COMPUTERISED PERSONNEL INFORMATION SYSTEM FOR AHMADU BELLO UNIVERSITY

BY

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DEPARTMENT OF MATHEMATICS
FACUITY OF SCIENCE AHMADU
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I hereby declare and certify that this Project, which is my own research work, was carried out in the Department of Mathematics, Ahmadu Bello University and that, no part of this Thesis has been submitted elsewhere for the award of a degree or diploma.

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CERTIFICATION

The undersigned certify that this Thesis entitled "COMPUTERISED PERSONNEL INFORMATION SYSTEM FOR AHMADU BELLO UNIVERSITY" by HENRY ADE BABAGBALE meets the regulations governing the award of the degree of Master of Science of Ahmadu Bello University, and is approved for its contributions to scientific knowledge and literary presentation.

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DEDICATION

This work is dedicated to the memory of my late father, Mr Rowland Babagbale, and to my mother, Mrs Dorcas.I. Babagbale, who inspite of my father's early death struggled to bring me up.

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My most profound gratitude is due to Dr. G.A. Olayi who as my major supervisor, shared with me all the difficult moments of this work with satisfactory assistance and guidance. His patience, understanding, suggestions, criticisms, kindness and friendliness made it possible for me to complete this work. I am grateful to Dr. Makarfi who as head of Department, left at my disposal every bit of academic facility needed for the success of this work.

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H.A. Babagbale
July, 1987

-ABSTRACT

This thesis details the investigation and analysis of the current manual administration of Ahmadu Bello University personnel records.

Problems and inefficiencies associated with this manual system are identified.

Analysis of these problems clearly indicates that some computing power could be explored to handle the University's personnel records administration. The proximity of the institution's Mainframe Computer System (CYBER 72) situated few meters away from her main administrative building is a big factor that further underscores to a large extent the "feasibility of this exploration since the facilities at the Computer Centre could be used to advantage in implementing the new system.

A careful study of the facilities obtainable on the University's CYBER 72 computer enabled me to recommend that, a strictly data processing activity which involves the MAINTENANCE OF AN INTEGRATED DATA BASE (instead of a COMMON DATA BASE) is the most economically feasible approach.

Based on this recommendation, a Computer-based information system entitled "COMPUTERISED

PERSONNEL INFORMATION SYSTEM FOR AHMADU BELLO UNIVERSITY" is designed.

Sample data used during the development of the system was collected from the Registry unit of Ahmadu Bello University.

Due in particular to the appalling- failure rates (due to old-age') of the University's present computer System, and the unreliable power supply witnessed towards the tail end of completing this project, it became nearly impossible to get serious work done by the computer, thus, exhaustive implementation could not be effected.

If the University so desires, full implementation could be carried out when the new Computer System being proposed is purchased and installed.

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CHAPTER 1

INTRODUCTION

1,1. Background

Customarily, when a new staff joins Ahmadu Bello University (A.B.U.), he or she has to undergo a process known as Documentation. Practically, this involves giving certain personal data to the administrative and/or service departments such as Registry, Bursary, Housing & Passages, Library, Security Office, and so on.

I observed that, though some departments may require more details than other, each of the affected administrative/ service departments opens a file for the staff with more or less the same kind of data. Clearly, this practice indicates that, Ahmadu Bello University manually maintains a distributed system of file in the administration of her personnel information.

This research investigates and analyses the current manual administration of staff records in Ahmadu Bello University.

During the course of investigations, it was noticed that staff record keepers/ administrators are usually surrounded by vast amounts of staff data that are sometimes extracted or abstracted, but which can remain buried in millions of words and tonnes of paper. For instance, statistics collated from the Registry reveals that in 1977 there were 6,953 staff records to be administered by the University while in 1979, this figure increased to 11,999.

Thus, for an organisation like Ahmadu Bello University that is open to an ever growing population, accurate and timely retrieval of desired information requires a high degree of skill.

Deriving from the foregoing, and other identified problems and inefficiencies inherent in the manual system, a computerised personnel records administration system is proposed.

Based on the facilities obtainable on the University's mainframe Computer System (CDC CYBER 72), the approach suggested as the most economical means of providing the needed computing power is that of a strictly data processing activity involving the

MAINTENANCE OF AN INTEGRATED DATA BASE instead of the MAINTENANCE OF A COMMON DATA BASE. The Common Data Base approach may be slightly costlier to realise in that it will necessitate the purchasing of a specialised software with Data Base Management capabilities which is presently not available on the CYBER 72 system of the Iya A bubakar Computer Centre in view.

In contrast, facilities on the University's Computer System (CYBER 72) suffice to be used to advantage in realising the INTEGRATED Data Base approach which has as its cornerstone the keeping of Integrated filing System whereby output from one section's activity can be used as input for another section.

In the light of this proposal, Computerised Personnel Information System (CPIS) is designed, The design ensures that, files and programs will allow later integration of further applications.

1.2. Literature Review

The personnel function involves the recruitment, placement, evaluation, compensation. and development of the

employees of an organisation.

"Traditionally, personnel information systems are used by organisations to produce Paychecks and Payroll reports; maintain personnel records; and analyse the amounts, types, and costs of labour utilised in operations", O'brien J.A. (1978).

Literature review indicates that, many organisations have gone beyond these traditional functions and have developed personnel information systems which support among other things:

- recruitment, selection, and hiring
- job placement
- performance appraisals
- employee benefits analysis,
- training and development
- health, safety, and security.

Thus it is evident that in a broad sense, personnel information systems support the concept of human resource management, which emphasises planning to meet the personnel needs of the organisation, and the control of all personnel policies and programmes so that effective and efficient use could be made of the human resources of such an organisation be it industrial, educational,

research, Government, or business.

Further surveys into literature reveal that, in developed countries several large corporations have employed the computer to help in the selection and allocation of their personnel resources.

"American Can Company maintains a computerised personnel system designed to primarily identify skills and qualifications needed in future; define corporate and business plan in 'people' terms; and provide information to solve personnel problems. In the operation of this system, personnel profiles on individuals fed into the computer are obtained via questionaires completed by the employee himself, and through personal interview with his supervisor.

General Electric's Valley Forge Space Technology Centre employs a form of computerised manpower system whereby, even the company personnel offices in remote stations can directly teletype a request for particular personnel information and receive an answer in seconds.

Eastman Kodak puts personnel information on microfilm for accessibility. Personnel reports are then generated from the master record at a frequency dependent on the company's need", Belinda, P.P. (1977).

"Military personnel information systems are known to mostly keep records on qualifications, training, and assignments in addition to the usual common information maintained on individual military personnel. These form the data base from which routine or special reports are prepared", Favret, A.G. (1965).

Literature review shows that in developing countries, there has not been tremendous growth of research in the area

of computerised Personnel Information System.

Deriving from my investigative reviews, it is evident that, in Nigeria, although not wholly negligent in harnessing computer power to advance the state of art activities in Personnel Information Management, organisations have yet to place maximum emphasis and totally directed efforts towards increased and expanded computer utilisation as has occured in Accounting Information Systems like Payroll, Inventory, General Ledger and so on.

For instance, we noticed that in Nigeria, apart from few establishments which attempted independently to set up personnel records system but which did not make great in-roads towards implementation, no other extensive work has been carried out in the area of Personnel Information System automation. Infact, with the few establishments, record of works/efforts involved are hitherto poorly documented as to help support future researches in automated personnel Information system in Nigeria.

1.3. Research Methodology

This project was undertaken in stages.

The various stages are outlined as follows:

(a) System Investigation and Analysis

This stage involves the detailed study and analysis of the manual system. The investigation, carried out by interviews, discussions, observation of the system in operation, and study of some Registry documents, endeavoured to know the repetitive tasks, specific and exceptional demands, volume of information demanded, frequency and speed of retrieving such information, and new information needs. Appendix II and III show example documents, and reports as found in the manual system. Based on the findings and analysis (as detailed in chapter 2), a Computer-based Personnel Infbrmation system is proposed.

(b) System Design

The system design stage borders on the design of the proposed computer-based system. This consists of three subsystems which collectively are capable of performing with higher speed and accuracy those jobs that are

presently done manually as well as those which though desired, could not be done because of the tedious nature of processings involved (e.g. statistical reports).

These three subsystems are

- the Personnel Information Data Base (PIDB) subsystem,
- the Personnel Information Report Generating (PIRG) subsystem,
- the Personnel Information Enquiry (PIE) subsystem.

The PIDB subsystem addresses itself to the creation and maintenance of the Personnel Information Data Base which could otherwise be referred to as the Personnel Information Master File.

Furthermore, it can produce on demand a master list of all fully documented Ahmadu Bello University staff. The PIRG subsystem produces various reports including those which though hitherto were desirable, could not be obtained in the manual system. An example list showing types of these reports that could be generated on demand are summarised in Appendix VIII

The PIE subsystem is an interactive one. It concerns itself with giving prompt response over the screen to different requests by the user.

(c) System Development And Implementation

This stage outlines the procedure for developing and implementing the system designed. Programs for the PIDB subsystem were fully written and tested (Appendix XII shows sample programs). Since all reports are not necessarily needed at the same time, a modular approach driven by the use of report codes is adopted in the development and testing of programs for the PIRG subsystem. Similarly, since all enquiries could not be made simultaneously, modular approach driven by the use of enquiry codes is adopted in the development and testing of programs for the PIE subsystem.

Because of the inability of the Registry unit to make perfected data available in time, and due in particular to the sudden and unrealistic poor performance of the

University's mainframe CYBER 72 computer system witnessed at the time of completion of this research, only a partial implementation could be done. However, even though the implementation is intended on Ahmadu Bello University's computer, the programs are not machine dependent. As such, if so desired, the University can implement the system when her new anticipated computer system is installed.

Sample program listings are included in the appendix.(Appendix XII).

CHAPTER 2

SYSTEM INVESTIGATION AND ANALYSIS

2.1. The Manual System

2.1.1. Purpose of Personnel Information System

> "Human resource planning/management is defined as the process by which an organisation ensures that it has the right number **and kinds** of people at the right places, at the right time, capable of effectively and efficiently completing those tasks that will aid the organisation in achieving its overall objectives", ROBBINS (1978).

Personnel Information System provides up-to-date information necessary to support the various human resource management decisions which as a whole emphasises

- planning to meet the personnel needs of the organisation; and,
- the control of personnel policies and programmes to ensure that effective and efficient use could be made of the human resources.

Specifically summarised, Personnel Information System supports

- manpower inventory, a process which describes available skill within the organisation.
- job analysis, a process which

Procurement; Development; Motivation; and Maintenance.

Procurement includes planning, recruitment, selection, placement, and orientation of employees. Development is the training and educating of the work force.

Motivation is concerned with factors that stimulate a worker's effort and performance.

Maintenance includes provision of benefits, services, and working conditions that maintain employees commitment.

These functions are exercised via its various sections/units, with each section/unit headed by appropriate officer as follows:

Establishment Secretary -

Who is responsible for the policy and administration of the establishment unit. He reports directly to the Registrar, as well as some University decision making committees (through the Registrar). He interacts with other units of the Registry, and all departments within the University on matters that concern the overall senior staff of the institution.

2.1.3. Activities

Summarily, the specific activities of the Personnel department as carried out through its various units include:

1. Coordinating and regulating recruitment of University staff.
2. Projecting University staff needs.
3. Documenting newly employed staff.
4. Coordinating matters of training and development of University staff.
5. Coordinating the provision of good welfare services to staff.
6. Coordinating issues of staff promotion.
7. Keeping records of data on each University staff.
8. Coordinating activities related to staff resignations, retirements, terminations and dismissals.
9. Generation of various statistics and management reports from staff records (appendix III details some of them).

2.1.4. Input And Output

1. Input -

The personnel department obtains its input data from different sources. These sources include:

(i) Requests from the various departments.

(ii) Requests from Management Decision Committee.

(iii) Data on new employees.

(iv) Changes in records of existing staff.

(v) Requests from individual staff

(vi) Requests from Government

(vii) Requests from within the Personnel Department itself.

(viii) Information available at each department within the University.

2. Output -

The following outputs are among those derived from the manual system:

(i) Analysis of I & J staff by function.

(ii) Analysis of Senior Staff by function.

(iii) Summary of Number of staff in post in Ahmadu Bello University.

(iv) Analysis of Senior Staff by sex and Nationality.

(v) Analysis of senior Academic staff by Sex and Nationality

(vi) Analysis of Senior Academic Staff by grade level.

(vii) Historical growth of staff in post in Ahmadu Bello University.

(viii) Analysis of staff by Residence.

2.1.5. Records And Files

For each staff in employment, there is a file in the form of a file jacket containing personal data of the staff, as well as all documented issues (such as Queries; Confirmations; Promotion; Training and Development issues; Performance evaluation; e.t.c.)

Collectively, all the information contained in each file jacket constitutes one record. Files of staff that are no longer in employment are separated and kept in a cabinet designated as ARCHIVE.

In the manual system, each file is assigned a unique number known as the staff's personal number.

2.1.6. Processing

The processingswhich are done manually

include the following:

Staff projections/estimates -

*Academic staff needs of the University are projected using the staff/student ratio classed by faculty as follows-

Staff	:	Student	
1	:	7	(Faculties of Human and Veterinary Medicine).
1	:	10	(Faculties of Science and Engineering).
1	:	15	(Faculties of Arts, Administration, and Social Sciences).
1	:	25	(Faculty of Education).

*Senior non-academic staff needs of the University are projected using the general ratio of -

Senior Non-Academic Staff	:	Academic Staff
1	:	3

*Intermediate & Junior (I & J) staff needs of the University are projected using the general relationship of -

1 I & J staff: 2 students

Based onthese formulae the planning unit is easily able to determine when the University is under-staffed or over-staffed.

(b) Staff Recruitment -

When requests for staff (Senior, or Intermediate or Junior) are received, from departments, the planning unit will advise on whether or not such vacancies could be filled. If approved, advertisements notice will be sent to Information & Publications unit where such vacancies will be advertised. Individual departments are responsible for interviewing candidates shortlisted for consideration; and for making recommendation to the Personnel Department on those candidates that are appointable. When such recommendations are approved by council, the Personnel Department issues letters of employment to successful candidates.

(b) Staff Documentation -

When a new staff assumes duty, he/she must undergo documentation. This involves completing some forms on his/her personal data, and supplying some other information like medical report, certificates' photocopy. The Personnel Department opens a file to contain all these information including the completed forms, and directs the staff to other units of the

(d) University like Bursary, Library and so on, where he or she needs to equally get properly documented.

Staff Promotions -

Once in a year, the Personnel Department makes call on all staff via their departments to submit papers for promotion consideration. Usually many copies of individual staff's Curriculum Vitae are requested. The compiled list of staff qualified for consideration is produced by the Personnel Department for presentation to the various promotions Committees.

All staff recommended and approved for promotion by the necessary Committees, receive letters of promotion from the Personnel Department. Copies of all transpiring documents in this regard are filed as additional information for individual staff concerned.

(e) Staff Training & Development -

Requests from individual staff or staff's department for a training desire are studied in line with provisions of staff rules and regulations (i.e. conditions of service). If found to be in order, and could be supported by available resources

(human, to serve in place of staff while undergoing training; and finance); the Personnel Department issues an approval letter explaining the terms of such approval. All documents relating to this will be kept in the staff's file.

(f) Retirements, Terminations, Dismissals -

In all cases of retirements, terminations, or dismissals the personnel department issues letters of notifications to the concerned officers and advise the bursary department accordingly. The files of such concerned staff are then closed and placed into ARCHIVE cabinets.

(g) Generation of Statistics/Reports -

To generate reports or statistics, the Personnel Department needs to scan through the file of individual staff that may be concerned. Such files are selected making use of the staff personal number that are indicated on the files.

This exercise is usually verycumbersome to realise even though several hands are normally involved.

Requests for reports come from different sources including departments, University management Committees, Government, and so on.

When they are received, appropriate unit officer will certify the authenticity of the request. If such is found to be authentic, staff of the unit will be set in motion to generate the required report/ statistics.

2.2. Problems

The problems and inefficiencies identified with the manual system are:

1. High rate of errors -

Because the system is very laborious, involving a lot of paper work and manual filings, it has been observed to be highly prone to errors such as those of

(a) transcription, transposition, and omission when preparing management information reports.

(b) spelling and filing mistakes.

2. Redundancy of data -

That each of several departments has to open a file for one staff with more or less the same kind of data results in data redundancy.

3. Inconsistencies in staff records -

Transcription, transposition or omission errors resulting from oversight during the completion of documentation

forms can make data of a staff as recorded in one department differ from how it is in another. This results in data inconsistencies.

4. Duplication of efforts -

The process whereby one staff needs to supply the same kind of data at different times and departments amounts to duplication of efforts and time-wastage.

5. Slow access to files -

Due in particular to the laborious volume of paper work and manual filings involved, access to information contained in files is usually very slow.

6. Misplacement of files -

In several cases, files are misplaced after accessing it for particular information. This can result in several days of delay in processing staff data for information at another time. The ultimate implication here is that, management decision based on such information becomes inevitably delayed.

7. Non-Update of files/records -

In certain cases, due to the large volume of files involved, changes to

staff record are lately reflected or forgotten to be reflected at all.

8. Inadequate security and privacy of files - Mostly, because of inability to provide appropriate file cabinets, staff files are loosely kept. In this way, files become highly exposed to the insecurity of thefts, rains, fire, or easy misplacements. Furthermore, the privacy of staff information becomes unguaranteed, since anyone can easily have access to the files.

9. Large surface area for storage of files - Resulting from the very large volume of files involved, there is always the requirement of a large surface area for storing staff files.

10. Difficulty in report generation - Statistical and management information reports are always very tedious to realise due to the very large volume of staff records involved at all times. Implication here is that, most management/statistical information reports are not usually timely produced or in some cases are ignored even though desired.

2.3. Constraints

There are no specific constraints (financial or otherwise) imposed on this research by anybody. It is however intended by the researcher that

(i) an improved system within reasonable costs be designed to solve most of the Ahmadu Bello University personnel records administration problems.

(ii) if possible, running of the eventual system should not necessitate hiring more staff (especially computer personnel) on a permanent basis.

(iii) even though the system is designed with Ahmadu Bell University in view, any other organisation could tailor it with little or no modifications for use to meet their needs.

That this project is not sponsored by anybody exposed it to incapacitating limitations of meeting the various financial costs needed for computer resources (whenever the University's CDC CYBER 72 machine breaks down) and accessories.

2.4. System Proposal

2.4.1. Objectives

A thorough analysis of the present manual system indicates that introduction of some computing power will ensure the achievement of a better, accurate, faster, and more efficient administration of personnel records. Specifically, the computer could be used to:

1. eliminate the possibility of transcription, transposition or omission errors during management information reports preparation.
2. eliminate data redundancy and inconsistencies as much as possible.
3. satisfy time-critical requests/ enquiries with minimum delay.
4. provide various statistical and management information reports some of which hitherto were ignored even though desired.
5. maintain a file of all staff validly in the University's employment and thus, eliminate the requirement of a very large surface area for files storage.
6. eliminate to a great extent, the misplacements of staff files.

7. ensure adequate security and privacy of staff information since only authorised officers may have access to the data base.

8. provide quick data base for enhanced researches in areas of personnel matters.

2.4.2. Possible Approaches

Three approaches could be adopted in providing the computing power to realise most of the objectives stated above, namely: off-line, on-line and mixed approaches.

Off-line Approach

In this approach, transactions (e.g. data on new staff; changes in the data of an existing staff; request for reports, e.t.c) are recorded by some data collection units, for example the keypunch machines. At the end of transactions, the recorded data will be transported manually to the supporting mainframe computer (CDC CYBER 72) for processing, updating of records and generation of reports.

Advantages of this approach -

1. It is simple to operate
2. It is not usually costly to provide.

3. It is independent of the mainframe and as such, if the mainframe breaksdown, the personnel department could continue to record transactions.

Disadvantages of this approach -

1. Manual transportation exposes recorded transactions to the danger of insecurity and damage.
2. Future enhancements to other areas may not be easily feassible.
3. Implementing an enquiry system is not feasible.
4. Personnel master file will not always be up-to-date.

On-line approach

In the on-line approach, the mainframe computer will provide via remote terminals, on-the-spot processing of transactions and immediate access to the data base, updating the records. With this approach, it is possible to implement batch tasks as well as enquiry facilities.

Advantages of this approach -

1. The personnel master file is always up-to-date. Thus,

up-to-date information reports could always be generated.

2. Enquiry facilities can easily be implemented.
3. Eliminates the likely insecurity posed by manual transportation of recorded transactions.
4. Capable of future enhancements to other personnel related tasks.

Disadvantages of this approach -

1. It could be very costly to provide in terms of hardware and software.
2. It is not suitable for jobs that are not relatively time-critical.

Mixed approach

The mixed approach (otherwise known as the hybrid approach) strikes a balance between the on-line and off-line. It will provide on-line capabilities for time-critical requests and those tasks essential for the day-to-day running of the personnel records administration. Also, it can provide off-line capabilities for such tasks as capturing new employees data; Variations' data, and the likes.

Advantages of this approach -

1. Virtually not dependent on the mainframe.

2. Could be enhanced to cater for other personnel related tasks.
3. Could provide on-line enquiry facilities.

Disadvantages of this approach -

1. Complex in hardware and software terms.
2. Usually a relatively expensive approach.

2.4.3. Computing Resources Available

Possibility of using to advantage the Control Data Corporation CYBER 72 computer system of the Iya Abubakar Computer Centre was investigated. The investigation revealed that, the machine is supported by a Network Operating System (NOS) which has provision for both batch and interactive (on-line) processing. The computer system (see appendix I for its detailed configuration) has sixty four kilo-bytes (64 KB) of memory. There are three disk drives, each disk being one hundred and ten mega-bytes (110 MB). A fourth one (double density) of two hundred and twenty mega-bytes (220 MB) is awaiting installation. Furthermore, there are two tape drives, one card reader, and one line printer. A remote

job entry printer serves as a back-up to the only main printer.

At the Computer Centre alone, there are 24 screen terminals and two hard-copy Diablo terminals.

The entire computer system is powered by a 468 KVA generator which is supposed to ensure un-interrupted power supply.

Exploration showed that, the computer system is under-utilised and as such, if in its normal/perfect working conditions, it could conveniently cope with the requirements of the Personnel Information System.

A major limitation is that, the computer system have come of age (over 10 years old), and this may surely affect its performance in general. This fear becomes allayed however by the intimation that, the University has reached advanced stage in the efforts to replace the old computer with another CDC CYBER 180-810 computer system which is assured to support in all ramifications an upward compatibility with the old system.

2.4.4. Justification For A Computer-Based System

A justification for a computer-based Personnel Information System could be made through the following considerations:

1. Costs -

Usually, the initial cost savings derivable from a computerised system are small compared with the capital cost of the system. Infact, the initial running cost would be slightly higher than that for initiating the manual system.

It is important to note however that over the past few years, striking advances in electronic data processing technology has tried to ascertain computer methods as capable of improving the accuracy and utility of information such that, if not able to reduce the absolute costs of data storage and transfer, they can at least make manageable a larger volume of data for the same costs; whereas for example, any significant increases in the manual personnel administration activities will necessitate hiring more staff or paying overtime wage thereby attracting additional costs with no assurance that expected level of efficiency will be achieved.

A further view remains that, if the capital cost of the computer system is spread over say, five years, the cost

savings will become favourably appreciated since an improved and more satisfying Personnel information flow as compared to in the manual system will be witnessed.

Thus, on costing grounds, the computerised system is justifiable.

2. Number of Records To Be Stored -

As indicated in chapter one, staff population of Ahmadu Bello University continues to grow each year.

To maintain up-to-date and complete personnel information, the record of each staff will necessitate storing slightly less than two thousand characters. When the growth of such records span over many years, a very large physical surface area will be required to store staff data files under a manually operated system. In contrast, a computerised system will require only a few magnetic files to store the same amount of data. This is therefore certainly another justification.

3. Number And Type of Reports Generated -

Summarised in Appendix VIII

. . are most of the reports usually desired to be generated. While some

of these reports may be considered to be moderate in size but demanding laborious computation, some of them could be very bulky and time consuming yet they could at times be desired for urgent decisions. Unreservedly, the manual system of obtaining these reports will be slow and cumbersome. The computerised system could produce them and other ones fastly and more accurately, hence its justification.

4. Benefits (tangible and Intangible)

Among other things, the computerised personnel information system could provide the following benefits:

(i) Staff cost saving - staff costs would be reduced via reduction in the personnel administration activity (especially in the circumstance of significant increases in activities).

(ii) Stationery cost saving - stationery costs for providing documentation forms would be reduced since staff will only need to supply data at the

personnel department rather than in several departments.

(iii) Faster access to Personnel records.

(iv) Greater facility to carry out managerial and clerical functions within the personnel department.

(v) Improved decision making at all levels.

(vi) Enhancement of prompt communication with other units of the Registry.

(vii) Accurate transfer of information cum relative low cost of data storage.

(viii) Economy of surface area requirement for storage of large volume of data.

2.5. Recommendation

In view of the problems and inefficiencies associated with the present manual system; the level of service expected to be provided by the Ahmadu Bello University personnel department; and the justification outlined above, we recommend that, a computer-based personnel Information System be implemented.

Since neither the off-line nor the on-line processing approach could stand alone to meet the evident needs of the personnel department, it is my recommendation that, the hybrid (mixed) approach be adopted.

CHAPTER 3

SYSTEM DESIGN

3.1. Scope

Primarily, this design is concerned with the various subsystems of the Computerised Personnel Information System as indicated in section 1.3/b. However, design considerations like hardware and software requirements provide adequate allowance for future enhancements to other areas and tasks as may be necessary.

Because of time constraint (worsened by frequent failures of the aged CYBER 72 computer system at the Computer Centre), and financial constraint (as it affected resources for developing, generating and listing reports and enquiries), only the generation of few reports and enquiries (see sections 3.4.4 and 3.4.5 for details) could be implemented. The modular approach adopted by this design for both the Personnel Information Report Generating (PIRG) subsystem and the Personnel Information Enquiry (PIE) subsystem, simplifies the task of future enhancements to include other reports and

support the contention that computer systems and applications are designed without adequate consideration given to human factors".

Thus, since users of the proposed system are non-computer experts, it has been designed to ensure that it is simple to use.

Efforts were actually made to integrate some staff of the personnel department in the planning and design stage.

2. Quick and Accurate Data Capture -

If the system is to cope effectively and satisfactorily with its objectives of faster and more accurate means of information, then it should be designed to capture transactions as fast as possible, and be able to validate such transactions for accuracy.

3. Flexibility -

Some parts of the personnel records not being used in any analysis today might be useful tomorrow. This fact is considered vital in the design, and as such those parts are stored.

Furthermore, dummy information fields were built in to enable the introduction with ease, of unforseen information that may arise sometimes.

4. Reliability -

Because of the critical nature of personnel information in the general and effective running of the University activities, an accurate personnel database is inevitable. For the accurate personnel database to be achieved, this design noted that hardware equipment and software should be reliable.

5. Extendability -

This design takes into consideration the future requirements of the personnel department in terms of hardware resources that may be required. For example, the personnel department may eventually wish to extend the automation to Skill Inventory; Housing Allocation Management, and so on. The implication of this remains that, modern equipment with add-on capability will inevitably be required for faster input of data

and enquiry response.

6. Modularity -

The design considers that the system should be modular in terms of hardware and software. In otherwords, the hardware should be capable of possible upgrade; and the software should be written in modules, permitting the use of overlay and segmentation techniques to maximise the use of internal memory (core store).

7. Locally Available Hardware -

The hardware chosen should be locally available. Thus, for the purpose of this design, the hardware equipment at Iya Abubakar Computer Centre has been chosen, being the one locally available at Ahmadu Bello University. A major advantage of this consideration is that, adequate and prompt maintenance of the computer-based system would be feasible.

8. Independence From Mainframe -

As far as possible, the system should not entirely depend on the mainframe for its day-to-day running. For instance, it should be possible to continue capturing transactions' data when the mainframe is

unavailable.

9. Security and Privacy -

This design gives adequate importance to Security and Privacy by incorporating some security checks (section 3.6 details these checks). Thus, only those authorised could operate or have access to the system. This would help largely to avoid fraud by some staff who if granted access, could alter information on their records, or add records of 'ghost workers' to the database.

3.2.2. Hardware

1. Data Collection Equipment -

As mentioned in 3.2.1/7 above, and section 2.4.3., the hardware available at Iya Abubakar Computer Centre, Ahmadu Bello University is considered to adequately meet the data entry needs of this system.

However, other faster data capturing and enquiry supporting equipment when available will be more useful.

Unlike the storage and processing of data that could constitute real

'bottle-neck' to the personnel department, the collection of data may not be too time-critical (moreso that, even when the mainframe is not available, data could still be continously collected).

For now, visual display terminals would be used as data collection equipment.

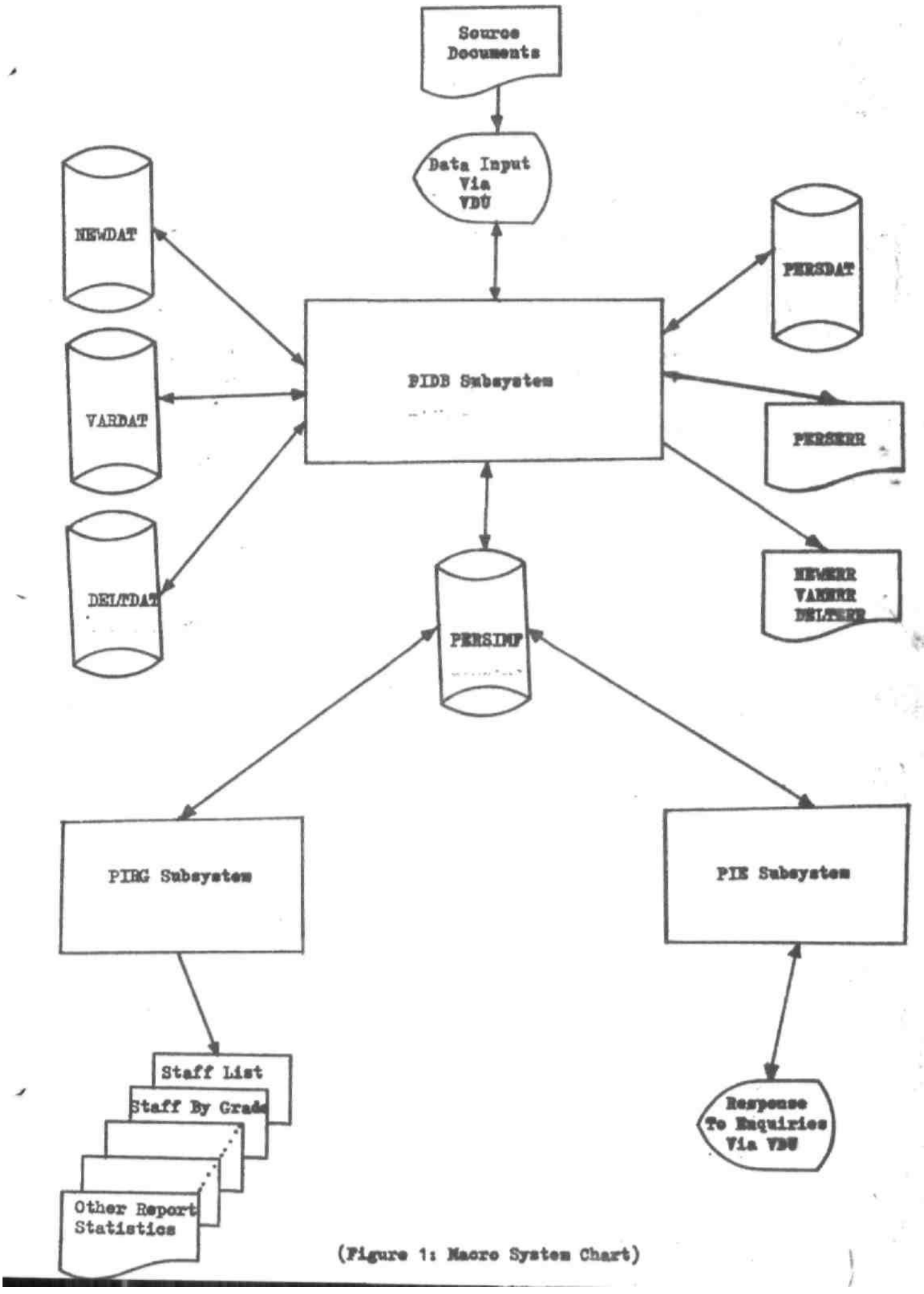
2. Data Storage -

Magnetic tapes (the low-cost storage devices), will provide a very inexpensive and handy storage medium for the personnel records, especially as the means of backing storage.

The more expensive but very high-speed storage devices, the magnetic disk packs available at the Computer Centre will provide enough of mass storage space that would be needed for direct/fast access processing and information retrieval.

3.3. Macro System Chart

Figure 1. shows a high level schematic view of the computer-based personnel information system. Basically, it consists



(Figure 1: Macro System Chart)

of three subsystems (see section 1.3/b), and each subsystem consists of a number of programs.

One integrated data base is maintained, viz: Personnel Information Data Base (PIDB).

The Personnel Information Data Base subsystem borders on

(a) creation of the personnel information data base master file (PERSIMF).

(b) maintenance of the data base master file.

The Personnel Information Report Generating subsystem is responsible for generating the various information reports/statistics based on the use of Report Generation Codes.

The Personnel Information Enquiry subsystem handles the provision of enquiry facilities as driven by Enquiry Codes.

It should be noted that, PERSDAT, NEWDAT, VARDAT and DELTDAT are transient files. PERSDAT would be destroyed as soon as it is processed to create PERSIMF. NEWDAT, VARDAT and DELTDAT would similarly be destroyed as as soon as they are processed to update PERSIMF.

In general, this design endeavours to make all data entry activities purely interactive (user-friendly) via Visual Display Terminals.

Section 3.4. bears the details of the various components of the system.

3.4. The Computer-Based System

This section tries to describe the data base of the computerised personnel information system. It also details the various subsystems and their modules/ programs. Mention is made as well of the kind of inputs to the system.

3.4.1. Organisation of the Data Base

There are three possible methdds of organising the data base, namely: sequential, indexed sequential and random organisations.

(a) Sequential Organisation -

In this type of organisation, records are maintained in the file in sequence according to specified keys. With this arrangement, the records must be retrieved or updated in the same order in which they appear.

Advantages:

(i) It is simple

(ii) It is easy to control

(iii) It supports easy implementation of back-up

(iv) Cheap storage medium like magnetic tapes could be used.

Disadvantages:

(i) Data must always be in key number sequence.

(ii) Low volume update or processing is not efficient since each record must be read.

(iii) Unsuitable for on-line applications

(iv) Use of multiple keys impossible.

(b) Indexed Sequential Organisation -

This type of organisation is similar to sequential organisation in that, sequential processing is possible. However, it is possible to locate individual records at will for non-sequential processing via maintenance of indexes. Organisation like this is done on a mass storage device such as the magnetic disk.

Advantages:

(i) Suitable for on-line applications

(ii) More than one file could be used in a single process.

(iii) Suitable for low volume access or update since individual records on desire could be located.

(iv) Multiple key accessing is possible.

Disadvantages:

(i) Back-up requires copying of files

(ii) Less easy to control

(iii) Has associated problems of overflows and extra storage for indexes.

(iv) File reorganisation periodically is mandatory for storage optimization.

(c) Random Organisation -

With random organisation, records are stored in random order, that is there

is no specific order for the key fields. Thus, as no general rules can be derived for storing and retrieving records from the file so organised, the user has the task of designing the storage/retrieval algorithms. Random organisation is also done on a mass storage device.

Advantages:

(i) Suitable for on-line applications

(ii) No indexes are maintained, it is therefore generally faster in access than indexed sequential.

(iii) Good for low volume access or update.

Disadvantages:

(i) Less easy to control

(ii) Randomizing algorithms need to be produced and checked.

(iii) Back-up requires copying of files.

(iv) Has associated problems of collisions and overflows

(v) File deserves to be reorganised periodically.

The time-critical nature of personnel information processing and retrieval, for the various day-to-day decision making demands that the data base be organised in a manner which would permit immediate access to specific staff records in the file during low activity processing or update, access to specific information in the file during enquiry transactions, and sequential processing during report/statistics generation. These requirements suggest that, the file of the personnel information data

base (PERSIMF) be organised indexed sequentially since it can conveniently support ordinary sequential processing.

3.4.2. Personnel Information Data Base

This is a comprehensive data base containing one single file - the Personnel Information Master File (PERSIMF). Appendix IV outlines the detailed specifications of this file which would hold the essential details of all the University staff. The file would be used to generate various reports/statistics and enquiries on staff.

Access Requirements -

Clearly, PERSIMF is a large file and would require the following accesses:

(i) Sequential access when each record would be examined. A good example of such an instance is when producing the master list of all University staff or during back-up.

(ii) Random access to specific records during low activity update and processing.

Evidently, these requirements suggest that the file be organised indexed sequentially.

PIDB Subsystem

The PIDB subsystem consists of four programs, namely: The Staff Data Initial Entry Program (PERS1A);
The Personnel Information Master File Creation Program (PERS1B);
The Maintenance Data Capture Program (PERS2A); and,
The Update Program (PERS2B);.
Appendix V contains the detailed system flowchart of this subsystem.

1. Staff Data Initial Entry Program -

This program would accept staff data item by item from a visual display terminal, validate each record within some specified constraints, and writes all valid records sequentially into a file called PERSDAT. Staff data to be entered would be coded on specially designed input forms called STARTER FORM (see figure 2 for a sample of this form).

All records found in error are rejected and written into a file called PERSERR. PERSDAT would be destroyed as soon as it is processed to create PERSIMF.

A.B.U. COMPUTERISED PERSONNEL INFORMATION SYSTEM

(STARTER FORM)

1. PARTICULARS OF PERSONAL DATA

PERSONAL NUMBER (001) | TITLE CODE (002) | INITIALS (003) | RELIGION CODE (005) | MARITAL STATUS (006)

SURNAME (004) | BANK CODE (007) | ACCOUNT TYPE (008)

BANK ACCOUNT NUMBER (009) | DATE OF BIRTH (010) | BIRTH PROOF CODE (011)

STATE OF (012) | NATIONALITY (013)

2. PARTICULARS OF PHYSICAL CHARACTERISTICS

SEX CODE (014) | COMPLEXION (015) | EYES (016) | HAIR (017) | HEIGHT (018) | WEIGHT (019)

BLOOD GROUP (020) | DEFORMITY (021) | LANGUAGE CODE (022)

3. PARTICULARS OF LOCAL RESIDENCE

HOUS TYPE (023) | LOCAL ADDRESS STREET AND TOWN/CITY (024)

STATE CODE (025) | TELEPHONE NUMBER (026)

PREPARED BY ..... CHECKED BY ..... ENTERED BY .....

SIGNATURE ..... SIGNATURE ..... SIGNATURE .....

DATE ..... DATE ..... DATE .....

(Figure 2)

4. PARTICULAR OF PERMANENT RESIDENCE

PERMANENT ADDRESS STREET AND CITY/TOWN (027)

STATE CODE (028)

COUNTRY CODE (029)

5. PARTICULARS OF SPOUSE (UP TO 2)

MARRIAGE DATE (030)

SPOUSE NAME (031)

MARRIAGE PROOF (032)

MARRIAGE DATE

SPOUSE NAME

MARRIAGE PROOF

6. PARTICULARS OF CHILDREN (UP TO 4)

DATE OF BIRTH (033)

NAME OF CHILD (034)

SEX CODE (035)

CHILD PROOF (036)

DATE OF BIRTH

NAME OF CHILD

SEX CODE

CHILD PROOF

DATE OF BIRTH

NAME OF CHILD

SEX CODE

CHILD PROOF

DATE OF BIRT

NAME OF CHILD

SEX CODE

CHILD PROOF

7. PARTICULARS OF NEXT OF KIN

NAME OF NEXT OF KIN (037)

TOWN/CITY (039)

STREET ADDRESS (038)

TELEPHONE NUMBER (040)

8. PARTICULARS OF APPOINTMENT

TYPE CODE (041)

START DATE (042)

DESIGNATION (043)

DEPARTMENT CODE (044)

FACULTY CODE (045)

SALARY LEVEL (046)

SALARY STEP (047)

CONFIRMATION DATE (048)

9. PARTICULARS OF PROMOTION (UP TO 4)

PROMOTION DATE (049)

NEW DESIGNATION (050)

NEW LEVEL (051)

NEW STEP

PROMOTION DATE

NEW DESIGNATION

NEW LEVEL

NEW STEP

PROMOTION DATE

NEW DESIGNATION

NEW LEVEL

NEW STEP

PROMOTION DATE

NEW DESIGNATION

NEW LEVEL

NEW STEP

10. PARTICULARS OF REGRADE/CONVERSION (UP TO 2)

DATE (053) | PREVIOUS DESIGNATION (054) | PREVIOUS LEVEL (055)

PREVIOUS STEP (056) | NEW DESIGNATION (057) | NEW LEVEL (058) | NEW STEP (059)

DATE | PREVIOUS DESIGNATION | PREVIOUS LEVEL

PREVIOUS STEP | NEW DESIGNATION | NEW LEVEL | NEW STEP

11. PARTICULARS OF PREVIOUS EMPLOYMENT (UP TO 2)

START DATE (060) | DATE LEFT (061) | REASON CODE (062) | LAST SALARY (063)

NAME OF EMPLOYER (064)

ADDRESS EMPLOYER (065)

START DATE | DATE LEFT | REASON CODE | LAST SALARY

NAME OF EMPLOYER

ADDRESS OF EMPLOYER

12. PARTICULARS OF EDUCATIONAL QUALIFICATIONS (UP TO 3)

BEGIN DATE (066) | FINISH DATE (067) | SPECIALIZATION (068) | QUAL. CODE (069) | QUAL. PROOF (070)

NAME OF INSTITUTION (071)

ADDRESS OF INSTITUTION (072)

BEGIN DATE | FINISH DATE | SPECIALIZATION | QUAL. CODE | QUAL. PROOF

NAME OF INSTITUTION

ADDRESS OF INSTITUTION

BEGIN DATE | FINISH DATE | SPECIALIZATION | QUAL. CODE | QUAL. PROOF

NAME OF INSTITUTION

ADDRESS OF INSTITUTION

13. PARTICULARS OF CENSURE/COMMENDATIONS (UP TO 3)

EVENT DATE (073)	SUMMARY OF EVENT (074)	ACTION CODE (075)
EVENT DATE	SUMMARY OF EVENT	ACTION CODE
EVENT DATE	SUMMARY OF EVENT	ACTION CODE

14. PARTICULARS OF PREVIOUS ARMED FORCE SERVICES

DATE JOINED (076)	DATE LEFT (077)	SERVICE NUMBER (078)	ARMED FORCE TYPE (079)

LAST UNIT SERVED (080)	LAST RANK HELD (081)

LAST SALARY (082)	LEAVING REASON CODE (083)	SERVICE PROOF CODE (084)

15. PARTICULARS OF LEAVE RECORD (UP TO 3)

LEAVE TYPE (085)	START DATE (086)	FINISH DATE (087)	RESUMPTION DATE (088)
LEAVE TYPE	START DATE	FINISH DATE	RESUMPTION DATE
LEAVE TYPE	START DATE	FINISH DATE	RESUMPTION DATE

16. PARTICULARS OF A.B.U. TRAINING HISTORY (UP TO 2)

BEGIN DATE (089) | FINISH DATE (090) | COURSE TITLE (091)

TRAINING INSTITUTE (092)

TRAINING COST (093) | QUALIFICATION CODE (094)

BEGIN DATE | FINISH DATE | COURSE TITLE

TRAINING INSTITUTE

TRAINING COST | QUALIFICATION CODE

17. PARTICULARS OF MOVEMENT (UP TO 3)

MOV.TYPE (095) | MOVEMENT DATE (096) | MOVEMENT REASON (097) | NEW DEPT. CODE (098) | NEW FAC. CODE (099)

MOV.TYPE | MOVEMENT DATE | MOVEMENT REASON | NEW DEPT. CODE | NEW FAC. CODE

MOV.TYPE | MOVEMENT DATE | MOVEMENT REASON | NEW DEPT. CODE | NEW

18. PARTICULARS OF LOAN INFORMATION (UP TO 3)

LOAN TYPE (100) | DATE TAKEN (101) | AMOUNT OF LOAN (102)

LOAN TYPE | DATE TAKEN | AMOUNT OF LOAN

LOAN TYPE | DATE TAKEN | AMOUNT OF LOAN

A.B.U. COMPUTERISED PERSONNEL INFORMATION SYSTEM

(VARIATION FORM)

SHEET NO.....

MONTH ....

YEAR ....

S/N	STAFF NAME	FAC	DEPT	PERSONAL NUMBER	VARIATION

PREPARED BY ....

SIGNATURE ....

DATE ....

CHECKED BY ....

SIGNATURE ....

DATE ....

ENTERED BY ....

SIGNATURE ....

DATE ....

(Figure 3)

A.B.U. COMPUTERISED PERSONNEL INFORMATION SYSTEM

(DELETION FORM)

SHEET NO.....
MONTH ....
YEAR ....

S/NO	STAFF NAME	FAC CODE	DEPT CODE		PERSONAL NO

PREPARED BY .....
SIGNATURE .....
DATE .....

CHECKED BY .....
SIGNATURE .....
DATE .....

ENTERED BY
SIGNATURE ...
DATE .....

(Figure 4)

2. Personnel Master File Creation Program -

Since all records of PERSDAT must have been ascertained error-free, this program would read through the file sequentially and create the Personnel Information Master File (PERSIMF) in an indexed sequential format keyed on staff personal number sequence.

3. Maintenance Data Capture Program -

This program would accept maintenance data via the terminal by first prompting the user to indicate the type of update required. In all, three update types are possible, namely: addition of new records to the master file; variation to existing records of the master file; and, deletion of certain records from the master file. If the update tape indicated is to add new records to the master file, then maintenance data would be written to NEWDAT with all records in error reported in NEWERR; if the update type indicated is to make changes on the existing records, then maintenance data are written to VARDAT with all rejected data reported in VARERR; or, if the update type is to delete certain records;

then maintenance data would be written to DELTDAT with data rejected reported in DELTERR.

Each of NEWDAT, VARDAT and DELTDAT would be destroyed as soon as they are processed to update PERSIMF.

Maintenance data would be coded on STARTER FORM for cases where update is to add new records, or VARIATION FORM where update is to make changes on existing records, or DELETION FORM where update is to delete certain records (see figures 3 and 4 for samples of VARIATION and DELETION forms respectively).

4. Update Program -

Making use of the three files (NEWDAT, VARDAT and DELTDAT), this program reads through each file, one after the other, to update the personnel information master file as appropriate.

3.4.3. PIRG Subsystem

The Personnel Information Data Base Master File (PERSIMF) is the source of input data to the PIRG subsystem. The PIRG subsystem is made up of one main program - the Report Generation Program, and several subprograms (function of the

Report Codes). Due to time and fund constraints only two reports/statistics (see section 3.4.4/2 and 3 for these reports) are implemented by this design. Future enhancements consideration makes adequate allowance for the development and generation of other reports/statistics.

1. The Report Generation Program -

This main program determines which report or statistics to be generated by prompting the user to indicate via the visual display terminal the code for the desired report/statistics. Appendix VII outlines a list of some of the reports/statistics along with their corresponding Report Codes, that would be able to be generated by this subsystem.

Soon as the type of report/statistics required is determined by a recognition of the report code, this program would pass control to the appropriate subprogram responsible for the generation of such report/statistics.

2. <u>Report Subprogram For Staff List By Department</u> -

This subprogram would have the responsibility of producing a master list

of all the University staff arranged department by department. It would sequence the staff list within a department in alphabetical order of senior staff followed by alphabetical order of junior staff.

3. Report Subprogram For Staff Statistics By Grade Level -

This subprogram would generate the statistics of University staff by grade level sequences in a manner that could show the numerical relationship between top management, middle management, and lower cadres. Appendix VI shows the system flowchart of this subsystem.

3.4.4. PIE Subsystem

Similar to the PIRG subsystem, the source of input data to the PIE subsystem is the Personnel Information Data Base Master File (PERSMF). The PIE subsystem is made up of one main program - the Enquiry Program, and several subprograms (function of Enquiry Codes). Both the main program, and the subprograms of this subsystem are purely interactive.

Due to time and fund constraints, only

two enquiry facilities (see section 3.4.5/2 and 3 for these enquiries) could be implemented by this design. Future enhancement considerations provide adequate room for the inclusion of other enquiry facilities as need may arise from time to time.

The subsystem would remain particularly invaluable to the entire Registry section, in that, it supports the possibility of obtaining vital information that may be needed for quick planning, and on the spot decision making.

1. The Enquiry Program -

This program determines which staff record is to be enquired for information by prompting the user to enter (via the visual display terminal) the staff personal number. As soon as such a record is recognised, the program proceedes to determine what type of enquiry should be made by further prompting the user to supply the enquiry code.

See appendix IX for a list of some enquiries along with their corresponding Enquiry Codes, that would

be able to be supported by this subsystem. On recognition of the enquiry code, this program would pass control to the appropriate subprogram responsible for identifying the desired information, and responding to the enquiry by way of displaying the information over the visual display terminal for the user to comprehend.

2. Enquiry Subprogram For Information on Particulars of Personal Data -

This subprogram would identify the entire information on particulars of staff personal data (such as name, sex, age and the likes), and display this information on the visual display terminal as a response to the user's enquiry on particulars of staff personal data in a manner that will be suitable for the user to comprehend.

3. Enquiry Subprogram For Information On Particulars of Children -

This subprogram would identify the entire information on particulars of staff children and display same in a manner that could be comprehended by the user.

Appendix VII contains the detailed system flowchart of this subsystem.

3.4.5. Input To The Computer-Based System

Basically, there is one kind of input to this computerised personnel information system, viz: input via the visual display units (VDU). In this kind of input, it is possible for the system to accept staff data, as well as other various transactions' data like variations, deletions, enquiries, and report/statistics selections via the VDU.

When available, certain faster and more effective data capturing and enquiry supporting equipment (like key-to-disk system) could serve as other kinds of input to the computer-based system.

3.5. System Controls

According to Oliver and Chapman, (1981), "Failure to build in adequate control has resulted into many expensive system failures". Thus, since invalid data would inevitably produce wrong outputs, it becomes necessary to ensure that all inputs to the system are correct. System controls of this computer-based system are aimed at detecting and preventing data errors. When such errors are detected, they could be corrected and re-processed.

Specifically, the following different controls are built into the system:

1. Visual Checks -

   Before entering data into the system, they should be visually inspected for accurate coding, legibility and field correspondence on the source document. For instance, new staff data and variation data coded on the input forms must be visually checked.

2. Programmed Validation -

   The measure here involves building into the application programs powers of judgement to detect and report items of data that are incorrect.

   The various validation checks inbuilt include:

   (a) Range and Limit Checks -

   Data item which has a range of values must be checked to ensure that it is within the range, and those having limiting values should not exceede the limits. For example, the system should check that the faculty code is within the range 1 to 22 inclusive. Also, it should check for instance that, if a staff

salary grade level is 9, then the salary step should not be greater than 4.

(b) Data Type Checks -

Fields should be checked to ensure that they contain characters of the correct type. For instance, numeric/alphabetic should receive numeric/alphabetic data values.

(c) Value Checks -

Fields having a set of values should be checked against the permitted values; in other words, they should neither be too high nor too low.

3. Control Reports -

At end of processing, a run summary should be printed showing total number of records accepted or rejected.

Maintenance routines should also print total number of additions accepted or rejected, total number of changes (variations) accepted or rejected, and total number of deletions accepted or rejected. Since data entry is via the VDU, any records/items in error should be displayed for correction (if possible)

and re-entry. In a case where correction is not immediately possible, the records/items in error should be reported and printed with associated error messages to aid easy correction.

4. Prevention of Record Duplication -

The system should fault as error, any attempts to add an already existing record to the master file (data base), change a non-existing record, or delete a non-existing record. The indexed sequential file organisation as detailed in section 3.4.1/b provides automatic check of this kind of error on Write, Rewrite into an already existing file or Delete from such a file. Whenever a situation like this arises, the application routine should display the key field and the record concerned for checking.

3.6. Security And Privacy

The computerised personnel information system once in operation may be the only reliable means of personnel information control. As such, adequate security and privacy should be provided to ensure its continual operation and in the case of

failure, quick recovery.

> "The term security is used here to mean the protection of the data in the data base against unauthorised disclosure, alteration, or destruction", Date, (1977).

Thus, in this design, security and privacy are aimed at protection of the system and/or data against unauthorised access; accidental or intentional disclosure to unauthorised persons; unauthorised modifications and/or destruction; and, hardware/software errors. Security also addresses the issue of protecting the installation against fire, flood, and other disasters. In this design, security considerations ensure that, at both the physical and operational levels, security is exercised. While physical security borders on ensuring that no damage is done to the data base and programs as they await processing, operational security ensures that, data are not lost during the actual processing. The problem of invasion of personal privacy was of paramount concern to this design.

According to Lindberg, (1970), "The question of invasion of personal privacy is the dominant problem in the construction of very large publicly supported data bases -

at least those that retain the association of individual data items with the identification of the person. Obviously, a system must retain such identification in order to really be useful".

Towards achieving the required security and privacy goals, the following explains some of the security threats to which the personnel information system could be exposed and how they could be minimised or prevented.

1. On-line Security -

The wealth of information in the computer room, and the personnel information control area should be secured. However, this security could be endangered by:

(a) Delibrate access to the computer room to change records;

(b) Accidental leakage by a person seeing or removing information;

(c) Hardware and software failures which corrupt or loose data.

(d) Unauthorised operation of the system.

To prevent some of these threats, the control of access to the computer room and personnel information area as follows are

inevitable:

(a) The computer room and personnel information area should be locked to avoid access except to authorised staff.

(b) Unauthorised persons should be admitted to the computer room, and the personnel information area in company of a senior staff incharge of personnel information.

(c) System operation should be limited to only those authorised by the Registrar.

2. Illegal Access To The Data Base -

Unauthorised staff should be prevented from having access to the data base, because such staff might modify records with a view to either meriting undue favours to themselves or their friends; or might add records of non-existent staff ('ghost workers') to the data base.

This implies that, the Personnel Information Master File (PERSIMF) should be adequately protected. Illegal access to this file could be prevented by use of file-access password or code in addition to the system password. With

such a protection, before the file is opened, the user would have to supply the file-access password. Handling of this password could be incorporated in the file creation and maintenance routines.

3. Fire and Other Disasters -

Should fire or flood destroy the computer records, reconstitution might be very expensive if not impossible. It would therefore be necessary to have a room protected against fire (and flood as well) to house the personnel records. It would also be necessary to keep back-up copies of the data base software, and application routines at safe locations outside the computer room (and the personnel department if possible). Like this, reconstitution from the security copies would be possible in the event of the computer room being destroyed. For the purpose of the security copies, magnetic tapes would provide cheap back-up. A further advantage with the use of magnetic tapes here is that, in a case of prolonged hardware failures, the back-up tapes could be taken to another computer

Centre for running when it is inevitable that reports must be produced.

4. Security of Outputs -

It would be necessary to ensure that outputs are sent to only those personnel officers or appropriate decision making officers who are permitted to see them.

3.7. Back-up, Recovery And Data Base Reorganisation

The computer-based personnel information system could crash due to hardware malfunction, file corruption, operator or software errors.

The important and critical nature of personnel information system demands a quick recovery when such circumstances arise. Also, the reorganisation of the personnel information master file which by role (as the only data base serving all the three subsystems) is exposed to very high activity rate, would be necessary.

1. Back-up -

Desired back-up could be realised through the following ways:

(a) The data base (PERSIMF) that is held on disk would be dumped to magnetic tapes periodically. The frequency of dumping should largely

depend on the activity rate, however, under normal circumstances once a week would be adequate.

(b) Copies of the application programs and the management system (that is the operating system) should be maintained as back-up. If changes are made to the programs, then such back-up copies should be updated. Where possible, two back-up copies could be kept at different locations.

2. Recovery -

(a) If the data base is corrupted, damaged or purged accidentally, it could be reconstructed using the latest file dump and changes to the data base since last dump.

(b) In the case of damage or loss of the application programs,,the back-up copies would be used to reconstitute them.

3. Data Base Reorganisation -

Because the file that would be used by the computerised system is on-line and organised indexed sequentially, it would be necessary to reorganise them periodically so as to reclaim space and arrange records in their proper locations

(since a number of records might have been displaced to overflow areas which could be filled up). This reorganisation could be ahhieved by a simple program which would copy records to tapes and rewrite them to disks. The file back-up indicated in section 3.7/1 above could be tied-up with the data base reorganisation via retention of tapes as back-up copies.

3.8. User Interface

Towards ensuring simplicity of use (section 3.2.1/1) of the computerised personnel information system, since the people to operate the system would be non-computer experts, this design tries to present to the user a friendly interface. The following briefly outlines how this could be achieved and it has been reflected in the implementation:

1. Code Design -

In designing codes, meaningful codes, would be used wherever possible rather than using digits. However, the codes should not be too long. Some of the codes could be converted internally to numerics by the application programs so as to

minimise storage spaces that they would occupy. For example, Mr, Miss, Prof., Mal., Chief could be used for title rather than 1,2,3,4,5 respectively, but internally such titles would be converted to and stored as 1,2,3,4,5.

2. Data Entry -

The data entry programs should guide the user as much as possible on what to do. They should prompt the user as what to enter each time; for example a prompt could be:

PERSONAL NO PLS

which instructs the user to enter a staff's personal number.

These programs should also make it possible for errors to be corrected on the spot if the user is able to. These aspects are intensively reflected in the development of the programs. For example, when a data item is entered and rejected by the system, the computer responds by displaying the reason for rejecting the item, followed by the message:

WISH TO CORRECT ITEM? (Y/N)

If the user is able to instantly correct

the error, he types Y or YES, and the system re-displays the item prompt for the user to re-enter the correct item.

3. User's Manual -

To ensure satisfactory and accurate operation of the system, a user's manual should be prepared. Appendix X describes an example of a user's manual for this system. When the University indicates her intention to fully implement this system, a more comprehensive User's manual would be prepared.

3.9. Implications Of The System

Introducing the computerised personnel information system is sure to have some obvious implications, particularly since computers are not only different from human beings but also inflexible in decision making. Among the several implications that are likely, the following details some:

1. Staff Re-Orientation -

All or most of the personnel department staff would have to be trained in computer procedures and appreciation to be able to operate the system. Thus, orientation of such staff would become

tailored towards computer using.

2. New Input Forms -

The introduction would necessitate discarding some of the forms that were hitherto being used for personnel records, and new ones that would facilitate input to computer be designed. Figures 2, 3 and 4 (see section 3.4.3) show some of the input forms that would be used by this system.

3. Activities

The computerised system would handle most activities of the manual system and possibly more. This does not render redundant all the clerical and/or filing clerks of the personnel department. For example, some staff would definitely be responsible for entry of staff data and the various transactions into the computer.

The new system would only endeavour to simplify most of the hitherto tedious and cumbersome activities of the personnel department while at the same time providing training opportunities for the department's staff.

4. Resistance to Change -

It is possible that some of the personnel department's staff could resist

the introduction of the computer-based personnel information system due to either the fear of loosing their jobs, or the problems associated with retraining. Some may resist because of the inherent threat to their status, prestige, security and possible disruption of personal relationships.

The Registry authorities should therefore endeavour to mount some campaigns, assuring the staff that nobody would loose his/her job except those who would refuse to get trained along with the new system. The authorities should equally explain the benefits derivable from the computerised system compared to the manual system.

CHAPTER 4

SYSTEM DEVELOPMENT AND IMPLEMENTATION

4.1. Program Development

A rough estimate of the effort that would be required for the development and exhaustive testing of the various programs making up the Computer-Based Personnel Information System shows that, about thirty six (36) man-weeks of intensive commitment would be involved. The initial coding and entering of staff data into the system would take about four (4) man-weeks to complete.

In this project, program development has been done in stages as follows:-

Stage 1: PIDB Subsystem -

This stage involves the development of:

(a) PERSØA which creates the Departments file while PERSØB lists the content of the file.

(b) THE PERSIMF creation programs, namely: PERS1A which accepts staff data via the Visual Display Terminals, validates such data, and writes all valid records sequentially into a file called PERSDAT with all data in error reported into PERSERR; and, PERS1B which

writes records of PERSDAT into PERSIMF indexed sequentially.

(c) The PERSIMF maintenance programs, namely:

PERS2A which accepts all maintenance data (starters, Variations, and/or Deletions), validates them, and writes valid records sequentially into NEWDAT, VARDAT, and/or DELTDAT depending on update type, with all data in error reported into NEWERR, VARERR, or DELTERR.

Stage 2: PIRG Subsystem-

Stage 2 of the program development involves the development of programs for:

(a) Comprehensive Staff List by Department;

(b) Staff Statistics by grade level

*It should be noted that allowance has been provided for other reports (as listed in appendix VIII) to be developed in future as the need arises.

Stage 3: PIB Subsystem-

The third stage includes the development of programs for:

(a) Enquiry on Particulars of personal data;

(b) Enquiry on particulars of children.

*It should be noted here as well that, adequate allowance is provided for other enquiries (as listed in appendix IX) to be developed in future as the need arises.

Stage 4: Back-up/Recovery Programs -

The nature and importance of personnel information system demands that, back-up/recovery programs be developed before the system goes live. Thus, stage 4 is aimed at designing and implementing such programs. That aspect is expected by this project to be handled as a future enhancement due to lack of adequate time and funding for computer resources like stationery, accessories and so on.

4.2. Implementation Language

Based on the following grounds, COBOL (Common Business Oriented Language) has been chosen as the implementation language:

(a) The CYBER 72 computer system at Iya Abubakar Computer Centre supports extensively the rugged usage of

COBOL.

(b) COBOL supports full indexed sequential capabilities.

(c) COBOL supports full random access facilities.

(d) COBOL is taught in Ahmadu Bello University and is widely used by staff and students alike.

(e) Most members of staff of the University's Computer Centre are experts in COBOL programming, thus, full system support in respect of certain machine dependent aspects of COBOL would always be available.

(f) Most of the computer installations around Zaria, and in Nigeria at large implement COBOL on their systems, therefore, back-up needs for the computer-based system would be feassible with ease in case of a major and prolonged break down of the CYBER 72 computer system.

4.3. Implementation

Before bringing this system into operation, an implementation plan should be drawn in consultation with the Registry authorities. Also, detailed User manuals would have to be prepared.

Specifically, the implementation would span such aspects as file conversion, User training, University staff education, and changeover to the new system.

4.3.1. File Conversion

The initial setting up of the Personnel Information Data Base would begin with the Senior Staff Data, and then followed by Intermediate and Junior Staff Data.

Staff data in general would be coded from the present manual system on the computer-based Starter Forms (Figure 2). This in other words means that, for the purpose of file conversion from the manual system to the computer-based system, all University staff would be treated as starters.

While more coding forms are being completed, it would be time saving to have the coded ones entered into the system. However, such entries should only be made after a senior personnel officer must have physically checked such coded data for correctness and accuracy.

4.3.2. User Training And Staff Education

User Training -

In order to ensure a smooth and

successful operation of the computer-based system, all staff connected with personnel activities should be trained. Broadly, the training would cover such areas as computer appreciation, computer operation, data coding and entry into the system, data control procedures, how to apply the User Manual, how to operate the new system, and schedule of activities. With respect to this training, the level of training for each staff depednds on his/her particular assignments. Usually, the training should take at least two to three weeks.

University Staff Education -

Before introducing the new system, an adequately wide publicity should be accorded to it in the University. The entire University staff should be informed of the benefits derivable with the new system, as well as get acquainted with any new guidelines on personnel information procedures (for example any changes in staff documentation procedures).

4.3.3. Changeover To The Computer-Based System

The method of Parallel running should be adopted for the changeover to the computer-based system. According to

Orilia et al (1977), "Essentially, this means that the new system will be run initially at the same time that the current system is working". This practice may be demanding in terms of workload and cost of maintaining two systems but, the following associated advantages explain why this method has been chosen:

(a) In the event of unforseen failure of the new system at the outset, the continuity of the manual system is ensured while the error of the new system is being corrected.

(b) Comparison of the manual and the new systems could be made with a view to making necessary amendments to the new one.

(c) The period of parallel running would provide opportunity for an adequately realistic final testing of the new system.

(d) All people involved in the running of the new system could take advantage of this period to fully familiarise themselves with the new system.

4.4. Implementation For This Project

Because of time constraints, sudden poor performance of the CYBER 72 system, and

inavailability of adequate funding coupled with the non-cooperative attitudes of most staff of the Registry (possibly due to the bureaucratic nature of their administrative system) during the fact finding stage, and request for test data stage, the implementation done for this project is limited to developing and testing some programs of the PIDB, PIRG and PJE subsystems. Appendices V, VI and VII detail the system flowcharts while appendix XII contains some sample programs, and output.

CHAPTER 5

FUTURE DEVELOPMENTS

The objective of this Computerised Personnel Information System will become defeated if this research fails to allow considerations for future enhancements and/or maintenance. Thus, most of the enhancements discussed below would apply after implementing the system fully.

5.1. System Evaluation

Usually, good systems are achieved through periodic evaluation. Therefore, when this system becomes fully operational, it would be necessary (after about four months for instance) to evaluate to what extent it has affected the various activities of the Personnel Department and identify those aspects that could be improved.

5.2. Enhancement To Other Reports

Since this research is not sponsored by anybody, a major limitation it has been exposed to remains that of meeting the financial cost of stationery and computer resources respectively needed for developing, generating and listing all the various information reports. Thus, only few information reports were able to be fully

developed, and generated by this design (section 3.4.4 explains those).. It should be noted however that, the PIRG subsystem adequately makes allowance for the eventual inclusion of other reports (including those that may be desirable in the future but have not been thought of presently). Enhancements in this area will involve assigning appropriate Report Generation Codes to the newly desired reports as they evolve.

5.3. Enhancements To Other Enquiries

For similar reasons stated in 5.2. above, all the various possible enquiries could not be fully developed by this design. Thus, the PIE subsystem endeavours to adequately make allowance for the eventual inclusion of other enquiries (including those that may be desirable in future but have yet to be thought of presently). Enhancements here will involve assigning appropriate Enquiry Codes to the newly desired enquiries as they involve.

5.4. Enhancements To Related Tasks

This system has been designed not to isolate the various functions of the entire Registry, but should instead bring them closer together by making each group's work more readily available to other groups. Thus

once the computer-based Personnel Information System has been implemented, evaluated and running satisfactorily, the computerisation could be extended to provide data and manpower resources that will support the integration of other related tasks. Among such related tasks are - Skill Inventory; Job Positions; Housing Allocation; Personnel Development; and, Personnel Budget.

Consider for example if a person applies for a job, the Establishment unit should be able to quickly

- enquire about the number of employees already in the University's employment having similar skill as the applicant and holding similar positions as desired by the applicant. The knowledge of this will easily indicate, when compared with approved estimates whether or not there exists a vacancy.
- in a circumstance where vacancy exists, it should be possible to compare applicant's qualifications with the qualifications held by employees already in service to determine whether or not applicant is suitable for the job.

For another example, consider the Housing Allocation Management circumstance where a

staff applies for an allocation of a University quarter. The Housing & Passages unit should be able to quickly

- determine whether or not the staff is qualified to have a University quarter by enquiring about his appointment type, marital status, designation and/or salary level.
- if qualified, knowledge of these information will simplify the determination of the house type the staff can be allocated.
- control statistics could then be easily generated for the total number of such house type that are already occupied. The knowledge of this when compared with the total number available at the University's disposal will determine whether or not there is still any such house left that could be allocated for staff accommodation.

CHAPTER 6

CONCLUSION

The Ahmadu Bello University manual system of personnel records administration has been investigated and the associated problems and inefficiencies noted. Analysis of thes problems and inefficiencies aroused a proposal for a computer-based administration system titled "Computerised Personnel Information System For Ahmadu Bello University". This system has been designed and trial implementation effected on the University's Computer Centre CDC machine (CYBER 72). Future enhancements of the system have also been discussed.

Appreciating that perfect systems are usually evolved after some refinements, it is hoped that this system can be gainfully used by the University to meet most requirements characteristics of an improved system in her personnel records administration.

Although this system has been designed with Ahmadu Bello University in view, it could be tailored for use with little or no modifications, to meet the needs of any organisation (Industrial, Business, Educational, Government, or Research).

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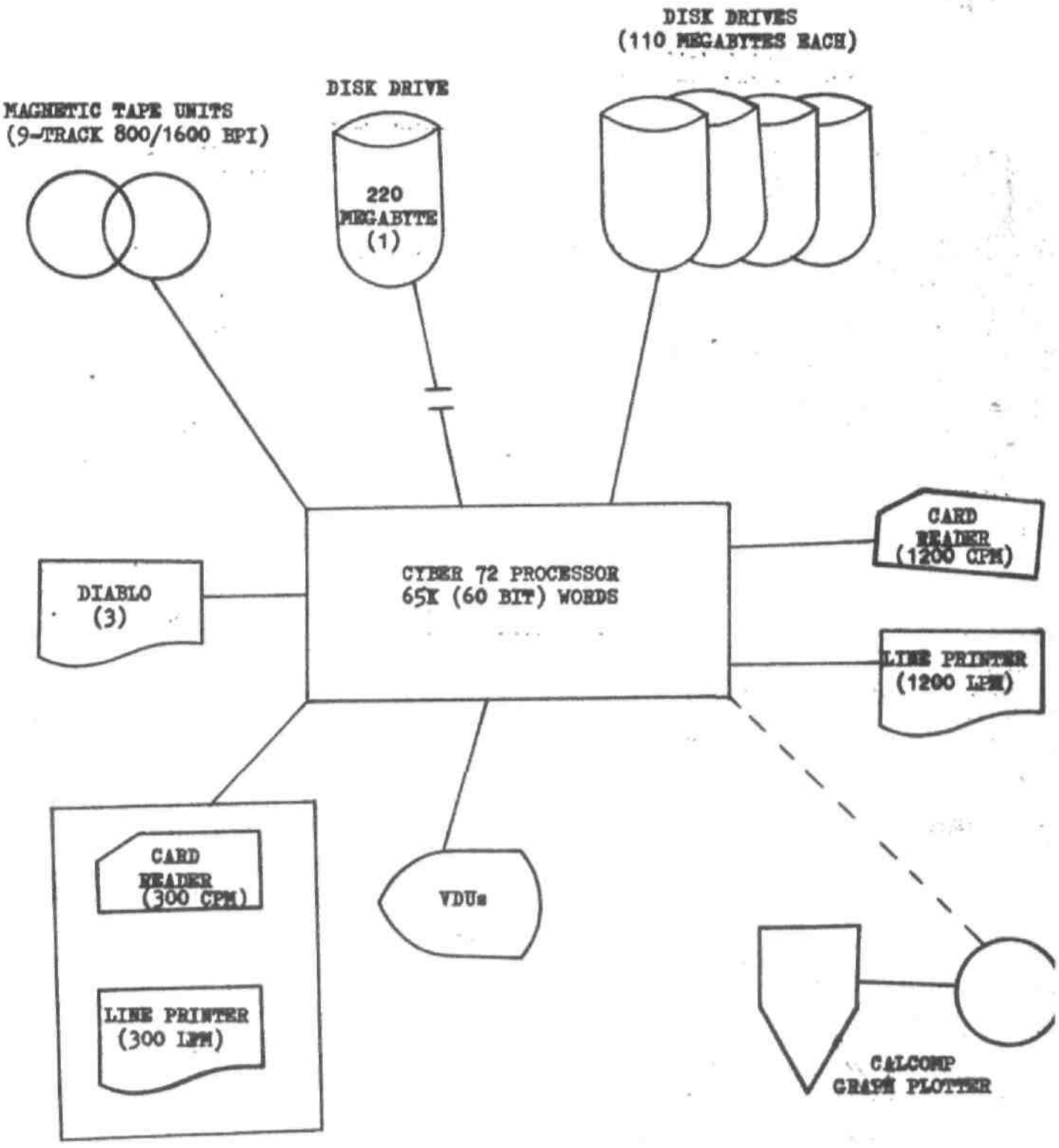
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APPENDIX I

COMPUTER HARDWARE CONFIGURATION AT IYA ABUBAKAR COMPUTER CENTRE, A.B.U., ZARIA



APPENDIX II **SAMPLE DOCUMENTATION FORMS AS USED IN THE MANUAL SYSTEM

AHMADU BELLO UNIVERSITY, ZARIA
(OFFICE OF THE REGISTRAR)

NOTICES: (1) Evidence may be required in support.
(2) Please report any subsequent changes in the particulars to the Registrar.

1. Personal Details

Surname .....Other Names .....

Date of Birth .....Marital Status .....

2. Appointment .....Department .....

3. Nationality .....

4. Native Place ....Local Govt. .....

.....

(Note: Wife's domicile is deemed to be that of her husband)

Town .....

5. Permanent Home Address .....

.....

6. I wish my name to appear in the Staff List as follows .....

.....

7. Qualifications .....

Academic Details .....

QUALIFICATIONS	INSTITUTION(S)	DATE
.....	.....	.....
.....	.....	.....
.....	.....	.....

8. Family Details

(a) Wife/Husband .....

(b) Children .....

Note: "Child" means a legitimate child, a step-child or a legally adopted or mandated child, aged less than 18-years, who is unmarried, not in gainful employment, and wholly dependent on the member of staff concerned.

** (Courtesy of The Registry Unit, A.B.U., Zaria)

NAME		DATE OF BIRTH
.....	.....	.....
.....	.....	.....
.....	.....	.....

9. Next of Kin (Other than wife/husband) Name: .....

Address: .....

....

I certify that the information provided above is to the best of my knowledge correct and complete.

Date:..... Signature ....

TO BE COMPLETED IN REGISTRY

Date of commencement of appointment .....

Type of Appointment: Tenure/Month-To-Month .....

.....

for: Registrar

APPENDIX II CONTINUE

[illegible] UNIVERSITY, ZARIA
(Office of the Registrar)

TO BE COMPLETED BY ALL NEW SENIOR STAFF

1. Name: ....
(Surname) (Other Names)

2. Appointment..... Department:.....

3. Date of arrival in Nigeria .....

4(a) Date assumed duty:.....

(b) Place of Previous Employment.....

5. Signature:.....

For staff arriving from outside Nigeria

For staff arriving within Nigeria.

(For Office Use)

6. Formal Acceptance of Offer received:.....

7. Personal Particulars Form Submitted:.....

8. Medical Certificates Submitted:.....

9. Curriculum Vitae available .....

10. Senior Staff New Arrivals Book .....

(for: Registrar)

APPENDIX III

** SAMPLE REPORTS GENERATED BY THE THE MANUAL SYSTEM

ANALYSIS OF SENIOR STAFF BY FUNCTION (1979/80)

U N I T S	ACADEMIC	TECHNICAL	ADMINISTRATIVE	TOTAL
A. Direct Teaching Units				
1. Fac. of Administration	74	-	1	76
2. Fac. of Agriculture	63	7	5	75
3. Fac.of Arts & Soc. Sc.	146	2	2	150
4. Fac. Of Education	81	-	5	86
5. Fact. of Engineeering	91	27	3	121
6. Fac. of Env. Design	68	6	4	78
7. Fac. Of Law	21	-	2	23
8. Fac. Of Medicine	76	16	8	100
9. Fac. of Pharm. Science	38	10	1	49
10. Fact. of Science	137	23	4	164
11. Fac. of Veterinary Med.	62	14	3	79
12. Sch. of Basic Studies	101	2	5	108
Sub - Total	958	108	43	1,109
B. TEACHING SUPPORT UNITS				
1. Universitty Farm	-	2	-	2
2. Educ. Tech. Centre	6	2	1	9
3. Samaru Lib. Lab.	2	-	-	2
4. Computer Centre	10	-	1	11
Sub - Total	18	4	2	24
C. ORGANISED RESEARCH UNITS				
1. Centre for Nigerian Cultural Studies	27	5	4	36
2. Centre for Social & Legal Studies	8	-	1	9
3. Arewa House	1	1	3	5
4. Centre for Social & Economic Research	14	-	1	15
5. Research & Consult	(See Faculty of Administration Column)			
Sub - Total	50	6	9	65

** (Courtesy of the planning Unit, A.B.U., Zaria)

APPENDIX III CONTINUE

ANALYSIS OF I. & J. TAFF BY FUNCTION (1979/80)

UNIT	ACADEMIC	TECHNICAL	ADMINISTRATIVE	TOTAL
DIRECT TEACHING UNITS:				
1. Fac. of Administration	-	9	55	64
2. Fac. of Agriculture	-	[illegible]	25	80
3. Fact. Of Arts & Soc.Sciences	-	27	73	100
4. Fac. of Educ. (including Staff School)	-	18	64	82
	49	3	10	62
5. Fac. Of Engineering	-	[illegible]5	70	145
6. Fac. Of Env. Design	-	[illegible]	75	107
7. Faculty Of Law	-	1	18	19
8. Fac. Of Medicine	-	[illegible]9	67	126
9. Fac. Of Pharm. Science	-	15	9	24
10.Fac. Of Science	-	[illegible]0	62	152
11.Fac. Of Veterinary Medicine	-	85	69	154
12.Sch.Of Basic Studies	-	38	18	76
Sub - Total	49	[illegible]27	615	1,191
TEACHING SUPPORT UNITS				
1. University Farm	-	13	27	40
2. Educ. Tech. Centre	-	10	3	13
3. Samaru Lib. Lab.	-	5	1	6
4. Computer Centre	-	17	9	26
Sub - Total	-	45	40	85
ORGANISED RESEARCH UNITS				
1. Centre for Nig. Cul Studies	-	13	22	45
2. Centre for Isl.Legal Studies	3	8	12	23
3. Arewa House	-	20	44	64
4. Centre for Soc.& Econs.Res.	-	3	8	11
5. Dept. of Research and Consultancy		(See Faculty Of Administration Column)		
Sub - Total	3	44	96	143

APPENDIX III CONTINUED

SENIOR STAFF BY SEX AND NATIONALITY - 1979/80 SESSION

UNITS	Nigerian		Non-Nigerian		Total		GRAND TOTAL
	Male	Female	Male	Female	Male	Female	
Main Campus (Excluding Faculty of Agriculture	766	138	277	74	1,043	212	1,255
Insitute of Administration	82	5	31	3	113	8	121
Institute of Education	125	37	17	10	142	47	189
I.A.R./Faculty of Agric.	177	3	51	1	228	7	235
A.E.R.L.S.	35	3	1	-	36	3	39
N.A.P.R.I.	40	-	3	2	43	2	45
C.N.C.S.	27	5	2	2	29	7	36
D.A.C.	58	11	10	5	68	16	84
TOTAL	1310	205	392	97	1702	302	
GRAND TOTAL	1,515		489		2,004		2,004

APPENDIX IV

PERSONNEL INFORMATION MASTERFILE SPECIFICATIONS

File Name: PERSIMF ..... System: COMPUTERISED PERS. INFO .....

File Organisation INDEXED ..... Block Size: 20 RECORDS .....

Key On: STAFF NUMBER ..... Record Size: 1633 ..... CHARACTERS

Label Records: OMITTED ..... Creating Program: PERS1B .....

Level No	Field Name	Picture	Field Description
01	PERS-INFOR-REC		
03	PERSONAL-DATA		PARTICULARS OF PERS DATA
05	STAFF-NO		STAFF PERSONAL NUMBER
07	PJP	X	
07	STFF-NO	9(5)	
05	TITLE-CD	9(2)	Title Code
05	INITIALS	X(5)	Initials
05	SURNAME	X(15)	Surname
05	RELIGION-CD	9(2)	Religion Code
05	M-STATUS-CD	9	Marital Status Code
05	BANK-INFO		
07	BANK-CD	9(2)	Bank Description Code
07	ACCT-TYPE-CD	9	Account Type Description Code
07	BANK-ACCT-NO	X(11)	Bank Account Number
05	BIRTH-INFO		
07	BIRTH-DT	9(6)	Date of Birth (ddmmyy)
07	BIRTH-PRF-CD	X	Birth Proof Description Code
05	STATE-ORIGIN-CD	9(2)	State of Origin Description Code
05	NATIONALITY-CD	9(3)	Nationality Description Code
03	PHYSICAL-CHAR		PARTICULARS OF PHYSICAL CHARACTERISTIC

APPENDIX IV CONTINUED

Level No	Field Name	Picture	Field Description
05	SEX-CD	X	Sex Description Code.
05	COMPLEXION-CD	X	Complexion Description Code
05	EYES-CD	X	Eyes Description Code.
05	HAIR-CD	X	Hair Description Code.
05	HEIGHT	9V99	Height in Meters
05	WEIGHT	9(3)V99	Weight in Kilograms
05	BLOOD-GRP	X(2)	Blood group
05	DEFORMITY-CD	X	Deformity Description Code
05	LANGUAGE-CD	99	Language Description Code.
03	RESIDENCE-DATA		PARTICULARS OF RESIDENCE.
05	LOCAL-ADDR		
07	HSE-TYPE-CD	9	House Type Description Code
07	LSTREET-CITY	X(24)	Local Address Street and City
07	LSTATE-CD		State Description Code of Local Address
07	LTELPHONE-NO	X(6)	Telephone Number of Local Address
05	PERMT-ADDR		
07	PSTREET-CITY	X( )	Permanent address street and city
07	PSTATE-CD	9(2)	State Description Code of Permanent Address
07	PCOUNTRY-CD	9(3)	Country Description Code of Permanent Address.
03	SPOUSE-DATA	OCCURS 2 TIMES	PARTICULARS OF SPOUSE
05	MARRIAGE-DT	9(6)	Date of Marriage (ddmmyy)
05	SPOUSE-NAME	X(15)	Name of Spouse

Level No	Field Name	Picture	Field Description
05	MARRIAGE-PRF-CD	X	Marriage Proof Description Code
03	CHILDREN-DATA	occurs 4 TIMES	PARTICULARS OF CHILDREN
05	CHILD-DOB	9(6)	Child's Date of Birth (ddmmyy)
05	CHILD-NAME	X(15)	Name of Child
05	CHILD-SEX-CD	X	Child Sex Description Code
05	CHILD-PRF-CD	X	Child Proof Description Code
03	N-O-KIN-DATA		PARTICULARS OF NEXT OF KIN.
05	NOK-NAME	X(24)	Name of Next of Kin
05	NOK-ADDR		
07	NOK-STREET	X(15)	Next of Kin's Street Address
07	NOK-TOWN	X(10)	Next of Kin's town
05	NOK-TEL-NO	X(6)	Next of Kin's telephone Number
03	APPOINTMENT-DATA		PARTICULARS OF APPOINTMENT
05	APPT-TYPE-CD	9	Appointment Type Description Code
05	APPT-STAT-DT	9(6)	Date of Starting Appointment (ddmmyy)
05	DESG-ON-APPT	X(15)	Designation on Appointment
05	DEPT-CD	9(3)	Department Description Code on Appointment.
05	FAC-CD	9(2)	Faculty Description Code on Appointment
05	LEVEL-STEP	9(3)	Salary level and Step on Appointment
05	CONFIRM-DT	9(6)	Date of Appointment
03	PROMOTION-HISTRY	OCCURS 4 TIMES	PARTICULARS OF PROMOTIONS

APPENDIX IV CONTINUED

Level No	Field Name	Picture	Field Description
05	PROMOTION-DT	9(6)	Date of Promotion (ddmmyy)
05	PREV-DESG		Designation before Promotion.
05	NEW-DESG	X(15)	Designation on Promotion.
05	NEW-LEV-STEP	9(3)	New Level and step
03	REGRADE-CONVERT	OCCURS 2 TIME	PARTICULARS OF REGRADE/CONVERSION
05	EVENT-DT	9(6)	Date of Regrading/ Converting
05	EX-DESG	X(15)	Previous Designation
9 05	EX-LEV-STEP	9(3)	Previous Level and Step
05	NEW-DESG	X(15)	New Designation
05	NEW-LEV-STEP	9(3)	New Level and Step
03	PREV-EMPLOYMENT	OCCURS 3 TIME	PARTICULARS OF PREVIOUS EMPLOYMENT
05	FROM-DATE	9(6)	Date Assumed Duty (ddmmyy)
05	TO-DATE	9(6)	Departure Date (ddmmyy)
05	PREV-EMPLOYER EMPL	X(15)	Previous Employer's Description
05	EMPLOYER-ADDR	X(20)	Previous Employer's Address
05	LEAVING-REASON	X	Description Code of Reason for Leaving
05	LAST-SALARY	9(5)V99	Last annual salary
03	EDUCATION-HISTORY	OCCURS 4 TIME	PARTICULARS OF EDUCATIONAL QUALIFICATIONS
05	BEGIN-DT	9(6)	Date of Beginning Course (ddmmyy)
05	END-DT	9(6)	Date of Ending Course (ddmmyy)
05	INSTITUTION	X(15)	Description of Institution
05	INSTITUTION-ADDR	X(2	Institution's Address

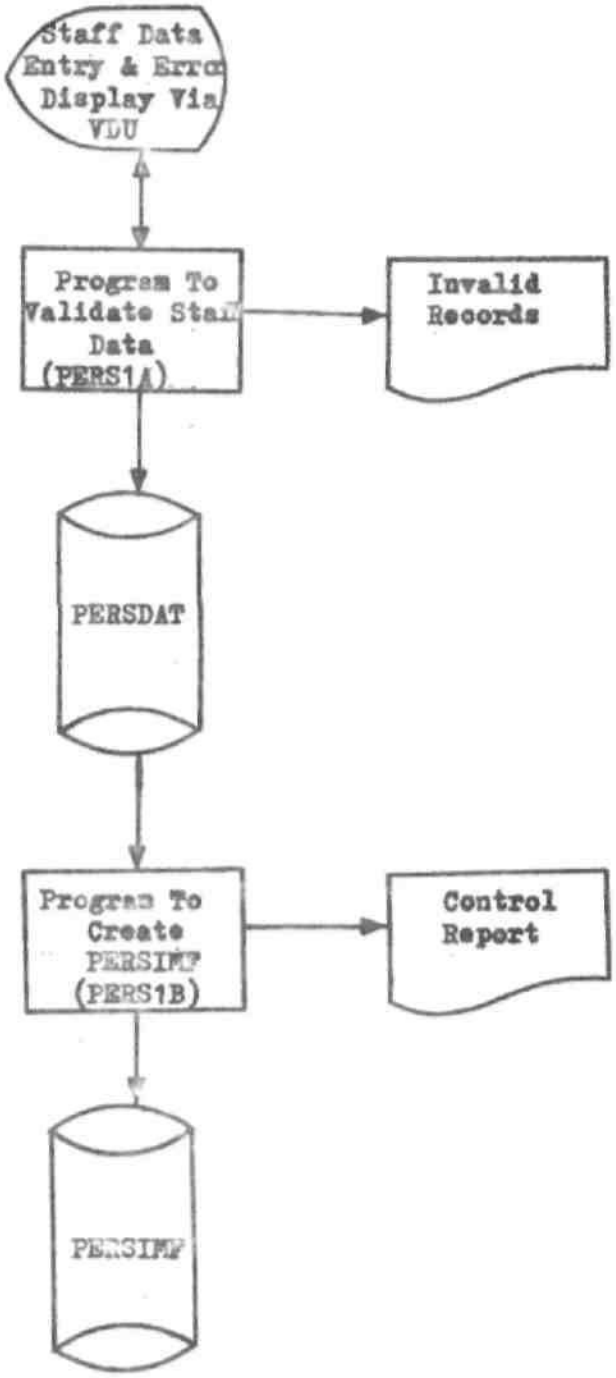
APPENDIX IV CONTINUED

Level No	Field Name	Picture	Field Description
05	SPECIALITY	X(8)	Area of Specialisation
05	QUALIFICATION-CD	X	Qualification Description Code
05	QUAL-PRF-CD	X	Qualification Proof Description Code
03	CENSURE-COMMEND	OCCURS 3 TIME	PARTICULARS OF CENSURES/ COMMENDATION
05	CEN-COM-DT	9(6)	Date of Censure/ Commendation (ddmmyy)
05	EVENT-SUMMRY	X(18)	Summary Description of Censure/ Commendation
05	ACTION-CD	X	Censure/Commendation action Description Code
03	ARMED-SERVICE		PARTICULARS OF ARMED SERVICES
05	ARM-START-DT	9(6)	Date of joining the service (ddmmyy)
05	ARM-LEAVE-DT	9(6)	Date of Leaving the Service (ddmmyy)
05	ARM-SERV-NO	X(10)	Personal Number in the armed force
05	ARM-TYPE-CD	9	Armed force type Description Code
05	LAST-UNIT	X(15)	Last Unit of Service in the force
05	LAST-RANK	X(10)	Last rank in the armed force.
05	ARM-LAST-SALARY	9(5)V99	Last annual salary in the force
05	ARM-LEAVE-REASON	X	Description Code of reason for leaving the force
05	SERV-PRF-CD	X	Previous armed service proof Code
03	LEAVE-RECORD	OCCUR 5 TIME	PARTICULARS OF LEAVE RECORDS
05	LEAVE-CD	X	Type of Leave Description Code

APPENDIX IV CONTINUED

Level No	Field Name	Picture	Field Description
05	LEAVE-STAT-DT	9(6)	Date of Commencing leave
05	LEAVE-END-DT	9(6)	Date of ending Leave
05	RESUME-DT	9(6)	Date of resumption from leave
03	ABU-TRNG-HISTRY	OCCURS 3 TIMES	PARTICULARS OF A.B.U. TRAINING
05	TRG-BEGIN-DT	9(6)	Date of beginning training (ddmmyy)
05	TRG-END-DT	9(6)	Date of ending training (ddmmyy)
05	COURSE-TITLE	X(13)	Title of training
05	TRG-INSTITUTE	X(20)	Institution of training
05	TRG-COST	9(5)V99	Financial cost of training on A.B.U.
05	TRG-QUAL-CD	X	Description code of qualification on completion.
03	MOVEMENT-HISTRY	OCCURS 6 TIMES	PARTICULARS OF MOVEMENTS
05	MOVE-TYPE	X	Movement type description code
05	MOVE-DT	9(6)	Effective date of movement.
05	MOVE-REASON	X(10)	Reason for Movement
05	NEW-DEPT-CD	9(3)	New department description code
05	NEW-FAC-CD	9(2)	New faculty description code
03	LOANS-INFO	OCCURS 3 TIMES	PARTICULARS OF LOANS
05	LOAN-TYPE-CD	9	Loan type description code
05	DATE-TAKEN	9(4)	Date of taken the loan (mmyy)
05	LOAN-AMT	9(6)V99	Amount of loan taken repayment (mm)
03	FILLER	X(90)	Blank spaces to allow easy introduction of unforesen fields of information that may arise as time goes o

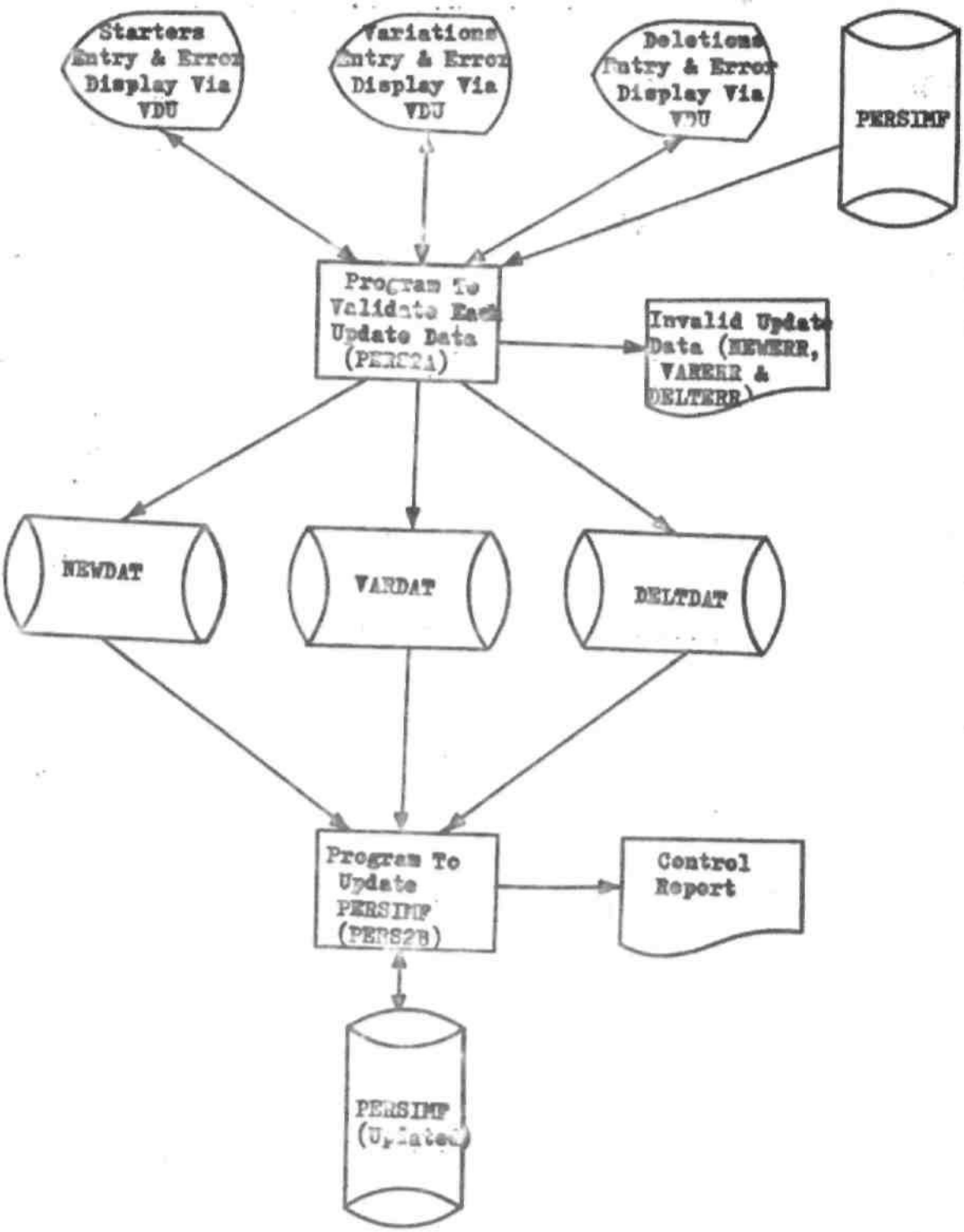
SYSTEM FLOWCHART FOR PIDB SUBSYSTEM



(PERSIMF Creation)

APPENDIX V CONTINUED

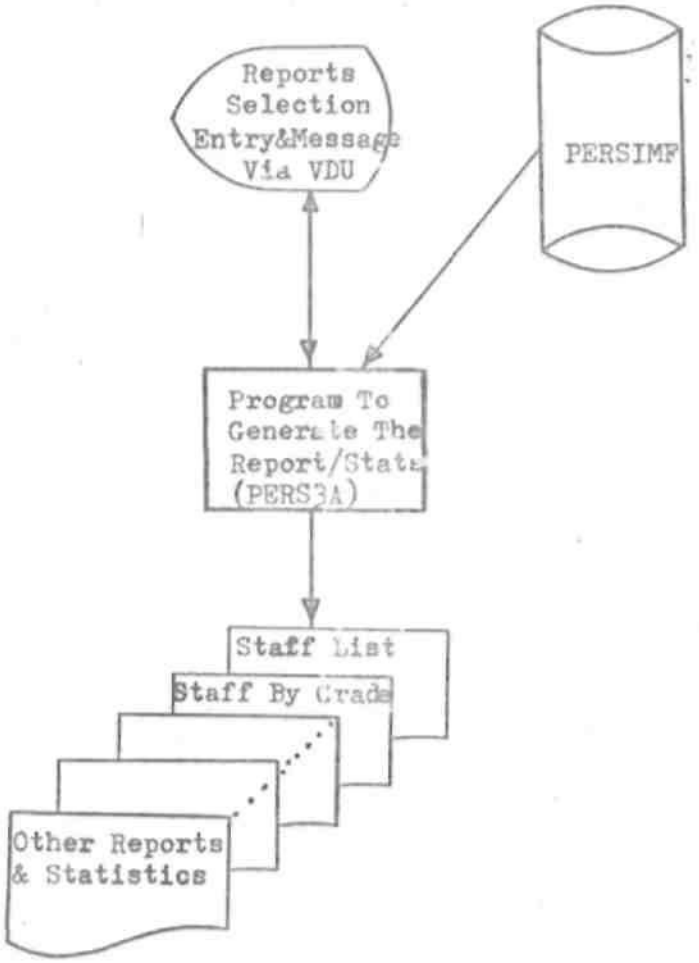
SYSTEM FLOWCHART FOR PIDB SUBSYSTEM



(PERSIMF Maintenance)

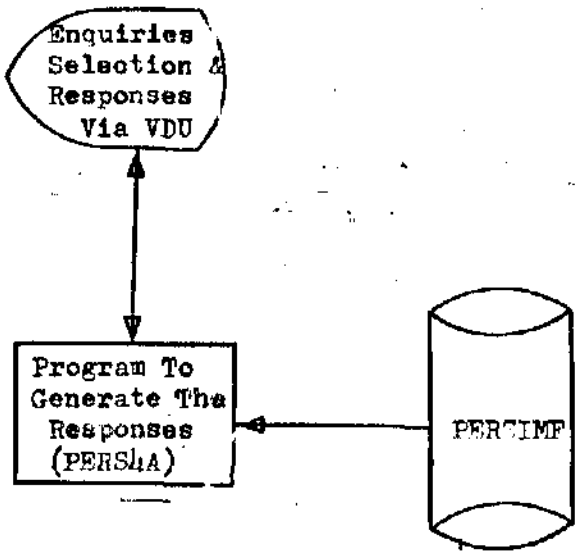
APPENDIX VI

SYSTEM FLOWCHART FOR PERG SUBSYSTEM



APPENDIX VII

SYSTEM FLOWCHART FOR THE SUBSYSTEM



APPENDIX VIII

LIST OF POSSIBLE REPORTS FROM THE COMPUTER-BASED SYSTEM ALONG WITH CORRESPONDING REPORT CODES

REPORT/STATISTICS CODE	REPORT/STATISTICS DESCRIPTION
01	Comprehensive staff list by department. Within the department, it could be ordered either alphabetically by name or sequentially by staff personal number. Also, if required, the list could be ordered by discipline or designation.
02	Staff statistics by grade level to show the numerical relationship between top management, middle management, and lower cadres in order to ensure continuing proper organisational development of the University. This report could be prepared on the basis of departments for easy comprehension.
03	Staff analysis by state - A statistical report on the distribution of staff by state of

REPORT/STATISTICS CODE	REPORT/STATISTICS DESCRIPTION
	origin and grade level as compliance to the Federal character requirements for Federal institutions and parastatals.
04	Early warning report on staff due for gratuity. This will report on all staff due to have served 10 years, about 6 months before due date. The report would be very useful for the organization in that . Management could also use is to plan any special activities on behalf of affected staff.
05	Early warning report on compulsory retirement about 1 year before due date to enable affected staff and management to prepare necessary documentation for pension/retirements. The generation of this report will note that compulsory retirement commences at the age of 60.
06	Early warning report on renewals of contract appointments

REPORT/STATISTICS CODE	REPORT/STATISTICS DESCRIPTION
	to enable essential documentation to be assembled as required by law or the University Management.
07	Audit on academic qualifications - A listing of all certificates held by each staff and attendant type of proof will provide the necessary global audit. Selective audit may be prepared for relevant staff whose background and necessary proof have not yet been formalised.
08	Selective reporting on ex-servicemen. This report will be generated specifically for ex-servicemen.. Also, for any group of staff whose profile is specifically defined, selective reporting could also be generated.
09	Early warning report on annual salary increment. This would be used as a turnaround document to report on all those due for increment 30 days before they are due. Such a report would particularly be useful to the Bursary department.

REPORT/STATISTICS CODE	REPORT/STATISTICS DESCRIPTION
10	Early warning report on date of confirmation. This report would be useful as a turnaround document to approve or reject confirmations coming due 30 days before they become effective.
11	Report on staff movement history. This could be reported for all staff or specified staff. The report would normally commence from a given date and terminate on a specified date as required.
12	Analysis of senior staff by function
13	Analysis of I & J staff by function
14	Summary of number of staff in post in Ahmadu Bello University. This will continue to guide the University, so as not to contravene staffing regulations as approved by the Nigerian Universities Commission (NUC). The report would be best prepared on departmental basis.
15	Analysis of academic staff by positions within departments in each faculty. This would help

REPORT/STATISTICS CODE	REPORT/STATISTICS DESCRIPTION
	ensure compliance with NUC regulations on academic staffing.
16	Analysis of senior staff by sex and nationality.
17	Analysis of I & J staff by sex and nationality.
18	Periodic analysis of staff on University quarters allocation by House Type.
19	Periodic summary of new arrivals. This report would usually commence from a particular date and terminate on a specified date.
20	Summary of all staff promotions in a given year by department.

Important Note:-

As new reports/statistics requirements arise, the report codes would continue to grow accordingly with each code corresponding to a report/statistics description.

APPENDIX IX

LIST OF POSSIBLE ENQUIRIES FROM THE COMPUTER-BASED SYSTEM ALONG WITH CORRESPONDING ENQUIRY CODES

ENQUIRY CODE	ENQUIRY DESCRIPTION
01	Particulars of Personal data (for example; name, title, nationality, bank information, and so on).
02	Particulars of Birth (for example; date, proof, and state of bith).
03	Particulars of Physical characteristics.
04	Particulars of Residence.
05	Particulars of Spouse.
06	Particulars of children
07	Particulars of next-of-kin
08	Particulars of Appointment
09	Promotion History
10	Regrading/Conversion History
11	Details of Previous Employment
12.	Details of Previous Armed Services
13	Educational History
14	Censures/Commendations History
15	Records of Leave

APPENDIX IX CONTINUED

16	Ahmadu Bello University Training History.
17	Movements History
18	Particulars of Loan

Important Note:-

As new enquiries requirements arise, the Enquiry Codes would continue to grow accordingly with each code corresponding to an enquiry description.

APPENDIX X

A SAMPLE USER MANUAL FOR THE COMPUTER-BASED SYSTEM

1. INTRODUCTION

This User Manual is prepared to assist the user in understanding and operating the designed computerised Personnel Information System with a minimum of difficulty.

In order to obtain the desired results, it is advisable that the user should as much as possible follow the manual to the letter. This is because, computers are mere machines only able to produce outputs according to the inputs - Garbage In means Garbage out.

For the purpose of this dissertation, the User Manual details a summarized version of the Procedures of Data coding and Data entry into the system; Security; Back-up; and System Usage.

Whenever the University decides to fully implement this design, a more elaborate and complete User Manual could be prepared. Presently, Appendix XI shows the list of all the various codes that would be used for Data Codings (STARTERS and VARIATIONS).

2. Data Coding

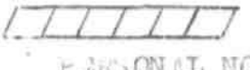
A successful computerised personnel information system starts with the capture of correct input data. These data are in the form

new employee records or records of staff being reinstated (STARTERS); changes to existing personnel records (VARIATIONS) or removal of certain existing records from the personnel file (DELETIONS). The user should therefore endeavour to grasp the following coding procedures.

2.1. Completion Of Starter Forms

A starter form is designed to capture the starter data (see figure 2 for sample form). The following instructions should be observed when completing the starter form:

(a) The three-digit number **directly** below each item description represents the item code for such piece of information/data.

e.g. 

This means that, the item code (or item number) for uniquely referencing the data item PERSONAL NUMBER is 001.

(b) All alphabetic data (e.g. name) must start from the leftmost data box.

(c) All money fields must carry decimal points and two digits (kobo) after the decimal point. e.g. 125.00 and 30.69 are valid codings.

(d) All other numeric fields must be right

justified. That is, the data must be coded with the least significant digit in the rightmost box. Any unused boxes on the left must be filled with zeros. e.g. 00065

(e) In coding the personal number, the first character must be J or P (P for senior and J for intermediate or Junior staff); the remaining five characters are digits.
e.g. P12208, J11418, and J00007 are valid codings.

(f) All items described together as one data item should be coded together.

(g) The List of VALID CODES as detailed in appendix XI should be used for the purpose of coding items like Faculty Code, Department Code, Sex Code, Title Code, Appointment Type Code, and so on.

2.2. Completion of Variation Forms

The process of raising variations is a tedious but necessary task in the operation of any personnel information system. It demands

APPENDIX X CONTINUED

care and deligence. A variation form is designed to capture such variation data (see figure 3 for sample form).

As seen in figure 2, the Starter Form shows each piece of possible information about a staff along with the corresponding item number. Thus, in raising the variation of any piece of information, the item number must be coded first preceeding the variation data. Generally, the following instructions should be observed when completing the variation form:

(a) After coding the item number, leave one blank before coding the variation data. This is to facilitate sight checking before entry is made.

(b) On the variation form, all the staff must be numbered serially. The names entered under the "NAME" column; the faculty code under the "FAC" column; and the department code under the "DEPT" column. These information are not to be entered into the compuer; rather they are for documentation and checking purposes to ensure that the actual record desired is the one being changed.

APPENDIX X CONTINUED

(c) The personal number of the staff (which infact is unique for each staff) is coded under "STAFF NO" column. It is the one that would be entered to locate the particular staff record due for amendments.

(d) Variations on each staff must be separated by the character "/". For example to code variations to change both the personal number and title of a given staff, one should code like this:

001 P11044/004 05//

The two characters "//" indicate the end of variation for that staff. Note that the slash (/) would not be entered as part of the variation data.

(e) The user should be on the lookout to know when a variation data cannot fit into the remaining part of the line. In this case, it is necessary to begin such a variation data on a new line entirely.

(f) The LIST OF VALID CODES in appendix XI should be referenced for codes like faculty code, Title Code, Sex Code, Marital Status Code, and so on.

APPENDIX X CONTINUED

2.3. Completion of Deletion Form

The process of raising deletions is about the simplest task in the operation of the computer-based personnel information system. A deletion form is designed to capture the deletions data (see figure 4 for sample form).

In completing the Deletion Form, the following instructions should generally be observed:

(a) On the Deletion Form, all the staff must be numbered serially; the names entered under the "NAME" column; the faculty code under the "FAC" column; and the department code under the "DEPT" column. Like in the case of variations, these information are not to be entered into the computer, they are only for documentation and checking purposes to ensure that the actual record desired is the one being deleted.

(b) The personal number of the staff whose record is desired for deletion should be coded under "STAFF NO" column. This would be entered into the computer to locate the actual record.

3. Data Entry

Data entry into the system is via the

APPENDIX X CONTINUED

Visual Display Unit (VDU). The input forms (as seen in figures 2, 3 and 4) are so designed to make such entries simple.

Each record is entered item by item under the direction of the computer (see section 6 below - Using The System). It should be noted specifically that, for all items that are not prompted automatically by the computer that is all optional items), the item numbers MUST be entered together with the data value. The item number is entered first followed by the data value.

If a data item is in error, it could be corrected on-the-spot and re-entered. The computer would usually ask you if you want to correct the error. It is left to you to answer the questions accordingly.

4. Security

In order to guard against unauthorised access to the personnel information data base, file access pasword has been incorporated into the system. Before the Personnel Information Master File (PERSIMF) can be accessed, the user MUST supply the correct password. Failure in three attempts automatically aborts the system. Note that,

the password should be remembered and kept secret always. It could be changed if it is suspected that it has been known by unauthorised persons.

5. Back-Up

If the computer breaks down, all Starters, Variations and/or Deletions should be coded on input forms. These transactions would then be entered as soon as the computer starts working again.

6. Using The System

6.1. Signing-On And Signing-Off

(a) Signing-On:

To establish contact with the computer, switch on the VDU if it is not already on and press the Carriage Return Key (CR). Any of the Computer Centre staff could show you how to do this. Within few seconds the computer responds:

ABUCC INTERACTIVE SYSTEM - CYBER 72
CDC NOS 1.1.0 - 430B

USER NUMBER:

You should type in the user number allocated to the personnel information system. The computer would next request for your password thus:

PASSWORD:

APPENDIX X CONTINUED

You then type in the correct password given to you by the University personnel information officer incharge of the computer-based system. You must not reveal it to anybody!!

Once the correct password is supplied, the computer responds:

TERMINAL: nn,TTY

RECOVER/SYSTEM:

Type in BATCH, 60000 and the computer would respond:

$ RFL, 60000

/

At this juncture, you have established the necessary contact with the computer and could now run any of the computerised personnel information subsystems. Section 6.2 below details an example of how to run the PIDB subsystem to capture data for maintaining the data base by adding new records to the Personnel Information Master File (PERSIMF).

(b) Signing-Off:

When you have finished your work and desire to go, you simply type:

BYE

As soon as you press the carriage return key following this command, the computer will automatically log you off, and you can no longer access the personnel information system until you sign-on again.

6.2. Capturing New Records For Maintaining The Master File

In general, to capture the maintenance data for the Personnel Information Masterfile, type:

GET, PER2A

The computer will respond with slash (/) which means it has obeyed the typed instruction. Next, type in the instruction:

PER2A

The computer responds with the following messages:

A.B.U PERSONNEL INFORMATION SYSTEM

PERSONNEL MASTERFILE MAINTENANCE MENU:-

```
**********************************
*                                *
*  A  FOR STARTER ENTRY          *
*  V  FOR VARIATION ENTRY        *
*                                *
*  D  FOR DELETIONS ENTRRY       *
*                                *
*  F  FOR FINISHED               *
*                                *
**********************************
```

GET READY PLEASE!!!

WHICH MENU

?

APPENDIX A CONTINUED

When the question mark (?) is displayed, you should type either A , V, D or F. If you enter A, the computer responds with the messages:

```
WELCOME TO

    STARTER ENTRY SUBSYSTEM:

    ALWAYS REMEMBER TO

    1.  WAIT FOR ? BEFORE ENTERING ANYTHING
    2.  PRESS CARRIAGE RETURN KEY (CR) AT
        END OF EACH LINE.

    INSTRUCTIONS CLEAR? (Y/N)

    ?
```

If you enter V, the computer would respond with similar messages except that "STARTER ENTRY" would be replaced by "VARIATION ENTRY". If you enter D, the computer responds with similar messages except that "STARTER ENTRY" would be replaced by "DELETION ENTRY". If you enter F, the computer would respond with the message: GOOD BYE FOR NOW, which means that you have finished the maintenance transactions you desire.

See appendix XIII for a sample terminal session during maintenance data entry. That explains further the working of the PIDB subsystem.

APPENDIX XI

LIST OF VALID CODES FOR THE COMPUTER-BASED PERSONNEL INFORMATION SYSTEM

A. DEPARTMENT CODES AND DESCRIPTION

DEPARTMENT CODE	DEPARTMENT DESCRIPTION	CORRESPONDING FACULTY CODE
001	VICE-CHANCELLOR'S OFFICE	02
002	REGISTRAR'S OFFICE	03
003	BURSAR'S OFFICE	04
005	KASHIM IBRAHIM LIBRARY	19
006	DEAN'S OFFICE (ARTS & SOC. SC.)	07
007	ENGLISH & DRAMA	07
008	HISTORY	07
009	GEOGRAPHY	07
010	EUROPEAN LANG (FRENCH)	07
011	FINE ARTS	10
012	LA GOS OFFICE	05
013	ECONOMICS	07
014	POLITICAL SCIENCE	07
015	SOCIOLOGY	07
016	DEA N'S OFFICE (SCIENCE	11
017	BIOLOGICAL SCIENCES	11
018	CHEMISTRY	11
019	PHYSICS	11
020	MATHEMATICS	11
021	EDUCATION/CHILD STUDY	08
022	LIBRARY SCIENCE	08

APPENDIX XI CONTINUED

023	CENTRE FOR ADULT EDUCATION	16
024	GEOLOGY	11
025	ARCHITECTURE	10
026	IYA ABUBAKAR COMPUTER CENTRE	14
027	VET PATHOLOGY & MICROBIOLOGY	12
028	DEAN'S OFFICE (ENGINEERING)	09
029	CIVIL ENGINEERING	09
030	ELECTRICAL ENGINEERING	09
031	MECHANICAL ENGINEERING	09
032	DEAN'S OFFICE (VET MEDICINE	12
033	VET SURGERY & MEDICINE	12
034	VET PHYSIOLOGY & PHARMACOLOGY	12
035	VET ANATOMY	12
037	MOBID ANATOMY	17
038	CHEMICAL PATHOLOGY	17
039	UNIVERSITY HEALTH SERVICES	20
040	ESTATE (ADMINISTRATION)	20
041	CENTRAL MECHANICAL WORKSHOP	20
042	TRANSPORT POOL	20
043	DEAN'S OFFICE (AGRICULTURE)	06
044	ANIMAL SCIENCE	06
045	PLANT SCIENCE	06
046	ECONS & RURAL SOCIOLOGY	06
047	SOIL SCIENCE	06
048	CROP PROTECTION	06
049	VET PARASTOLOGY & ENTOMOLOGY	
050	PRACTISING SCHOOL	08

APPENDIX XI CONTINUED

051	COUNCIL EXPENSES	01
055	DEAN'S OFFICE (HUMAN MEDICINE)	17
057	DEAN'S OFFICE (EDUCATION)	08
058	HUMAN ANATOMY	17
059	ANAESTHESIA	17
061	SURGERY	17
062	COMMUNITY MEDICINE	17
063	OBSTETRICS & GYNAECOLOGY	17
064	MEDICINE & PSYCHIATRY	17
065	MICROBIOLOGY	11
066	PAEDIATRICS	17
067	HAEMATHOLOGY	17
068	PHARMACOLOGY & CLINICAL PHARMACY	18
069	PHYSIOLOGY	17
070	RADIOLOGY	17
071	MEDICAL LIBRARY	19
072	SCHOOL OF BASIC STUDIES	13
073	AGRONOMY	06
074	DEAN'S OFFICE (ENVIRONMENTAL DESIGN)	10
075	BUILDING	10
077	BIOCHEMISTRY	11
078	CHEMICAL ENGINEERING	09
079	SURVEYING	09
080	IMMUNOLOGY	17
082	UNIVERSITY FARM	14
083	CENTRE FOR SOC. & ECON. RESEARCH	15

APPENDIX XI CONTINUED

085	OPTHAMOLOGY	17
087	URBAN & REGIONAL PLANNING	10
088	CENTRE FOR EDUCATIONAL TECH	14
089	NIG & AFRICAN LANGS	07
090	FINANCE OFFICE (STUDENT AFFAIRS)	25
091	BINDERY UNIT	19
092	SAMARU LIBRARY	14
093	CENTRE FOR NIGERIA CULT. STUDIES	14
097	PROJECT OFFICE	10
098	AGRIC ENGINEERING	09
099	VET PUBLIC HEALTH & PREV. MEDICINE	12
100	PHYSICAL & HEALTH EDUCATION	08
103	VOCATIONAL & TECH EDUCATION	08
104	AREWA HOUSE	15
106	DEAN'S OFFICE (PHA RM SCIENCES)	18
107	PHARMACEUTICS & PHARM MICROBIOLOGY	18
108	INDUSTRIAL DESIGN	10
110	VETERINARY MEDICINE LIBRARY	12
111	ANIMAL PROCESSING LAB	21
112	METALLURGICAL ENGINEERING	09
113	WATER RESOURCES & ENVIRONMENTAL ENGINEERING	09
114	TEXTILE SCIENCES & TECHNOLOGY	11
115	PSYCHIATRICS	17
116	DENTISTRY	17

APPENDIX XI CONTINUED

117	ORTHOPAEDIC SURGERY	17
118	PHARMACOGNOSY & DRUG	18
119	PHARMACEUTICAL CHEMISTRY	18
123	POSTGRADUATE SCHOOL	14
124	MEDICAL MICROBIOLOGY	17
125	DEMONSTRATION SEC. SCHOOL	08
500	AKENZUA HALL	25
501	AMINA HALL	25
502	ALEXANDER HALL	25
503	BARAU DIKKO HALL	25
504	DANFODIO HALL	25
505	ICSA HALL	25
506	RAMAT HALL	25
507	RIBADU HALL	25
508	UMAR SULEIMAN HALL	25
509	MEDICAL HALL KADUNA	25

APPENDIX XI CONTINUED

B. FACULTY CODES AND DESCRIPTION

FACULTY CODE	FACULTY DESCRIPTION
01	UNIVERSITY COUNCIL
02	VICE CHANCELLOR'S OFFICE
03	REGISTRY SECTION
04	BURSARY SECTION
05	LAGOS OFFICE
06	FACULTY OF AGRICULTURE
07	FACULTY OF ARTS & SOCIAL SCIENCES
08	FACULTY OF EDUCATION
09	FACULTY OF ENGINEERING
10	FACULTY OF ENVIRONMENTAL DESIGN
11	FACULTY OF SCIENCE
12	FACULTY OF VETERINARY MEDICINE
13	SCHOOL OF BASIC STUDIES
14	TEACHING SUPPORT UNITS
15	RESEARCH CENTRES
16	FACULTY OF HUMAN MEDICINE
17	FACULTY OF PHARMACEUTICAL SCIENCES
18	LIBRARY DIVISION
19	ESTATE DEPARTMENT
20	ANIMAL PROCESSING LAB
25	STUDENT AFFAIRS

APPENDIX XI CONTINUED

C. BANK CODES AND DESCRIPTIONS

BANK CODE	BANK DESCRIPTION
01	UNION BANK OF NIGERIAN LIMITED, SAMARU
02	UNION BANK OF NIGERIAN LIMITED, ZARIA
03	UNION BANK OF NIGERIAN LIMITED, KADUNA
04	UNION BANK OF NIGERIAN LIMITED, KANO
05	UNION BANK OF NIGERIAN LIMITED, JOS
06	UNION BANK OF NIGERIAN LIMITED, ILORIN
07	FIRST BANK OF NIGERIAN LIMITED, SAMARU
08	FIRST BANK OF NIGERIAN LIMITED, ZARIA
09	FIRST BANK OF NIGERIAN LIMITED, KADUNA
10.	FIRST BANK OF NIGERIAN LIMITED, MARKET ROAD, JOS.
11	FIRST BANK OF NIGERIAN LIMITED, BANK ROAD, JOS.
12	FIRST BANK OF NIGERIAN LIMITED, NGURU
13	BANK OF THE NORTH LIMITED, ZARIA
14	BANK OF THE NORTH LIMITED, JOS
15	BANK OF THE NORTH LIMITED, LAGOS STREET, KANO.
16.	BANK OF THE NORTH LIMITED, ILORIN
17.	BANK OF THE NORTH LIMITED, YAKUBU GOWON WAY, KADUNA.
18.	UNITED BANK FOR AFRICAN LIMITED, ZARIA
19.	UNITED BANK FOR AFRICAN LIMITED, KADUNA.
20.	NATIONAL BANK OF NIGERIAN LIMITED, ZARIA.
21.	NATIONAL BANK OF NIGERIAN LIMITED, KADUNA.

APPENDIX XI CONTINUED

22	FIRST BANK OF NIGERIAN LIMITED, . LAGOS STREET, KANO.
23	FIRST BANK OF NIGERIAN LIMITED, ILORIN
24	NATIONAL BANK OF NIGERIAN LIMITED, KANO.
25	FIRST BANK OF NIGERIAN LIMITED, B.U.K, KANO.
26	CO-OPERATIVE BANK LIMITED, ZARIA
27	BANK OF THE NORTH LIMITED, BIDA
28	BANK OF THE NORTH LIMITED, TALATA MAFARA..
29	NATIONAL BANK OF NIGERIA LIMITED, KABBA.
30	UNITED BANK FOR AFRICAN LIMITED, KANO.
31	INTERNATIONAL BANK FOR WEST AFRICAN LIMITED, KADUNA.
32	CO-OPERATIVE BANK LIMITED, KADUNA.
33	NATIONAL BANK OF NIGERIAN LIMITED, ILORIN.
34	NATIONAL BANK OF NIGERIAN LIMITED, OTUKPO.
35	BANK OF THE NORTH LIMITED, KAFANCHAN
36	BANK OF THE NORTH LIMITED, YOLA
37	UNION BANK OF NIGERIAN LIMITED, OFFA
38	MERCHANTILE BANK LIMITED, UYO
39	FIRST BANK OF NIGERIAN LIMITED, MOLONEY STREET, LAGOS.
40	SOCIETE' GENERALE' BANK, KACHIA

APPENDIX IX CONTINUED

D. TITLE CODES AND DESCRIPTIONS

TITLE CODE	TITLE DESCRIPTION
01	MR
02	MALLAM
03	DR
04	MRS
05	ALHAJI
06	PROFESSOR
07	MISS
08	ALHAJA
09	MS
10	REVEREND
11	CANNON
12	CHIEF
13	DEACON
14	OTHERS

E. MARITAL STATUS CODES AND DESCRIPTIONS

MARITAL STATUS CODE	MARITAL STATUS DESCRIPTION
01	SINGLE
02	MARRIED
03	DIVORCED
04	WIDOWED
05	SEPARATED
06	UNKNOWN

APPENDIX XI CONTINUED

F. TYPE OF APPOINTMENT CODE

TYPE OF APPOINTMENT CODE	TYPE OF APPOINTMENT DESCRIPTION
01	CONTRACT
02	TENURE
03	TEMPORARY FULL TIME
04	STUDY FELLOWSHIP ABROAD
05	STUDY FELLOWSHIP IN NIGERIA NOT A.B.U.
06	STUDY FELLOWSHIP IN A.B.U.
07	INTERIDCTION

G. STATE OF ORIGIN CODES AND DESCRIPTIONS

STATE OF ORIGIN CODE	STATE OF ORIGIN DESCRIPTION
01	ANAMBRA
02	ABUJA
03	CROSS RIVER
04	BAUCHI
05	BENDEL
06	BENUE
07	BORNO
08	GONGOLA
09	KADUNA
10	KANO
11	KWARAR
12	IMO
13	NIGER
14	LAGOS
15	OGUN

APPENDIX XI CONTINUED

16	ONDO
17	OYO
18	PLATEAU
19	SOKOTO
20	RIVERS
21	KATSINA
22	AKWA-IBOM

H. NATIONALITY CODES AND DESCRIPTIONS

NATIONALITY CODE	NATIONALITY DESCRIPTION
01	NIGERIAN
02	AFRICAN
03	EUROPEAN
04	ASIAN
05	INDIAN
06	ENGLISH
07	IRISH
08	AMERICAN
09	CANADIAN
10	CHINESE
11	JAPANESE
12	RUSSIAN
13	SOUTH AMERICAN

I. RELIGION CODES AND DESCRIPTIONS

RELIGION CODE	RELIGION DESCRIPTION
01	CHRISTIANITY
02	MUSLIM
03	OTHERS

APPENDIX XI CONTINUED

J. SEX CODES AND DESCRIPTIONS

SEX CODE	SEX DESCRIPTION
M	MALE
F	FEMALE

K. COMPLEXION CODES AND DESCRIPTIONS

COMPLEXION CODE	COMPLEXION DESCRIPTION
A	ALBINO
F	FAIR
D	DARK
W	WHITE

L. EYES COLOUR CODES AND DESCRIPTIONS

EYES COLOUR CODE	EYES COLOUR DESCRIPTION
01	BROWN
02	BLUE
03	GREEN
04	GREY

M. HAIR COLOUR CODES AND DESCRIPTIONS

HAIR COLOUR CODE	HARI COLOUR DESCRIPTION
01	BLACK
02	BROWN
03	RED
04	BLONDE

N. DEFORMITY CODE	DEFORMITY DESCRIPTION
N	NO
Y	YES

APPENDIX XI CONTINUED

O. LANGUAGE CODES AND DESCRIPTIONS

LANGUAGE CODE	LANGUAGE DESCRIPTION
01	HAUSA
02	IBO
03	YORUBA
04	EFIK
05	ENGLISH
06	PORTUGUESE
07	GERMAN
08	ARABIC
09	GREEK
10	CHINESE
11	JAPANESE
12	FULANI
13	FRENCH
14	SPANISH
15	RUSSIAN
16	INDIA

P. BIRTH PROOF CODES AND DESCRIPTIONS

BIRTH PROOF CODE	BIRTH PROOF DESCRIPTION
A	AFFIDAVIT
B	BIRTH CERTIFICATE
N	NO PROOF

APPENDIX XI CONTINUED

Q. MARRIAGE-PROOF CODES AND DESCRIPTIONS

MARRIAGE PROOF CODE	MARRIAGE PROOF DESCRIPTION
A	AFFIDAVIT
C	MARRIAGE CERTIFICATE
N	NO PROOF

R. NEXT-OF-KIN RELATIONSHIP CODES AND DESCRIPTIONS

NEXT-OF-KIN RELATIONSHIP CODE	NEXT-OF-KIN RELATIONSHIP DESCRIPTION
F	FATHER
M	MOTHER
B	BROTHER
S	SISTER
U	UNCLE
A	AUNTIE

S. REASON FOR LEAVING EMPLOYMENT CODES AND DESCRIPTION

REASON FOR LEAVING CODE	REASON FOR LEAVING DESCRIPTION
1	RESIGNATION
2	SECONDMENT
3	TERMINATION
4	DISMISSAL
5	RETIREMENT
6	DISCHARGE (Armed Forces Only)
7	OTHERS

APPENDIX XI CONTINUED

T. ARM-OF-SERVICE CODES AND DESCRIPTION

ARM-OF-SERVICE CODE	ARM-OF-SERVICE DESCRIPTION
1	ARMY
2	AIR FORCE
3	NAVY
4	POLICE
5	PRISONS
6	CUSTOMS
7	IMMIGRATION
8	OTHERS

U. QUALIFICATION

QUALIFICATION CODE	QUALIFICATION DESCRIPTION
1	FIRST SCHOOL LEAVING CERTIFICATE
2	ORDINARY LEVEL
3	ADVANCED LEVEL
4	FIRST DEGREE (BSc; BA; BENG; e.t.c.)
5	SECOND DEGREE (MSc; MA; MENG; e.t.c.)
6	THIRD DEGREE (PhD; DSC; e.t.c.)
7	PROFESSIONAL (Intermediate)
8	PROFESSIONAL (Final)
9	OTHERS

V. QUALIFICATION-PROOF CODES AND DESCRIPTION

QUALIFICATION-PROOF CODE	QUALIFICATION-PROOF DESCRIPTION
1	ORIGINAL CERTIFICATE

APPENDIX XI CONTINUED

2	AFFIDAVIT
3	STATEMENT OF RESULTS
4	TESTIMONIAL
5	OTHERS
6	

W. TRAINING RESULT CODES AND DESCRIPTIONS

TRAINING RESULT CODE	TRAINING RESULT DESCRIPTION
P	PASSED
F	FAILED
C	ATTENDANCE CERTIFICATE

X TYPE OF LEAVE CODES AND DESCRIPTIONS

TYPE OF LEAVE CODE	TYPE OF LEAVE DESCRIPTION
1	ANNUAL LEAVE
2	MATERNITY LEAVE
3	SICK LEAVE
4	CASUAL LEAVE
5	COMPASSIONATE LEAVE

Y. TYPE OF MOVEMENT CODES AND DESCRIPTIONS

TYPE OF MOVEMENT CODE	TYPE OF MOVEMENT DESCRIPTION
A	FIRST APPOINTMENT IN A.B.U
B	SECONDMENT/TRANSFER
C	ACTING APPOINTMENT
D	RETIREMENT/GRATUITY/PENSION

APPENDIX XI CONTINUED

E	CONTRACT APPOINTMENT
F	SUSPENSION
G	TERMINATION/RESIGNATION/
I	DEATH

Z. CENSURE ACTION CODES AND DESCRIPTIONS

CENSURE ACTION CODE	CENSURE ACTION DESCRIPTION
1	EXPLANATION TO QUERY ACCEPTED
2	WARNING
3	SUSPENSION
4	DEMOTION
5	TERMINATION
6	DISMISSAL
7	COMMENDATION
8	REWARD/MERIT
9	PROMOTION

Appendix XII

```
      ************************************************************************
      *          COMPUTERISED PERSONNEL INFORMATION SYSTEM FOR A.B.U.        *
      *            (DEPARTMENT FILE CREATION PROGRAM : PERSFA)                *
      ************************************************************************

       IDENT-PROGRAM-ID. DEPTS.
       PROGRAMMER. PERSON.
       INSTALLATION.  A.B.U. COMPUTER CENTER.
       AUTHOR.  H.E. JABAGBALE.
       DATE-WRITTEN.  AUGUST,1987.
       DATE-COMPILED.                07/22/24.
       REMARKS.      THIS PROGRAM CREATES AN INDEXED SEQUENTIAL FILE
                     CALLED DEPTS. DEPTS IS A REFERENCE FILE CONTAINING
                     THE CODES(ALONG WITH THEIR CORRESPONDING DESCRIPTIONS)

                     OF ALL VALID DEPARTMENTS IN A.B.U.  THE FILE ALSO STORES
                     CORRESPONDING FACULTY CODE FOR EACH VALID DEPARTMENT.
                       DEPTS IS USED BY THE COMPUTER-BASED PERSONNEL INFORMATIO
                     SYSTEM AS A REFERENCE FILE FOR REPORT GENERATION BASED ON
                     DEPARTMENTS AND FOR VALIDITY CHECKS DURING DATA ENTRIES
                     (CRITERIA & VARIATIONS).
                       THE PROGRAM ALSO GENERATES AN ERROR REPORT FILE
                     CALLED 'DERROR'. 'DERROR' IS A FILE WHERE ALL DEPARTMENT RE
                     THAT ARE IN ERROR ARE SUMMARIZED.

      ************************************************************************
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      *  PROPERTY OF HENRY ADE BABAGBALE AND ARE NOT TO                      *
      *  BE CONVEYED OR DISSEMINATED TO THIRD PERSONS                        *
      *  WITHOUT EXPRESS WRITTEN PERMISSION OF THE OWNER.                    *
      ************************************************************************

       ENVIRONMENT DIVISION.

       CONFIGURATION SECTION.
       SOURCE-COMPUTER.  CYBER 72.


       OBJECT-COMPUTER.  CYBER 72.
       INPUT-OUTPUT SECTION.
       FILE-CONTROL.
            SELECT DEPT-IN ASSIGN  DEPDATA-F2.

            SELECT SORTFILE ASSIGN TO SORTF-F2.
            SELECT ERR-FILE ASSIGN  DERROR-F2.

            SELECT DEPT-OUT ASSIGN  DEPTS
              ORGANIZATION INDEXED

              ACCESS RANDOM
              SYMBOLIC KEY IS DEP-CODE.


       DATA DIVISION.

       FILE SECTION.
       FD     DEPT-F
                  LABEL RECORDS OMITTED

                  DATA RECORD IS DEPT-IN-REC.
       01     DEPT-F-REC.
              05  F-CODE                  PIC 9(2).
                  88  FAC-RANGE           VALUES 12 THRU 23.
```

```
                                                                    )
                    02  D-CODE     PIC 9(2).
                    02  D-NAME     PIC  X(20).
                FD      DEPT-OUT
                        LABEL RECORDS OMITTED
E15.A             AS 2222                                   COBOL    V4.5  L428 87/11

                        DATA RECORD IS DEPT-OUT-REC.
                01      DEPT-OUT-REC.
                    02  DEPT-CODE       PIC 9(2).

                    02  DEPT-NAME     PIC  X(20).
                    02  DEPT-ADDR     PIC  X(20).
                FD      CARD-FILE
                        LABEL RECORDS OMITTED
                        DATA RECORD IS ERROR-REC.
                01  ERROR-REC           PIC  X(22).
                SD      SORT-FILE
                        LABEL RECORDS OMITTED
                        DATA RECORD IS SORT-REC.
                01      SORT-REC.

                    02  SD-CODE         PIC 9(2).
                    02  SD-NAME         PIC X(4).
                WORKING-STORAGE SECTION.
                77  ARG-TC-FLAG PIC 9.
                77      ARG-PRINT PIC 9(3) VALUE ZEROS.
            77  NDUP    PIC 9 VALUE .
                77  ARG-READ PIC 9(3) VALUE ZEROS.
                77  ARG-REJ-FLAG  PIC 9.
                77  ARG-REJ   PIC 9(3) VALUE ZEROS.
                01  HEAD-1.

                    02  FILLER      PIC  X(20) VALUE SPACES.
                    02  TITLE1      PIC  X(17) VALUE "DEPT. FILE ERRORS".
                01  HEAD-2.
                    02  FILLER  PIC X(6) VALUE SPACES.
                    02  TITLE2  PIC X(10) VALUE "CARD IMAGE".
                    02  FILLER  PIC X(7) VALUE SPACES.
                    02  TITLE3  PIC X(12) VALUE "ERROR REPORT".
                01      HEAD-3.
                    02 FILLER PIC X(7).
                    02  CARD-IMAGE.

                        03 ARG-CODE PIC 9(2).
                        03 FILLER     PIC X(2).
                        03 REC-CODE     PIC 9(3).
                        03 FILLER     PIC X(2).
                        03 ERROR      PIC X(40).
                01  FILLER PIC X(24).
                    02  ERROR-MESSAGE  PIC X  X(2).
                01      FOOT-1.
                    02 FILLER PIC X(2) VALUE SPACES.
                    02  FILLER  PIC  X(9)  VALUE "TOTAL RECS READ".

                    02  FILLER  PIC  X(6)  VALUE SPACES.
                    02  FILLER  PIC  X  VALUE "=".
```

```
                    05 FILLER PIC X(3) VALUE SPACES.
                    05 FILLER PIC X(16) VALUE "TOTAL RECS WRITTEN".
                    05 FILLER PIC X(3) VALUE SPACES.
                    05 FILLER PIC X VALUE ".

                    05 WTOT-RECS-PRINT PIC 9(3).
                02  FOOTING.
                  03 FILLER PIC X(5) VALUE SPACES.
                  03  FILLER  PIC X(21) VALUE "TOTAL RECS  REJECTED".
PERS.A          AS ....                                        COBOL    V4.5  L428 8771

                  03  FILLER  PIC  X(3)   VALUE SPACES.
                  03  FILLER PIC X VALUE  "=".
                03  WTOT-RECS-REJ  PIC 9(3).

              02  WDATE-TEMP.
                03 WYY PIC 99.
                03 WMM PIC 99.
                03 WDD PIC 99.

              02  WDATE.
                03 WDD PIC 99.
                03 FILLER PIC X VALUE "/".
                03 WMM PIC 99.
                03 FILLER PIC X VALUE "/".
                03 WYY PIC 99.

            02  FOOTING.
                03 FILLER PIC X(5) VALUE SPACES.
                03 FILLER PIC X(12) VALUE "RUN DATE :".
                03  WRUN-DATE  PIC X(8).

            02  FOOTING.
                03 FILLER PIC X(5) VALUE SPACES.

                03 FILLER PIC  X(7) VALUE "PROGRAM".
                03  FILLER PIC  X(3) VALUE SPACES .

                03  PROG-NAME  PIC X(6) VALUE "PERS3A".
PERS.A          AS ....                                        COBOL    V4.5  L428 8771


        PROCEDURE DIVISION.
        FILE-CONTROL.
             PERFORM SORT-PARA.

                PERFORM START-UP.
                READ DEPT-IN AT END
                          DISPLAY "DEPT. INPUT FILE IS EMPTY"
                          STOP RUN.

                          ADD 1 TO WCOL-NEED.
                PERFORM PROCESS-PARA UNTIL WEOF = 1.


                PERFORM ERROR-FOOT.

                CLOSE DEPT-IN DEPT-OUT ERR-FILE.
                STOP RUN.
        SORT-PARA.
                SORT SORTFILE ASCENDING KEY-CODE USING DEPT-IN
                                                  GIVING DEPT-IN.

             START-UP.
                OPEN INPUT DEPT-IN OUTPUT DEPT-OUT ERR-FILE.
```

```
                *   WRITING THE TITLE OF ERROR FILE.
                    MOVE SPACES TO ERROR-REC.
                    WRITE ERROR-REC FROM HEADING1.
                    MOVE SPACES TO ERROR-REC.
                    WRITE ERROR-REC FROM HEADING2.
                PROCESS-PARA.
                    MOVE ZEROS TO REJ-FLAG WRITE-FLAG.
                    MOVE SPACES TO MESSAGE.
                IF F-CODE NOT NUMERIC
                    MOVE "FACULTY CODE NOT NUMERIC" TO MERR-MESSAGE

                    MOVE F-CODE TO MFAC-CODE
                    MOVE D-NAME TO MNAME
                    MOVE SPACES TO ERROR-REC
                    WRITE ERROR-REC FROM MERROR AFTER 1
                    MOVE 1 TO REJ-FLAG
                    MOVE SPACES TO MERROR
                ELSE IF NOT FAC-RANGE
                    MOVE "FACULTY CODE OUT OF RANGE" TO MERR-MESSAGE
                    MOVE F-CODE TO MFAC-CODE
                    MOVE D-CODE TO MDEP-CODE


                    MOVE D-NAME TO MNAME
                    MOVE SPACES TO ERROR-REC
                    WRITE ERROR-REC FROM MERROR AFTER 2
                    MOVE 1 TO REJ-FLAG
                    MOVE SPACES TO MERROR.
                    IF D-CODE NOT NUMERIC
                        MOVE "DEPT. CODE NOT NUMERIC" TO
                        MOVE F-CODE TO MFAC-CODE
                        MOVE D-CODE TO MDEP-CODE


                        MOVE D-NAME TO MNAME
                        MOVE SPACES TO ERROR-REC
                    IF D-NAME EQUAL SPACES
                        MOVE " DEPT. NAME BLANK" TO
                    MERR-MESSAGE
                        MOVE F-CODE TO MFAC-CODE
                        MOVE D-CODE TO MDEP-CODE
                        MOVE D-NAME TO MNAME
                        MOVE SPACES TO ERROR-REC
                    IF REJ-FLAG = 1

                        WRITE ERROR-REC FROM MERROR AFTER 1
                        MOVE 1 TO REJ-FLAG
```

```
                    MOVE 1 TO WREJ-FLAG
                    MOVE SPACES TO WERROR.

                IF WREJ-FLAG = 2
                                ADD 1 TO WREC-REJ


                MOVE SPACES TO DEPT-OUT-REC

                    MOVE F-CODE TO FAC-CODE
                  MOVE D-CODE TO DEP-CODE
                  MOVE D-NAME TO DEP-NAME
                MOVE 1 TO WRITE-FLAG
                  WRITE DEPT-OUT-REC INVALID KEY
                                MOVE "DEPT. CODE RESULTS IN INVALID KEY"
                    TO WERR-MESSAGE
                      MOVE ZERO TO WRIT-FLAG
                                MOVE F-CODE TO WFAC-CODE


                                MOVE D-CODE TO WDEP-CODE

                                MOVE D-NAME TO WNAME
                               MOVE SPACES TO ERROR-REC
                               WRITE ERROR-REC FROM WERROR AFTER 1

                               ADD 1 TO WREC-REJ.
                IF WRITE-FLAG = 1
                                    ADD 1 TO WREC-PRINT.
                 READ DEPT-IN AT END MOVE 1 TO WEOF.

                IF WEOF NOT = 1 ADD 1 TO WREC-READ.
           ERROR-OUT.


            MOVE SPACES TO ERROR-REC.

            WRITE ERROR-REC FROM FOOTING1 AFTER 4.
           MOVE WREC-PRINT TO WTOT-REC-PRINT.
            MOVE SPACES TO ERROR-REC.

            WRITE ERROR-REC FROM FOOTING2 AFTER 1.
            MOVE WREC-REJ TO WTOT-REC-REJ.

            MOVE SPACES TO ERROR-REC.
            WRITE ERROR-REC FROM FOOTING3 AFTER 1.

            ACCEPT WDATE-TEMP FROM DATE.
           MOVE CORR WDATE-TEMP TO WDATE.


            MOVE SPACES TO ERROR-REC.

            WRITE ERROR-REC FROM FOOTING4 AFTER 1.
            MOVE SPACES TO ERROR-REC.
            WRITE ERROR-REC FROM FOOTING5 AFTER 1.
```

```
CODOL  V 2.5 L42  7711
```

```
*****************************************************
*                                                   *
*  INFORMATION SYSTEMS AB                           *
*  LISTING PROGRAM FOR PERSTB                       *
*                                                   *
*****************************************************
```

```
A CENTRAL
```

```
/264*
OCESS A LISTING OF THE CONTENTS
CALLED DEPTS* A REFERENCE FILE
D DEPARTMENTS IN A*SJÖZARP*
```

```
*****************************************************
*                                                   *
*  HEMFÖRSÄKRINGSBOLAGET PROGRESSIV AKTIEBOLAG      *
*                                                   *
*****************************************************
```

```
OR OMSKRIVNING TO THIRD PERSONS
```

```
*****************************************************
*  ACCESS WRITTEN PERMISSION OF THE OWNER.          *
*****************************************************
```

```
J-PTS
D
TAL
DE=SLUSY-PZ.
```

```
WRITTEN
L.
```

```
FILE B(22).
S(50).
X(4-).
OPERATED
AUTHORIZED
S X(8).
```

```
FILE S(22).
  P=O X(9).
```

```
  P=O->(2).
```

```
FILE X(11).
```

```
WORKING-STORAGE SECTION.
77  WPAGE-COUNT        PIC 9(2) VALUE ZERO.

77  WLEAD-COUNT        PIC 9(2) VALUE ZEROS.

                                                    COBOL   V4.2  L

77  WLINE-COUNT        PIC 9(2) VALUE ZEROS.
77  WLOF               PIC 9    VALUE ZEROS.
01  WDATE-TEMP.
    05  WYY            PIC 9(2).
    05  WMM            PIC 9(2).
    05  WDD            PIC 9(2).
01  HEADING1.
    05  FILLER         PIC X(42) VALUE SPACES.
    05  FILLER         PIC X(28) VALUE
                "LIST OF DEPARTMENTS".
    05  FILLER         PIC X(15) VALUE SPACES.
    05  HDATE.
        10  HDAY       PIC 9(2).
        10  FILLER     PIC X VALUE "/".
        10  HMONTH     PIC 9(2).
        10  FILLER     PIC X VALUE "/".
        10  HYEAR      PIC 9(2).

    05  FILLER         PIC X(5) VALUE SPACES.
    05  FILLER  PIC X(4)  VALUE "PAGE".
    05  FILLER  PIC X(2).
    05  HPAGE          PIC Z9.
01  HEADING2.
    05  FILLER         PIC X(47) VALUE SPACES.
    05  FILLER         PIC X(26) VALUE ALL "-".
01  HEADING3.
    05  FILLER         PIC X(3)  VALUE SPACES.
    05  FILLER         PIC X(9)  VALUE "DEPT CODE".

    05  FILLER PIC X(3) VALUE SPACES.
    05  FILLER PIC X(6) VALUE "FAC CODE".
    05  FILLER         PIC X(6)  VALUE SPACES.
    05  FILLER         PIC X(22) VALUE
                "DEPARTMENT DESCRIPTION".
01  HEADING4.
    05  FILLER         PIC X(3) VALUE SPACES.
    05  FILLER         PIC X(9) VALUE ALL "-".
    05  FILLER PIC X(3) VALUE SPACES.
    05  FILLER PIC X(6) VALUE ALL "-".
    05  FILLER         PIC X(6)  VALUE SPACES.
    05  FILLER         PIC X(22) VALUE ALL "-".
01  DETAIL-LINE.
    05  FILLER         PIC X(3)  VALUE SPACES.
    05  FILLER         PIC X(34) VALUE
                "TOTAL NUMBER OF DEPARTMENTS =".
    05  NODEPTREC      PIC 9(3).
                                                    COBOL   V4.2  L
```

```
PROCEDURE DIVISION.

MAIN-PARA.
    PERFORM OPEN-PARA.
    PERFORM READ-PARA.
    PERFORM STOP-PARA.

OPEN-PARA.
    OPEN INPUT IN-FILE
         OUTPUT OUT-FILE.
    MOVE ZERO TO A-NO-COUNT
                 B-NO-COUNT.
    MOVE SPACES TO HEADER1
                   HEADER2.
    ACCEPT TODAYS-DATE FROM DATE.
    MOVE DD TO DAYS.
    MOVE MM TO MONTHS.
    MOVE YY TO YEARS.

READ-PARA.
    READ IN-FILE AT END
         PERFORM LAST-PARA.
    ADD 1 TO A-NO-COUNT.
    IF A-NO-COUNT = 1
       MOVE IN-REC TO HEADER1
       WRITE OUT-REC FROM HEADER1
             AFTER ADVANCING NEW-PAGE
       MOVE SPACES TO OUT-REC
       WRITE OUT-REC AFTER 1
       MOVE IN-REC TO HEADER2
       WRITE OUT-REC FROM HEADER2
             AFTER 1
       MOVE SPACES TO OUT-REC
       WRITE OUT-REC AFTER 1
       GO TO READ-PARA.
    IF A-NO-COUNT > 52
       MOVE ZERO TO A-NO-COUNT
       WRITE OUT-REC FROM HEADER1
             AFTER NEW-PAGE
       WRITE OUT-REC FROM HEADER2
             AFTER 1
       MOVE SPACES TO OUT-REC
       WRITE OUT-REC AFTER 1.
    MOVE IN-REC TO OUT-REC.
    WRITE OUT-REC AFTER 1.
    ADD 1 TO B-NO-COUNT.
    GO TO READ-PARA.

LAST-PARA.
    MOVE SPACES TO OUT-REC.
    WRITE OUT-REC AFTER 2.
    MOVE B-NO-COUNT TO TOTAL.
    WRITE OUT-REC FROM TOTAL-LINE
          AFTER 1.
    MOVE SPACES TO OUT-REC.
    WRITE OUT-REC AFTER 1.
    MOVE A-NO-COUNT TO TOTAL.
    WRITE OUT-REC FROM TOTAL-LINE
          AFTER 1.

STOP-PARA.
    CLOSE IN-FILE
          OUT-FILE.
    STOP RUN.
```

LIST OF DEPARTMENTS

DEPT CODE	FEE CODE	DEPARTMENT DESCRIPTION
[illegible]	16	VICE-CHANCELLOR'S OFFICE
[illegible]	15	REGISTRAR'S OFFICE
[illegible]	15	BURSAR'S OFFICE
[illegible]	29	KACHERE LORRAIN LIBRARY
[illegible]	17	DEAN'S OFFICE(ARTS & SOCIAL SC)
[illegible]	17	ENGLISH & DRAMA
[illegible]	17	HISTORY
[illegible]	17	GEOGRAPHY
[illegible]	17	EUROPEAN LANG(FRENCH)
[illegible]	17	FINE ARTS
[illegible]	17	LANGS OFFICE
[illegible]	17	ECONOMICS
[illegible]	17	POLITICAL SCIENCE
[illegible]	17	SOCIOLOGY
[illegible]	11	DEAN'S OFFICE(SCIENCE)
[illegible]	11	ZOOLOGICAL SCIENCES
[illegible]	11	CHEMISTRY
[illegible]	11	PHYSICS
[illegible]	11	MATHEMATICS
[illegible]	11	EDUCATIONALLED STUDY
[illegible]	11	BIOLOGY DEPARTMENT
[illegible]	11	CENTRE FOR ADULT EDUCATION & EXT SERV
[illegible]	11	GEOLOGY
[illegible]	11	ARCHITECTURE
[illegible]	11	ZAMBIA ADVANCED COMPUTER CENTRE
[illegible]	11	VET PATHOLOGY & MICROBIOLOGY
[illegible]	13	DEAN'S OFFICE(ENGINEERING)
[illegible]	13	CIVIL ENGINEERING
[illegible]	13	ELECTRICAL ENGINEERING
[illegible]	13	MECHANICAL ENGINEERING
[illegible]	11	DEAN'S OFFICE(VET MEDICINE)
[illegible]	11	VET SURGERY & MEDICINE
[illegible]	11	VET PHYSIOLOGY & PHARMACOLOGY
[illegible]	11	VET ANATOMY
[illegible]	11	MEDICAL ANATOMY
[illegible]	11	CHEMICAL PATHOLOGY
[illegible]	11	UNIVERSITY HEALTH SERVICES
[illegible]	11	ESTATE(ADMINISTRATION)
[illegible]	11	CENTRAL MECHANICAL WORKSHOP
[illegible]	11	TRANSPORT POOL
[illegible]	11	DEAN'S OFFICE(AGRICULTURE)
[illegible]	11	ANIMAL SCIENCE
[illegible]	11	PLANT SCIENCE
[illegible]	11	SOILS & RURAL SOCIOLOGY
[illegible]	11	SOIL SCIENCE
[illegible]	11	CROP PROTECTION

LIST OF DEPARTMENTS

DEPT CODE	FAC CODE	DEPARTMENT DESCRIPTION
[illegible]	[illegible]	ANATOMY
[illegible]	[illegible]	SURGERY
[illegible]	[illegible]	OBSTETRICS & GYNAECOLOGY
[illegible]	[illegible]	MEDICINE & PSYCHIATRY
[illegible]	[illegible]	RADIOLOGY
[illegible]	[illegible]	PAEDIATRICS
[illegible]	[illegible]	ANESTHESIOLOGY
[illegible]	[illegible]	PHARMACOLOGY & CLINICAL PHARMACY
[illegible]	[illegible]	PHYSIOLOGY
[illegible]	[illegible]	PATHOLOGY
[illegible]	[illegible]	MEDICAL LIBRARY
[illegible]	[illegible]	SCHOOL OF BASIC STUDIES
[illegible]	[illegible]	ASTRONOMY
[illegible]	[illegible]	DEAN'S OFFICE(ENVIRONMENTAL DESIGN)
[illegible]	[illegible]	BUILDING
[illegible]	[illegible]	BIOCHEMISTRY
[illegible]	[illegible]	CHEMICAL ENGINEERING
[illegible]	[illegible]	CURVE-FITTING
[illegible]	[illegible]	IMMUNOLOGY
[illegible]	[illegible]	UNIVERSITY PRESS
[illegible]	[illegible]	CENTRE FOR DOC & COOP RESEARCH
[illegible]	[illegible]	OPTHAMOLOGY
[illegible]	[illegible]	URBAN & REGIONAL PLANNING
[illegible]	[illegible]	CENTRE FOR EDUCATIONAL TECH
[illegible]	[illegible]	ASIA & AFRICAN LANGS
[illegible]	[illegible]	FINANCE OFFICE(STUDENT AFFAIRS)
[illegible]	[illegible]	SENIORITY UNIT
[illegible]	[illegible]	FAMILY LIBRARY
[illegible]	[illegible]	CENTRE FOR NEOPLEA CULT STUDIES
[illegible]	[illegible]	PRODUCT OFFICE
[illegible]	[illegible]	METAL ENGINEERING
[illegible]	[illegible]	EAT FOODS HEALTH & PREV MEDICINE
[illegible]	[illegible]	PHYSICAL & HEALTH EDUCATION
[illegible]	[illegible]	VOCATIONAL & TECH EDUCATION
[illegible]	[illegible]	TAXING TOOL
[illegible]	[illegible]	DEAN'S OFFICE(PHARM SCIENCES)
[illegible]	[illegible]	PHARMACEUTICS & PHARM MICROBIOLOGY
[illegible]	[illegible]	INDUSTRIAL DESIGN
[illegible]	[illegible]	VETERINARY MEDICINE LIBRARY
[illegible]	[illegible]	ANIMAL PRODUCTS LAB
[illegible]	[illegible]	MATERIALS SCIENCE ENGINEERING

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	TEXTILE SCIENCES & TECHNOLOGY
[illegible]	[illegible]	POLYMER TECHS
[illegible]	[illegible]	DENTISTRY
[illegible]	[illegible]	ORTHOPAEDIC SURGERY
[illegible]	[illegible]	PHARMACOGNOSY & DRUG
[illegible]	[illegible]	PHARMACEUTICAL CHEMISTRY
[illegible]	[illegible]	POSTGRADUATE SCHOOL
[illegible]	[illegible]	MEDICAL MICROBIOLOGY
[illegible]	[illegible]	DERMATOLOGY SEX SCHOOL

LIST OF DEPARTMENTS

DEPT CODE	FAC CODE	DEPARTMENT DESCRIPTION
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

TOTAL NUMBER OF DEPARTMENTS = [illegible]

```
      ************************************************************
      *                COMPUTERISED PERSONNEL INFORMATION SYSTEM  *
      *                                                           *
      *                (STAFF DATA INITIAL ENTRY PROGRAM : PERSIA)*
      *                                                           *
      ************************************************************

      ************************************************************
      *                                                           *
      *    THIS PROGRAM SUPPORTS THE INITIAL CAPTURING OF STAFF DATA *
      *    FOR THE PURPOSE OF FILE CONVERSION FROM THE MANUAL SYSTEM *
      *    TO THE COMPUTER-BASED SYSTEM. AT THIS STAGE EVERY STAFF IS *
      *  TREATED AS A STARTER.                                    *
      ************************************************************

       IDENTIFICATION DIVISION.

       PROGRAM-ID.     PERSIA.
       AUTHOR.         H.A.BASNAGALE.

       INSTALATION.    A.B.U COMPUTER CENTRE.
       DATE-WRITTEN.   AUGUST.1987.
       REMARKS.        THIS PROGRAM ACCEPTS AND VALIDATES DATA
                       OF A.B.U EMPLOYEES ITEM BY ITEM VIA THE
                       TERMINAL.  IT THEN GENERATES A VALIDATED
                       PERSONAL DATA FILE CALLED PERSDAT.  THIS
                       FILE WILL BE USED BY PROGRAM PERSID TO CREATE
                       THE COMPUTERISED PERSONNEL INFORMATION MASTER FILE.
                       ALL RECORDS WHICH FAIL AT LEAST ONE VALIDITY CHECK A
                       RE
                       REJECTED AND WRITTEN TO AN ERROR REPORT FILE
                       CALLED PERSERR (ALONG WITH ERRONEOUS DATA
                       ERROR MESSAGES).

      ************************************************************
      *  COPYRIGHTS :- THE IDEAS AND DESIGNS IN THIS PROGRAM ARE THE *
      *                PROPERTY OF HENRY ADE BASNAGALE AND ARE NOT TO *
      *                BE CONVEYED OR DISSEMINATED TO THIRD PERSONS *
      *                WITHOUT EXPRESS WRITTEN PERMISSION OF THE OWNER. *
      ************************************************************

       ENVIRONMENT DIVISION.
       CONFIGURATION SECTION.

       SOURCE-COMPUTER.  XYBER2.
       OBJECT-COMPUTER.  CYBER72.

       INPUT-OUTPUT SECTION.
       FILE-CONTROL.

            SELECT INFILE ASSIGN TO INPUT-FZ.
            SELECT PERFILE ASSIGN PERFILE-FZ.

            SELECT STATION ASSIGN STERROR-FZ.
       DATA DIVISION.
       FILE SECTION.

       FD   INFILE
                  LABEL RECORDS OMITTED

                  DATA RECORD IS INREC.
       01   INREC                          PIC X(25).
       FD   PERFILE
                  LABEL RECORDS OMITTED

                  DATA RECORD IS PERREC.
       01   PERREC.

            03 PERNO-NUM.
               05 STAFF-NO          PIC 9(5).
               05 PUP               PIC X.
```

```
           03 INITIALS                 PIC X(2).
           03 SURNAME                  PIC X(20).
           03 TITLE                    PIC 9(2).
           03 SEX                      PIC 9.
           03 M-STATUS                 PIC 9.
           03 START-DATE               PIC 9(6).
           03 APP-TYPE                 PIC 9.
           03 SALARY.

              05 LEVEL                 PIC 99.
              05 STEP                  PIC 9.

           03 B-PAY-AGENT              PIC 999.
           03 INOK-CODE                PIC 9.

           03 BANK-CODE                PIC 99.
           03 SAV-ACCT                 PIC X(11).

           03 CAR-FLAG                 PIC 9.
           03 FREEPAY                  PIC 9(5)V99.

           03 TAX-TODATE               PIC 9(6)V99.
           03 TGROSS-TODATE            PIC 9(6)V99.

           03 PAYOUT-TODATE            PIC 9(6)V99.

           03 ALLOW-DED OCCURS 10 TIMES PIC 9(2).

              05 FLAG-TEMP                 PIC X.
              05 POS-NEG                   PIC X.

              05 COMP-CODE              PIC 9(2).
              05 AMOUNT                 PIC 9(5)V99.

              05 DURATION               PIC 9(2).
           03 LOANS-OT                  PIC 9.

           03  LO-NS     OCCURS 3 TIMES.
              05  LPER-TEMP            PIC X.

              05  LPOS-NEG             PIC X.

              05  LPRINCIPAL           PIC 9(5)V99.

              05  LINTR-ST             PIC 9(2)V99.
              05  LDURATION            PIC 9(2).

       FD   STAFILE
            LABEL RECORDS ARE STD
            DATA RECORD IS START-REC.
       01   START-REC                  PIC X(132).

       WORKING-STORAGE SECTION.
       77   WINVALID-FLAG              PIC 9.
       77   WANSWER                    PIC 9.

       77   WADSUB                     PIC 99.
       77   WSECSUB                    PIC 99.

       77   WEXIST-FLAG                PIC X(3).
        77 WS                          PIC 9.
        77 WOFF-CT                     PIC 9.
        77 WFPB4-CT                    PIC 9.

        77 WAFP-CT                     PIC 9.
        77 WFP-TEMP-CT                 PIC 9.

        77 WFPB4-SUB                   PIC 9.
        77 WFPBASUB                    PIC 9.

        77 WFPAFTSUB                   PIC 9.

        77 WFPAFT-SUB                  PIC 9.
        77 WSTPB-CT                    PIC 9.

        77 WTPB4-CT                    PIC 9.
        77 WATP-CT                     PIC 9.

        77 WTP-TEMP-CT                 PIC 9.
        77 WTPB4-SUB                   PIC 9.
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77 WTFAFTSUB                    PIC 9.
77 WTFAFT-SUB                   PIC 9.

77 WAGT-CT                      PIC 9.
77 WGTDB-CT                     PIC 9.

77 WAGT-CT                      PIC 9.
77 WGT-TEMP-CT                  PIC 9.

77 WGTDB-SUB                    PIC 9.
77 WGTDBSUB                     PIC 9.

77 WGTAFTSUB                    PIC 9.
77 WGTAFT-SUB                   PIC 9.

77 WDPC-CT                      PIC 9.
77 WPCDB-CT                     PIC 9.

77 WAPC-CT                      PIC 9.

77 WPC-TEMP-CT                  PIC 9.
77 WPCDB-SUB                    PIC 9.

77 WPCDBSUB                     PIC 9.
77 WPCAFTSUB                    PIC 9.

77 WPCAFT-SUB                   PIC 9.
77 WALL-DUP-CT                  PIC 99.

77 WDEC-FLAG                    PIC 9.
77 WDECI-CT                     PIC 9.

77 WDB-CT                       PIC 9.
77 WAFTER-CT                    PIC 9.

77 WWAIRA-CT                    PIC 9.

77 WLTID-WAIRA                  PIC 9.
77 WB                           PIC 9.

77 WY                           PIC 9.
77 WDB-SUB                      PIC 9.

77 WDB-SCRPT                    PIC 9.
77 WAFTER-SUB                   PIC 99.

77 WAFTER-SCRPT                 PIC 99.
77 WWAIRA-SUB                   PIC 9.

77 WWAIRA-SUB                   PIC 9.
77 WSUB                         PIC 9(2).

77 WLSUB                        PIC 9.

77 WLCHN-CT                     PIC 9.
77 WL                           PIC 9.

77 WII                          PIC 99.
77 WLC                          PIC 99.

77 WLOERROR                     PIC 9.
77 WLCSUB                       PIC 9.

77 WDBNR-SUB                    PIC 9.
77 WPFLIN-CT                    PIC 9.

77 WPFLIN-SUB                   PIC 9.
77 WPFLIN-SCRPT                 PIC 9.

77 WPWAIRE-END                  PIC 9.
77 WPWAIRE-CT                   PIC 9.

77 WPLAIRA-SUB                  PIC 9.
77 WPWAIRASUB                   PIC 9.

77 WINTL-DLCL-CT                PIC 9.
77 WINTE-SCRPT                  PIC 9.

77 WINTL-SUB                    PIC 99.
77 WWAIRA-CT                    PIC 9.

77 WIWAIRA-END                  PIC 9.
77 WIWAIRA-SUB                  PIC 9.

77 WIWAIRASUB                   PIC 99.
```

NCR Systemhouse Division

```
       77  WRITTEN-FLAG            PIC 9.
       77  WJUST-LENGTH            PIC X.
       77  WREPEAT-FLAG            PIC 9 VALUE 0.
       77  WOPT-BEGIN              PIC 9.
       77  WRCENTER                  PIC 9.
       77  WEPTETGPS               PIC 9(5).99.
       11  WALD-PRINT.
           13 WALL-USED  OCCURS 12.

              15 WPT                 PIC X.
              15 WSIGNS              PIC X.

              15 WCODE               PIC 99.
              15 WAMT                PIC 9(5).99.

              15 WJUNK               PIC 99.
       11  WLOAN-PRINT.
           13  WLOAN     OCCURS  3.
              15  WLPT               PIC X.

              15  WLSIGNS            PIC X.
              15  WLCODE             PIC 99.

              15  WLPRINCIPAL        PIC 9(5).99.

              15  WINTS              PIC 9(3).99.

              15  WLBUX              PIC 9(3).99.

       21   WSIGNS.
            15  WREPLY               PIC X(3).

                88 WYES-NO  VALUES "Y  " "N  " "YES" "NO ".
                88 WYES     VALUES "Y  " "YES".

                88 WNO      VALUES "N  " "NO ".
       21   WHEADING1.

              13 FILLER              PIC X(37) VALUE SPACES.
              13 FILLER              PIC X(34) VALUE
                                 "STARTER ERROR REPORT AS ENTERED BY".

              13 FNAME               PIC X VALUE SPACES.
              13 WNAMES              PIC X(12).

         01   WHEADING2.
              13 FILLER              PIC X(25) VALUE SPACES.

              13 FILLER              PIC X(66) VALUE ALL "-".
         01   WHEADINGS.

              13 FILLER              PIC X(2) VALUE SPACES.
              13 FILLER              PIC X(29) VALUE
                                  "RECORD NOT ACCEPTED".
              13 FILLER              PIC X(44) VALUE SPACES.

              13 FILLER              PIC X(13) VALUE "ERROR MESSAGE".

         01   WHSAPACE.
              13 FILLER              PIC X(2) VALUE SPACES.

              13 FILLER              PIC X(2) VALUE ALL "=".
              13 FILLER              PIC X(44) VALUE SPACES.

              13 FILLER              PIC X(13) VALUE ALL "-".
       21   WPERF-DETAIL.

              13 WPERS-NUM.
                 15 WPJP  PIC X.

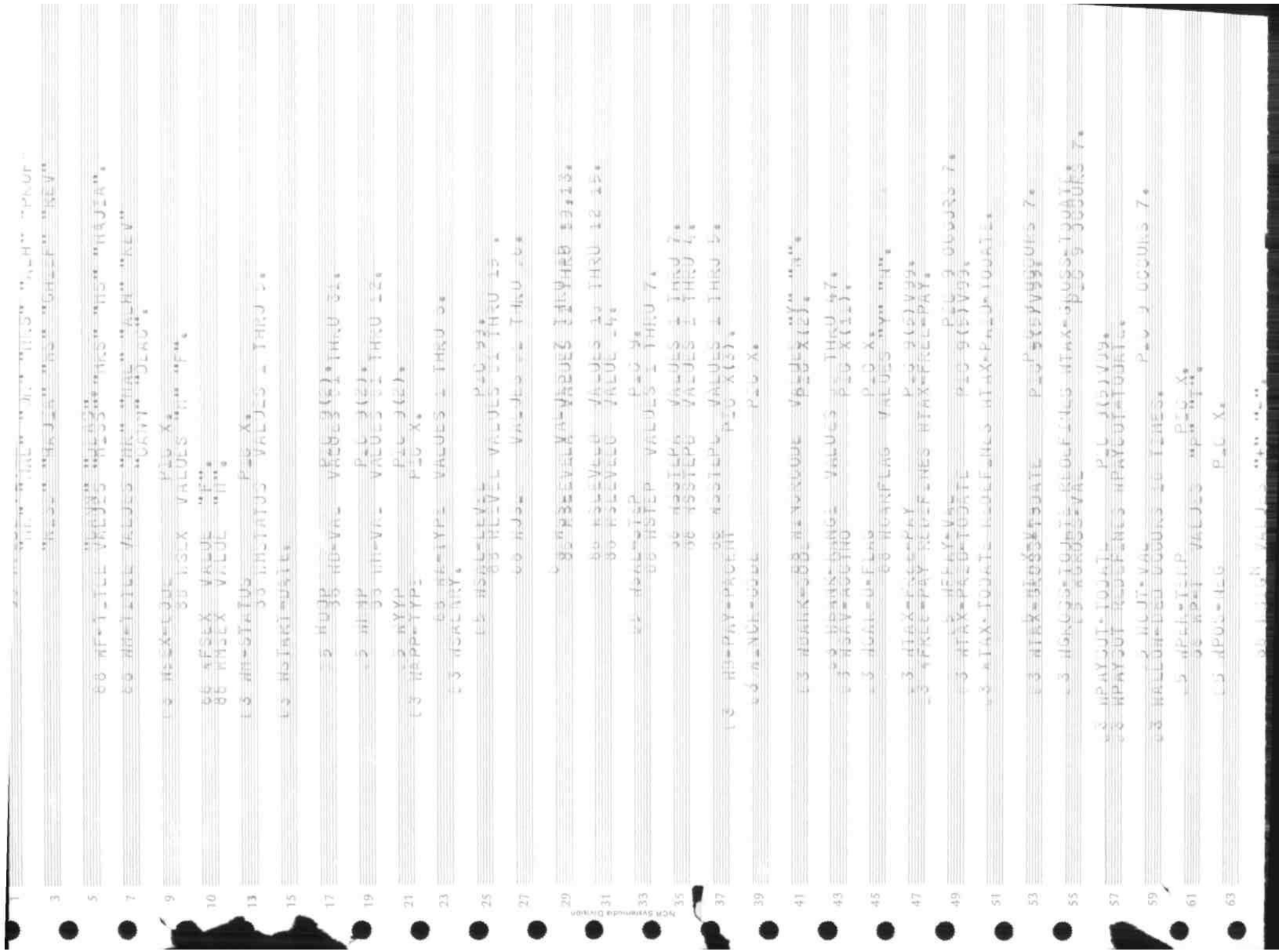
                    88 WPJP-VAL  VALUES "J" "P".
                 15 WSTAFF-NO   PIC 9(5).

              13  WSUB-PROG-CODE.

                  88 WSUB-RANGE  VALUES  ARE 1 THRU 32.

                 15  WPROG-CODE          PIC 9(3).
              13 WINITIALS                PIC  A(2).

              13 WSURNAME                   PIC  A(15).
              13 WTITLE-CODE          PIC X(2).
```



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           05 NCOMP-CODE    PIC 9(2).
              88 VS-CODE  VALUES 12 THRU 20.
           05 WAMOUNT       PIC  9(5)V99.
           05 NDURATION     PIC 9(2).
        03 WALS-VAL REDEFINES WALLOW-DED OCCURS 20.
           05 WAD           PIC X OCCURS 13.
        03  WLOANS        OCCURS  3 TIMES.
           05 WLPER-TEMP                 PIC X.

              88 WLP-T  VALUES "P" "T".
           05 WLPOS-NEG                  PIC X.

              88 WLS-GN VALUES "+" "-".
           05 WLCOMP-CODE                PIC 9(2).

              88 WLC-CODE   VALUES 20 THRU 34.
           05 WLPTENCEPA                 PIC 9(3)V99.

           05 WLINTREST                  PIC 9(3)V99.
           05 WLDURATION                 PIC 9(3).

        03  WLOANS  REDEFINES WLOANS OCCURS 3.
           05 WLOAN-VAL                  PIC X OCCURS 17.
    01 WOPT-ITEM.

        03 WITEMNO                PIC 9(2).
              88 WITEMNO  VALUES 20 THRU 31.

        03 WDATA-ITEM             PIC X(13).
           03 WDATA-VAL REDEFINES WDATA-ITEM.

              05 WDATA            PIC X OCCURS 13.
    01 WDATA-ENDS                 PIC X(3).

       88 WEND  VALUE "END".
    01   WERROR-LINE.

           05 FILLER              PIC X(2) VALUE SPACES.
        03 WERRS-NUM              PIC X(6).

        03 FILLER                 PIC X VALUE SPACES.
        03 WERR-TEXT              PIC X(9).

        03 FILLER                 PIC X VALUE SPACES.
        03 WERR-WORD              PIC X(9).

        03 FILLER                 PIC X VALUE SPACES.
        03 WERR-MESSAGE           PIC X(23).
        03 FILLER                 PIC X(25).
    01   WFOOTING1.

        05 FILLER                 PIC X(22) VALUE SPACES.
        05 FILLER                 PIC X(17) VALUE
                                        "TOTAL RECS READ =".

        05 WREC-READ              PIC 9(5).VALUE SPACES.
    01   WFOOTING2.
        05 FILLER                 PIC X(20) VALUE SPACES.
        05 FILLER                 PIC X(21) VALUE
                                        "TOTAL RECS REJECTED =".

        05 FILLER                 PIC X(2) VALUE SPACES.
        05 WREC-REJ               PIC 9(3).
    01   WFOOTING3.
        05 FILLER                 PIC X(18) VALUE SPACES.
        05 FILLER                 PIC X(25) VALUE
                                        "TOTAL RECS ACCEPTED =".

        05 WREC-ACCPT             PIC 9(3).
    01   WFOOTING4.
        05 FILLER                 PIC X(22) VALUE SPACES.
        05 FILLER                 PIC X(25) VALUE "PROGRAM NAME IS".
```

```
                05 FILLER                   PIC X(7) VALUE "PERS14".
           01   RDATE.

                05 RYY                      PIC 99.
                05 RMM                      PIC 99.

                05 RDD                      PIC 99.
           01   RDATE-TEMP.

                05 RDD                      PIC 99.
                05 FILLER                   PIC X VALUE "/".
                05 RMM                      PIC 99.
                05 FILLER                   PIC X VALUE "/".
                05 RYY                      PIC 99.
           01   RFOOTING5.
                05 FILLER                   PIC X(22) VALUE SPACES.

                05 FILLER                   PIC X(22) VALUE "RUN DATE IS".
                05 FILLER                   PIC X(12) VALUE SPACES.

                05 RRUN-DATE                PIC X(8).
       PROCEDURE DIVISION.
       HOUSE-KEEPING.
           OPEN INPUT INFILE OUTPUT PERFILE STARTERS.

           DISPLAY "ATTO PAYROLL SYSTEM".
           DISPLAY "STARTER ENTRY PROGRAM".

           DISPLAY " ALWAYS REMEMBER TO :".
           DISPLAY "1. WAIT FOR ? BEFORE YOU ENTER ANYTHING".
           DISPLAY "2. PRESS THE RETURN KEY AT END OF EACH LINE".

           DISPLAY " TYPE EMPLOYEE NAMES PLS".
           MOVE 2 TO ADJUST-BEGIN.

           READ INFILE AT END
                        MOVE ZERO TO ADJUST-BEGIN
                        GO TO RETURN-PARA.
           MOVE INREC TO NNAMES.

           MOVE SPACES TO INREC.
           MOVE SPACES TO START-REC.

           WRITE START-REC FROM NHEAD-1 AFTER 2.
           MOVE SPACES TO START-REC.

           WRITE START-REC FROM NHEAD-2 AFTER 1.

           MOVE SPACES TO START-REC.
           WRITE START-REC FROM NHEAD-3 AFTER 1.

           MOVE SPACES TO START-REC.
           WRITE START-REC FROM NHEAD-4.

           MOVE ZEROS TO NREC-READ NREC-REJ NREC-ACCPT.
             DISPLAY "GET READY PLS".
       ENTRY-BEGINS.
           MOVE SPACES TO NPERF-DETAIL NEXIST-FLAG.

           MOVE ZEROS TO NADDERROR NADDOD NREC-DED-OT
                                NEOSOB NEDERROR NEORN-OT
                                NREGREC-FLAG NRNTDED-FLAG .

           IF NACCEPT-FLAG EQUAL 1 TO NREC-READ.
           MOVE ZERO TO NRECENTER.

       PERS-NUM-PARA.
           MOVE SPACES TO INREC NEMESSAGE.

           MOVE ZERO TO NINVALID-FLAG.
           DISPLAY "PERSONAL NUMBER PLS".

           READ INFILE AT END GO TO RETURN-PARA.
           MOVE SPACES TO NPERS-NUM.

           MOVE INREC TO NPERS-NUM.
           IF NOT NPSP-VAL
              DISPLAY "FIRST CHAR NOT J OR P"

              MOVE "FIRST CHAR OF P-NO NOT J OR P" TO NMESSAGE
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```
                MOVE 1 TO WINVALID-FLAG
            ELSE IF WSTAFF-NO NOT NUMERIC
                DISPLAY "F-NO NOT NUMERIC"
                MOVE "F-NO NOT NUMERIC" TO WEMESSAGE
                MOVE 1 TO WINVALID-FLAG.
            IF WINVALID-FLAG = 1
               PERFORM DECIDE-PARA THRU DECIDE-EXIT
               IF WYES GO TO PASS-NUM-PARA

               ELSE GO TO WRITE-REJEC
            ELSE NEXT SENTENCE.
        SCH-PROG-PARA.
            MOVE SPACES TO INREC WEMESSAGE.
            MOVE ZERO TO WINVALID-FLAG.
            DISPLAY "SCHOOL-PROGRAM CODE PLS"
            READ INFILE AT END GO TO RETURN-PARA.
            MOVE SPACES TO WSCH-PROG-CODE.
            MOVE INREC TO WSCH-PROG-CODE.
            IF WSCH-CODE NOT NUMERIC
               DISPLAY "SCHOOL CODE NOT NUMERIC"

               MOVE "SCHOOL CODE NOT NUMERIC" TO WEMESSAGE
               MOVE 1 TO WINVALID-FLAG

            ELSE IF NOT WSCH-RANGE
               DISPLAY "SCHOOL CODE OUT OF RANGE"
               MOVE "SCHOOL CODE OUT OF RANGE" TO WEMESSAGE
               MOVE 1 TO WINVALID-FLAG

            ELSE IF WPROG-CODE NOT NUMERIC
               DISPLAY "PROGRAM CODE NOT NUMERIC"
               MOVE "PROGRAM CODE NOT NUMERIC" TO WEMESSAGE
               MOVE 1 TO WINVALID-FLAG.
            IF WINVALID-FLAG = 1

               PERFORM DEC-DE-PARA THRU DEC-DE-EX-T
               IF WYES GO TO SCH-PROG-PARA

               ELSE GO TO WRITE-REJEC

            ELSE NEXT SENTENCE.
        INITIAL-PARA.
            MOVE SPACES TO INREC WEMESSAGE.
            MOVE ZERO TO WINVALID-FLAG.

            DISPLAY "INITIALS PLS".
            READ INFILE AT END GO TO RETURN-PARA.
            MOVE SPACES TO WINITIALS.

            MOVE INREC TO WINITIALS
            IF WINITIALS = SPACES

               DISPLAY "INITIALS CAN'T ALL BE BLANKS"
               MOVE "INITIALS ARE ALL BLANKS" TO WEMESSAGE

               MOVE 1 TO WINVALID-FLAG
               ELSE IF WINITIALS NOT ALPHABETIC

                  DISPLAY "INITIALS MUST BE ALPHABETIC"
                  MOVE "INITIALS MUST BE ALPHABETIC" TO WEMESSAGE

                  MOVE 1 TO WINVALID-FLAG.
            IF WINVALID-FLAG = 1

               PERFORM DEC-DE-PARA THRU DEC-DE-EX-T

               IF WYES GO TO INITIAL-PARA
               ELSE GO TO WRITE-REJEC

            ELSE NEXT SENTENCE.
        SURNAME-PARA.
            MOVE ZERO TO WINVALID-FLAG.
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```
           DISPLAY "SURNAME PLS".
           READ INFILE AT END GO TO RETURN-PARA.

           MOVE SPACES TO WSURNAME.
           MOVE INREC TO WSURNAME.

           IF WSURNAME EQUAL SPACES
              DISPLAY "SURNAME CAN'T BE ALL SPACES"
              MOVE "SURNAME IS ALL SPACES" TO WERRMSAGE
              MOVE 1 TO WINVALID-FLAG
              ELSE IF WSURNAME NOT ALPHABETIC
                      DISPLAY "SURNAME MUST BE ALPHABETIC"
                      MOVE "SURNAME MUST BE ALPHABETIC" TO WERRMSAGE
              MOVE 1 TO WINVALID-FLAG.
           IF WINVALID-FLAG = 1
              PERFORM DECIDE-PARA THRU DECIDE-EX-1
              IF WYES GO TO SURNAME-PARA
              ELSE GO TO WRITE-REJEC
              ELSE NEXT SENTENCE.
      TITLE-PARA.
           MOVE SPACES TO INREC WERRMSAGE.
           DISPLAY "TITLE CODE PLS".
           READ INFILE AT END GO TO RETURN-PARA.
           MOVE SPACES TO WTITLE-CODE.
           MOVE INREC TO WTITLE-CODE.

           IF NOT VALID-TITLE
              DISPLAY "INVALID TITLE CODE"
              MOVE "INVALID TITLE CODE" TO WERRMSAGE
              PERFORM DECIDE-PARA THRU DECIDE-EXIT
              IF WYES GO TO TITLE-PARA
              ELSE GO TO WRITE-REJEC
           ELSE NEXT SENTENCE.
      SEX-PARA.
           MOVE SPACES TO INREC WERRMSAGE.
           MOVE ZERO TO WINVALID-FLAG.

           DISPLAY "SEX CODE PLS".
           READ INFILE AT END GO TO SEX-PARA.

           MOVE SPACES TO WSEX-CODE.
           MOVE INREC TO WSEX-CODE.

           IF NOT WSEX
              DISPLAY "INVALID SEX CODE"
              MOVE "INVALID SEX CODE" TO WERRMSAGE
              MOVE 1 TO WINVALID-FLAG
           ELSE IF (WF-TITLE AND NOT WFSEX) OR
                   (WM-TITLE AND NOT WMSEX)
            DISPLAY "SEX CODE INVALID FOR STAFF'S TITLE"

            MOVE "SEX CODE INVALID FOR TITLE" TO WERRMSAGE
           IF WINVALID-FLAG = 1
              PERFORM DECIDE-PARA THRU DECIDE-EXIT
              IF WYES GO TO SEX-PARA
              ELSE GO TO WRITE-REJEC

           ELSE NEXT SENTENCE.
      STATUS-PARA.
           MOVE SPACES TO INREC WERRMSAGE.
           MOVE ZERO TO WINVALID-FLAG.

           DISPLAY "MANTA STATUS CODE PLS".
```

```
           READ ENFILE AT END GO TO RETURN-PARA.
           MOVE SPACES TO WH-STATUS
           MOVE ENREC TO WH-STATUS.
           IF NOT WHSTATUS
              DISPLAY "INVALID MARITAL STATUS"
              MOVE "INVALID MARITAL STATUS" TO WEMESSAGE
              MOVE 1 TO WINVALID-FLAG
           ELSE IF (WT-TITLE-CODE = "BOSS" AND WH-STATUS = 2) OR
                   (WT-TITLE-CODE = "MRS" AND WH-STATUS = 1)
              DISPLAY "MARITAL STATUS INVALID FOR STAFF'S TITLE"
              MOVE "MARITAL STATUS INVALID FOR TITLE" TO WEMESSAGE
              MOVE 1 TO WINVALID-FLAG.
           IF WINVALID-FLAG = 1
              PERFORM DECODE-PARA THRU DECODE-EXIT
              IF WYES GO TO WSTATUS-PARA
              ELSE GO TO WRITE-REJEC
           ELSE NEXT SENTENCE.
       APPT-DATE-PARA.
           MOVE SPACES TO WEMESSAGE.
           MOVE ZERO TO WINVALID-FLAG.
           DISPLAY "DATE OF STARTING APPT PLS(DDMMYY)".
           READ ENFILE AT END GO TO RETURN-PARA.
           MOVE SPACES TO WSTART-DATE.
           MOVE ENREC TO WSTART-DATE.
           IF NOT WD-VAL
              DISPLAY "DAY OUT OF RANGE"
              MOVE "DAY OUT OF RANGE" TO WEMESSAGE
              MOVE 1 TO WINVALID-FLAG
           ELSE IF NOT WM-VAL
              DISPLAY "MONTH OUT OF RANGE"
              MOVE "MONTH OUT OF RANGE" TO WEMESSAGE
              MOVE 1 TO WINVALID-FLAG
           ELSE IF WYY NOT NUMERIC
                   DISPLAY "YEAR NOT NUMERIC"
                   MOVE "YEAR NOT NUMERIC" TO WEMESSAGE
                   MOVE 1 TO WINVALID-FLAG.
           IF WINVALID-FLAG = 1
              PERFORM DECODE-PARA THRU DECODE-EXIT
              IF WYES GO TO APPT-DATE-PARA
              ELSE GO TO WRITE-REJEC
           ELSE NEXT SENTENCE.
       APPT-TYPE-PARA.
           MOVE SPACES TO ENREC WEMESSAGE.
           DISPLAY "TYPE OF APPOINTMENT PLS".
           READ ENFILE AT END GO TO RETURN-PARA.
           MOVE SPACES TO WAPP-TYPE.
           MOVE ENREC TO WAPP-TYPE.
           IF NOT WA-TYPE
              DISPLAY "INVALID APPOINTMENT CODE"
              MOVE "INVALID APPOINTMENT CODE" TO WEMESSAGE
              PERFORM DECODE-PARA THRU DECODE-EXIT
              IF WYES GO TO APPT-TYPE-PARA
              ELSE GO TO WRITE-REJEC
           ELSE NEXT SENTENCE.
       SALARY-PARA.
```

```
                MOVE ZERO TO WINVALID-FLAG.
                DISPLAY "SALARY LEVEL AND STEP PLS".

                ACCEPT WSALARY AT END GO TO RETURN-PARA.
                MOVE SPACES TO WSALARY.

                MOVE ZEROS TO WSALARY.
                IF NOT WLEVEL
                   DISPLAY "INVALID SALARY LEVEL"
                   MOVE "INVALID SALARY LEVEL" TO WERRMSGL
                   MOVE 1 TO WINVALID-FLAG
                ELSE IF NOT WSTEP
                        DISPLAY "SALARY STEP OUT OF RANGE"
                        MOVE "SALARY STEP OUT OF RANGE" TO WERRMSGL
                        MOVE 1 TO WINVALID-FLAG

                     ELSE IF WPOP = "J" AND NOT WJSL
                             DISPLAY "INVALID LEVEL! JUNIOR STAFF(01-06)"
                        MOVE "INVALID LEVEL FOR JUNIOR STAFF" TO
                                                        WERRMSGL
                        MOVE 1 TO WINVALID-FLAG
                     ELSE IF WPOP = "P" AND NOT WSSL
                             DISPLAY "INVALID LEVEL! SENIOR STAFF(07-15)"
                             MOVE "INVALID LEVEL FOR SENIOR STAFF" TO
                                                        WERRMSGL
                             MOVE 1 TO WINVALID-FLAG
                          ELSE IF (WSLEVELA AND NOT WSSTEPA) OR
                                  (WSLEVELB AND NOT WSSTEPB) OR
                                  (WSLEVELC AND NOT WSSTEPC)
                                  DISPLAY "STEP OUT OF RANGE FOR LEVEL"
                                  MOVE "STEP OUT OF RANGE FOR LEVEL" TO
                                                        WERRMSGL
                                  MOVE 1 TO WINVALID-FLAG
                               ELSE IF WSAL-LEVEL = 15 AND WSAL-STEP = 9
                                       PERFORM V-C-TEST THRU V-C-EXIT
                                    ELSE NEXT SENTENCE
                                  ELSE NEXT SENTENCE.
                IF WINVALID-FLAG = 1
                   PERFORM DECIDE-PARA THRU DECIDE-EXIT
                   IF WYES GO TO FAMILY-PARA
                   ELSE GO TO WRITE-REJEC

                ELSE NEXT SENTENCE.
            PAGENT-PARA.

                MOVE ZERO TO WPERCENT
                DISPLAY "PERCENTAGE OF BASIC PAY PLS".

                READ WINFILE AT END GO TO RETURN-PARA.
                MOVE SPACES TO WS-PAY-PAGENT.

                MOVE WNULL TO WS-PAY-PAGENT.
                IF WS-PAY-PAGENT NOT NUMERIC
                   DISPLAY "PERCENTAGE OF BASIC PAY NOT NUMERIC"
                   MOVE "PERCENTAGE OF BASIC PAY NOT NUMERIC" TO
                                                        WERRMSGL
                   PERFORM DECIDE-PARA THRU DECIDE-EXIT
                   IF WYES GO TO PAGENT-PARA

                   ELSE GO TO WRITE-REJEC
```

```
                ELSE NEXT SENTENCE.
INCREMENT-PARA.

        MOVE SPACES TO INCR-MESSAGE.
        MOVE ZERO TO W-INVALID-FLAG.
        DISPLAY "INCREMENT CODE PLS".
        READ INFILE AT END GO TO RETURN-PARA.
        MOVE SPACES TO W-INCR-CODE.

        MOVE INCR-CODE TO W-INCR-CODE.
        IF NOT W-INC-CODE
            DISPLAY "INVALID INCREMENT CODE"
            MOVE "INVALID INCREMENT CODE" TO W-MESSAGE
            MOVE 1 TO W-INVALID-FLAG
        ELSE IF W-APP-TYPE = 3 AND W-INCR-CODE = "Y"
            DISPLAY "ILLEGAL INCREMENT CODE FOR TEMPORARY STAFF"
            MOVE "ILLEGAL INCREMENT CODE FOR TEMPORARY STAFF" TO
                                                    W-MESSAGE
            MOVE 1 TO W-INVALID-FLAG
              ELSE IF W-SAL-LEVEL = 25 AND W-SAL-STEP = 4 AND


            DISPLAY "ILLEGAL INCREMENT CODE FOR VICE-CHANCELLOR"

            MOVE "ILLEGAL INCREMENT CODE FOR V-C" TO W-MESSAGE
            MOVE 1 TO W-INVALID-FLAG.

        IF W-INVALID-FLAG = 1
            PERFORM DECIDE-PARA THRU DECIDE-EXIT
            IF W-YES GO TO INCREMENT-PARA
            ELSE GO TO W-REJECT-PARA.
        ELSE NEXT SENTENCE.
BANK-PARA.
        MOVE SPACES TO INFILE-MESSAGE.

        MOVE ZERO TO W-INVALID-FLAG.
        DISPLAY "BANK CODE PLS".

        READ INFILE AT END GO TO RETURN-PARA.
        MOVE SPACES TO W-BANK-CODE.

        MOVE INFILE TO I-BANK-CODE.
    IF NOT W-BANK-RANGE
        DISPLAY "BANK CODE OUT OF RANGE"
        MOVE "BANK CODE OUT OF RANGE" TO W-MESSAGE

        MOVE 1 TO W-INVALID-FLAG
    ELSE IF (W-SAL-LEVEL > 12) AND I-BANK-CODE = 0
            DISPLAY "BANK CODE CAN'T BE ZERO FOR STAFF"

            MOVE "BANK CODE CAN'T BE ZERO" TO W-MESSAGE
            MOVE 1 TO W-INVALID-FLAG.

    IF W-INVALID-FLAG = 1
            PERFORM DECIDE-PARA THRU DECIDE-EXIT
            IF W-YES GO TO BANK-PARA
            ELSE GO TO W-REJECT-PARA
    ELSE NEXT SENTENCE.
OPTIONS-BEGIN.
        DISPLAY "THANK YOU! ALL MANDATORY ITEMS ENTERED".
        DISPLAY "OPTIONAL ITEMS TO FOLLOW".
            MOVE 1 TO W-OPT-DES-N.

SELECT-PARA.
            MOVE SPACES TO W-ENTER-ITEM INFILE-MESSAGE.
        IF W-RECENTCL = 1 DISPLAY "PLS RECENTER IT"
                          MOVE ZERO TO W-RECENTER
            ELSE IF W-OPT-DES-N = 1
            DISPLAY "NEXT OPTIONAL ITEM PLS"
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                READ I-FILE AT END GO TO RETURN-PARA.
                 MOVE ZERO TO WOPT-BEGIN.

                MOVE ANSW TO WOPT-ITEM.
                IF NOT WSTAND DISPLAY "INVALID ITEM NUMBER"

                          MOVE "INVALID ITEM NUMBER" TO WMESSAGE
                          PERFORM DECIDE-PARA THRU DECIDE-EXIT

                          IF WYES MOVE 2 TO WMENTRY
                                  GO TO SELECT-PARA

                          ELSE GO TO WRITE-REJEC
                ELSE NEXT SENTENCE.
                IF WITEM-NO = 20 MOVE 20 TO W-ITEM-NO
                                 MOVE 1 TO WDEC-FLAG.
                    SUBTRACT 27 FROM W-ITEM-NO GIVING WSELECT.

                    GO TO SAV-ACC-NO, W-ITEM-NO, FLAG-DUMMY2, FREE-PAY,
                    TAX-PAID, TAX-DEDUCT, PAY-CUT, ALLOW-DEDS,

                    DEDUCT-PARA, LOANS-PARA, DUMMY2a, DUMMY2a, DUMMY3a,
                    DATA-ENDS DEPENDING ON WSELECT.

        SAV-ACC-NO.
                 MOVE SPACES TO WMESSAGE.

            MOVE SPACES TO WSAV-ACCTNO.
                 MOVE WDATA-ITEM TO WSAV-ACCTNO.

            DISPLAY "SAV-ACC ACCT NO ENTERED AS " WSAV-ACCTNO.
                IF WMARK-CODE = " " AND WSAV-ACCTNO NOT = SPACES
                 DISPLAY "SAV-ACC ACCT CAN'T BE SET FOR CASH PAYEES"

                 MOVE SPACES TO WSAV-ACCTNO
            DISPLAY "ITEM TREATED AS NOT APPLICABLE"

                ELSE IF WPOP = "P" AND WSAV-ACCTNO NOT = SPACES
                 DISPLAY "SAV-ACC ACCT CAN'T BE SET FOR SENIOR STAFF"
                 MOVE SPACES TO WSAV-ACCTNO
            DISPLAY "ITEM TREATED AS NOT APPLICABLE"

                ELSE
                IF WSAV-ACCTNO EQUAL SPACES

                    DISPLAY "SAV-ACC ACCT NO CAN'T ALL BE SPACES"
                    MOVE "SAVINGS ACCT NO IS ALL SPACES" TO WMESSAGE
                    PERFORM DECIDE-PARA THRU DECIDE-EXIT

                    IF WYES GO TO SELECT-PARA

                    ELSE GO TO WRITE-REJEC.
                GO TO SELECT-PARA.

        DAR-FLAG.
                 MOVE SPACES TO WMESSAGE.

                 MOVE WDATA-ITEM TO WDAR-O-FLAG.
                  DISPLAY "DAR FLAG ENTERED " WDAR-O-FLAG.

                IF NOT WDAR-FLAG
                    DISPLAY "DAR OWNER FLAG INVALID"
                    MOVE "DAR OWNER FLAG INVALID" TO WMESSAGE

                    PERFORM DECIDE-PARA THRU DECIDE-EXIT

                    IF WYES PERFORM ENTRY-PARA
                            GO TO SELECT-PARA
                    ELSE GO TO WRITE-REJEC
                ELSE GO TO SELECT-PARA.
        DUMMY2.
                DISPLAY "ITEM NUMBER 20 DOES NOT EXIST".
                    GO TO SELECT-PARA.

        FREE-PAY.
                 MOVE ZEROS TO WPAYROLL.

            MOVE SPACES TO WMESSAGE.

            MOVE ZEROS TO WTAX-FREE-PAY.
```

```
           EXAMINE NDATA-ITEM TALLYING UNTIL FIRST ".".
           MOVE TALLY TO NDECI-CT.
           IF NDATA(NDECI-CT + 1) NOT = "."
               DISPLAY "NO DECIMAL POINT IN FREEPAY"
               MOVE "NO DECIMAL POINT IN FREEPAY " TO
                                                   MESSAGE
               PERFORM DECIDE-PARA THRU DECIDE-EXIT
               IF ANSS MOVE 2 TO NRECNTR
                       GO TO SELECT-PARA
               ELSE GO TO WRITE-REJEC.
           SUBTRACT 2 FROM NDECI-CT GIVING NFPD-CT.
           MOVE 5 TO N5.
           PERFORM FREEPAY-PARA VARYING NDFP-CT FROM ZERO BY 1
                                   UNTIL NDFP-CT > NFPD-CT.
           PERFORM FREEPAY-PARA VARYING NAFP-CT FROM 1 BY 2
                                   UNTIL NAFP-CT > 2.
           MOVE MAX-FREE-PAY TO NFPTPTGPC.
           DISPLAY "FREE PAY ENTERED " NFPTPTGPC.
           IF MAX-FREE-PAY NOT NUMERIC
               DISPLAY "ANNUAL FREE PAY NOT NUMERIC"
               MOVE "ANNUAL FREE PAY NOT NUMERIC" TO MESSAGE
           PERFORM DECIDE-PARA THRU DECIDE-EXIT
           IF ANSS MOVE 2 TO NRECNTR
                   GO TO SELECT-PARA
           ELSE GO TO WRITE-REJEC
           ELSE GO TO SELECT-PARA.

       TAX-PAID.
           MOVE ZEROS TO NFPTPTGPC.
           MOVE SPACES TO MESSAGE.
           MOVE ZEROS TO NTAX-PAID-TODATE.
           EXAMINE NDATA-ITEM TALLYING UNTIL FIRST ".".
           MOVE TALLY TO NDECI-CT.
           IF NDATA(NDECI-CT + 1) NOT = "."
               DISPLAY "NO DECIMAL POINT IN TAXPAID"
               MOVE "NO DECIMAL POINT IN TAXPAID " TO
                                                   MESSAGE
               PERFORM DECIDE-PARA THRU DECIDE-EXIT
               IF ANSS MOVE 2 TO NRECNTR
                       GO TO SELECT-PARA
               ELSE GO TO WRITE-REJEC.
           SUBTRACT 2 FROM NDECI-CT GIVING NTPD-CT.
           MOVE 5 TO N5.
           PERFORM TAXPAID-PARA VARYING NDTP-CT FROM 1 BY 1
                                   UNTIL NDTP-CT > NTPD-CT.
           PERFORM TAXPAID-PARA VARYING NATP-CT FROM 1 BY 2
                                   UNTIL NATP-CT > 2.
           MOVE MAX-PAID-TODATE TO NFPTPTGPC.
           DISPLAY "TAX TODATE ENTERED " NFPTPTGPC.
           IF NTAX-PAID-TODATE NOT NUMERIC
               DISPLAY "TAX PAID TODATE NOT NUMERIC"
               MOVE "TAX PAID TODATE NOT NUMERIC" TO MESSAGE
           PERFORM DECIDE-PARA THRU DECIDE-EXIT
           IF ANSS MOVE 2 TO NRECNTR
                   GO TO SELECT-PARA
           ELSE GO TO WRITE-REJEC
           ELSE GO TO SELECT-PARA.
       TAX-GROSS.
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     MOVE SPACES TO WEMESSAGE.
     MOVE ZEROS TO WTAX-GROSS-TODATE.
     EXAMINE WDATA-ITEM TALLYING UNTIL FIRST ".".
     MOVE TALLY TO WDECI-CT.
     IF WDATA(WDECI-CT + 1) NOT = "."
         DISPLAY "NO DECIMAL POINT IN TAXGROSS"
         MOVE "NO DECIMAL POINT IN TAXGROSS " TO
                                   WEMESSAGE
         PERFORM DECIDE-PARA THRU DECIDE-EXIT
         IF WYES MOVE 1 TO WREENTER
              GO TO SELECT-PARA
         ELSE GO TO WRITE-REJEC.
     SUBTRACT 1 FROM WDECI-CT GIVING WGTB4-CT.
     MOVE 2 TO W8.
     PERFORM GROSS-B4-MOVE VARYING WBGT-CT FROM 1 BY 1
                   UNTIL WBGT-CT > WGTB4-CT.
     PERFORM GROSS-AFT-MOVE VARYING WAGT-CT FROM 1 BY 1
                   UNTIL WAGT-CT > 2.
     MOVE WTAX-GROSS-TODATE TO WFPTPTGPC.
     DISPLAY "GROSS TODATE ENTERED " WFPTPTGPC.
      IF WTAX-GROSS-TODATE NOT NUMERIC
         DISPLAY "TAX GROSS TODATE NOT NUMERIC"
         MOVE "TAX GROSS TODATE NOT NUMERIC" TO WEMESSAGE
         PERFORM DECIDE-PARA THRU DECIDE-EXIT
      IF WYES MOVE 1 TO WREENTER
              GO TO SELECT-PARA
      ELSE GO TO WRITE-REJEC
     ELSE GO TO SELECT-PARA.
 PAY-OUT.
     MOVE ZEROS TO WFPTPTGPC.
     MOVE SPACES TO WEMESSAGE.
     MOVE ZEROS TO WPAYOUT-TODATE.
     EXAMINE WDATA-ITEM TALLYING UNTIL FIRST ".".
     MOVE TALLY TO WDECI-CT.
     IF WDATA(WDECI-CT + 1) NOT = "."
         DISPLAY "NO DECIMAL POINT IN PAYOUT"
         MOVE "NO DECIMAL POINT IN PAYOUT " TO
                                WEMESSAGE
         PERFORM DECIDE-PARA THRU DECIDE-EXIT
         IF WYES MOVE 1 TO WREENTER
              GO TO SELECT-PARA
         ELSE GO TO WRITE-REJEC.
     SUBTRACT 1 FROM WDECI-CT GIVING WPOB4-CT.
     MOVE 5 TO W5.
     PERFORM OUT-B4-MOVE VARYING WBPO-CT FROM 1 BY 1
                   UNTIL WBPO-CT > WPOB4-CT.
     PERFORM OUT-AFT-MOVE VARYING WAPO-CT FROM 1 BY 1
                   UNTIL WAPO-CT > 2.
     MOVE WPAYOUT-TODATE TO WFPTPTGPC.
     DISPLAY "PAYOUT TODATE ENTERED " WFPTPTGPC.
     IF WPAYOUT-TODATE NOT NUMERIC
         DISPLAY "PAYOUT TODATE NOT NUMERIC"
         MOVE "PAYOUT TODATE NOT NUMERIC" TO WEMESSAGE
         PERFORM DECIDE-PARA THRU DECIDE-EXIT
         IF WYES MOVE 1 TO WREENTER
              GO TO SELECT-PARA
         ELSE GO TO WRITE-REJEC
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            ELSE GO TO SELECT-PARA.

ALLOW-DEDS.
            IF WADERROR EQUAL ZERO
                ADD 1 TO WADSUB
                    IF WALL-DED-CT < 11 ADD 1 TO WALL-DED-CT
                    ELSE
                DISPLAY "11 ALLOW./DED. ITEMS ALREADY ENTERED"

                DISPLAY "NO. OF DEP CAN HAVE NOT MORE THAN 10 ALLOWS./DEDS."
                DISPLAY "ITEM JUST ENTERED REJECTED"

                GO TO SELECT-PARA.
                MOVE ZEROS TO WAL-DED(WADSUB).

                MOVE SPACES TO WMESSAGE.
                MOVE ZERO TO WINVALID-FLAG.

                MOVE ZEROS TO WALLOW-DED(WADSUB).
            EXAMINE WDATA-ITEM TALLYING UNTIL FIRST ".".

            MOVE TALLY TO WDEC-CT.
            IF WDATA(WDEC1-CT + 1) NOT = "."
                DISPLAY "NO DECIMAL POINT IN MONEY FIELD"

                MOVE "NO DECIMAL POINT IN ALL MONEY FIELD" TO
                                                    WMESSAGE

                PERFORM DECODE-PARA THRU DECODE-EXIT
                IF YES MOVE 1 TO WRCENTER

                        GO TO SELECT-PARA
                ELSE GO TO WRITE-REJEC.

            MOVE 0 TO W3.
            MOVE 9 TO W4.

            PERFORM BRANCHUNT-MOVE VARYING W34-SUB FROM 1 BY 1
                                    UNTIL W34-SUB > 4.

            PERFORM AFTER-DEC-MOVE VARYING WAFTER-CT FROM 2 BY 1

                                    UNTIL WAFTER-CT > 5.
            SUBTRACT 2 FROM WDEC1-CT GIVING WEND-WHOLE.

            PERFORM WHOLE-MOVE VARYING WWHOLE-CT FROM 1 BY 1
                                    UNTIL WWHOLE-CT > WEND-WHOLE.

            MOVE WALLOW-DED(WADSUB) TO WALL-DED(WADSUB).
            IF WDED-FLAG = 1
                DISPLAY "DEDUCTION ITEM ENTERED " WALL-DED(WADSUB)
                MOVE ZERO TO WDED-FLAG

            ELSE DISPLAY "ALLOWANCE ITEM ENTERED " WALL-DED(WADSUB).
            IF WCOMP-CODE(WADSUB) = 01
                MOVE 1 TO WHEALTH-FLAG

            ELSE IF WCOMP-CODE(WADSUB) = 02
                MOVE 1 TO WPAYROLL-FLAG

                ELSE NEXT SENTENCE.
            IF NOT WP-T(WADSUB)
                DISPLAY "FIRST CHAR. NOT P OR T"
                MOVE "1ST CHAR. OF ALLOWANCE/DEDUCTION NOT P OR T" TO
                                                    WMESSAGE
                MOVE 1 TO WINVALID-FLAG

            ELSE IF NOT WS-OR(WADSUB)
            DISPLAY "SECOND CHAR NOT + OR -"
                MOVE "2ND CHAR. OF ALLOWANCE/DEDUCTION NOT + OR -" TO

                MOVE 1 TO WINVALID-FLAG                    WMESSAGE

                ELSE IF NOT WC-CODE(WADSUB)
            DISPLAY "COMPUTER CODE OUT OF RANGE"
                    MOVE "ALLOWANCE/DEDUCTION CODE OUT OF RANGE"
                                                    TO WMESSAGE
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                                    IF WA-AMOUNT(WA-SUB) NOT NUMERIC
                                        DISPLAY "AMOUNT NOT NUMERIC"
                                        MOVE "ALLOWANCE/DEDUCTION AMOUNT NOT NUMERIC" TO
                                                                              WE-MESSAGE
                                        MOVE 1 TO WE-INVALID-FLAG
                                    ELSE IF WDURATION(WA-SUB) NOT NUMERIC
                                        DISPLAY "DURATION NOT NUMERIC"
                                        MOVE "ALLOWANCE/DEDUCTION DURATION NOT NUMERIC"
                                                                          TO WE-MESSAGE
                                        MOVE 1 TO WE-INVALID-FLAG
                                    ELSE MOVE ZERO TO WA-ERROR
                                        GO TO SELECT-PARA.

                                IF WE-INVALID-FLAG = 1
                                    PERFORM DECIDE-PARA THRU DECIDE-EXIT

                                    IF WYES MOVE 1 TO WA-ERROR
                                                      MOVE 1 TO WA-ENTER
                                        GO TO SELECT-PARA
                                    ELSE GO TO WRITE-REJEC.

                            DEDS-PARA.
                        ****IT IS A DEDUCTION ITEM.
                                GO TO SELECT-PARA.
                            LOANS-PARA.
                                IF WA-ERROR = 1

                                    ADD 1 TO WA-SUB
                                    IF WA-LOAN-CT < 3 ADD 1 TO WA-LOAN-CT

                                    ELSE DISPLAY "3 LOANS ALREADY ENTERED"
                                        DISPLAY "NO STAFF ENTITLED TO MORE THAN 3"

                                        DISPLAY "ITEM JUST ENTERED IGNORED"
                                        GO TO SELECT-PARA.

                                    MOVE ZEROS TO WA-LOAN(WA-SUB).
                            MOVE SPACES TO WA-MESSAGE.

                            MOVE ZERO TO WA-INVALID-FLAG.
                            MOVE ZEROS TO WA-LOANS(WA-SUB).

                            EXAMINE WDATA-ITEM TALLYING UNTIL FIRST ".".

                                MOVE TALLY TO DUMMY
                            IF WDATA-ITEM(DUMMY + 2:1) NOT = "."

                                DISPLAY "NO DECIMAL POINT IN MONEY FIELD"
                                MOVE "NO DECIMAL POINT IN PRING MONEY FIELD" TO
                                                                      WE-MESSAGE
                                PERFORM DECIDE-PARA THRU DECIDE-EXIT

                                IF WYES MOVE 1 TO WA-ENTER
                                        GO TO SELECT-PARA

                                ELSE GO TO WRITE-REJEC.
                            MOVE 6 TO W6.
                            MOVE 7 TO W7.

                            PERFORM 94-PRING-MOVE VARYING WA-SUB FROM 1 BY 1
                                                  UNTIL WDATA-ITEM(WA-SUB:1) = "."

                            PERFORM PRING-MOVE VARYING WPNA-CT FROM 2 BY 1
                                                  UNTIL WPRIN-CT > 3.

                            SUBTRACT 1 FROM WDECI-CT GIVING WPNAIRA-END.
                            PERFORM PRING-NAIRA-MOVE VARYING WPNAIRA-CT FROM 0 BY 1
                                                  UNTIL WPNAIRA-CT > WPNAIRA-END.
                            MOVE SPACES TO ENREC WDATA-ITEM.

                            DISPLAY "ENTRIES FOLLOWED BY DURATION PLS".
                            READ ENFILE AT END GO TO RETURN-PARA.
                            MOVE ENREC TO WDATA-ITEM.
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           MOVE TALLY TO NDECI-CT.
           IF NDATA(NDECI-CT + 1) NOT = "."
              DISPLAY "NO DECIMAL POINT IN MONEY FIELD"
              MOVE "NO DECIMAL POINT IN INTEREST MONEY FIELD" TO
                                              MEMESSAGE
              PERFORM DECIDE-PARA THRU DECIDE-EXIT
              IF MYES MOVE 1 TO MRELENTER
                      GO TO SELECT-PARA
              ELSE GO TO WRITE-REJEC.
           MOVE ZZ TO MCC.
           MOVE ZZ TO MZZ.
           PERFORM ENTR-AFTERDECI-MOVE VARYING MINTR-DECI-CT FROM
                                  2 BY 1 UNTIL MINTR-DECI-CT > 6.
           SUBTRACT 2 FROM NDECI-CT GIVING MINTRA-END.
           PERFORM ENTR-INTRA-MOVE VARYING MINTRA-CT FROM 2 BY 1
                                  UNTIL MINTRA-CT > MINTRA-END.
           MOVE M-LOAN(MLOSUB) TO MLOAN1(MLOSUB).
       DISPLAY "LOAN PRINCIPAL & INTEREST ENTERED " MLOAN(MLOSUB).
       IF NOT MLP-1(MLOSUB)

           DISPLAY "FIRST CHAR OF LOAN NOT P OR I"
           MOVE "1ST CHAR OF LOAN NOT P OR I" TO MEMESSAGE
           MOVE 1 TO MINVALID-FLAG
       ELSE IF NOT MLOSIGN(MLOSUB)
                DISPLAY "SECOND CHAR NOT + OR -"
                MOVE "2ND CHAR OF LOAN NOT + OR -" TO MEMESSAGE
                MOVE 1 TO MINVALID-FLAG
           ELSE IF NOT MLO-CODE(MLOSUB)
                    DISPLAY "COMPUTER CODE OUT OF RANGE"
                MOVE "LOAN CODE OUT OF RANGE " TO MEMESSAGE
                MOVE 1 TO MINVALID-FLAG
           ELSE IF MPRINCIPAL(MLOSUB) NOT NUMERIC
                DISPLAY "LOAN PRINCIPAL NOT NUMERIC"
                MOVE "LOAN PRINCIPAL NOT NUMERIC" TO MEMESSAGE
                MOVE 1 TO MINVALID-FLAG
           ELSE IF MINTEREST(MLOSUB) NOT NUMERIC
                DISPLAY "LOAN INTREST NOT NUMERIC"
                MOVE "LOAN INTREST NOT NUMERIC" TO MEMESSAGE
                MOVE 1 TO MINVALID-FLAG
           ELSE IF MDURATION(MLOSUB) NOT NUMERIC
                DISPLAY "LOAN DURATION NOT NUMERIC"
                MOVE "LOAN DURATION NOT NUMERIC" TO MEMESSAGE
                MOVE 1 TO MINVALID-FLAG

                ELSE MOVE "END" TO MLOERROR
                     GO TO SELECT-PARA.

       IF MINVALID-FLAG = 1
           PERFORM DECIDE-PARA THRU DECIDE-EXIT
           IF MYES MOVE 1 TO MLOERROR
                   MOVE 2 TO MRELENTER
                   GO TO SELECT-PARA
           ELSE GO TO WRITE-REJEC.
   JUNNY6.
           DISPLAY "ITEM NUMBER 06 DOES NOT EXIST".
           GO TO SELECT-PARA.

   JUNNY5.
           DISPLAY "ITEM NUMBER 05 DOES NOT EXIST".
           GO TO SELECT-PARA.
   JUNNY3.
           DISPLAY "ITEM NUMBER 03 DOES NOT EXIST".
           GO TO SELECT-PARA.
```

```
           MOVE WDATA-ITEM TO WDATA-ENDS.
            IF WEND

              DISPLAY "THANK YOU FOR DATA FOR THE STAFF ENTERED"
                GO TO ADDITIONAL-CHECKS

            ELSE DISPLAY "END OF DATA FLAG WRONG"
                 MOVE "END OF DATA FLAG WRONG" TO WEMESSAGE
                 PERFORM DECODE-PARA THRU DECODE-EXIT
                 IF WYES MOVE 1 TO WREENTER
                         GO TO SELECT-PARA
                 ELSE GO TO WRITE-REJEC.
FREEPAY-BY-MOVE.
            SUBTRACT WSPP-CT FROM WDECI-CT GIVING WPPBY-SUB.
            SUBTRACT WSPP-CT FROM WD GIVING WPPBY-SUB.

            MOVE WDATA(WPPBY-SUB) TO WPPAY-VAL(WPPBY-SUB).
FREEPAY-AFT-MOVE.

            ADD 1 TO WAPP-CT GIVING WPP-TEMPCT.
            ADD WPP-TEMPCT TO WDECI-CT GIVING WPPAFT-SUB.

            ADD WAPP-CT TO WD GIVING WPPAFTSUB.
            MOVE WDATA(WPPAFT-SUB) TO WPPAY-VAL(WPPAFTSUB).
TAXPAID-BY-MOVE.
            SUBTRACT WSTP-CT FROM WDECI-CT GIVING WTPBY-SUB.

            SUBTRACT WSTP-CT FROM WD GIVING WTPBY-SUB.
            MOVE WDATA(WTPBY-SUB) TO WTAX-VAL(WTPBY-SUB).
TAXPAID-AFT-MOVE.

            ADD 1 TO WAPT-CT GIVING WTP-TEMPCT.
            ADD WTP-TEMPCT TO WDECI-CT GIVING WTPAFT-SUB.

            ADD WAPT-CT TO WD GIVING WTPAFTSUB.
            MOVE WDATA(WTPAFT-SUB) TO WTAX-VAL(WTPAFTSUB).
GROSS-BY-MOVE.
            SUBTRACT WGST-CT FROM WDECI-CT GIVING WGTBY-SUB.

            SUBTRACT WGST-CT FROM WD GIVING WGTBY-SUB.
            MOVE WDATA(WGTBY-SUB) TO WGROSS-VAL(WGTBY-SUB).
GROSS-AFT-MOVE.
            ADD 1 TO WAPT-CT GIVING WGT-TEMPCT.
            ADD WGT-TEMPCT TO WDECI-CT GIVING WGTAFT-SUB.

            ADD WAPT-CT TO WD GIVING WGTAFTSUB.
            MOVE WDATA(WGTAFT-SUB) TO WGROSS-VAL(WGTAFTSUB).
OUT-BY-MOVE.
            SUBTRACT WOPO-CT FROM WDECI-CT GIVING WPOBY-SUB.

            SUBTRACT WOPO-CT FROM WD GIVING WPOBY-SUB.
            MOVE WDATA(WPOBY-SUB) TO WOUT-VAL(WPOBY-SUB).
OUT-AFT-MOVE.
            ADD 1 TO WAPO-CT GIVING WPO-TEMPCT.

            ADD WPO-TEMPCT TO WDECI-CT GIVING WPOAFT-SUB.
            ADD WAPO-CT TO WD GIVING WPOAFTSUB.

            MOVE WDATA(WPOAFT-SUB) TO WOUT-VAL(WPOAFTSUB).


34AMOUNT-MOVE.

            SUBTRACT W34-SUB FROM WD-CT GIVING W34-CT.
            SUBTRACT W34-CT FROM WDECI-CT GIVING W34-SCRPT.

            MOVE WDATA(W34-SCRPT) TO W34(W34SUB,W34-SUB).
AFTER-DECI-MOVE.

            ADD WAFTER-CT TO 48 GIVING WAFTER-SUB.
            ADD WAFTER-CT TO WDECI-CT GIVING WAFTER-SCRPT.

            MOVE WDATA(WAFTER-SCRPT) TO W34(W34SUB,WAFTER-SUB).
WHERA-MOVE.

            SUBTRACT WWHERA-CT FROM WDECI-CT GIVING WWHERA-SUB.


            SUBTRACT WWATER-CT FROM WD GIVING WWATER-SUB.
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           MOVE WDATA(WNR-RA-SUB) TO WAD(WADSUB,WNR-RASUB).
34-PRINT-MOVE.
             MOVE WDATA(WL-HR-SUB) TO WLOAN-VAL(WLOSUB,W34NR-SUB).
PRINT-LOOP-MOVE.
           ADD WPRIN-CT TO WC GIVING WPRIN-SUB.
           ADD WPRIN-CT TO WDEDUCT-CT GIVING WPRIN-SCRPT.
           MOVE WDATA(WPRIN-SCRPT) TO WLOAN-VAL(WLOSUB,WPRIN-SUB).

PRINT-NEGRA-MOVE.
           SUBTRACT WPNAIRA-CT FROM WDEDUCT-CT GIVING WPNAIRA-SUB.

           SUBTRACT WPNAIRA-CT FROM WZ GIVING WPNAIRASUB.
           MOVE WDATA(WPNAIRA-SUB) TO WLOAN-VAL(WLOSUB,WPNAIRASUB).
INTR-AFTERDEDUCT-MOVE.

           ADD WINTR-DEDUCT-CT TO WDEDUCT-CT GIVING WINTR-SCRPT.
           ADD WINTR-DEDUCT-CT TO WZZ GIVING WINTR-SUB.

           MOVE WDATA(WINTR-SCRPT) TO WLOAN-VAL(WLOSUB,WINTR-SUB).
INTR-NAIRA-MOVE.
           SUBTRACT WINAIRA-CT FROM WDEDUCT-CT GIVING WINAIRA-SUB.

           SUBTRACT WINAIRASUB-CT FROM WZ GIVING WINAIRASUB.
           MOVE WDATA(WINAIRA-SUB) TO WLOAN-VAL(WLOSUB,WINAIRASUB).

ADDITIONAL-CHECKS.
       IF WBSERIAL-FLAG = 1 AND WRENTDED-FLAG = 1

           DISPLAY "HOUSING ALLOW. & RENT DED. INVALID TOGETHER"
           MOVE "HOUSING ALLOW. & RENT DED. INVALID TOGETHER" TO
                                                    WS-MESSAGE
           GO TO WRITE-REJEC

       ELSE IF WTAX-PAID-TODATE NOT = SPACES AND
               WTAX-GROSS-TODATE NOT = SPACES

           DISPLAY "TAX-PAID & TAX-GROSS ENTERED TOGETHER"
           IF WTAX-PAID-TODATE NOT < WTAX-GROSS-TODATE
           DISPLAY "TAX-PAID TODATE CAN'T BE > TAX-GROSS-TODATE"
           MOVE "TAX-PAID TODATE CAN'T BE > TAX-GROSS TODATE" TO
                                                    WS-MESSAGE
       ***    GO TO WRITE-REJEC.
           GO TO WRITE-ACCEPT.

WR-TO-REJEC.
           MOVE SPACES TO WSPERS-NUM WS-TITLE WS-INITIALS WS-SURNAME.

           MOVE WPERS-NUM TO WSPERS-NUM.
           MOVE WTITLE-CODE TO WS-TITLE.

           MOVE WINITIALS TO WS-INITIALS.

           MOVE WDUPKEY TO WSDUPKEY.
           WRITE START-REC FROM WERROR-LINE AFTER 1.

           ADD 1 TO WNUMREJ.
       DISPLAY "RECORD REJECTED DUE TO LAST ERROR DISPLAYED".
           GO TO ANY-MORE-STAFF.
WRITE-ACCEPT.

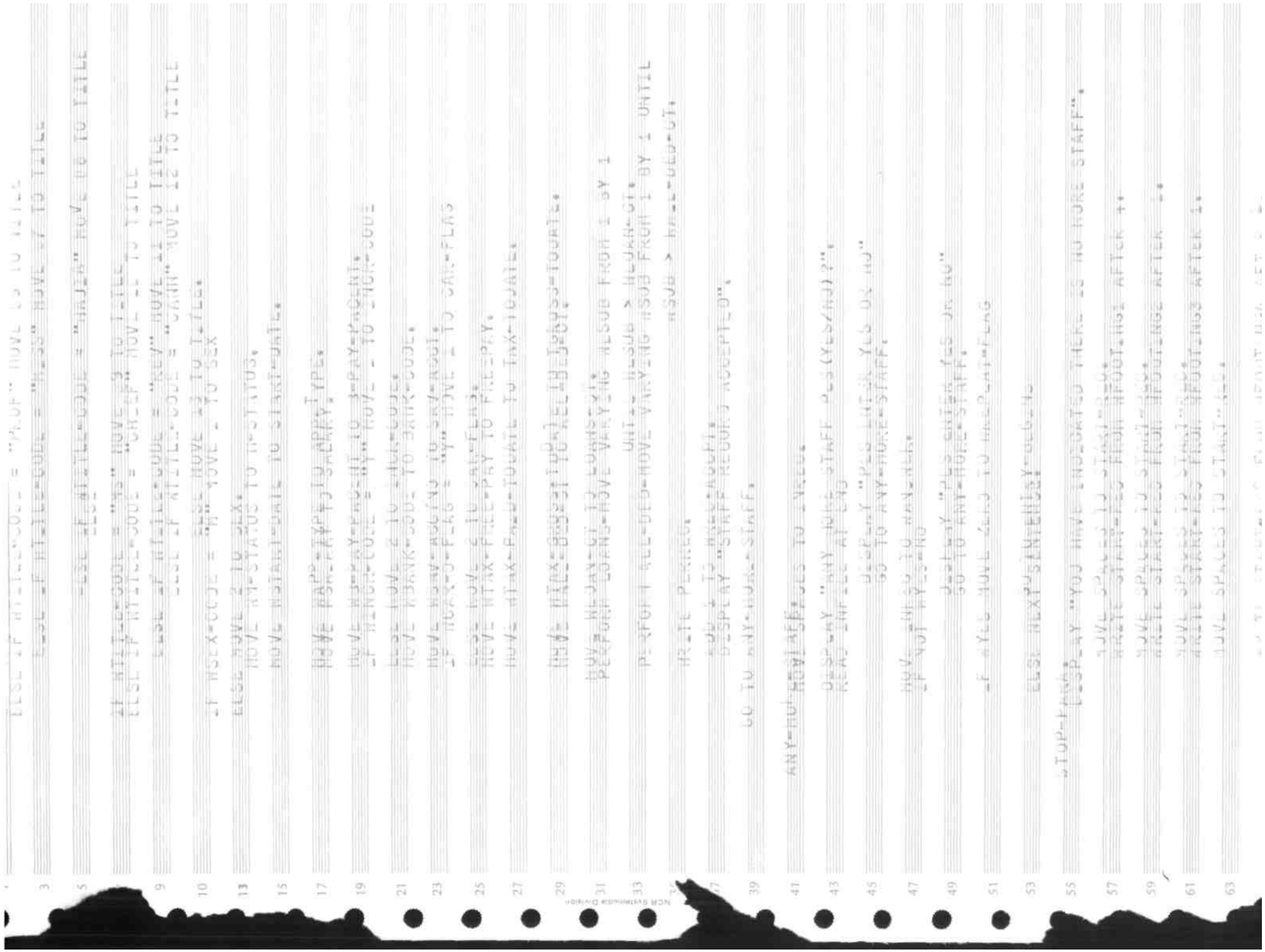
           MOVE SPACES TO PERSEC.
           MOVE WSTAFF-NO TO STAFF-NO.

           MOVE WPJP TO PJP.
           MOVE WSCH-PROG-CODE TO SCH-PROG-CODE.
           MOVE WINITIALS TO INITIALS.

           MOVE WDUPKEY TO SDUPKEY.
           IF WTITLE-CODE = "MR" MOVE 01 TO TITLE

           ELSE IF WTITLE-CODE = "MAL" MOVE 02 TO TITLE
                ELSE IF WTITLE-CODE = "DR" MOVE 03 TO TITLE

                     ELSE IF WTITLE-CODE = "MRS" MOVE 04 TO TITLE
                          ELSE
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                ACCEPT WDATE FROM DATE.
                MOVE CORR WDATE TO WDATE-TEMP.
                MOVE WDATE-TEMP TO ERUN-DATE.
                MOVE SPACES TO START-REC.
                WRITE START-REC FROM WFOOTINGS AFTER 1.
                DISPLAY "GOOD BYE FOR NOW " ANAMES.
                CLOSE INFILE PERFILE STARTERR.
                STOP RUN.

        DECIDE-PARA.
            MOVE SPACES TO INREC.
             DISPLAY "WISH TO REENTER ITEM(YES/NO)?".
             READ INFILE AT END DISPLAY "PLS ENTER YES OR NO"
                                GO TO DECIDE-PARA.
             MOVE INREC TO HANSWER.
             IF NOT WYES=NO DISPLAY "PLS ENTER YES OR NO"
                            GO TO DECIDE-PARA
             ELSE NEXT SENTENCE.
        DECIDE-EXIT.
            EXIT.

**      RETURN-PARA.
            MOVE SPACES TO INREC.
             DISPLAY "DID YOU PRESS RETURN KEY BY MISTAKE OR".
             DISPLAY "BECAUSE YOU WISH TO RESTART(YES/NO)?".
             READ INFILE AT END DISPLAY "PLS ENTER YES OR NO"
                                GO TO RETURN-PARA.
             MOVE INREC TO HANSWER.
             IF NOT WYES=NO
                  DISPLAY "PLS ENTER YES OR NO"
                  GO TO RETURN-PARA.
             IF WYES AND WJUST-BEGIN = 1 GO TO MOVE-ALL-ING
             ELSE IF WYES DISPLAY "RESTART ENTRY FOR THIS STAFF"
                  MOVE 1 TO WRESTART-FLAG
                  GO TO ENTRY-DECIDE
             ELSE GO TO STOP-PARA.

        V-C-TEST.
            MOVE SPACES TO INREC.
             DISPLAY "DO YOU STAFF THE VOICE-CHANGE-COIL(YES/NO)?".
             READ INFILE AT END DISPLAY "PLS ENTER YES OR NO"
                                GO TO V-C-TEST.
             MOVE INREC TO HANSWER.
             IF NOT WYES=NO DISPLAY "PLS ENTER YES OR NO"
                            GO TO V-C-TEST
             ELSE NEXT SENTENCE.
        V-C-EXIT.
            EXIT.
        ALL-OLD-MOVE.
            MOVE WPER-TEMP(WSUB) TO PER-TEMP(WSUB).
             MOVE WPOS-NEG(WSUB) TO POS-NEG(WSUB).
             MOVE WCOMP-CODE(WSUB) TO COMP-CODE(WSUB).
             MOVE WAMOUNT(WSUB) TO AMOUNT(WSUB).
             MOVE WDURATION(WSUB) TO DURATION(WSUB).
        MOVE-MOVE.
             MOVE WPER-TEMP(WSUB) TO PER-TEMP(WSUB).
             MOVE WPOS-NEG(WSUB) TO POS-NEG(WSUB).
             MOVE WCOMP-CODE(WSUB) TO COMP-CODE(WSUB).
             MOVE WPERSONPA(WSUB) TO PERSONPA(WSUB).
             MOVE WCENTEST(WSUB) TO CENTEST(WSUB).
             MOVE WDURATION(WSUB) TO DURATION(WSUB).
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      ************************************************************
      *                                                          *
      *          COMPUTERISED PERSONNEL INFORMATION SYSTEM FOR A.B.U *
      *            (MASTER FILE CREATION PROGRAM : PERS1B)       *
      *                                                          *
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       IDENTIFICATION DIVISION.

       PROGRAM-ID.     PERS2B.
       AUTHOR.         H.A.BABAGBALE.

       DATE-WRITTEN.   MAY,1986.
       REMARKS.  THIS PROGRAM PERFORMS CONSISTENCY CHECKS ON EACH
                 OF THE STAFF RECORDS CAPTURED BY THE PERSONNEL
                 SYSTEM STARTER PROGRAM(PERS1A). ANY RECORD CONTAINING
                 AT LEAST ONE INCONSISTENT FIELD OF INFORMATION IS
                 REJECTED AND WRITTEN TO A FILE CALLED "REJRECS"
                 ALONG WITH ITS CORRESPONDING ERROR MESSAGES.
                 ALL RECORDS THAT PASS THE CONSISTENCY CHECKS ARE
                 WRITTEN INDEXED SEQUENTIALLY TO A FILE CALLED
                 "PERS2MF".

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      *                 BE COPIED OR DISSEMINATED TO THIRD PERSONS      *
      *                 WITHOUT EXPRESS WRITTEN PERMISSION OF THE OWNER.*
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       ENVIRONMENT DIVISION.
       CONFIGURATION SECTION.

       SOURCE-COMPUTER.  CYBER72.
       OBJECT-COMPUTER.  CYBER72.

       INPUT-OUTPUT SECTION.

       FILE-CONTROL.
            SELECT PERF ASSIGN PERFILE-FZ.
            SELECT PERS2MF ASSIGN PERS2MF
                       ORGANIZATION INDEXED
                       ACCESS MODE RANDOM
                       RECORD KEY IS P-NO.
            SELECT REJTREC ASSIGN REJRECS-FZ.

       DATA DIVISION.
       FILE SECTION.

       FD   PERF

                  LABEL RECORDS OMITTED
                  RECORD CONTAINS 320 CHARACTERS
                  DATA RECORD IS PERSREC.

       01   PERSREC.
            05 PERS-NUM.

               10 STAFF-NO      PIC 9(5).
               10 PJP           PIC X.

            05 DEPT-PROJ-NO     PIC 9(2).
            05 INITIALS         PIC X(3).


            05 SURNAME          PIC X(15).

            05 TITLE            PIC 9(2).
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                                                    PIC 9.
           03 START-DT                               PIC 9(6).
           03 APP-TYPE                               PIC 9.

           03 SLEVg-                                 P.C 9(2).
           03 SETEP-                                 PIC 9.

           03 BMCR-ADDRT                             PIC X(3).

           03 BANK-CD                                PIC 9(2).
           03 SAV-ACCT                               P.C X(11).
           03 CAR-FLAG                               PIC X.

           03 FALLPAY                                PIC 9(2)V99.
           03 TAX-TD                                 PIC 9(5)V99.

           03 TGROSS-TD                              P.C 9(5)V99.
           03 PAYOUT-TD                              PIC 9(5)V99.

           03 ALL-DED-DT                             P.C 9(6).
           03 ALLOW-DED  OCCURS  22  TIMES.

               05 PER-TEMP                           P.C X.

               05 POS-NEG                            PIC X.
               05 COMP-CD                            PIC 9(2).
               05 AMT                                PIC 9(5)V99.

               05 FILLER                             P.C 9(2).
               05 LOANS-DT                           PIC 9.

               05 LOANS  OCCURS  4  TIMES.
               05 LPER-TEMP                          PIC X.

               05 LPOS-NEG                           P.C X.
               05 LCOMP-CD                           PIC 9(2).

               05 PRINCIPA                           P.C 9(5)V99.

               05 INTREST                            PIC 9(5)V99.
               05 LOAN                               P.C 9(5).
       FD  PERSINF
               LABEL RECORDS ARE STANDARD
               RECORD CONTAINS 54 TO 178 CHARACTERS
               BLOCK CONTAINS 1 RECORDS
               DATA RECORD IS PRREC.
       01  PRREC.
           05 P-PNO.

           05 P-STAFNO                               PIC 9(5).

           05 P-PDP                                  PIC X.
           03 P-SOC-PRG                              P.C 9(2).
           05 P-INITIA                               PIC X(2).
           03 P-SURNAM-                              P.C X(11).
           03 P-TITLE                                PIC 9(2).

           03 P-SEX                                  PIC X.
           03 P-STATUS                               P.C 9.

           03 P-SUBTL                                P.C 9(6).
           05 P-A-P-TYPE                             PIC 9.

           03 P-SERVLL                               P.C 9(2).

           05 P-SHIFT                                PIC 9
           03 P-BP-PRC                               P.C 9(3).
           05 P-GARNT                                P.C X.

           03 P-NOS                                  P.C X.
           03 P-BANK                                 PIC 9(2).

           03 P-SAV-ACCT                             P.C X(11).
           03 P-CARFLAG                              PIC X.
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           05  P-GROSS-PAY          PIC 9(5)V99.
           05  P-TAX-TD             PIC 9(5)V99.
           05  P-TAX-TU             PIC 9(5)V99.
           05  P-POST-TX            PIC 9(4)V99.
           05  P-ALL-DED-CT         PIC 99.
           05  P-ALL-DED  OCCURS 1 TO 22 TIMES DEPENDING ON
                                    P-ALL-DED-CT.
               10  P-DED-DESC       PIC 99.
               10  P-AMOUNT         PIC 9(3)V99.
       FD  REJTREC
           LABEL RECORDS OMITTED
           DATA RECORD IS REJREC.
       01  REJREC                   PIC X(132).
       WORKING-STORAGE SECTION.
       77  MODULY                    PIC 9.
       77  WADSUB                   PIC 99.
       77  WLSUB                    PIC 9.
       77  WMSUB                    PIC 99.
       77  WLLSUB                   PIC 9.
       77  WRITE-P-FLG              PIC 9.

       77  WRITE-T-FLG              PIC 9.

       77  WREJ-FLG                 PIC 9.
       77  WRITE-PAY                PIC 9.
       77  WPAY-FLG                 PIC 9.
       01  WHEAD1.
           05  FILLER               PIC X(31) VALUE SPACES.
           05  TITLE1               PIC X(21) VALUE
                                    "CONSISTENCY CHECK ERROR REPORT".
       01  WSUB1.
           05  FILLER               PIC X(51) VALUE SPACES.

           05  FILLER               PIC X(30) VALUE ALL "-".
       01  WHEAD2.
           05  FILLER               PIC X(3) VALUE SPACES.
           05  TITLE2               PIC X(15) VALUE "REC DESCRIPTION".
           05  FILLER               PIC X(67) VALUE SPACES.

           05  TITLE3               PIC X(17) VALUE "ERROR DESCRIPTION".
       01  WSUB2.
           05  FILLER               PIC X(3) VALUE SPACES.
           05  FILLER               PIC X(15) VALUE ALL "-".

           05  FILLER               PIC X(67) VALUE SPACES.

           05  FILLER               PIC X(17) VALUE ALL "-".
       01  WERROR.
           05  FILLER               PIC X(7).
           05  WEMPNO.
               10  WPROP            PIC X.
               10  WSTAFF-NO        PIC 9(5).
           05  FILLER               PIC X(2).
           05  WSOH-PKG-CD          PIC X(2).
           05  FILLER               PIC X(2).

           05  W-INITIAL            PIC X(5).

           05  WSURNAME             PIC X(15).
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01  HFLOUT.
    03 FILLER          PIC X(5) VALUE SPACES.
    03 FILLER          PIC X(14) VALUE "TOTAL RECS READ".
    03 FILLER          PIC X(5) VALUE SPACES.

    03 FILLER          PIC X VALUE "=".
    03 WR-READ-CT      PIC 9(4).
01  HFLOUT2.
    03 FILLER          PIC X(5) VALUE SPACES.
    03 FILLER          PIC X(16) VALUE "TOTAL RECS WRITTEN".
    03 FILLER          PIC X(3) VALUE SPACES.
    03 FILLER          PIC X VALUE "=".
    03 WRITE-CT        PIC 9(4).
01  HFOUT3.
    03 FILLER          PIC X(5) VALUE SPACES.

    03 FILLER          PIC X(20) VALUE "TOTAL RECS REJECTED".
    03 FILLER          PIC X(3) VALUE SPACES.
    03 FILLER          PIC X VALUE "=".
    03 REJ-CT          PIC 9(4).
01  HTEMP-OUT.
    03 HYY             PIC 99.
    03 HMM             PIC 99.
    03 HDD             PIC 99.
01  HDATE.
    03 HDD             PIC 99.

    03 FILLER          PIC X VALUE "/".
    03 HMM             PIC 99.
    03 FILLER          PIC X VALUE "/".
    03 HYY             PIC 99.
01  HFOUT4.
    03 FILLER          PIC X(5) VALUE SPACES.
    03 FILLER          PIC X(11) VALUE "RUN DATE :".
    03 HRUN-DT         PIC X(8).
01  HFOUT5.
    03 FILLER          PIC X(5) VALUE SPACES.

    03 FILLER          PIC X(9) VALUE "PROGRAM :".

    03 FILLER          PIC X(3) VALUE SPACES.
    03 RUN-NAME        PIC X(7) VALUE "PERS25".
PROCEDURE DIVISION.
START-OFF.
    OPEN INPUT PERF OUTPUT PERS25F,REJTREC.
    DISPLAY "FILES OPENED SUCCESSFULLY".
* WRITING THE TITLE OF REJECTED RECORDS' FILE.
    MOVE SPACES TO REJREC.
    WRITE REJREC FROM HREAD1.

    MOVE SPACES TO REJREC.

    WRITE REJREC FROM HSUB1.
    MOVE SPACES TO REJREC.
    WRITE REJREC FROM HREAD2.
    MOVE SPACES TO REJREC.
    WRITE REJREC FROM HSUB2.
    READ PERF AT END
         DISPLAY "STARTER FILE EMPTY"
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                CLOSE PERM PERSONF REJTREC
                STOP RUN.
        ADD 1 TO WRONG-CT.
        DISPLAY "FIRST READING  SUCCESSFUL".
CHECKS-PARA.
        MOVE ZEROS TO WREJ-FLG WRITE-P-FLG WRITE-T-FLG
                      WTP-Y-FLG WRITE-TPAY.
        PERFORM ALL-DED-CHEK VARYING WADSUB FROM 1 BY 1
                                UNTIL WADSUB > ALL-DED-CT.
        PERFORM LOAN-CHEK VARYING WLSUB FROM 1 BY 1 UNTIL
                                WLSUB > LOANS-CT.

        MOVE SPACES TO PWREC .
        IF WREJ-FLG = 1
           PERFORM CREATE-PARA
        ELSE MOVE ZEROS TO P-ALL-DED-CT T-ALL-DED-CT
             ADD 1 TO WREJ-CT.
        READ PERF AT END
                        PERFORM FOOTINGS
                        CLOSE PERF PERSONF TEAPP REJTREC
                        STOP RUN.

        GO TO CHECKS-PARA.

ALL-DED-CHEK.
     IF COMP-CD(WADSUB) = 05 AND PJP NOT = "P"
        MOVE "JUNIOR STAFF CAN'T HAVE ENT. ALLOWANCE" TO
                                                WMESSAGE
        PERFORM WRITE-ERROR
        MOVE SPACES TO WERROR.
     IF COMP-CD(WADSUB) = 06 AND PJP NOT = "J"
        MOVE "SENIOR STAFF CAN'T HAVE SHIFT ALLOWANCE" TO
                                                WMESSAGE

        PERFORM WRITE-ERROR

        MOVE SPACES TO WERROR.
     IF COMP-CD(WADSUB) = 06 AND (APP-TYPE = 4 OR 5)
        MOVE "SHIFT ALLOW. NOT FOR STAFF ON STUDY LEAVE" TO
                                                WMESSAGE
        PERFORM WRITE-ERROR
        MOVE SPACES TO WERROR.
     IF COMP-CD(WADSUB) = 06 AND (AMT(WADSUB) NOT =
                                        12.50 OR 17.50)
        MOVE "AMOUNT OF SHIFT ALLOW. NOT 12.50 OR 17.50" TO

                                                WMESSAGE

        PERFORM WRITE-ERROR
        MOVE SPACES TO WERROR.
     IF COMP-CD(WADSUB) = 06 AND (APP-TYPE = 4 OR 5)
        MOVE "TRANSPORT ALLOW. NOT FOR STAFF ON STUDY LEAVE" TO
                                                WMESSAGE
        PERFORM WRITE-ERROR
        MOVE SPACES TO WERROR.
     IF COMP-CD(WADSUB) = 06 AND (APP-TYPE = 4 OR 5)
        MOVE "HOUSE ALLOW. NOT FOR STAFF ON STUDY LEAVE" TO

                                                WMESSAGE

        PERFORM WRITE-ERROR
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                                                          =05.00
           MOVE "RENT DED. OF JUNIOR STAFF NOT 05.00" TO WMESSAGE
           PERFORM WRITE-ERROR
           MOVE SPACES TO WERROR.

       IF COMP-CD(WADSUB) = 12 AND PJP = "P" AND
           (SLEVEL < 7 OR (SLEVEL = 7 AND SSTEP < 5)) AND
           AMT(WADSUB) NOT = 16.33
           MOVE "RENT FOR SNR STAFF BELOW LEVEL 7/6 NOT 16.33" TO
                                                      WMESSAGE
           PERFORM WRITE-ERROR
           MOVE SPACES TO WERROR.
       IF COMP-CD(WADSUB) = 12 AND PJP = "P" AND
           ((SLEVEL = 7 AND (SSTEP = 6 OR > 6)) OR (SLEVEL > 7))
           AND AMT(WADSUB) NOT = 50.00

           MOVE "RENT FOR STAFF ON LEVEL 7/6 OR ABOVE NOT 50.00"
                                                 TO WMESSAGE
           PERFORM WRITE-ERROR
           MOVE SPACES TO WERROR.
           IF COMP-CD(WADSUB) = 15 AND PJP NOT = "P"
               MOVE "ONLY SNR STAFF CAN BE IN ASUU" TO WMESSAGE
               PERFORM WRITE-ERROR
               MOVE SPACES TO WERROR.
            IF COMP-CD(WADSUB) = 15 AND AMT(WADSUB) NOT = 05.00
               MOVE "ASUU DUE MUST BE 5 NAIRA" TO WMESSAGE

               PERFORM WRITE-ERROR
               MOVE SPACES TO WERROR.
           IF COMP-CD(WADSUB) = 16 AND PJP NOT = "J"
               MOVE "ONLY J & J STAFF ARE IN NASU" TO WMESSAGE
               PERFORM WRITE-ERROR
               MOVE SPACES TO WERROR.
           IF COMP-CD(WADSUB) = 16 AND AMT(WADSUB) NOT = 01.00
               MOVE "NASU DUE MUST BE 2 NAIRA" TO WMESSAGE
               PERFORM WRITE-ERROR
               MOVE SPACES TO WERROR.

           IF COMP-CD(WADSUB) = 17 AND PJP NOT = "P"

               MOVE "ONLY SNR STAFF CAN BE IN SSAU" TO WMESSAGE
               PERFORM WRITE-ERROR
               MOVE SPACES TO WERROR.
           IF COMP-CD(WADSUB) = 17 AND AMT(WADSUB) NOT = 02.00
               MOVE "SSAU DUE MUST BE 2 NAIRA" TO WMESSAGE
               PERFORM WRITE-ERROR
               MOVE SPACES TO WERROR.
           IF PER-TEMP(WADSUB) = "T" ADD 1 TO T-ALL-DED-CT
           ELSE ADD 1 TO P-ALL-DED-CT.

       LOAN-CHEK.

           MOVE ZEROS TO WOUNNY.
       WRITE-ERROR.
           MOVE PJP TO WPJP.
           MOVE STAFF-NO TO WSTFF-NO.
           MOVE SCH-PRG-CD TO WSCH-PRG-CD.
           MOVE INITIALS TO WINITIAL.
           MOVE SURNAME TO WSURNAME.
```

```
           MOVE SPACES TO REJREC.
           IF WREJ-FLG = 2
               MOVE SPACES TO WP-NO WSOH-PRG-CD W-INITIAL
                             WSURNAME
               WRITE REJREC FROM WERROR AFTER 2
           ELSE WRITE REJREC FROM WERROR AFTER 1.
               MOVE 1 TO WREJ-FLG.
       CREATE-PARA.
           MOVE PERS-NUM TO P-PNO.
           MOVE SOH-PRG-CD TO P-SOH-PRG.

           MOVE INITIALS TO P-INIT-A.

           MOVE SURNAME TO P-SURNAME.
           MOVE TITLE TO P-TITLE.
           MOVE SEX TO P-SEX.
           MOVE M-STATUS TO P-MSTATUS.
           MOVE START-DT TO P-SDATE.
           MOVE APP-TYPE TO P-APP-TYPE.
           MOVE SLEVEL TO P-SLEVEL.
           MOVE SSTEP TO P-SSTEP.
           MOVE DP-PASCNT TO P-DP-PAS.

           MOVE "N" TO P-LGRANT.

           MOVE ENOK-CD TO P-ENOK.
           MOVE BANK-CD TO P-BANK.
           MOVE SAV-ACCT TO P-SAV-ACCT.
           MOVE CAR-FLAG TO P-CARFLAG.
           MOVE FREEPAY TO P-FREEPAY.
           MOVE TAX-TD TO P-TAX-TD.
           MOVE TGROSS-TD TO P-TGR-TD.
           MOVE PAYOUT-TD TO P-POUT-TD.
       PERFORM ALD-MOVE VARYING WMSUB FROM 1 BY 1 UNTIL
                                  WMSUB > ALL-DED-CT.
           MOVE SPACES TO WERROR.
           MOVE 1 TO WRITE-P-FLG.
           WRITE PMREC INVALID KEY
               MOVE "STAFF NO. GIVES INVALID KEY FOR PERSINF" TO
                                                    WMESSAGE
               MOVE ZERO TO WRITE-P-FLG
           MOVE PJP TO WPJP
               MOVE STAFF-NO TO WSTFF-NO
               MOVE SOH-PRG-CD TO WSOH-PRG-CD

               MOVE INITIALS TO WINITIAL

               MOVE SURNAME TO WSURNAME
               MOVE SPACES TO REJREC
               WRITE REJREC FROM WERROR AFTER 1
               MOVE 1 TO WREJ-FLG.
       IF (INTPAY-FLG = 1 OR LOANS-CT > 0) AND WREJ-FLG NOT = 1
           MOVE PERS-NUM TO T-PNO
           PERFORM LON-MOVE VARYING WLNSUB FROM 1 BY 1 UNTIL
                                      WLNSUB > LOANS-CT
           MOVE 1 TO WRITE-TPAY.

       IF WRITE-TPAY = 1
           MOVE SPACES TO WERROR.
```

```
                MOVE "STAFF NO. DOES NOT EXIST - INVALID KEY FOR TEMPF" TO
                                                              MESSAGE
                MOVE ZERO TO WRITE-T-FLG
                MOVE PSP TO APSP

                MOVE STAFF-NO TO NSTFF-NO

                MOVE SCH-PRG-CD TO NSCH-PRG-CD
                MOVE INITIALS TO N-INITIAL
                MOVE SURNAME TO NSURNAME

                WRITE REJREC FROM HEADER AFTER 2.
        IF WRITE-P-FLG = 1 AND WRITE-T-FLG = 1
            ADD 1 TO WR-TE-CT.
        IF WRITE-TRAY = 0 AND WRITE-P-FLG = 1
            ADD 1 TO WRITE-CT.
        IF WRITE-TRAY = 1 AND (WRITE-P-FLG = 1 AND WRITE-T-FLG
                                                        = 1)

                ADD 1 TO WREJ-CT
                MOVE SPACES TO PNREC
                MOVE SPACES TO .
        IF WR-TE-P-FLG =
                ADD 1 TO WREJ-CT
                MOVE SPACES TO PNREC
                MOVE SPACES TO .
    FOOTINGS.
        MOVE SPACES TO REJREC.

        WRITE REJREC FROM WFOOT2 AFTER 4.

        MOVE SPACES TO REJREC.
        WRITE REJREC FROM WFOOT2 AFTER 4.
        MOVE SPACES TO REJREC.
        WRITE REJREC FROM WFOOT3 AFTER 1.
        ACCEPT WTEMP-DT FROM DATE.
        MOVE CORR WTEMP-DT TO WDATE.
        MOVE WDATE TO WRUN-DT.
        MOVE SPACES TO REJREC.
        WRITE REJREC FROM WFOOT4 AFTER 1.

        MOVE SPACES TO REJREC.

        WRITE REJREC FROM WFOOT5 AFTER 1.
    ALD-MOVE.
        IF PER-TEMP(NMSUB) = "P"
            MOVE COMP-CD(NMSUB) TO P-COMP-CD(NMSUB)
            MOVE AMT(NMSUB) TO P-AMOUNT(NMSUB)
        ELSE MOVE POS-NEG(NMSUB) TO TDR-DR(NMSUB)
            MOVE COMP-CD(NMSUB) TO T-COMP-CD(NMSUB)
            MOVE AMT(NMSUB) TO T-AMOUNT(NMSUB)
            MOVE DDR(NMSUB) TO T-DDR(NMSUB)

            MOVE 1 TO WTRAY-FLG.
    LON-MOVE.
        MOVE LPOS-NEG(NLNSUB) TO TL-DR-DR(NLNSUB).
        MOVE LCOMP-CD(NLNSUB) TO TL-CCODE(NLNSUB).
        MOVE PRINCIPA(NLNSUB) TO TPRINC(NLNSUB).
        MOVE INTREST(NLNSUB) TO TINTR(NLNSUB).
        MOVE LDDR(NLNSUB) TO TDDR(NLNSUB).
```

```
)ASSWORD:STAFF

(TERMINAL=_2_TTY
(RECOVER)SYSTEM:BATCH,000 00

)REL;REL2A
)GET;PER2A

)PER2A
            A.B.U PERSONNEL INFORMATION SYSTEM
            PERSONNEL MASTERFILE MAINTENANCE MENU :-
            ****************************************

             * A FOR STARTERS ENTRY                 *
             * V FOR VARIATIONS ENTRY               *
             * D FOR DELETIONS ENTRY                *

             *E.F.O.R.E.V.E.R*********************

            GET READY PLEASE !!!
            WHICH MENU
            ? A

                        WELCOME TO
                          STARTER ENTRY SUBSYSTEM;

                        ALWAYS REMEMBER TO
                          1. WAIT FOR ? BEFORE ENTERING ANYTHING
                          2. PRESS CARRIAGE RETURN KEY(CR) AT END OFEAC LINE.

                        ARE THE INSTRUCTIONS CLEAR (Y/N)?
            ?Y

      PERSONAL NUMBER PLS
      ? P122:6
      FACULTY CODE PLS
   ? :4
      DEPARTMENT CODE PLS
   ? 026
      INITIALS PLS

   ? AM
      SURNAME PLS
   ? FAUNUS
      TITLE CODE PLS
   ? 05
      SEX CODE PLS
   ? 1
      MARITAL STATUS CODE PLS
   ? 6
      APPOINTMENT TYPE PLS
   ? 1

   ? 5
      SALARY LEVEL PLS
   ? 10
      SALARY STEP PLS
   ? 1
      BANK CODE PLS
   ? 07
```