COMPUTERIZATION OF STOCK/INVENTORY CONTROL SYSTEM

A CASE STUDY OF THE NYSC NDHQ WAREHOUSE ABUJA

BY

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DEDICATION

This project is dedicated to my Darling wife and children.

CERTIFICATION

This project titled: **THE COMPUTERIZATION OF STOCK/INVENTORY CONTROL SYSTEM: A CASE STUDY OF NYSC NDHQ WAREHOUSE ABUJA** written by **BAMAI, D. SHAMANG** meets the Requirement for the award of Postgraduate Diploma in Computer Science of the Federal University of Technology Minna, Niger State.

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ACKNOWLEDGEMENT

It is gives me pleasure to write this project at the end of a postgraduate programme, a golden opportunity and platform to put into practical use much of the skills and knowledge acquired during the course.

It delights me to thank my supervision, Prince R. O. Badamosi for his guidance techniques, knowledge, shorts inspiration even in lectures to allow me see things the way I hardly expected. I also wish to thank my Head of Department DR. K. R. Adeboye a born lecturer, prodigy of erudition who contributed in no small measure to my acquiring the requisite knowledge needed to write this project.

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ABSTRACT

All commercial Organizations and government organisation such as factories, warehouses and traders (wholesalers as well as retailers) keep items in stock, either for their own future use or for sale. The factories also stock material for servicing, machines. Material stocked for future consumption or sale constitute inventory.

Inventory control therefore is reducing the size and cost of inventory. Is a way of safe guarding against running short of items or materials or inability to meet demand. It involves the cost of storage space, handling and insurance as well as costs associated with product obsolence and deterioration.

Scheme for inventory Control require complete information regarding the latest position of stock (inventory)

The computerization of NYSC warehouse is therefore taken as a case study because such a big organisation with a big warehouse, compiling the latest inventory information manually becomes a difficult task. The system will ensure improvement in stock control in term of reliability, effectiveness, security and privacy.

CHAPTER ONE

1.1 INTRODUCTION

Inventory policy or management help in better decision making. Inventories consist of resources such as raw materials or goods partially completed product and finished goods which are temporarily idle. Retail stores hold inventories in order to supply immediately the goods which are demanded by their customers, Since a delay in satisfying customers demand would result in a loss of goodwill and perhaps the loss of sales.

When the size of an organisation for instance grows, usually the inventory size also grows. when an organisation holds an inventory, it blocks its money. Many times, the size of the inventory becomes unnecessarily large and thus a lot of money becomes unproductive. Reducing the size and cost of inventory constitute inventory control or stock control.

Several schemes are followed for inventory control but each scheme requires complete information regarding the latest position of the inventory. Compiling the latest position of information manually becomes a difficult task in the case of big organisations or organisations with big warehouses. An example can be drawn from NYSC warehouse where the number of items run into several thousands and where thousands of items are issued at a particular period and purchases or suppliers are done almost every time. In cases like these, computers helps us to store and update information and to know the latest stock position of inventory. Then the users or management can take decisions to reduce the stock of selected items.

1.2 STATEMENT OF THE PROBLEM

Inventory control system has been traditionally process manually, A method so tasking, tedious, time consuming and

without the real 'Control' and information not easily accessed
at short notices.

With the expansion of organisation the complexity of the
stock control section become more intensive than ever. People
are now so indifferent to the manual process of the control
system of inventory in doing the real job.

Due to the fact that organisations grow and become so
complex in their inventory control and need effectiveness and
reliability.

More so people want to do their job with a lot of ease hence
computers have to be introduce to facilitate the goal of many
organisations.

The objective of this study and the implementation of the
system would be to enhance the efficiency, effectiveness,
reliability, privacy and security of the stock control.

1.3   BACKGROUND OF THE STUDY.

The case study of this project is drawn from the National
Youth Service Corps (NYSC) at the National Directorate
Headquarters (NDHQ) Abuja. An organisation established in 1973
has seven (7) departments and the warehouse in the department
of finance and supplies i.e. (Supplies division) is as old as
the organisation itself.

Items supplied to the store house range from capital
items to consumables like water tankers, grinders, TV sets,
video machines, corps members outfit, Toiletries mattresses,
stationeries etc.

These items are used in running the NYSC organisation at
the Headquarters and also distributed to the NYSC state
secretariats for running the Secretariats and also taking care
of the corps members especially during the orientation course

and thereafter.

From the above it is clear that the need for efficient, effective reliable stock control system with high security and privacy is desired.

1.4 STOCK CONTROL SYSTEM
Stock (inventory) are usable but idle resources, men, machine, money and materials (goods).
(A)   A convenient classification of the types of inventory is as follows:-

a.   Raw materials - the materials, components fuels etc used in the manufacture of products.

b.   Work - in - Progress (W-I-P) partly finished goods and materials, Sub-assemblies etc held between manufacturing stages.

c.   Finished goods - complete products ready for sale or distribution.

The particular items included in each classification depend on the particular firm or organisation. What would be classified as a finished product for one company might be classified as raw materials for another. For instance, steel bars would be classified as a finished product for a steal mill and as raw material for a nut and bolt manufacturer.

B.   REASONS FOR HOLDING STOCKS
The main reasons for holding stocks (inventory) can be summarised thus:-

a.   to ensure that sufficient goods are available to meet anticipated demand;

b.   to absorb variations in demand and production;

c.   to provide a buffer between production processes. This is

applicable to work - in - progress stocks which effectively decouple operations;

d. to take advantage of bulk purchasing discounts;

e. to meet possible shortages in the future;

f. to absorb seasonal fluctuations in usage or demand;

g. to enable production processes to flow smoothly and efficiently;

h. as a necessary part of the production process e.g. the maturing of whiskey;

i. as deliberate investment policy particularly in times of inflation or possible shortage;

C. ALTERNATIVE REASONS FOR THE EXISTENCE OF STOCKS

The reasons given in B above are the logical ones based on deliberate decision. However, stocks accumulate for other, less praise worthy reasons, typical of which are thus:-

a. Obsolete items are retained in stock.

b. Poor or non existent inventory control resulting in over-large orders, replenishment orders being out of phase with production, etc.

c. In adequate or non - existent stock records.

d. Poor liaison between the production Control, purchasing and marketing departments.

e. Sub-optimal decision making e.g. the production Department might increase W.I.P. stocks unduly so as to ensure long production runs.

D. STOCK COSTS

Whether as a result of deliberate policy or not, stock represents an investment by the organisation. As with any other investment, the costs of holding stock must be related to the benefits to be gained. To do this effectively, the cost must be identified and this can be done in three categories; costs of holding stocks, costs of obtaining stock and stock out costs otherwise known as inventory variables.

E. COSTS OF HOLDING STOCK

1. Uncontrolled costs

    a. Interest on Capital invested in the stock.

    b. Storage charges (rent, lighting, heating, refrigeration, air conditioning etc.).

    c. Stores staffing equipment maintenance and running costs

    d. Handling costs.

    e. Audit, stocktaking or perpetual inventory costs,

    f. Insurance, security

    g. Deterioration and obsolescence

    h. pilferage vermin damage.

2. Controlled Costs

    a. The amount to be acquired.

    b. Frequency or Timing of acquisition.

    c. Stage of completion of the product.

F. COSTS OF OBTAINING STOCK

These costs sometimes known as ordering costs include:-

    a. The clerical and administrative costs associated with the purchasing, Accounting and goods received departments.

    b. Transport costs.

    c. Where goods are manufactured internally the set up and tooling costs associated with each production run.

It is worthy of note that ordering costs does not only include those costs associated with ordering external to the firm or organisation but also internal ordering (i.e. own manufacture) may involve high costs for production planning set up.

G. STOCKOUT COSTS

These are the costs associated with running out of stock. The avoidance of these costs is the basic reason why stocks

are held in the first instance. These costs include the following:-

(a) lost contribution through the lost sale caused by the stock out.

(b) Loss of future sales because customers go elsewhere.

(c) Loss of customer goodwill

(d) Cost of production stoppages caused by stockouts of W-I-P or raw materials.

(e) Labour frustration overstoppages.

(f) Extra costs associated with urgent, often small quantity, replenishment purchases.

Clearly many of these costs are difficult to quantify, but they are often significant.

H. OBJECTIVE OR INVENTORY CONTROL

The overall objective of inventory control is to maintain stock levels so that the combined costs, detailed in E, F and G above are at a minimum. This is done by establishing two factors viz:

(1) When to order and

(2) How many to order

1.5   OBJECTIVE OF PROJECT

The main objective of this project are summarized thus:-

1. To consider and discuss the manual traditional system of stock control

2. To make this project as a reference for any investigation of inventory control system.

3. To attempt computerization of stock control system of the NYSC organisation warehouse with a view to reduce errors delays, system inefficiencies and aim at increasing profits or reduce costs by eliminating these deficiencies.

4. To make relevant recommendation for the computerization of the NYSC warehouse.

5. To list some problems requiring further study or investigation to complete this study.

INVENTORY CONTROL TERMINOLOGIES AND A SIMPLE STOCK SITUATION ILLUSTRATION.

(a)　lead or procurement time: The period of time expressed in days weeks, months, etc between ordering (either externally or internally) and replenishment, i.e when the goods are available for use.

(b)　Demand: The amount required by sales, production, etc. Usually expressed as a rate of demand per week, month, etc. Estimates of the rate of demand during the lead time are critical factors in inventory control systems.

(c)　Economic order Quantity (EOQ) or Economic Batch Quantity (EBQ): This is a calculated ordering quantity which minimises the balance of costs between inventory holding costs and reorder costs. We shall see the rationale of EBQ in Chapter two (2).

(d)　Physical stock: The number of items physically in stock at a given time.

(e)　Freestock: Physical stock Plus outstanding replenishment orders minus unfulfilled requirements.

(f)　Buffer stock or minimum stock or safety stock: A stock allowance to cover errors in forecasting the lead time or the demand during the lead time.

(g)　Maximum stock: A stock level selected as the maximum desirable which is used as an indicator to show when stocks have risen too high.

(h)　Recorder level: The level of stock at which a further replenishment orders should be placed. The reorder level is dependent upon the lead time and the demand during the lead time.

(i)　Reorder Quantity: The quantity of the replenishment

order. In some types of inventory control systems this is the EBQ, but in some other systems a different value is used.

THE STOCK TERMINOLOGY ILLUSTRATED - Below with the following assumptions:-
(1)   regular rate of demand
(2)   a fixed lead time and
(3)   a replenishment in one batch

Slopes Indicate
average Maximum
anticipated rate
demand.

Recorder Level
700 unit

Recorder Quantity
(usually EBQ)
in this case
60 units

safety stock

Lead Time
(5 weeks)

Stock Level

Time (in days or weeks etc)
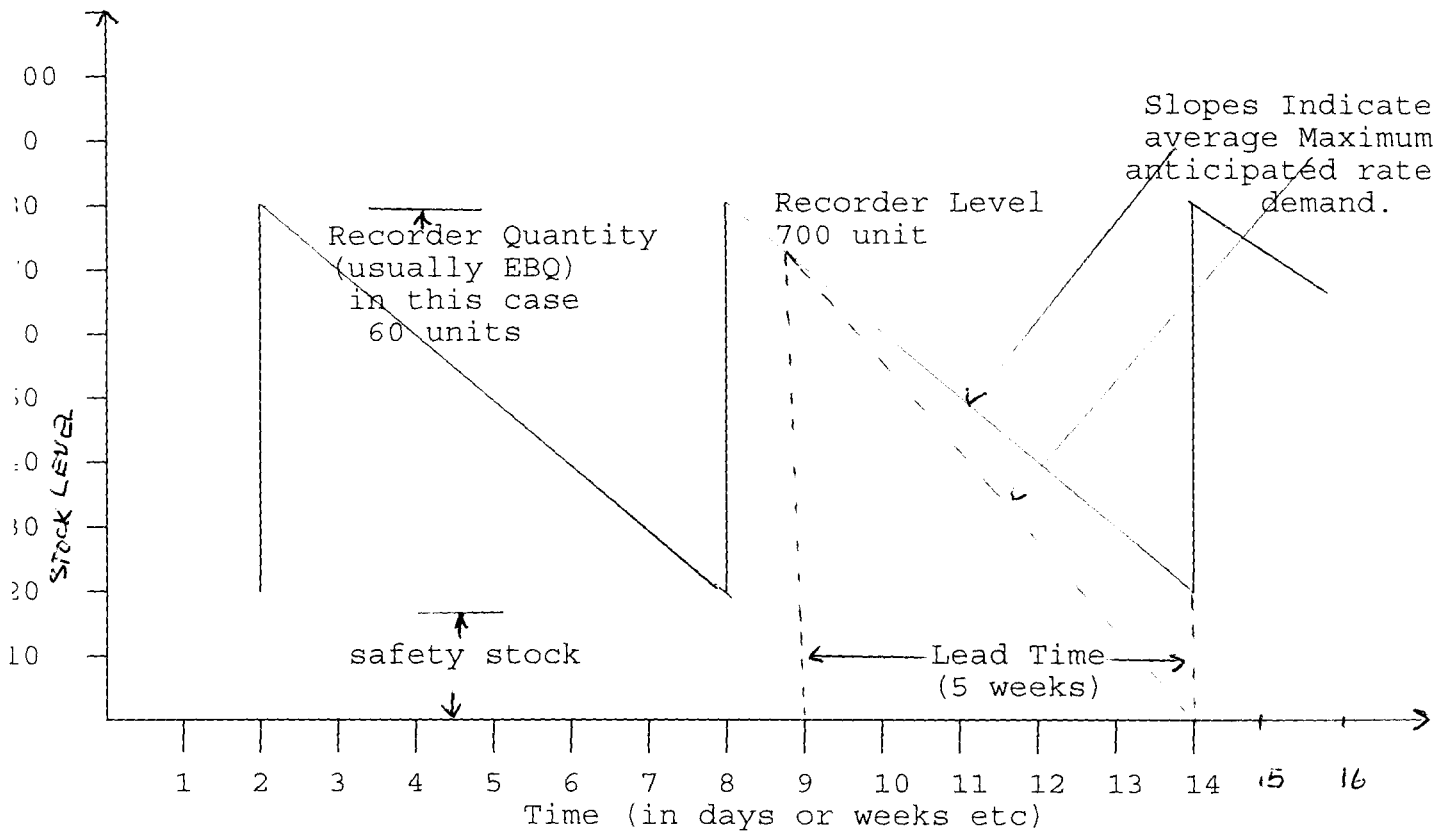
IG 1

Note: (a) It will be seen above (fig 1) that the safety stock in this illustration is needed to cope with periods of maximum demand during the lead time.

(b) The lead time as shown in 5 weeks, the safety stock 200 units and the reorder quantity 600 units

(c) With constants rates of demand as shown, the average stock is the safety stock plus 1/2 Recorder quantity; e.g in the fig 1 above the average stock is 20 + 1/2 (60) = 50.

CHAPTER TWO

2.0   BRIEF HISTORY AND PROCESS DESCRIPTION

The National Youth Service Corps (NYSC) scheme was established by Decree 24 of 22nd May, 1973, principally to promote national unity,integration and development. The National Directorate was inaugurated on   June 4, 1973. Professor Adebayo Adediji was appointed it's first Chairman (National) and Colonel(Dr) Ahmadu Ali it's first Director (National). The decree stated that the NYSC is being established "with a view to the proper encouragement and development of common ties among the youths of Nigeria and the promotion of national unity".

The objectives of the Service Corps were spelt out in some detail in Section 1(3) of the decree. While the scheme has itself undergone several changes and amendments, it's objectives have remained constant:

(a)   to inculcate discipline in Nigerian youths by instilling in them a tradition of industry at work and of patriotic and loyal service to the nation in any situation they may find themselves;

(b)   to raise the moral tone of our youths by giving them the opportunity to learn about higher ideals of national achievement and social and cultural improvement;

(c)   to develop in our youths attitudes of mind , acquired through shared experience and suitable training , which will make them more amenable to mobilization in the national interest;

(d)   to develop common ties among our youths and promote national unity by ensuring that :-

(i)   as far as possible, youths are assigned to jobs in states other than their states of origin;

(ii) each group assigned to work together,is as representative of the country as possible;

(iii) the youths are exposed to the modes of living of the people in different parts of the country,with a view to removing the prejudices, eliminating ignorance and confirming at first hand the many similarities among Nigerians of all ethnic groups;

(e) to encourage members of the service corps to seek, at the end of their corps service,career employment all over the country, thus promoting the free movement of labour;

(f) to induce employers, partly through their experience with service corps members, to employ more readily qualified Nigerians irrespective of their states of origin;and

(g) to enable Nigerian youths to acquire the spirit of self-reliance.

The decree also addressed the contentious issues of scope and applicability. While many Nigerians had advocated a scheme for Secondary school leavers and some preferred that it be targeted at first year University undergraduates, Section 2(1)(a)initially limited the scheme to first degree graduands of the Nigerian Universities not above the ages of 30. Section 4 and 5 of the decree outlined the structure, and gave the functions of it's principal officers. The Directorate, headed by a Chairman, was to be the governing body of the Service Corps and the now Director-General would be it's chief executive.

The organisational chart is clearly seen in fig 2 below

THE CURRENT ORGANISATIONAL CHART OF NYSC DIRECTORATE
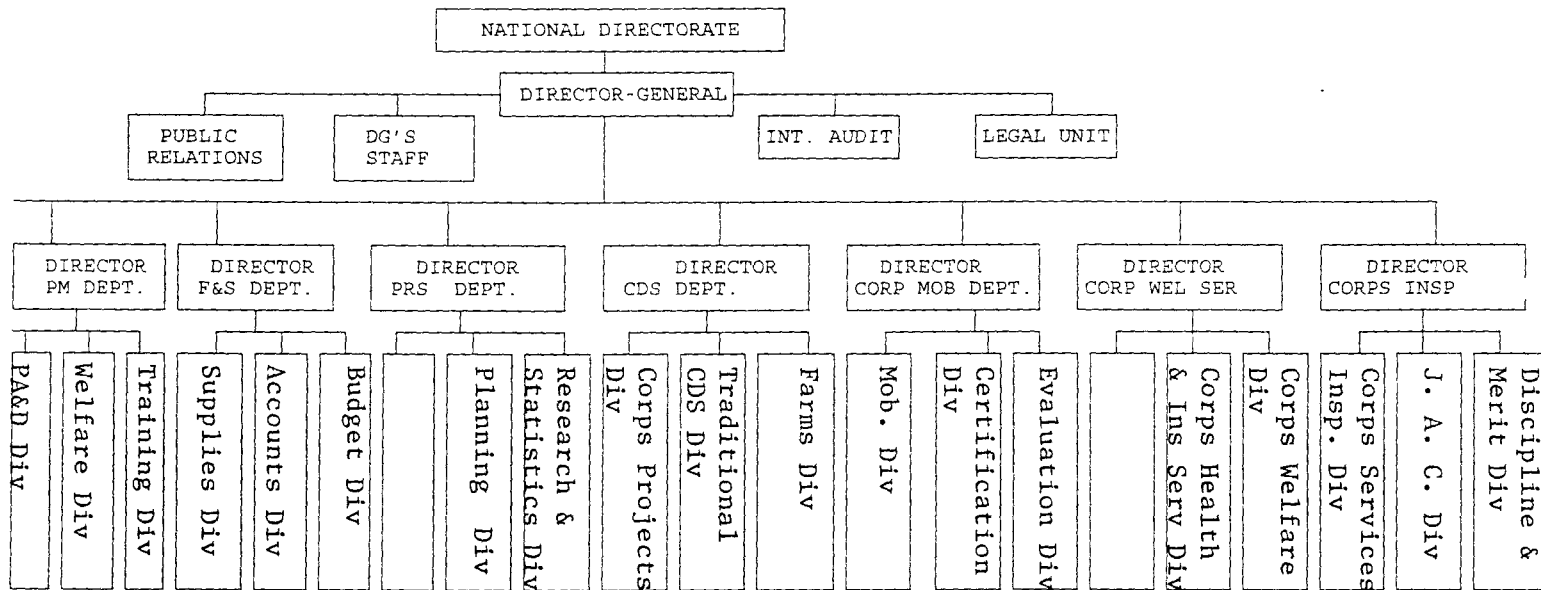
FIG.2

2.1 BRIEF FUNCTIONS OF THE UNITS AND DEPARTMENTS

The Director-General: The chief executive of the scheme was redesignated Director-General in line with the schemes status as a grade"A" parastatal in 1993

The Director-General's office has three statutory units. The three units are outlined below.

(i)   PUBLIC RELATIONS UNIT

The Public Relations Unit takes responsibility for protocol, publications, information photography/video matters.

(ii) AUDIT UNIT: A special cadre was approved for Audit staff in order to promote professionalism.

(iii)   LEGAL UNIT :   Legal unit was retained to continue to take charge of all the legal matters in the organisation.

THE DEPARTMENTS

The National Directorate Headquarters has seven Departments each headed by a Director on Salary Grade Level 17. Each Department is further subdivided into Divisions headed by a Deputy Director on Grade Level 16, assisted by Assistant Director, Grade level
15 heading branches and Grade Level .14 officers heading sections.

The organisation is as in fig.2 above.

(i)   Personnel Management Department

Personnel Management Department is responsible for personnel and establishment matters within the scheme. Essentially, the Department is responsible for appointment, promotion and discipline of staff; training and retraining of officers; annual personnel budget and pension and gratuities.   The Personnel Department is divided into three divisions   (a)

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Appointment, Promotions and Discipline. (b) Training. (c) Welfare.

(ii) Finance and Supplies Department:

The Department is made up of three divisions with the following functions; (a) Accounts: The division deals with the financial administration of the organisation. (b) Budgets: The Budget Division is responsible for the preparation of the annual budget of the organisation and monitoring of budget implementation.

(c) Supplies: The Division is in charge of procurement, administration and maintenance of vehicles.

(iii) Planning, Research and Statistics.

The Department is in charge of corporate and programme planning, plan and programme monitoring and evaluation, research, statistics, records, library and the computer. For the efficient performance of these functions, the Department is organised around two Divisions namely: (a) Planning Division and (b) Research and Statistics Division.

(iv) Corps Mobilization

The Department is mainly concerned with the mobilization of corps members for national service, their deployment, as well as their certification after a successful service year. The Department is made up of three Divisions, namely;

(a) Mobilization.

(b) Evaluation.

(c) Certification.

(v) Inspectorate Department

The Inspectorate Department is in charge of supervision and inspection of corps members in their various places of primary assignment, close monitoring for disciplinary cases and merit award for outstanding service, and for a smooth transition to a profitable career after the service year. The following are the Divisions under the Department; (a) Corps Service

Inspection. (b) Job Counselling, and (c) Discipline and Merit.

(iv) Community Development Service Department

The Department is responsible for the coordination of all NYSC farm projects nation-wide and traditional community development projects embarked upon by corp members in their places of primary assignment and for corps projects and ventures. The Department is also an operational Department concerned with corps projects like feed mill, Garment Factory, Shoe Factory, and Garri Factory. The CDS Department consists of three Divisions:

(a) Farms. (b) Traditional Community Development Service (CDS).

(c) Corps Projects.

(vii) Corps Welfare Services Department

The Department, formerly Health and Corps Welfare Services, was renamed Corps Welfare Services in line with the primary focus of the scheme on corps members. The Department is responsible for the supervision of health services delivery to various communities by the corps health personnel. The health needs of corps members and staff, corps insurance and administration of the burial of deceased corps members. The Department is sub-divided into two Divisions; (a) Corps Welfare. (b) Corps Health and Insurance.

2.2   <u>STATES SECRETARIATS</u>

NYSC Secretariats are located in each of the 36 states of the federation and the Federal Capital Territory, Abuja. The State Secretariats are headed by State Directors (Deputy Director, Grade Level 16) who is assisted by a number of other principal officers.

The various Departments and Divisions at the National Directorate Headquarters are replicated at the State Secretariats. The State Secretariats are expected to implement NYSC policies as they affect the states. However, there is room for local variation in view of the geo-political, socio-

cultural and economic peculiarities of each state.

2.3 ORGANOGRAM OF FINANCE AND SUPPLIES DEPARTMENT

As mentioned earlier, the NYSC organisation has seven Departments and the warehouse is in the Finance and Supplies Department. It is represented thus:

```
                    ┌─────────────────────────────────────────┐
                    │        FINANCE AND SUPPLIES  DEPT.      │
                    └─────────────────────────────────────────┘
                                       │
         ┌─────────────────────────────┼──────────────────────────────┐
  ┌──────────────┐            ┌──────────────┐             ┌──────────────┐
  │   ACCOUNTS   │            │   SUPPLIES   │             │    BUDGET    │
  │   DIVISION   │            │   DIVISION   │             │   DIVISION   │
  └──────────────┘            └──────────────┘             └──────────────┘
```

FIG.3

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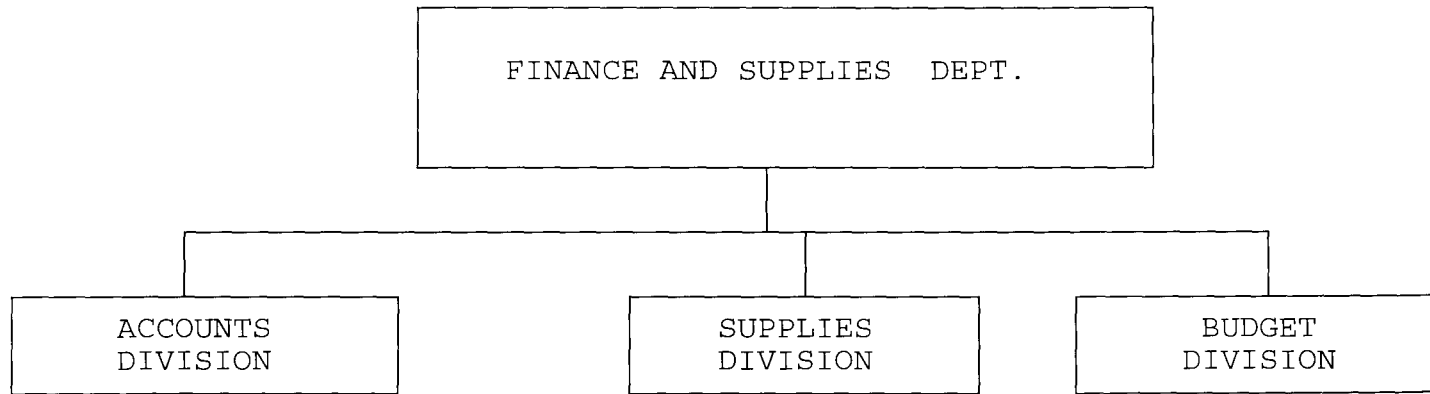
The warehouse is in the Supplies Division and comprises of three subsections
thus;

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                        ┌──────────────────────────────────┐
                        │                                  │
                        │             SUPPLIES             │
                        │             DIVISION             │
                        │                                  │
                        └──────────────────┬───────────────┘
                                           │
            ┌──────────────────────────────┼──────────────────────────────┐
            │                              │                              │
   ┌────────┴─────────┐          ┌─────────┴────────┐          ┌──────────┴────────┐
   │    RECEIVING     │          │    PHYSICAL      │          │     RECORDS       │
   │    SECTION       │          │    SECTION       │          │     SECTION       │
   └──────────────────┘          └──────────────────┘          └───────────────────┘
```

FIG.4

18
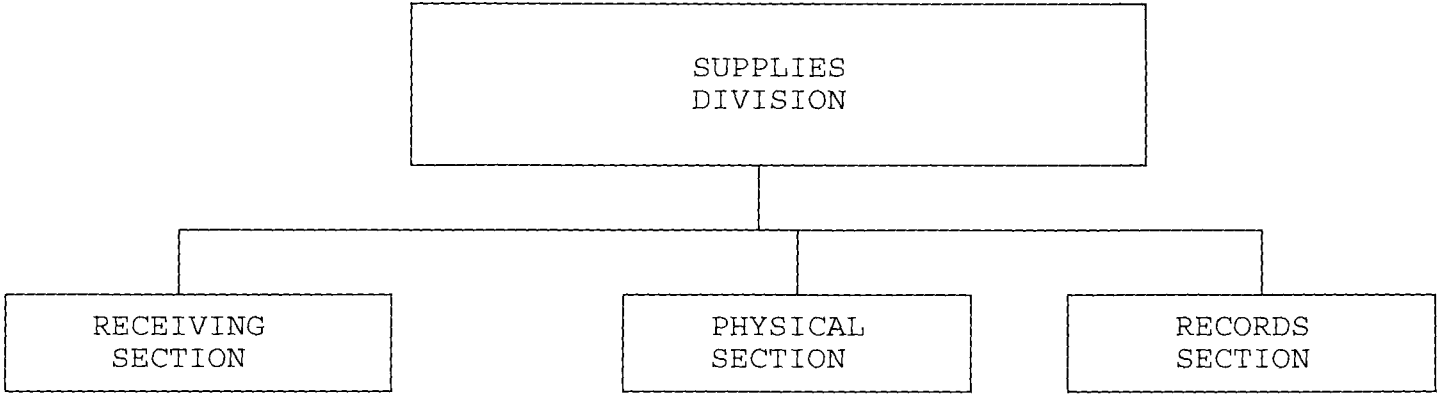
Each of the subsections above is vividly described below under the term:-

PROCESS DESCRIPTION

In the process description, it would be seen how items come into the warehouse, how they are received, stored and issued out. How the records are kept and maintained.

2.4 THE RECEIVING SECTION

As suppliers bring items to the warehouse, they go first to the receiving section. Suppliers present original contract paper to the receiving officer.

The officer then checks the items supplied in accordance with control procedures (pre-inspection). If the items are okay, goods are accepted from the contractor/supplier. Also, the Receiving Officer signs the delivery note and invoice from the contractor/supplier. Store verification forms are prepared that is Quality control format Appendix I. The Quality Control Committee (QCC) is invited for actual inspection. When the quality is

ascertained, then stock verifiers (auditors) are invited for the

certification of the quality of the items. When the two (2) teams, that is, Quality Control Committee and stock verifiers have completed the inspections and are satisfied with the items then the items are taken on charge (i.e. you are accountable) with Store Receipt Voucher (SRV) booklet.

After this the Receiving Unit will hand over the items to the officer in charge of the physical section.

2.5 PHYSICAL SECTION

The Physical Section receives items from the Receiving Officer after having duly signed the Store Receipt Voucher (to put on charge). The items range from capital, stationary, kits etc.

The items are recorded into the Bin card. They arrange the

stock in shelves alphabetically.

The Bin card is as shown below:-

DATE	SRV OR SIV NO	FROM WHOM REC'D OR WHOM ISSUED	RATE	RECEIPT QTY/VALUE	BALANCE QTY/VALUE	SIGN

FIG.5

The Bin card is attached to the particular item supplied . That is to say, each has it's Bin card attached. The users come for their items after due approval by the appropriate authority then Store Issue Voucher (SIV) is issued for the item(s) to be collected and same number posted to the Bin card.

2.6 STOCK TAKING

Stock taking is conducted in three ways viz; (1) continuous, (2) periodic and (3) annual stock taking.

The continuous stock taking is conducted continuously. That is to say, it can be conducted at any point in time.

The periodic stock taking is conducted periodically, say quarterly and the annual stock taking is conducted or comes every end of year.

This allows the organisation know what is in stock.

2.7 REORDER LEVEL

The periodic stock balance is used to prepare the next order. That is to say, the reorder level is determined by the physical section based on the stock balance.

Two Bin cards are kept for this , that is, the Reorder Level, these are;

(1) Maximum to be kept, say 50, and

(2) Reorder level, say 15, and the stock should not go less than 10 minimum.

2.8 THE RECORDS SECTION

The Records Section just as the name implies keeps records on items supplied and issued out.

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Items are received on Stock Receipt Vouchers (SRV) booklets. The SRV contains the items. Records Section takes on charge into the ledger, on certainty that the items are supplied and are available in the store.

The Records Section does not see the physical items, only the Receiving and Physical Sections see the items and handle them.

The Physical Section takes the items into the store and they are recorded into the Bin card. The Bin card is in the form below;

DATE	SRV OR SIV NO	FROM WHOM REC'D OR WHOM ISSUED	RATE	RECEIPT QTY/VALUE	BALANCE QTY/VALUE	SIGN

FIG.6

An approval for issuance of items is required. After which it comes to the Record Section. The Record Section raises (SIV) on the item approved to be issued. The recipient signs for the item on the SIV. The duplicate copy of the SIV is given to the recipient for collection of the items from the physical section of the warehouse.

The Records Section then posts each item into their respective folios into the ledger (kalamazoo). The ledger or kalamazoo looks similar to the Bin card.

ITEM....   UNIT ISSUE.... MAX.... MIN....
    REORDER LEVEL.... FOLIO....

DATE	S/NO	SRV OR SIV NO	FROM WHOM REC'D OR WHOM ISSUED	RATE	RECEIPT QTY/VALUE	BALANCE QTY/VALUE	SIGN

FIG.7

Any item issued is being deducted from each folio of the particular item and any item that comes into the store is being added into it's own folio.

2.9   HAND OVER OF STORE PROCESS

In the process of handing over of store, two officers are involved viz; the in-coming and the out-going. The two officers involved should be available and stock taking conducted in the presence of all concerned. After the stock taking has been conducted, the officer being handed over to will be responsible for any shortage recorded or discovered. In the case of the person to be handed over to not being available, a member of the Board of Survey is called upon for same purpose, who will then hand over later to the store officer when he/she avails himself/herself.

Three (3) hand over notes copies will be prepared for the following purposes;

(1) For the outgoing officer;

(2) For the incoming officer;

(3) For filing.

However, for a member of the Board of Survey, eight (8) hand over notes copies are prepared.

CHAPTER THREE

3.1   TESTING PROJECT FEASIBILITY

There are three testing project feasibility that has to be undertaken, these are:-

a) OPERATIONAL FEASIBILITY:- This relates or is concerned with the workability of the proposed information system when developed and installed.

b) TECHNICAL FEASIBILITY:- This test seeks to clarify if the proposed project can be done with current equipment, existing software technology and available personnel.

c) ECONOMICAL FEASIBILITY:- The test for financial feasibility is undertaken to assess cost of implementing a proposed project vis-a vis the benefit derived in implementing the project.

3.2   COST ANALYSIS

The cost analysis for this system to be feasible in the NYSC Organisation is detailed below. It is expected that this could be improved upon as the management continue to appreciate the ne system.

HARDWARE	N#,000.00
COMPUTER SYSTEM (IBM)	90,000.00
PRINTER (EPSON)	40,000.00
UNINTERRUPTED POWER SUPPLY (UPS)	40,000.00

CONSUMMABLES	50,000.00
PERSONNEL	
OPERATORS (3)	15,000.00
STAFF TRAINING FOR 3 DAYS	20,000.00
SOFTWARE: dBASE IV	
MAINTENANCE	20,000.00
MISCELLANEOUS	25,000.00
	_____
TOTAL	**300,000.00**

3.3   BENEFITS

The benefits of the new system when implemented would take care of the following:-

1. Job will be done with a lot of ease, neatness and less complexity.

   2. As a check to pilfering of store items.

   3. Calculate the cost of inventory on demand

   4. Prepare the list of those items where the stock has fallen below a predefined limit

   5. Prepare the list of items where the stock has gone higher than a predefined limit

   6. Keep track of the complete record of all items issued and purchased so far for the record (history) and for costing purposes.

   7. Print various reports at short notices.

3.4   INPUT AND OUTPUT ELEMENTS

Some of the input elements which are invariable the output elements are:

Khaki Suit

Plain Vest

Crested Vest

Jungle Boots

Canvas

Cap

Motorised Lawn Mower

Wheel Barrow

Vacuum Cleaner

Giant Fridge (T 400)

Duplicating Machine

Public Address System

Standing Fan

Ceiling Fan

Steel Cabinet

Fire prove Cabinet

Laminating Machine

Thermocool Fridge (m)

Deep Freezer (g)

Manual Typewriter

Fax Machine

Stabilizer

Industrial Gas cooker

Video machine

Colour T.V "21"

Micro wave

Gas cooker 4 burners

Window airconditioner

Colour TV "14"

Heavy duty T battery

60 Amp car battery

Steel bucket

Electric typewriter (IBM)

Universal typewriter

Wall clock

11.00 x20 tyre

11.00 x 20 tube

9.00 x 20 tyre

9.00 x 20 tube

185 x 14 tyre

185 x 14 tube

175 x 14 tyre

175 x 14 tube

7.50 x 16 tyre

7.50 x 16 tube

Mail franking machine

Computer machine

Manual block making machine

Roofing machine

Tissue paper

Lux

Toilet roll

Raid

Omo

Airfreshner cake

Bar soap

Hand towel

Liquid soap

Airfreshner (tin)

Izal

Big serving spoons

Big tray pan

Aluminum serving basin (5)

Battery Charger

Biro

Duplicating paper f/s

Duplicating paper q/s

Photocopy paper f/s

Photocopy paper A/4

Typing sheet f/s

Typing sheet q/s

Ruled sheet

IBM ribbon

Tonner ink
Stencil paper
Duplicating ink
Tippex corrector
Stencil corr. fluid
Developer (730)
Typewriter eraser
4ft flourecent fitting
4ft flourecent tubes
2ft flourecent fitting
2ft flourecent tubes
Envelop 16 x 12
Envelop 9 x 4
Envelop 15 x 10
Electric bulb
Double punch
Liquid gum
Single punch
Dictionary
Office pin
Office clip
Sellotape
Stapling pin
Stapler giant
Pocket calculator
Torch light
Ruler (12/18)
Stamp pad
Adding machine roll
Endorsing ink
Inward/Outward reg.
File jacket
Corps ID cards
Reporter notebook
Attendance Register

Carbon paper f/s

File tag

Carbon paper q/s

Marker pen

Manual call bell

Rain coats

Rain boot

White tereflen

Blue tergal

Brown Tecellen

Pin bord

Steple remover

Staff ID cards

CHAPTER FOUR

SOFTWARE/PROGRAM DEVELOPMENT AND DOCUMENTATION

INTRODUCTION:- Software/program development process is a cooperative effort of users and computer professionals. The skills and knowledge of these two groups complement each other and can be combined to create any type of information system during the system's development process. There are five important phases of system development. These are:-

system analysis

system design

programming

system conversion and

system implementation.

4.0 SYSTEM DESIGN: In the previous chapters it is seen how the process description in the case of the manual system works. Our aim now is to work from the requirements specification to produce a system specification. In system specification we will attempt to give detailed set of input documents, forms, report layouts which provide details of all features of the system.

In the NYSC organisation, in developing the stock control system; besides providing the latest stock position. The important functions of the Inventory control program are:-

1. Supplying instant and accurate position of stock.
2. Grouping and sorting of items
3. Providing "ABC" or other types of classification to assist in actual inventory control.
4. Giving information and latest stock position about a particular item.
5. On-line or batch mode of issue of material to various

department, states/cost centres.

6. Identifying and preparing indents or purchase orders for the items whose stock goes below the pre-set limit.
7. Keeping track of items being purchased.
8. Helping in production planning
9. Maintaining a history file for all purchases and issues.

4.1   CHOICE OF LANGUAGE

The popular Dbase IV an advanced version of dBASE III that provides a full relational database environment to users will be used. Many find the assistant mode in dBase III plus too restrictive, the Control centre of DBase IV is a significant improvement. Through the Control centre and without the use of command language, One can design databases, manipulate and edit records and files, generate reports perform database query, design labels and browse databases. Data fields can be specified with default values as well as valid ranges. Data can be verified automatically as the are entered into fields.

Up to 255 fields can now be specified per record and a database can be related to more than two other database programs and procedures can also be compiled and saved as object codes for further execution. Pop-up menus and windows can be designed. Other improvements include a larger number of memory variables, user definable functions. indexing, larger command line buffer, an improved command line editor, improved printer handling capabilities and faster execution. A query-by-example function is also provided.

The SQL (Structured Query Language) command Language is for more powerful than Dbase command language and provides relational database capabilities that far exceed those offered in Dbase III plus. For example, using SQL, it is possible to perform queries on relationships that span several database,

without using the large number of commands that would be necessary with dbase III plus. The Dbase IV is menu driven. The concept of an integrated, modular menu driven program will be used for inventory Control which uses multiple database files.

4.2   THE SCHEME OF THE STOCK CONTROL SYSTEM

An organization NYSC maintains a central store/warehouse where all items used in the organisation are stocked. Items are issued from this warehouse to the departments/states. When the stock of items falls below a pre-set limit, the management purchase additional stock. The Inventory control program takes care of the following three basic jobs:

1.   Maintaining the correct stock position

2.   Issuing items from the store/warehouse

3.   Receiving purchased items.

In addition to these functions the Inventory Control Program should also do the following Jobs:

1.   Calculate the cost of inventory on demand

2.   Prepare the list of those items where the stock has fallen below a predefined limit

3.   Prepare the list of items where the stock has gone higher than a predefined limit

4.   Keep track of the complete record of all items issued and purchased so far for the record (history) and for costing purposes.

5.   Print various reports.

It is clear that from the above discussion this inventory Control program moves around the stores/warehouse. That is, the warehouse department maintains the stock, the items are issued from the same department, the items are purchase by the organisation in the first place. The report are prepared based on the stock position in the warehouse. In fact, the whole Inventory Control Program moves around the current stock in

the warehouse department.

The items issued from the warehouse are recorded in the issue file and the ones purchased in the purchase file. The current stock position file, which is also called the master file, is updated by the issue and purchase files (also called child or transaction files). Symbolically, this is shown in the figure below

```
+-------------------------------------------------+
|    Master Inventory Database file               |
|    (STOCK.dbf) Keeps track of latest            |
|    Inventory position                           |
+-------------------------------------------------+
         |                              |
         |                              |
+----------------------------+   +----------------------------+
|  issue database file ISSUE.dbf |   |  Purchase database        |
|  Keeps track of items issued from|   |   PURCHASE.dbf keep       |
| store                      |   |    track of Items          |
+----------------------------+   | purchased for Store        |
                                 +----------------------------+
```
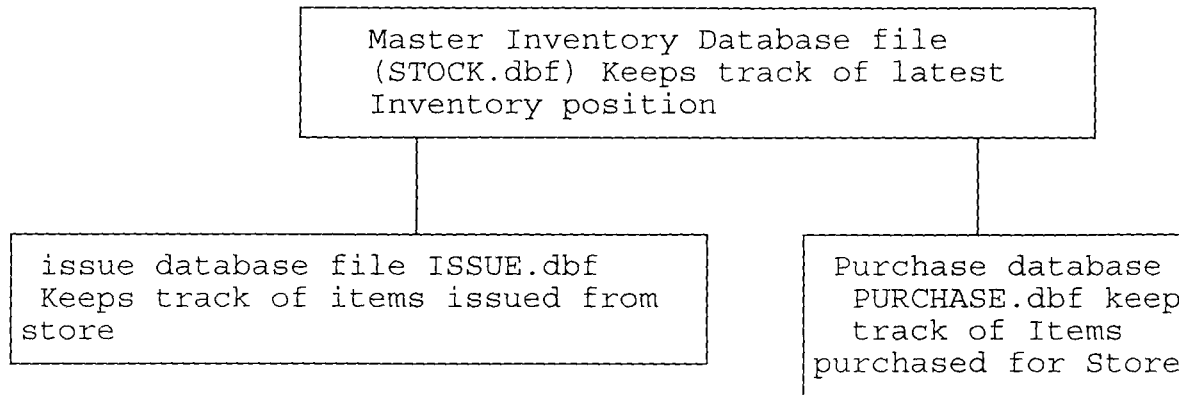
FIG.8   Basic inventory control Scheme.

4.3   FILES CREATION PROCESSING SYSTEM

From the discussion so far, three database files are needed. The main (Master) database file, which is named Stock.dbf, will store the following information:-

1. Part number of Item
2. Description of Item
3. current Quantity in Stock
4. Unit Price
5. Last Date of Issue
6. Low Record level (re-order level)
7. High Record level

A STOCK.dbf is created with the structure below

	FIELD NAME	TYPE	WIDTH	DEC.
1.	ITEMNO	CHARACTER	6	
2.	DETAIL	CHARACTER	20	
3.	QNT	NUMERIC	5	0
4.	PRICE	NUMERIC	8	2
5.	DATE-ISU	DATE	8	
6.	LOW	NUMERIC	3	0
7.	HIGH	NUMERIC	4	0

FIG.9 STRUCTURE OF STOCK database file

This structure is saved and records will be entered through the inventory control programme later.This file is indexed on the PARTNO field (a file can be indexed even if it does not contain any record). The following commands are used to index the file.

     . USE STOCK

     . INDEX ON PARTNO TO STOCK

Again the CREATE ISSUE command is used to create a database file to hold the information for the issue of items from warehouse. This file has fields for part number, Quantity and

date of Issue as follows:

	FIELD NAME	TYPE	WIDTH	DEC
1.	PARTNO	CHARACTER	6	0
2.	QNT	NUMERIC	5	0
3.	DATE-ISU	DATE	8	

Fig.10 Structure of Issue.dbf file

This structure is saved and records not entered. Both STOCK and ISSUED files use the same field names to store the part number. This is so because we have to link these files, for which it is essential that both have a common field. This file is indexed on the PARTNO field.
.INDEX ON PARTNO TO ISSUE

A file to store the information regarding the items purchased is created with the fields part number, quantity purchased, purchase order number, price, name and address of contractor or vendor.The CREATE PURCHASE command is used to enter the structure given below.

	FIELD NAME	TYPE	WIDTH	DEC
1.	PARTNO	CHARACTER	6	
2.	QNT	NUMERIC	5	0
3.	PURDRDNO	CHARACTER		
4.	PRICE	NUMERIC		
5.	NAME & CONTRA			
6.	CONTRAT ADD			

FIG.11   Structure of Purchase.dbf file

The structure is saved and no record is entered in this file. Here too, the name of the part number field is PARTNO. This PURCHASE database file is indexed on the PARTNO field.
. INDEX ON PARTNO PURCHASE

This completes the creation of the three database files required for the inventory control programme. The STOCK database file maintains the current stock position. The items

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which are issued during the day from the store are appended in the ISSUE database file. The ISSUE database file is used to update the STORE.dbf file after the day's work or transaction. After updating the STORE.dbf file, all records from the ISSUE.dbf are removed (deleted), so that the STORE.dbf file is not updated twice (by mistake). Since records are deleted from the ISSUE.dbf, another database file has to be maintained to store a record of all the items issued (so far) from the store. Obviously, this file will have the same structure as that of the ISSUE.dbf file. The COPY STRUCTURE command is used to copy the structure of the ISSUE.dbf file to IMASTER.dbf (Issue Master file)

. USE ISSUE

. COPY STRUCTURE TO IMASTER

Similarly, a Purchase Master file is needed. The structure of the PURCHASE.dbf file is copied to create the PMASTER.dbf file

. USE PURCHASE

. COPY STRUCTURE TO PMASTER

Now, there are 5 database files in all:-

1. STORE.dbf: Maintains the current stock position.

2. ISSUE.dbf: Maintains a list items issued (Prior to updating the STORE.dbf file)

3. PURCHASE.dbf: Maintains a list of items purchased (Prior to update the STORE.dbf file)

4. IMASTER.dbf: Master Issue file. A complete record of all items issued so far is stored here

5. PMASTER.dbf: Master purchase file. A complete list of all items purchased so far is stored in this file.

4.4   ON-LINE DATA ENTRY IN FILES

This inventory control programme should have a facility for an on-line entry of records in STORE, ISSUE and PURCHASE

database files. In dBase IV we easily design separate screen format files for data entry in ISSUE and PURCHASE database files.

4.5 THE STOCK CONTROL SYSTEM PROGRAM:- The inventory control is a menu driven programme, that is, it should display the jobs it can do and ask the user to make a choice. Then, depending on the users choice, it should do the required job and redisplay the menu. It continues to run in this manner unless the user selects the option to exit from the program. The program do the following jobs:

1. List Items
2. Add Items
3. Receive Items
4. Issue Items
5. Calculate Inventory Cost
6. Update Stock
7. Edit Item
8. Generate Reports
9. Exit

What these options are supposed to do are:-

The first option "List Item" is used to list the records of the STORE.dbf file on the screen, or optionally, on the printer too.

The second option "Add Items" is used to add a new item in the STOCK database file. This is different from a simple APPEND, because the program checks whether the ITEMNO being entered already exists. This prevents the same part number being assigned to two different items.

The third option "Receive Items" is used to append the items received (purchased) in the warehouse in the PURCHASE.dbf file using the PURCHASE.fmt format file.

The fourth option is used to append records in the ISSUE database file (using the ISSUE.fmt format file) corresponding to the items being issued from the warehouse (STORE.dbf file)

Option 5 is used to calculate the total cost of the

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inventory (cost * price for all items) and option 6 to update the STORE.dbf file. Option 6 reads all records from the PURCHASE.dbf file and add the quantities in the corresponding records in the STOCK database file. It also copies the records from the PURCHASE database file in PMASTER. Then it will update the STORE.dbf file from the ISSUE file (by subtracting the QNT field from the QNT field of the ISSUE file for those records where part numbers are common to both files). Similarly, it also appends records from the ISSUE file into the master Issue file (IMASTER.dbf). After updating the stock file from ISSUE and PURCHASE files, it deletes all records from these files (ISSUE and PURCHASE), So that if this option is used twice, it does not update (change) the stock position again.

The seventh option "Edith Item" is used to edit any item by entering the ITEMNO. and the eight option is used to display or print reports and the last terminates the program and returns to the dot prompt mode.

4.6   PROGRAM LISTING SYSTEM

The Inventory control program uses a main program called INVENT.prg, and four other programs - ITEM ADD.prg, UPDATE.prg, EDITH ITEM.prg and REPORTS.prg.

The inventory/stock control program also includes a procedure file GENERAL.prg. The program listing for these programs is given in the appendixes. The programs are liberally commented for any other programmer to follow.

INVENT program: The invent program is the main program which displays the menu and lets the user select an option and accordingly branches to the corresponding part. The program listing for the INVENT.prg program is given in appendix---

4.7   ITEM ADD Program.

The ITEM ADD PROGRAM is used to add a new item in the STOCK database file. The program listing is given in appendix

4.8 UPDATE PROGRAM.

The main objective of the update program is to update the STOCK file from the PURCHASE and ISSUE database files. The program listing for the update program is given in appendix

4.9 REPORTS PROGRAM

The main objective of this program file is to display or print reports. this listing program is given in appendix .....

4.1.0 GENERAL PROGRAM

This is a procedure file which contains two procedures that is procedure TITLE and procedure PRINTCHK.

PROGRAM DOCUMENTATION

4.1.1 GENERAL.prg File

This program file, which is a procedure file, contains two procedures: TITLE and PRINTCHk. The TITLE procedure is used to display the name of the organisation (NYSC NDHQ WAREHOUSE ABUJA)

and the current date and time. A parameter that has been passed to this program is assigned to a character variable HEADING and displayed with a @ 4,5 SAY HEADING command. Thus, any message can be displayed in this line. The command @ 5,0 SAY REPLICATE ("-",80) will repeat "-" character 80 times to display a continous line. RETURN makes the end of this procedure and returns control to the calling program.

The PRINTCHK procedure is used to ask for the users option for printing results. It first clears the screen from the 22nd row onward and then displays a message and asks for the user's choice through the WAIT command. The key pressed by the user is stored in a character variable PRCHK. The IF-ELSE-ENDIF structure converts the PRCHK variable to upper case and validates it. If PRCHK contains P, it stores " TO PRINT" in a variable PSELECT, else " " is storeD in it. This variable is used in the calling program through macro, eg LIST & PSELECT is transformed to LIST TO PRINT If the PSELECT contains "TO

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PRINT "

4.1.2   INVENT. Prg File.

This is the main program . The first part of this program is used to established a working environment, ie to change the SET parameters, declare the variables and select the procedure file.

The PUBLIC PSELECT command creates a variable PSELECT which is of public type, ie this variable can be defined anywhere in the program and is available in all programs . Initially a blank space is assigned to it (PSELECT = " ") the next command (SET PROCEDURE TO GENERAL) selects the GENERAL.prg file as the procedure file for this program.

The command DO WHILE .T. establishes a loop which is always true.
Then, it displays a title " Main Menu" (through DO TITLE WITH Main
Menu"). The main menu options are displayed by enclosing the text (to be displayed on the screen) within the TEXT and ENDTEXT commands. The text typed between TEXT and ENDTEXT will be displayed on the screen exactly as typed here when the program is executed.

The following commands are used to assign the value 9 to a numeric variable CHOICE, display it on the screen and READ its value from the keyboard.

```
CHOICE = 8
@ 18, 5 SAY " Enter your choice(1-9)...;
GET CHOICE PICTURE "9" RANGE 1,9
READ
```

The PICTURE "9" option limits the number of digits that can be entered for the CHOICE variable to 1 and RANGE 1, 9 limits the range of numbers form 1 through 9.

After the user types his option (in the CHOICE Variable), DO CASE_
ENDCASE checks the value of this variable and accordingly

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executes the commands associated with the corresponding CASE. When you study the program listing,you will find that DO TITLE has been used at several places. In all these a places, the same procedure is used to display a different title. This is one of the most common uses of a procedure file. " CASE CHOICE=1" just displays the title, selects the database file, asks for the print option (through the PRINTCHK procedure) and LISTS the records.

"CASE CHOICE = 2" is used to add new items in the STORE.dbf file. In this CASE, the program only displays the title and executes the program from the ITEMADD.prg file . So dBase IV executes commands from the ITEMADD program file, after which it returns to the program.

The next CASE is used to receive items purchased by the WAREHOUSE of NYSC DHQ ABUJA. This CASE displays the title, selects the PURCHASE database file with the index file PURCHASE.ndx, select the PURCHASE.fmt format file (SET FORMAT TO PURCHASE) for data entry , and APPEND records . After the user has appended all records, the program returns to the SET FORMAT TO command,which de-selects the PURCHASE.fmt format file and selects the dbase IV standard format file. "CASE CHOICE=4" works exactly in the same fashion as the previous CASE except that it appends records in the ISSUE database file.

"CASE CHOICE =5" is used to calculate the total cost of an inventory (in the stock database file). The program displays the title, displays a message and calculates total inventory cost by using the SUM QNT* PRICE command . The result of the sum command is stored in the INVCOST command and which is then displayed.

The next CASE updates the STOCK.dbf file. This CASE only displays a title and the rest of the job is done by calling the UPDATE.prg file.

"CASE CHOICE =7" works as "CASE CHOICE =4" except that it edits the records in the database of the item entered.

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"CASE CHOICE=8" prints reports through the REPORTS program file and the last CASE, When true, executes the EXIT command to exit from the DO WHILE - ENDDO loop. When the program exits, it closes all database files, restores the SET parameters to their original settings and clears the screen.

4.1.3   ITEM ADD.prg file:

The ITEM ADD.prg program is used to add new items in the STORE.dbf file. This program does not use the simple APPEND command to add new records (part or item number and other details). Here, the program asks for a part number. Then it checks if this part number already exists. If so, it does not add a new record. If the entered item number does not already exist in the STORE.dbf, it adds a new record with the ITEMNO field as the newly entered Item number and asks for more information regarding this record. This is done in such a manner that each ITEMNO refers to a unique item. In other words, more than one item should not have the same ITEMNO.

In the program listing, initially the STORE.dbf file is opened with the index file (STOCK.ndx). Refer to the following three commands in ITEM ADD.prg.

```
FPART = SPACE (6)
@ 7,0 SAY "Enter new part number ....;
"GET FPART PICTURE" @"
READ
```

The first command creates a blank variable FPART, which is six characters long (same as the ITEMNO field). The next command displays a prompt (Enter new Item number...) and also the FPART variable and the READ command asks for a value for FPART. Anything that is typed is assigned to the FPART variable. The PICTURE clause (PICTURE "@!") Converts all lower case letters to upper case.

The next command [SEEK TRIM (FPART)] removes the trailing blanks from the FPART variable and SEEK it in the STORE.dbf.

file.

If the item number in the FPART variable already exists [IF FOUND()],it displays a message and sounds a beeper (through the ? CHR(7)command),else the program appends a blank record (APPEND BLANK) and writes FPART in the ITEMNO field (REPLACE ITEMNO WITH FPART). After that,it selects the format (for data entry) through the SET FORMAT TO STOCKADD command and the READ command accepts data for the newly created record. Then the program restores the DBASE IV standard format (SET FORMAT TO),closes databases files and RETURNS to the INVENT.prg program (which is called ITEMADD program).

4.1.4   UPDATE.prg file

This file is used to update the STORE.dbf file from PURCHASE and ISSUE database files.The SET SAFETY OFF command asks DBASE IV not to give a warning message when the program tries to overwrite any file.Then the program displays "please wait ..." and "updating STOCK file from PURCHASE file ..." messages.

Next the program opens the STOCK database file (with the index file)in work area 1 and the PURCHASE file(with index file)in work area 2.After opening both the files,it selects work area 1 and the UPDATE command updates the STORE file from the PURCHASE file in the following way:

> The QNT field of the STOCK file changes to the previous QNT value + the QNT field contents of the PURCHASE file; the DATE_ISU field changes to the current date for those records where the ITEMNO field is the name in both files.

After that, it updates the PMASTER file from PURCHASE,i.e. appends records from the PURCHASE file into the PMASTER file. The following three commands perform this function;

SELECT 2
USE PMASTER
APPEND FROM PURCHASE

Next, the program deletes records from the PURCHASE file.The

ZAP command is used for this purpose.The program first opens the PURCHASE file with the index file(USE PURCHASE INDEX PURCHASE) and then uses the ZAP command.

Likewise,the UPDATE.prg program uses the ISSUE file to update the STOCK.dbf file. Then the program closes the database files,restores SAFETY and RETURN.

4.1.5   REPORTS.prg file

The REPORTS.prg file is called by the main program to print reports. It uses the STORE.dbf file (with the index file) and establishes an infinite DO WHILE - END DO loop.Then, it first displays the title and then a menu (the menu text is enclosed within TEXT and ENDTEXT). Similar to the INVENT.prg program ,it initialises the OPTION variable and asks you for its value.

Then, depending on this value,the program selects the appropriate CASE and generates the corresponding report. The program uses a report format file STOCK. To create this report format file, use the command;

.USE STOCK

.CREATE REPORT STOCK

and define a suitable report title. Include all fields in the report and define suitable column headings.The STORE.dbf file contains many numeric fields and the DBASE IV report format totals all numeric fields by default. Change the "To this column" option from the default "Yes" to "No".(move cursor to this option and press "enter").

In the REPORTS.prg program,all reports use the same report

format file. In all CASE statements,the program displays the title,asks for the print option and display/prints the report by including a suitable "condition",as required.

The program exists to the main program when the user

selects OPTION 4. It CLOSES all database files before returning to the INVENT program.

4.1.6   SYSTEM IMPLEMENTATION

The series of programs written in chapter four has been tested with some data for any bugs in the running of the program. To run the stock/inventory control program, we use the DO INVENT command. The program displays the main menu as shown below.

INVENTORY CONTROL PROGRAM FOR NYSC NDHQ

WAREHOUSE ABUJA

   MAIN MENU

1. List items

2. Add items

3. Receive items

4. Issue items

5. Calculate inventory cost

6. Update stock

7. Edit item

8. Reports generation

9. Exit

ENTER your choice(1-9)

FIG. 12 Main Menu Display In Inventory Control Program

Depending on the response typed by the user, the program selects the corresponding CASE and executes the commands or program file listed there. As the STOCK file was empty before but option 2 was selected and few items added. After this we try other options.

4.1.7   SYSTEM CHANGE OVER.

The changeover may be achieved in a number of ways. The

most common methods are - direct, parallel running, pilot running and staged changeover.

A) DIRECT Changeover:- This method is the complete replacement of the old system by the new one, in one move. This should be undertaken only when everyone concerned has confidence in the new system. This method is potentially the least expensive but the most risky.

B) PARALLEL RUNNING:- This means processing current data by both the old and new systems to cross-check the result.

   Its main attraction is that the old system is kept alive and operational until the new system has been proved for at least one system cycle, using full live data in the real operational environment of place, people, equipment and time. It allows the results of the new system to be compared with the old system before acceptance by the user, thereby promoting user confidence. Its main disadvantage is the extra cost, the difficulty and (sometime) the impracticability, of user staff having to carry out the different clerical operation for two systems (old and new), the time available for one .

C) PILOT RUNNING:- This is similar in concept to parallel running. 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, It is not as disruptive as parallel operation, since timing is less critical. This method is more like an extended system, test, but it may be considered as practical form of changeover for organisational reasons.

(D) STAGED CHANGEOVER:- This involves a series of limited - size direct changeovers, the new system being introduced piece-by-peace. A complete part, or logical section, is committed to the new system while the remaining parts or sections are processed by the old system. Only when the selected part is operating satisfactorily is the remainder

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transferred.

This method reduces the risks inherent in a direct changeover of the whole system and enables the analyst and user to learn from mistakes made as the changeover progresses.

Disadvantages

a) It creates problems of controlling the selected parts of the old and new system.

b) It tends to prolong the implementation period.

From the different changeovers discussed above, (B) THE PARALLEL RUNNING change over IS RECOMMENDED IN THIS STUDY. This will allow the new system to be proved for at least one system cycle with full live data in the real operational environment. This will allow the results of the new system to be compared with the old system for acceptance and thereby promoting user confidence. However, for this study data has been used to test the programs and has proved, running efficiently.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATION
5.0   SUMMARY

This project has been written on the NYSC DHQ Abuja central store/ware house. A brief history of the Organisation was looked into. Also the manual operational aspect of the warehouse has been highlighted. The necessity of using the Computer System rather than the manual, cumbersome and tasking method is clearly seen.

Software used in the development of the inventory control system is the dbase IV, an advanced database of the dbase III plus. The programs liberally commented on so that any programmer can follow.

Both the objective of the project and the programs have been clearly spelt out.

5.1   RECOMMENDATION

Base on the study undertaken it is recommended that:

1.   The NYSC Organisation buy at least a computer system with printer and all that is stated in the cost Analysis in Chapter four for use than warehouse

2.   The use of computer will enhance productivity, effectiveness, security and privacy and the latest position of STOCK at the WAREHOUSE at any time on any issue with ease.

3.   Any study taken on this subject this project could be improved even with a full fledged commercial package by expanding this project to include more features as well as validation checks at all stages.

4.   With the implementation of the system, pilfering in the central store will be minimised.

5.2   CONCLUSION

Though the work from manual to the computerised system in the inventory control system has been tasking but the end result is amazing. It is indeed a task to start from the scratch to the stage of conclusion.

The computerised system speaks for itself in a situation of thousand upon thousands of items in warehouse and human resources are limited. The initial staff strength required for this system could be just three operators and the work will keep going because computer is involved.

STORES VERIFICATION FORM

NAME OF SUPPLIER... DATE..

CONTRACT AGREEMENT/LPO NO... OF...

S/NO	ITEMS SUPPLIED WITH SPECIFICATION	QUANTITY SUPPLIED	REMARKS			NAME AND SIGNATURE OF VERIFYING OFFICERS

   This is to certify that the item/items stated above was/were inspected and checked by sampling by members of the Quality Control Committee hence/signature appear in column seven above. The items are in opinion of the members of the same quality as those tendered for and are therefore accepted to store. By this token the payment of the amount due on the accepted items is recommended.

....
    CHAIRMAN Q. C. C.

NATIONAL YOUTH SERVICE CORPS
DIRECTORATE HQ.
ABUJA

No.

INTERNAL AUDIT STOCK VERIFICATION FORM

L.P.O. NO. _NYSC-22/S.18/_ S/NO.

SUPPLIER'S NAME _CEO FAMS_ DATE
No. 21 AHMADU BELLO

QTY. SUPP	DESCRIPTION OF ITEMS	UNIT PRICE		TOTAL COST		REMARKS
		N	K	N	K	
475	PAIRS OF KHAKI SUITS					
	ONE ITEM ONLY					
	GRAND TOTAL					

Having carefully inspected the above Items, I hereby certify that I found everything in good and complete conformity with the specification of the tender or bid.

SIGN/DATE _____   SIGN/DATE _____

NAME/RANK _____Okon E._____   NAME/RANK _____

STOCK VERIFIER) ___Auditor___   STOCK OFFICER (RECEIPT) _____

DRV. NO. _____

LED. GER FOLIO _____

Any observations should be recorded in the claims column
Original copy should be attached to the payment voucher

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No. Supp/13/47

To the Storekeeper NYSC DHQ Abuja

Please receive into Store the undermentioned stores.

Signature of Officer returning Store.

Store Bk 3 TOKLAS ENT

Articles	Denomination of Quantity	Quantity to be received	Value
APEL Form At Nb 30			
One Item only			
Vide Invoice No			
1437 of			
25/11/42			

I hereby certify that the above-mentioned Stores have been received

_____ 19___

Signature of Storekeeper

This Form is not to be used in cases of receipts from the Crown Agents, receipts from contractors or Transfers from another Store.

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APPENDIX

* INVENT.PRG FILE
* INVENTORY CONTROL PROGRAM FOR NYSC DHQ WAREHOUSE ABUJA
* DEVELOPED BY BAMAI,D.S

```
    SET TALK OFF
    SET STATUS OFF
    SET BELL OFF
    SET CONFIRM ON
    SET DELIMITERS OFF
    SET INTENSITY ON
    SET DATE BRITISH
    CLEAR


* DECLARE MEMORY VARIABLES

PUBLIC PSELECT
PSELECT = " "
SET PROCEDURE TO GENERAL
DO WHILE .T.
DO TITLE WITH "              MAIN MENU                "
@ 2,5 FILL TO 3,59 COLOR +RG
@ 4,24 FILL TO 4,35 COLOR +G
TEXT


            1. LIST ITEMS
          2. ADD ITEM
               3. RECEIVE ITEMS
          4. ISSUE ITEMS
          5. CALCULATE INVENTORY COST
            6. UPDATE STOCK
            7. REPORT GENERATION
            8. EDIT ITEM
```

```
                        9. EXIT


ENDTEXT


* ASK FOR THE USE'S CHOICE
CHOICE = 9
@ 18,15 SAY "ENTER YOUR CHOICE (1-9).. " GET CHOICE ;
    PICTURE "9" RANGE 1,9 COLOR *+W
 READ


DO CASE


   CASE CHOICE = 1
        DO TITLE WITH "LISTING ITEMS IN STOCK.."
   * ASK FOR PRINT OPTION
        DO PRINTCHK
     CLEAR
        USE STOCK
        LIST   &PSELECT


   CASE CHOICE = 2


        DO TITLE WITH "ADD NEW ITEM IN STOCK"
   * Execute ITEMADD.prg program file
        DO ITEMADD


   CASE CHOICE = 3
        DO TITLE WITH "RECEIVE ITEMS FOR STOCK"
        USE PURCHASE INDEX PURCHASE
   * Select format file and Append
        SET FORMAT TO PURCHASE
        APPEND
        SET FORMAT TO


   CASE CHOICE = 4
```

```
            DO TITLE WITH "ISSUE ITEMS FROM STOCK FILE"
@ 4,5 FILL TO 4,32 COLOR +R
            DO ISSUE
*          USE ISSUE INDEX ISSUE
*          SET FORMAT TO ISSUE
*      APPEND
         SET FORMAT TO

     CASE CHOICE = 5
            DO TITLE WITH "CALCULATE COST OF INVETORY"
            USE STOCK
 @ 10,0 SAY "CALCULATING...., PLEASE WAIT.... "
    SUM QNT* PRICE TO INVCOST
 ?
 ? "Total cost of Inventory: ",INVCOST

      CASE CHOICE = 6
      DO TITLE WITH "UPDATING STOCK FROM PURCHASE & ISSUE
FILES"
* Execute program from UPDATE.prg file
      DO UPDATE

      CASE CHOICE = 7
       DO REPORTS

      CASE CHOICE = 8
       DO TITLE WITH " ENTER ITEM TO BE EDITED "
 * Execute ITEMEDIT.prg program file
         DO ITEMEDIT

      CASE CHOICE = 9
         EXIT
* END of DO CASE
   ENDCASE
@ 24,0
```

```
    WAIT
* CLEAR any pending GET variable
  CLEAR GETS


ENDDO   *** .T.


    CLOSE ALL
CLEAR MEMORY


SET TALK ON
SET STATUS ON
SET BELL ON
SET CONFIRM ON


* End of INVENT.prg
```

```
*  ITEMADD.PRG PROGRAM
*  ADDS NEW ITEMS TO STOCK FILE
*  DEVELOPED BY BAMAI,D.S

   USE STOCK
SET ORDER TO ITEMNO
*  Create a variable FITEM and ask for item number

   FITEM = SPACE(6)
   @ 7,0 SAY "ENTER NEW ITEM NUMBER... " GET FITEM PICTURE
"@!"
      READ

   SEEK TRIM(FITEM)
     IF FOUND()
     @ 10,0 SAY FITEM + " ALREADY EXIST.. "
     ?
     ? CHR(7)

      ELSE
*  Add a new record in STOCK file and write FITEM in it.

   APPEND BLANK
   REPLACE ITEMNO WITH FITEM

*  Now ask for other information for this record through
STOCKADD format file
   SET FORMAT TO STOCK
   READ

   SET FORMAT TO

   ENDIF
   CLOSE DATABASES
   RETURN
```

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```
* ITEM EDIT PROGRAM.PRG PROGRAM
* Developed by BAMAI,D.S

USE STOCK
SET ORDER TO ITEMNO


    FITEM = SPACE(6)
@ 7,0 SAY " ENTER ITEM NUMBER TO BE EDITED.. " GET FITEM
PICTURE "@!"
   READ
SEEK TRIM (FITEM)
  IF FOUND()
      SET FORMAT TO STOCK
       EDIT
      SET FORMAT TO
 ELSE
 @ 10,1 SAY "RECORD NOT FOUND"
ENDIF
CLOSE DATABASES
RETURN
```

```
* UPDATE.PRG program file
* Developed by BAMAI,D.S
* UPDATE RECORDS FROM PURCHASE & ISSUE FILE IN STOCK FILE

   SET SAFETY OFF
* First update records from purchase file..
* Select files & Update

   @ 9,0 SAY "PLEASE WAIT....updating in progress" COLOR *+W
   @ 10,5 SAY " Updating STOCK file  from PURCHASE file.."

   SELECT 1
   USE STOCK INDEX STOCK
   SELECT 2
   USE PURCHASE INDEX PURCHASE

   SELECT 1
   UPDATE ON ITEMNO FROM PURCHASE REPLACE QNT WITH QNT +
PURCHASE->QNT
* Update PMASTER file from PURCHASE ,i.e. append records
from PURCHASE
* file into PMASTER file
   @ 11,5 SAY "Appending records to PMASTER FILE.. "
   SELECT 2
   USE PMASTER
   APPEND FROM PURCHASE
*  Remove all reords from PURCHASE file
   SELECT 2
   USE PURCHASE INDEX PURCHASE
   ZAP

* Updating from PURCHASE file over..
* Take up ISSUE file and subtract QNT ( from ISSUE file) in
STOCK file
```

```
@ 12,5 SAY " updating STOCK from ISSUE file.."
SELECT 2
USE ISSUE INDEX ISSUE
SELECT 1

UPDATE ON ITEMNO FROM ISSUE REPLACE QNT WITH ;
QNT - ISSUE ->QNT, DATE_ISU WITH ISSUE->DATE_ISU

@ 13,5 SAY " Appending records from ISSUE.dbf to
IMASTER.dbf"
SELECT 2
USE IMASTER
APPEND FROM ISSUE

* Remove all records from ISSUE file
USE ISSUE INDEX ISSUE
ZAP

@ 15,0 SAY " DONE... "

CLOSE DATABASES
SET SAFETY ON
RETURN
```

```
* REPORTS.PRG file
* Developed by BAMAI.D.S
* Use to generate report for INVENTORY.PRG program

 USE STOCK INDEX STOCK
* Establish a DO WHILE - ENDDO loop
 DO WHILE .T.
CLEAR
* Display Title & Menu
 DO TITLE WITH " REPORTS GENERATION.... "
@ 3,5 FILL TO 3,58 COLOR +RB
@ 4,10 FILL TO 4,40 COLOR +GR
 TEXT


        1.    REPORT OF ALL ITEMS IN STOCK


        2.    REPORT OF ITEMS  BELOW LOW RECORD LEVEL


        3.    REPORT OF ITEMS ABOVE HIGH RECORD LEVEL


        4.    EXIT


ENDTEXT

   OPTION = 4
   @ 16,10 SAY "ENTER YOUR CHOICE  " GET OPTION PICTURE "9"
RANGE 1,4 COLOR +W
   READ

* Select appropriat CASE

   DO CASE

       CASE OPTION = 1
```

```
                 DO TITLE WITH "REPORT OF ALL ITEMS IN STOCK..."
* Ask for printer option & generate report
   DO PRINTCHK
   REPORT FORM STOCK &PSELECT NOEJECT


         CASE OPTION = 2

               DO TITLE WITH "REPORT OF ITEMS BELOW  LOW RECORD
LEVEL"
                DO PRINTCHK
                  REPORT FORM STOCK FOR QNT < LOW &PSELECT
NOEJECT


         CASE OPTION = 3
               DO TITLE WITH "REPORT OF ITEMS ABOVE HIGH
RECORD LEVEL"
                DO PRINTCHK
                  REPORT FORM STOCK FOR QNT > HIGH &PSELECT
NOEJECT


          CASE OPTION = 4
                EXIT
     ENDCASE


     WAIT
     ENDDO
     CLOSE DATABASES
     RETURN
```

```
*  GENERAL.PRG,  Procedure file
*

PROCEDURE TITLE
*  Procedure to display Title
PARAMETER HEADING
CLEAR
@ 1,62 SAY "DATE: "
@ 1,68 SAY DATE()
@ 2,62 SAY "TIME: "
@ 2,68 SAY TIME()
@ 3,5 SAY "INVENTORY CONTROL PROGRAM FOR NYSC DHQ WAREHOUSE
ABUJA"
@ 4,15 SAY HEADING
@ 5,0 SAY REPLICATE ("_",80)
RETURN

PROCEDURE PRINTCHK
*  Procedure to ask for print option
*  It will return "TO PRINT" in PSELECT variable if Print
option is selected
*  Else PSELECT will have "   ".

@ 22,0 CLEAR
@ 22,0 SAY "DO YOU WANT TO PRINT?"
WAIT "Press p to print, else press any other key.. " TO
PRCHK
        IF UPPER(PRCHK) = "P"
            STORE " TO PRINT " TO PSELECT
        ELSE
            STORE " " TO PSELECT
        ENDIF
RETURN
*  End of procedure file
```

ITEM NUMBER	DETAIL	QUANTITY	PRICE	DATE ISSUED	LOW	HIGH
000013	chair	-111	88888.00	01/08/97	5	100
000022	table	0	9999.99	14/11/97	100	8888
000003	OMO	-4850	3000.00	14/11/97	20	300
000015	TV	40	3000.00	10/06/97	5	50
000005	VIDEO	3015	2500.00	14/11/97	3	40
000006	BAR SOAP	4050	2000.00	12/05/97	5	100
000007	TOILET SOAP	5100	1500.00	06/02/97	5	200
000008	LIQUID SOAP	8400	3000.00	04/03/97	20	500
000009	HAPIC	4150	900.00	01/02/97	10	300
000010	TOILET ROLL	6000	2000.00	12/05/97	10	150
000011	DUPL.PAPER	4000	2000.00	09/07/97	500	9000
	TOTALS	29794	118787.99		683	19628

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ITEM NUMBER	DETAIL	QUANTITY	PRICE	DATE ISSUED	LOW	HIGH
000013	chair	-111	88888.00	01/08/97	5	100
000022	table	0	9999.99	14/11/97	100	8888
000003	OMO	-4850	3000.00	14/11/97	20	300
	TOTALS	-4961	101887.99		125	9288

ITEM NUMBER	DETAIL	QUANTITY	PRICE	DATE ISSUED	LOW	HIGH
000005	VIDEO	3015	2500.00	14/11/97	3	40
000006	BAR SOAP	4050	2000.00	12/05/97	5	100
000007	TOILET SOAP	5100	1500.00	06/02/97	5	200
000008	LIQUID SOAP	8400	3000.00	04/03/97	20	500
000009	HAPIC	4150	900.00	01/02/97	10	300
000010	TOILET ROLL	6000	2000.00	12/05/97	10	150
	TOTALS	30715	11900.00		53	1290

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