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Egypt: Aspirations for Missile Production

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An Intelligence Assessment

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Egypt: Aspirations for Missile Production

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An Intelligence Assessment

This paper was prepared by [redacted] Office of
Near Eastern and South Asian Analysis, with a
contribution from [redacted] Office of
Scientific and Weapons Research. It was coordinated
with the Directorate of Operations. [redacted]

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Comments and queries are welcome and may be
directed to the Chief, Arab-Israeli Division, NESA,
[redacted]

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**Egypt: Aspirations
for Missile Production**

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Key Judgments*Information available
as of 13 April 1988
was used in this report.*

Cairo has made the development and production of ballistic missiles a high priority in its defense planning. The military has been secretly sponsoring a missile program [redacted] through its office of "special projects," [redacted] and its recent missile efforts appear likely to succeed. [redacted]

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The missile program encompasses at least two surface-to-surface ballistic missile projects:

- The Egyptians are working on a Scud-like missile, most likely based on a North Korean-engineered copy of a 300-kilometer-range Soviet Scud. They have test-fired this missile and, with North Korean assistance, could begin series production next year. The military may be attempting to modify some of the Scud-like missiles to extend their maximum range.
- The Ministry of Defense is trying, as part of a joint program with Argentina, to produce a new missile, which it will call the Vector. This missile is similar or identical to Argentina's Condor II missile and probably will have a range of some 750 to 1,000 kilometers. Egypt could begin series production of Vector missiles in the early 1990s. [redacted]

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Egypt's current surface-to-surface missile capabilities are extremely limited. Cairo appears to be focusing on its missile program to boost its military's prestige and to keep pace with other states in the region—especially Libya and Israel—that are pursuing their own missile development and production projects. [redacted]

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The Ministry of Defense wants the technology to produce ballistic missiles, rather than simply buy them, to avoid dependence on foreign suppliers and because it believes the technological expertise acquired through the ballistic missile program will contribute to Egypt's effort to expand its defense industries. It will try to export missiles. [redacted]

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Iraqi officials are working through Egypt's office of special projects, [redacted] to obtain surface-to-surface missiles and production technology for Baghdad. The Iraqis probably are providing most of the funding for Egypt's Condor II/Vector development program and may be involved in the Scud project as well. [redacted]

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April 1988

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The Egyptians are slowly building their development and production capabilities, but the missile program will continue to depend on foreign expertise and foreign funding. Restrictions in the transfer of Western technology to Argentina and Egypt or, less likely, from North Korea to Egypt or a reduction in Iraqi financing probably would set back but not halt Cairo's missile program. [REDACTED]

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Additional Scud and Condor II/Vector missiles will substantially enhance Cairo's deterrent and retaliatory capabilities. Cairo probably would use the missiles during another war to try to achieve tactical goals. It also might use the missiles to strike strategic targets but would do so, particularly in the case of Israel, only in retaliation for attacks or to avoid defeat. [REDACTED]

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Egypt's acquisition of the Scuds and Condor II/Vectors and related missile production technology will contribute to missile proliferation in the region and spur other countries with less advanced missile capabilities—Libya, for example—to keep up with Cairo by accelerating their own missile procurement and development programs. Next to the Saudis, who recently bought the CSS-2 intermediate-range ballistic missile from the Chinese, the Egyptians, with the Condor II/Vector, will have the second-longest-range system of any Arab state in the Middle East. [REDACTED]

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The Israelis will continue to be concerned about Saudi and Egyptian capabilities and the likely spread of missiles to other Arab countries, especially Iraq. Tel Aviv could respond to Egyptian progress in missile production by speeding its own ballistic missile research and development efforts and urging the United States to increase pressure on Arab states to halt the proliferation of missiles. [REDACTED]

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A direct US confrontation of Egypt with evidence of its involvement in missile development probably would result in Egyptian denials, temporarily strained relations with Cairo, and a brief slowing of the program to tighten access to information on the program's progress. [REDACTED]

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Contents

	<i>Page</i>
Key Judgments	iii
Scope Note	vii
Desire for New Missiles	1
Desire for Missile Production Technology	5
Production Capabilities	5
Development Program	7
Scud Project	12
Condor II/Vector Project	14
Iraqi Involvement in Egyptian Missile Projects	16
Dependence on Foreign Assistance	18
Outlook	19
Implications for the Region and the United States	19

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Scope Note

This assessment focuses on Egypt's surface-to-surface ballistic missile development and production program and on related questions concerning technology transfer and Egyptian goals.

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Egypt: Aspirations for Missile Production

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Despite unsuccessful efforts in the 1960s, Cairo renewed its search for technology to develop short-range ballistic missiles in the late 1970s and has again made development and production of surface-to-surface missiles a high priority in its defense planning. A new program calls for Egyptian production of several types of surface-to-surface missiles by the mid-1990s.

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We suspect Cairo's primary aim is to obtain a powerful deterrent against other states in the region—particularly Libya and Israel—that are pursuing their own missile development and production projects.

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Desire for New Missiles

Egypt's current surface-to-surface missile capabilities are extremely limited.

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it acquired about 70 Scud-Bs and 40 FROGs from the Soviets before Cairo broke relations with Moscow in the early 1970s. Some of these missiles were used in the Arab-Israeli war in 1973, and a small number probably have been sold to Iraq over the past eight years. The number of missiles remaining operational probably is less than 50,

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Cairo probably worries about missile proliferation in the Middle East and sees its missile capabilities shrinking when compared with those of other military forces in the region. In addition to fielding missiles with shorter ranges, Syria, Iraq, Iran, Libya, and South Yemen already have Scuds.¹ The Egyptians are especially concerned about Libya's missile development program and anticipate Soviet deliveries of new, more capable missiles to Libya, Syria, and other Arab

¹ Syria also has SSC-1Bs, supersonic, tactical cruise missiles used for coastal defense. The missiles have a maximum range of 300 kilometers.

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countries. Israeli efforts to develop longer range surface-to-surface missile systems also trouble Cairo. The Israelis have flight-tested two new surface-to-surface missiles, both with ranges of at least 600 kilometers. The Egyptians undoubtedly worry about Israeli conflicts with other Arab states and, though Cairo wants to abide by its peace treaty with Tel Aviv, the potential for Egyptian involvement.

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The Egyptians probably view the acquisition of additional Scuds, FROGs, and more capable missiles as a feasible deterrent to aggression by Egypt's neighbors and as necessary to counter the development of missiles by other regional states. In our judgment, countries in the Middle East would find it nearly impossible to defend against missiles once they were launched, and the Ministry of Defense probably believes the threat of possible Egyptian retaliation would make other countries reluctant to strike Egypt. In particular, the Egyptian military appears to be seeking a way to discourage possible Israeli aggression and to respond to Libyan operations without committing large numbers of forces. Nonetheless, Egypt would act cautiously in using such weapons to strike enemy strategic targets, especially in the case of Israel. Even though the missiles Cairo acquires are likely to be inaccurate, the military will count on them to weaken the military and civilian morale of their enemies as well as to disrupt military activity behind enemy lines. The Egyptians probably are convinced of the value of surface-to-surface missiles as psychological weapons from their observations of the effects of Scuds used in the Iran-Iraq war.

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The military may also regard acquisition of new surface-to-surface missiles as essential to maintain its prestige in the region. We believe it sees itself as a leading force there—especially after regaining its honor in the 1973 war—and is reluctant to fall behind its neighbors in securing new technology.

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We believe the Egyptians want to obtain a variety of surface-to-surface missiles to meet the military's requirements. Short-range tactical missiles like FROGs and Scuds most likely would be fielded with artillery brigades, perhaps even in battalions, to supplement longer range artillery. The Egyptians probably believe such weapons would be especially useful in defending against another Israeli attack through the Sinai. The military will probably continue to want missiles with longer ranges to expand its capabilities to strike deep into enemy territory without endangering air assets.

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the military considers the Scud's range too short for purposes of strategic deterrence.

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In general, the Egyptians appeared to be looking for missiles that would have a range of at least 700 kilometers, could carry a 400-kilogram or larger payload, and have an accuracy of about 700 meters CEP.² Such longer range missiles would give the Egyptians the capability to hit targets throughout the Middle East, possibly an important consideration for Cairo if its enemies in the region change during the next decade.

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The Ministry of Defense in the short term probably intends to use conventional warheads on its surface-to-surface missiles, but defense planners expect them eventually to carry a variety of warheads. The Egyptians, for example, probably would seek to expand their strike capabilities by fitting cluster or chemical warheads on surface-to-surface missiles. Cairo is expanding its chemical industries, and Egypt's use of chemicals in the mid-1960s in the Yemen war and the transfer of chemical technology to the Iraqis suggest that the Egyptians would consider using chemical warheads in a future conflict. Although the surface-to-surface missiles Egypt is seeking could accommodate nuclear warheads, Egypt will lack the capability to produce such warheads for the foreseeable future.

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² The circular error probable (CEP) is the radius of a circle centered on the target into which half the missiles fired could be expected to fall.

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Egypt's Chemical Warfare Capability

Egypt's chemical warfare capability is one of the oldest and best among the Arab states. The Egyptian military began developing its chemical capability, including training, materiel, and indoctrination, in the late 1950s with Soviet assistance. It used chemical agents—probably tear gas, mustard, and phosgene—against Yemeni tribesmen in 1963. After Soviet assistance ended in the 1970s, Cairo continued to enhance its chemical warfare capabilities.

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the Egyptians have been attempting to acquire technology and precursor chemicals for indigenous production of chemical agents, probably to be carried out in their Abu Za'bal plant north of Cairo. The Egyptians also have been involved in Iraqi chemical warfare efforts.

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Missiles	FROG	Scud-B	Al-Husayn ^a	SS-21	Jericho	CSS-2
Maximum range (km)	70	300	600+	100	500	2,800-3,100
Warhead weight (kg)	430	1,000	160	500	1,000	1,600 ^b
Origin	USSR	USSR	Iraq	USSR	Israel	China

^a Iraq's Al-Husayn missile probably is a modified Scud. Figures for range and payload weight are estimates.

^b Weight of reentry vehicle.

Surface-to-Surface Missiles in the Middle East

	FROG	Scud-B	Al-Husayn	SS-21	Lance	Jericho	CSS-2	Comment
Egypt	•	•						Egypt is producing prototypes of a FROG-like missile called the Sakr-80. It also is developing surface-to-surface ballistic missile systems with Argentina—the 750- to 1,000-kilometer-range Condor II/Vector—and with North Korea—a Scud-like missile probably with a range of some 300 kilometers. [redacted] Iraq is involved in the Condor II/Vector program and probably in the Scud project as well.
Iran		•						Iran is producing the "Eagle" missile—an inaccurate system with a maximum range of 40 kilometers and capable of carrying a payload of up to 80 kilograms. [redacted]
Iraq	•	•	•					Iraq probably has several missile development programs under way. One is based largely on Egypt's Condor II/Vector project. Baghdad has been funding Egyptian missile development since 1984 and probably hopes to obtain operational systems as well as a production capability. Iraq also is working on some shorter range systems—including the extended-range Scud missiles that it has been using against Iran.
Israel					•	•		[redacted] Tel Aviv also has been working on a single-stage surface-to-surface missile with a maximum range of probably 600 to 1,400 kilometers.
Libya	•	•						Libya since the early 1980s has been developing a liquid-fuel rocket with a 70-kilometer range and 40-kilogram payload. Production probably will begin by the end of 1988. It also is working on a longer range, solid-propellant missile, but development is proceeding slowly and production before the mid-1990s, even with continued foreign assistance, is unlikely. Libya is developing both missiles under the project name "Al Fatah."
Syria	•	•		•				Although Syria lacks a surface-to-surface missile production capability, Damascus probably is placing a high priority on developing one. Economic constraints are likely to delay development efforts, and Syria probably cannot produce its own missiles before the 1990s, and then only with considerable foreign assistance.
Saudi Arabia							•	Saudi Arabia probably has no missile development program but has constructed CSS-2-related missile facilities with Chinese assistance and may have or soon receive CSS-2 missiles.
North Yemen				•				North Yemen has no missile development program and may not be trained to use its SS-21s.
South Yemen	•	•						South Yemen has no missile development program.
Kuwait	•							Kuwait has no missile development program.

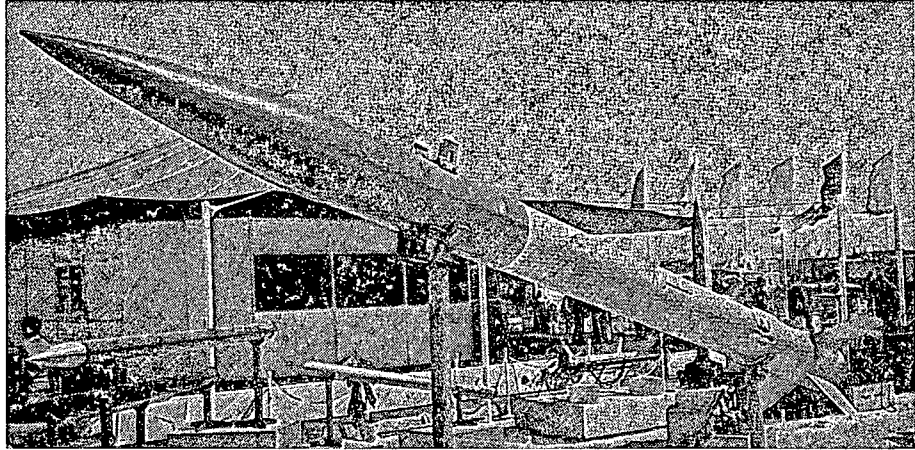
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Figure 1. Sakr-80 rocket. The Egyptians exhibited this FROG-like system at their defense show in Cairo in November 1987. The Sakr-80 is an unguided rocket with a range of 30 to 60 kilometers [redacted]



Desire for Missile Production Technology

Cairo wants the technology to produce ballistic missiles rather than buy them, [redacted]

[redacted] As is the case with other weapons, the Egyptians probably fear dependence on foreign suppliers and are willing to pay high initial costs to produce their own missiles. We suspect the scarcity of reliable suppliers of surface-to-surface missiles and Western efforts to restrict transfers of missiles and related technology are reinforcing the Egyptians' commitment to indigenous production. Moreover, Cairo probably hopes technology acquired through the missile program will help establish a technological and industrial base that will benefit other parts of Egypt's defense industries. [redacted]

[redacted] Cairo intends to earn needed foreign exchange by selling missiles and possibly guidance and other missile technology. [redacted]

Egypt has been seeking to produce surface-to-surface missiles since the 1950s. Financial difficulties, higher priorities for other projects, and interruptions of research by war have caused temporary setbacks. Several missile programs begun in the 1960s—the Victor, Conqueror, and Pioneer—met with little success and were canceled after the Arab-Israeli war in 1967. Nonetheless, Cairo's interest in missile development and production intensified in the late 1970s, when peace with Israel enabled it to redirect resources and

the Arab Organization for Industrialization offered the prospect of increased funding and cooperation with Western firms. [redacted]

Production Capabilities

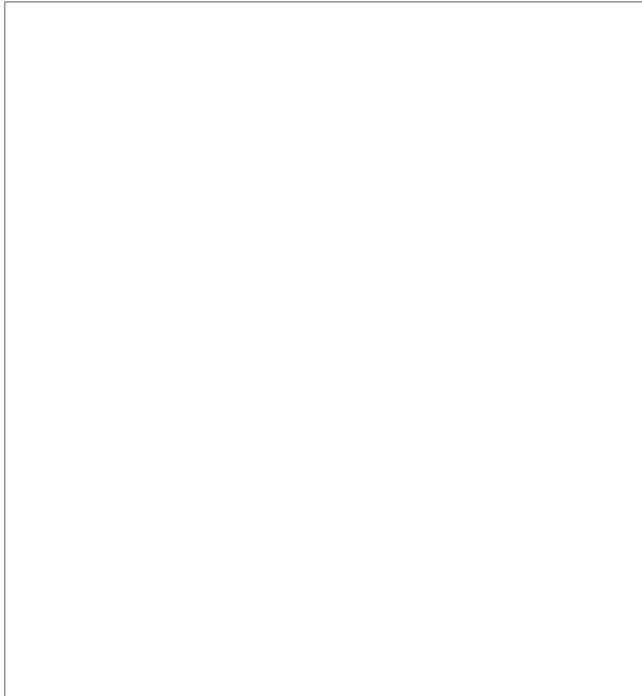
A series of joint ventures and contracts with Western firms has enabled the Egyptians to make gradual progress in building their missile production capabilities since the late 1970s, but their output is limited to smaller scale rockets and missiles [redacted]

[redacted] is producing RPG-7 antitank rockets, 122-mm light artillery rockets, target rockets, smoke-generating rockets, and Sakr-eye surface-to-air missiles (reverse-engineered SA-7s). The Egyptians also have developed a prototype of a FROG-like weapon, called the Sakr-80. [redacted]

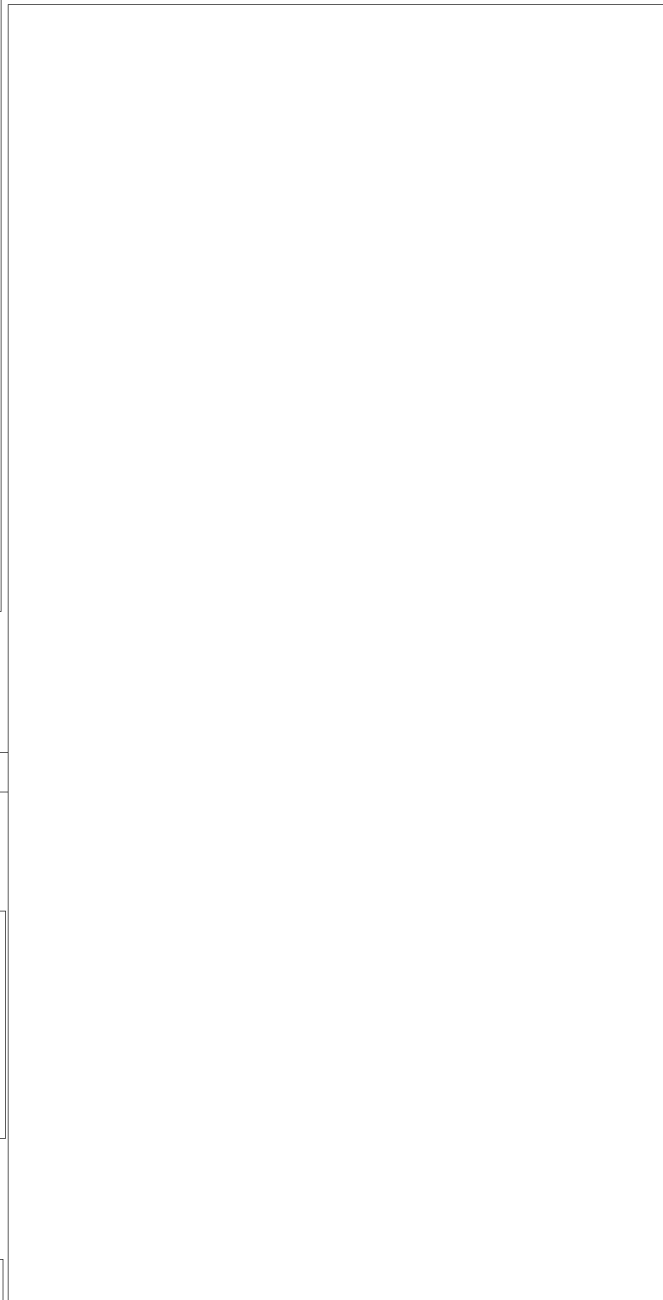
¹ The Arab Organization for Industrialization (AOI) was formally established in 1975 when Saudi Arabia, Kuwait, Qatar, and the United Arab Emirates provided about \$2 billion to start an Arab military industry based in Egypt. Cairo contributed manpower and four arms factories that could produce aircraft, armor, munitions, and engines. Egypt's peace treaty with Israel resulted in the withdrawal of Arab funding from AOI, but Cairo has been operating the AOI on its own, relying on foreign credits and money from arms exports. With the gradual warming of relations with the Gulf states, Cairo has been trying to rekindle interest in renewed funding for joint Arab projects. [redacted]

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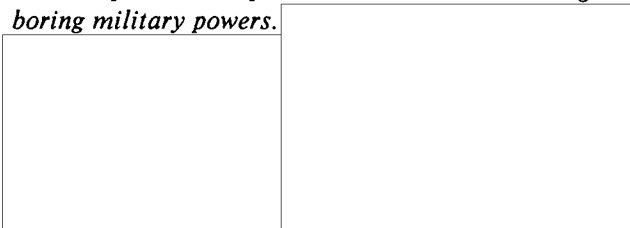


As part of a completely separate program from its ballistic missile development, Cairo is attempting to improve its remotely piloted vehicle (RPV) fleet,

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Egypt is undertaking the multimillion-dollar RPV program to build the military's reputation as a modern force and to keep up with the perceived capabilities of Western and neighboring military powers.

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Cairo's plans call for purchases of more sophisticated systems that will enhance Egypt's reconnaissance capabilities in the short term but that can be configured to perform other tasks.

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but the Ministry of Defense is working to extend its range to at least 60 kilometers. [redacted]

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While expanding its capabilities to produce small missiles and rockets, we believe Egypt has been gradually acquiring some of the technology, expertise, and facilities it will need to manufacture surface-to-surface ballistic missiles:

- The Egyptians probably have sufficient capacity and the work force to increase production of ballistic missiles at their Sakr Factory (and the nearby Arab-British Dynamics building, which is part of the Sakr complex), located north of Cairo, Egypt's primary missile and rocket production facility. [redacted]

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[redacted] development, is well equipped with modern Western machinery and is generally well managed.

- The Egyptians have established a "Space Research Center" in the Cairo area with assistance and technology from a West German firm, Messerschmitt-Boelkow-Blohm, [redacted]. The center will be used to improve guidance systems for surface-to-air missiles, but we believe some facilities within the center or nearby will support work on inertial navigation systems and components used in ballistic missile production. [redacted]

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- Egypt is continuing efforts to expand its solid-rocket-propellant manufacturing capacity at its Abu Za'bal chemical factory. With assistance from a West German firm in 1979, the factory probably [redacted]

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gained the capability to manufacture composite propellants that could be used in rocket motors. [redacted]

[redacted] in August 1987, Cairo expected to obtain a 300-gallon propellant mixer from a West German firm that will enhance Egypt's propellant production capabilities (the mixer will enable Egypt to produce at one time enough propellant to load a 2,000-kilogram solid-rocket motor or several smaller motors). The Egyptians also are seeking West European assistance to expand their facilities for producing ammonium perchlorate, a key solid-propellant ingredient, and to improve their ammonium perchlorate grinding technology in order to reduce Egypt's dependence on external suppliers of solid-propellant ingredients.

- Between 1984 and 1985, Egypt acquired a static-firing rocket test facility and calibration laboratory from a French company and, with French assistance, gained the capability to manufacture large rocket motors. [redacted]

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Development Program

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We believe responsibility for surface-to-surface missile development continues to rest with the military, which [redacted] has been secretly sponsoring the missile program through its office of special projects, [redacted]

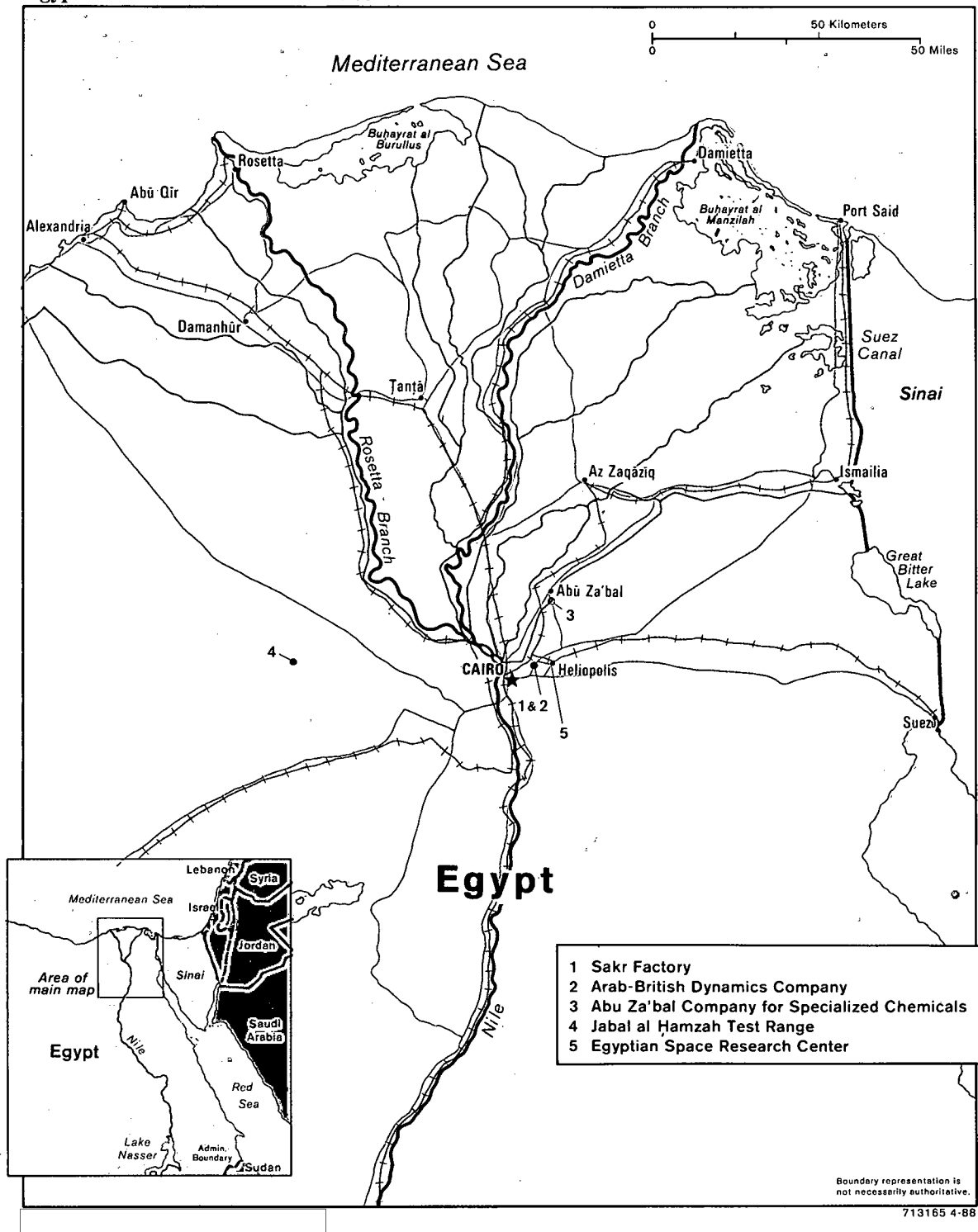
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[redacted] The primary role of special projects appears to be coordinating missile development and production plans, obtaining needed technology, and managing joint ventures. We believe physical development and production of surface-to-surface missiles takes place at the Sakr and Arab-British Dynamics facilities under strict secrecy. [redacted]

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Figure 2
Egyptian Missile-Related Facilities



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Facilities Related to Missile Production(b)(1)
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[redacted] the following facilities are in some way related to surface-to-surface ballistic missile development and production in Egypt:

- **Sakr Factory for Developed Industries** (formerly Factory 333). The Egyptians carry out most of their missile development and production at this factory, located in the Almaza section of northeast Cairo.

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[redacted]

clean and well equipped with machines from West Germany, France, the United Kingdom, the United States, and Switzerland and has a work force of about 5,000 people. The Sakr Factory produces a variety of rockets and missiles including RPG-7 antitank rockets, Hosam antitank handgrenades, 122-mm artillery rockets, trainer flying target rockets, smoke generating rockets, 122-mm illuminating rockets, Sakr-eye surface-to-air missiles (reverse-engineered SA-7s), and the Sakr-80 rocket (FROG-like weapon). We believe development of Egypt's Condor II/Vector also is under way at the Sakr Factory, probably in one of the newer buildings.

- **Arab-British Dynamics Company.** This facility is also part of the Arab Organization for Industrialization and is located in the Sakr Factory compound adjacent to Sakr facilities. The Egyptians have used the factory to produce British-designed, 1960s-generation Swingfire antitank guided missiles. [redacted]

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- **Abu Za'bal Company for Specialized Chemicals.** (b)(1)
We believe the Egyptians are manufacturing solid (b)(3)
fuel for rocket motors at this facility and testing rocket motors.

- **Jabal al Hamzah Range.** The Egyptians probably conduct most of their surface-to-surface ballistic missile tests at this range. It is located northwest of Cairo. The Sakr Factory also uses the range to test other munitions.

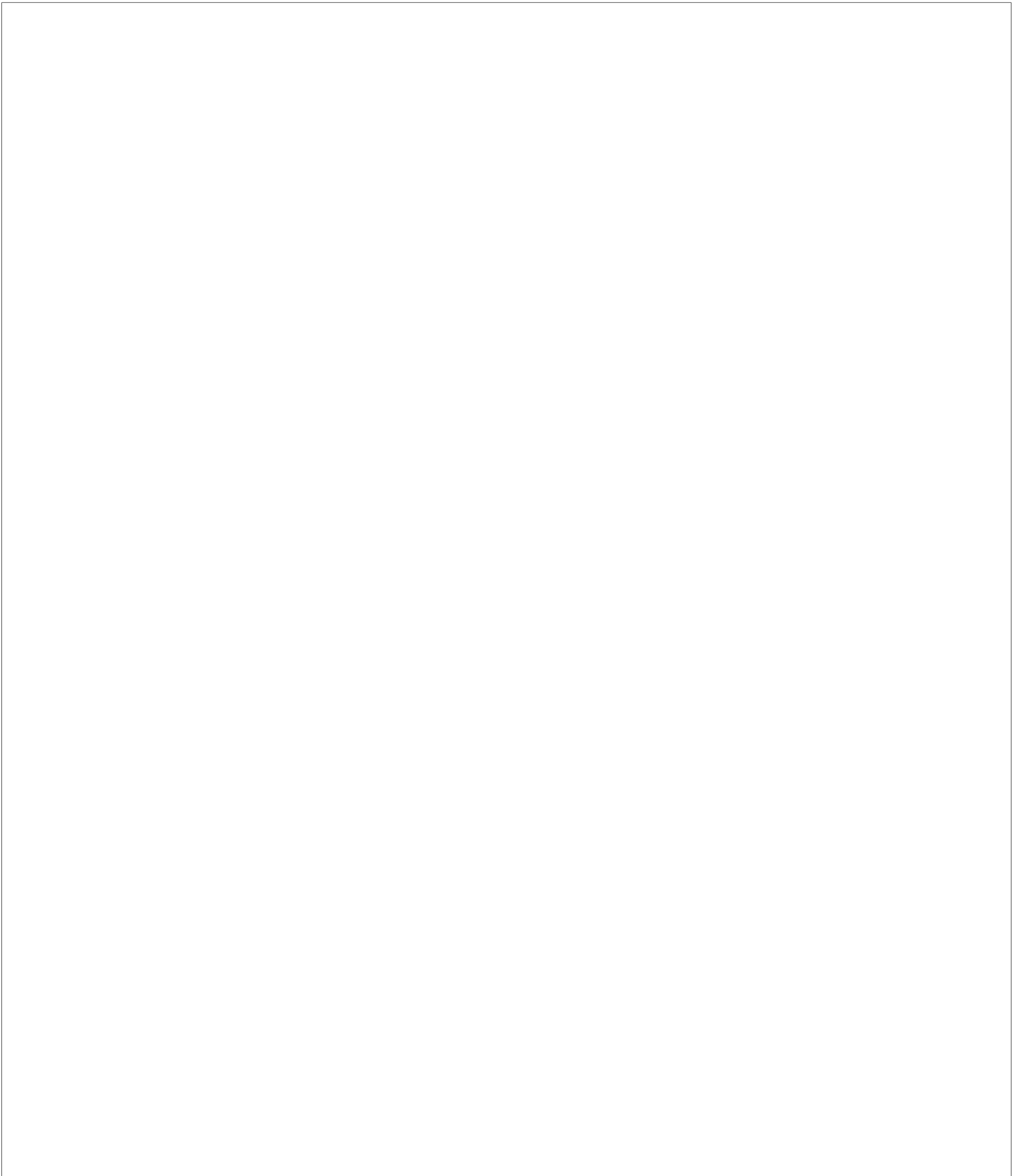
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- **Egyptian Space Research Center.** We believe part (b)(3)
of the center may house surface-to-surface ballistic missile-related equipment.

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[redacted]
[redacted] The "special projects" office probably is funded partly through the official budget. [redacted]

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[redacted]
[redacted]

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Many of the details of Egypt's missile development program are unclear, but, [redacted] we believe the Ministry of Defense is developing at least two surface-to-surface ballistic missiles for Egyptian forces and to sell abroad. In the next one to five years we expect Egypt to produce versions of Scud missiles and a longer range missile system similar to Argentina's Condor II missile currently under development. The Egyptians cannot manufacture entire Scud or Condor systems independently, however, and are involved in coproduction projects with North Korea and Argentina, respectively. [redacted]

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Scud Project

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The Ministry of Defense, we believe, has been working with North Korea since the early 1980s on a project to produce in Egypt missiles similar to Soviet Scuds. [redacted] Cairo provided Scuds to North Korea in 1983 for reverse-engineering, most likely in exchange for North Korean promises to assist in production of Scuds in Egypt. We believe the Egyptians are paying P'yongyang a considerable sum for its assistance. [redacted]

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[redacted]
[redacted] the Ministry of Defense was negotiating a license to manufacture North Korean Scuds in 1986, and North Korean and Egyptian officials signed an

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[redacted]
[redacted]

agreement in December 1987 for the transfer of missile technology—probably for Scuds—to Egypt. [redacted] the North Koreans expect to receive some of the Egyptian missiles as part of the agreement, but the deal may only call for additional royalty payments on Egyptian-produced Scuds. [redacted]

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[redacted] the Scud project [redacted]
[redacted]

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[redacted] consists of several phases. During the first phase, Egypt was to conduct a range test of a missile assembled in North Korea. The intermediate stage involves moving to Egyptian assembly and testing of Scud-"kits" provided by North Korea and developing the tooling and infrastructure that would enable Egypt to manufacture all components. During the last part of the program, Egypt is to begin series production of the missiles with little or no North Korean assistance. [redacted]

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We believe the Egyptians have reached the intermediate phase of the project—building missiles from kits and testing them. [redacted] Egyptian military officers spent some 18 months in North Korea during the period 1984-85 conducting research and receiving training on the Scud system.

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[redacted]
[redacted] by September 1986, the Egyptians and North Koreans were assembling missiles—probably prototypes—in Egypt.⁶ The Egyptians apparently made more progress in 1987. [redacted]

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[redacted]
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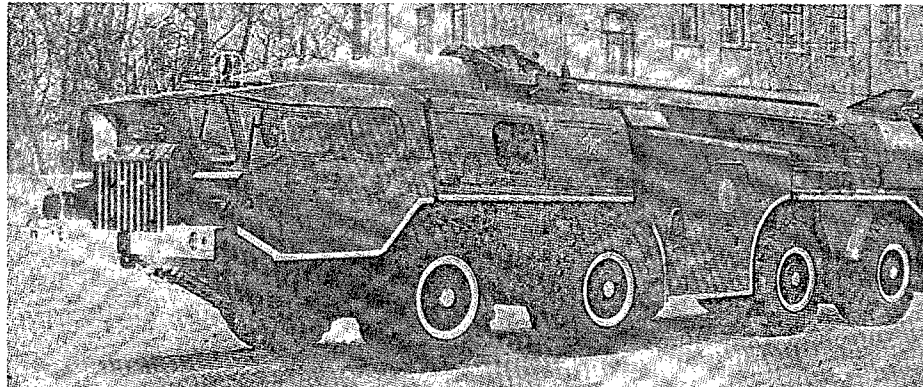
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Figure 6. Scud missile system.

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probably manufactured with North Korean assistance from kits, at their Jabal al Hamzah test range. [redacted]

Argentina's Condor II project—an effort to develop a two-stage, short-range ballistic missile system—as early as 1983.⁷ We do not know the specifics of the Argentine-Egyptian cooperation agreement, but we believe Cairo is helping to fund the program and is assisting directly in coproducing the system. Egyptian military technicians have been working with Argentine engineers at Argentina's Cordoba facility since about 1984. [redacted]

We do not know the specifications of the North Korean-Egyptian Scud-like missile, but the North Koreans probably have made few if any modifications to the Soviet system. [redacted]

[redacted] the missiles tested in Egypt were similar in maximum range—about 300 kilometers. [redacted]

[redacted] Nonetheless, we cannot rule out Egyptian attempts to alter the missile, possibly using technology acquired from the West or from Iraq, to achieve greater range and accuracy and perhaps to carry a different payload. [redacted]

[redacted] Egypt in 1986 was exploring possibilities that might lead to production of a 600-kilometer-range system. [redacted]

[redacted] Both countries are working closely with West European firms from which they are receiving technology for the missile subsystems. [redacted]

Cairo may buy a small number of missiles and key components in the short term, but the Ministry of Defense probably expects to gain full production technology for the Condor II system by the early 1990s through cooperation with Argentina. The office of special projects is sponsoring a separate development and production program in Egypt for a missile similar or identical to Argentina's Condor II [redacted]

[redacted] the Egyptians refer to [redacted]

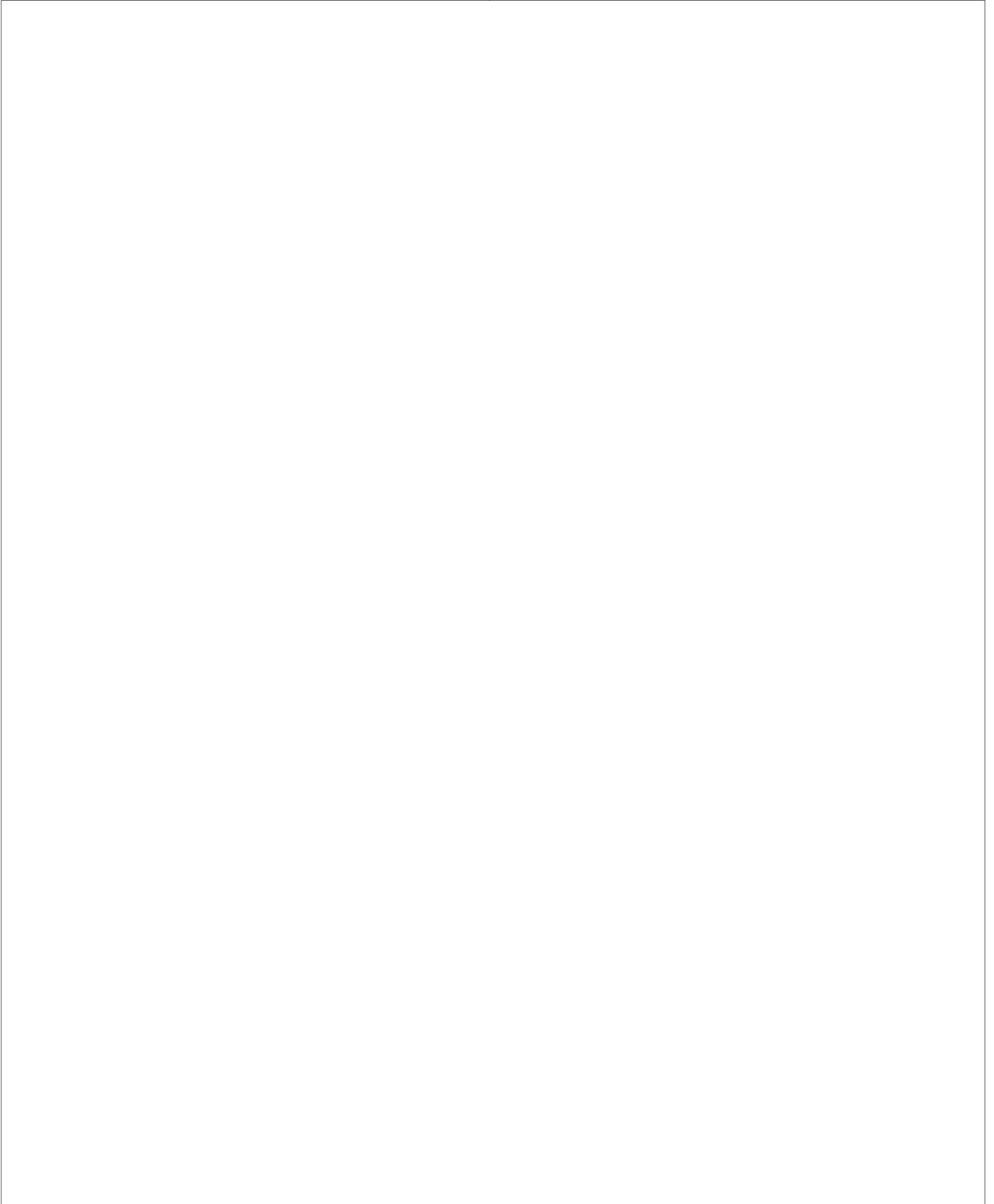
Condor II/Vector Project

The office of special projects is working with Argentina and West European firms to develop a new surface-to-surface missile. [redacted]

[redacted] the Egyptians began participating in [redacted]

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their missile as the "Vector" rather than the "Condor II." [REDACTED]

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The Condor II/Vector relies on Western technology, and it will have greater range than the Scud. [REDACTED]

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Iraqi Involvement in Egyptian Missile Projects

We believe Iraqi officials are working with Egypt's office of special projects to obtain surface-to-surface missiles and production technology. The Iraqis provided startup capital [REDACTED] for a joint project with the Egyptians. [REDACTED]

(b)(1)
(b)(3)(b)(1)
(b)(3)

[REDACTED] Although the exact nature of Iraqi involvement is uncertain, Baghdad appears to be working with the special projects office in a program—codenamed "Badr 2000" or "Project 2000,"

(b)(1)
(b)(3)

[REDACTED] to produce a missile with a range of at least 700 kilometers. This missile almost certainly is the Condor II or Vector. Baghdad's participation in the Egyptian-Argentine program appears to be limited mainly to providing funding. The Iraqis probably expect to gain Egyptian-produced Vectors (or possibly some Argentine-produced Condor IIs) in the short term and to

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Iraq's Missile Development Program

(b)(1)

(b)(3)

Baghdad probably is pursuing two separate missile development and production projects. One involves modifying Scud-B missiles to increase their range. The second project most likely calls for acquiring production technology for the Condor II/Vector system through the Egyptian missile program and from Western firms.

(b)(3)

The Iraqis may have produced the missiles—probably modified Scuds—that the military used against Iranian cities this spring. Iraq fired more than 100 of the missiles, referred to in Iraqi press statements as Al-Husayn missiles, into Tehran in March.

(b)(1)

(b)(3)

the Iraqis have modified Scud-B missiles acquired from the Soviets to increase their maximum range to some 600 kilometers—sufficient to strike Tehran at a distance of about 580 kilometers from Iraq's launchsite.

we believe Egypt is transferring Condor II/Vector-related technology to Iraq and suspect it will supply Baghdad with some of the first Condor II/Vector missiles produced by Argentina. Once Cairo obtains full production technology for the missiles, it is likely to transfer additional material and technical expertise to Iraq so that it can begin its own production.

(b)(1)

(b)(3)

even with foreign assistance, the Iraqis probably cannot begin full production of the missiles until the mid-1990s at the earliest.

(b)(1)

(b)(3)

Cairo and Baghdad may be negotiating on details for a sale of Egyptian-produced Scuds to Baghdad. We cannot rule out a possible transfer of Iraqi technology to Cairo to make modifications in the Scuds Egypt will produce.

(b)(3)

acquire the technology and expertise to build their own missiles. Iraq has a national missile production program under way and is acquiring production technology and materials from Western firms that supply Argentina and Egypt. Baghdad may have decided to work with Egypt to take advantage of Egyptian expertise and to gain access to Western technology it might find more difficult to obtain independently.

(b)(3)

(b)(3)

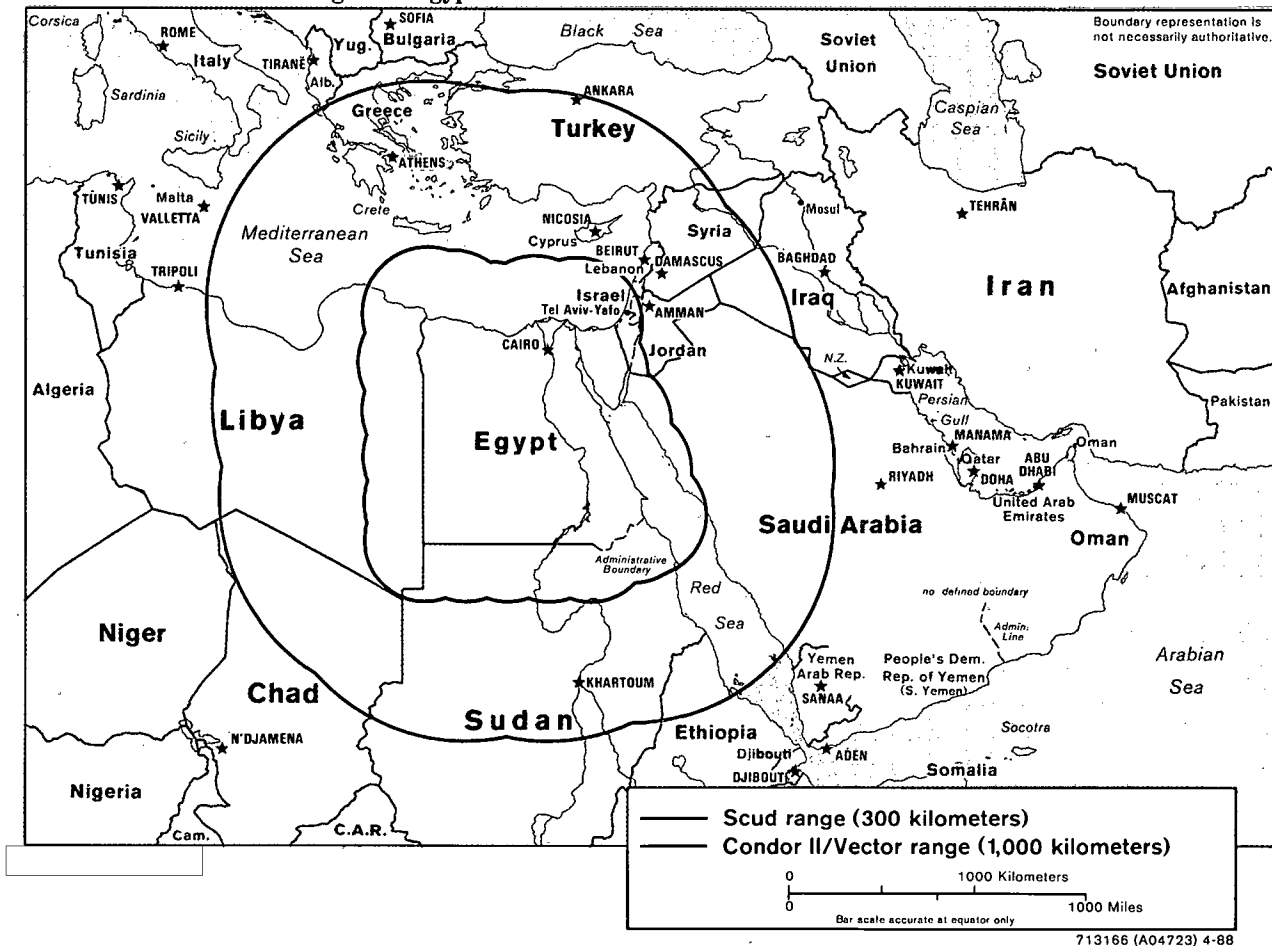
(b)(1)

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Figure 9
Estimated Maximum Ranges of Egyptian Missiles



(b)(3)

Dependence on Foreign Assistance

Foreign technology and material assistance are critical to Egypt's missile program. Cairo, in our view, lacks sufficient technical expertise—especially in propulsion systems, rocket-motor production, and guidance and control—to produce surface-to-surface missiles like the Scud and the Condor independently. In particular, the Egyptians cannot manufacture in sufficient quality and quantity many of the materials needed for Condor production, including ammonium perchlorate for solid propellants and probably the special steel needed for motor cases. Cairo has acquired or will soon obtain most of the equipment, technology, and materials to produce Scuds, but,

given Egypt's poor performance in other military production efforts, we suspect that assembly of such missiles would quickly stop without North Korean technical assistance. The North Koreans must help the Egyptians overcome even minor difficulties and assure quality control. [REDACTED]

(b)(3)

Cairo also depends on foreign financial assistance to continue its missile program. Even though the Ministry of Defense pays for part of the program [REDACTED]

(b)(1)*

[REDACTED] it probably cannot cover all costs, especially with other military programs competing for funds. We suspect that most of the missile program is

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supported by Iraqi payments and perhaps transfers from Saudi Arabia either directly or through Iraq.

(b)(3)

Outlook

Cairo is likely to continue making surface-to-surface ballistic missile development a high priority. The military's progress with the Scud and Condor II/Vector projects will sustain high-level support for missile development, in our view. Moreover, the acquisition of new or more missiles by other Middle Eastern states—such as the Saudis' purchase of CSS-2 intermediate-range ballistic missiles from China—may cause the Egyptians to try to accelerate or expand their program, though they probably would need additional foreign support.

(b)(3)

The military appears more likely to succeed in the near term with its Scud production efforts than with its Condor II/Vector project. Series production of Scud-like missiles in Egypt could begin late next year if North Korea provides assistance and kits or most of the parts for assembly. Egypt probably cannot produce the entire missile independently before the early 1990s.

(b)(1)

(b)(3)

we believe Cairo could receive the necessary assistance from Western firms involved in Egypt's other missile projects or possibly from Iraq.

(b)(3)

We believe Egypt could begin series production of Vector missiles by the early to middle 1990s. Access to Western technology and systems, such as the thrust-vector control for guidance, has advanced Argentine and Egyptian progress over the past 18 months on the Condor II. Full-scale production of that system in Argentina may begin by 1990, and we would expect to see additional technology and component transfers to Egypt shortly thereafter that would enable Cairo to begin producing Vector missiles within two years. Argentina's and Egypt's continued uncertainty about the missile's second stage and reliance on Western firms for parts and technology may slow development and production efforts.

(b)(3)

Implications for the Region and the United States

Possession of more Scuds and of Condor II/Vector surface-to-surface missiles, in our view, will substantially enhance Egypt's capability to deter and retaliate against enemy attacks:

- Additional secure supplies of Scud missiles—particularly if Egypt's inventory is larger than that of its opponent—may increase Cairo's willingness to use the weapons in response to military threats. Larger numbers of the missiles would increase the Egyptians' chances of hitting specific targets, since many missiles often must be used to compensate for their inaccuracy. The range of the Scud would allow Cairo to hit targets in Israel as well as Israeli troop concentrations in the Sinai. Most important targets in Libya and Sudan, however, would remain out of range.

- If Cairo obtains the Condor II/Vector, it will have a longer range surface-to-surface missile than those held by other Arab states, except for Saudi Arabia. The Condor II/Vector would put many targets in the Middle East and Africa within range, including those in northern Chad, northern Sudan (including Khartoum), southern Syria (including Damascus), and western Libya (including about half of Libya's ground forces and some Libyan oilfields).

(b)(3)

Cairo almost certainly would use the missiles in the event of another war to try to achieve tactical aims. It also might use such weapons against enemy strategic targets—civilian and economic facilities—but probably only in retaliation for similar attacks against Egypt or to avoid defeat. In the case of another war with Israel, Cairo probably would be especially reluctant to escalate the conflict by initiating missile strikes against strategic targets for fear of devastating Israeli reprisals.

(b)(3)

Egypt's acquisition of additional Scuds and Condor II/Vectors will contribute to and probably accelerate the proliferation of surface-to-surface missiles and missile production efforts in the region. The Saudis'

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recent purchase of CSS-2 missiles from China and Iraq's acquisition—probably by altering a Scud—of the Al-Husayn missile already have weakened constraints on the proliferation of missiles with ranges greater than 300 kilometers. Libya and Syria, in particular, would want to hasten their missile development programs to keep pace with other states in the Middle East. Meanwhile, Cairo eventually will sell Scuds and Condor II/Vectors to Baghdad while Iraq completes its own missile-production facilities. We cannot rule out sales of the Egyptian missiles to other countries, including the Arab Gulf states and Pakistan, possibly giving Islamabad a delivery vehicle for nuclear weapons. [redacted]

The Israelis consider the Saudis' CSS-2s a serious security threat and will continue to be concerned about Egyptian capabilities and the likely spread of missile systems and production technology to other Arab countries, especially Iraq. [redacted]

Tel Aviv could respond [redacted]

to Egyptian advances in missile production by speeding its own ballistic missile research and development efforts as well as urging the United States to increase its efforts to help halt the proliferation of such Arab missiles. [redacted]

US efforts to curtail transfers of missile-related technology and raw materials to Egypt probably would slow but not halt Cairo's missile program. Unless more countries support the Missile Technology Control Regime and those countries in the Regime enforce its restrictions more rigorously, Cairo will continue to find firms or countries—such as North Korea and possibly China—that will be willing to provide support.⁸ A direct US confrontation of Egypt with evidence of its involvement in missile development probably would result in Egyptian denials, temporarily strained relations with Cairo, and a brief slowing of the program to increase security and tighten access to information on the program's progress. [redacted]

⁸ The Missile Technology Control Regime was announced by the United States and Canada, France, West Germany, Italy, Japan, and the United Kingdom in April 1987. It attempts to halt the transfer of ballistic missile technology to potential nuclear proliferants. [redacted]

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