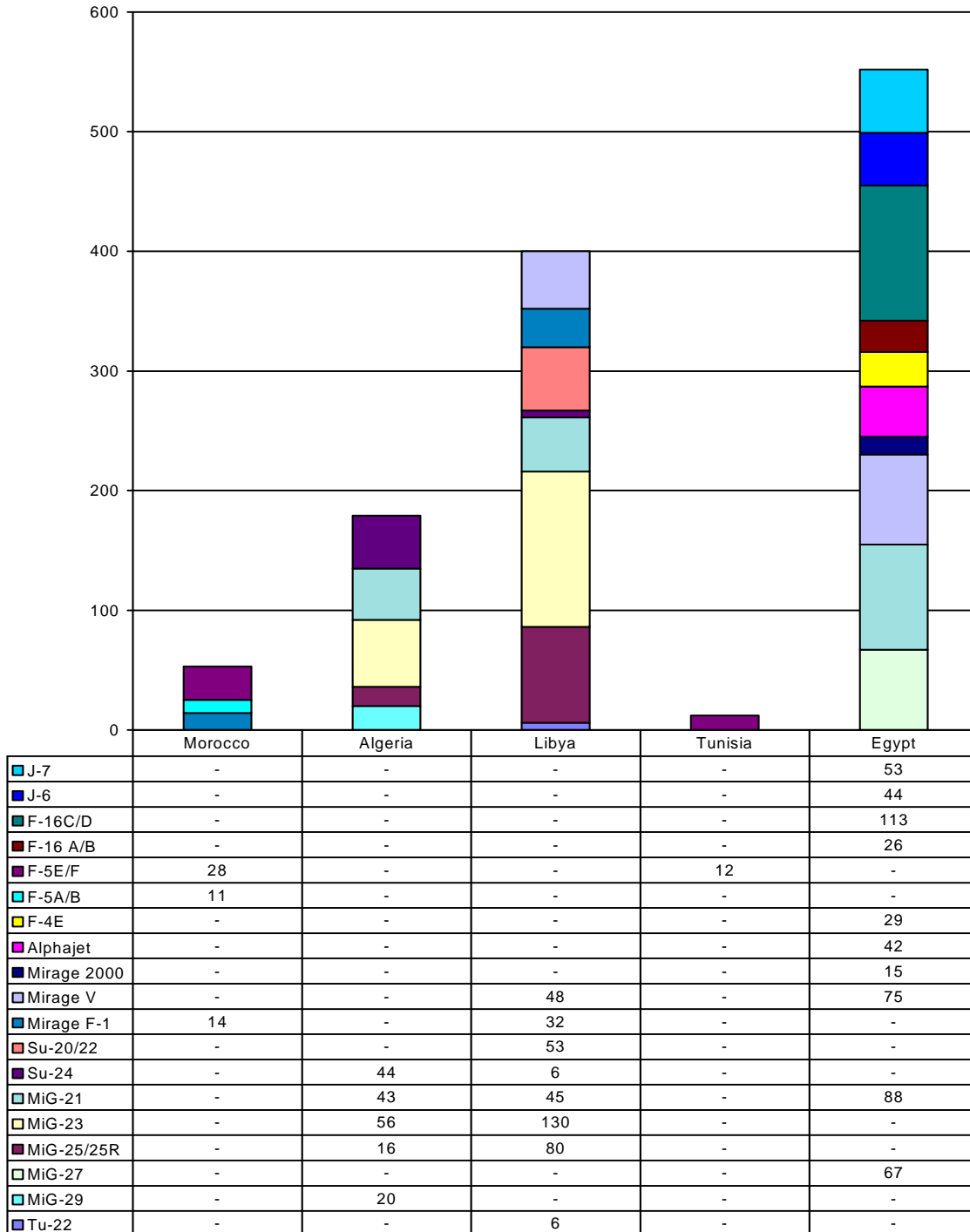


Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, various editions.

**Figure 3.9**

**North African Active Bomber, Fighter, FGA, and Strike Combat Aircraft by Type in 2005**

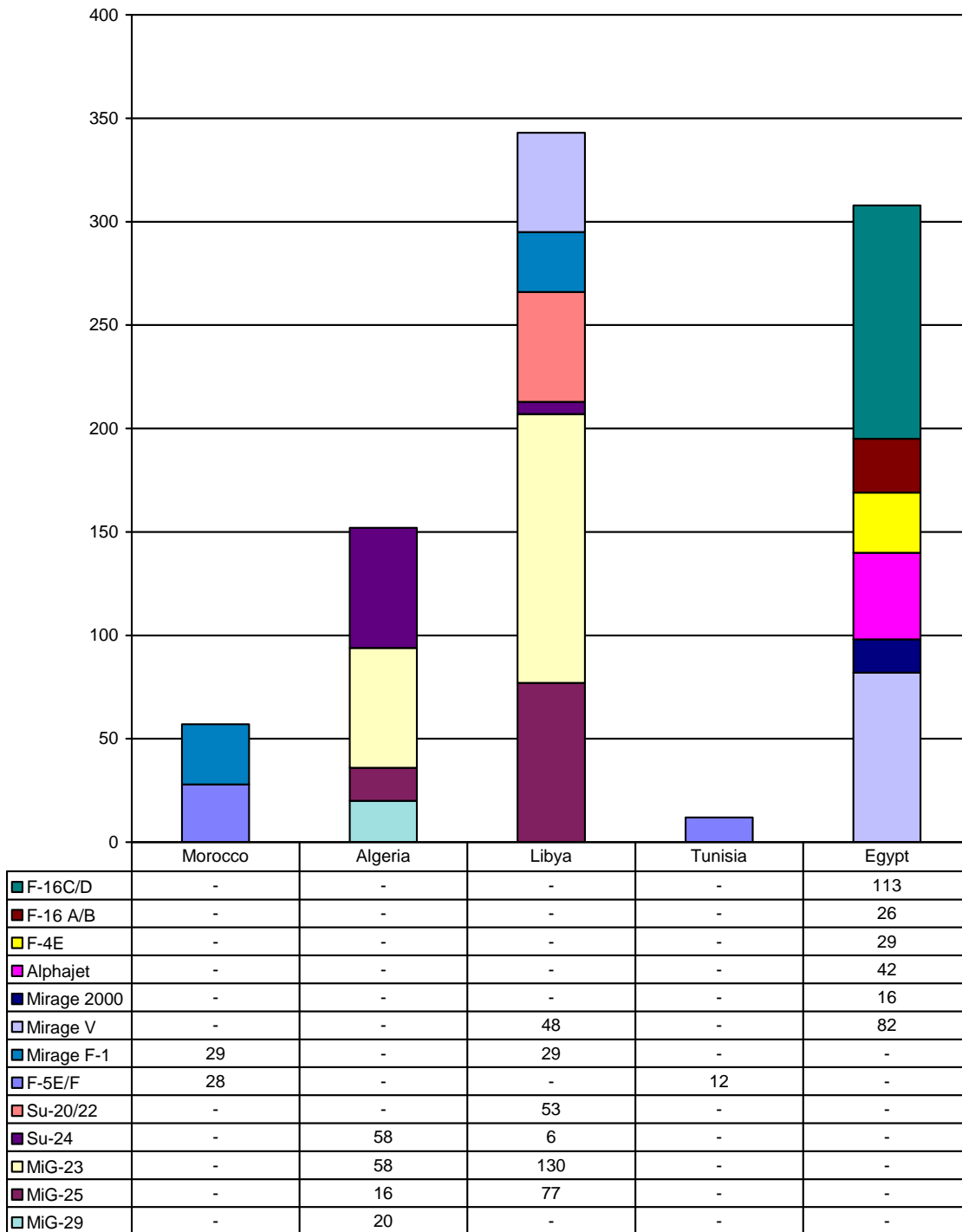
(Does not include stored, unarmed electronic warfare or combat-capable recce and trainer aircraft)



Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance*, various editions.

**Figure 3.10**

**North African Medium and High Quality Combat Aircraft by Type in 2005**  
 (Does not include stored, unarmed electronic warfare or combat-capable recce and trainer aircraft)

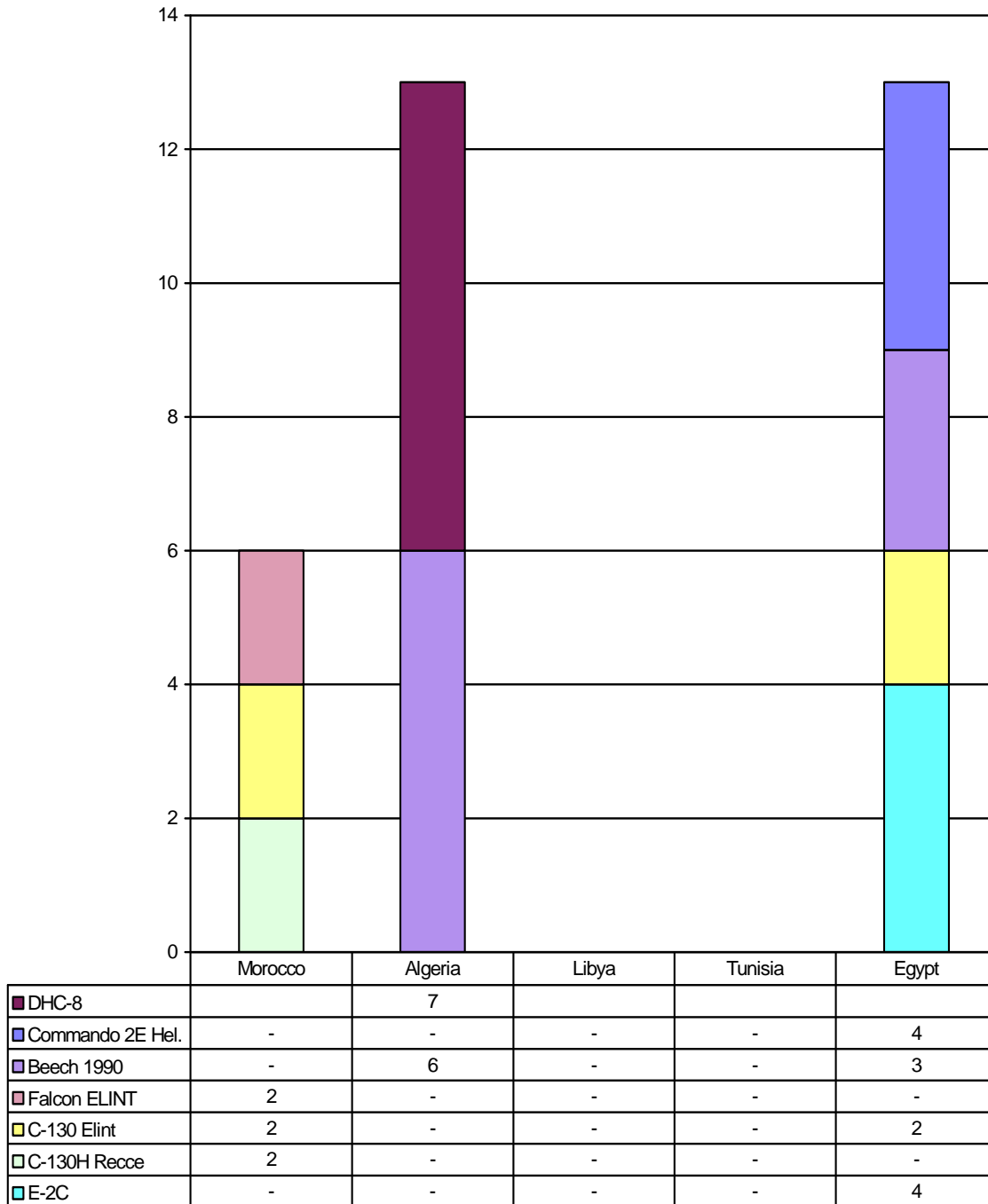


Source: Adapted by Anthony H. Cordesman from the IISS, The Military Balance, various editions.

**Figure 3.11**

**North African Active AEW, ELINT and Electronic Warfare Aircraft by Type in 2005**

(Does not include recce or dedicated maritime reconnaissance aircraft)



Source: Adapted by Anthony H. Cordesman from the IISS, The Military Balance, various editions.

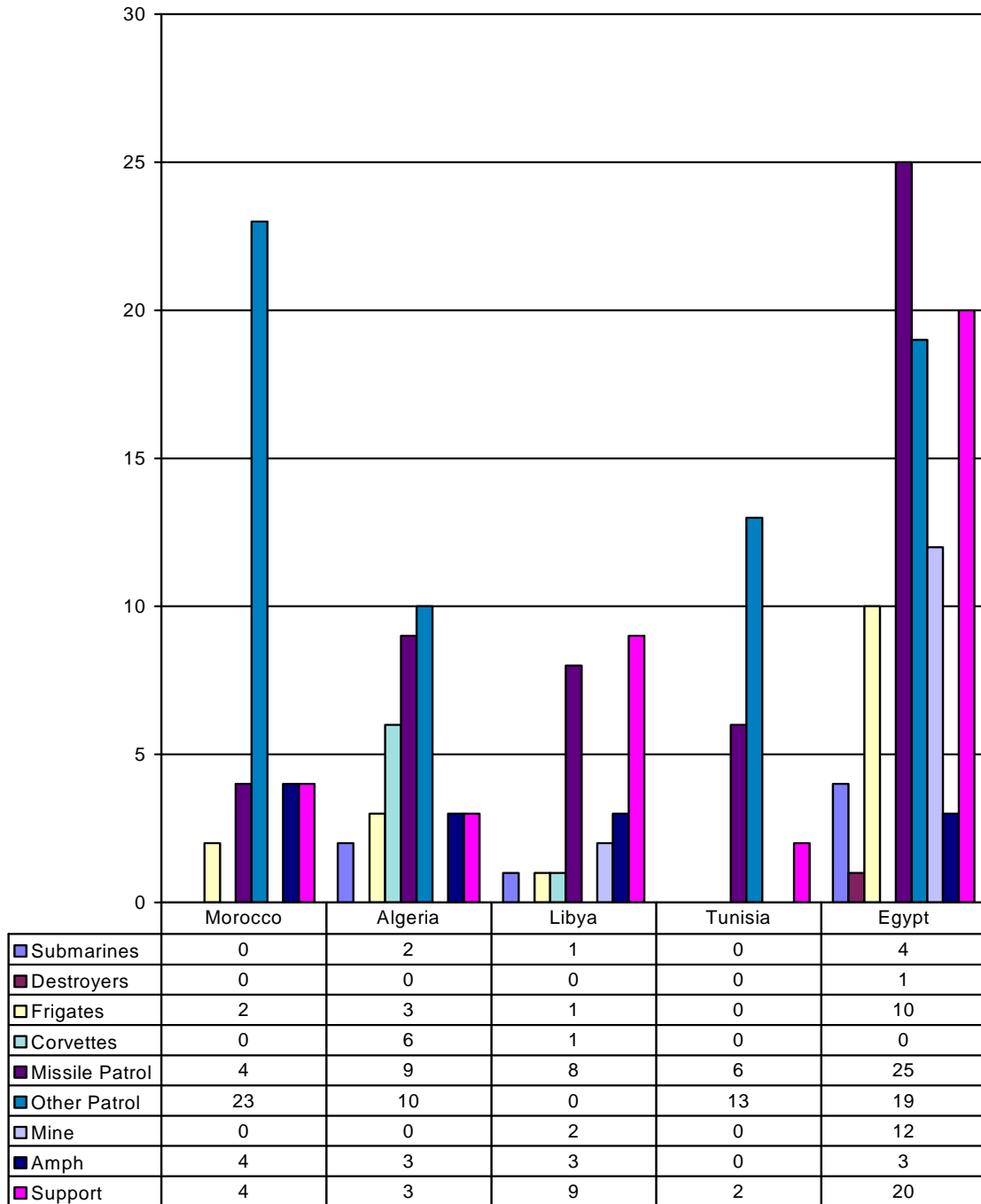
**Figure 3.12****North African Land Based Air Defenses in 2005**

<u>Country</u>	<u>Major SAM</u>	<u>Light SAM</u>	<u>AA Guns</u>
<u>Morocco</u>	None	37 M-54 Chaparral 70 SA-7	200 ZPU-2 14.5mm 20 ZPU-4 14.5mm 40 M-167 Vulcan 20mm 60 M-163 Vulcan SP 90 ZU-23-2 15 KS-19 100mm
<u>Algeria</u>	1/24 SA-6 1/18 SA-3 SA-2	SA-7 SA-8 <u>SA-8</u> 1 SA-8 SA-9 SA-14 SA-16	895 guns 80 ZPU-2/4 14.5mm 100 20mm 105 ZU-23 219 ZSU-23-4 SP 150 M-1939 37mm 75 S-60 57mm 20 KS-12 85mm 150 KS-19 100mm <u>10 KS-30 130mm</u> 725 guns 1 85mm regt. 1 100mm regt. 1 130mm regt.
<u>Libya</u>	Senez Air Defense command & control system 4/8/48 SA-5A 5/90-108 SA-2 3/24-36 Twin SA-3 2/48 SA-6	SA-7 SA-9 SA-13 <u>24 Quad Crotale</u> 1/20-24 SA-8	600 guns ZU-23, ZSU-23-4, M-53/59 30mm, S-60 57mm
<u>Tunisia</u>	None	48 RBS-70 25 M-48 Chaparral	100 M-55 20mm 15 T-55/56 37mm
<u>Egypt</u>	664 launchers 40/282 SA-2 53/212 SA-3 14/56 SA-6 12/78 I Hawk (4 Div./100 Btn.)	2,000 SA-7 Ayn as Saqr 20 SA-9 <u>50 M-54 Chaparral SP</u> 14/24 Crotale 72 Amoun Skyguard/ RIM-7F 36 quad SAM Ayn as Saqr  57mm, 85mm, 100mm	200 ZPU-2/4 14.5 mm 280 ZU-23-2 23mm 230- ZSU-23-4 SP 23mm 36 Sinai SP 23mm 200 M-1939 37mm 600 S-60 57mm <u>40 ZSU-57-2 SP 57mm</u> 14/- Chaparral 2000 20mm, 23mm,37mm,  36 twin radar guided 35mm guns Sinai radar-guided 23mm guns

Adapted by Anthony H. Cordesman from the IISS, Military Balance and Jane's Sentinel, various editions.

**Figure 3.13**

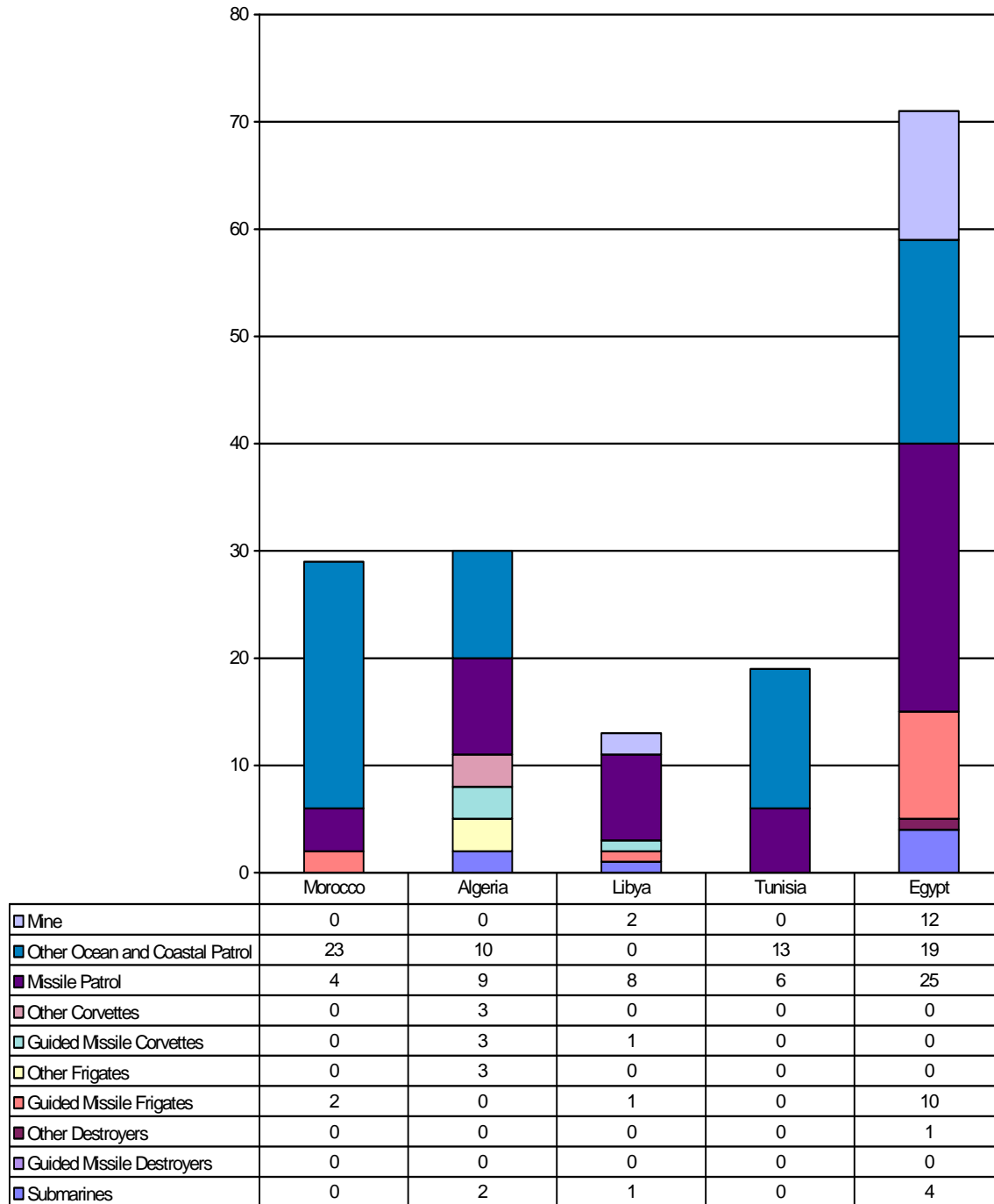
**North African Naval Ships in Active Inventory by Category in 2005**



Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance* and *Jane's Fighting Ships*, various editions.

**Figure 3.14**

**North African Major Active Combat Ships in 2005**



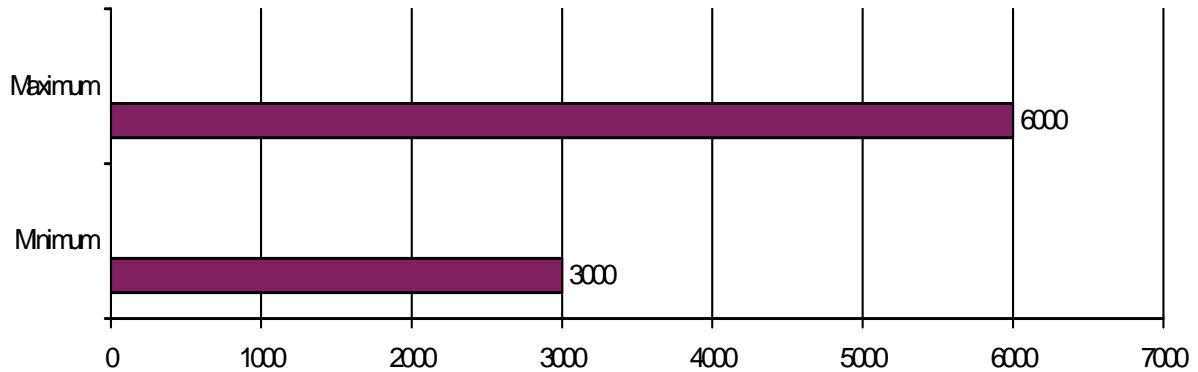
Source: Adapted by Anthony H. Cordesman from the IISS, *The Military Balance* and *Jane's Fighting Ships*, various editions



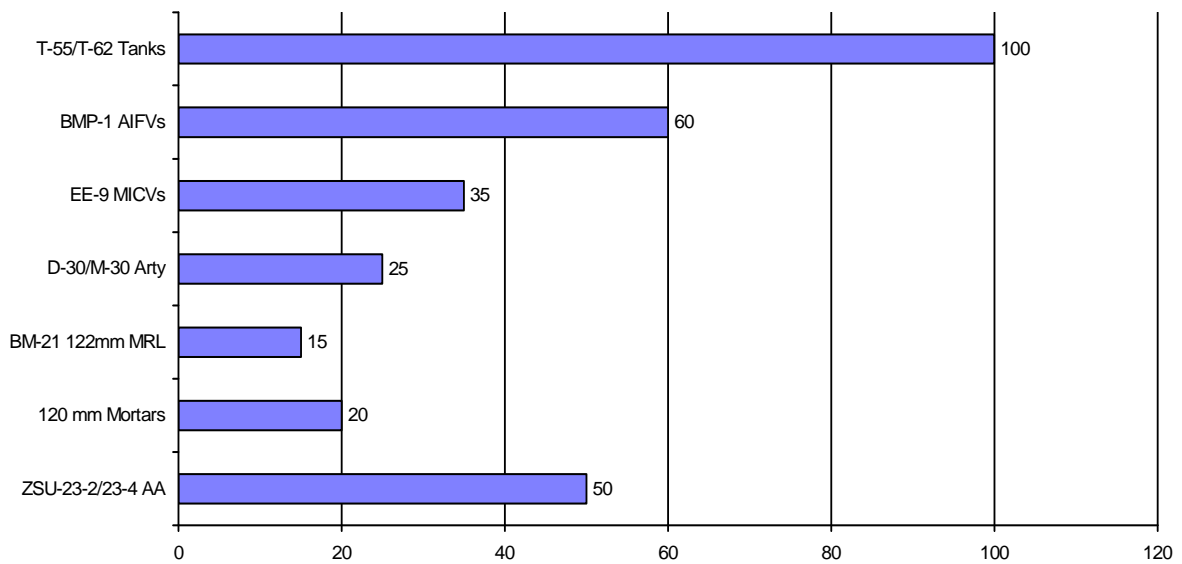
**Figure 3.15**

**Polisario Forces in 2005**  
(Sahrawi People's Liberation Army)

**Manpower**



**Weapons**



**Other Equipment: Numbers Unknown**

- Steyr SK-105 Light. Tanks
- Panhard APCs
- Ratel 20 AFVs
- Eland armored reconnaissance vehicles
- AML-90
- AT-3 Sagger anti-tank guided missiles
- SA-6, SA-7, SA-8, SA-9 surface-to-air missiles

Source: Adapted by Anthony H. Cordesman from data provided by US experts, the IISS, Military Balance, and Jane's Sentinel.

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<sup>i</sup> For further details see US State Department, Bureau of Arms Control, World Military Expenditures and Arms Transfers.

<sup>ii</sup> This discussion draws heavily on interviews and the details provided in Jane's Fighting Ships, 2003-2004, and the country section in the IISS, Military Balance, 2003-2004.

<sup>iii</sup> IISS, Military Balance, 2003-2004.

<sup>iv</sup> Jane's Defense Weekly, October 25, 2000, p. 15.

<sup>v</sup> Jane's Defense Weekly, "Algeria to Get Night-Upgraded Mi-171 Helicopters," January 15, 2003, <http://jdw.janes.com>, Accessed January 8, 2004. Labeled Baetjer 1

<sup>vi</sup> This discussion draws heavily on interviews and the details provided in Jane's Fighting Ships, 2003-2004, plus other data from London, Jane's Information Group, and the country section in the IISS, Military Balance, 2003-2004.

<sup>vii</sup> This discussion draws heavily on interviews and the details provided in Jane's Fighting Ships, 2003-2004, London, Jane's Information Group, 1, and the country section in the IISS, Military Balance, 2003-2004.

<sup>viii</sup> This is a report from one source. The creation of a coast watch seems erratic even for Libya.

<sup>ix</sup> Reports that Libya acquired 12 Soviet SS-12M (SS-22) missiles between mid-1980 and mid-1981 do not seem accurate. Yoseff Bodansky and Vaughn Forrest, Chemical Weapons in the Third World, p. 4; Libya's Chemical-Biological Warfare Capabilities, Task Force on Terrorism and Unconventional Warfare, House Republican Research Committee, U.S. House of Representatives, Washington, D.C., June 12, 1990, p. 3; M. Sicker, The Making of a Pariah State, New York, Praeger, 1987, pp. 104- 105; John K. Colley, Libyan Sandstorm, New York, Holt, Rinehart, and Winston, 1982, pp. 248-251.

<sup>x</sup> Aviation Week and Space Technology, April 10, 1989, pp. 19-20; New York Times, April 5, 1989, September 7, 1989; Washington Times, January 16, 1989; FBIS/NES, April 10, 1989.

<sup>xi</sup> Foreign technicians could provide effective support in the use of radar reconnaissance data. The basic problems with daylight reconnaissance photography are that it is not as discriminating as radar or electro-optics, cannot be processed until the aircraft lands, takes several hours to process, and requires expert interpretation. This is adequate against static targets, but even infantry units often move too quickly to use such data for targeting purposes.

<sup>xii</sup> IISS Strategic Comments, "Libya's armed forces," Volume 6, Issue 10, December 2000.