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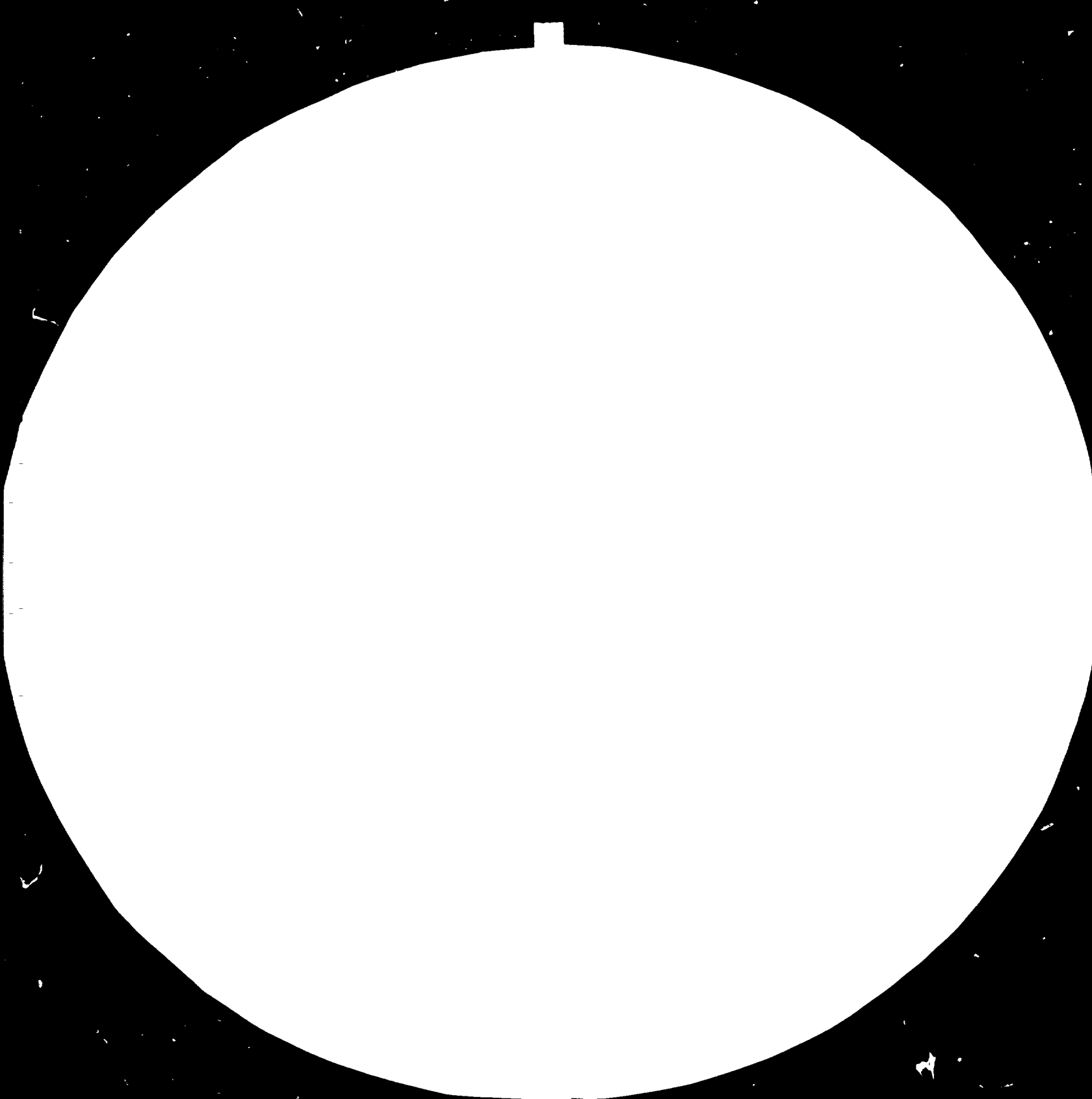
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2.8



3.2



4



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A  
STANDARD REFERENCE MATERIAL 2500  
AUGUST 1963 (REVISED EDITION)

14395

UNITED NATIONS DEVELOPMENT PROGRAMME

DP/RAB/78/021/11-55

**FINAL REPORT**

Kuwait.

Computerized Data Processing System.

Dr. I. Bana - INTM Expert

Kuwait 12. Dec. 1984



received  
from: S. Sazonov  
UNIDO

**MANAGEMENT SUMMARY****A. Main Results**

1. The existing computer system has been put into full operation. One member of AFCEP has been trained on the operation.
2. The required hardware units and software packages have been selected and purchased.
3. Courses on System Development Methodology and Information Retrieval have been developed and delivered.
4. The Statistical Information System has been implemented in part. The structure of the system is clear and the development can be continued.
5. The Preliminary Design of the Library Information System has been completed and the structure of the system is clear.
6. The modem for the establishment of connections to overseas data bases via LOCKHEED DIALOG has been ordered and everything is prepared for joining the service.

7. The Microfilm and microfiche equipment have been installed.

B. Main Problem

Due to time shortage the implementation of of the information systems could not be fully completed.

C. Recommendations

1. There should be either initiated a new joint . UNIDO - AFCFP - AIDO project or AFCFP should try to complete the above mentioned information systems. In latter case. the lack of experienced personnel could be a problem.

The system implementation can be completed even without additional equipment.

2. UNIDO should follow the fate of the VIDEQ equipment which has not arrived to Kuwait

3. The third step of hardware and software purchase should be completed using the money already available through authorization. The purchase order has been issued.

D. Working Conditions and Counterpart Support was excellent through the whole mission.

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## INTRODUCTION

### A. MAIN DUTIES

As per Job Description:

- Assist AFCFP's computer operators in their day-to-day work and conduct on-the-job training in applying the information system developed by the UNIDO expert in computerized information system (Post No. 11-54).
- Install and put into operation the supplementary equipment purchased under the project, and to provide additional training in using the new hard-and soft-ware.
- Complement the established technical classification and computer coding system if and when needs arise to introduce new sources and types of data and documentation. This work needs to be co-ordinated with the functions and systems applied by the Industrial Information Unit of AIM.
- Assist the librarian of AFCFP in maintaining consistency of the data storage system in particular in connection with the constantly expanding statistical and publication services rendered by AFCFP.
- Compile a set of pertinent manuals for AFCFP's staff of the Information and Documentation Unit.



- Prepare a technical report comprising descriptions of direct advice given to AFCFP, descriptions of supplementary classification and coding introduced, and recommendations on further development/improvements of the Unit.

The Job Description emphasizes the training activity as a primary function of my mission. After having studied the given circumstances at AFCFP I have put the emphasis on the development of the data processing system itself, because there was nothing like a computerized data processing system here. This, however, does not mean the omission of training activities.

#### B. REPORT STRUCTURE

In order of better understanding among all participants, I have developed a Project Plan / Appendix 1./ which has been discussed by the AFCFP management and staff members and agreed to be a good project control facility. The Project Plan includes the main activities which had to be performed, therefore it seemed to be a useful guideline by structuring this report. As a consequence the chapters of this report are numbered according to the Activity Numbers of the Project Plan. The numbering of the Appendices is adjusted to that of the chapters they are belonging to. There are some chapters having no appendices therefore the corresponding numbers do not appear in their sequence.

## 1. ENVIRONMENT STUDY

I arrived in Kuwait on the 23rd of May. 1984-Wednesday. Thursday and Friday were off at AFCEP. so the discussions with the mangement and with Mr. Ciochina. the expert preceeding me in this project. started on the 26th.

Final reports of other UNIDO experts (Mr. T. M. Alexander/May 1981 and Mr. H. G. Koerner/June 1981) also helped to understand the goals of the project.

Parallel to this discussion and studies. I tried to perform different tests on the existing microcoputer system which was out of use at all. It had to be cleaned because there was sand in the floppy disc drive (!) scratching the diskette surfaces and ruining them. Some hardware problems with the printer had also to be fixed.

Within about 15 workdays I could set the computer into normal operation connecting my trials with the development of the material of the training course I was going to deliver.

On the 14th of June I received a copy of Mr. Ciochina's Final Report (it will be referenced as Report) in draft. Having studied the Report we discussed with Dr. M. Abu-Khader. Secretary General the following main points:

- a/ Decision about the hardware/software purchase
- b/ Training activities
- c/ Project Plan

ad a/ The Report lists hardware units of five different computer companies and software packages along with their approximate prices, delivery time, payment conditions and warranty periods. It also provides some remarks concerning compatibility with the existing computer system. It does not however make any decision.

Thus, I was asked by Dr. Abu-Khader to select the most favourable solution.

ad b/ We could agree that the training activity had to start with two courses:

- Introduction to System Development (30 hours).
- Introduction to Information Retrieval (20 hours).

The first one was supposed to prepare the staff for our common work during the development period of the new data processing system.

The reason for the second course was to let the staff have a comprehensive idea about Information Retrieval Systems they are supposed to use in connection with the Library System and by searching overseas database via LOCFEED/DIALOG.

ad c/ We also agreed in setting up a Project Plan that reflects the logical structure and time requirements of the activities to be performed.

## 2. COURSE DEVELOPMENT & LECTURING

This activity refers to the two courses mentioned above. The written manual of both courses are developed, edited and printed by using AFCEP's Word Processor (on the microcomputer system existing at that time). This course development activity was also connected with the training of one of the staff members on the usage of the Word Processor.

The first course was about systems development, and the written manual has been developed in a way allowing to use is not only as a course material, but as a reference manual for later work as well. The course itself was delivered during July.

The development of the second course was done throughout a long period, overlapped with other activities and was delivered during the last week of my mission. The reason for this can be easily understood by looking at those numerous difficulties I had to face in connection with other activities also explained in this report.

Copies of the written manuals of the courses can be found in Appendix 2

### 3. PRELIMINARY DESIGN

This phase of Systems Development is independent of any hardware and software (for details see Introduction to Systems Development Chapter 11. Appendix 2.). Therefore, I could start with this activity before the purchase of the new computer.

The output requirements /reports/ of the statistics and the library have been re-examined, improved and additional reports supplemented. Based on the set of reports, the data requirements have been discussed with the statistician and the librarian at AFCFP resulting to Preliminary Data Models.

The data models were developed with active participation of the whole AFCFP staff. They were able to contribute because of two important points:

- The staff had been trained for this during the first course;
- A special method, called wall-diagram method, was used (see Photographs which allows the discussion and easy, quick change of the model for a lot of participants.

The Preliminary Design phase included not only the development of the Data Models, but a comprehensive test of them as well. This test, Called Functional Analysis, helped to check the Data Models if they are capable to serve all the user needs. As a result of the analysis, the models were changed in several steps.

The documentation of the Preliminary Design phase can be found in Appendix 3.

#### 4. REVISION OF THE HARDWARE/SOFTWARE REQUIREMENTS

As I mentioned above (Ch. 1. Par. a/ ). I was expected to select the most appropriate hardware and software.

Considering the compatibility problems more or less present by all companies' products except ISC. I preferred to purchase ISC-hardware.

On the other hand, ready-made software packages seemed to be of vital importance because they can usually be applied even without special programming skills. /There are no skilled programmers at AFCFP neither can be employed any in the near future./

For the sake of easier decision I developed a table comparing four different versions of software and programming /Appendix 4-1./. The common hardware requirements were listed on a separate sheet.

At first, Version IV seemed to be the best one inspite of its high costs because the Report emphasized the importance of bilingual software especially for the Library System. Based on information sources available I could not find dedicated library software /Information Retrieval System/ satisfying this requirement. SUPERFILE recommended by Mr. Ciocchina does not match this requirement either and is incompatible with ISC-computers. MDRS-III is the only data base management system for micros being programmable by standard high level languages and this way it could have been made bilingual. This solution would however have needed skilled programmers with high level Arabic knowledge/ see "Programming by contract" in Appendix 4-1.

The decision was telexed to Vienna and it turned out that manpower costs cannot be covered from the budget. Then, rediscussing the question with Dr. Abu-Khader, I changed the decision in favour of Version II because ARCEP did not insist on bilingual software for the Library. dBASE II has an information retrieval feature but its report generator is pure consequently it is not suitable for generating reports of statistics. FMS-80, however, has a sophisticated report generation facility (lacking information retrieval feature). this was the reason for combination.

During the process of software selection it became clear that a precise written specification had to be developed and sent to the vendor by asking for quotation (Appendix 4-2).

A copy of the official quotation along with a schema referencing the most important items of the quotation is attached (Appendix 4-3). The whole offer contains about 80 pages justifying the items.

In the meantime I visited competitive companies Olivetti and Burroughs for more information (I did not have time for visiting other companies also in the Report). The quotations sent by these companies on Mr. Ciocchina's request are namely not directly comparable because there wasn't given one common specification to the competitors.

My investigations resulted in a telex sent to UNIDO-Vienna on the 7th of July (Appendix 4-4) listing all the required HW/SW units along with their prices and asking for authorization. During the authorization process my contact points in Vienna changed. Mr. May and Mr. Panfil left the Chemical Industries Branch, and the process itself became a little longer than expected.

This, however, did not affect my work too much because I could proceed with the Preliminary Design in the meantime (Activity 3 and 4 were parallel).

After having finished with the Preliminary design, I went to AIDO, Baghdad in order to adjust the statistical information system to AIDO's requirements. During my stay there the AlKhalidiyat Trading co. which represents ISC in Kuwait practically closed its computer department and I had to choose another supplier. I decided to purchase a COLUMBIA computer system, fully IBM compatible (reasons for this are explained in chapter 9 of this report). The software, already purchased for the ISC computer could not be used on COLUMBIA, but the Marefie Sons Co., representing COLUMBIA, in Kuwait, offered the bilingual version of dBASE II. At that time, I had already experiences with dBASE II (English only) on the old ISC Micro computer and my impression were really good, it was, therefore, reasonable to take dBASE II (bilingual) again. However, after having studied the biligual version, it turned out that by making the software bilingual they sacrificed numrous useful facilities of the original software. On the other hand, this was the time of announcement of rBASE III (English only) which is the successor of dBASE II with even more advanced features and lower price than the bilingual dBASE II. So I decided to modify the purchase and to take dBASE III. I had the Secretary General's full agreement.

The whole process described here is documented in Appendix 5.



## 5. SOFTWARE ORDER

The SW order has been made in three different steps.

1. SW for the ISC computer hardware. Originally two different SW packages were ordered.
  - DRASE II and
  - FMS 80.(see Appendix 5-1).

This purchase was modified omitting FMS 80. (see Appendix 5-2).

2. SW for the COLUMBIA computer purchased at the time of hardware purchased.
  - dBASE II (bilingual)
  - Sysgen "IMAGE" for backing up the content of the 12 Mb hard disk to tape
  - MS-DOS, PC-DOS and CP/M-86 operating system (N/C)
  - BASICA interpreter of BASIC - language with graphics extension (N/C).
  - MACRO Assembler for the machine level language (N/C).
  - Asynchronous communication support.
  - PERFECT WRITER, the professional word processor of COLUMBIA (N/C).
  - PERFECT FILER, a simple file manager (N/C).
  - PERFECT CALC, an electronic spreadsheet for calculations performed on big tables (matrices) (N/C).
  - FAST GRAPHS, a color graphics report generator for the production of different statistical graphs (N/C).
  - Diagnostics, a troubleshooting package (N/C).
  - Lessons on diskette about the COLUMBIA MPC and the different SW packages.

A copy of the purchase order is attached as Appendix 5-3.

This order was modified replacing dBASE II (bilingual) by dBASE III (English only) as shown on Appendix 5-4. Reasons for replacement are described in chapter 4. of this report.

3. Post-adjustment software for COLUMBIA :

- Systemate utility program making the whole operating system menu driven. This helps even those users without any knowledge about the operating system.
- Sidekick Program consisting of several different minor functions like calculator, calendar, automatic phone dialing etc... .

A copy of the purchase order of these latter two packages is presented on Appendix 5-5.

It is the SW what makes a computer system really powerful therefore I tried to collect the best packages available at the time being.

## **6. SOFTWARE DELIVERY**

The delivery of Software has been done in three steps according to the steps of the purchase orders:

1. dBASE II. for ISC
2. SW for COLUMBIA together with HW
3. Post adjustment SW for COLUMBIA

(there is no Appendix for this chapter)

## **7. SOFTWARE STUDY**

This study was performed according to the steps of software purchased as described in chapter 5. and 6. of this report.

All the software purchased is very well documented. the only problem was the extent of the documentation which had to be studied (over 1000 pages). As a consequence, the time originally allocated to this activity turned out to be seriously underestimated. For details see Appendix 1.

( There is no Appendix for this chapter).

## 8. SYSTEM DESIGN

As emphasized in chapter 3. of this report. the Preliminary Design phase was strictly hardware/software independent. the main role of the System Design phase was to take in account the characteristics of the available computer (COLUMBIA) and to specify the details needed by the next system development activity. the Programming.

The tasks performed were the following:

1. Definition of the data base structure.
2. Definition of the coding systems (codes for identifications and/or abbreviation).
3. Definition of the data base file structure.
4. Development of input forms.

The System Design documentation is presented in Appendix 8-1.

Because of the shortage on time. no detailed program specification was developed. Instead. I used the documentation of the functional analysis (Preliminary Design) as a firm aid by programming.

The development of the coding systems had to be coordinated with the information system development efforts of the Arab Industrial Development Organization (AIDO) located in Baghdad. Therefore. I spent one week in Baghdad between the 10<sup>th</sup> and 17 of September. The agreements achieved have been put down in a memo (Appendix 8-2).

## 9. HARDWARE ORDER

Logically, the hardware order followed the revision of the hardware and software requirements as described in chapter 4. of this report and was performed parallel to the software order.

The authorization for hardware purchase arrived later than expected therefore I was not able to manage the purchase of an ISC computer system according to the original plans (see reasons for change in chapter 4 of this report).

At the time I had to choose another supplier, the following points were the most important factors:

- a. shortest possible delivery time
- b. fulfillment of user requirements
- c. strong and stable dealer company
- d. reasonable price
- e. ISC compatibility if possible.

In order to find a satisfactory solution, I resumed discussions with companies selling those computers investigated by Mr. Ciocina, the INTM expert having preceeded me in this project and I visited some other companies too (Canon, Hewlett Packard, Columbia).

As a result, it turned out that there was no company being able to satisfy all the requirements listed above, the requirements for ISC compatibility has to be omitted. This meant in other words that the old and the new system could

not be directly connected and the old computer is to be used as a word processor only. but at least it is bilingual. On the other hand however. I got more freedom this way. and the more advanced 16 bit micros could be taken in account by the selection (the old system has an 8 bit microprocessor).

There was only one company among all which offered delivery ex stock. Marafie Sons Co., representing COLUMBIA (U.S). This company is really strong on the market. they are the agent of the COLUMBIA for the whole Gulf Region and sell in big quantities. therefore. they could offer a very reasonable price. Besides this. their computer is 100 % IBM PC compatible which is a great advantage. This way AFCFP has immediate access to all the software running on IBM and compatible systems.

COLUMBIA has a 16 bit processor insuring the most advanced technical level for years. Having this processor. file size of the main memory of the computer is 512 kilobyte. 8 times the size of the memory of an 8 bit computer.

dBASE II, the 8 bit version of which we already had on the old system. was also available on COLUMBIA thus I did not loose time by studying some other data management software.

Concerning all these points and having discussed the case with the Secretary General. I decided to purchase COLUMBIA.\*

At the time of this purchase. the exact requirements concerning the Modem (the hardware unit required for the access of overseas databases) were not

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\* The purchase was modified as explained in chapter 5 of this report.

known. A letter to LOCKHEED DIALOG Services was sent by Mr. ciochina in June. Since there was no answer. I tried to call them by phone but I could not succeed. Then I sent my first telex to them on the 26th of August but again. there was no answer. Even I asked UNIDO's help for finding this company and repeated my telex inquiry to LOCKHEED four times. Finally. they answered by telex on the 11th of October (!) telling that the required informations had been mailed to us. Nothing arrived till the 3rd of November. Then I sent them a telex again. which was not really friendly. Next day the information arrived by mail.

Copies of all the correspondence can be found in Appendix 9-6 and 9-7.

Before ordering a modem. I had to discuss the case with the authorities of the Ministry of Communication of Kuwait. Then I asked Marafie Sons for a new quotation including the Modem (Appendix 9-7) and some software items. in order to make the system complete and to use the money saved by the modification of the first purchase from Marafie.

The quotation included some more items. the reasons for which can be found in my telexes sent to Vienna proposing additional purchases (Appendix 9-8).

The actual purchase order issued by us utilizes only the money saved (Appendix 9-9).

## **10. HARDWARE DELIVERY**

Marafie Sons Co. delivered the system ordered on the 24 of October along with the complete documentation (about 2000 pages!). (see their invoices in Appendix 10).

I have an oral promise for the delivery of the modem during my stay in Kuwait.

## **11. HARDWARE INSTALLATION**

The installation was quite smooth. Some minor problems arose but after one week already everything runs well.

There is a picture among the photographs showing the system as it was installed.



## 12. PROGRAMMING & MANUAL

### WORK DEFINITION

This activity needs the presence of the computer itself because otherwise the programming as impossible. On the other hand, the design of manual activities, to be performed by the users, mainly depends on the compromises made during programming. The computer arrived on the 24th of October and needed about one week of installation as described in chapter 10 and 11 of this report.

Some additional delay was introduced by studying the documentation which was around 2000 pages.

First the general program design was done and then some of the programs were coded and tested. During the system development process it turned out that around 100 programs had to be written provided that the information systems be completely menu-driven and user friendly, without any need of programming knowledge.

Concerning the high number of the programs and the time available, it was impossible to complete the task according to my plans. Therefore, I concentrated to the main program structure, the menu programs and some demonstration of the systems operation. At the same time I tried to pass as much knowledge as possible to the person assigned by AFCEP to the Information Unit.

The documentation of the work done is collected in Appendix 12.

### 13. SYSTEM IMPLEMENTATION

The information systems of Statistics and Library have been implemented in part. A complete implementation was impossible because:

- I could not complete the programming
- AFCCP was not able to provide all the data to be loaded.

The reason for both points above is the shortage of time.

The Statistical Data Base has been defined and programmed. The structure of the whole data base is stored on hard disk and can be manipulated. All the data base files except two are loaded with actual data. The main menu and the second level menu programs are implemented and working. The conversation program of the statistical report is working. The program producing the report about raw material resources is also working.

The Library Data Base has been defined and programmed. The structure of the whole data base is stored on hard disk and can be manipulated.

This is the level I could reach.

Copies of the data sheets used for the initial load of data are presented in Appendix 13.

**14. ACTIVITIES RELATED TO MICROFILM,  
MICROFICHE AND VIDEO EQUIPMENT**

This equipment was ordered by UNIDO according to Mr. Ciohina's suggestions. The purchase was made directly from Vienna. I have got copies of the purchase orders on the 29th of September. The Microfilm and Microfiche equipment arrived in Kuwait about one month later but it could not be released from the customs office for a long time because of the lack of proper Certificate of Origin. I had to communicate about the case by phone several times. No other activities were required from my side.

Finally the equipment was delivered to AFCFP on the 28th of November but one lens has to be replaced and a glass plate is missing. The case is managed by AFCFP personnel.

The Video equipment did not arrive during my mission and I could not get information about its fate.

### List of Appendices

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