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Prepared For:
U.S. Agency for International Development
Health Insurance Organization, Egypt

Contract Number:
263-0170-C-00-3042-00

TELECOMMUNICATIONS NETWORK DESIGN AND COST

USAID Project Number: 263-0170
[Develop a Detailed and Updated Management Information System for the Egyptian Health Insurance Organization, Cost Recovery Project]

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Date:
April 19, 1994

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HIO

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CRHP

مشروع إسترداد نفقات العلاج

April 19, 1994

Dr. Mohamed Arafa
Chairman
Health Insurance Organization
Heliopolis, Cairo, Egypt

Dear Dr. Arafa:

MAXIMUS is pleased to submit this telecommunications plan for the HIO Management Information System network. This document describes the approach used to develop the design of the telecommunications network for the HIO system. In this analysis we identified and considered several potential network approaches. The recommended design, after all analyses were completed, uses EgyptNet (X.25) to connect all branches to each other and, where available, uses it between each branch and clinic/hospital. Where EgyptNet is not available, the design uses point-to-point leased lines.

This report has undergone minor revisions in order to incorporate the comments and questions of your technical staff at the HIO. We feel the current design is sound and will serve as the foundation for the communications network being built. As time goes on, we will revisit the design to keep it current. The principal issue in this regard is ARENTO extending X.25 service to all of Egypt. The extension is planned for the near future, and the telecommunications design may need to be revised to respond to the extension. The plan presented here, however, is based on the best technology and options currently available. Also, as the software modules are completed, more accurate data for the network traffic will be available. It might be of interest to recalculate the expected operational costs at that time.

We continue to welcome careful reviews of this report and any questions and comments about the design's technical details and costs.

A number of people contributed substantively to this report, including Randall Bartlett of MAXIMUS and Professor Dr. A.Y. Bilal, Director of the National Telecommunications Research Institute and Chairman of the Department of Electronics and Communications, Faculty of Engineering, Cairo University. Members of Dr. Bilal's staff also contributed to the report. Additional contributions are acknowledged in Appendix B. If you have any questions about this report, please do not hesitate to contact me.

Sincerely,

Thomas E. Knotts
Chief of Party

cc: Dr. Fahd El Minshawy, HIO
Ms. Mellen Tanamly, USAID

53 Berout Street (Apt. 401) • Heliopolis, Cairo, Egypt. • P.O.Box 1051 Heliopolis, Bahary • Tel.: 678-552 / 418-3970 • Fax: (202) 418-3909

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HIO CRHP

MAXIMUS·CHEMONICS·ARABSOFT

مشروع إسترداد نفقات العلاج

April 19, 1994

Ms. Mellen Tanamly
Project Officer
USAID - Egypt
106 Kasr El Aini Street, 7th Floor
Cairo, Egypt

Ref: Project Number 263-0170

Dear Ms. Tanamly:

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1 EXECUTIVE SUMMARY

This report describes the analysis and results of a study conducted to develop a design for the HIO telecommunications network. The analysis, using factors of cost and technical attributes, was intended to identify the best feasible approach for the HIO network. The result of the analysis, a recommended design for the HIO telecommunications network, is detailed in Section 6 of this report.

The initial step for this analysis was to identify the nodes of the network and the feasible circuit options among the nodes. We identified each location that needed to be served by the network from a list supplied by the HIO. The HIO list included the names, addresses, and telephone numbers (where available) for each of the HIO clinics, hospitals, and branch offices. The geographical relationships between these locations were made clear by developing and analyzing maps of the sites by branch and by studying the locations of the branch offices with respect to each other.

Additional information was obtained through interviews with senior members of the engineering staff at the Arab Republic of Egypt National Telecommunications Organization (ARENTO). The ARENTO engineers detailed the circuits and services currently available at the HIO facility locations. We also reviewed, in detail, the current and future plans for EgyptNet X.25 services, existing management facilities and hardware devices, and the current tariff structure. Finally, we interviewed AT&T staff and other ARENTO engineering staff to determine the future availability of digital technology and fibre optic circuit paths in remote areas of Egypt.

In the next step, we established estimates of the data traffic volumes to be generated at each HIO site. These estimates were analyzed for daily and non-daily data traffic loads between polyclinics, hospitals and branches, and for traffic loads between the branches directly. These volumes were estimated in concert with the software design teams by developing transaction scenarios and associated network loading parameters. The traffic volume estimates provided the final element necessary to calculate the first estimates of the network costs.

The results of the analysis showed a combination design to be the best for the HIO telecommunications network. With this design, each branch is connected to every other branch through the X.25 service. For the clinics, the solution is more complex. In the Cairo, Northwest Delta and Canal Branches, where EgyptNet is available, an X.25 network is used directly for all clinics and hospitals. In the Middle Delta, East Delta and North Upper Egypt Branches, where EgyptNet is not yet available but nodes are accessibly close, lines are leased to EgyptNet nodes. In the Middle and South Upper Egypt Branches, where EgyptNet is neither available nor close, a point-to-point system using leased lines between and among all the HIO facilities is used.

A point-to-point leased line approach could have been used in the three branches with proximity to EgyptNet nodes, but we elected not to utilize this design option in our recommended solution. For one thing it turned out to be more expensive. For another, we felt that the future of the HIO telecommunications network rests with packet-switching technologies and it is better to get started on that path now.

We have included a dial-up backup system into the design for this network. The dial-up system makes use of the dual-use modems specified for the network and only adds the cost of the additional line for each clinic and whatever usage charges occur. This is low cost insurance against a catastrophic and lengthy loss of communications services through EgyptNet.

Finally, the network management responsibilities for the EgyptNet segments of the telecommunications network rest with ARENTO, not the HIO. We felt this was highly desirable since the HIO does not have the technical resources that ARENTO possesses for such a responsibility. On the leased lines segments, the network management responsibility falls partially to ARENTO and partially to the HIO, a situation that we believe is manageable until EgyptNet is extended by ARENTO into upper Egypt.

2 GENERAL OVERVIEW

This report is a draft of the initial design of the telecommunications network for the HIO computer system. The initial design is based on a study of the requirements of the emerging software system and the capabilities of the telecommunications infrastructure in Egypt. Since this design was selected based on both cost and technical considerations, a cost analysis of all feasible designs is included in this report.

A critical element in the Health Insurance Organization's Cost Recovery In Health Project (CRHP) is telecommunications. It is vital that the telecommunications infrastructure be evaluated to help assure an effective processing distribution and transport environment for the applications of the CRHP. The requirement is to develop a network design that builds on the strengths and capacities of the current telecommunications environment in Egypt and avoids the problem areas to the extent possible.

One of the problem areas explored during the course of this analysis was the reliability of the EgyptNet network. The Arab Republic of Egypt National Telecommunications Organization (ARENTO) reported past reliability problems with the X.25 system and we wished to investigate these. ARENTO engineers indicated that these early problems were the result of start-up software problems with the Alcatel software used to control the network. These are now resolved and the network is stabilized. This conclusion was verified by several independent engineers.

This report also itemizes the actions and deliverables associated with the initial, working analysis and design recommendations for CRHP telecommunications support. For the feasible network designs analyzed, this report also provides an estimate of support costs for the telecommunications hardware, circuits and services over the five years of the implementation phase of the project and over one year of operation for the full network.

The findings of this study and its recommendations are developed in four additional sections. The sections are:

- Approach
- Study Products
- Assumptions
- Network Design

Furthermore, the Appendices contain extensive data and calculations with the supporting detail for the recommendations and conclusions reached.

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3 APPROACH

MAXIMUS conducted an assessment of telecommunications network design options for supporting CRHP. This assessment was carried out initially by a MAXIMUS home office technical staff member. The results of that effort were reviewed and extended by other members of the project team working in conjunction with Professor Dr. A. Y. Bilal, Chairman of the Electronics and Communications Department in the Faculty of Engineering at Cairo University. The ultimate goal of the assessment was to investigate issues associated with telecommunications support for the project, develop viable network designs and, finally, estimate the costs likely to be incurred for those designs.

The initial step for this analysis was to identify the nodes of the network and the feasible circuit options among the nodes. This required MAXIMUS to identify each potential location that needed to be served by the network. HIO provided a list of names, addresses and telephone numbers (where available) of all clinics, hospitals and branch offices. This list was then translated. The geographical relationships between these locations were made clear by developing and analyzing maps of the sites by branch. The locations of the branch offices with respect to each other was also studied. Exhibit 1 illustrates the maps developed during this effort. These maps served as the geographical frames of reference for the network designs developed later.

We interviewed senior managing engineers at ARENTO (see Appendix B) to identify the circuits and services currently available to the HIO facility locations we identified. We also reviewed, in detail, the current and future plans for EgyptNet X.25 services, existing management facilities and hardware devices, and the current tariff structure. Finally, we interviewed AT&T and ARENTO staff to determine the future availability of digital technology and fibre optic circuit paths in remote areas of Egypt.

These discussions and materials provided necessary information on viable approaches, circuit and services billing, and required hardware.

The next step was to establish estimates of the daily data traffic volumes to be generated at each HIO site. We also estimated the ongoing and non-daily data traffic between sites and branches, and between branches directly. This was done by working with the software design teams to develop transaction scenarios and associated network loading estimates. The data traffic volume estimates provided the final element necessary to calculate the first estimates of network system loads and costs.

In this analysis we assessed the cost of the CRHP network system in relation to several interdependent system components, design factors, and architecture options. These included:

- **Processing Distribution**
  The extent to which data are maintained close to the user affects network loading. Where processing and data management are distributed, the result is lower network loading. Where processing and data management are centralized, the network must carry more data traffic.

Exhibit 1A
NORTHWEST DELTA BRANCH FACILITY MAP

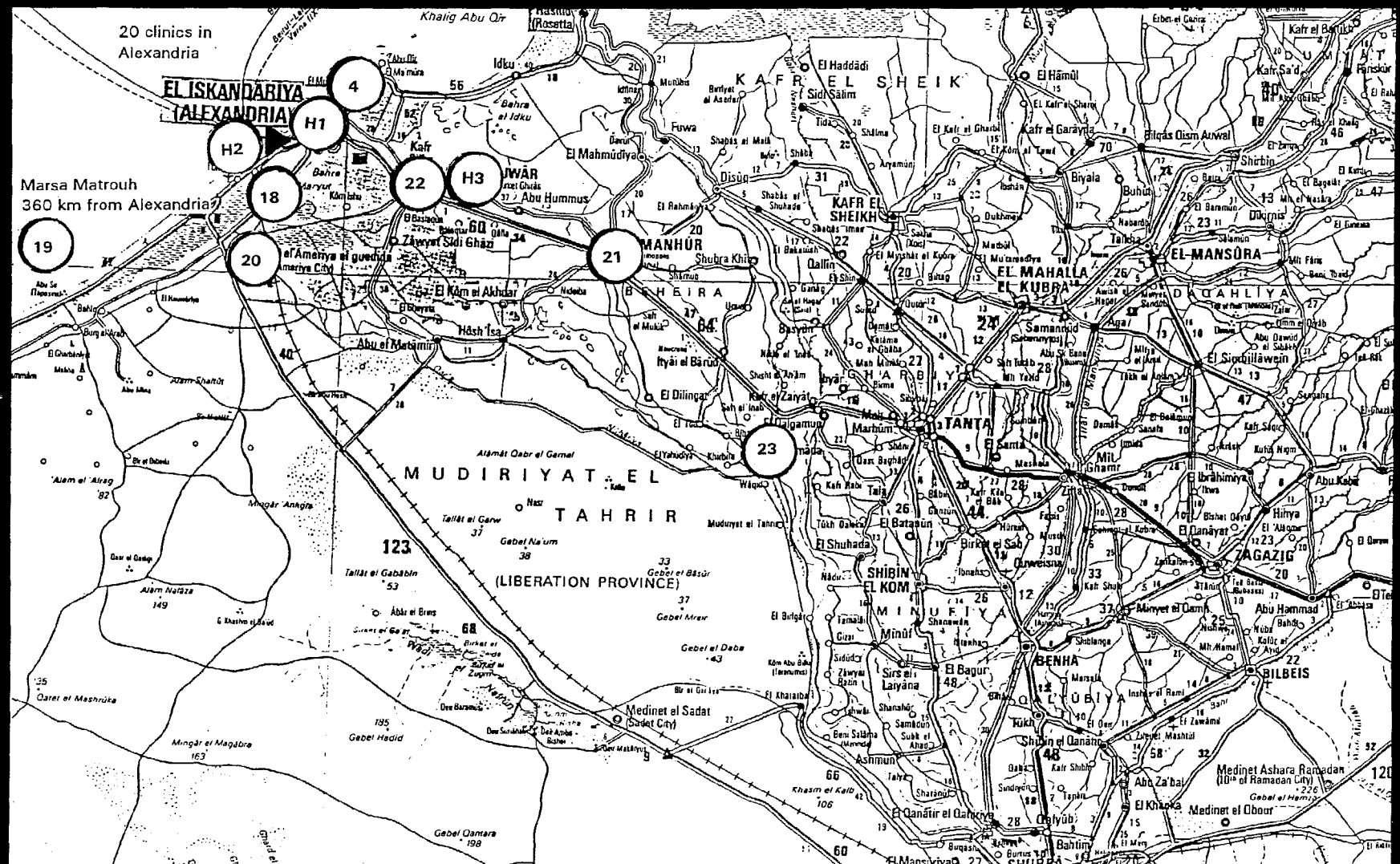

Exhibit 1B
MIDDLE DELTA (TANTA) BRANCH FACILITY MAP

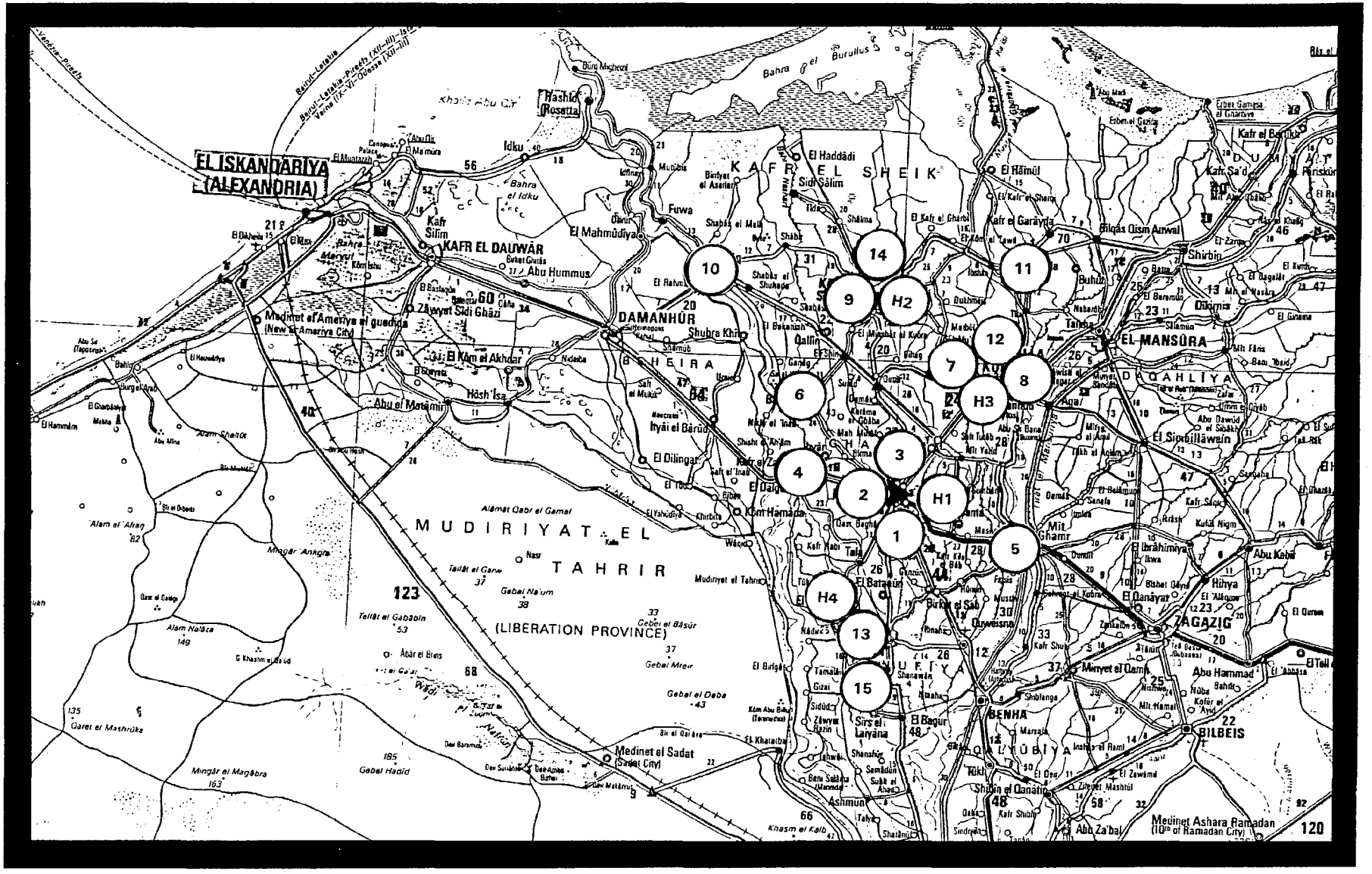

Exhibit 1C
EAST DELTA BRANCH FACILITY MAP

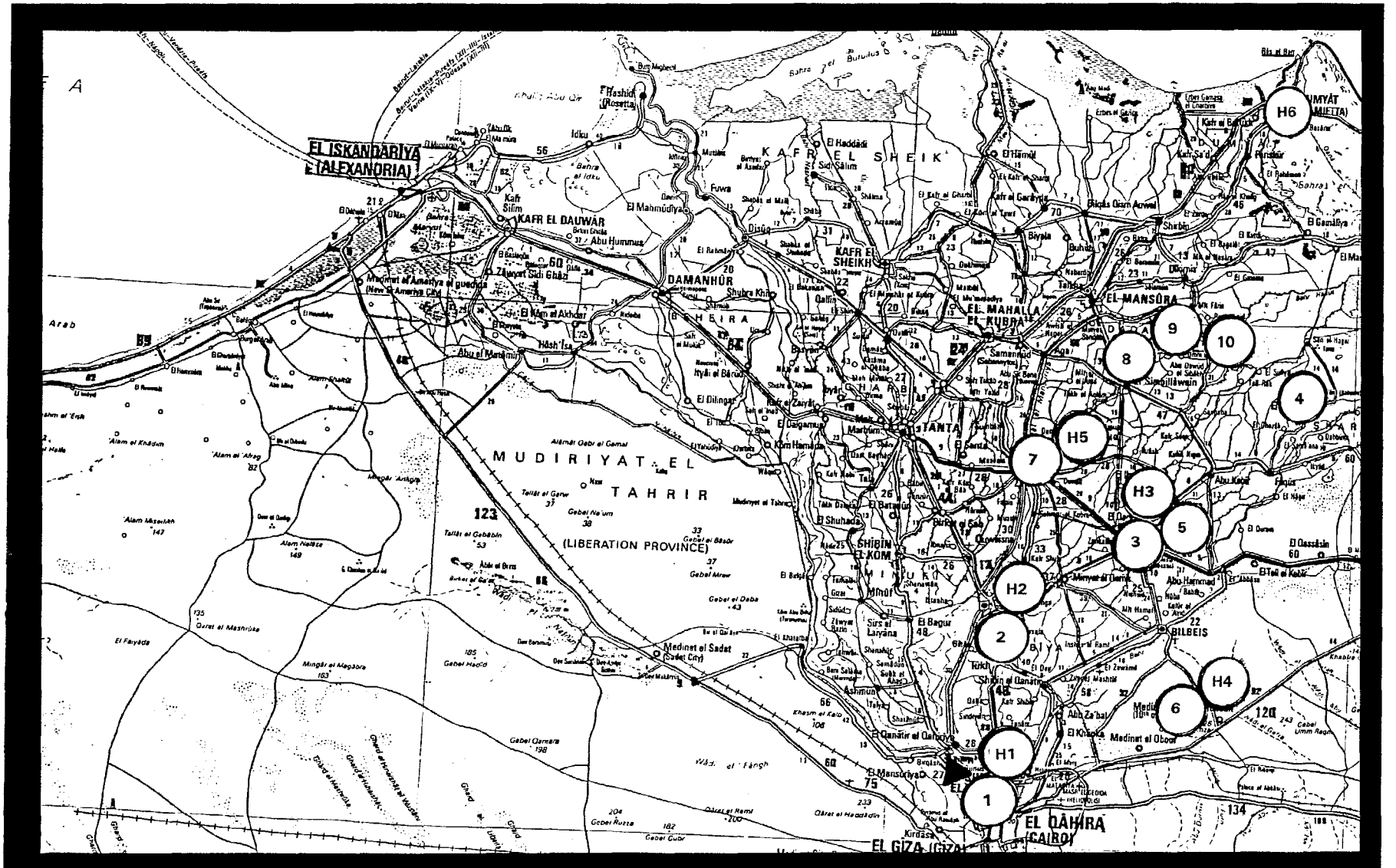

Exhibit 1D
CAIRO BRANCH FACILITY MAP

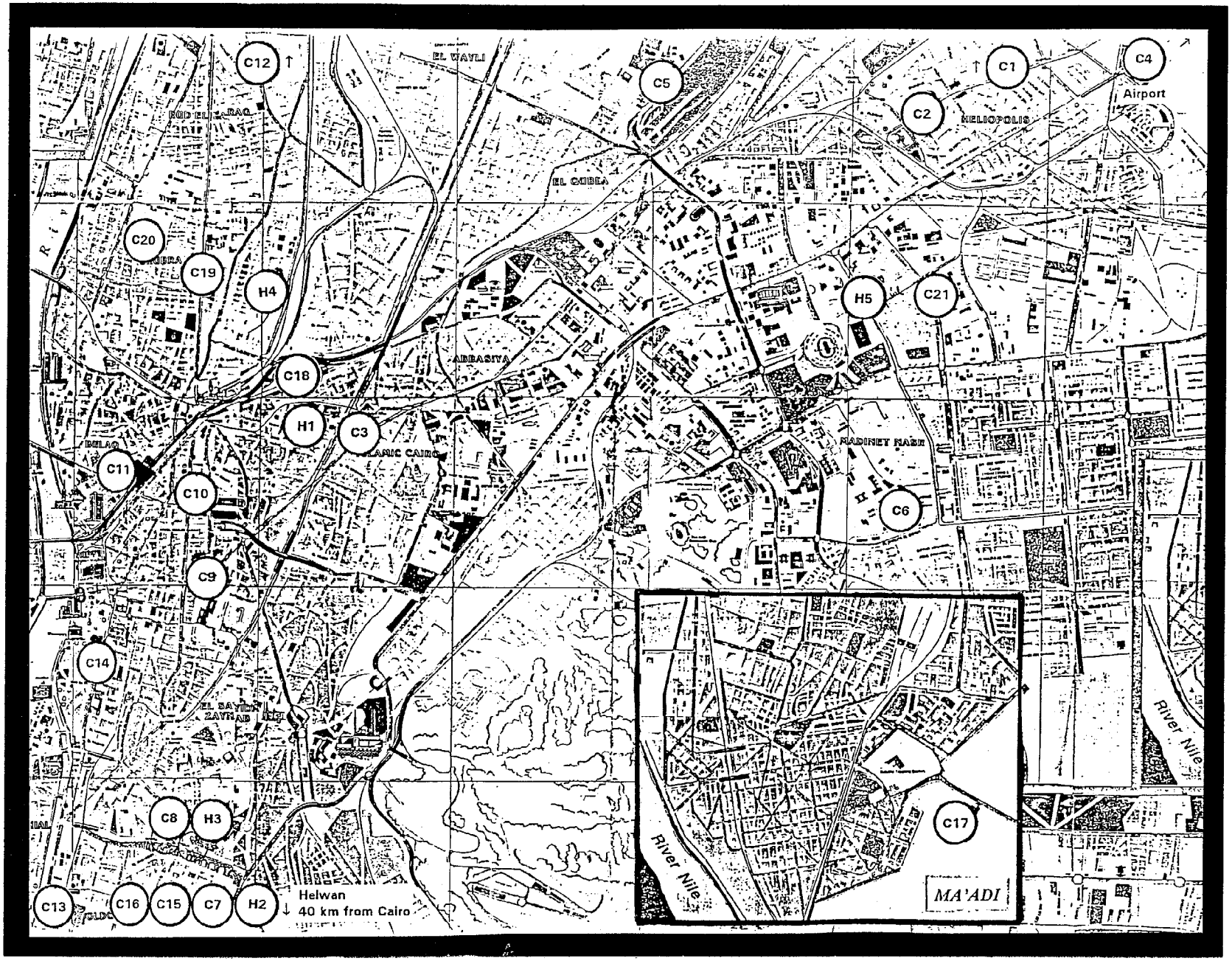

Exhibit 1E
GIZA BRANCH FACILITY MAP

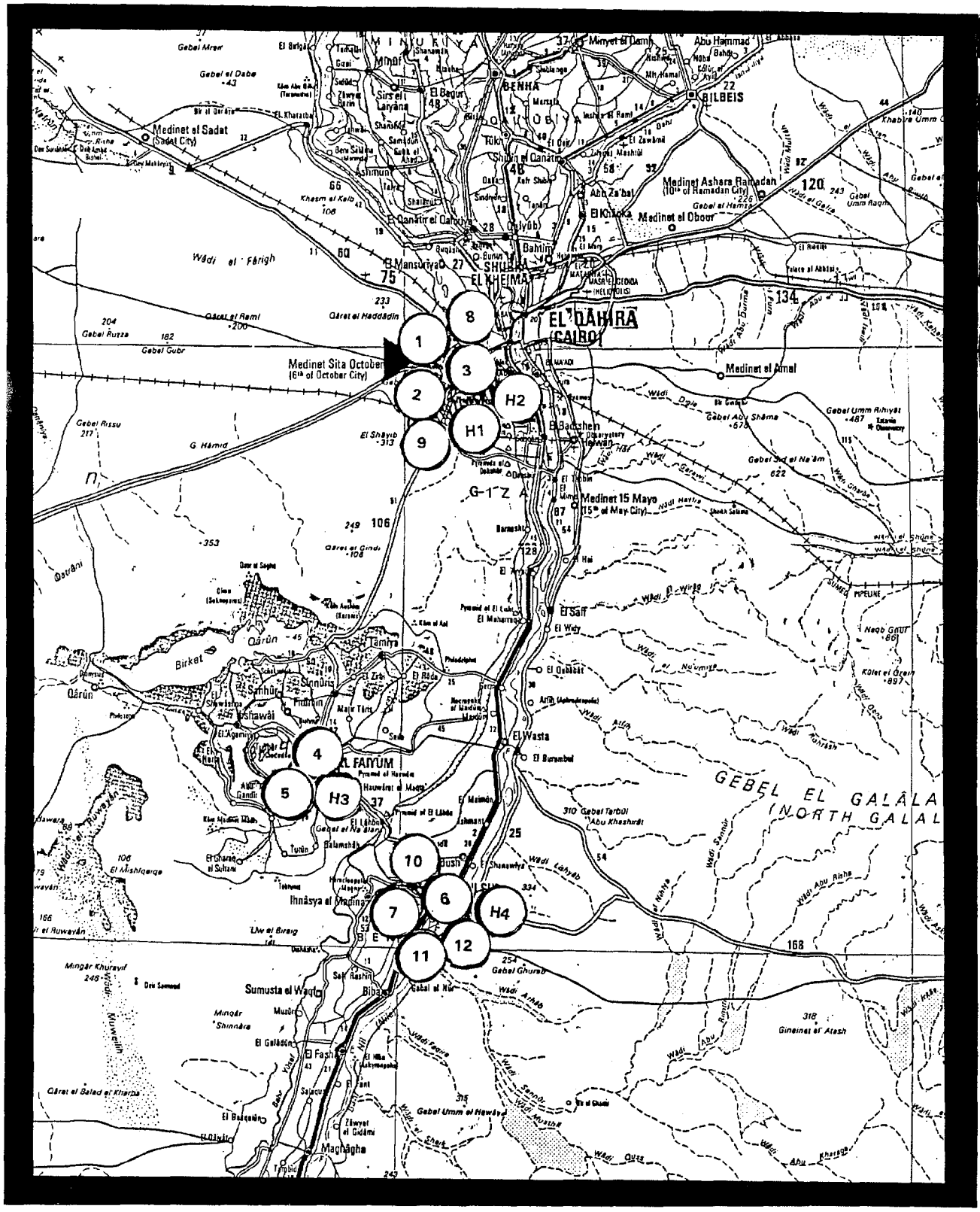

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Exhibit 1F
MIDDLE UPPER EGYPT BRANCH FACILITY MAP

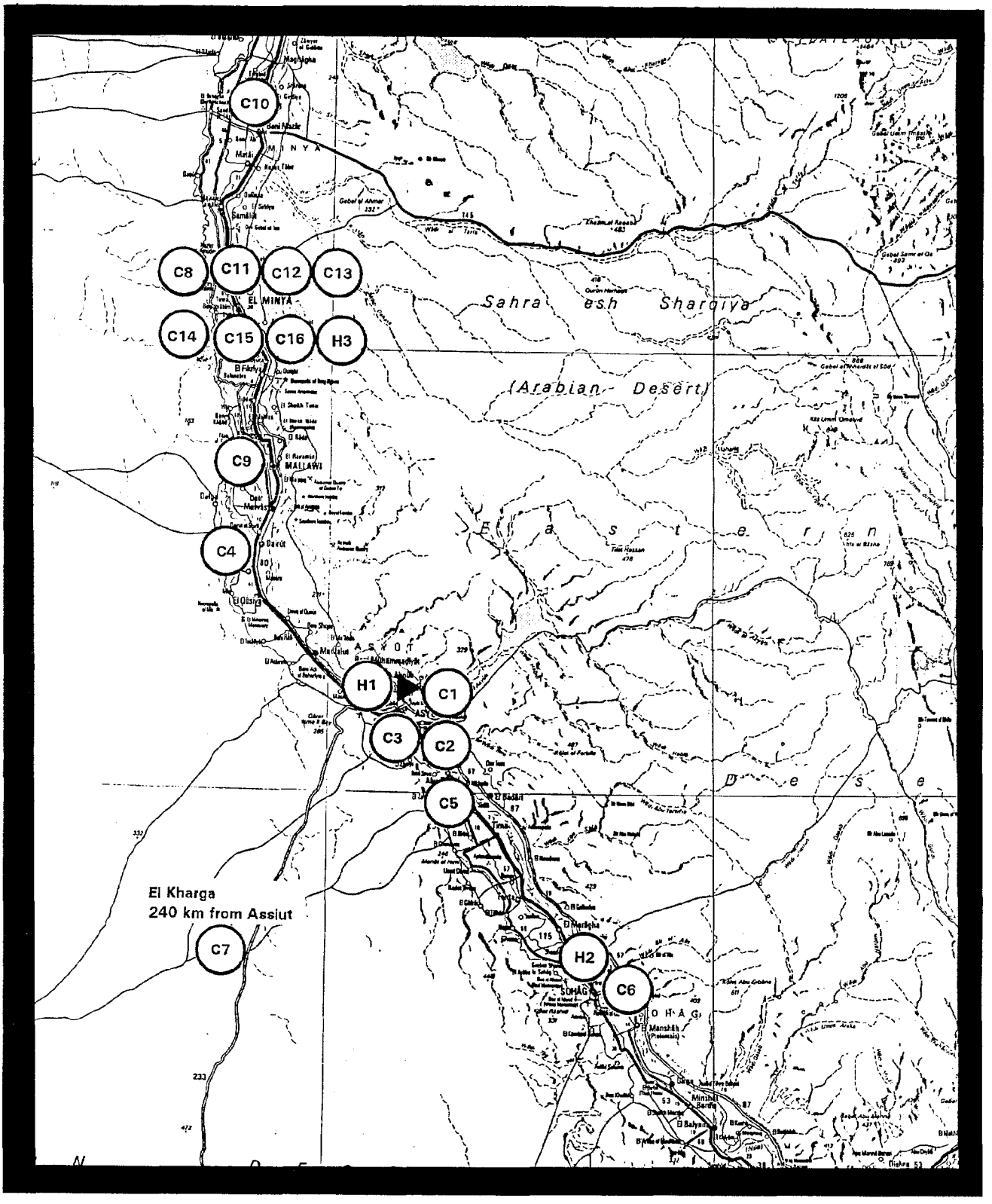

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Exhibit 1G
SOUTH UPPER EGYPT BRANCH FACILITY MAP

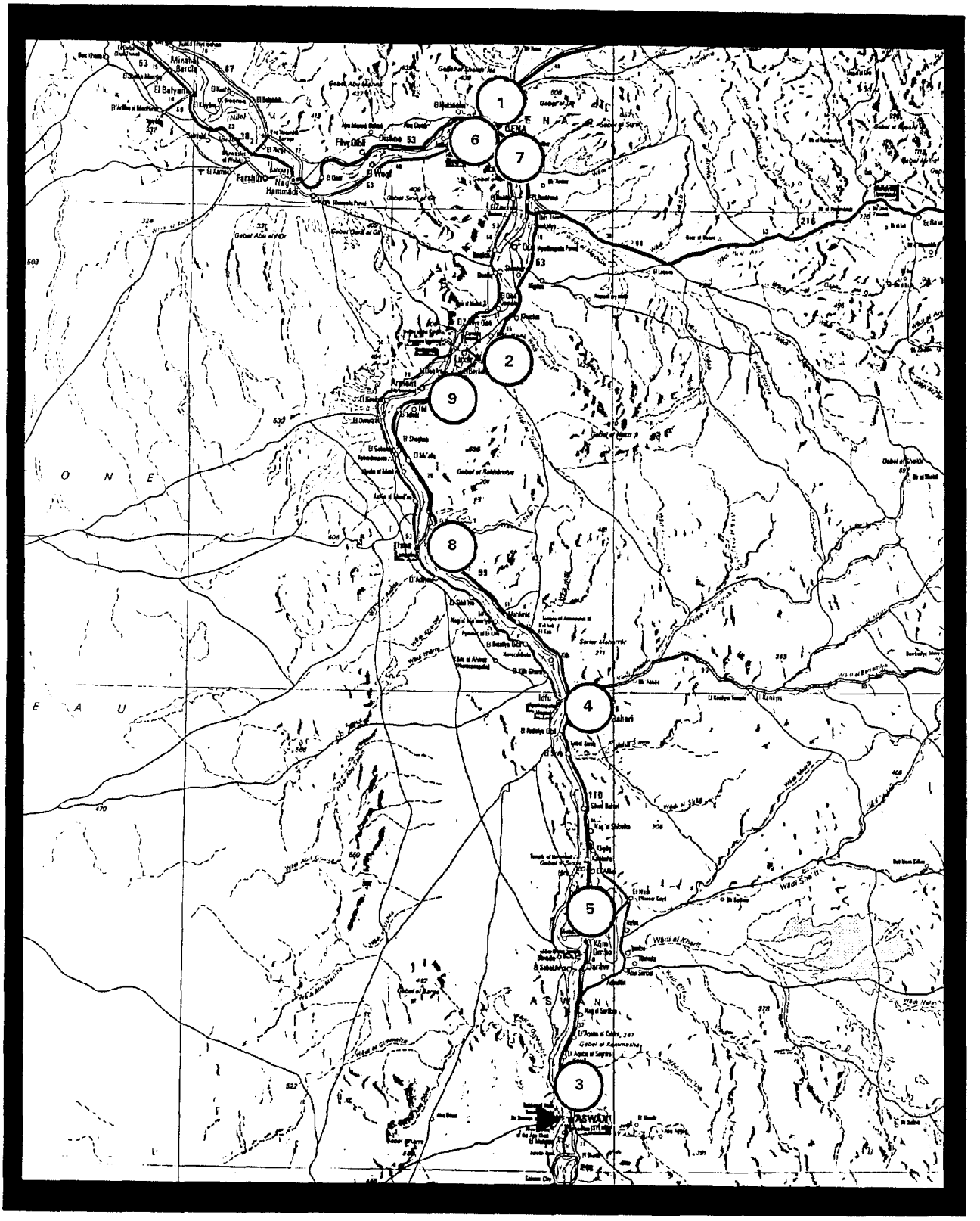
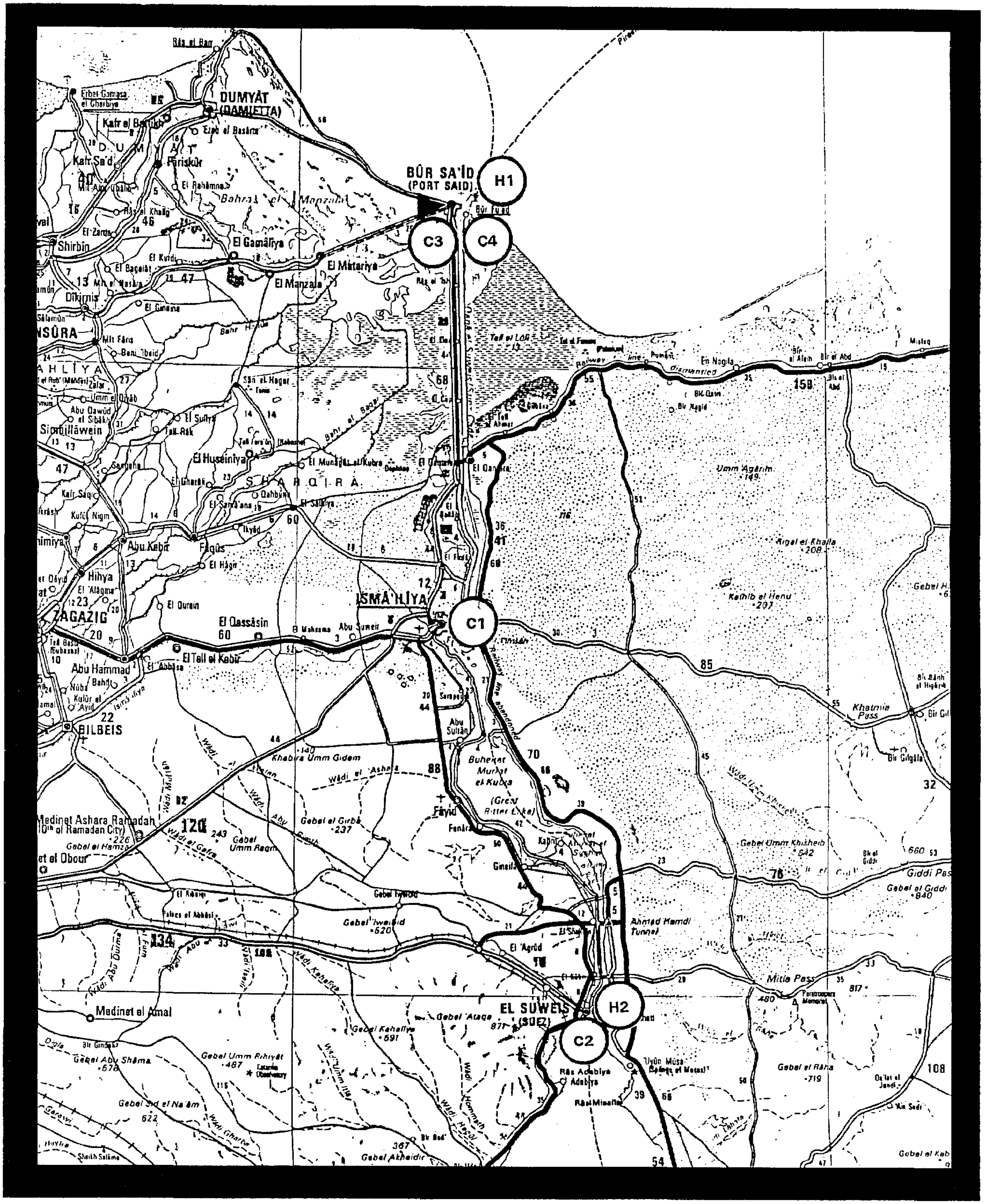


Exhibit 1H
CANAL BRANCH FACILITY MAP



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- **Data Communication Equipment**
  We considered codex modems with dual mode operating capabilities. These support dedicated access mode and alternative dial-up mode if dedicated access is broken.

- **Circuit Types, Number and Channel Capacity**
  We concluded that 9600 baud (bits per second) was the maximum continuous assured bandwidth for the network on any given circuit, X.25 or direct. Greater rates were possible, but 9600 can be relied upon with existing circuit paths throughout the system. This became the assumed speed floor for cost planning.

- **Network Topology and Protocol**
  We evaluated several possible approaches to identify the reliable topologies. One design approach was to provide X.25 for all locations. This proposed approach could result in both improved technical capacity and improved network configuration flexibility over time, but is infeasible at this time. Another approach combined EgyptNet (X.25) service where available with leased lines where EgyptNet is not yet available. Variations on each of these were also explored, but were eliminated for technical or cost reasons.

- **Data Traffic Volumes**
  As mentioned, the EgyptNet X.25 tariff is data traffic sensitive. Costs are incurred for initial access, for the time of access, for each Switched Virtual Circuit path, and for the number of packets transported by kilopacket. Since the EgyptNet service is volume (data traffic) sensitive, costs can increase over time. Additional nodes, and/or increased data traffic volumes from the addition of beneficiaries will increase the cost of the system. The cost of the leased line segments is fixed and distance, not volume sensitive. The full capacity of the circuit can be used at the same price and circuit capacity can be increased by data set improvement. The only concern is underutilization. Even then, however, the costs remain fixed.

We examined a number of technology options that could provide the Wide Area Network (WAN) connectivity needed for the HIO network environment. These options included such interconnection approaches as dial-up lines, satellite transmissions, point-to-point, multidrop, and X.25 access. The media available included coaxial, analog microwave, copper, and fibre optic communication channels.

The satellite option was quickly eliminated due to lack of access and other practical reasons. The dial-up option was relegated to backup use only, due to the lack of consistency and reliability in the area where it would most likely be used. Leased line and, where available, X.25-based EgyptNet services were the two principal technologies for reliable service for the network.

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To calculate costs, we first established the sites and the volumes of transactions that were expected. Site location information was obtained from HIO-published resources. We developed specific information on the location and principal phone number for each site. We then used HIO statistical information (for the month of January 1993) to determine the number of registered beneficiaries, visits, and drug inventory information at each site. We measured the distances between a site and its associated branch, and, when important for the analysis, between sites and branches generally.

The cost analyses complete the initial assessment. These analyses provided reasonable cost scenarios for the development of network support and ongoing operation for the design approaches recommended.

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4 STUDY PRODUCTS

The approach described in the preceding section resulted in a series of outputs or study products. Most of these should be considered interim in nature and are incorporated as part of the project work files. The following are the key products generated by the analysis:

- **List of Current Sites**
  This includes the names, addresses, and phone numbers (where given) of each clinic, hospital and branch. Drug "stores" or warehouses are also included where information was available.

- **Coding Structure**
  To facilitate site reference in the telecommunication environment MAXIMUS developed a simple coding structure. Branches were numbered B1...Bn. Clinics and hospitals were numbered within each branch B1C1...Cn or B1H1...Hn. This coding structure is for immediate convenience only. It is not recommended for long term coding since it will have to change if the number of branches or the clinic allocations to branches change.

- **Critical Data on Clinics and Hospitals**
  The HIO Statistical Department provided information for the month of January 1993. This data included counts of registered beneficiaries, the monthly visits experienced, and the prescriptions issued by clinic. We also sought to record the number of beds and the average patients in residence at the hospitals. This hospital information is still being developed.

- **Site Location Maps**
  These maps depict the locations of the clinics and hospitals in relation to the branch offices. See Exhibits 1A through 1H.

- **Network Options Diagrams**
  These diagrams show representative hardware, circuit paths, and interconnection approaches for the principal communications options studied. Exhibit 2A shows the X.25 design for the Cairo Branch. Exhibit 2B illustrates the point-to-point leased line as studied for the Giza Branch. Exhibit 2C shows a leased line design with cascade connections in the South Upper Egypt Branch. These exhibits are intended only to illustrate some of the alternative approaches considered during the analysis.

- **Network and Cost Spreadsheet**
  This spreadsheet lists each branch, clinic and hospital that needs to be interconnected to the HIO system. For each, it shows the distances and traffic loading based on data throughput loading assumptions. Using the traffic loading, the spreadsheet computes the traffic volumes and circuit loading for the circuit configuration, as applicable.

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Exhibit 2A
NETWORK OPTIONS DIAGRAM/CAIRO BRANCH
X.25 DESIGN

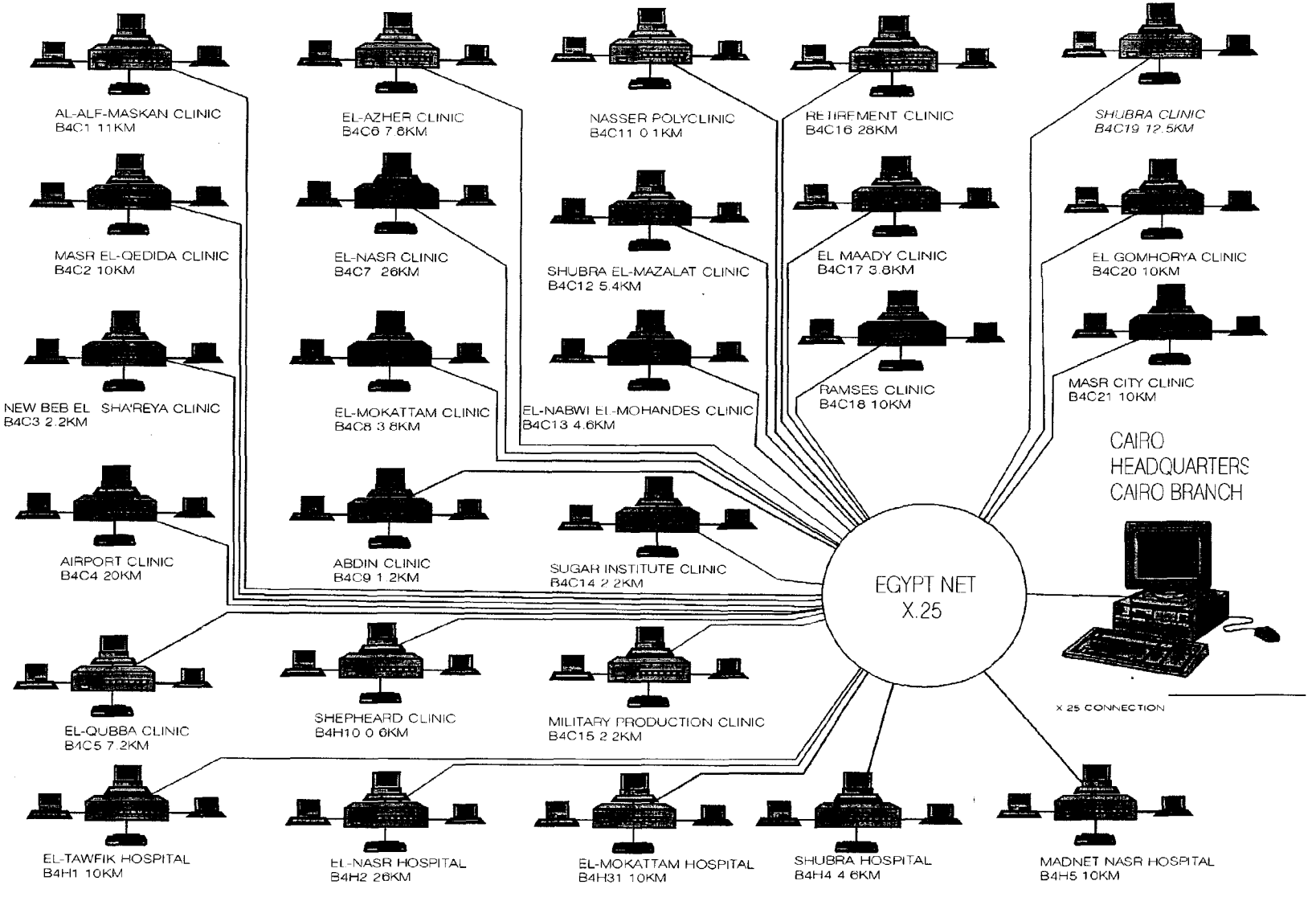

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Exhibit 2B
NETWORK OPTIONS DIAGRAM/SOUTH UPPER EGYPT BRANCH
LEASED LINES WITH CASCADE ALTERNATIVE DESIGN

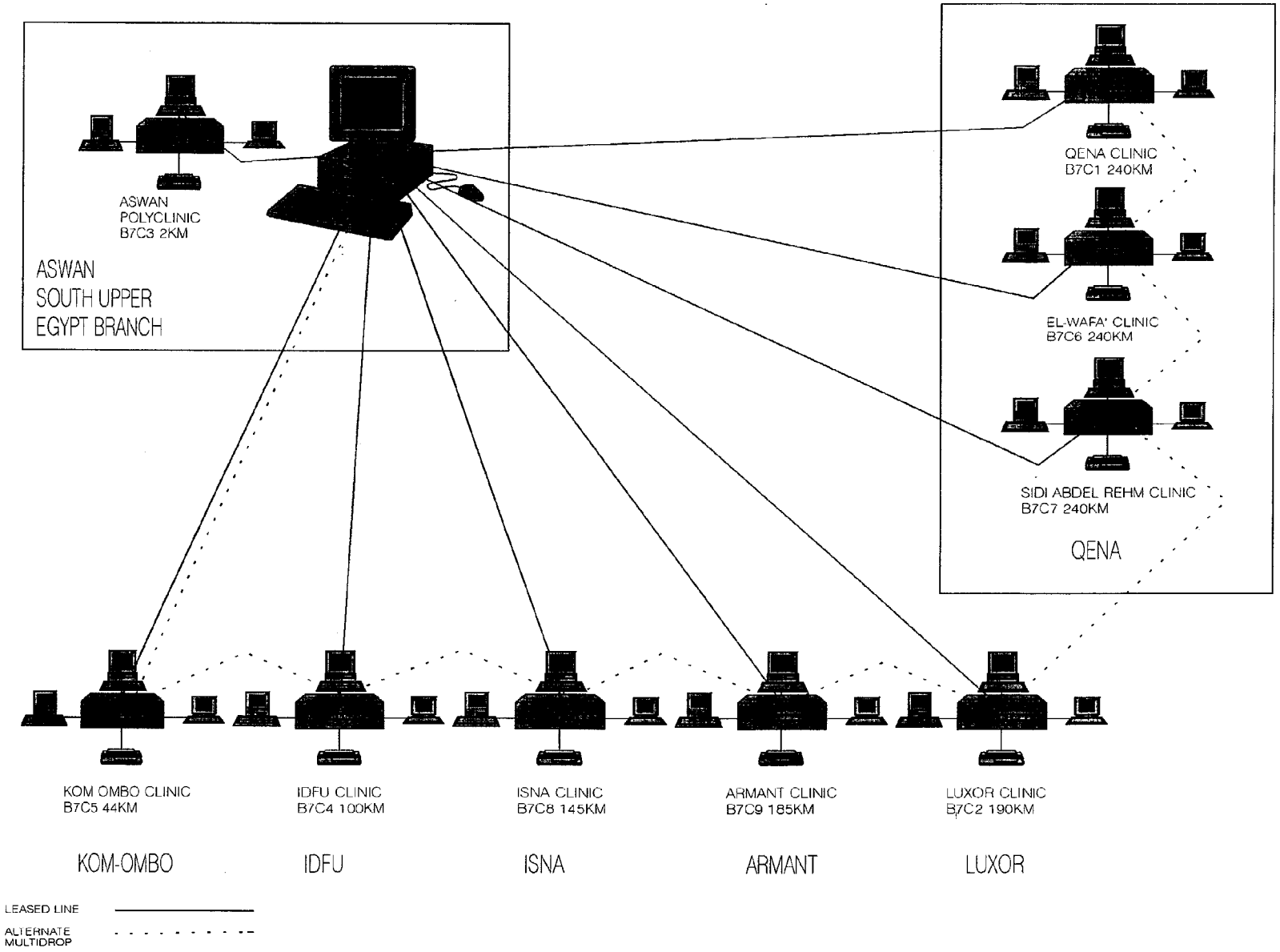
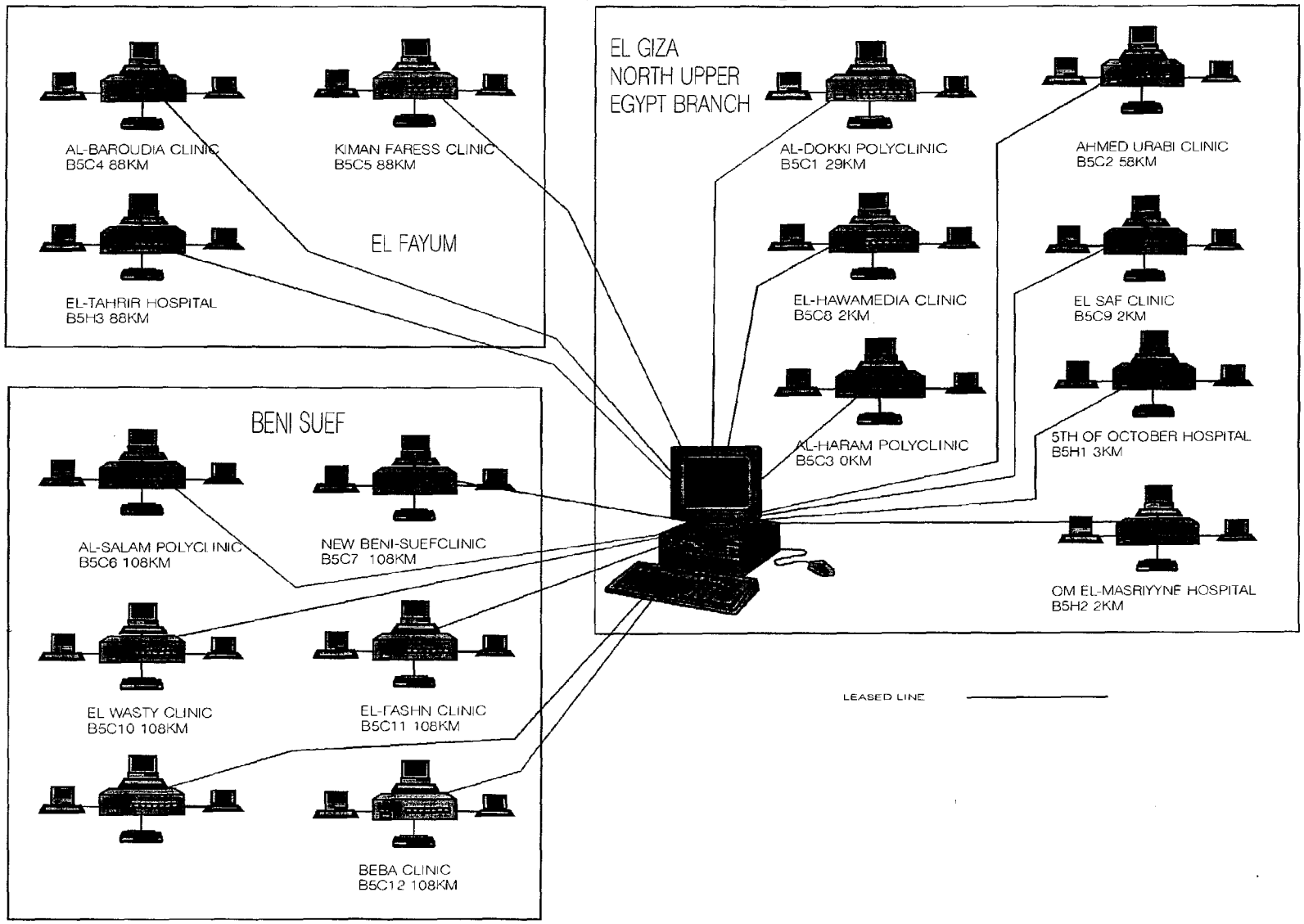


Exhibit 2C
NETWORK OPTIONS DIAGRAM/GIZA BRANCH
POINT-TO-POINT LEASED LINES DESIGN



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The network architecture includes a combination of X.25 (EgyptNet), point-to-point leased line, and cascade linked lease line approaches. The report sets produced by this spreadsheet are provided in the Appendices.

In addition, the spreadsheet depicts the cost patterns for the network configuration, including initial costs (such as circuit installation costs and hardware purchase costs) and ongoing costs (such as access and packet volume costs). Finally the spreadsheet projects annual costs based on an assumed implementation schedule. It takes each site, assigns an implementation date to it, and estimates the costs for the implementation period and annual operating periods thereafter. Each year's costs are totaled. The annual and cumulative costs are also shown over a six-year period, up through the first year of full network operation.

- **Telecommunications Analysis Materials**
  These materials were gathered to clarify the telecommunications infrastructure and the costs and options for the HIO CRHP project telecommunications services. They include maps of ARENTO current and proposed fibre optic, microwave, and coaxial cable for the nation in general and Cairo specifically. They also provide current status and future plans for the EgyptNet system and current tariff information for all ARENTO circuits and services. These are in the project files.

These reports and documents, taken together, comprise the preliminary detailed network design. They are intended to provide a basis for initial software and hardware system decisions. Each of these products must be refined as further analysis and planning provides more detailed information on the assumptions, or on the fixed costing estimates of the network elements. The model of the network structure, as represented in the spreadsheets, can also be used to develop better cost efficiencies and improved system reliability.

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5 ASSUMPTIONS

The following assumptions were used to develop the costing and network configuration for the spreadsheet reports in the Appendices. These assumptions are almost invariably conservative. The rationale for the assumptions is summarized and possible offsetting factors are also noted. The following data represent the key assumptions made in the analysis.

5.1 Clinics Operations

Beneficiary and Medical Records Applications

- Two percent of the total beneficiaries appear each day for treatment services.
- One percent of the daily visits generate the following on-line network traffic:
  - 2000 bytes of beneficiary data to branch
  - 500 bytes of beneficiary data from another clinic
  - 1000 bytes of medical record data from another clinic
- Each daily visit generates a 100 byte record to update the branch medical record. These data are batched daily to the branch.

Drug Control Application

- Quarterly, one hundred fifty (150) bytes to the branch for formulary update requests.
- Daily, five thousand (5000) bytes for inventory summaries to the store.
- Weekly, five hundred (500) bytes for drug requests to the store.
- Weekly, five thousand (5000) bytes for physician updates to the branch.

5.2 Branch Operations

Beneficiary and Medical Records Applications

- One tenth of one percent (0.1%) of the branch beneficiaries generate the following batch network traffic to the clinics daily:
  - Five hundred (500) bytes of beneficiary data.
  - One thousand (1000) bytes of medical records data.

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Drug Control Application

- To the store:
  - Monthly, five hundred (500) bytes of drug request responses.
  - Monthly, one thousand (1000) bytes of purchase order data.
- To each clinic:
  - Annually, two megabytes of formulary file data.
  - Monthly, two thousand (2000) bytes of drug interaction file data.
  - Quarterly, two thousand (2000) bytes of drug protocol file data.
  - Quarterly, two thousand (2000) bytes of drug dosage file data.
  - Annually, two thousand (2000) bytes of diagnosis code table data.
  - Annually, two thousand (2000) bytes of procedure code table data.

5.3 System Operations Data

- TCP/IP overhead - 30% of traffic volume.
- System bandwidth - 9600 bits per second.
- SQLnet overhead - 500 bytes per transaction.

Since the functional designs have been completed for the first of the outpatient applications modules, the record size estimates for each medical record are educated ones. However, our assumptions about the proportion of the daily patient visits that will generate network line traffic represents a much softer estimate. The true proportion will depend upon HIO policies with regard to patient mobility between clinics and the frequency of emergency cases that arise in the course of a day. Likewise, the data traffic volume between the clinic and branch for medical records purposes represents an estimate only. At this time we have yet to complete our designs for the data base to be maintained at the branch level, especially in relation to patient data from the clinic level.

These data traffic volumes are based upon assumptions for the first four application modules only. These include the beneficiary registration, drug control, cost accounting, and medical records modules. We do not expect that the additional modules developed in later

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phases will impact the network traffic related to polyclinic operations to any significant degree. Our assumptions do not include network traffic generated by the hospitals since the application modules for the hospitals have not yet been designed. When the design efforts for the inpatient modules are sufficiently advanced, the calculations will be redone to include the hospital-generated network data traffic.

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6 NETWORK DESIGN

As a result of the preceding analysis, MAXIMUS recommends one design solution for the HIO network. The preferred design is an EgyptNet X.25 network connecting each branch, and connecting the clinics and hospitals to the branch, in the three branches where EgyptNet services are presently available (Cairo, Northwest Delta, and Canal Branches). A leased-line to EgyptNet node design will be used for the three branches close to EgyptNet nodes (Middle Delta, East Delta, and North Upper Egypt Branches), and a simple point-to-point leased lines approach (using cascade connections) in the two branches where EgyptNet is not available (Middle Upper Egypt and South Upper Egypt Branches). This provides X.25 service to all facilities and branches, except for the Middle and South Upper Egypt Branches. In these two latter cases, EgyptNet services may also be available by the time the project is ready for implementation in these regions.

The annual operating cost for this network design is estimated at just under 445,000 £E. Exhibit 3 displays the annual installation and operating expenses in £E for the recommended network design approach.

Exhibit 3
INSTALLATION AND OPERATING COSTS BY BRANCH

BRANCH	INSTALLATION COSTS (£E)	ANNUAL OPERATING COSTS (£E)
Cairo	19,360	44,536
Northwest Delta	29,590	74,657
Canal	8,360	20,879
Middle Delta	29,920	69,097
East Delta	18,590	36,383
North Upper Egypt	20,350	34,645
Middle Upper Egypt	14,850	69,441
South Upper Egypt	11,220	50,560
Branch-to-Branch	11,000	43,681
Totals	**163,240**	**443,679**

The detailed calculations for the cost of this approach are contained in the Appendices of this report. The tables in the Appendices show the cost calculations for the preferred design as well as for a variation of the preferred design. In the variation, we explored the possibility of using point-to-point leased lines in the five branches with no direct access to EgyptNet nodes (Middle Delta, East Delta, North Upper Egypt, Middle Upper Egypt, and South Upper Egypt Branches). The result of latter analysis confirmed the preference for the design utilizing connections to the nearest EgyptNet node when possible.

For either approach, however, the installation costs shown are one-time costs, incurred as each branch network is implemented. The operational costs are repetitive charges that are incurred each year in the operation of the network. These costs grow larger as each new segment of the network is installed.

The mixed EgyptNet plus leased line network design combines the approaches shown in Exhibits 2A, 2B, and 2C in Section 3 of this report. Polyclinics and hospitals are linked to branches and branches are linked to Cairo. This can support either a distributed or a branch-centralized processing approach. The cost estimates for this network assume distributed processing. If centralized processing were decided upon, the cost of the remote processor would be deducted from processing equipment costs and a communications controller cost would be added to the network costs for each site.

One advantage of the combined EgyptNet plus leased line system is its short-term costs and simplicity. Once established, the leased line circuit portion of the network would be either operational or not. The equipment for this segment is simple and reasonably priced. Since the line costs are fixed and billed on distance as opposed to transaction volume, the leased line segment of the network could absorb increases in data traffic due to greater transaction volumes without additional cost. Obtaining the proper modems initially could slightly increase the maintenance costs of the network since the best modems would have greater bandwidth (i.e., baud rates) than might be needed by initial transaction volumes. However, the offset to this is that if a greater bandwidth were needed the modems could simply be adjusted to provide it, with circuit acquisition costs unchanged.

Where the system has access to EgyptNet, a packet assembler/disassembler (PAD) provides the access and the EgyptNet tariffs apply. Where there is no access to EgyptNet, two approaches are followed. The first is the use of leased lines to connect each site to the nearest EgyptNet node for the three branches (Middle Delta, East Delta, and North Upper Egypt Branches) with proximity to EgyptNet nodes. The second approach used is to utilize a cascade leased lines design in the remaining two branches, Middle Upper Egypt and South Upper Egypt, where no X.25 service is presently available.

The EgyptNet (X.25) segments of the network link to the main processor in Cairo. This provides a simple interface standard across this segment of the network. Also, for centralized processing the PAD can act as a communications controller. Thus, the resilience of the X.25 segment of the network is much greater than that for the leased line segment. Meshed routing, error correction, and dynamic network management bring high reliability on a day-to-day basis to all nodes in the X.25 segment. The two leased line branches in Upper Egypt are connected to the Cairo Data Center through leased lines.

Since the tariff for EgyptNet is usage sensitive, the principal variable is data transaction volume. In terms of both access time and packet throughput, costs can change under X.25 for the EgyptNet access only. The leased line segment costs are not usage sensitive. In fact, the cost per transaction goes down as more usage occurs, up to the point of full practical utilization. For the EgyptNet portion of the network, however, costs will be less if data traffic is less than projected. If the number of beneficiaries and visit loading increases, the projected costs of the X.25 segment would be higher than the projections for the leased lines segment. An offset to these costs is the possibility of lower tariff rates. Just

before the start of this study ARENTO lowered X.25 tariff rates significantly. In addition, the purchase of the **Closed User Group** option with the ARENTO EgyptNet service offers the probability of greater, volume-based discounts. Tariff changes could open access to other discounts as well.

The best approach, then, is the combined EgyptNet plus leased lines design that offers basic connectivity with modem-based error correction. Unfortunately, this design offers little or no dynamic network management capability where EgyptNet is not used. The principal costs derive from the high distance, lower utilization circuits in the rural areas of the nation. On the other hand, a major advantage of this design is that it has low installation and operating costs.

Finally, the network management for the X.25 and leased line segments of the network is the responsibility of ARENTO. HIO staff would participate in problem solving, but the responsibility would rest with ARENTO. This is a considerable advantage because HIO will not be burdened by telecommunications network management problems.

GLOSSARY OF TERMS AND ACRONYMS

Alcatel: French telecommunications firm that contracted with ARENTO (see below) for the packet switching equipment in use in Egypt.

ARENTO: Arab Republic of Egypt National Telecommunications Organization.

AT&T: An American telecommunications company.

Baud: Bits per second. This is the transmission speed for data on a particular telecommunications channel.

CRHP: Cost Recovery in Health Project.

EgyptNet: The name given to the X.25 service of ARENTO in Egypt.

HIO: Health Insurance Organization.

LAN: Local Area Network.

MAXIMUS: Prime contractor for HIO Management Information System project.

NCR: A computer hardware company.

PAD: Packet Assembler/Disassembler - A hardware/software device that collects data and aggregates that data into a packet. Also, it disaggregates packets into data messages.

SNMP: Simple Network Management Protocol. A software package used for monitoring the operational status of a network and its devices.

WAN: Wide Area Network. A computer network that extends over a wide area, usually defined as an area greater than one building.

X.25: This the name assigned to a particular type of data transmission protocol by the CCITT, the international engineering association that sets standards for electronic devices.

APPENDIX B

REFERENCES

The following organizations and staff were visited and interviewed for this study during the month of September 1993.

Place: NCR Corporation

Attendee	Position
Eng. Ashraf Gamal	Telecommunications Specialist
Mr. Ahmed Abu El Saad	District Manager, NCR - Egypt

Place: Systems Engineers of Egypt (SEE)

Attendee	Position
Dr. Abdel Rahman El Sawi	Engineer, Systems Engineers of Egypt

Place: ARENTO

Attendee	Position
Eng. Aida Ismael	Engineer, ARENTO
Eng. Ilham Zakaria	Engineer, ARENTO

Place: AT&T

Attendee	Position
Eng. Khaled Zeidan	Engineer, AT&T
Eng. Khaled Helmy	Engineer, AT&T

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Place: Abdeen Polyclinic

Attendee	Position
Dr. Mohammed Abdel Hammed Helal	Physician, Abdeen Polyclinic
Dr. Abdel Rahman	Physician, Abdeen Polyclinic

Place: El Korba Polyclinic

Attendee	Position
Dr. Hassan Abo Zeed El Kakharany	Physician, El Korba Polyclinic

FORMULAS, ASSUMPTIONS, AND TERMS USED IN THE SPREADSHEETS

The following defines the formulas, assumptions, and terms used in the spreadsheets which are presented in the subsequent Appendices.

Cascade Connection

This connection strategy applies to leased lines only. It involves connecting the branch to one clinic, that clinic to a second clinic, the second clinic to a third clinic, and so on. It is an alternative to simple point-to-point connections, wherein all clinics are directly connected to the branch. The cascade connection strategy is more economical than simple point-to-point connections, where it can be used. We have used it in Upper Egypt primarily.

Installation Cost

The following are the installation fees for each of the network options considered in the cost tables presented in the appendix.

1. EGYPTNET (X.25)

£.E. 600	installation
£.E. 200	insurance
plus 10%	sales tax

2. LEASED LINE POINT-TO-POINT

- Inside the same city

£.E. 300	installation
plus 10%	sales tax

- Outside the city

£.E.1500	installation
plus 10%	sales tax

3. LEASED LINE TO EGYPTNET

£.E. 900	installation.
plus 10%	sales tax

Annual Subscription Cost

The following are the rates for the annual subscription fees charged by ARENTO for each of the different services used in the network design.

1. EGYPTNET

£.E. 1000	annual subscription
£.E. 24	closed user group fee
£.E. 12	for any extra logical channel
plus 10%	sales tax

2. LEASED LINE POINT-TO-POINT

- o Inside the same city

£.E. 2400	annual subscription
plus 10%	sales tax

- o Outside the city

£.E. 2400	annual subscription in the first city
£.E. 2400	annual subscription in the other city
Annual subscription fees vary by distance.	
plus 10%	sales tax

3. LEASED LINE TO EGYPTNET

Annual subscription fees vary by distance.	
plus 10%	sales tax.

Time Access Cost

According to the EgyptNet tariff scheme, the access to the network from 6 AM to 6 PM costs 0.05 £.E. for every 3 minutes. The minimum access time charge for any connection is 3 minutes.

Packet Base Cost

The cost for each kilosegment is 0.35 £.E. , taking in consideration that the minimum charge is for 50 segments (3200 bytes) for every opened connection.

Total Annual Cost

Annual Subscription + Time Access Cost + Packet Base Cost

APPENDIX D

X.25 PLUS LEASED LINES - RECOMMENDED OPTION MIDDLE DELTA, EAST DELTA, NORTH UPPER EGYPT BRANCHES CONNECTED TO EGYPTNET NODE

HIO PROJECT NETWORK COST
CAIRO BRANCH (EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
CAIRO BRANCH	B4	880,375					£E800		£E880	£E1,024		£E1,126	8369.06	897.49	£E137.28	£E3,243.29	£E4,507
AL-ALF-MASKAN CLINIC	B4C1	48,268					£E800		£E880	£E1,024		£E1,126	1070.64	42.98	£E498.59	£E389.77	£E2,015
MASR EL-QEDIDA CLINIC	B4C2	83,490					£E800		£E880	£E1,024		£E1,126	1851.91	42.98	£E828.27	£E663.21	£E2,618
NEW BEB EL-SHA'REYA CLINIC	B4C3	54,947					£E800		£E880	£E1,024		£E1,126	1218.79	42.98	£E561.10	£E441.62	£E2,129
AIRPORT CLINIC,(EL MATAR)	B4C4	8,010					£E800		£E880	£E1,024		£E1,126	177.67	42.98	£E121.77	£E77.23	£E1,325
EL-QUBBA CLINIC	B4C5	62,317					£E800		£E880	£E1,024		£E1,126	1382.27	42.98	£E630.09	£E498.84	£E2,255
EL-AZHER CLINIC	B4C6	11,726					£E800		£E880	£E1,024		£E1,126	260.10	42.98	£E156.56	£E106.08	£E1,389
EL-NASR CLINIC	B4C7	47,031					£E800		£E880	£E1,024		£E1,126	1043.21	42.98	£E487.01	£E380.17	£E1,994
EL MOKATTAM CLINIC	B4C8	87,932					£E800		£E880	£E1,024		£E1,126	1950.44	42.98	£E869.84	£E697.70	£E2,694
ABDIN CLINIC	B4C9	24,360					£E800		£E880	£E1,024		£E1,126	540.34	42.98	£E274.81	£E204.16	£E1,605
SHEPHEARD CLINIC	B4C10	56,710					£E800		£E880	£E1,024		£E1,126	1257.90	42.98	£E577.61	£E455.31	£E2,159
NASSER POLYCLINIC	B4C11	61,396					£E800		£E880	£E1,024		£E1,126	1361.84	42.98	£E621.47	£E491.69	£E2,240
SHUBRA EL-MAZALAT CLINIC	B4C12	24,696					£E800		£E880	£E1,024		£E1,126	547.79	42.98	£E277.95	£E206.77	£E1,611
EL-NABAWI EL-MOHANDES CLINIC	B4C13	41,923					£E800		£E880	£E1,024		£E1,126	929.90	42.98	£E439.20	£E340.51	£E1,906
SUGAR INSTITUTE CLINIC	B4C14	19,977					£E800		£E880	£E1,024		£E1,126	443.11	42.98	£E233.78	£E170.13	£E1,530
MILITARY PRODUCTION CLINIC	B4C15	32,465					£E800		£E880	£E1,024		£E1,126	720.11	42.98	£E350.67	£E267.08	£E1,744
RETIREMENT CLINIC	B4C16	16,133					£E800		£E880	£E1,024		£E1,126	357.85	42.98	£E197.80	£E140.29	£E1,464
EL MAADY CLINIC	B4C17	19,129					£E800		£E880	£E1,024		£E1,126	424.31	42.98	£E225.85	£E163.55	£E1,516
RAMSES CLINIC	B4C18	15,009					£E800		£E880	£E1,024		£E1,126	332.92	42.98	£E187.28	£E131.56	£E1,445
SHUBRA CLINIC	B4C19	53,191					£E800		£E880	£E1,024		£E1,126	1179.84	42.98	£E544.67	£E427.59	£E2,099
EL-GOMHORIYA CLINIC	B4C20	36,552					£E800		£E880	£E1,024		£E1,126	810.77	42.98	£E388.93	£E298.81	£E1,814
NASR CITY CLINIC	B4C21	75,113					£E800		£E880	£E1,024		£E1,126	1666.10	42.98	£E749.86	£E598.18	£E2,474
TOTAL		880,375					£E17,600		£E19,360	£E22,528		£E24,781	27896.87	1800.09	£E9,360.39	£E10,393.94	£E44,535

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HIO PROJECT NETWORK COST
NORTHWEST DELTA BRANCH (EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
NORTHWEST DELTA BRANCH	B1	1,299,914					£E800		£E880	£E1,024		£E1,126	12,357.31	1,153.91	£E200.17	£E4,728.93	£E6,055
EL-RAML CLINIC	B1C1	62,301					£E800		£E880	£E1,024		£E1,126	1,381.91	42.98	£E629.94	£E498.71	£E2,255
ROUSHDI CLINIC	B1C2	65,184					£E800		£E880	£E1,024		£E1,126	1,445.86	42.98	£E656.92	£E521.09	£E2,304
GELIM CLINIC	B1C3	58,161					£E800		£E880	£E1,024		£E1,126	1,290.08	42.98	£E591.19	£E466.57	£E2,184
EL-SEYOUF CLINIC	B1C4	71,207					£E800		£E880	£E1,024		£E1,126	1,579.46	42.98	£E713.30	£E567.85	£E2,408
LORAN CLINIC	B1C5	26,481					£E800		£E880	£E1,024		£E1,126	587.38	42.98	£E294.66	£E220.63	£E1,642
ALEXANDRIA CLINIC	B1C6	92,373					£E800		£E880	£E1,024		£E1,126	2,048.95	42.98	£E911.41	£E732.18	£E2,770
MOHAMED FARID CLINIC	B1C7	74,475					£E800		£E880	£E1,024		£E1,126	1,651.95	42.98	£E743.89	£E593.23	£E2,464
EL-FARANA CLINIC	B1C8	20,152					£E800		£E880	£E1,024		£E1,126	447.00	42.98	£E235.42	£E171.49	£E1,533
EL-HADARA EL-BAHARIYA CLINIC	B1C9	43,642					£E800		£E880	£E1,024		£E1,126	968.03	42.98	£E455.29	£E353.85	£E1,936
MOHAREM BEK CLINIC	B1C10	24,816					£E800		£E880	£E1,024		£E1,126	550.45	42.98	£E279.08	£E207.70	£E1,613
NEW MOHAREM BEK CLINIC	B1C11	24,474					£E800		£E880	£E1,024		£E1,126	542.86	42.98	£E275.88	£E205.05	£E1,607
EL-GOMHORIA CLINIC	B1C12	74,704					£E800		£E880	£E1,024		£E1,126	1,657.03	42.98	£E746.03	£E595.00	£E2,457
EL-HORREYA CLINIC	B1C13	68,458					£E800		£E880	£E1,024		£E1,126	1,518.48	42.98	£E687.57	£E546.51	£E2,360
EL-NOKRASHY CLINIC	B1C14	60,170					£E800		£E880	£E1,024		£E1,126	1,334.65	42.98	£E609.99	£E482.17	£E2,219
EL-MANSHIA CLINIC	B1C15	22,491					£E800		£E880	£E1,024		£E1,126	498.88	42.98	£E257.32	£E189.65	£E1,573
SIZOSTRIS CLINIC	B1C16	47,730					£E800		£E880	£E1,024		£E1,126	1,058.71	42.98	£E493.55	£E385.59	£E2,006
MINA EL-BASAL CLINIC	B1C17	54,066					£E800		£E880	£E1,024		£E1,126	1,199.25	42.98	£E552.86	£E434.78	£E2,114
EL NASSR POLYCLINIC	B1C18	106,077					£E800		£E880	£E1,024		£E1,126	2,352.92	42.98	£E1,039.68	£E838.57	£E3,005
MARSA MATROUH POLYCLINIC	B1C19	11,193	330				£E800	£E900	£E1,870	£E1,024	£E7,560	£E9,442	248.27	42.98	£E151.57	£E101.94	£E9,696
NEW EL-AMERIYA CLINIC	B1C20	5,497	33				£E800	£E900	£E1,870	£E1,024	£E1,080	£E2,314	121.93	42.98	£E98.25	£E57.72	£E2,470
DAMANHUR CLINIC	B1C21	71,521	60				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	1,586.43	42.98	£E716.24	£E570.29	£E4,195
KAFR EL-DAUWAR CLINIC	B1C22	34,712	25				£E800	£E900	£E1,870	£E1,024	£E544	£E1,725	769.96	42.98	£E371.70	£E284.53	£E2,381
KOM HAMADA CLINIC	B1C23	24,673	95				£E800	£E900	£E1,870	£E1,024	£E2,160	£E3,502	547.28	42.98	£E277.74	£E206.59	£E3,987
MAHFOUZ POLYCLINIC	B1C24	49,763					£E800		£E880	£E1,024		£E1,126	1,103.81	42.98	£E512.59	£E401.38	£E2,040
SALAH SALEM POLYCLINIC	B1C25	49,763					£E800		£E880	£E1,024		£E1,126	1,103.81	42.98	£E512.59	£E401.38	£E2,040
MOHAREM BEK TEXTILE CLINIC	B1C26	49,763					£E800		£E880	£E1,024		£E1,126	1,103.81	42.98	£E512.59	£E401.38	£E2,040
KARMOUZ CLINIC	B1C27	6,066					£E800		£E880	£E1,024		£E1,126	134.55	42.98	£E103.58	£E62.14	£E1,292
TOTAL		1,299,914					£E22,400	£E4,500	£E29,590	£E28,672	£E12,964	£E45,800	41,191.03	1,314.37	£E13,630.96	£E15,226.89	£E74,657

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HIO PROJECT NETWORK COST
CANAL BRANCH (EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
CANAL BRANCH	B8	119,641	150				£E800	£E900	£E1,870	£E1,024	£E3,240	£E4,690	1,137.34	170.95	£E19.38	£E457.90	£E5,168
EL-MABARA CLINIC	B8C1	12,866	75				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	285.38	42.98	£E167.23	£E114.93	£E3,191
EL-HELAL EL-AHMAR CLINIC	B8C2	18,117					£E800		£E880	£E1,024		£E1,126	401.86	42.98	£E216.38	£E155.69	£E1,498
EL-MABARA CLINIC	B8C3	58,748	150				£E800	£E900	£E1,870	£E1,024	£E3,240	£E4,690	1303.10	42.98	£E596.68	£E471.13	£E5,758
EL-AMAL CLINIC	B8C4	29,910	150				£E800	£E900	£E1,870	£E1,024	£E3,240	£E4,690	663.45	42.98	£E326.76	£E247.25	£E5,264
TOTAL		£E119,641					£E4,000	£E3,600	£E8,360	£E5,120	£E11,340.00	£E18,106.00	3,791.13	342.87	£E1,326.42	£E1,446.90	£E20,879

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HIO PROJECT NETWORK COST
MIDDLE DELTA BRANCH (LEASED LINE TO EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
MIDDLE DELTA BRANCH	B2	372,632	90				£E800	£E900	£E1,870	£E1,084	£E2,160	£E3,568	3,542.33	641.06	£E61.98	£E1,464.19	£E5,095
KHALID IBN EL-WALID POLYCLINIC	B2C1	41,264	90				£E800	£E900	£E1,870	£E1,024	£E2,160	£E3,502	915.29	42.98	£E433.03	£E335.39	£E4,271
PHYSIOTHERAPY CLINIC	B2C2	24,842	90				£E800	£E900	£E1,870	£E1,024	£E2,160	£E3,502	551.03	42.98	£E279.32	£E207.90	£E3,990
ALY IBN ABY TALIB POLYCLINIC	B2C3	13,473	90				£E800	£E900	£E1,870	£E1,024	£E2,160	£E3,502	298.85	42.98	£E172.91	£E119.64	£E3,795
AHMED 'URABI POLYCLINIC	B2C4	14,367	100				£E800	£E900	£E1,870	£E1,024	£E2,160	£E3,502	318.68	42.98	£E181.28	£E126.58	£E3,810
OMAR IBN ABDEL-AZIZ POLYCLINIC	B2C5	26,946	75				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	597.70	42.98	£E299.01	£E224.24	£E3,432
EL-SHAHID AIMEN EL FATA POLYCLINIC	B2C6	13,043	110				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	289.31	42.98	£E168.88	£E116.30	£E4,382
TAL'AT HARB POLYCLINIC	B2C7	37,247	105				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	826.19	42.98	£E395.43	£E304.21	£E4,796
IBN SINAI POLYCLINIC	B2C8	42,198	105				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	936.00	42.98	£E441.77	£E342.64	£E4,881
OMAR IBN EL-KHATAB POLYCLINIC	B2C9	21,023	125				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	466.32	42.98	£E243.58	£E178.25	£E4,518
OSMAN IBN AFAN POLYCLINC	B2C10	25,622	140				£E800	£E900	£E1,870	£E1,024	£E3,240	£E4,690	568.33	42.98	£E286.62	£E213.96	£E5,191
BIYALA POLYCLINIC	B2C11	13,478	130				£E800	£E900	£E1,870	£E1,024	£E3,240	£E4,690	298.96	42.98	£E172.95	£E119.68	£E4,983
QOTOUR CLINIC	B2C12	15,713	105				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	348.53	42.98	£E193.87	£E137.03	£E4,427
ABU BAKR AS-SEDDIQ POLYCLINIC	B2C13	35,517	60				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	787.81	42.98	£E379.24	£E290.78	£E3,578
EL-OBOUR CLINIC	B2C14	27,345	125				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	606.55	42.98	£E302.75	£E227.33	£E4,626
MINUF CLINIC	B2C15	20,554	60				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	455.91	42.98	£E239.19	£E174.61	£E3,322
TOTAL		372,632					£E12,800	£E14,400	£E29,920	£E16,444	£E38,340	£E60,262	11,807.78	1,285.76	£E4,251.81	£E4,582.74	£E69,097

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HIO PROJECT NETWORK COST
EAST DELTA BRANCH (LEASED LINE TO EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
EAST OF DELTA BRANCH	B3	316,874					£E800		£E880	£E1,024			3,012.28	427.38	£E50.96	£E1,203.88	£E2,279
EL-NIL POLYCLINIC	B3C1	45,810					£E800		£E880	£E1,024			1,016.12	42.98	£E45.58	£E370.69	£E1,870
BENHA CLINIC	B3C2	40,447	40				£E800	£E900	£E1,870	£E1,024	£E1,080	£E2,314	897.17	42.98	£E425.38	£E329.05	£E2,858
EL-MABARA CLINIC	B3C3	76,402	60				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	1,694.69	42.98	£E761.92	£E608.19	£E4,014
EL-HOSINEIA CLINIC	B3C4	9,087	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	201.56	42.98	£E131.85	£E85.59	£E3,941
TEXTILE FACTORY CLINIC	B3C5	3,672	60				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	81.45	42.98	£E81.17	£E43.55	£E2,769
10TH OF RAMADAN CLINIC	B3C6	34,443	48				£E800	£E900	£E1,870	£E1,024	£E1,080	£E2,314	763.99	42.98	£E369.19	£E282.44	£E2,756
EL-MABARA CLINIC	B3C7	45,212	70				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	1,002.86	42.98	£E469.98	£E366.04	£E3,480
AL-FARDUS CLINIC	B3C8	13,377	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	296.72	42.98	£E172.01	£E118.89	£E4,015
IBN-LOKMAN CLINIC	B3C9	23,350	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	517.93	42.98	£E265.36	£E196.32	£E4,186
GADILA CLINIC	B3C10	25,074	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	556.17	42.98	£E281.49	£E209.70	£E4,215
TOTAL		316,874					£E8,800	£E8,100	£E18,590	£E11,264	£E17,820	£E29,740	10,040.94	857.17	£E3,484.90	£E3,814.34	£E36,383

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HIO PROJECT NETWORK COST
NORTH UPPER EGYPT BRANCH (LEASED LINE TO EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
NORTH UPPER EGYPT BRANCH	B5	302,504					£E800		£E880	£E1,024			2875.68	512.85	£E50.20	£E1,185.98	£E1,236
AL-DOKKI POLYCLINIC	B5C1	76,005					£E800		£E880	£E1,024			1685.89	42.98	£E758.31	£E605.10	£E1,363
AHMED URABI CLINIC	B5C2	31,149					£E800		£E880	£E1,024			690.92	42.98	£E338.95	£E256.87	£E595
AL-HARAM POLYCLINIC	B5C3	46,162					£E800		£E880	£E1,024			1023.93	42.98	£E478.88	£E373.42	£E852
AL-BAROUDIA CLINIC	B5C4	14,724	88				£E800	£E900	£E1,870	£E1,024	£E2,160	£E3,502	326.60	42.98	£E184.62	£E129.35	£E3,816
KIMAN FARESS CLINIC	B5C5	30,924	88				£E800	£E900	£E1,870	£E1,024	£E2,160	£E3,502	685.93	42.98	£E336.25	£E255.12	£E4,094
AL-SALAM POLYCLINIC	B5C6	19,370	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	429.65	42.98	£E228.10	£E165.42	£E4,490
NEW BENI-SUEF CLINIC	B5C7	17,058	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	378.37	42.98	£E206.46	£E147.47	£E4,450
EL HAWAMEDIA CLINIC	B5C8	15,712					£E800	£E900	£E1,870	£E1,024			348.51	42.98	£E193.86	£E137.02	£E331
EL SAF CLINIC	B5C9	25,209					£E800	£E900	£E1,870	£E1,024			559.16	42.98	£E282.75	£E210.75	£E494
EL-WASTY CLINIC	B5C10	8,373	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	185.72	42.98	£E125.17	£E80.05	£E4,302
EL-FASHN CLINIC	B5C11	8,415	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	186.66	42.98	£E125.56	£E80.37	£E4,302
BEBA CLINIC	B5C12	9,403	108				£E800	£E900	£E1,870	£E1,024	£E2,700	£E4,096	208.57	42.98	£E134.81	£E88.04	£E4,319
TOTAL		302504					£E10,400	£E8,100	£E20,350	£E13,312	£E17,820	£E27,487	9,585.58	1,028.63	£E3,443.23	£E3,714.97	£E34,645

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HIO PROJECT NETWORK COST
MIDDLE UPPER EGYPT BRANCH (LEASED LINE CASCADE OPTION)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
MIDDLE UPPER EGYPT BRANCH	B6	223,680						£E300	£E330		£E2,400	£E2,640					£E2,640
CENTRAL CLINIC	B6C1	7,804			B6			£E300	£E330		£E2,400	£E2,640					£E2,640
MOGAMAA EL MASLEH CLINIC	B6C2	14,702			C1			£E300	£E330		£E2,400	£E2,640					£E2,640
AL SALAM CLINIC	B6C3	15,392			C2			£E300	£E330		£E2,400	£E2,640					£E2,640
DAIRUT CLINIC	B6C4	15,735		58	B6	58		£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
ABU TIG CLINIC	B6C5	12,037		20	B6	20		£E1,500	£E1,650		£E5,344	£E5,878					£E5,878
SOHAG CLINIC	B6C6	41,207		90	C5	90		£E1,500	£E1,650		£E4,560	£E5,016					£E5,016
WADI EL QUEDID CLINIC	B6C7	13,394		305	B6	305		£E1,500	£E1,650		£E12,360	£E13,596					£E13,596
MABARA EL MINYA POLYCLINIC	B6C8	74,910		110	C9	42		£E1,500	£E1,650		£E3,480	£E3,828					£E3,828
MALLAWI CLINIC	B6C9	16,530		73	C4	21		£E1,500	£E1,650		£E2,944	£E3,238					£E3,238
BENY-MAZAR CLINIC	B6C10	11,969		156	C8	55		£E1,500	£E1,650		£E4,020	£E4,422					£E4,422
MATAI CLINIC	B6C11	4,768		110	C12			£E300	£E330		£E2,400	£E2,640					£E2,640
SAMALUT CLINIC	B6C12	13,461		110	C13			£E300	£E330		£E2,400	£E2,640					£E2,640
DEIR MOWAS CLINIC	B6C13	7,798		110	C14			£E300	£E330		£E2,400	£E2,640					£E2,640
ABU-QURQAS CLINIC	B6C14	11,657		110	C15			£E300	£E330		£E2,400	£E2,640					£E2,640
MAGHAGA CLINIC	B6C15	12,464		110	C16			£E300	£E330		£E2,400	£E2,640					£E2,640
EL-ADWA CLINIC	B6C16	5,496		110	C8			£E300	£E330		£E2,400	£E2,640					£E2,640
TOTAL		279,324						£E13,500	£E14,850		£E63,128.00	£E69,440.80					£E69,441

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HIO PROJECT NETWORK COST
SOUTH UPPER EGYPT BRANCH (LEASED LINE CASCADE OPTION)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
SOUTH UPPER EGYPT BRANCH	B7	123,986						£E300	£E330		£E2,400	£E2,640					£E2,640
QENA CLINIC	B7C1	13,776		240	C2	55		£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
LUXOR CLINIC	B7C2	19,283		190	C9	14		£E1,500	£E1,650		£E5,344	£E5,878					£E5,878
ASWAN POLYCLINIC	B7C3	13,776			B7	0		£E300	£E330		£E2,400	£E2,640					£E2,640
IDFOU POLYCLINIC	B7C4	13,776		101	C5	60		£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
KOM-OMBOU POLYCLINIC	B7C5	13,776		44	B7	40		£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
EL-WAFA' CLINIC	B7C6	13,382		240	C7	0		£E300	£E330		£E2,400	£E2,640					£E2,640
SIDI AEDEL REHIM CLINIC	B7C7	16,717		240	C1	0		£E300	£E330		£E2,400	£E2,640					£E2,640
ISNA CLINIC	B7C8	13,776		145	C4	52		£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
ARMANT CLINIC	B7C9	5,723		185	C8	40		£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
TOTAL		123,986						£E10,200	£E11,220		£E45,964.00	£E50,560.40					£E50,560

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HIO PROJECT NETWORK COST
BRANCHES TO HEADQUARTERS

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
ALEXANDRIA		1,299,914					£E800		£E880	£E1,180		£E1,298	609		£E9.03	£E213.27	£E1,520
TANTA		372,632	90				£E800	£E900	£E1,870	£E1,108	£E2,160	£E3,595	175		£E2.59	£E61.13	£E3,659
SHUBRA EL KHEIMA		316,874					£E800		£E880	£E1,072		£E1,179	149		£E2.20	£E51.99	£E1,233
CAIRO		880,375					£E800		£E880	£E1,244		£E1,368	413		£E6.11	£E144.44	£E1,519
GIZA		302,504					£E800		£E880	£E1,084		£E1,192	142		£E2.10	£E49.63	£E1,244
ASYUT		223,680	330				£E800	£E900	£E1,870	£E1,108	£E7,560	£E9,535	105		£E1.55	£E36.70	£E9,573
ASWAN		123,986	710				£E800	£E900	£E1,870	£E1,072	£E16,200	£E18,999	58		£E0.86	£E20.34	£E19,020
PORT SAID		119,641	180				£E800	£E900	£E1,870	£E1,036	£E4,320	£E5,892	56		£E0.83	£E19.63	£E5,912
TOTAL							£E6,400	£E3,600	£E11,000	£E8,904	£E30,240	£E43,058	1706		£E25.28	£E597.12	£E43,681

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HIO PROJECT NETWORK COST
SYSTEM TOTAL

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
SYSTEM TOTAL									£E163,240						£E35,523	£E39,777	£E443,879

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APPENDIX E

X.25 PLUS LEASED LINES - ALTERNATE OPTION MIDDLE DELTA, EAST DELTA, NORTH UPPER EGYPT BRANCHES WITH POINT-TO-POINT ONLY

HIO PROJECT NETWORK COST
CAIRO BRANCH (EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
CAIRO BRANCH	B4	880,375					£E800		£E880	£E1,024		£E1,126	8369.06	897.49	£E137.28	£E3,243.29	£E4,507
AL-ALF-MASKAN CLINIC	B4C1	48,268					£E800		£E880	£E1,024		£E1,126	1070.64	42.98	£E498.59	£E389.77	£E2,015
MASR EL-QEDIDA CLINIC	B4C2	83,490					£E800		£E880	£E1,024		£E1,126	1851.91	42.98	£E828.27	£E663.21	£E2,618
NEW BEB EL-SHA'REYA CLINIC	B4C3	54,947					£E800		£E880	£E1,024		£E1,126	1218.79	42.98	£E561.10	£E441.62	£E2,129
AIRPORT CLINIC,(EL MATAR)	B4C4	8,010					£E800		£E880	£E1,024		£E1,126	177.67	42.98	£E121.77	£E77.23	£E1,325
EL-QUBBA CLINIC	B4C5	62,317					£E800		£E880	£E1,024		£E1,126	1382.27	42.98	£E630.09	£E498.84	£E2,255
EL-AZHER CLINIC	B4C6	11,726					£E800		£E880	£E1,024		£E1,126	260.10	42.98	£E156.56	£E106.08	£E1,389
EL-NASR CLINIC	B4C7	47,031					£E800		£E880	£E1,024		£E1,126	1043.21	42.98	£E487.01	£E380.17	£E1,994
EL MOKATTAM CLINIC	B4C8	87,932					£E800		£E880	£E1,024		£E1,126	1950.44	42.98	£E869.84	£E697.70	£E2,694
ABDIN CLINIC	B4C9	24,360					£E800		£E880	£E1,024		£E1,126	540.34	42.98	£E274.81	£E204.16	£E1,605
SHEPHEARD CLINIC	B4C10	56,710					£E800		£E880	£E1,024		£E1,126	1257.90	42.98	£E577.61	£E455.31	£E2,159
NASSER POLYCLINIC	B4C11	61,396					£E800		£E880	£E1,024		£E1,126	1361.84	42.98	£E621.47	£E491.69	£E2,240
SHUBRA EL-MAZALAT CLINIC	B4C12	24,696					£E800		£E880	£E1,024		£E1,126	547.79	42.98	£E277.95	£E206.77	£E1,611
EL-NABAWI EL-MOHANDES CLINIC	B4C13	41,923					£E800		£E880	£E1,024		£E1,126	929.90	42.98	£E439.20	£E340.51	£E1,906
SUGAR INSTITUTE CLINIC	B4C14	19,977					£E800		£E880	£E1,024		£E1,126	443.11	42.98	£E233.78	£E170.13	£E1,530
MILITARY PRODUCTION CLINIC	B4C15	32,465					£E800		£E880	£E1,024		£E1,126	720.11	42.98	£E350.67	£E267.08	£E1,744
RETIREMENT CLINIC	B4C16	16,133					£E800		£E880	£E1,024		£E1,126	357.85	42.98	£E197.80	£E140.29	£E1,464
EL MAADY CLINIC	B4C17	19,129					£E800		£E880	£E1,024		£E1,126	424.31	42.98	£E225.85	£E163.55	£E1,516
RAMSES CLINIC	B4C18	15,009					£E800		£E880	£E1,024		£E1,126	332.92	42.98	£E187.28	£E131.56	£E1,445
SHUBRA CLINIC	B4C19	53,191					£E800		£E880	£E1,024		£E1,126	1179.84	42.98	£E544.67	£E427.99	£E2,099
EL-GOMHORIYA CLINIC	B4C20	36,552					£E800		£E880	£E1,024		£E1,126	810.77	42.98	£E388.93	£E298.81	£E1,814
NASR CITY CLINIC	B4C21	75,113					£E800		£E880	£E1,024		£E1,126	1666.10	42.98	£E749.86	£E598.18	£E2,474
TOTAL		880,375					£E17,600		£E19,360	£E22,528		£E24,781	27896.87	1800.09	£E9,360.39	£E10,393.94	£E44,535

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HIO PROJECT NETWORK COST
NORTHWEST DELTA BRANCH (EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
NORTHWEST DELTA BRANCH	B1	1,299,914					£E800		£E880	£E1,024		£E1,126	12,357.31	1,153.91	£E200.17	£E4,728.93	£E6,055
EL-RAML CLINIC	B1C1	62,301					£E800		£E880	£E1,024		£E1,126	1,381.91	42.98	£E629.94	£E498.71	£E2,255
ROUSEIDI CLINIC	B1C2	65,184					£E800		£E880	£E1,024		£E1,126	1,445.86	42.98	£E656.92	£E521.09	£E2,304
GELIM CLINIC	B1C3	58,161					£E800		£E880	£E1,024		£E1,126	1,290.08	42.98	£E591.19	£E466.57	£E2,184
EL-SEYOUF CLINIC	B1C4	71,207					£E800		£E880	£E1,024		£E1,126	1,579.46	42.98	£E713.30	£E567.85	£E2,408
LORAN CLINIC	B1C5	26,481					£E800		£E880	£E1,024		£E1,126	587.38	42.98	£E294.66	£E220.63	£E1,642
ALEXANDRIA CLINIC	B1C6	92,373					£E800		£E880	£E1,024		£E1,126	2,048.95	42.98	£E911.41	£E732.18	£E2,770
MOHAMED FARID CLINIC	B1C7	74,475					£E800		£E880	£E1,024		£E1,126	1,651.95	42.98	£E743.89	£E593.23	£E2,464
EL-FARA'NA CLINIC	B1C8	20,152					£E800		£E880	£E1,024		£E1,126	447.00	42.98	£E235.42	£E171.49	£E1,533
EL-HADARA EL-BAHARIYA CLINIC	B1C9	43,642					£E800		£E880	£E1,024		£E1,126	968.03	42.98	£E455.29	£E353.85	£E1,936
MOHAREM BEK CLINIC	B1C10	24,816					£E800		£E880	£E1,024		£E1,126	550.45	42.98	£E279.08	£E207.70	£E1,613
NEW MOHAREM BEK CLINIC	B1C11	24,474					£E800		£E880	£E1,024		£E1,126	542.86	42.98	£E275.88	£E205.05	£E1,607
EL-GOMHORIA CLINIC	B1C12	74,704					£E800		£E880	£E1,024		£E1,126	1,657.03	42.98	£E746.03	£E595.00	£E2,467
EL-HORREYA CLINIC	B1C13	68,458					£E800		£E880	£E1,024		£E1,126	1,518.48	42.98	£E687.57	£E546.51	£E2,360
EL-NOKRASHY CLINIC	B1C14	60,170					£E800		£E880	£E1,024		£E1,126	1,334.65	42.98	£E609.99	£E482.17	£E2,219
EL-MANSHIA CLINIC	B1C15	22,491					£E800		£E880	£E1,024		£E1,126	498.88	42.98	£E257.32	£E189.65	£E1,573
SIZOSTRIS CLINIC	B1C16	47,730					£E800		£E880	£E1,024		£E1,126	1,058.71	42.98	£E493.55	£E385.59	£E2,006
MINA EL-BASAL CLINIC	B1C17	54,066					£E800		£E880	£E1,024		£E1,126	1,199.25	42.98	£E552.86	£E434.78	£E2,114
EL NASSR POLYCLINIC	B1C18	106,077					£E800		£E880	£E1,024		£E1,126	2,352.92	42.98	£E1,039.68	£E838.57	£E3,005
MARSA MATROUH POLYCLINIC	B1C19	11,193	330				£E800	£E900	£E1,870	£E1,024	£E7,560	£E9,442	248.27	42.98	£E151.57	£E101.94	£E9,696
NEW EL-AMERIYA CLINIC	B1C20	5,497	33				£E800	£E900	£E1,870	£E1,024	£E1,080	£E2,314	121.93	42.98	£E98.25	£E57.72	£E2,470
DAMANHUR CLINIC	B1C21	71,521	60				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	1,586.43	42.98	£E716.24	£E570.29	£E4,195
KAFR EL-DAUWAR CLINIC	B1C22	34,712	25				£E800	£E900	£E1,870	£E1,024	£E544	£E1,725	769.96	42.98	£E371.70	£E284.53	£E2,381
KOM HAMADA CLINIC	B1C23	24,673	95				£E800	£E900	£E1,870	£E1,024	£E2,160	£E3,502	547.28	42.98	£E277.74	£E206.59	£E3,987
MAHFOUZ POLYCLINIC	B1C24	49,763					£E800		£E880	£E1,024		£E1,126	1,103.81	42.98	£E512.59	£E401.38	£E2,040
SALAH SALEM POLYCLINIC	B1C25	49,763					£E800		£E880	£E1,024		£E1,126	1,103.81	42.98	£E512.59	£E401.38	£E2,040
MOHAREM BEK TEXTILE CLINIC	B1C26	49,763					£E800		£E880	£E1,024		£E1,126	1,103.81	42.98	£E512.59	£E401.38	£E2,040
KARMOUZ CLINIC	B1C27	6,066					£E800		£E880	£E1,024		£E1,126	134.55	42.98	£E103.58	£E62.14	£E1,292
TOTAL		1,299,914					£E22,400	£E4,500	£E29,590	£E28,672	£E12,964	£E45,800	41,191.03	2,314.37	£E13,630.96	£E15,226.89	£E74,657

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HIO PROJECT NETWORK COST
CANAL BRANCH (EGYPTNET)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
CANAL BRANCH	B8	119,641	150				£E800	£E900	£E1,870	£E1,024	£E3,240	£E4,690	1,137.34	170.95	£E19.38	£E457.90	£E5,168
EL-MABARA CLINIC	B8C1	12,866	75				£E800	£E900	£E1,870	£E1,024	£E1,620	£E2,908	285.38	42.98	£E167.23	£E114.93	£E3,191
EL-HELAL EL-AHMAR CLINIC	B8C2	18,117					£E800		£E880	£E1,024		£E1,126	401.86	42.98	£E216.38	£E155.69	£E1,498
EL-MABARA CLINIC	B8C3	58,748	150				£E800	£E900	£E1,870	£E1,024	£E3,240	£E4,690	1303.10	42.98	£E596.68	£E471.13	£E5,758
EL-AMAL CLINIC	B8C4	29,910	150				£E800	£E900	£E1,870	£E1,024	£E3,240	£E4,690	663.45	42.98	£E326.76	£E247.25	£E5,264
TOTAL		£E119,641					£E4,000	£E3,600	£E8,360	£E5,120	£E11,340.00	£E18,106.00	3,791.13	342.87	£E1,326.42	£E1,446.90	£E20,879

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HIO PROJECT NETWORK COST
MIDDLE DELTA BRANCH (LEASED LINE POINT-TO-POINT OPTION)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
MIDDLE DELTA BRANCH	B2	372,632						£E300	£E330		£E2,400	£E2,640					£E2,640
KHALED IBN EL-WALID POLYCLINIC	B2C1	41,264						£E300	£E330		£E2,400	£E2,640					£E2,640
PHYSIOTHERAPY CLINIC	B2C2	24,842						£E300	£E330		£E2,400	£E2,640					£E2,640
ALY IBN ABY TALIB POLYCLINIC	B2C3	13,473						£E300	£E330		£E2,400	£E2,640					£E2,640
AHMED 'URABI POLYCLINIC	B2C4	14,367		18				£E1,500	£E1,650		£E5,344	£E5,878					£E5,878
OMAR IBN ABDEL-AZIZ POLYCLINIC	B2C5	26,946		25				£E1,500	£E1,650		£E5,344	£E5,878					£E5,878
EL-SHAHID AIMEN EL FATA POLYCLINIC	B2C6	13,043		26				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
TAL'AT HARB POLYCLINIC	B2C7	37,247		27				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
IBN SINAI POLYCLINIC	B2C8	42,198		27				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
OMAR IBN EL-KHATAB POLYCLINIC	B2C9	21,023		37				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
OSMAN IBN AFAN POLYCLINC	B2C10	25,622		65				£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
BIYALA POLYCLINIC	B2C11	13,478		50				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
QOTOUR CLINIC	B2C12	15,713		27				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
ABU BAKR AS-SEDDIQ POLYCLINIC	B2C13	35,517		26				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
EL-OBOUR CLINIC	B2C14	27,345		37				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
MINUF CLINIC	B2C15	20,554		26				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
TOTAL		372,632						£E19,200	£E21,120		£E79,628	£E87,591					£E87,591

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HIO PROJECT NETWORK COST
EAST DELTA BRANCH (LEASED LINE POINT-TO-POINT OPTION)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
EAST OF DELTA BRANCH	B3	316,874															
EL-NIL POLYCLINIC	B3C1	45,810						£E300	£E330		£E2,400	£E2,640					£E2,640
BENHA CLINIC	B3C2	40,447		40				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
EL-MABARA CLINIC	B3C3	76,402		60				£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
EL-HOSINEIA CLINIC	B3C4	9,087		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
TEXTILE FACTORY CLINIC	B3C5	3,672		60				£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
10TH OF RAMADAN CLINIC	B3C6	34,443		48				£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
EL-MABARA CLINIC	B3C7	45,212		70				£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
AL-FARDUS CLINIC	B3C8	13,377		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
IBN-LOKMAN CLINIC	B3C9	23,350		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
GADILA CLINIC	B3C10	25,074		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
TOTAL		316,874						£E14,100	£E15,510		£E65,820	£E72,402					£E72,402

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HIO PROJECT NETWORK COST
NORTH UPPER EGYPT (LEASED LINE POINT-TO-POINT OPTION)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
NORTH UPPER EGYPT BRANCH	B5	302,504						£E300	£E330		£E2,400	£E2,640					£E2,640
AL-DOKKI POLYCLINIC	B5C1	76,005						£E300	£E330		£E2,400	£E2,640					£E2,640
AHMED URABI CLINIC	B5C2	31,149						£E300	£E330		£E2,400	£E2,640					£E2,640
AL-HARAM POLYCLINIC	B5C3	46,162						£E300	£E330		£E2,400	£E2,640					£E2,640
AL-BAROUDIA CLINIC	B5C4	14,724		88				£E1,500	£E1,650		£E6,960	£E7,656					£E7,656
KIMAN FARESS CLINIC	B5C5	30,924		88				£E1,500	£E1,650		£E6,960	£E7,656					£E7,656
AL-SALAM POLYCLINIC	B5C6	19,370		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
NEW BENI-SUEF CLINIC	B5C7	17,058		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
EL HAWAMEDIA CLINIC	B5C8	15,712						£E300	£E330		£E5,344	£E5,878					£E5,878
EL SAF CLINIC	B5C9	25,209						£E300	£E330		£E5,344	£E5,878					£E5,878
EL-WASTY CLINIC	B5C10	8,373		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
EL-FASHN CLINIC	B5C11	8,415		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
BEBA CLINIC	B5C12	9,403		108				£E1,500	£E1,650		£E7,500	£E8,250					£E8,250
TOTAL		302,504						£E12,300	£E13,530		£E71,708	£E78,879					£E78,879

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HIO PROJECT NETWORK COST
MIDDLE UPPER EGYPT BRANCH (LEASED LINE CASCADE OPTION)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
MIDDLE UPPER EGYPT BRANCH	B6	223,680						£E300	£E330		£E2,400	£E2,640					£E2,640
CENTRAL CLINIC	B6C1	7,804			B6			£E300	£E330		£E2,400	£E2,640					£E2,640
MOGAMAA EL MASLEH CLINIC	B6C2	14,702			C1			£E300	£E330		£E2,400	£E2,640					£E2,640
AL SALAM CLINIC	B6C3	15,392			C2			£E300	£E330		£E2,400	£E2,640					£E2,640
DAIRUT CLINIC	B6C4	15,735		58	B6	58		£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
ABU TIG CLINIC	B6C5	12,037		20	B6	20		£E1,500	£E1,650		£E5,344	£E5,878					£E5,878
SOHAG CLINIC	B6C6	41,207		90	C5	90		£E1,500	£E1,650		£E4,560	£E5,016					£E5,016
WADI EL QUEDID CLINIC	B6C7	13,394		305	B6	305		£E1,500	£E1,650		£E12,360	£E13,596					£E13,596
MABARA EL MINYA POLYCLINIC	B6C8	74,910		110	C9	42		£E1,500	£E1,650		£E3,480	£E3,828					£E3,828
MALLAWI CLINIC	B6C9	16,530		73	C4	21		£E1,500	£E1,650		£E2,944	£E3,238					£E3,238
BENY-MAZAR CLINIC	B6C10	11,969		156	C8	55		£E1,500	£E1,650		£E4,020	£E4,422					£E4,422
MATAI CLINIC	B6C11	4,768		110	C12			£E300	£E330		£E2,400	£E2,640					£E2,640
SAMALUT CLINIC	B6C12	13,461		110	C13			£E300	£E330		£E2,400	£E2,640					£E2,640
DEIR MOWAS CLINIC	B6C13	7,798		110	C14			£E300	£E330		£E2,400	£E2,640					£E2,640
ABU-QURQAS CLINIC	B6C14	11,657		110	C15			£E300	£E330		£E2,400	£E2,640					£E2,640
MAGHAGA CLINIC	B6C15	12,464		110	C16			£E300	£E330		£E2,400	£E2,640					£E2,640
EL-ADWA CLINIC	B6C16	5,496		110	C8			£E300	£E330		£E2,400	£E2,640					£E2,640
TOTAL		279,324						£E13,500	£E14,850		£E63,128.00	£E69,440.80					£E69,441

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HIO PROJECT NETWORK COST
SOUTH UPPER EGYPT BRANCH (LEASED LINE CASCADE OPTION)

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
SOUTH UPPER EGYPT BRANCH	B7	123,986						£E300	£E330		£E2,400	£E2,640					£E2,640
QENA CLINIC	B7C1	13,776		240	C2	55		£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
LUXOR CLINIC	B7C2	19,283		190	C9	14		£E1,500	£E1,650		£E5,344	£E5,878					£E5,878
ASWAN POLYCLINIC	B7C3	13,776			B7	0		£E300	£E330		£E2,400	£E2,640					£E2,640
IDFOU POLYCLINIC	B7C4	13,776		101	C5	60		£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
KOM-OMBOU POLYCLINIC	B7C5	13,776		44	B7	40		£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
EL-WAFA' CLINIC	B7C6	13,382		240	C7	0		£E300	£E330		£E2,400	£E2,640					£E2,640
SIDI ABDEL REHIM CLINIC	B7C7	16,717		240	C1	0		£E300	£E330		£E2,400	£E2,640					£E2,640
ISNA CLINIC	B7C8	13,776		145	C4	52		£E1,500	£E1,650		£E6,420	£E7,062					£E7,062
ARMANT CLINIC	B7C9	5,723		185	C8	40		£E1,500	£E1,650		£E5,880	£E6,468					£E6,468
TOTAL		123,986						£E10,200	£E11,220		£E45,964.00	£E50,560.40					£E50,560

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HIO PROJECT NETWORK COST
BRANCHES TO HEADQUARTERS

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
ALEXANDRIA		1,299,914					£E800		£E880	£E1,180		£E1,298	609		£E9.03	£E213.27	£E1,520
TANTA		372,632	90				£E800	£E900	£E1,870	£E1,108	£E2,160	£E3,595	175		£E2.59	£E61.13	£E3,659
SHUBRA EL KHEIMA		316,874					£E800		£E880	£E1,072		£E1,179	149		£E2.20	£E51.99	£E1,233
CAIRO		880,375					£E800		£E880	£E1,244		£E1,368	413		£E6.11	£E144.44	£E1,519
GIZA		302,504					£E800		£E880	£E1,084		£E1,192	142		£E2.10	£E49.63	£E1,244
ASYUT		223,680	330				£E800	£E900	£E1,870	£E1,108	£E7,560	£E9,535	105		£E1.55	£E36.70	£E9,573
ASWAN		123,986	710				£E800	£E900	£E1,870	£E1,072	£E16,200	£E18,999	58		£E0.86	£E20.34	£E19,020
PORT SAID		119,641	180				£E800	£E900	£E1,870	£E1,036	£E4,320	£E5,892	56		£E0.83	£E19.63	£E5,912
TOTAL							£E6,400	£E3,600	£E11,000	£E8,904	£E30,240	£E43,058	1706		£E25.28	£E597.12	£E43,681

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HIO PROJECT NETWORK COST
SYSTEM TOTAL

NETWORK SITE	SITE CODE	CLINIC BENEFI-CIARIES	SITE TO EGYPTNET DISTANCE	SITE TO BRANCH DISTANCE	CASCADE CONNECTION		INSTALLATION COST			ANNUAL SUBSCRIPTIONS COST			ANNUAL KILOSEGMENTS		ANNUAL TRAFFIC COST		ANNUAL COST
					SECTION LINK TO	SECTION LINK DISTANCE	EGYPTNET	LEASED LINE	TOTAL INSTALL. COST WITH TAXES	EGYPTNET	LEASED LINE	TOTAL SUBSCRIP. COST WITH TAXES	BENEFICIARY MED. RECORDS	DRUG CONTROL	TIME ACCESS COST	PACKET BASE COST	
SYSTEM TOTAL									£E144,540						£E24,343	£E27,665	£E542,626

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