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**Medical Acquisition  
Shelf-Life System  
(MASS)  
Decision Support Model  
User's Guide**

Operations Research and Economic Analysis Office

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MEDICAL ACQUISITION SHELF-LIFE SYSTEM

(MASS)

DECISION SUPPORT MODEL USER'S GUIDE

May 1989

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**FOREWORD**

The Medical Acquisition Shelf-Life System (MASS) Model is a decision aid to assist procurement analysts in evaluating alternative bids for stocked medical shelf-life items. MASS attempts to identify the best value bid by balancing longer shelf-life against higher purchase price in order to identify the bid with the lowest life cycle costs. The objectives of this systems documentation are to briefly review the model features, document the MASS programs, describe the MASS files, and explain the procedures for updating the MASS data.

*Christine L. Hello*

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## I. INTRODUCTION

The Medical Acquisition Shelf-life System (MASS) model is a decision aid to assist procurement analysts in evaluating alternative bids for stocked medical shelf-life items. The idea behind this model is not new. The model attempts to identify the best value bid by balancing longer shelf-life against higher purchase price. Life cycle costs are calculated by considering the purchase price, administrative buy, transportation, handling, storage, disposal, and replacement costs incurred for each bid.

This user's guide briefly documents how to input data, move through the screens, and interpret the output of the MASS model. Technical descriptions of the data update procedures, the dBASE programs, and the programs which produce the MASS data files are contained in the MASS Systems Documentation.

## II. MODEL FEATURES

MASS allows you, the user, to evaluate virtually an unlimited number of bids for an NSN at the same time. Additionally, it is easier for you to use because it provides NSN characteristics that are derived from historical data. In order to make running the model as easy as possible, the model provides default suggestions based on historical data for necessary input values. The model will display these default values and will give you the opportunity to change them.

Also the model will save the original bid information to facilitate investigating "what if" questions. For example, if you wanted to investigate the effects on which bid would be accepted by changing the transportation and handling costs, the model will save the bid information for you so that you can rerun the model changing the transportation and handling costs as many times as you want. You can then see what the affects of these changes are on the life cycle costs and ranking of the bids. Saving your bid information relieves you of reentering this information each time you want to change the defaults.

The model also gives you the option to save your output to a disk file for use by other programs or packages such as dBASE, LOTUS, and ENABLE. If the MASS results are moved to these packages, reports can be customized, combined with other data, or graphed. This interface ability provides great flexibility. However, some familiarity with these packages is required.

## III. LOADING THE MODEL

- A. Place the NSN.DBF diskette in your A drive.
- B. Type "COPY A:M.BAT C:". This will copy a file which prepares your system for the MASS model, calls dBASE, executes the MASS programs, and places read only protection for some dBASE files.

- C. Type "COPY A:CRASH.BAT C:". This will copy a file which reinstates your MASS system in the event of a power failure while executing MASS.
- D. Change the directory to your dBASE directory by typing "CD\" followed by your dBASE directory name; for most systems the data base directory name is "DBASE".
- E. Type "COPY A:NSN.DBF C:" to copy the NSN data to your dBASE directory.
- F. Place the MASS diskette in your A drive then type "COPY A:\*. \* C:", this will copy the remaining MASS files to your dBASE directory.
- G. Installation is complete. Test the model by typing the following commands:
  - CD\ <ENTER>
  - M <ENTER>
- H. The model will roll through some introductory screens then ask for an NSN. If the model does not do this ask your system administrator for assistance.

#### IV. REQUIRED KNOWLEDGE FOR RUNNING MASS

To run MASS you will need to know what NSN you wish to study, the price, shelf-life months, and buy quantity for all the bids you wish to evaluate. There must be at least two bids. You also need to know if the vendors agree to later inspect the stock and extend it if it passes inspection. If so, you will need the additional charge for this service. If unsure, assume that the vendor will not extend shelf life and that there are no additional costs. Vendors typically do not provide this service. All other needed information is provided by the model based on historical data. The model will display this information and allow you to overwrite if you wish. Programming experience and knowledge of dBASE are not required for running MASS.

#### V. GENERAL INSTRUCTIONS

Do not hit keys (particularly the <ENTER> key) while MASS is still writing to the screen or printer. When MASS asks for your input, it will ask a question then display a highlighted area for your response. If you are impatient and hit keys while the model is writing, the model will accept your inputs as answers to questions the model has not asked yet. When using MASS for the first time we suggest that you take your time and read the screens before hitting <ENTER>. Note: MASS is a decision aid and not

the decision maker. MASS considers only economic factors for typical conditions. Political factors and unusual situations may require the user to override defaults or use their expert judgment. An enter key, <ENTER>, is required for each entry.

## VI. MODEL EXECUTION

To execute MASS begin by typing "M" at the "C:\>" prompt. The routine will roll through some introductory screens then ask for a National Stock Number (NSN). Type a 13 position NSN <ENTER> (see Figure 1).

Figure 1

### NSN SELECTION SCREEN

MASS evaluates stocked replenishment demand  
Medical shelf-life item life cycle costs for any number of bids.

Please enter the national stock number (NSN) for the bids  
that you wish to evaluate.

NSN - 6505000000072

#### A. Identifying NSN Characteristics

The model will search for NSN data related to your selection. A message will be provided to tell you if the NSN was found in the data base. If the NSN was not found, the model will use system averages as suggested defaults for the NSN. The model displays the NSN characteristics and asks you if you wish to accept the default NSN characteristics (see Figure 2).

Figure 2

### NSN DISPLAY SCREEN

I wish to accept all these NSN characteristics (T or F)? T  
NSN - 6505000000072  
Hazardous storage compatibility code (blank means nonhaz.) -  
Item name - CEPHALOTHIN SODIUM  
Min shelf-life required for this NSN (valid range 3-120) - 24  
Unit weight - 0.03  
Safety level months - 0.0  
Annual demand frequency - 103  
Procurement cycle months (valid range 3 to 36) - 3  
Probability of rotatable pwr - 0.0066  
Probability of nonrotatable pwr - 0.0022  
Transportation and handling \$ per pound - 1.2171

You may accept by pressing <ENTER> or reject by typing "F" <ENTER>. If you reject the defaults the model displays a screen which allows you to override these defaults (see Figure 3).

Figure 3

NSN OVERRIDE SCREEN

```

NSN - 6505000000072
Hazardous storage compatibility code (blank means nonhaz.) -
Item name - CEPHALOTHIN SODIUM
Min shelf-life required for this NSN (valid range 3-120) - 24
Unit weight - 0.03
Safety level months - 0.0
Annual demand frequency - 103
Procurement cycle months (valid range 3 to 36) = 3
Probability of rotatable pwr = 0.0066
Probability of nonrotatable pwr = 0.0022
Transportation and handling $ per pound = 1.2171
I wish to stop and enter a new NSN (T or F)? F
  
```

To override the defaults, move the highlight bar to the characteristic you wish to change by using the up/down arrow keys. Type the desired information over the displayed entry and then hit <ENTER>. The last prompt asks if you wish to reenter the NSN. If you hit <ENTER> the model will display the bid screen (see Figure 4). If you type "T" and then <ENTER>, the model will start over with the NSN selection screen (see Figure 1).

Figure 4

BID SCREEN

Enter a blank for BID ID when finished entering all bids.

BID ID	OFFERED UNIT PRICE	SHELF LIFE VALID RANGE (3-120)	BUY QTY	DOES VENDOR EXTEND SHELF LIFE? (T OR F)	ADDITIONAL PER UNIT COSTS NOT INCLUDED IN OFFERED UNIT PRICE
BID 1	112.80	60	12000	F	0.00

This is the bid that I normally would have taken (T or F) F

## B. Entering Bids

The bid screen (Figure 4) asks for a BID ID. You may specify any combination of numbers, special characters, or letters. Up to 12 characters are permitted. BID IDs can be repeated for different bids if desired. A blank BID ID tells the model that you have finished entering bids. You will be asked for the price, shelf-life months, buy quantity, and whether the vendor agrees to later inspect the stock and extend any stock which passes inspection. The model also allows you to enter per unit additional costs which might be incurred due to extending stock, transportation, or other circumstances. Note that this should be a per unit cost, not a per buy cost. The model will allow negative costs to be entered. Generally additional costs will be zero.

MASS will ask if this is the bid that you normally would have taken if you had not used MASS. This bid will be used as the standard bid. Only one bid can be the standard bid. The life cycle cost of the standard bid will be subtracted from the life cycle costs of all other bids to calculate cost avoidance. Once you answer "true," this is the bid that I normally would have taken, the question is no longer asked on subsequent bids. This is to prevent you from accidentally choosing more than one bid as the standard. If you do not choose any bids as the standard, MASS, by default, will pick the bid with the lowest bid price which meets or exceeds the minimum shelf-life requirement as the standard.

The model will continue to prompt for additional bids until you enter a blank BID ID. The model allows any number of bids. Note that the bid quantities are repeated on subsequent bids for your convenience. These quantities may be overridden.

## C. Selecting Output Options

When a blank bid is entered the model writes a copy of the MASS report to your screen for review (Figure 5).

Press <ENTER> to page through the report. When all pages are finished the model will ask if you want to print the report. Hit <ENTER> to print or "F" <ENTER> to not print. The model will ask if you wish to print the input data. We recommend that you keep this data for your records. Press <ENTER> to print or "F" <ENTER> to not print. The model will display instructions for interfacing files to LOTUS and ENABLE. The model asks if you want to erase the previous MASS123.DBF output file. If you don't erase this file, you may have reports from previous runs included in your disk file. If you do erase, be careful that you are not erasing someone else's file that they may still want. The model will ask you to confirm that you want to erase MASS123.DBF. When exiting MASS it is a good practice to copy your MASS123.DBF to another file if you want to save your results.

Figure 5

EXAMPLE OUTPUT

Medical Acquisition Shelf-life System (MASS) Report

NSN - 6505000000072  
Item Name - CEPHALOTHIN SODIUM  
Current Shelf-life Month Requirement - 24  
Date (mm/dd/yy) - 09/20/88                      Time (hh:mm:ss) - 11:30:41

Bid ID	Vendor Unit Price	Shelf Life Month	Ten Year Discounted Unit Life Cycle Cost	Buy Quantity	Ten Year Discounted Life Cycle Cost	Ten Year Cost Avoidance
BID 1	112.80	60	120.50	12000	1446000	522,000
BID 2	112.44	24	120.94	12000	1451222	0

Next the model will ask you if you want to append your current results to the end of the MASS123.DBF file. If you want to save your results to disk, press <ENTER>; otherwise type "F" <ENTER>.

D. Rerunning MASS

The model will ask if you wish to run MASS again. Rerunning MASS allows you to do a "what if" analysis or sensitivity analysis. Hit <ENTER> to leave MASS or "T" <ENTER> to rerun MASS. If you rerun MASS, the model will return you to the NSN screen (Figure 1). The model retains the NSN entered previously. You may either accept the NSN by hitting <ENTER> or type a new NSN and <ENTER>. The model will allow you to change the NSN characteristics to rerun the analysis. To facilitate reruns the model maintains the previously entered bid information. This bid information may be confirmed by hitting <ENTER> or changed by keying over the displayed fields. You may also add additional bids. MASS may be rerun as many times as you wish. By controlling when the MASS123.DBF file is erased and appended to, you can custom build a file of your MASS results.

E. Exiting MASS

Mass can be exited by pressing <ENTER> at the prompt "I want to run MASS again?". When exiting MASS the M.BAT file renames files and places read only protection back on some of the MASS files. It returns you to your root directory and executes your autoexec file.

#### F. Copying Your File

If you wish to save your results we recommend that you copy your MASS123.DBF file to prevent its loss during future MASS runs. This file may be copied in DOS by typing "COPY MASS123.DBF new-name.DBF."

#### G. Escaping From MASS

1. You may escape MASS at any time by hitting the escape key until the "Terminate Command File? (Y/N)" question appears.
2. Type "Y".
3. You will exit MASS to dBASE.
4. You may reenter MASS by typing "DO MASS" or exit dBASE by typing "QUIT".

#### H. Reestablishing MASS After A Power Failure

If you exit MASS by turning off power or hitting CONTROL/ALT/DELETE, configuration files will not be renamed and read only protection on the dBASE files will not be reestablished. These problems can be corrected by typing "CD\" followed by "CRASH."

#### I. Data Validation

MASS performs some data validation of entries. If an error is encountered, a message is printed in the upper right hand corner. Then you are asked to hit a space bar and reenter.

### VII. MASS INTERFACES

#### A. Interfacing MASS to dBASE III or III +

The MASS123.DBF file written by MASS is a dBASE data base file. It may be listed, edited, combined with other files or used for customized reports with dBASE. To do this, enter dBASE and then type "USE MASS123.DBF." The file can then be accessed by normal dBASE commands.

## **B. Interfacing With LOTUS Version II**

Enter LOTUS version II. Take the translate option in the main menu of LOTUS by typing "T". Translate from dBASE III by highlighting dBASE III then <ENTER>. You may translate to release IA or release II. However, if you wish to interface with ENABLE, select release IA. LOTUS will display some information. Hit the <ESCAPE> key twice to eliminate these messages. Edit the source file to display the appropriate directory and file name. For example, if you have not renamed your file, you might type the following:

"C:\DBASE\MASS123.DBF"

Hit <ENTER> twice to specify the destination file. Hit <ENTER> again to proceed with the translation. The translation is complete. Hit <ESCAPE> twice and "Y" to exit the LOTUS translate option.

## **C. Interfacing With ENABLE**

To interface MASS with ENABLE, you must first make a LOTUS version IA ".WKS" file. (See section VII.B. above.) Once the MASS123.WKS file has been created, you should enter ENABLE, then press <ENTER> three times to display the main screen. The main screen gives options to use system, help, MCM, or return to DOS. Type "U" to use system, then "S" for spreadsheet/graphics, and then "R" to revise. Next enter the name and directory of the MASS LOTUS interface file. For example, if you have a dBASE directory, you might enter the following name:

"C:\DBASE\MASS123.WKS"

Type "1" to select 123 format. Your MASS file has been translated to ENABLE. You may now edit, graph, or save this file using the ENABLE menus.

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