

## **Brazil Country Handbook**

1. This handbook provides basic reference information on Brazil, including its geography, history, government, military forces, and communications and transportation networks. This information is intended to familiarize military personnel with local customs and area knowledge to assist them during their assignment to Brazil.
2. This product is published under the auspices of the U.S. Department of Defense Intelligence Production Program (DoDIPP) with the Marine Corps Intelligence Activity designated as the community coordinator for the Country Handbook Program. This product reflects the coordinated U.S. Defense Intelligence Community position on Brazil.
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## Brazil

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## KEY FACTS

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**Country Name.** Federative Republic of Brazil

**Local Short Form.** Brasil

**Head of State.** President Luiz Ignacio Lula da Silva (January 2003)

**Capital.** Brasilia

**National Flag.** Green with a large yellow diamond in the center bearing a blue celestial globe with 27 white, 5-pointed stars (one for each state and the Federal District) arranged in the same pattern as the night sky over Brazil. The globe has a white equatorial band with the motto *Ordem e Progresso* (Order and Progress).

**Time Zone.** From UTC (formerly GMT) -3 to UTC -5; Brazil observes daylight savings time from October to March.

**Telephone Country Code.** 55

**Population.** 182,032,604 (2003)

**Languages.** Portuguese (official).

**Currency.** The Brazilian *real* (BRL) is divided into 100 centavos.

**Exchange Rate.** 1 BRL = US\$2.96 (2004)

**Calendar.** Gregorian



National Flag

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## U.S. MISSION

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### U.S. Embassy

<b>Location</b>	Brasilia
<b>Mailing Address</b>	Avenida das Nações, Quadra 801, Lote 03 70403-900, Brasília, DF BRAZIL
<b>Telephone</b>	011-55-61-312-7000
<b>Fax</b>	011-55-61-225-9136
<b>Web Address</b>	<a href="http://www.embaixada-americana.org.br">www.embaixada-americana.org.br</a>
<b>E-mail</b>	<a href="mailto:contact@embaixadaamericana.org.br">contact@embaixadaamericana.org.br</a>
<b>Hours</b>	0800-1200 and 1330-1600; Monday through Friday except Brazilian and U.S. holidays

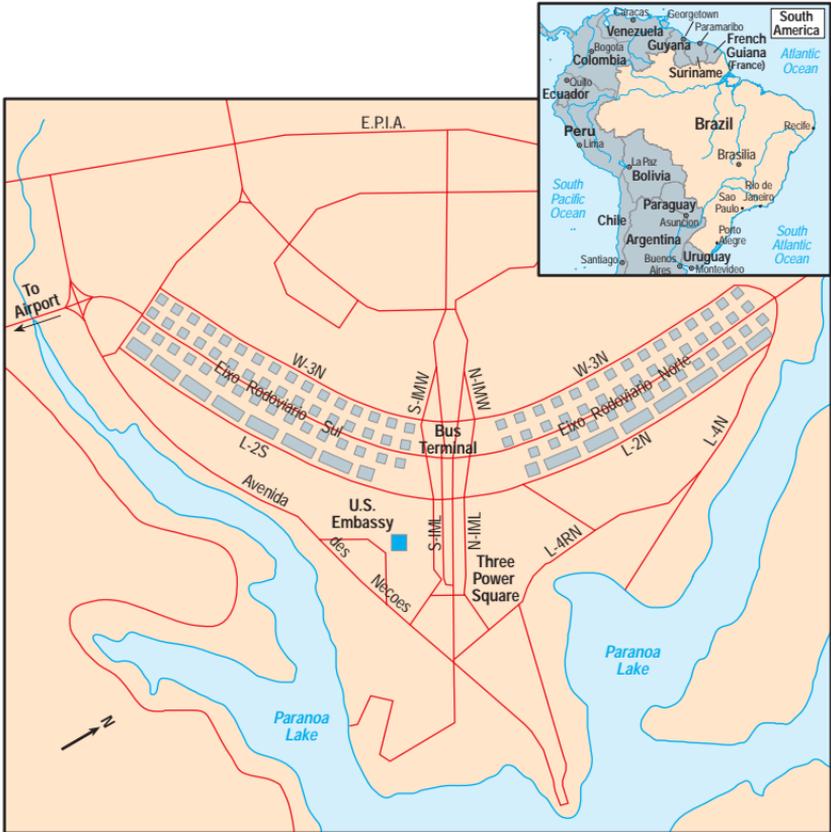
### U.S. Consulates

#### *Recife*

<b>Mailing Address</b>	Rua Gonçalves Maia, 163, Boa Vista 50070-060, Recife, PE BRAZIL
<b>Telephone</b>	011-55-81-3421-2441
<b>Fax</b>	011-55-81-3231-1906
<b>Hours</b>	0800-1200 and 1300-1600; Monday through Friday except Brazilian and U.S. holidays

#### *Rio De Janeiro*

<b>Mailing Address</b>	Avenida Presidente Wilson 147, Castelo 20030-020, Rio de Janeiro, RJ BRAZIL
<b>Telephone</b>	011-55-21-2292-7117
<b>Fax</b>	011-55-21-2220-0439
<b>Hours</b>	0830-1100 and 1300-1500, Monday through Friday except Brazilian and U.S. holidays

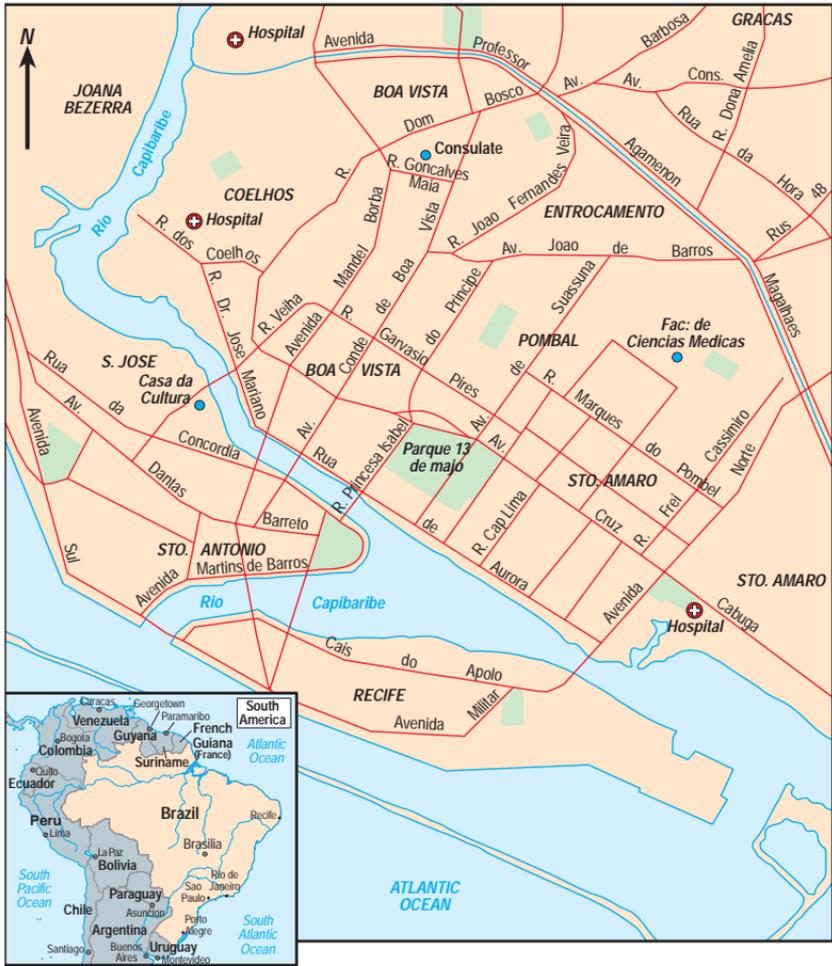


**U.S. Embassy Location in Brasilia**

**Sao Paulo**

**Mailing Address** Rua Henry Dunant, 700,  
 Chacara Santo Antonio,  
 Sao Paulo, SP 04709-110, BRAZIL

**Telephone** 011-55-11-5186-7000  
**Fax** 011-55-11-5186-7199



## U.S. Consulate Location in Recife

**After-hours**

011-55-11-5181-8730

**Hours**

0830-1100 Monday through Friday

1400-1530 Monday, Wednesday, and Friday  
except Brazilian and U.S. holidays



**U.S. Consulate Location in Rio De Janeiro**



## **Travel Advisories**

U.S. citizens traveling or residing in Brazil are advised to avoid large gatherings and protests, especially in urban areas. Other areas to avoid are the Colombian border areas and the tri-border area of Brazil, Argentina, and Paraguay. Travelers should avoid wearing expensive clothing or jewelry. Before traveling to Brazil, it is advisable to obtain a current consular information sheet from the U.S. State Department web site at [www.travel.state.gov](http://www.travel.state.gov). The Overseas Citizens Services office at the State Department can be reached at 1-888-407-4747 in the United States and 317-472-2328 from overseas.

## **Entry Requirements**

### ***Passport/Visa Requirements***

A passport valid for at least 6 months from entry date is required for U.S. citizens traveling to Brazil. Visas must be obtained in advance from the Brazilian Embassy or consulate nearest the traveler's place of residence. There are no airport visas, and immigration authorities will refuse entry to anyone without a valid visa. Children under 10 years old traveling alone, with one parent or with a third party, must have written (in Portuguese), notarized authorization to travel by the absent parent(s) or legal guardian. This must be authenticated by the Brazilian Embassy or consulate. Visas are generally for 90 days, with possible extension of up to 90 days.

### ***Immunization Requirements***

Visitors must present proof of yellow fever inoculation or they may not be allowed to board the plane or enter the country.

### ***Customs Restrictions***

Customs regulations in Brazil allow for the temporary admission of goods for personal or professional use, including motor vehicles, cameras, notebooks and similar equipment, and sports equipment. Dogs, cats, and birds may only be brought into Brazil with proper vaccination certificates.

Travelers should check with the Brazilian consulate for information on importing animals, plants, or items for commercial purposes.

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## **GEOGRAPHY AND CLIMATE**

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### **Geography**

Brazil is located on the central and eastern part of South America. The country is 5,320 kilometers (3,306 miles) from north to south and 4,328 kilometers (2,689 miles) from east to west. Brazil shares boundaries with all South American countries except Chile and Ecuador. Brazil occupies about 47 percent of South America's area, and is slightly smaller than the continental United States. It has 14,691 kilometers (9,108 miles) of borders and 7,491 kilometers (4,644 miles) of coastline.

### **Land Statistics**

Total Area	8,511,965 square kilometers (3,319,666 square miles)
Land	8,456,510 square kilometers (3,688,039 square miles)
Water	55,455 square kilometers (21,627 square miles)

### **Boundaries**

<b>Country</b>	<b>Border Length</b>	
	<b>Kilometers</b>	<b>Miles</b>
Argentina	1,224	759
Bolivia	3,400	2,108
Colombia	1,643	1,019
French Guiana	673	417
Guyana	1,119	694
Paraguay	1,290	800
Peru	1,560	967
Suriname	597	370
Uruguay	985	610
Venezuela	2,200	1,364



**South America**

## ***Border Disputes***

Brazil has a border dispute with Uruguay concerning islands in the Quairai (Cuareim) and Arroio Invernada (Arroyo de la Invernada) boundary streams and the resulting tri-point with Argentina.

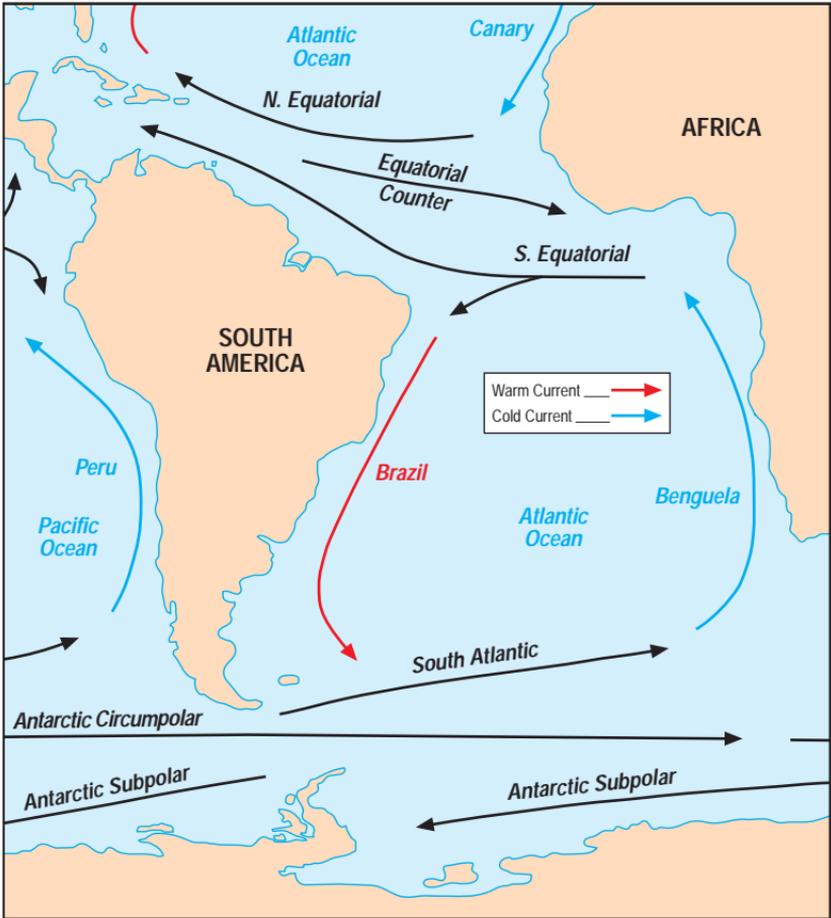
## ***Bodies of Water***

Brazil has a long Atlantic Ocean coastline and a crowded, complex system of rivers. The warm southern equatorial and Brazilian oceanic currents, with temperatures that vary from 19° to 27°C (66° to 81°F), help temper the climates in Brazil. The harbors on the Atlantic coast connect Brazil economically to the rest of the world. Moreover, the waters of the Amazon Basin — 20 percent of the world's fresh water — connect Brazil ecologically to the rest of the world.

Brazil's Atlantic coastline has two major terrain types, low and flat at the river delta, and narrow, steep, and rocky elsewhere. Along the northern coast there are many islands, swamps with mangrove trees, and other lowlands subject to seasonal flooding. East of Sao Lius, the northeastern coast becomes smoother, with long stretches of sand dunes, beaches, mangroves, and lagoons. The Brazilian Highlands are close to the coastline. South of Salvador, the continental shelf widens; however, the coastal plain is narrow or non-existent as the mountains are close to the coast. There are lagoons, sand spits, and sandy beaches. Only south of Porto Alegre does the coastal plain widen again.

## ***Brazilian River Basins***

The rivers of Brazil can be grouped into three basins: the Amazon, Sao Francisco, and Paraná. Many of the rivers are navigable for significant distances; however, only the Amazon River is used as a significant transportation route since most of the population lives near the Atlantic coast. Instead, Brazil's rivers are important sources of hydroelectricity. Most of Brazil's large lakes are created by dams that have been constructed to produce hydroelectric power or provide water for irrigation.



## Atlantic Ocean Currents

### The Amazon

The Amazon River Basin in South America is the world's largest in watershed area and volume of water, containing up to 20 percent of the world's fresh water. This basin occupies more than one-third of the

country and forms the largest rain forest in the world. The Amazon River is the second longest river in the world, after the Nile. It starts in the Peruvian Andes about 160 kilometers (99 miles) from the Pacific Ocean and flows generally east about 6,500 kilometers (4,030 miles) to the Atlantic Ocean. More than 3,600 kilometers (2,200 miles) of the Amazon are in Brazil.



## Geological Regions

The Amazon River basin receives water from tributaries in Colombia, Ecuador, Bolivia, and Venezuela, and is sometimes called the Ocean River because of its size. Its basin covers more than 6 million square kilometers (2.34 million square miles), three times the area of the Mississippi River Basin.

The Amazon River carries about 3 million tons of sediment into the Atlantic Ocean each day. The sediment causes a variety of colors in the various tributaries depending on the terrain and vegetation through which the waters flow. The waters of the Amazon, Madeira, and Solimoes Rivers are muddy-yellow; the Xingu and Tocantins Rivers are crystal-clear; the waters of the Trombetas and Tapajos Rivers are green; and the Rio Negro is black. The immense volume of sediment created Majaro Island at the mouth of the Amazon. It is the world's largest island created by a river, and is about the size of Switzerland. Another large fluvial island is Ilha do Bananal, located on the Araguaia River. It is about 370 kilometers (230 miles) long and up to 56 kilometers (35 miles) wide.

The volume and force of the Amazon river is so great that the salinity and color of the Atlantic Ocean's water is significantly affected, providing fresh water to sailors more than 160 kilometers (100 miles) out from the mouth of the river. The central portion of the Amazon River is also referred to as the Solimoes River. Near the city of Manaus, the much swifter brownish Solimoes (Amazon) River meets the dark black Rio Negro. The waters of two rivers, however, flow side by side for several miles with the waters and colors unmixed.

The Amazon is navigable to oceangoing ships throughout the country, and as far as Iquitos, in Peru. Except for the Tocantins River, which is blocked by a dam, the Amazon's major tributaries are suitable for inland navigation for several hundred miles upstream from where they respectively join the Amazon. In some cases, such as along the Xingu and Tapajós Rivers, rapids may limit navigation in the dry season.

## The Sao Francisco

The Sao Francisco River, in the Brazilian Highlands, is the largest river wholly within Brazil. It flows more than 1,609 kilometers (1,000 miles) northward before turning eastward into the Atlantic. About 1,368 kilometers (850 miles) of the upper river is navigable for shallow-draft riverboats. Ocean-going ships can navigate the Sao Francisco as far as the Paulo Alfonso Falls 310 kilometers (190 miles) above the mouth of the river. Riverboats can navigate another 1,000 kilometers (600 miles) of river, to the large dam near Petrolina, about 700 kilometers (434 miles) above the mouth. The dam creates Répresa Sobradinho, the 230-kilometer (200-mile) long freshwater reservoir. Sao Francisco River system provides water for irrigation and drinking during the dry season and drought years.



Rio Negro and Rio Solimoes Converging at Manaus, Brazil

## The Paraná

The principal rivers in the Paraná basin are the Paraná, the Paranaíba, and the Paraguai. The Paraná is navigable by riverboats for 1,610 kilometers (1,000 miles), the Paranaíba for 640 kilometers (400 miles), and the Paraguai for more than 1,000 kilometers (600 miles). Rapids, falls, and dams prevent navigation of the Tietê, Paranapanema, and Uruguay.

### Brazil's Major Rivers

River Name	Length		Source Region
	Kilometers	Miles	
Branco	775	482	Venezuela Border
Negro	1,610	1,000	Venezuela
Japurá	2,815	1,750	Colombia
Putumayo	1,610	1,000	Equador
Amazon	6,500	4,030	Peru
Purus	2,300	1,400	Peru
Madeira	2,600	1,600	Bolivia
Tapajós	900	560	Sao Manuel and Juruena
Juruena	800	500	Mato Grosso Plateau, Brazil
Sao Manuel	1,500	930	Mato Grosso Plateau, Brazil
Xingu	1,979	1,230	Mato Grosso Plateau, Brazil
Araguaia	2,575	1,600	Mato Grosso Plateau, Brazil
Tocantins	2,639	1,640	Mato Grosso Plateau, Brazil
Sao Francisco	1,609	1,000	Mato Grosso Plateau, Brazil
Paranaíba	1,000	600	Mato Grosso Plateau, Brazil
Paraná	4,880	3,032	Mato Grosso Plateau, Brazil
Tietê	1,130	700	Sao Paulo, Brazil
Paranapanema	900	560	Sao Paulo, Brazil
Paraguai	2,550	1,581	Mato Grosso Plateau, Brazil
Uruguay	965	600	Santa Catalina, Brazil
Rio de la Plata	Estuary Only		Paraná and Uruguay rivers

## Topography

Brazil has rolling lowlands in the north, plains in the west, hills and mountains in the east, and a narrow coastal strip along the Atlantic Coast. Brazil has seven topographical regions that vary in size. The Guiana Highlands along Brazil's northern border is the smallest region. The highlands are formed by the Serra Acaraí, Serra Tumucumaque, and



## Topography and Drainage

Serra Parima mountain ranges with elevations ranging from 460 to 1,525 meters (1,500 to 5,000 feet). On the west end of the Guiana Highlands, on the border between Venezuela and Brazil, is the Serra Imeri with Brazil's highest peak, Pico da Neblina, which rises to an elevation of 3,014 meters (9,888 feet).

The Amazon River Basin is located south of the Guiana Highlands. It covers more than one-third of the surface of Brazil. This area contains dense tropical rain forests (selvas), swamps, and floodplains that rarely exceed 150 meters (500 feet) in elevation.

The Brazilian Highlands, also known as the Brazilian Plateau, and the Central Highlands, occupy most of the southeastern half of the country. The region is mostly rolling prairies and forest tableland with several large rivers in relatively deep valleys. Elevations in the highlands range from about 300 to 900 meters (1,000 to 3,000 feet).

The Coastal Mountains contain several small mountain ranges that separate the Atlantic Coastal Region and interior regions of the Brazilian Highlands and Mata Grosso. The primary mountain ranges are the Serra do Mar, Serra Geral, and Serra da Mantiqueira with elevations of about 1,200 meters (4,000 feet). The region has several high peaks. Pico da Bandeira, at an elevation of 2,890 meters (9,482 feet), located north of Rio de Janeiro in the Serra da Mantiqueira, is the second highest peak in Brazil. Southwest of Rio de Janeiro is Pico Pedra Açú, which has an elevation of 2,232 meters (7,323 feet).

The Mata Grosso region, located in southwestern Brazil, is covered by open forest, grasslands with scrub brush, and swamp (pantanal). Generally south of the higher Brazilian Highlands and much flatter than the Coastal Mountains to the east, the region is essentially the northeastern half of South America's Parana-Paraguto basin.

Brazil's coastal mountains limit the coastal plains from near the southern border with Uruguay. Only west of Sao Luis on the Brazil's northern shore does the coastline broaden, eventually becoming a broad plain at



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## **Pantanal**

the mouth of the Amazon River. The coast also contains many natural harbors such as those located at Rio de Janeiro, Salvador, and Recife.

The southern region is mostly a low wide plain, *pampas*, edged on the north by the coastal mountains, which are high enough in elevation and far enough from the Equator to get snow in the winter. Iguazu Falls is on the western edge of the region where Brazil borders Argentina. Northwest about 20 kilometers (12 miles) away, on the Paraná River is Itaipu, one of the largest hydroelectric dams in the world.

## ***Cross-Country Movement***

In the Amazon River Basin, substantial cross-country movement by vehicle and foot is prevented by the several-thousand waterways that intersect the region.

In the northeastern portion of the Brazilian Highlands near the Atlantic coast, cross-country movement for vehicles is slowed by large sand dunes. Local areas of both dense and open forests affect movement in the remainder of the highlands. In the Coastal Mountain and Guiana Highlands regions, cross-country movement by vehicles is limited or prevented by heavy forest and deep ravines. The largely flat grassland terrain in the Mata Grosso and southern regions supports limited cross-country movement.

## Climate

Brazil's tropical location and topographic features strongly influence its climatic patterns. Brazil has five climatic regions, ranging from the predominant tropical or semitropical to the South Temperate Zone in the south. Brazil's four seasons occur opposite to those in the United States.



**Brazilian Pasture**



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## Vegetation

The Amazon basin has a tropically warm, wet climate that averages 21 days of rain during the fall months and 16 to 18 days of rain in summer and winter months. The spring season, from August to October, is relatively dryer, with an average of only 4 days of rain per month. The eastern portion of the region near the city of Belém (at the mouth of the Amazon) is more consistently humid and rainy than the Amazon's western areas.

The climate of the interior area of the Brazil's northeast is tropical semi-arid. This is Brazil's hottest and driest region. Temperatures rise to more than 38 °C (100°F) in the summer. Sharp daily variations of temperature occur from hot days to chilly nights. Seasonal rainfall is scarce but severe when it comes. The scarcity of rains and high evaporation rates commonly cause severe drought conditions in the region.

The Central Highlands' average monthly temperatures rarely drop below 25°C (77°F) and regularly rise to 40°C (104°F); seasonal variations in temperatures are more marked at higher elevations inland. Storms are seasonal and violent, with 80 percent of the rains occurring during summer.

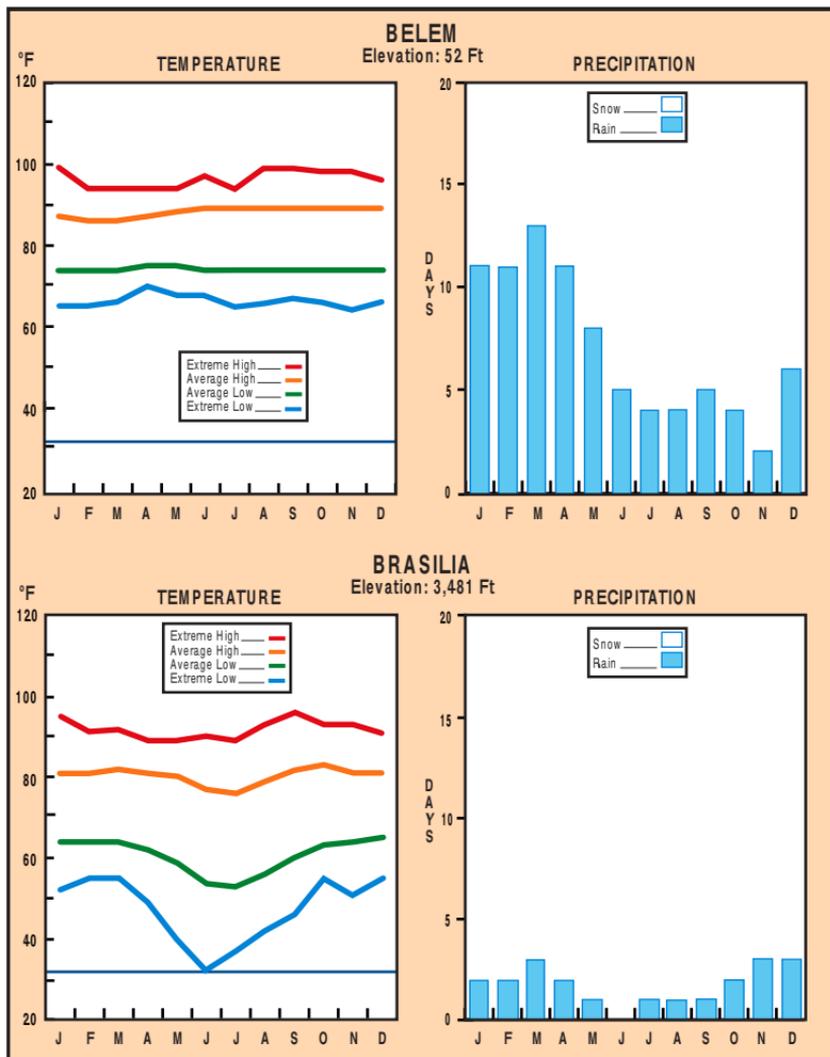
The warm tropical climate of the southeastern Atlantic Coast is moderated by the trade winds and oceanic current of the Atlantic that flows

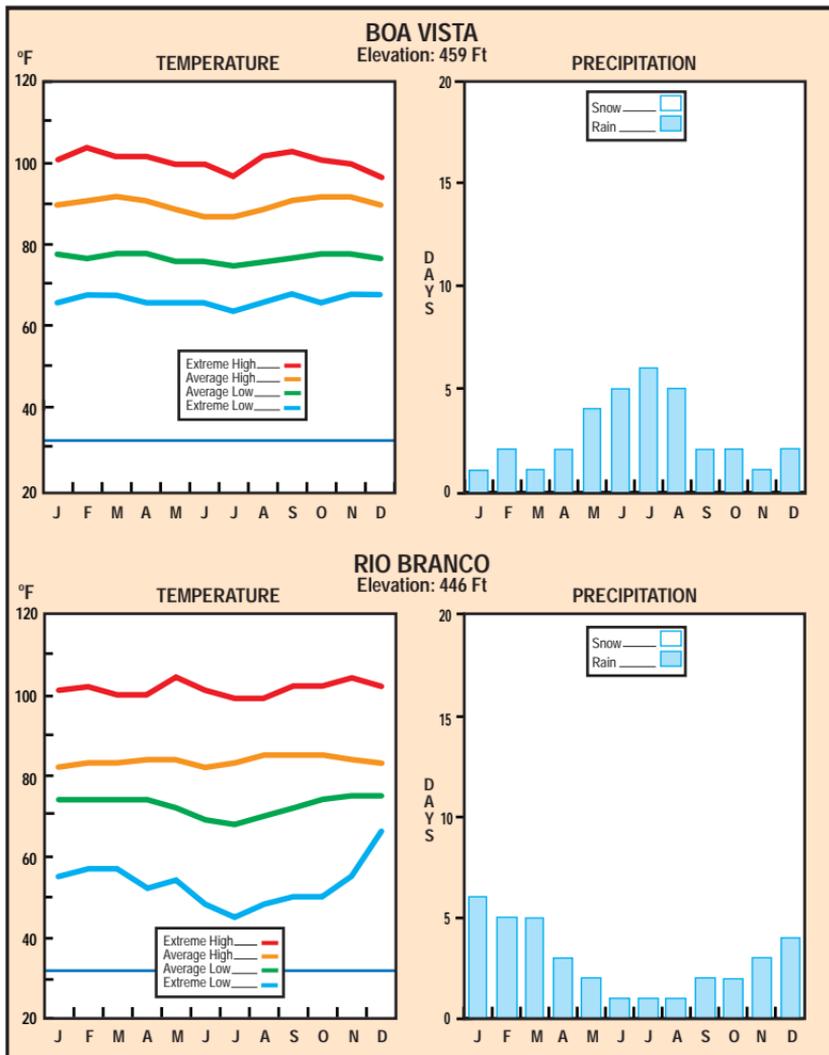
south along the coast from the equatorial region. Winter brings many cloudy days, but fewer days of rain.

In the subtropical humid and temperate south, seasonal changes are more pronounced than in the rest of Brazil. Rainfall is fairly consistent at about 10 days each month, year-round. Temperatures range from highs of 31°C (88°F) in the summer to lows of -5.6°C (22°F) in the winter in the extreme



### Eco-System Areas





south. The region is far enough south that crop-damaging frost is common and the coastal mountains near Santa Catarina get snow in the winter.

### ***Precipitation***

Rain in Brazil usually comes in the form of a short daily downpour. The area around the Amazon River Basin on average receives more than 2.2 meters (90 inches) of rainfall every year. Some parts of the Amazon get about 5 meters (200 inches) of rain annually. The eastern edge of the central highlands in the state of Sao Paulo also receives heavy annual rainfall. The south, southeast, and central highlands receive much less rain, only about 1 to 1.5 meters (39 to 59 inches), with most falling in the summer, (December to April).

Brazilian winters tend to be dry, except for the Amazon and the northeast, where rainfall is consistent throughout the year. In contrast, rainfall is greatest during the winter in the semiarid northeast region.

### ***Environment***

Major environmental problems in Brazil include deforestation and land degradation, desertification, air and water pollution, wetland degradation, coastal contamination, and illegal trade in wildlife (poaching).

### ***Phenomena***

#### **Tidal Bore**

During each full and new moon, a phenomenon called tidal bore or wave front, sweeps the Amazon River from the mouth on the Atlantic Ocean. These swells create waves as high as 5 meters (16 feet) that can run for 45 minutes traveling upstream more than 650 kilometers (400 miles) at speeds in excess of 65 kilometers per hour (40 miles per hour). The local Brazilian Tupi Indian word for the phenomenon is *pororoca* (great noise). Amazon residents have ridden the *pororoca* for years in their canoes, but the powerful wave can be dangerous, tossing debris and the boats into the jungle as the wave passes.

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## TRANSPORTATION AND COMMUNICATION

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### Transportation

#### *Roads*

As of 2000, Brazil has 1,724,929 kilometers (1,069,456 miles) of road, with about 164,988 kilometers (102,293 miles) or 10 percent paved.

Brazil began a national highway system linking the state capitals with Brasília in the late 1950s. Major road building projects such as the Trans-Amazonian highway began in the early 1970s. The Trans-Amazonian highway runs 5,300 kilometers (3,286 miles) from Recife and Cabedelo to the Peruvian border. Major projects underway include the Cuiba-Santarem highway running 4,138 kilometers (2,566 miles) from north to south and the Trans-Brasília project that will have 3,555 kilometers (2,204 miles) of road and link the Trans-Amazonian highway with Uruguay. Projects for the next 10 years include a highway linking Sao Paulo with the capitals of Argentina and Chile. Some of the road-work has been opened up to private investment resulting in toll roads.

#### **Distance from Selected Cities to Rio de Janeiro**

<b>City</b>	<b>Kilometers</b>	<b>Miles</b>	<b>City</b>	<b>Kilometers</b>	<b>Miles</b>
Belém	2,014	3,240	Natal	1,709	2,680
Belo Horizonte	275	442	Porto Alegre	963	1,555
Brasília	711	1,140	Recife	1,529	2,460
Curitiba	520	835	Salvador	1,051	1,726
Fortaleza	1,771	2,900	Santarém	2,404	3,856
Foz do Iguaçu	932	1,500	Santos	311	500
João Pessoa	1,600	2,575	Sao Paulo	266	429
Manaus	2,741	4,410	Vitória	319	525

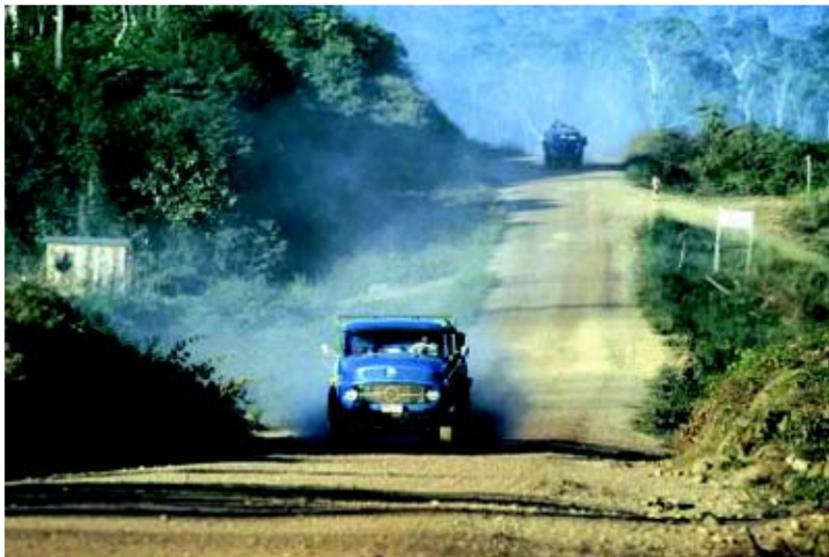
Road conditions vary from graded dirt to gravel and pavement. The type of road and maintenance vary according to region, population, and

industry. The south and southeast regions have a good road network with much of it paved. Some portions of road, especially in the state of Sao Paulo, are modern divided highways. The road network along the coast in the northeast is good, but the network and condition is poor inland. The roads in the Amazon Basin — even major highways — are generally the worst. Many in that area are closed for weeks or months during the rainy season. Urban roads tend to be better maintained; however, surfaces are frequently uneven and bumpy, and potholes are common. In general, maintenance of most urban roads ranges from good to fair, and for rural roads from fair to poor condition. Brazil uses standard international traffic signs and lane markings. The actual placing of road signs and markings in the more rural areas tends to be more haphazard.

Traffic drives on the right. Most roads have only two lanes. Traffic congestion in major cities, bad roads, poorly regulated large commercial trucks, and poor driving skills have combined to give Brazil one of the highest driving-related death tolls in the world. The maximum speed limit on major highways is 120 kilometers per hour (74 miles per hour), in urban areas it is usually 60 kilometers per hour (40 miles per hour). Speed limits are widely ignored and rarely enforced. Stop signs are rarely enforced, so many motorists treat them as yield signs. Brazilian drivers commonly wave a hand out the window or flash headlights to signal other drivers to slow down.

Emergency services are available by dialing 193. The 193 operators speak only Portuguese. Roadside assistance is irregular, usually local private mechanics. Some toll roads have their own services.

Public transportation is reasonably safe in most areas, although travel after dark outside city centers is not recommended. There are random, usually non-violent bus hijackings in the larger cities of Sao Paulo and Rio de Janeiro. Pocket picking is common on buses; the safest seats are away from the exit. Ground transportation accounts for about 97 percent of public urban travel. Public buses and private cars are the main modes of travel between cities.



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### Trans-Amazon Highway

Brazil has an extensive bus system within and between all the main cities. Standards have been improving but still vary from luxurious, well-maintained, air-conditioned express coaches to inexpensive, overcrowded, and mechanically unsound buses. Distances are vast between some large cities and timetables are not reliable. Travelers commonly experience unplanned overnight stops or long waits for connections. Bus fares vary; they are reasonable within the city and can be quite high for long, intercity trips on a nice bus.

In larger Brazilian cities, taxis are identified by red number plates. Most fares are low, although rides in air-conditioned taxis cost more. Taxis are metered and passengers should insist the meter be turned on.

Rental cars are available in all major cities, but rates are usually expensive and parking in downtown areas is difficult. Also, about half of the cars in Brazil

now run on álcool, which is a mixture of petroleum-based fuel and alcohol. It is half the price of gasoline, but the cars don't run as well on the álcool. Most service stations require cash and do not accept international credit cards.

## ***Rail***

The railroad's development in Brazil started in the late 1800s as disjointed systems that hauled freight. In the 1960s, a federal agency was created to oversee and coordinate the development of the state-controlled railways. In 1994, Brazil privatized much of the government-owned railroads to improve efficiency and service. Plans exist to upgrade and expand the rail system; however, investment is slow.

Brazil has an extensive railway network with 29,283 kilometers (18,155 miles) of railway, of which 384 kilometers (238 miles) is electrified. The



**Train Crossing in Southern Brazil**



## Major Roads and Railroads

railway system consists of 20 railways grouped into regional networks. About two-thirds of the railway system is in the south, within 300 kilometers (186 miles) of the coast. Brazil ranks first in the world in quantity of narrow-gauge (1-meter) railways with 23,460 kilometers (14,545 miles), and ranks 58th for standard-gauge (1.44-meter) with 199 kilometers (123 miles). Between 1996 and 2000, the length of electrified

railways dropped from 1,981 to 384 kilometers (1,231 to 238 miles). The largest shift away from electric trains came in 1999 when Ferrovias Bandeirantes converted to diesel locomotives from electric, which affected 1,354 kilometers (839 miles) of railway. The different track gauges restrict the ability to travel continuously across the country.

### Length of Track by Gauge

Gauge	1-meter	1.44-meter	1.6-meter	Total
Length kilometers (miles)	23,460 (14,545)	199 (123)	5,623 (3,487)	29,282 (18,155)

Nearly 99 percent of the railroads operating between cities carry freight. Brazil's railroads were primarily built and still operate to haul specialized cargo such as minerals (iron ore), steel, petroleum, and timber. In 2000, Brazilian railroads transported 302,441,000 tons of cargo, up about 18



Modern Locomotive in Brazil

percent from 1996. Ridership is declining. From 1996 to 1999, annual commuter ridership fell by 25 percent to about 6 billion. Passenger service, however, is only a small portion of the overall market.

Travel by train accounts for about 1 percent of the travel volume in Brazil. Passenger rail service is slower and less convenient than bus service, except for the modern mass transit systems around the larger cities. Rio de Janeiro, Sao Paulo, Belo Horizonte, Porto Alegre, and Recife have modern, efficient, and safe subway and trolleybus systems with cheap fares. Passenger railroads operating between cities in the south offer tourists trains with restaurant, first-class, air-conditioned, buffet, and sleeping cars.

## ***Air***

Brazil heavily relies on air travel. In areas such as the Amazon River Basin, (also known as Amazonia), roads can be washed out and rivers can become too shallow for navigation seasonally; the airways are the most important means of transportation.

Brazil is second in the world in number of airports with 3,365. Most towns have at least an airstrip, and all cities have airports, although usually situated some distance from the city. There are 570 airports with runways of more than 900 meters (3,000 feet) and more than 150 airports with runways longer than 1,500 meters (5,000 feet). Airport facilities range from fully developed airports to dirt runways. Of Brazil's 48 principal airports, 21 are considered international facilities.

Brasilia's President Juscelino Kubitschek International, Rio de Janeiro's Galeão-Antonio Jobim International, and Sao Paulo's Guarulhos International handle most of Brazil's international passenger traffic. Brazil's principle airports are fairly modern facilities. They provide facilities such as duty-free shops, banks, and restaurants. Taxis are readily available at major airports, and airport buses run regularly, about every 30 minutes during the day. Also, several rental car companies are available.



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### **Aerial Photo of Rio De Janeiro Airport**

Brazil's main domestic carriers for passenger and cargo services are VASP (Viação Aérea Sao Paulo), Varig, Transbrasil, and TAM. VASP and Varig fly international routes that include North America, Central America, South America, Africa, Europe, and Japan. About 10 smaller airlines provide domestic passenger and cargo services. Foreign airlines serving Brazil include Aerolineas Argentinas, Air France, Alitalia, American Airlines, British Airways, Continental Airlines, KLM, Lufthansa, Japan Airlines, and United Airlines.

*Teco-teco* is the local term for air travel in small planes in remote areas such as Amazonia. Travel can be time-consuming and dangerous. Small air services string together destinations like a city bus route. In addition, many remote or rural airstrips are not controlled or maintained, aircraft are not reliably maintained, and a pilot's qualifications are not guaranteed.



**Transbrasil 767 at Porto Alegre Airport**

**Primary Airports**

City/Name	Coordinates	Elevation m (ft)	Length x Width m (ft)	Capacity
Belem/Val De Caes	012301S 0482870W	16 (52)	2,774 x 45 (9,180 x 148)	C-141; C-130; KC-10; KC-135; C-9
Belo Horizonte/ Pampulha	195106S 0435703W		2,530 x 45 (8,300 x 148)	No Data
Brasilia/President Juscelino Kubitschek International	155150S 0475459W	323 (1,059)	3,171 x 46 (10,400 x 151)	C-141; C-5; C-130; C-17; KC-135
Campinas/ Viracopos International	230029S 0470804W		3,232 x 45 (10,600 x 148)	C-141; C-130; C-17; KC-10; KC-135
Campo Grande/ Campo Grande Intl.	202802S 0544002W	186 (610)	2,591 x 43 (8,500 x 141)	C-141; C-130; C-17; KC-135; C-9
Curitiba/Afonso Pena International	153900S 0567010W	911 (2,988)	2,195 x 46 (7,200 x 151)	C-141; C-130; C-17; KC-10; KC-135; C-9
Fortaleza/ Pinto Martins International	034616S 0038315W	25 (82)	2,530 x 45 (8,300 x 148)	C-141; C-130; C-17; KC-10; KC-135; C-9
Foz Do Iguacu/ Cataratas International	253508S 542903W	240 (787)	2,195 x 46 (7,200 x 151)	C-141; C-5; C-130; C-17; KC-10; KC-135; C-9

City/Name	Coordinates	Elevation m (ft)	Length x Width m (ft)	Capacity
Maceio/Zumbi Dos Palmares	093100S 354700W	118 (387)	2,195 x 45 (7,200 x 148)	C-141; C-130
Manaus/ Eduardo Gomes International	030204S 602009W	80 (264)	2,683 x 46 (8,800 x 151)	C-141; C-5; C-130; C-17; KC-10; C-9
Manaus/ Ponta Pelada	030845S 059591W	81 (266)	2,165 x 46 (7,100 x 151)	C-141; C-130; C-17; KC-135; C-9
Natal/Augusto Severo International	055405S 351500W	52 (171)	? x 45 (8,530 x 148)	C-141; C-5; C-130; KC-10; KC-135
Porto Alegre/ Salgado Filho International	295907S 511003W	3 (10)	2,256 x 43 (7,400 x 141)	C-141; C-130; C-17; KC-135; C-9
Porto Alegre/ Canoas Airbase	295645S 051084W	8 (26)	2,643 x 42 (8,668 x 138)	C-141; C-130; C-9
Recife / Guararapes International	080706S 345506W	10 (33)	2,988 x 46 (9,800 x 151)	C-141; C-5; KC-135; C-17
Rio Branco/ Presidente Medici Intl.	095909S 674800W	142 (466)	2,591 x 46 (8,500 x 151)	C-141; C-130; C-17; C-9
Rio De Janeiro/ Galeao-Antonio C Jobim International	224806S 421500W	9 (30)	3,994 x 46 (13,100 x 151)	C-141; C-5; C-9; C-130; C-17; KC-10; KC-135
Rio De Janeiro/ Santa Cruz Airbase	225602S 043430W	3 (10)	2,739 x 46 (8,984 x 151)	C-141; C-130; C-17; C-9
Rio De Janeiro/ Afonso Airbase	161348S 485812W	(130)	1,982 x? (6,500 x 171)	C-141; C-130; KC-135; C-9
Salvador/ Magalhaes International	125405S 381904W	19 (62)	2,988 x 45 (9,800 x 148)	C-141; C-130; C-17; KC-10; KC-135; C-9
Santa Maria	294240S 534117W	(287)	2,683 x 45 (8,800 x 148)	C-141; C-130; C-17; KC-10; KC-135; C-9
Sao Jose Dos Campos	231345S 455141W	(2,120)	2,652 x 45 (8,700 x 148)	C-141; C-5; C-9; C-130; KC-135
Sao Luis/Marechal Cunha Machado	023502S 441402W	54 (177)	2,378 x 45 (7,800 x 148)	C-141; C-130; C-9
Guarulhos Intl./ Sao Paulo	232601S 462840W	777 (2,549)	3,689 x 45 (12,100 x 148)	C-141; C-5; C-9; KC-135
Congonhas Intl./ Sao Paulo	233739S 046393W	801 (2,627)	1,940 x 50 (6,364 x 164)	C-141; C-130; C-17; KC-135; C-9

The top three airports in passenger volume are Guarulhos (Sao Paulo), Congonhas (San Paulo), and the Juscelino Kubitschek (Brasilia). The top three airports in freight volume are Guarulhos (Sao Paulo), Eduardo Gomes (Manaus), and Internacional (Salvador).

### **Maritime**

Brazil's 50,000 kilometers (31,000 miles) of navigable inland waterways and 7,491-kilometer (4,644-mile) coastline form the most significant means of transportation in Brazil. In 2000, sea and inland ports handled more than 478 million of tons of cargo. The sea ports near the three major cities of Rio de Janeiro, Sao Paulo, and Sao Luis handle about 60 percent of the national volume. In 2000, five river ports in the Amazon and Paran River basins accounted for about 14 million tons of cargo.

Riverboats are the primary means of transportation in many parts of the Amazon Basin. Riverboats have used the Amazon River and its tributaries for centuries. Private companies provide ferry service throughout most of the country. Ferry terminals serve large riverside cities along the Amazon. Some ferries offer different classes of travel, from a first-class cabin to second-class hammock space.

Many international cruise ship lines visit Brazil's coastal ports. The main international seaport for travel in Brazil is Rio de Janeiro; however, Manaus, Fortaleza, Recife, Salvador, and Vtoria also service cruise ships.

### **Primary Ports**

<b>Name</b>	<b>Location</b>	<b>Berths</b>	<b>Anchor/Pier Depth m (ft)</b>	<b>Cargo Capability</b>
Angra dos Reis	2301S 4419W	1	0 / 10 (33)	general cargo, bulk petroleum
Antonina	2530'S 4831W	1	0 / 6 (20)	general
Aratu	1249S 3827W	5	0 / 11 (36)	general, bulk, and roll on/roll off
Areia Branca	0457S 3702W	1	0 / 18 (59)	Bulk salt

Name	Location	Berths	Anchor/Pier Depth m (ft)	Cargo Capability
Barra do Riacho	1949S 4002W	2	0 / 11 (36)	general, bulk liquid, solid bulk, wood
Barra dos Coqueiros	1055S 3703W	2	15 (49) / 5 (16)	bulk crude oil
Belem	0127S 4830W	12	8 (26) / 6 (20)	general cargo, petrochemical



**Primary Airports and Ports**

<b>Name</b>	<b>Location</b>	<b>Berths</b>	<b>Anchor/Pier Depth m (ft)</b>	<b>Cargo Capability</b>
Cabedelo	0658S 3451W	2	15 (49) / 4 (13)	general cargo, roll on/roll off
Cáceres	1604S 5740W	1	0 / 4 (13)	general, bulk grain
Charqueadas	2958S 5137W	2	0 / 4 (13)	general, bulk grain
Corumbá / Ladário	1901S 5734W	1	0 / 4 (13)	bulk grain
Estrela	2928S 5158W	1	0 / 4 (13)	bulk grain
Forno	2301S 4200W	3	0 / 10 (33)	general cargo, solid bulk
Fortaleza	0341S 3829W	4	11 (36) / 10 (33)	general cargo, bulk petroleum
Ilhéus	1447S 3902W	3	0 / 10 (33)	cocoa beans, petroleum gas
Imbituba	2817S 4840W	1	0 / 9 (30)	general cargo
Itajaí	2655S 4838W	5	8 (26) / 8 (26)	timber, small containers
Itaqui	0234S 4421W	3	27 (89) / 12 (39)	bulk grain and ore
Macapá (Santana)	0001N 5102W	2	13 (43) / 10 (33)	general cargo, container, bulk manganese
Maceió	0940S 3544W	4	10 (33) / 10 (33)	bulk sugar and petroleum
Manaus	0309S 6001W	2	0 / 10 (33)	bulk grain and petroleum
Munguba	0105S 5223W	3	0 / 12 (39)	general cargo, dry bulk
Natal	0547S 3511W	3	10 (33) / 7 (23)	general cargo, bulk petroleum
Niterói	2252S 4307W	3	0 / 12 (39)	bulk grain

<b>Name</b>	<b>Location</b>	<b>Berths</b>	<b>Anchor/Pier Depth m (ft)</b>	<b>Cargo Capability</b>
Panorama	2121S 5151W	1	0 / 4 (13)	bulk grain
Paranaguá	2530S 4831W	9	14 (46) / 10 (33)	general cargo, bulk petroleum
Pelotas	3145S 5215W	3	0) / 6 (20)	general cargo
Pirapora	1721S 4455W	1	0 / 3 (10)	general, bulk grain
Ponta do Ubu	2047S 4035W	1	0 / 18 (59)	bulk iron ore
Porto Alegre	3002S 5113W	33	10 (33) / 4 (13)	general cargo, lumber, bulk food
Porto Velho	0846S 6355W	1	0 / 2 (6)	general cargo, bulk lumber
Praia Mole	2017S 4014W	3	0 / 17 (56)	bulk coal; steel
Presidente Epitácio	2146S 5606W	1	0 / 3 (10)	bulk grain
Recife	0804S 3452W	15	0 / 10 (33)	container, bulk fuel, grain, sugar
Regência	1936S 3949W	4	20 (66) / 0 (0)	bulk petroleum
Rio de Janeiro	2255S 4312W	28	0 / 7 (23)	container, general, roll on/roll off, bulk coal
Rio Grande	3210S 5205W	9	0 / 8 (26)	container, general, bulk oil, grain
Salvador	1258S 3831W	34	13 (43) / 10 (33)	general cargo, petrochemical
Santa Clara	2954S 5122W	3	0 / 5 (16)	petrochemical
Santarém	0225S 5442W	2	0 / 6 (20)	bulk lumber
Santos	2356S 4620W	28	11 (36) / 10 (33)	bulk conveyor, roll on/roll off

Name	Location	Berths	Anchor/Pier Depth m (ft)	Cargo Capability
Sao Francisco do Sul	2614S 4838W	4	9 (30) / 7 (23)	container, bulk fuel, grain
Sao Sebastião	2348S 4523W	4	25 (82) / 7 (23)	general, bulk, and roll on/roll off
Sepetiba	2256S 4350W	2	10 (33) / 12 (39)	bulk coal, iron
Suaape	0824S 3457W	2	0 / 14 (46)	liquid bulk and multipurpose
Tramandaí	3000S 5005W	2	21 (69) / 16 (52)	bulk fuel
Tubarão	2066S 4013W	6	26 (85) / 16 (52)	general, bulk, and roll on/roll off
Vila do Conde	0133S 4845W	4	0 / 16 (52)	bulk mineral
Vitória	2018S 4020W	17	0 / 10 (33)	general, roll on/roll off auto

## Communication

### *Radio*

Brazil is South America's largest media market with more than 2,700 radio stations (1,400 AM; 1,200 FM; and 150 shortwave). There are an estimated 100 million radios.

Most radio stations are privately owned. Radio Globo, Radio Eldorado, and Radio Bandeirantes are three of the largest commercial networks in Brazil. BBC World Service is also available by shortwave radio. The Brazilian government controls national radio stations through licensing. The government broadcasts domestically for 1 hour each night by requisitioning time on more than 600 national radio stations with programming directed by the government-owned Brasília-based Brazilian Communications Company (Empresa Brasileira de Comunicações S.A.—Radiobrás). Rádio Nacional, the state-run radio network, transmits medium wave (AM) and shortwave broadcasts of music, sports, and

news programs in Portuguese to the Amazon region, Americas, Africa, Europe, and parts of Asia.

## ***Television***

Brazilian television (TV) programming is commercially driven and run primarily by private enterprises. The Brazilian Ministry of Communications controls the industry through licensing.

There are nearly 300 TV stations in Brazil, 20 of which are operated by universities or other educational organizations. These stations are owned by universities or federal or state governments. The main non-commercial networks are NBR, operated by state-run Radiobrás, and TV Cultura, a public TV network with educational and cultural programming.

Brazil has about 270 commercial TV stations owned by 5 major conglomerates. Globol Television Network (Rêde Globo de Televisão), the most dominant, has 81 stations. The other major commercial networks are Brazilian Television System (Sistema Brasileiro de Televisão–SBT), which has 77, Rêde Bandeirantes has 63, Rêde Manchete has 36 stations, and TV Record has 12.

In 1997, the number of televisions in Brazil was estimated at about 36.5 million, with an estimated potential audience of 80 million. This makes Brazil South America's largest media market. *Telenovelas*, Brazilian soap operas, dominate prime time and are now exported throughout Latin America, Europe, Asia, and Africa. In addition to *Telenovelas* and sports, shows *de auditório*, which includes game shows, comedy, discussion, and reality TV, have become extremely popular. Almost all programming is in Portuguese.

Satellite networks are the most significant media technology advancement since the advent of the television. With the installation of satellite dishes and small low-power repeaters in thousands of small rural towns, and subscription-based satellite broadcasting (DBS), television networks are available to virtually all of Brazil. All five major domestic networks transmit on two domestic Brasilsat satellites operated by the

Brazilian Telecommunication Company (*Empresa Brasileira de Telecomunicações* – Embratel). Embratel also operates as a microwave and cable system in major Brazilian cities. Although satellite networks have brought access to networks with largely U.S. programming, most satellite dishes and many cable connections are being used to secure better reception of Brazilian channels.

### ***Telecommunication***

Brazil has about 73 million telephones with a density of 29.4 fixed lines per 100 people and 19 cellular telephones per 100 people. Of 49 million fixed lines, 39 million are actually in service, including 1.3 million public telephones. Brazil has 33.3 million wireless phones. The cellular phone market grew by 36 percent in 2001, and is increasing at such a rate that will allow the number of cellular phones to surpass the number of fixed-line phones in Brazil by 2005.

Brazil has a modern telecommunication network with more than 97 percent of existing telephones using digital technology and more than 15,000 kilometers (9,300 miles) of fiber-optic cable. Brazil's domestic network includes an extensive microwave radio relay system and a domestic satellite system with 64 earth stations. The network is connected internationally through three undersea coaxial cables; 4 satellite earth stations (three Intelsat and one Inmarsat); plus a microwave relay system to the Mercosur Brazilsat B3 satellite earth station.

In 1998, Brazil completed the privatization of the Brazilian Telecommunication System. *Agencia Nacional de Telecomunicacoes* (ANATEL), Brazil's telecommunication regulatory body, established standards for companies to operate domestic long-distance and international lines. Telemar, BrasilTelecom, and Telefonica control more than 98 percent of the long distance market. Long Distance International (LDI), which is owned by Worldcom, controls more than 85 percent of the data communications market.

*Serviço Móvel Global por Satélite Não-Geoestacionário* (Global Satellite Mobile Service) provides satellite telephone service in Brazil. Brazil has tone, numeric, and alphanumeric paging services provided by 250 companies serving 1 million customers.

### ***Newspapers and Magazines***

Brazil's constitution guarantees freedom of the press. Of the more than 300 privately owned and operated newspapers in Brazil, more than 100 are available on the internet. Total daily circulation is estimated to vary between 2.2 and 2.6 million. The largest newspaper is the *Folha de Sao Paulo* with a daily circulation of 540,000 and twice that on Sunday. The other major newspapers are the *O Estado de Sao Paulo*, and Rio de Janeiro's *O Globo* newspaper. These papers primarily contain regionally focused content such as news, cultural events, entertainment listings, and some international news.

Brazil also has newspapers that report sensational topics such as scandals, crime, and sports, mostly football (soccer). *Última Hora* is a popular example of this group of papers.

There are several hundred periodicals published in Brazil, including the largest news and current affairs magazines *Veja*, *Visão*, and *IstoÉ*. *Gazeta Mercantil* is a high-quality newspaper containing financial articles. *Exáme* is Brazil's leading business news biweekly. Other periodicals cover fashion and sports.

English-language newspapers and magazines are difficult to find in Brazil. *The Economist* and the *International Herald Tribune* are usually available only in Rio de Janeiro and Sao Paulo, at five-star hotels, and in larger airports; so is the *Brazil Times*, an English-language Brazilian paper aimed largely at the business community.

### ***Postal Service***

Post offices in Brazil, *Correio*, have bright yellow postboxes and signs. Post offices with telegram capability, *Correios e Telégrafos*, are found in

large cities. A *Correios e Telégrafos* is usually located in the city center. Smaller post offices and kiosks scattered around a city usually only handle mail. Post offices are open Monday through Saturday from 0900 to 1300. *Correios e Telégrafos* provide other functions besides mail and telegram services, and may have long lines.

Postal service in Brazil is fairly reliable; however, valuables should not be sent through the mail. Domestic mail usually takes 3 to 4 days, although delivery to the North and Northeast may take longer. Mail sent to Europe and North America generally takes 4 to 5 days via airmail and about 4 weeks by ship.

Stamps are available in two varieties — domestic and foreign. A foreign postage stamp costs around 60 cents for either a postcard or a normal letter. Mailing items abroad is much more expensive. For greatest reliability and security, mail should be sent registered or franked, and the post office box (*Caixa Postal*) address and postal code number (similar to a zip code) should be used.

## **Satellites**

In 1961, Brazilians created the Organizing Group for the National Commission on Space Activities, which has evolved into the current National Institute for Space Research (INPE). The goal of Brazil's space program is autonomy in the development and operation of meteorological, communications, and earth observation satellites. Brazil has launched hundreds of rockets since the mid-1960s from the Natal (0547S 3511W) and Alcantara (022360S 442360W) launch sites. Since 1993, INPE has successfully launched its own scientific rocket payloads such as the SCD-1 and SCD-2 satellites from Barreira do Inferno, Natal, on the northeastern coast of Brazil. The first high-resolution remote sensing image satellite, the joint China-Brazil Earth Resources Satellite (CBERS), was launched in 1999. With the CBERS-1 already having been used to image 99 percent of China, the two countries plans to continue with three more joint satellites. In addition to the work for China,

the Brazilian Space Agency (AEB) plans to launch rockets and satellites from Alcântara for other nations, including the United States, Israel, Russia, and Ukraine.

Brazil's second-generation communications satellites, the Brasilsat B series, were built during the 1990s in a joint project with Hughes Space and Communications Company in the United States and INPE in Sao José dos Campos.

The Brasilsat B series satellites were launched on French Ariane rockets from Kourou in neighboring French Guiana. Each of the satellites provides telephone, television, facsimile, data transmission, and business network services over 1 X-band (military) and 28 active C-band transponders. In addition to nationwide communication coverage, the satellites transmit a high-gain area beam to four cities (Belo Horizonte, Curitiba, Rio de Janeiro, and Sao Paulo). The X-band antenna on B1 and B2 covers South America and the south Atlantic.



Alcantara Launch Center



## Major Satellite Communications, Control, and Launch Locations

Embratel, Brazil’s telecommunication company, operates three tracking and control earth stations. The primary station is in Sao José dos Campos, with regional facilities at Cuiabá and Alcântara. Other system control stations include an earth station in Guaratiba and a backup control station at Tanguá, both are outside Rio de Janeiro.

Brazilian satellite operator Star One is building the new C1 series of telecommunication satellites for Alcatel to serve Latin America. The first satellite will have 37 transponders in C and Ku bands with the C band providing South America with high-speed internet and multimedia capacity. The first of the C1 series of satellites is scheduled for launch on Ariane in 2005.

Brazil is developing the Alcântara Launch Center in an attempt to duplicate the success of the European Space Agency space launch site at Kourou, French Guiana. Now Brazil's main rocket launch site, Alcântara is located 241 kilometers (150 miles) south of the equator on Brazil's northeast coast, across the Bala de Sao Marcos near the city of Sao Luiz. The facility's proximity to the equator reduces the fuel required to lift a rocket into orbit. AEB mission control is located in Cachoeira Paulista in Sao Paulo.

Brazil has been developing a rocket similar to the French Ariane rocket. However, launches of Brazil's first family of satellite launch vehicles, *Veículo Lançador de Satélites* (VLS), failed in 1997 and 1999. During a third attempt on 22 August 2003, the rocket exploded destroying 2 satellites and killing 21 engineers and technicians.



Satellite Rocket at Alcântara

## *Internet*

Brazil's internet and e-commerce industries are the most advanced in Latin America. Despite an economic slowdown since 2000, private companies and the Brazilian government continue to make significant investments especially in the broadband segment. High-speed internet access is available to users in some of the larger urban centers such as Sao Paulo. All cities and many towns now have cybercafés and many hotels are online; however, public access is not as widely available. With the exception of Manaus, Belém, and Salvador, most of the Amazon and the Northeast regions do not have internet access.

With about 6 percent of Brazilians owning personal computers, estimates put the number of internet users at approximately 23 million. There are about 1,000 internet service providers (ISP), but only a few hold more than 50 percent of the market share. The top three ISPs are Universo Online (UOL), Brazil Online (BOL) and ZipNet respectively. UOL has partnered with many businesses to build BOL's e-commerce site, Shopping UOL. However, the depreciation of the *real*, power shortages, and the U.S. economic slowdown have slowed the growth of e-commerce.

Business-to-business e-commerce in Brazil was estimated at US\$7.4 million in 2002, although growth by Brazilian companies was slow. Business-to-consumer is growing more rapidly. Most local Brazilian sites are dedicated to books, music, groceries, electronics, brokerages, banks, airlines, and computer software and hardware. Bradesco, the largest private Brazilian bank pioneered internet-based home banking systems that have led the way for the industry. Home banking services were used by 1.5 million Brazilian consumers in 1999. On-line government and business services have also become successful; Brazilians even file income taxes electronically.

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## CULTURE

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### Statistics

<b>Population (2003)</b>	182,032,604
<i>0-14 years</i>	27.1% (male 25,151,855; female 24,196,506)
<i>15-64 years</i>	67.2% (male 60,667,014; female 61,683,580)
<i>65 years and over</i>	5.7% (male 4,232,784; female 6,100,865)
<b>Population growth rate</b>	1.15%
<b>Birth rate</b>	17.67 births/1,000 population
<b>Death rate</b>	6.13 deaths/1,000 population
<b>Net migration rate</b>	-0.03 migrant/1,000 population
<b>Sex ratio</b>	(males per female)
<i>At birth</i>	1.05
<i>Under 15 years</i>	1.04
<i>15-64 years</i>	0.98
<i>65 years and over</i>	0.69
<i>Overall</i>	0.98
<b>Infant mortality rate</b>	(deaths per 1,000 live births)
<i>Overall</i>	31.74
<b>Life expectancy at birth</b>	
<i>Overall</i>	71.13 years (67.16 male; 75.3 female)

### Population Patterns

The population density of Brazil is 18 people per square kilometer (48 people per square mile); however, the population is unevenly distributed. Seventy percent of Brazil's population lives in the south and southeast, which constitute only about 18 percent of the total land area of Brazil. Nearly 80 percent of the population lives in urban areas within 322 kilometers (200 miles) of the Atlantic coast. This leaves large areas of the interior sparsely populated.

The city of Sao Paulo has the largest population with more than 10 million. Rio de Janeiro is second with a population topping 6 million. There are four cities with populations of more than 2 million and eight cities with populations of more than 1 million.

### ***Ethnic Density***

Brazilians sometimes refer to themselves as a successful amalgam of African, European, and indigenous peoples. Ethnic groups have tended to remain in the areas in which they originally settled. German, Italian, Lebanese, and Japanese immigrants maintain ethnic communities in the Southern region, where they speak their native language. Sao Paulo is home to the largest community of Japanese outside of Japan and Hawaii. The black population, descended from African slaves, lives mostly in northeastern states like Bahia. Most of the estimated 150,000 to 200,000 indigenous peoples in Brazil are found in the rain forests of the Amazon River basin. Fifty-five percent of the population is white (Portuguese, German, Italian, Spanish, or Polish), 38 percent mixed white and black, 6 percent black, and 1 percent other (indigenous peoples, Japanese or Arab).

### **Society**

#### ***People***

Brazilian people are descended from indigenous people, Europeans (primarily Portuguese), and Africans (mostly from Nigeria and Benin). Racial mixing in Brazil began in the 16th century. Brazil has an international image as a happy, unprejudiced melting pot. Brazilians have promoted the concept of a Brazilian racial democracy, denied the existence of racism and racial discrimination, and demonstrated the fusion of cultures and religions. While there are no legal forms of racial discrimination, and races do seem to mix freely in public, there are, however, socioeconomic differences that have lingered for more than a century. These differences indicate institutional prejudice and stereotyping based on race. They affect life in areas ranging from access to education, to

employment opportunities and treatment in the criminal justice system. The average income for white Brazilians is twice that for blacks. While there is a growing black middle class, it is concentrated in the arts, music, and sports.

Brazil's 250,000 indigenous people descend from more than 200 tribes. Although racially similar, their ancestors spoke 180 different languages and had different cultures. Tribes that spoke Guarani and Tupi lived in the Northeastern areas. Those were the first groups to intermarry with the Portuguese settlers. Other tribes such as the Ge, Arwak, and Karib lived much farther inland in the Amazon Basin. Many of these tribes did not have contact with Europeans until well into the 20th century. Today, the tribes live in areas that are 10 percent of Brazil's total territory; the Brazilian government has set aside 850,000 square kilometers (328,185 square miles) for the preservation of their way of life. Over the past several years attempts to develop the area have threatened the integrity of these preserves.

### ***Social Strata***

The socioeconomic strata of Brazil is evident in residential, educational, and work environments. Although social stratification was originally based on property, upward mobility has evolved so that it is possible for people with special skills to earn reasonable incomes. There are four classes in Brazilian society.

Upper class Brazilians represent 11 percent of the population. They live in spacious air-conditioned apartments or private homes in nice, secure neighborhoods. Their households have servants to cook, clean, and care for the children. They typically have one or more automobiles, and their children attend expensive private schools. Leisure time is spent at beaches, night clubs, theaters, and restaurants.

The middle class, about 20 percent of the population, earn significantly less than the upper class. They typically own small businesses, or are managers, administrators, teachers, salespersons, or highly skilled

workers. They tend to live in modest apartments, but have electrical appliances such as color televisions and a small Brazilian-made car. Their children likely attend public schools.

About 28 percent of Brazilians are in the lower middle class. They tend to be blue-collar workers struggling economically just to maintain a modest life for the family.

About 41 percent of Brazilians are classified as poor or lower class; they include many urban and most rural Brazilians. The urban poor live in *favelas* (shanty-towns) or housing projects. They endure long bus trips to work, and attend public schools but often drop out to go to work. Many of the poor, especially in rural areas, receive assistance from patrons, rural landowners, in exchange for employment.

### ***Family***

The Portuguese Roman Catholic church established the cultural ideals with regard to marriage and the patriarchal family. However, the Brazilians' affinity for compromise has created a lax standard of behavior, resulting in consensual unions, marital dissolution, and serial unions.

Traditional Brazilian families are large and include the extended family, which can include 300 relatives. Most Brazilians strongly feel that family comes first and have an obligation to help family members in any way possible. Relationships with godchildren, godparents, and ritual co-parents are also strong. Close extended families often have a large gathering at the mid day meal on Sunday.

The father usually leads the family, with strong input from the mother on household issues. Although there is no longer an authoritarian patriarch, the advice and consent of the eldest male of the extended family is usually sought on important decisions.

Although unmarried men are more likely to leave home earlier for employment, it is still common for adult children to live at home until

marriage or until about the age of 30. Even when children leave home, it is common for them to make frequent, even weekly, visits.

Brazilians consider it improper to send elderly relatives who cannot care for themselves to a nursing home. Instead, the family usually takes care of them.

In modern urban Brazil, extended family networks are losing their importance. The trend in families is toward smaller nuclear families, with between one and three children. Divorce and informal marriage are now more common resulting in increase in women becoming the head of households.

Along with the deterioration of the traditional family, the level of care for children plummeted in the late 1980s and 1990s. An estimated 12 million children live as orphans on the streets of the large cities in Brazil. They are called *abandonados* (the deserted ones). These children survive by begging, washing cars, shining shoes, or stealing. In the last 5 years, there has been a concerted nationwide effort to help these children improve their lives.

## **Education and Literacy Rates**

In 2003, the literacy rate in Brazil, defined as the percentage of the population age 15 and over who can read and write, was 86.4 percent. There is essentially no percentage difference between genders; however, illiteracy is 10 times greater among the poor.

Brazil's educational system includes public and private institutions, which are available from preschool through elementary (8 years), secondary (3 years), university, and post-graduate levels. State and local governments manage elementary and secondary education. The Federal Ministry of Education controls nearly all colleges and universities.

Public education through university level is tuition-free at all levels, and is compulsory through the secondary level. Education in Brazil has improved during the past 25 years, with 97 percent of eligible children attending school as of 2000. This was achieved largely through government subsidies for books and lunches to poorer families with the aim of

encouraging children to stay in school rather than entering the workforce. Major improvements include *TV Escola* (School Television), a long-distance program installing 30,000 computers in 2,276 elementary schools and providing 57 million new school textbooks. Still, most public schools remain underfunded, have underpaid teachers, and fall short of private schools in the quality of education provided.

The Brazilian government maintains at least one university in each state, where students may obtain bachelor's degrees and post-graduate degrees in subjects including medicine, public health, law, social sciences, engineering, and mining. All colleges and universities, public and private, require an entrance exam. Nearly two-thirds of the country's colleges and universities are in the southeast region, consistent with population patterns. In 1993, about 65 percent of college students majored in social sciences or humanities, as opposed to scientific or technical fields. Due to a shortage of jobs in these fields and the 8 years typically required to complete college, about 40 percent of students quit college without graduating.

## Religion

The Brazilian constitution guarantees freedom of religion, declares no official religion, and has a formal separation of church and state. However, Brazil is about 70 percent Roman Catholic, making it the largest Roman Catholic country in the world. Despite the large percentage, church statistics put attendance at only 20 percent. Moreover, in the 1991 census, 15 percent of Brazilians declared that they have no religion and 19 percent claimed to be Protestants. Muslims, Kardecists, Mormons, Jehovah's Witnesses, Jews, Buddhists, and Indian animists account for about 3 to 5 percent of Brazilians. The religious groups that have grown the most are fundamentalists with strict standards of personal behavior regarding dress, drinking, smoking, and gambling.

The most widely known and socially accepted of the Afro-Brazilian cults is called *Umbanda* or *Candomblé*, which was introduced by the slaves from Nigeria and Benin. To avoid persecution from Catholic slave owners, African slaves hid their gods by using the names of Cath-

olic saints that most closely fit a specific African deity. An example is the cult of Exú, whose god has a mixture of animal and human characteristics. Exú represents the contact between the spiritual and material worlds. On New Year's Day, millions of people go to the beach dressed in white for a large public ritual making offerings to spirit protectors and to Exú. *Umbanda* combines with other spiritualism, and practices white magic. The more extreme spiritualism, called *macumba*, is a kind of black magic. It is used for either good or evil purposes. Its practitioners leave offerings such as chicken, flowers, and candles at crossroads and other public places.

## Recreation

Soccer is Brazil's national passion to both play and watch. During the World Cup or significant national competitions, schools and businesses effectively close. Rio de Janeiro's Maracana Stadium is one of the largest in the world. Other popular sports include basketball and volleyball. Brazilians are huge fans of auto racing, and golf is popular with the upper class.

In addition to sports, popular forms of recreation are beach going, surfing, boating, fishing, swimming, enjoying music, and dancing. Brazilians partying at night love music and dancing, especially the samba,



Maracana Stadium in Rio de Janeiro

bossa nova, and lambada. However, recreation often takes the form of visiting friends or watching television. Weekend and holiday barbecues are common. Brazilians go to cinemas; but, attendance has drastically dropped with the advent of the national television networks. Most films shown in Brazilian cinemas are American with Portuguese subtitles.

Carnaval is an immense raucous party held 4 days before Ash Wednesday each year. Carnaval is held in every town and village in Brazil, although the event in Rio de Janeiro is most widely attended by foreigners. In some northern cities such as Recife and Salvador, Carnaval can last 2 weeks.

## Customs and Courtesies

Social customs in Brazil are strongly influenced by Europe. It is customary to greet relatives, friends, and complete strangers with a short hug and a social kiss, which is a quick kiss on each cheek, except when men greet men. Men greet men with a handshake and a pat on the shoulder with the other hand. Handshaking is also customary when a person is leaving. Superiors and authorities are formally addressed as Senhor (Mr.) and Senhora (Mrs.). Men tend to stare at women and women usually ignore the stares. Attire is generally casual, particularly during hot weather.

A few helpful things to remember:

- Brazilians consider it more polite to use a fork and knife than using fingers to hold food.
- Drivers are often rude and expect the right of way from pedestrians.
- Tipping taxi drivers is not a usual practice.
- Smoking is generally acceptable everywhere.
- Brazilians beckon one another by waving all of the fingers of the hand.
- Partially closing one eyelid is a sign of disbelief.
- The American “OK” sign with the forefinger and thumb forming a circle is an offensive gesture.

## ***Cultural Considerations***

The machismo attitude in Brazil is much more subtle than in neighboring Latin America.

Brazilians do not keep exact time schedules for social engagements; they consider it acceptable to be up to a half hour late. Although this permeates into business settings, people are much more punctual in Sao Paulo and Brasília.

Brazilians seek to avoid conflict through compromise in many areas of life such as politics, ethics, justice, and finances. There is a prevalent attitude that everything is open to negotiation.

There are stereotypes associated with different regions of the country. These regional rivalries are often the basis of cultural kidding.

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## **MEDICAL ASSESSMENT**

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### **Infectious Disease Risks to Deployed Personnel**

Brazil is assessed as a high-risk country for infectious diseases. Without force health protection measures, mission effectiveness will be seriously jeopardized. Risk varies greatly depending on location, individual exposures, and other factors.

#### ***Food- or Waterborne Diseases***

Sanitation is poor throughout the country, including in major urban areas. Local food and water sources (including ice) are heavily contaminated with pathogenic bacteria, parasites, and viruses to which most U.S. service members have little or no natural immunity.

If local food, water, or ice from unapproved sources is consumed, diarrhea can be expected to temporarily incapacitate a very high percentage of personnel within days. Hepatitis A, typhoid fever, and hepatitis E can

cause prolonged illness in a smaller percentage of U.S. personnel exposed to contaminated food or water sources.

### ***Vector-borne Diseases***

Vector-borne diseases are a major risk in Brazil. Personnel exposed to mosquitoes, ticks, sand flies, or other biting vectors are at high risk during the day and night, in both urban and rural areas.

The vector-borne diseases posing the greatest risk include dengue fever, malaria, leishmaniasis, yellow fever, and Mayaro virus.

Dengue and malaria are transmitted by mosquitoes and can debilitate a high percentage of personnel for up to a week or more. Dengue occurs year-round and countrywide, particularly in coastal urban areas. All four serotypes of dengue have been reported in Brazil, and mosquito populations reportedly are increasing due to uncontrolled urbanization. Malaria risk occurs year-round at elevations below 900 meters (2,950 feet), in all areas of Acre, Amapa, Rondonia, and Roraima states, and in most rural areas of Amazonas (including outskirts of urban areas, where risk increased during the mid-1990s), Goias, Maranhao, Mato Grosso, Para, and Tocantins states. Limited risk also may exist in some rural areas of coastal states from Piaui in the north to Santa Catarina in the south, including the outskirts of Rio de Janeiro in enclaves in the Atlantic rainforest.

Leishmaniasis can cause skin lesions in a high percentage of personnel. Leishmaniasis is transmitted by sand flies that are most active between dusk and dawn. The risk is year-round and nearly countrywide, mainly in rural and near urban areas, with the risk elevated in the more humid areas of northern, north-central, and central states.

Yellow fever can cause severe illness in a small percentage of personnel. Yellow fever is found in scattered rural locations, primarily in the interior jungle areas of north-central and northwestern states.

Mayaro virus, transmitted by culicine mosquitoes, can cause febrile illness in a high percentage of personnel. The virus is found countrywide in rural and jungle areas.

### ***Sexually Transmitted and/or Bloodborne Diseases***

Gonorrhea, chlamydia, and other infections are very common, and may affect a high percentage of personnel who have sexual contact, particularly with prostitutes. HIV/AIDS and hepatitis B infections are also risks and are associated with unprotected sexual contact. Though the immediate impact of HIV/AIDS and hepatitis B on an operation is limited, the long-term health impact on individuals is substantial.

### ***Water-contact Diseases***

Riverine operations and activities that involve extensive water contact may result in personnel being temporarily debilitated with leptospirosis in locations countrywide and year-round.

### ***Respiratory Diseases***

Acute respiratory infections such as colds, bronchitis, influenza, pharyngitis, and pneumonia are a risk, particularly in crowded living conditions. In addition, tuberculosis (TB) skin test conversions among personnel who have contact with the local population could be elevated over U.S. military baseline rates.

### ***Animal-contact Diseases***

Throughout Brazil, human rabies cases occur sporadically. Dogs are the main source for human rabies cases; however, human cases attributed to rabid vampire bats also have been reported.

### ***Soil-contact Diseases***

Activities that bring personnel in contact with dust or aerosols in rodent-infested areas may cause infrequent or sporadic numbers of personnel to

develop very severe illness from hantavirus pulmonary syndrome. The risk is year-round and primarily in rural areas.

## **Medical Capabilities**

The quality of Brazil's health care system is poor according to U.S. standards, but steadily improving due to health care reform. Brazil has over 7,000 hospitals, 12,000 diagnostic clinics, and 280,000 physicians.

Although Brazil has a sufficient number of physicians, shortages of nurses and auxiliary personnel exist. Most medical personnel are concentrated in developed regions; only nurses are evenly distributed. Some physicians and dentists are highly competent and provide acceptable care by U.S. standards. The quality of nursing and paramedical care generally is below U.S. standards.

Brazilian hospitals sometimes specialize in specific areas of medicine. Patients seeking medical care not available at a particular hospital may be refused treatment and referred to another hospital. Throughout Brazil, many private clinics that advertise as being emergency hospitals are equivalent to walk-in clinics in the United States.

The quality of most medical treatment facilities is below U.S. standards. Several public and private hospitals operate in very poor conditions because of a lack of financial resources, inadequate medical materiel, personnel shortages, or poor administration. The best medical treatment facilities are comparable to those in the United States, possessing state-of-the-art technology. These facilities are concentrated in developed areas such as Rio de Janeiro and São Paulo. The country's best medical treatment facility is the Israelita Albert Einstein Hospital, which is used by the U.S. Embassy.

Emergency medical response is best in large cities. However, during hours of peak traffic congestion, ground ambulances cannot be relied on to provide timely service.

Portuguese is the official language of Brazil, but Spanish, English, and French also are spoken by some health care providers.

### ***Key Medical Facilities***

#### **Israelita Albert Einstein Hospital**

<i>Coordinates</i>	23-36-03S 046-42-52W
<i>Location</i>	Ave. Albert Einstein 627, Morumbi
<i>City</i>	Sao Paulo
<i>Telephone</i>	345-1233, ambulance 845-1000
<i>Type</i>	Private, 500 beds
<i>Capabilities</i>	Internal medicine, cardiology, emergency medicine, neurology, pediatrics, psychiatry, pulmonology, traumatology; general surgery, cardiothoracic, neurosurgery, ophthalmology, orthopedic, vascular; ancillary — 24-hour emergency room (ER), cardiac care unit (CCU), intensive care unit (ICU), 17-bed medical ICU, 9 operating rooms, blood bank, computed tomography (CT), hemodialysis, laboratory, magnetic resonance imaging.
<i>Comments</i>	Best hospital in Brazil. Recommended by U.S. Consulate. Quality of care comparable to U.S. standards.

#### **Rio de Janeiro Hospital Miguel Couto Municipal**

<i>Coordinates</i>	22-58-38S 043-13-25W
<i>Location</i>	R. Bartolomeu Mitre, 1108, Logoa District
<i>City</i>	Rio de Janeiro
<i>Telephone</i>	274-2121, -6050, -9097, -5702
<i>Type</i>	Public, 400 beds
<i>Capabilities</i>	Cardiology, general internal medicine, family medicine, anesthesia, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, thoracic surgery, urology, CT, electrocardiogram, hemodialysis unit, x-ray, ambulance, blood bank, CCU, neonatal, laboratory, 9 operating rooms, 24-hour ER, helipad, ICU.

## **Federal District Hospital de Base**

<i>Coordinates</i>	15-49-37S 047-55-49W
<i>Location</i>	Sector Hospitalar Sul, Quadra 101
<i>City</i>	Brasilia
<i>Telephone</i>	225-0070
<i>Type</i>	Public, 750 beds
<i>Capabilities</i>	Cardiology, endocrinology, gastroenterology, infectious diseases, neurology, pediatrics, pulmonology, radiology, rheumatology; neurosurgery, orthopedic, ophthalmology, cardiothoracic, ear/nose/throat (ENT); ancillary — 24-hour ER, 19-bed ICU, CCU, anesthesiology, blood bank, CT, hemodialysis, laboratory, radioisotope facility, ultrasound, trauma unit, radiology.
<i>Comments</i>	Public hospital with large capacity. Emergency services are well developed, but hospital is short of funds, which may affect quality of care. Minimal mass-casualty capability. Emergency electrical generator. Helipad.

## **Rio de Janeiro Samaritan Hospital**

<i>Coordinates</i>	22-57-00S 043-11-31W
<i>Location</i>	Rua Bambina, 98
<i>City</i>	Botafogo
<i>Telephone</i>	537-9722
<i>Type</i>	Private, 75 beds
<i>Capabilities</i>	General medicine, general surgery, x-ray, 24-hour ER, ICU, operating room.
<i>Comments</i>	The quality of care in ICU and surgical suites generally is good for the region — compares to U.S. standards.

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## **HISTORY**

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Brazilian civilizations date to at least 5,000 BC. However, unlike the Inca and Maya, they never developed a centralized civilization. The diverse tribes were seminomadic and scattered throughout Brazil. Tribes

included the Arawak and Carib in the north, the Tupí-Guaraní of the east coast and the Amazon River valley, the Ge of eastern and southern Brazil, and the Pano in the west. There were an estimated 2 to 6 million indigenous people living in Brazil when the Portuguese first arrived. Today, there are fewer than 200,000.

Spanish navigator Vicente Yáñez Pinzón was the first known European in the region, landing near the site of present-day Recife on 26 January 1500. In April of that year, Portuguese explorer Pedro Alvares Cabral arrived and claimed the territory for Portugal. Colonization began in the 1530s when Portugal's King João III sent the first settlers to Brazil. The territory was originally named *Terra da Vera Cruz* (Land of the True Cross), but became known as Brazil after a cargo of valuable brazilwood from the territory arrived in Portugal.

The colonists discovered that the region was ideal for growing sugar cane, using the indigenous population as slave labor. The import of African slaves became a lucrative business, and by the mid-17th century, African slaves replaced indigenous people on the plantations.

Brazil was under Spanish rule from 1580 to 1640, because Spain's Philip II inherited the Portuguese crown. The period of Spanish rule was marked by frequent conflicts with the English and Dutch, the traditional enemies of Spain. The Dutch attacked in 1630, and occupied a portion of Brazil until 1661. The Dutch West India Company played a major role in the conquest and control of Dutch-occupied Brazil, which prospered for several years. With the successful revolt in Portugal against the Spanish in 1640, Brazil reverted to Portuguese rule. Brazil was relatively peaceful until 1680, when the Portuguese expansion southward sparked conflict over present-day Uruguay.

Gold was discovered in Brazil in 1693, starting a gold rush that brought tens of thousands of Portuguese colonists to Brazil. Economic growth continued with the discovery of diamonds in 1721 and by the expansion of the coffee and sugar growing industries. By the late 1770s, Brazil's land claims extended far into the west of the continent, and boundaries were confirmed by treaty with Spain.

In 1807, as Napoleon's army advanced on Lisbon, Portugal's Prince Regent Dom Joao VI, set sail for Brazil with his court. He made Rio de Janeiro the seat of the royal government of Portugal making Brazil the only New World colony to serve as the seat of a European monarch. By the time he ascended the throne in 1816, now King Joao's corrupt and inefficient government was unpopular with the Brazilians. He abdicated to his son Dom Pedro and returned to Portugal. Dom Pedro was popular with Brazilians and a favorite son of Portugal.

After Brazil's Latin American neighbors won independence from Spain, momentum gathered for Brazil to follow suit. Portugal made no concessions to Brazilian nationalism, and ordered Dom Pedro to return to Europe. In 1822, responding to the pleas of the indignant Brazilians, Dom Pedro announced his refusal to leave Brazil and proclaimed the country's independence. Rather than send troops to fight their favorite son, Portugal did nothing, and Dom Pedro became emperor of an independent Brazil.

An autocratic ruler, Pedro quickly lost popular support. In 1827, Brazil lost a war with Argentina over territory that is now Uruguay. Due to popular opposition to his reign, he abdicated in April 1831 in favor of Pedro II, the 5-year-old heir apparent.

The following decade was politically turbulent, with frequent provincial uprisings against regents (members of the royal court) that ruled Brazil. In July 1840, the Brazilian Parliament proclaimed Pedro II an adult and monarch of Brazil.

Pedro II was one of the most able monarchs of his time. During his reign, the population and economy expanded at unprecedented rates. National production increased by more than 900 percent. A network of railroads was constructed. Brazil helped Argentina and Paraguay oust dictatorial regimes in the late 1860s. The main political issue during the reign of Pedro II was slavery, which was abolished in 1888.

Emancipation of the slaves alienated the powerful land owners, the Roman Catholic clergy were hostile to Pedro's liberal policies, and the

public wanted a republican form of government. In November 1889, senior army officers led by Deodoro da Fonseca staged a revolt, ousting Pedro II. A republic was proclaimed, with Fonseca as head of the provisional government. Separation of church and state and other republican reforms were decreed. A constitution similar to the Constitution of the United States was completed in June 1890 and adopted in February 1891, making Brazil a federal republic. Fonseca was elected president.

Political turbulence marked the early years of the new republic, and the country went through a succession of military coups. By the end of the 19th century, Brazil's republic was stable and the practice of democracy more firmly established. However, the economy depended on coffee, sugar, and rubber exports. Economic problems caused by falling coffee and rubber prices in the early 20th century led to more political unrest.

During World War I, rising demand in foreign markets for Brazilian products relieved the economic difficulties of the country. Brazil was initially neutral, but joined with the Allies after German attacks on its shipping. Brazil made substantial contributions to the war effort.

The onset of an economic crisis in 1922 sparked two decades of civil unrest, and the imprisonment of political dissidents. Martial law did little to help the economy. It was the onset of World War II that stimulated industrial expansion and reinvigorated the Brazilian economy. Naval bases and airfields, constructed at strategic coastal points, became important centers of Allied antisubmarine warfare. The Brazilian navy eventually assumed all patrol activities in the South Atlantic Ocean. In 1944 and 1945, a Brazilian expeditionary force participated in the Allied campaign in Italy. Democracy was restored after World War II, but was still prone to political unrest and military intervention in the political process.

During the summer of 1947, Petropolis, Brazil, was the site of the International (Pan-American) Conference for the Maintenance of Peace and Security. The Inter-American Treaty of Reciprocal Assistance, known as the Rio Treaty, was drafted at the conference and signed by Brazil in September. A

provision of the treaty stipulates a united defense by the signatories against armed aggression directed at any nation of the Western hemisphere.

After being elected president in 1956, Juscelino Kubitschek began building roads and hydroelectric plants. He also built a new city in the Brazilian interior, Brasilia, that was designed to foster the development of the interior. In 1960, Kubitschek moved the capital of Brazil to Brasilia. That year, Janio Quadros of the National Democratic Union party was elected president. President and vice president are elected on separate tickets; João Goulart, a communist, was elected vice president. When Quadros suddenly resigned with little explanation only 7 months into his presidency, communist Goulart became president, sparking a crisis.

In the era of the Cold War and revolution in Cuba, the armed forces viewed Goulart as a threat. He was sworn in, but never had the support of the military. His years were characterized by high inflation, economic stagnation, and the increasing influence of radical political elements. On 31 March 1964, the military staged a coup.

A military government was established that instituted austerity measures that controlled the economy and limited politics. Those controls curbed inflation and seemed to stabilize the government. That stability fostered foreign investment. The period between 1964 and 1974 brought economic growth, with real growth as measured by gross domestic product (GDP) reaching 14 percent in 1973. Along with the economic growth, there was political repression. In 1979, the government started restoring political rights. Many of the country's exiles were allowed to return, and the public voiced its demand for re-democratization. In 1982, the country held direct elections for state governors.

To stimulate a sagging economy, the government allowed the clearing of vast areas of the Amazonian rainforests for logging and ranching. The government hoped to sell the lumber and create ranches. But the lumber did not sell, and the land did not support crops. Support from international banks through loans stopped, and Brazil's economic prosperity began to fail.

By 1985, the military handed power back to a civilian government, which elected Tancredo Neves to be Brazil's first civilian president in 21 years. Neves became ill and died before taking office, however, and was replaced by the Deputy President-Designate, José Sarney. Sarney successfully lead the country during transition from military to civilian rule. The end of military rule brought open discussion about the policies damaging the Amazonian rainforests. In 1992, Rio de Janeiro hosted the first global summit on environmental issues.

In 1989, with 53 percent of the vote, Fernando Collor de Mello was elected over socialist Luiz da Silva in the first direct presidential election in 29 years. Accused of extortion and bribery in 1992, President Collor faced impeachment and ultimately resigned. Collor's vice president, Itamar Franco, became president until the national elections in October 1994.

In January 1995, Fernando Henrique Cardoso, a former finance minister, took office as the president and sought to establish the basis for long-term stability and growth and to reduce Brazil's extreme socioeconomic imbalances. A United Nations report in 1996 showed that Brazil had the world's most uneven distribution of wealth. Cardoso implemented sweeping reforms that reduced government spending and improved efficiency. Cardoso sold off inefficient, government-owned monopolies in the telecommunication, electrical power, port, mining, railway, and banking industries, which resulted in a measurable drop in Brazil's poverty level. Cardoso also shut down Brazil's advanced nuclear weapons development program, which had been underway since 1965. Cardoso earned the trust of the people and won a second term in 1998.

Cardoso further decreased spending and, by 2000 the economy was growing again. As evidence of the strength of its economy, Brazil was not substantially hurt by Argentina's catastrophic economic problems. Yet, gains in education, land reform, and welfare were measured against other issues such as an inadequate health system and rural landlessness.

In 2002, the people looked to Luis Inácio da Silva, the Workers' Party candidate, widely known as Lula, to change things for the poor. Although Brazil's first leftist president was João Goulart in 1960, Lula was the first leftist president to be elected. Lula promised during his campaign to institute social reforms for the poor and working class, create jobs, and raise salaries. However, once in office, Lula has reneged on campaign promises, such as to not raise interest rates, which were raised twice in 2003.

## Chronology of Key Events

- 1500** Portugal claims Brazil.
- 1693** Gold is discovered in Brazil
- 1721** Diamonds are discovered in Brazil
- 1807-1821** Prince Regent Dom Joao VI moves Portugal's government to Rio de Janeiro during the Napoleonic Wars.
- 1822** Dom Pedro declares Brazil's independence from Portugal, becomes Brazil's first monarch, King Pedro I.
- 1840** Pedro II is proclaimed King of Brazil at age 14. Rules for almost 50 years.
- 1888** Slavery is abolished.
- 1889** Pedro II is ousted by military revolt. A constitutional republic is established. Brazil enters a period of economic problems and political unrest.
- 1914** Start of WWI revives the economy. Brazil sides with the Allies.
- 1922** Economic crisis leads to decades of dictatorship and restrictions on civil liberties.
- 1944** WWII stimulates the economy. Brazil makes major contributions to the Allied war effort.
- Post-WWII** Democracy is restored, sporadic political unrest remains.
- 1947** Rio Treaty is signed.
- 1960** Capital moves to Brasilia.
- 1960** President Quadros resigns, Communist Vice President Goulart becomes president.
- 1964** Military coup overthrows Goulart.

- 1964-1979** Period of economic growth but few civil liberties.
- 1992** First global summit on environmental issues is held.
- 2003** Space program setback when 21 engineers and technicians die and satellites are destroyed in launch-rocket explosion.

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## GOVERNMENT AND POLITICS

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### Government

#### *National Level*

Brazil's national government is a federal republic made up of executive, legislative, and judicial branches. The 1988 constitution establishes a system of checks and balances for the three branches similar to the federal system in the United States.

**Executive Branch.** The president and vice president are elected on the same ticket by direct popular vote for a 4-year term, with the right to re-election for an additional term. The president must be a native Brazilian older than age 35. The president appoints his cabinet and 48,000 senior government officials. Only ambassadors, higher-court judges, the solicitor general, and Central Bank directors require Senate approval.

The president can issue decrees and provisional measures, ini-



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President Lula da Silva

tiate legislation, enact laws, perform line-item vetoes, and impound appropriated funds.

Presidential succession falls to the vice president, the president of the Chamber of Deputies, the president of the Senate, and the president of the Federal Supreme Court. If less than half of the term has been completed, a new election is required within 90 days. Otherwise, the Congress elects a new president and vice president within 30 days.

**Legislative Branch.** The Brazilian Congress is bicameral, and has a senate and chamber of deputies. Congress meets from March through June, and from August through December. It enacts laws and manages the budget. It must approve all international agreements, including renegotiation of the foreign debt. It can, under certain circumstances, enact legislative decrees not subject to presidential veto, or it can override a presidential veto with an absolute majority. Legislators have almost total immunity, even for capital crimes such as homicide.

The Federal District and each state have three Senate seats for a total of 81 members. Senators must be at least 35 years old and are elected to 8-year terms. The terms are staggered so that two-thirds of the Senate is up for election at one time, and the remaining third 4 years later.

The Chamber of Deputies has 513 members, which serve 4-year terms. Members must be at least 21 years old. Although each state is eligible for a minimum of eight seats, the distribution of seats is based on a complex system, called the d'Hondt method, which determines the proportional representation by states. The Sao Paulo's delegation, the largest, is limited to 70 seats. The result is a system that is weighted in favor of the geographically large but less populated states.

**Judicial Branch.** The judicial system in Brazil has federal, state, and municipal courts, and some small-claims courts that augment larger municipal courts.

Federal judges are presidential appointees and subject to senate approval. Federal judges are appointed for life. The minimum age for a federal judge

is 35 and the maximum age at the time of appointment is 65. Mandatory retirement age is 70. Federal courts have no chief justice. The presidency of each court rotates on a 2-year cycle and is based on seniority.

The Federal Supreme Court (STF) has 11 members appointed by the president and approved by the Senate. The STF decides cases between the executive and legislative branches, between the states, between the federal government and the states, and cases involving foreign governments and extradition. The STF also rules on the constitutionality of laws, and executive and legislative branch procedures. The STF does not have to wait for an appeal to come through the federal courts to rule on matters of constitutionality. The president of the STF is third in the line of presidential succession and would preside over an impeachment trial held by the Senate.

The Superior Court of Justice was previously known as the Federal Court of Appeals. It is the last court of appeals for non-constitutional questions and review Regional Federal Court decisions. Its 33 members are presidential appointees subject to approval by the Senate.

The each Regional Federal Court has at least six judges, which are presidential appointees approved by the Senate. These courts are in Recife, Brasília, Rio de Janeiro, Sao Paulo, and Porto Alegre. Members must be at least 30 years old, but not older than 65 when appointed.

The Superior Military Court consists of 15 judges with jurisdiction over crimes committed by members of the armed forces. In certain cases it has tried civilians accused of crimes involving national security. The members are military and civilian judges and lawyers.

The Superior Electoral Court has seven members, which have jurisdiction over all aspects of elections and the regulation of political parties. Each member serves a 2-year term.

The Superior Labor Court has jurisdiction over all labor-related questions. The 27 judges of the Superior Labor Court are presidential

appointees subject to Senate approval. Regional Labor Courts handle cases at the state level.

The Office of the Solicitor General of the Republic (PGR) is the principal component of the Public Ministry. It is headquartered in Brasília, with branches in each state. This office prosecutes federal crimes. With Senate approval the president appoints the Solicitor General, the head of the PGR, to a fixed, renewable 2-year term.

The Office of the Federal Attorney General, which is separate from the PGR, defends the federal government against lawsuits and provides legal counsel to the executive branch.

### ***Key Government Officials***

**President**

Luiz Inacio “Lula” da Silva

**Vice President**

Jose Alencar Gomes da Silva

**Chief of the Cabinet for**

**Institutional Security**

Jorge Armando Felix

**Minister of Defense**

Jose Viegas Filho

**Minister of Foreign Affairs**

Celso Amorim

**Ambassador to the United States**

Rubens Barbosa

**Ambassador to the United Nations**

Gelson Fonseca, Jr.

**Ambassador to the OAS**

Valter Moreira

### ***Local Government***

Each state has a governor and a legislature. Governors have state cabinets with an executive branch structure similar to the federal executive branch. The State Assembly is a unicameral legislature that is elected simultaneously with Congress. State deputies are elected to 4-year terms with no term limits.

State governments manage the public infrastructure including the state highway systems and transit police. State and municipal governments share responsibility for public primary and secondary schools and public hospitals.

The 26 states are Acre, Alagoas, Amapa, Amazonas, Bahia, Ceara, Espirito Santo, Goias, Maranhao, Mato Grosso, Mato Grosso do Sul,

Minas Gerais, Para, Paraiba, Parana, Pernambuco, Piaui, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Rondonia, Roraima, Santa Catarina, Sao Paulo, Sergipe, and Tocantins. The national capital, Brasilia, is located in the 1st Federal District.

The State Supreme Court in each state decides cases involving state law. The governor appoints judges with approval by the State Assem-



## Administrative States

bly. The court organizes and supervises the lower district courts, called *Comarcas*.

A regional electoral court has jurisdiction over state elections. Larger cities have municipal election judges, and smaller towns have local election boards that perform this function.

A regional labor court has jurisdiction over all labor-related questions in each state. Because of its large population, Sao Paulo State has an extra court.

The basic unit of local government within the states is the municipality. In most cases, a municipality has an urban seat and a rural region. However, some of the municipalities that contain Brazil's largest cities have no rural areas. Mayors and councils administer Brazil's 5,581 municipalities, which are similar to counties in the United States. Municipalities are responsible for local taxation, planning, and basic services such as water, sewerage, and trash removal. Mayors, vice mayors, and city council members are elected to 4-year terms without term limits. Municipal elections take place 2 years after state and national elections.

## **Politics**

### ***Political Parties***

Political parties in Brazil have traditionally either represented interests focused on regions or support for a specific political leader. Party loyalty is weak; it is common for politicians to switch parties. In the 2002 election, Lula was elected with the support of a coalition composed of his own Workers' Party, the Liberal Party, (PL), National Mobilization Party, Popular Socialist Party, and Communist Party of Brazil.

President Lula co-founded the Sao Paulo Forum with Cuban leader Fidel Castro. The forum is an umbrella group for Latin American Marxist and socialist parties. President Lula is ideologically close to Venezuela's President Hugo Chavez and has expressed his admiration and support for Chavez's revolution.

## 2002 Election Results

Party	Leader	Deputies	Senate
Brazilian Democratic Movement Party (PMDB)	Michel Temer	74	19
Brazilian Labor Party (PTB)	Jose Carlos Martinez	26	3
Brazilian Progressive Party (PPB)	Paulo Salim Maluf	48	1
Brazilian Social Democracy Party (PSDB)	Senator Jose Anibal	71	11
Brazilian Socialist Party (PSB)	Miguel Arraes	22	4
Communist Party of Brazil (PCdoB)	Renato Rabello	12	–
Democratic Labor Party (PDT)	Leonel Brizola	21	5
Green Party (PV)	Unknown	5	–
Liberal Front Party (PFL)	Jorge Bornhausen	85	19
Liberal Party (PL)	Valdemar Costa Neto	27	3
National Order Reconstruction Party (PRONA)	Dr. Eneas Carneiro	6	–
Popular Socialist Party (PPS)	Sen. Roberto Freire	15	1
Social Democratic Party (PSD)	Unknown	–	1
Worker's Party (PT)	Jose Genoino	91	14

### *Foreign Relations*

Brazil usually gets along with its geographic neighbors and is a member of several organizations and agreements for collective security and economic cooperation. Brazil's collective security efforts started with the Inter-American Treaty of Reciprocal Assistance of 1947, known as the Rio Treaty, and also include being an active member of the Organization of American States (OAS) and the United Nations. Brazil has been a member of the UN Security Council four times. Brazil is lobbying for a

permanent position on the United Nations (UN) Security Council, a bid that is supported by Russia.

Brazil's trade, lending, and investment relationships fall into four general regions: the European Union with 28 percent; the United States, around 27 percent; Pacific Rim (mostly Japan), 20 percent; and Latin America, 20 percent. Brazil is a member of the strong economic trade group known as Mercosur, which includes Argentina, Brazil, Bolivia, Chile, Paraguay, and Uruguay. In 1995, the European Union signed an important free-trade protocol with Mercosur.

Brazil has ratified the Nuclear Non-Proliferation Treaty, signing a full-scale nuclear safeguard agreement with the International Atomic Energy Agency, acceding to the Treaty of Tlatelolco, and joining the Missile Technology Control Regime and the Nuclear Suppliers Group. Lula's pre-election statement in 2002 about the advantages of having nuclear weapons raised concern that Lula would try to restart Brazil's nuclear program. However, because of Brazil's constitutional prohibition of nuclear weapons and its need for loans from the international community for domestic programs, this concern has subsided.

**Argentina.** Argentina and Brazil reconciled 160 years of regional rivalry in 1991 with the signing of the Treaty of Asunción, which unites the two in a strategic alliance. Although tensions have risen because of import restrictions in 1999, Argentina and Brazil continue to deepen bilateral partnerships.

**Bolivia.** Bolivia has amicable relations with Brazil, Bolivia's second largest trading partner. Brazil continues to be a great source of investment, minerals, and energy for Bolivia.

**Colombia.** Colombia has bilateral agreements with Brazil on trade and a regional integration package involving roads, canals, waterways, electricity supply, the environment, and regional security. As the first and second largest coffee producers in the world, the two countries have a number of agreements on coffee. In 2003, Colombia's concerns centered

on Brazil's unsecured border and its efforts to remain neutral in Colombia's struggle with Marxist guerrillas and international drug traffickers.

**Paraguay.** In the 1970s, 60 percent of the Paraguayan work force in agriculture, industry, commerce, and services were Brazilians living in the border region of Paraguay. In the 1980s, Brazil supplied military equipment and training to Paraguay, and held a large portion of Paraguay's foreign debt. The completion of the binational Itaipu hydroelectric dam on the borders in 1991 tied Paraguay and Brazil even more closely together. In 2002, 33 percent of Paraguayan imports came from Brazil and 31 percent of Paraguay's exports went to Brazil. The leader of the 1996 coup attempt in Paraguay, who fled to Brazil, was captured and extradited from Brazil in 2000.

**Uruguay.** Although Uruguay, with the help of Argentina, gained independence from Brazil in 1828, the two countries are on good terms. In 2002, 20 percent of Uruguay's import business and 23 percent of its export business was with Brazil. The countries' electrical power grids are interconnected.

**Venezuela.** Brazil has good relations with Venezuela, with Presidents Lula and Chavez expressing mutual admiration and support. Brazil chairs the Group of Friends countries, which are committed to supporting democracy in Venezuela. Venezuela is one of Brazil's major petroleum suppliers, and the two countries continue to pursue the expansion of commercial exchanges.

**Cuba.** Diplomatic relations between Brazil and Cuba were reestablished in 1986. Brazil supports resolutions in the UN General Assembly asking the United States to lift the embargo against Cuba. Brazil is strengthening trade and investment between the two countries with programs such as the sale of 480 buses to Cuba in 2000 and the establishment of a joint venture between a Brazilian company and a Cuban state-owned company for the manufacturing of cigarettes.

**China.** In 1974, Brazil established full relations with China, unceremoniously evicting the delegation from Taiwan from the Chinese embassy in Brasília. Since then, China has cultivated economic, political, and military

cooperation, including a joint reconnaissance satellite venture with Brazil. China has also contracted to build hundreds of commercial aircraft for Brazil's Embraer, the world's fourth-largest aircraft manufacturer. The alliance with China is seen as a counterbalance to economic pressure from the United States. There are concerns that China might secretly help the Lula government with its nuclear weapon and ballistic missile ambitions.

**Germany.** Germany is Brazil's main economic partner in Europe and among the five major sources of direct foreign investment in Brazil. Germany and Brazil have developed close bilateral cooperation in fields such as the environment, science, and technology.

**Japan.** Diplomatic relations broke off during World War II, but they resumed in 1952. Today the Japanese community in Brazil is one of the largest outside of Japan. Japanese companies have invested heavily in Brazil's telecommunication, capital goods, mining, and metallurgy. Brazil exports large quantities of iron, nonferrous ores, unfinished steel and aluminum products, soybeans, and other agricultural products to Japan.

**Saudi Arabia.** Saudi Arabia has been a significant trading partner due to Brazil's growing industrialized economy. Before the first Gulf War in 1990, Saudi Arabia had awarded a US\$5-billion contract for new battle tanks to the Brazilian company Osório. However, due to the performance of the U.S. Abrams tank in the Gulf war, the Saudi government bought the M-1A1 tank instead.

**United States.** The relationship between Brazil and the United States strengthened in 1995, and during meetings between President Bush and President Lula in Washington in 2003. Topics of the 2003 discussions included trade and finance; economic integration; human rights; environmental issues; and counternarcotics, and international crime, including terrorist groups along the tri-border area (Brazil, Argentina, and Paraguay). In response to U.S. criticism of its unfair trade practices, Brazil changed laws regarding pharmaceutical patents and agreed to enact legislation on copyright, software, and semiconductor layout design laws. In 2003, the United States and Brazil signed a technical safeguards agree-

ment to permit U.S. firms to participate in the development of the Alcántara spaceport; however, Brazil's congress has not ratified the agreement.

### ***International Organizations***

Brazil is a member of the OAS and a signatory to the Inter-American Treaty of Reciprocal Assistance (Rio Treaty). Brazil is a charter member of the UN, and has served on the UN Security Council four times. Brazil is active in UN peacekeeping operations and leads the peacekeeping force in Haiti. Brazil has signed and ratified the NPT, cooperated with the International Atomic Energy Agency, and is a member of the Missile Technology Control Regime and the Nuclear Supplier Group.

Brazil is a full member of the Latin American trade organization Mercosur and a founding member of the Latin American Integration Association. Brazil holds membership in organizations committed to promoting its exports, such as the International Coffee Organization and the International Labor Organization, which promotes working conditions, social justice, and human rights

Mercosur, the common market of the south, is an economic bloc created in 1995, which set up a customs union between Brazil, Argentina, Uruguay, and Paraguay. In 1996, Chile and Bolivia were added to Mercosur as associate members. With a land area slightly more than four times the size of Europe, Mercosur has a market of 200 million people and a joint GDP of more than US\$1 trillion.

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## **ECONOMY**

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### **Statistics**

<b>Gross Domestic Product (GDP)</b>	\$1.34 trillion
<i>Agriculture</i>	8 percent
<i>Industry</i>	36 percent
<i>Services</i>	56 percent
<b>GDP Growth Rate</b>	4 percent

<b>GDP Per Capita</b>	\$7,600
<b>Inflation Rate</b>	8.3 percent
<b>Budget</b>	
<i>Revenues</i>	\$101 billion
<i>Expenditures</i>	\$91 billion
<b>Exports</b>	\$59 billion
<b>Imports</b>	\$46 billion
<b>Debt (external):</b>	\$222 billion
<b>Economic Aid (IMF)</b>	\$30 billion

Brazil's economy is built on large and well-developed agricultural, mining, manufacturing, and service sectors, and is larger than the economies of all the other South American countries combined. Most of Brazil's heavy industry is located in the south and southeast. Although the northeast is a much poorer part of Brazil, it is beginning to attract investment.

Because Brazil is crucial to South America's economic health, Brazil received \$41.5 billion in 1998 and \$30 billion in 2002 from the International Monetary Fund (IMF) to bolster its economy. However, economic growth in Brazil slowed to less than 2 percent in 2001, then to 1 percent in 2002. The economy continues to be under incredible stress with the Brazilian real weakening from an exchange rate of BRL1.83 = US\$1 in 2000 to BRL2.92 = US\$1 in 2002. President Lula da Silva came to office 2003 with promises to reform the complex tax code, trim the civil service pension system, and fight inflation. Lula's incoming government slashed spending and increased its primary budget surplus target from 3.75 percent to 4.25 percent of GDP, going beyond the letter of the IMF agreement. The government of Brazil has given other positive signals to the international financial community.

Brazil's main exports include coffee, iron, concentrated orange juice, soybeans, beef, tropical hardwoods, and footwear. Brazil's primary imports include crude oil, manufactured goods, and chemical products.

## Resources

Brazil has two types of agricultural environments with extensive resources. The southern half of Brazil has a semi-temperate climate, high rainfall, good soils, adequate infrastructure, and experienced farmers. It produces most of Brazil's grains, oilseeds, and export crops. The northeast region and the Amazon basin has poor soil, infrastructure, and development capital, keeping agriculture mostly at a subsistence level. The Amazon has become increasingly important to exporters of forest products, cocoa, and tropical fruits. However, farmers who cleared land by burning the rainforest found that the soil does not support agriculture on a large scale. An environmental crimes law now prohibits large-scale burning of forest areas with serious penalties for infractions.

## *Industry*

The leading manufacturing industries produce steel, motor vehicles, pharmaceuticals, aircraft, ships, machinery, textiles, chemicals, shoes, and food products. Embraer, the Brazilian civilian aircraft manufacturer, builds the airborne early warning EMB 145 AEW&C platform, the Super Tucano/ALX, and the new jet AMX trainer. Engesa Engenheiros Especializados SA is a Sao Paulo-based company that developed the Osóior, a main battle tank, and manufactures armored wheeled vehicles, trucks, and components that are used in militaries around the world.

## *Agriculture*

Brazil's major commercial crops are coffee, citrus fruit, sugarcane, rice, corn, cocoa, soybeans, bananas, cotton, and tobacco. Cattle, pigs, and sheep represent the largest portion of livestock production. Although timber is important, much of it is harvested illegally. Brazil is second in world production of broad-leaved, sawn wood and ninth in the world in production of conifer sawn wood.

## **Mining**

Brazil has extensive mineral wealth. The minerals sector employs about 4 percent of Brazil's workforce and produces 2 percent of Brazil's GDP. In 2000, Brazil processed 200 million metric tons of iron ore, making it the world's largest iron ore producer. Brazil exported approximately 75 percent of its iron ore to Japan, Germany, China, and South Korea. Brazil's iron ore reserves are primarily located in the State of Minas Gerais in a region known as the *Quadrilátero Ferrífero* (Iron-bearing Quadrilateral). Brazil also mines quartz, chromium, manganese, industrial diamonds, gemstones, gold, nickel, tin, bauxite, uranium, and platinum.

## **Utilities**

The National Electric Energy Agency under Brazil's Ministry of Mines and Energy controls and regulates all power companies in Brazil. The Ministry of Mines forecasts a 5.9 percent annual growth rate in the national demand for energy. Growth in consumption is out-pacing growth in power generation. Because of Brazil's heavy dependence on hydropower, drought leads to brownouts, blackouts, and rationing.

The Brazilian electricity sector is predominantly a hydroelectric generation infrastructure connected by 185,000 kilometers (114,700 miles) of transmission lines at 230 and 500 kilovolts. The northeast is connected to the national system, the north and northwest regions are not connected. The cities of Macapá, Manaus, Boa Vista, Porto Velho, and Rio Branco have regional stand-alone systems.

Electrobras, Brazil's government-controlled electrical power holding company, is responsible for the national electric power policy, which includes expansion and operation of the generation, transmission, and distribution systems for the nearly 47 million households across the country. The United States, Portugal, and Spain have controlling assets of many of the 64 vendors that provide electricity distribution services in Brazil.

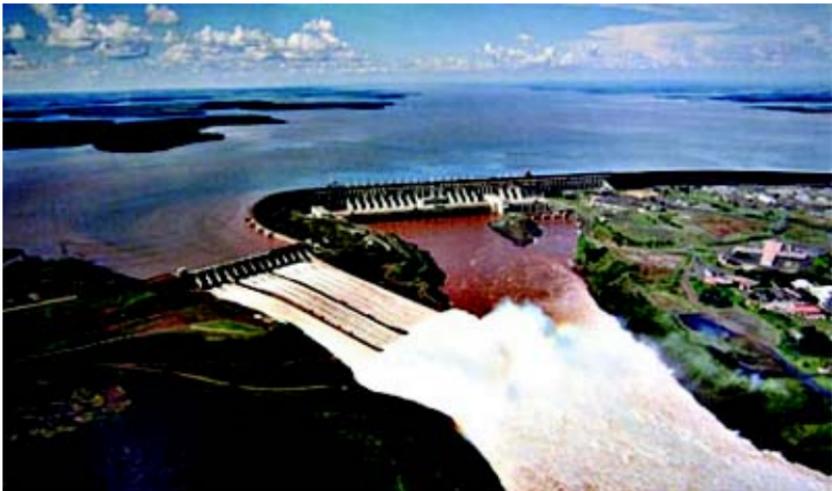
**Hydroelectric.** Approximately 92 percent of Brazil's electric generation capacity is the result of hydroelectric generation. Brazil has about 62

hydroelectric plants with 65,818 megawatts of capacity. Itaipú hydroelectric power plant, located on the Paraná River between Brazil and Paraguay, is the world's largest. However, once complete, Three Gorges Dam on the China's Yangtze River will dwarf the Itaipú facility.

Brazil's fossil fuel reserves include 8.15 billion barrels of crude oil, 228.7 billion cubic meters (8 trillion cubic feet) of natural gas, and 13.2 billion short tons of relatively low-quality coal.

**Coal.** About 60 percent of the 17.05 million tons of coal used in Brazil annually is a high-grade imported coal, most of which is used by the steel industry. Brazil's coal-fired electric power plants are in southern Brazil. Brazil expects to have another 1,050 megawatts of coal-generated electricity capacity by 2006.

**Petroleum.** Brazil's petroleum refineries have a combined capacity of 1,879,000 barrels of diesel per day. Automotive gasoline, naphtha, and liquefied petroleum gas composed about 72 percent of the 2000 annual



**Itaipu Dam and Hydroelectric Power Plant**

production. In addition to domestic production, Brazil imports more than 40 percent of its petroleum. Brazil's main suppliers are Argentina, Saudi Arabia, and Venezuela. The nearly 20-year-old National Alcohol Program, which produces a premium grade of gasoline with methyl tertiary butyl ether (MTBE), may be phased out due to the privatization of Petrobras, the state petroleum power company.

Brazil's oil pipeline infrastructure has approximately 15,330 kilometers (9,505 miles) of petroleum pipeline and 119 petroleum transport ships. The natural gas pipeline infrastructure has 4,273 kilometers (2,649 miles) of operational pipeline with another 3,228 kilometers (2001 miles) under construction.

Electricity generation accounts for about 80 percent of Brazil's natural gas consumption. There are many gas pipelines that transport Bolivian natural gas to Brazil's southernmost states. In 2000, Brazil imported about 5.8 million cubic meters (0.205 trillion cubic feet) of natural gas from Bolivia. The Argentine gas pipeline to Uruguaiiana pumps 15 million cubic meters (0.530 trillion cubic feet) per day.

In early 2001, Petrobras lost P-36, the world's largest off-shore oil production rig, in an explosion that killed 11 people. After 5 days of damage control, the platform sank, resulting in the loss of 180,000 barrels per day in production capacity and enormous environmental damage. Brazil's sale of Petrobras later that year was the biggest privatization event of 2001. The U.S. companies that have been active in the energy sector privatization include: BP Amoco, Enron, Shell, Exxon, Kerr-McGee, Texaco, and Unocal.

**Nuclear.** The Eletrobras Thermonuclear S.A develops and operates nuclear power plants in Brazil. The two operational plants, Angra 1 and 2, are on the Atlantic coast in the State of Rio de Janeiro. The plants have a capacity of 657 and 1,309 megawatts, respectively. Angra 3, expected to be operational in 2006, will have a capacity of 1,325 megawatts. Brazil's power plant uranium consumption is 299 tons per year.



**Angra 1 Nuclear Power Plant**

**Water and Sanitation.** Brazil's two major water resource problems are droughts in the northeast and urban water pollution. Nearly all of the rivers that pass through urban areas are highly polluted.

Brazil's steady program of dam building is designed to temper the effect of droughts. However, dam construction meets with opposition from environmentalists because of the detrimental environmental impact.

Brazil's Plano Nacional de Saneamento (PLANASA), the national sanitation plan, has made incredible progress in the extension of water sup-

ply and sanitation services. The goal of the National Sanitation Policy is to have 100 percent access to water and treatment of at least 80 percent of sanitary sewage collected in public systems by the year 2010.

### Percentage of Households with Access to Water and Sanitation

Household Type	Urban	Rural
Households with water supply (not necessarily potable)	90	18
Households with sewage systems	56	1
Households with septic systems	16	13

Urban access to water supply has become high; however, quality differs substantially across each city, and coverage varies considerably across regions and states. The relatively affluent south and southeast have the best access and sanitation systems except in the *favelas*, large shanty towns near the largest cities, where the urban poor live. The poorer states of the north and northeast have the worst sanitation.

Although 15 percent of Brazil's water supply and sanitation sector has been privatized, both public and private companies have problems collecting revenue. These continuing economic problems have slowed investment in water infrastructure. Projects also suffer from both poor administration and maintenance, and many projects are abandoned or become obsolete before completion. The congestion of the *favelas* can prohibit installation of infrastructure. The result is that less than 10 percent of the wastewater collected is actually treated. Additional pollution comes from solid waste. Only about 60 percent of solid waste is even collected, and less than half of that is disposed of in an environmentally sound manner.

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## THREAT

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### Crime

Crime rates throughout Brazil are high. The rates are highest in the larger cities of Sao Paulo and Rio de Janeiro. Recently, the capital city of Brasilia has seen a marked increase in crime.

Pocket picking, good-samaritan scams, and the theft of carry-on luggage, briefcases, and laptop computers is common in airports, hotel lobbies, bus stations, and other public places. Armed robberies of homes and vehicles (some violent), and street crime are becoming commonplace. Also, carjackings in major cities have increased. Petty crimes by desperate street kids, many working for drug dealers, are common. Crime against tourists has occasionally been violent and even deadly. Efforts to jail drug lords in Rio de Janeiro have led to a string of violent attacks against the local authorities and businesses.

Crime against tourists occurs most often near beaches, hotels, bars, nightclubs, and other similar establishments that cater to visitors, and is especially prevalent during Carnival. Thefts on city buses are frequent, and such transportation should be avoided. Criminal activity is common in *Favelas*, which often are not patrolled by police. Generally the criminals are after valuables, so, total cooperation in turning over property is considered the best course of action to stay alive.

When possessions are lost or stolen, travelers should complete a police report at a police station. The Brazilian police are not likely to recover stolen property; however, this will facilitate the traveler's departure from Brazil and claims against insurance. The loss or theft of a U.S. passport should be reported immediately to the local police and the nearest U.S. embassy or consulate. Brazilian police have a reputation for extreme violence. The best police to deal with are usually the tourist police, who often speak some English or French.

Brazil's major organized crime groups, Rio de Janeiro's the Red Command, Third Command, and Friends of Friends, plus Sao Paulo's First Capital Command (PCC) all originated from Brazilian prison gangs. They are sophisticated and extremely violent. The groups are armed with assault rifles, explosives, night-vision devices, and state-of-the-art cell phone technology. During 2002 and 2003, these groups fought police almost daily, killing more than 50 police officers, detonating bombs, torching dozens of buses, and attacking public shopping malls.

They have the potential to become a threat to domestic security. This threat could increase if the groups unite with the 4 million poor rural Brazilians who make up the Brazil Landless Movement.

## **Travel Security**

The U.S. State Department advises U.S. citizens in Brazil to avoid large gatherings and protests, and to avoid travel outside major city centers after dark. Passenger-bus hijacking, usually non-violent, occurs at random, most commonly in metropolitan areas such as Sao Paulo and Rio de Janeiro. Travel near the Colombian border and remote parts of the Amazon basin should also be avoided, as U.S. citizens have been targets of kidnapping. There have been small-scale armed incursions from Colombian terrorist and rebel groups into Brazil. The border where Argentina, Brazil, and Paraguay meet (the tri-border area) should be avoided because of drug trafficking and related criminal activity there.

In remote rural areas, roads may quickly become more dangerous and impassable during rainy weather. There have also been cases of indigenous people detaining U.S. citizens for trespassing on protected land.

## **Terrorism**

Although there were no acts of international terrorism in Brazil, the tri-border area has been identified as a center for HAMAS and Hizballah activities such as fund raising, contraband smuggling, drug trafficking, the manufacture and movement of pirated goods, money laundering, and document and currency fraud. Media reports of an al-Qaida presence in the area during 2002 remain uncorroborated by Brazilian or U.S. government sources.

During 2002, the Brazilian Federal Police made several arrests of individuals in the triborder city of Foz do Iguazu. The suspects with alleged ties to the terrorist group al-Gama'a al-Islamiyya (Islamic Group, IG) and Lebanese Hizballah were arrested for extradition purposes.

## Drug Trafficking

Brazil's illicit drug production is relatively small. The cannabis and coca produced is primarily consumed domestically. Drug use, primarily among Brazilian young people, continues to climb, especially with a local version of crack cocaine. Local drug lords control the *favelas* surrounding several cities in Rio de Janeiro, Sao Paulo, and Porto Alegre.

Brazil's well-developed communications, banking, and transportation infrastructure and its long, unsecured borders make it a highly-attractive conduit for illicit Colombian, Bolivian, and Peruvian cocaine bound for the U.S. and European markets. Brazil's substantial industrial base also supports production of substantial amounts of precursor chemicals and synthetic drugs such as Rohypnol, the so-called date rape drug. Brazil's financial system in the tri-border area is used for laundering drug money. Drug traffickers trying to avoid aircraft patrols in neighboring countries use Brazilian airspace.

Organized crime in major Brazilian cities has become more technically sophisticated and influential in politics in recent years. After a recent crackdown on drug operations in Rio de Janeiro, drug lords struck back violently with bomb attacks against the local authorities and businesses.

In 1998, Brazil formed the National Anti-Drug Secretariat, which coordinates counternarcotics efforts including Operation COBRA, a 3-year joint effort in the border area with Colombian, Peru, and Venezuela. Brazil also has a large-scale internal eradication program to control marijuana. In 1999, Brazil's congress passed anti-money-laundering legislation, and legislation that permits the Brazilian military to intercept aircraft suspected of smuggling narcotics. In 2002, Brazil inaugurated the Amazon Region Surveillance System, the integrated air- and land-based radar system for surveillance and traffic control using the Ericsson radar onboard the Embraer EMB-145SA.

Brazil actively cooperates with the United States in counternarcotic efforts. In 1998, Brazil's Federal Police received \$2 million worth of boats, field gear, and radios from the United States. Brazil does not

extradite its own citizens. However, in 1998 Brazil did allow the extradition of a Colombian accused by the United States of being a narcotics smuggler linked to multi-ton cocaine shipments. In that same year, Brazilian Federal Police reported seizing 61 metric tons of marijuana and nearly 8 metric tons of cocaine.

## Major Intelligence Services

The Brazilian press contains reports from Argentine intelligence, Paraguayan intelligence, and the Mossad about activities in Brazil. The Brazilian Intelligence Agency, which was founded in 1999, monitors national strategic threats.

## Opposition Forces

Brazil maintains cordial relations with all of the South American countries with which it shares borders. There are no external government-



EMB-145SA Surveillance Aircraft

sponsored forces threatening Brazil's sovereignty. Colombian rebel groups conduct small-scale cross-border conflict with the Brazilian military in the remote northwest and western areas of the Amazon Basin.

## **Threat to U.S. Personnel**

Other than being specifically targeted for kidnapping in the Colombian border areas, the threat to U.S. personnel does not substantially differ from the high threat to the members of the Brazilian population generally perceived as affluent.

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## **ARMED FORCES**

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### **Army**

#### ***Mission***

The Brazilian constitution assigns the following mission to the Army:

- To reach an operational state that allows it to defend the nation
- To guarantee law and order
- To cooperate with national development and civil defense
- To participate in international and peacekeeping operations

#### ***Personnel***

The Brazilian Army has about 195,000 personnel.

#### ***Disposition***

The following are major Brazilian Army commands:

### **Comando Militar da Amazonia (CMA)**

#### **Major Units**

Amazon Military Command  
8th Military Region  
12th Military Region

#### **Headquarters**

Manaus  
Belem  
Manaus

## **Comando Militar do Nordeste (CMNE)**

### **Major Units**

Northeastern Military Command  
6th Military Region  
7th Military Region  
10th Military Region  
7th Army Division  
    7th Motorized Infantry Brigade  
    19th Motorized Infantry Brigade  
1st Jungle Infantry Brigade  
16th Jungle Infantry Brigade  
17th Jungle Infantry Brigade  
23rd Jungle Infantry Brigade  
Jungle Infantry Brigade  
Amapa Frontier Command  
Roraima Frontier Command  
Rio Negro Frontier Command  
Solimoes Frontier Command  
Acre Frontier Command  
Rondonia Frontier Command

### **Headquarters**

Recife  
Salvador  
Recife  
Fortaleza  
Recife  
Natal  
Fortaleza  
Boa Vista  
Tefe  
Porto Velho  
Maraba  
Cabeca de Cachorro  
Macapa  
Boa Vista  
Sao Gabriel da Cachoeira  
Tabatinga  
Rio Branco  
Guajara-Mirim

## **Comando Militar do Leste (CMNL)**

### **Major Units**

Eastern Military Command  
1st Military Region  
4th Military Region  
1st Army Division  
    Divisional Artillery Group  
    5th Armored Cavalry Brigade  
    9th Motorized Infantry Brigade (training)  
    2nd Motorized Infantry Brigade  
4th Army Division  
    4th Motorized Infantry Brigade  
    14th Field Artillery Group

### **Headquarters**

Rio de Janeiro  
Rio de Janeiro  
Belo Horizonte  
Rio de Janeiro  
Belo Horizonte  
Juiz de Fora  
Pouso Alegre



## Brazilian Army Regions

### Comando Do Sul (CMS)

#### Major Units

- Southern Military Command
- 3rd Mechanized Cavalry Brigade
- 3rd Military Region
- 3rd Army Division

#### Headquarters

- Porto Alegre
- Bage
- Porto Alegre
- Santa Maria

### **Major Units**

Divisional Artillery Group  
1st Mechanized Cavalry Brigade  
2nd Mechanized Cavalry Brigade  
6th Armored Infantry Brigade  
5th Military Region  
5th Army Division  
5th Divisional Artillery Group  
5th Armored Infantry Brigade  
14th Motorized Infantry Brigade  
15th Motorized Infantry Brigade  
6th Army Division  
Divisional Artillery Group  
8th Motorized Infantry Brigade

### **Comand Militar do Sudeste (CMSE)**

#### **Major Units**

Southeastern Military Command  
Army Aviation Command  
1st Antiaircraft artillery Brigade  
2nd Military Region  
11th Armored Infantry Brigade  
12th Light Infantry Brigade  
(Airmobile)

### **Comando Militar do Oeste (CMO)**

#### **Major Units**

Western Military Command  
18th Frontier Infantry Brigade  
9th Military Region  
9th Army Division  
13th Motorized Infantry Brigade  
4th Mechanized Cavalry Brigade

### **Headquarters**

Cruz Alta  
Santiago  
Uruguiana  
Santa Maria  
Curitiba  
Curitiba  
Curitiba  
Ponta Grossa  
Florianopolis  
Cascavel  
Porto Alegre  
Porto Alegre  
Pelotas

### **Headquarters**

Sao Paulo  
Taubate  
Guaruja  
Sao Pãulo  
Campinas  
Cacapava

### **Headquarters**

Campo Grande  
Corumba  
Campo Grande  
Campo Grande  
Cuiaba  
Dourados



Army Uniform

## OFFICERS



*Marechal*  
Marschal



*General-de-Exercito*  
Lieutenant General



*General-de-Divisao*  
Major General



*General-de-Brigada*  
Brigadier General



*Coronel*  
Colonel



*Tenente Coronel*  
Lieutenant Colonel



*Major*  
Major



*Capiteo*  
Captain



*1º Tenente*  
1st Lieutenant



*2º Tenente*  
2nd Lieutenant



*Aspirante-a-Oficial*  
Officer Candidate



*Subtenente*  
Warrant Officer

## ENLISTED



*1º Sargento*  
Master Sergeant



*2º Sargento*  
Staff Sergeant



*3º Sargento*  
Sergeant



*Taifeiro-Mor*  
Senior Technician



*Cabo*  
Corporal



*Taifeiro de 1ª Classe*  
1st Class Technician



*Taifeiro de 2ª Classe*  
2nd Class Technician

## Army Rank and Insignia

## Comando Militar do Planalto (CMP)

### Major Units

Planalto Military Command  
Presidential Guards Battalion  
1st Guards Cavalry Regiment  
11th Military Region  
3rd Motorized Infantry Brigade

### Headquarters

Brasilia  
Brasília  
Brasilia  
Brasilia  
Goiania

## Equipment

### Armor

Type	Role	Quantity
M113, M113A1	Armored Personnel Carrier	502
M113A1 w/.50-cal MG	Armored Personnel Carrier	7
M113A1B	Armored Personnel Carrier	54
M59	Armored Personnel Carrier	4
EE-11 Urutu	Armored Personnel Carrier	248
EE-9 Cascavel	Armored Personnel Carrier	374
Jararaca	Armored Personnel Carrier	27
Leopard	Tank	31
M3 Stuart	Tank	253
M41 Walker Bulldog	Tank	388
M41A1 Walker Bulldog	Tank	18
M60A3	Tank	86
M4A1 Sherman	Tank	79
X1A2	Tank	41

### Air Defense

Type	Role	Quantity
12.7-mm M55	Quad Antiaircraft Machinegun	UNK
35-mm Oerlikon	Twin Towed Antiaircraft Gun	38
40-mm Bofors L60	Towed Antiaircraft Gun	50
40-mm BOFI L/70	Antiaircraft Gun	36
40-mm M1	Antiaircraft Gun	40
SA-18 IGLA	Manportable SAM	50
ROLAND II	Self-propelled low-altitude SAM	4

## Artillery

Type	Role	Quantity
155-mm M109A3	Self-Propelled Howitzer	40
155-mm M123A1	Towed Howitzer	12
155-mm M114A1	Towed Howitzer	84
105 mm M101A1/M102	Towed Howitzer	278
105-mm M56	Pack Howitzer	21
105-mm L118	Light Gun, Towed	18
120-mm	Manportable Mortar	32
4.2-in	Manportable Mortar	224
81-mm	Manportable Mortar	104
81-mm IMBEL	Mortar	
60-mm	Manportable Mortar	89
107-mm M30	Mortar	200
75-mm	Pack Howitzer	8
Multicaliber ASTROS II	Multiple Rocket Launcher	6

## Infantry Weapons

Type	Role
7.62-mm IMBEL M964	Rifle
7.62-mm FN-FAL	Rifle
7.62-mm G3	Rifle
5.56-mm M16A1	Rifle
5.56-mm HK33E	Rifle
9-mm Beretta M972	Submachinegun
9-mm Beretta M12S	Submachinegun
9-mm Walther MPK	Submachinegun
9-mm Mekanika	Submachinegun
7.62-mm Madsen	Machinegun
0.30-in Colt-Browning	Machinegun
7.62-mm FN MAG	General-Purpose Machinegun
0.5 in Browning M2HB	Heavy Machinegun

## Antitank

Type	Role	Quantity
Cobra	Antitank Guided Missile	300
Milan	Antitank Guided Missile	12
ERYX	Antitank Guided Missile	20
AT-4	Antitank Guided Missile	400

## Army Aviation

Type	Role	Quantity
AS-350 Esquilo	Helicopter	16
AS-550 Fennec	Helicopter	19
Bell UH-1	Helicopter	30
UH-60 Black Hawk	Helicopter	4
AS-365/565 Panther	Helicopter	36

## Air Force

### *Mission*

The Brazilian constitution assigns the following missions to the Brazilian Air Force:

- To formulate and lead national, civil, and military aeronautics policies
- To organize, equip, and train the Brazilian Air Force
- To formulate strategic plans for the air defense of Brazil
- To contribute to the formulation and conduct of national policies in the development of aerospace activities
- To operate the national airmail
- To guide, coordinate, and control the activities of civil aviation
- To establish, equip, and operate the national airport infrastructure directly or by means of concession
- To stimulate and conduct research and development relating to aerospace
- To stimulate the aerospace industry
- To provide for the security of air travel



## **Brazilian Air Force Major Units**

II Air Force

### **Search and Rescue**

2nd/10th Aviation Group (GAV)      PARASAR

### **Rotary Aviation**

1st/8th GAV	5th/8th GAV
2nd/8th GAV	7th/8th GAV
3rd/8th GAV	1st/11th GAV

### **Patrol Aviation**

1st/7th GAV	4th/7th GAV
2nd/7th GAV	III Air Force
3rd/7th GAV	

### **Reconnaissance Aviation**

1st/6th GAV	2nd/6th GAV
1st/10th GAV	3rd/8th GAV

### **Command and Control**

2nd ELO

### **Fighter Aviation**

1st GDA	1st/14th GAV
1st GAVCA	1st/16th GAV
1st /3rd GAV	1st/16th GAV
2nd/3rd GAV	3rd/10th GAV
1st /4th GAV	V Air Force

### **Transport Aviation and Parachute Transport**

1st GTT	1st/2nd GT
1st/1st GTT	2nd/2nd GT
2nd/1st GTT	1st/9th GAV
1st GT	1st/15th GAV

## **Transport Aviation**

1st Air Transport Squadron (ETA)	5th ETA
2nd ETA	6th ETA
3rd ETA	7th ETA
4th ETA	

## ***Personnel***

The Brazilian Air Force has about 50,000 personnel.

## ***Capabilities***

The Brazilian Air Force is the largest in Latin America; however, it needs to replace its aging Mirage III interceptors. Aircraft under consideration include F-16, Su-35, MiG-29, Mirage 2000, and JAS 39 Gripen. Plans were put on hold in early 2003 because of budget constraints.

## ***Disposition***

Anápolis Air Base	Anápolis
Belém Air Base	Belém
Boa Vista Air Base	Boa Vista
Brasilia Air Base	Brasilia
Campo Grande Air Base	Campo Grande
Canoas Air Base	Canoas
Florianópolis Air Base	Florianópolis
Fortaleza Air Base	Fortaleza
Galeao Air Base	Rio de Janeiro
Manaus Air Base	Manaus
Porto Velho Air Base	Porto Velho
Recife Air Base	Recife
Salvador Air Base	Salvador
Santa Cruz Air Base	Santa Cruz
Santa Maria Air Base	Santa Maria
Santos Air Base	Guarujá
Sao Paulo Air Base	Guarulhos



## Brazilian Air Force Bases

### Equipment

Type	Role	Quantity
F-103 IIIIE Mirage	Fighter	6
F-103 IIIIEBR Mirage	Fighter	16
F-5E Tiger II	Fighter Ground Attack	60
AMX A-1A	Fighter Ground Attack	45

Type	Role	Quantity
A-29 Super Tucano	Fighter Ground Attack	49
P-3A/B Orion	Maritime Patrol	12
P-95	Maritime Patrol	23
R-99A	Airborne Early Warning	5
R-99B	Elint	3
Neiva Regente	Observation	120
C-91	Transport	12
C-155 Buffalo	Transport	24



## Air Force Rank and Insignia

<b>Type</b>	<b>Role</b>	<b>Quantity</b>
C-130E Hercules	Transport	6
C-130H Hercules	Transport	9
KC-137	Tanker Transport	4
KC-130H Hercules	Tanker Transport	2
VC-96	Communications	2
VU-93	Communications	8
VU-35	Communications	9
C-98 Caravan	Communications	8
VC-97	Communications	6
VU-9	Communications	8
U-7	Liaison/Observation	35
EMB-110 Bandeirante	Utility	130
EU-93	Calibration	4
AT-29 Super Tucano	Armed Trainer	50
AT-27 Tucano	Armed Trainer	133
AT-26 Xavante	Armed Trainer	166
F-103D Mirage	Trainer	8
AMX-T	Trainer	11
T-25	Trainer	140

## **Navy**

### ***Key Naval Personnel***

<b>Commander of the Navy</b>	Admiral Roberto de Guimaraes Carvalho
<b>Commandant of the Marine Corps</b>	Admiral Maracelo Gaya Cardoso Tosta

### **Mission**

The Navy is tasked with protecting the country's vital trade arteries, which encompass more than 7,491 kilometers (4,644 miles) of coastline and 50,000 kilometers (31,069 miles) of navigable riverine routes. Ninety-five percent of the country's commercial traffic and 75 percent of its oil imports navigate these routes. Although it is involved in brown-water (river and coastal) operations, the navy's primary goal has been to become an effective blue-water navy, able to project power on the high

seas. Brazil claims a 200-nautical-mile economic exclusion zone along its coast and around the Archipelago of Fernando de Noronha, Sao Pedro, and Sao Paulo. Its primary missions are to control maritime areas in support of and in defense of Brazilian interests, denial of use of the ocean, power projection over the land, and to contribute to deterrence. Secondary missions include hydrography, safety of navigation, control of the merchant navy, and providing assistance to Brazil's riverine population. The Navy is also assigned international search and rescue responsibilities in the South Atlantic and Antarctica.

## **Organization**

Overall naval authority is held by the Commander of the Navy (Chief of Naval Operations equivalent). The Commander of the Navy commands the fleet based in Rio de Janeiro, the Marines, the Naval Districts, and the Recruiting and Training Commands. Overseeing the Commander of the Navy is the civilian Minister of Defense. The Minister of Defense reports to the President.

## ***Personnel***

The Brazilian Navy strength is 52,000 (6,580 officers) active personnel. This includes 1,300 naval aviation personnel.

## ***Training***

Personnel are usually well trained and technically competent, but budgetary constraints often limit practical experience. All officers are graduates of the 4-year Naval Academy. Additional mid-career military education is a prerequisite for future promotion. Shipboard training is emphasized, even for naval aviators (initial sea tour). Brazil's Naval Aviation squadron, VF-1, has practiced limited take offs and arrested landings on the Brazilian aircraft carrier. The Brazilian Navy conducts regularly scheduled joint exercises with the Brazilian Army and Air Force. Combined exercises with navies of other countries are also held, often on an annual or semi-annual basis. Examples of these exercises are UNITAS (with the United States and other South American countries), ATLASUR (with South Africa, Argentina, and Uruguay) and FRATERNO (with Argentina).



## ***Disposition***

<b>Naval District</b>	<b>Headquarters</b>	<b>Naval District</b>	<b>Headquarters</b>
First	Rio de Janeiro	Fifth	Rio Grande
Second	Salvador	Sixth	Ladario
Third	Natal	Seventh	Brasilia
Fourth	Belem	Eighth	Sao Paolo

The Eighth District in Sao Paolo was established in 1997 with no units assigned. There is also a *Comando Naval da Amazonia Ocidental* with headquarters in Manau.

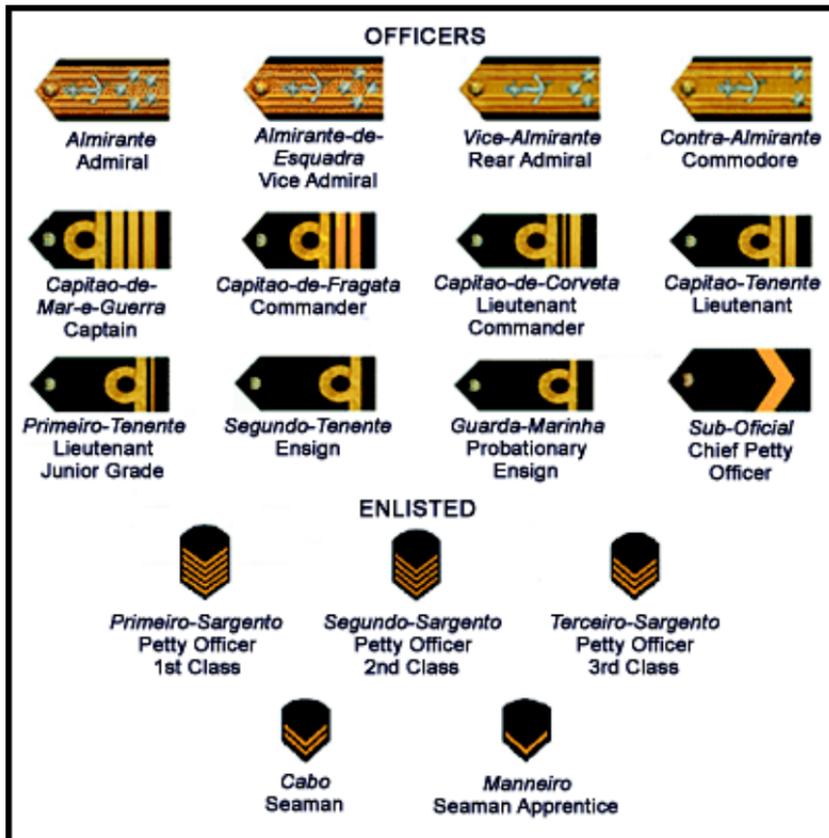
## ***Equipment***

### **Submarines**

<b>Class</b>	<b>Role</b>	<b>Quantity</b>
TUPI (Type 209-1400)	Attack	4
TIKUNA (Modified Type 209-1400; under construction)	Attack	1

### **Surface Fleet**

<b>Class</b>	<b>Role</b>	<b>Quantity</b>
CLEMENCEAU	Aircraft Carrier	1
BROADSWORD (TYPE 22)	Frigate	4
NITEROI	Frigate	6
GARCIA	Frigate	4
BARROSO (under construction)	Corvette	1
INHAUMA	Corvette	4
IMPERIAL MARINHEIRO	Coastal Patrol Ship	6
BARACUI	Patrol Craft	4
PEDRO TEIXERIA	River Patrol Ship	2
RORAIMA	River Patrol Ship	3
GRAJAU (VOSPER 46-M)	Large Patrol Craft	12
PIRATINI (PGM 39)	Large Patrol Craft	6
TRACKER II (FAIREY MARINE)	Patrol Craft	4



## Navy Rank and Insignia

Class	Role	Quantity
ARATU	Minesweeper Coastal	6
THOMASTON	Landing Ship; Dock	2

## Naval Aviation

The Naval Aviation element consists of one interception/attack squadron and helicopters.

## Fixed-Wing

Class	Role	Quantity
A4-KU SKYHAWK	Attack	20
TA4-KU SKYHAWK Trainer	Training	3

## Helicopters

Class	Role	Quantity
UH-14 SUPER PUMA	Transport	7
SH-3A/B SEA KING	Antisubmarine Warfare	13
IH-6B JET RANGER	Trainer	16
UN-12/13 ESQUILO	Utility	27
AH-11A SUPER LYNX	Antisubmarine Warfare	13

## Marine Corps

### *Mission*

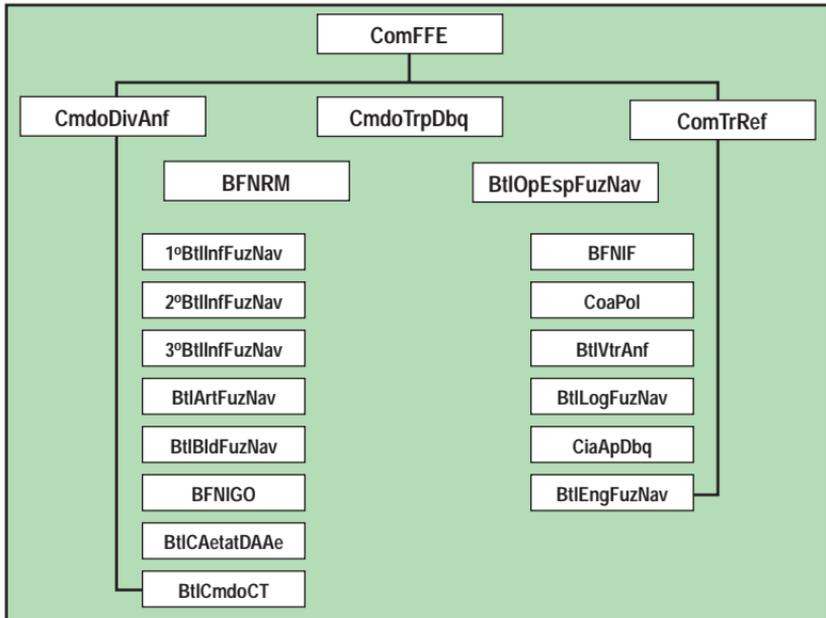
The Brazilian Marine Corps are known as the *Corpo de Fuzileiros Navais*. Missions of the Marine Corps are to execute riverine operations, conduct coastal patrol in the fluvial area, and provide hospital services to the river population along more than 50,000 kilometers (31,000 miles) of navigable rivers.

### *Organization*

The Marine Corps is distributed in different levels of operational and administrative branches. The Brazilian Marine General Commandant is a Marine Admiral directly subordinated to the Navy Commandant. Subordinate to the Marine General Commandant are the Marine Corps Personnel Command and the Marine Corps Material Command. There are two instructional centers and one deployment facility at the Personnel Command. The Material Command consists of one logistics center and one support battalion.

### *Personnel*

There are approximately 15,100 Marines (690 officers).



## Marine Organization

### *Training*

The Marines have a training facility on the island of Marambaia. Exercises include day and night live-fire training, survival swimming, helicopter transport, and land navigation. The Brazilian Marines, in conjunction with the Brazilian Navy's Air Force and Surface Force, have also performed non-combatant evacuation exercises. The exercise included events and simulations similar to operations performed by international forces and observed by Brazilians who have been on United Nations missions. There is another training center located in Brasilia responsible for processing recruits for the Navy and Marines.

## *Capabilities*

In addition to providing an infantry brigade capable of an amphibious landing, the Marines provide base security for some Naval facilities. They also have a special operations capability. Brazilian Marines have a long history of service in international operations. Recently Brazilian Marines have served in El Salvador, Bosnia, Honduras, Mozambique, Rwanda/Uganda, Peru, Ecuador, and Angola. Marine detachments also provide security for Brazilian Diplomatic Missions and Embassies around the world.

## *Disposition*

Marine Corps headquarters (HQ) are at Fort Sao Jose, Rio de Janeiro. The Brazilian Marine Corps comprises:

- A Fleet Marine Force consisting of an amphibious division with three infantry battalions, one artillery battalion, one HQ company, one air defense battery, and one tank company.



**Marines in Dress Uniform**



## Marine Detachments

- A Reinforcement Command consisting of one combat engineer battalion, one amphibious assault vehicles battalion, and one logistics battalion.
- The Marine Corps' Special Forces Battalion (Tonelero) consisting of the *Comandos Anfíbios* (COMANFI) and the Combat Divers Group (*Grupo de Mergulhadores de Combate/GRUMEC*). The latter trains in the style of the U.S. Navy SEALs.

- One internal security group in each naval district and command.

## ***Uniforms***

Brazilian Marines are part of the Navy and use Navy ranks. Brazilian Marines wear a different dress uniform and camouflaged field uniform.

## ***Equipment***

### **Armor**

<b>Type</b>	<b>Role</b>	<b>Quantity</b>
EE-9 Cascavel	Armored Reconnaissance Carrier	6
M-113 APC	Armored Personnel Carrier	28
EE-11 URUTU	Armored Vehicle	5
LVTP-7A1	Armored Vehicle	12
DUKW	Armored Vehicle	UNK

### **Artillery**

<b>Type</b>	<b>Role</b>	<b>Quantity</b>
155-mm M114	Howitzer	6
106-mm M40A1	Recoilless Rifles	UNK
105-mm M101	Howitzer	12
105-mm L118	Howitzer	10
81-mm M29	Mortars	UNK
40-mm L/70	Towed Air Defense	6

### **Coast Guard**

#### ***Mission***

The Maritime Police, a component of the Brazilian Navy, is responsible for waterborne law enforcement, and the security of coastal areas. They are the equivalent of the U.S. Coast Guard.

## **Federal Police**

There are four tiers in Brazilian law enforcement organization, the Federal Police, State Military Police, State Civil Police, and the municipal guard. The responsibilities and activities of the Federal Police are similar to the U.S. Federal Bureau of Investigation (FBI) in dealing with cases of federal crime intelligence and investigation, national security, and liaison with foreign law enforcement.

### ***Mission***

The Federal Police missions are to:

- Control access to Brazil across its borders
- Secure major federal facilities
- Maintain liaison with foreign law enforcement such as Interpol
- Collect and manage intelligence regarding crime
- Provide security to the President of Brazil and foreign diplomats

### ***Organization***

The Federal Police are under the Brazilian Ministry of Justice. Detachments are stationed at land and sea frontiers, and across the country.

The central agencies of the Federal Police include:

- National Police Academy
- Tactical Operations Command
- Technical and Scientific Directorate
- National Institute of Criminology
- National Institute of Identification
- Coordination of Immigration Police
- Special nucleus of Maritime Police
- Coordination of Operational Aviation
- Control of Private Security

Specialized Federal Police units include the Directorate of Combating Organized Crime, Tactical Operations Command, and Counter-Narcotics Division.

### ***Personnel***

The Federal Police has about 15,000 personnel.

### ***Disposition***

Federal Police detachments are located throughout the country.

### ***Equipment***

Federal Police carry light-infantry small arms. Units of the Tactical Operations Command have modern, specialized equipment.

## **State Military Police Forces**

In 1969, along with the move to a civilian-controlled government, the operational control of the state military police forces was shifted from the Army back to the governors of the respective states. The state military police are distinct from the Brazilian Army Military Police force, which is referred to as *Policia do Exército*.

### ***Mission***

The missions of the state military police include security, law enforcement, and crime prevention.

### ***Organization***

The state military police organization varies between states.

### ***Personnel***

Each state establishes and operates its state military police. The size of the force varies with population. The Sao Paulo military police force is the largest with 55,000 personnel.

### ***Training***

State military police are trained in law enforcement and fire fighting.



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## State Military Police in Formation

### *Capabilities*

State military police can perform typical law enforcement and internal security functions.

### *Uniforms*

Police uniforms include a blue-gray shirt and trousers with a blue beret.

### *Equipment*

Personnel generally carry light-infantry small arms. Tactical operations command units have modern specialized weapons and equipment.

### **Weapons of Mass Destruction**

Brazil does not have weapons of mass destruction. Brazil conducted an advanced nuclear weapons development program from 1965 to 1994. Economic constraints and international pressure led President Cardoso

to shut down the program in 1995. Brazil's constitution prohibits the development of nuclear weapons, and the country has signed and ratified the Nuclear Test Ban Treaty. Comments by President Lula de Silva in October 2002 about the value of a nuclear capability in dealing with large foreign governments and Brazil's close relationship with China raised concerns that the president would restart the nuclear weapons program. However, by mid-2003 the general international consensus was that President Lula did not have the domestic funding, nor could risk international funding by restarting the program.



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## APPENDIX A: Equipment Recognition

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### INFANTRY WEAPONS

#### 7.62-mm IMBEL M964



Caliber	7.62- x 51-mm NATO
System of Operation	Gas, selective fire
Rate of Fire	Cyclic: 650-750 rds/min
Length	1.10 m
Feed	20-rd detachable box magazine
Weight (Empty)	4.4 kg

## 7.62-mm FN FAL



Maximum Effective Range	800 m
Caliber	7.62-mm
System of Operation	Gas
Length	1.02 m
Feed	20-rd detachable box magazine
Weight (Empty)	4.4-6 kg

## 7.62-mm G3



Maximum Effective Range	400 m
Caliber	7.63 x 51-mm
System of Operation	Delayed blowback, selective fire
Length	1.025 m
Feed	20-rd detachable, staggered-row box magazine
Weight (Empty)	4.4 kg

**Using the G3:** (1) Put selector switch, located on the left side of pistol grip, to the Top position: **SAFE**. (2) Pull operating handle to the rear. (3) Insert loaded 20-rd magazine into magazine well at bottom of receiver. (4) Allow bolt to go home chambering a round. **G3 IS READY TO FIRE.** (5) Put selector switch to Middle Position: **SEMI** or Bottom Position: **AUTO**.

## 5.56-mm Galil



Type	Assault rifle
Maximum Effective Range	600 m
Caliber	5.56-mm
System of Operation	Gas, selective fire
Feed	35- or 50-rd detachable box magazine
Rate of Fire	Cyclic, 650 rds/min
Weight (Loaded)	3.95 kg

### 5.56-mm M16A1



<b>Caliber</b>	5.56-mm
<b>System of Operation</b>	Gas, direct action, selective fire
<b>Length</b>	.99 m
<b>Feed</b>	20- or 30-rd detachable box magazine
<b>Weight (Loaded)</b>	3.68 kg (20-rd magazine)

### 5.56-mm HK33



<b>Maximum Effective Range</b>	600 m
<b>Caliber</b>	5.56-mm
<b>System of Operation</b>	Delayed blowback, selective fire
<b>Overall Length</b>	670 mm (stock folded) 865 mm (stock extended)
<b>Feed</b>	25- or 30-rd detachable box magazine
<b>Weight (Loaded)</b>	4.2 kg

## 9-mm Beretta M12



<b>Maximum Effective Range</b>	200 m
<b>Caliber</b>	9-mm
<b>System of Operation</b>	Blowback, selective fire
<b>Rate of Fire</b>	Cyclic, 550 rds/min
<b>Length</b>	645 mm (stock extended)
<b>Feed</b>	20-, 32-, or 40-rd detachable box magazine
<b>Weight (Loaded)</b>	3.77 kg

**NOTE:** Weapon has two safety systems: a grip safety in the front of the pistol grip, below the trigger must be held in before the action can be cocked; a push-button safety above the pistol grip locks the grip safety until pushed to the right.

## 9-mm Mekanika URU



<b>Caliber</b>	9-mm
<b>System of Operation</b>	Blowback, selective fire
<b>Rate of Fire</b>	Cyclic, 750 rds/min
<b>Length</b>	689 mm (stock extended)
<b>Feed</b>	30-rd box magazine
<b>Weight (Empty)</b>	3.9 kg

## 9-mm Madsen M53



<b>Maximum Effective Range</b>	100 m
<b>Caliber</b>	9-mm
<b>System of Operation</b>	Blowback, selective fire
<b>Length</b>	780 mm
<b>Feed</b>	32-rd box magazine
<b>Weight (Loaded)</b>	3.83 kg

## 7.62-mm FN MAG



Maximum Effective Range	1,500 m
Caliber	7.62 x 51-mm
System of Operation	Gas, automatic
Length	1.26 m
Feed Device	Belt
Weight (Loaded)	13.92 kg (with butt stock and bipod)

## **.50 cal. Browning M2HB**



<b>Maximum Effective Range</b>	1,500 m
<b>Caliber</b>	12.7- x 99-mm
<b>System of Operation</b>	Short recoil
<b>Overall Length</b>	1.651 m
<b>Feed</b>	100-rd disintegrating link belt
<b>Weight (Loaded)</b>	38 kg

## ARMOR

### Leopard 1A



<b>Crew</b>	4
<b>Armament</b>	(Main) 1 x 105-mm L7A3 gun (Coaxial) 1 x 7.62-mm MG3 MG (Anti-aircraft) 1 x 7.62-mm MG3 MG
<b>Night Vision</b>	Yes
<b>NBC Capable</b>	Yes
<b>Maximum Range</b>	600 km (road) 450 km (cross-country)
<b>Maximum Speed</b>	65 km/h
<b>Fuel Capacity</b>	955 liters
<b>Combat Weight</b>	40,000 kg
<b>Height</b>	2.613 m
<b>Length</b>	9.543 m (gun forward)
<b>Width</b>	3.25 m (with track skirts)
<b>Fording</b>	2.25 m
<b>Gradient</b>	60%

## M-60A3



<b>Crew</b>	4
<b>Armament</b>	(Main) 1 x 105-mm M68 rifled gun w/63 rds (Coaxial) 1 x 7.62-mm MG w/6,000 rds (Antiaircraft) 1 x 12.7-mm MG w/900 rds (Smoke) 1 x 12.7-mm MG w/900 rds
<b>Night Vision</b>	Yes
<b>NBC Capable</b>	Yes
<b>Maximum Road Range</b>	480 km
<b>Maximum Road Speed</b>	48.3 km/h
<b>Fuel Capacity</b>	1,420 liters
<b>Fording</b>	1.22 m
<b>Gradient</b>	60%
<b>Vertical Obstacle</b>	0.914 m
<b>Trench</b>	2.59 m
<b>Combat Weight</b>	52,617 kg
<b>Height</b>	3.27 m
<b>Length</b>	9.436 (gun forward)
<b>Width</b>	3.631 m

## M41B/C Light Tank



<b>Crew</b>	4
<b>Armament</b>	Main: 1 x 76-mm M32 rifled gun Coaxial: 1 x 7.62-mm M1919A4E1 MG Antiaircraft: 1 x 12.7-mm M2 MG
<b>Maximum Speed</b>	72 km/h
<b>Range</b>	161 km
<b>Fuel Capacity</b>	530 liters
<b>Length</b>	8.2 m (gun fwd)
<b>Width</b>	3.2 m
<b>Height</b>	2.72 m
<b>Combat Weight</b>	23,495 kg
<b>Night Vision</b>	Yes
<b>NBC</b>	No
<b>Fording</b>	1.06 m
<b>Gradient</b>	60%
<b>Vertical Obstacle</b>	0.71 m

**NOTE:** All M41 tanks in Brazil have been upgraded to M41B and M41C (above) configurations.

## M3A1 Light Tank



<b>Crew</b>	4
<b>Armament</b>	Main: 1 x 37-mm rifled gun Coaxial: 3 x 7.62-mm light MG
<b>Maximum Speed</b>	56 km/h
<b>Range</b>	120 km
<b>Fuel Capacity</b>	212 liters
<b>Length</b>	4.54 m (gun fwd)
<b>Width</b>	3.2 m
<b>Height</b>	2.23 m
<b>Combat Weight</b>	12,900kg
<b>Night Vision</b>	None
<b>NBC</b>	No
<b>Fording</b>	0.9 m
<b>Gradient</b>	60%
<b>Vertical Obstacle</b>	0.7 m
<b>Trench</b>	1.83 m

## X1A/X1A2 Light Tank



<b>Crew</b>	3
<b>Armament</b>	Main: 1 x 90-mm gun Coaxial: 1 x 7.62-mm light MG; 1 x 12.7-mm heavy MG
<b>Maximum Speed</b>	55 km/h
<b>Range</b>	750 km
<b>Fuel Capacity</b>	750 liters
<b>Length</b>	7.1 m (gun fwd)
<b>Width</b>	2.6 m
<b>Height</b>	2.45 m
<b>Combat Weight</b>	19,000kg
<b>Night Vision</b>	None
<b>Fording</b>	1.3 m
<b>Gradient</b>	70%
<b>Vertical Obstacle</b>	0.7 m
<b>Trench</b>	2.1 m

## EE-9 (Cascavel)



<b>Role</b>	Armored Fighting Vehicle
<b>Length</b>	5.2 m
<b>Width</b>	2.6 m
<b>Crew</b>	3
<b>Combat Weight</b>	13,400 kg
<b>Configuration</b>	6 x 6
<b>Armament</b>	Main: 90-mm gun Coaxial: 7.62-mm MG Antiaircraft: 7.62-mm or 12.7-mm MG (optional)
<b>Fording</b>	1 meter
<b>Maximum Road Speed</b>	100 km/h
<b>Gradient</b>	60 percent
<b>Maximum Range</b>	880 km
<b>Smoke Laying</b>	Yes
<b>Recognition:</b>	Clipped in front and rear (angled corners); one forward hatch on left side; polygon shaped turret in center; 2 turret hatches in line across; muzzle extends slightly past chassis

## M8 Light Armored Car



<b>Crew</b>	4
<b>Type</b>	6 x 6
<b>Armament</b>	1 x 37-mm gun w/80 rds 1 x 7.62-mm coaxial MG w/1,500 rds 1 x 12.7-mm AA MG w/400 rds
<b>Maximum Speed</b>	90 km/h
<b>Maximum Range</b>	560 km
<b>Fuel Capacity</b>	212 liters
<b>Combat Weight</b>	7,892 kg
<b>Length</b>	5.003 m
<b>Width</b>	2.54 m
<b>Height</b>	2.247 m
<b>Night Vision</b>	No
<b>NBC</b>	No
<b>Fording</b>	0.609 m
<b>Gradient</b>	60%
<b>Vertical Obstacle</b>	0.304 m

## EE-11 Urutu



<b>Crew/Passengers</b>	3 + 10
<b>Type</b>	6 x 6
<b>Armament</b>	1 x 12.7-mm MG w/1,000 rds
<b>Maximum Speed</b>	100 km/h (road)
<b>Maximum Range</b>	850 km/h (road)
<b>Combat Weight</b>	14,000 kg
<b>Length</b>	6.1 m
<b>Width</b>	2.65 m
<b>Height</b>	2.125 m (hull top)

## M113



<b>Crew/Passengers</b>	2 + 11
<b>Type</b>	Tracked
<b>Armament</b>	12.7-mm AA MG
<b>Maximum Speed</b>	58 km/h
<b>Maximum Range</b>	480 km
<b>Fuel Capacity</b>	360 liters
<b>Combat Weight</b>	12,094 kg
<b>Length</b>	4.92 m
<b>Width</b>	3.11 m
<b>Height</b>	2.52 m
<b>Night Vision</b>	Yes
<b>NBC</b>	Yes
<b>Fording</b>	Amphibious
<b>Gradient</b>	60%
<b>Vertical Obstacle</b>	0.61 m
<b>Trench</b>	1.68 m

## ARTILLERY

### 155-mm M109A1 Self-Propelled Howitzer



<b>Crew</b>	6
<b>Armament</b>	1 x 155-mm M185 cannon tube 1 x 12.7-mm M2 MG
<b>Cannon Range</b>	18.1 km (conventional), 23.5 km (extended)
<b>Rate of Fire</b>	2 rd/min (1 rd/min sustained)
<b>Maximum Speed</b>	56.3 km/h
<b>Cruising Range</b>	349 km
<b>Combat Weight</b>	24,948 kg
<b>Fording</b>	1.14 m
<b>Gradient</b>	60%
<b>Gap Crossing</b>	1.8 m

## 155-mm M114



<b>Crew</b>	11
<b>Maximum Range</b>	14,600 m
<b>Rate of Fire</b>	40 rds/h
<b>Combat Weight</b>	5,760 kg
<b>Length</b>	7.315 m
<b>Width</b>	2.438 m
<b>Height</b>	1.803 m
<b>Prime Mover</b>	6 x 6

## 105-mm M101



<b>Crew</b>	8
<b>Maximum Range</b>	11,270 m
<b>Rate of Fire</b>	10 rds/min
<b>Combat Weight</b>	2,030 kg
<b>Length</b>	5.991 m
<b>Width</b>	3.65 m
<b>Height</b>	1.574 m
<b>Prime Mover</b>	6 x 6

## 105-mm M102



<b>Crew</b>	8
<b>Maximum Range</b>	15,100 m
<b>Rate of Fire</b>	10 rds/min
<b>Combat Weight</b>	1,496 kg
<b>Length</b>	5.18 m
<b>Width</b>	1.96 m
<b>Height</b>	1.594 m
<b>Prime Mover</b>	6 x 6

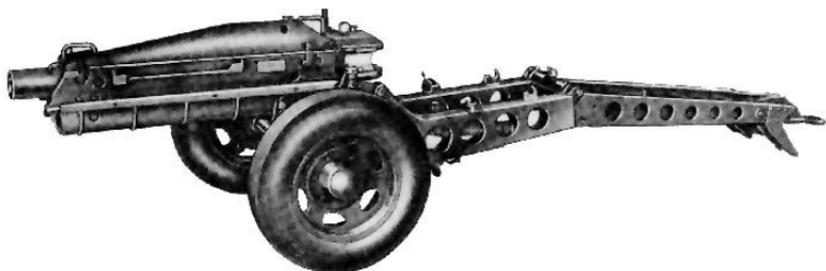
## 105-mm M-56 Pack Howitzer



<b>Crew</b>	7
<b>Weight</b>	1,290 kg
<b>Length</b>	4.8 m (extended)
<b>Width</b>	2.9 m (extended)
<b>Height</b>	1.93 m
<b>Maximum Fire Range</b>	10,575 m
<b>Maximum Rate of Fire</b>	4 rds/min
<b>Ammunition</b>	HE(M1), HEAT(M67)

**NOTE:** The Model 56 Pack Howitzer can be dismantled into several subassemblies for easy transport by truck or aircraft. It has two rubber wheels and may or may not be equipped with a shield.

## 75-mm M116 (M1A1)



<b>Maximum Range</b>	8,797 m
<b>Rate of Fire</b>	Burst: 16 rds/min; sustained: 150 rds/hr
<b>Combat Weight</b>	537 kg
<b>Length</b>	3.20 m
<b>Width</b>	1.27 m
<b>Height</b>	.838 m

## 105-mm L118 Light Gun



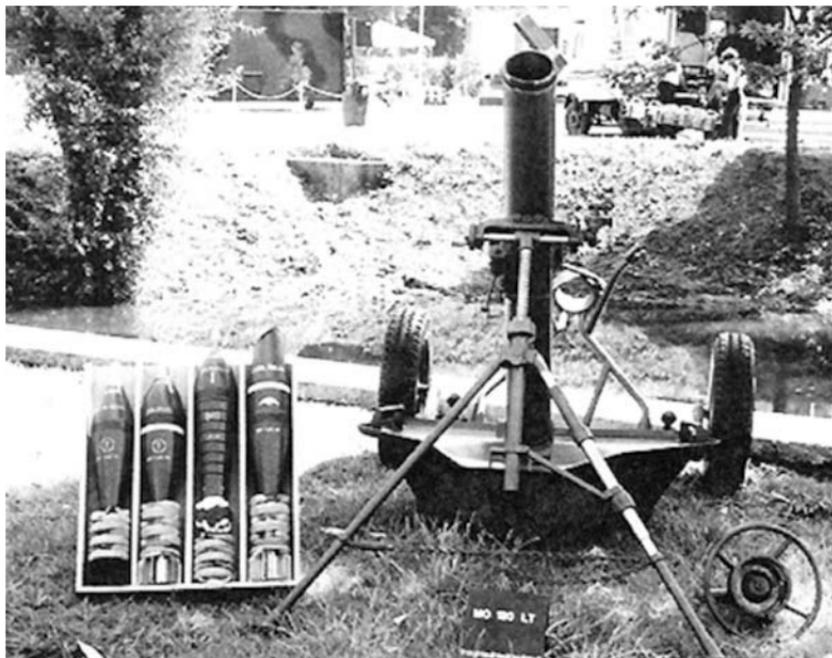
<b>Crew</b>	7
<b>Weight</b>	1,860 kg
<b>Length</b>	6.62 m
<b>Width</b>	1.77 m
<b>Height</b>	2.63 m
<b>Maximum Fire Range</b>	17,200 m
<b>Maximum Rate of Fire</b>	12 rds/min; sustained: 3 rds/min

## Multicaliber (Modular Pod) ASTROS II



<b>Crew</b>	4
<b>Caliber</b>	127-, 180- or 300-mm
<b>Range</b>	30,000 (SS-30); 35,000 (SS-40); 90,000 (SS-80)
<b>Rate of Fire</b>	32 rds/16 sec (SS-30); 16 rds/16 sec (SS-40); 4 rds/16 sec (SS-80)
<b>Length</b>	7.850 (travelling)
<b>Weight</b>	20,000 kg
<b>Emplacement Time</b>	6 minutes

## 120-mm BRANDT



<b>Minimum Range</b>	500 m
<b>Maximum Range</b>	9,000 m
<b>Traverse Limits</b>	17°
<b>Ammunition Types</b>	HE, HE-RA, smoke, illumination, practice, marker
<b>Weight</b>	402 kg (travelling)
<b>Length of Barrel</b>	1.746 m with breech cap
<b>Elevation</b>	+45 to +80°
<b>Rate of Fire</b>	12 rds/min

## 81-mm M29



<b>Crew</b>	2
<b>Feed</b>	Muzzle loaded
<b>Length of Barrel</b>	1.295 m
<b>Elevation</b>	800-1,500 mils

## 107-mm M30



<b>Crew</b>	2
<b>Caliber</b>	107-mm
<b>Rate of Fire</b>	18 rds/min max; 3 rds/min sustained
<b>Maximum Range</b>	5,650 m (with tactical CS XM630)
<b>Tube Length</b>	1.524 m
<b>Weight</b>	305 kg
<b>Ammunition</b>	Fires HE, Smoke, Illumination, Gas and Tactical CS

## ANTIARMOR

### MILAN Ground Launcher



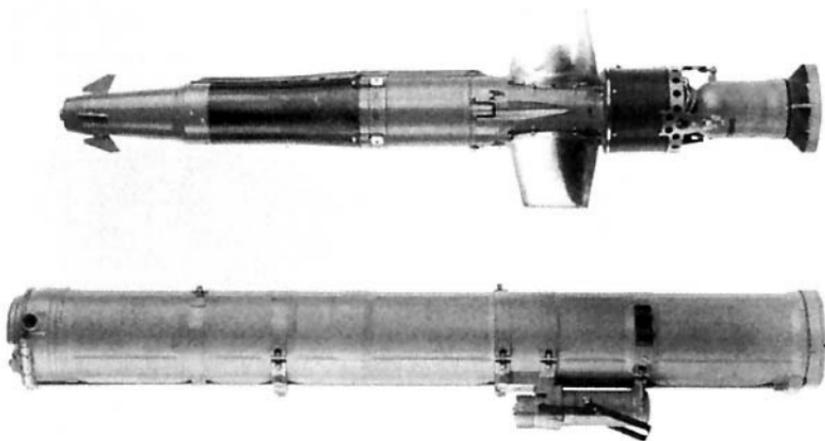
<b>Max Range and Flight Time</b>	2,000 m in 12.5 seconds
<b>Night Vision Device</b>	Thermal Imaging
<b>Warhead Type</b>	Unitary Shaped Charge
<b>Warhead Penetration</b>	1000 mm of RHA
<b>Guidance/Command Link</b>	SACLOS/Wire
<b>Attack Profile</b>	Direct LOS
<b>Launch Platforms</b>	Ground Tripod, Compact Turret

## Eryx



<b>Role</b>	Short Range Anti-Tank Missile
<b>Maximum Effective Range</b>	600 m
<b>Caliber</b>	136-mm
<b>Length</b>	905 mm
<b>Armor Penetration</b>	900 mm
<b>Emplacement Time</b>	5 seconds

## AT-4 Spigot



<b>Role</b>	Anti-tank guided missile system
<b>Type</b>	Wire-guided SACLOS
<b>Maximum Range</b>	70 - 2,000 m (9M111) 70 - 2,500 m (9M111-2)
<b>Launch Weight</b>	12.5 kg
<b>Armor Penetration</b>	400 mm (9M111) 460 mm (9M111-2)

## 106-mm M40A1 RCL



<b>Crew</b>	3
<b>Maximum Range</b>	3,000 m (HEAT)
<b>Rate of Fire</b>	1 rd/min
<b>Combat Weight</b>	209.5 kg
<b>Length</b>	3.404 m
<b>Width</b>	1.52 m
<b>Height</b>	1.11 m
<b>Prime Mover</b>	4 x 4

## AIRDEFENSE

### SA-18 IGLA



<b>Role</b>	2-stage, low altitude SAM
<b>Guidance</b>	2-channel, passive infrared-homing
<b>Maximum Range</b>	5.20 km
<b>Deployment Time</b>	10 seconds
<b>Missile Prep Time</b>	5 seconds
<b>Combat Weight</b>	18.4 kg
<b>Length</b>	1.7 m

## Roland II SAM



<b>Weight</b>	66.5 kg
<b>Length</b>	2.4 m
<b>Maximum Speed</b>	Mach 1.2
<b>Maximum Range</b>	6,300 m
<b>Maximum Altitude</b>	5,500 m

**Description:** The Roland 2 SAM is mounted on an AMX-30 chassis along with its associated radar. It carries two missiles ready to launch and another eight in two magazines and can engage aircraft at very low altitudes.

## 40-mm Bofors L/60 Antiaircraft Gun



<b>Crew</b>	3-6
<b>Weight</b>	2,400 kg
<b>Length</b>	6.38 m
<b>Width</b>	1.72 m (contracted)
<b>Height</b>	2 m
<b>Maximum Road Speed</b>	Towed
<b>Maximum Fire Range</b>	4750 m
<b>Maximum Fire Altitude</b>	2,560 m
<b>Ammunition</b>	AP, HE

**Description:** The Bofors L/60 AAG has a single barrel and the entire carriage is mounted on 4 screw lifts on each side when firing. A curved ammunition feed extends vertically from the breech. It has four rubber wheels.

## 40-mm BOFI/BOFOR L/70



Crew	5
Tactical Range	4,000 m
Maximum Ranges	7,800 m (vertical) 10,500 to 12,600 m (horizontal)
Rate of Fire	240-300 rds/min
Emplacement Time	3 min
Combat Weight	Up to 5,700 kg
Travel speed	Towed up to 60 km/h

## Swiss GDF Twin 35-mm



<b>Crew</b>	3 (1 for GDF-005)
<b>Tactical Range</b>	4,000 m
<b>Maximum Ranges</b>	8,500 m (vertical), 11,200 m (horizontal)
<b>Rate of Fire (Per Barrel)</b>	550 rd/min
<b>Emplacement Time</b>	2 to 4 min
<b>Combat Weight</b>	6,300 - 6,400 kg

**NOTE:** Brazil's inventory includes GDF 001-003 and 005 variants.

## 12.7-mm M55 Quad Light AAG



<b>Crew</b>	4 (1 on mount)
<b>Type</b>	12.7-mm quad AAG
<b>Maximum Range</b>	Horizontal: 1,500 m; vertical: 1,000 m
<b>Rate of Fire (Per Barrel)</b>	Cyclic: 450-550 rds/min Practical: 150 rds/min
<b>Traverse</b>	360 degrees
<b>Feed</b>	210-round belt per barrel
<b>Weight</b>	1,338 kg
<b>Length</b>	2.89 m
<b>Width</b>	2.09 m
<b>Height</b>	1.606 m
<b>Prime Mover</b>	4 x 4 Jeep (towing) or carried on rear of 6 x 6 truck

## 40-mm M1 AAG



<b>Crew</b>	4-6
<b>Type</b>	
<b>Maximum Range</b>	4,661 m (vertical), 4,753 (horizontal)
<b>Rate of Fire (Per Barrel)</b>	60 rds/min
<b>Traverse</b>	360 degrees
<b>Weight</b>	2,656 kg
<b>Length</b>	5.728 m
<b>Width</b>	1.829 m
<b>Height</b>	2.019 m

## AIRCRAFT

### AS-365 Dauphin



<b>Type</b>	Light utility helicopter
<b>Crew</b>	2 (carries 12 troops)
<b>Armament</b>	Up to 8 ATMs; twin 12.7-mm or 23-mm gun pods or two pods of 57- or 90-mm rockets.
<b>Payload</b>	2,038 kg
<b>Main Rotor Diameter</b>	11.93 m
<b>Maximum Cruising Speed</b>	280 km/h
<b>Maximum Range</b>	860 km; with auxiliary fuel: 1,000 km
<b>Length</b>	11.44 m
<b>Height</b>	4.01 m

**NOTE:** Also known as the HAI (Eurocopter) Z-9, English name: Dolphin

## AS 565 Pantera



<b>Type</b>	Assault helicopter
<b>Crew</b>	2 (carries 10 troops)
<b>Armament</b>	2 x 68-mm rocket pods; 2 x 20-mm gun pods
<b>Weight (Empty)</b>	2,305 kg
<b>Main Rotor Diameter</b>	11.94 m
<b>Maximum Cruising Speed</b>	278 km/h
<b>Maximum Range</b>	820 km
<b>Length</b>	12.08 m
<b>Height</b>	4.06 m
<b>Brazilian Army Designation</b>	HM-1
<b>NOTE:</b>	developed from the AS 365 Dauphin 2.

## UH-1H



<b>Type</b>	Multi-role utility helicopter
<b>Crew</b>	2 (+11 troops)
<b>Armament</b>	Assorted guns, rockets, and/or missiles
<b>Maximum Speed</b>	128 kts
<b>Maximum Range</b>	400 km
<b>Main Rotor Diameter</b>	14.72 m
<b>Length</b>	12.98 m
<b>Height</b>	3.87 m

**NOTE:** Brazil's military also flies the UH-1D.

## UH-60 Blackhawk



<b>Type</b>	Medium lift helicopter
<b>Crew</b>	3 (carries 14 troops)
<b>Armament</b>	Provisions for pintle-mounted crew-served weapons
<b>Take-off weight</b>	10,659 kg
<b>Main Rotor Diameter</b>	16.4 m
<b>Maximum Cruising Speed</b>	315 km/h
<b>Maximum Range</b>	566 km
<b>Length</b>	19.8 m
<b>Height</b>	5.1 m

## CH-34 Super Puma



<b>Role</b>	Transport helicopter
<b>Main Rotor Diameter</b>	3.05 m
<b>Armament</b>	Optional cannon, machine guns, or rocket pods
<b>Maximum Speed</b>	262 km/h
<b>Maximum Range</b>	842 km
<b>Length</b>	18.70 m

## SH-3 Sea King



<b>Role</b>	Anti-submarine warfare
<b>Crew</b>	4 (pilot, co-pilot, 2 sonar operators) (can carry 31 passengers)
<b>Main Rotor Diameter</b>	18.9 m
<b>Armament</b>	ASW; up to 4 x Mk46 torpedoes or MkII depth bombs; provisions for 2 x AM 39 Exocet missiles
<b>Maximum Speed</b>	267 km/h
<b>Maximum Range</b>	1,166 km
<b>Length</b>	16.69 m
<b>Max Take-off Weight</b>	9,525 kg

## AH-11 Super Lynx



<b>Role</b>	Anti-submarine warfare
<b>Crew</b>	4 (pilot, co-pilot, 2 sonar operators)
<b>Main Rotor Diameter</b>	12.8 m
<b>Armament</b>	ASW: 2 x torpedoes; 6 x marine markers; or 2 x Mk11 depth charges; up to 4 Sea Skua or 2 Penguin anti-ship missiles
<b>Maximum Speed</b>	289 km/h
<b>Length</b>	15.24 m
<b>Max Take-off Weight</b>	5,125 kg

## Mirage IIIE



<b>Type</b>	Single-seat, fighter-bomber
<b>Armament</b>	Assorted guns, rockets, and/or missiles
<b>Maximum Speed</b>	M2 (at low altitude 1,390 km/h)
<b>Weight (Empty)</b>	7,050 kg
<b>Wing Span</b>	8.22 m
<b>Height</b>	4.50 m

**NOTE:** Above photo is a Mirage IIIE; Brazil also flies the Mirage IIIEBR. Brazilian designator is F-103.

## F5E Tiger II



<b>Role</b>	Ground Attack Fighter
<b>Armament</b>	Air-to-air missiles: Rafael Python 3; Python 4.
<b>Wing Span</b>	8.13 m
<b>Length</b>	14.45 m
<b>Weight</b>	4,410 kg
<b>Maximum Level Speed</b>	M1.64 km/h
<b>Range</b>	2,483 km

## AMX A-1



<b>Role</b>	Single-seat, ground attack fighter
<b>Armament</b>	2 x 30-mm guns in forward fuselage; attachments for MAA-1 Piranha air-to-air missiles; assorted rockets and munitions.
<b>Wing Span</b>	9.97 m
<b>Length</b>	13.23 m
<b>Weight (Empty)</b>	7,000 kg
<b>Range</b>	2,483 km

## AF-1 Skyhawk



<b>Role</b>	Attack
<b>Crew</b>	2 (in tandem)
<b>Armament</b>	AAM; 4 x MAA-1; 2 x Colt 20-mm cannon, assorted bombs and rocket pods.
<b>Max Level Speed</b>	1,040 km/h
<b>Range</b>	1,965 km

## A-29 Super Tucano



<b>Role</b>	Light attack /trainer plane
<b>Crew</b>	2 (in tandem)
<b>Armament</b>	2 x 12.7-mm guns; assorted cannon, bombs, and air-to-air missiles
<b>Wing Span</b>	11.14 m
<b>Length</b>	11.42 m
<b>Weight (Empty)</b>	2,420 kg
<b>Max Level Speed</b>	557 km/h
<b>Range</b>	1,568 km

## C-130 Hercules



<b>Crew</b>	4 -5 (+ 92 troops)
<b>Wing Span</b>	40.41 m
<b>Length</b>	29.79 m
<b>Height</b>	11.66 m
<b>Max T/O Weight</b>	70,310 kg
<b>Max Speed</b>	602 km/h
<b>Max Range</b>	3,791 km
<b>Armament</b>	None

**Description:** Four turboprop engines; Straight high mount wing; Low rider landing gear; Rear ramp. Brazil's military forces also fly the C-130E, KC-137, KC-130H, C-91, and C-155 transport aircraft.

## C-95 Bandeirante



<b>Role</b>	General Transport
<b>Crew</b>	2 (+ 21 troops)
<b>Wing Span</b>	15.33 m
<b>Length</b>	15.10 m
<b>Height</b>	4.92 m
<b>Max T/O Weight</b>	5,670 kg
<b>Max Speed</b>	460 km/h
<b>Max Range</b>	2,000 km
<b>Armament</b>	None

## SHIPS

### CLEMENCEAU Class



<b>Type</b>	Aircraft Carrier
<b>Complement</b>	1,220 (80 officers); 358 aircrew
<b>Armament</b>	Many, to include: SAM: 2 x Albatros Mk2; Guns: 2 x Bofors 40-mm; 5 x 12.7-mm MGs
<b>Aircraft</b>	15-18 x A4 Skyhawks; 4-6 x SH-3 Sea Kings; 3 x UH-12s; 2 x UH-14 Cougars
<b>Flight deck</b>	259 x 47 m
<b>Speed</b>	30 knots; Range: 7,000 miles at 18 knots
<b>Displacement</b>	33,673 tons, full
<b>LOA/Beam/Draft m(ft)</b>	265 x 51.2 x 8.6 (869.4 x 168 x 28.3)

**NOTE:** Ship shown is Brazil's *Sao Paulo*

## NITEROI Class



<b>Type</b>	Fast Frigate
<b>Number in Country</b>	6
<b>Complement</b>	217 (22 officers)
<b>Armament</b>	SSMs, SAMs, torpedoes, A/S mortars, depth charges, Guns: Vickers 115-mm; Bofors 40-mm MGs
<b>Aircraft</b>	One SAH-11 Super Lynx helicopter
<b>Speed</b>	22-30 knots
<b>Range</b>	Diesel: 4,200 miles at 19 kn; gas: 1,300 at 28 kn
<b>Displacement</b>	3,707 tons, full
<b>LOA/Beam/Draft m(ft)</b>	129.2 x 13.5 x 5.5 (424 x 44.2 x 18.2)
<b>Radar</b>	AESN RTN 30X, Decca TM 1226; I-band
<b>Sonar</b>	EDO 610E; EDO 700E (F 40 and 41)

## GARCIA Class



<b>Type</b>	Fast Frigate
<b>Complement</b>	286+ (18 officers)
<b>Armament</b>	Mk 16 launchers; ASROC torpedo system; Guns: 2 x Mk 30 127-mm L/38 single mounts; decoys
<b>Aircraft</b>	Flight deck supports SAH-11 Super Lynx helicopters
<b>Speed</b>	27.5 knots; Range: 4,000 miles at 20 knots
<b>Displacement</b>	3,403 tons, full
<b>LOA/Beam/Draft m(ft)</b>	126 x 13.5 x 7.3 (414.5 x 44.2 x 24)
<b>Radar</b>	AN/SPS-40B and 10C; LN 66; Mk 35
<b>Sonar</b>	AN/SQS-26AXR or -26BX

## THOMASTON Class



<b>Type</b>	LSD
<b>Number in Country</b>	2
<b>Complement</b>	345+ (20 officers)
<b>Capability</b>	Carries 340 troops; has 975 square meters of vehicle space; carries 7,400 tons of cargo
<b>Aircraft</b>	Has removable flight deck; supports AS Super Puma or AS 350 B or AS 355 helicopters
<b>Armament</b>	3 x Twin 76-mm/50 Mk 33 MGs
<b>Speed</b>	22.5 knots; Range: 10,000 miles at 18 knots
<b>Displacement</b>	12,150 tons, full
<b>LOA/Beam/Draft m(ft)</b>	155.5 x 25.6 x 5.8 (510 x 84 x 19)
<b>Radar</b>	Raytheon SPS-10; CRP 3100 Pathfinder

## ALMIRANTE GASTAO MOTTA



<b>Type</b>	Replenishment Tanker
<b>Number in Country</b>	1
<b>Complement</b>	121 (13 officers)
<b>Capability</b>	Carries 500 tons liquid cargo; 200 tons dry
<b>Armament</b>	2 x12.7-mm MGs
<b>Speed</b>	20 knots; Range: 9,000 miles at 15 knots
<b>Displacement</b>	10,320 tons, full
<b>LOA/Beam/Draft m(ft)</b>	135 x 19 x 7.5 (442.9 x 62.3 x 24.6)
<b>Radar</b>	DF LOOP

## ALMIRANTE GRACA ARANHA AGL



Type	Bouy Tender
Complement	80
Speed	13 knots
Displacement	2,390 tons (full)
LOA/Beam/Draft m(ft)	75.6 x 13 x 3.7 (248 x 42.7 x 12.1)
Radar	2 DECCA Series
Sonar	ECHO SOUNDER, 1 OMEGA
Aircraft	Bell 206B

## PEDRO TEIXEIRA PC



<b>Role</b>	Coastal Patrol
<b>Complement</b>	61
<b>Speed</b>	17 knots
<b>Displacement</b>	692 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	63.6 x 9.7 x 2 (208.7 x 31.8 x 6.6)
<b>Radar</b>	2 DECCA-1226
<b>Weapons</b>	1 x 40-mm L70, 2 x 12.7-mm MG w/81-mm mortar, 6 x 12.7 MG

## PENGUIN MCS



<b>Role</b>	Mine countermeasures support
<b>Complement</b>	104
<b>Speed (maximum sustained)</b>	14.7 knots (range 13,612 km [7,350 nmi])
<b>Displacement</b>	1,839 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	62.5 x 12.4 x 5.2 (205 x 40.6 x 17.1)
<b>Radar</b>	AN/SPS-5D
<b>Sonar</b>	AN/UQN-1 series, QHB series
<b>Weapons</b>	1 x 20-mm MG (Mk 10)

## PARNAIBA PC



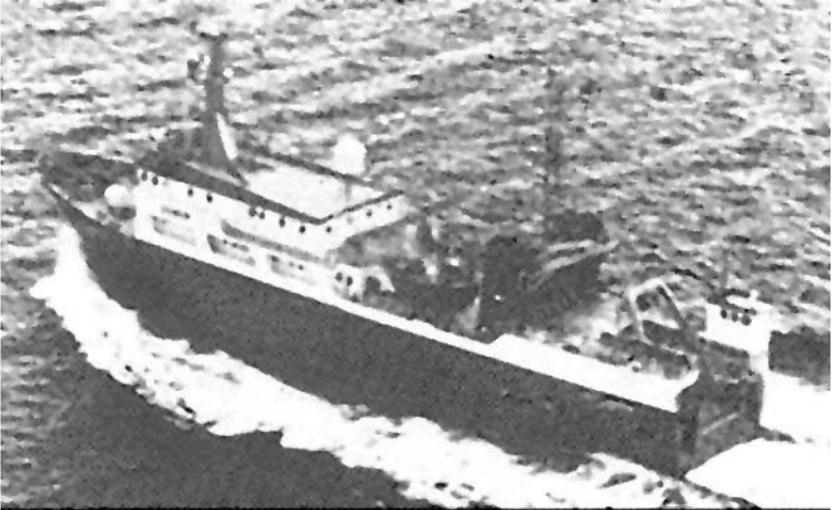
<b>Role</b>	Coastal patrol
<b>Complement</b>	69
<b>Speed</b>	11.5 knots
<b>Displacement (t)</b>	610 (full)
<b>LOA/Beam/Draft m(ft)</b>	55 x 10.2 x 2 (180.5 x 33.5 x 6.6)

## FELINTO PERRY ASR



<b>Role</b>	Submarine rescue
<b>Complement</b>	65
<b>Speed</b>	14.5 knots
<b>Displacement (tons)</b>	3,030 (full)
<b>LOA/Beam/Draft m(ft)</b>	78.2 x 17.5 x 4.7 (256.6 x 57.4 x 15.2)

## ANTARES AGS



<b>Role</b>	Hydrographic survey
<b>Complement</b>	45
<b>Speed (maximum sustained)</b>	13.5 knots
<b>Displacement</b>	1,250 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	55 x 10.5 x 5.1 x (180.3 x 34.5 x 16.6)
<b>Radar</b>	2 DECCA series
<b>Sonar</b>	ECHO SOUNDER

## ARGUS AGS



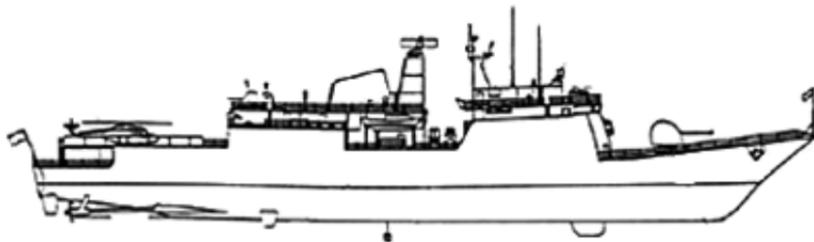
<b>Role</b>	Hydrographic survey
<b>Complement</b>	34
<b>Speed</b>	15 knots
<b>Displacement</b>	350 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	44.7 x 6.5 x 2.8 (146.7 x 21.3 x 9.2)'
<b>Radar</b>	DECCA-1226
<b>Sonar</b>	ECHO SOUNDER

## ARY RONGEL Class AGOR



<b>Role</b>	Oceanographic research
<b>Speed</b>	15 knots
<b>Displacement</b>	3,600 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	75.2 x 13 x NA (246.7 x 42.7 x NA)

## BARROSO FF



<b>Type</b>	Frigate
<b>Complement</b>	122
<b>Speed</b>	27 knots
<b>Displacement</b>	2,350 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	103.39 x 11.4 x 5.3 (339.2 x 37.4 x 17.4)
<b>Aircraft</b>	Helicopter flight deck
<b>Guns</b>	1 x 40-mm/70 MG, 1 x 114-mm/55 MG,
<b>Other weapons</b>	MM 40, Mk 46 series
<b>Radar</b>	Mk-46 series, KH-1007, RTN-30X
<b>Sonar</b>	DSQS-21C

## BRAZIL AXT



<b>Role</b>	Training
<b>Complement</b>	215
<b>Speed</b>	18 knots
<b>Displacement</b>	3,400 full
<b>LOA/Beam/Draft m(ft)</b>	131.3 x 13.5 x 4.3 (430.8 x 44.3 x 14.1)
<b>Guns</b>	1 x 40-mm L /70
<b>Aircraft</b>	MK 21 Lynx

## BROADSWORD FF



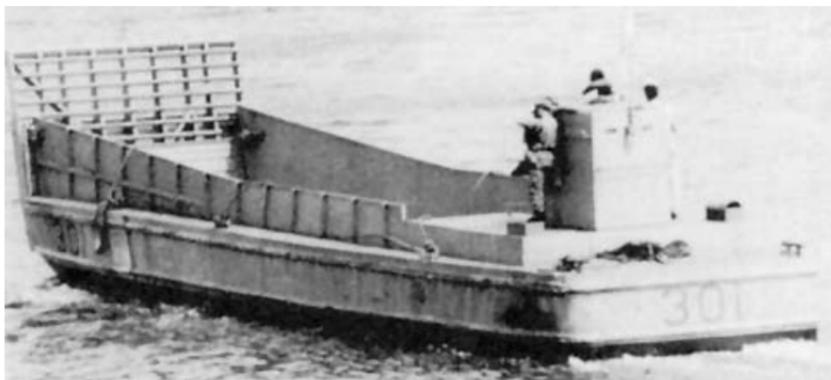
<b>Type</b>	Frigate
<b>Complement</b>	239 (17 officers)
<b>Aircraft</b>	2 x Westland Super Lynx AH-11A helicopters
<b>Speed</b>	18 knots
<b>Range</b>	4,500 miles at 18 kts
<b>Displacement (tons)</b>	4,731 full
<b>LOA/Beam/Draft m(ft)</b>	125x14.8x6 (410x48.5x19.9)
<b>Weapons</b>	2 Bofors 40-mm L70s; 2 Oerlikon 20-mm GAM-B01s; 6 x Plessey STWS Mke (2 triple) torpedo tubes
<b>Radar</b>	Air/surface search: Marconi Type 967/968; D/E-band
<b>Sonar</b>	Plessey Type 2050; hull-mounted; search and attack; med. frequency

## FAIREY MARINE TRACKER 20-M PB



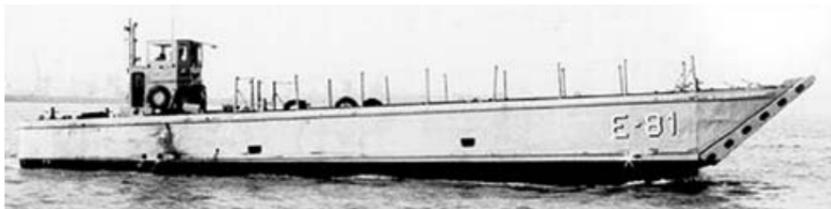
<b>Role</b>	Patrol
<b>Complement</b>	11
<b>Speed</b>	24 knots
<b>Displacement</b>	34.5 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	20 x 5.2 x 1.5 (65.6 x 17 x 4.8)
<b>Guns</b>	2 x 12.7-mm MGs
<b>Radar</b>	DECCA-1070A RM

## LCM(6)



<b>Role</b>	Landing
<b>Complement</b>	4
<b>Speed</b>	11 knots
<b>Displacement</b>	56.2 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	17.1 x 4.4 x 1.2 (56 x 14.3 x 3.9)

## LCM(8)



<b>Role</b>	Landing
<b>Complement</b>	5
<b>Speed</b>	12 knots
<b>Displacement</b>	97.5 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	22.6 x 6.4 x 1.2 (74.2 x 21 x 3.9)

## LCU 1610



<b>Role</b>	Utility landing
<b>Complement</b>	13
<b>Speed</b>	11 knots
<b>Displacement</b>	348 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	36.4 x 10.6 x 1.6 (119.4 x 34.8 x 5.2)
<b>Guns</b>	2 x 20-mm/70 MG
<b>Radars</b>	Raytheon-1500

## LCVP



<b>Role</b>	Vehicle/personnel landing
<b>Complement</b>	5
<b>Speed</b>	10 knots
<b>Displacement</b>	12.1 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	10.9 x 3.4 x 1.1 (35.8 x 11.2 x 3.6)

## NEWPORT LST



<b>Role</b>	Tank landing
<b>Complement</b>	187
<b>Speed</b>	22 knots
<b>Displacement</b>	8,450 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	159.2 x 21.2 x 5.3 (522.3 x 69.6 x 17.4)
<b>Guns</b>	2 x twin 76-mm/50, 1 x Gatling 20-mm/70
<b>Radar</b>	AN/SPS-67, LN-66
<b>Sonar</b>	ECHO SOUNDER

## PGM 39 PC



<b>Role</b>	Coastal patrol
<b>Complement</b>	15
<b>Speed</b>	19.6 knots
<b>Displacement</b>	103.8 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	29 x 6.2 x 2 (95 x 20.3 x 6.6)
<b>Guns</b>	7 x 12.7-mm/90 MG, 1 x 81-mm mortar combination
<b>Radar</b>	Raytheon-2840
<b>Sonar</b>	OCU-1

## River Tender



<b>Type</b>	Buoy tender
<b>Complement</b>	19 (2 officers)
<b>Speed</b>	14 knots
<b>Displacement</b>	890 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	54.5 x 7.5 x 1.8 (178.8 x 24.5 x 6)

## ROBERT D CONRAD AGOR



<b>Role</b>	Oceanographic research
<b>Complement</b>	40
<b>Speed</b>	13.5 knots
<b>Displacement</b>	1,432 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	63.5 x 12 x 5.9 (208.3 x 39.4 x 19.4)

## RORAIMA PC



<b>Role</b>	Patrol
<b>Complement</b>	49 (5 officers)
<b>Speed</b>	14.5 knots
<b>Displacement</b>	364 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	46.3 x 8.5 x 1.4 (152 x 27.9 x 4.6)
<b>Guns</b>	1 x 40-mm/70, 2 x 12.7-mm MG w/81-mm mortar, 4 x 12.7-mm/90 MG
<b>Aircraft</b>	UH-12 helicopter
<b>Radar</b>	2 DECCA Series

## SIRIUS AGS



<b>Role</b>	Hydrographic survey
<b>Complement</b>	102
<b>Aircraft</b>	Can support one Bell JetRanger or UH-12
<b>Speed</b>	15.7 knots
<b>Displacement</b>	1,916 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	77.9 x 12 x 3.9 (255.6 x 29.4 x 12.8)
<b>Radar</b>	Navigation: Racal DECCA TME 1226C; I-band
<b>Sonar</b>	MS 26

## TRITAO ATA



Type	Ocean tug
Complement	49
Speed (maximum sustained)	12 knots
Displacement	1,680 tons (full)
LOA/Beam/Draft m(ft)	53.5 x 11.6 x 3.4 (175.6 x 38.1 x 11)
Guns	2 x 20-mm/70 MG
Radars	DECCA Series

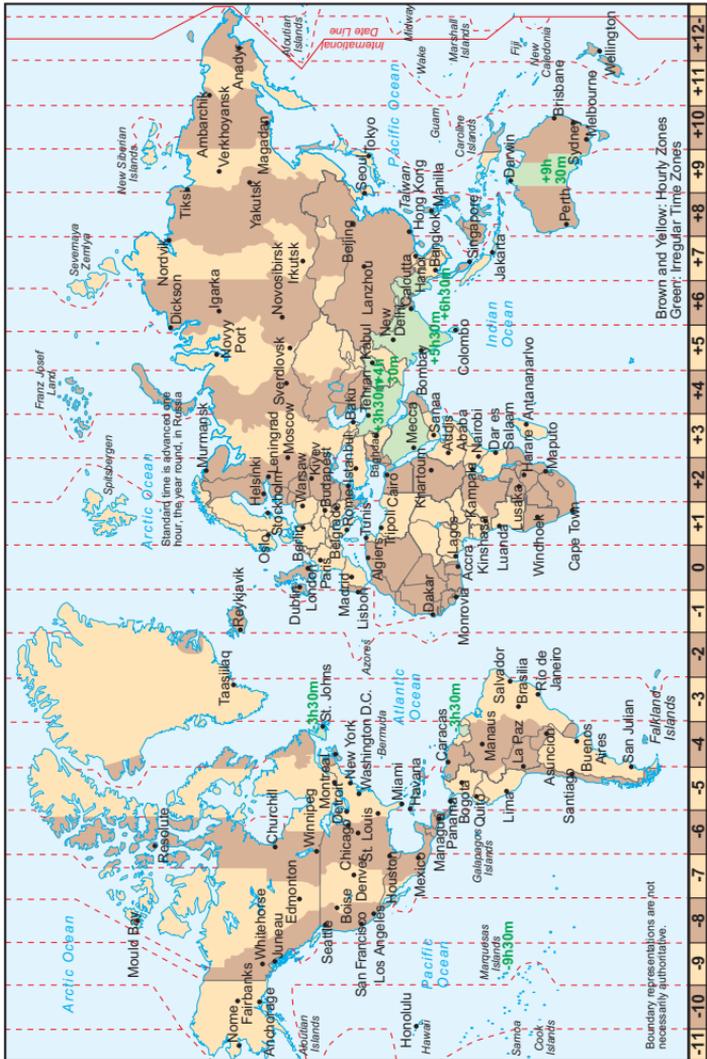
## VOSPER 46-M PC



<b>Role</b>	Patrol
<b>Complement</b>	31
<b>Speed</b>	20 knots
<b>Displacement</b>	294 tons (full)
<b>LOA/Beam/Draft m(ft)</b>	46.5 x 7.5 x 2.7 (152.6 x 24.6 x 8.9)
<b>Guns</b>	SAK 40 L/70 MG, 20-mm/85 MGs, 20-mm/70 MGs
<b>Radars</b>	DECCA-1290 RM
<b>Sonars</b>	ECHO SOUNDER



# APPENDIX B: International Time Zones



## Coordinated Universal Time (UTC)

To use the table, go to the country you are interested in, and add the number of hours corresponding to the United States time zone to the current time. The UTC is also known as Greenwich Mean Time (GMT).

Country	UTC	Eastern	Central	Mountain	Pacific
Afghanistan	+4.5 H	+9.5 H	+10.5 H	+11.5 H	+12.5 H
Albania	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Algeria	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
American Samoa	-11.0 H	-6.0 H	-5.0 H	-4.0 H	-3.0 H
Andorra	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Angola	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Antarctica	-2.0 H	+3.0 H	+4.0 H	+5.0 H	+6.0 H
Antigua and Barbuda	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Argentina	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
Armenia	+4.0 H	+9.0 H	+10.0 H	+11.0 H	+12.0 H
Aruba	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Ascension	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Australia North	+9.5 H	+14.5 H	+15.5 H	+16.5 H	+17.5 H
Australia South	+10.0 H	+15.0 H	+16.0 H	+17.0 H	+18.0 H
Australia West	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Australia East	+10.0 H	+15.0 H	+16.0 H	+17.0 H	+18.0 H
Austria	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Azerbaijan	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Bahamas	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Bahrain	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Bangladesh	+6.0 H	+11.0 H	+12.0 H	+13.0 H	+14.0 H
Barbados	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Belarus	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Belgium	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Belize	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
Benin	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Bermuda	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Bhutan	+6.0 H	+11.0 H	+12.0 H	+13.0 H	+14.0 H
Bolivia	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Bosnia Herzegovina	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Botswana	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H

<b>Country</b>	<b>UTC</b>	<b>Eastern</b>	<b>Central</b>	<b>Mountain</b>	<b>Pacific</b>
Brazil East	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
Brazil West	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
British Virgin Islands	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Brunei	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Bulgaria	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Burkina Faso	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Burundi	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Cambodia	+7.0 H	+12.0 H	+13.0 H	+14.0 H	+15.0 H
Cameroon	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Canada East	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Canada Central	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
Canada Mountain	-7.0 H	-2.0 H	-1.0 H	+0.0 H	+1.0 H
Canada West	-8.0 H	-3.0 H	-2.0 H	-1.0 H	+0.0 H
Cape Verde	-1.0 H	+4.0 H	+5.0 H	+6.0 H	+7.0 H
Cayman Islands	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Central African Rep.	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Chad Republic	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Chile	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
China	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Christmas Island	-10.0 H	-5.0 H	-4.0 H	-3.0 H	-2.0 H
Colombia	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Congo	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Cook Island	-10.0 H	-5.0 H	-4.0 H	-3.0 H	-2.0 H
Costa Rica	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
Croatia	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Cuba	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Cyprus	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Czech Republic	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Denmark	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Djibouti	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Dominica	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Dominican Republic	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Ecuador	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Egypt	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
El Salvador	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
Equatorial Guinea	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H

<b>Country</b>	<b>UTC</b>	<b>Eastern</b>	<b>Central</b>	<b>Mountain</b>	<b>Pacific</b>
Eritrea	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Estonia	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Ethiopia	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Falkland Islands	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Fiji Islands	+12.0 H	+17.0 H	+18.0 H	+19.0 H	+20.0 H
Finland	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
France	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
French Antilles	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
French Guinea	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
French Polynesia	-10.0 H	-5.0 H	-4.0 H	-3.0 H	-2.0 H
Gabon Republic	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Gambia	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Georgia	+4.0 H	+9.0 H	+10.0 H	+11.0 H	+12.0 H
Germany	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Ghana	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Gibraltar	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Greece	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Greenland	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
Grenada	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Guadeloupe	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Guam	+10.0 H	+15.0 H	+16.0 H	+17.0 H	+18.0 H
Guatemala	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
Guinea-Bissau	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Guinea	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Guyana	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
Haiti	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Honduras	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
Hong Kong	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Hungary	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Iceland	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
India	+5.5 H	+10.5 H	+11.5 H	+12.5 H	+13.5 H
Indonesia East	+9.0 H	+14.0 H	+15.0 H	+16.0 H	+17.0 H
Indonesia Central	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Indonesia West	+7.0 H	+12.0 H	+13.0 H	+14.0 H	+15.0 H
Iran	+3.5 H	+8.5 H	+9.5 H	+10.5 H	+11.5 H
Iraq	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H

<b>Country</b>	<b>UTC</b>	<b>Eastern</b>	<b>Central</b>	<b>Mountain</b>	<b>Pacific</b>
Ireland	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Israel	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Italy	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Jamaica	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Japan	+9.0 H	+14.0 H	+15.0 H	+16.0 H	+17.0 H
Kazakhstan	+6.0 H	+11.0 H	+12.0 H	+13.0 H	+14.0 H
Kenya	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Kiribati	+12.0 H	+17.0 H	+18.0 H	+19.0 H	+20.0 H
Korea, North	+9.0 H	+14.0 H	+15.0 H	+16.0 H	+17.0 H
Korea, South	+9.0 H	+14.0 H	+15.0 H	+16.0 H	+17.0 H
Kuwait	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Kyrgyzstan	+5.0 H	+10.0 H	+11.0 H	+12.0 H	+13.0 H
Laos	+7.0 H	+12.0 H	+13.0 H	+14.0 H	+15.0 H
Latvia	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Lebanon	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Lesotho	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Liberia	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Libya	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Liechtenstein	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Lithuania	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Luxembourg	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Macedonia	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Madagascar	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Malawi	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Malaysia	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Maldives	+5.0 H	+10.0 H	+11.0 H	+12.0 H	+13.0 H
Mali Republic	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Malta	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Marshall Islands	+12.0 H	+17.0 H	+18.0 H	+19.0 H	+20.0 H
Mauritania	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Mauritius	+4.0 H	+9.0 H	+10.0 H	+11.0 H	+12.0 H
Mayotte	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Mexico East	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Mexico Central	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
Mexico West	-7.0 H	-2.0 H	-1.0 H	+0.0 H	+1.0 H
Moldova	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H

<b>Country</b>	<b>UTC</b>	<b>Eastern</b>	<b>Central</b>	<b>Mountain</b>	<b>Pacific</b>
Monaco	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Mongolia	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Morocco	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Mozambique	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Myanmar (Burma)	+6.5 H	+11.5 H	+12.5 H	+13.5 H	+14.5 H
Namibia	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Nauru	+12.0 H	+17.0 H	+18.0 H	+19.0 H	+20.0 H
Nepal	+5.5 H	+10.5 H	+11.5 H	+12.5 H	+13.5 H
Netherlands	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Netherlands Antilles	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
New Caledonia	+11.0 H	+16.0 H	+17.0 H	+18.0 H	+19.0 H
New Zealand	+12.0 H	+17.0 H	+18.0 H	+19.0 H	+20.0 H
Newfoundland	-3.5 H	+1.5 H	+2.5 H	+3.5 H	+4.5 H
Nicaragua	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
Nigeria	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Niger Republic	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Norfolk Island	+11.5 H	+16.5 H	+17.5 H	+18.5 H	+19.5 H
Norway	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Oman	+4.0 H	+9.0 H	+10.0 H	+11.0 H	+12.0 H
Pakistan	+5.0 H	+10.0 H	+11.0 H	+12.0 H	+13.0 H
Palau	+9.0 H	+14.0 H	+15.0 H	+16.0 H	+17.0 H
Panama, Rep. of	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Papua New Guinea	+10.0 H	+15.0 H	+16.0 H	+17.0 H	+18.0 H
Paraguay	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Peru	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Philippines	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Poland	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Portugal	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Puerto Rico	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Qatar	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Reunion Island	+4.0 H	+9.0 H	+10.0 H	+11.0 H	+12.0 H
Romania	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Russia West	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Russia Central 1	+4.0 H	+9.0 H	+10.0 H	+11.0 H	+12.0 H
Russia Central 2	+7.0 H	+12.0 H	+13.0 H	+14.0 H	+15.0 H
Russia East	+11.0 H	+16.0 H	+17.0 H	+18.0 H	+19.0 H

<b>Country</b>	<b>UTC</b>	<b>Eastern</b>	<b>Central</b>	<b>Mountain</b>	<b>Pacific</b>
Rwanda	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Saba	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Samoa	-11.0 H	-6.0 H	-5.0 H	-4.0 H	-3.0 H
San Marino	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Sao Tome	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Saudi Arabia	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Senegal	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Seychelles Islands	+4.0 H	+9.0 H	+10.0 H	+11.0 H	+12.0 H
Sierra Leone	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Singapore	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Slovakia	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Slovenia	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Solomon Islands	+11.0 H	+16.0 H	+17.0 H	+18.0 H	+19.0 H
Somalia	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
South Africa	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Spain	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Sri Lanka	+5.5 H	+10.5 H	+11.5 H	+12.5 H	+13.5 H
St. Lucia	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
St. Maarten	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
St. Pierre & Miquelon	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
St. Thomas	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
St. Vincent	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Sudan	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Suriname	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
Swaziland	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Sweden	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Switzerland	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Syria	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Taiwan	+8.0 H	+13.0 H	+14.0 H	+15.0 H	+16.0 H
Tajikistan	+6.0 H	+11.0 H	+12.0 H	+13.0 H	+14.0 H
Tanzania	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Thailand	+7.0 H	+12.0 H	+13.0 H	+14.0 H	+15.0 H
Togo	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Tonga Islands	+13.0 H	+18.0 H	+19.0 H	+20.0 H	+21.0 H
Trinidad and Tobago	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Tunisia	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H

<b>Country</b>	<b>UTC</b>	<b>Eastern</b>	<b>Central</b>	<b>Mountain</b>	<b>Pacific</b>
Turkey	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Turkmenistan	+5.0 H	+10.0 H	+11.0 H	+12.0 H	+13.0 H
Turks and Caicos	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
Tuvalu	+12.0 H	+17.0 H	+18.0 H	+19.0 H	+20.0 H
Uganda	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Ukraine	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
United Arab Emirates	+4.0 H	+9.0 H	+10.0 H	+11.0 H	+12.0 H
United Kingdom	+0.0 H	+5.0 H	+6.0 H	+7.0 H	+8.0 H
Uruguay	-3.0 H	+2.0 H	+3.0 H	+4.0 H	+5.0 H
USA Eastern	-5.0 H	+0.0 H	+1.0 H	+2.0 H	+3.0 H
USA Central	-6.0 H	-1.0 H	+0.0 H	+1.0 H	+2.0 H
USA Mountain	-7.0 H	-2.0 H	-1.0 H	+0.0 H	+1.0 H
USA Western	-8.0 H	-3.0 H	-2.0 H	-1.0 H	+0.0 H
USA Alaska	-9.0 H	-4.0 H	-3.0 H	-2.0 H	-1.0 H
USA Hawaii	-10.0 H	-5.0 H	-4.0 H	-3.0 H	-2.0 H
Uzbekistan	+5.0 H	+10.0 H	+11.0 H	+12.0 H	+13.0 H
Vanuatu	+11.0 H	+16.0 H	+17.0 H	+18.0 H	+19.0 H
Vatican City	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Venezuela	-4.0 H	+1.0 H	+2.0 H	+3.0 H	+4.0 H
Vietnam	+7.0 H	+12.0 H	+13.0 H	+14.0 H	+15.0 H
Wallis & Futuna Islands	+12.0 H	+17.0 H	+18.0 H	+19.0 H	+20.0 H
Yemen	+3.0 H	+8.0 H	+9.0 H	+10.0 H	+11.0 H
Yugoslavia	+1.0 H	+6.0 H	+7.0 H	+8.0 H	+9.0 H
Zaire	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Zambia	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H
Zimbabwe	+2.0 H	+7.0 H	+8.0 H	+9.0 H	+10.0 H

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## APPENDIX C: Conversion Charts

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### When You Know

Units of Length	Multiply by	To find
Millimeters	0.04	Inches
Centimeters	0.39	Inches
Meters	3.28	Feet
Meters	1.09	Yards
Kilometers	0.62	Miles
Inches	25.40	Millimeters
Inches	2.54	Centimeters
Feet	30.48	Centimeters
Yards	0.91	Meters
Miles	1.61	Kilometers

### Units of Area

Sq. Centimeters	0.16	Sq. Inches
Sq. Meters	1.20	Sq. Yards
Sq. Kilometers	0.39	Sq. Miles
Hectares	2.47	Acres
Sq. Inches	6.45	Sq. Cm
Sq. Feet	0.09	Sq. Meters
Sq. Yards	0.84	Sq. Meters
Sq. Miles	2.60	Sq. Km
Acres	0.40	Hectares

### Units of Mass and Weight

Grams	0.035	Ounces
Kilograms	2.21	Pounds
Tons (100kg)	1.10	Short Tons
Ounces	28.35	Grams
Pounds	0.45	Kilograms
Short Tons	2.12	Tons

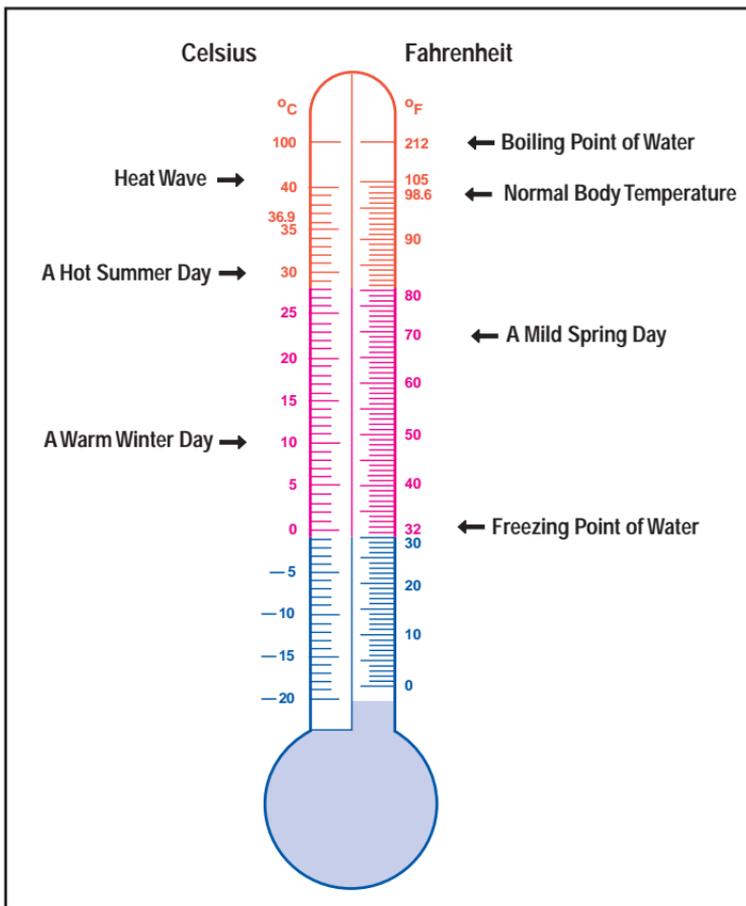
<b>Units of Volume</b>	<b>Multiply by</b>	<b>To find</b>
Milliliters	0.20	Teaspoons
Milliliters	0.06	Tablespoons
Milliliters	0.03	Fluid Ounces
Liters	4.23	Cups
Liters	2.12	Pints
Liters	1.06	Quarts
Liters	0.26	Gallons
Cubic Meters	35.32	Cubic Feet
Cubic Meters	1.35	Cubic Yards
Teaspoons	4.93	Milliliters
Tablespoons	14.78	Milliliters
Fluid Ounces	29.57	Milliliters
Cups	0.24	Liters
Pints	0.47	Liters
Quarts	0.95	Liters
Gallons	3.79	Liters
Cubic Feet	0.03	Cubic Meters
Cubic Yards	0.76	Cubic Meters

### **Units of Speed**

Miles per Hour	1.61	Km per Hour
Km per Hour	0.62	Miles per Hour

## Temperature

To convert Celsius into degrees Fahrenheit, multiply Celsius by 1.8 and add 32. To convert degrees Fahrenheit to Celsius, subtract 32 and divide by 1.8.



Temperature Chart



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## APPENDIX D: Holidays

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1 January	New Year's Day
Date Varies	Carnival
Date Varies	Good Friday (Christian)
21 April	Tiradente's (Revolutionary hero 1789)
1 May	Labor Day
May or June (Date Varies)	Corpus Christi (Christian)
7 September	Independence Day
12 October	Our Lady of Aparecida (Brazil's patron Saint)
2 November	All Souls' Day (Christian)
15 November	Proclamation of the Republic
25 December	Christmas Day

Carnival, Good Friday, and Corpus Christi are all dependant on the date of Easter, which is in either March or April.



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## APPENDIX E: Language

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### Key Phrases

<b>English</b>	<b>Portuguese</b>
Yes	Sim
No	Não
Thank you	Obrigado (male), Obrigada (female)
You are welcome	De nada
Please	Por favor
Excuse me	Desculpe-me, Com licença
Hello	Olá, Oi
Good morning	Bom dia
Good afternoon	Boa tarde
Good evening	Boa noite
Good night	Boa noite
Good bye	Tchau, adeus
I	Eu
You (singular, familiar)	Você
You (singular, formal)	O senhor (male), a senhora (female)
You (plural)	Vocês
We	Nós
They	Eles (male), elas (female)
Do you speak English?	Você fala Inglês?
I don't speak Portuguese.	Eu não falo Português
I do not understand	Eu não entendo.
How do you say this in Portuguese?	Como se diz isso em português?
Speak slower, please	Fale mais devagar, por favor.
Say it again, please	Repita, por favor.
Do you have .....?	Você tem .....?
I want .....	Eu quero .....

**English**

I don't want .....

I would like .....

Where is .....?

What time is it?

How much does it cost?

Where can I change money?

What is the exchange rate  
for the dollar?

I would like to change \$100.

**Portuguese**

Eu não quero .....

Eu gostaria .....

Onde é .....?

Que horas são?

Quanto custa isto?

Onde posso trocar dinheiro?

Qual é a cotação do dólar?

Eu gostaria de trocar cem dólares.

**Introduction****English**

How are you?

My name is .....

What is your name?

Nice to meet you

**Portuguese**

Como vai? Tudo bem?

Meu nome é.....

Como você se chama?

Prazer em conhecê-lo (male)

Prazer em conhecê-la (female)

**Directions****English**

Where is the post office?

Left

Right

Straight ahead

Up

Down

Far

Near

**Portuguese**

Onde é o correio?

Esquerda

Direita

Em frente

Para cima

Para baixo

Longe

Perto

**Places****English**

Museum

Bank

**Portuguese**

Museu

Banco

**English**

Police Station

Hospital

Pharmacy

Store, shop

Restaurant

Church

Restrooms

Beach

Street

Swimming Pool

**Portuguese**

Delegacia de polícia

Hospital

Farmácia

Loja

Restaurante

Igreja

Banheiro

Praia

Rua

Piscina

**Hotel****English**

Hotel

Bedroom

Double Bed

Keys

Bathroom

Shower

I have a reservation at this hotel.

Are there rooms available for tonight?

Is breakfast included?

Can I take a look at the room?

I want a room with an ocean view.

Can I have a wake up call at 6:00 AM?

I would like to pay the bill.

**Portuguese**

Hotel

Quarto

Cama de Casal

Chaves

Banheiro

Chuveiro

Eu tenho uma reserva neste hotel.

Há quartos disponíveis para esta noite?

O café da manhã está incluso?

Posso dar uma olhada no quarto?

Quero um quarto com vista para o mar.

Você pode me acordar às seis horas da manhã?

Eu gostaria de pagar a conta.

**Restaurant****English**

Breakfast

Lunch

**Portuguese**

Café da manhã

Almoço

**English**

Dinner  
Menu  
Waiter  
Check/Bill  
Napkin  
Glass  
Plate  
Fork  
Knife  
Spoon  
Table  
Chair  
Rare  
Medium  
Well done  
Bread  
Coffee  
Milk  
Tea  
Juice  
Water  
Sparkling  
Beer (bottled)  
Beer (draft)  
Wine/White/Red  
Salt  
Pepper  
Beef  
Pork  
Fish  
Vegetable  
Fruit  
Potato

**Portuguese**

Jantar  
Cardápio  
Garçom  
Conta  
Guardanapo  
Copo  
Prato  
Garfo  
Faca  
Colher  
Mesa  
Cadeira  
Mal-passado  
Ao ponto  
Bem-passado  
Pão  
Café  
Leite  
Chá  
Suco  
still água sem gás  
água com gás  
Cerveja  
Chopp  
Vinho/Branco/Tinto  
Sal  
Pimenta  
Bife  
Porco  
Peixe  
Legumes  
Frutas  
Batata

**English**

Salad

Dessert

Ice Cream

I have a reservation for two people.

Smoking/non smoking, please

I want a table near the window.

What do you recommend?

What is the specialty of the day?

Cheers!

Check, please.

**Portuguese**

Salada

Sobremesa

Sorvete

Eu fiz uma reserva para duas pessoas.

Fumante/ não fumante por favor

Quero uma mesa perto da janela.

O que você recomenda?

Qual é o prato do dia?

Tim- tim! Saúde!

A conta por favor.

**Transportation****English**

Bus Station

Bus

Bus stop

Airport

Airplane

Train Station

Train

Subway Station

Subway

Taxi

Taxi Stand

Car

Parking

Rent a Car

Departure

Arrival

I would like a round trip ticket to...

I would like one way ticket to ...

**Portuguese**

Rodoviária

Ônibus

Ponto de ônibus

Aeroporto

Avião

Estação Ferroviária

Trem

Estação de Metrô

Metrô

Táxi

Ponto de táxi

Carro

Estacionamento

Alugar um carro

Partida

Chegada

Eu gostaria de uma passagem de ida e volta para ...

Eu gostaria de uma passagem só de ida para ...

**English**

What time does the bus/plane leave?

What is the gate number ?

How long is the trip ?

**Portuguese**

Que horas sai o ônibus/avião ?

Qual o número do portão de embarque?

Quantas horas são de viagem ?

**Numbers**

<b>English</b>	<b>Portuguese</b>	<b>English</b>	<b>Portuguese</b>
0	Zero	15	Quinze
1	Um	16	Dezesseis
2	Dois	17	Dezessete
3	Três	18	Dezoito
4	Quarto	19	Dezenove
5	Cinco	20	Vinte
6	Seis	30	Trinta
7	Sete	40	Quarenta
8	Oito	50	Cinquenta
9	Nove	60	Sessenta
10	Dez	70	Setenta
11	Onze	80	Oitenta
12	Doze	90	Noventa
13	Treze	100	Cem
14	Quatorze	1000	Mil

**Shopping****English**

Money

Coins

Credit card

Tax

Receipt

Expensive

Cheap

Open

Closed

**Portuguese**

Dinheiro

Moedas

Cartão de crédito

Taxa

Recibo

Caro

Barato

Aberto

Fechado

**English**

Postcard

Stamps

How much does it cost?

Do you accept credit cards?

I don't have small change.

**Portuguese**

Cartão Postal

Selos

Quanto custa?

Você aceita cartão de crédito?

Eu não tenho trocado.

**Time****English**

What time is it?

11:30 half past eleven

11:30 eleven thirty

4:15 four fifteen

2:45 two forty five

2:45 a quarter to three

**Portuguese**

Que horas são?

São onze e meia.

São onze e trinta

São quatro e quinze.

São duas e quarenta e cinco

São quinze para as três

**Dates****English**

Day

Week

Month

Year

Days of the week

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

Sunday

Months

January

February

March

April

**Portuguese**

Dia

Semana

Mês

Ano

Dias da Semana

Segunda-feira

Terça-feira

Quarta-feira

Quinta-feira

Sexta-feira

Sábado

Domingo

Meses

Janeiro

Fevereiro

Março

Abril

**English**

May

June

July

August

September

October

November

December

Seasons

Spring

Summer

Fall

Winter

Today

Yesterday

Tomorrow

**Portuguese**

Maio

Junho

Julho

Agosto

Setembro

Outubro

Novembro

Dezembro

Estações

Primavera

Verão

Outono

Inverno

Hoje

Ontem

Amanhã



## APPENDIX F: International Road Signs



Crossroads



Maximum speed



No through road



Road narrows



Fallen/falling rock



No entry for  
vehicular traffic



Motorway



Stop and give way



Low flying aircraft or  
sudden aircraft noise



No left turn



One way street



Tourist  
information point



Traffic signals



No u-turn



Cable height  
16' - 6"

Overhead cables,  
Maximum height



Failure of  
traffic light signals



Sharp deviation



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## **APPENDIX G: Deployed Personnel's Guide to Health Maintenance**

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DoD-prescribed immunizations and medications, including birth control pills, should be brought in sufficient quantity for deployment's duration.

Only food, water, and ice from approved U.S. military sources should be consumed. Consuming food or water from unapproved sources may cause illness. Food should be thoroughly cooked and served hot.

Thorough hand-washing before eating and after using the latrine is highly recommended, as is regular bathing. Feet should be kept dry and treated with antifungal powder. Socks and underwear should be changed daily; underwear should fit loosely and be made of cotton fiber.

Excessive heat and sunlight exposure should be minimized. Maintaining hydration is important, as are following work-rest cycles and wearing uniforms properly. Sunglasses, sunscreen (SPF 15 or higher), and lip balm are recommended. Drinking alcohol should be avoided. Personnel with previous heat injuries should be closely monitored.

Uniforms should be worn properly (blouse boots). DEET should be applied to exposed skin and uniforms treated with permethrin; permethrin is not intended for use on skin. Proper treatment and wear of uniform, plus application of DEET to exposed skin, decreases the risk of diseases transmitted by biting insects.

Overcrowded living areas should be avoided. Ventilated living areas and avoiding coughing or sneezing toward others will reduce colds and other respiratory infections. Cots or sleeping bags should be arranged "head to toe" to avoid the face-to-face contact that spreads germs.

Contact with animals is not recommended. Animals should not be kept as mascots. Cats, dogs, and other animals can transmit disease. Food should not be kept in living areas as it attracts rodents and insects, and trash should be disposed of properly.

Hazardous snakes, plants, spiders, and other insects and arthropods such as scorpions, centipedes, ants, bees, wasps, and flies should be avoided. Those bitten or stung should contact U.S. medical personnel.

All sexual contact should be avoided. Properly used condoms offer some protection from sexually transmitted diseases but not full protection.

Stress and fatigue can be minimized by maintaining physical fitness, staying informed, and sleeping when the mission and safety permits. Alcohol should be avoided as it causes dehydration, contributes to jet lag, can lead to depression, and decreases physical and mental readiness. Separation anxiety, continuous operations, changing conditions, and the observation of human suffering will intensify stress. Assistance from medical personnel or chaplains is available.

### **Additional Information**

#### ***Water***

If unapproved water, as found in many lakes, rivers, streams, and city water supplies must be used in an emergency, the water may be disinfected by:

- Adding calcium hypochlorite at 5.0 ppm for 30 minutes;
- Adding Chlor-Floc or iodine tablets according to label instructions;
- Heating water to a rolling boil for 5 to 10 minutes; or
- Adding 2 to 4 drops of ordinary chlorine bleach per quart of water and waiting 30 minutes before using it.

Either U.S. military preventive medicine or veterinary personnel should inspect bottled water supplies. Bottled water does not guarantee purity; direct sunlight on bottled water supplies may promote bacterial growth.

Water in canals, lakes, rivers, and streams is likely contaminated; unnecessary bathing, swimming, and wading should be avoided. If the tactical situation requires entering bodies of water, all exposed skin should be covered to protect from parasites. Following exposure, it is important to dry vigorously and change clothing.

## ***Rodents***

Rodents should not be tolerated in the unit area; they can spread serious illness. Diseases may be contracted through rodent bites or scratches, transmitted by insects carried on rodents (such as fleas, ticks, or mites), or by contamination of food from rodent nesting or feeding. Personnel can minimize the risk of disease caused by rodents by:

- Maintaining a high state of sanitation throughout the unit area;
- Sealing openings 1/4 inch or greater to prevent rodents from entering unit areas;
- Avoiding inhalation of dust when cleaning previously unoccupied areas (mist these areas with water prior to sweeping; when possible, disinfect area using 3 ounces of liquid bleach per 1 gallon of water).
- Promptly removing dead rodents. Personnel should use disposable gloves or plastic bags over the hands when handling any dead animal and place the dead rodent/animal into a plastic bag prior to disposal.
- Seeking immediate attention if bitten or scratched by a rodent or if experiencing difficulty breathing or flu-like symptoms.

## ***Insects***

Exposure to harmful insects, ticks, and other pests is a year-round, worldwide risk. The following protective measures reduce the risk of insect and tick bites:

- Use DoD-approved insect repellents properly;
- Apply DEET on all exposed skin;
- Apply permethrin on clothing and bed nets;
- Tuck bed net under bedding; use bed net pole;
- Avoid exposure to living or dead animals;
- Regularly check for ticks;
- Discourage pests by disposing of trash properly; eliminate food storage in living areas; and
- Cover exposed skin by keeping sleeves rolled down when possible, especially during peak periods of mosquito biting (dusk and dawn); keep undershirts tucked into pants; tuck pant legs into boots.

Uniforms correctly treated with permethrin, using either the aerosol spray-can method (reapply after sixth laundering) or with the Individual Dynamic Absorption (IDA) impregnation kit (good for 6 months or the life of the uniform) will help minimize risks posed by insects. The date of treatment should be labeled on the uniform.

Bed nets should be treated with permethrin for protection against biting insects using either the single aerosol spray can method (treating two bed nets) or the unit's 2-gallon sprayer. All personnel should sleep under mosquito nets, regardless of time of day, ensure netting is tucked under bedding, and use poles to prevent bed nets from draping on the skin.

### **DoD-approved insect repellents are:**

IDA KIT: NSN 6840-01-345-0237

Permethrin Aerosol Spray: NSN 6840-01-278-1336

DEET Insect Repellent: NSN 6840-01-284-3982

### **Hot Weather**

If heat is a threat in the area, personnel should:

- Stay hydrated by drinking water frequently;
- Follow work-rest cycles;
- Monitor others who may have heat-related problems;
- Wear uniforms properly;
- Use a sun block (SPF 15 or higher), sunglasses, and lip balm;
- During hot weather, wear natural fiber clothing (such as cotton) next to the skin for increased ventilation;
- Seek immediate medical attention for heat injuries such as cramps, exhaustion, or stroke. Heat injuries can also occur in cold weather;
- Avoid standing in direct sunlight for long periods; be prepared for sudden drops in temperature at night, and construct wind screens if necessary to avoid blowing dust or sand.

### **Sunscreens:**

Sunscreen lotion: NSN 6505-01-121-2336

Non-alcohol lotion base sunscreen: NSN 6505-01-267-1486

## WORK/REST TABLE

Heat Cat	WBGT Index (° F)	EASY WORK		MODERATE WORK		HARD WORK	
		Work / Rest	Water Intake (Qt/Hr)	Work / Rest	Water Intake (Qt/Hr)	Work / Rest	Water Intake (Qt/Hr)
1	78 – 81.9	NL	1/2	NL	3/4	40/20 min	3/4
2	82 – 84.9	NL	1/2	50/10 min	3/4	30/30 min	1
3	85 – 87.9	NL	3/4	40/20 min	3/4	30/30 min	1
4	88 – 89.9	NL	3/4	30/30 min	3/4	20/40 min	1
5	> 90	50/10 min	1	20/40 min	1	10/50 min	1

The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hours of work in the specific heat category. Individual water needs will vary +/- (plus/minus) 1/4 qt/hr. NL = no limit to work time per hour. Rest means minimal physical activity (sitting or standing) and should be done in shade if possible.

**Caution:** Hourly fluid intake should not exceed 1 ½ quarts. Daily intake should not exceed 12 quarts. Note: MOPP gear adds 10° to WBGT Index.

### ***Food***

High risk food items such as fresh eggs, unpasteurized dairy products, lettuce or other uncooked vegetables, and raw or undercooked meats should be avoided unless they are from U.S. military approved sources. Those who must consume unapproved foods should choose low risk foods such as bread and other baked goods, fruits that have thick peels (washed with safe water), and boiled foods such as rice and vegetables.

### ***Human Waste***

Military-approved latrines should be used when possible. If no latrines are available, personnel should bury all human waste in pits or trenches.

## Cold Weather

If cold weather injuries are a threat in the area, personnel should:

- Drink plenty of fluids, preferably water or other decaffeinated beverages;
- Closely monitor others who have had previous cold injuries;
- Use well-ventilated warming tents and hot liquids for relief from the cold. Watch for shivering and increase rations to the equivalent of four MREs per day;
- Not rest or sleep in tents or vehicles unless well ventilated; temperatures can drop drastically at night;
- Dress in layers, wear polypropylene long underwear, and use sunglasses, scarf, unscented lip balm, sunscreen, and skin moisturizers;
- Insulate themselves from the ground with tree boughs or sleeping mats and construct windscreens to avoid unnecessary heat loss; and
- Remember that loss of sensitivity in any body part requires immediate medical attention.

WIND SPEED		COOLING POWER OF WIND EXPRESSED AS "EQUIVALENT CHILL TEMPERATURE"																				
KNOTS	MPH	TEMPERATURE (°F)																				
		CALM	CALM	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
		EQUIVALENT CHILL TEMPERATURE																				
3 - 6	5	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60	-70
7 - 10	10	30	20	15	10	5	0	-10	-15	-20	-25	-35	-40	-45	-50	-60	-65	-70	-75	-80	-90	-95
11 - 15	15	25	15	10	0	-5	-10	-20	-25	-30	-40	-45	-50	-60	-65	-70	-80	-85	-90	-100	-105	-110
16 - 19	20	20	10	5	0	-10	-15	-25	-30	-35	-45	-50	-60	-65	-75	-80	-85	-95	-100	-110	-115	-120
20 - 23	25	15	10	0	-5	-15	-20	-30	-35	-45	-50	-60	-65	-75	-80	-90	-95	-105	-110	-120	-125	-135
24 - 28	30	10	5	0	-10	-20	-25	-30	-40	-50	-55	-65	-70	-80	-85	-95	-100	-110	-115	-125	-130	-140
29 - 32	35	10	5	-5	-10	-20	-30	-35	-40	-50	-60	-65	-75	-80	-90	-100	-105	-115	-120	-130	-135	-145
33 - 36	40	10	0	-5	-10	-20	-30	-35	-45	-55	-60	-70	-75	-85	-95	-100	-110	-115	-125	-130	-140	-150
Winds Above 40 MPH Have Little Additional Effect		LITTLE DANGER				INCREASING DANGER Flesh may freeze within 1 minute					GREAT DANGER Flesh may freeze within 30 seconds											

## First Aid

### *Basic Lifesaving*

Those caring for injured persons should immediately:

- Establish an open airway,
- Ensure the victim is breathing,
- Stop bleeding to support circulation,
- Prevent further disability,
- Place dressing over open wounds,
- Immobilize neck injuries,
- Splint obvious limb deformities, and
- Minimize further exposure to adverse weather.

## Injuries and Care

### *Shock*

- Symptoms:
  - Confusion
  - Cold, clammy skin
  - Sweating
  - Shallow, labored, and rapid breathing
  - Rapid pulse
- Treatment:
  - An open airway should be maintained.
  - Unconscious victims should be placed on their side.
  - Victims should be kept calm, warm, and comfortable.
  - Lower extremities should be elevated.
  - Medical attention should be sought as soon as possible.

## ***Abdominal Wound***

### ■ Treatment:

- ❑ Exposed organs should be covered with moist, clean dressing.
- ❑ Wound should be secured with bandages.
- ❑ Displaced organs should never be reintroduced to the body.

## ***Bleeding***

### ■ Treatment:

- ❑ Direct pressure with hand should be applied; a dressing should be used if available.
- ❑ Injured extremity should be elevated if no fractures are suspected.
- ❑ Pressure points may be used to control bleeding.
- ❑ Dressings should not be removed; additional dressings may be applied over old dressings.

### ■ Tourniquet:

- ❑ **NOTE: Tourniquets should only be used when an injury is life threatening.**
- ❑ A 1-inch band should be tied between the injury and the heart, 2 to 4 inches from the injury, to stop severe bleeding; wire or shoe strings should not be used.
- ❑ Band should be tight enough to stop bleeding and no tighter.
- ❑ Once the tourniquet is tied, it should not be loosened.
- ❑ The tourniquet should be left exposed for quick visual reference.
- ❑ The time that the tourniquet is tied and the letter “T” should be written on the casualty’s forehead.

## ***Eye Injury***

### Treatment:

- Embedded objects should not be removed; dressings should secure objects to prohibit movement.
- Bandages should be applied lightly to both eyes.
- Patients should be continuously attended.

## ***Chest Wound***

Symptoms:

- Sucking noise from chest
- Frothy red blood from wound

Treatment:

- Entry and exit wounds should be identified; wounds should be covered (aluminum foil, ID card).
- Three sides of the material covering the wound should be taped, leaving the bottom untaped.
- Victim should be positioned to facilitate easiest breathing.

## ***Fractures***

Symptoms:

- Deformity, bruising
- Tenderness
- Swelling and discoloration

Treatment:

- Fractured limb should not be straightened.
- Injury should be splinted with minimal movement of injured person.
- Joints above and below the injury should be splinted.
- If not in a chemical environment, remove clothing from injured area.
- Rings should be removed from fingers.
- Check pulse below injury to determine blood flow restrictions.

## ***Spinal, Neck, Head Injury***

Symptoms:

- Lack of feeling and/or control below neck

Treatment:

- Conscious victims should be cautioned to remain still.
- Airway should be checked without moving injured person's head.

- Victims who must be moved should be placed, without bending or rotating victim's head and neck, on a hard surface that would act as a litter (door, cut lumber).
- Head and neck should be immobilized.

## ***Heat Injuries***

### **Heat Cramps**

Symptoms:

- Spasms, usually in muscles or arms
- Results from strenuous work or exercise
- Loss of salt in the body
- Normal body temperature

### **Heat Exhaustion**

Symptoms:

- Cramps in abdomen or limbs
- Pale skin
- Dizziness, faintness, weakness
- Nausea or vomiting
- Profuse sweating or moist, cool skin
- Weak pulse
- Normal body temperature

### **Heat Stroke**

Symptoms:

- Headache, dizziness
- Red face/skin
- Hot, dry skin (no sweating)
- Strong, rapid pulse
- High body temperature (hot to touch)

Treatment:

- Victim should be treated for shock.
- Victim should be laid in a cool area with clothing loosened.
- Victim can be cooled by sprinkling with cool water or fanning (though not to the point of shivering).
- If conscious, victim may drink cool water (2 teaspoons of salt to one canteen may be added).
- Seek medical attention immediately; heat stroke can result in death.

## ***Burns***

Burns may be caused by heat (thermal), electricity, chemicals, or radiation. Treatment is based on depth, size, and severity (degree of burn). All burn victims should be treated for shock and seen by medical personnel.

### **Thermal/First Degree**

Symptoms:

- Skin reddens
- Painful

Treatment:

- Source of burn should be removed.
- Cool water should be applied to the affected area.

### **Thermal/Second Degree**

Symptoms:

- Skin reddens and blisters
- Very painful

Treatment:

- Source of burn should be removed.
- Cool water should be applied to the affected area.
- Blisters should not be broken.
- A dry dressing should cover the affected area.

## **Thermal/Third Degree**

Symptoms:

- Charred or whitish looking skin
- May burn to the bone
- Burned area not painful; surrounding area very painful

Treatment:

- Source of burn should be removed.
- Clothing that adheres to burned area should not be removed.
- A dry dressing should cover the affected area.

## **Electrical Burns**

Treatment:

- Power source must be off.
- Entry and exit wounds should be identified.
- Burned area should be treated in accordance with its severity.

## **Chemical Burns**

Treatment:

- Skin should be flushed with a large amount of water; eyes should be flushed for at least 20 minutes.
- Visible contaminants should be removed.
- Phosphorus burns should be covered with a wet dressing (prevents air from activating the phosphorous)

## ***Cold Injuries***

### **Hypothermia**

Symptoms:

- Body is cold under clothing
- Victim may appear confused or dead

Treatment:

- Victim should be moved to a warm place.
- Wet clothing should be removed; victim should be dressed in warm clothing or wrapped in a dry blanket.
- Body parts should not be rubbed.
- Victims must not consume alcoholic beverages.

### **Frostbite**

Symptoms:

- Skin appears white or waxy
- Skin is hard to the touch

Treatment:

- Victim should be moved to a warm place.
- Affected area should be warmed in 104 to 108° F (40° C) water for 15 to 30 minutes (NOT hot water).
- Affected area should be covered with several layers of clothing.
- Affected area must not be rubbed.
- Victim must seek medical attention.

## **Emergency Life-Saving Equipment**

Equipment may be improvised when necessary. Following is a list of possible uses for commonly found items.

Shirts = Dressings/Bandages

Belts, Ties = Tourniquets, Bandages

Towels, Sheets = Dressings/Bandages

Socks, Panty Hose, Flight cap = Dressings/Bandages

Sticks or Tree Limbs = Splints

Blankets = Litters, Splints

Field Jackets = Litters

BDU Shirts = Litters/Splints

Ponchos = Litters/Bandages

Rifle Sling = Bandages

M-16 Heat Guards = Splints



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## APPENDIX H: Individual Protective Measures

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### Security Threats

Individual protective measures are the conscious actions which people take to guard themselves against physical harm. These measures can involve simple acts such as locking your car and avoiding areas where crime is rampant. When physical protection measures are combined they form a personal security program, the object of which is to make yourself a harder target. The following checklists contain basic individual protective measures that, if understood and followed, may significantly reduce your vulnerability to the security threats overseas (foreign intelligence, security services, and terrorist organizations). If you are detained or taken hostage, following the measures listed in these checklists may influence or improve your treatment.

#### *Foreign Intelligence and Security Services*

- Avoid any actions or activities that are illegal, improper, or indiscreet.
- Guard your conversation and keep sensitive papers in your custody at all times.
- Take it for granted that you are under surveillance by both technical and physical means, including:
  - ❑ Communications monitoring (telephone, telex, mail, and radio)
  - ❑ Photography
  - ❑ Search
  - ❑ Eavesdropping in hotels, offices, and apartments
- Do not discuss sensitive matters:
  - ❑ On the telephone
  - ❑ In your room
  - ❑ In a car, particularly in front of an assigned driver

- Do not leave sensitive personal or business papers:
  - ❑ In your room
  - ❑ In the hotel safe
  - ❑ In a locked suitcase or briefcase
  - ❑ In unattended cars, offices, trains, or planes
  - ❑ Open to photography from the ceiling
  - ❑ In wastebaskets as drafts or doodles
- Do not try to defeat surveillance by trying to slip away from followers or by trying to locate “bugs” in your room. These actions will only generate more interest in you. If you feel you are under surveillance, act as naturally as possible, go to a safe location (your office, hotel, U.S. Embassy), and contact your superior.
- Avoid offers of sexual companionship. They may lead to a room raid, photography, and blackmail. Prostitutes in many countries report to the police, work for a criminal organization, or are sympathetic to insurgent or terrorist organizations; in other words, are anti-U.S. Others may be employed by an intelligence service.
- Be suspicious of casual acquaintances and quick friendships with local citizens in intelligence/terrorist threat countries. In many countries, people tend to stay away from foreigners and do not readily or easily make contact. Many who actively seek out friendships with Americans may do so as a result of government orders or for personal gain.

In your personal contacts, follow these guidelines:

- Do not attempt to keep up with your hosts in social drinking.
- Do not engage in black market activity for money or goods.
- Do not sell your possessions.
- Do not bring in or purchase illegal drugs.
- Do not bring in pornography.

- Do not bring in religious literature for distribution. (You may bring one Bible, Koran, or other religious material for your own personal use.)
- Do not seek out religious or political dissidents.
- Do not take ashtrays, towels, menus, glasses, or other mementos from hotels or restaurants.
- Do not accept packages, letters, etc., from local citizens for delivery to the U.S.
- Do not make political comments or engage in political activity.
- Do not be lured into clandestine meetings with would-be informants or defectors.
- Be careful about taking pictures. In some countries it is unwise to take photographs of scenes that could be used to make unfavorable comparisons between U.S. and local standards of living or other cultural differences. Avoid taking any photographs from moving buses, trains, or aircraft.

The following picture subjects are clearly prohibited in most countries where an intelligence or terrorist/insurgent threat is evident:

- Police or military installations and personnel
- Bridges
- Fortifications
- Railroad facilities
- Tunnels
- Elevated trains
- Border areas
- Industrial complexes
- Port complexes
- Airports

## *Detention*

Most intelligence and security services in threat countries detain persons for a wide range of real or imagined wrongs. The best advice, of course, is to do nothing that would give a foreign service the least reason to pick you up. If you are arrested or detained by host nation intelligence or security, however, remember the following:

- Always ask to contact the U.S. Embassy. You are entitled to do so under international diplomatic and consular agreements, to which most countries are signatories.
- Phrase your request appropriately. In Third World countries, however, making demands could lead to physical abuse.
- Do not admit to wrongdoing or sign anything. Part of the detention ritual in some threat countries is a written report you will be asked or told to sign. Decline to do so, and continue demanding to contact the Embassy or consulate.
- Do not agree to help your detainer. The foreign intelligence or security service may offer you the opportunity to help them in return for releasing you, foregoing prosecution, or not informing your employer or spouse of your indiscretion. If they will not take a simple no, delay a firm commitment by saying that you have to think it over.
- Report to your supervisor immediately. Once your supervisor is informed, the Embassy or consulate security officer needs to be informed. Depending on the circumstances and your status, the Embassy or consulate may have to provide you assistance in departing the country expeditiously.
- Report to your unit's security officer and your service's criminal investigative branch upon returning to the U.S. This is especially important if you were unable to report to the Embassy or consulate in country. Remember, you will not be able to outwit a foreign intelligence organization. Do not compound your error by betraying your country.

## *Foreign Terrorist Threat*

Terrorism may seem like mindless violence committed without logic or purpose, but it is not. Terrorists attack soft and undefended targets, both people and facilities, to gain political objectives they see as out of reach by less violent means. Many of today's terrorists view no one as innocent. Thus, injury and loss of life are justified as acceptable means to gain the notoriety generated by a violent act in order to support their cause.

Because of their distinctive dress, speech patterns, and outgoing personalities, Americans are often highly visible and easily recognized when they are abroad. The obvious association of U.S. military personnel with their government enhances their potential media and political worth as casualties or hostages. Other U.S. citizens are also at risk, including political figures, police, intelligence personnel, and VIPs (such as businessmen and celebrities).

Therefore, you must develop a comprehensive personal security program to safeguard yourself while traveling abroad. An awareness of the threat and the practice of security procedures like those advocated in crime prevention programs are adequate precautions for the majority of people. While total protection is impossible, basic common sense precautions such as an awareness of any local threat, elimination of predictable travel and lifestyle routines, and security consciousness at your quarters or work locations significantly reduce the probability of success of terrorist attacks.

To realistically evaluate your individual security program, you must understand how terrorists select and identify their victims. Terrorists generally classify targets in terms of accessibility, vulnerability, and political worth (symbolic nature). These perceptions may not be based on the person's actual position, but rather the image of wealth or importance they represent to the public. For each potential target, a risk versus gain assessment is conducted to determine if a terrorist can victimize a target without ramifications to the terrorist organization. It is during this

phase that the terrorist determines if a target is “hard or soft.” A hard target is someone who is aware of the threat of terrorism and adjusts his personal habits accordingly. Soft targets are oblivious to the threat and their surroundings, making an easy target.

Identification by name is another targeting method gathered from aircraft manifests, unit/duty rosters, public documents (Who’s Who or the Social Register), personnel files, discarded mail, or personal papers in trash. Many targets are selected based upon their easily identifiable symbols or trademarks, such as uniforms, luggage (seabags or duffle bags), blatant national symbols (currency, tatoos, and clothing), and decals and bumper stickers.

### *Travel Security*

Travel on temporary duty (TAD/TDY) abroad may require you to stay in commercial hotels. Being away from your home duty station requires increasing your security planning and awareness; this is especially important when choosing and checking into a hotel and during your residence there.

The recent experiences with airport bombings and airplane hijacking suggest some simple precautions:

- You should not travel on commercial aircraft outside the continental U.S. in uniform.
- Prior to traveling by commercial aircraft, you should screen your wallet and other personal items, removing any documents (that is, credit cards, club membership cards, etc.) which would reveal your military affiliation.

**NOTE:** Current USMC policy requires service members to wear two I.D. tags with metal necklaces when on official business. Also, the current I.D. card must be in possession at all times. These requirements include travel to or through terrorist areas. In view of these requirements, the service member must be prepared to remove and

conceal these and any other items which would identify them as military personnel in the event of a skyjacking.

- You should stay alert to any suspicious activity when traveling. Keep in mind that the less time spent in waiting areas and lobbies, the better. This means adjusting your schedule to reduce your wait at these locations.
- You should not discuss your military affiliation with anyone during your travels because it increases your chances of being singled out as a symbolic victim.
- In case of an incident, you should not confront a terrorist or present a threatening image. The lower profile you present, the less likely you will become a victim or bargaining chip for the terrorists, and your survivability increases.

### *Hostage Situation*

The probability of anyone becoming a hostage is very remote. However, as a member of the Armed Forces, you should always consider yourself a potential hostage or terrorist victim and reflect this in planning your affairs, both personal and professional. You should have an up-to-date will, provide next of kin with an appropriate power-of-attorney, and take measures to ensure your dependents' financial security if necessary. Experience has shown that concern for the welfare of family members is a source of great stress to kidnap victims.

Do not be depressed if negotiation efforts appear to be taking a long time. Remember, chance of survival actually increases with time. The physical and psychological stress while a hostage could seem overpowering, but the key to your well-being is to approach captivity as a mission. Maintaining emotional control, alertness, and introducing order into each day of captivity will ensure your success and survival with honor.

During interaction with captors, maintaining self respect and dignity can be keys to retaining status as a human being in the captor's eyes. Complying with instructions, avoiding provocative conversations (political,

religious, etc.), and establishing a positive relationship will increase survivability. Being polite and freely discussing insignificant and nonessential matters can reinforce this relationship. Under no circumstance should classified information be divulged. If forced to present terrorist demands to the media, make it clear that the demands are those of the captor and that the plea is not made on your behalf. You must remember that you are an American service member; conduct yourself with dignity and honor while maintaining your bearing.

Hostages sometimes are killed during rescue attempts; consequently, you should take measures to protect yourself during such an action. Drop to the floor immediately, remain still and avoiding any sudden movement; select a safe corner if it offers more security than the floor. Do not attempt to assist the rescuing forces but wait for instructions. After the rescue, do not make any comment to the media until you have been debriefed by appropriate U.S. authorities.

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## APPENDIX I: Dangerous Animals and Plants

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### Snakes

#### *Coral Snakes*

##### **Description:**

Coral snakes are prevalent throughout Brazil. Species types include (but are not limited to) the Guianan black backed coral, the Andean black-backed coral, the annellated coral, the black-headed coral, the painted coral, the



Brazilian coral, the slender coral, the southern coral, Hemprich's coral, the Caatinga coral, Langsdorff's coral, the aquatic coral, and the carib coral. Most corals have a body pattern that includes red and yellow rings on a black body, though some can have gray, white, or blue stripes, or can be solid black with few or no stripes. Corals are usually slender snakes, with a head that is often indistinct from the neck.

##### **Habitat:**

Coral snakes can be found from sea level up to elevations of more than 2,500 meters. Many species prefer a wet environment, and can be found along rivers and lakes, though many can be found in more arid regions. Mainly terrestrial, and is sometimes aquatic; some corals can remain under water for an extended period of time.

**Activity and****Behavioral Patterns:**

Coral snakes can be highly aggressive. Corals will defend themselves vigorously, and some have mouths large enough to bite through thick clothing.

**Venom's effects:**

Primarily neurotoxic, sometimes with monocrotalic toxins and postsynaptic effect. Venom is highly toxic, and fatalities have been reported.

***Caatinga Lancehead***

**No photograph available.**

**Description:**

Adult length from 0.4 to 0.8 meter; a moderately slender snake. Background color usually brown to red-brown with a series of pale edged, dark brown to black blotches that may form irregular bands. Head brown to red-brown, variably marked with darker spots dorsally.

**Habitat:**

Most commonly found in dry and semi-arid thorn forest and open rocky areas, but also reported from along river margins. May be found under thick vegetation. Found at elevations up to 2,000 meters.

**Activity and behavioral patterns:**

Reported to be responsible for many snakebites in its region.

**Venom's effects:**

Venom is primarily hemotoxic and cytotoxic; bite can result in systemic internal bleeding and local tissue destruction.

## *Urutu*

### **Description:**

Adult length is usually 1 to 1.7 meters; it is a relatively heavy-bodied snake. Background color is variable; it may be brown, tan, or gray, sometimes with an olive cast. Body usually



has a series of dark, C-shaped markings that are boldly outlined with pale or white scales.

### **Habitat:**

Found primarily in low-lying swampy areas, river banks, marshes, and other humid habitats at elevations of up to 700 meters. Also found in open fields and rocky areas of Argentina.

### **Activity and behavioral patterns:**

Terrestrial. Easily provoked; it can be aggressive, and will defend itself vigorously. Often lives close to civilized areas, and the majority of bites occur near household areas or in fields where people work.

### **Venom's effects:**

Primarily hemotoxic and cytotoxic; bite can cause systemic internal bleeding and local tissue destruction. It is the primary cause of snake-bites throughout its region, and most bites are to lower limbs. Although seldom fatal, bites often result in severe local damage.

## *Fonseca's lancehead*

**No photograph available.**

### **Description:**

Adult length 1 to 1.5 meters; a heavy-bodied snake. Background color tan to medium brown with a series of pale edged, black blotches that may form irregular bands. Sides have paired smaller dark blotches

beneath the lower margin of each large dorsal blotch. Head tan to medium brown, usually with an arrowhead-shaped darker marking.

**Habitat:**

Most commonly found in well-drained areas of the Atlantic forest zone at elevations up to 1,800 meters.

**Activity and behavioral patterns:**

Terrestrial.

***Two Striped Forest Pit Viper***

**Description:**

Adult length less than 1.0 meter; a slender snake with prehensile tail. Overall pale green to pale blue-green. Head speckled with black; body sometimes with variable blotches. Always has a longitudinal thin yellow line separating the lateral scales from the ventral.



**Habitat:**

Lowland rainforest, near waterways; elevations up to 2,650 meters.

**Activity and behavioral patterns:**

Arboreal, slow-moving.

**Venom's effects:**

Primarily hemotoxic. Bite has resulted in human deaths.

**Venom's effects:**

Venom is primarily hemotoxic and cytotoxic; bite can cause systemic internal bleeding and local tissue destruction.

***Serato Lancehead***

**No photograph available.**

**Description:**

Adult length 0.4 to 0.7 meter; relatively slender snake. Background color usually brown; body has a series of pale-edged, darker irregular bands. Head brown, usually with white markings above the eyes and near the base of the neck.

**Habitat:**

Primarily found in dry to semi-arid rocky regions at elevations of up to 300 meters. Commonly found in west central Piauí State.

**Activity and behavioral patterns:**

Terrestrial.

**Venom's effects:**

Venom is primarily hemotoxic and cytotoxic; bite can result in systemic internal bleeding and local tissue destruction.

***Lancehead*****Description:**

Adult length is usually 0.8 to 1 meter, with a maximum of 2 meters. A moderately heavy-bodied snake. Overall color and body patterns are extremely



variable, but most specimens have a dorsal body pattern consisting of a series of distinct, light-edged, dark crossbands or triangles that make a rectangular to trapezoidal pattern on each side of the body. The head lacks any distinct markings on the upper surface.

**Habitat:**

Found in lowlands drained by the Amazon River, at elevations of up to 1,300 meters. Prefers damp locations near creeks, lakes, or rivers; has also been found in cultivated areas and around human habitations, including weedy urban lots.

**Activity and behavioral patterns:**

Primarily terrestrial, but will climb at least 4 meters above the ground in vegetation. Nocturnal. Can usually be found near human habitation.

**Venom's effects:**

Has a potent venom that is primarily hemotoxic and cytotoxic; bite can result in systemic internal bleeding and local tissue destruction.

## *Speckled Forest Pit Viper*

### **Description:**

Adult length 1 to 1.5 meters; relatively slender snake with prehensile tail. Background color varies from purple gray to yellow green. Body pattern extremely variable, but nearly all specimens have prominent white blotches. Head usually has a spear-point-shaped dark marking extending from the eye to the corner of the mouth.



Head usually has a spear-point-shaped dark marking extending from the eye to the corner of the mouth.

### **Habitat:**

Found in lowland and foothill forests at elevations of up to 1,900 meters.

### **Activity and behavioral patterns:**

Arboreal; usually encountered in primary forest or forest edge areas, in vines and low vegetation. Difficult to see because of coloration.

### **Venom's effects:**

No specific data; however, the large size and long fangs of this snake make it potentially dangerous. Venom is primarily hemotoxic.

## *Jararaca*

### **Description:**

Adult length usually 0.8 to 1.6 meters; a relatively slender snake. Background color can vary from yellow or tan to nearly maroon (usually darker at the ends). The body pattern is extremely variable.



**Habitat:**

Most commonly found in open regions near vegetation cover at low to medium elevations.

**Activity and behavioral patterns:**

Terrestrial; abundant in many parts of its range.

**Venom's effects:**

There is little specific data available. Snake is reportedly a primary cause of bites in its region. Venom is considered primarily hemotoxic and cytotoxic; its bite can cause systemic internal bleeding and local tissue destruction.

***Golden Lancehead***

**No photograph available.**

**Description:**

Adult length is from 0.7 to 1 meter; moderately slender snake. Background color usually pale yellow-brown, sometimes with a series of dark irregular bands or large blotches. Head pale yellow-brown dorsally.

**Habitat:**

Found in scrub forest at elevations of up to 200 meters.

**Activity and behavioral patterns:**

Terrestrial.

**Venom's effects:**

Venom highly toxic. Venom is primarily hemotoxic and cytotoxic; bite can cause systemic internal bleeding and local tissue destruction.

***Sao Paulo Lancehead***

**No photograph available.**

**Description:**

Adult length is usually 0.3 to 0.5 meter; it is a relatively heavy snake. Background color is usually pale or dark brown with red, pink, or orange overtones. It usually has a series of white-edged, dark, narrow, transversely oval blotches that are narrowly separated both dorsally and

laterally. The top of the head is usually pale or dark brown with red, pink, or orange overtones; the sides of the snout are usually white to very pale tan.

**Habitat:**

Primarily found in open fields and bushy areas at elevations of up to 1,500 meters.

**Activity and behavioral patterns:**

Terrestrial.

**Venom's effects:**

There is little specific data available. The snake is reportedly a primary cause of bites in its region. Venom is considered primarily hemotoxic and cytotoxic; the bite can cause systemic internal bleeding and local tissue destruction.

***Jararacussu***

**Description:**

Adult length 1 to 2.2 meters; a heavy-bodied snake. Background color and patterns are extremely variable -- can vary from tan or yellow to nearly black.



Pattern of dark and pale scales results in prominent, inverted pale V-shaped markings along the upper sides.

**Habitat:**

Found at elevations of up to 700 meters in a wide variety of habitats, including tropical rainforest, tropical semideciduous forest, broadleaf evergreen forest, and parana pine forest. Also found in swampy, low-lying areas, and along river banks.

**Activity and behavioral patterns:**

Terrestrial, nocturnal.

**Venom's effects:**

Snake has an exceptionally large venom capacity, and is a primary cause of snakebite in its region. Venom is primarily hemotoxic and cytotoxic; bite can cause systemic internal bleeding and local tissue destruction.

***Small-eyed  
Lancehead*****Description:**

Adult length is usually 0.4 to 0.7 meter, maximum of 1.4 meters. A slightly stocky snake. Background color is usually brown to tan to gray, with alternating light and dark,



roughly triangular to trapezoidal lateral blotches that often meet dorsally to form irregular bands. The top of the head lacks any distinct markings. A relatively dull-colored snake.

**Habitat:**

Most commonly found in lower mountain area wet forest and cloud forest at elevations of up to 1,300 meters.

**Activity and behavioral patterns:**

No specific data available.

**Venom's effects:**

No specific data. Lancehead venom is usually hemotoxic and cytotoxic; bite can cause systemic internal bleeding and local tissue destruction.

***Cotiara***

**No photograph available.**

**Description:**

Adult length usually 0.7 to 1.0 meters; a moderately heavy-bodied snake. Background color is usually tan to pale olive brown; body usu-

ally has a series of large, pale-edged darker brown rounded trapezoidal to triangular blotches on either side of its body; has a series of similar but smaller blotches laterally. Head usually has a dark brown spear-shaped marking on the upper surface.

**Habitat:**

Most common in humid, temperate Araucaria (monkey-puzzle) forest and associated savanna at elevations of up to 1,800 meters.

**Activity and behavioral patterns:**

No specific data available.

**Venom's effects:**

Venom is considered primarily hemotoxic and cytotoxic; bite can cause systemic internal bleeding and local tissue destruction.

***Neuwied's Lancehead***

**Description:**

Adult length 0.6 to 0.7 meter, maximum of 1.2 meters. A slender snake. Background color and pattern are extremely variable, not only among the 12 recognized subspecies, but within individual populations. No general description could characterize this species.



**Habitat:**

Most commonly found in dry or semiarid, rocky regions at elevations of up to 600 meters; some inhabit humid or marshy regions.

**Activity and behavioral patterns:**

Terrestrial. Can be aggressive and will defend itself.

**Venom's effects:**

Hemotoxic and cytotoxic; venom produces extensive tissue destruction. Necrosis can be expected in 10 to 15 percent and abscesses in 15 to 20 percent of all cases. Incoagulable blood and bleeding occur in majority of cases. Major cause of snakebite in southern South America.

***Brazil's Lancehead*****Description:**

Adult length usually 0.7 to 0.9 meter; can exceed 1.4 meters. A moderately stout snake. Background color varies from coppery brown to pale gray; body usually has pale-bordered, darker blotches that may form irregular bands. Upper surface of the head usually a uni-



form pink-tan to pink-gray. This species is reported to be greatly feared by Amerindians in southern Colombia.

**Habitat:**

Most commonly found in Amazonian primary forests at elevations of up to 500 meters; also seems to prefer humid, leaf-litter habitat.

**Activity and behavioral patterns:**

Nocturnal; can be aggressive and will strike if disturbed.

**Venom's effects:**

There is little specific data; venom is primarily hemotoxic and cytotoxic. Bite can result in systemic internal bleeding and local tissue destruction.

### ***White-tailed Lancehead***

**No photograph available.**

#### **Description:**

Adult length is usually 0.6 to 1 meter; a moderately slender snake. Background colors vary from tan to red-brown, usually with a variable pattern of darker and paler markings that cause the appearance of diagonal, dorsolateral pale lines. Although known as the white-tailed lancehead, the snake's tail is usually white only in juveniles.

#### **Habitat:**

Associated with remnants of Atlantic forest in valleys. Also found in deforested agricultural areas at elevations of up to 400 meters.

#### **Activity and behavioral patterns:**

No data available.

#### **Venom's effects:**

Snake is reportedly a primary cause of bites in its region. Venom is considered primarily hemotoxic and cytotoxic; bite can cause systemic internal bleeding and local tissue destruction.

### ***Prado's Lancehead***

**No photograph available.**

#### **Description:**

Adult length is usually 0.6 to 0.9 meter; it is a moderately slender snake. Background color is usually gray-brown, with a series of dark, dorsolateral trapezoidal marks that have distinct, paler margins. There is a pair of similar, but smaller dark marks beneath the lower margin of each dorsolateral mark.

#### **Habitat:**

Found in the Atlantic rainforest, tropical deciduous forest, and humid rocky valleys in deforested areas at elevations of up to 300 meters.

#### **Activity and behavioral pattern:**

No specific data available.

**Venom's effects:**

A dangerous species that has caused human deaths. Venom is primarily hemotoxic and cytotoxic; bite can result in systemic internal bleeding and local tissue destruction.

***Marajo Lancehead***

**No photograph available.**

**Description:**

Adult length is usually from 1 to 1.5 meters; a moderately heavy-bodied snake. Background color is usually olive brown; the body has a series of prominent trapezoidal markings laterally, formed by pairs of vertically aligned pale marks and rounded black blotches.

**Habitat:**

Usually found in lowland savanna.

**Activity and behavioral patterns:**

No specific data.

**Venom's effects:**

Lancehead venom is usually hemotoxic and cytotoxic; bite can cause systemic internal bleeding and local tissue destruction.

***Amazonian Hog-nosed  
Pit Viper*****Description:**

Adult length is 0.4 to 0.5 meter; maximum of 0.8 meter. A moderately stout pit viper with an upturned snout. A darker body color alternates with patches of paler scales, often resulting in a banded appearance; the bands become more contrasting toward the tail.

**Habitat:**

Rainforest or very humid tropical forest, usually near water, in leaf litter on elevated ground. Found at elevations of up to 1,000 meters.

**Activity and behavioral patterns:**

When disturbed, adults tend to move about vigorously, but appear reluctant to strike.

**Venom's effects:**

Little specific data. Venom is predominantly hemotoxic with necrotic (tissue-destroying) factors. Most species have relatively low venom yield, and bite usually has mild to moderately severe effects. There are no specific antivenins manufactured.

***Neotropical  
Rattlesnake*****Description:**

Adult length 1 to 1.8 meters. Is a relatively stout rattlesnake with a prominent spinal ridge along the body, most evident on the front part of the body. Background color and body



pattern are extremely variable; however, in nearly all specimens, the dark blotches on the body are extended rearward into prominent stripes.

**Habitat:**

Primarily found in semiarid regions and drier areas of more humid environments. Not found in rainforest. Most often found at elevations of less than 700 meters, but has been found at elevations up to 1,000 meters in Costa Rica, 2,000 meters in Mexico and Colombia, 2,300 meters in Peru, and 2,800 meters in Venezuela.

**Activity and behavioral patterns:**

Most active during twilight and early morning hours. Will move away from humans if allowed, but will assume a defensive coil and strike if cornered or startled.

**Venom's effects:**

Reportedly the most dangerous snake in the region. Has both hemotoxic and neurotoxic components that vary among the subspecies. Primarily hemotoxic in Mexican and Central American races, the venom of South American species has myotoxic and neurotoxic components; bites have a relatively high fatality rate. Local tissue damage and swelling is minimal, but the myotoxic component causes extensive muscle necrosis.

***Piraja's Lancehead***

**No photograph available.**

**Description:**

Adult length from 0.5 to 1.1 meters; moderately stocky snake. Background color brown-yellow to yellow-gray. Black markings shaped like inverted "Y" or irregular squares may alternate or oppose one another, sometimes joining middorsally to form a wavy black stripe. Overall appearance similar to the jararacussu or Brazilian lancehead.

**Habitat:**

Rare. Found mainly in cocoa groves, in Atlantic lowland wet forest and lower montane wet forests.

**Activity and behavioral pattern:**

No specific data available.

**Venom's effects:**

A dangerous species that has caused human deaths. Venom is primarily hemotoxic and cytotoxic; bite can result in systemic internal bleeding and local tissue destruction.

***Bushmaster*****Description:**

Adult length 2.0 to 3.6 meters; longest venomous snake in the Americas. Prominent ridge along the backbone, especially noticeable on the front half of the body. Background color usually red-brown, yellow-tan, or pink-tan. Dorsal body pattern usually a series of dark brown to black

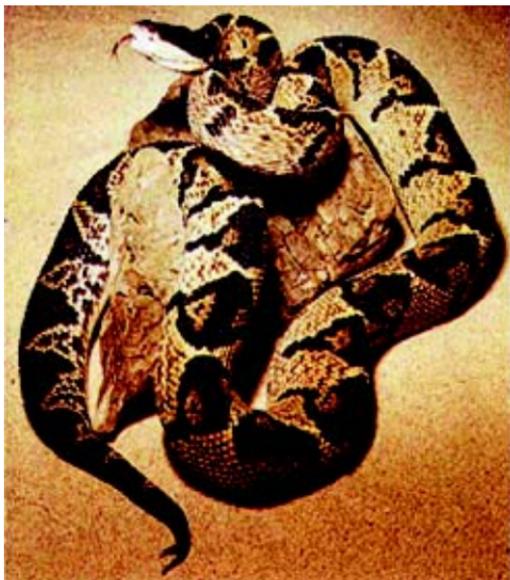
diamond-shaped blotches. The head is broadly rounded, and is usually tan, brown, or black on top.

**Habitat:**

Found primarily in wet forested areas, though it may be found along rivers in drier regions. Often found near large, buttressed trees or fallen logs. Found at elevations of up to at least 1,800 meters.

**Activity and behavioral patterns:**

Active from dusk to dawn, when it is most likely to respond quickly to disturbance (often inflating neck and vibrating tail rapidly). It is highly aggressive when disturbed.



**Venom's effects:**

Symptoms include intense pain, swelling, and necrosis (tissue death, often extensive) around the bite site, sometimes followed by gangrene. Even when antivenin is used, bites can be fatal.

**Arthropods**

***Scorpions***

Several scorpions in the region are capable of inflicting a painful sting, and there are four species that are known to be life threatening.



## ***Spiders***

Although there are several spider species found in the region that are capable of inflicting a painful bite, including some very large and physically imposing tarantulas, only the following are known to be life-threatening: the black widow spider, the recluse spider, the bola or pruning spider, and the huntsman spider.



## ***Insects***

Brazil has several species of venomous moths, including puss caterpillars and multiple species of giant silkworm moths; contact with the silkworm moths has



caused fatalities. Adults (moths) and larvae (caterpillars) of most of these species have venomous spines or venomous hairs. Usually, the caterpillars are very hairy, and are nearly unrecognizable as caterpillars. They often have long, silky hairs that completely cover the shorter venomous spines, or have prominent clumps of stiff, venomous spines. Some, but not all, are brightly colored.

The paederus is a small (usually 4 to 7 millimeters), slender rove beetle that does not look like a typical beetle. It has very short wing covers that expose most of its flexible abdomen. When crushed, its body fluid contains an agent that will blister skin on contact. The lesions take a week to heal, and the area remains painful for two weeks. The substance is extremely irritating if it contacts the eyes, and temporary blindness has been reported.

## ***Centipedes***

Although area centipedes are capable of inflicting a painful bite, none are known to be life-threatening.

## ***Millipedes***

Millipedes do not bite, and in general are harmless to humans.

However, when handled, some larger millipedes, which may be more than 50 millimeters long, secrete a noxious fluid that can cause severe blistering upon contact. Some species can squirt this fluid at least 2 feet.



## **Plants**

### ***Agave***

#### **Other names:**

Century plant,  
agave, maguey.

#### **Mechanisms of toxicity:**

American species are not edible; some contain saponins, oxalic acid, and others calcium oxalate crystals called raphides. Sap is irritating.



#### **Comments:**

Many species; widely cultivated. There are 650 species in tropical and subtropical regions. A thick-stemmed plants with confusing taxonomy. Leaves are long and narrow with spiny edges. Used for cultured ornamentals, medicinals, mexal (a type of brandy), pulque (a fermented beverage), a fiber source for paper-making, and as a food source. Often cooked in tortillas; the heart (bud) is edible.

## *Panama Tree*

### **Other names:**

Castano, tartarum.

### **Mechanisms of toxicity:**

Seeds are edible, but the pods have internal stiff bristles that can easily penetrate skin, causing intense irritation.

### **Comments:**

There are 200 tropical species.



## *Cashew*

### **Mechanisms of toxicity:**

The red or yellow fruit has a shell containing a brown, oily juice that will blister skin on contact, and will cause severe gastroenteritis on ingestion. Oils are used to mark skin for tribal rituals. Fumes from the roasting process are irritating to the eyes and face. Tar from the bark causes blistering, and is used to make poison arrows.



### **Comments:**

The toxin is removed in a heating process before the nuts are released. Yellow-to-purple fruit is edible.

## ***Blistering Ammania***

**No photograph available.**

### **Mechanisms of toxicity:**

Found mostly in wet places; has an extremely acrid sap that causes intense pain and blistering on contact with skin

### **Comments:**

Often confused with loosestrife plants in the primrose family.

## ***Indian laurel***

### **Other names:**

Mastwood, domba oil, pinnay oil.

### **Mechanisms of toxicity:**

Cream-colored, resinous sap is irritating to the skin and eyes. Round fruit contains one large, poisonous seed. The sap is toxic, and the leaves contain cyanide and a saponin.



### **Comments:**

An upright, dense, low-branched tree with leathery smooth leaves (to 15 centimeters) and white flowers with 4 petals. Originally from India and the Pacific islands. Seeds are dispersed by bats and by sea.

## ***Crownflower***

### **Other Name:**

Milkweed.

### **Mechanisms of toxicity:**

Sap is extremely irritating to the eyes; also causes an allergic type contact vesicant skin reaction. The active prin-



ciples include calcium oxalate, a proteolytic enzyme, digitalis-like glycosides, and an unidentified allergen.

**Comments:**

Poisonings have resulted in fatality. The flowers are candied by Chinese in Java. In Africa, the plant has been used to make arrow poison, and the roots have been used as chew-sticks.

***African Teak***

**Other names:**

Osage Orange,  
fustic, bow wood.

**Mechanisms  
of toxicity:**

Benzophenones, xanthonenes, stilbenes, flavonoids, and tannins are known to the genus. Has a milky, bitter sap, and yields an orange dye that causes dermatitis.



**Comments:**

There are different 12 species found in tropical America, in South Africa, and in Madagascar.

***Guaio***

**Mechanisms of toxicity:**

Several species cause contact dermatitis. A member of the Anacardiaceae family with allergy-causing properties similar to its relatives, marking nut tree, poison ivy, and cashew.



**Comments:**

There are 20 tropical American species of shrubs or small trees with long-leaf stems and few or no branches. Leaves are often spiny and clustered at the ends of the branches; flowers are small and green.

***Croton*****Other names:**

Ciega-vista, purging croton.

**Mechanisms of toxicity:**

Contact with the toxic resin causes long-lasting vesicular dermatitis. Croton oil, (a “phorbol”) in leaves, stems and seeds, has cathartic and purgative toxic properties.



It causes severe gastroenteritis, even death; 20 drops are potentially lethal, and the oil will blister the skin on contact. Many species are covered with hundreds of sticky hairs that cling to the skin if contacted. Contact with the eyes can be very serious.

**Comments:**

Croton is a woolly-haired annual herb, evergreen bush, or small tree with smooth, ash-colored bark, yellow-green leaves, small flowers, and fruit.

***Pigeonberry*****Other name:**

Golden dewdrop.

**Mechanisms of toxicity:**

The roots contain dioscorine (an alkaloid), diosgenin (a steroidal saponin), and diosbulbine (a diterpene lactone). Berries and leaves have a saponin



that causes sleepiness, fever, and seizures; child deaths have been recorded. Contact with skin can cause dermatitis.

**Comments:**

Plant is a tree or shrub with many yellow to orange round juicy fruits with few seeds. Small flowers are light blue or white. Native to tropical America. Grown as an ornamental shrub in tropical and subtropical areas of the world.

***Cowitch cherry***

**Mechanism of toxicity:**

Genus is found in tropical America, especially in the Caribbean. Can be a tree or a shrub, and can sometimes have stinging hairs.

**Comments:**

With careful handling, many parts can be cooked and eaten.



***Velvet Bean***

**Other names:**

Cowitch, cowhage, pica-pica, ox eye bean, horse-eye bean.

**Mechanisms of toxicity:**

Many of the species' pods and flowers are covered with irritant hairs with proteolytic enzymes. Can be dangerous if the hairs become embedded in the eye. Beans tend to be foul tasting, even after thorough boiling, so there is little danger of ingestion.



**Comments:**

Many species are widely naturalized.

***Spurge Laurel*****Other names:**

February daphne,  
merezon, mezereon.

**Mechanisms of toxicity:**

The bark, leaves, and fruit contain toxic agents. The entire plant is toxic. The resin is acrid; it has been used as a pepper substitute, with fatal consequences. Contact with skin causes vesicular dermatitis; extract has been used by beggars to induce skin lesions to arouse pity.

**Comments:**

A very dangerous ornamental. Has been used as a folk remedy for many symptoms, including dropsy, neuralgia, and snakebite.

***Jimsonweed*****Other names:**

Thorn-apple, stinkweed,  
Devil's trumpet.

**Mechanisms of toxicity:**

Entire plant is toxic due to tropane alkaloids. Fragrance from the flowers may cause respiratory irritation, and the sap can



cause contact dermatitis. People have been poisoned through consumption of crushed seeds accidentally included in flour, as well as through

attempts to experience the hallucinogenic high. Can kill. In particular, jimsonweed has a quickly fatal potential.

**Comments:**

Called Jamestown weed after the mass poisoning of soldiers who were sent to quell Bacon's Rebellion in 1666, and who ate the seeds during a severe food shortage. Often confused with Angel's Trumpet.

***Angel's trumpet***

**Mechanisms of toxicity:**

Can kill. Tropane alkaloids are the toxic principle. People have been poisoned through consumption of crushed seeds that were accidentally included in flour.

**Comments:**

Used by Indians to worm hunting dogs, and as a plant to prevent insects from destroying other cultivated plants. Has been added to beer in west Africa to make the drink more potent.



***Mole Plant***

**Other names:**

Caper spurge, Mexican fire plant, milkweed, red spurge, poison spurge, mala mujer, cypress spurge, cat's milk, wart-wort, sun spurge, candelabra cactus, Indian spurge tree, milkweed, pencil tree, pencil cactus, rubber euphorbia.



**Mechanisms of toxicity:**

Plant is usually an herb, often with colored or milky sap, containing complex terpenes that are irritating to the eyes, mouth, and gastrointestinal tract. Many species cause dermatitis by direct contact. In some cases, rain water dripping from the plant will contain enough toxic principle to cause dermatitis and keratoconjunctivitis; toxins can blind. Some species have urticating hairs; skin contact breaks off ends and toxic chemicals are injected. The caper spurge has killed those who mistook the fruit for capers. The Mexican fire plant was known for having medicinal properties in the first century, and has killed children. Red spurge causes dermatitis. The pencil cactus has an abundant, white, acrid sap extremely irritating to the skin; has caused temporary blindness when accidentally splashed in the eyes, and has killed as a result of severe gastroenteritis after ingestion.

**Comments:**

There are 2,000 species of extremely variable form. Plants may appear as herbs, shrubs, or trees, and many are cactus-like. Fruit is usually a capsule opening in three parts, each one seeded; sometimes a drupe.

***Sandbox Tree*****Other names:**

Huru, bombardier.

**Mechanisms of toxicity:**

Toxins include hurin and huratoxin. Hurin is a plant lecithin and inhibits protein synthesis in the intestinal wall. Symptoms appear after several hours, and include nausea, vomiting, and diarrhea. Huratoxin is presumed to be the irritating agent in the sap, which causes dermatitis and keratoconjunctivitis. Used as a fish poison.



**Comments:**

A tree that grows to 60 feet; bears a woody fruit resembling a small pumpkin. When dry, the fruit pod explodes with considerable force and makes a popping sound. Dangerous to handle when dry.

**Strychnine****Other names:**

Nuxvomica tree, Snakewood tree.

**Mechanisms of toxicity:**

Entire plant, including the seeds, contains the indole alkaloid strychnine, which can kill.

**Comments:**

Genus of 190 different species of trees, shrubs and vines with berry-like fruits, found in most tropical regions. Some are thought to have edible fruit despite dangerous seeds. Is a source of curare obtained by stripping and chewing its bark. Curare, now used as a muscle relaxant, was formerly used as an arrow poison by indigenous South American.

**Physic Nut****Other names:**

Purging nut, pinon, tempate, Barbados nut.

**Mechanisms of toxicity:**

Quickly fatal potential. Fruit has two or three black, oily, pleasant tasting, poisonous seeds that contain a plant lecithin (a toxalbumin called curcin) which, in contrast to many of the toxic lecithins, causes rapid toxicity. Has caused death; severe toxicity can follow ingestion of a single seed. Roots and leaves are also toxic. Has intensely



cathartic oils that have caused fatal intoxication; some have used the oil for lamps, etc. Bark has been used as a fish poison. Also a skin irritant (hairs), as are all euphorbs.

**Comments:**

There are 170 species of warm and tropical northern American trees or shrubs, usually with red flowers. Naturalized worldwide. Fruit is a three-sided capsule in many species.

***Shanshi***

**Mechanisms of toxicity:**

Has hallucinogenic effects; has caused death.

**Comments:**

This is a group of deciduous shrubs or small trees with red, yellow or purple/black berry-like fruit. Has five one-seeded nutlets.



Bark is used for tanning, and crushed fruit is used as a fly poison. Has been used in folk remedies.

***Castor Oil Plant***

**Other Name:**

Castorbean.

**Mechanisms of toxicity:**

Used to make a feed supplement. Highly toxic; serious poisonings have been caused by toxins, which include a leci-



thin, and some low-molecular weight glycoproteins with allergenic

activity. Factors making this a high-risk plant threat are its attractive nuts with a hazelnut-like taste; the highly toxic ricin present in high concentration (2-6 seeds can be fatal); and the stability of ricin in the presence of gastric enzymes. The seeds are used to make necklaces, a process which requires boring a hole through the seed, and breaking the otherwise impermeable coat; this allows the toxin to reach the skin and enter the body through minor abrasions. Poisoning becomes evident after several hours.

**Comments:**

The seeds of this plant have been found in Egyptian graves dating as far back as 4,000 B.C. Has been cultivated worldwide for 6,000 years for producing castor oil.

***Dalechampia***

**No photograph available.**

**Mechanisms of toxicity:**

Some species have stinging glands that cause irritant dermatitis.

**Comments:**

A member of the Euphorbeacea family. Common in Mexico.

***White Snake Root***

**Other names:**

Fall poison, richwood.

**Mechanisms of toxicity:**

Entire plant is extremely toxic with tremetol (a highly toxic complex alcohol) and several glycosides. "Milk sickness" results from drinking milk from a cow that has eaten the plant. Symptoms have slow onset (less than 24 hours), and include nausea, vomiting, tremors, jaundice, anuria, and prostration. Has



killed; was a major cause of deaths in the early 1800s. Causes liver and kidney degeneration.

**Comments:**

Plant is a perennial herb found on roadsides, fields, open woods, and pastures. There are many similar, white-flowered species, and it requires expertise to identify them. Modern milk-processing eliminates danger from consuming milk.

***Jaborandi Plant***

**No photograph available.**

**Mechanisms of toxicity:**

There are 22 tropical American species containing alkaloids (mainly pilocarpine), that cause miosis, increased salivation, diaphoresis, bronchospasm (increased airway resistance, bronchial smooth muscle tone, and increased secretions), pulmonary edema, cardiovascular instability, and increased intraocular pressure.

**Comments:**

None.

***Trumpet Plant***

**Other name:**

Chalice vine.

**Mechanisms of toxicity:**

The entire plant is toxic, with tropane alkaloids.

**Comments:**

Plant is a climbing or upright woody vine with large, prominent yellow or cream-yellow flowers in a trumpet shape. Fruit is a fleshy elongated berry. Source of sacred hallucinogens in Mexico.



## *Pokeweed*

### **Other names:**

Pokeberry, poke salet.

### **Mechanisms of toxicity:**

Mature stems, roots, and berries are poison; the saponins are mostly in foliage and roots. Fatality possible when plant is not prepared properly.



### **Comments:**

Young shoot tips, less than 6 inches, are eaten in many cultures, including Canada; requires proper preparation, to include boiling with water changes; water contains toxic substances that kills snails that carry bilharzia. Dye from berries used to color ink, wine, and sweets.

## *Nettle Tree*

### **Other names:**

Ortiga brava, pringamoza.

### **Mechanisms of toxicity:**

Plant is a tree or shrub with powerful stinging hairs. Intensity of the sting is species-variable. The bushy, tree-like varieties tend to be more irritating. Any contact



between leaves or branches and skin can result in profound burning pain that can last for more than 24 hours. There is no permanent damage.

### **Comments:**

There are 35 native species in tropical and southern Africa, and in tropical America. Often used as hedges or in local medicinals.

## *Tapioca*

### **Other names:**

Manioc, cassava, yuca.

### **Mechanisms of toxicity:**

Plant toxin breaks down in heat. Bitter or sweet casava can be distinguished only by taste. Bitter casava is toxic if eaten raw. Boiling with several changes of water eliminates the toxic principle; requires special preparation.



### **Comments:**

Genus includes 100 species of trees, shrubs, and herbs in tropical and warm Americas. Used as food source. Same subfamily as Croton. Shrubby tree 3 to 5 feet high. Widely cultivated. Roots rich in starch.

## *Rattlepod*

### **Other names:**

Rattlebox, rattleweed, chillagoe, horse poison.

### **Mechanisms of toxicity:**

Contains pyrrolizidine alkaloids (monocrotaline, heliotrine, retrorsine); can kill. Low-level ingestion can cause lung damage; high levels will damage the liver. Some species have caused toxicity through the contamination of flour or when incorporated into teas.



### **Comments:**

Fruits are inflated dehiscent pods with parchment-like walls; ripe seeds come loose within the pods and

rattle when shaken. Flowers are pea-like. Found in open woods, roadsides, margins, sandy soils, and fields.

### ***Stinging Nettle***

#### **Other names:**

Roman nettle, Roman nettle, dog or small nettle.

#### **Mechanisms of toxicity:**

Brushing against the plant shears off a protective cap from specialized stinging hairs that puncture the skin. After puncture, an irritant liquid is released that can contain several pro-inflammatory mediators, including alkaloids, histamine, acetylcholine, and 5 hydroxytryptamine. These substances are what cause the immediate reaction after a nettle sting. Symptoms of toxicity usually do not involve a hyper-

sensitivity reaction. Stinging can persist at the site of the sting for more than 12 hours after clinical features of urticaria have disappeared. This persistence of symptoms is due to a secondary release of inflammatory mediators, or the persistence of implanted hairs.

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#### **Comments:**

This is a genus of 30 species that are usually perennial, single-stalked herbs less than 0.3 meter (1 foot) in height. Found mainly in northern temperate areas. The tender tips are used as a leafy vegetable in some locales; simmering in water renders the stingers ineffective.



## *Chinaberry*

### **Other names:**

White cedar, African lilac, bead tree

### **Mechanisms of toxicity:**

Round, yellow berry with three to five smooth, black seeds. Has a resin; all parts have a saponin, triterpene neurotoxins,

and a gastrointestinal irritant of uncertain chemical nature. Widely varying genetic variable toxicity. Has killed adults.

### **Comments:**

Widely cultivated.



## *Bulb Yam*

### **Other Name:**

Air potato, wild yam.

### **Mechanisms of toxicity:**

Bulb yam, air potato, and wild yam have tubers that contain diosgenin, a steroidal saponin, the alkaloid dioscorine, and a norditerpene lactone (diosbulbine). These and a number of other yams are poisonous when eaten raw. Causes gastroenteritis; symptoms include nausea and



bloody diarrhea. Some people eat these yams after special preparation. Plant has been used to commit murder. Found mainly in the lowlands.

**Comments:**

A prickly climber with a cluster of tubers just below the soil surface. Considered the chief “famine-food” of the tropical east. Poisonous unless properly prepared. Other species of this genus are good to eat with no special preparation, such as gao yam and buck yam.

***Black Nightshade***

**Other names:**

Deadly/common/white-edged nightshade, horse nettle, bitter-sweet, Jerusalem cherry, nipple fruit, quena, wild tomato, apple of Sodom.



**Mechanisms of toxicity:**

Fruit of Jerusalem cherry is a black berry. Fully ripe berries can be eaten; unripe berries contain solanine alkaloids, which can cause gastroenteritis, weakness, and circulatory depression. Can kill.

**Comments:**

There are 2,000 species of herbs, vines, and shrubs covered with small star-shaped hairs. Has white, yellow, or blue flowers. Berries have dry or juicy pulp and several seeds.

***Peppertree***

**Other names:**

Peruvian mastic tree, Brazilian peppertree, Christmas berry, Florida Holly.

**Mechanisms of toxicity:**

Contains urushiol triterpene. Severe dermatitis, facial swell-



ing, and keratoconjunctivitis have been caused by volatile resin contacting skin or eyes; simply cutting branches can produce enough resin to cause toxicity. Used for medicinal purposes and as an additive in pepper. Very strong gastrointestinal irritant.

**Comments:**

Has been used as a treatment for skin disorders (e.g. warts). Many children have been poisoned from eating the fruits.

***Heliotrope***

**Other names:**

Cherry pie, scorpion's tail, Indian heliotrope.

**Mechanisms of toxicity:**

Contains pyrrolizidine alkaloids. Cause of large epidemics in Afghanistan and India of illness following ingestion of bread made with flour contaminated with members of this genus. The pathologic effects (Budd-Chiari syndrome) take weeks to months; causes fatality after many years. Chronic copper poisoning has been associated with this plant.



**Comments:**

There are 250 trees and shrubs with worldwide distribution.

## *Popcorn Tree*

### **Other names:**

Chinese tallow tree; hinchahuevos

### **Mechanisms of toxicity:**

The latex is poison, and has been used as arrow poison in Central America; causes contact dermatitis. Unripe berries can cause nausea and vomiting.



### **Comments:**

Native to China and Japan but cultivated widely in warm areas. The fruit is a three-lobed capsule that falls away, leaving white seeds.

## *Scarlet Wisteria*

### **Other names:**

Corkwood tree, bagpod, purple sesbane, false poinciana, rattlebush.

### **Mechanisms of toxicity:**

All parts poisonous; most poisonings from use in teas. Causes Budd-Chiari syndrome. Seeds contain saponins.



Up to 24 hours after ingestion, nausea

and vomiting occur, with abdominal pain, abnormal accumulation of serous fluid in abdominal cavity, abnormal enlargement of spleen, severe diarrhea, hemolysis (red blood cell destruction), respiratory failure, and death.

### **Comments:**

Shrub or small tree with drooping, red-orange flowers in clusters; June through September. Fruit is a legume. Native to South America.

## *Yellow Oleander*

### **Other names:**

Peruviana, lucky nut, be-still tree.

### **Mechanisms of toxicity:**

Contains cardiac glycosides in all parts; seeds have particularly high concentrations. Symptoms of toxicity include numbness and burning in the mouth, dry throat, dilated pupils, abdominal pain, nausea, vomiting, diarrhea, slow irregular heartbeat, hypertension, seizures, coma, and death. The sap can cause skin and eye irritation.



### **Comments:**

Shrub to 1 meter, or a small tree to 10 meters. Native to tropical America; has been imported to other tropical regions. Flowers yellow with pink tinge, or white, pink, and cream. Has been used to commit murder.

## APPENDIX J:

### International Telephone Codes

#### International Telephone Codes

Algeria	213	Malta	356
Australia	61	Mexico	52
Austria	43	Morocco	212
Bahrain	973	Netherlands	31
Belgium	32	Nigeria	234
Brazil	55	New Zealand	64
Canada	1	Norway	47
China	86	Oman	968
Cyprus	357	Philippines	63
Denmark	45	Portugal	351
Djibouti	253	Qatar	974
Egypt	20	Republic of Korea	82
Ethiopia	251	Saudi Arabia	966
Finland	358	Senegal	221
France	33	Seychelles	248
Gabon	241	Singapore	65
Germany	49	Somalia	252
Greece	30	South Africa	27
Hawaii	1	Spain	34
Hong Kong	852	Sweden	46
Indonesia	62	Switzerland	41
Iran	98	Syria	963
Iraq	964	Taiwan	886
Ireland	353	Tanzania	255
Israel	972	Thailand	66
Ivory Coast	225	Tunisia	216
Japan	81	Turkey	90
Jordan	962	UAE	971
Kenya	254	United Kingdom	44
Kuwait	965	United States	1
Libya	218	Yemen	967
Madagascar	261	Zambia	260
Malaysia	60	Zimbabwe	263
AT&T (public phones)	0072-911 or 0030-911	On-base	550-HOME or 550-2USA

















