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**INVESTMENT
AND
FREE ZONES
AUTHORITY**

Sectoral Survey 9

**THE ELECTRONIC AND ELECTRICAL
INDUSTRIES IN EGYPT**

1982

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A GUIDE TO DOING BUSINESS IN EGYPT follows page 148 of this report.

PREFACE

This report is one of a series published by the General Authority for Investment and Free Zones and designed specifically to promote the participation of U.S. companies in investment projects in Egypt.

Funded by the U.S. Agency for International Development (U.S. AID) and prepared by the Chase World Advisory Group of Chase Trade Information Corporation, these reports focus on sectors of the Egyptian economy which offer the foreign investor specific investment opportunities in significant areas of the Egyptian economy ranging from pharmaceuticals, the processing and distribution of food crops; and the production and processing of livestock, poultry, and fish products, to construction materials, components, and systems; and chemical products.

There are ten reports in all. This ninth report, on the electronic and electrical equipment and products industries in Egypt, was prepared by the engineering construction firm of Singmaster & Breyer, Inc., a member of the SNC Group, under the direction of Dr. Ray S. Kelley, Jr. of the Chase Trade Information Corporation.

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INTRODUCTION

The Egyptian government has made the rapid industrialization of Egypt's economy one of its major economic goals. The electronic and electrical industries will play key roles in the modernization and growth of Egypt's industry, as well as in supplying the goods necessary for increasing the standard of living for Egypt's rapidly growing population.

In order to accomplish these goals, Egypt will have to import technological "know-how" and, in many cases, the necessary financing to implement these projects. This situation creates opportunities for U.S. companies to engage in active trade with Egypt, both as profitable joint venturers with local enterprises, and/or as sellers of equipment whose local production is not yet feasible. To further enhance the investment opportunities, the Egyptian government has enacted legislation offering significant concessions to foreign investors.

This report provides an in-depth review of the electronic and electrical industries in Egypt, and identifies potential joint-venture opportunities stemming from the projected growth of this vital sector of the Egyptian economy. In addition to the potential

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investment opportunities identified in this report, there are undoubtedly a significant number of other Egyptian businessmen or companies interested in participation in electronic and electrical industry joint ventures.

Interested U.S. investors are encouraged to contact any of the following organizations involved in the continuing review of investment opportunities:

- o The Egyptian General Authority for Investment and Free Zones
- o Chase Trade Information Corporation
- o Egypt-U.S. Business Council
- o The Special Office of the U.S. Trade Representative, and
- o The U.S. Department of Commerce.

Scope of Products Covered

While the report deals with a broad spectrum of the electronic and electrical industries, the range of products covered by the report was limited based upon discussions with knowledgeable Egyptian government employees, Chase Trade Information Corporation (CTIC) personnel, and Egyptian industry consultants.

The purpose of the screening was to select those products which are fundamental to the economy, which

will reduce imports, have the potential for exports, and which appear to offer the greatest potential for joint ventures and investment opportunities. As a result of the screening process, the following products were selected for detailed study:

- o Communication system equipment
- o Electronic consumer products
- o Computers, word processors, and related accessories
- o Medical electronic equipment
- o Electrical transmission and distribution equipment
- o Electrical appliances
- o Lamps and wiring devices
- o Miscellaneous electrical equipment.

Methodology

After initial scoping discussions in the United States, Singmaster & Breyer, Inc. assigned a team consisting of a Resident Technical Coordinator and a Senior Electrical Engineer to carry out the necessary field work in Egypt. During their assignment in Egypt, they operated as members of a project team which included Chase Trade Information Corporation personnel, General Authority for Investment and Free Zones

personnel, and an Egyptian consultant, Dr. Mohammed Abdou El-Said. Dr. El-Said, a former professor of electronics and telecommunications at the Faculty of Engineering, Cairo University and Dean of the Faculty of Engineering, was Managing Director of the joint Egypt-U.S. research and planning team for Egypt's telecommunications systems and ground satellite development.

The major work activity in Egypt consisted of conducting interviews with top executives of key electrical and electronics companies. The report is based upon twenty-one such interviews. Each interview was carried out by a member of the Singmaster & Breyer team, and a counterpart Investment Authority representative, who provided translation services and technical assistance. Dr. El-Said also attended most of the interviews. A "Call Report," as well as a "Joint-Venture Profile," where applicable, was prepared for each meeting. A list of organizations contacted is given in the Appendix. The Call Reports and Profiles served as the basis for the joint-venture opportunity descriptions which are discussed in the report.

The other work activity consisted of obtaining statistical data in regard to production, imports and

exports, and other relevant areas. Most of this data was obtained from Egyptian government sources, and various U.S. agency publications and reports.

Outline of Report

The first section of the report provides a general overview of the electronic and electrical industries, including the role of public and private sector companies, the role of the government and its key agencies, general pricing conditions, methods of distribution, the labor picture, and other general information.

Subsequent sections deal with the product categories studied. Each product section includes a brief description of the product and its uses, its method of manufacture, and raw materials used; a brief discussion of the industry structure and a discussion of the present and projected market demand, including where available, statistics on production, imports, exports, and growth rates; and a review of the potential investment opportunities.

Chapter 11 includes a profile of each of the potential investment opportunities developed during the sector survey.

The second section of this volume, A Guide to

Doing Business in Egypt, provides background data in regard to the Egyptian business environment including information on the economy, taxes, repatriation of funds, key government agencies and addresses, and other helpful information.

1. EXECUTIVE SUMMARY

The Electronic and Electrical Equipment Market in General

Imports of finished goods and components play a predominant role in the supply of equipment to the electronic and electrical industries. While there are a number of Egyptian companies which manufacture equipment using local raw materials, they are relatively few in number. Most of the companies act as assemblers using foreign components, or as sales agents for foreign companies.

Overall, the demand for electronic and electrical equipment has been strong. It should remain strong and even increase due to Egypt's rapidly growing population with its rising expectations, the government's announced intention to modernize and expand its industrial base, and its desire to reduce imports and increase exports.

The Industrial Environment

Egypt has many advantages in carrying out its planned expansion program. An industrial base already exists, a basic infrastructure is in place, major financial institutions are functioning, a large labor pool exists, and there are many excellent technical and educational institutions in operation. Its strategic

location also makes Egypt an ideal base for exporting of industrial products, especially to Middle East countries.

Along with its assets, Egypt has a number of significant problems to overcome. These include a shortage of skilled technicians and managers, high unemployment and restrictive labor laws which frequently result in overstaffing and inefficiency, high cost and poor quality resulting from a lack of incentives and skills, and the excessive bureaucratic involvement in the operation and planning of the industrial sector.

Cognizant of these problems and of the need to involve foreign investors to assist in building its economy, the Egyptian government has undertaken a series of steps to overcome these difficulties. The most important for the foreign investor was the enactment of its so-called "Open Door" policy. The major thrust of this policy was the enactment in 1974 of Public Law 43, which provides major incentives for the foreign investor. The legislation, as later amended by Law 32, features tax holidays for five years, regulations which facilitate the repatriation of invested capital and profits, freedom from local taxes

for Free Zone products, exemption from government regulation on labor participation in management, profit sharing, and board composition. The combination of the Public Law 43 legislation and the anticipated growth of the electronics and electrical sectors provide excellent opportunities for the U.S. businessman.

Industry Structure

Egypt's economy operates on a dual track, including both public and private sector companies. Each sector operates under different guidelines with respect to production goals, investment, expansion, and pricing. The public sector, which stems from the nationalization policies of the early 1960s, is the larger of the two sectors and is subject to strict governmental control.

The intent of the "Open Door" policy and the Law 43 legislation is to increase the role of the private sector, to reduce the tightly centralized control over the public sector, and to allow the effect of free market forces to play a greater role in establishing prices and wages.

Survey Results

Twenty-five potential joint-venture opportunities are discussed in the report, twenty-one of which are a

result of the survey work carried out for this sector study. The results of the survey for each product category are summarized below.

Communication System Equipment

The communication system in Egypt consists of five broad groupings: a nationwide telephone system; a telex system; mobile radio systems; TV and radio broadcasting systems; and data communication systems. The telephone system is in dire need of expansion and modernization. A major upgrading program is presently underway. Large expansions will be required for at least the next 20 years. The telex and mobile radio systems are limited in extent. The TV and radio broadcasting system is in place, and only moderate growth is visualized. Data communication systems are almost non-existent at present.

Egyptian production of equipment for the communications industry is relatively small. In 1979, local production accounted for less than nine percent of the total market demand. Projections for the year 1985 indicate that the total market demand will almost triple, while Egyptian production will satisfy only about four percent of that demand.

Four joint ventures are discussed in the report:

two involve the manufacture of telephone equipment, one deals with the assembly of HF and VHF equipment, and the last covers a joint venture to produce telephone cables.

Electronic Consumer Products

This category includes television sets, radios, cassette tape players, stereo sets, record players, and tape recorders. TV sets and radio/cassette players account for the bulk of the total Egyptian sales in this category. Imports of finished products account for about one-half of the total sales volume. The Egyptian production consists primarily of equipment which is assembled from components which are imported. The demand for TV sets, especially color sets, is growing rapidly and is expected to continue to do so in the future.

Two joint ventures were identified. One involves the production of CRT (picture) tubes and then assembly into finished sets. The other contemplates the production of CRTs and other TV components and their assembly into TV sets.

Computers, Word Processors, and Related Accessories

The use of computers, word processors, and related accessories in Egypt has been very limited to date.

Almost all of the equipment is imported. Many of the industry leaders in the U.S. are present in Egypt, including IBM, NCR, Wang, Digital Equipment Corporation, Burroughs, Texas Instruments, and Apple. The market, while still small, has been growing rapidly. With major industrialization and modernization programs underway, both in Egypt and the Near East countries, demand for this type of equipment should rise dramatically.

Three project opportunities were identified. One involves the assembly and sale of word processing equipment, the second the production of minicomputers for business applications, and the third involves production of a broad range of computer and peripheral equipment.

Medical Electronic Equipment

The report covers two types of medical electronic equipment: artificial kidney machines and electrocardiogram monitors. Substantially, all of this type of equipment is imported by licensed Egyptian agents.

Two joint ventures are discussed in the report. One covers the production of artificial kidney machines and disposable filters. The second covers the production of electrocardiogram monitors.

Electrical Transmission and Distribution Equipment

The equipment included in this category includes power and distribution transformers, circuit breakers, fuses, switches, towers, substation structures, wire and cable, and poles and pole line hardware. A number of Egyptian public sector companies produce a range of these products. However, the bulk of the required equipment is imported.

Three potential joint ventures are discussed in this report. One involves the manufacture of porcelain insulators, the second the manufacture of low and medium voltage power fuses, and the third the production of steel transmission towers. An expression of interest was also obtained for a plant to manufacture distribution capacitors.

Electrical Appliances

The electrical appliances used in Egypt include washing machines, refrigerators, freezers, air conditioners, and other similar products. The demand for these items is growing rapidly. Egyptian producers supply a major part of the market, protected in part by high tariffs on imported goods.

Six joint ventures were identified. All of them involve the production of one or more appliances.

Lighting and Wiring Accessories

There are two major local producers of electrical lamps in Egypt. While statistical data is lacking, it appears that about 30 percent of the market demand is satisfied by imports. About 90 percent of the raw materials used in the manufacture of lamps are imported. The production of lamps has been growing steadily. The increase is expected to continue.

Two joint ventures were identified, one covering the production of incandescent and fluorescent lamps, the second a plant to produce electrical wiring accessories.

Miscellaneous Electrical Equipment

The equipment covered by the report includes wet cell industrial and automotive batteries, and fire and burglar alarm system equipment. Local industry provides substantially all of the demand for batteries. Fire and burglar alarm system equipment is almost all imported. Demand for all of the above categories of equipment is expected to remain strong.

Three joint-venture opportunities were developed: one covering the manufacture of wet cell batteries, and two covering fire and burglar alarm system equipment.

An expression of interest was also identified for

the production of fractional horsepower motors, cable accessories, small diesel generators, automotive generators, and test and measuring instruments.

2. GENERAL OVERVIEW OF THE ELECTRONIC AND ELECTRICAL INDUSTRIES

The electronic and electrical industries' operations in Egypt are subject to many of the same conditions and restraints that affect most of the industrial sector. The discussion which follows provides a broad overview of the organization and operation of industry in general and the electronic and electrical industries in particular.

Governmental Policy in the Public and Private Sectors

Industry in Egypt consists of two basic groupings, the public sector and the private sector, the latter including joint-venture companies formed under Law 43. Both operate in the same marketplace under somewhat different conditions. A brief historical review will be helpful in understanding the role of the two sectors and of the shifts in emphasis that have taken place in recent years.

In the early 1960s the Egyptian government nationalized all major enterprises. Most basic and strategic industries employing one hundred or more people turned public and were placed under government control. This resulted in a large number of companies with overlapping operations. In due course, the

government consolidated and restructured the number of public sector companies to provide more efficient operation.

Today, the public sector in the electronic and electrical equipment industries is comprised of 20 companies. Each company reports to a governmental agency which monitors its operation. Most of the companies report to the Ministry of Industry and Mineral Wealth, but other key companies report to the Ministry of Electricity and Energy and the Ministry of Military Production.

In the period between 1960 and the early 1970s, the major emphasis for industrial growth was on the public sector, with a high degree of centralized planning and control. In 1974, the government instituted the "Open Door" policy. The program was aimed at stimulating the private sector, encouraging foreign investment, de-emphasizing the tight control over all aspects of the public sector, and on a limited scale introducing market forces in establishing wages and prices. However, at this time the Egyptian economy still remains extensively controlled by the government. It is estimated that approximately 70 percent of domestic industrial production is generated by the

public sector. Table 2-1 shows the relative shares of the public and private sectors for the years 1975-1979.

The private sector is generally composed of establishments employing ten to fifty people, although there are a few firms with much larger workforces. It has been estimated that there were approximately 4,000 privately owned establishments in the industrial sector in 1978.*

Table 2-1

TOTAL ANNUAL INDUSTRIAL PRODUCTION:
PUBLIC VERSUS PRIVATE SECTORS

(L.E. 1,000)

Year	Public Sector		Private Sector		Total Production
	Value	Percent	Value	Percent	Value
1975	1,538.0	72	589.9	28	2,136.9
1976	1,733.8	70	735.3	30	2,469.1
1977	2,080.0	74	793.4	26	2,873.4
1978	2,391.9	70	1,040.3	30	3,432.2
1979	2,760.0	70	1,203.0	30	3,963.0

Source: Ministry of Industry and Mineral Wealth.

* A.D. Little, "Report to the Special Inter-agency Task Force Reviewing the U.S. Security Supporting Assistance Program for Egypt. An Assessment of Egypt's Industrial Sector," January 1978.

Public Law 43

The most important legislation affecting foreign investment in Egypt today is "Public Law 43 of 1974, Concerning the Investment of Arab and Foreign Funds and the Free Zones," as amended by Law 32 of 1977. The legislation deals with three main areas: 1) It provides the principles for establishing and regulating foreign investments; 2) It establishes regulations for investments in free zones; and 3) It establishes regulations for incorporating joint-venture companies.

Under Public Law 43, the investor is offered tax incentives, simplified methods for repatriation of earnings and capital, freedom from price controls, and other concessions. A more complete discussion of Public Law 43 may be found in the second part of this report entitled A Guide to Doing Business in Egypt. As of December 1981, some 1,287 projects had been approved under the legislation, although only about 555 were actually reported to be in operation by December 30, 1980.

Excerpts from 1982-1987 Egyptian Development Plan for Investment are shown in Table 2-2. The data indicates a major role for private investment in the industrial sector, calling for expenditures of 2.6 billion Egyptian pounds (L.E.). Data as to what part of this investment is in the electronic and electrical industries is not readily available.

Table 2-2

TOTAL PUBLIC AND PRIVATE INVESTMENTS
(DIVIDED BETWEEN THE ECONOMIC SECTORS)
FOR THE FIVE YEAR PLAN
1982/83-1986/87

(L.E. Million)

Sector	Public	Private	Total
Agriculture, land reclamation, irrigation, and drainage	2,720.7	1,000.0	3,720.7
Industry and mining	6,793.3	2,560.0	9,353.3
Petroleum	1,353.5	-	1,353.5
Electricity	2,844.4	-	2,844.4
Building and construction	<u>526.7</u>	<u>415.0</u>	<u>941.7</u>
Total commodity sectors	14,238.6	3,975.0	18,213.6
Transportation and Suez Canal	5,585.9	330.0	5,915.9
Trade, money, insurance, and tourism	<u>899.8</u>	<u>180.0</u>	<u>1,079.8</u>
Total service products sector	6,485.7	510.0	6,995.7
Habitation	263.2	3,565.0	3,828.2
Public services	2,858.1	-	2,858.1
Other services	<u>2,404.4</u>	<u>150.0</u>	<u>2,554.4</u>
Total service sectors	5,525.7	3,715.0	9,240.7
TOTAL	26,250.0	8,200.0	34,450.0

Source: Ministry of Planning.

Governmental Regulation - Key Agencies

General Authority for Investment and Free Zones

The governmental agency which administers Public Law 43 is the General Authority for Investment and Free Zones, also referred to as the Investment Authority. The agency promotes investment in Egypt by providing advisory services, offering projects for investment, operating promotional campaigns, and assisting investors in implementing projects. A more detailed discussion of the Investment Authority's services is also given in A Guide to Doing Business in Egypt. The Investment Authority relies on an allied agency, the General Organization for Industrialization (GOFI), for technical and feasibility evaluations of proposed projects.

Ministry of Industry and Mineral Wealth

The governmental agency regulating the operation of most of the companies in the electronic and electrical equipment industries is the Ministry of Industry and Mineral Wealth. The electronics and electrical equipment industries grouping is part of the metallurgical and technical industries sector which is administered by a "Higher Council" made up of ministry and company officials, representatives of the

Ministries of Finance, Planning, and Economics, and experts in the technical, economic, or legal fields. The Higher Councils provide overall planning and coordination for the industry. Pricing, employment, and other key factors are controlled through this organization.

General Organization for Industrialization

The General Organization for Industrialization (GOFI) is a branch of the Ministry of Industry and Mineral Wealth. GOFI employs about 1,300 people, of whom 800 are engineers, technicians, and commercial staff. GOFI's functions include formulation of industrial development policies, collection of data, studies to improve efficiency and technology, identification of investment opportunities, performance of pre-investment feasibility studies of proposed projects, examination and review of applications for establishing new joint ventures submitted to the Investment Authority, implementation of industrial projects, and other related activities. GOFI's approval is required before a Public Law 43 joint venture may proceed.

Ministry of Electricity and Energy and Ministry of
Military Production

A number of major companies in the electronic and electrical industries report to agencies other than the Ministry of Industry and Mineral Wealth. The El Nasr Company for the Manufacture of Electrical Transformers and Products (ELMACO), which is the major producer of transformers and distribution panels in Egypt, reports to the Ministry of Electricity and Energy.

Similarly, the Benha Company for Electronic Industries, which is a major producer of radio and TV sets and other electronic equipment, reports to the Ministry of Military Production. Other companies reporting to this ministry are the Shubra Company for Engineering Industries, which produces fractional horsepower motors, electrical fans, switches, and receptacles; and the Helwan Company for Non-Ferric Industries, which produces aluminum and copper cables and fittings.

Pricing and Price Controls

Prices for products may be fixed or allowed to float free, depending upon the nature of the product. Prices of essential consumer items are generally fixed by the government. For example, simple refrigerators

produced by the public sector are subsidized and price-controlled to be marketed in Egypt for about L.E. 200. A more sophisticated unit is imported, at a cost of L.E. 800, due to the heavy tariff imposed on it. This price is well above the purchasing power of the average Egyptian consumer. The resulting demand for locally produced refrigerators has produced a one year long waiting time to take delivery.

Pricing of output produced by the public sector, including raw materials, intermediate products, and finished products, is generally subject to rigorous control by the government. The price levels are generally set up on a cost-plus basis, but the pricing of essential consumer products is frequently established on the basis of sociopolitical considerations rather than economic criteria.

Occasionally a public company's cost to produce a product is more than its controlled selling price. Budgets of these companies are allowed to show a deficit which is financed in the budget by the government. The government intends to allow free market forces to play a greater role in the future.

Pricing of products in the private sector is subject to less control, and enforcement is frequently

not as strict as in the public sector. Generally, companies operating under Law 43 are not subject to price controls on their output. On the other hand, the prices of their inputs are not subsidized either.

Tariffs

The government imposes high tariffs on imported goods which compete with locally manufactured products. In some cases, where local production is adequate to meet the local demand, as with dry cell batteries, a temporary ban on all imports is imposed in order to protect the local industry. In other cases, imports are admitted only with the permission of the local manufacturer, such as with air conditioning parts.

Distribution Patterns - Procurement and Sales

Procurement

Raw materials for an industrial producer may be obtained on an allocated basis from an Egyptian company or may be obtained from foreign sources.

Transactions which involve finished products or intermediates moving from one public sector company to another are carried out on the basis of a quota at a government-controlled price. The quotas are based upon the previous year's purchase. Thus, the supplying company must produce a quantity of material to allow

the purchasing company to at least meet its previous year's demand. The allocation may also require the supplying company to meet, where possible, the increased requirements of an expanding market.

The purchasing company can, if it wishes, purchase additional raw materials on the open market. But it will not enjoy the advantage of government-controlled prices for these additional requirements. To purchase raw materials on the world market, electronic and electrical equipment industry companies in the public sector must first submit a request to the Sector Foreign Trade Committee. This information includes commodity specifications, price, delivery, and method of payment. With approval by the Committee, the import transaction may take place. For large-quantity bulk products, international tenders are issued with the prior approval of the Ministry of Industry. Generally a fee is paid by the potential seller to obtain the tender specifications.

Commercial Agents

In order to submit a bid to a public sector company, a foreign company must engage the services of an Egyptian commercial agent. In certain cases, however, direct orders by Egyptian companies from

foreign suppliers or government agencies can be processed directly without the help of an intermediary. An agent is not required for bids to private sector companies or for sales financed by U.S. AID. Egyptian law also requires that foreign companies engage the services of agents, regardless of whether sales or services are involved, where activities such as technical consulting, market research, or operation of a representative office are involved. In any case, private sector companies may also engage the services of an agent because of his well established access to certain markets. Further information in regard to agents may be found in the section entitled A Guide to Doing Business in Egypt.

Sales - Wholesale and Retail

Wholesale and retail distribution operations are generally carried out by vertically integrated merchants or public sector trading companies. Government-run consumer cooperatives with many hundreds of retail outlets also provide wholesale and retail distribution activities. The co-ops purchase directly from producers, other cooperatives, or from importers, and distribute the products through their own shops. These co-ops operate mainly in the food industry, but

many electrical products are also distributed in this manner.

The retail trade in Egypt is conducted by numerous small private shops and factories having in-house sales personnel. In the smaller shops, the proprietor and, possibly, members of his family are the retail sales personnel, an arrangement not unlike the smaller stores in the U.S. According to size, these companies may sell both wholesale and retail. They may sell locally produced electronic and electrical products and also imports. Also, the government operates large, modern retail department stores in major Egyptian cities, where privately owned general and specialized stores can be found. The famous Khan el Khahli and Muskhil bazaars in Cairo are another source of retail distribution.

Sales - Commercial and Industrial Products

Many of the electronic and electrical equipment products which are sold to businesses and industry require installation, training, and servicing. Companies in these fields generally sell directly to the customer.. These organizations include application specialists, technicians, and maintenance and repair personnel in addition to the normal sales forces.

Labor

General

The labor picture for the electronic and electrical equipment industries resembles that for most of Egyptian industry. Egypt has a large labor force which is characterized by a number of chronic difficulties:

- 1) Large-scale latent unemployment, which is estimated to be in the range of 10-15 percent. Egypt's population growth requires the addition of 359,000 new jobs each year to maintain stable employment which has been the national target since Egypt embarked on the socialist implementation in 1962. This goal has not been met. In order to ease the problem, public industrial firms are forced to use a larger staff than it requires for efficient operation.
- 2) A shortage of skilled technicians and managers. While industry and labor unions do carry out vocational training programs, these have not been adequate. To correct the problem, the government has established an independent vocational training program which is planned to produce 50,000 graduates and 600 instructors

annually. Public Law 43 joint-venture companies must also establish training programs but are entitled to bring in a cadre of expatriates for key positions.

- 3) A "brain and skill drain" which results from the large number of Egyptian skilled workers who leave to work in the oil producing Arab states. Wages in these countries are very much higher than those paid by the Egyptian public sector companies.
- 4) Underemployment and inefficiency in the white collar category of the public sector, resulting from the government's guarantee of a job to all college graduates.

Unions

Egypt has a large trade union movement. There are 21 general trade unions (syndicates) organized on industry lines. Professional groups such as engineers, doctors, lawyers, and teachers also have their own organizations, also called syndicates.

Need for Research and Development - Industrial Parks

Maintenance of viable electronic and electrical industries will require the support of research and development facilities and a large pool of highly

trained technicians. Discussions with key industry leaders, government personnel, and industry consultants indicated a strong awareness of the problem. The Egyptians are also considering establishing industrial parks, a procedure which has been highly successful in nourishing the growth of the electronics industry in the United States.

3. COMMUNICATION SYSTEM EQUIPMENT

Overview

One of Egypt's major problems is that its communication systems are highly unreliable and inadequate to meet the needs of its growing population and of its rapidly expanding industrial base. The Egyptian government views this problem as extremely important, eclipsed only by problems in food, housing, and transportation. The various communication systems which are in service in Egypt and the type of equipment involved are:

- o The conventional telephone system which forms the backbone of the nation's communications network. The equipment is old and in poor condition. The existing network consists of approximately 375,000 lines of switching equipment, a network of inter-office junctions within multi-exchange areas (Cairo and Alexandria), and a national trunk network between manual and automatic switchboards. Switchboards in use vary in size from 6-10 lines, to multi-office installations consisting of up to 35,000 lines of cross-bar automatic switching equipment. Connections to

the outside world are provided by an extensive network of long distance circuits.

The system is in dire need of modernization and expansion. A recent U.S. AID-funded study by the Continental Telephone Company estimated that modernization of the telephone system will cost about U.S. \$20 billion over a 20-year period.* A U.S. \$1.8 billion quick-fix program is currently underway as a first step in the system's rehabilitation.

The equipment utilized includes telephone switching devices of various complexities, telephones, primarily of the rotary type, wire, and cable, transmission facilities using microwave and HF radio equipment, and miscellaneous hardware and fittings. The governmental agency responsible for the telephone system is the Arab Republic of Egypt National Telecommunications Organization (ARENTO).

* "Telecommunications Master Plan, 1980-2000" prepared by Continental Telephone Company for ARENTO, 1978.

- o A telex system which is primarily used by business. The existing facilities are presently underutilized, probably as a result of poor performance, high cost, and bureaucratic obstacles. Telex machines are the major equipment components required for system operation.
- o Mobile radio systems for land, air, and marine applications. These systems utilize HF, VHF, and UHF equipment. End-users include police and fire departments, ambulance services, airports, and various governmental agencies and authorities. Microwave links are being considered by a number of users for tying various locations together.
- o Broadcasting systems for radio and television. The radio system includes 24 transmitters, of which 14 are short wave, ranging from 10 to 140 kilowatts, and 10 are medium range, ranging from 2 to 450 kilowatts. There are 28 television transmission stations. The new color equipment was supplied by Marconi, a British firm, and Thomson-CSF, a French company. The equipment involved includes

transmitters, studio equipment, and closed circuit television. These facilities are fairly new and modern.

- o Data communication systems. The extent of these systems is presently very limited due to the lack of reliable and adequate telephone facilities and the relatively few and simple type of computers in existence. Equipment in this category includes terminals, which provide communication between a user and a central main frame computer; modems, which interface between the computer output and telephone lines; multiplexers, which permit sending more than one set of signals over a single line; and concentrators, which also permit sharing channels.

All of the systems utilize testing and metering equipment for proper operation and maintenance, providing another category of equipment required.

Industry Structure

Almost all of the communication system equipment is imported except for a line of telephone equipment manufactured by the Egyptian Telephone Apparatus Company. Table 3-1 shows production and import

statistics for communication equipment for the years 1977-1979, and a projection for the year 1985. Table 3-2 indicates the companies that are the leading equipment suppliers to Egypt.

Table 3-1
EGYPT: THE MARKET FOR COMMUNICATIONS EQUIPMENT*
 1977-1979 AND 1985
 (in millions of U.S. dollars)

	1977	1978	Estimated 1979	Projected 1985
Telephone and telex equipment				
Local production	12.0	12.9	12.5	15
Imports	<u>38.7</u>	<u>64.5</u>	<u>70.8</u>	<u>183</u>
Total	50.7	77.4	83.3	198
Transmission equipment (includes telephone cables)				
Local production	-	-	-	1
Imports	<u>45.2</u>	<u>31.3</u>	<u>28.3</u>	<u>175</u>
Total	45.2	31.3	28.3	176
Mobile Radio				
Local production	-	-	-	-
Imports	<u>7.7</u>	<u>30.7</u>	<u>15.7</u>	<u>15</u>
Total	7.7	30.7	15.7	15

Table 3-1 (cont'd)

	1977	1978	Estimated 1979	Projected 1985
Video and radio broadcasting equipment				
Local production	-	-	-	-
Imports	<u>37.2</u>	<u>21.7</u>	<u>15.4</u>	<u>12</u>
Total	37.2	21.7	15.4	12
Data communications equipment				
Local production	-	-	-	-
Imports	-	-	-	<u>6</u>
Total	-	-	-	6
Communications test and measurement** equipment				
Local production	-	-	-	-
Imports	<u>.6</u>	<u>1.5</u>	<u>1.3</u>	<u>2</u>
Total	.6	1.5	1.3	2

Table 3-1 (cont'd)

	1977	1978	Estimated 1979	Projected 1985
Total market				
Local production	12.0	12.9	12.5	16
Imports	<u>129.4</u>	<u>149.7</u>	<u>131.5</u>	<u>393</u>
Total	141.4	162.6	144.0	409

- * Size of market equals production plus imports (c.i.f.)
 minus exports (f.o.b.).
 ** Includes equipment for noncommunications uses.

Source: U.S. Department of Commerce, International Trade Administration, Office of Export Planning and Evaluation research study, The Market for Communications Equipment and Systems - Egypt.

Table 3-2

LEADING SUPPLIERS OF COMMUNICATION EQUIPMENT

	Country of Manufacture	Type of Equipment
<u>Telephone and Telex Equipment</u>		
Telephone Apparatus Company	Egypt	Cross-bar exchanges, PABX telephone sets
CIT Alcatel	France	Switching equipment
Ericsson	Sweden	Cross-bar switches, cross-bar switches with electronic Stored Program Control (SPC)
Siemens	Germany	Telex machines
Soghem	France	Telex machines
<u>Transmission Equipment</u>		
Collins	United States	Microwave link
Ford Aerospace	United States	Transmission equipment
Raytheon	United States	Microwave link
STC (ITT)	United Kingdom	Cable
Telefunken	Germany	Transmission equipment
<u>Mobile Radio</u>		
NEC	Japan	Walkie-Talkie sets
Toshiba	Japan	Walkie-Talkie sets

Table 3-2 (cont'd)

	Country of Manufacture	Type of Equipment
<u>Communications Tests and Measurement Equipment</u>		
Plessey	United Kingdom	Telephone test sets

Source: U.S. Department of Commerce, International Trade Administration, Country Market Survey CMS 81-054, July 1981 (Egypt).

Telephone Equipment

The Egyptian Telephone (Apparatus) Company is a public sector company that began as a joint venture with Ericsson of Sweden and continues to manufacture to Ericsson designs. Ninety percent of the Egyptian Telephone Company's production is sold directly to the Arab Republic of Egypt National Telecommunications Organization (ARENTO). The company's output is limited to public telephone exchanges (cross-bar systems), private exchanges, PABXs (Private Automatic Branch Exchange), and telephone sets. Production capacities are determined by Ericsson in light of ARENTO's requirements.

The company's current production is approximately

30,000 telephone lines annually at a value of approximately U.S. \$18 million. Total Egyptian telephone demand was about \$100 million in 1980.

It should be noted that the telephone exchanges and PABXs manufactured by the Egyptian Telephone Apparatus Company employ an Ericsson cross-bar system, which does not employ the latest technology. Parts and components are imported directly from Ericsson and are assembled under license in Egypt. The Continental Telephone Company study sponsored by U.S. AID recommended that state-of-the-art electronic switching equipment should be used in most new installations. Most imported telephone equipment is of this type.

ARENTO is not the only Egyptian customer for telephone equipment. Additionally, ten major public agencies and numerous private sector concerns contribute to the market demand. Even if the aggressive Continental Telephone plan is met on schedule, the telephone equipment demand will still not be met, and the country will be short nearly 600,000 lines in 1985.

Egypt's telephone industry has been using paper-insulated, lead sheathed cables. The Continental study noted that one of the most frequent causes of telephone

failure is wet cables. Cairo's water and sewer mains frequently overflow, soaking through the paper insulation which is under the lead sheath. A very high degree of skill is required to make proper joints in this type of cable. The study recommended that these cables be phased out of service. One of the alternatives that Egypt is considering is utilization of "jelly-filled" cables which are a relatively recent American innovation. These cables use PVC insulation and a petroleum compound as a protective medium.

Other Communications Equipment

According to the International Trade Administration, virtually all communication products (other than telephone equipment) have been and will be imported through 1985 (see Table 3-1). The interviews conducted as part of this report confirm this situation, although one Egyptian company, the Benha Company for Electronic Industries, a public sector company, is currently manufacturing some of these items, and several others have demonstrated an interest in starting to manufacture them in the near future. The Benha Company for Electronic Industries produces limited quantities of HF, VHF, and UHF communication products along with other non-related items.

Much of the electronic communications equipment not included in the telephone category is used for military and defense projects. Data regarding production and imports of these items is generally not available and is outside the scope of this report.

Market Demand

Telephone and Telex Equipment

In terms of foreign trade, Egypt's telephone requirements alone represent a potential multi-billion dollar program. As noted earlier, a study by Continental Telephone placed an ultimate \$20 billion price tag on the modernization of the telephone system over a 20 year period. The study's recommendations were accepted virtually in their entirety. A contract for implementing the first five years of this plan (1980-1984) was awarded to a European group composed of Siemens of West Germany, Siemens of Austria, and Thomson-CSF of France.

The governments of all three countries are assisting in the financing of this "stop gap" or "quick fix" initial stage, which is expected to cost U.S. \$1.8 billion. The first phase program calls for the installation of 500,000 new telephone lines and rehabilitation of 250,000 existing lines in Egypt. The

entire 20 Year Master Plan schedules the installation of up to five million telephone lines and six million telephone sets by 1999. This is an ambitious undertaking which requires heavy foreign assistance, both financial and technical. ARENTO can currently install only about 30,000 new lines annually. A recent report by the National Council for Production and Economic Affairs on "Electronic Industry Strategy Up to the Year 2000" recommends that this production increase by almost sevenfold (200,000 telephone lines annually) in order to meet the requirements of the 20 Year Master Plan.*

It is clear that the potential for growth of the telephone industry is large. Analysis of the data in Table 3-1 indicates that the demand for telephone equipment is projected to increase to U.S. \$198 million in 1985 from an estimated 83.3 million in 1979, a compound annual growth rate of 15.5 percent, and transmission equipment demand, which includes telephone cables, will increase to \$176 million in 1985 from a base of \$28.3 million in 1979, an annual growth rate of 35.6 percent.

* Egyptian National Council for Production and Economic Affairs, Industrial Production Department, Electronic Industries Committee, Report: Electronic Industries Strategy in Egypt Until Year 2000, undated.

Data provided by ARENTO indicates that approximately forty percent of the telex lines available in Egypt are not utilized, despite an apparent need for this type of service. The main suppliers of telex equipment are Siemens, which makes excellent equipment and who will probably continue to supply most of the equipment in the near future, and Soghem of France. There appears to be little promise for U.S. manufacturers in this area in the near future.

Mobile Radio Equipment

The demand for mobile radio systems is not expected to show any significant growth, despite the need for these systems. Some of the problems inhibiting growth are delays in allotment of frequencies and licensing delays.

Broadcasting System Equipment

Table 3-1 indicates that demand for this type of equipment is expected to decline between 1979 and 1985. The peak demand was reached in 1977 when color television was introduced. The color equipment was supplied by Marconi of Great Britain and Thomson-CSF of France. One Egyptian firm is trying to promote an unwired pay television system using a transmitter and a decoder for each set. If the system succeeds,

additional equipment would be required. The demand for closed circuit television systems is expected to be low for the near term.

Data Communications Equipment

The market for data communications equipment is expected to grow slowly from an almost non-existent base. Industry would like to utilize large main frame computers with telecommunication, once they are convinced that proper communication facilities are in place. The present number of computers in Egypt is estimated at 300 (mostly minicomputers), and is expected to double in the next five years.*

Project Opportunities

The interviews conducted in Egypt with local electronic companies identified the four joint-venture opportunities described below.

The Egyptian Telephone Apparatus Company is Egypt's major telephone equipment producer. The company is proposing a joint venture to produce electronic telephone exchanges, telephone sets, key telephone systems, and intercom systems. The facility would be located at their existing plant in El Massara, Cairo. The

* International Trade Administration, Office of Export Planning and Evaluation Research Study, The Market for Communications Equipment - Egypt.

investment cost has not yet been estimated.

Suez Electronics S.A.E. Company is a private sector company whose principal activities are sales, service, and installation of marine VHF communications systems and radar systems. The company was formed as a joint venture between Port Said Company (ship repairs) and the ITT Company from the Netherlands. It is presently negotiating with Raytheon (USA) to become its agent for marine system equipment. Suez Electronics is interested in starting a joint venture to assemble HF and VHF equipment including power supplies from imported components. The company feels that there is excellent potential for VHF systems as an alternative to the conventional telephone system which has a poor operating record. A site has not yet been selected for the plant although Alexandria is preferred.

Unitra Universal Traders is a private sector, family owned company which deals in sales, installation and maintenance of telecommunications equipment, including electronic telephone switching systems, telephone sets, central exchanges, and military communications equipment. Their interest in a joint-venture project is to assemble electronic switching systems, key telephone systems, and telephone sets

using imported components. A site for the facility has not been selected. At this point in time, the project should be considered "conceptual" in nature.

The Egyptian Electro Cable Company, a public sector company, is proposing to establish a joint venture to produce "jelly-filled" communication cables. The company has located a site for a new plant, but it has not disclosed it. The company has discussed the project with a number of foreign companies including the General Cable Company of the United States.

Further details on these four project opportunities are given in Chapter 11, Profiles 1 through 4.

4. ELECTRONIC CONSUMER PRODUCTS

Product Description

The consumer electronic products known as "brown goods" include radios, cassette tape players, combined radio/cassette units, television sets, stereo sets, record players, and tape recorders. These goods are mainly used for entertainment, with some application in the field of learning.

Normal household voltage is 220 volts, 50 hertz. Color TVs are designed to receive both PAL and SECAM signals, although the only system now in EGYPT is SECAM. Black and white TVs use the CCIR system with 635 lines per frame and 50 frames per second.

Industry Structure

Egypt's historical involvement in the production of "brown goods" had been limited to "assembly" operations. Slowly, manufacturing operations are being added to the scope of work performed by Egyptian industry. Most of the finished products are assembled from component parts, which are imported. Some of the Egyptian companies are under license from foreign corporations, which provide both technology and component parts. Egyptian companies which do not have such an arrangement rely on international open tenders

for their components. In either case, only a relatively small percentage of the required components are available from local Egyptian sources.

In the "brown goods" industry, the public sector companies dominate. There are four major companies, all in the public sector, currently involved in assembly and/or manufacturing operations:

- o The Arab Company for Transistor Radio and Electronic Equipment
- o El Nasr Television and Electronics Company
- o El Nasr Company for Electrical and Electronic Apparatus
- o Benha Company for Electronic Industries

Table 4-1 shows the Egyptian "brown goods" production for the years 1979-1981, by each of the four major Egyptian producers mentioned above. Table 4-2 provides data on imports of radios, cassette players, and TVs for the years 1979-1980.

A review of the statistics indicates that the demand for both black and white and color television sets is increasing rapidly, while the demand for radios and radio/cassette units peaked in 1979 and has subsequently stabilized at a lower demand level.

A comparison of local production volume versus

import volume indicates that imports play a major role in satisfying the local demand for "brown goods."

Imports provided the following percentages of the total demand:

	1979	1980
Radio and Radio Cassettes	52.5%	55.0%
Black and White and Color TVs	50.3%	45.5%

The four major Egyptian public companies producing "brown goods" distribute through wholesalers and dealers. Retail prices for these Egyptian-produced items are much less than for imported items due to high custom duties on imported goods. A May 1982 article in the Al Ahram newspaper in regard to TV sets indicated that the prices of imported items are 114 to 168 percent higher than local goods due largely to customs duties of 100 percent ad valorem. Still, many Egyptian consumers prefer imports because they feel that they are of superior quality.

Table 4-1

EGYPTIAN "BROWN GOODS" PRODUCTION
(Breakdown by Companies)

(in 1,000s of units)

	1979 Production Quantity					1980 Production Quantity					1981 Production Quantity				
	Co. 1	Co. 2	Co. 3	Co. 4	Total	Co. 1	Co. 2	Co. 3	Co. 4	Total	Co. 1	Co. 2	Co. 3	Co. 4	Total
Radios & Radio Cassettes	132	0	187	0	319	90	0	92	0	182	54	0	138	0	192
Black & White TVs	114	69	8	0	191	155e	67e	25	0	247	197	67	62	10i	336
Color TVs	11	13	0	0	24	23e	15e	1	0	39	35	15	9	30i	89

List of Production Companies:

1. The Arab Company for Transistor Radio and Electronic Equipment
2. El Nasr Television and Electronics Company
3. El Nasr Company for Electrical and Electronic Apparatus (Philips)
4. Benha Company for Electronic Industries

Source: Egyptian Investment Authority, except where indicated otherwise: e = estimated, i = interview data.

Table 4-2
**IMPORTS OF RADIOS,
 CASSETTE PLAYERS, AND TELEVISION SETS**
 (in 1,000s of units)

	1979	1980
	Quantity	Quantity
Radio and Radio/Cassette Players	353	223
Black and White TVs and Color TVs	218	239

Source: Federation of Egyptian Industries.

Market Demand

The Egyptian "brown goods" industry, in general, places particular emphasis on and directs attention to the television market. It is felt that TV sets represent the strongest item of consumer demand and offer the greatest potential for import substitution and profit. A favorable government attitude toward increased local TV production and import substitution is evident. Among the four "brown goods" producers, there seemed to be little, if any, interest in expanding "brown goods" operations, other than for television sets.

The Cairo Chamber of Commerce recently conducted a survey in regard to both the present and projected demand for television sets, including both black and white and color types. The results are shown in Table 4-3. The data indicates that the demand will increase at a compound annual rate of 20.0 percent from 1982-1985. This is consistent with the annual growth rate of 19.8 percent from 1979-1982.

Table 4-3

PROJECTED TELEVISION SET DEMAND IN EGYPT
1982-1985

Year	Total Demand (Number of Units)
1982	745,000
1983	894,000
1984	1,073,000
1985	1,288,000

Source: Survey by Cairo Chamber of Commerce.

Imports will undoubtedly continue to play a major role in meeting the demand for TV sets. In 1982, imports were estimated at 312,000 sets, over 40 percent

of total demand in Egypt. The Egyptian companies are gradually increasing production on their own. If any of the potential joint-venture projects are brought to fruition, local production will increase dramatically.

Data on the market demand for other "brown goods" were not readily available. However, we would expect an increase in demand for these items consistent with a growing consumer affluence, but the increase will not be as dramatic as for television sets.

Project Opportunities

Two companies, belonging to the public sector, have demonstrated an interest in joint ventures to produce cathode ray tubes (CRTs) for TV set utilization. These project opportunities are briefly outlined below.

The Arab Company for Transistor Radio and Electronic Equipment is a large public sector company, which ranks first in overall radio and television set production. It currently assembles equipment using components imported from Nippon Electric Company (NEC), Japan. The joint-venture company would manufacture CRTs using modern technology. These CRTs would then be installed in cabinets to be sold as complete TV units by the joint-venture company. The Egyptian company has

already purchased property for the factory. Some preliminary studies have been carried out, although at this point in time, investment costs have not been established.

El Nasr Television and Electronics Company is a company engaged in the manufacture and assembly of black and white TV sets, and assembly only of color TV sets. It ranks second in overall TV set production. It has the most advanced technology in Egypt for the assembly, production, and testing of these products. The proposed project is for the manufacture and assembly of TV sets, including CRTs, cabinets, metal and plastic parts, coils, etc. At present it is the only company licensed by the government to manufacture CRTs. Its planned output in 1985 includes sales of CRTs to its competitors, a program which clearly conflicts with the projected joint venture proposed by the Arab Company for Transistor Radio and Electronic Equipment, as discussed in the above paragraph.

These two proposed ventures are described in further detail in Chapter 11 as Profiles 5 and 6.

5. COMPUTERS, WORD PROCESSORS, AND RELATED ACCESSORIES

Product Description

This section covers computers, primarily for business applications, Arabic language word processors, and related accessories. The computers sold encompass the full range of equipment including main frame machines, minicomputers, and microcomputers. At this time, there are a few main frame computers in use, most being mini- or microcomputers. The accessories include data storage devices (disc, tape), input/output devices (keyboards, card readers), modems, CRTs, special purpose terminals, and software packages. This equipment may be purchased or leased from the sales agents.

The computer has not yet become a major tool of Egyptian business and industry. Computers are primarily employed for limited applications such as payroll, bookkeeping, and stock control. Use of the computer by industry is minimal. The Military Factories Computer Center utilizes its computer for centralized production control of its 18 companies. Only a few other companies are using computers for production control. None of the companies are using computers for process control.*

* Margaret Hughes, "Egypt's Computer Market," Cairo Today, October 1981.

Word processors are microcomputers which have been adapted for text editing service. They include a keyboard, CRT, printer, a CPU, and disc drives. Their capabilities have been extended significantly beyond simple text editing. For word processors to be of maximum use in Egypt, they must be able to function in the Arabic language. Egyptian electronics engineers have already been successful in designing, producing, and installing "interface kits," which enable English character computers to be operated from Arabic character terminals.

Industry Structure

The Egyptian production of items associated with computers and word processors is very small, limited to printed circuit boards, the supply of services for document retrieval systems design and implementation, and the development of software for "Arabicizing" the equipment with English characters. Most of the enterprises dedicated to this type of equipment deal with imports, sales, and services.

The primary suppliers of minicomputer and word processing equipment are IBM, ICL, and NCR, all of whom have branches in Egypt. Other suppliers operating through agents are the Digital Equipment Corporation,

Wang, Data General, Burroughs, Texas Instruments, and Perkin Elmer. Microcomputers have also reached Egypt, with Apple and Commodore entering the market and Fujitsu expected to do so in the future.

One of the major Egyptian computer companies is the Giza Systems Engineering Company (GSE), a private sector operation which deals with sales, installation, and service of digital computer systems, software development, and manufacture of "interface kits" to enable use of Arabic computer terminals with computers developed for the English language. GSE represents Digital Equipment Corporation and Tektronix (Information Display Group) for marketing, installing, and after-sales servicing of computer systems. GSE has a consulting division assisting local government agencies in collaboration with major American Engineering Firms in the field of computers as well as power engineering and communications. The company has a research and development department with six highly qualified engineers and ten experienced technicians. The company has installed electronic equipment for trainer aircraft for the Egyptian Air Force, as well as microwave links for the Ministry of Communications in Egypt.

A major company in the supply of office products is Le Scribe Egyptian S.A.E., a public sector company. The company is agent for German, Swedish, British, and Australian manufacturers of computers, typewriters, calculators, fire resistant vaults, addressing machines, credit card and ID machines, and office furniture.

A company of note in the information processing area is the Microfilming and Organization Center - Al Ahram Organization. The company is in the private sector and engages in the design of information retrieval systems, management consulting, and providing microfilm services. All of the equipment utilized and sold by this company is imported.

Market Demand

In the last five years the number of computers and electronic data systems installed in Egypt has increased considerably, along with the number of suppliers. This coincided with the beginning of the open door policy on foreign investment, and more recently, with the increasing availability of foreign currency. Another contributing factor was the lifting, in 1976, of the regulation which required anyone wishing to use or install a computer to obtain approval

from the Central Agency for Public Mobilization and Statistics (CAPMAS). When this requirement was removed, "computer fever" spread. Whereas in the 1960s, there were less than 10 computers in Egypt and about 100 in 1977, it is estimated that in 1981 there were between 300 and 400. It is difficult to obtain a precise figure since the only statistics are compiled by CAPMAS and they are not for publication. The market is still relatively small, variously estimated to be somewhere between U.S. \$14 and \$20 million, with demand trebling in the past three years.

In the early 1970s there were only three suppliers of computers and data processing systems in Egypt: IBM, ICL, and NCR. In the late 1970s they were joined by other suppliers operating through agents. One of the most successful of these is Digital Equipment Corporation (DEC), a pioneer of the minicomputer and of decentralized processing equipment and represented by Giza Systems Engineering Company. Another is Wang, also a pioneer in word processors, which was the first to introduce them in Egypt. The word processor market is put at around half a million dollars and growing rapidly.

The three largest suppliers--IBM, ICL, and NCR--

have between 60 and 70 percent of the market. The remainder is divided among local agencies. The growth rate is put at around 50 percent mainly at the smaller end of the scale. Because the cost of leasing hardware is relatively high, more and more computers are being bought.

One of the problems in selling computers in Egypt through agents is that there are only a few companies which specialize in computers. Most agents sell computers along with an array of other goods. This is partly due to traditional Egyptian marketing methods, and partly due to the fact that the computer market is not yet big enough to be profitable on its own. A large financial base is generally needed to market computers. The marketing company is required to carry a large stock of spare parts and to maintain a skilled force of service and maintenance personnel, software designers, and training staff. NCR, for example, has 30 supporting staff members plus 60 engineers as well as a sales force of 25.

Another factor inhibiting the use of larger computers is the lack of adequate communication links within Egypt. The telephone system is quite poor and unreliable, and microwave systems have only limited

use. However, it is expected that computer sales will grow at a very rapid rate when the telecommunication system modernization that is underway is completed in about five years.

Among the new applications for which computers are to be used in Egypt are tax collection, car registration, and recording of traffic penalties. The Ministry of Interior has had a computer for years linked to terminals at the airport, but it has yet to work. Perhaps the Ministry of Tourism's plan to computerize its statistics will be more successful.

New users who have emerged in the past year or so are the large number of banks in Egypt, while hotels and airlines are also using or sharing computers.

Project Opportunities

Three joint-venture opportunities were identified during the survey carried out in Egypt.

Giza Systems Engineering Company, a private sector company, is proposing a joint-venture company to assemble, sell, install, and service word processing equipment for small business office applications and to manufacture interface kits to "Arabicize" computers programmed in English. The plant will be located in a portion of a 170,000-square-meter land area, currently

used for warehousing, which is available in Mokattam, Cairo near El Nasr City. The bulk of the output will be exported to Arab countries, assigning a small percentage for the Egyptian market. Production output and capital investment have not yet been determined; a complete feasibility study with the joint-venture partner will have to be made.

Le Scribe Egyptian S.A.E., a public sector company, is proposing a joint venture to assemble business-oriented minicomputers and to provide sales, service, installation, and maintenance of all products. Le Scribe is currently engaged in a joint venture (Scribe-Secoinsa) to assemble minicomputers which has not been successful. The failure is due primarily to non-competitive minicomputer prices resulting from expensive technology and problems in obtaining finished components from Secoinsa in Spain. Secoinsa is licensed by Fujitsu in Japan. Le Scribe seeks to dissolve the joint venture and start a new one. The location will be in the Cairo Private Free Zone, Nasr City, in a 1,000-square-meter building presently used by Scribe-Secoinsa. The capital investment and plant output have not been defined. At this point in time, the proposed project should be considered "conceptual"

in nature.

The Microfilming and Organization Center - Al Ahram Organization, a private sector company, is proposing a joint venture to produce computers and a broad range of peripheral equipment and to provide management consulting and training services. The proposed program is very wide in scope and requires a detailed marketing and feasibility study to quantify the desired production goals. Al Ahram has been discussing the proposed project with a number of companies, including the Systems Engineering Labs (SEL) subsidiary of Gould, as well as Motorola, Zylog, and Onyx. The plant would be located in a Free Zone area in the vicinity of Nasr City. The proposed project is also in the "conceptual" stage.

The above three project opportunities are further discussed in Profiles 7 through 9 of Chapter 11.

6. MEDICAL ELECTRONIC EQUIPMENT

Product Description

Two items of medical electronic equipment are covered in this section: artificial kidney machines (AKM) (hemodialysis monitors) and electrocardiogram (EKG) monitors.

Artificial kidney machines are devices designed to treat patients with renal diseases. These "artificial kidneys" remove solutes by ultrafiltration. The devices can also be applied to patients intoxicated with poisons or drugs. These machines require disposable filters or "dialyzers."

Electrocardiogram monitors are devices that enable the cardiologist to analyze the condition of a patient's heart by monitoring the changes of electrical potential occurring during the heartbeat. This device helps in diagnosing abnormalities of the heart.

Industry Structure

There is no local production of artificial kidney machines or electrocardiogram machines in Egypt. The equipment is obtained from different countries, mostly from the U.S., West Germany, and Japan. The equipment is sold, or leased, and serviced by Egyptian companies acting as agents for the manufacturers. There are at

has been estimated at 50 to 100 artificial kidney machines per year and 50,000 to 100,000 disposable dialyzers per year. The required capital investment has not been established.

The second proposed joint venture is to assemble EKG monitors. The expected production rate of EKG monitors is 50 to 100 units per year.

These two joint-venture opportunities are further discussed in Profiles 10 and 11 of Chapter 11.

7. ELECTRICAL TRANSMISSION AND DISTRIBUTION EQUIPMENT

Product Description

The term "transmission and distribution" equipment encompasses a wide range of products including power and distribution transformers, circuit breakers, fuses, switches, wire and cable, substation structures, transmission line towers, poles, and pole line hardware (insulators, fittings, and anchors).

Transmission and distribution circuits move electrical power from one location to another. Transmission circuits transmit relatively large amounts of power from generating stations to key distribution points (substations). Distribution circuits move smaller blocks of power to areas of utilization.

The transmission system in Egypt consists of two 500,000 volt AC bulk transmission power lines, a network of 230,000, 115,000, and 69,000 volt circuits and associated substations. The primary distribution voltage in Egypt is 11,000 volts. Consumer utilization voltage is primarily 220 volts, 50 hertz, although there is some 110 volt service in Alexandria and Heliopolis.

All generation, transmission, and distribution facilities are owned by the government. The Ministry

of Electricity and Energy has overall responsibility for the facilities. There are sixteen authorities and companies affiliated with the Ministry. The two most important are the Egyptian Electricity Authority (EEA) which manages, operates, and maintains the power generation and system facilities, and constructs new projects related to the electrical power system; and the Rural Electrification Authority (REA), which supervises the construction of electrical transmission and distribution facilities in rural areas. After each REA project is completed, it is turned over to the EEA for operation.

Industry Structure

There are a number of large Egyptian companies which produce transmission and distribution equipment. However, imports account for a major part of the equipment used.

The largest Egyptian electrical equipment producer is the El Nasr Company for the Manufacture of Electrical Transformers and Products, more generally known as ELMACO. ELMACO, a public sector company, manufactures power and distribution transformers, welding transformers, and panelboards for various voltages. At present, the largest transformer it

manufactures is 1,600 KVA. However, it is planning to construct a new factory to produce transformers with ratings up to 40,000 KVA. ELMACO also manufactures disconnect switches under license from the Brush Company of England.

The EGEMAC Company is a joint venture of ELMACO and Siemens of Germany, which produces high, medium, and low voltage switchgear, switchboards, and current and potential transformers.

The General Company for Electrical Projects (ELEJECT), a public sector company, manufactures medium voltage distribution switchboards and is involved in various engineering and construction activities.

There are two Egyptian manufacturers of wire and cable: The Egyptian Electro Cables Company and Polymetal. The Egyptian Electro Cables Company is a large public sector company which manufactures bare copper and aluminum cables, low and medium voltage plastic insulated cables, paper insulated oil impregnated cables, and telephone and electronic instrumentation cables. Of its total output, 90 percent is supplied to the Egyptian market and 10 percent is for export. The company possesses a high level of technology and is continually expanding its

production and product lines based upon consumer demand.

Polymetal is a private company, the largest in lead smelting, but relatively small in the manufacture of plastic insulated copper wires (small gages only) and PVC plastic conduits. The company produces for the Egyptian market only, with a moderate level of technology.

There are also about fifteen private sector companies which provide materials, equipment, and services for the power industry.

Market Demand

Meaningful statistics in regard to the past and projected market demand for many items of transmission and distribution equipment are not readily available. But an overall perspective can be obtained by reviewing the status and plans for Egypt's electrical power system.

Egypt places a very high priority on the development of its electrical power system. Major system additions will be required by the ambitious industrial program Egypt has undertaken. Approximately U.S. \$2.5 billion has been allocated for power system investments during the next five years or about

6.9 percent of the total five-year development budget. Egyptian electrical authorities estimate that Egypt will have to install the equivalent of a 300 megawatt generating unit every year for the next 22 years. Demand has grown from 987 megawatts in 1969 to 3,260 megawatts in 1980. Its installed capacity now exceeds 4,720 megawatts.

Table 7-1 provides a listing of power system projects which are presently underway and an estimate of their costs. Table 7-2 provides a listing of power system projects which have been approved, but which have not yet received funding. It should be noted that U.S. AID has been actively involved in helping to develop Egypt's electrical power system.

Table 7-1
POWER SYSTEMS PROJECTS
BEING IMPLEMENTED OR FUNDED IN 1982

Type of Project	Capacity or Length	Investment (Million L.E.)		
		Local	Foreign	Total
Thermal Power Stations and Units	2,517.5 MW	252.4	848.1	1,100.5
Combustion Turbine Power Stations and Units	749 MW	15.3	41.5	56.8
Hydro Power Plants	300 MW	23.5	70.5	94.0
Substations 220/66 KV	3,125 MVA	19.1	41.2	60.3
Substations 66/11 KV	645 MVA	6.7	6.8	13.5
Transmission Lines and Cables 222 KV	644 KM	21.4	7.0	28.4
Transmission Lines and Cables 66 KV	463 KM	8.7	12.2	20.9
TOTAL		347.1	1,027.3	1,374.4

Source: Unclassified Report by the Commercial Center of the American Embassy (Cairo) in connection with a U.S. Department of Commerce Electric Power Trade Mission in January 1982.

Table 7-2

**POWER SYSTEMS PROJECTS
PLANNED BUT NOT YET FUNDED AS OF 1982**

Type of Project	Capacity or Length	Investment (Million L.E.)		
		Local	Foreign	Total
Thermal Power Stations and Units	1,080 MW	90.0	450.0	540.0
Combustion Turbine Power Stations and Units	123 MW	4.0	24.6	28.6
Hydro Electric Power Stations	600 MW	45.2	79.8	125.0
Substations 220/66 KV	4,475 MVA	29.4	85.1	114.5
Substations 66/11 KV	1,025 MVA	10.8	28.9	39.7
Transmission Lines and Cables 220 KV	2,108 KM	62.0	86.3	148.3
Transmission Lines and Cables 66.33 KV	422 KM	8.9	18.9	27.8
TOTAL		250.3	773.6	1023.9

Source: Unclassified Report by the Commercial Center of the American Embassy (Cairo) in connection with a U.S. Department of Commerce Electric Power Trade Mission in January 1982.

Project Opportunities

Three joint ventures, all sponsored by ELMACO, are discussed below. Two were developed as a result of this survey. The third involving transmission line towers has been advertised by the Ministry of Electricity and Energy. Bids were received in March 1982. The status of the project is not known. If an agreement is reached with a bidder, the joint-venture opportunity will be cancelled.

The first joint venture proposed by ELMACO involves a new plant to manufacture porcelain insulators to international specification in all voltage ratings. The plant would be located at a site in one of the new cities, such as Tenth of Ramadan City, Sixth of October City, or in the greater Cairo area. The projected output is 3,000 to 4,000 tons per year. ELMACO is conducting preliminary negotiations with an English company, Doultan, in regard to this project.

The second joint venture proposed by ELMACO would involve a new plant to manufacture low and medium voltage power fuses. The plant would also be located at a new site as described above. The proposed annual output would be 500,000 low voltage fuses and

100,000 medium voltage fuses.

The third joint venture involves a plant to construct steel transmission towers at a new site in Tenth of Ramadan City. The output would be 10,000 to 15,000 tons per year with possible expansion to 20,000 tons per year. The project investment is approximately L.E. 15 million.

These three joint-venture opportunities are further discussed in Profiles 12 through 14 of Chapter 11.

ELMACO has expressed general interest in a joint venture to produce distribution capacitors, but since ELMACO did not appear to have developed any specific details in regard to this project, a separate profile was not prepared. However, interested American investors may wish to follow up on this opportunity.

8. ELECTRICAL APPLIANCES

Product Description

This category includes both household electrical appliances and appliances used in offices and public places. The items covered include:

- o Refrigerators
- o Washing machines
- o Freezers
- o Dishwashers
- o Air conditioners
- o Microwave ovens
- o Fans
- o Water coolers
- o Mixers and blenders
- o Vacuum cleaners
- o Hot water heaters
- o Cold drink dispensers and vending machines

Industry Structure

There are four major Egyptian public sector companies which dominate the production and sale of appliances for the domestic market. These are:

- o The El Nasr Company (Philips), a public sector company, which has started assembling refrigerators and washing machines in a joint

venture with Philips Holland

- o The Delta Industrial Company (Deal), a public sector company, which manufactures refrigerators and washing machines
- o The El Nasr Company (Koldair), a public sector company, which manufactures air conditioners, water coolers, and deep freezers
- o The Benha Company (for Electronic Industries), a diversified public sector company, which is a major manufacturer of electronic communications and TV equipment and also produces a line of fans.

Market Demand

The demand for electrical appliances in Egypt is growing at a very rapid rate. Table 8-1 shows production, imports, and total demand data for the years 1976-1980, for a number of different types of appliances. The 1981 production data are also shown, though data for imports were not available. While the list is limited, it is probably representative of what is happening for most types of consumer goods.

Table 8-1

SELECTED DATA ON THE PRODUCTION, IMPORTS,
AND TOTAL DEMAND FOR DOMESTIC APPLIANCES, 1976-1981

(1,000s of units)

	1976	1977	1978	1979	1980	1981
Air Conditioners						
Production	6.8	8.4	11.1	15.4	18.9	19.6
Imports	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>2.7</u>	<u>1.5</u>	<u>N/A</u>
Total	N/A	N/A	N/A	18.1	20.4	N/A
Washing Machines						
Production	71.0	126.0	227.6	274.0	269.0	269.0
Imports	<u>11.5</u>	<u>12.4</u>	<u>11.9</u>	<u>12.1</u>	<u>2.2</u>	<u>N/A</u>
Total	82.5	138.4	239.5	286.1	271.2	N/A
Refrigerators						
Production	112.0	129.0	137.7	189.6	N/A	N/A
Imports	<u>13.6</u>	<u>14.9</u>	<u>15.9</u>	<u>17.8</u>	<u>5.7</u>	<u>N/A</u>
Total	125.6	143.9	153.6	207.4	N/A	N/A

N/A: Data not available.

Source: Federation of Egyptian Industries.

Analysis of the data in Table 8-1 indicates that the production of air conditioners grew at a compound annual rate of 23.5 percent from the years 1976 through 1981. The comparable figures for washing machines and refrigerators is 30.5 percent and 19.1 percent, respectively. Growth rates for other appliances, such as vacuum cleaners (16 percent) and water coolers (39 percent) are also high.

The statistics on imports are also very interesting and illuminating. While local production of air conditioners, washing machines, and refrigerators grew significantly, the imports of these products declined sharply. The data reflect the government's policy of protecting its local "white goods" (household appliances) industry by placing restriction on imports. As an example, a decree by the Ministry of Economy and Foreign Trade was issued early in 1982, prohibiting imports of items similar to those manufactured by El Nasr-Koldair, except with the company's approval.

Based upon the past production pattern and interviews with the industry leaders, it is expected that the demand for all "white goods" will continue to increase rapidly as Egypt's economy grows. It is

interesting to note that purchasers of refrigerators and washing machines must pay cash for these items 14 months before delivery is made. The leveling off of washing machine production shown in Table 8-1 is due to the fact that the units produced are relatively "simple" in their operation. They lack the sophistication of more modern units, which include "semi-automatic operation" in which the machine cycles and settings are accomplished manually and "automatic operation" in which the cycles and settings can be set by built-in automatic control devices. Units of this type are presently being imported.

Project Opportunities

Six project opportunities were identified, all of them with public sector companies. One of these, the Koldair air conditioner project, was developed by GOFI and has already been advertised. These opportunities are briefly outlined below. Further details are provided in Chapter 11, Profiles 15 through 20.

The Benha Company for Electronic Industries, is contemplating entering into a joint venture to produce air conditioners, washing machines, gas hot water heaters, and microwave ovens. The company has the necessary plant property, labor, and capital resources.

The foreign partner is to supply technical expertise, equipment, and up to 25 percent equity. This proposed project is currently in the "conceptual" phase.

The Arab Company for Transistor Radio and Electronic Equipment is presently engaged in producing electronic goods, mainly radio and television sets. It is proposing a joint venture for the manufacture of fans, vacuum cleaners, mixers and blenders, microwave ovens, and automatic washing machines. The plant would be located at the same site as their existing facilities at Giza. At this point in time, investment costs have not been defined, although some preliminary studies have been done by the company.

The Delta Industrial Company (IDEAL) is a company whose principal activities include the manufacture of refrigerators and washing machines. The company is proposing a project for the manufacture and assembly of domestic refrigerators and is very anxious to proceed with this project. A previous agreement with Thomson-CSF of France was not consummated due to monopoly requirements demanded by Thomson. More recently, Electrolux of Sweden has been under consideration. No decisions have been made to date. Approximately, half of this facility will be located in available space in

one of the company's existing factories. The other half will be located in a new multi-story empty building in Nasr City. The expected yearly output will be 700,000 refrigerators to cover the local demand plus exports to the Arab world. The total investment cost in U.S. dollars is 100 million. This project opportunity was also included in the sectoral report entitled The Non-Electrical Machinery Industry in Egypt.

The Delta Industrial Company is also interested in manufacturing modern ("fully automatic") washing machines and window-type air conditioners. Their present production of washing machines substantially satisfied the local market, but these units are "primitive," and a modern plant to manufacture fully automatic machines is desired. The expected output of units per year will be 250,000 washers and 20,000-30,000 air conditioners. It is intended to locate these operations in the same new building described above for the refrigerators. The plant output would meet the total Egyptian demand.

El Nasr Company for Engineering and Refrigeration (Koldair) is a large public sector company which produces air conditioners and deep freezers. It is

proposing to set up a plant to manufacture air conditioners for export to the Middle East and Africa. Koldair is currently conducting negotiations with various American and other foreign companies, but no agreements have been reached. The present Koldair production meets the current Egyptian demand for air conditioners. In addition to the current Koldair production of 25,000 units per year, the project's output estimate is for 50,000 units per year minimum. Koldair has already made initial studies and is awaiting a joint-venture partner in order to proceed.

El Nasr Company for Engineering and Refrigeration (Koldair) also has expressed an interest in establishing a joint venture for the production of dishwashing machines, small cold drink dispensers, and large vending machines for drinks. However, the company has not carried out any detailed studies in regard to this project which is considered to be "conceptual" in nature at this time.

9. LIGHTING AND WIRING DEVICES

Product Description

Lamps and Ballasts

Egypt uses three type of lamps, the incandescent, flourescent, and mercury vapor types. They differ in simplicity of operation, efficiency, life, and color rendition.

The incandescent lamps in use include the regular household and industrial types as well as the automobile type (headlights and taillights). They are least efficient in terms of light output per unit of energy, have the shortest life (750 to 1,000 hours depending upon size), but are the least costly.

Fluorescent lamps require a "ballast" for proper operation. The ballast provides proper voltage and impedance to the lamp circuit. Depending upon the design, fluorescent lamps may or may not require a "starter" in the circuit. Fluorescent lamps and ballasts cost considerably more than incandescent lamps but are about twice as efficient and have a life of about 20,000 hours.

Mercury vapor lamps are used primarily in industrial applications. These lamps also require a ballast for proper operation. The lamps are the most

expensive and have efficiencies comparable to the fluorescent lamps. Their life is about 24,000 hours. Mercury vapor lamps are in widespread use in the United States, but they are now being replaced by the low and high pressure sodium vapor lamps which are considerably more efficient.

Wiring Devices

The items included in this group are basically residential type accessories with plastic bodies and enclosures such as: light switches, switch plates, receptacle plates, plugs, outlet boxes, sockets, lamp holders, etc.

Industry Structure

Lamps and Ballasts

There are two major producers of lamps in Egypt: Canalectron and Philips. The Canal Refrigeration and Electrical Marine Industry Company (Canalectron) is a public sector company which manufactures incandescent lamps for residential, commercial, and industrial use. They also manufacture uncapped (unfinished) fluorescent tubes. The company imports about 90 percent of its raw materials, including filaments, electrodes, caps, glass tubes for core stems, and chemicals, from abroad, mostly from an English company, Spirrella Electric Ltd.

Bulbs are obtained locally from the Alexandria Glass Company.

The El Nasr Company for Electrical and Electronic Apparatus (Philips) is a public sector company established in 1932. It was nationalized in 1961, when its equity was split in equal parts between Philips (Holland) and the public sector. The company manufactures both incandescent and fluorescent lamps as well as electronic equipment.

The Arab Company for Transistor Radio and Electronic Equipment is a local supplier of fluorescent ballasts. It is a public sector company, mainly involved in the manufacture of radio and TV equipment, but it also produces fluorescent lamp ballasts and PVC conduits.

Data in regard to the local production of lamps and ballasts for the years 1976-1980 are shown in Table 9-1. The data indicate that the production of incandescent lamps exceeds that for the other lamp types by a factor of about 20. The production appears to rise rapidly and then stay at a plateau. This probably indicates that the output increased to the production limit and stayed there until the next expansion. The production of fluorescent lamps is

completely flat, probably at the limit of capacity. The data in regard to production of mercury vapor lamps and fluorescent lamp ballasts appear to be questionable.

Detailed data in regard to the role of imports in supplying the market were not readily available. However, during a meeting with senior officials at Canalectron, in May 1982, it was learned that a recent market study by GOFI and Canalectron on the demand for lamps indicates that about 28 percent of the total incandescent lamps sold and about 69 percent of the fluorescent lamps sold are imported. The study also estimates that demand for incandescent and fluorescent lamps is increasing at the rate of 20 percent and 50 percent, respectively.

Wiring Devices

There are no published data available on the production of wiring devices. However, the Egyptian Plastics and Electrical Industries Company is presently conducting a market survey to determine the demand for lighting switches, switch plates, receptacles and receptacle plates, plugs, outlet boxes, sockets, etc. One of the preliminary results of the survey indicates that local manufacturers produce only about 20 percent of the local demand with the balance being imported.

Table 9-1
PRODUCTION OF LAMPS AND LAMP ACCESSORIES
 (1,000s of units)

	1976 (1)	1977 (1)	1978 (1)	1979 (2)	1980 (2)
Incandescent Lamps	23,000	23,000	33,000	40,000	42,000
Fluorescent Lamps	2,170	2,200	2,200	2,100	2,150
Mercury Vapor Lamps	56	92	32	N/A	N/A
Fluorescent Lamp Ballasts	3	N/A	126	28	N/A

N/A: Not available.

Sources: (1) Central Agency for Public Mobilization and Statistics; (2) Federation of Egyptian Industries.

Market Demand

The GOFI-Canalectron survey projected growth rates of 20 percent for incandescent lamps and 50 percent for fluorescent lamps, which are impressive figures. The results of the survey cannot be extrapolated directly to the demand for fluorescent ballasts, because the lamp market includes normal replacements. Nevertheless, the projected 50 percent growth rate for fluorescent lamps bodes well for the demand for ballasts.

A market study on wiring devices has been

initiated by GOFI, but this study was not complete at the time that this volume was published. Data in regard to the present and projected demand for wiring devices are not readily available. However, with the indicated rapid growth in the demand for lamps and electrical and electronic equipment, it is reasonable to expect that the demand for wiring devices will also be very substantial.

Project Opportunities

The interviews carried out in Egypt resulted in the identification of two project opportunities for the manufacture of lamps and wiring devices. These are described briefly below. Further details are given in Profiles 21 and 22 in Chapter 11.

Canaletron, a public sector company, is proposing a joint venture for manufacturing incandescent lamps (all sizes), fluorescent lamps, and car lamps (headlights and taillights), using the most recent production techniques. Canaletron has been working with GOFI on this project. Preliminary discussions were held with GTE Sylvania (Swiss branch) in regard to the joint venture but no agreements were reached. The plant will be located on land to be leased in the public free zone of Ismailia. The annual output of the

plant is planned at 20 million incandescent lamps and 10 million car lamps. The investment has been estimated to be U.S. \$8 million as the foreign component and L.E. 2 million as the local component.

The Egyptian Plastics and Electrical Industries is a large public sector company which produces a wide range of plastic products. It is proposing to construct a plant which will manufacture electrical wiring devices, including lighting switches, switch plates, receptacles, receptacle plates, plugs, outlet boxes, sockets, lamp holders, etc. The plant would be built at a new industrial location in Ameria, Alexandria. Ample land area and complete utilities are available.

The El Nasr Transformer and Electric Products Manufacturing Company (ELMACO) has also expressed an interest in establishing a joint venture to produce fluorescent starters. While not listed as a joint-venture profile, interested parties may wish to pursue this matter further with ELMACO through the Investment Authority or CTIC.

10. MISCELLANEOUS ELECTRICAL EQUIPMENT

Product Description

This chapter covers wet cell industrial and automotive batteries and fire and burglar alarm system equipment, as these categories were ones in which joint-venture opportunities were identified. Dry cell batteries were omitted because this survey found that the market can be satisfied by local production.

The survey also found a general interest in joint ventures for other items of equipment such as fractional horsepower motors, small diesel generators, and test and measuring equipment. This matter is covered in the project opportunities section only.

Industry Structure

Wet Cell Batteries

There are three major manufacturers of wet cell batteries: National Plastics Company, Egyptian Plastics and Electrical Industries, and Chloride Egypt S.A.E.

The National Plastics Company is a public sector company that manufactures plastic products and wet cell batteries. It is the largest plastics manufacturer in Egypt; its production includes melamine products, PVC pipes and containers, "Formica" type laminates, molded

furniture, and polyethylene film bags. The batteries are manufactured under a license agreement with Prestolite of Toledo, Ohio. These batteries are mainly consumed by the automotive sector, by the army, and by the railways. The current yearly production is as follows:

Industrial Batteries - 25,000

Automotive Batteries - 100,000

At the present time, the company imports rubber for the battery cases from Europe and the United States. All other raw materials are available locally.

The Egyptian Plastics and Electrical Industries is also a public sector company, the largest in the manufacture of plastic coated fabrics and wet cell batteries. A third activity of this company is injection molding (polypropylene and polyethylene) for household items, and Egyptian Plastics is the second largest manufacturer in this specialty. The batteries (6 and 12 volt) are produced under license from Varta of Germany and marketed under the trade name of Nisr-Varta. The plastic battery cases are imported, and the rest of the elements are produced using local raw materials. In 1981, their production of batteries reached 500,000 units, a unit being considered a 6-volt

90 ampere-hour battery.

Chloride Egypt S.A.E. is a recently formed joint-venture company which includes Chloride (U.K.), Egyptian General Battery Company (GENBAT), American University of Cairo Pension Fund, and Barclay's Bank. It has produced wet cell batteries since April 1982. This is a complete manufacturing operation: the cases (plastic/rubber), as well as the plates, separators, etc., are made locally. A high level of automation has been designed into this plant. The only labor intensive operation is the assembly of components inside the case. The initial production has been estimated at 400,000 units per year.

Fire and Burglar Alarms

There is only one company that assembles fire and burglar alarms in Egypt. The National Video Company is a private joint-venture company operating in the Alexandria free zone. The company assembles, tests, and sells security systems, especially burglar and fire alarms. Its annual production is 4,300 alarm units, with sales amounting to U.S. \$300,000. The raw materials and components are supplied by U.S. manufacturers.

Market Demand

Wet Cell Batteries

Table 10-1 provides data on local production and imports of wet cell batteries. The statistics indicate that from 1979 to 1981 the total Egyptian consumption of batteries did not increase steadily.

Table 10-1
PRODUCTION AND IMPORTS OF WET CELL BATTERIES
(1000s of units)

	1979	1980	1981
Production	734	651	770*
Imports	103	101	112
Total	837	752	882

* Sum of the two largest manufacturers' production (National Plastics and Egyptian Plastics).

Sources: Production - Central Agency for Public Mobilization and Statistics (CAPMAS); Imports - Federation of Egyptian Industries.

In 1982/83, the new Chloride Egypt S.A.E. joint-venture plant is expected to start production. Planned annual production is 400,000 batteries. If

this production is added to that expected by the Egyptian Plastics and the National Plastics Companies for the same period, total production will be 1,170,000 batteries, substantially above 1981 demand. Furthermore, Chloride Egypt S.A.E. foresees a doubling of its capacity by 1984, which if producing at full capacity, would bring the total production for 1984 to 1,570,000 units. It is not clear from the data obtained from the manufacturers whether this steep increase in projected production is due to a similar expected increase in local demand or to an ambitious export drive to market the batteries in the rest of the Arab world.

Fire and Burglar Alarms

It appears that the only company, the National Video Company, presently assembling and selling alarms satisfies the local demand with a yearly production of 4,300 units. No further data on market demand were gathered during the field interviews.

Project Opportunities

Wet Cell Batteries

The National Plastics Company is the only company that has proposed a project opportunity to manufacture wet cell (lead-acid) batteries. The plant will be

located in an available 25,000-square-meter plant in Giza. The annual output of the plant will be 400,000 batteries; approximately 20 percent will be industrial batteries and the remaining 80 percent will be automotive type batteries for sale in the Egyptian market. The National Plastics Company has already completed a feasibility study, establishing an investment on the part of the foreign partner of 49 percent of the total equity, or approximately U.S. \$4 million (see Profile 23).

Fire and Burglar Alarm System Equipment

Two project opportunities have been identified by the only company presently assembling fire and burglar alarm system equipment. Both projects would involve exports to other Arab countries. Further details are provided in Profiles 24 and 25 of Chapter 11.

The National Video Company is proposing a joint-venture project to assemble electronic burglar and fire alarm equipment, including home and commercial security alarm systems. The plant will be located in the private free zone of Alexandria. It is expected that the production volume will be approximately 100,000 alarm units. The foreign component of the capital investment amounts to U.S. \$1 million. The

production will be mainly for export to other Arab countries.

Giza Systems Engineering is a private sector company proposing a joint venture to assemble commercial and industrial fire and burglar alarm components for sales and installation as integrated systems. The plant will be located at a site currently used for warehousing in Mokattam, Cairo, near El Nasr City. The production is intended primarily for other Arab countries. Both the output and the capital investment have not yet been defined.

In addition to the joint ventures described above, the interview with the El Nasr Transformers and Electrical Products Manufacturing Company (ELMACO) elicited the information that ELMACO would like to enter into joint ventures for the production of the following miscellaneous equipment:

- o Fractional horsepower motors
- o Cable accessories
- o Small diesel generators and automotive generators
- o Test and measuring instruments

Interested parties may contact ELMACO directly or through the Investment Authority or CTIC, in regard to these projects.

11. A REVIEW OF POTENTIAL INVESTMENT OPPORTUNITIES

The 25 potential joint-venture opportunities identified in this report on electronic and electrical products are summarized in Table 11-1. Most of these opportunities are in the preliminary stage and require market analysis and discussions with Ministry of Industry and Mineral Wealth officials to determine possible production and marketing constraints as well as possible joint ventures with public companies.

In principle, the Ministry and the Investment Authority rate all of these opportunities as having high priority among Egypt's development goals.

The "Profiles" that follow Table 11-1 describe the potential opportunities which were briefly discussed in the earlier sections of this report.

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Table 11-1

LIST OF JOINT-VENTURE OPPORTUNITIES

Profile Number	Type of Equipment Involved	Egyptian Partner
1	Telephone System Equipment	Egyptian Telephone Company
2	VHF and HF Components	Suez Electronics
3	Telephone Switches and Key Telephones	Unitra Universal Traders
4	Telephone Cable	Egyptian Electro Cables Company
5	Cathode Ray Tubes and TVs	Arab Company for Transistor Radio and Electronic Equipment
6	TV Components and TV Sets	El Nasr Television and Electronics
7	Word Processing Equipment	Giza Systems Engineering Company
8	Business-oriented Minicomputers	Le Scribe Egyptian S.A.E.
9	Computers and Peripheral Equipment	Microfilming and Organization Center - Al Ahram Organization

Table 11-1 (cont'd)

Profile Number	Type of Equipment Involved	Egyptian Partner
10	Artificial Kidney Machines	Alkan Establishment - Medical Division
11	Electrocardiogram Monitors	Alkan Establishment - Medical Division
12	Porcelain Cable Insulators	El Nasr Transformers and Electronic Products Manufacturing Company (ELMACO)
13	Low and Medium Voltage Fuses	ELMACO
14	Steel Transmission Towers	ELMACO
15	Air Conditioners, Washing Machines, Gas Hot Water Heaters, and Microwave Ovens	Benha Company for Electronic Industries
16	Fans, Vacuum Cleaners, Mixers and Blenders, Microwave Ovens, and Automatic Washing Machines	Arab Company for Transistor Radio and Electronic Equipment
17	Refrigerators	Delta Industrial Company
18	Automatic Washing Machines and Window Air Conditioners	Delta Industrial Company

Table 11-1 (cont'd)

Profile Number	Type of Equipment Involved	Egyptian Partner
19	Air Conditioners	El Nasr Company for Engineering and Refrigeration (Koldair)
20	Dishwashing Machines and Vending Machines for Drinks	Koldair
21	Incandescent and Fluorescent Lamps	Canalectron
22	Electrical Wiring Devices	Egyptian Plastics and Electrical Industries
23	Lead - Acid Batteries	National Plastics Company
24	Fire and Burglar Alarm System Components	National Video Company
25	Fire and Burglar Alarm System Components	Giza Systems Engineering Company

Profile 1

TELEPHONE SYSTEM EQUIPMENT

Description: Joint venture for the manufacture and sale of electronic telephone exchanges (public and private), telephone sets (different types), key telephone systems and intercom systems, installation of public and private exchange systems.

Egyptian Interest: The Egyptian Telephone Company, a public sector company, is Egypt's major telephone equipment producer.

Location: At existing location of The Egyptian Telephone Company, El Massara, Cairo.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance. Also provide many of the parts and components for assembly in Egypt.

Project Status: Project considered to be "specific" joint-venture opportunity.

Output: Electronic telephone exchanges (public) - 250,000 lines per year.
Electronic telephone exchanges (private) - 20,000 lines per year.
Telephone sets (different types) - 250,000 units per year.
Key telephone systems; Intercom systems - Subject to market survey.
Expected annual turnover at full capacity = L.E. 75,000,000

Investment: Undefined - must await study with potential partner.

Markets: Initially Egyptian local market and later to export market.

Competition: Negligible.

Raw Materials: Raw materials to be imported. Piece parts, components, and auxiliary equipment by direct order from joint-venture partner.

Profile 2

VHF AND HF COMPONENTS

Description: Joint venture for the assembly of VHF and HF components (including AC to DC power supplies) into systems. Manufacture of these items is a possibility at a later date.

Egyptian Interest: Suez Electronics S.A.E., a private sector joint-venture company between Port Said Co. (ship repairs) and ITT Netherlands. The company's principal activities are sales, service, and installation of marine VHF communications systems and radio systems.

Location: Preferably Alexandria (Ameria), but site has not been chosen.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "specific" joint-venture opportunity.

Output: Initially assemble 1,000 VHF units and 30 HF units. Potential increase estimated between 50 percent & 100 percent annually. Manufacture of items later.

Investment: Foreign component: U.S. \$600,000.
Local component: None.

Markets: Local as an alternative to conventional telephone systems. Also potential export to other Middle East countries.

Competition: Benha Company for Electronic Industries, an Egyptian public sector company (assembly and sales).

Ban Arab Company, a private importer.

Raw Materials:

Component parts to be imported from company providing technology.

Profile 3

ELECTRONIC TELEPHONE SWITCHES AND KEY TELEPHONE SYSTEMS

Description: Joint venture for the assembly of the following imported items for use by hotels, offices, hospitals, and for manufacturing certain specialty components:

- a. Electronic telephone switches (50-100 line capacity).
- b. Key telephone systems (up to 16 line capacity).
- c. Telephone sets.

Egyptian Interest: Unitra Universal Traders, a private sector company, sells, installs, and maintains telecommunication equipment, telephone sets, central exchanges, and military communication equipment.

Location: Any new communities (such as Tenth of Ramadan City, Cairo).

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology, financial assistance, brand name.

Project Status: In "conceptual" stage.

Output: Dependent on results of market survey.

Investment: To be developed with joint-venture partner.

Markets: 50 percent for Egypt; 50 percent for export to Middle East countries.

Competition: From imports - for modern electronic telephone switches.

From the Egyptian Telephone Co. and

the Massara Company (Military
Factory No. 45) for outdated
cross-bar telephone switches.

Raw Materials:

Component parts for assembly to be
imported from the foreign company
providing technology.

Profile 4

TELEPHONE CABLES

Description: Joint venture for the manufacture and sale of "jelly-filled" telephone cables.

Egyptian Interest: The Egyptian Electro Cables Company, a public sector company.

Location: At a new location the company has researched; land is available.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology. Financial assistance is not necessary, but remains a possibility.

Project Status: Project considered to be "specific" opportunity.

Output: 650,000 pair - kilometers per year equals total of 1,300,000 kilometers per year.

Investment: Awaiting final studies after selection of joint-venture partner.

Markets: Initially for Egyptian local market and later to export market.

Competition: Negligible.

Raw Materials: Raw materials to be imported from all over the world.

Profile 5

CATHODE RAY TUBES AND TVS

Description: A joint venture to manufacture cathode ray tubes, install them in cabinets, and market as complete TV sets.

Egyptian Interest: The Arab Company for Transistor Radio and Electronic Equipment, a public sector company which ranks first in overall radio and television set production. The company currently assembles equipment using components imported from Nippon Electronic Company (NEC).

Location: A new plant site in El Ismailia Industrial Free Zone.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "specific" opportunity. Property has already been purchased for the plant.

Output: Manufacture 700,000 CRTs, install into cabinets, and market as complete TV units. The company would import the CRT components (screen face, funnel, and gun) and would assemble and seal them in its local plant. The company presently imports complete CRTs from Nippon Electric of Japan.

Investment: Undefined, must wait study with partners.

Markets: Initially, Egypt local market and later to export market.

Competition:

Principally from three public sector companies:

- o El Nasr Company for Electrical & Electronic Apparatus (Philips)
- o El Nasr Television and Electronics Company
- o Benha Company for Electronics Industries

Raw Materials:

CRT components to be imported. Piece parts and cabinet materials are available from local markets.

Profile 6

TV COMPONENTS AND TV SETS

- Description:** A joint venture for manufacturing TV components for in-house assembly and sales as complete TV sets.
- Egyptian Interest:** El Nasr Television and Electronics Company, a public sector company, manufactures and assembles black and white TV sets, and assembles color TV sets.
- Location:** Company has purchased new property in Dar El Salam and is currently erecting a 3-story, 1000 square meter factory for this project.
- Role of Foreign Firm:** Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.
- Project Status:** Project considered to be "specific" opportunity.
- Output:** Earliest implementation of program would be 1985. Anticipated 1985 output is as follows:
- Black and white TV manufacture and assembly - 250,000 units
 - Color TV assembly = 100,000
 - Black and white CRT manufacture (for El Nasr TV Company's own use) = 250,000
 - Black and white CRT manufacture (for sales to competitors up to 750,000 - see Note).
- Investment:** Total investment approximately L.E. 15 million (exclusive of CRT manufacture for sales to competitors). Foreign partner's share = 49 percent.
- Markets:** Egypt only, import substitution.

Competition:

The three public sector companies:

- 1) The Arab Company for Transistor Radio and Electronic Equipment.
- 2) El Nasr Company for Electrical and Electronic Apparatus (Philips).
- 3) Benha Factory for Electronic Industries.

Raw Materials:

From company providing technology, some standard items from international market.

Note: The proposed sale of CRTs to competitors is tentative based upon its assumption that it will maintain its exclusive position as the only Egyptian company with a government license to manufacture CRTs. This clearly conflicts with the plans of the Transistor Radio and Electronic Equipment company as described in TV Profile 5.

Profile 7

WORD PROCESSING EQUIPMENT

Description: A joint venture for the assembly, manufacture, sale, installation, and servicing of word processing equipment for small business office applications.

Egyptian Interest: Giza Systems Engineering Company, a private sector company.

Location: A portion of a 170,000 square-meter-land area (currently used for warehousing) available in Mokattam, Cairo near El Nasr City.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "specific" joint-venture opportunity.

Output: Dependent on market survey. Order of magnitude estimate, based upon preliminary discussions, is about 100 units per year.

Investment: Dependent on output; requires complete feasibility study with joint-venture partner.

Markets: Small percentage for Egyptian market; bulk for export to Arab countries.

Competition: Presently, from imports only (Wang, CPT). Possible future local competition from Al Ahram potential joint venture.

Raw Materials: Systems components to be imported from company providing technology. Some raw materials for manufactured items (interface kits) to be procured from open market.

Profile 8

BUSINESS-ORIENTED MINICOMPUTERS

Description: A joint venture specializing in business-oriented minicomputers capable of maintaining records such as payroll, inventory, etc. Services to include minicomputer hardware assembly, software development, sales of complete hardware/software systems, installation, maintenance, and repair of all products.

Egyptian Interest: Le Scribe Egyptian S.A.E., a public sector company that is currently engaged in a joint venture to assemble minicomputers. The proposed project would replace the existing unsuccessful joint venture.

Location: Cairo Private Free Zone, Nasr City. Le Scribe has 1,000 square-meter-building which will be available when its current Scribe-Secoinsa joint venture is dissolved.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology, famous brand name, financial assistance.

Project Status: Project considered to be "specific" opportunity.

Output: Extremely dependent on the unit's sales price. If the above conditions are met, Le Scribe feels that its output could ultimately reach 1,000 units per year for the Egyptian Market and 100 units per year for export (but this seems high). More realistically, Le Scribe hopes to produce enough to meet 25 percent of the Egyptian

market needs (probably about 1,000 total or less per year) in the first 5 years of operation and 40 percent in the 5 subsequent years. An equal amount would be produced for export. However, demand must be established during the feasibility study stage.

Investment:

Undefined. Depends on technology offered and ultimate output.

Markets:

Egypt and for export to Arab world.

Competition:

Much competition from imports.

Raw Materials:

Receive components for assembly from company providing technology.

Profile 9

COMPUTERS AND PERIPHERAL EQUIPMENT

Description: Joint venture for the manufacture of computers and a broad range of peripheral equipment, and to provide consulting and training services.

Egyptian Interest: The Microfilming and Organization Center - Al Ahram Organization, a private sector company.

Location: Nasr City - Potential (Free Zone).

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "conceptual" in nature. However, preliminary discussions have been held with several potential international partners.

Output: Requires detailed market study by joint-venture partner and the Microfilming and Organization Center.

Investment: To be established after feasibility and market studies completed.

Markets: Pending market study. Preliminary market analysis is available from the Al Ahram Organization.

Competition: From potential Giza Engineering joint venture, IBM, NCR, ICL.

Raw Materials: Component parts to be imported from company providing technology.

Profile 10

ARTIFICIAL KIDNEY MACHINES

Description: A joint venture for the assembly of hemodialysis monitors (artificial kidney machines) and manufacture of disposables (dialyzers).

Egyptian Interest: Alkan Establishment - Medical Division, a private sector company which acts as agent for a number of foreign medical equipment suppliers.

Location: Cairo.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "specific" joint-venture opportunity.

Output: 50 to 100 hemodialysis monitors per year; 50,000 to 100,000 dialyzers per year.

Investment: To be negotiated between Alkan and joint-venture partner.

Markets: All over Egypt at start; export to be discussed after feasibility study.

Competition: All currently imported: from U.S.A. (five companies), Sweden (one company), West Germany (two companies), Italy (one company), Japan (one company).

Raw Materials: To be imported according to joint-venture partner's advice.

Profile 11

ELECTROCARDIOGRAM MONITORS

Description: A joint venture for the assembly of EKG monitors.

Egyptian Interest: Alkan Establishment - Medical Division, a private sector company which acts as agent for a number of foreign medical equipment suppliers.

Location: Cairo.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "specific" joint-venture opportunity.

Output: 50 to 100 monitors per year.

Investment: To be worked out by mutual agreement of Alkan and joint-venture partner.

Markets: Egypt; export according to feasibility.

Competition: Imports.

Raw Materials: To be imported.

Profile 12

PORCELAIN CABLE INSULATORS

Description: Joint venture to manufacture porcelain insulators in all voltage ratings up to 500 KV.

Egyptian Interest: El Nasr Transformers and Electric Products Manufacturing Company (ELMACO), the largest Egyptian electrical equipment producer, is a public sector company manufacturing power and distribution transformers, welding transformers and panel boards for a variety of voltages.

Location: A separate location, to be purchased probably in one of the new cities (Tenth of Ramadan City or Sixth of October City) or in greater Cairo.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance. Partners share on equity might be up to 49 percent.

Project Status: Project considered to be "specific" opportunity.

Output: 3,000 to 4,000 tons per year.

Investment: Awaiting study with partner.

Markets: Initially Egypt; export later.

Competition: No similar project has been undertaken in Egypt.

Raw Materials: All metal parts of insulators (approximately 40 percent of total parts) will be manufactured by the company. The raw material (copper) must be imported. All porcelain parts of insulators (approximately

60 percent of total parts) will be purchased initially from a local porcelain manufacturing company. Later ELMACO will manufacture the porcelain parts.

Profile 13

LOW AND MEDIUM VOLTAGE POWER FUSES

Description: Joint venture to manufacture low and medium voltage power fuses.

Egyptian Interest: El Nasr Transformers and Electric Products Manufacturing Company (ELMACO), the largest Egyptian electrical equipment producer, is a public sector company manufacturing power and distribution transformers, welding transformers, and panel boards for a variety of voltages.

Location: A separate location, to be purchased probably in one of the new cities (Tenth of Ramadan City or Sixth of October City) or in greater Cairo.

Role of Foreign Firm: Joint-venture partner in a Public Law company. Provide technology and financial assistance.

Project Status: Project considered to be "specific" opportunity.

Output: 500,000 low voltage fuses per year.
100,000 medium voltage fuses per year.

Investment: Awaiting study with partner.

Markets: Initially Egypt; export later.

Competition: None for medium voltage fuses.
Little competition for low voltage fuses.

Raw Materials: Most fuse material are available from local suppliers.

Profile 14

STEEL TRANSMISSION TOWERS

Description: Joint venture to manufacture steel towers for transmission lines. Towers would be designed for circuits ranging in voltage from 11,000 volts to 500,000 volts.

Egyptian Interest: El Nasr Transformers and Electric Products Manufacturing Company (ELMACO), the largest Egyptian electrical equipment producer, is a public sector company manufacturing power and distribution transformers and panel boards for a variety of voltages.

Location: New land will be purchased by the Company in the Tenth of Ramadan City, about 40,000 to 50,000 square meters.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance, and engineer the plant layout.

Project Status: Project considered to be "specific" opportunity.

Output: 10,000 to 15,000 tons per year with possible expansion to 20,000 tons per year.

Investment: Total investment approximately L.E. 15,000,000 (depending on level of technology in new plant).

Markets: Initially Egypt; export later.

Competition: None for complete towers. Some steel parts are manufactured locally.

Raw Materials:

The steel for towers is available locally from Iron and Steel Company in Helwan, and some from imports.

Note:

Project has already been advertised by ELMACO. Depending upon the outcome of the tender negotiations, this joint-venture opportunity may be cancelled.

Profile 15

AIR CONDITIONERS, WASHING MACHINES,
GAS HOT WATER HEATERS, AND MICROWAVE OVENS

Description: Joint venture for the manufacture of air conditioners, washing machines, gas hot water heaters, and microwave ovens.

Egyptian Interest: Benha Company for Electronic Industries, a diversified public sector company, producing a line of fans as well as electronic communications and TV equipment.

Location: Benha - at existing plant property.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: In "conceptual" stage.

Output: 50,000 units first year, no specific breakdown. Ultimate 500,000 units in 10 years.

Investment: Not yet established.

Markets: Egypt and Arab countries.

Competition: Limited. There is a high and growing demand for these items.

Raw Materials: Initially to be supplied by the joint-venture partner or foreign companies as parts for assembly.

Profile 16

SMALL APPLIANCES, MICROWAVE OVENS,
AND AUTOMATIC WASHERS

Description: Joint venture for the manufacture and sale of fans, vacuum cleaners, mixers and blenders, microwave ovens, and fully automatic washers.

Egyptian Interest: The Arab Company for Transistor Radio and Electronic Equipment, a public sector company engaged in producing electronic goods, mainly radio and TV sets.

Location: In existing company plant at Giza.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Preliminary studies have been completed by the Egyptian company.

Output:
Fans - 100,000 units per year
Vacuum Cleaners - 15,000 units per year
Mixers and Blenders - 10,000 units per year
Microwave Ovens - 5,000 units per year
Full Automatic Washers - 20,000 units per year

Investment: Undefined. Complete study must be made with joint-venture partner.

Markets: Egypt only - demand high.

Competition: Little; there is a large unfulfilled demand for these products.

Raw Materials: Dependent upon technology to be furnished by the joint-venture partner.

Profile 17

REFRIGERATORS

Description: A joint venture to manufacture and assemble refrigerators.

Egyptian Interest: The Delta Industrial Company (IDEAL), a public sector company which manufactures refrigerators and washing machines.

Location: Approximately half in available space in one of Ideal's existing factories. Other half in a new multi-story empty building in Nasr City, built for this project.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "specific" opportunity. The company has completed some initial studies and has contacted several possible international partners. However, no partner has been selected as yet.

Output: 700,000 per year - 600,000 per year for local market (80 percent of these to be small 7-13 cu. ft. refrigerators), plus 100,000 units per year for export to Arab countries.

Investment: U.S. \$100 million. An existing building will be brought into project on a rental basis at a mutually agreed upon rent.

Markets: Egypt and later for export to Arab world.

Competition: None.

Raw Materials:

**All components except compressors
to be manufactured locally.**

Profile 18

WASHING MACHINES AND WINDOW AIR CONDITIONING

Description: Joint venture for manufacturing modern washing machines and window air conditioners.

Egyptian Interest: The Delta Industrial Co. (IDEAL), a public sector company which manufactures refrigerators and washing machines.

Location: New multi-story empty building in Nasr City already built for this project.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "specific" opportunity.

Output: To meet the total Egyptian demand.
Modern Washing Machines: 250,000 per year.
Window Air Conditioners: 20,000-30,000 per year.

Investment: To be determined.

Markets: Egypt. IDEAL practically satisfies the Egyptian market with its current output of washing machines (primitive type). There is a demand for automatic and semi-automatic machines.

Competition: Benha Company for Electronic Industries and Arab Company for Transistor Radio and Electronic Equipment, if their joint ventures come to fruition.

Raw Materials:

Data not available. Joint-venture partner might supply components initially.

Profile 19

AIR CONDITIONERS

Description: Joint venture for manufacturing air conditioners, including window type, and split type with separate condenser.

Egyptian Interest: El Nasr Company for Engineering and Refrigeration (Koldair), a public sector company manufacturing air conditioners, water coolers, and deep freezers.

Location: An 11,000-square-meter area on existing premises of Koldair in Saklet Miki, Giza. Koldair has unused equipment and empty buildings for this project.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Marketing abroad and provide technology and financial assistance.

Project Status: Project considered to be "specific" opportunity. Initial studies have been completed and Koldair has contacted several international firms to determine interest in a joint venture.

Output: 50,000 air conditioners per year minimum (in addition to existing Koldair output of 25,000 per year.

Investment: Foreign component up to U.S. \$6 million.

Markets: Primarily for export to Middle East and Africa. Existing Koldair production meets current Egyptian needs.

Competition: No manufacturing or import competition in Egypt. Numerous competitors abroad.

Raw Materials:

Via international tenders except as noted. Compressors, motors, pumps, copper piping, and plasticated sheet metal to be imported. Aluminum, sheet metals, etc. to be obtained from local markets.

Profile 20

DISHWASHING MACHINES AND VENDING MACHINES

Description: Joint venture for the manufacture of dishwashing machines and vending machines.

Egyptian Interest: El Nasr Company for Engineering and Refrigeration (Koldair), a public sector company manufacturing air conditioners, water coolers, and deep freezers.

Location: Not established.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance.

Project Status: Project considered to be "conceptual" in nature.

Output: Requires detailed study.

Investment: Not established.

Markets: Local and other Arab countries.

Competition: From imports.

Raw Materials: Depends upon technology of joint-venture partner.

Profile 21

INCANDESCENT LIGHT BULBS,
FLUORESCENT TUBES, AND CAR LAMPS

Description: A joint venture for manufacturing incandescent light bulbs (all sizes), fluorescent tubes, and car lamps (headlights and taillights).

Egyptian Interest: Canal Refrigeration and Electrical Marine Industry Company (Canalectron), a public sector company which manufactures incandescent lamps for residential, commercial, and industrial use, and uncapped fluorescent tubes.

Location: Land to be leased in the public free zone of Ismailia.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide brand name, technology, financial assistance.

Project Status: Project considered to be "specific" opportunity.

Output: Incandescent lamps - 20 million per year
Fluorescent tubes - 10 million per year
Car lamps - 10 million per year

These are in addition to existing plant production.

Investment: Foreign component: U.S. \$8 million
Local component: L.E. 2 million

Markets: 50 percent Egypt and 50 percent export to Near East, African, and Asian countries for each of the production items.

Competition:

Philips is the local competitor in the incandescent bulb and fluorescent tube market. There is no local competitor for car lamps. Presently there is competition for all of these products from imports.

Raw Materials:

To be imported from company providing technology.

Notes:

- 1) In the future Canalectron would like to produce mercury vapor and low and high pressure sodium lamps.
- 2) Canalectron is presently unprofitable due to price controls.

* This profile is based on a study by GOFI.

Profile 22

ELECTRICAL WIRING DEVICES

Description: Joint venture to manufacture plastic electrical accessories including snap switches, switch plates, receptacles, receptacle plates, plugs, outlet boxes, sockets, lamp holders, etc.

Egyptian Interest: Egyptian Plastics and Electrical Industries, a large public sector company which produces a wide range of plastic products.

Location: Preferably at a new industrial location in Ameria, Alexandria. Ample land and complete utilities available.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology, management, commercial name, financial assistance. Joint-venture partner can take equity position from 25 to 50 percent. A majority share is possible, if desired.

Project Status: Project considered to be "specific" joint-venture opportunity.

Output: Awaiting completion of market survey by Egyptian Plastics and Electrical Industries.

Investment: Awaiting completion of market survey.

Markets: First to satisfy Egyptian demand and later for export to Middle East.

Competition: From imported goods only; little local competition from a military factory and small private sector

companies. Egyptian Plastics estimates that local manufacturers produce only enough to meet 20 percent of local demand. The balance must be imported.

Raw Materials:

Plastic, procelain, steel, and copper alloys are practically all available locally.

Note:

This company is also interested in a joint-venture project to produce P.V.C. electrical tape.

Profile 23

LEAD-ACID BATTERIES

Description: Joint venture to manufacture lead-acid batteries.

Egyptian Interest: National Plastics Company, a public sector company, manufactures plastic products and wet cell batteries. It is the largest plastics manufacturer in Egypt.

Location: Plant to be situated in available 25,000-square-meter plant area in Giza.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology and financial assistance, including injection molding machines and tools.

Project Status: Feasibility study completed by Egyptian company.

Output: 400,000 batteries total; approximately 20 percent to be electrical industrial batteries and 80 percent to be automotive starter batteries.

Investment: 49 percent equity from joint-venture partner is expected to be approximately U.S. \$4 million.

Markets: Egypt and export to Middle East, Africa, etc.

Competition: Chloride/Egypt, Egyptian Plastics. No foreign competition, since no wet cell batteries are imported.

Raw Materials: Hard rubber or polypropylene for battery cases to be imported from Europe and U.S.A. Other materials including PVC for separators and lead alloys available locally.

Profile 24

FIRE AND BURGLAR ALARM SYSTEM COMPONENTS

Description: Joint venture to assemble electronic burglar and fire alarm units, for home and commercial security alarm systems.

Egyptian Interest: National Video Company, a private sector Law 43 company operating in the Alexandria free zone, is involved in the assembly, testing, and sales of security systems, especially burglar and fire alarms.

Location: Free Zone in Alexandria; exact site has not been determined.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide financial assistance up to 50 percent equity, and establish trademark.

Project Status: Project considered to be "specific" opportunity.

Output: U.S. \$10 million by volume; approximately 100,000 alarm units (all types).

Investment: Foreign component: approximate U.S. \$1 million.

Markets: Mainly for export to other Arab countries.

Competition: International manufacturers. There is no other producer in Egypt.

Raw Materials: Components to be imported from U.S.A. for assembly in Egypt.

Profile 25

FIRE AND BURGLAR ALARM SYSTEM COMPONENTS

Description: Joint venture to assemble commercial and industrial fire and burglar alarm components for sales and installation as integrated systems. The concept is to provide a sophisticated, individually engineered system for each application: the components of these systems to be the assembled items.

Egyptian Interest: Giza Systems Engineering Company, a private electronics company.

Location: A portion of a 170,000-square-meter land area (currently used for warehousing) which is available in Mokattam, Cairo near El Nasr City.

Role of Foreign Firm: Joint-venture partner in a Public Law 43 company. Provide technology, technology management, furnish components for assembly, and financial assistance.

Project Status: Project considered to be "specific" opportunity.

Output: Dependent on market survey and feasibility study.

Investment: Undefined: A complete feasibility study with the joint-venture partner is needed.

Markets: Small percentage for Egyptian market; bulk for export to Arab countries.

Competition: Locally, from imports only; especially Honeywell. Other Arab countries; from international producers and traders.

Raw Materials:

Components (for assembly into systems) to be imported from joint-venture company providing technology.

APPENDIX

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Appendix

ELECTRONICS AND ELECTRICAL SECTOR COMPANIES INTERVIEWED FOR THIS REPORT, IN ORDER OF VISIT

Company Name	Activity	Sector
Benha Company for Electronic Industries	Electronics	Public
El Nasr Television and Electronics Company	Electronics	Public
The Egyptian Telephone Company	Electronics	Public
El Nasr Company for Electrical and Electronics Apparatus (Philips)	Electronics and Electrical	Public
The Arab Company for Transistor Radio and Electronic Equipment	Electronics	Public
Giza Systems Engineering	Electronics	Private
Alkan Establishment, Medical Division	Electronics	Private
The Egyptian Electro Cables Company	Electrical	Public
El Nasr Transformers and Electric Products Manufacturing Company (ELMACO)	Electrical	Public
The General Company for Batteries	Electronics	Public
National Plastics Company	Electrical	Public
Al Ahram Organization, Microfilming Department	Electronics	Private

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Appendix (cont'd)

Company Name	Activity	Sector
Suez Electronics Company S.A.E.	Electronics	Private Law 43 Joint Venture
Polymetal	Electrical	Private
National Video Company	Electrical	Private Law 43 Joint Venture
Egyptian Plastics and Electrical Industries Company	Electrical	Public
Le Scribe Egyptian S.A.E.	Electronics	Public
The Delta Industrial Company (IDEAL)	Electrical	Public
Unitra Universal Traders	Electronics	Private
Canal Refrigeration and Electrical Marine Industry Company (Canalelectron)	Electrical	Public
El Nasr Company for Engineering and Refrigeration (Koldair)	Electrical	Public