

COMPUTER APPROACH TO MAINTENANCE OF  
MASS TRANSIT VEHICLES IN NIGER STATE  
(A CASE STUDY OF NIGER STATE TRANSPORT AUTHORITY)

BY

ABUBAKAR SULE BABATETENGI  
PGD/MCS/98/99/794

DEPARTMENT OF MATHEMATICS AND COMPUTER  
SCIENCE  
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.

SEPTEMBER 2001

COMPUTER APPROACH TO MAINTENANCE OF MASS  
TRANSIT VEHICLES IN NIGER STATE  
(A CASE STUDY OF NIGER STATE TRANSPORT AUTHORITY)

BY

ABUBAKAR SULE BABATETENGI  
PGD/MCS/98/99/794

A PROJECT SUBMITTED TO  
THE DEPARTMENT OF MATHEMATICS AND  
COMPUTER SCIENCE  
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR  
THE AWARD OF A POSTGRADUATE DIPLOMA IN  
COMPUTER SCIENCE

SEPTEMBER 2001

## CERTIFICATION

I certify that the work recorded in this report was carried out by  
ABUBAKAR SULE BABATETENGI in the Department of  
Mathematics/ Computer Science, Federal University of Technology,  
Minna.

.....  
PRINCE R. O. BADMUS  
SUPERVISOR

.....  
DATE

## APPROVAL

This project has been read and approved by the undersigned as meeting the requirement of the Department of Mathematics/Computer Science, Federal University of Technology, Minna.

.....  
PRINCE R. O. BADMUS  
SUPERVISOR

.....  
DATE

.....  
DR. S. A. REJU  
HEAD OF DEPARTMENT

.....  
DATE

.....  
EXTERNAL EXAMINER

.....  
DATE

## DEDICATION

This project work is dedicated to the Almighty ALLAH for His mercy.

## ACKNOWLEDGEMENT

First and foremost, I must express my sincere gratitude to the Almighty ALLAH for giving me the opportunity to carryout this project through his support and guidance.

Profound gratitude is due to my worthy project supervisor PRINCE R. O. BADMUS whose encouragement, advice and continuous assistance throughout the period of my research also contributed to the success of this project.

I am also grateful to the Head of Mathematics/Computer Science Department, Dr. Sunday A. Reju for his kindness. My appreciation also goes to the rest staff of the department, for their kindness and assistance throughout the duration of my programme.

The greatest thanks also goes to my parent ALHAJI SULE K. MOHAMMED and HAJIYA AISHETU SULE. My special thanks also goes to my brother MALLAM USMAN SULE YANGBO for his encouragement and financial assistance during the initial stages of my career and my friend Zubayr Emimaru of Computer Centre, Federal University of Technology, Minna.

Finally, my gratitude also goes to my Mallam, USTAZ ABDULKADIR IDRIS ZANCHITA for his financial assistance whenever the need arose during the research of this project.

## ABSTRACT

The maintenance of vehicles is very important for safety, effective performance and efficiency. It cannot be over-emphasised, the need to keep vehicles in good conditions, especially those that are meant to transport goods and human-beings, because their safety depends on the safety of the vehicles.

This project looked into different ways of the authority vehicles inefficiency and faults. It goes about teaching how the highlighted problems will be remedied. It discussed how the authority vehicles will be maintained in computer approach manner.

This project highlighted on the different types of maintenance that is being carried out and when to adopt particular type of maintenance.

## TABLE OF CONTENT

	<u>PAGE</u>
Title Page .....	i
Certification .....	ii
Approval .....	iii
Dedication .....	iv
Acknowledgement .....	v
Abstract .....	vi
Table of Contents .....	vii
 <b>CHAPTER ONE</b>	
1.1 Introduction .....	1
1.2 Background of the problem.....	1
1.3 Statement of the problem .....	1
1.4 Aims/objectives of the study.....	2
1.5 Scope and limitations of the study.....	2
1.6 Methods of data collection .....	2
1.7 Research Methodology .....	3
1.8 Definition of terms .....	3
 <b>CHAPTER TWO</b>	
2.1 Automobiles in perspective .....	5
2.2 Selection of vehicles for commercial purposes .....	6
2.3 History of Niger State Transport Authority (N.S.T.A.) .....	7
2.4 Organizational setup in N.S.T.A. ....	9
2.5 Attributes of a System Analyst .....	11
2.6 System investigation and analysis .....	12
2.7 Problems of current system .....	13
2.8 The new system .....	13



### CHAPTER THREE

3.1	Maintenance .....	15
3.2	Maintenance system in N.S.T.A.....	15
3.3	Contents of system specification.....	16
3.4	Evaluating proposed project.....	17
3.5	Cost-Benefit Analysis.....	18
3.6	Factors considered in the system design.....	19
3.7	Design of new system .....	19

### CHAPTER FOUR

	<b>Program Development and Implementation</b>	
4.1	Introduction .....	21
4.2	Choice of programming language.....	21
4.3	Features of language chosen.....	22
4.4	Change over procedure .....	23
4.5	Starting the system .....	31
4.6	Main menu .....	31
4.7	Quitting/Exiting the program.....	34
4.8	Training .....	34
4.9	Program Maintenance .....	34

### CHAPTER FIVE

5.1	Conclusion .....	35
5.2	Summary .....	35
5.3	Recommendation .....	36
	References .....	37
	Appendices .....	38

# CHAPTER ONE

## **1.1 Introduction**

Computer approach to vehicle maintenance used for Mass Transit in Niger State is very important for safety, effective performance and efficiency. It can not be over-emphasized, the need to keep vehicles in good condition, especially those that are meant to transport goods and human beings, because their safety depends on the safety of the vehicles.

## **1.2 Background of the problem**

If automobiles are not properly maintained to specification by their manufacturers, there is the possibility of frequent breakdown and disappointment which could finally lead to a great loss in the investment made on the vehicles.

## **1.3 Statement of the problem**

It is well know fact that anything that is properly maintained lasts long. From the manufacturers sides, it will be a matter of pride and competition if some brands of vehicles last longer than others. To this end manufacturers usually developed the habit of regular maintenance or to ensure that this is carried out by the users of their brand.

#### **1.4 Aims/objectives of the study**

The aims/objectives of carrying out this research are :-

- 1) To look into different ways of the authority vehicles inefficiency and faults.
- 2) How to go about the remedy.
- 3) How these vehicles will be maintained in computer approach manner.

#### **1.5 Scope and limitations of the study**

The scope of this project will cover only the application of computer as it concerns the maintenance of vehicles used for mass transit in Niger State.

Many factors constitute limitations to this study such as :-

*Secrecy* :- Many members of the staff of the organization were not willing to discuss issues relating to how they carryout the maintenance of their vehicles with the researcher.

*Time*:- The researcher being a civil servant, had problem of traveling to organization headquarters at Minna for discussion with the management.

#### **1.5 Methods of data collection**

The methods of data collection for this research project includes :-

- 1) Official reports, pamphlets and publications. An attempt was also made to examine some of the official document like files and records of the Niger State Transport Authority.

- 2) Available literature dealing with similar research topics under taken earlier.
- 3) Personal interview with some of the personnel who have knowledge on the subject or similar topics.
- 4) Personal observation : Some data included in this research project are available from the researcher's personal observations being a long time customer of the Authority.

### **1.7 Research Methodology**

This method of analysis is based to a large extent on the actual area of point to show how effective the computer approach to vehicle maintenance used for mass transit in Niger State is likely to be.

The efforts made to train more Authority staffs on the use and maintenance of computers will also be brought to light for the purpose of reducing if not totally eliminated the frequent problems usually developed by the Authority vehicles.

### **1.8 Definitions of terms**

The following terms are defined in the operational sense in which they are used in this project work.

- 1) Computer :- Is an electronic device which accepts and processes data by following a set of instructions (program) to produce accurate and efficient result (information).

- 2) Maintenance :- Is the correction of minor faults before they result into complete failure. It can only be attained by regular inspection.
- 3) Data :- This is a collection of raw facts, figures, charts or symbols that represent an idea, condition, objects or situation that need to be processed to provide meaningful information.
- 4) Database :- This is a file of information organized so that particular records regarding maintenance of vehicles can be quickly and easily retrieved.
- 5) Vehicle :- Is a device used to convey people or goods from one place to another. Vehicles can be categorized into the following :-
  - a) Motor cars
  - b) Motor cycles
- 6) Mass transit :- It is a vehicle mainly assigned to serve the general purpose of the common man.
- 7) Information :- Is a final result or output of the processed data.
- 8) Approach :- Is a procedure of carrying out an action.

# CHAPTER TWO

## 2.1 Automobiles in perspective

Transportation system has started in ages when people travel by trekking distances and use bag to carry their load along. At a very early age, men must have realized that the means of transport which nature had provided him was very limiting. He was limited in the loads he could carry, the distance he could cover with them and the speed at which he could travel even without a load.

The taming and training of suitable animals enable heavier loads to be carried to greater distances often at greater speed than man was capable of attaining and there was the added advantages that most of the efforts was provided by the animal, while the man could travel at his ease in comfort.

Heavy loads were dragged upon sledge until an early and unknown Engineer invented the wheel. This made it possible to construct crude carts upon which even heavier load could be carried more easily. The developing of wheel vehicles is closely related to the development of roads.

As new materials and manufacturing methods were developed, it become possible to make improvements in vehicles, but so long as

animals were the only forms of motive power it was not possible to increase loads and speeds very much.

In England, the first vehicle driven by a petrol engine was produced by Edward Butler in 1884.

Also in 1892, another Engineer took out a research on an engine which relied on the heat generated during compression to ignite a fuel. This type of engine is often called a Diesel engine, the name is derived from the German Engineer, Dr. Rudolf Diesel.

## **2.2 Selection of vehicles for commercial purposes**

If a bad set of vehicles are selected or dealership cannot live up to expectation in terms of profit and services, because the vehicles will always give problem and within a short period they will become obsolete or scraps. Therefore before choosing any brand of vehicles it must be well studied to ascertain the following :-

- 1) Suitability
- 2) Durability
- 3) Maintainability
- 4) Availability of spare parts
- 5) Qualified technician for adequate maintenance.

In commencing a study of the motor vehicle for commercial purposes, it is necessary to understand the factors which control its design. The object of the manufacturers are to build a vehicle which will

transport passengers, run at a good speed and in comfort at a minimum cost.

Commercial vehicles are therefore usually powered, not in order to achieve high speeds, but ensure long periods between engines overhauls and to secure optimum performances.

### **2.3 History of Niger State Transport Authority (N.S.T.A.)**

The Niger State Transport Authority was established on 11<sup>th</sup> August, 1988 by the then state government under the leadership of Lt. Colonel Lawan Gwadabe.

The objective of establishing the Authority is to help reduce the problem faced by civil servants, students and traders in terms of traveling. This is by providing cheap and affordable transport to the people of Niger State and Nigerians at large.

The Authority started with transportation along some of the local government headquarters routes, with each route starting from Minna, the state capital. The local government areas are :- (1) Bida (2) Suleja (3) Kontagora (4) Mokwa and (5) Town serve within Minna. Presently, the Authority has extended its services to almost all the local government headquarters within the state.

For inter state, it started by running the following cities daily :- (1) Lagos (2) Jos (3) Makurdi (4) Onitsha (5) Kaduna and (6)



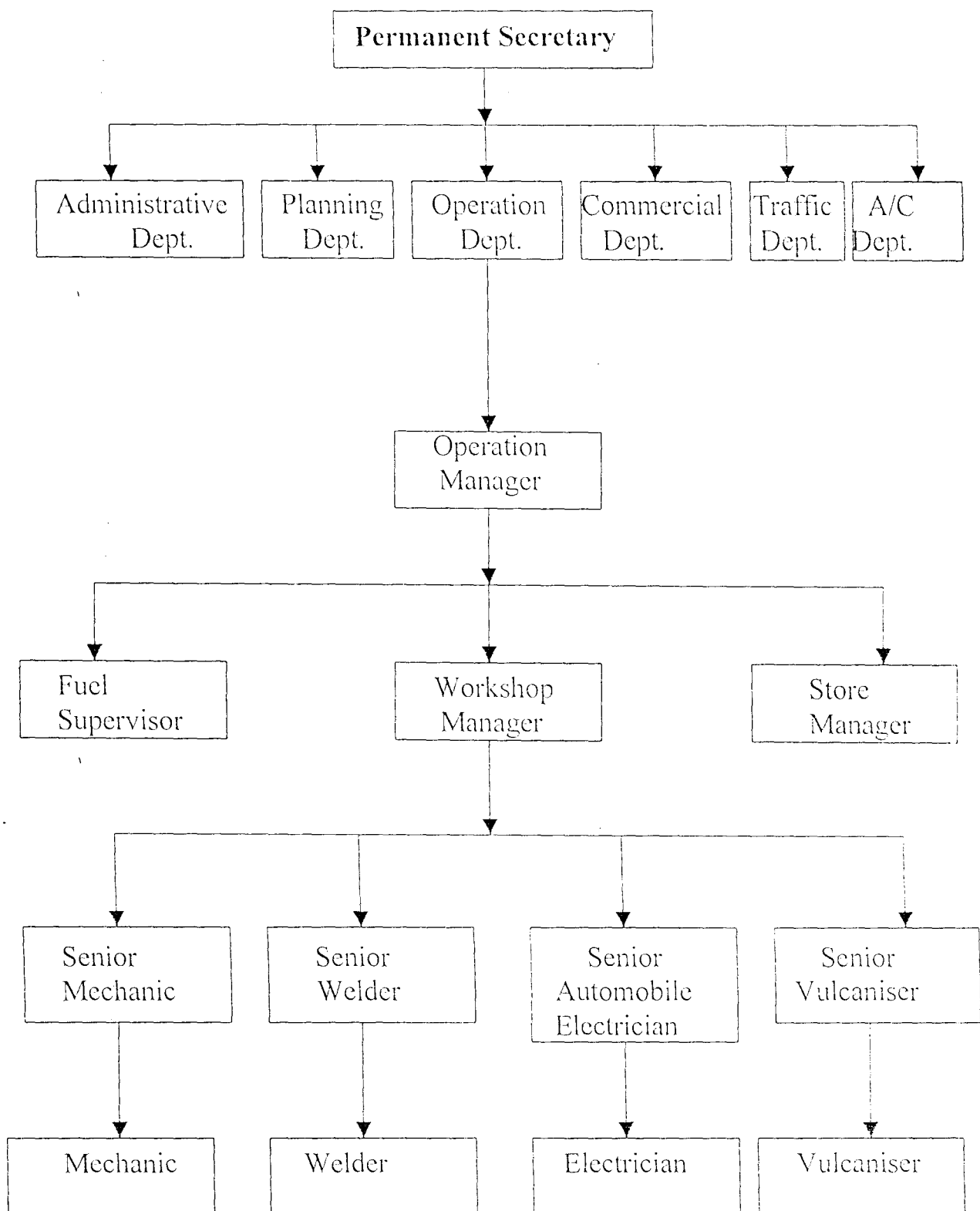
Ilorin. Now, they have extended their services to the following cities :-

(1) Abuja (2) Kano and (3) Sokoto.

The Authority started with forty nine (49) vehicles. The breakdown of the vehicles are as follows:-

- (1) 4 Pick-up
- (2) 7 911 Buses i.e. 45 seaters
- (3) 8 Luxurious i.e. 41 seaters
- (4) 15 Toyota Haice i.e 18 seaters
- (5) 15 Parkers i.e. 34 seaters.

## 2.4 Organizational Setup in Niger State Transport Authority



The Permanent Secretary is the overall head of this organization. His function is overseeing the activities of Head of departments within the Authority and ensures that the set objectives are attainable. The Authority is divided into the following departments :- (1) Administrative (2) Operations (3) Planning (4) Commercial (5) Traffic and (6) Account.

In this case, we are concerned with the operation department. The operation department is headed by the Operation Manager. Its main function is to draw up job schedule and maintain records of work carried out. In this department, there are three distinct divisions as follows :-

- (i) Fuel division : - This is headed by the Fuel Supervisor, who sees to the general supply of fuel to the Authority and also how it is distributed to individual vehicle.
- (ii) Store division :- This is headed by the Store Manager. Its function is in-charge of the spare parts and other items kept in the store.
- (iii) Workshop division :- This is headed by the Workshop Manager. Its function is to oversee the work of the sectional heads under this division. The sections are :-
  - (a) Mechanic section
  - (b) Welding section
  - (c) Electric section

(d) Vulcanize section

Each of the above are headed by the senior officer. These Senior officers sign the jobs submitted to them for repair. Any job submitted to them for repair is given to an immediate junior officer directly below them (i.e. Mechanic, Welder, Electrician and Vulcanizer) who carried out the actual repair and then in turn return the finished job to the senior officer who assigned the job to them.

## 2.5 Attributes of a System Analyst

A system analyst's primary responsibility is to identify information needs of an organization and obtain a logical design of an information system which will meet these needs. Such information system will be a combination of manual and computer based procedures to process a collection of data which are useful to the managers of the organization in taking decisions.

To be effective, a system analyst must have several attributes.

These include :-

- (1) Knowledge of organizations.
- (2) Knowledge of computer system and software
- (3) Good inter-personal relations
- (4) Ability to communicate
- (5) Analytical mind
- (6) Breadth of knowledge

- (7) Have confidence
- (8) Must be creative

## 2.6 System investigation and Analysis

System investigation is the act of gathering all the necessary information concerning an existing system of an organization, knowing the weakness and strengths of such system.

The information gathered will help the analyst in designing a suitable system that will take care of the problems encountered by the old system.

System investigations are made for the following reasons :-

- (1) Modifications are needed in an existing system that no longer meets the needs of the Authority.
- (2) A new system is needed to solve a problem that previously had not been identified.
- (3) Management believes an existing system could be redesigned so that it could be more effective.
- (4) The existing system indicates a variety of problems such as frequent breakdown of vehicles and lack of qualified technicians to carry out proper maintenance.

A good system investigation and analysis is showing that there is the need for a good update and standardization of the Niger State

Transport Authority to enable it measure up to the demands and expectation of the passengers' interest.

## **2.7 Problems of current System**

Manual method of processing the files for maintenance is not the best due to the repetitive nature of the work. This is a job that involves a high level of clerical process which is expensive in terms of money and time.

Access to individual vehicle filled forms are difficult and slow. There is no guaranteed security for each vehicle documents since they can be moved physically out of building or office. The question now is that, what happens when these files are missing or gets destroyed by fire ?

The knowledge of a total number of registered vehicles for maintenance cannot be known as there are no authentic serial numbering of individual vehicles.

Infact, the manual system will make a mess of the maintenance of vehicles used for mass transit in Niger State. As a result of these, a computer based method is needed to eliminate these problems.

## **3.8 The New System**

Based on the problems of the current system, there is the need to introduce an effective method which will automatically reduce the current problems if not totally eliminating them.

Maintenance of vehicle used for mass transit in Niger State will be effective if the problems of the existing system are neglected.

We can see from this research that the manual procedure has failed. The new system must be capable of adjusting itself to accommodate all necessary inputs needed by the old system and at the same time make authentic and thorough analysis of existing data by making use of computers.

# CHAPTER THREE

## 3.1 Maintenance

Maintenance is the correction of minor faults before they result into complete failure, so rendering the vehicle unserviceable. It can only be attained by regular inspection. There are two types of maintenance :-

- (1) Structured maintenance
- (2) Unstructured maintenance

In the case of Niger State Transport Authority, the type of maintenance they are carrying out is unstructured maintenance.

The need for maintenance of vehicles arises because of the following reasons :-

- (1) Vehicles are not maintained to specification by their manufacturers.
- (2) In order to keep them in good working conditions.
- (3) The need to keep vehicles in good working condition, especially those that are meant to transport goods and human beings, because their safety depends on the safety of the vehicle.

## 3.2 Maintenance system in N.S.T.A.

Niger State Transport Authority (N.S.T.A.) has an individual file of maintenance for each vehicle. The Authority vehicles use to cover at least 1,500 Km before taken for service.



In the event of vehicle breakdown on the road, if it is close to the headquarter, it will be towed down to the workshop and if it is far place from the headquarters, a qualified technician (Mechanic) will be sent to carry out the repair or they will look for a mechanic near by for a repair.

It is only in the headquarters that the Authority has a workshop. The Authority has mechanics at Bida and Kontagora stations that carry out only minor repairs and when it is total failure, that particular vehicle must be towed down to the workshop at Minna for the repair.

### **3.3 Contents of System specification**

- (1) Preliminary information in contents, names of those who can change files, programs etc.
- (2) Objectives of the system depth involved.
- (3) System description in detail procedure both clerical and consulting using flowcharts were applicable.
- (4) Detailed specification of input files, output files, master files, source document and output document.
- (5) Time scale for getting the system working.
- (6) Plan to enable a smooth change over from the old to the new system.

### 3.4 Evaluating proposed project

The solutions for evaluating proposed project are:-

- (1) Technical Feasibility :- This tries to see whether the technology needed is available and if available whether it is used.
- (2) Operation Feasibility :- In this case, we ask whether the proposed solution can fit with existing operations and whether the right information at the right time is provided to users.
- (3) Economic Feasibility :- Here, we ask, whether finances are available for implementing the proposed solution and whether the money spent is recovered by the savings or by better user satisfaction.

### 3.5 Cost And Benefit Analysis

#### A - Cost Analysis

<b>Development cost</b>	<b>₦</b>
5 Pc (Pentium 586p)	200,000
1 Printer - HP Desk Jet 895 Cxi	35,000
2 Air conditioners	120,000
1 Stabilizer	25,000
Software	80,000
1 Scanner	28,000
Staff Training	40,000
Installation cost	15,000
Miscellaneous	<u>10,000</u>
	<b><u>553,000</u></b>
<b>Operational cost</b>	<b>₦</b>
UPS	16,800
Diskettes	5,000
Stationeries	23,000
Furniture	<u>30,000</u>
	<b><u>74,800</u></b>
<b>Grand Total</b>	<b><u>627,800</u></b>

## B - Benefit Analysis

Some of the benefits analysis are as follows :-

- (1) Access to inquire about vehicles record in the database.
- (2) Easy access to information regarding maintenance of any vehicle.
- (3) Know when to carry out the next service of any vehicle.
- (4) Know the available spare parts in store.
- (5) Know when to place order to new spare parts.

### 3.6 Factors considered in the system design

- (1) To design a system that will be able to validate inputs to make sure that inputs are correct.
- (2) To design a system that can perform a desired task at a lesser expense and faster.
- (3) To design a system that can produce a database for information storage and retrieval to assist Niger State Transport Authority.
- (4) To design a system that can maintain a master file and update the contents.
- (5) To design a system capable of storing unique data.

### 3.7 Design of new system

The analysis of the current problems is used at the beginning of systems design to develop objectives for the proposed system.

The analysis may lead to a number of possible alternative designs. For example, different combinations of manual and computerized elements may be considered. Once one alternative has been selected the purpose of the design stage is to work from the requirements specification to produce a system specification.

The system specification will be a detailed set of input documents, forms, report layouts which provide details of all features of the system.

# CHAPTER FOUR

## *Program Development and Implementation*

### **4.1 Introduction**

This is to develop a new system that will help to overcome some of the shortcomings and limitations of existing system. In order to achieve this, the system has to be computerized, that is by introducing computer system in every activities that will be carried out in terms of maintenance within the Authority.

Implementation is the process of coding, testing and documenting programs in the system. The process may take about sixty to seventy percent of the overall system development effort.

### **4.2 Choice of programming language**

This is the determination of the best programming language at a suitable language some important characteristics were considered. They include the following :-

- (a) The technical skills required for the computer programmer
- (b) The availability of programmers for the various languages.
- (c) The type of processing to be used, that is batch or real-time processing.

- (d) The availability of sub routine that may be used by the programs.
- (e) The efficiency of the computer or language translator.
- (f) The support from the computer vendors in maintaining and up-dating the programming language.
- (g) The ease with which the programs can be changed at a later date.

Some of the popular programming languages in use today are :-

- (a) Basic (b) Cobol (c) Dbase (d) Fortran (e) Pascal.

After much analysis and consideration of the different languages, Dbase programming language was chosen and recommended as the best for this system, for it is not too complex to understand in comparison to others.

#### **4.3 Features of language chosen**

Dbase being a powerful Database Management System is ideal for this study because of the following features it possesses.

- (1) It provides full relational database system.
- (2) Its capability to access as many as ninety-nine database files at a time.
- (3) It supports up to 255 fields per record.
- (4) Handles substantial number of memory variables.
- (5) Supports data shareability with other DBMS .

(6) And it is one of the most popular DBMS on microcomputers.

#### 4.4 Changeover procedure

The changeover procedure are :-

- (h) The system has been proved to the satisfaction of the system analyst and the other implementation activities have been completed.
- (i) User Managers are satisfied with the results of the system tests, staff training and reference manuals.
- (j) The target date for changeover is due.

Changeover is the conversion of the old file data into the form required by the new system, and is usually a very expensive stage in the whole project.

The three most widely used changeover methods are :- (1)

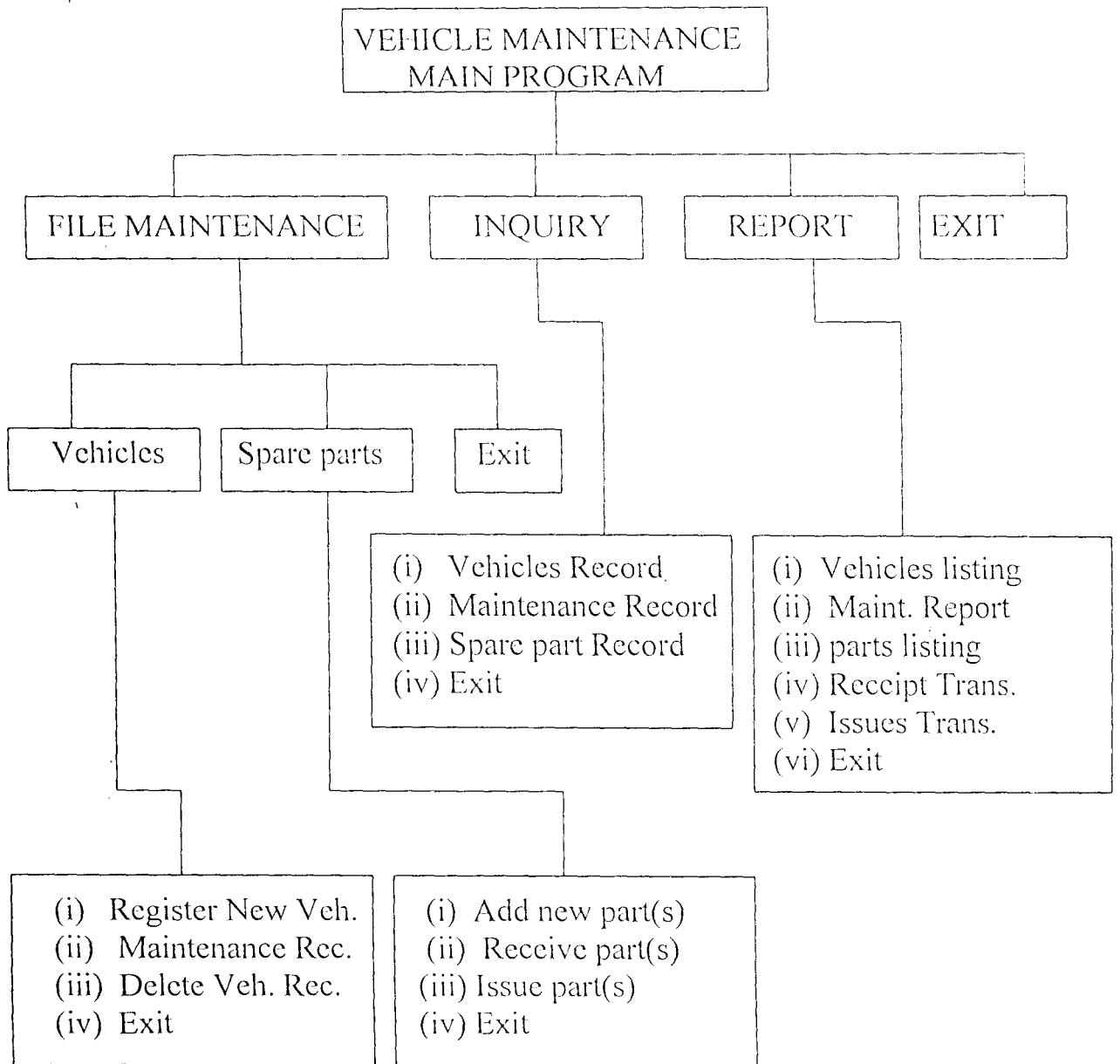
Direct (2) Parallel and (3) Partial.

- (1) Direct changeover :- This method is the complete replacement of the old system by the new system in one move. It is a bold move, which should be undertaken only when everyone concerned has confidence in the new system.
- (2) Parallel changeover :- This means processing current data by both the old and new systems to cross check the results. The old system is kept alive and operational until the new system has been proved for at least one system cycle.



(3) Partial changeover :- This is similar to parallel changeover. Data from one or more previous periods for the whole or part of the system is run on the new system after results have been obtained from the old system, and the new results are compared with the old.

Therefore, a direct changeover procedure is considered most appropriate for the maintenance of vehicles used for mass transit in Niger State by Niger State Transport Authority. This is because, it is easy and also takes no time to change completely from old system to new one.



BLOCK DIAGRAM - VEHICLE MAINTENANCE PROGRAM

## INPUT FILES

### *VEHICLES.DBF - Vehicles record database file*

<i>S/NO</i>	<i>Fieldname</i>	<i>Description</i>	<i>Type</i>	<i>Size</i>
1.	V_NO	Vehicle Registration No.	Character	10
2.	MODEL	Vehicle model	Character	15
3.	DESC	Vehicle description	Character	20
4.	DT	Date registered	Date	10
5.	SR	Speedometer reading	Numeric	9
6.	LDS	Last date of service	Date	10
7.	NDS	Next date of service	Date	10

### *MAINT.DBF - Vehicle Maintenance Record database file*

<i>S/NO</i>	<i>Fieldname</i>	<i>Description</i>	<i>Type</i>	<i>Size</i>
1.	V_NO	Vehicle Registration No.	Character	10
2.	DTS	Date serviced	Date	10
3.	SBY	Serviced by	Character	20
4.	TBY	Tested by	Character	20
5.	REM	Engineers comment	Character	20

### *PARTS.DBF - Spare parts database file*

<i>S/NO</i>	<i>Fieldname</i>	<i>Description</i>	<i>Type</i>	<i>Size</i>
1.	CODE	Spare parts code	Character	8
2.	DESC	Description	Character	20
3.	U_PRICE	Unit price	Numeric	9
4.	BAL	Stock balance	Numeric	9

*RECEIPTS.DBF - Spare parts Receipts transactions file*

<i>S/NO</i>	<i>Fieldname</i>	<i>Description</i>	<i>Type</i>	<i>Size</i>
1.	CODE	Spare parts code	Character	8
2.	DESC	Description	Character	20
3.	U_PRICE	Unit price	Numeric	9
4.	QR	Quantity received	Numeric	9
5.	DTR	Date received	Date	10

*RECEIPTS.DBF - Spare parts Receipts transactions file*

<i>S/NO</i>	<i>Fieldname</i>	<i>Description</i>	<i>Type</i>	<i>Size</i>
1.	CODE	Spare parts code	Character	8
2.	DESC	Description	Character	20
3.	QI	Quantity issued	Numeric	9
4.	DTI	Date issued	Numeric	9
5.	V_NO	Vehicle Number	Character	10
6.	CBY	Collected by	Character	20

### New Vehicle Record Input Form

COMPUTER APPROACH TO VEHICLE MAINTENANCE NIGER STATE TRANSPORT AUTHORITY MINNA		
VEHICLE RECORD		
Vehicle Number	[	]
Model	[	]
Description	[	]
Today's Date	[	]
Speedometer Reading	[	]
Date Serviced	[	]

Save/Continue

Save/Exit

Abandon

### Spare Parts Record Input Form

COMPUTER APPROACH TO VEHICLE MAINTENANCE NIGER STATE TRANSPORT AUTHORITY MINNA		
SPARE PARTS RECORD		
Spare part code	[	]
Description	[	]
Unit price	[	]
Quantity received	[	]
Date received	[	]
Quantity issued	[	]
Date issued	[	]
Vehicle Number	[	]

Save/Continue

Save/Exit

Abandon

## Vehicle Maintenance Record Input Form

COMPUTER APPROACH TO VEHICLE MAINTENANCE NIGER STATE TRANSPORT AUTHORITY MINNA		
MAINTENANCE RECORD		
Vehicle Number	[	]
Date serviced	[	]
Serviced by	[	]
Tested by	[	]
Engineers comment	[	]

Save/Continue

Save/Exit

Abandon

### REPORTS LAYOUT:

#### NIGER STATE TRANSPORT AUTHORITY, MINNA RECEIPTS TRANSACTIONS

S/NO	CODE	DESCRIPTION	UNIT PRICE	QTY RECVD	DATE
1.	-	-	-	-	-
2.	-	-	-	-	-
3.	-	-	-	-	-
4.	-	-	-	-	-
5.	-	-	-	-	-

NIGER STATE TRANSPORT AUTHORITY, MINNA  
ISSUES TRANSACTIONS

<i>S/NO</i>	<i>CODE</i>	<i>DESCRIPTION</i>	<i>QTY ISSUED</i>	<i>VEH. NO</i>	<i>COLLECTED BY</i>	<i>DATE</i>
1.	-	-	-	-	-	-
2.	-	-	-	-	-	-
3.	-	-	-	-	-	-
4.	-	-	-	-	-	-
5.	-	-	-	-	-	-

#### 4.5 Starting the program

The “*Vehicle Maintenance Program*” is user friendly. And therefore quite simple to operate. The following are the steps for starting the program.

- (1) Insert the program disk into drive A:
- (2) Make drive A: active by entering A:
- (3) Type at A:\> prompt **VM** then press ENTER key.

You should now have the program Main-menu displayed on the screen.

#### Main - menu

The main menu consists of File Maintenance, Inquiry, Report and Exit options.

##### (A) FILE MAINTENANCE

Three options are available under File Maintenance, among two of them constituting a sub-menu.

##### (1) Vehicle File Maintenance.

The sub-menu items of this are :-

##### (i) Register new vehicle

To register new vehicle, press R, enter the new vehicle registration number (if it is found to be a duplicate number, the system will reject it) and then enter the details of the new vehicle.



ii) Maintenance Record

Each time maintenance work is carried out on vehicles, detail of work done and spare parts replaced are recorded through this module. To enter maintenance record, press M.

(ii) Delete Record

If entry is made in error and required to be completely eliminated, the delete record option is used to remove such record from database. To delete record, press D and enter vehicle number to be deleted.

(2) Spare Parts

This menu comprises of :-

(i) Add new spare parts

To add a new spare part to stock, press A and enter new spare part code and description.

(ii) Receive part(s)

When new parts are purchased they are received and recorded in the store and therefore added to the existing stock. To do this, press R and enter existing code, then enter receipts details after physical inspection.

(iii) Issue part(s)

As vehicles are being serviced/repaired, parts may be required for replacement. These parts are then requested from the store to the

workshop. To issue part, press I and enter spare part code, quantity and other details.

(B) INQUIRY

When need arises to have idea or information about the database in order to find record of any vehicle, spare part or maintenance work carried out, the inquiry sub-menu helps to achieve this. The following can be enquired.

(1) Vehicles Record

To inquire about vehicles record in the database, press V in order to browse through the entire vehicle database.

(2) Maintenance Record

Press M in order to browse through the entire maintenance records in the database.

(3) Spare parts

In order to browse through the spare parts records, press S

(C) REPORT

The report menu consists of the following options.

- (1) Vehicles listing
- (2) Maintenance report
- (3) Spare Part Listing
- (4) Receipts transactions
- (5) Issues transactions

All these produce hard copies or printouts for the respective records/transactions.

To print report, press R (which is the first letter of the report name), but first ensure that printer is ready and paper loaded before selecting the report or attempting to print.

#### **4.6 Quitting/Exiting the Program**

The maintenance program uses a common key for closing or exiting the program as well as returning from any sub-menu to the main menu.

To quit or exit, press E. This closes the files and returns you to main menu (if you are in a sub-menu or returns you to system prompt (A:\>) prompt (if you are in the Main menu).

#### **4.8 Training**

Niger State Transport Authority staffs need to be trained. Since it is impossible to train everybody before the final take off of the new system, phase-training programme can be conducted for those that will be using or dealing with the computer systems.

In addition, computer operators can be granted in-service training to where computer operators courses are run.

#### **4.9 Program Maintenance**

This includes whatever changes and enhancements needed to be made after the system is up and running.

# CHAPTER FIVE

## 5.1 CONCLUSION

Manual method of maintenance of vehicles used for mass transit by Niger State Transport Authority were carefully analysed and found to have a lot of problems when using it. The new system (computer system) helped in eliminating these problems and also in improving accuracy, effectiveness and efficiency in the maintenance of vehicles used for mass transit by the Authority.

## 5.2 Summary

The vehicles used for mass transit in Niger State are not properly maintained to specification by their manufacturer. This is leading to frequent breakdown and disappointment which could finally lead to a great loss in the investment made on the vehicles.

In the light of the above, the researcher looked into different ways of the Authority vehicles inefficiency and how these vehicles will be maintained in computer approach manner.

### 5.3 Recommendation

After researcher's thorough observations and considerations, the following recommendations are made :-

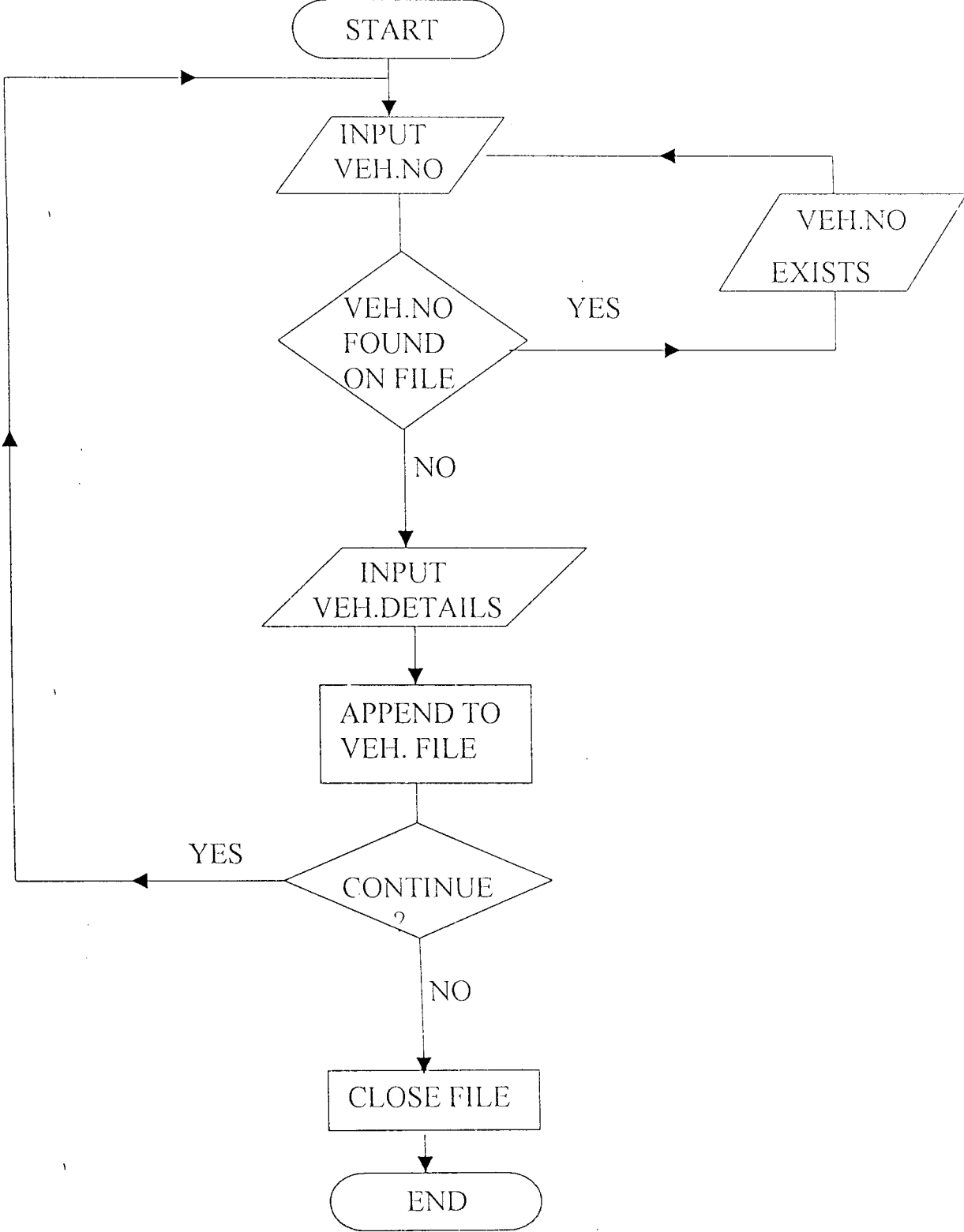
- (1) Before choosing any brand of vehicles for commercial purposes, the followings should be taken in to consideration:
  - (i) Suitability
  - (ii) Durability
  - (iii) Maintainability
  - (iv) Availability of its spare parts
  - (v) Qualified technicians for adequate maintenance.
- (2) There should be incentives for the staffs of the Authority (i.e. Drivers) for proper handling of the Authority vehicles.
- (3) Computer literate staffs should be recruited into the Authority, especially in the computer section for handling both the software and hardware in order to yield the expected result.

## 5.4 REFERENCES

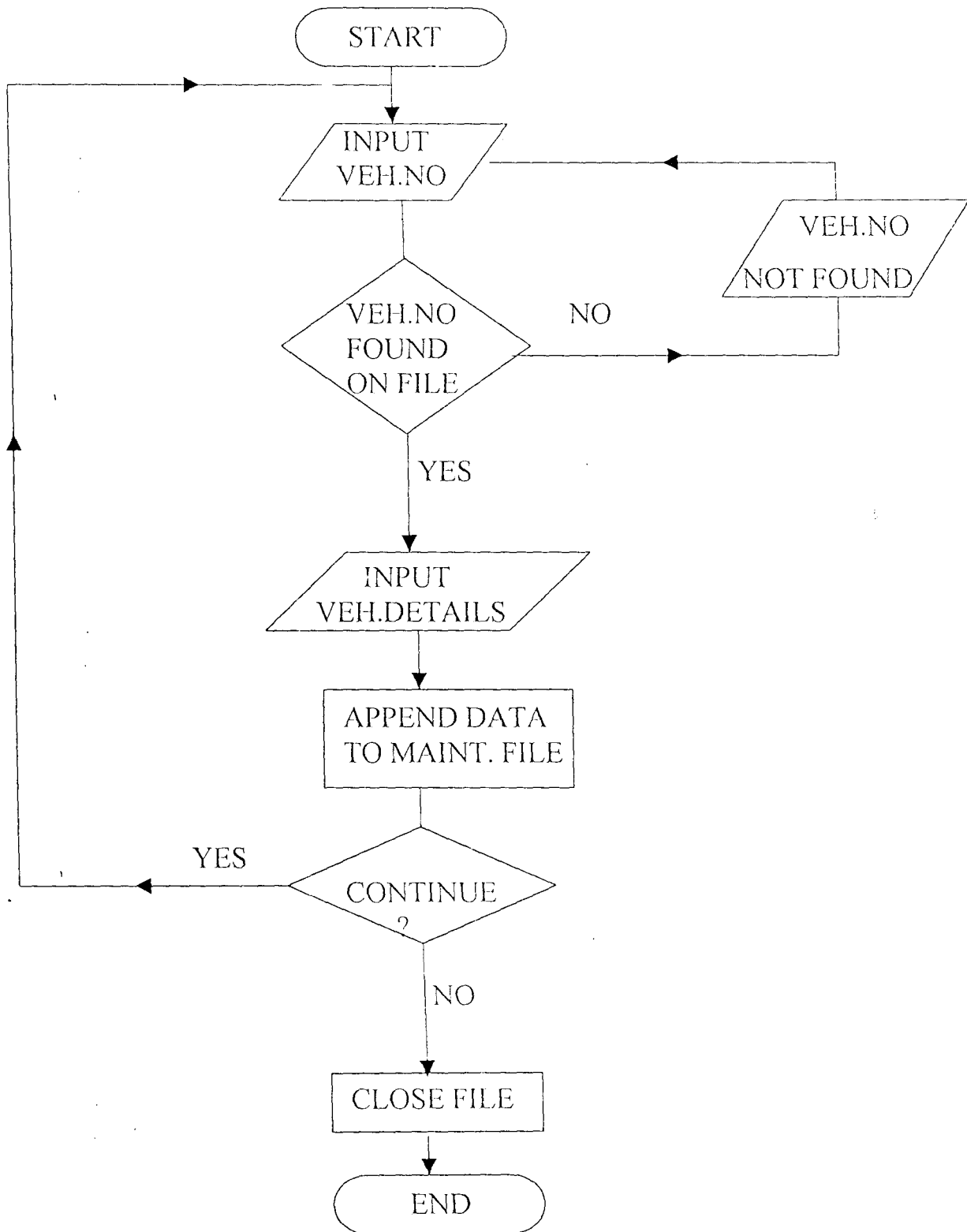
1. Ayo, C.K. (1994) Computer Literacy (Operation & Appreciation), Alanukitan Commercial Press (Nig) Ltd., EGBE.
2. Badmus, R. O. (1998) Handout on System Analysis and Design. F.U.T., Minna
3. Burns, A. (1984) New Information Technology, Elis Harwood Ltd., England.
4. French, C. S. (1990) Computer Science, Dp Publications Ltd., London.
5. Graham, W. (1988) Mastering Computers, Macmillan Educ. Ltd., London.
6. Hakimi, D. (1998) Handout on Database Management System. F.U.T., Minna.
7. Abdulraheem, K. (1998) Handout on Computer Programming, F.U.T., Minna.

# APPENDICES

## NEW VEHICLE PROGRAM FLOWCHART

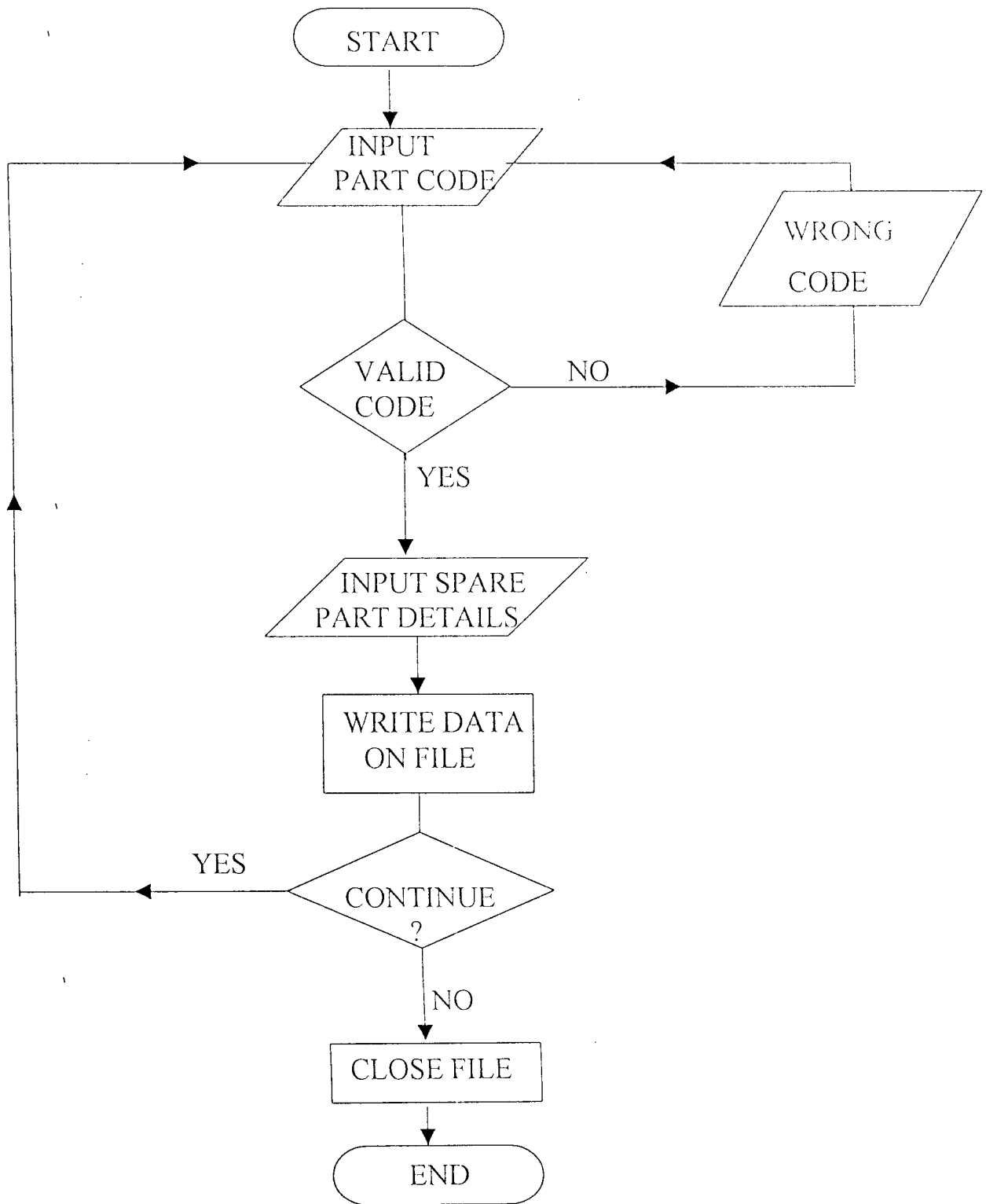


# VEHICLE MAINTENANCE PROGRAM FLOWCHART

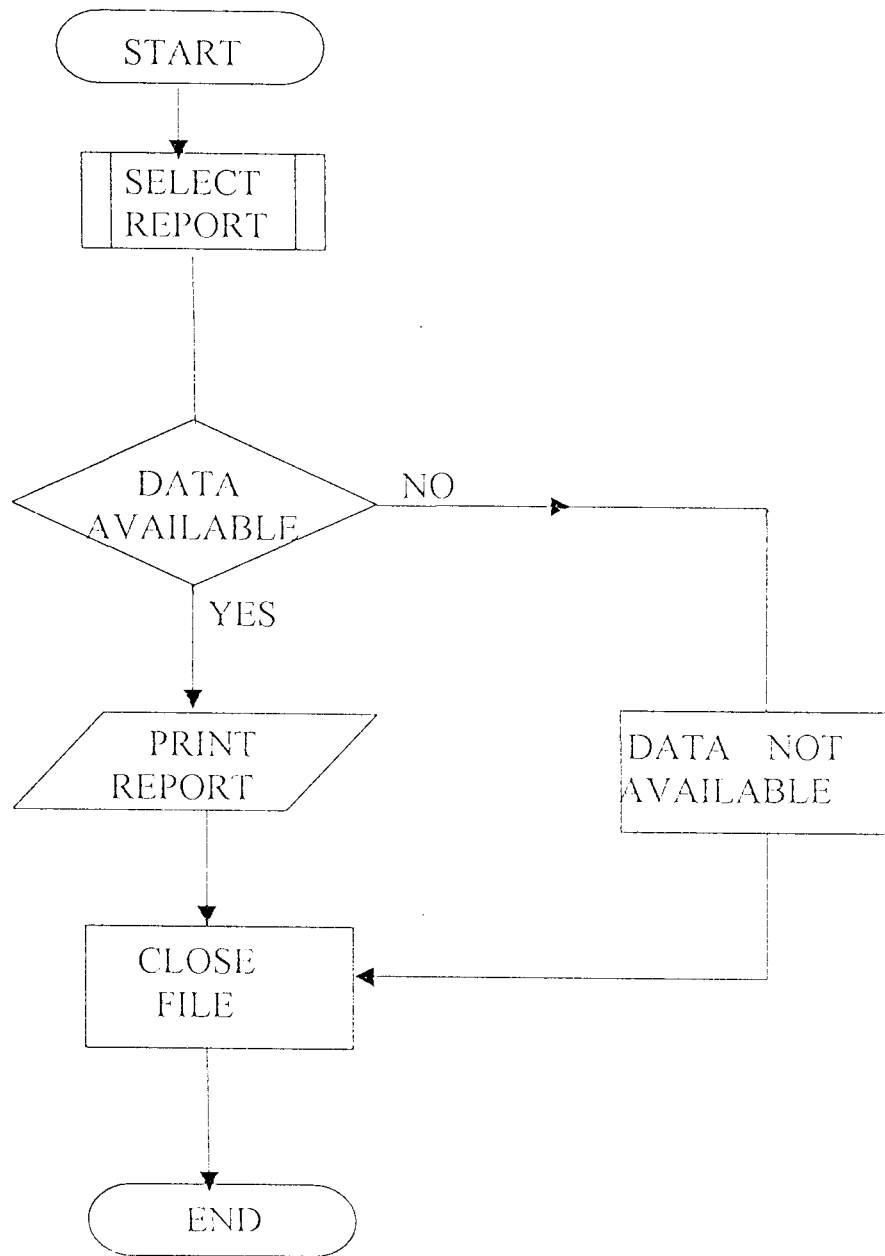




# SPARE PARTS PROGRAM FLOWCHART



# MAINTENANCE REPORT PROGRAM FLOWCHART



## PROGRAM LISTING

```
***** PROGRAM : COMPUTER APPROACH TO VEHICLE MAINTENANCE
***** CASE STUDY: NIGER STATE TRANSPORT AUTHORITY
***** ADDRESS : MINNA, NIGER STATE
***** BY : ABUBAKAR SOLE BABATETENGI
***** REG.NO. : PGD/MCS/98/99/794
***** DEPT. : MATHEMATICS/COMPUTER SCIENCE
***** DATE : MARCH, 2001
*****
```

\*\*\*\*\* MAIN PROGRAM

```
SET TALK OFF
SET ECHO OFF
SET STAT OFF
PUBLIC I
DO WHILE .T.
CLEAR
@ 2,9 TO 19,65 DOUBLE
@ 4,20 SAY " NIGER STATE TRANSPORT AUTHORITY"
@ 5,20 SAY " MINNA, NIGER STATE"
SET COLO TO W+
@ 7,20 SAY " VEHICLE MAINTENANCE SYSTEM"
SET COLO TO
@ 8,10 TO 8,64
@ 10,24 SAY "F I L E M A I N T E N A N C E"
@ 12,24 SAY "I N Q U I R I E S"
@ 14,24 SAY "R E P O R T"
@ 16,24 SAY "E X I T"
SET COLO TO GR+
@ 18,16 SAY "DEVELOPED BY:- ABUBAKAR SOLE BABATETENGI"
SET COLO TO R+
@ 10,24 SAY "F"
@ 12,24 SAY "I"
@ 14,24 SAY "R"
@ 16,24 SAY "E"
SET COLOR TO W+
@ 20,24 SAY "Enter your choice."
SET COLOR TO
I=0
DO WHILE I=0
I=INKEY()
IF UPPER(CHR(I)) $ "FIRE"
EXIT
ENDIF
I=0
ENDDO
DO CASE
CASE UPPER(CHR(I)) $ "F"
DO FILEM
CASE UPPER(CHR(I)) $ "I"
DO INQUIRYM
CASE UPPER(CHR(I)) $ "R"
DO REPORTM
CASE UPPER(CHR(I)) $ "E"
EXIT
ENDCASE
ENDDO
CLEAR
CLEAR ALL
RETURN
```

```

*** NEW SPARE PARTS PROGRAM MODULE
USE PARTS
DO WHILE .T.
    CLEAR
    @3,06 TO 22,69 DOUBLE
    @08,10 TO 22,67
    @ 4,15 SAY "      NIGER STATE TRANSPORT AUTHORITY"
    @ 5,15 SAY "      MINNA, NIGER STATE"
    @ 6,15 SAY "      VEHICLE MAINTENANCE SYSTEM"
    @ 7,15 SAY "      NEW SPARE PARTS RECORD"
    STORE SPACE(5) TO MCODE
    STORE SPACE(10) TO MDT
    STORE SPACE(20) TO MDESC
    STORE 0 TO MUP,MBAL
    @10,15 SAY "NEW SPARE PART CODE [99999]=Exit " GET MCODE PICT "99999"
    READ
    IF MCODE = "99999"
        EXIT
    ENDIF
    LOCATE FOR CODE = MCODE
    IF .NOT. EOF()
        @22,1 SAY ""
        ? CHR(7)
        WAIT+"      PART CODE ALREADY EXISTS!  PRESS ANY KEY."
        @23,10 SAY SPACE(50)
        LOOP
    ENDIF
    @12,15 SAY "PART DESCRIPTION      " GET MDESC PICT "@"
    @14,15 SAY "UNIT PRICE      " GET MUP PICT "99,999.99"
    @16,15 SAY "STOCK BALANCE      " GET MBAL PICT "99,999.99"
    @18,15 SAY "TODAY'S DATE      " GET MDT PICT "99/99/9999"
    READ
    K=SPACE(1)
    @23,15 SAY "      [C]ontinuc/save  [E]xit/save  [A]bandon" GET K PICT
    "!"
    READ
    IF K = "A"
        LOOP
    ENDIF
    APPEND BLANK
    REPLACE CODE WITH MCODE, DESC WITH MDESC
    REPEACE 0 PRICE WITH MUP, BAL WITH MBAL
    IF K = "E"
        EXIT
    ENDIF
ENDDO
CLEAR
CLOSE DATABASE
RETURN*** VEHICLE RECORD DELETION PROGRAM MODULE
USE VEHICLE
DO WHILE .T.
    CLEAR
    @3,06 TO 22,69 DOUBLE
    @08,10 TO 22,67
    @ 4,15 SAY "      NIGER STATE TRANSPORT AUTHORITY"
    @ 5,15 SAY "      MINNA, NIGER STATE"
    @ 6,15 SAY "      VEHICLE MAINTENANCE SYSTEM"
    @ 7,15 SAY "      VEHICLE RECORD DELETION"
    STORE SPACE(10) TO MCODE,MDT,MLDS,MNDS,MSTATE
    STORE SPACE(20) TO MDESC,MMODEL

```

```

STORE 0 TO MSR
@10,15 SAY "VEHICLE NUMBER [AA999AAA]-EXIT " GET MCODE PICT
"AA999AAA"
READ
    IF MCODE = "AA999AAA"
        EXIT
    ENDIF
    LOCATE FOR VNO = MCODE
    IF EOF()
        @22,1 SAY ""
        ? CHR(7)
        WAIT+ "          VEHICLE NUMBER DOESN'T EXIST! ENTER ANY
FEY."
        @23,10 SAY SPACE(10)
        LOOP
    ENDIF
@12,15 SAY "STATE REGISTERED " GET STATE PICT "0!"
@14,15 SAY "VEHICLE MODEL " GET MODEL PICT "0!"
@16,15 SAY "DESCRIPTION " GET DESC PICT "0!"
@18,15 SAY "LAST SERVICE DATE " GET DT PICT "99/99/9999"
@20,15 SAY "SPEEDOMETER READING " GET SR PICT "999999999"
    CLEAR GETS
    K=SPACE(1)
@23,15 SAY " [D]elete Record [S]ave Record " GET K PICT "!"
    READ
    IF K = "S"
        LOOP
    ENDIF
    IF K = "D"
        K=SPACE(1)
@23,15 SAY " ARE YOU SURE YOU WANT TO DELETE ? (Y/N)" GET K PICT
"! "
        READ
        IF K = "Y"
            DELETE
            PACK
            ENDIF
        ENDIF
    ENDIF
ENDDO
CLEAR
CLOSE DATABASE
RETURN

```

\*\*\*\*\* FILE MAINTENANCE MODULE

```

SET TALK OFF
SET ECHO OFF
SET STAT OFF
PUBLIC I
DO WHILE .T.
CLEAR
@ 2,9 TO 19,65 DOUBLE
@ 3,20 SAY " NIGER STATE TRANSPORT AUTHORITY"
@ 4,20 SAY " MINNA, NIGER STATE"
@ 6,20 SAY " VEHICLE MAINTENANCE SYSTEM"
@ 8,10 TO 8,64
@ 7,20 SAY " FILE MAINTENANCE MENU"
@ 11,26 SAY "VEHICLES FILE MAINTENANCE"
@ 13,26 SAY "SPARE PARTS FILE MAINTENANCE"
@ 15,26 SAY "E X I T"
SET COLO TO GR+

```

```

@ 18,16 SAY "DEVELOPED BY:- ABUBAKAR SULE BABATETENGI"
SET COLO TO W+
@ 11,26 SAY "V"
@ 13,26 SAY "S"
@ 15,26 SAY "E"
@ 20,26 SAY "Enter your choice."
SET COLOR TO
I=0
DO WHILE I=0
I=INKEY()
IF UPPER(CHR(I)) $ "VSE"
EXIT
ENDIF
I=0
ENDDO
DO CASE
CASE UPPER(CHR(I)) $ "V"
DO VEHM
CASE UPPER(CHR(I)) $ "S"
DO PARTSM
CASE UPPER(CHR(I)) $ "E"
EXIT
ENDCASE
ENDDO
CLEAR
CLEAR ALL
RETURN

```

\*\*\*\*\* INQUIRY MENU PROGRAM MODULE

```

SET TALK OFF
SET ECHO OFF
SET STAT OFF
PUBLIC I
DO WHILE .T.
CLEAR
@ 2,9 TO 19,65 DOUBLE
@ 3,20 SAY " NIGER STATE TRANSPORT AUTHORITY"
@ 4,20 SAY " MINNA, NIGER STATE"
@ 6,20 SAY " VEHICLE MAINTENANCE SYSTEM"
@ 8,10 TO 8,64
@ 7,20 SAY " I N Q U I R Y M E N U"
@ 10,26 SAY "VEHICLE RECORDS"
@ 12,26 SAY "MAINTENANCE RECORDS"
@ 14,26 SAY "SPARE PARTS"
@ 16,26 SAY "E X I T"
SET COLO TO GR+
@ 18,16 SAY "DEVELOPED BY:- ABUBAKAR SULE BABATETENGI"
SET COLO TO W+
@ 10,26 SAY "V"
@ 12,26 SAY "M"
@ 14,26 SAY "S"
@ 16,26 SAY "E"
@ 20,26 SAY "Enter your choice."
SET COLOR TO
I=0
DO WHILE I=0
I=INKEY()
IF UPPER(CHR(I)) $ "VMSE"
EXIT
ENDIF

```

```

      I=0
ENDDO
DO CASE
  CASE UPPER(CHR(I)) $ "V"
    DO VEHINQ
  CASE UPPER(CHR(I)) $ "M"
    DO MAINTINQ
  CASE UPPER(CHR(I)) $ "S"
    DO PARTSINQ
  CASE UPPER(CHR(I)) $ "E"
    .EXIT
ENDCASE
ENDDO
CLEAR
CLEAR ALL
RETURN

```

```

***** ISSUES TRANSACTIONS REPORT
CLEAR
STORE 0 TO L,P
STORE 60 TO L
USE ISSUE
*SET DEVICE TO PRINT
DO WHILE .NOT. EOF()
IFL > 22
P=P+1
@ 1,25 SAY "      NIGER STATE TRANSPORT AUTHORITY"
@ 2,25 SAY "      MINNA, NIGER STATE"
@ 4,25 SAY "      ISSUES TRANSACTIONS REPORT"
@5,01 SAY "DATE : "
@5,08 SAY DATE()
@5,70 SAY "PAGE "+LTRIM(STR(P))
@6,01 SAY REPL('-',79)
@7,01 SAY "C O D E"
@7,10 SAY "DESCRIPTION"
@7,32 SAY "QTY ISSUED"
@7,43 SAY "VEH.NO."
@7,54 SAY "COLLECTED BY"
@7,70 SAY "D A T E"
@8,01 SAY REPL('-',79)
L-9
ENDIF
@L,01 SAY CODE
@L,10 SAY DESC
@L,32 SAY Q1 PICT "9,999"
@L,43 SAY VNO
@L,54 SAY CBY
@L,70 SAY DTI
L=L+1
SKIP
ENDDO
@L,1 SAY REPL('-',79)
CLOSE DATABASE
WAIT
*SET DEVICE TO SCREEN
RETURN

```

```

*** SPARE PARTS ISSUES TRANSACTIONS PROGRAM MODULE
SELE 1
USE PARTS
SELE 2
USE ISSUE

```

```

SELE 3
USE VEHICLE
DO WHILE .T.
    CLEAR
    @3,06 TO 22,69 DOUBLE
    @08,10 TO 22,67
@ 4,15 SAY "        NIGER STATE TRANSPORT AUTHORITY"
@ 5,15 SAY "        MINNA, NIGER STATE"
@ 6,15 SAY "        VEHICLE MAINTENANCE SYSTEM"
@ 7,15 SAY "        SPARE PARTS ISSUES TRANSACTIONS"
    STORE SPACE(5) TO MCODE
    STORE SPACE(10) TO MDTI, MDTI
    STORE SPACE(20) TO MDESC, MCBY
    STORE 9 TO MQI, MBAL
@10,15 SAY "ENTER SPARE PART CODE [99999]=Exit " GET MCODE PICT
"99999"
READ
    IF MCODE = "99999"
        EXIT
    ENDIF
    SELE 1
    LOCATE FOR CODE = MCODE
    IF EOF()
        @22,1 SAY ""
        ? CHR(7)
    WAIT+"                INVALID SPARE PART CODE !  PRESS ANY KEY."
        @23,10 SAY SPACE(50)
        LOOP
    ENDIF
    MDESC = DESC
*****
@10,15 SAY "VEHICLE NUMBER [AA999AAA]=Exit      " GET MVNO PICT
"AA999AAA"
READ
    IF MVNO = "AA999AAA"
        EXIT
    ENDIF
    SELE 3
    LOCATE FOR VNO = MVNO
    IF EOF()
        @22,1 SAY ""
        ? CHR(7)
    WAIT+"                INVALID VEHICLE NUMBER !  PRESS ANY KEY."
        @23,10 SAY SPACE(50)
        LOOP
    ENDIF
@12,15 SAY "PART DESCRIPTION      " GET MDESC PICT "6!"
    CLEAR GETS
@14,15 SAY "QUANTITY ISSUED      " GET MQI PICT "99,999.99"
@16,15 SAY "DATE ISSUED          " GET MDTI PICT "99/99/9999"
@18,15 SAY "COLLECTED BY          " GET MCBY PICT "0!"
    READ
    K=SPACE(1)
@23,15 SAY "        [C]ontinuc/save  [E]xit/save  [A]bandon" GET K PICT
"! "
    READ
    IF K = "A"
        LOOP
    ENDIF
    SELE 1
    REPL BAL WITH BAL-MQI
    SELE 2

```



```

APPEND BLANK
REPLACE CODE WITH MCODE, DESC WITH MDESC, CBY WITH MCBY
REPLACE VNO WITH MVNO, QI WITH MQI, DTI WITH MDTI
    IF K = "E"
        EXIT
    ENDIF
ENDDO
CLEAR
CLOSE DATABASE
RETURN

```

\*\*\* VEHICLE MAINTENANCE INQUIRY PROGRAM MODULE  
 USE MAINTCE  
 DO WHILE .NOT. EOF(,
 CLEAR
 @3,06 TO 21,69 DOUBLE
 @08,10 TO 20,67
 @ 4,15 SAY " NIGER STATE TRANSPORT AUTHORITY"
 @ 5,15 SAY " MINNA, NIGER STATE"
 @ 6,15 SAY " VEHICLE MAINTENANCE SYSTEM"
 @ 7,15 SAY " MAINTENANCE/SERVICE INQUIRY"

```

            @10,15 SAY "VEHICLE NUMBER          " GET VNO PICT "@!"
            @12,15 SAY "SERVICED BY:          " GET SBY PICT "@!"
            @14,15 SAY "TESTED BY:           " GET TBY PICT "@!"
            @16,15 SAY "DATE SERVICED          " GET DTS PICT "99/99/9999"
            @18,15 SAY "ENGINEER'S REMARK       " GET REM PICT "@!"
                CLEAR GETS
                K=SPACE(1)
            @22,15 SAY " [C]ontinue [E]xit " GET K PICT "!"
                READ
                IF K = "E"
                    EXIT
                ENDIF
            SKIP
        ENDDO
        IF EOF()
            K=SPACE(1)
            @22,15 SAY "END OF FILE ENCOUNTERED, PRESS ANY KEY " GET
            K
                READ
            ENDIF
        CLEAR
        CLOSE DATABASE
        RETURN
    ***** VEHICLE MAINTENANCE REPORT PROGRAM
    CLEAR
    STORE 0 TO TOTR,TOTI,TOTV,P,SV
    STORE 60 TO L
    USE MAINTCE
    *SET DEVICE TO PRINT
    DO WHILE .NOT. EOF()
    IF L > 22
    P=P+1
    @ 1,25 SAY " NIGER STATE TRANSPORT AUTHORITY"
    @ 2,25 SAY " MINNA, NIGER STATE"
    @ 4,25 SAY " VEHICLE MAINTENANCE REPORT"
    @5,01 SAY "DATE : "
    @5,08 SAY DATE()
    @5,70 SAY "PAGE "+LTRIM(STR(P))
    @6,01 SAY REPL('-',79)
    @7,01 SAY "VEH.NO"

```

```

@7,11 SAY "SERVC.DATE"
@7,25 SAY "SERVICED BY"
@7,43 SAY "TESTED BY"
@7,64 SAY "ENGR'S REMARK"
@8,01 SAY REPL('-',79)
L=9
ENDIF

```

```

@L,01 SAY VNO
@L,11 SAY DTS
@L,22 SAY SBY
@L,43 SAY TBY
@L,64 SAY REM
L=L+1
SKIP
ENDDO
*L=L+1
@L,1 SAY REPL('-',79)
CLOSE DATABASE
WAIT
*SET DEVICE TO SCREEN
RETURN

```

```

*** VEHICLE REGISTRATION PROGRAM MODULE

```

```

USE VEHICLE

```

```

DO WHILE .T.

```

```

    CLEAR

```

```

    @3,06 TO 22,69 DOUBLE

```

```

    @08,10 TO 22,67

```

```

@ 4,15 SAY "      NIGER STATE TRANSPORT AUTHORITY"

```

```

@ 5,15 SAY "      MINNA, NIGER STATE"

```

```

@ 6,15 SAY "      VEHICLE MAINTENANCE SYSTEM"

```

```

@ 7,15 SAY "      NEW VEHICLE RECORD"

```

```

    STORE SPACE(10) TO MCODE,MDT,MLDS,MNDS,MSTATE

```

```

    STORE SPACE(20) TO MDESC,MMODEL

```

```

    STORE 0 TO MSR

```

```

@10,15 SAY "NEW VEHICLE NUMBER [AA999AAA]=EXIT " GET MCODE PICT
"AA999AAA"

```

```

READ

```

```

    IF MCODE = "AA999AAA"

```

```

        EXIT

```

```

    ENDIF

```

```

    LOCATE FOR VNO = MCODE

```

```

    IF .NOT. EOF()

```

```

        @22,1 SAY ""

```

```

        ? CHR(7)

```

```

    WAIT+"      VEHICLE REG.NUMBER EXISTS!  PRESS ANY KEY."

```

```

        @23,10 SAY SPACE(50)

```

```

        LOOP

```

```

    ENDIF

```

```

@12,15 SAY "STATE REGISTERED      " GET MSTATE PICT "3!"

```

```

@14,15 SAY "VEHICLE MODEL      " GET MMODEL PICT "3!"

```

```

@16,15 SAY "DESCRIPTION      " GET MDESC PICT "@!"

```

```

@18,15 SAY "TODAY'S DATE      " GET MDT PICT "99/99/9999"

```

```

@20,15 SAY "SPEEDOMETER READING  " GET MSR PICT "999999999"

```

```

    READ

```

```

    K=SPACE(1)

```

```

@23,15 SAY "      [C]ontinue/save  [E]xit/save  [A]bandon" GET K PICT
"! "

```

```

    READ

```

```

    IF K = "A"

```

```

        LOOP

```

```

        ENDIF
    APPEND BLANK
    REPLACE VNO WITH MCODE, DESC WITH MDESC
    REPLACE DT WITH MDT, SR WITH MSR, MODEL WITH MMODEL
        IF K = "E"
            EXIT
        ENDIF
ENDDO
CLEAR
CLOSE DATABASE
RETURN

*** SPARE PARTS INQUIRY PROGRAM MODULE
USE PARTS
DO WHILE .NOT. EOF()
    CLEAR
        @3,06 TO 21,69 DOUBLE
        @08,10 TO 20,67
@ 4,15 SAY "        NIGER STATE TRANSPORT AUTHORITY"
@ 5,15 SAY "        MINNA, NIGER STATE"
@ 6,15 SAY "        VEHICLE MAINTENANCE SYSTEM"
@ 7,15 SAY "        SPARE PARTS INQUIRY"

@11,15 SAY "SPARE PART CODE          " GET CODE
@13,15 SAY "DESCRIPTION                " GET DESC
@15,15 SAY "UNIT PRICE (IN NAIRA)        " GET U_PRICE PICT "99,999.99"
@17,15 SAY "STOCK BALANCE                " GET BAL PICT "9,999,9999"
    CLEAR GETS
    K=SPACE(1)
@22,15 SAY "        [C]ontinue [E]xit " GET K PICT ":"
    READ
        IF K = "E"
            EXIT
        ENDIF
    SKIP
ENDDO
IF EOF()
    K=SPACE(1)
    @22,15 SAY "END OF FILE ENCOUNTERED, PRESS ANY KEY" GET K
    READ
ENDIF
CLEAR
CLOSE DATABASE
RETURN

```

\*\*\*\*\* SPARE PARTS TRANSACTIONS MENU

```

SET TALK OFF
SET ECHO OFF
SET STAT OFF
PUBLIC I
DO WHILE .T.
    CLEAR
    @ 2,9 TO 19,65 DOUBLE
    @ 3,20 SAY "        NIGER STATE TRANSPORT AUTHORITY"
    @ 4,20 SAY "        MINNA, NIGER STATE"
    @ 6,20 SAY "        VEHICLE MAINTENANCE SYSTEM"
    @ 8,10 TO 8,64
    @ 7,20 SAY "        SPARE PARTS TANSCTIONS MENU"
    @ 10,24 SAY "ADD NEW STOCK (SPARE PART(S))"
    @ 12,24 SAY "RECEIPT TRANSACTIONS"

```

```

@ 14,24 SAY "ISSUE TRANSACTIONS"
@ 16,24 SAY "E X I T"
SET COLO TO GR+
@ 18,16 SAY "DEVELOPED BY:- ABUBAKAR SOLE BABATETENGI"
SET COLO TO W+
@ 10,24 SAY "A"
@ 12,24 SAY "R"
@ 14,24 SAY "I"
@ 16,24 SAY "E"
@ 20,24 SAY "Enter your choice."
SET COLOR TO
I=0
DO WHILE I=0
I=INKEY()
IF UPPER(CHR(I)) $ "ARIE"
EXIT
ENDIF
I=0
ENDDO
DO CASE
CASE UPPER(CHR(I)) $ "A"
DO ADDEPART
CASE UPPER(CHR(I)) $ "R"
DO RECEIPT
CASE UPPER(CHR(I)) $ "I"
DO ISSUE
CASE UPPER(CHR(I)) $ "E"
EXIT
ENDCASE
ENDDO
CLEAR
CLEAR ALL
RETURN

*** SPARE PARTS RECEIPT TRANSACTIONS PROGRAM MODULE
SELE 1
USE PARTS
SELE 2
USE RECEIPT
DO WHILE .T.
CLEAR
@3,06 TO 22,09 DOUBLE
@08,10 TO 22,07
@ 4,15 SAY " NIGER STATE TRANSPORT AUTHORITY"
@ 5,15 SAY " MINNA, NIGER STATE"
@ 6,15 SAY " VEHICLE MAINTENANCE SYSTEM"
@ 7,15 SAY " SPARE PARTS RECEIPT TRANSACTIONS"
STORE SPACE(5) TO MCODE
STORE SPACE(10) TO MSTR
STORE SPACE(20) TO MDISC
STORE 0 TO MUP, MQR, MEAL
@10,15 SAY "ENTER SPARE PART CODE (99999)=EXIT " GET MCODE PICT
"99999"
READ
IF MCODE = "99999"
EXIT
ENDIF
SELE 1
LOCATE FOR CODE = MCODE
IF EOF()
@22,1 SAY ""
? CHR(7)

```

```

WAIT+"          PART CODE DOESN'T EXIST!  PRESS ANY KEY."
          @23,10 SAY SPACE(50)
          LOOP
        ENDIF
        MDESC=DESC
@12,15 SAY "PART DESCRIPTION          " GET MDESC PICT "8!"
          CLEAR GETS
@14,15 SAY "UNIT PRICE                " GET MUP PICT "99,999.99"
@16,15 SAY "QUANTITY RECEIVED        " GET MQR PICT "99,999"
@18,15 SAY "DATE RECEIVED              " GET MDTR  PICT "99/99/9999"
          READ
          K=SPACE(1)
@23,15 SAY "          [C]ontinue/[N]ext/[A]bort" GET K PICT
"0"
          READ
          IF K = "A"
            LOOP
          ENDIF
          REPL BAL WITH BAL+MQR
          SELE 2
          APPEND BLANK
          REPLACE CODE WITH MCODE, DESC WITH MDESC
          REPLACE U PRICE WITH MUP, QR WITH MQR, DTR WITH MDTR
          IF K = "E"
            EXIT
          ENDIF
        ENDDO
        CLEAR
        CLOSE DATABASE
        RETURN

```

\*\*\*\* REPORT MENU PROGRAM MODULE

```

          SET TALK OFF
          SET ECHO OFF
          SET STAT OFF
          PUBLIC I
          DO WHILE .T.
          CLEAR
          @ 2,9 TO 20,65 DOUBLE
          @ 3,20 SAY "          NIGER STATE TRANSPORT AUTHORITY"
          @ 4,20 SAY "          MINNA, NIGER STATE"
          @ 6,20 SAY "          VEHICLE MAINTENANCE SYSTEM"
          @ 8,10 TO 8,64
          @ 7,20 SAY "          R E P O R T  M E N U"
          @ 09,28 SAY "VEHICLES LISTING"
          @ 11,28 SAY "MAINTENANCE REPORT"
          @ 13,28 SAY "SPARE PARTS LISTING"
          @ 15,28 SAY "RECEIPT TRANSACTIONS"
          @ 17,28 SAY "ISSUES TRANSACTIONS"
          @ 19,28 SAY "E X I T"
          SET COLO TO GR+
          @ 23,16 SAY "DEVELOPED BY:- ARUBAKAR SOLE BABATETENGI"
          SET COLO TO W+
          @ 09,28 SAY "V"
          @ 11,28 SAY "M"
          @ 13,28 SAY "S"
          @ 15,28 SAY "R"
          @ 17,28 SAY "I"
          @ 19,28 SAY "E"
          @ 21,28 SAY "Enter your choice."

```

```

SET COLOR TO
I=0
DO WHILE I=0
I=INKEY()
IF UPPER(CHR(I)) $ "VMGRIE"
EXIT
ENDIF
I=0
ENDDO
DO CASE
CASE UPPER(CHR(I)) $ "V"
DO VEHLIST
CASE UPPER(CHR(I)) $ "M"
DO MAINTREP
CASE UPPER(CHR(I)) $ "S"
DO PARTLIST
CASE UPPER(CHR(I)) $ "R"
DO RECREP
CASE UPPER(CHR(I)) $ "I"
DO ISSREP
CASE UPPER(CHR(I)) $ "E"
EXIT
ENDCASE
ENDDO
CLEAR
CLEAR ALL
RETURN

```

\*\*\* VEHICLE RECORDS INQUIRY PROGRAM MODULE

```

USE VEHICLE
DO WHILE .NOT. EOF()
CLEAR
@3,06 TO 21,69 DOUBLE
@08,10 TO 20,67
@ 4,15 SAY " NIGER STATE TRANSPORT AUTHORITY"
@ 5,15 SAY " MINNA, NIGER STATE"
@ 6,15 SAY " VEHICLE MAINTENANCE SYSTEM"
@ 7,15 SAY " VEHICLE RECORDS INQUIRY"

@10,15 SAY "VEHICLE NUMBER " GET VNO
@12,15 SAY "MODEL " GET MODEL
@14,15 SAY "VEHICLE DESCRIPTION " GET DESC
@16,15 SAY "SPEEDOMETER READING " GET SR PICT "9,999,9999"
@18,15 SAY "DATE SERVICED " GET DSD
CLEAR GETS
K=SPACE(1)
@22,15 SAY " [C]ontinue [E]xit " GET K PICT "!"
READ
IF K = "E"
EXIT
ENDIF
SKIP
ENDDO
IF EOF()
K=SPACE(1)
@22,15 SAY "END OF FILE ENCOUNTERED, PRESS ANY KEY" GET K
READ
ENDIF
CLEAR

```

CLOSE DATABASE  
RETURN

\*\*\*\*\* VEHICLE LISTING PROGRAM MODULE

CLEAR  
STORE 0 TO TOTR, TOTI, TOTV, P, SV  
STORE 60 TO L  
USE VEHICLE  
\*SET DEVICE TO PRINT  
DO WHILE .NOT. EOF()  
IF L > 22  
P=P+1  
@ 1,25 SAY " NIGER STATE TRANSPORT AUTHORITY"  
@ 2,25 SAY " MINNA, NIGER STATE"  
@ 4,25 SAY " VEHICLE LISTING"  
@5,01 SAY "DATE :"  
@5,08 SAY DATE()  
@5,70 SAY "PAGE "+LTRIM(STR(P))  
@6,01 SAY REPL('-',79)  
@7,01 SAY "VEH.NO"  
@7,12 SAY "MODEL"  
@7,30 SAY "DESCRIPTION"  
@7,52 SAY "SPEEDOMETER"  
@7,66 SAY "SERVICED LAST"  
@8,01 SAY REPL('-',79)  
L=9  
ENDIF  
  
@L,01 SAY VNO  
@L,12 SAY MODEL  
@L,30 SAY DESC  
@L,52 SAY SR  
@L,66 SAY LDS  
L=L+1  
SKIP  
ENDDO  
\*L=L+1  
@L,1 SAY REPL('-',79)  
CLOSE DATABASE  
WAIT  
\*SET DEVICE TO SCREEN  
RETURN

\*\*\*\*\* VEHICLE MAINTENANCE MENU

SET TALK OFF  
SET ECHO OFF  
SET STAT OFF  
PUBLIC I  
DO WHILE .T.  
CLEAR  
@ 2,9 TO 19,65 DOUBLE  
@ 3,20 SAY " NIGER STATE TRANSPORT AUTHORITY"  
@ 4,20 SAY " MINNA, NIGER STATE"  
@ 6,20 SAY " VEHICLE MAINTENANCE SYSTEM"  
@ 8,10 TO 8,64  
@ 7,20 SAY " VEHICLE MAINTENANCE MENU"  
@ 10,24 SAY "REGISTER NEW VEHICLE"  
@ 12,24 SAY "MAINTENANCE/SERVICE RECORD"  
@ 14,24 SAY "DELETE VEHICLE RECORD"

```

@ 16,24 SAY "E X I T"
SET COLO TO GR+
@ 18,16 SAY "DEVELOPED BY:- ABUBAKAR SULE BABATETENGI"
    SET COLO TO W+
    @ 10,24 SAY "R"
    @ 12,24 SAY "M"
    @ 14,24 SAY "D"
    @ 16,24 SAY "E"
@ 20,24 SAY "Enter your choice."
SET COLOR TO
    I=0
DO WHILE I=0
    I=INKEY()
    IF UPPER(CHR(I)) $ "RMD"
        EXIT
    ENDIF
    I=0
ENDDO
DO CASE
    CASE UPPER(CHR(I)) $ "R"
        DO NEWVEH
    CASE UPPER(CHR(I)) $ "M"
        DO MAINTVEH
    CASE UPPER(CHR(I)) $ "D"
        DO DELVEH
    CASE UPPER(CHR(I)) $ "E"
        EXIT
ENDCASE
ENDDO
CLEAR
CLEAR ALL
RETURN

```

\*\*\*\*\* VEHICLE MAINTENANCE MENU

```

    SET TALK OFF
    SET ECHO OFF
    SET STAT OFF
    PUBLIC I
DO WHILE .T.
CLEAR
@ 2,9 TO 19,65 DOUBLE
@ 3,20 SAY "    NIGER STATE TRANSPORT AUTHORITY"
@ 4,20 SAY "    MINNA, NIGER STATE"
@ 6,20 SAY "    VEHICLE MAINTENANCE SYSTEM"
@ 8,10 TO 8,64
@ 7,20 SAY "    VEHICLE MAINTENANCE MENU"
@ 10,24 SAY "REGISTER NEW VEHICLE"
@ 12,24 SAY "MAINTENANCE/SERVICE RECORD"
@ 14,24 SAY "DELETE VEHICLE RECORD"
@ 16,24 SAY "E X I T"
SET COLO TO GR+
@ 18,16 SAY "DEVELOPED BY:- ABUBAKAR SULE BABATETENGI"
    SET COLO TO W+
    @ 10,24 SAY "R"
    @ 12,24 SAY "M"
    @ 14,24 SAY "D"
    @ 16,24 SAY "E"
@ 20,24 SAY "Enter your choice."
SET COLOR TO

```



```
      I=0
DO WHILE I=0
      I=INKEY()
IF UPPER(CHR(I)) $ "RMDE"
      EXIT
ENDIF
      I=0
ENDDO
DO CASE
      CASE UPPER(CHR(I)) $ "R"
        DO NEWVEH
      CASE UPPER(CHR(I)) $ "M"
        DO MAINTVEH
      CASE UPPER(CHR(I)) $ "D"
        DO DELVEH
      CASE UPPER(CHR(I)) $ "E"
        EXIT
ENDCASE
ENDDO
CLEAR
CLEAR ALL
RETURN
```

NIGER STATE TRANSPORT AUTHORITY  
MINNA, NIGER STATE

VEHICLE MAINTENANCE REPORT

DATE : 06/10/01

PAGE 1

VEH.NO	SERV.C.DATE	SERVICED BY	TESTED BY	ENGR'S REMARK
AA450MNA	17/12/2000	AHMED K. IBRAHIM	HASSAN J.	SATISFACTORY

NIGER STATE TRANSPORT AUTHORITY  
MINNA, NIGER STATE

SPARE PARTS LISTING REPORT

: 06/10/01

PAGE 1

DESCRIPTION	UNIT PRICE	QTY IN STOCK	STOCK VALUE
BRAKE LINING	780.00	1	780.00
TYRE 175 X 14"	3,500.00	6	21,000.00
OIL FILTER	800.00	21	16,800.00
	T C T A L		38,580.00

NIGER STATE TRANSPORT AUTHORITY  
MINNA, NIGER STATE

RECEIPT TRANSACTIONS REPORT

: 06/10/01

PAGE 1

DESCRIPTION	UNIT PRICE	QTY RECEIVED	TRANS.DATE
TYRE 175 X 14"	3,500.00	6	18/12/2000
OIL FILTER	850.00	12	17/12/2000

NIGER STATE TRANSPORT AUTHORITY  
MINNA, NIGER STATE

ISSUES TRANSACTIONS REPORT

TE : 06/10/01

PAGE 1

O D E	DESCRIPTION	QTY ISSUED	VEH.NO.	COLLECTED BY	D A T E
102	TYRE 175 X 14"	4	AA450MNA	KELECHI OBINA	17/12/20
103	OIL FILTER	1	AA450MNA	IBRAHEM AHMED	17/12/20

NIGER STATE TRANSPORT AUTHORITY  
MINNA, NIGER STATE

VEHICLE LISTING

: 06/10/01

PAGE 1

NO	MODEL	DESCRIPTION	SPEEDOMETER	SERVICED LAST
6MNA	SR	504 SALOON CAR	45332	
0BDA	DX	TOYOTA 14-SEATER BUS	83427	
0MNA	911 MERCEDEZ	54 SEATER BUS	9877	17/12/2000