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Final Report
on the Study of Computer
Requirements for the
Regional Government of Madeira,
Republic of Portugal

This study was completed under
the auspices of the
Agency for International Development
of the United States Government

by
Dynamic Data Processing, Inc.

29 October 1979

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Information and Data-Bank Survey

Madeira

Contract No. AID/NE-C-1648



Dynamic Data Processing, Inc.

October 29, 1979

Mr. James T. McMahon
Director, Office of Data
Management
Agency for International
Development
1875 Connecticut Avenue, N.W.
Washington, D.C.

Dear Mr. McMahon:

Dynamic Data Processing, Inc. takes pleasure presenting the final report on our study of computer needs on the island of Madeira. We hope that this report will be of benefit to both the United States Government, as represented by the Agency for International Development, and the Regional Government of Madeira.

If any question arises concerning any part of this report feel free to contact us at anytime.

Yours truly,

Robert Thompson
Director of Systems & Programming
Project Leader

Vincent J. Mooney, Jr.
Senior Marketing Representative
Senior Consultant

Acknowledgments

The team from Dynamic Data Processing, Inc. would like to take this opportunity to express its gratitude to all of the kind people of Madeira who made our stay such a pleasant one. We are indebted especially to those people listed below without whose assistance we would never have been able to accomplish our assignment. As in all such cases it is possible that we may have overlooked someone. If we have we ask his forgiveness.

Dr. José António Camacho
Dr. Jorge Maurício Pinto Correia
Eng. Ernesto Luís Jardim
Eng. João José de Oliveira Mendes
Sr. Luís de França Brazão
Eng. Leandro Câmara
Dr. Gomes Oliveira
Eng. Teixeira de Sousa
Dr. Maria Martins Góis Ferreira
Dr. Maria Carlota Carvalho Santos
Dr. Rui Adriano
Eng. Fernando Oliveira
Dr. José Jorge Gomes
Sr. Araújo Adelino
Sr. Jorge Freitas
Dr. Rui Humberto Gordon Camacho Ramos
Sr. Fernanda Maria Rodrigues Ferreira
Sr. Maria Teresa Dos Passos
Sr. Agda Marlene Figueira
Sr. José Antonio Paixão

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I. INTRODUCTION

A. Assumptions

The mission to investigate the feasibility of the acquisition of a computer for the Regional Government of Madeira (RGM) was undertaken with certain assumptions in mind. The assumptions were predicated on the information derived from two sources: The first source was the scope of work (see attachment 1) included in the contract between the Agency for International Development and Dynamic Data Processing, Inc. (DDP). The second source of information was a letter (see Attachment 2) from (RGM) in response to some questions posed by DDP to that government.

The major assumptions were:

1. There was one computer in Madeira, a UNIVAC 90/25;
2. The UNIVAC 90/25 belonged to the local electric company (Empresa de Electricidade da Madeira (EEM)) and was for its exclusive use;
3. There was one minicomputer on Madeira, an ISE - 80. This computer was assembled in Germany from Texas Instrument Co. components;
4. There was only one experienced programmer in Madeira;
5. There were two maintenance technicians fro the 90/25 in Madeira; and
6. There was no experienced computer management in Madeira

B. Actual Conditions

Upon the arrival of the DDP analysts on the island of Madeira, a situation considerably different was encountered. The actual situation regarding the points described above is as follows:

1. There is in fact a UNIVAC 90/25 computer in Madeira;
2. The UNIVAC 90/25 had originally been purchased for the exclusive use of the electric company but was now designated as the computer for all governmental agencies. The electric company (EEM), it must be noted, is an entirely government-owned corporation. The computer, while physically present on Madeira, will not be actually installed until sometime at the beginning of October;
3. In place of one ISE 80 computer there are in fact two ISE 80 computers installed in government offices: One in operation and one being programmed at this time. In addition, a third ISE 80 is about to be ordered. All of the ISE 80 computers are being used by various agencies in the health sector, but only for administrative applications, not for health applications. There are also other mini-computers installed in private companies in Madeira;
4. There is in fact one experienced computer programmer resident in Madeira. There are other programmers in Madeira on a temporary basis for work related to the installation of an ISE 80. There are, at present,

two programmers in training in Lisbon. It is questionable how soon these people will begin to be effective;

5. There are two maintenance technicians employed by the EEM for the UNIVAC 90/25. They each have received six months of training by UNIVAC in Lisbon;
6. The assumption that there were no experienced EDP managerial or supervisory personnel in Madeira was, unfortunately, an accurate assumption. The managerial personnel charged with responsibility for the computer have no experience in the field. In addition to the above conditions relating to computers in Madeira, it should be noted in passing that the Portuguese Airline, Transports Aereos Portugueses (TAP), has an online linkage to Lisbon for reservations.

It can be seen that things as they are, are not what were expected. In the scope of work and in the instructions during the briefings prior to entering Madeira, the DDP personnel were advised to avoid engaging in discussions relating to any specific hardware. In view of existing conditions avoiding hardware discussions was clearly impossible. This was reported in a letter to AID, Washington as soon as the facts became clear (see Attachment 3)

II. APPROACH TO STUDY

In making any system study the primary requirement is to determine the desired results the study is expected to produce. In the case of the study performed by the team from Dynamic Data Processing, Inc., it was initially intended to determine the feasibility of taking further action toward the automation of data processing by the RGM. Since the acquisition of a computer was already a fait accompli, the study requirement changed. The requirement became one to determine the most effective use of the computer on hand if, indeed, the computer were satisfactory at all.

After establishment of the goals, the next step would be to determine the means available to achieve the goals. This step required an immediate consultation with those responsible for the acquisition and installation of the UNIVAC 90/25.

On Monday the 10th of September a preliminary meeting was held at EEM. Present at the meeting were Dr. Jorge Maurício Pinto Correia, representing Dr. José António Camacho, the Regional Secretary of Planning and Financas, Eng. Ernesto Luis Jardim, Eng. João José de Oliveira Mendes, Manager for EDP for EEM, Mr. Robert Thompson, Project Leader for DDP, Mr. Vincent Mooney, Senior EDP Consultant for DDP.

The meeting consisted of a discussion establishing the fact that the UNIVAC 90/25 is the computer for all Government operations on Madeira. The discussion also outlined the general applications for which the computer will be used.

At the end of the discussion, DDP presented a tentative schedule, which had been proposed before leaving the United States, to the personnel present. (see Attachment 4). The schedule was accepted without change.

The schedule called for a two phased approach. The first phase consisted of fact gathering. The second phase consisted of analysis and assimilation of the data, including the preparation of a report.

The first phase was divided into three parts:

- A. A meeting with the department head of each department to be studied.
- B. A general tour of all departments to be included in the study as time permitted.
- C. From a half a day to one day of more detailed study of each department as time permitted.

In a general sense this plan was adhered to with changes dictated by the availability of personnel and time.

In all inquiries and studies the DDP personnel were accompanied by Dr. Correia and Eng. Mendes who provided liason and administrative assistance as needed.

The second phase was divided into two parts:

- A. The analysis and assimilation of data.
- B. Report preparation.

Part A included a great deal of discussion with RGM interface personnel. Part B was primarily executed by the DDP personnel

III. DEPARTMENTAL STUDIES

A. During the studies of individual departments and agencies, certain observations were noted which apply across the board and will be described at this time to avoid unnecessary repetition.

Only those areas at variance with the general observations will be described individually in detail.

1. All accounting operations were organized down to the most minute detail. This is a result of the fact that the accounting systems used in all of Portugal for government operations and for government-owned corporations are spelled out in detail by very specific laws. This leaves little latitude for variations in approaches to accounting.
2. Tight control is maintained by supervisory personnel of all functions at all levels. There was no question as to who ran the departments.
3. The personnel involved were highly disciplined and meticulous in their work.
4. The manual systems used were replete with repetition and redundancies.

B. In making these studies of the various departments and agencies it became apparent also that the desire to computerize certain applications was common to all. The areas of commonality were: Payroll (all monthly), Generalized Accounting (including General Ledger), and Inventory.

C. The following activities were studied:

1. Empresa de Electricidade da Madeira (EEM). This company is entirely government-owned and controlled. The employees, however, are not government employees. The operation is similar in nature to AMTRAK in the United States. The operations to be computerized would be:

- a. Payroll; this application will be discussed in the chapter on software packages, but this is the first application to be computerized in Madeira.
- b. Accounting; this operation generates about 2000 transactions per month. There are 4 major files in the manual system: a general accounts file; an internal accounts file; an inventory accounts file; a general ledger file.
- c. Inventory; this function generates three or four hundred transactions a week. The major files are: the Stock Control File; the Vendor File. With automation the Inventory Accounts File of the Accounting Department should be combined with the Stock Control File.
- d. Billing; this operation handles manually 55,000 bills a month. This is a large operation. There is no way to determine the accuracy of the bills now being issued.

- e. The computerization of the control of power generation is definitely a possible application.

The EEM has four hydroelectric generating stations. The other electricity generating station is Diesel powered, and a new Diesel powered station is under construction. The hydroelectric stations produce about 40% of the annual production. The percentage varies seasonally, with water providing the source of generation for 10% of the monthly electricity during the summer season (4 months) and rising to 60% during heavy rain in winter. The four hydroelectric stations of Medeira and their dam capacities are:

- | | |
|----------------------|------------------------|
| 1. Serra da Agua | 1,500 m3 dam capacity |
| 2. Calheta | 14,500 m3 dam capacity |
| 3. Ribeira da Janela | 14,000 m3 dam capacity |
| 4. Faja da Nogueira | 12,000 m3 dam capacity |

The dam capacity at Serra da Agua will be 14,000 m3 starting about September 1980. The increase results from a tunnel which has been dug through the mountain next to the existing dam. This tunnel as yet must be lined with concrete to prevent seepage. The water from Serra da Agua dam falls 650 meters through a pipe 1,600 meters long and about 90 cm in diameter. When the Serra da Agua enlargement

is completed, it will be approximately the equal of each of the other 3 hydroelectric stations.

Typical electricity power requirements for Serra da Agua over a 24 hour period are as follows:

Summer Months	Winter Months
7 am - 7 pm 1,2MW	7 am - 7 pm 3MW
7 pm -10 pm 4,8MW	7 pm -10 pm 4'8MW
10 pm - 7 am 0,8MW	10 pm - 7 am 1,2MW

There are two turbines at Serra da Agua.

During the 12 hour summer day, only one is used, running at half-speed for 1.2 megawatts (MW).

During the peak evening period, both are run to full capacity for a total of 4.8MW. The same general pattern, allowing for dam capacity, occurs at the three other hydroelectric plants.

During the winter at Serra da Agua, the input water stored in the dam may easily overflow.

The amount lost is not known precisely - the canal to the dam also overflows at times, but the EEM engineers are confident that the 14,000 m3 dam under construction is justified. It may become advantageous to add a third generator to the Serra da Agua plant after the new dam is completed.

The EEM wishes to make maximum use of the hydroelectric generating potential and minimal use of the diesel plants. At present, each hydroelectric plant produces a fixed wattage in a given hour, although the amount may vary from one hour to another. Since in any given hour, the actual demand varies from minute to minute, the variance is provided by the diesel plants. This situation should be reversed to provide the most economical cost of fuel (water is free, petroleum expensive).

The following series of questions represents preliminary data required so that on a minute-by-minute basis, the maximum use of hydroelectric power can be obtained.

1. How much water is retained by each dam?
2. At what rate is water increasing/decreasing at each dam?
3. How much water is accumulating behind the dam?
4. How much water is flowing from the dam through the conduit to the power station?
5. What is the anticipated flow of water through the canals into each dam? For example, it may have rained for two hours in the mountains which supply the canals for Ribeira da Janela but not for Faja da Nogueira. Clearly, it would be wiser, all else being equal, to generate more power from Ribeira da Janela's station than from Faja da Nogueira's station.

6. How much electricity is currently being demanded? And is this demand rising or falling?
 7. How much water must be stored for next peak period?
 8. Is the power station at capacity? Should another hydroelectric generator be started?
 9. What is the water level relative abundance at the stations - i.e.; how to select one station as the best to use for increasing demands.
 10. What sort of sensor measurement devices are needed? How accurate and reliable should these devices be? Observe that the sensors required for questions (3) and (4) will serve to answer question (2).
2. The Regional Department of Planning and Finances. The person contacted here was Mr. Luis de França Brazão. This office would be the Central Accounting Office for the Regional Government of Madeira in the event of consolidation. This office maintains the general ledger to which all other departmental ledgers are subsidiary. The major files maintained by this operation are the general ledger file, and a budget account file. As a result of various listings and breakdowns of personnel and accounts, several levels of summary files are maintained manually which would be eliminated as manual files under an automated system. They would be created automatically by each run.

3. The Regional Department of Education and Culture.
- Two operations were studied under this department.
- a. The department itself, which was represented by Dr. Gomes Oliveira, was visited. Dr. Oliveira explained that the application which required the most assistance from the computer was the assignment of teachers to schools. This would involve some 3000 teachers. It has proven more and more difficult to find teachers. It has proven more and more difficult to find teachers willing to accept assignments outside of the city of Funchal. This is particularly true of the secondary school teachers. While the computer would not be able to alter the wishes of the teachers where assignments are concerned, at least it could aid in making more equitable assignments to the seventeen secondary schools of Madeira.
 - b. The Francisco Franco Secondary School (a vocational/industrial high school) represented by its principal Engr. Caldas and Engr. Teixeira de Sousa. Engr. de Sousa described his major problem. The school was designed to serve about 1800 students. Its present enrollment is approaching 7,000. It is necessary to run 3 sessions starting at eight in the morning and continuing until midnight. Clearly, space is at a premium. Since scheduling is so difficult, it will often happen that two classes are scheduled for the same room. In that

case it becomes necessary for the student to wander around looking for an empty room in which to hold the class. Any assistance from the computer in reducing this problem to manageable proportions would obviously be appreciated. Another problem related to the overcrowded conditions concerns teacher schedules. It is prohibited by law for any teacher to teach in all three sessions on any one day. The computer may be an aid in reducing this problem also.

4. The Regional Department of Labor. Two separate operations of this department were studied.
 - a. The office of the Regional Director of Labor under Dr. Augusto Marques was visited. In addition to the usual payroll and accounting applications, Dr. Marques expressed the desire to establish a data base for statistical analysis. He also had questions about programming for such statistics. Dr. Marques was informed of the availability of such packages as BMDP and SPSS which already exist. This information was well received.
 - b. The Regional Director of Employment and Professional Training felt a need for computer assistance in controlling payment of unemployment compensation and workmen's compensation. He was also interested in the possibilities of job placement by means of the computer. In this case, the volume involved, perhaps 200 people a month for placement, does not

justify special programming. However, if existing packages could be employed at little expense, job placement might be a possible application.

5. The Regional Department of Social Welfare. Three operations of this department were examined.
 - a. The Regional Center of Public Health under the direction of Sr Maria Martins Gois Ferreira did not fall into the usual pattern of the other operations visited; the reason being that this agency already has a minicomputer which is being programmed now for operations. The minicomputer is an ISE 80. The problem is that this computer is being programmed for payroll, thus duplicating the efforts of UNIVAC 90/25 application. No purely health-related application such as hospital billing, patient assignment, etc, is being planned at this time.
 - b. The Regional Center of Social Security under Dr. Rui Adriano also has an ISE 80 minicomputer which is also programmed for payroll. This compounds the redundancy of applications applied to the UNIVAC 90/25.
 - c. The Clinic Center under Dr. Maria Carlota Carvalho Santos was also visited. This operation deals mostly with outpatients and Dr. Santos was interested in the possibility of maintaining patient records by means of the computer. This could be as many as 20,000 records at any given time.

6. The Regional Department of Agriculture and Fishing.
Time only permitted a visit to one operation of this department.

The hydrological section is directed by Engr. Leandro Câmara. This section is charged with the responsibility of the distribution of irrigation water. Almost all farming in Madeira uses water collected during the rainy season for irrigation. As much as possible, rain must be stored during the winter or wet season, and used during the dry season. Rain occurs in quantity during the winter months, mostly on the northern part of the island and must be channelled to the southern part of the island.

The water is distributed by means of a network of channels covering the entire island. The users are assigned certain hours and days during which they are allowed to open the irrigation gates for their own property. Theoretically the gate openings are controlled down to the minute.

The administration and control of this operation gives rise to an elaborate manual system requiring forty clerks to operate. Even the staff of forty cannot keep up with the work and is six months behind schedule in operations. Clearly, Engr. Câmara would like to see the computer used to reduce the work load for his section.

7. The Department of Public Works. In the case of this department an interview with the person in charge, Engr. Fernando Oliveira, encountered the following possible applications. Peak load determination for household water distribution could be improved. Billing for water could easily be automated. Equipment maintenance records could be maintained automatically, if a suitable package could be found. Programming for this would not be cost-effective.

The main concern for Engr. Oliveira is budgeting for public works. With inflation in mind it has become more difficult to project costs for any given type of work. Engr. Oliveira has hopes that the computer might help improve the situation.

8. The Municipal Government of Funchal. The municipal government is in fact almost a mirror image of Regional Department of Planning and Finances. The same functions are performed with minor variations. Therefore, the remarks included in Section B of this chapter apply here.

IV. COMPUTER CENTER HARDWARE

This section discusses the hardware used by the Regional Government of Madeira and the electric company. In one attachment, (see Attachment 6) a discussion of the hardware acquisition process, including the RFP and the UNIVAC response, is given. A large number of comments and suggestions are made so that when RGM/EEM again contract for computer hardware, the process will be improved. A second attachment (see Attachment 7) provides technical details of the UNIVAC 90/25, including configuration diagrams, and briefly discusses the UDS 2000 and the ISE System 80.

The UNIVAC 90/25 is the smallest series 90 computer offered by UNIVAC. As delivered to Madeira, the 90/25 has two disk spindles, 64K bytes of memory of which 24K bytes are reserved for system supervisor use, leaving 40K for application programs, and a diskette reader. There are no magnetic tape drives and no card readers or card punches. All input is through the diskettes which are keyed with the UDS 2000 diskette reader/writer system. There are 3 UDS 2000 machines installed and operating in the electric company facilities.

The DDP team is convinced that the current 90/25 is too small for most applications studied. An upgrade to a large system suitable for most applications will cost about 8,000,000 escudos (\$200,000), a price more than what existing configuration cost. The system is now deficient in main memory core, disk space, tape and card use. These areas will be separately dealt with.

First, the 40K of main memory is too small to run any UNIVAC application software package which the DDP team examined. The payroll system purchased by EEM is being modified so that it will run in the 40K memory available. Applications can indeed be run in the available memory, but the simultaneous execution of two programs will be very difficult to do. The cost of increasing the core to 131K is approximately 1,500,000 escudos (\$30,000) and must be considered when the use of software packages is evaluated.

Consequently, the use of free UNIVAC application packages for payroll or general ledger applications is not really free. It is the feeling of the DDP team that the increase in core is a choice that must be seriously faced. Since the use of packages saves development time and reduces the number of programmers and system analysts needed by the data center, the cost of the addition main memory core can be viewed as a trade for more rapid development of applications.

Second, the two disk spindles hold 28MB apiece. This yields slightly less than 60MB total and only two spindles are allowed on the 90/25. According to the UNIVAC representatives in Maderia on Oct 1 and 2, this limit is a marketing decision only. The CPU can easily support additional drives, and UNIVAC's own 90/25 in Lisbon does so, but customers must upgrade to a 90/30 to have more than two spindles. Some of the systems examined by DDP require several million bytes and our worry is that the available disk space will quickly run out. Such disk usage as sorting and temporary files may be difficult if not impossible to manage.

While disks with a larger capacity can be obtained the problem of two spindles remains. Even if more core is added to the CPU, the lack of spindles will force serial processing. It is doubtful that a mix of data sets on disk packs will be feasible, requiring constant disk mounting and dismounting. It is, therefore, the judgement of the DDP team that additional spindles must be obtained.

Third, there are no magnetic tape drives. Magnetic tape could relieve the pressure of disk space, could hold the major file systems, and serve as a backup media for full disk and system dumps. The DDP team examined several systems where the main files are well suited for tape storage (e.g., the electric billing system, the payroll system, and the water distribution system).

No data center should run without a daily backup procedure, preferably using tape as the storage media. A regular dump of entire disk packs onto magnetic tape is a "must" for data center management. Also, using tapes as exchange media allows the sending and receiving of data to/from Lisbon or other data centers. Diskettes and disk packs are not suitable for mailing or shipping. The DDP team is firmly convinced that tape drives should be acquired, therefore, for backup purposes, for file storage purposes (to release disk space), and for exchange between Madeira and other computer centers.

The 90/25 has only a diskette reader. It supports a card reader and both diskette reader and card reader. However, UNIVAC's proposal for a card reader was deleted and the RGM/EEM data center has neither a card reader nor a cardpunch. The UDS

2000 UNIVAC diskette reader/writer is used for data entry so that programmers preparing programs or OS/3 Job Control Language statements must either reserve one of the three UDS 2000 work stations or interrupt data entry personnel. It is expensive to use a UDS 2000 for programmers only and none of the machines are located in the data center, but are, instead, several blocks away.

Card decks are a common way of running jobs. In large data centers, interactive and/or conversational software systems have replaced most, but not all, card use. For the Madeira data center, card use should be constant and normal. Diskettes may hold many programs and OS/3 JCL, but cards are easy to change and very versatile. The DDP team recommends that a card reader and card punch be acquired for the data center.

For the above reasons, the DDP team is very doubtful that much processing can run on the 90/25. The problems were caused by the failure to perform a general system analysis, a detailed system analysis, a detailed hardware plan, and a good Request For Proposals reflecting what was needed accurately. In our meetings with the Madeira staff, we emphasized that there was insufficient core and disk space, and that tape drives and a card reader and cardpunch were necessary. The team does not believe that no applications can run on the 90/25, however. It is possible that some small payroll processing and inventory processing can be done.

Our evaluation is that increasing the core size, disk capacity or adding tape drives should not be done singly. All three should be done together after a series of detailed system

analyses are prepared so that a hardware plan can be prepared. There are a dozen potential application systems and the failure to perform a detailed system analysis on any one could result in inadequate hardware. In addition, buying additional core, disk space, tape drives, etc., without forecasting data center growth is foolish. Therefore, even if it is decided to add hardware for some systems, ignoring others, the data center management risks running into the same problem in the future.

One recommendation which must not be overlooked is to retain the 90/25 as it is now and use it as best as possible. When the complete hardware system has been planned, a new Request For Proposals should be issued. While the RFP will consider an upgrade of the 90/25 equally with new systems, the emphasis should be on a unified, total system from respondents, not a patched-up system. If the best proposal is a new system, the 90/25 may be sold or retained as a computer for small applications and development work. If the best proposal is an upgrade of the 90/25 to a 90/30 or 90/40, etc., then it should be accepted. Only by comparing UNIVAC's proposal to proposals from other companies can it be determined which response is best, both with regard to price and with regard to cost.

One consideration that the Madeira computer center management should keep in mind is the isolation of the island. A system which supports dual and/or redundant hardware and software features is highly desirable. A second consideration which should not be ignored is the linkage of the two ISE System 80 computers to the main data center. This will allow extra use of the ISE computers and centralize the computer management on the island.

In conclusion, the DDP team feels strongly that the current hardware is inadequate. There is a great gap between the applications desired and the small capacity of the 90/25. We firmly feel that before any hardware changes are made, detailed system analyses must be made, a hardware plan derived, and future growth evaluated as best as is possible. Then a new Request For Proposals should be issued to all interested hardware firms so that the best (measured by technical ability and cost) total hardware system is obtained. Until this is done, the 90/25 should be left as it is and used to collect data, run small systems, and to train the Madeira computer center staff.

V. EVALUATION OF APPLICATION SOFTWARE PACKAGES

Thus far only one application software package has been acquired for installation on the UNIVAC 90/25. This is a payroll package and it was purchased from the National Soap Company (Sociedade Nacional de Sabões) of Lisbon. (see Attachment NN)

Since most accounting and payroll systems in Portugal are substantially mandated by law, there really is no doubt that a payroll package written for a Portuguese company and in service in other parts of the country will fulfill the role here satisfactorily. The only question is: will the 90/25 configuration they have in Madeira accommodate the package.

Insofar as the implementation of other packages are concerned, it is the belief of the DDP team that as many applications packages as possible should be utilized. This is particularly true where the packages can be supplied by the manufacturer. It appears that UNIVAC has some difficulty in this area. There appears to be a conflict between what is stated to be available in the brochure on the 90/25 and what UNIVAC says it can deliver.

Additional applications packages that could be utilized by the RGM which do exist cover the following applications:

- o General purpose statistical routines
- o Secondary school packages
- o Employment placement packages
- o Maintenance scheduling
- o Billing

- o Hydrological applications
- o Work cost forecasting
- o Industrial production indices

With research it should be possible to find other packages useful to Madeira. For example:

- o Traffic management
- o Licencing control
- o Hotel reservation (consolidated)

In line with economical procurement, EEM & RGM should seek assistance in finding packages which are available at little or no cost. Many packages and programs used by all levels of government in the United States are in the public domain and available for the price of copying them. The people operating the system would have to know, of course, whether or not the system hardware and/or software could support the implementation of any given applications package. There would also have to be personnel available with sufficient experience to install and operate the packages.

The selection of packages and other application software should be made prior to be selection of hardware and operating systems. Since this was not done we have serious doubts about the installation of any software package on the UNIVAC series 90 hardware. This is especially true for non-UNIVAC packages. Our concern is partly caused by the fact that the COBOL and FORTRAN compilers are low level. COBOL is level 2 (except one module which is level 3) and the FORTRAN levels are basic and extended.

Concern is also caused by the fact that the core size of the UNIVAC 90/25 is so small (65 K) that many packages will not fit. The actual program core size is a maximum of 44 K as the supervisor takes 21 K. Also, the 90/25 has no magnetic tape drives and only two disk packs totaling 58 MB, making it impossible to use magnetic tape input and making disk space hard to obtain for sorts, temporary files, etc.

VI. EVALUATION OF PERSONNEL SELECTION

This is perhaps the most critical area of the entire automation effort in Madeira. Without proper personnel available nothing will function.

Madeira has had serious problems in recruiting experienced computer professionals. At present their staff consists of the following people:

- A. 1 experienced programmer (8 years)
- B. 2 trainees in school in Lisbon
- C. 2 maintenance technicians
(UNIVAC trained - no experience)
- D. 1 maintenance engineer in school
- E. 1 experienced operator
- F. 6 data entry personnel (3 months experience)
- G. 9 ISE system 80 operators

The problems that Madeira has been having so far are as follows. The salary levels of continental Portugal are higher for equivalent positions than in Madeira. Computer professionals not only expect to be paid at the level of Lisbon but expect to be paid 2 or 3 times the Lisbon level since they consider Madeira to be out of the main stream.

An alternative to recruiting in Portugal would be to recruit and train personnel from Madeira. As mentioned above there are two trainees from Madeira already in school. It remains to be seen whether they will return to Madeira or, induced by a higher salary structure, choose to remain in Lisbon. Even recruiting and training in Madeira can encounter other problems.

Madeira does not only face the problem of trained personnel but the problem of experienced personnel. Training alone is not enough. It takes from two to three years to develop a programmer to the point where he can function without assistance or direction. If an entry level or junior programmer has no senior programmer to turn to when in difficulties he must learn through slow trial and error. He will probably learn but the lessons are very, very frustrating and cause a loss of time. That which holds true for programmers is even more critical where supervisory personnel are concerned. To learn programming, operations, systems and management all at the same time is a difficult task, a task which will require a considerable learning curve. The point is that the hiring of experienced personnel is almost unavoidable.

If personnel from the continent are not available, what other sources exist? It is almost certain that the other sources are going to be even more expensive. This would probably require financial aid of some type. There are three sources outside of those mentioned already. The first source would be contracting personnel from the United States.

The advantages to this would be that the United States has the greatest pool of experienced personnel in the world. The technical competence can be reasonably guaranteed. The disadvantages would be the cost, and language problems.

The second possibility would be other parts of Europe, England, France and Germany. While the personnel pool is not so large as the United States the level of competence would be about the same. The cost would be just about as great as the

cost for Americans, though the cost of transportation would be somewhat less. The language problem, while probably not so great, would still be a factor.

A third possibility as a source of experienced personnel would be Brazil. The salary levels though higher than Madeira are about one half to two-thirds of the United States at the intermediate levels. While the pool of experienced personnel is very much smaller than either the United States or Europe, there are people available. Another obvious advantage, of course, is that there would be no language problem.

In training indigenous personnel there are certain qualities which should govern selection. A logical mind is far more important than academic background. There appears to be very little relationship between academic background and job performance in programming. This appears to be true also with the programmer aptitude tests. Good scores do not necessarily indicate good performance.

Experience with programmers in the United States, while it may not conform to experience elsewhere, shows pretty much the following pattern to prevail. Programmers are independent, preferring to receive very little direction. They prefer to develop detailed instructions from very general instructions. They are usually multidisciplined, that is, they have received training or experience in several different areas. They must know or be able to learn everything from flowcharting through systems operations (hardware), job control language, several programming languages, user interface, writing ability and, of course, technical competence.

The type of individual best suited to the computer industry is flexible and versatile in his approach to problem solving.

Recruiting and training the proper personnel will not be easy. The RGM can obviously use assistance in this area.

Still another problem to be faced by the computer industry in Madeira is the establishment of salary scales for systems analysts and programmers. In the United States it frequently occurs that beginning programmers earn more than department managers in other departments of the same company. This is a source of friction but must be contended with. There may be no other way to prevent a rapid turnover of personnel.

VII. APPROACHES TO CONVERSION

There are two approaches to converting manual operations to automated. One approach is the conversion to separately execute job runs for each department. The other approach is to convert to consolidated job runs, all consolidated departments included in a single job run.

In either case, conversion to serial (see figure VII-1) or consolidated (see figure VII-2) runs would require a department-by-department conversion. One or two departments a month until completed.

The priority for conversion should be the most common application first. This would be payroll in most cases, followed by accounting.

The considerations for choosing approach to conversion, serial as opposed to consolidating are first policy, followed by hardware capacity.

In the case of the UNIVAC 90/25 being installed in Madeira as it is now configured, the serial approach is the most practical method. This approach would serve for both payroll and accounting systems, or in fact any system which is common to all departments.

Another consideration for conversion must be whether the system as applied to the computer will be an optimized system or simply mirror the manual system in existence. The mirrored approach will be easier for the users to follow but may not be as efficient for computerization.

SERIAL PAYROLL RUN

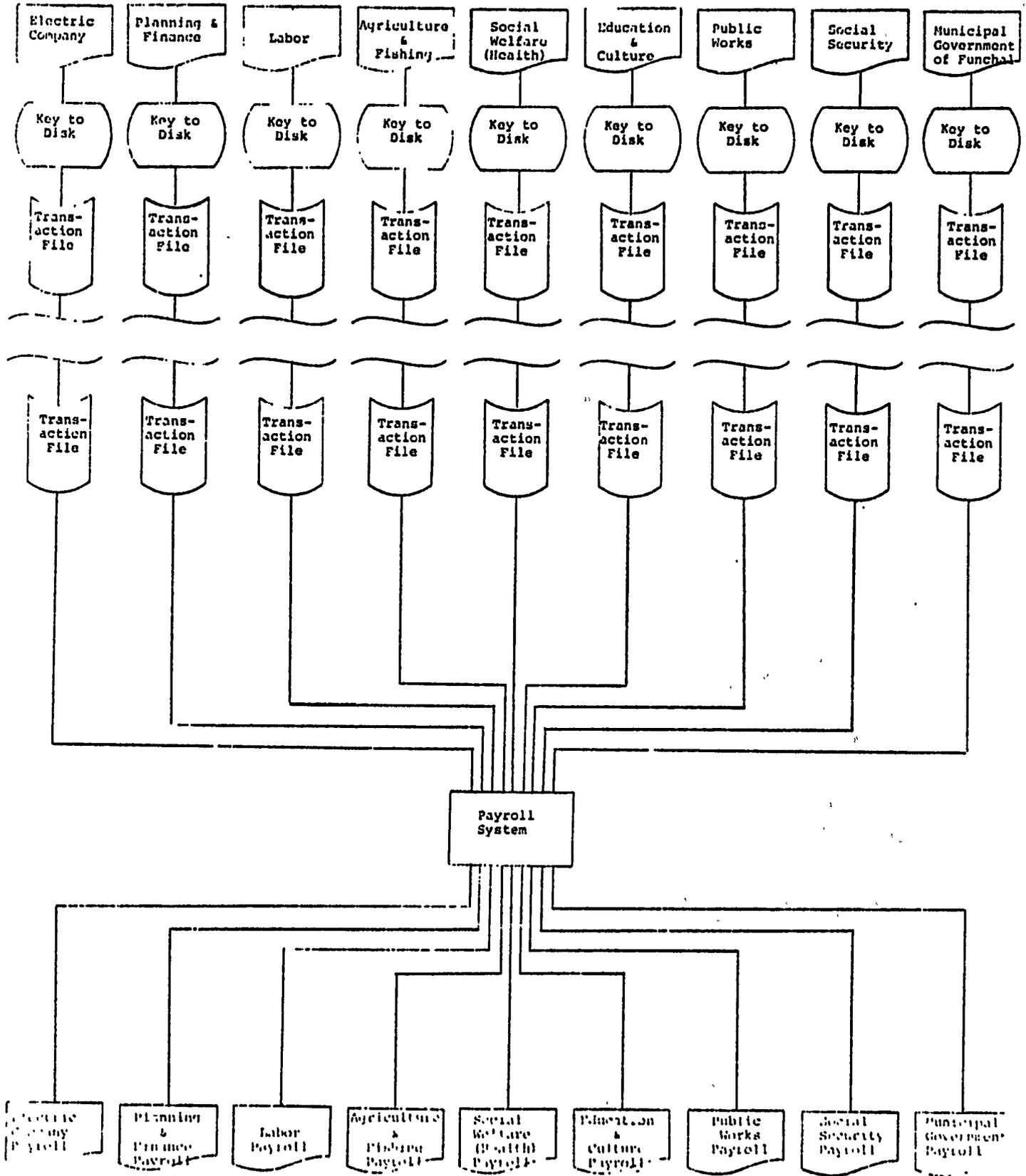


Figure VII-1

CONSOLIDATED PAYROLL RBN

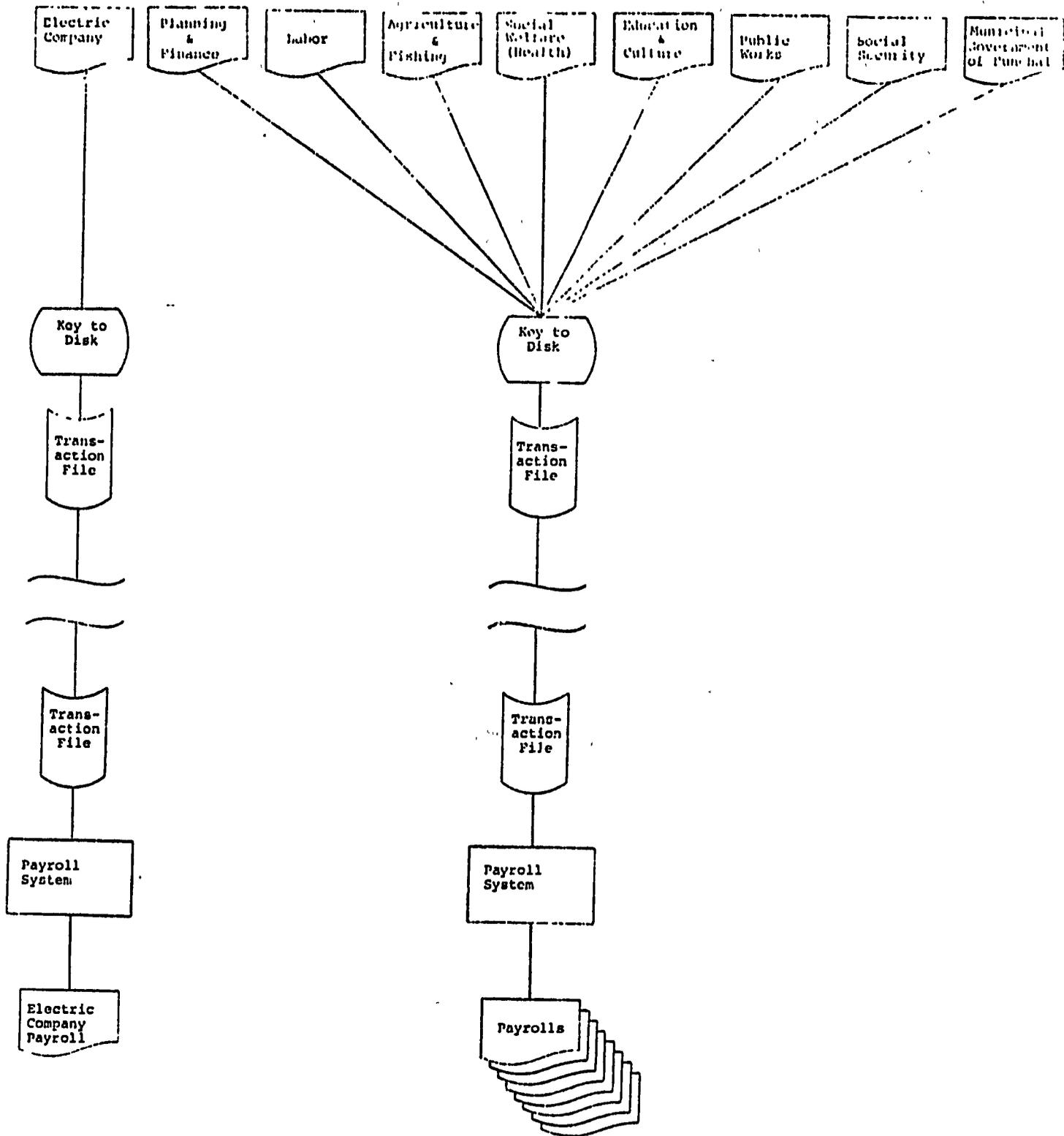


Figure VII-2

The DDP team is of the opinion that until priorities are set by EEM/RGM, we should not recommend firmly any area as the first to convert. We have observed, in our comments on software, that packages should be used whenever possible. The conversion effort may place priority on those areas where packages are easily available, and as payroll is an effort common to all departments, it is a prime candidate for the first conversion effort.

Another consideration for conversion is the economic benefit to be derived from the computer. Engr. Câmara of the island's irrigation project stated that his staff of 40 clerks is months behind in the billing system. Also, the EEM has a massive billing system for electricity, growing rapidly, and requiring much manual effort. This is also true of the billing for water for household use. If the detailed study showed that the conversion of one or all of these systems was fairly easy and that the economic benefit resulting was sufficient then these systems might be chosen as the first conversion applications.

A third consideration for conversion priority is the visibility to the public of the project. Here the irrigation project and the electric or water billing projects come up again, in contrast to the government payroll which is the government using a computer for its own purposes and not for the public's purpose. The DDP team, however, also has in mind having the computer assist in Madeira's tourist activities more than anything else. As tourism is the prime source of income to the island, increasing tourism is clearly desirable.

Examples where computer utilization maybe of assistance are
A. reservations for all hotels linked by computer, B. analysis
of countries which supply tourists so as to improve advertising
in those countries, C. analysis of cruise ship stops and
maximal scheduling of stops.

The means for gathering foreign tourist information already
exists. As each foreigner registers at a hotel his passport
is collected and taken to the police. Whatever data is
collected by the police need only be entered into the computer
to establish a tourist data base.

VIII. MANAGEMENT FOR COMPUTERS

Management practices as they exist in Madeira are highly organized, disciplined and static. Changes within any manual system would appear to be difficult to introduce. Many things which, even in government operations, are, more or less, left to the descretion of individual departments in the United States are covered by law in Portugal. For example, there is no single government payroll package in the United States for the Federal Government. Every department has its own operation. For Portugal to have autonomy in that area would be highly unlikely. The Portuguese method has some clear advantages over the American.

Management would have to adapt to a different approach, in directing a computer operation, than it is accustomed to. One of the first traditions to go would be the fixed work schedule. Computer operations are not a nine to five proposition but, by their very nature, must be highly flexible. The manager of a systems and programming staff must become results oriented as opposed to schedules oriented. In order to achieve the desired results under an open schedule the selection of responsible and conscientious people for the systems and programming staff is absolutely essential. Technical ability is not, by itself, sufficient to qualify for employment as a programmer. In many cases a dedicated person will produce results where a more expert programmer will fail. The difference is simply one of application. A truly dedicated programmer will not break for lunch or leave for the day until the last program

error has been corrected and the last test has been turned around.

It is essential in this regard for management to set the example. If a programmer is having difficulty and chooses to remain to resolve a problem the programmer's immediate supervisor should not leave until the problem is resolved. Proper supervisory practices require a great deal of patience on the part of management. With good work attitudes on the part of subordinates, such patience shown by management will pay dividends.

Management would be well served also by making certain that the facilities to be used by the systems and programming staff are adequate. To perform at his best a system analyst or programmer does not need luxurious accommodations but he does need space. A small desk is simply not enough. A programmer needs a desk and at least a table. Computer listings are large and cumbersome. It may be necessary to spread two or three listings out side by side. For this you need a table. If the table is large enough it may be used in common by several programmers. Because of the nature of computer listings each programmer needs storage space of some kind for the crucial listings he wishes to retain. Computer listings should not be allowed to accumulate except in designated areas. Each programmer must be made responsible for the disposition of his own listings.

Management also has the responsibility to establish as comprehensive a technical library as possible (see Attachment 11). This library should contain concepts and facilities

manuals for the current equipment of as many manufacturers as possible. It is important also that all of the systems and programming staff have an idea of the larger systems of UNIVAC in the event of upgrading the system.

The manager of the computer operation should constantly be planning for expansion and new applications. This should be done in coordination with the managers of using departments. Planning should be done also to integrate other systems on Madeira, such as the ISE 80 machines, into an interactive network. The manager of a computer department must always be alert to the possibility of improving the effectiveness of his department.

In line with effectiveness the organization of the systems and programming staff should receive a great deal of consideration. The manager must decide if it would be best to assign responsibility for a given system to one person or a group. It may be more effective to organize ad hoc teams as situations arise and thus have the entire staff involved in most projects. It is possible that some of the staff will be recruited from among the staffs of using departments. In that case the person from any given department may have as a priority the task of interfacing with that department to receive instructions or resolve problems.

The idea of using persons, as programmer trainees, from various departments will help in placing personnel from those departments who are displaced by the computer. Absorbing surplus personnel should be a major concern for managers throughout the entire government.

The managers of the computer installation will generally be responsible for the use of the computer. He will establish priorities and schedules. In the establishment of schedules it should be remembered that, where possible, development and testing should have priority during certain hours. Routine and extensive test runs should be done at night, while developmental testing should be done during the day.

The manager of the computer center would normally be responsible for the physical security of the equipment. In line with this responsibility he must establish a strict code of discipline in the computer area. Smoking should not be permitted in the computer room and the room should be kept clean and orderly at all times. No loose equipment should be permitted to accumulate in the computer room. All paper to be discarded from the computer room should be stored for at least one week before being thrown out. This will help prevent unfortunate accidental discard of important production, and this will also give a measure of control over paper usage. These rules should be strictly enforced. In the event a hard copy control station is used any control sheets (console sheets) should be saved for at least one year.

As a management tool, logs should be established for both hardware usage and job run control. As mentioned above, enforcement of compliance is a management responsibility. Every event involving hardware or job runs must be entered. A log should also must be established for data entry. This should also be maintained accurately, and all personnel should understand the purpose of a log is not to fix blame but to

resolve or avoid problems and to determine patterns of inefficient usage.

Good management requires security for software as well as hardware. Change logs should be established and maintained for all software. Once a program has passed its acceptance tests and is in production, no one should be allowed to change the program in any way of his own volition. Either the programming supervisor or the installation manager should approve a change, in writing, before the change is made. We will touch upon this again later.

The cardinal sin for any computer manager is to fail to safeguard his data. To be caught without "backup" is unforgivable, all master files should be recoverable for at least one year. There should be a copy of all backed up data at the installation. There should be another backup copy stored in another separate building entirely.

There is no management function more important than the training of personnel. If the staff produces, the manager is a success, but if the staff fails to produce, the manager is a failure. The more training given to conscientious personnel the better they will perform. Programmers should not only receive instruction in programming they should also receive training in the use of all equipment at the installation. Training should be given in the use of all utility programs, sorts and packages used at the installation. Opportunities should also be given to programmers to experiment with new or unfamiliar packages to see how the packages work.

No one in the computer industry has that much experience that he cannot learn something new. Even after formal training ends a program of continuing training should be established both for review material and for new material. Classes in the established programming standards, structured programming, efficient programming techniques, systems analysis, forms design, programming languages and documentation are all desirable.

Documentation is one of the most neglected areas of programming. This is unfortunate since good documentation makes it very simple for an experienced programmer to quickly learn a system and for a non-programmer to understand the operation of the system. When working on a system, from 40 to 50 percent of the time used should be devoted to documentation. In the case where a programmer is given detailed specifications, those specifications should be able to serve as program documentation.

We stated previously that no changes should be made to any system or program without authorization. This applies equally to documentation as well. No documentation should be changed without authorization. The authorization should be given, in writing after the change to the program has been tested and is working. The change should never be made in a production program, before acceptance testing, but only to a test version of the program.

Whether changing an existing system or writing a new one there are some rules that should always be followed. Every task requires a detailed study of the problem. It is a management function to see that this is done. The study should be

made from the point of view of the desired results. It should be the responsibility of the systems analyst to design all records and files for the system. All record formats should be maintained on a copy library. All programmers should be required to use the standard record formats. When a record is designed it should contain sufficient extra space for a 20 percent expansion. In addition to the system design the systems analyst should be responsible for developing all test data. This is best done in three phases.

The first phase of test data should be a minimum amount of contrived data to test each path through the system. The second phase is a test of mixed contrived data with a random sampling of live data, with predetermined results. The third phase will be a test with a full file of live data. This should, of course, also have predetermined results.

There may be times when certain problems require outside assistance by contract personnel.

Management must be extremely careful of the type of contract entered into. Fixed price contracts and open ended contracts should be avoided. A contract which is flexible but puts a maximum limit on time is best. Under such a contract, if a task that has been estimated to take one year only takes six months, six months is all that will be paid for. At the same time locking a contractor into a very tight time frame can be self defeating.

The production of either regular staff personnel or contract personnel should be closely monitored.

Progress should be measured by means of goals and milestones with deliverables clearly defined.

In any operation the expectations of management should be made clear to all personnel. It is in the best interest of the managers that a Standard Operating Procedure (SOP) Manual be established. This book should contain all of the rules for the installation. The book should be updated as needs require. All members of the staff have the responsibility to review the SOP periodically both to be aware of its contents and to check for areas which need updating.

In order for management to get the cooperation desired from managers of other departments, frequent demonstrations should be given of projects which have been completed. Don't try to demonstrate what you hope to achieve, only what you have achieved. Try to satisfy the user. He is the final judge of the computer's effectiveness. A satisfied user is the best advertisement one can have. Never underestimate the requirements of a task. Do not try to proceed too fast. Never promise more than you can deliver. If these guidelines are followed the manager will not avoid difficulties, however, he should be able to keep them to manageable proportions.

IX. CONCLUSIONS AND RECOMMENDATIONS

A. In closing this report, it would be best to point out that the possibility exists for errors in both judgement and fact. The DDP team examined 14 different operations, held numerous additional interviews and meetings with users and our Portuguese counterparts, and produced this report, all in 15 working days. Some inaccuracy was unavoidable; something was bound to be lost or misunderstood in the process of study and in translation.

Be that as it may, there are some overall conclusions which we are able to draw. Based upon those conclusions, we are able to make some recommendations. The conclusions we have found are:

- A. Though the UNIVAC 90/25 will probably serve adequately for some tasks, the present configuration will not allow the flexibility and capacity we believe the system must have to meet the user needs described to us.
- B. Certain software packages for common applications have not been made available by UNIVAC even though advertised in 90/25 literature.
- C. The EDP operation lacks experienced personnel, both at the supervisory level and at the programmer level. This will severely restrict the quality and quantity of work undertaken by the EDP center.

- D. The computer operation in Madeira can be brought to a point where it can function independently in about one year with the proper outside help.
 - E. Both the government users and the present members of the EDP center of Madeira are eager and anxious to start operations and both are willing to listen to and consider advice from experienced personnel.
 - F. The variety and complexity of potential applications clearly justifies a unified EDP operation of at least medium size for EEM, RGM and Funchal City users.
- B. In summary, we recommend the following:
1. Applications must conform to Portuguese standards in such areas as payroll and accounting. The use of a computer may alter work flow, involve consolidation of effort and reduce manual tasks, but such usage should not alter the basic structure of the departments and the forms in use.
 2. The UNIVAC 90/25 must be upgraded to include more disk space, more CPU memory, tape drives and a card reader. Exact quantities and time frame depend on EEM/RGM priorities and the results of detailed studies of applications.

In addition to simply upgrading the UNIVAC 90/25, it may be wise to consider another alternative. The alternative would be to use the present system as it is until either sufficient experience is gained to determine what the hardware requirements should be or until the 90/25 is saturated. At

that time, the Regional Government of Madeira might enter into the procurement process again.

The present computer could be retained for certain applications or disposed of after all applications are transferred to the newly procured hardware.

3. Every effort must be made to obtain applications packages compatible with the 90/25 or its upgrade to avoid excessive development costs. The search for suitable applications packages should not be limited to UNIVAC packages and should allow for some minor local adjustments.
4. Supervisory personnel must understand proper EDP management and experienced personnel must be employed to carry out the tasks and to lead trainee personnel. Sources of experienced personnel are not to be limited by geography and may include Brazil, the U.S.A., continental Portugal and Europe.
5. The Regional Government of Madeira requires the services of an experienced EDP advisor for at least a one year period. It would be even more desirable to consider a period of 18 to 24 months. This will permit the RGM to start operations rapidly and with experienced personnel until a pool of professionals is established in Madeira. The RGM should make immediate efforts to recruit such an

advisor using either its own resources or requesting assistance from some international source (such as UNDP) or a bilateral donor.

ATTACHMENT 1
STATEMENT OF WORK

ARTICLE I - STATEMENT OF WORK

A. Background and Objective

The Regional Government of Madeira (RGM) is interested in establishing an information and data bank with the capability of collecting, storing and distributing information in the following areas:

1. Regional trade and commerce accounts, balance of trade and balance of payments calculations;
2. Basic statistics storage and demographic projections, industry, transportation, agricultural and fisheries production, price indexes, revenue, taxation, banking;
3. Administrative and accounting services in education, public health, social security, hospital accounts;
4. Billings on water and electricity supply, etc.;
5. Payrolls for RGM civil servants;
6. Stocks and materials inventory management;
7. Support to municipality of functional and
8. Support to local industry on time-sharing basis of hardware.

B. Scope of Work

The contractor will complete a Feasibility Study in sufficient detail to permit RGM to reach a decision on the advisability of further action. In doing so the contractor will:

1. Review with RGM counterparts and INE/Madeira existing arrangements for statistics generation and data collection; also review any RGM plans to expand its

- collection capability, assess major system design alternatives which accomplish applications under consideration;
2. Analyze suitability of statistics/data being collected for computerization under data bank concept, make recommendations seen necessary for changes in collection procedures;
 3. Propose step by step action program for RGM to follow to establish computerized data bank including detailed description of information system within which it would function. Also provide recommendations on design of new organization or organizational changes seen necessary to manage system
 4. Analyze present and projected hardware needs; RGM existing plans; capability of local vendors, if any, to supply and maintain hardware and software, make recommendations as to elements, components of equipment needed as well as equipment design, features, capacity, and accessories of hardware considered most suitable for situation; discuss advantages and disadvantages of, identify alternative equipment configurations capable of supporting probable applications to be included;
 5. Assess present automatic data processing (ADP) personnel capability, level of competence and training requirements; and
 6. Express manpower requirements in work months and dollars for each required skill level for all alternatives discussed.

ARTICLE II - PERIOD OF CONTRACT

This contract is effective as of 15 August, 1979 and the estimated completion date is 18 October, 1979.

ARTICLE III - REPORTS

- A. The contractor shall submit a Draft Report of findings and recommendations to the RGM (two copies) and to the AID Representative, Lisbon (two copies), prior to the departure of the contract team from Portugal. Within two weeks of the team's return to the U.S. the contractor shall submit a fully documented Final Report based upon the efforts under Article I. The Final Report will include recommendations on (1) the advisability/feasibility of proceeding with automation and, if ADP systems are recommended; (2) a graphic presentation (PERT preferred) of the proposed sequence of events.

The Final Report shall be prepared in 14 copies of which 10 copies shall be sent to the Portugal Desk, AID/W, two copies to the Contracting Officer whose signature is affixed hereto, and two copies to the A.I.D. Reference Center, Agency for International Development, Washington, D.C. 20523. The Title Page of all reports forwarded to the A.I.D. Reference Center shall include the contract number and project title as set forth in the schedule of this contact.

ATTACHMENT 2

**LETTER FROM REGIONAL GOVERNMENT
OF MADEIRA**



S. R.
REGIÃO AUTÓNOMA DA MADEIRA
GOVERNO REGIONAL
SECRETARIA DO PLANEAMENTO E FINANÇAS

Ao
Programa de Cooperação Económica e
Técnica
A c/ Dr. Buchanan
Embaixada dos Estados Unidos da
América
Av. Duque de Loulé LISBOA -1

Sua referência

Sua comunicação de

Nossa referência

DATA

Proc. 32

15. MAI 1979

N.º

089

-PR/F

ASSUNTO :

Com o objectivo de dar a V. Ex^{sa}. uma visão aproximada do parque informático existente na Região Autónoma da Madeira, bem como dos respectivos recursos humanos foram estabelecidos contactos com a Empresa de Electricidade da Madeira e com o Centro Regional de Segurança Social.

Das diligências efectuadas colheram-se os seguintes elementos.

1 - Empresa de Electricidade da Madeira.

a) - Equipamento adquirido.

Processador SPERRY UNIVAC 90/25 - SISTEMA OPERACIONAL OS/3.

Na resposta indicar a mesma referência. Em cada caso tratar só de um assunto.

MEMÓRIA DESCRITIVA DO EQUIPAMENTO
(Equipamento principal)

MODELO	QUANTIDADES	DESCRIÇÃO
T-3029-72	1	Processador C/64 K bytes de memória principal.
F-1622-00	1	Protecção de memória.
F-6123-00	1	Expansão microológica.
T-0788-02	1	Impressora de 500 l pm.
F-2386-00	1	Aumento das posições de impressão de 120 para 136
F-1647-15	1	Cinta de impressão.
F-1621-02	1	Adaptador para discos integrados.
T-8418-93	2	Unidade de discos 8418.
F-1216-02	6	Pilhas de discos para unidades 8418.

(Equipamento adicional)

MODELO	QUANTIDADES	DESCRIÇÃO
T-8413-00	1	Leitor de diskettes 8.413.
F-1624-00	1	Interface para 8.413.
T-3039-24	2	Estações de trabalho principais com: Processador, écran vídeo, conjunto, gerador de caracteres, uma drive de diskettes, controlador da drive, 32 K bytes de memória.
C-2528-07	3	National character Font.
F-2502-00	3	Teclades.
C-2659-07	3	Seleções de teclas.
T-3546-94	1	Estação de trabalho com: écran vídeo, conjunto gerador de caracteres, uma drive de diskettes, controlador da drive.
T-2768-00	1	Interface para Estação de trabalho.
F-2665-00	2	Expansões de memória de 8 K (32/40 K).
F-2665-01	1	Expansão de memória 8 K (40/48 K).
0786-81	2	Impressores de 200 C.P.S. (indireccionais).

- b) Recursos humanos
1 analista-programador
2 técnicos de manutenção.

2 - Centro Regional de Segurança Social
Equipamento

- a) 1 mincomputador marca "I.S.E. COMPUTER SYSTEM 80".
- b) Equipamento de recolha (consola e display).
O referido equipamento tem a capacidade de 24 K bytes, podendo ser ampliada até 64 K bytes.
- c) Recursos humanos.
9 operadores.

São consideradas tarefas prioritárias:

SECRETARIA REGIONAL DO EQUIPAMENTO SOCIAL:

- Fichas de pessoal.
- Elaboração de horários para distribuição de água.
- Processamento recibos de água.
- Processamento de vencimentos de pessoal.
- Obras
 - medição de trabalhos, revisão de preços.
 - custes obras de administração directa.
 - gestão de stocks (materiais, peças e máquinas).
 - índices de revisão de preços.
- Aplicação à engenharia do computador (numa fase posterior; actualmente recorre-se ao computador do LNEC).

SECRETARIA REGIONAL DE EDUCAÇÃO E CULTURA:

- Processamento de vencimentos de pessoal.
- Processamento de despesas (orçamentologia).
- Colocação de professores.
- Inventariação permanente do material escolar.

SECRETARIA REGIONAL DOS ASSUNTOS SOCIAIS:

- Processamento vencimentos de pessoal.
- Gestão de stocks.
- Contabilidade orçamental.
- Estatística movimento hospitalar.

SECRETARIA REGIONAL DO TRABALHO:

- Processamento vencimentos de pessoal.
- Tratamento de mapas de pessoal.
- Subsídio de desemprego.
- Candidatos a emprego.
- Acidentes de trabalho.

SECRETARIA REGIONAL DE AGRICULTURA E PISCAS:

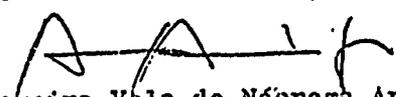
- Processamento de vencimentos.
- Tratamento do volume, por zonas estatísticas de pesca.
- Número de embarcações.

SECRETARIA REGIONAL DA ECONOMIA:

- Processamento de vencimentos.
- Registo de importações e exportações.
- Processamento licenças de condução.
- Índice de Produção Industrial.

Com os melhores cumprimentos.

P'lo Secretário Regional,
O CHEFE DE GABINETE,


Ana Maria Moreira Vêla de Nóbrega Araújo

ATTACHMENT 3

DDP INTERIM REPORT



REGIÃO AUTÓNOMA DA MADEIRA
GOVERNO REGIONAL
SECRETARIA DO PLANEAMENTO E FINANÇAS

MEMORANDUM

14 Sept. 1979

To: Mr. James T. Mc Mahon
From: R Thompson, Project Leader, Dynamic Data Processing
Subject: Change in scope of work

This memorandum is for the purpose of informing you of a change in the nature of our assignment here in Madeira. This change is necessitated by facts which were not available at the time the scope of work was established.

When the scope of work was determined, the assumption was that a computer existed on Madeira but that the computer existed for the exclusive use of the local electric company. The true situation was not known by either AID or DDP. The computer to be used by the electric company is to be the computer for the Regional Government of Madeira as well. The hardware selection process which took over one year has been completed. A UNIVAC 90/25 configuration has been purchased and will be installed next month. Consequently, when we visit the governmental offices, we are expected to advise on the use of the 90/25.

During our briefings by Mr. Mc Mahon and by Mr. Duchanan, we were advised to avoid involvement in hardware. However, we are being asked many questions involving hardware and it is clear that advice is needed. Since we must provide assistance, in using the UNIVAC system already here, we have not hesitated to provide information both of a general nature and specific to UNIVAC. We will continue to proceed in this direction unless instructions to the contrary are received.



REGIÃO AUTÓNOMA DA MADEIRA
GOVERNO REGIONAL
SECRETARIA DO PLANEAMENTO E FINANÇAS

There is also an ISE (German) System ⁸⁰ installed by the regional Public Health Service. This machine is now being programmed for payroll and accounting applications. This machine will operate independantly of the UNIVAC and at least 2 other ISE computers are now being considered for purchase by other Madeira health-service agencies.

It is our feeling that the study is proceeding well. The number of potential computer applications to evaluate is considerable. The time available to us will not allow as comprehensive a study as the statement of work anticipated. We do feel that our final report will be of great value to the Madeira Government although limited to more important applications rather than to all potential ones.

During our investigation of possible computer applications, some questions have come to light concerning UNIVAC applications software (e.g., payroll, accounting and inventory) availability for the 90/25. We would be anxious to discuss this matter with Mr. Mc Mahon upon his arrival here. We will attempt to have a UNIVAC representative here on Oct 1 and 2 to discuss the software and hardware UNIVAC is supplying.

We feel that the attitude of our Portuguese counterparts could not be better. Several of them have shown a good grasp of computer technology basics. Moreover, the attitude of every official with whom we have been in contact has been very positive.

If you have any questions, please inform us.

Robert Thompson
Project Leader
Dynamic Data Processing

ATTACHMENT 4

**SCHEDULE FOR DDP
ON MADEIRA**

SCHEDULE FOR DDP
ON MADEIRA

	MORNING	AFTERNOON
Sept. 10	Introduction	Meet Department Heads
11	Tour Department	Same
12	Analyze 1st Dept.	Same
13	Analyze 2nd Dept.	Same
14	Analyze 3rd Dept.	Same
Sat. 15		
Sun. 16		
17	Analyze 4th Dept.	Same
18	Analyze 5th Dept.	Same
19	Analyze 6th Dept.	Same
20	Other included dept.	Overall consolidation
21	Review & Summarize w/interface	Return to departments where needed
Sat. 22		
Sun. 23		
24	Review again w/interface	Same
25	Begin to prepare report	Same
26	Write report	Same
27	Write report	Same
28	Review Draft	Revise Draft as needed
Sat. 29		
Sun. 30		
Oct. 1	Prepare final revision	Same
2	Present Preliminary Report	Answer any questions
3	Leave Madeira	Present Preliminary Report to AID
4	Discussions w/AID	Leave Lisbon
5	Return to Washington	
6		

UPDATED SCHEDULE FOR DDP

	MORNING	AFTERNOON
Sept. 17	Electric Company	Same
18	Review and Summarize	Same
19	Open Time	Same
20	Consolidation	Same
21	Review w/Regional Govt.	Open time
Sat. 22		
Sun. 23		
24	Organize Report	Same
25	Preparation of Report	Same
26	Preparation of Report	Same
27	Review of first draft	Revisions
28	Preparation of second draft	Same
Sat. 29		
Sun. 30		
Oct. 1	Presentation of Preliminary Report	Questions
2	Open time	Return to Lisbon
3	Discussions w/AID	Same
4	Discussions w/AID	Return to States
5	Return to Washington	
Sat. 6		

ATTACHMENT 5

**AGENDA USED FOR MEETING
WITH RGM/EEM MANAGERS
. 21 SEPT. 1979**

Agenda Used For Sept 21, 1979
Meeting With RGM/EEM Managers

1. HARDWARE

- a. 90/25 too small
- b. ISE computers separate from 90/25
- c. Insufficient data for proper choice of hardware
- d. Can run small systems, on 90/25 but need tapes and card input.

2. SOFTWARE

- a. Problems getting UNIVAC software
- b. Doubtful that U.S. packages will run on 90/25
- c. Must have complete detailed study of EEM/RGM and Funchal City Hall
- d. There are a dozen potential users of software.

3. PERSONNEL

- a. Must have systems programmer, 1 at least, possibly 2
- b. Training of Junior Programmers
- c. Must have well qualified Project Leaders, at least 2, maybe 4.
- d. Must have qualified Senior Analysts, 2 per Project Leader, Cortez (current programmer) is one
- e. Use transfer of personnel to EDP + new, eager young people.

4. MANAGEMENT BY MADEIRA GOVERNMENT

- a. Who controls EDP operations? Who runs day-to-day decisions?
- b. Programmers are under whose control? On whose payroll?
- c. How many computer centers will there be? (UNIVAC + ISE)
- d. How and by whom will several difficult, hard decisions be made?

5. CONTINUATION OF ASSISTANCE

- a. How much money is available for start - up? And in what time-frame can the money be spent?
- b. Should A.I.D. be asked for continuation? What kind of request?

ATTACHMENT 6

HARDWARE ACQUISITION

HARDWARE ACQUISITION

The hardware acquisition process began in 1978. We are not able to report on all of the details of this process. In part, this is because the Portuguese who contracted for the UNIVAC 90/25 are no longer on the island and are no longer connected in any way to either the Regional Government of Madeira (RGM) or to Empresa de Electricidade da Madeira (EEM). Also, a background report on the acquisition process would require reading and translating many documents, the time for which was simply not available.

On March 28, 1978, a two page letter was sent to IBM in Lisbon and to UNIVAC in Lisbon. The letter (see Attachment 8) was the Request For Proposal (RFP) used by EEM, the electric company for Madeira. EEM is a part of the Madeira regional governmental structure. A reply was received from UNIVAC and IBM; NCR who somehow obtained a copy of the letter proposal also responded. As the UNIVAC proposal was selected, we have not concerned ourselves with the other two replies. We have not seen the NCR reply, and concerning the IBM reply, we know little more than that an IBM System 34 and an IBM 370/115 (upgradable to a 370/125) were proposed.

An immediate question which arises is why only UNIVAC and IBM were formally solicited. Both Honeywell-Bull and Siemens, for instance, are European computer companies who would, no doubt, be anxious to expand their business base in Portugal. NCR clearly was interested enough to respond, even though not formally invited.

The first step should have been to send a letter to all possible vendors. The letter would state that EEM and RGM were considering buying a computer system, state a few facts such as anticipated date of release of the proposal, state the general nature of the work, and give a person for the bidders to contact in the event of questions. Since this was to be the first computer purchase, a visit to the island may be offered so that bidders may investigate to their own satisfaction whether they should bid or not.

All firms which responded to EEM - whether by a return letter, by phone or by visiting Madeira - would be entered onto the bidder's list for receipt of the proposal. After issuing the proposal, any other firms who express interest should be allowed to bid.

The comments presented here, while derived from the UNIVAC documents, are intended to be applicable to any subsequent hardware acquisition process undertaken by EEM, RGM, or any other governmental agency within the geographical area of Madeira.

The EEM letter request is not internally consistent and not at all appropriate for the actual situation. The first mandatory condition states that the equipment will serve the electric company, the Regional Government, and eventually, the city government of Funchal. The eleventh point, however, states that only the volume of work at EEM will be considered in the initial phase. The author of the letter request clearly knew that EEM's workload was smaller than the RGM workload, yet ignored this. While this is possibly due to the fact that EEM was issuing the request, not RGM, it resulted in a tail-wagging-the-dog process.

In addition, the volume of work described in point no. 11 hardly justifies a computer. The number of keystrokes, 1,600,000 per month requires no more than one person averaging 10,000 strokes per hour (an easily accomplished standard value) for 35 hours per week, with 4½ weeks per month. The volume of print, 250,000 lines per month, is, at 50 lines per page, 5,000 pages or 2 boxes of computer paper per month. This is a gross under utilization of a computer. It would take, at UNIVAC's bid rate of 500 lines per minute for its line printer, approximately 8 hours to print the monthly requirement.

We note, without elaboration, that the initial estimated space to be used, 12 MB, is very, very, small and that the initial disk capacity required, 60 MB, is also small.

The letter RFP contains several other weak, indecisive points, and omits a number of important points. The ten points below correspond to the first ten points of the letter proposal.

1. Given that EEM and RGM (and eventually, Funchal Municipal government) were to use the computer, why weren't any RGM officials contacted? This would be, at the very least, an act of courtesy, and properly done, a way to describe more accurately the sort of computer desired. Indeed, had this elementary step been taken, RGM officials may have realized that a study of their needs was necessary. If this had been done, the computer acquisition may have been delayed for several months, but at least hardware and software would have been better coordinated.

It is also very likely that the letter request would have been greatly improved. The RGM would have been able to specify, in general terms, when their applications would start to go on the computer and the approximate volume. Therefore, the letter RFP could have stated the nature of the second phase, enabling responders to bid accordingly. As the RFP stands, bidders were bidding blindly beyond the vague initial phase.

In summary, had the RGM been consulted about the RFP, even if the consultation only began as an act of courtesy, it is likely that much better results would have been achieved in both the RFP statement and in the hardware and software acquired.

2. The memory size range of from 32 k to at least 262 k shows an indecisive, unsure feeling of computer use. Many mini-computers today cover this range easily. The request should, therefore, distinguish between a mini-computer of the 32 k to 262 k range and a modern, third-generation computer in the same range. It is worth nothing that IBM's two responses acknowledge, by implication, this indecision. The IBM System 34 is a minicomputer and the IBM 370/115 is the entrance level computer in the advanced and highly sophisticated 370 series of third generation computers.

The UNIVAC response of a 90/25 is a good response in terms of the Request For Proposal. The 90/25 is not a minicomputer, and while manufactured with current technological ideas in mind, is not a large scale machine such as the UNIVAC 1100 Series (1108, 1106, 1140 etc.) As such, the UNIVAC 90

Series is a "middle sized" computer, conforming to the vague but modest requirements of EEM.

The request for a memory size range of 32k to 262 k also indicates that a preliminary cost study of computers was not done. In most computer configurations, the single most costly element is memory. The stated range is in about a 1 to 8 ratio, which could result in a system eight times more costly, for the largest, than for the smallest. The electric company should have had an estimate of costs with the low and high value differing by a factor of, at most, 3. The memory size range requested should be over a factor of 2 to 3, e.g. 64 k to 128 k or 32 k to 96 k. The author of the letter to IBM and UNIVAC clearly knew something about computers, and so it is entirely reasonable to assume the author knew that memory cost is high. Why the author allowed for such a great variance in costs is a mystery.

3. The initial disk capacity of 60 MB is not explained. How are these 60 MB to be used? Some could be used by the system supervisor, reducing available space, or by the output spool, also reducing available space. A better phrase would have been "60 MB, exclusive of system use (supervisor, spooling, work areas, etc.)". Or, it could have been expressed as "60 MB of user available disk storage".

The disk space could be offered in a great variety of ways by bidders as no restrictions were placed by the proposal request. For example, the disks could be fixed or removable, and if removable, the number of alternate disk packs

is not specified. This could have severe adverse effects if a disk file exceeded disk capacity. The number of disk spindles is not stated. The UNIVAC 90/25 system, as it turns out, will support only 2 disk spindles, no more. To add more disk spindles, there must be a CPU upgrade. This point was uncovered by our investigation. The request for 60 MB again shows the lack of preparation. If a detailed or a general system study had been performed - preferably both - a much better estimate would have been available. The estimate would not be accurate as disk space use is notoriously variable and often depends on disk space management in the computer center. However, the estimate would certainly include disk pack capacity, and whether the disks were fixed or removable. A detailed study of applications should reveal the number of spindles and the number disk packs, and possibly advise if a mixture of disk types (single versus dual density, fixed plus removable, and disk pack model variance) is to be recommended.

4. The request for a card reader and a line printer is, of course, quite normal. For some reason unknown to us, the final UNIVAC proposal omits a card reader. We understand only that the original EEM proposal team dropped the request and UNIVAC complied. We believe that the diskette reader was used as the replacement for the card reader. It is, however, very awkward to use a computer with no card reader. Many small systems can be effectively run with card entry, and many systems programmer and technical maintenance functions can be effectively run with a card reader. To use diskettes only means that a key-to-disk device must be

used to change a diskette. Since the key-to-disk devices are all to be used by the data entry personnel, programmers would have to interrupt entry work to modify a diskette. The system should have a card punch, possibly with an interpreter and duplicator feature, but not with a verifier feature. The IBM 029 keypunch is a standard punch-interpreter-duplicator without verifier and this or an equivalent device should be used with the card reader.

The line printer is to be of medium speed. The UNIVAC response meets this need, but the estimated volume of 250,000 lines per month can be printed in 8 hours with a 500 line/min printer. Clearly, the printer will be severely underutilized. Even a ten fold increase in print would result in printer use of under 50% of time available, and allowing for two 8 hour shifts a day would result in approximately 75% idle time. The request for the line printer also does not specify the type of character sets desired. While uppercase only is the norm, the EEM RFP allowed bidders to respond with any character set they wished. It would be helpful to bidders to specify the type of print desired, uppercase only, upper and lower case, special symbols, etc., as well as demonstrate that some thought had been given to the matter.

5. The future teleprocessing capability is another vague, unspecific request. Telecommunications cannot be approached leisurely. Any computer manufacturer would have to have an understanding of baud rates, number of terminals, protocol standards, etc. to add teleprocessing. The computer center should have some clear ideas about the modems to be used, multiplexing (if any), line distances and remote sites, etc.

Without any precise data or estimates on teleprocessing, it would be best to not request the capability at all. The third generation computers all can accommodate teleprocessing and it is best to withhold the request until details are known. Moreover, no terminals are owned by EEM.

6. The utilization of multiprogramming is a characteristic of third generation computers, whether minicomputers or larger. Some minicomputers do not automatically allow multiprogramming, and it may have been the case that the EEM RFP author wanted multiprogramming to be assured if a minicomputer was proposed.
7. The use of COBOL, RPG and FORTRAN as standard languages is a normal request, but unsatisfactory due to lack of qualification. The levels of COBOL and FORTRAN are not asked for by EEM, and so it is not surprising that low levels of COBOL and FORTRAN were proposed by UNIVAC. UNIVAC carefully and clearly shows the level of various COBOL modules (Section 5.2.2.4.1 of the UNIVAC proposal) for both the "Basic COBOL" compiler and the "Extended COBOL" compiler.

The FORTRAN supplied by UNIVAC is stated as FORTRAN IV and Basic (Section 5.2.2.4) and meet the 1966 ANSI Standards (3.9 and 3.10 of FORTRAN) according to Section 5.2.2.4. However, some doubt about FORTRAN IV has arisen during our investigation since the FORTRAN manuals supplied by UNIVAC are only for "Basic FORTRAN" and "Extended FORTRAN". The UNIVAC System 90 OS/3 manual (the job control language manual) shows a difference between compilation. Even if

FORTRAN IV was supplied, the level of FORTRAN IV is not given and as levels G, H and H1 are all easily available, there is a question as to what level was supplied. The UNIVAC representatives present in Madeira on Oct. 1 and 2 told the DDP team that the FORTRAN level is F. This level will not support almost all-and possible all-FORTRAN packages available in the U.S. for known RGM/EEM applications. UNIVAC states that the RPG II is compatible with others in the market. No doubt this is true and the comparison will be that the UNIVAC RPG II is (a) inferior to most on the market, (b) equal to ANSI standards of 1966 or 1968, or (c) superior to most RPG II compilers (particularly that of IBM). No information is given to evaluate the RPG II, but, then, the EEM request did not ask for any information about any compilers offered.

In addition to COBOL, FORTRAN and RPG II, UNIVAC proposed BASIC (an interactive language) and Assembler. The Assembler language should have been requested by EEM as it is necessary to do any systems programming work and also permits, on occasion, more effective applications programming. The BASIC compiler is useless to EEM as they have no on-line terminals. As with the FORTRAN, UNIVAC only says that the BASIC meets ANSI standards, but does not state which ones.

The concern of the investigation team is not so much on the lack of data on the compilers as with what can be done with the compilers. If statistical packages are brought to Madeira, will they compile? If UNIVAC software packages are bought, will they compile? If software systems are

used from other Portuguese UNIVAC System 90 computer centers, will they compile? Unless the EEM data center can tell exactly what compilers it has, there will be confusion and frustration in attempting to use software prepared at other data centers. There may even be problems installing UNIVAC packages since the packages may require a compiler more advanced than the one at EEM. In terms of the EEM request for languages, UNIVAC did a fair job. UNIVAC should have realized, however, that its response was weak and that the electric company, sooner or later, would ask questions about the compilers. UNIVAC could, no doubt, identify compilers that are available as upgrades and requirements for getting such compilers. The electric company probably should have asked for a list of compilers and levels available so that a choice could be made. As a final observation, the EEM letter RFP should not have requested RPG. This language is fast fading from use. RPG II is not very powerful or flexible. The use of COBOL is widely recommended instead of RPG, unless a small mini-computer is used, and the UNIVAC 90/25 is clearly not a minicomputer.

8. The RFP requests that the proposed system be able to eventually incorporate magnetic tape. The general study performed has shown that magnetic tape is necessary now for applications desired. It is our belief that the lack of direct insistence on magnetic tape was due to lack of understanding of the workload EEM and RGM would put on the system. This RFP request is worded in such a fashion as

to meet the small system requests of points 2.3 and 11 and so the tape request is consistent with other areas of the RFP. Nevertheless, the author of the RFP knew that the computer center was to serve RGM as well as EEM and so probably should have insisted upon tape drives at the outset. Had the approach been taken which was outlined in point no. 1 above, it is very likely that tape drives would have been seen to be necessary.

9. The request for data entry systems is a good request. The most serious error in it is failure to provide workload estimates for each station and the nature of the documents being used for data input. RFP item no. 11 provides a total monthly figure but no more. To make a proper choice between cards or magnetic device, such topics as retention of machine - readable records, verification, storage space available and reading mechanism should be given to the bidders. With respect to the last item, RFP item no. 4 requests a card reader so that the data gathering would have to be on cards. In fact, UNIVAC did propose, initially, 3 card punch devices. For reasons we have not been able to determine, the system to be installed uses only a diskette reader with key-to-disk as the data gathering input method.
10. All the topics in point no. 10 of the RFP are necessary topics. Only one issue stated is unclear - the request for "methods of assistance". It is not clear whether this refers to applications programming, systems programming, technical and mechanical assistance (computer engineering), or management of the data center itself. An analysis of the UNIVAC response will be given in a later part of this report.

This completes a review of the EEM RFP statement. In summary, the author did not know how to acquire a computer system and, consequently, wrote a very poor request. In addition, the following observations deal with issues not covered by the RFP which should have been included.

- A. Reliability of hardware is always important, and it rises to great importance in a site such as Madeira. For each component of the system proposed, such as main CPU, tape/disk units, printer and card or diskette reader, the bidders should be required to provide the Mean Time Between Failure (MTBF) and Mean Time to Repair (MTTR).

It is a known fact that some computer units (main CPU components or peripheral devices) have low MTBF values and others have high values. The bidders should be encouraged to propose reliable equipment. This may well result in equipment which has not been recently introduced. Madeira cannot be a test site for new hardware of any sort.

The MTTR value can be reduced by storing parts, by training EEM personnel in repair, and by a methodological system of device maintenance. All these areas were well addressed by UNIVAC in their proposal. In addition, however, there should be some means described of obtaining UNIVAC specialist help. Because of the problems of getting in and out of Madeira, it would be difficult to insist upon rapid response. This does not mean no attempt should be made in the final contract to address the issue; a

negotiated agreement with each bidder EEM thought a final contract might arise would be necessary.

B. Provisions for backup are not requested. The systems proposed by UNIVAC and IBM contained no dual or alternate software or hardware recommendations. We do not believe that EEM should be forced to buy two of all components. Peripheral failure is usually more frequent than main CPU failure, and such peripheral failures are as often "software downs" as "hardware downs". Such software/hardware backup techniques as dual ports on controllers, reserved and hence alternate CPU channels, dual read stations, and critical component inventory should be carefully addressed. The general idea of duality and alternate and/or reserved paths or channels would be presented to the bidders for their response.

C. Prepared software packages for the bidder's proposed system are not requested. It would be only a small effort to ask if a payroll system, an inventory system or other types of software packages are available from the bidder which will run on the proposed system. There is no good justification for writing a software system when a package can be obtained, unless the cost of the package demonstrably exceeds the development costs, and this is very unlikely.

The electric company should not request all software packages the bidder has to offer as this may be excessive, but EEM should specify the type of software needed as best as possible.

In the event that software packages are known which are desired but are not from bidders, a very possible situation as hardware vendors do not make it a primary concern to sell software packages, a description of the package should be included. This will allow bidders of the hardware system to specify what considerations are necessary to run the software. These considerations may include core size, compilers, peripherals, and meshing with the operating system.

- D. The method of use of the computer - batch, real-time, on-line conversational use - should be given. The bidders will match their capabilities to the uses described. The UNIVAC 90/25, for example, supports 3 telecommunications lines, half-duplex, and the 90/30 supports 24 lines, half duplex. If the RFP had stated that EEM wanted more than 3 conversational terminals, UNIVAC would have been forced to alter its bid.

Our investigation of the EEM proposed projects for the computer has turned up one real-time, on-line system. We do not know how UNIVAC, in its System 90 line of computers, handles this and as no conditions for real-time work were presented in the EEM letter - RFP, UNIVAC was not prepared to answer any real-time questions. This matter will now have to be investigated, after a detailed study of the real time application, to see if the UNIVAC System 90 series of computers supports real time in a way that meets EEM needs.

For batch work, the EEM should have stated whether the computer was for commercial or scientific work. Since the letter RFP requests COBOL and FORTRAN, and since EEM is an electric company, it is not unreasonable to ask how much engineering work in FORTRAN was anticipated. If the answer were 90% FORTRAN and 10% COBOL a bidder may well respond with a computer which is a "number cruncher" rather than one which is best for commercial, business operations.

- E. A general view of expansion capabilities should have been requested. The UNIVAC proposal showed that the 90/25 could be expanded to a 90/30, and the IBM proposal showed that the 370/115 could be expanded to a 370/125. Our investigation showed that the 90/30 could grow to a 90/40 or to a 90/50. The 90/70 and 90/80 use the OS/9 (not OS/3) operating system, and there are other differences among the 90 series, such as core size, compilers, peripheral support, etc. Not being aware of these differences clearly impedes the planning effort of EEM when considering new or enlarged applications of the system.
- This request would have been particularly appropriate since the EEM letter proposal makes it very plain that only the initial phase of EEM and RGM work would go on the bidder's system. The next and subsequent phases would clearly require an up grade and a general understanding of computer expansion capabilities would be very useful.
- F. Evaluation criteria must be set forth in the RFP. These criteria will reflect what EEM considers important, and

in so doing, will require EEM to decide more carefully what it wants as well as tell the bidders where EEM sees greater needs and what the relationship between price and technical offering is. For example, EEM may well place reliability high on the evaluation list due to Madeira's remoteness from the continent. The balance between cost evaluation and technical evaluation need not be 50% - 50%; EEM must decide whether cost or technical approach is more valuable and assign a higher number of evaluation points to the one or the other.

An available option is to separate technical responses from cost responses, evaluate the technical proposals separately from cost proposals, and then use a formula to combine the separate evaluations. If this option were used, the bidders should be requested to submit their cost proposal separate from their technical proposal.

Regardless of the method chosen, evaluation criteria not only inform bidders of the emphasis EEM places on proposal requirements, it also assures bidders of equal treatment in consideration of their proposal. There will not be, then, any favoritism to one vendor over all others.

THE UNIVAC PROPOSAL

The EEM procurement process resulted in the purchase of a UNIVAC 90/25. The contract from UNIVAC explained that the system could be upgraded to a 90/30. We looked into the matter of upgrading, and found that the series 90 has a broad range of models, including 90/40, 90/50, 90/70 and 90/80. We do not have manuals explaining the difference among these models, and proper use of such knowledge depends first upon a detailed system analysis anyway.

The final five chapters of the UNIVAC proposal (chapters 10 to 14) contain some contract terms and a summary of how UNIVAC meets the letter RFP requirements (chapter 14). Because some contract considerations are not as good as they should be, a few comments are presented on each of Chapters 10 to 13.

Chapter 10 covers terms of delivery. Sperry UNIVAC promises delivery within six months of the date of the contract unless there are import license delays. UNIVAC also allows for an extended delivery period if mutually agreed upon. This is a good clause, fair to both parties.

Chapter 11 states that the proposal is valid for 60 days from submission and that any alterations to the proposal must be in writing. This is also a good clause, but it should have been EEM which stated for how long the proposal was to be valid. This would reflect the length of time EEM needed to evaluate the proposals from all bidders. The period of time is known to EEM and not UNIVAC and so EEM should have stated the period. The 60 day time is adequate, however, so that the clause is acceptable as written.

Chapter 12 gives UNIVAC's conditions of payment. A payment of 25% is to be made on signing the contract, 50% of the total on delivery of equipment and spares, and the final 25% of the total within six months of the beginning of operations. This contract clause posed potential problems for EEM and UNIVAC. A slight rewording of the second payment - 50% of the total - would be better. The money should belong to UNIVAC after delivery, as only upon completion of the delivery of equipment and spares, can UNIVAC be said to have done its part.

On addition to this, the clause provides UNIVAC with 75% of the price before installation and operation. EEM has paid UNIVAC 100% of the price, through a bank note. There is not time period for installation, testing and turn over to EEM. In theory, therefore, UNIVAC could delay installation. No doubt UNIVAC would not delay, but the lack of protection for EEM should be changed.

For its part, UNIVAC does not stipulate when the site preparations must be ready. If UNIVAC were not to be paid until the physical computer site is ready, air conditioning, raised flooring, etc., then UNIVAC should require payment if the site is not ready by the completion of delivery. In fact, EEM should have the site preparations completed as soon as possible so that UNIVAC personnel could check all details in the event that corrections are needed.

In addition to installation and operation, EEM should have some sort of acceptance testing period. With a machine as small as the 90/25, this can be very brief. Since UNIVAC provided a list of firms which use UNIVAC equipment in continental Portugal (in chapter 13), EEM could have prepared for acceptance by borrowing

for a few days, someone who could make test runs or at least observe UNIVAC's own testing procedures. If this was not possible, or considered too expensive, or if EEM wished to do its own verification, then EEM should consider assigning someone to read UNIVAC's manuals on computer operations so that EEM could be satisfied. Such a person could also observe 90/25 operations in continental Portugal.

The issue here is not that UNIVAC would improperly install the computer. No doubt, UNIVAC personnel would be the first to announce that a hardware or software defect existed, and UNIVAC would promptly act to correct the defect. The acceptance period has two purposes. One to leave EEM satisfied that the 90/25 system is, in total, correct (a feeling that UNIVAC should try to create), and the other is to provide a criteria for the completion of UNIVAC work. The acceptance testing and time period is, therefore, for the benefit of both parties.

As the computer has not been installed at the time of the writing of this report due to EEM which has not completed the physical computer site, we cannot say that UNIVAC has no installation, testing, operation and acceptance plan. We expect they do have a thorough plan, but it is not stated in any way in the contract.

Finally, as the EEM and RGM are first time users of computer equipment, both UNIVAC and the Madeira people should be more careful than if experienced buyers were dealing with UNIVAC or if UNIVAC had a good working relationship in dealing with Madeira personnel. The best way to make UNIVAC react if problems arise is to withhold payment, and EEM simply doesn't have this course

of action available. This is true both contractually and in fact as all monies have been paid to UNIVAC through the EEM bank loan.

Chapter 13 lists references of Portuguese clients who are now using UNIVAC equipment, including System 90 equipment. We were, in our investigation, unable to find any contact made with these users for the purpose of evaluating UNIVAC hardware, software or support services. EEM, because it is a first time user, would benefit from discussions with other computer centers whose managers would explain how they went about the task of obtaining a computer, what mistakes were made that can be avoided, and various other pieces of advice.

Chapter 14 of the UNIVAC proposal is titled "Final Considerations". It contains a point-by-point summary of the proposal where each point corresponds to the point of the RFP. A brief summary of these points is made below:

1. UNIVAC proposes a 90/25, upgradable to a 90/30.
2. Memory capacity can expand to 524 K.
3. Initial disk capacity is 58 MB and may expand to 3,200 MB with 8433 disks and to 464 MB with 8318 disks.
4. A 500 LPM printer and a 300 CPM card reader is proposed. These may expand to 1000 CPM and 2000 LPM.
5. The 90/25 permits 3 lines of teleprocessing, half-duplex. The 90/30 permits 24 lines of teleprocessing, half-duplex.
6. The proposed system includes multiprogramming and multitasking.

7. In addition to COBOL; RPG II and FORTRAN, the system accommodates BASIC and Assembler.
8. The 90/25 can accommodate up to 8 UNISERVO 10 magnetic tape drives. The 90/30 can have attached a UNISERVO 10, UNISERVO 14 or UNISERVO 20.
9. Three keypunch machines are proposed.
10. Incidental costs (transportation, freight, insurance etc.) are estimated to be about 15% of the total value of the equipment. (Comment - about \$21,000) Costs for training EEM personnel will only occur if courses are taught in Madeira. Courses in Lisbon, selected from the general catalogue; are free and will require only EEM student per deim costs. The standard software for the system is furnished free. The Hardware will cost 6,870,732 escudos. (Comment this does not include spare parts, an additional 2,000,000 escudos. The hardware costs are then, \$143,140 + \$41,667 = \$184,807). The terms of delivery are within 6 months. Assistance may be had by sending two or three technicians to Lisbon for course work, costing 250,000 escudos (= \$5,200) plus per deim student costs. The method of payment is described in chapter 12 of the proposal and the characteristics of the installation site are given in chapter 9.
11. Chapter 8 states what personnel estimates are needed. This estimate may appear to be inflated but anticipates the future of the data center and unforeseen problems which may arise. (Comment - The personnel estimates from chapter 8 are: 1 data processing manager who is a

good analyst and if possible a programmer; 1 analyst-programmer; 2 programmers in RPG II who can become good in COBOL; 3 computer operators; and 6 data entry clerks).

12. Chapter 13 lists clients who have operations in Madeira. (Comment - this is not accurate, but is what is said by UNIVAC). The names of other clients who have 90/25 and 90/30 equipment will be given, if desired.

The summary chapter contains information not contained elsewhere - a bad practice. The UNISERVO 14 and UNISERVO 20 tape drives are introduced for the first time and no characteristics are given. The 8433 model disks are also mentioned for the first time.

Several summaries leave open questions. Summaries nos. 1, 5 and 8 distinguish between the 90/25 and 90/30 but summaries 2, 3 and 4 do not. A 90/25 cannot have 524 K but a 90/30 (as a maximum) can. However, a reader of the summary would not know that fact, in contrast to summary no. 8. In section 1.2 of the proposal, a good outline of the 90/30 - B is given. (Whether this is the same as a 90/30 or 90/30 - A, if such model numbers exist, is not stated). And chapter 6, less than 2 pages, encompass the whole discussion of expansion possibility. The reader of the proposal must cross - reference the main text to understand the summary correctly, and a properly written summary would not require an evaluator to do this.

One open question is in summary no. 10 where it is stated that the standard software is supplied free. What this software consists of is not stated. In addition to operating software (OS/3), compilers and system software such as ICAM (Integrated Communications Access Method) the UNIVAC proposal also describes

IMS/90. Is IMS/90 "standard software" within the meaning of the contract? UNIVAC would have been wiser to simply list all free software. This was the approach taken by IBM in its 370/115 proposal.

The proposal was accepted by EEM as it stood. There was no list of questions prepared and forwarded to UNIVAC. As we have shown, our investigation of the EEM situation and our past experience with hardware acquisition has revealed a number of weaknesses in the EEM Request For Proposal and the UNIVAC response. A list of questions and UNIVAC's responses would have gone a long way to repair these weaknesses. It's not our intention to severely criticize EEM and RGM or UNIVAC; rather it is our intent to point to improvements so that both sides can have a highly satisfactory relationship.

As noted earlier, UNIVAC has been paid in full. This was done by EEM, borrowing money from a bank for 2½ years, at 22.7% interest. The repayment schedule is 1,041,213 escudos on August 23, 1979 and every 6 months thereafter (Feb. 23, 1980, August 23, 1980, Feb. 23, 1981, August 23, 1981) until the final payment on Feb. 23, 1982. The interest amounts to slightly over 2,000,000 escudos, which 30.5% of the final amount contracted for of 6,741,279 escudos.

ATTACHMENT 7

HARDWARE TECHNICAL DETAILS

HARDWARE TECHNICAL DETAILS

The UNIVAC System 90/25 finally contracted for consists of the following:

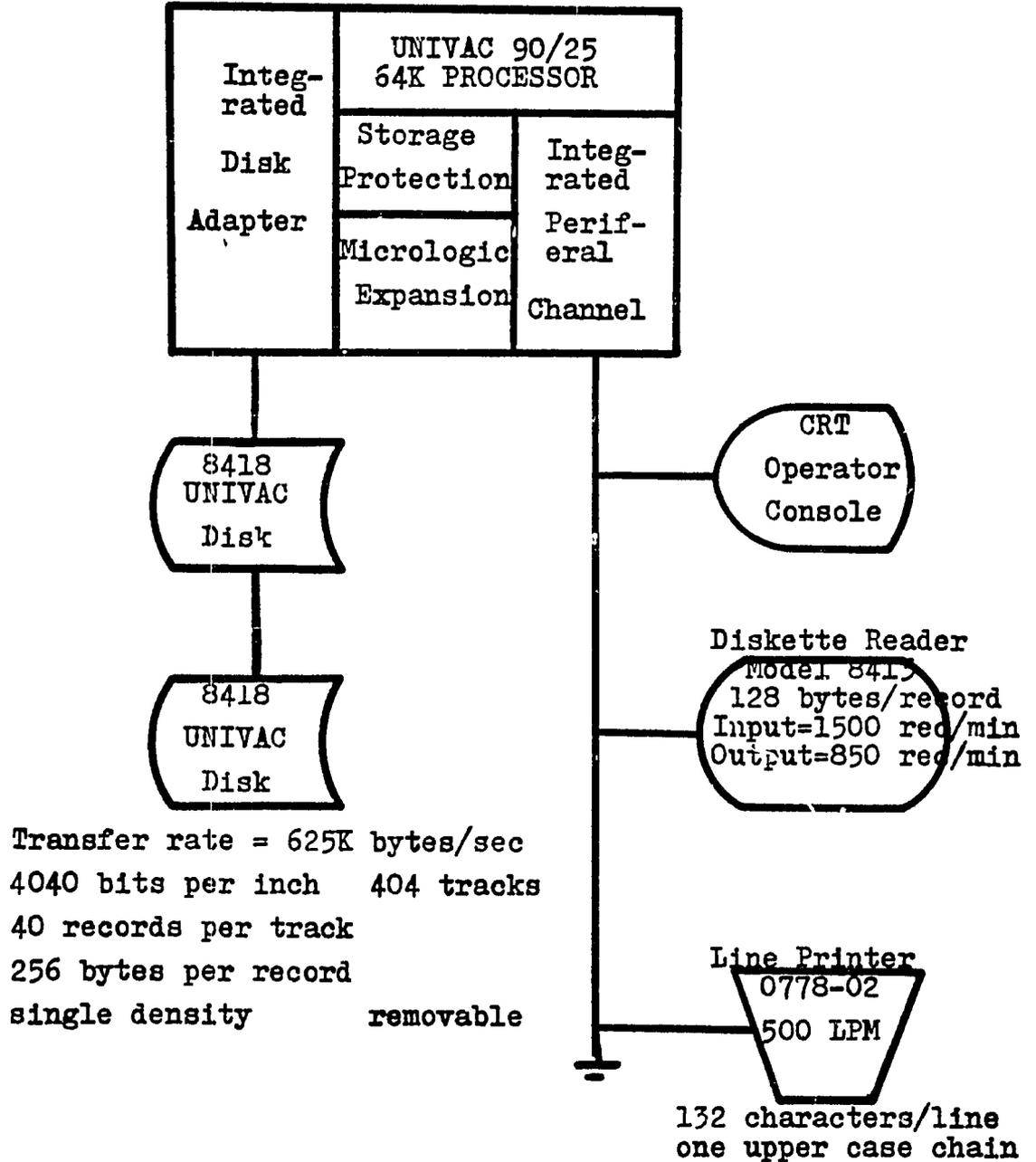
- Processor with 64 K bytes of memory.
- Storage Protection feature.
- Micrologic Expansion.
- Line Printer, 500 LPM.
- Line width increased from 120 to 132.
- Upper case only print chain.
- Integrated Disk Adapter.
- Two disk spindles, model 8418.
- Six disk packs for 8418 spindles.
- CRT video operator console.
- Diskette reader, model 8413.

A diagram of the configuration is shown on the next page, followed by a diagram of an initial recommendation for an upgraded system. The recommendations are tentative as our brief study did not enable us to obtain sufficient detail. The recommended items are:

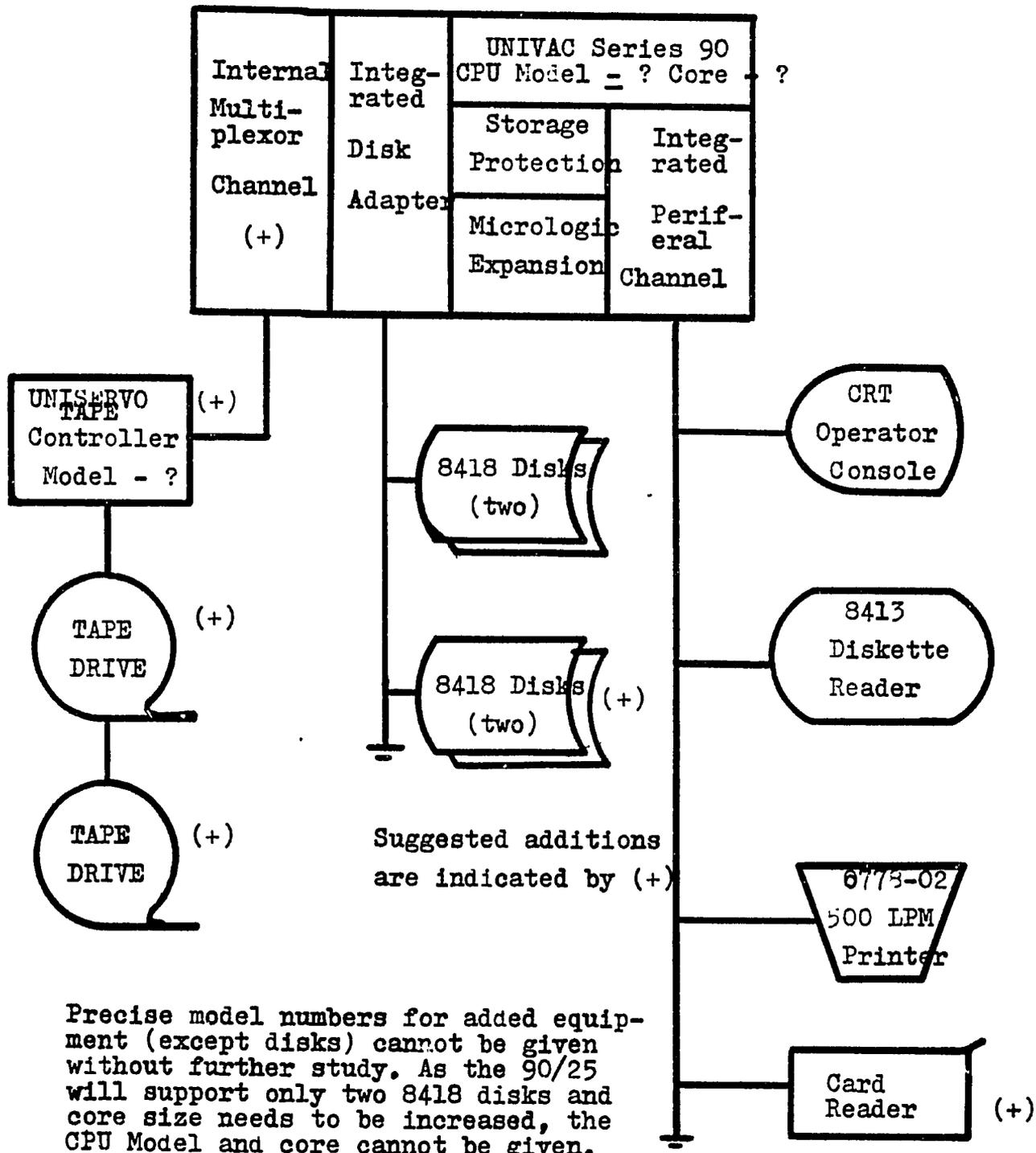
- Processor upgrade to model 90/30 or higher, with memory size tripled or better.
- Internal Multiplexor channel.
- UNISERVO tape controller and drives, model and number of drives uncertain.
- At least two additional 8418 disk spindles, and perhaps six additional disk packs.
- One card reader, 300 CPM.

EEM/RGM UNIVAC COMPUTER CONFIGURATION

AS OF OCT. 1, 1979



UPGRADED EEM/RGM UNIVAC CONFIGURATION



Precise model numbers for added equipment (except disks) cannot be given without further study. As the 90/25 will support only two 8418 disks and core size needs to be increased, the CPU Model and core cannot be given.

Not shown on the recommended up grade diagram is a mechanical card punch, without verification features. A preliminary investigation of the cost of up-grading the 90/25 to a 90/30 was made by the EEM Director of Data Processing. He assumed that the following changes were to be made:

- Change of 90/25 to 90/30, with 256 K bytes of memory.
- UNISERVO - 10 controller with two tape drives.
- Internal Multiplexor Channel (for UNISERVO - 10).
- Two additional 8418 disk spindles.
- One 300 LPM card reader.

The costs of this upgrade were estimated, by UNIVAC, at 8,000,000 escudos - more than the original configuration. EEM is, of course, anxious to study what is needed very carefully before getting anything added to the 90/25.

The diagram on the next page shows the configuration of the SPERRY UNIVAC Universal Distributed System 2000. This system was selected as the data entry system. Two charts from the UDS 2000 General Description manual are included, showing the UDS 2000 Basic System and the UDS 2000 Maximum System Hardware Configuration.

The UDS 2000 system has been in operation since July of 1979. There are six operators assigned. At present, there is no full-time data entry manager and the manager's role is being capably filled by the EEM experienced programmer. There has been one blown fuse since operations began. The data entry clerks are producing an average of from 10,000 to 12,000 key-strokes per hour. Sixty "Accutrack" diskettes were purchased, for 300 escudos each, from a Lisbon company. The diskettes

were manufactured in the U.S, by KYBE Corporation in Massachusetts.

The basic functions of the UDS 2000 are:

- Writing data to diskette.
- Verification (by sight or by keying) of a record.
- Searching for a record in an existing batch of records.
- Updating selected fields in an existing batch.
- Operator statistics on total records, keystrokes errors and time used.
- Record insertion and deletion.

The master work station differ from other stations only in that it has the system controller. The UDS 2000 manual states that it is useable on the 90/25 and 90/30 systems, and on other UNIVAC computer systems using the same communication protocol as the UDS 2000.

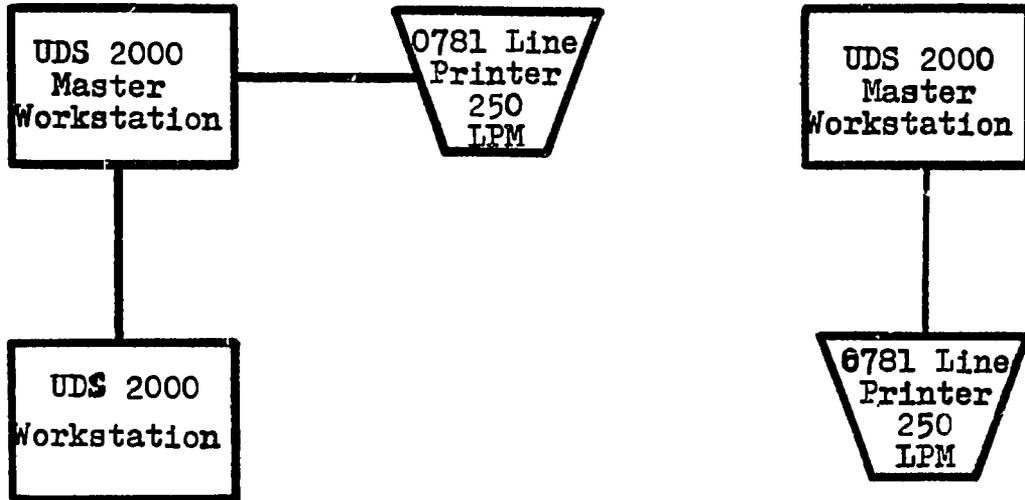
Our investigation of the UDS 2000 shows that it is being well used, and was a good choice of equipment.

ISE MINICOMPUTER

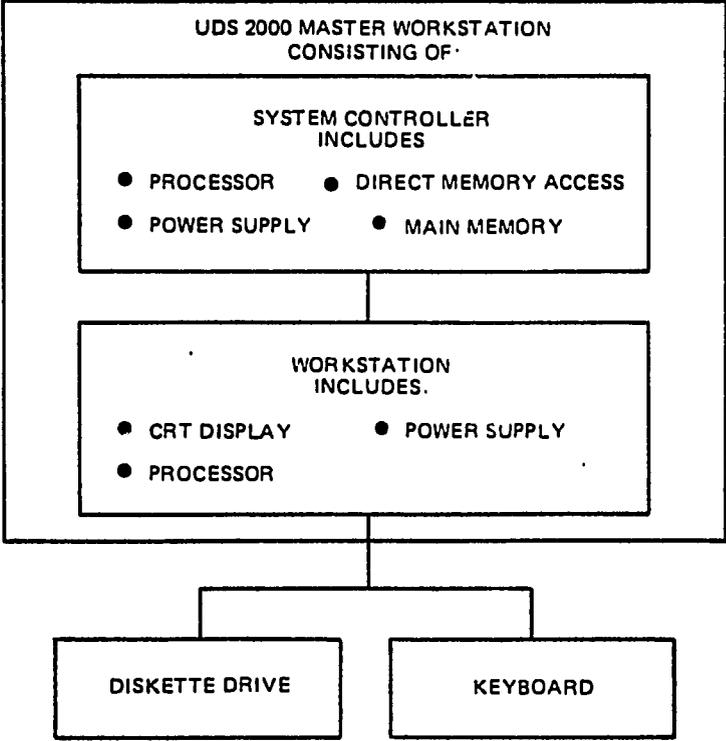
The ISE Computer System 80, according to its promotional literature, is a 4th generation device. The system consists of a central processor, a CRT video display, a character printer and input-output devices which may be (a) magnetic cassette tape, (b) floppy or mini-floppy disk, or (c) magnetic card.

The CPU is not a multiprocessor. Multiple CPUs may be joined to handle multiple tasks simultaneously. The CPU is integrated circuit LSI (Large Scale Integration), with Texas Instruments as the circuit manufacturer. Internal operations

EEM/RGM DATA ENTRY SYSTEM AS OF OCT. 1, 1979
UNIVAC UNIVERSAL DISTRIBUTED SYSTEM 2000



Each diskette is single density, 128 bytes per record. All three workstations have one diskette drive, a CRT video display and a moveable keyboard.



UDS 2000 Basic System Hardware Configuration

are hexadecimal and standard memory size goes up to 48 K. A Keyboard is used for manual data entry with 10 numeric keys, 49 alphanumeric keys and 6 program function keys, used for operator commands and program decisions.

The system will read in a program stored on cassette tape or (mini-) floppy disk. The program will then sequentially process the input file while allowing the operator to respond to prompts on the CRT. So far as could be determined an operator must be present during all program execution time to respond to system or program prompts or to insert next magnetic card, cassette tape or floppy disk.

The floppy disks are imitations of IBM 3740 floppy disks. The total capacity is 256,256 bytes and each sector has 128 bytes. The mini-floppy disks have the same sector size and 81,920 total bytes, one third of the IBM type floppy disks. The ISE programmers stated that the data format could be made compatible with the UNIVAC diskette system.

The magnetic cards have a strip of magnetically sensitive metal on one edge. The strip can hold 1024 characters. Output is onto the card itself with the character printer. The cards are the simplest input mechanism available and are being used exclusively as the file system on one ISE system 80.

The character printer is wide carriage (200 characters per line) and can accept forms with up to 6 copies. Up to two devices may be attached and run simultaneously, allowing two output files to be printed (e.g. individual payroll and section summary). Our visit to one ISE System 80 showed this process of two forms being printed upon in operation for a payroll. Character sets available include both upper case and upper/lower case.

ATTACHMENT 8

**LETTER FOR REQUEST
FOR PROPOSAL**

INSTALLATION OF COMPUTER EQUIPMENT

Gentlemen,

This company is decidedly interested in installing computer equipment for automating services with the ability to automatically process data. However we find ourselves in a clearly basic phase in all things related to data processing.

We are absolutely committed to overcoming all the difficulties so that we will find a convenient solution for every problem that arises.

It is with the desire to know your intentions to meet our desires that we are writing to you requesting that you be so kind as to present us with your conditions on or before April 18.

You must, in your proposal, consider the following questions:

1. The company desires the installation of equipment that will serve the company itself, the Regional Government of Madeira, and, eventually, the municipal government of Funchal.
2. The equipment must have a large capability of expansion with memory capacity from 32 K to at least 262 K.
3. Initial disk capacity of approximately 60 MB.
4. Have an attached printer of medium speed and a card reader also of medium speed.
5. Future possibility of teleprocessing
6. Utilization of multiprogramming
7. Use of standard (COBOL, RPG and FORTRAN) languages

8. Eventual incorporation of magnetic tape
9. Equipment for data gathering on cards and or on a magnetic device (initially there will be two work stations) which utilize check-digit
10. You must indicate all expenses resulting from the installation of equipment, training of personnel software, hardware, etc., the terms of delivery, the methods of assistance, the conditions of payment in the eventuality of purchase, and the site preparation for the installation of the equipment.
11. We intend to take into consideration, for the equipment, only the volume of work of EEM in this initial phase, and considering the following, we desire that you tell us the staff of people necessary to make normal use of the equipment.

We have:

- a. punch - 1,600,000 strokes per month
 - b. print - 250,000 lines per month
 - c. disk space - approximately 12 MB
12. We would be grateful also for a list of actual users of your equipment who are connected to services for the island of Madeira.

Sincerely yours,

ATTACHMENT 9

RGM TELEX TO UNIVAC

28 April 1979

72105 COREMA P
10.54
12694?
12694 UNIVAC P
72105 COREMA P

386/79 28/4

To: Exm^o. Senhor
Dr. José Vaz Pinto
Secção de Vendas - UNIVAC

FM: Secretaria Regional do Planeamento e Finanças / Madeira

O Centro de Informatica da Empresa de Electricidade da Madeira, ao ser integrado no Governo Regional passará a servir o Sector Público da Região Autónoma da Madeira. Assim, por, Secretarias Regionais, são consideradas tarefas prioritárias:

SECRETARIA REGIONAL DO EQUIPAMENTO SOCIAL:

- Fichas de pessoal
- Elaboração de horários para distribuição de água.
- Processamento recibos de água
- Processamento de vencimentos de pessoal.
- Obras.
 - Medição de trabalhos, revisão de preços.
 - Custos obras de administração directa.
 - Gestão de stocks (materiais, peças e máquinas).
 - Índices de revisão de preços.
- Aplicação à engenharia do computador (numa fase posterior, actualmente recorre-se ao computador do LNEC)

SECRETARIA REGIONAL DE EDUCAÇÃO E CULTURA

- Processamento de vencimentos de pessoal.
- Processamento de despesas (Orçamentologia).
- Colocação de professores.
- Inventariação permanente de material escolar.

SECRETARIA REGIONAL DOS ASSUNTOS SOCIAIS:

- Processamento de vencimentos de pessoal
- Gestão de stocks.
- Contabilidade Orçamental.
- Estatística movimento hospitalar.

SECRETARIA REGIONAL DO TRABALHO:

- Processamento de vencimentos de pessoal.
- Tratamento de mapas de pessoal.
- Subsídio de desemprego.
- Candidatos a emprego.
- Acidentes de trabalho.

SECRETARIA REGIONAL DE AGRICULTURA E PESCAS:

- Processamento de vencimentos.
- Tratamento do volume do pescado, por zonas estatísticas de pesca
- Número de embarcações.

SECRETARIA REGIONAL DE ECONOMIA:

- Processamento de vencimentos.
- Registo de importações e exportações.
- Processamento licenças de condução
- Índice de Produção Industrial.

Com os melhores cumprimentos.

O SECRETARIO REGIONAL,
(José António Camacho)

12694 UNIVAC P

72105 GOREMA P

007,1

V

TELEX ON APRIL 20, 1979 TO UNIVAC, LISBON
ATTENTION OF DR. JOSÉ VAZ PINTO, EEM SALES REP.

FROM: Regional Secretary of Planning and Finance, Madeira

The Information Center of EEM will be combined with the Regional Government to serve the public sector of the Autonomous Region of Madeira. So, through the Regional Secretary, we are considering these tasks and priorities:

Regional Secretary of Social Services

- Personnel files
- Preparation for planning water distribution
- Bill processing for water
- Payroll processing
- Public works
 - Work Evaluation and price revisions
 - Administrative costs of work
 - Inventory Management (materials, spare parts and machines)
 - Price Revision Index
- Engineering Applications on the computer (in a later phase, currently we are using the computer at National Laboratory of Civil Engineering)

Regional Secretary of Education And Culture

- Payroll processing
- Expenses processing (Budget)
- Teacher placement
- Inventory of school materials

Regional Secretary of Social Affairs

- Payroll processing
- Inventory management
- Budget and accountability
- Statistics on hospitalization

Regional Secretary of Work

- Payroll processing
- Processing of personnel charts
- Unemployment compensation
- Employment application
- Work accidents

Regional Secretary of Agriculture and Fishing

- Payroll processing
- Study of fishing, by fishing zone
- Number of fishing boats.

Regional Secretary of Economics

- Payroll processing

- Import and export registration
- Driving licence processing
- Industrial Production Index

With my sincere compliments,

The Regional Secretary,

José António Camacho

ATTACHMENT 10

RGM TELEX TO UNIVAC

19 SEPT. 1979

TELEX

A

U.N.I.V.A.C (Telex 12694 Univac P)

Ao c/ do Dr. Vaz Pinto

Solicita-se resposta às seguintes questões no seguimento dos contactos havidos entre esta Secretaria e V. Ex^ª:

- 1 - Preços para a elevação do nível de qualidade de 90/25 para 90/30 , 90/40 e 90/50 incluindo todos os periféricos.
- 2 - Características e resultados dos controladores dos transportes dos discos e dos reprodutores das bandas magnéticas.
- 3 - Viabilidade e exigências para usar os compiladores de nível 4 "(COBOL, FORTRAN ASSEMBLER, ETC". e características de cada um dos compiladores.
- 4 - Exigências do C.P.U. e periféricos para ACS (Accounting Control System) e o Software do IHS 90. Também as exigências para telecomunicações para o IMS 90.
- 5 - Assistência na programação de sistemas "Sysgen, telecomunicações, etc."
- 6 - Todas as rotinas "Packages" (sistemas e aplicações) com as exigências do sistema (memória e periféricos necessários).

Com os melhores cumprimentos.

O SECRETARIO REGIONAL,

José António Camacho

TELEX ON SEPT. 19, 1979 TO UNIVAC, LISBON
ATTENTION OF DR. JOSE VAZ PINTO, BEM SALES REP.

We request your response to the following questions with regard to the existing contract between this Secretariat and yourselves:

1. Prices to upgrade the 90/25 to 90/30, 90/40 and 90/50 including all peripherals.
2. Characteristics and performance of tape and disk controllers and devices.
3. Possibility and requirements of compilers of level 4 for COBOL, FORTRAN, Assembler, Etc. and the characteristics of each compiler.
4. Requirements of the CPU and peripherals for ACS (Accounting Control System) and the software of IMS 90. Also the requirements for the IMS 90 telecommunications.
5. Assistance in system programming (SYSGEN, telecommunication, etc.)
6. All the package routines (systems and applications) with all the system requirements (memory and peripherals) necessary.

With my sincere compliments

The Regional Secretary of Planning
and Finance

José António Camacho

ATTACHMENT 11

MANUALS AT EEM

MANUALS AT EEM

The following list of manuals was created during our investigation. The EEM has no list themselves and no one is either officially or unofficially in charge of the computer library.

A. Instruction manuals by UNIVAC in Portuguese:

1. UNIVAC Catálogo de Curso (2 copies)
2. Conceitos Sobre Fincheiros em Banda e Disco (18 copies)
3. Introdução Ao Processamento Electronico de Dados Manual de Instrução Programada (18 copies)
4. Sistemas de Numeração e Representação da Informação em Memoraia (18 copies)
5. CAMEL - Manual de Programação (8 copies)

The above manuals are by the Sperry UNIVAC Departamento de Educação. The source (Portugal or Brazil) is not stated and the dates of publication are not given.

B. The following manuals are in English. The EEM library has two copies of these manuals.

The first group is for Sperry Univac Operating System/3 (OS/3)

1. Report Program Generator II (RPG II) User Guide/
Programmer Reference
2. Job Control
3. System Service Programs (SSP)

- | | | |
|-----|---|--|
| 4. | Sort/Merge | User Guide/Programmer Ref. |
| 5. | Data Management | " " |
| 6. | Data Utilities | " " |
| 7. | System Installation | " " |
| 8. | Supervisor | " " |
| 9. | Assembler | " " |
| 10. | BASIC COBOL | Supplementary Reference |
| 11. | Extended COBOL | " " |
| 12. | Extended FORTRAN | " " |
| 13. | FORTRAN User Guide/ | " " |
| 14. | Communications Adapter Subsystem Reference | |
| 15. | Data Base Management System 90 (DMS 90) has 3 manuals: | |
| | a. | Data Description Language Programmer Ref. |
| | b. | Data Manipulation Language Programmer Ref. |
| | c. | System Support Functions User Guide/Prog. Ref. |
| 16. | Fundamentals of Integrated Communications Access Method (ICAM) User Guide | |
| 17. | Integrated Communications Access Method (ICAM) Programmer Reference | |
| 18. | There are four ICAM manuals, subtitled as shown: | |
| | a. | Direct Data Interface (DDI) User Guide |
| | b. | Standard MCP Interface (STDMCP) User Guide |
| | c. | Transaction Control Interface (TCI) User Guide |
| | d. | Utilities |

The manuals listed so far are all a part of the Sperry Univac Operating System/3 (OS/3). The next two groups of manual are separate from OS/3.

C. SPERRY UNIVAC SERIES 90 MANUALS:

1. Management Control System/90 (MCS 90) Prog. Ref.
2. Linear Programming System/90 (LPS 90) Prog. Ref.
3. Critical Path Method/30 (CPM/30) User Guide
Prog. Ref.
4. Information Management System 90 (IMS 90)
 - a. Programmer Reference
 - b. System Support Functions: User/Guide
Programmer Reference

D. SPERRY UNIVAC UNIVERSAL DISTRIBUTED SYSTEM 2000 MANUALS:

1. General Description
2. System Reference
3. Operator's Reference
4. Operator's Quick Reference Guide

ATTACHMENT 12

**CHAPTERS 10 THROUGH 14
OF THE UNIVAC PROPOSAL**

Chapters 10 to 14 of UNIVAC Proposal.

Chapter 10. TERMS OF DELIVERY

The terms of delivery of the SPERRY UNIVAC 90/25 will be within six months of the date of the contract unless delays are caused by problems in obtaining the import license. The time frame may be extended provided both parties are in agreement.

Chapter 11. TERMS OF VALIDITY

This proposal is valid for 60 days from the date of the proposal. Any alterations to this proposal must be requested in writing.

Chapter 12. CONDITIONS OF PAYMENT

SPERRY UNIVAC proposes the following conditions of payment for the equipment and spare parts.

- 25% of the total upon contract award
- 50% on delivery of equipment and spares
- 25% in installments within six months of the beginning of equipment operation.

The cost of importation whether of equipment or spares as well as all other charges to the EEM account must be paid within 30 days of the date of invoice.

Chapter 13. REFERENCES

As you requested, we list below the names of our clients who, we believe, have links with services in Madeira.

<u>Client</u>	<u>System Installed</u>
Caixa Nacional de Pensões	1100/41 + 9300 II + 1005
Electricidade de Portugal	1106
Ministério das Finanças	90/70
Correios e Telecomunicações de Portugal	90/60 + 9480
Instituto Nacional de Estatística	9480
Empresa Pública das Águas de Lisboa	90/30
Banco Espírito Santo e Comercial de Lisboa	2 of 90/70

Chapter 14. FINAL CONSIDERATIONS

We believe that we have responded to all of the questions in your Request for Proposal, but permit us, with the idea making clearer the conditions we have presented, in this chapter, to restate briefly the conditions, following as closely as possible, the order in which they were asked.

- 1) The proposed equipment is a Sperry Univac 90/25 which must be upgraded to a 90/30 within 3 years.
- 2) The capability of the proposed equipment to expand memory capacity to 524 K has been clearly explained.

- 3) The proposed initial capacity is 58 MB. It may, however, be expanded to 3,200 MB with 0433 disks, and to 464 MB with 8418 double density disks.
- 4) The proposed equipment includes a 500 line per minute printer and a 300 card per minute card reader. The card reader, however, may be upgraded to 1000 CPM and the printer to 2000 LPM.
- 5) The System 90/25 permits teleprocessing with 3 lines half-duplexed. The System 90/30 permits operations with 24 lines half-duplexed.
- 6) The system may include multiprogramming and multitasking executing, concurrently, 7 programs and 256 tasks, with core available and the size of the programs permitting.
- 7) As well as using the standard programming languages (COBOL, RPG II, FORTRAN), the system also accommodates BASIC and Assembler.
- 8) The 90/25 can use up to 8 UNISERVO 10 magnetic tape drives. The System 90/30 in addition to the UNISERVO 10 may also use the UNISERVO 14 or UNISERVO 20.
- 9) For the reasons indicated, we propose keypunch machines (three keypunch machines, all with the check-digit feature).
- 10) The cost of equipment installation beyond those costs resulting from importation, that is to say, transportation, freight charges and insurance, will be invoiced against receipt of supporting documents. We estimate

mate all of these expenses should be about 15% of the total value of the equipment.

Costs for training personnel will only be incurred if you choose to teach the courses in Madeira. If the courses are given in Lisbon following the general course outline, of Sperry Univac, the only costs will be the per diem expenses of the students during their stay in Lisbon.

The standard software necessary for operation of the system is furnished without charge to EEM. The hardware as described will cost in all 6,870,732\$00 escudos.

The terms of delivery will be six months unless unforeseen importation difficulties arise.

As for assistance, the method most economical is to select two or three technicians from EEM and send them for a course, which will be arranged in Lisbon. The course will cost 250,000\$00 Escudos beyond the per diem expenses of the personnel selected.

The method of payment is explained in Chapter 12 of this proposal.

The characteristics for the installation site are described in Chapter 9 of this proposal.

- 11) We describe in Chapter 8 what personnel will be needed, as we understand the situation, to staff the future EEM computer center. We feel that the number of personnel is inflated in relation to the start up phase but it appears to us that we must consider the future of the compu

tor center and thus anticipate problems which may arise in the future.

- 12) In chapter 13 we list those of our clients who have operations linked to Madeira.

In case EEM is interested, we will happily provide the names of many other clients with our equipment such as 90/25 and 90/30.

10. PRAZO DE ENTREGA

O prazo de entrega do sistema SPERRY UNIVAC 90/25 é de seis meses contados a partir da data da assinatura do contrato, salvo dificuldades na obtenção do respectivo licenciamento de importação.

Este prazo, ^{pode} no entanto, ser dilatado em função do planeamento da actividades do utilizador, a elaborar de acordo com a SPERRY UNIVAC.

11. PRAZO DE VALIDADE

O prazo de validade desta proposta é de sessenta dias contados a partir da data da mesma.

Qualquer prorrogação deste prazo deve ser solicitada por escrito.

12. CONDIÇÕES DE PAGAMENTO

A SPERRY UNIVAC propõe as seguintes condições de pagamento para o equipamento proposto e para o stock de peças de reserva:

25% do total na data de assinatura do contrato

50% na data da entrega do equipamento e das peças de reserva

25% em prestações a pagar nos 6 meses subsequentes à data do entrada em funcionamento do equipamento.

As despesas com a importação quer do equipamento quer das peças de reserva bem como todos os outros encargos de conta de E.E.M. deverão ser pagos num prazo de 30 dias após a data da respectiva factura.

13. REFERÊNCIAS

De acordo com o solicitado na vossa consulta, seguidamente indicamos nomes de nossos clientes, que, supomos têm ligação com Serviços da Ilha da Madeira:

- 6.- O sistema pode ser utilizado em multi-programação e multi-tasking, podendo realizar, em concorrência, até 7 programas e 256 "tasks", conforme a quantidade de memória disponível e o comprimento dos programas.
- 7.- Além de utilizar as linguagens standard indicadas (COBOL, RPG II, FORTRAN), o sistema aceita ainda as linguagens BASIC e ASSEMBLER.
- 8.- O 90/25 pode conectar até 8 unidades de banda UNISERVO 10. O sistema 90/30, além deste tipo de unidades de banda pode ainda conectar bandas do tipo UNISERVO 14 ou UNISERVO 20.
- 9.- Pelas razões que indicamos, propomos equipamento de perfuração de cartões (três máquinas, todas com chave dígito).
- 10.- As despesas com a instalação do equipamento além das que derivam da sua importação, referem-se a transportes, fretes e seguros e serão facturadas contra a apresentação dos documentos comprovativos. Estimamos que todas estas despesas andem à volta de 15% do valor total do equipamento.

As despesas com a formação do pessoal só existirão se se optar pela realização de cursos na Ilha da Madeira. Se os cursos forem dados em Lisboa e enquadrados no plano geral de cursos da SPERRY UNIVAC os encargos a considerar serão apenas aqueles que derivam da deslocação dos alunos e da sua estadia em Lisboa.

O software standard necessário para a normal exploração do sistema é fornecido sem encargos para a E.E.II. O hardware, tal como foi indicado, é vendido pelo valor total de 6 870 732.000 (seis milhões oitocentos e setenta mil setecentos e trinta e dois escudos).

O prazo de entrega é de 6 meses, salvo dificuldades imprevistas na importação do equipamento.

No que se refere à assistência, a forma mais económica de a encarar será pela realização, em Lisboa, de um curso no qual serão preparados 2 ou três técnicos designados pela E.E.II. Esse curso importará em

250 000\$00 além das despesas com a deslocação e estadia dos elementos escolhidos.

A forma de pagamento vem indicada no capítulo 12 desta proposta.

As características para o local de instalação estão descritas ao longo do capítulo 9 desta proposta.

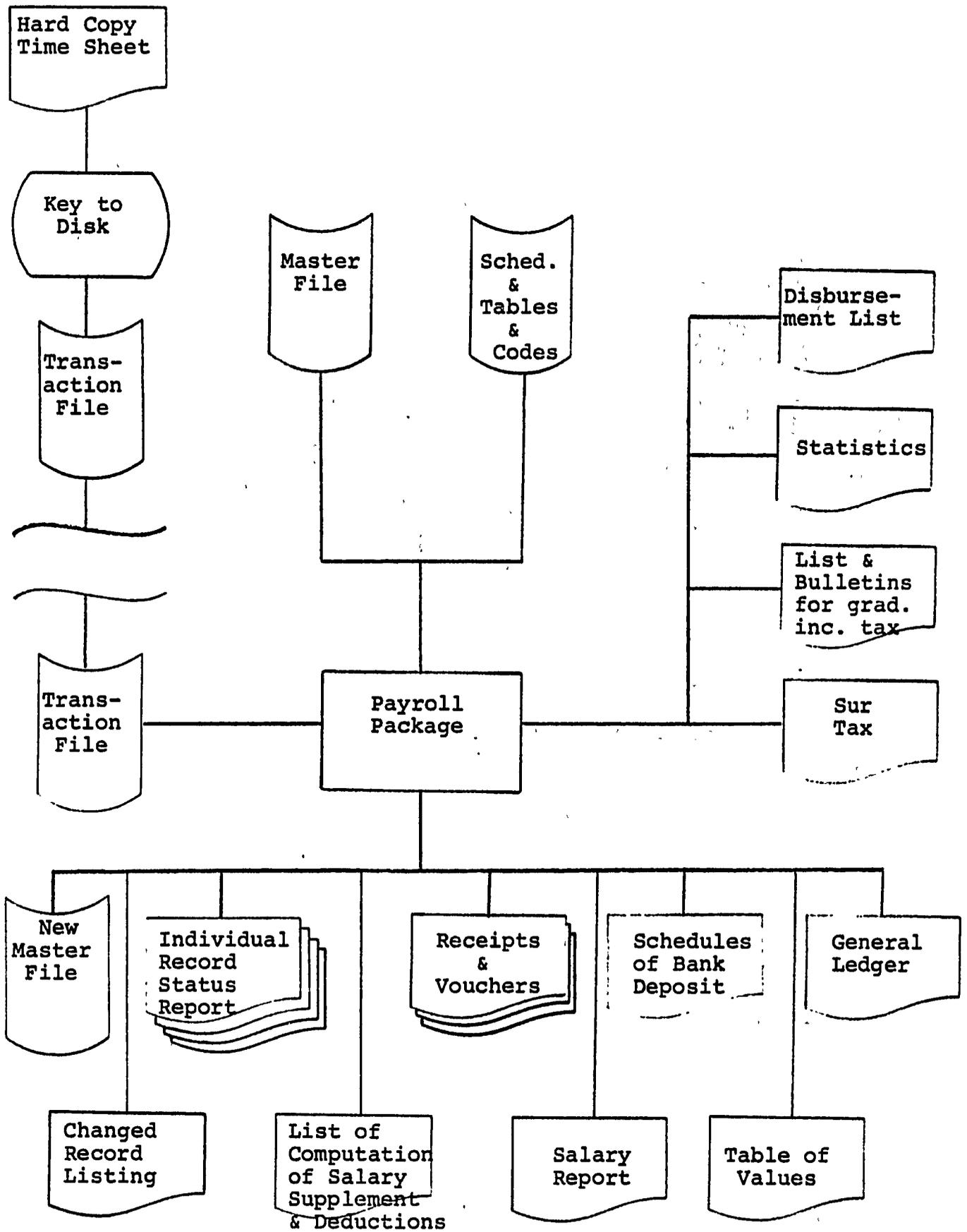
11.- Indicámos no capítulo 8 qual o pessoal que, em nosso entender, deveria constituir o futuro centro da E.E.M. Sentimos que o número de pessoas indicado está sobredimensionado em relação à fase de arranque mas parece-nos que devemos ter em conta o futuro do centro, de modo a serem prevenidos problemas que possam vir a surgir.

12.- No capítulo 13 indicamos quais os clientes de equipamento UNIVAC que nos parece terem ligações com serviços da Ilha da Madeira.

Existem, no entanto, muitos outros clientes com equipamento da SPERRY UNIVAC, nomeadamente com 90/25 e 90/30, cuja relação forneceremos com muito gosto, no caso de a E.E.M. nela estar interessada.

ATTACHMENT 13

**DESCRIPTION OF PAYROLL
AND ACCOUNTING
PACKAGES OF THE
NATIONAL SOAP COMPANY OF LISBON**



E. E. S.		DATA 16 JUL 1979	
ENTRADA		N.º 048	
GEP <input type="checkbox"/>	SEH <input type="checkbox"/>	SAT <input type="checkbox"/>	SP <input type="checkbox"/>
CA <input type="checkbox"/>	ZPO <input type="checkbox"/>	ZDC <input type="checkbox"/>	ZOL <input type="checkbox"/>
TB <input type="checkbox"/>	OT <input type="checkbox"/>	CT <input type="checkbox"/>	AP <input type="checkbox"/>
Proc. n.º		FAC <input type="checkbox"/>	LC <input type="checkbox"/>
EMPRESA DE ELECTRICIDADE DA MADEIRA			
Avenida do Mar, 32. 1. ...			
FUNCHAL			

CI/AF/VH

10/7/79

À atenção do Exmo. Conselho de Gerência

1. Na sequência de reuniões efectuadas com o vosso colaborador Sr. Engº João Mendes, em que procedemos à descrição de diversas aplicações de computador elaboradas pelo Centro de Informática desta Sociedade, apresentamos uma proposta com as condições de cedência à Empresa de Electricidade da Madeira dos respectivos programas, prestação de apoio para lançamento dos trabalhos e treino do Pessoal. Ficamos, entretanto, disponíveis para prestação de eventuais esclarecimentos complementares que venham a ser considerados necessários.

Sem outro assunto, de momento, subscrevemo-nos com elevada consideração,

De V. Exas
Atentamente

Sociedade Nacional de ...

[Handwritten signature]

C/C Sr. Engº João Mendes

1 - INTRODUÇÃO

1.1 - A estrutura das aplicações abrangidas por esta proposta ajusta-se aos diferentes fluxos de dados a tratar, tanto em volume como em frequência. Precedendo a descrição contida nesta proposta destacamos alguns detalhes importantes que valorizam os "packages":

- Foram organizados para Empresas nacionais, considerando os seus condicionalismos e problemas específicos;
- Estão ao serviço de diversos utilizadores;
- A sua implementação foi conseguida após vasta experiência adquirida por pessoal treinado nestes domínios;
- Foram objecto de apreciação favorável por parte de técnicos de Países possuidores de tecnologia avançada no processamento de dados.
- Linguagem de programação adoptada: COBOL;

O tipo de organização destas aplicações permite um lançamento bastante rápido, para exploração em batch.

Para descrição dos "packages" escolhemos um método essencialmente descritivo com vista a proporcionar uma informação mais clara sobre os ficheiros, as possibilidades de tratamento, a extensão e variedade do out-put. Alguns desenhos incluídos no texto destinam-se a simplificar a exposição, não fazendo parte da documentação técnica respeitante aos sistemas. Esta é constituída por organigramas, desenhos de ficheiros, lay-out de mapas, especificações de exploração e listagens de programas.

1.2 - O Centro de Informática da SNS é uma unidade operacional organizada com vista ao processamento de dados e à produção de software para diversos utilizadores.

No decurso da sua actividade desenvolveu um conjunto de "packages" que, além de funcionarem no seu Service Bureau, têm sido transaccionados com Empresas exteriores.

• Clientes do Centro de Informática SNS:

Service Bureau

- Fábrica Nacional de Margarina, Lda
- Vitamealo Portuguesa, Lda.
- Sovendal, Lda.
- Sociedade Nacional de Sabões, Lda
- Synres Portuguesa, SARL
- Sovena, SARL
- Mensor, Lda.
- Previnil, SARL
- Moapão
- Pedro S. Pires, Lda.
- Colgate-Palmolive Portuguesa, Lda
- Ciosa
- Mobil Oil Portuguesa, SARL

Empresas que compraram "packages":

- Livraria Bertrand (vencimentos)
- Tickett Restaurant
- Reckitt Portuguesa
- Oril
- Fábrica de Chocolates Regina

2 - VENCIMENTOS (PESSOAL)

2.1 - DESCRIÇÃO GERAL

O "package" inclui todos os impressos necessários ao processamento de vencimentos. Este sistema facilita a articulação com diversos utilizadores e permite lançar os respectivos trabalhos em prazos curtos.

As alterações para o processamento (horas extraordinárias, faltas, licenças, etc.) são inscritas em fichas previamente preparadas pelo computador com a vantagem de permitir melhor qualidade e rapidez no registo dos dados. Estas informações são apenas quantitativas; o "package" executa todas as operações de cálculo e de ajustamento.

Assim, as situações que provocam alterações ao salário mensal, no que respeita aos abonos e aos descontos, aparecem automaticamente valorizadas.

Do conjunto do "out-put" destacamos o

MAPA DE CÁLCULO DE ABONOS E DESCONTOS

pela variedade de informações que apresenta. Trata-se de uma síntese do processamento mensal, oferecendo a possibilidade de controlar, por empregado, os descontos legais e taxas acumulados desde o início do ano, ao mesmo tempo que determina e ajusta a taxa do Imposto Profissional.

O "package" produz também todos os mapas necessários para efeitos legais e fiscais, incluindo o registo das horas extraordinárias e do trabalho em dias de descanso.

Com vista à utilização da Contabilidade, produzem quadros resumo dos valores processados e mapas de imputação, podendo estes considerar-se como informações utilizáveis a outros níveis do Management da Empresa.

No que respeita às capacidades de tratamento, o sistema aceita até 23 alterações por empregado em cada mês.

2.2 - DESCRIÇÃO DE FICHEIROS

2.2.1 - MESTRE DE PESSOA

Conteúdo correspondente à ficha de abertura
- ANEXO 1

2.2.2 - FICHEIRO DE MOVIMENTOS

Conteúdo:

- Código de Empresa
- Nº de empregado
- Código de alteração
- " " inversão de alteração
- " " desconto
- Designação da alteração
- Horas
- Valor hora
- Valor da alteração
- Data

2.2.3 - TABELAS E CÓDIGOS

- Mestres de alterações
- " " Sindicatos
- " " Empresa e Caixa de
Previdência
- Mestres de Categorias profissionais
- Tabela para cálculo do Imposto
Profissional
- Tabela para cálculo do desconto
para Previdência
- Tabela para cálculo do desconto
para Fundo Desemprego
- Tabela para cálculo do Imposto de
Selo

2.3.6 - LISTAS DE DEPÓSITOS BANCÁRIOS

Contêm, por agência bancária (codificada no ficheiro mestre de empregados):

- Nº da Conta
- Nome do empregado
- Valor a pagar (o Abono de Família pode ser incluído)

2.3.7 - QUADRO RESUMO DOS VALORES PROCESSADOS

Por grupos e/ou secções:

abonos	código de alteração
descontos	valor " "

2.3.8 - FOLHAS PARA CAIXA DE PREVIDÊNCIA

MAPAS PARA SINDICATOS

LISTAS FNAF

REGISTO DE HORAS EXTRAORDINÁRIAS

Trata-se dos mapas necessários para efeitos legais.

Este out-put obedece aos requisitos estabelecidos e é aceite pelos Departamentos oficiais.

2.3.9 - MAPAS DE IMPUTAÇÃO

Contêm, por Secção ou por Conta de Imputação, os valores processados e os correspondentes encargos sociais e fiscais da Empresa.

Estes mapas são complementados com alterações devidas a trabalho efectuado em obras, noutras secções ou para terceiro:

2.3.10 - ESTATÍSTICAS

Há 2 tipos de relatórios, por secção

- horas extraordinárias
- absentismo

2.3.11 - MAPAS E BOLETINS PARA IMPOSTO
PROFISSIONAL

No fim de cada ano é emitido uma lista para conferência dos valores do imposto profissional e eventuais correcções. Produzem-se seguidamente os modelos 8 e 8A.

2.3.12 - IMPOSTO COMPLEMENTAR

Emissão das declarações a entregar aos Empregados.

2.3.13 - OUTRAS POSSIBILIDADES

- Correcção, se necessária, dos valores acumulados por empregado;
- No processamento de vencimentos há possibilidade de corrigir valores depois do cálculo mas antes da emissão dos recibos.

3 - CONTABILIDADE FINANCEIRA E ANALÍTICA

3.1 - GENERALIDADES

O "package" de Contabilidade está estruturado de forma a obter um tratamento completo de elementos básicos de fácil recolha. Assim, os dados a tratar (movimentos) podem ser registados a partir dos documentos originais, devidamente classificados com códigos de

- Diário Auxiliar
- Conta (da Contabilidade Geral)
- Centro de Custo (opcional)
- Operação

É possível trabalhar também sobre listas intermédias de lançamentos, evitando a saída dos papéis originais do Serviço de Contabilidade.

O sistema orienta-se para o registo de dados em diskette, cuja utilização se recomenda em virtude das possibilidades de validação que oferece através de visualização nos ecrans-video e comparação com totais de controlo.

Os lançamentos são listados em Diários Auxiliares emitidos pelo computador. Algumas correcções ocasionais podem ser introduzidas após fecho do movimento mensal, seguindo-se a emissão dos Diários definitivos e o lançamento das cadeias de programas com vista à obtenção do restante output.

Para o processamento da Contabilidade Analítica bastará juntar as classificações dos Centros de Custos aos outros elementos de input. Este tipo de organização, que evita sobrecarregar a estrutura do ficheiro mestre, permite obter uma gama de balancetes com informações a todos os níveis constantes da classificação estabelecida.

No aspecto de capacidades, referimos

- Contas até 15 dígitos e 6 níveis de controlo, na Contabilidade Geral;
- Códigos até 7 dígitos e 4 níveis de controlo, nos Centros de Custos.

É viável a generalização do "package" a vários utilizadores em simultâneo, mesmo que cada um tenha adoptado um Plano Contabilístico diferenciado.

3.2 - DESCRIÇÃO DE FICHEIROS

3.2.1 - FICHEIRO MESTRE CONTABILÍSTICO

Artigo 1 - Descrição do utente (Empresa utilizadora)

Artigo 2 - Opções de tratamento

- Capacidades das Contas da Contabilidade de Geral
- Capacidades das Contas da Contabilidade de Analítica
- Opções de emissão de fichas do Razão

Artigo 3 - Opções para emissão dos balancetes
(34 opções)

- Por níveis dos Centros de Custos
- " " da Contabilidade Financeira

Artigo 4 - Plano Contabilístico

COD.						COD.	
UTENTE	NºCONTA	DESIGNAÇÃO	NÍVEL	S/MOVIM.	BALANÇO	DATA	

Artigo 5 - Plano dos Centros de Custo

COD. UTENTE	COD. CENTRO CUSTO	DESIGNAÇÃO	NÍVEL	S/MOVIM.	DATA
----------------	----------------------	------------	-------	----------	------

3.2.2 - FICHEIRO DE DESCRIÇÕES

- Códigos de operação (100 hipóteses)
- " " diários ("
- " " balanço

3.2.3 - FICHEIRO DE ACUMULADOS

Acumulados de débito e crédito de cada Conta

COD. UTENTE	CENTRO CUSTOS	Nº CONTA	ACUM. DÉBITO	ACUM. CRÉDITO	MOVIM. DEB.	MOVIM. CRED.	DATA
----------------	------------------	-------------	-----------------	------------------	----------------	-----------------	------

3.2.4 - FICHEIRO DE MOVIMENTOS DIÁRIOS

Conteúdo:

- Código do utente
- " " diário
- Nº do documento
- Centro de Custos/Conta devedora
ou
- Centro de Custos/Conta credora
- Valor
- Código de operação
- Data
- Registo de controlo

3.2.5 - FICHEIRO DE MOVIMENTOS MENSUAIS

Conteúdo:

- Código do utente
- " " diário
- Nº do documento
- Centro de Custos/Nº da Conta
- Nº da Conta (Contabilidade Geral)
- Código de operação
- Data

3.3 - DESCRIÇÃO DO OUT-PUT

3.3.1 - LISTAGENS DO FICHEIRO MESTRE CONTABILÍSTICO E DOS FICHEIROS BASE

Todos os elementos constantes do ficheiro são apresentados nestas listagens.

NOTA: As tabelas dos códigos de operação e dos diários podem ser estruturadas de acordo com as necessidades da Empresa utente, devendo apenas respeitar os limites anteriormente indicados (100 diários e 100 códigos de operação).

3.3.2 - LISTAGENS DE ACTUALIZAÇÃO DO FICHEIRO MESTRE

Sempre que se procede a modificações do ficheiro mestre, o sistema emite as correspondentes listagens, mostrando os campos alterados, com mensagens indicativas do tipo de actualização efectuada.

3.3.3 - DIÁRIOS AUXILIARES

Trata-se de mapas que apresentam todos os lançamentos a considerar no respectivo mês, organizados em diários.

Além, do aspecto informativo, estes mapas permitem controlar o movimento de entrada por comparação de totais e consultas de tabelas, assinalando todas as anomalias detectadas com mensagens orientadoras para acções de correcção.

Anexo

3.3.4 - FICHAS DO PAZÃO

Conforme modelo junto - Anexo

A emissão das fichas pode processar-se, conforme a Empresa utente necessitar

- para as Contas da Contabilidade Financeira com movimento no período
- para todas as contas
- para contas da Contabilidade Analítica

3.3.5 - BALANCETES

Conforme modelo junto - Anexo

O sistema oferece 34 opções diferentes. Em geral, podemos considerar as possibilidades de fazer emissões de

- Resumos Analíticos por níveis de Centros de Custos
- Balancetes Analíticos por níveis de Centros de Custos e da Contabilidade Financeira
- Balancetes da Contabilidade Financeira por cada nível de Contas.

3.3.6 - BALANÇO

Contém as informações relativas a

- Activo
- Passivo
- Situação Líquida
- Contas de Ordem

3.3.7 - MAPA DE ENCEPRAMENTO DE CONTAS (Anual)

Com apuramento de resultados e abertura de contas

3.4 - POSSIBILIDADES DE IMPLEMENTAÇÃO DO SISTEMA

Apontamos duas linhas de desenvolvimento que se nos afiguram do maior interesse por constituírem módulos complementares do "package" visando o alargamento do seu campo de aplicação.

A respectiva programação poderá ser oportunamente fornecida pelo Centro de Informática SNS, após estabilização dos sistemas a lançar na fase inicial.

3.4.1 - INTEGRAÇÃO DAS DIVERSAS APLICAÇÕES NA CONTABILIDADE

Diários relativos ao movimento de várias aplicações são produzidos automaticamente, no contexto da Contabilidade, sem intervenção dos Serviços da Empresa utilizadora.

O lay-out destes mapas é idêntico ao que se descreveu no capítulo 3.

O tratamento baseia-se em tabelas de conversão e incide sobre os ficheiros de

- vendas
- stocks
- contas-correntes
- activos fixos
- ordenados

A integração conseguida proporciona as vantagens seguintes:

- redução drástica do trabalho de preparação
- economia de tempo
- elevado nível de qualidade e segurança nos dados obtidos

3.4.2 - CONTROLO ORÇAMENTAL

O sistema utiliza dados tratados nas Contabilidades Geral e Analítica e ficheiros de

- orçamentos
- acumulados anuais
- rubricas

A estrutura do "package" responde às necessidades específicas da Empresa. Assim, dois conjuntos de out-put são previstos

- mapas demonstrativos de resultados
- mapas demonstrativos por rubricas e conjuntos de rubricas

a emitir de acordo com os códigos de agrupamento e os títulos pretendidos pela Empresa utilizadora .

Alguns modelos de mapas poderão ser apresentados com exemplos das possibilidades do sistema.

4 - CUSTOS E CONDIÇÕES DIVERSAS

4.1 - Os preços para execução dos programas relativos às aplicações descritas nos capítulos 2 e 3 são os seguintes:

VENCIMENTOS (PESSOAL) 160.000\$0
CONTABILIDADE FINANCEIRA E ANALÍTICA 270.000\$0

Estes preços compreendem o fornecimento de

- programas registados em disc-pack (do cliente)
- flow-charts
- lay-out de todos os ficheiros
- documentação para operação de computador (job control).

4.2 - O Centro de Informática da SNS, Lda. prevê também a prestação de apoio, por pessoal técnico, para lançamento e operação das aplicações que lhe venham a ser adquiridas.

Para o package de VENCIMENTOS considerámos o seguinte esquema:

- a) Deslocação de 1 analista de sistemas e de 1 técnico de codificação e controlo, com estadia de 2 dias completos no Funchal, para
- elucidação do pessoal da EEM quanto à preparação de elementos relativos aos ficheiros de base e início das respectivas operações de registo em diskette;

Data prevista fins de Julho ou princípios de Agosto

- b) Estágio de programação, até 30 dias, para 2 funcionários da EEM nas instalações do Centro de Informática da SNS, Lda.;

Data prevista Julho/Agosto

c) Recepção das diskettes com o registo dos ficheiros de base (e correspondente documentação de origem);

-Carregamento dos ficheiros em disco magnético (da EEM); no computador do C.I. da SNC;

-Emissão de listagens;

-Detecção e correcção de alguns erros;

-Envio das listagens para a EEM;

Data prevista 19 quinzena de Setembro

d) Deslocação de 1 analista de sistemas e de 1 técnico de codificação e controlo, com estadia de 5 dias completos no Funchal para

-execução do paralelo dos vencimentos de Setembro

-emissão dos vencimentos de Outubro

-acompanhamento dos operadores da EEM

-contactos e esclarecimentos ao Pessoal de serviços periféricos.

Data prevista 29 quinzena de Outubro

O custo deste apoio, envolvendo

-viagens

-estadia

-ocupação do nosso pessoal

-utilização do nosso equipamento

será de Escudos 90.000\$00

.4.3 - O esquema de apoio para o "package" CONTABILIDADE deverá ser planeado e orçado oportunamente, tendo em consideração as datas para treino do Pessoal da EEM, os prazos para lançamento e a extensão dos contactos com os Serviços utilizadores.

105 RPC

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W453 1975.

Reunion de Discusion sobre Hemoparasitos
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131 p.

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In Spanish and English. English: PN-AAF-599.
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4. Anaplasmosis. 5. Cattle-Diseases. I. Wells, E. A.
II. Centro Internacional. III. Title.