VIII. PRICING/DISCOUNTING

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR PRODUCT DESCRIPTION

MDS for Windows - Connected to 199.5.163.1 - [PRICE.BOOK.MENU]

File Settings View Reset Tools GUI Help

Account:BASE.12   Port:023 Menu:PRICE.BOOK.MENU   Capture:On

Price Book Maintenance and Listings

Current Price Changes

1. Product File Price Maintenance
2. Special File Price Maintenance
3. Customer Price Matrix Maint(Ver 1)
4. Customer Price Matrix Maint (Ver 2)
5. Customer Class Product Number Matrix

Advance Price Changes

6. Product File--Price/Discounts
7. Product File--Price/Discounts Listing
8. Update Product File with New Prices
9. Update Special Price File New Prices
10. Special File Price Maintenance
11. Special File Price Listing

Batch Price Changes

12. Batch Price Changes-by Product Class
13. Batch Price Changes-by Vendor

Price Books

14. Entire Price Book (Cost Book)
15. Selective Price Book (Column)
16. Price Book For A Customer
17. Price Matrix Listing
18. Special Price File Listing
19. Update PRICE.XREF File

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VIII. PRICING/ DISCOUNTING

A. PRICING METHODOLOGIES

MDS offers several flexible methods to determine customer pricing. These methods organized in the sequence of general to specific are as follows:

1. PRODUCT FILE PRICES

The product file provides the ability to store up to 99 prices (and or discounts) each with a corresponding quantity break. These prices can be used in various ways.

A. **CUSTOMER CLASS** - Each customer may be assigned to a pricing category (up to 99) which corresponds to a pricing schedule contained in the product record.

B. **QUANTITY BREAKS** - In this method the quantity ordered determines which of the stored 99 prices is to be used.

C. **PRICE POINTER - QUANTITY BREAKS** - Provisions have also been made to handle the case where different quantity break schedules have been established for different classes of customer. In this technique, the price pointer (derived from either the customer record or matrix pricing file) is interpreted as the beginning of the quantity break schedule.

2. CONTRACT (SPECIAL) PRICING

When a specific price (or discount) has been arranged for a customer, this information is stored in the special price file. The special price may be stored as a specific price, or a plus/minus adjustment to list or cost. The effective date of the special price is stored, as well as the expiration dates. New prices may be stored in the file in advance of their taking effective. Based on the new effective date, the new special price takes affect.

A report is available to analyze special prices and to recommend the new price to be charged to maintain similar margins based on new vendor costs.

VIII. PRICING/DISCOUNTING

3. MATRIX PRICING

Various combinations of customer and product pricing, commonly referred to as matrix pricing, are available. The different programs available provide different methods to build the price matrix.

A. **Customer class - Product class - (Version 1)** - In this method a discount percentage application to a class of customers by product class can be entered.

B. **Customer - Product class - (Version 2)** - In this method a customer can be set up with a matrix by product class, with each product class having a differing setup based upon a price column, plus/minus a discount, or based on cost plus. This method also provides the ability to provide the customer with one of four uniform pricing schemes based on a code: M,D,C and L.

> M and C use the cost in determining price.
> D and L use the List Price to determine actual price.
> M = Markup percent of Cost
> C = Cost plus dollar amount entered.
> D = Discount percent of List Price
> L = List price minus dollar amount entered.

C. **Customer Number - Product** - The Customer Class Product Number Matrix file is intended to serve the needs of customers whose pricing policies require the ability to specify a specific price to a specific customer class. This file allows the entry of special pricing on specific products based on customer class.

B. CONTRACT REBATE PRICING

Contract rebate pricing is used to do pricing and net rebate costing based on a vendor defined contract. For reduced maintenance, the system allows entry at three levels:

1. Individual Product
2. Product Line (Group of Products)
3. Entire Vendor Product Line

In addition, the system can price/cost off one of the following three catalogs prices/costs:

1. Current Catalog Price and Cost
2. Previous Catalog Price and Cost
3. 2nd Previous Catalog Price and Cost

There is a more detailed description located elsewhere in this document.

VIII. PRICING/DISCOUNTING

C. ADVANCE PRICE CHANGES

A unique feature of the system is its ability to allow the input of price changes in advance of their taking effect. When the new prices are to become effective, they are automatically moved into the main pricing file areas. Thus there are a series of programs to allow the inoput of new prices or matrix arrangements in advance of their taking affect.

D. PRICE BOOKS

Price books can be generated in several formats (based on either current or future prices) to serve as reference material for customers and salesmen.

E. INVOICE PRESENTATION

All the techniques described above are equally applicable to discount schedules. On the face of the invoice, the unit price can be reflected as:

A. Unit price at gross, extension at net
B. Unit price at net (after discount)
C. Discount percent can optionally be shown on each invoice line

IX. COSTING/INVENTORY EVALUATION

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

COSTING/INVENTORY EVALUATION MENU
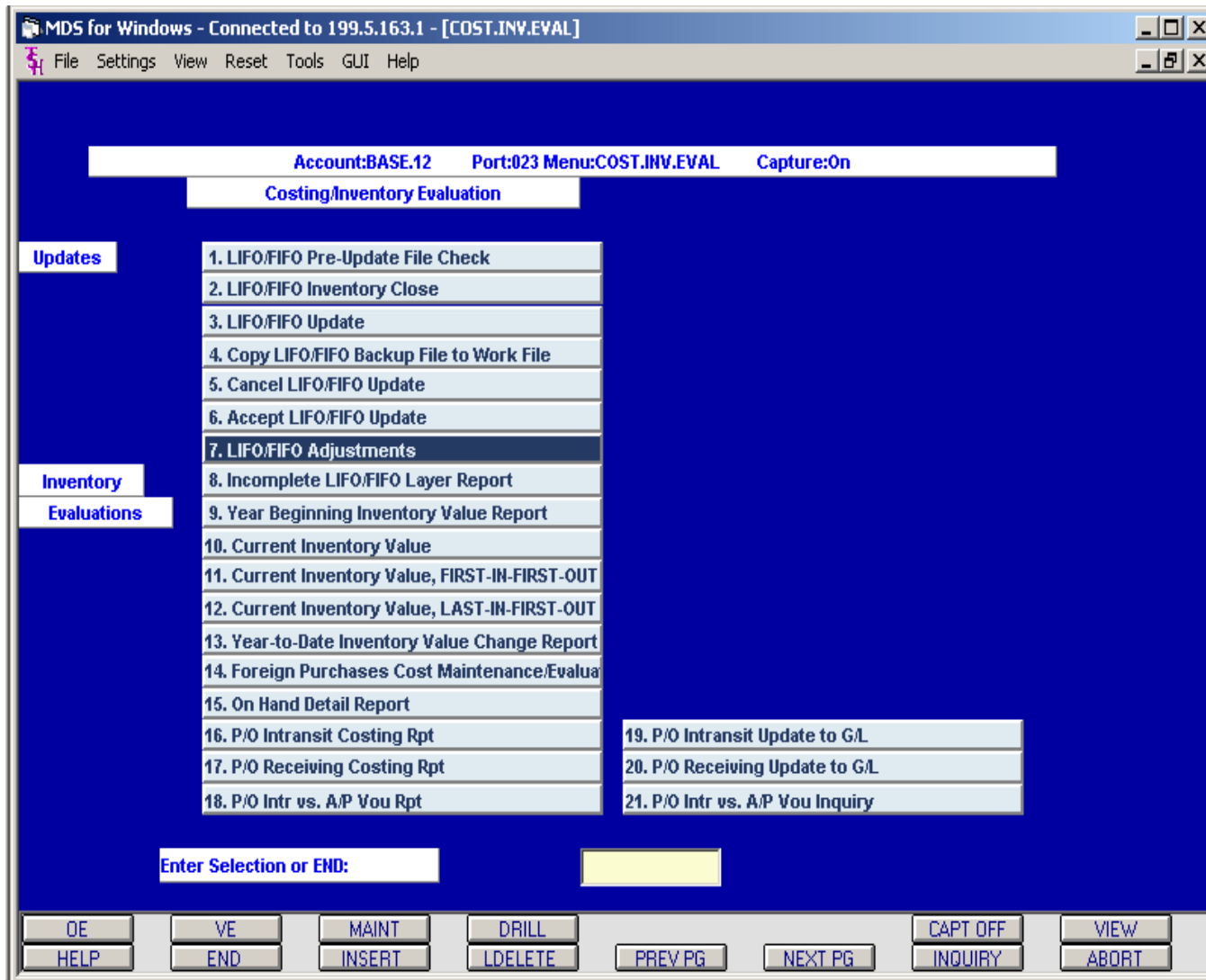
IX. COSTING/INVENTORY EVALUATION

A. INVENTORY VALUE

The cost of an inventory item is needed at several points in the system.

1. Determine the value of merchandise sold:

    A. For Cost of Goods sold General Ledger posting
    B. For invoice gross profit calculation
    C. For salesman commission reporting (if done on gross profit)

2. Evaluation of inventory Value

    A. Periodically on stock status reporting
    B. Evaluation of physical inventory taken
    C. For year end financial reporting

3. Cost on Vendor Purchase Orders

B. INVENTORY EVALUATION IN MDS

Several different methods of inventory evaluation are available WITHIN MDS:

1. Standard
2. Average cost
3. Last cost paid
4. LIFO (last in, first out)
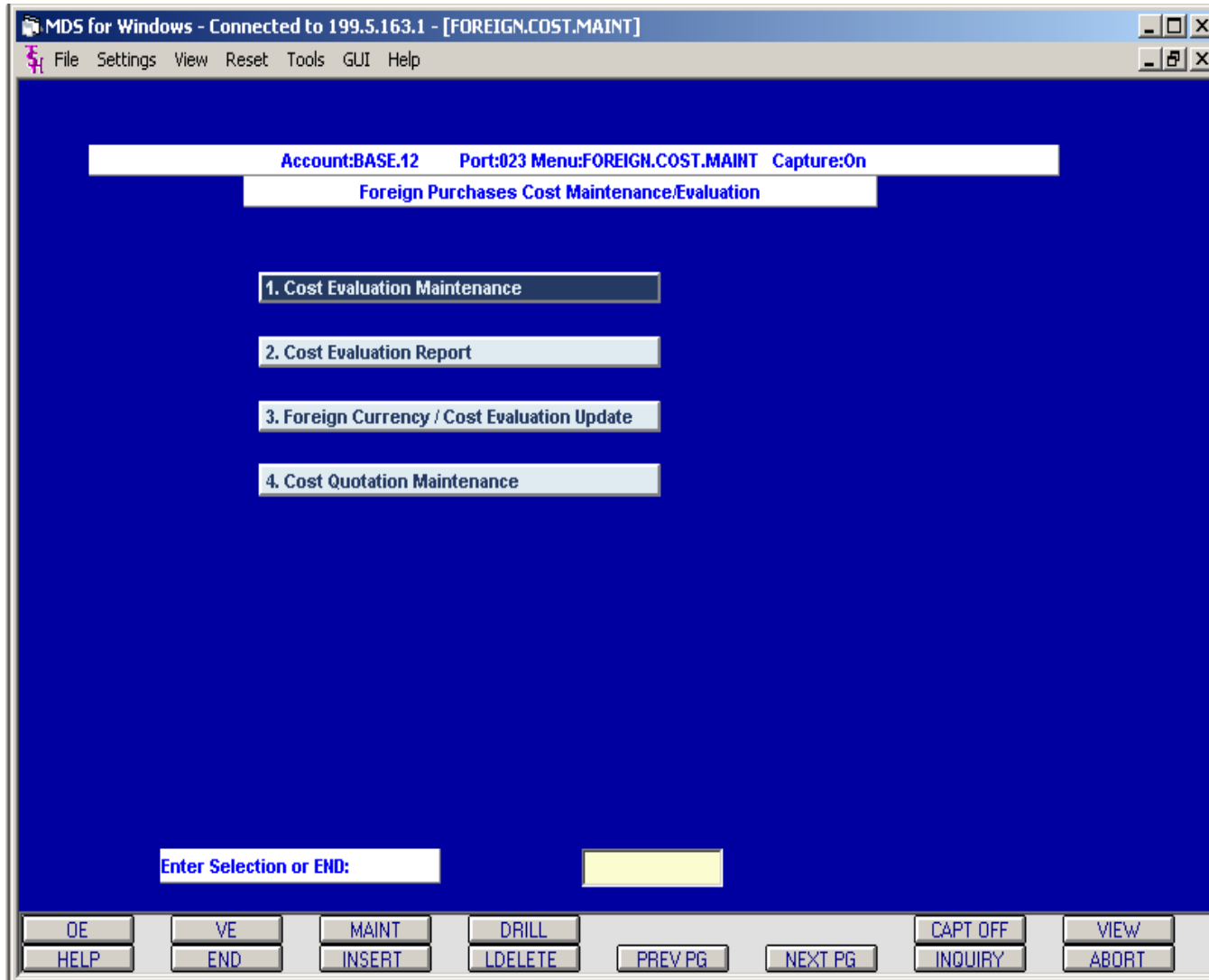5. FIFO (first in, first out)
6. Lot cost

MDS allows the customer to select different methods of costing for different calculations. For example, standard cost might be used for invoice costing, last cost paid for purchase orders, and FIFO/LIFO for inventory evaluation. In addition, the system provides reporting showing the inventory value based upon any of the costing methods.

To support the various inventory evaluation methods, the system includes a number of inventory evaluation reports based on any of the evaluation methods.

IX. COSTING/INVENTORY EVALUATION

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

FOREIGN PURCHASE COST MENU

MDS for Windows - Connected to 199.5.163.1 - [FOREIGN.COST.MAINT]

File Settings View Reset Tools GUI Help

Account:BASE.12   Port:023 Menu:FOREIGN.COST.MAINT   Capture:On

Foreign Purchases Cost Maintenance/Evaluation

1. Cost Evaluation Maintenance

2. Cost Evaluation Report

3. Foreign Currency / Cost Evaluation Update

4. Cost Quotation Maintenance

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IX. COSTING/INVENTORY EVALUATION

C. FOREIGN PURCHASE COST MAINTENANCE/EVALUATION

MDS incorporates all necessary features to support the import of product purchased in foreign currency. This has wide ranging import throughout the system, and is summarized in this section.

1. **Product Landed Cost Evaluation**

   MDS provides the facility to evaluate the landed cost of a product based on all the relevant factors. A table can be maintained by product and vendor (if the product is purchased from more than one vendor).

   The factors included are:

   1. Purchase cost in the currency of the country of origin
   2. Current exchange rate
   3. Duty Amount Calculation based on:
      Duty Base and Duty Rate
      Or Net Weight and Duty Per LB
   4. Freight: Foreign and inland
   5. Insurance
   6. Brokerage Costs

   MDS provides the ability to automatically recost all items or (items within a group) to reflect changes in rates of exchange, duty rates or freight charges

2. **Entry of Purchase Orders in foreign currency.**

   The purchase order module provides the ability to enter the items on a purchase in foreign cost. This begins the foreign cost system.

3. **In-Transit Posting**

   Importers take ownership (possession) of the inventory when it is received by the shipper in the foreign country -- which is prior to shipping and receipt in the US. This is markedly different than case with domestic purchases.

   The first indication that the merchandise is coming is the receipt of a Bill of Lading, commercial invoice, and packing list via E-mail or fax. The documents are received approximately one week later. With these documents, the importer takes ownership of the product. The Intransit procedure will create the General Ledger entry to record the value of the Inventory in transit, as to record the offsetting liabilities for the merchandise vendor's charge, as well as the duty, freight, and handling charges.

IX. COSTING/INVENTORY EVALUATION

4. **Inventory Receipt**

Several weeks later the merchandise is received into the domestic warehouse. Receipts posting is used to record the receipt, update the on-hand and reduce the in-transit amounts. At this time an entry is created to reflect the movement of the inventory from the in transit inventory into the inventory in the warehouse general ledger account (at landed cost). The foreign cost factors are updated to the LIFO/FIFO files.

5. **Accounts Payable**

When invoices from the various vendors are received, they will be entered into the accounts payable system. As an example, when the collection letter is received approximately two weeks after in transit notification, (and approximately one week later the Invoice is paid by the bank), a voucher to record the inventory at first cost is entered.

In a similar fashion, invoices for the duty freight etc. are entered. These entries are debited to the accrual accounts credited by the Intransit entry.

6. **Cost Reconciliation**

At some point there will need to be reconcile the accrual accounts, since duty freight etc are being accrued at standard, and relieved at actual. To assist in this reconciliation effort, the accounts payable procedure allows an entry to be recorded against a specific intransit transaction. A report is then prepared to show the actual versus standard amounts by category (i.e. Duty, ocean and inland freight, brokerage and insurance. Run time selection by date will be provided. Using this report, the balance in the accrual accounts can capitalized or written off.
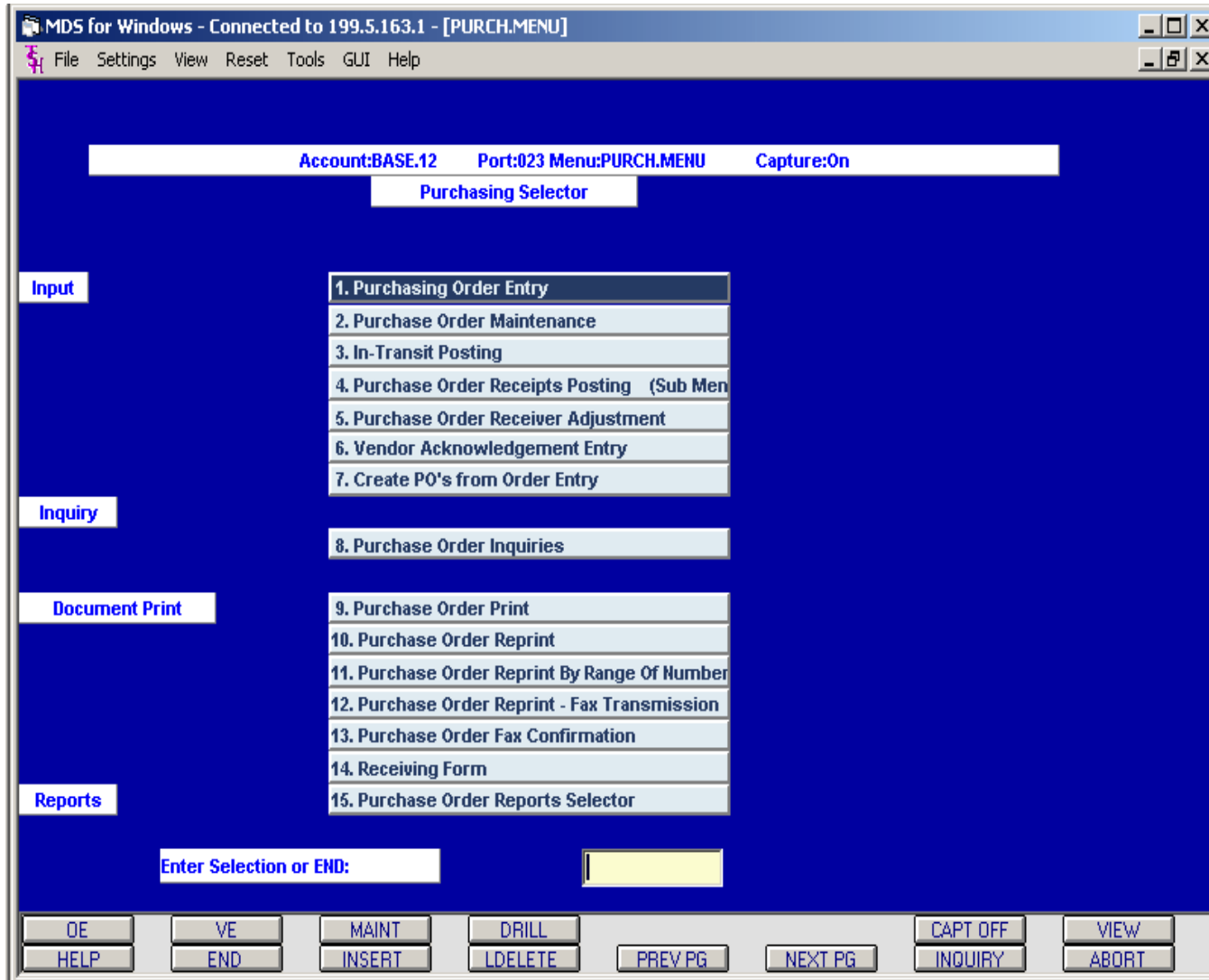
E. VENDOR QUOTATIONS

This procedure is used to store vendor quotations on a product level. Quotations may be stored in U.S. currency or foreign currency, and can include freight and duty factors. The stored information can be queried from the stock status inquiry.

X. PURCHASING AND INVENTORY CONTROL

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

PURCHASING MENU

MDS for Windows - Connected to 199.5.163.1 - [PURCH.MENU]

File Settings View Reset Tools GUI Help

Account:BASE.12   Port:023 Menu:PURCH.MENU   Capture:On

Purchasing Selector

Input
1. Purchasing Order Entry
2. Purchase Order Maintenance
3. In-Transit Posting
4. Purchase Order Receipts Posting   (Sub Men
5. Purchase Order Receiver Adjustment
6. Vendor Acknowledgement Entry
7. Create PO's from Order Entry

Inquiry
8. Purchase Order Inquiries

Document Print
9. Purchase Order Print
10. Purchase Order Reprint
11. Purchase Order Reprint By Range Of Number
12. Purchase Order Reprint - Fax Transmission
13. Purchase Order Fax Confirmation
14. Receiving Form

Reports
15. Purchase Order Reports Selector

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X.   PURCHASING AND INVENTORY CONTROL

The Purchasing and Inventory Control Module is designed to track issues and receipts to inventory and orders to vendors through their receipt.

The following inventory balance fields are maintained in the product record for each warehouse:

1. On hand in warehouse
2. On order from vendors
3. In-transit from vendors
4. On backorder to customers
5. Customer open orders
6. In picking

All transactions affecting the on hand of an item are recorded on the Inventory Audit Report, to form a complete audit trail of all transactions.

A. INITIATING THE PURCHASING CYCLE

Separate approaches to purchasing are taken for stock and nonstock items.

1.   PURCHASING STOCK ITEMS

The MDS Inventory Management System (Section XII) enables the MDS customer to establish reorder points and quantities appropriate to the customer's operation. Many options are available; following illustrates the basic methodology.

On a periodic basis, the low stock report can be printed in vendor sequence showing all items at or below reorder point. This report also displays the current inventory status of each item recommended for procurement, as well as the suggested reorder quantity. This report is intended to serve as a working document for the Purchasing Department to prepare a vendor purchase order.

Alternately, the Inventory Management System will generate the vendor purchase orders (and if multi-branch replenishment is in effect, warehouse transfer documents). The Purchasing Department has the option to review the computer's recommendation, modify the order quantity through a maintenance procedure, and then issue the purchase order document to the vendor.

Supplementing the low stock report are the stock status report (available by product class and vendor), as well as an inventory by vendor inquiry (screen or printer) which is prepared by vendor.

X.   **PURCHASING AND INVENTORY CONTROL**

A. **INITIATING THE PURCHASING CYCLE (Continued)**

2. **PURCHASING OF NONSTOCK ITEMS**

Nonstock purchasing is triggered once a customer order for a nonstock item is placed. If the vendor information is known at the time the purchase order is placed (via operator input or file data), the order entry system will automatically generate the vendor purchase order.

If Purchasing Department review is required, daily nonstock reporting is provided. Using this information, Purchasing determines the least cost vendor and initiates the purchasing cycle.

B. **PURCHASE ORDER SYSTEM**

The Purchase Order System provides a series of procedures to generate a purchase order document and related file data, maintain the files, and lastly integrate the updating of this file into the inventory receipts procedure. Inquiry capabilities are built into the system to determine the status of the purchase order.

The Purchase Order Module supports varying units of measure for purchasing. Thus, a product can be purchased in different units of measure, none of which need to be the same as the stocking or selling units of measure. The selling/costing unit of measure is used to define the costing relationship, and it too may be overridden during purchase order entry.

The various procedures under the Inventory Control System include:

1. Purchase Order System
2. Inventory Maintenance
3. Inventory Reporting
4. Inventory History Inquiry

A short description of each follows:

1. **PURCHASE ORDER GENERATION AND MAINTENANCE**

This procedure accepts the data to create a formal purchase order, or to adjust information on an existing purchase order. Some of the significant features of this system include:

a. Direct shipment orders identify the customer involved, and upon entry of the vendor's invoice, the customer is billed for the merchandise received. Warehouse shipments can also be pre-identified to a particular customer to facilitate immediate reshipment upon inventory receipt.

X.   PURCHASING AND INVENTORY CONTROL

B. PURCHASE ORDER SYSTEM

1. PURCHASE ORDER GENERATION AND MAINTENANCE (Con't)

b. The system provides the ability to store several alternate vendors from which an item can be purchased. This subsystem can be used to identify the least cost vendor and to determine how much product/value has been purchased from each vendor.

c. Maintenance ability is provided to:

> change a quantity
> delete an item from the order
> add an item to the order
> change a schedule date
> cancel the order
> close out the order

d. There are several options as to how to establish the cost/price on the purchase order, including cost in currency of country of origin, or U.S. dollars.

2. IN-TRANSIT POSTING (Optional)

The in-transit procedure allows the entry of shipping information and estimated arrived dates, and quantities into the system. This procedure would be most beneficial to importers who require status information on "swimming" merchandise.

If the price on the purchase order has been entered in the country of origin, a conversion to U.S .currency occurs based on the current exchange rate.

3. PURCHASE ORDER RECEIPTS

Since the purchase order has previously been generated, the only entry required is the receiver number and any quantities received which differ from the purchase order. In all other regards, this program references the original purchase order, and performs the additional function of calculating the current U.S. cost. Inventory, purchase order, and receiving records are updated by this program.

There is a one step process for billing drop ship purchase orders. Upon entry of the vendor's bill, the system will create the accounts payable voucher and bill the customer for the merchandise shipped directly from the vendor.

To facilitate the receiving process, the system can prepare a receiving form showing all open lines for a given purchase order. The receiving procedure records the actual cost paid and quantity received for use in the inventory costing module (FIFO and LIFO evaluations); and provides the ability to adjust last cost paid and recalculate average cost.

X. PURCHASING AND INVENTORY CONTROL

B. PURCHASE ORDER SYSTEM

4. INTEGRATION WITH ACCOUNTS PAYABLE

To insure that the "Book" general ledger inventory control account balances to the value of inventory received (and of course sold), MDS has implemented extensive controls to insure that the amounts entered into accounts payable matches the value of receivers recorded.

As the inventory is received, a transaction is created internally to record the date and value of the receipt by purchase order and receiver. When the vendor invoice is received, it is entered into the accounts payable system as a voucher and referenced to the original purchase orders and receivers involved. Inquiry ability is provided to assist the operator in selecting which purchase orders/receivers are appropriate for this vendor's invoice.

To insure that the accounting controls are maintained, all vouchers pertaining to inventory transactions must be "charged" to general ledger accounts pre-coded as inventory accounts in the Chart of Accounts description file.

If the amount charged by the vendor fully agrees with the value of the merchandise received on that purchase order receiver combination, the voucher is approved for payment and the receiver marked as "complete". Tolerance dollars and percents are established for each company. If the difference(s) fall within the tolerance setup, the voucher is removed from hold.   Optionally, a journal entry can be posted to record the inventory/voucher discrepancies.

If the amounts do not agree, the system takes the following action:

a. the voucher is put on "inventory hold" status and cannot be paid, and
b. the details of the purchase order receipt and the vendor's invoice are printed on the purchase order exception report.

The methodology to complete the transaction differs based upon the cause of discrepancy.

a. If the vendor has made the mistake (i.e., the purchase order/receiver is correct), a debit memo is issued to the vendor notifying them of the discrepancy. The vendor invoice and receiver are now in agreement and will be processed by the system as appropriate.The debit memo is cross-referenced to the voucher, which now in aggregate should agree with the value of the purchase order/receiver. The system will now recognize the balance, clear the voucher for payment, and mark the receiver as complete.
b. If there is an error in either the purchase order or the receiving, the Purchase Order Receiver Adjustment Program is used to correct the pricing and/or quantity errors identified on the original receiver. The adjustment program affects the purchase order, the receiver, LIFO/FIFO files, as well as product master file cost data, and may be used even on purchase orders that have been marked as complete.

X. PURCHASING AND INVENTORY CONTROL

B. PURCHASE ORDER SYSTEM

5. CREATION OF PURCHASE ORDERS FROM ORDER ENTRY

This procedure creates the purchase orders corresponding to the drop ship orders previously entered through the Order Entry Module. MDS has the ability to identify an entire order as being a drop ship (or a direct ship) from a single vendor, or a single customer order may consist of a mixture of warehouse shipments and drop ship lines, each of which may be to a different vendor. This procedure generates all the necessary purchasing in any of the above situations.

6. INQUIRIES

All MDS inquiries may be accessed by the selection of the Purchase Order Inquiry Program. Please refer to the inquiry section for a detailed discussion of the various Purchasing Inquiries.

7. PURCHASE ORDER PRINT

This routine prints all purchase orders that have not been printed.

8. PURCHASE ORDER REPRINT

Two procedures are provided to reprint purchase orders, specifically, or by range.

9. PURCHASE ORDER REPRINT- FAX TRANSMISSION

This procedure is used to refax a purchase order.

10. PURCHASE ORDER- FAX CONFIRMATION

This report prints a listing of all faxed purchase orders for confirmation.
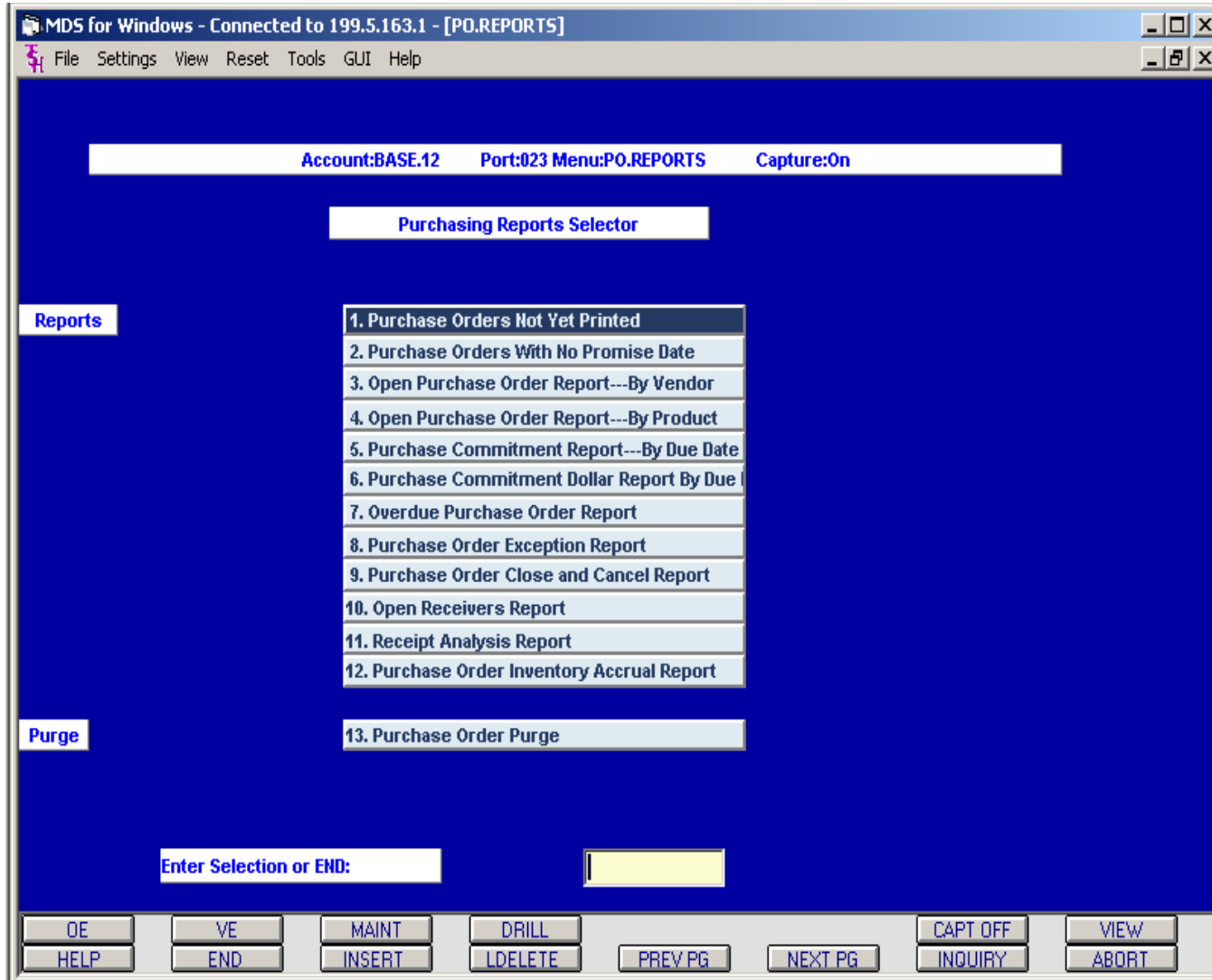
11. RECEIVING FORM

This routine prints a receiving form for specific purchase orders, sorted by required date and then by vendor.

X.   PURCHASING AND INVENTORY CONTROL

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

PURCHASING REPORTS MENU

X.   PURCHASING AND INVENTORY CONTROL

C. PURCHASE ORDER SYSTEM REPORTING

Extensive reporting is available from the Purchase Order System.

1. PURCHASE ORDERS NOT YET PRINTED

A list of all purchase orders that have not yet been printed.

2. PURCHASE ORDERS WITH NO PROMISE DATE

A list of all purchase orders without a promise date.

3. OPEN PURCHASE ORDERS BY VENDOR

Listing of all open purchase orders in vendor sequence.

4. OPEN PURCHASE ORDERS BY PRODUCT

Listing of all open purchase orders by product.

5. PURCHASE ORDER COMMITMENT REPORT BY DUE DATE BY PRODUCT

This report is used for cash forecasting. It is sorted by required date and will print only lines with open quantities.

6. PURCHASE ORDER DOLLAR COMMITMENT REPORT BY DUE DATE

This report is also used for cash forecasting. It is sorted by required date and vendor and will list all open items on the purchase order for each vendor.

7. OVERDUE PURCHASE ORDER REPORT

Listing of all purchase orders with open quantities and a required date less than the date entered for the report.

8. PURCHASE ORDER EXCEPTION REPORT

Listing of all purchase orders where the vouchered amount is more or less than the received value.

9. PURCHASE ORDER CLOSE OUT AND CANCELED REPORT

Listing of all purchase orders that have been received and invoiced complete, closed through purchase order entry or purchase orders that have been canceled.

X.   PURCHASING AND INVENTORY CONTROL

C. PURCHASE ORDER SYSTEM REPORTING

10. OPEN RECEIVERS REPORT

Listing of all open receivers with the value of the received merchandise and the vouchered amounts.

11. RECEIPTS ANALYSIS REPORT

Listing of all purchase order receipts breaking out the landed cost values (i.e. duty, freight etc.)

12. PURCHASE ORDER INVENTORY ACCRUAL REPORT

Used to reconcile physical receipts not yet recorded in the General Ledger. Listing of all purchase orders showing amount received, but not yet vouchered..

13. PURCHASE ORDER PURGE

Program to purge completed purchase orders earlier than "X" date. The purge moves the purchase orders to the history file..

X. PURCHASING AND INVENTORY CONTROL

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

INVENTORY WAREHOUSE MENU

X.   PURCHASING AND INVENTORY CONTROL

D. INVENTORY MAINTENANCE

1. ON-ORDER POSTING

This procedure maintains/adjusts the vendor on order position. It should <u>not</u> be used if the Purchase Order system is in operation.

2. VENDOR IN-TRANSIT POSTING

This procedure maintains the in-transit field in the non-purchase order environment.

3. NON-PURCHASE ORDER RECEIPTS

This procedure increments the on hand of an item record, and decreases the on-order posting (if maintained).The receiving procedure records the actual cost paid and quantity received for use in the inventory costing module (FIFO and LIFO evaluations); and adjusts the last cost paid and recalculates average cost.

4. INVENTORY ADJUSTMENTS

This procedure provides the ability to directly affect the on-hand field with appropriate audit trail and accountability controls.

5. INVENTORY TRANSFERS - WITHOUT TRANSFER BILLING

This procedure is used to control inventory movement between warehouses. The inventory in the sending warehouse is decreased and the inventory in the receiving warehouse is increased. This procedure would be used if the transfer billing subsystem is not being utilized.

6. INVENTORY TRANSFERS - WITH LOT SYSTEM

This procedure is utilized in conjunction with the transfer billing subsystem. The transfer file balances are reduced, and the on hand at the receiving location is updated.

7. TRANSFER RECEIPTS POSTING
A series of maintenance procedures are provided to adjust any of the product activity fields. They can also be used by a customer not desiring a complete purchase order system to maintain a piece count of vendor orders.

8. TRANSFERS IN PROCESS REPORT
This report lists all transfer billing records with open quantities.
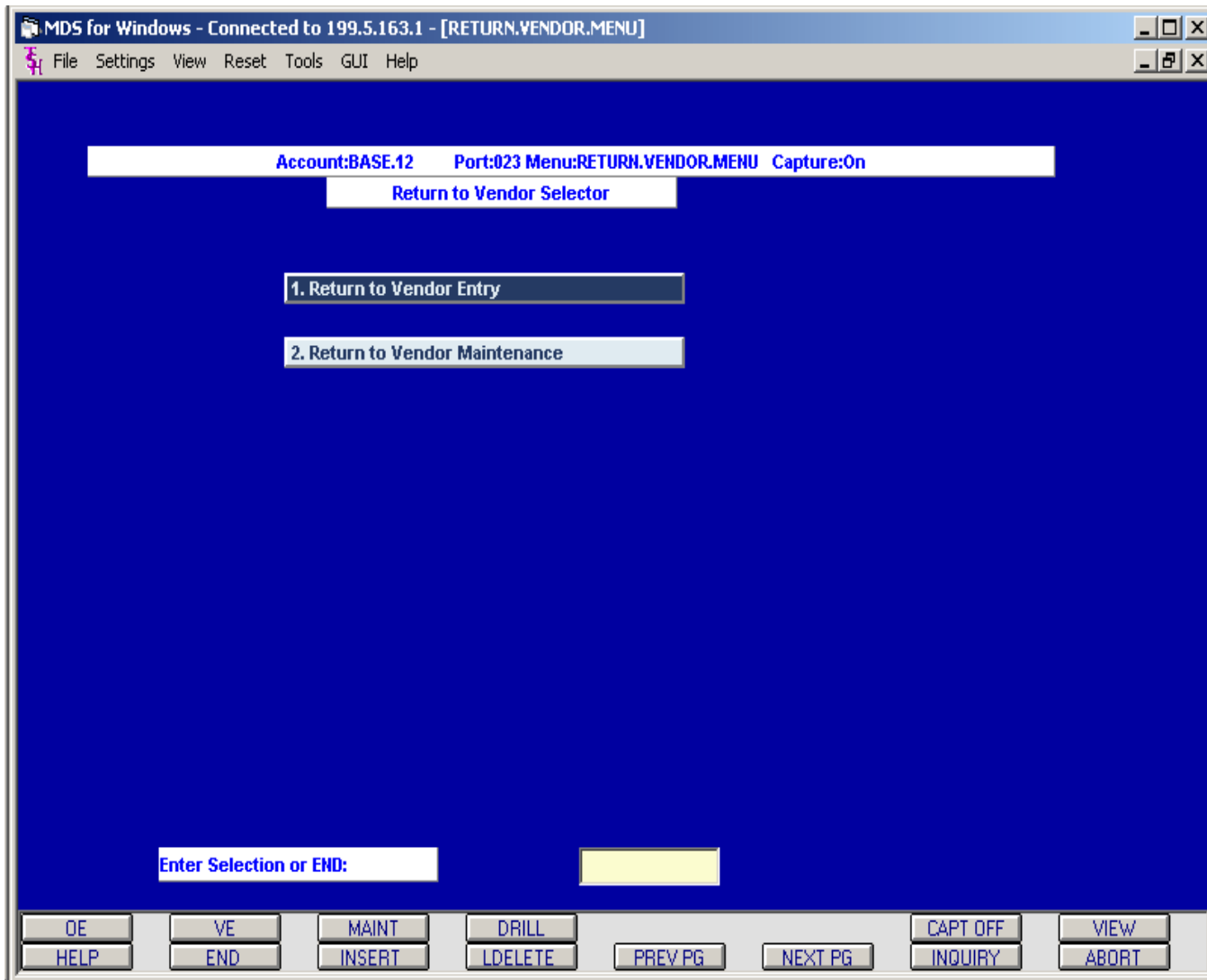
9. TRANSFER RECEIVING FORM
Form to be used to receive transfers.

X.   PURCHASING AND INVENTORY CONTROL

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

RETURN TO VENDOR MENU

X. PURCHASING AND INVENTORY CONTROL

E. Return to Vendor System

The return to vendor module is used to process the return of product to vendors. In this respect, the program will function as a "negative" purchasing program, and therefore, is modeled after the purchase order entry program. The program performs the following functions:

A. **Issuance of the request to the vendor**:

1. In this mode the operator inputs the items and quantities to be returned, and the data is written to a pending file.

2. The items to be returned are entered. The return cost is based upon the purchase order cost parameter, which may be standard (replacement cost) or last cost, with override allowed. Text entry capability is provided to explain to the vendor the reason for the return.

3. Each item is coded as to the reason for the return as well as whether or not the product is defective. File update does not occur at this time.

4. After input the program generates a return to vendor document which can be printed and mailed, faxed or E-mailed to the vendor for approval.

B. **Issuance of the return document.**

The second function this module performs is to effect the return of the merchandise to the vendor. The program can function in either a one-pass or two-pass mode. I.e. at the time of initial entry, the operator can indicate whether the actual return should be effected in addition to the issuance of the vendor request for return.

1. Vendor approval information is entered including the RMA number and terms of the credit that is to be issued. Inventory and purchase fields are reduced in the product file. If a defective return is indicated, the on hand is not reduced. If the vendor charges a restocking fee then it can be entered and the amount will be reduced from the credit.

2. An accounts payable debit transaction is created for the value of the return, inclusive of shipping cost. The terms from the Vendor return will govern the dating of the debit memo. The voucher will be created with a transaction of "D"ebit memo in a hold status. Once the vendor acknowledges the debit, the voucher is taken off hold, and the vendor's assigned credit number can be inserted in the "invoice number" field.

3. This procedure will generate a shipping document, modeled after the picking document, which will be used to pick the items and initiate return the product return to the vendor.

X. PURCHASING AND INVENTORY CONTROL

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

INVENTORY REPORTS AND INQUIRIES MENU
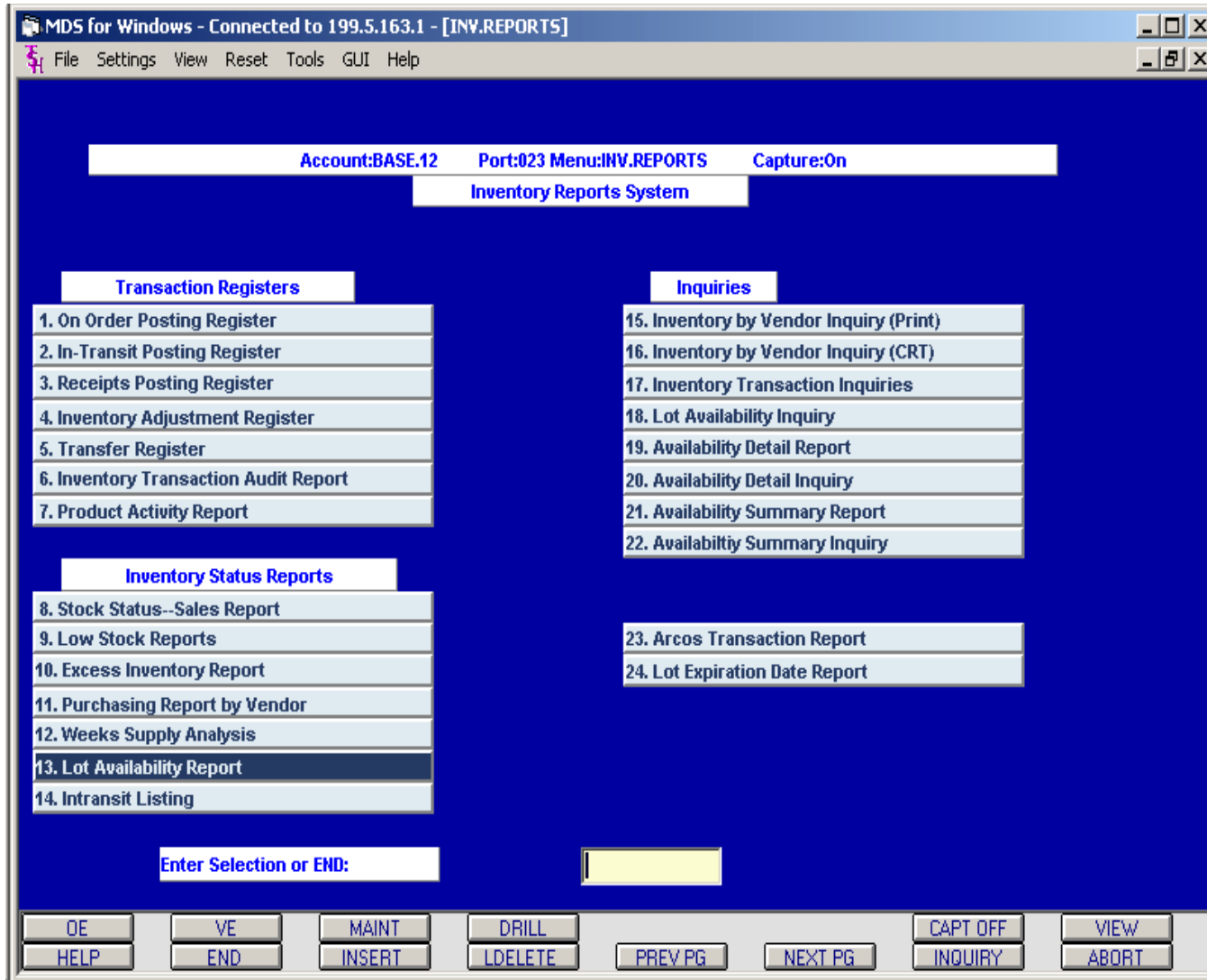
X.   PURCHASING AND INVENTORY CONTROL

F. INVENTORY REPORTS AND INQUIRIES

A series of inventory status reports and inquiries are provided.

1. ON-ORDER POSTING REGISTER

Listing of all transactions posted via the inventory on order posting program for the date input.

2. IN-TRANSIT POSTING REGISTER

Listing of all transactions posted via the inventory in-transit posting program for the date input.

3. RECEIPTS POSTING REGISTER

Listing of all purchase order and non-purchase order receipts posted for the date entered.

4. INVENTORY ADJUSTMENT REGISTER

Listing of all inventory adjustments posted for a specific date.

5. TRANSFER REGISTER

Listing of all transfers posted via any of the transfer procedures for a specific date.

6. INVENTORY TRANSACTION AUDIT REPORT

Listing of all transactions posted which have an affect on inventory for the specific date input.

7. PRODUCT ACTIVITY REPORT

Listing of all transactions posted which have an affect on inventory for a specific date range.

8. STOCK STATUS — SALES REPORT

This report prints on hand quantity for the beginning of month, sales, receipts, current on hand and current inventory value.

9. LOW STOCK REPORT

This report will print a listing of all items that are at or below the reorder point.

X.   PURCHASING AND INVENTORY CONTROL

F. INVENTORY REPORTS AND INQUIRIES

G. EXCESS INVENTORY REPORT

This report calculates the excess inventory in quantity and dollar value.

11. PURCHASING REPORT BY VENDOR

A series of audit trail reports are provided to reflect each of the inventory transactions. In addition, the inventory transaction audit report logs all additions or subtractions to the on-hand of an item for a complete audit record (including billing, receipts, and adjustments). This report prints all items purchased from a particular vendor. The on-hand on order, on back order and available quantities are displayed.

12. WEEKS SUPPLY ANALYSIS

This report will calculate stock availability based on six months' usage.

13. LOT AVAILABILITY REPORT

This report is available with or without costs and lists each lot quantity and cost.

14. OPEN INTRANSIT LISTING

This report lists all open intransit transactions.

15. INVENTORY INQUIRY BY VENDOR

This report prints all items purchased from a particular vendor. The report can be generated to the printer or to the screen.

16. INVENTORY HISTORY INQUIRY

This report prints all transactions for a specific customer or product. It is available on the screen or on the printer.

17. INVENTORY TRANSACTION INQUIRIES

Detailed inventory transaction inquiries by customer and product

18. LOT AVAILABILITY INQUIRY

This inquiry will display all available lots for a specific product.

X. PURCHASING AND INVENTORY CONTROL

F. INVENTORY REPORTS AND INQUIRIES

18. AVAILABILITY DETAIL REPORT/INQUIRY

This report shows availability along with vendor on order and customer open orders for all products for a six month time span. The inquiry option shows availability for a specific product.

20. AVAILABILITY SUMMARY REPORT/INQUIRY

This report shows availability in summary for all products for a six month time span. The inquiry option shows availability in summary for a specific product.

24. LOT EXPIRATION DATE REPORT

This report lists all lots close to their expiration dates.

F. ARCOS MANAGEMENT AND REPORTING

1. Background

The ARCOS reporting system is a mandatory reporting system managed by the DEA to document the purchase and sale of controlled drug substances.

2. Files

A. **Drug Type File** - This file is used to define the types of controlled substances that will be handled in the system. This codes established in this file will be used to categorize the drugs, as well as to define which drugs each doctor can purchase.

B. **Customer Master File** - The MDS Customer Master file contains the following data elements:

    a. The Doctors DEA code. (check digit in DEA number is verified.)
    b. The DEA license expiration date
    c. The Physicians's License Number
    d. The specific Drug types that this physician may order

C. **Ship To File** - Since each location must be separately licensed and monitored, if the doctor has multiple locations, DEA coding information can be entered at this level as well. This file is also used to accommodate the multiple locations in a hospital facility.

D. **Product Master File** - The Product Master file defines each drug, and specifies if the Drug is subject to ARCOS reporting, and to which Product Type it belongs.

X.   PURCHASING AND INVENTORY CONTROL

3. Procedures

    A. **Receiving** - The receipt of all controlled substances are logged in the reporting file. The vendor from whom the drug is received is recorded as well. In addition, if lot control is in use, the special serial and/or batch numbers are recorded.

    B. **Order Entry:** Before allowing a doctor to order a controlled drug, the DEA information in the customer master file is validated, to insure the Doctor's DEA number has not expired, is on file, and is valid. As the line items are entered, the Drug type in the product record is matched to the allowed product types stored in the customer and ship to files. If not on the customer file, the operator is alerted, and specific order approval is required.

    C. **Verification (Shipment)** - The standard vendor is displayed from the product file. If this drug was obtained from an alternate vendor it must entered at this time. If Lot control is in use, the lot number contains the proper vendor identification, so the vendor information need not be entered.

4. Reporting - Based upon the receipt and shipment information, the required ARCOS reporting is prepared in report as well as diskette formats.

The Arcos Transaction Report can be run monthly or quarterly. They are segregated by company and warehouse. Only acquisitions and dispositions of products that are flagged as a controlled drug will appear on this report.

XI. <u>PHYSICAL INVENTORY</u>

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

PHYSICAL INVENTORY MENU

MDS for Windows – Connected to 199.5.163.1 – [PHY.INV.MENU010]

File Settings View Reset Tools GUI Help

Account:BASE.12   Port:023 Menu:PHY.INV.MENU010   Capture:On

Physical Inventory Procedures

1. Create Cycles for Physical Inventory Count
2. Physical Inventory Cycle Inquiry
3. Print Physical Inventory Tags
4. Freeze On-Hand Balances by Cycle
5. Physical Inventory/Cycle Count Entry
6. Missing P.I. Tag Report
7. Physical Inventory Tag Inquiry
8. Physical Inventory Tag Maintenance
9. Physical Inventory Tag List
10. Physical Inventory Variance Update
11. Physical Inventory Variance Report
12. Physical Inventory Lot Variance Report
13. Physical Inventory Report of Items Not Count
14. Negative On-Hand Report
15. Physical Inventory On-Hand Update *** PROCI
16. Physical Inventory Purge   *** PROCEDURE N

Enter Selection or END:

| OE | VE | MAINT | DRILL | | | CAPT OFF | VIEW |
| HELP | END | INSERT | LDELETE | PREV PG | NEXT PG | INQUIRY | ABORT |

E.   PHYSICAL INVENTORY

A. PHYSICAL INVENTORY OVERVIEW

The Physical Inventory Module is designed to allow a complete or partial physical inventory to be taken which will allow for:

1. Create a cycle for counting, using various methods of selection criteria.
2. Create tags.
3. Inquire on both individual tags and whole cycle counts.
4. Freeze the selected inventory.
5. Enter the physical counts.
6. Account for missing tags.
7. Do maintenance on tags that have been entered.
8. Print lists of tags to check for errors.
9. Calculate variances in inventory and print edit reports of inventory variances.
10. Print a report of any negative on hand quantities the variance update may create.
11. Do a purge of old inventory cycle counts that have been completed.

The procedures, beyond allowing for the correction of on hand inventory to agree with physical inventory, incorporate the proper accounting practices and contain the accepted auditing functions required to validate on hand inventory levels.

B. PROCEDURES

1. CREATE CYCLE FOR PHYSICAL INVENTORY COUNT

This is where the process of cycle counting begins. Cycles can be created by purchase order number, vendor, product line, range of products, cycle count code, product rank, product class and entire warehouse. In cycle counts, the choice of warehouse determines how each of the selections will occur. This procedure also allows for the creation of a cycle count that does not generate tags.

2. CREATE PHYSICAL INVENTORY TAGS FROM PRODUCT AND/OR LOT FILE

This procedure creates physical inventory tags for one or all cycles and generates one tag for each location of a product in each cycle. If this product is stocked in lots, this process will create a tag for each lot/warehouse location combination. If a product is not maintained in a particular warehouse, no tag is created. The tag file is updated with tag number, item number, description, warehouse number and warehouse location. Control totals of the number of tags for each warehouse are displayed.

3. PRINT PHYSICAL INVENTORY TAGS

This procedure prints tags from the tag file (regardless of the method of creation) by warehouse, cycle, warehouse location by product number or by counter name and tag number. The tags are meant to print on a continuous form, one up.

XI.   PHYSICAL INVENTORY

B. PROCEDURES

4. VERIFICATION OF INVENTORY LEVELS PRIOR TO FREEZING OF ON HAND BALANCES

Cycle counting allows the operator to create the tags for a count well in advance of the actual count.   Once the inventory is frozen, however, the count must take place immediately following the freeze.   No inventory movement can occur until the inventory count is completed.   In order to ensure the accuracy of the count, all outstanding inventory transactions must be completed and updated before the freeze.   All picked orders must be verified, all received purchase order must be entered into the system.   If the parameter file is set to run bulk verification in the end of day processing, the freeze must occur after the end of day is run but before any other inventory transaction (order entry, warehouse transfers, receipts, etc.) occur for the products in this cycle.

5. FREEZE THE ON HAND BALANCES

Once all inventory transactions have been updated, this procedure captures the on hand inventory prior to the count of the inventory.   After the physical count has been taken, normal order entry and invoicing procedures may be used even if all the physical inventory has not been posted.   This helps keep the impact of a physical inventory on day to day work to a minimum.

6. PHYSICAL INVENTORY TAG ENTRY

The physical inventory tag entry procedure allows the operator to enter counts by tag numbers, regardless of the method the tag was created.

The procedure provides for optional use of batch entry controls to minimize entry errors.The system also allows cycle counting without the use of pre-printed tags.   In order to enter counts on products from a cycle that was generated without tags, type the letter "N" at the prompt for the tag number.   The system assigns the next available tag number and allows the operator to enter the product and count.

7. MISSING PHYSICAL INVENTORY TAG REPORT

This report lists all tags that do not have a count entered against them.   It is meant to be a means of accounting for all tags that were created but not entered.

8. PHYSICAL INVENTORY TAG INQUIRY

A physical inventory tag inquiry is provided to inquire into the current status of a tag.   This inquiry displays the item number, description, warehouse number, tag creation date, count posting date, count, frozen on hand, counter, counter's initials, purchase order number, update indicator warehouse location and cycle code information are displayed.

XI. PHYSICAL INVENTORY

B. PROCEDURES

9. PHYSICAL INVENTORY TAG MAINTENANCE

Physical inventory tag maintenance allows the operator the option to change any data relating to a given physical inventory tag. This procedure is useful for correcting any count entry errors.

10. PHYSICAL INVENTORY TAG LISTING

After entering the tag count, run the listing as a proof. All tags that have been entered appear on the report. The report can be run in five different sequences:

a. Tag number
b. Counter
c. Warehouse Location
d. Item Number
e. Batch Number

11. PHYSICAL INVENTORY VARIANCE UPDATE

The variance update calculates differences between the on hand frozen inventory and the total counts of all tags for the same item.

12. PHYSICAL INVENTORY VARIANCE REPORT

This report is produced by warehouse by product and shows the physical count, the on hand at the time of the freeze and the variance. This listing is run after doing the variance update to recheck the count on the products listed.

13. PHYSICAL INVENTORY LOT VARIANCE REPORT

This report is produced by warehouse by product and shows the physical count by lot and location, the on hand at the time of the freeze and the variance.

14. NEGATIVE ON HAND REPORT

This report determines if, when the physical variance applied to the current on hand, will cause a negative on hand balance. Usually, this is caused by doing invoicing after the inventory value was frozen but before the count was taken. An adjustment will be required to correct the situation.

15. PHYSICAL INVENTORY ON HAND UPDATE

This procedure applies the variance to the current on hand figure, bringing the physical inventory and book inventory into balance. It must be ascertained that inventory information is accurate before running this procedure as it is a final update and cannot be reversed.

XII. INVENTORY MANAGEMENT

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

INVENTORY MANAGEMENT MAIN MENU
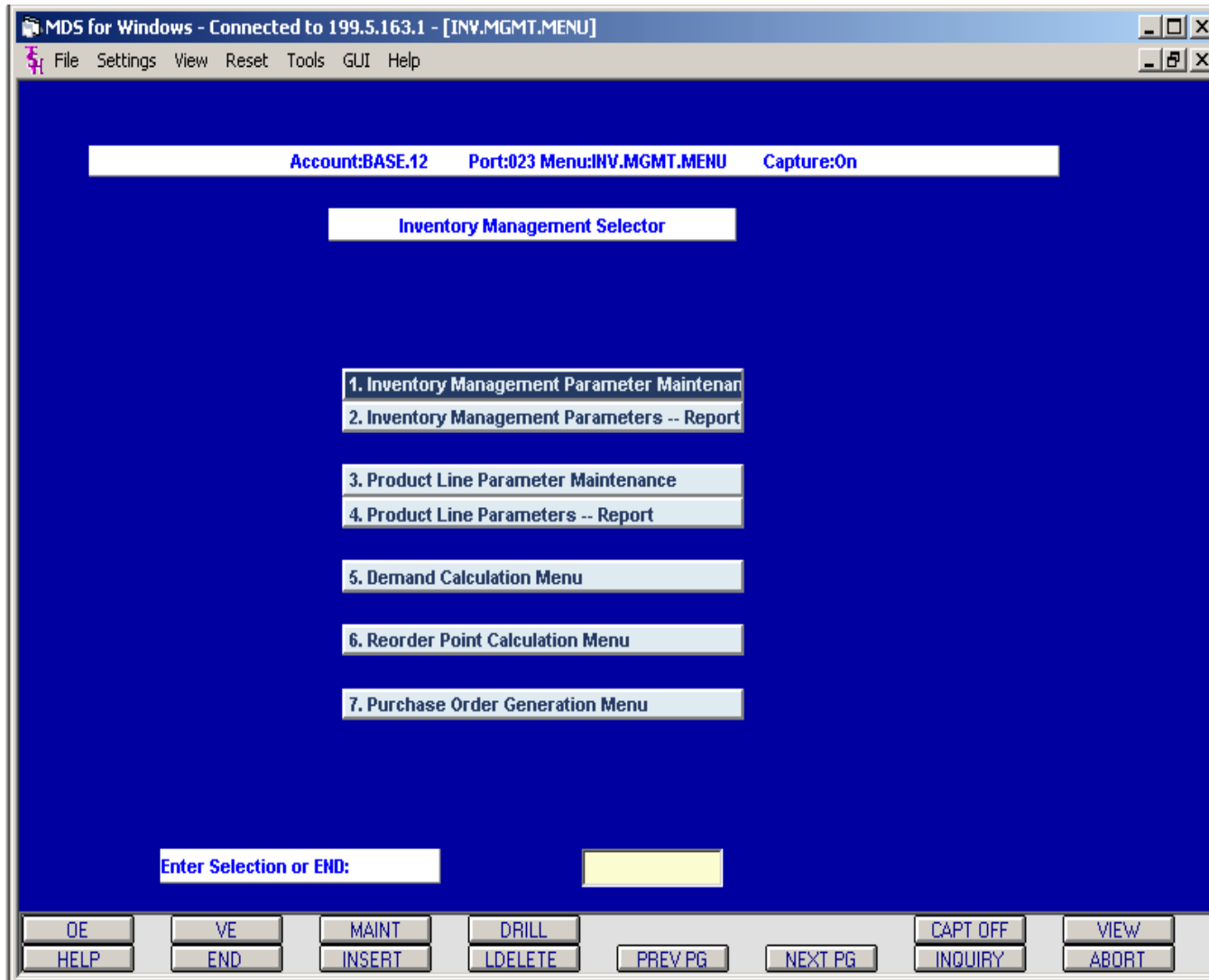
THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

DEMAND CALCULATION MENU
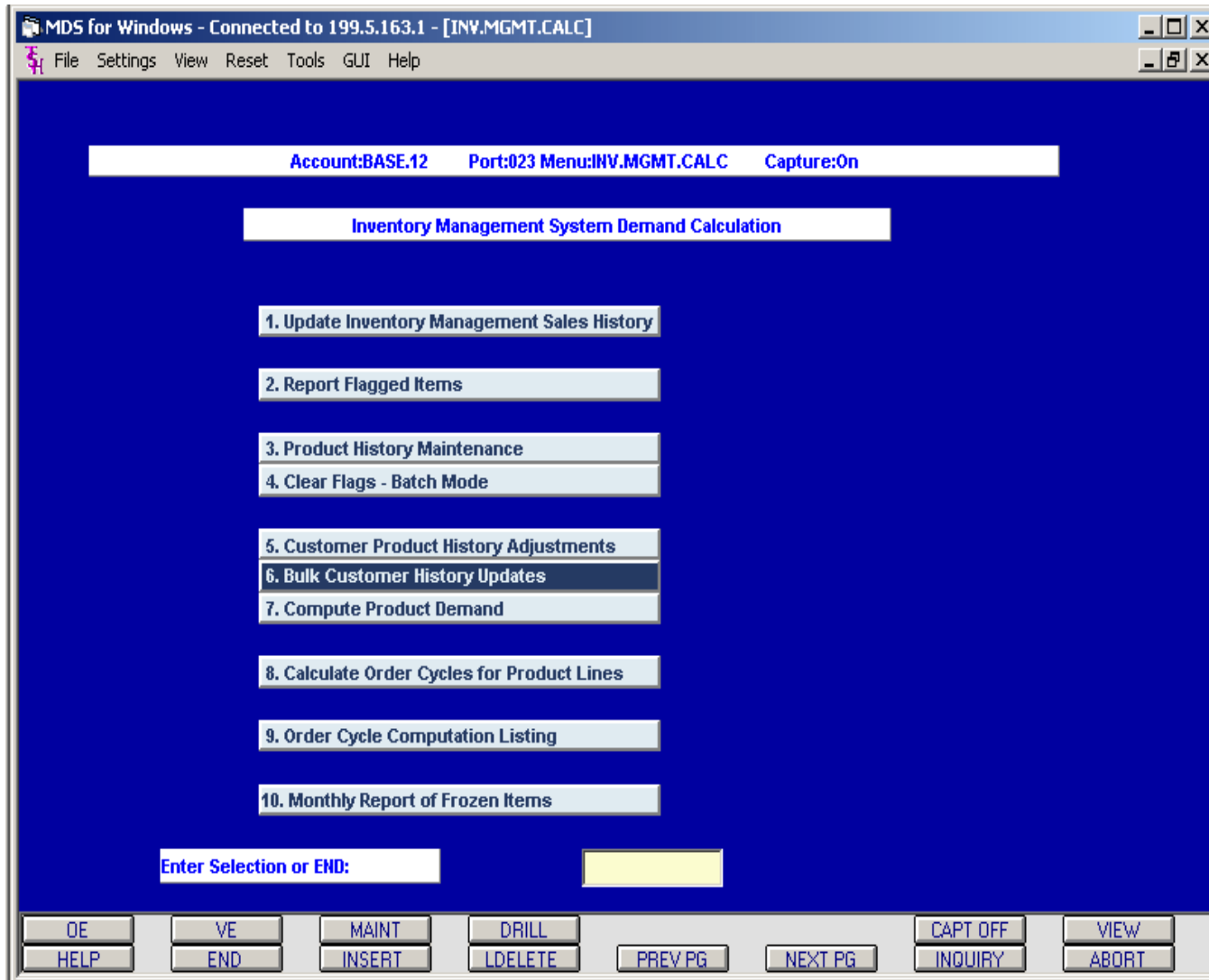
THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

REORDER POINT MENU
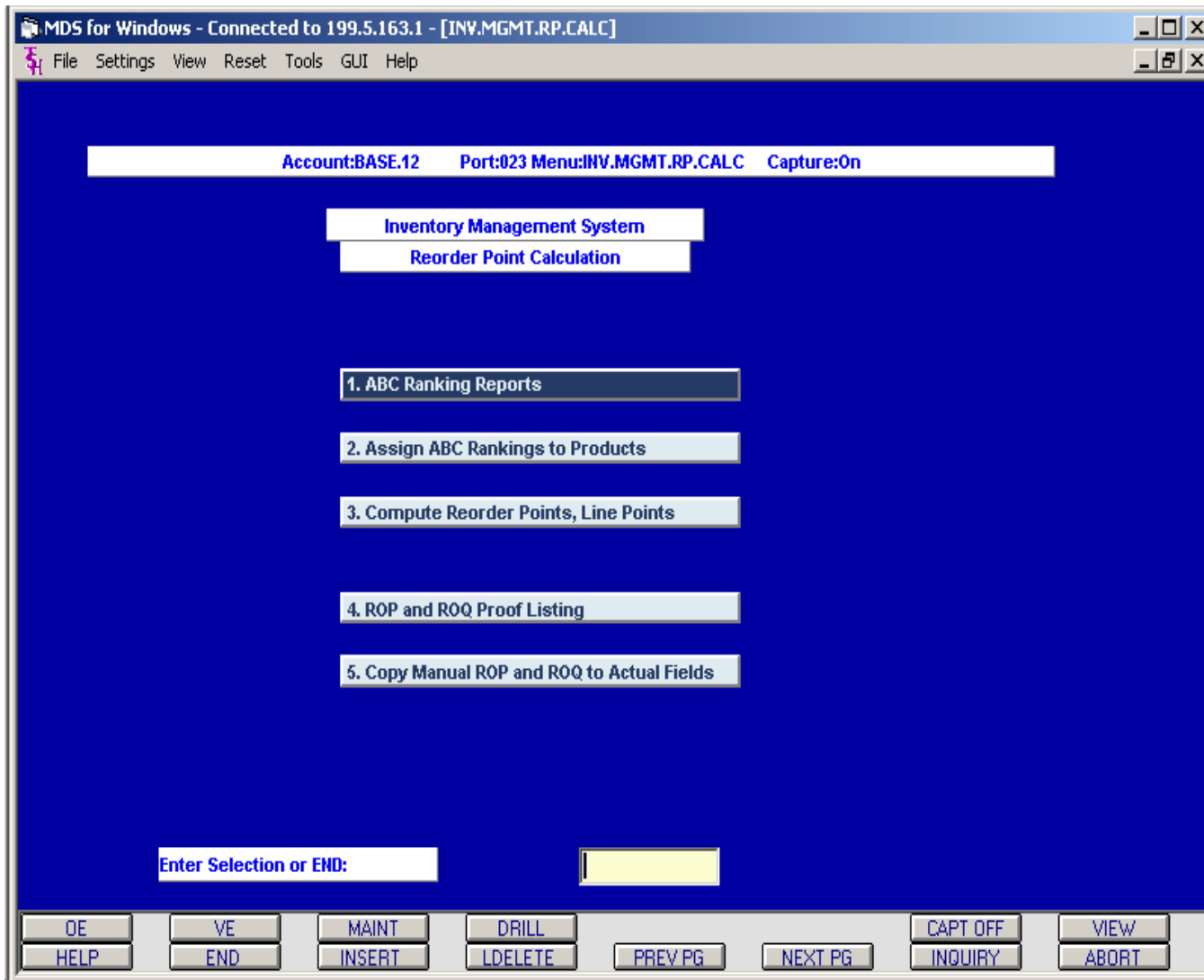
XII. INVENTORY MANAGEMENT

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

RECOMMENDED PURCHASE ORDER GENERATION MENU

MDS for Windows - Connected to 199.5.163.1 - [INV.MGMT.PO.GEN]

File   Settings   View   Reset   Tools   GUI   Help

Account:BASE.12   Port:023 Menu:INV.MGMT.PO.GEN   Capture:On

Inventory Management System
Purchase   Order   Generation

1. Generate Recommended Purchase Order by
2. Recommended Purchase Inquiry / Update
3. Recommended Purchase Report
4. Generate Purchase Orders and Transfers
5. Below ROP Report
6. Inventory Analysis Report

7. Generate PO by Vendor and Reorder Point Se

Enter Selection or END:

OE	VE	MAINT	DRILL			CAPT OFF	VIEW
HELP	END	INSERT	LDELETE	PREV PG	NEXT PG	INQUIRY	ABORT

XII. INVENTORY MANAGEMENT

A. THEORY OF AN INVENTORY MANAGEMENT SYSTEM

Inventory control is the tracking of the ins and outs to inventory, and purchase orders to vendors through their receipt.

Inventory Management is the application of a set of scientifically derived rules to the purchasing and stocking of inventory, with the dual objectives of minimizing inventory investment while maximizing customer service levels. Inventory control is straight forward and somewhat mechanical. Inventory Management, on the other hand, requires an in depth study and customization to each client's operation, if it is to achieve the desired results.

The objective of any Inventory Management System is to balance two conflicting needs.

1. Maintain sufficient inventory on hand to properly service customer orders, and

2. Minimize inventory investment and carrying costs.

For most distributors, their investment in inventory represents 60% or more of their total assets. The consensus of opinion is that inventory carrying costs are somewhere in the 22% to 30% range, with 25% being an average estimate. Thus, a reduction in the size of a distributor's inventory by $400,000 (for example: from $1,000,000 to $600,000) will improve bottom line performance by $100,000. Before the introduction of sophisticated inventory management systems, this reduction usually led to reduced levels of customer service. This need not be the case now.

To balance these two objectives, the system must perform the following functions.:

1. WHEN TO ORDER

By establishing sales forecasts (based upon past sales experience) and tracking lead time, the system alerts management when it is time to reorder. The reorder point takes into account the desired service level as well.

2. HOW MUCH TO ORDER

The MDS system supports several approaches to the reordering process. The first is based on the concept of economic lot sizing (EOQ). However, this approach is frequently misunderstood and does not always result in reasonable order quantities since its singular objective is to minimize overall inventory investment.

Product line purchasing ("line- buy") is the third approach supported by MDS. The system establishes the proper order cycle for the product line based on the sale rate for the line, compared to the vendor purchase minimums (expressed in dollars, units, pounds).

The last method is called the "Min/Max" or "order up to" method of replenishment. This approach is best suited to branch replenishment situations.

XII. INVENTORY MANAGEMENT

A. THEORY OF AN INVENTORY MANAGEMENT SYSTEM

3. GENERATION OF THE PURCHASE ORDER

Based upon the user recommended purchase quantity, MDS allows the buyer to review and adjust the suggested purchase quantities. After approval, the purchase order to the vendor will automatically be generated.

4. MONITORING INVENTORY LEVELS

A series of reports designed to alert management to exceptional situations (i.e., slow moving items) and to help establish the appropriate service levels are included as part of the system. Ranking of items by profit, by volume, etc., are also included.

This module performs the actual calculation of reorder points and reorder quantities based upon information recorded as a by-product of the order entry module. This information in turn is used in the various reports included in the inventory control subsystem.

B. GRAPHICAL PRESENTATION

The amount of inventory to be ordered is established by estimating how much inventory will be sold each month and taking into account factors such as vendor minimums, item cost, inventory carrying costs, as well as the costs of purchasing.

As previously stated, the objective of the Inventory Management System is to balance the requirement of stocking inventory to servicing customer orders, and the goal of minimizing inventory investment and carrying costs.

As Figure 1 graphically illustrates, if inventory is depleted at a higher rate then normal, a stock out would result (Point 3). To protect against this happening, a safety stock is established to cover higher than anticipated depletions against inventory.

The calculation of safety stock is therefore at the heart of the system, since it is in this calculation that the choice must be made between lower inventory carrying costs, or lower stock outs, and higher service levels.

The size of the order has a significant impact on the average inventory level. Through control of the order size policy, management can therefore regulate the level of inventory. Control is exercised by changing either of the two cost elements that determine order size: inventory carrying costs and order costs.

The theory of economical lot sizing (EOQ) is presented in Figure 2. As the order quantity is increased, the average level of inventory rises. The carrying costs therefore increase at a constant rate. As order size increases, acquisition costs such as setup can be spread over more units, and the unit cost therefore decreases. The total cost line in Figure 2 represents the sum of two lines. The point of minimum cost indicates the most economical order quantity.

XII. INVENTORY MANAGEMENT

B. GRAPHICAL PRESENTATION

```
INVENTORY
LEVEL
      ^    (1) Review              Lead            ( For          ^
           <---Cycle--->|<------Time------>   | ( Review
                .                                  (
                     .    Order                    <        Order
                        .  Point                    (       Quantity
                         .                           (
       --------.------------------------------------ ------  ----
                  .  .                               (                    ^
                     .  .                            ( For
                       .    .                      ( Lead
                        .       .                     < Time
                     .     .      .                    (
                   .         .      .                  (
                 .             .      .       .  .    Average
                  .              .      .     . (2)   (      Inventory
                        .              .          .  .  .
                            .                .      . | .
                              .                .        (
                                .           .    Safety
                                   (3)           Stock
```
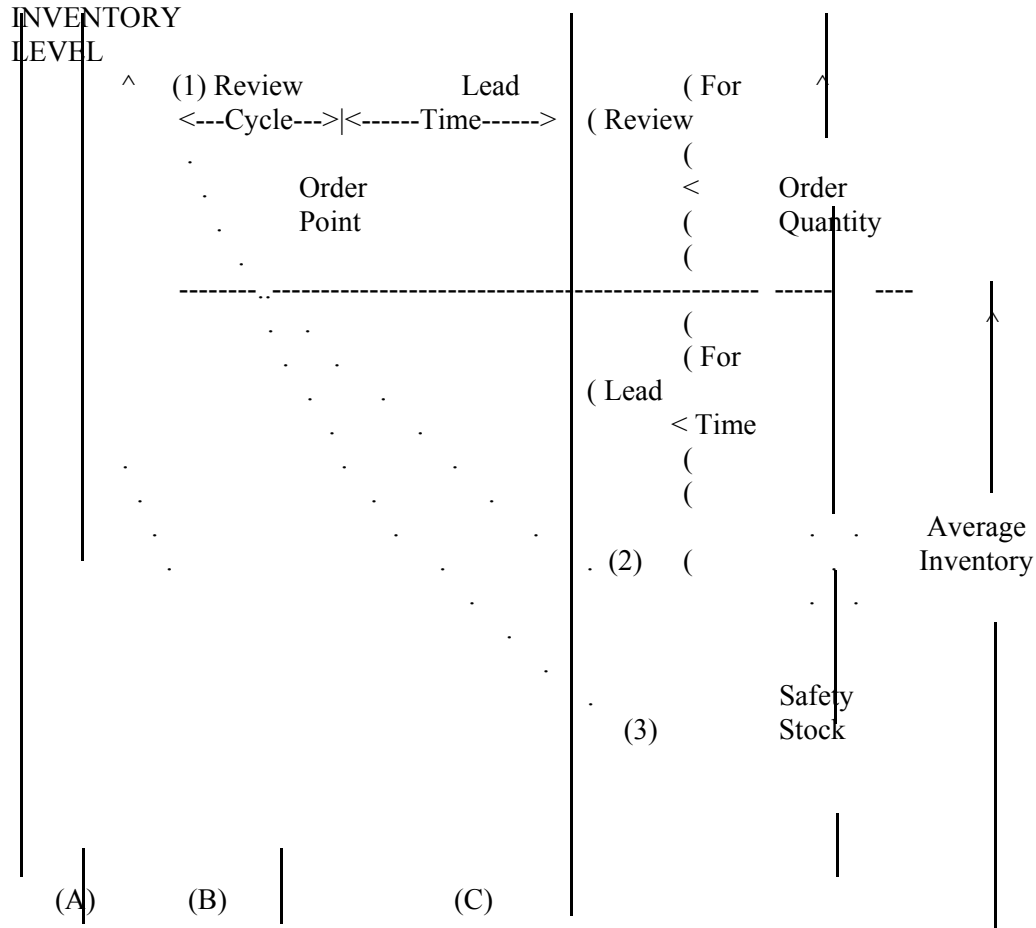
Figure 1

Figure 1 shows how a scientific inventory management system operates.

Starting from point (1) on the chart, inventory is reduced gradually until it reaches a level called the reorder point. At this time, a purchase order (or shop order) is placed. Inventory continues to be depleted until at point (2), the ordered quantity is received.

XII. INVENTORY MANAGEMENT
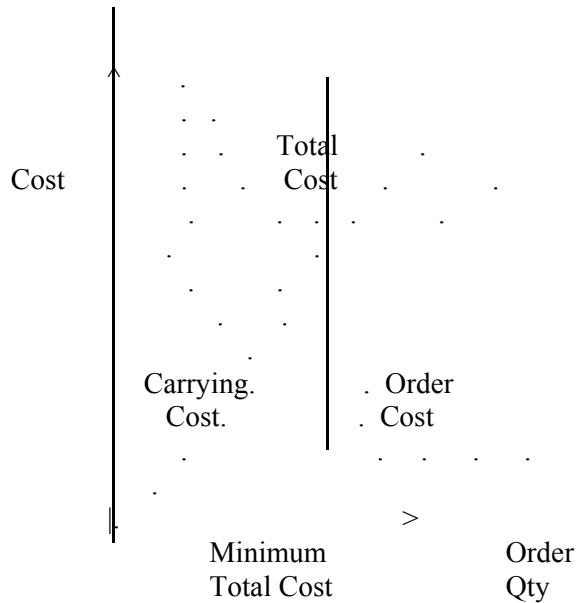
B. GRAPHICAL PRESENTATION

Figure 2

Figure analysis of the two major cost elements, order and carrying costs, determines the order quantity that will result in the lowest total cost.

Analysis of the two major cost elements, order costs and carrying costs, will determine the order quantity that will result in the lowest total cost.

C. SERVICE LEVELS, SAFETY STOCK AND VELOCITY CODES

Most distributors will agree that it is very important in terms of customer service, sales, inventory investment, etc., to place the major portion of their attention and inventory investment behind those items which contribute most to their sales dollars. The system encourages the use of this basic concept.

The system will take all the items in a distributor's inventory and rank them based on their sales dollars during the last 12 month period. Other criteria, such as gross margin dollars, number of orders and gross margin percent are optionally available.

A velocity code, based on actual sales ranking from high to low sales usage (A,B,C, or D), is assigned to each item automatically. At the same time, a velocity code report is produced for each buyer's review. Whenever there are reasons why the computer assignment of velocity code is misleading. (e.g., recently added items, "must be in stock" items, or items to be phased out, etc.), the buyer can go directly into the item file and change the velocity code.

XII. INVENTORY MANAGEMENT

C. SERVICE LEVELS, SAFETY STOCK AND VELOCITY CODES

The purpose of the assignment of velocity code is two-fold:

1. It helps the buyer and management make such merchandising decisions as:

   a. which items to discontinue
   b. which items to promote more
   c. where to change prices

2. It is used by the Inventory Management System to set safety stock levels.

   As service level objectives go up, the system must account for and provide for a higher percentage of the possible deviation in demand from that forecast by statistical formula. Several factors work together to help keep control over the amount of money invested in safety stock to account for these deviations. These include:

1. The higher velocity items tend to have a "smoother" history of sales and are less probable to have sharp deviations from the forecast. The additional inventory required to meet a specified service level objective varies based upon the variability of demand on the item (i.e., how much do sales vary from month to month). The statistical measure of variability used by the MDS system is the <u>standard deviation.</u>

2. Management is more concerned that there is a higher level of service on the better selling items.

3. The system permits the setting of service level objectives by velocity code. Each user sets his own criteria. One typical set of goals might be:

Velocity Code1	Service Level Objective	Safety Stock Required
A	93%	148%
B	85%	104%
C	75%	68%
D	50%	0%

Note that a 50% service level objective means that no safety stock will be added to the recommended buy. Since D items, at their best, contribute only 5% of the sales dollars, they do not justify any safety stock investment. Also note that a service level of 85% requires a quantity equal to slightly more than 1 standard deviation unit of the item, a significant increase in the amount of inventory required. Since average inventory on hand is one half of the order quantity plus safety stock, this inventory excess must be reserved for only a selected portion of the total inventory.

XII. INVENTORY MANAGEMENT

C. SERVICE LEVELS, SAFETY STOCK AND VELOCITY CODES

There is a table which directly translates service level goals to standard deviations. This table is shown on the next page. At a more technical level, order rates are generally assumed to follow a Poisson Distribution, which can be approximated by the normal distribution in large numbers. The table shown is actually various values for the normal distribution ("bell shaped") curve.

The inventory management system will dictate the buying of items where there is not enough stock much more rapidly that it can tell a distributor how to get rid of excess inventory. Therefore, one must be careful not to make the service level objectives too high to avoid an unreasonable build up of inventory. The objectives can be changed at any time and gradually massaged to the levels management wants to support.

D. VELOCITY CODES AND SAFETY STOCK

Service Level Goal	Number of Standard Deviations
50%	0.00
60%	.25
70%	.52
75%	.68
80%	.84
85%	1.04
90%	1.28
91%	1.34
92%	1.41
93%	1.48
94%	1.56
95%	1.65
96%	1.76
97%	1.88
98%	2.06
99%	2.33

E. APPLICATION OF THEORY - WHEN TO ORDER - THE REORDER POINT

The system will, upon request, compare available inventory (on hand + on order from vendor - backorders) to the reorder point (sometimes referred to as the "minimum" or "trigger").

The reorder point (ROP) is calculated as follows:

ROP = Administrative + Purchasing * Demand + Safety Stock
       Lead Time   Lead Time

XII. INVENTORY MANAGEMENT

E. APPLICATION OF THEORY - WHEN TO ORDER - THE REORDER POINT

1. ADMINISTRATIVE LEAD TIME

The time it takes your company to issue a purchase order to the vendor from the point in time a reorder notice is given.

2. PURCHASING LEAD TIME

The vendor's lead time, established initially by manual input, and then maintained in the purchasing module.

3. DEMAND

Forecast of sales for the coming month. The demand is based on past usage information (warehouse sales, not including shipments made directly from the vendor to the customer). In multi-branch replenishment networks, the demand is the summation of the demand of all warehouses replenished from this branch. The computed demand can then be adjusted to take into account:

a. seasonal variation in demand
b. trend line of sales growth or loss of the product or product line
c. unusual sales patterns such as:
  - unusual sales, transfers, etc., in a month
  - stockouts that last too long
  - items that only one customer buys
    - items with very low sales per year
d. specific known customer demand situations
e. manual override to adjust unusual sales history

4. SAFETY STOCK

The safety level is a multiplication of demand times a factor reflective of the desired service level (using the normal distribution curve to relate service level to stock level), as described in the preceding section.

F. APPLICATION OF THEORY - HOW MUCH TO ORDER - REORDER QUANTITY

The MDS system supports several approaches to the reordering process. These methodologies may vary by product, product line, and/or warehouse.

1. EOQ

This method is based on the concept of economic lot sizing (EOQ). However, this approach is frequently misunderstood and does not always result in reasonable order quantities since its only objective is to minimize overall inventory investment.

XII. INVENTORY MANAGEMENT

2. INVENTORY CLASS

This off shoot of the EOQ method is based upon a simplified inventory classification procedure developed by Gordon Graham. It approximates EOQ's but is easier to maintain.

3. LINE-BUY

This approach supports product line purchasing ("line-buy"). The system establishes the proper order cycle for the product line based on the sales rate for the line, compared to the vendor purchase minimums (expressed in dollars,units,or pounds). For example, if the vendor's terms require a minimum of 360 pieces for a freight prepaid shipment and the average monthly usage quantity for all items in that line is 180, you should purchase the line every 60 days. Similarly, if the vendor freight prepaid requirement was 10,000 lbs. and the sales rate is 10,000 lbs. per month, then the order cycle for the line would be 1 month.

4. MINIMUM/MAXIMUM

This method, which is most suitable to branch replenishment, utilizes a somewhat different approach as discussed below.

5. EOQ THEORY

The EOQ formula tries to find the "happy medium" between two extremes. Wholesalers traditionally want to maximize turns and minimize overhead. You can produce a large turnover rate by buying small quantities frequently during the year. You can reduce overhead by buying large quantities a few times a year. The EOQ formula gives an order quantity which balances the two extremes and "leans" toward whichever extreme, high turns or low overhead, is appropriate for a given product.

The true theoretical value of the EOQ is the minimum quantity to buy at the point when the cost of carrying inventory is equal to the cost of ordering. Rather than deal with straight theory, consider the following example:

Assume two products have identical costs of ordering ($5.00), costs of carrying inventory (30%) and usage rates (1,000). However, Product A costs $1.00 and Product B costs $100.00. Using the formula, the EOQ for Product A would be 632 and the EOQ for Product B would be 63.

It makes sense that Product A should be bought in large quantities infrequently during the year. Since the cost is low, low overhead is a primary concern, so the EOQ favors that extreme. By the same token, Product B should be purchased in smaller quantities frequently during the year. Its higher cost means a higher inventory investment, so high turns is the primary concern. The EOQ therefore, "leans" to that extreme.

Problems with EOQ's surface at either end of the stock item profile - the fast moving and/or high cost items. Unreasonably low order quantities might result from the strict application of the EOQ formula.

XII. INVENTORY MANAGEMENT

F. APPLICATION OF THEORY - HOW MUCH TO ORDER - REORDER QUANTITY

5. EOQ THEORY

The EOQ formula is as follows:

$$EOQ = \sqrt{\frac{24 * \text{Month Usage} * \text{Order Cost}}{\text{Inventory Carrying Cost} * \text{Unit Cost}}}$$

The factors include in the EOQ calculation include:

a. The system's estimate of product demand.

b. The cost of the item, and hence, how much it costs to carry the item in inventory.

c. The inventory carrying costs, typically expressed as a percentage of the average inventory value. Typical values range between 22% and 30%. This cost represents the cost of money, insurance, taxes, obsolescence, and storage.

d. Purchase order costs which can be calculated by dividing the total number of purchase order line items into the costs of the purchasing, accounts payable, and receiving departments. Costs per incremental purchase order are not considered a factor. Typical costs vary from $3 to $10 per purchase order line item.

5. INVENTORY CLASS METHOD

An alternate method to the EOQ is the inventory class computation method. The primary benefit of this approach is its simplicity and avoidance of the extreme results sometimes obtained from EOQ. Items are categorized into 13 categories, and then bought according to the following table:

CLASS X MONTHLY USAGE RATE

Class	Percent of Items in Class	Months Supply to Purchase	Turns Per Year to Expect
1	7.5	1	12
2	7.5	2	6
3	10	3	4
4	10	4	3
5	8	5	2.4
6	8	6	2
7	8	7	1.7
8	8	8	1.5
9	8	9	1.3
10	8	10	1.2
11	8	11	1.1
12	9	12	1
13	0	0	0

XII. INVENTORY MANAGEMENT

F. APPLICATION OF THEORY - HOW MUCH TO ORDER - REORDER QUANTITY

6. INVENTORY CLASS METHOD (Continued)

When you review how items are sequenced as the classification step is completed, you'll note that Classes 1 and 2 have only 15 percent of your non-dog (D) items. . . but account for 65 percent of the annual dollar movement through inventory. Classes 3 and 4 add 20 percent more of the item total and 25 percent of the money movement. Classes 1,2,3, and 4 account for 35 percent of all your good stock items. . . . BUT 90 PERCENT OF THE ANNUAL MOVEMENT OF DOLLARS THROUGH INVENTORY! All the rest of the "good" stock items (65 percent of the total number) account for only 10 percent of total sales.

The Classification Method approximates the results you'd get with EOQ. . . not as precisely, but certainly within an order quantity's general range for any specific stock item. Classification is easier to understand, very easy to program, and easier to adapt to. A buyer might be mystified by EOQ's math and yet have no trouble at all grasping how classification works.

7. LINE BUYING - LINE POINT ORDERING

Line buying is one of the toughest problems a distributor's purchasing people face. "Which stock items in this supplier's line should be purchased so that the total order meets the free freight requirement? Or gets us an extra 10% discount?"

Line buying is a constraint on your ability to replenish stock items properly. A single item reaches its order point, but you can't buy that one item all by itself. You would pay an exorbitant price, because your total order would not be anywhere near the amount required by the supplier to qualify for special handling or discounts. So you look around for other items to fill up the purchase order. But you really don't need anything else right now. Anything added onto the purchase order to make weight or build up enough dollars will be excess inventory.

Traditionally, the buyer flips through a printout of all items in the manufacturer's line and fills in the purchase order with some fast movers. The total order requirement has been met. Regardless of the fact that none of these "good" items were near the point at which they needed to be replenished or that many other items in the product line were not considered even though they were closer to an order point.

It is easy to fill up purchase orders with fast movers in most product lines, but what happens when you do? The inventory investment becomes badly imbalanced. Those fast movers, which should be turning over quickly as the foundation of the replenishment system, instead turn over slowly. The problem compounds. The next purchase order requirement is more difficult to reach. Many other items in the line sell moderately, but as they reach their order points they cannot be purchased.

There is such a glut in the fast movers that future orders from this supplier must be postponed to sell off some inventory.

The answer: Establish a higher control (set above the reorder point) for each stocked item that will tell you when and when not to add the item to the current purchase order.

XII. INVENTORY MANAGEMENT

F. APPLICATION OF THEORY - HOW MUCH TO ORDER - REORDER QUANTITY

7. LINE BUYING - LINE POINT ORDERING (Continued)

The higher control level is called a "line point". Every item stocked in a supplier's product line (where a total order discount is offered), has a normal replenishment control (the reorder point) but also has a line point. Any item below reorder point should be replenished as well as any item below the line point.

Line Point = Reorder Point + Usage During the Order Cycle

Reorder Point = Usage Per Day * Lead Time Days + Safety Stock

The calculation of the line point is straight forward. Assuming:

Usage	= 100/Month
Reorder Point	= 150 Units
Order Cycle	= 1 Month
Line Point	= 250 Units

The Rule to Follow:

During a purchasing order cycle, purchase all items below their line or reorder points. The reason? The reorder points clearly control service. The items below line point will be below their reorder points by the time the next order cycle comes around. If you are actually below reorder point when an item is replenished, you will likely run out of stock. This approach allows you to replenish those items that will be hitting their reorder points before you get another chance to order the line. Those are the items now below their line points.

Clearly, using line points will require a larger inventory investment since more products will be ordered earlier. But that is the cost of carrying a product line with the attendant minimum order constraints.

Therefore, the reorder quantity is defined as the greater of:

a.   the quantity needed to raise availability to the line point, or
b.   the EOQ.

8. MINIMUM/MAXIMUM

The Min/Max approach is to order when the quantity available is less than or equal to the minimum; and order a quantity sufficient to bring the available balance to the maximum. The maximum is determined by adding the computer reorder quantity to the minimum. The amount to be ordered is then the quantity needed to raise availability to the maximum.

XII. INVENTORY MANAGEMENT

F.   APPLICATION OF THEORY - HOW MUCH TO ORDER - REORDER QUANTITY

8.   MINIMUM/MAXIMUM (Continued)

For example: If the minimum is 10, the maximum is 20, and the available is 5, a quantity of 15 should be ordered.

Gordon Graham recommends that the Min/max approach be used for branch replenishment. He suggests that the reorder quantity (maximum) for branches be developed along the lines of the inventory class method, but with a more aggressive turn ratio.

To illustrate:

If management decides that a branch's inventory investment should turn 12 times a year, the individual classes must turn as follows:

Class 1	20 times/year	Class 7	6 times/year
Class 2	18	Class 8	5
Class 3	16	Class 9	4
Class 4	12	Class 10	3
Class 5	10	Class 11	2
Class 6	8	Class 12	1
		Class 13	0

If an item is Class 1 in the branch, its replenishment quantity (when resupply is needed from the central warehouse) is 1/20th of the year's supply. A Class 2 item's quantity is 1/18th for the year's supply.   The difference between the Minimum/Maximum in a Class 1 item is 1/20th of a year's supply.

Monthly Usage = 100   Annual Usage = 1200
Class = 1   Replenishment Quantity = 60
Difference between Minimum and Maximum = 60

When the stock available for sale of this item reaches the minimum (very similar to an order point: enough material to last until the warehouse can resupply the item, plus a normal safety allowance), the warehouse ships 60 units to the branch. If the item had been a Class 7, the replenishment quantity would change to 1/6th of the year's supply, or 200 in the example.

XII. INVENTORY MANAGEMENT

G.   PURCHASE ORDER GENERATION

This procedure utilizes the parameters and calculations previously performed to arrive at a recommended purchase order to a vendor for a product line.

1.   The assumption is made that the usage and reorder point/quantity calculation procedures have been run.

2.   The program operates on a single product line at a time.

3.   Only items purchased directly from a vendor are considered. The usage of a branch being replenished from another (i.e., Branch 3 is restocked from Branch 1), is considered as part of the vendor purchase from Branch 1.

4.   In an iterative fashion, the program determines if a single branch or a combination of branches can qualify for the vendor purchase minimum. If so, a suggested purchase order is generated for purchasing review and approval.

    The reorder quantity is computed based upon the normal order cycle. If the vendor minimum is not met at that level, the order cycle is incremented by .1 months until the maximum order cycle or the vendor minimum is reached.

5.   A procedure is available to modify the recommended purchase order.

6.   Lastly, once accepted, a vendor purchase order (or a series of purchase orders) are generated, as well as transfers for that portion of the purchase order that is to be transhipped to another branch that could not meet its minimum.

H.   MONITORING INVENTORY LEVELS

Reports available in an inventory system fall into the following categories:

1.   Stock status reporting

2.   Exceptional situations

    a.   Items below reorder point (low stock report, used for between cycle margins)
    b.   Recommended purchase orders
    c.   Excess inventory report

3.   Categorization reports (to help establish service leads)

    a.   Lost sales report
    b.   Ranking reports (A,B,C, analysis)
            by sales units
            by sales dollars
            by gross profit

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

SALES ANALYSIS MENU

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

PRODUCT ANALYSIS MENU

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MDS for Windows - Connected to 199.5.163.1 - [SA.PROD]                      _ □ ✕
  File  Settings  View  Reset  Tools  GUI  Help                             _ ❒ ✕

          Account:BASE.12      Port:023 Menu:SA.PROD      Capture:On

                        Product Analysis Reports


          1. Product Sales Summary by Whse-Product Cla

          2. Discontinued Items

          3. Descending Product Unit Sales

          4. Descending Product Dollar Sales

          5. Sales History (this year - last year)

          6. Sales Summary -- Spread by Month  (spread)

          7. Sales Summary -- Spread by Month  (spread)



    Enter Selection or END:



  OE       VE       MAINT      DRILL                        CAPT OFF    VIEW
  HELP     END      INSERT     LDELETE    PREV PG  NEXT PG   INQUIRY    ABORT
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THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

CUSTOMER SALES ANALYSIS MENU

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MDS for Windows - Connected to 199.5.163.1 - [SA.CUST]          _ □ ×
File  Settings  View  Reset  Tools  GUI  Help                   _ □ ×


           Account:BASE.12     Port:023 Menu:SA.CUST      Capture:On

                         Customer Analysis Reports



                  1. Customer Activity Analysis
                  2. Customer Activity Analysis (No Gross Profit)
                  3. Customer Gross Profit Report by Salesman

                  4. Inactive Customer Report
                  5. Descending Customer Dollar Sales
                  6. Descending Customer Gross Profit

                  7. Comparative Sales by Customer
                  8. Comparative Sales by Salesman




        Enter Selection or END:

   OE          VE          MAINT        DRILL                          CAPT OFF      VIEW
   HELP        END         INSERT       LDELETE     PREV PG   NEXT PG   INQUIRY      ABORT
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THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

CUSTOMER PRODUCT SALES ANALYSIS

THE SYSTEMS HOUSE, INC.
MASTER DISTRIBUTOR SYSTEM PRODUCT DESCRIPTION

SALES HISTORY INQUIRIES

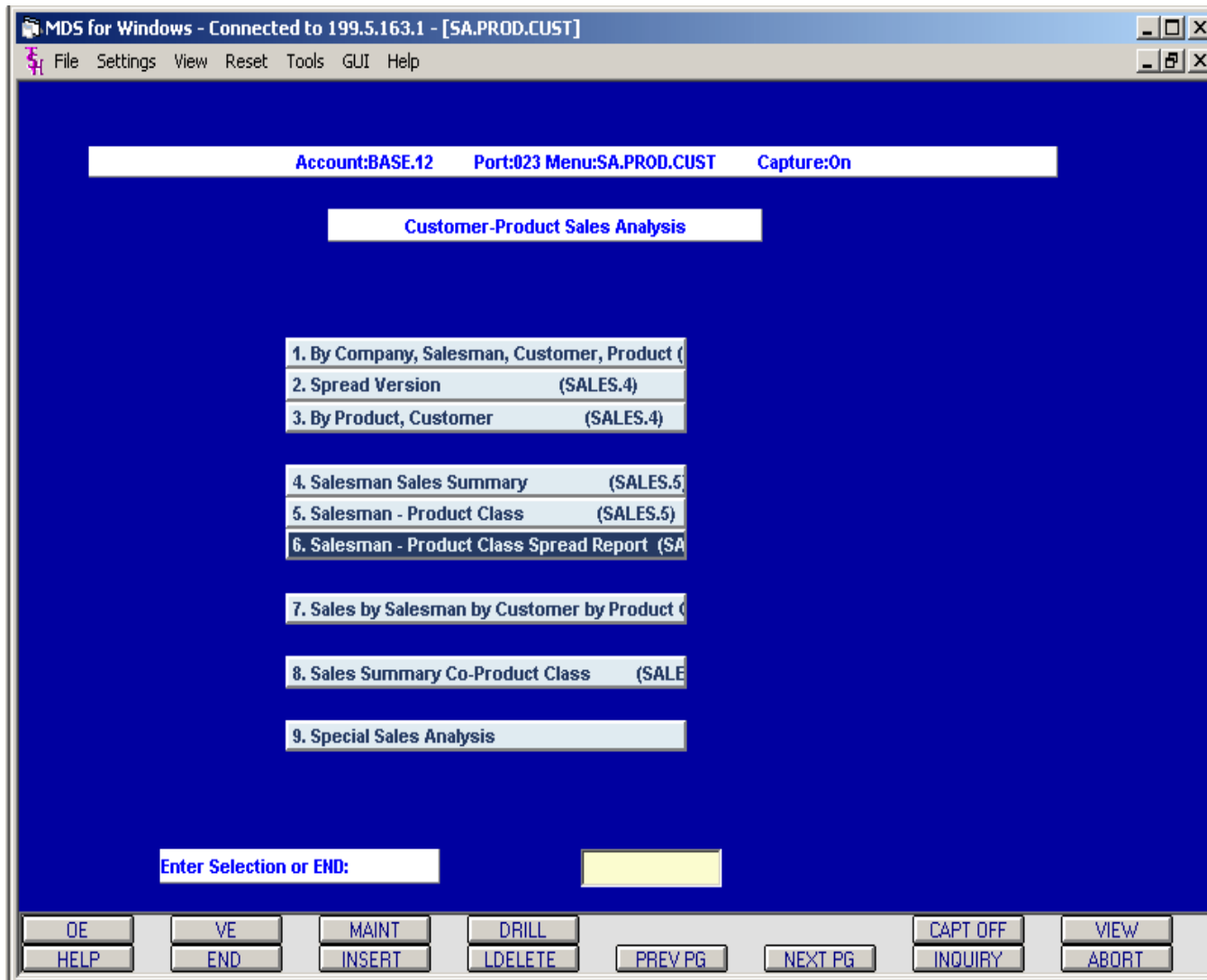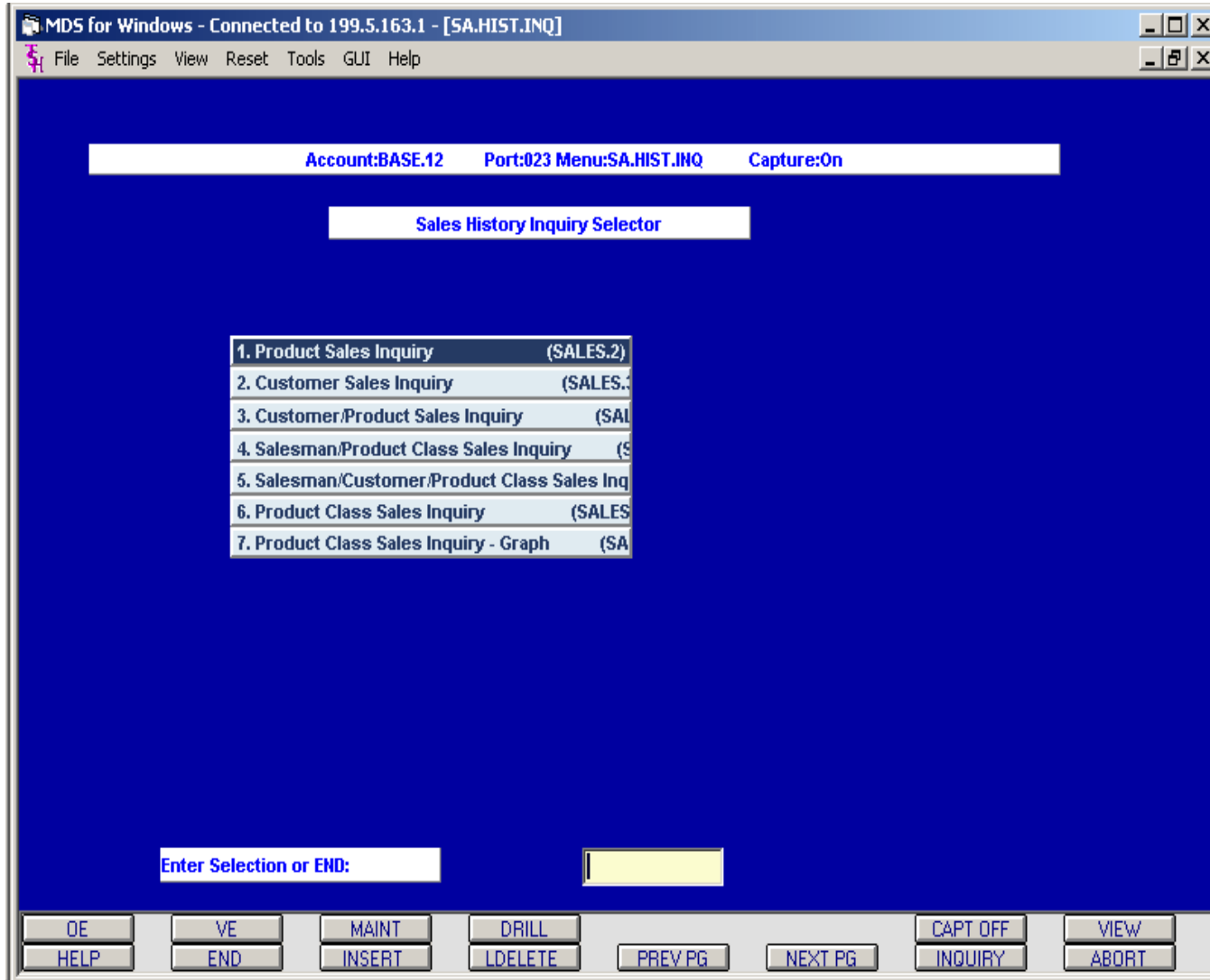MDS for Windows - Connected to 199.5.163.1 - [SA.HIST.INQ]

File Settings View Reset Tools GUI Help

Account:BASE.12   Port:023 Menu:SA.HIST.INQ   Capture:On

Sales History Inquiry Selector

1. Product Sales Inquiry   (SALES.2)
2. Customer Sales Inquiry   (SALES.
3. Customer/Product Sales Inquiry   (SAL
4. Salesman/Product Class Sales Inquiry   (S
5. Salesman/Customer/Product Class Sales Inq
6. Product Class Sales Inquiry   (SALES
7. Product Class Sales Inquiry - Graph   (SA

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XIII. SALES ANALYSIS

A. THE OBJECTIVE OF SALES ANALYSIS

An effective sales reporting system will attempt to answer the following three questions (sometimes called the three W's).

1. WHO IS SELLING? - Salesman Analysis

Management must know not only which salesman are selling the highest volume of product, they must also know if the salesman is selling profitably and is selling the products the company wants to move.

2. TO WHOM IS IT BEING SOLD - Customer Analysis

The question answered by the customer analysis reports include:

a. Who is buying the greatest volume?

b. Is the assigned salesman bringing in the business or is the customer calling the order himself?

c. Which customers are providing the highest gross profit dollars and margins?

d. Is the customer ordering profitably? i.e., average order analysis

e. Is he buying more or less than last year?

3. WHAT PRODUCTS ARE BEING SOLD? - Item Analysis

Item analysis is closely tied to the Inventory Management System in that sales history forms the basis of the sales forecast. Furthermore, the only way optimum sales service levels can be established is if the profitable items are known. Therefore, item (or product class) analysis seeks to answer the following questions:

a. Which items represent the highest dollar volume?

b. Which items are most profitable?

c. Are we selling more or less than last year for the corresponding period?

XIII. SALES ANALYSIS

B. THE SALES HISTORY DATABASE

There are literally hundreds of potential combinations and report formats that can be constructed to answer these questions. The approach taken by MDS is to maintain a generalized Data Base format, which can serve as the input to any required report.

1. SALES.1

The Sales.1 file is a summary record by company, warehouse, product type and fiscal period. This file is normally purged monthly, but can be retained as long as desired by the customer (subject to disk space limitations). This file is used for the deferred sales and cost of goods update to the general ledger.

The information contained in the record is:

a.   Sales Dollars
b.   Cost Dollars (can be used to compute gross profit)

2. SALES.2 ITEM HISTORY

This file contains a record for each product / warehouse combination and stores 24 months of history for:

a.   Sales Units (36 months)
b.   Sales Dollars
c.   Cost Dollars

NOTE: This file is the source of inventory management data.

3. SALES.3 CUSTOMER HISTORY

This file contains a record for each company / customer combination, and stores 24 months of history for:

a.   Sales Dollars
b.   Cost Dollars
c.   AR Balance at End of Month

XIII. SALES ANALYSIS

B. THE SALES HISTORY DATABASE

4. SALES.4 PRODUCT/CUSTOMER SALES HISTORY
SALES.5
SALES.6
SALES.7

These optional sales files contain the last 24 periods of:

    a. Sales Dollars
    b. Cost Dollars
    c. Sales Units

The base system will generate four sales files with the following keys:

Sales.4 Slsm-Cust-Prod	Customer/Product Analysis
Sales.5 Slsm-Prod Class	Salesman Analysis
Sales.6 Slsm-Cust-Prod Class	Salesman/Customer Analysis
Sales.7 Company-Prod Class	Product Class Analysis

C. REPORTING FORMATS

For any level of detail required, reports can be printed in any sequence in any or all of the following formats:

1. Comparison of two activity fields to the corresponding periods last year - both month to date and year to date with percentage changes.

2. Spread reports showing the actual activity for the past 12 months as well as year to date versus last year to date.

3. Ranking reports of customer's products or salesman based on unit or dealer volume, or gross profit.

Approximately 25 reports are included with the MDS product. Many other formats and sequences can be made available on an as needed basis.

XIII. SALES ANALYSIS

D. INQUIRY PROGRAMS

Corresponding to each of the sales history files, a screen inquiry is available. The inquiry displays a two year comparison of sales units, sales dollars, and gross profit.