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Iran

May 1973

NATIONAL INTELLIGENCE SURVEY

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Military Geography

NATIONAL INTELLIGENCE SURVEY PUBLICATIONS

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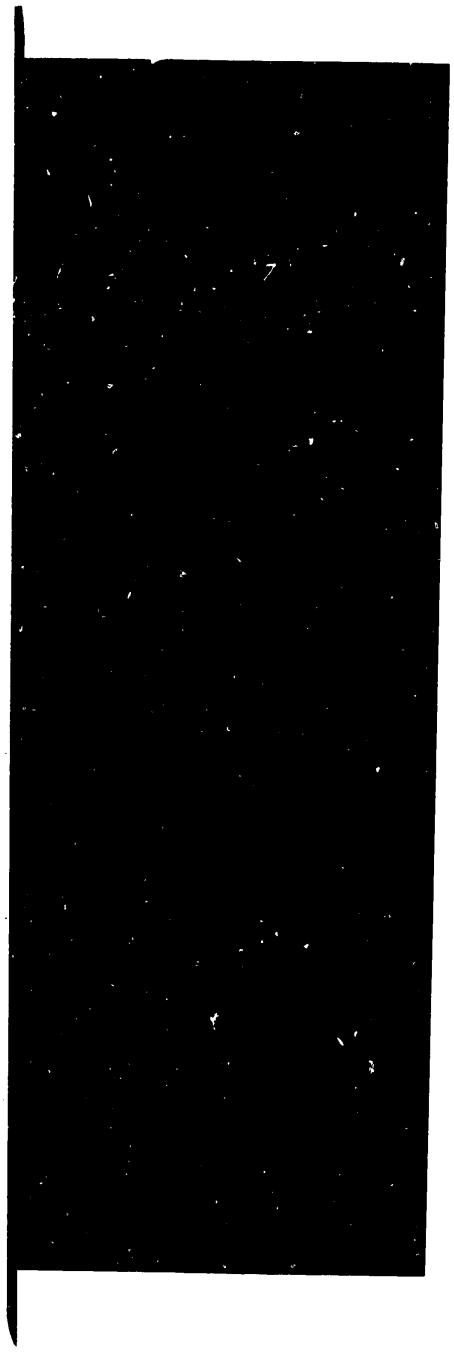
APPROVED FOR RELEASE: 2009/06/16: CIA-RDP01-00707R000200070044-0

This chapter was prepared for the NIS by the Defense Intelligence Agency. Research was substantially completed by January 1973.



Iran

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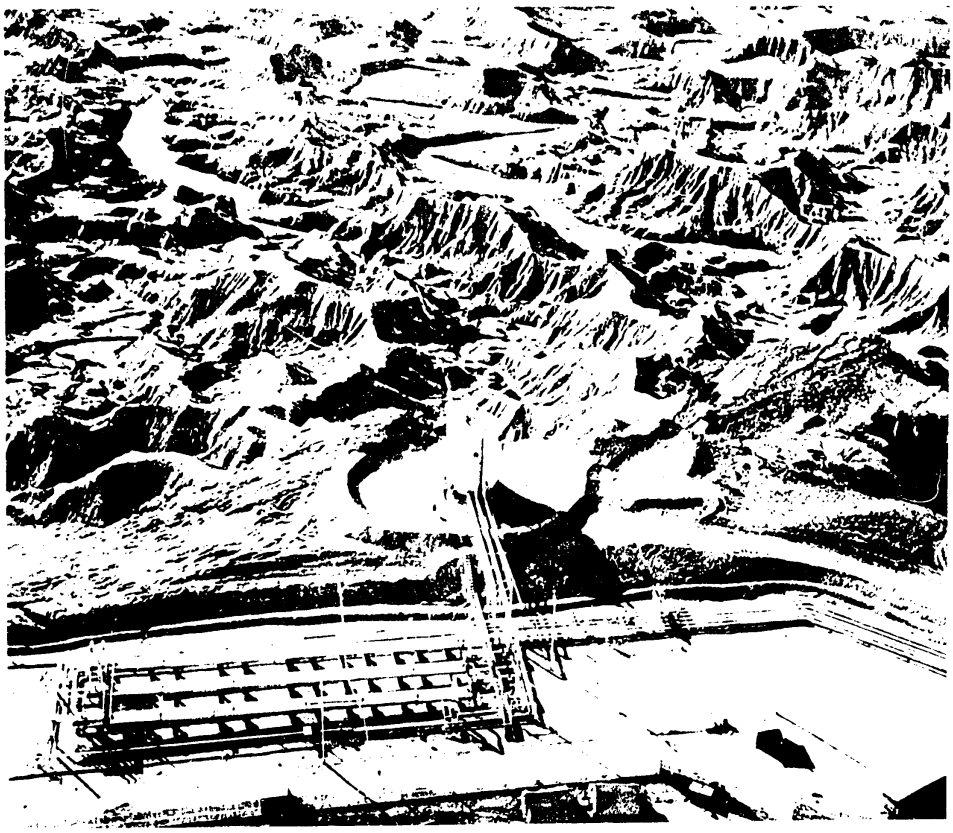

Military Geography

A. Location and description (U/OU)

Iran, one of the largest oil-producing countries in the world, is located in the highlands of southwest Asia between the Caspian Sea and the Persian Gulf. From the northern border of Iran, it is only about 90 nautical miles to the Caspian seaport of Baku and less than 1,500 nautical miles to Moscow and many of the large industrial centers of the Ukraine and southern Urals. From the southwestern border of Iran, it is less than 200 nautical miles to the major oilfields of Iraq and the Persian Gulf, and from the western border, it is about 1,500 nautical miles to the Turkish straits and the Suez Canal. With the British withdrawal from the Persian Gulf, Iran is determined to restore its historic position of supremacy in this oil-rich region.

The country has an area of about 636,000 square miles, about one-fifth the size of the United States. It has a northwest-southeast extent of about 1,400 miles,[1] and an east-west extent of about 900 miles (Figure 23, the map at the end of the chapter). The population of Iran is about 30,805,000.

1. Topography

Iran consists of rugged hills and mountains that form a wide rimland nearly enclosing an interior area of plains, hills, and mountains; discontinuous low plains along the northern and southern coasts fringe the Caspian Sea and Persian Gulf (Figure 1).

The interior section of the country is a sparsely populated area of desert plains and highlands (Figure 2). The plains are between about 650 and 5,000 feet above sea level and have flat to gently rolling surfaces. Intermittent streams carry the small amount of runoff inland to low-lying areas, where salt lakes are formed; the lakes vary in size according to the amount of rainfall. During dry periods, the salt lake beds have a firm crusty surface underlain by miry soil. Some dunes and unstable sand are located in many parts of the plains. For the most part, the plains are barren; some desert scrub and tufts of grass can be found in areas in the north and southeast, usually adjacent to the highlands; grass, trees, and crops are common only in the northwest (Figure 3). Some crops are also grown around settlements that have irrigation facilities in the southeast. The interior highlands rise abruptly from the plains and have steep rocky slopes and rugged crests which stand 2,500 to 8,000 feet above the surrounding lowlands. Broadleaf deciduous forests, desert scrub, or tufts of grass cover most slopes, but some slopes are barren. In parts of the northwest and southeast, grass and crops are on the lower slopes of the mountains. The growing season is generally between April and October. The few scattered rural settlements in the interior plains and highlands are located along the periphery and are usually composed of one-story mudbrick buildings. They are interconnected by a few earth and gravel roads. In urban centers, some buildings have two or three stories and courtyards.

The mountain rimland, which comprises about one-half of Iran, is composed of high rugged mountains, narrow valleys, and a few areas of plains (Figure 4). The mountain crests—3,500 to 13,000 feet above adjacent valley bottoms—are usually at least 6,000 feet above sea level, and reach over 18,000 feet in the Elburz Mountains in the northwest. In the few hill areas, irregular to rounded crests are between 1,000 to 1,600 feet above the adjacent lowlands. Extensive deciduous broadleaf forests cover the northern part of the Zagros Mountains and the northward-facing slopes of the Elburz Mountains (Figure 5); other slopes are either barren or have small areas of forest, brush, grass, or crops. Some fairly extensive grasslands are in the Zagros Mountains. Included in the mountain rimland are small areas of plains, mostly scattered throughout the mountains of the east, that have flat to dissected surfaces; some of these plains have small areas of unstable sand or steep-sided dunes. Desert scrub and tufts of grass cover most parts of these plains, but some forests, brush, or crops can occur. The growing season is generally from April to October. In the north and west, a few deeply incised perennial

[1] Distances are in statute miles unless nautical miles are specifically indicated.

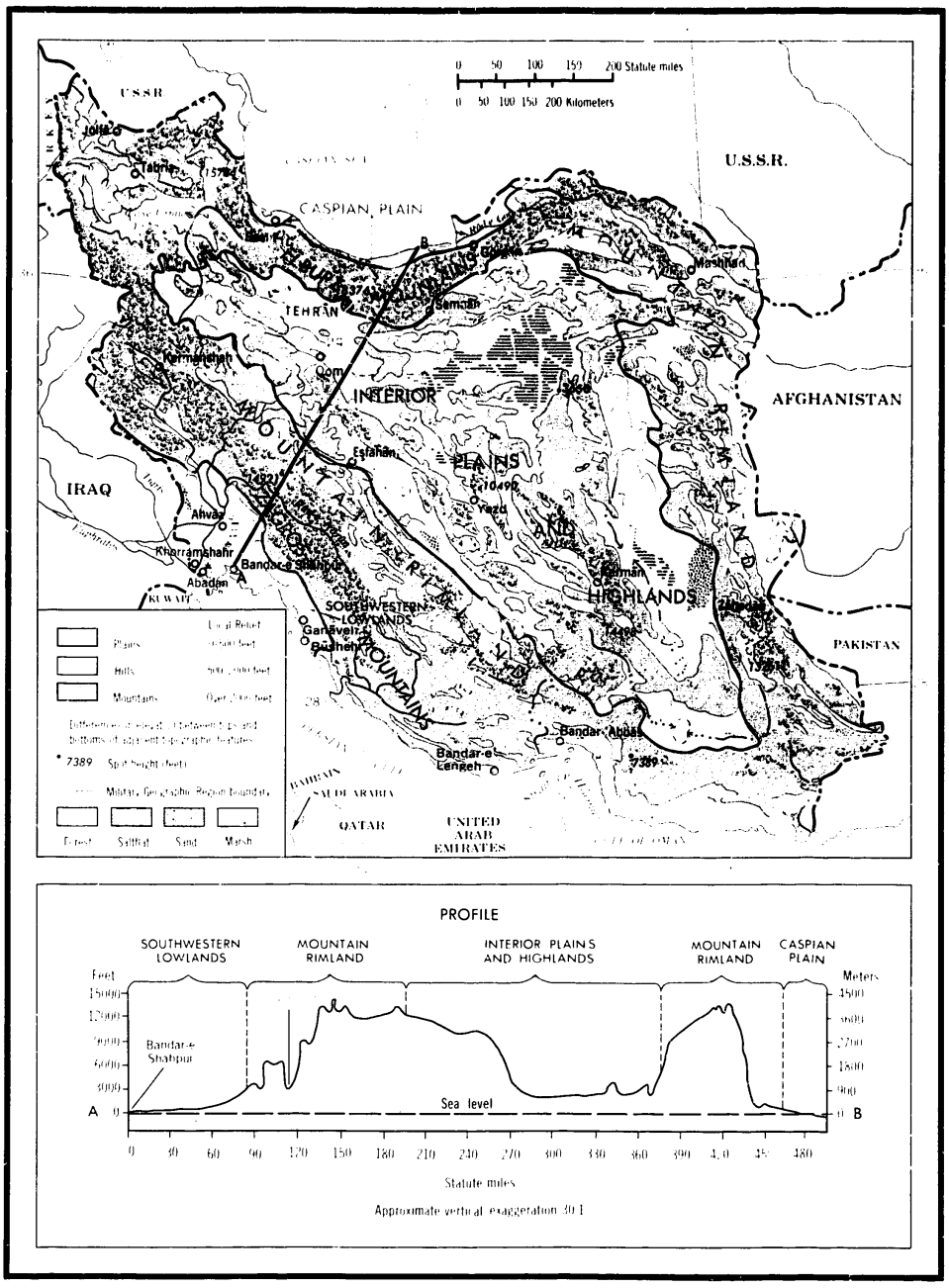

FIGURE 1. Military geographic regions and terrain (C)

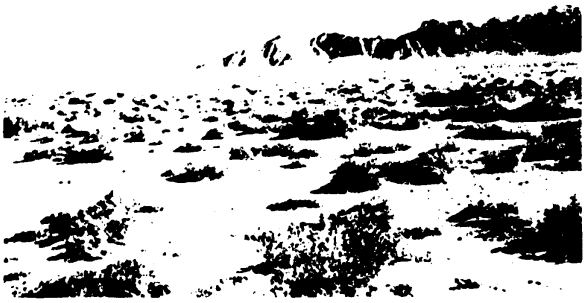

FIGURE 2. Flat desert plains separated by dissected highlands compose most of central Iran (U/OU)

streams flow in narrow, intensively cultivated valleys (Figure 6). Numerous steep-banked intermittent streams drain into the perennial streams during the period from early December to April. Most towns and transportation facilities of the mountain rimland are located in the north and west. Buildings are usually one story, and constructed of mudbrick, brick, or masonry, with courtyards; some buildings in larger cities have two or three stories. The few main roads are bituminous or gravel, and the narrow connecting roads are earth or gravel.

A narrow flat plain edges the coast of the Caspian Sea and extends along the Rud-e Gorgan[2] into the U.S.S.R. Vegetation consists of shrubs, sparse grass, crops, and, adjacent to watercourses, a few trees (Figures 7 and 8). There are several perennial streams, most of which have low banks, and many small shallow irrigation ditches. Flooding occurs sporadically during April, May, September, and October. Several minor fishing ports and trading centers along the Caspian coast are interconnected by a surfaced road that roughly parallels the coast and connected with the scattered rural villages by a sparse network of mostly earth or gravel roads. Buildings are generally one story and are built of mudbrick, brick, or masonry in the small urban centers and mudbrick or wood and grass in the rural areas.

The Khuzestan plains in the southwest are an extension of the eastern part of the Tigris-Euphrates basin of southeastern Iraq. The plains are flat to rolling and are covered by small areas of loose sand, cultivated crops, and desert grass (Figure 9). Several large perennial streams dissect the plains and flow southward into the Persian Gulf. Low areas are

[2]For diacritics on place names see the list of names on the apron of the Terrain and Transportation map, the map itself, and the maps in the text.

FIGURE 3. Cultivated areas in central Iran are small and in the vicinity of towns, such as this area near Esfahan (U/OU)

FIGURE 4. In the southern Zagros Mountains, ridge crests are barren rock, but lower slopes are covered by shrubs and grass (U OU)

inundated or miry from early March through May. This includes large marshes, mudflats, and areas of tall grass and reeds found along the lower reaches of streams and along the Gulf coast (Figure 10). Grains, palms, citrus, tea, and cotton are grown in areas where the deep stable soil is not subject to inundation. Most of the major oilfield of Iran are located in this area and are interconnected with processing and storage facilities by several aboveground pipelines. A fairly extensive system of bituminous- and gravel-surfaced roads and several railroads connect the large urban centers. Most buildings are one story, constructed of mudbrick, brick, or masonry, and have courtyards; a few buildings have two or three stories.

FIGURE 5. Dense forests cover the northward-facing slopes of the Elburz Mountains (U/OU)

2. Climate

Most of Iran has an arid or semiarid climate with marked seasonal extremes of temperature (Figure 11). Winters (December through February) are characterized by a variety of constantly changing air masses associated with passing migratory lows and frontal systems. Summers (June through August) are monotonously sunny, dry, and hot almost everywhere. Topographical features strongly influence all aspects of the climate, causing variation according to location.

Winter temperatures are cold throughout much of the northern and central regions of the country. Mean daily maximums reach the upper 30's (°F.) to the 50's, but the temperatures cool substantially to mean minimums in the teens to the middle 30's; nighttime frosts are common. At the highest elevations, temperatures usually remain below freezing all winter and some minimums register well below zero. In the south, however, the average daily temperatures in winter warm to maximums in the 60's and 70's and cool to minimums in the 40's and 50's. The intense heat of summer, in contrast, makes Iran one of the hottest countries in the world during this season. The afternoon heat is most intense on the Khuzestan plains at the head of the Persian Gulf, where daily maximum temperatures exceed 110°F. throughout most of the summer. Afternoon temperatures reach above 90°F. almost daily in the rest of the country except along the Caspian Sea and at the highest elevations. Summer nights are very warm in the south but are more comfortable elsewhere. The most humid parts of Iran are the coastal regions along the Caspian Sea and Gulf of Oman. These areas are especially uncomfortable during summer, when the high temperatures and humidity create a very oppressive condition. In the interior, relative humidity is moderately high during winter but is very low on summer afternoons, somewhat mitigating the effects of the intense heat.

Considerable precipitation falls on parts of the Caspian littoral and adjacent mountain slopes, particularly in the western sections where mean

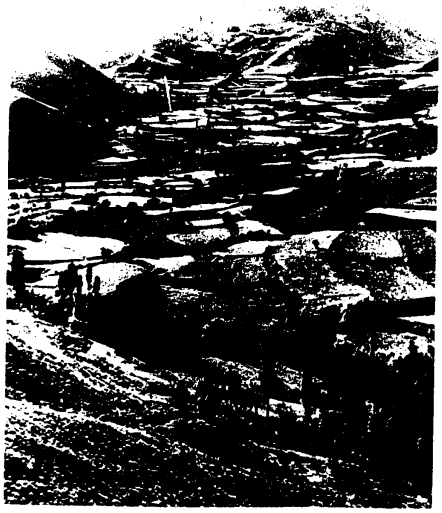

FIGURE 6. Cultivated valley in the northwest (C)

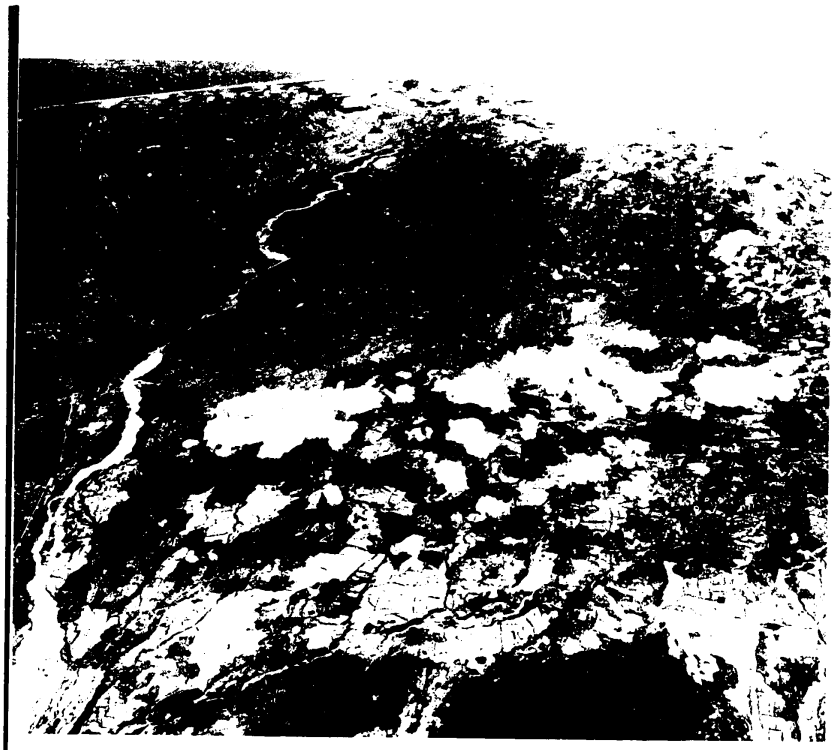

FIGURE 7. Forests and crops are intermixed on the coastal lowland bordering the Caspian Sea. Water for the cultivated fields comes from streams and irrigation canals. (U/OU)

FIGURE 8. Ricefield and elevated storage building on the Caspian coastal plain (U/OU)

FIGURE 9. Khuzestan plains of the southwest, showing a sparse cover of salt-tolerant desert grass (U/OU)

FIGURE 10. Area of the Khuzestan plains subject to intermittent inundation (U/OU)

annual amounts exceed 45 inches. Most of the rest of the country receives scanty precipitation except for a few mountain areas in the west and north. The extensive interior basins and the lowlands along the Gulf of Oman are the most arid, averaging less than 5 inches of precipitation annually. Most of the annual precipitation occurs in autumn through early spring on the Caspian littoral and during winter and spring in the rest of Iran. Monthly amounts during these periods of maximum precipitation are around 1 to 4 inches except at some Caspian locations in autumn, when monthly means exceed 7 or 10 inches. Summers, on the other hand, are almost rainless throughout much of the country. The most prominent exception is on the Caspian littoral, where summer rainfall amounts average 1 to 3 inches monthly. Snowfall is most frequent in the northern portion of the country, particularly in the Elburz and western Zagros Mountains where heavy winter snowfalls may accumulate to a depth of several feet on the highest slopes and passes. Thunderstorms are infrequent all year in most sections; the area of greatest activity is in northwestern Iran in April through June, when thunderstorms can occur on 2 to 4 days per month. The seasonal patterns of cloudiness are similar to those of precipitation. Winter and most of spring are the cloudiest periods in most sections; autumn is also quite cloudy on the Caspian littoral. Mean monthly cloudiness during these periods ranges between about 40% and 80% in the north to between about 20% and 50% in the south. Summers are almost cloudless everywhere and the sun shines intensely for weeks at a time. The exception is along the eastern portions of the Gulf of Oman, where weak monsoonal intrusions make summer the cloudiest part of the year.

Visibility is generally good all year in most sections, only occasionally falling below 2½ miles. The primary restrictions are fog, precipitation, and low clouds in autumn through spring, and sand, dust, haze, and mirage in summer. Surface winds are strongly influenced by the topography and adjacent large bodies of water. As a result, mountain and valley winds and land and sea breezes are common. Diurnal variations in direction and speed are marked. The strongest winds occur generally during the afternoons, particularly in summer, and the winds decrease during the night.

B. Military geographic regions (C)

There are four military geographic regions—Interior Plains and Highlands, Mountain Rimland, Caspian Plain, and Southwestern Lowlands (Figure 1). The combination of environmental conditions within each region would have a uniform effect on military operations, but there would be marked differences between adjacent regions.

1. Interior Plains and Highlands

This region is composed of desert plains and highlands. The predominantly barren plains are characterized by salt lakes, sand dunes and sandy areas, and some desert scrub and grass. The steep, rocky highlands are covered by desert scrub and grass but are occasionally barren.

The region is generally unsuited for ground operations. Cross-country movement in the plains would be restricted by loose sand, sand dunes, and miry salt flats to the scattered areas with flat, stable surfaces; in the mountains and hills, movement would be precluded by steep slopes and rugged surfaces. The earth and gravel roads would deteriorate rapidly under

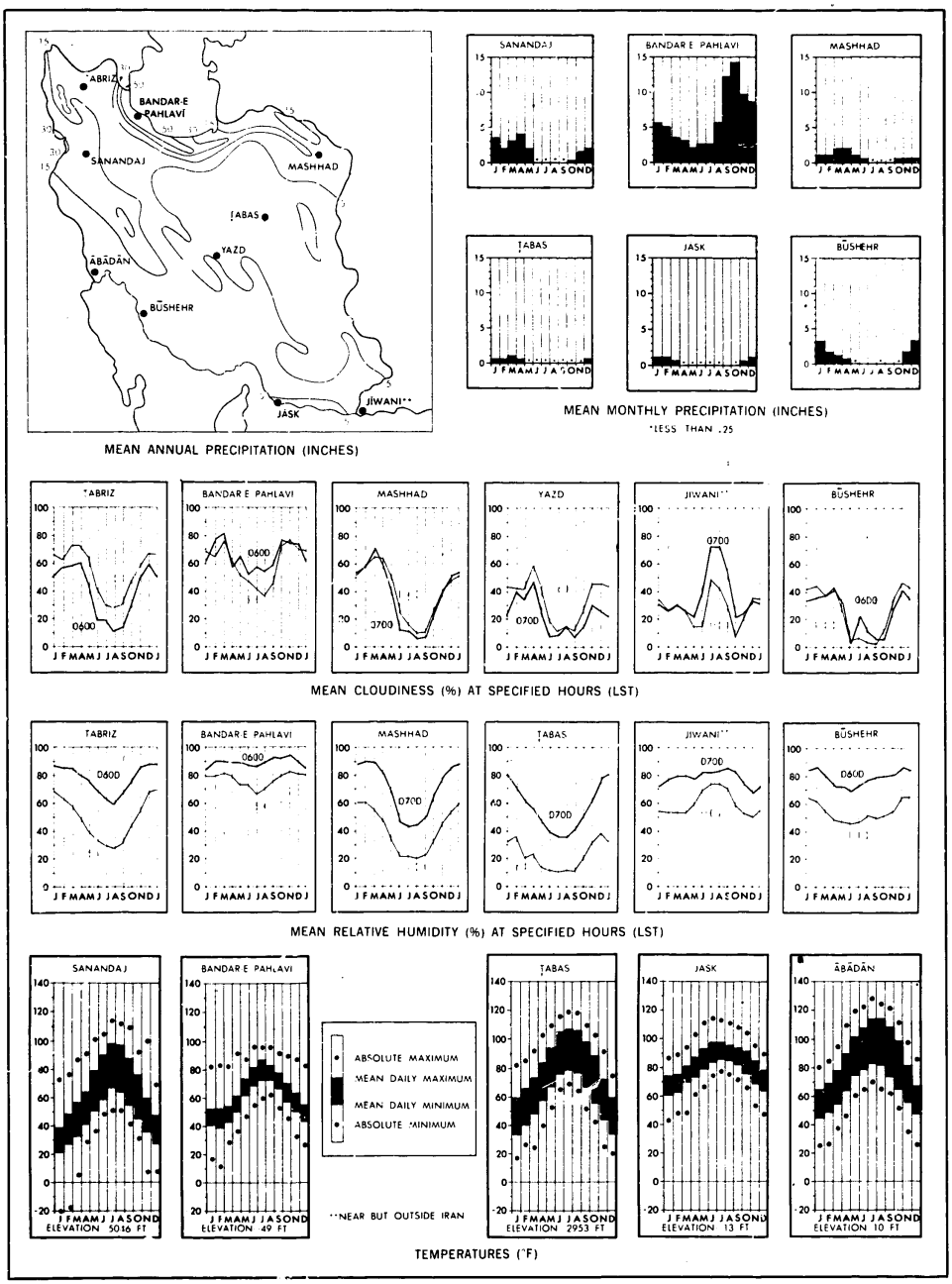

FIGURE 11. Precipitation, cloudiness, relative humidity, and temperatures (U/OU)

sustained use, and dispersal from the roads would be limited by unstable ground surfaces in the plains and by steep slopes in the mountains and hills. Road construction would be difficult in the plains because of unstable soil, occasional duststorms, and the lack of adequate water resources; construction would be nearly precluded in the hills and mountains by steep slopes. In most parts of the region, concealment from ground observation and cover from flat-trajectory fire would be available from the hills and mountains or from sand dunes. There is little or no concealment from air observation. Sites suitable for the construction of bunker-type installations are located throughout the plains except in areas of salt flats or sand dunes. Sites suitable for the construction of tunnel-type installations are numerous in the hills and mountains, although access to the sites would be limited by the steep slopes.

Conditions are generally unfavorable for airborne and airmobile operations. Sites are restricted for drop zones, helicopter landings, and assault-type aircraft landings to the flat stable surfaces of the plains. A few airfields located along the western and southern edges of the region provide additional sites for landing assault-type aircraft. Airfield construction would be hindered in the highlands by steep slopes and restricted approaches; and in the plains by salt flats, sand dunes, unstable soils, and—to the southeast—by blowing sand. Only flat, stable surfaces on the plains would be suitable for airfield construction. Water is scarce throughout the plains.

Conditions are generally unfavorable for irregular force operations. Concealment from ground observation and cover from flat-trajectory fire would be provided in the highlands by rugged terrain and on the plains by high sand dunes, but there is almost no concealment from air observation. Cross-country movement for foot troops in the plains would be moderately restricted because of salt flats and sand dunes. Movement on the steep slopes of the highlands would be difficult. Very little natural food, water, or shelter materials are available, although small amounts of water and cultivated food may be available in the small villages, particularly in the northwest. Supplies could be airdropped on the plains, except in areas of salt flats and dunes, but sites are few in the highlands.

2. Mountain Rimland

This region is chiefly composed of steep rugged mountains and hills dissected by deep narrow valleys. Small areas of flat to dissected plains are located throughout the region, but most are in the east. Slopes are usually covered by extensive areas of forest, although many have scrub and grass or are barren.

Conditions are generally unfavorable for conventional ground operations. In the hills and mountains, cross-country movement and dispersal from the roads by tracked and wheeled vehicles would be limited to narrow valley floors (Figure 12). Movement on the small plains areas would be easy except in the north and west between December and April, when swollen streams, wet ground, or occasionally deep snow would hamper movement. On-road movement would be fair on the few bituminous-surfaced roads, but hampered by the earth or gravel roads, which would deteriorate rapidly under sustained use (Figure 13). Most of the few surfaced roads are poorly maintained and have many short radius turns, low-capacity bridges, and steep grades. Road construction in mountain and hill areas would be nearly precluded by steep slopes; major construction problems include severely restricted alignments and, in the forested areas, extensive clearing. Roads could be built with relative ease on the small plains, but construction would be hampered from December through April by flooding, wet ground, and occasionally deep snow in the north and west. Cover from flat-trajectory fire and concealment from ground observation would be provided in the greater part of the region by rugged terrain. Concealment from ground and air observation would be provided by the dense broadleaf deciduous forests on the northern slopes of the Elburz Mountains, and by bushy trees and shrubs in the northwest and in the Zagros Mountains from April through October. Elsewhere, concealment primarily would be lacking. Sites suitable for the construction of bunker-type installations are available only in the deep soil of the plains, except in the north and west from December through April when flooding occurs. During this period occasionally deep snow would hamper construction, particularly in the Elburz and western Zagros Mountains. Sites suitable for the construction of tunnel-type installations are numerous in the hills and mountains; however, access to the sites would be hampered by steep slopes.

The Mountain Rimland Region is generally unsuited for airborne and airmobile operations. Parachute drop zones and helicopter landing areas are available only in the few flat, grassy or barren areas, but would be precluded elsewhere. The landing of assault-type aircraft would be limited to the few small airfields located near the major urban areas, which are mainly in the west. Airfield construction in the hills and mountains would be nearly precluded by the steep slopes of the rugged terrain. A few sites for

FIGURE 12. River valley in the western Zagros Mountains (U/OU)

FIGURE 13. Road through shrub-covered hills north of Shiraz (U/OU)

airfields are available in the flat plains areas, although the orientation of runways and approaches would be restricted by the adjacent high mountains and hills.

The southern coast of the region, including the offshore islands, is generally unsuited for large-scale amphibious operations because of flat nearshore gradients and poor exits. The offshore approaches are generally clear, but the nearshore approaches are partly obstructed by mudflats, shoals, coral reefs, and islands. Numerous beaches line the coast, and the majority are less than 5 miles long. Except for the almost complete lack of exits along the eastern part of the coast, exits from the beaches are by cross-country movement to a nearby coastal track roughly paralleling the shore, and a hard-surfaced road connecting the port of Bandar 'Abbas on the Strait of Hormuz with Bandar-e Lengeh and extending westward for about 100 miles.

Conditions are moderately favorable for irregular force operations. Concealment from air observation would be available during April through October on the northward-facing slopes of the Elburz Mountains, where there are dense broadleaf deciduous forests, and in the northwest and in the Zagros Mountains where there are bush trees and shrubs; elsewhere in the hills and mountains, concealment would be limited. Concealment from ground observation and cover from flat-trajectory fire would be provided by the steep slopes of the irregular terrain. Little cover or concealment would be available in the plains. Movement cross-country by foot troops would be possible in much of the region, although steep, rocky slopes make movement difficult in many parts of the hills and mountains, and small areas of sand dunes hamper movement in the plains. Food and water could be obtained from the urban centers, which are located mostly in the west and northwest, and shelter materials are available in the forested areas. Supplies could be airdropped in the small plains areas and in a few places in the mountains. Also, supplies could be brought in by sea at numerous places along the Persian Gulf coast and along a short stretch of the Caspian Sea coast.

3. Caspian Plain

This region is a narrow, flat to rolling plain covered by crops, shrubs, grass, and a few trees. It is crossed by several north-south trending perennial streams and numerous shallow irrigation ditches. The streams flood occasionally during April, May, September, and October.

The plain is poorly suited for conventional ground operations. Conditions for cross-country movement and off-road dispersal are good east of the Caspian Sea but poor elsewhere; the numerous streams, periods of wet ground (September through May), irrigation ditches, and rice fields (flooded in spring and early summer) would all impede movement. Even east of the Caspian Sea cross-country movement would be restricted locally by steep-sided stream channels. Roads are sparse and mostly have surfaces that would not support sustained heavy use. Conditions for road construction are good on most parts of the plain, but periods of wet ground and flooding would hamper construction. Concealment from ground and air observation generally would be unavailable except in the few small areas of trees, and cover from flat-trajectory fire would be almost nonexistent. There are numerous sites for the construction of bunker-type installations except near the coast where the water table is high. There are no sites suitable for the construction of tunnel-type installations because of low relief.

Conditions are favorable for airborne and airmobile operations. Sites for parachute drop zones and helicopter landing areas are numerous on the generally flat cultivated or shrub- and grass-covered plain. Sites for landing assault-type aircraft are limited to the few small airfields located near the major towns. Many sites are available for the construction of new airfields on the generally flat surface of the plain, although approaches from the south would be hindered by the adjacent mountains. Seasonal restriction to airfield construction include stream flooding, wet ground, and flooded rice fields.

The region is not suited for irregular force operations. Concealment generally would not be available except in small scattered areas of trees, and there is little or no cover from flat-trajectory fire. Cross-country movement of foot troops is possible in most of the region except during April, May, September, and October, when the streams may be flooded and unfordable. Food is available from the scattered cultivated areas and from small urban settlements, but shelter materials primarily are restricted to wooded areas along watercourses. Supplies could be airdropped in many places or brought in via the Caspian Sea.

4. Southwestern Lowlands

This region is primarily a flat to rolling plain crossed by several large perennial streams. The plains are covered by cultivated crops, desert grass, and small areas of loose sand. Large areas of marsh and mudflats are located along the lower reaches of most streams, along the coast, and in low areas; land at the mouths of most streams is subject to inundation from early March through May.

The region is fairly well suited for conventional ground operations. Cross-country movement would be relatively easy on the plains except in marshes and along the lower reaches of most streams; locally, loose sand and large streams restrict movement. Movement would be moderately restricted in the small area of hills in the east. On-road movement would be relatively easy on the bituminous-surfaced roads, although these roads are not capable of handling large amounts of sustained traffic without serious deterioration. The gravel roads would deteriorate more rapidly. Dispersal from the roads would be limited in areas of miry ground or by loose sandy surfaces. New roads could be constructed with relative ease on the firm surfaces of the plains, but severe drainage problems would hamper construction in wet areas. Minor road alignment and grading problems would hinder road construction in the small area of hills in the east. Concealment from ground and air observation and cover from flat-trajectory fire mostly would be unavailable except in the hills, where slopes provide limited amounts of cover and concealment from ground observation. Bunker-type installations could be constructed in areas of well-drained deep soils but would be precluded where the soils are miry or subject to inundation. A few sites suitable for the construction of tunnel-type installations are located in the small hills in the east.

Conditions are favorable for airborne and airmobile operations. Sites for parachute drop zones and helicopter landing areas are numerous on the generally flat, grass-covered or barren plains except in areas of marsh. Assault-type aircraft could land on several airfields and landing strips located near the major urban centers. New airfields could be constructed with relative ease on the flat surfaces of the plains except in marshy areas or where inundation occurs; construction in the hills would be limited by steep slopes.

The coast of this region is unsuitable for large-scale amphibious operations because of partly obstructed approaches, flat nearshore gradients, and the lack of prepared exits. The sea approaches are encumbered by shoals and extensive mudflats except where channels have been dredged. Several sandy beaches are scattered along the coast and range from 1,000 yards to

9 miles in length. Except for bituminous-surfaced roads leading inland from Ganaveh and the port of Bushehr, exits from the beaches are by cross-country movement to a coastal track.

Conditions are generally unfavorable for irregular force operations. Concealment from ground and air observation and cover from flat-trajectory fire generally would be unavailable on the plains that comprise most of the region; limited cover would be provided only by the slopes of the small hill area in the east. Cross-country movement of foot troops would be easy on the flat, grassy surfaces except where locally hindered by loose sand or marshy ground. Supplies could be airdropped in many places or brought in by sea at a few places along the Persian Gulf coast. Food, primarily grains, is available in most areas, but shelter materials are limited to tall grass and reeds in the low-lying areas.

C. Strategic areas (C)

The Tehran and Khuzestan strategic areas (Figure 14) contain most of the major cities, seaports, industrial centers, and oil-producing areas in Iran.

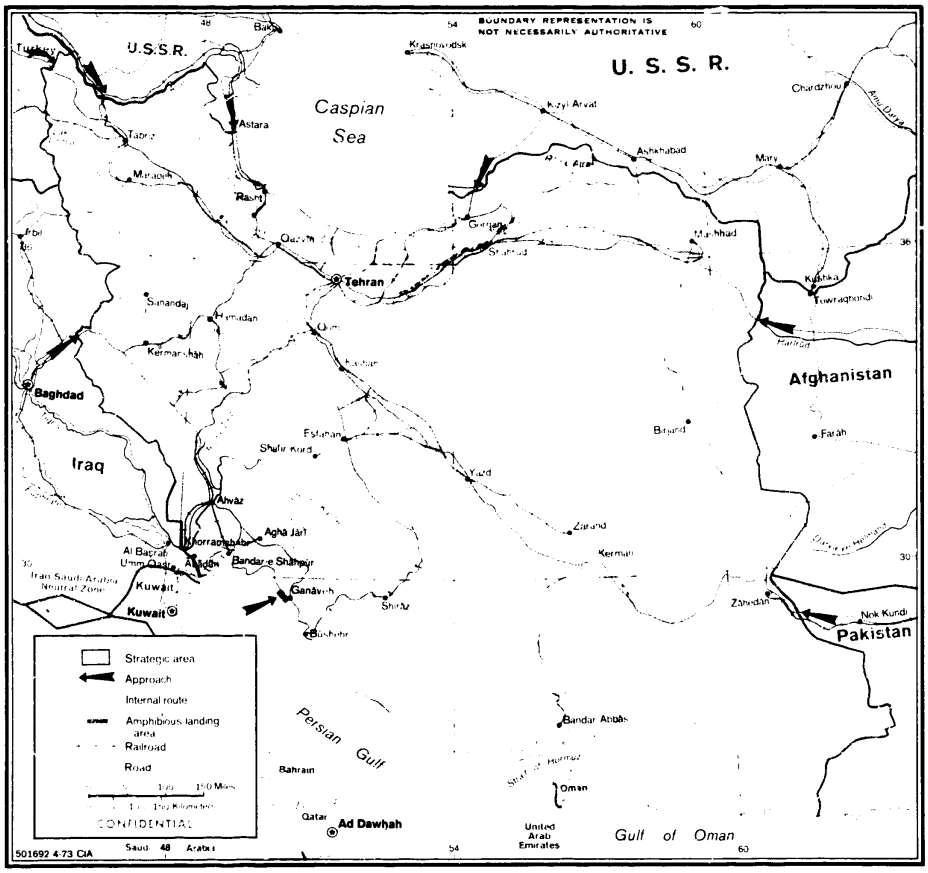

FIGURE 14. Strategic areas, internal routes, and approaches (C)

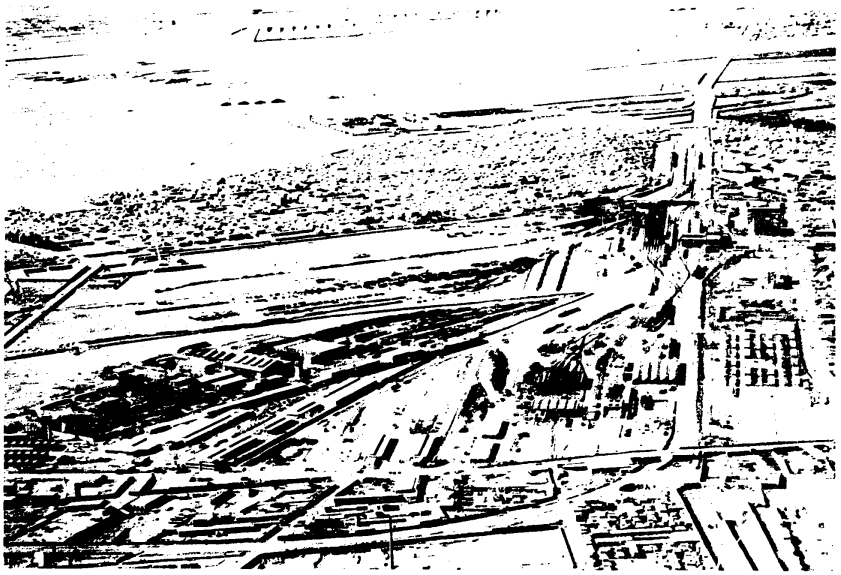

FIGURE 15. Tehran lies in a nearly level basin at the foot of the Elburz Mountains (C)

1. Tehran

Tehran is the capital and largest city in Iran (population about 3,230,000 in 1971), as well as the major transportation, communication, and industrial center (Figures 15 and 16). The city is the center of the open-wire, radiotelephone, and radiobroadcast networks and has several relay stations. Significant industrial installations are several armament plants, an arsenal, a chemical factory, a munitions plant, jet aircraft repair and maintenance shops, auto, truck, and bus assembly plants, a petroleum refinery, glass factory, textile factories, and the main railroad repair shops of the Iran State Railways. The area has two military airfields, and the field west of the city is used by civilian international and military flights.

2. Khuzestan

This area contains most of the oilfields, oil-related installations, and the principal ports (Figure 17). Abadan (estimated population 280,000 in 1971) is the site of one of the largest petroleum refineries in the world, and is the major refined oil exporting port of the country. Abadan has a POL (crude oil and refined petroleum products) storage capacity of about 38 million barrels (Figure 18). Khorramshahr (estimated population 90,000 in 1971) is the major maritime center and the site of the principal naval base (Figure 19). This base is the main naval supply center, and also has shipyard, communications, training, and medical facilities. Khorramshahr and Bandar-e Shahpur, the second-ranking general cargo port, are the Persian Gulf terminals of the Iran State Railways. Bandar-e Shapur has one of the world's largest petrochemical plants. Bandar-e Mah Shahr is the National Iranian Oil Co. pipeline terminal for the oilfields in southwestern Iran, and is a tanker port for the export of refined products. The city has a POL storage capacity of about 9 million barrels. Jazireh-ye Khark (Kharq Island) has one of the largest crude oil terminals in the world and has a POL storage capacity of 14 million barrels. This island also has a small repair yard and naval base. Ahvaz (estimated population 215,000 in 1971) is a river port and a military and industrial center with a steel mill, large railroad workshops, and several textile plants. Two large

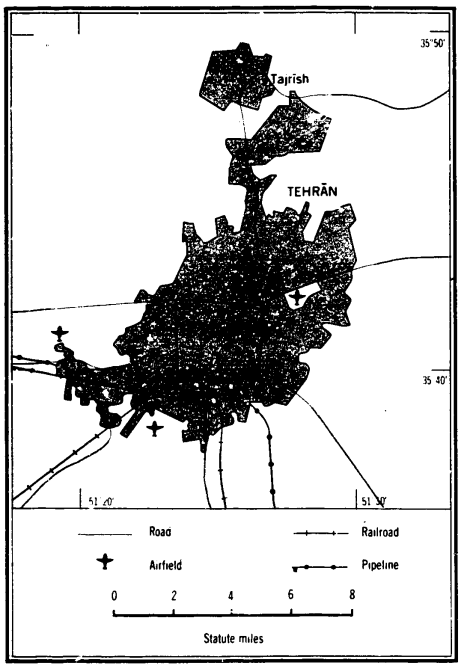

FIGURE 16. Tehran strategic area (C)

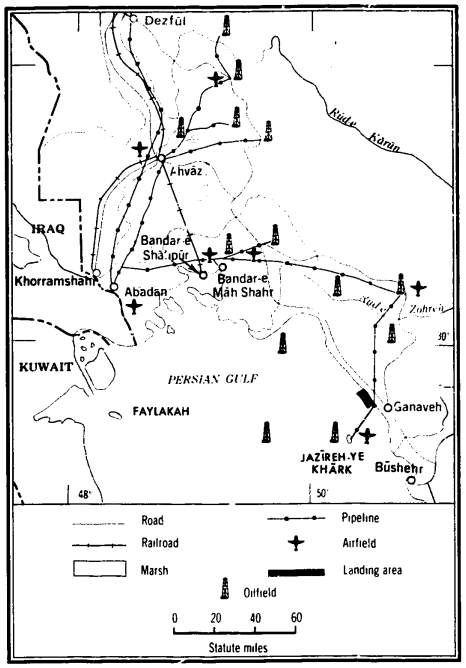

FIGURE 17. Khuzestan strategic area (C)

airfields, near Abadan and Dezful, and several small airfields are located within the strategic area.

D. Internal routes (C)

The internal routes provide the easiest avenues of movement between land approaches and strategic areas and between the strategic areas (Figure 14). An amphibious landing area northwest of Bushehr provides access to the Khuzestan strategic area. Figure 20 describes each route in detail.

E. Approaches

The perimeter of contiguous Iran is about 4,865 miles, of which 1,560 miles are seacoast and 3,305 miles are land boundaries; The southern coast—along the Gulf of Oman and the Persian Gulf—is about 1,160 miles long, and the northern coast—along the Caspian Sea—is about 400 miles long. The islands which lie off the southern coast have a total coastal length of about 420 miles. Iran claims territorial jurisdiction for 12 nautical miles offshore. Figure 21 presents data on land boundaries. (U/OU)

1. Land (C)

Conditions generally are unfavorable for cross-country movement on the steep slopes of the hills and mountains which characterize most of the border zones. Conditions are favorable only on the barren intermontane plains and basins, which are located along the border zones with Afghanistan and Pakistan. Transportation lines that cross the borders consist mainly of a few roads, desert tracks, and trails. Three railroads cross the borders—one is an approximately 50-mile extension of a Pakistan railroad into Iran; another at Jolfa, where transloading is required, is a connection with the U.S.S.R. system; and a third line connects with the Turkish standard gage system at

FIGURE 18. Oil refinery and tank farm which occupies the center of Abadan is the largest industrial complex in Iran (C)

Qotur. The approaches shown in Figure 14 and described in Figure 22 are the best means of land access to Iran.

2. Sea (C)

Sea approaches are through the Gulf of Oman, Strait of Hormuz, and the Persian Gulf. Conditions are generally unfavorable for large-scale amphibious operations because of extensive mudflats and predominantly flat nearshore gradients. In addition, the prevailing northwest wind causes duststorms, which markedly reduce visibility. Also, considerable swell occurs in the Persian Gulf during these strong winds, immediately after the passage of winter low pressure systems. The offshore approaches are clear; nearshore approaches are encumbered by bars, shoals, reefs, mudflats, and islands. The nearshore bottom material is predominantly sand, with areas of rock, coral, or clay. The minimum occurrence of surf 4 feet or higher can be expected 9% of the time along the coast of the Strait of Hormuz, and the maximum

FIGURE 19. Khorramshahr naval base (C)

FIGURE 20. Internal routes (C)

ROUTE	ROAD	RAILROAD	OFF-ROAD DISPERSAL AND CROSS-COUNTRY MOVEMENT
Between U.S.S.R. border and Afghanistan-Tehran route. Across flat plains between U.S.S.R. and Gorgan and rugged mountains east and south of Gorgan.	One to four lanes, earth, gravel, and bituminous treated, in poor to good condition. Many bridges, mostly east and south of Gorgan.	None	Unsuited in mountainous areas because of steep slopes. Fair to good on flat plains in north.
Between Afghanistan and Tehran strategic area. Principally across desert plains flanked by hills and mountains.	Two to three lanes, stretches of bituminous surface and gravel surface, in fair to good condition. Gravel sections deteriorate rapidly during and shortly after rain. Under construction between Afghanistan and Mashhad. Several bridges, most of them between Mashhad and a point 150 miles west of Mashhad.	4′8½″ gage, single track; generally parallels route between Mashhad and Tehran.	Fair in desert plains, except poor locally in areas of unstable sand.
Between Pakistan and eastern route that connects Tehran and Khuzestan strategic areas. Principally across desert plains, but several mountainous areas.	Two to three lanes, bituminous, bituminous treated or gravel, in fair to good condition.	5′6″ gage, single track; between Pakistan border and Zahedan. From Zarand to Tehran 4′8½″ gage, single track.	Fair to good on flat desert plains. Unsuited in mountains because of steep slopes.
Between Iraq and western route that connects Tehran and Khuzestan strategic areas. Principally across rugged mountains; a few small areas of plains.	Two to three lanes, bituminous surface, in good condition. Many bridges, evenly distributed. Blocked by snow occasionally between mid-December and early April	None	Unsuited in mountains because of steep slopes; locally fair in small areas of plains.
Between Turkey and western route that connects Tehran and Khuzestan strategic areas. Principally across rugged hills and mountains; some areas of narrow plains.	Two lanes, bituminous surface, in good condition. Numerous bridges, mostly in central one-third of route. Blocked by snow occasionally between mid-December and early April.	4′8½″ gage, single track; between Marand and Tabriz and in eastern one-third of route to Takestan. Another 4′8½″ gage line parallels route from a point south of Khvoy to Sufian, on the segment between Marand and Tabriz.	Unsuited in hills and mountains because of steep slopes; locally fair in narrow plains.
Between U.S.S.R. and route connecting Turkey with strategic areas at Takestan. Across rugged mountains.	Two lanes, gravel in fair condition. A few bridges, all in northern one-half. Blocked by snow occasionally between mid-December and early April.	4′8½″ gage, single track	Unsuited in mountains because of steep slopes.
Between U.S.S.R. and western route that connects Tehran and Khuzestan strategic areas; along western coast of Caspian Sea. Principally across narrow flat plains in northern one-third, broad flat plains in central one-third, and rugged mountains in southern one-third.	Two to three lanes, bituminous and gravel sections, in poor to good condition. Numerous bridges, mostly in southern half of route.	None	Poor on plains in northern one-third because of soft ground and intermittant inundation and on plains in central one-third because of soft ground primarily in September through December, and dissected surfaces. Unsuited in southern mountain area because of steep slopes.

Between Tehran and Khuzestan strategic areas, via Hamadan. Principally across mountains, hills, and desert plains in northern half and rugged mountains in southern half.	Two to three lanes, bituminous, in good condition. Many bridges, most within 75 miles north or south of Khorramabad.	$4'8\frac{1}{2}''$ gage, single track; between Tehran and Takestan.	Poor in most places because of steep slopes of hills and mountains; locally fair in desert plains.
Between Tehran and Khuzestan strategic areas, via Esfahan and Kashan. In northern half, principally across desert plains with some hills and mountains; in southern half across rugged mountains interspersed with some areas of desert plains.	Most of length is two to three lanes, bituminous surface in fair to good condition; southernmost 77 miles gravel, under construction for asphalting. Many bridges, mostly between Qom and Esfahan.	$4'8\frac{1}{2}''$ gage, single track; between Tehran and Na'in.	Fair to poor on hills and desert plains because of steep slopes and unstable sand. Unsuited in mountains because of steep slopes.

FIGURE 21. Boundaries (U/OU)

BOUNDARY	LENGTH	STATUS	TERRAIN
	Miles		
Iraq	875	Demarcated and undisputed except along Shatt al Arab, south of Khorramshahr. Unfortified.	Forested hills and mountains for most of length. Flat to rolling grassy plains in south, with marshes, loose sand, and dunes.
Turkey	310	Demarcated, undisputed, and fortified.	High, rugged, forested hills and mountains.
U.S.S.R	1,050	Demarcated and undisputed, some light fortifications.	High, rugged, forested hills and mountains and small plains east and west of Caspian Sea.
Afghanistan	550	Demarcated, undisputed, and unfortified.	Principally barren or scrub-covered intermontane basins and plains, with scattered areas of hills, mountains, and salt flats.
Pakistan	520	*....do*	Principally rugged hills and mountains, with basins and plains; narrow coastal plain in south. Vegetation mostly scrub and grass, with some forest.

FIGURE 22. Land approaches (C)

APPROACH	ROAD	RAILROAD	OFF-ROAD DISPERSAL AND CROSS-COUNTRY MOVEMENT
From Kizyl-Arvat, U.S.S.R. Across hills and mountains in the north and flat plain in the south.	One to two lanes, gravel in fair condition.	None	Poor in mountains and hills because of steep slopes. Fair on plains except when ground is miry for up to 3 days after rains, mainly between mid-March and October.
From Herat, Afghanistan. Across flat to rolling sandy and stony plain.	Two to three lanes, bituminous in good condition.	None	Good on flat to rolling plain.
From Nok Kundi, Pakistan. Across stony and sandy desert plains.	Two lanes, mostly bituminous in poor to good condition.	5'6" gage, single track.	Fair on flat desert plains; locally poor areas of loose sand.
From Baghdad, Iraq. Across flat irrigated plains and dissected plains.	Two lanes, bituminous in fair to good condition.	Meter gage single track. Generally parallels entire route, but near border trends northwestward and does not cross boundary.	Fair on flat plains except poor from early November through April, when ground miry; locally poor in areas of irrigation canals and ditches. Poor in dissected areas because of steep slope.
From Karakose, Turkey. Across narrow flat valley plains flanked by mountains.	Two lanes, gravel in good condition.	None	Fair along narrow, flat plains. Miry soils early Nov. through May and some snow blockage.
From Yerevan, U.S.S.R. Across narrow, irrigated river valley plain in northwest and a small area of hills near Iran border.	Two lanes, bituminous in good good condition.	5'0" gage, single track.	Poor in hills. Fair in narrow river valley plains; locally hindered by miry ground for 2 to 3 weeks during March and by irrigation canals.
From Baku, U.S.S.R. Across hills in north and flat, narrow plains with marshes and ponds in south.	Two lanes bituminous surface in good condition.	*....do*	Poor in hills because of steep slopes. Fair on narrow plains except where locally hindered by marshes and ponds.

occurrence can be expected 33% of the time along the Persian Gulf coast. Tides are mixed, and the spring range varies from about 5 to 13 feet. Except for the head of the Persian Gulf, numerous beaches fringe the coast. The majority of the beaches are less than 5 miles in length and have a gentle to steep gradient. The beaches are generally backed by dunes that are backed in turn by low, narrow coastal plains containing scattered marshy areas and isolated hills. The plains are backed by steep hills and mountains. Exits are mostly by tracks or by cross-country movement to nearby coastal roads and tracks that roughly parallel the shore except along the eastern coast, where there are no prepared exits leading inland.

The amphibious landing area located on the northwestern coast at Ganaveh on the Persian Gulf provides access to the Khuzestan strategic area (Figure 17). Seaward of the 6-fathom curve, offshore approaches are clear; shoreward, the nearshore approaches are partly obstructed by drying bars along the entire beach. In addition, a mudflat and pipeline flank the southeastern end of the beach and a reef, the northwestern end. The nearshore bottom material is sand and mud. The gradient is flat and would preclude dry ramp landings of LST's and smaller landing craft. Surf 4 feet or higher occurs up to 6% of the time during November through March, and infrequently during the remainder of the year. Tides are mixed, and the diurnal range is 4½ feet. The beach is 4.7 miles long and is interrupted near the center by a stream fronted by mudflats. The beach is composed of sand and some mud; the sand is firm where wet and soft where dry. Beach widths average 148 yards at low water and 5 yards at high water; gradients are mild to gentle in the low-water to high-water zone and steep in the high-water zone. The beach is immediately backed by old beach ridges merging with sandflats and dunes behind the southeastern end. Exits are by cross-country movement to a track 165 to 745 yards inland; movement farther inland would be by tracks and trails to a bituminous road which is parallel to the beach, and as much as 3 miles back at the southeastern end.

3. Air (U/OU)

Air approaches[3] are over mountains except in the north and south, where they are over water and desert plains.

Approaches from the northwest are over the mountains of eastern Turkey and southern U.S.S.R. The mountains in eastern Turkey are mostly over 10,000 feet and reach a maximum of about 17,000 feet within 10 nautical miles of Iran, and the mountains in southern U.S.S.R. have maximum elevations of about 17,000 feet within 200 nautical miles of Iran. Approaches from the north are over the Caspian Sea and the desert and steppe plains of southern U.S.S.R. east of the Caspian Sea and are relatively unobstructed except adjacent to the Iran boundary, where mountain elevations reach over 7,000 feet. Approaches from the east are over the high mountains and desert plains of Afghanistan and Pakistan; the mountains reach peak elevations of over 13,500 feet in Afghanistan, 180 nautical miles from Iran, and reach more than 9,000 in Pakistan within 130 nautical miles of Iran. Approaches from the west and south, across the Arabian Sea, Gulf of Oman, Persian Gulf, northeastern Saudi Arabia, Kuwait, Iraq, and Syria, are generally free from surface obstructions except for the highlands south of the Gulf of Oman in Saudi Arabia and along the border with Iraq. The mountains in the northeastern part of the Arabian Peninsula reach a peak elevation of nearly 10,000 feet, 150 nautical miles from Iran, and the mountains in northeastern Iraq reach a maximum elevation of nearly 12,500 feet along the border with Iran.

Although weather conditions are generally favorable for aircraft operations in all approaches throughout the year, the approaches from the north and northwest are the least favorable. Usually, the worst weather occurs during November through April, when migratory low-pressure centers and their associated frontal systems affect all approaches. These weather systems are accompanied by extensive cloudiness, precipitation, conditions often conducive to aircraft icing, and moderate to severe turbulence. The influence of these lows is greatest in the northern and northwestern approaches, where cloudiness averages 60% to 90%, and is least in the southern approach, where cloudiness is usually less than 40%. During May through October, weather conditions are very much improved throughout all approaches. Mean cloudiness ranges from 40% to 50% in the northwestern approach (in the Caucasus and parts of Turkey) to less than 20% over much of the remaining approaches. In the vicinity of southern Pakistan and the Gulf of Oman, however, there is a midseason increase in cloudiness, and mean amounts range from 40% to 60%. Thunderstorm activity reaches a maximum during May through October, occurring on 5 to 10 days per month at many places in the northern and northwestern approaches. In the remaining

[3]The discussion zone for air approaches extends approximately 250 nautical miles beyond the borders of Iran.

approaches, thunderstorms occur infrequently. The average height of the freezing level is lowest in the northern approach and highest in the southern approach, ranging from near the surface to about 11,000 feet during midwinter and from about 14,000 feet to near 18,000 feet in midsummer. Upper winds are predominantly westerly between 10,000 and 55,000 feet throughout the year in all approaches. Below 10,000 feet, winds are light and variable. Mean wind speeds reach a maximum of 60 to 95 knots at about 40,000 to 45,000 feet during December through February.

Places and features referred to in this General Survey (U/OU)

	COORDINATES	
	° 'N.	° 'E.
Ābīd	38 11	15 56
Ābādān	30 20	48 16
Āghā Jārī	30 42	49 50
Ahvāz	31 19	48 42
Andīmeshk	32 27	48 21
Arāk	34 05	49 41
Aras River *strm*	39 56	48 20
Asadābād	34 47	48 07
'Asalūyeh	27 28	52 37
Āstārā	38 26	48 52
Bād	31 11	52 01
Bāfq	31 35	55 24
Bāghīn	30 12	56 48
Bahmanshir, Khowr-e *strm*	30 02	48 11
Baku, U.S.S.R.	40 23	49 51
Bandar 'Abbās	27 11	56 17
Bandar-e Lengeh	26 33	54 53
Bandar-e Māh Shahr	30 33	49 12
Bandar-e Pahlavi	37 28	49 27
Bandar-e Shāh	36 56	54 06
Bandar-e Shāhpūr	30 25	49 05
Bang	29 14	50 19
Bīd Boland	27 51	52 19
Bīnak *oilfield*	29 45	50 22
Bojnūrd	37 28	57 19
Būshehr	28 59	52 50
Chāh Bahār	25 18	60 37
Dasht-e Kavīr *desert*	34 10	54 30
Dezfūl	32 23	48 24
Dez, Rūd-e *strm*	31 39	48 52
Elburz Mountains *mts*	36 00	53 00
Emām Hasan	29 52	50 15
Eṣfahān	32 40	51 38
Farahābād	35 42	51 30
Fīrūz Kūh	35 45	52 47
Gachsārān	30 12	50 47
Ganāveh	29 32	50 31
Garmsār	35 20	52 13
Golmānkhāneh	37 36	45 15
Gorgān	36 50	54 29
Gorgān, Rūd-e *strm*	36 59	54 05
Gulf of Oman *gulf*	25 00	58 00
Hafar Channel *see of strm*	30 26	48 10
Hamadān	34 48	48 30
Hendijān	30 14	49 43
Hendijān *offshore oilfield*	30 05	49 50
Herāt, Afghanistan	34 20	62 12
Hindu Kush, Afghanistan *mts*	35 00	71 00
Hōrmoz	27 06	56 28
Hormoz, Strait of	26 34	56 15
Jāsk	25 38	57 46
Jolfā	38 57	45 38
Kamālābād	28 19	61 27
Karaj	35 48	50 59
Karakose, Turkey	39 44	43 03
Karbalā', Iraq	32 36	44 02
Kārūn Bar *bar*	30 24	48 44
Kārūn, Rūd-e *strm*	30 26	48 10
Kāshān	33 59	51 29
Kāzerūn	29 37	51 38
Kermān	30 17	57 05
Kermānshah	34 19	47 04
Khārk, Jazireh-ye	29 15	50 20
Khārk (Kharg, Jazireh-ye *pipeline term*)	29 15	50 20
Khorramābād	33 30	48 20
Khorramshahr	30 25	48 11
Khosrowābād	30 10	48 25
Khūzestān *rgn*	30 30	50 00
Khvoy	38 33	44 58
Kizyl Arvat, U.S.S.R.	38 58	56 15
Lake Urmia *lake*	37 40	45 30
Lāli	32 21	49 06
Lashkarak	35 49	51 36
Lavān, Jazireh-ye *isl*	26 48	53 15
Leylā	35 47	51 41
Malāyer	34 15	48 48
Manjil	36 44	49 24
Marand	38 26	45 46
Marathón, Greece	38 09	23 58
Mārūn, Rūd-e *strm*	31 05	49 36
Mashhad	36 18	59 36
Māh Shahr, Khowr-e *channel*	30 26	49 09
Masjed Soleymān	31 58	49 18
Mendāb	36 02	48 01
Mirjāveh	29 01	61 28
Musa, Khowr-e *inlet*	30 18	48 55
Naft-e Shāh	33 59	45 30
Na'īn	32 52	53 05
Nikshahr	26 13	60 12
Nok Kundi, Pakistan	28 48	62 46
Now Rūz *offshore oilfield*	29 30	49 25
Now Shahr	36 39	51 31
Pasargadae *ancient site*	30 17	53 13
Pazanan	30 35	49 59
Persepolis *site*	29 57	52 52
Persian Gulf *gulf*	27 00	51 00
Pishin	26 06	61 47
Qareh Sū *strm*	34 52	51 25
Qazvīn	36 16	50 00
Qazvīn *rgn*	35 30	50 30
Qeshm *isl*	26 45	55 45
Qom	34 39	50 54
Qoṭūr	38 28	44 25
Qūchan	37 06	58 30
Rafsanjān	30 24	56 01
Rāhmanlū	37 32	45 18
Rakhsh *offshore oilfield*	26 25	52 40
Rasht	37 16	49 36
Ray	31 50	59 58
Reza'īyeh	37 33	45 04
Rīz	32 23	51 20
Robaṭ Karīm	35 28	51 05
Rostam *offshore oilfield*	25 55	52 54
Safīd Rūd *strm*	37 26	49 55
Sanandaj	35 19	47 00
Sarajeh	34 36	51 04
Sarakhs	36 32	61 11
Sārī	36 34	53 04
Semnan	35 33	53 24
Sendarak	26 50	57 25
Shāh Pasand	37 07	55 16
Shahrūd	36 25	55 01
Shahīl-ye Bala	31 59	48 52
Shamsabad	33 49	49 45
Sharafkhaneh	38 11	45 29
Shatt al Arab	29 57	48 34
Shīraz	29 36	52 32
Sufīan	38 17	45 59
Soltani, Khowr-e *bay*	29 00	50 50
Strait of Hormuz *str*	26 34	56 15
Sūfīan	38 17	45 59
Tabas	33 36	56 54
Tabrīz	38 05	46 18
Tajrish	35 48	51 25
Takestan	36 04	49 43
Tarasht	33 58	57 13
Tehrān	35 40	51 26
Tembī	31 55	49 17
Torbat-e Heydarīyeh	35 16	59 13
Veys	31 29	48 52
Yazd	31 53	54 25
Yerevan, U.S.S.R.	40 11	44 30
Zagros Mountains *mts*	33 40	47 00
Zarand	30 48	56 35
Zāhedān	29 30	60 52
Zāyandeh Rūd *strm*	32 20	52 50

SELECTED AIRFIELDS

Abadan International	30 22	48 14
Agha Jari	30 45	49 40
Bandar Abbas International	27 14	56 23
Bushehr	28 57	50 50
Esfahan	32 37	51 42
Cach Saran New	30 20	50 49
Kerman	30 16	56 57
Kermanshah North	34 21	47 09
Khark Island	29 16	50 19
Mashhad	36 14	59 39
Masjed Soleiman	32 00	49 17
Rasht International	37 20	49 37
Rezaiyeh International	37 40	45 4
Shahrokhi	35 13	4 9
Shiraz International	29 32	52 46
Tabriz	38 08	46 15
Tehran Doshan Tappeh	35 42	51 29
Tehran Mehrabad	35 41	51 19
Vahdati	32 26	48 24
Yazd West	31 54	54 17
Zahedan	29 27	60 51

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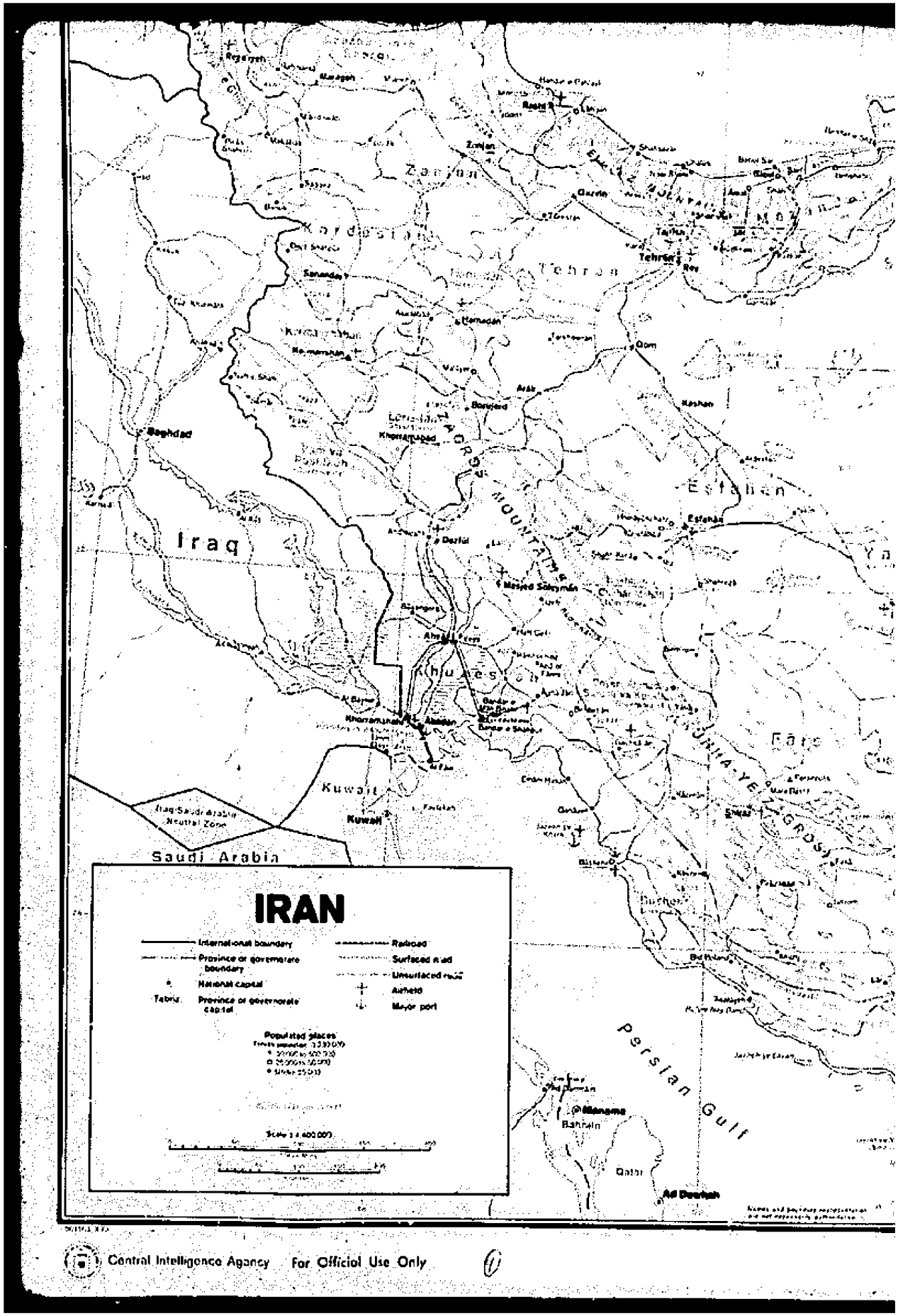

Terrain and Transportation Figure 23