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## 1. INTRODUCTION

The Management Reports System (MRS) is intended to give all such information to the user that can be subtracted and evaluated from the air waybill and flight record data and can be described by mathematical or logical formulas. Therefore it makes possible for the user to gain precise view of the amount and volume of shipped cargo, of the load factor of each flight leg and of the pattern of the traffic for the user defined period of time. It also enables the user to calculate the net revenue based on the rates and charges entered to the CARs.

MRS based on MS FoxPro for Windows programming language and development environment. To run the compiled MRS software the user should only have MS Windows.

## 2. CONNECTION TO CARGO MAINFRAME

The communication between the IBM compatible PC and the SITA Cargo System in London may be done on different ways depending on the hardware and software of the user.

For the download two sessions must be set up. The first is a terminal session for the communications (sending action codes and monitoring system responses). The second is a printer session for the data reception. The printer used for the printer session is not connected to a physical printer port but to a file. This session is printing to a text file appending to the existing data base each piece of AWB information received. Having finished the download procedure a text file is formed that can easily be converted to (xBase compatible) FoxPro database.

### 2.1 Hardware and software requirements

The development and testing of MRS basically was made by STARS gateway card and for the supporting MS WINDOWS using the ACCESS emulation software while leaving the possibility of fitting to other environments (See addendum 1!).

To run MRS, MS DOS 3.3 or higher and MS WINDOWS 3.1 required.

It is also required to have 80386DX or 80486DX processor, VGA display card and a high resolution printer.

The installation and set-up of the communication card and the ACCESS emulator software requires expertise. The MRS software itself may practically be installed by anyone.

### 2.2 Set up the connection

The MRS interface module is a routine written in C programming language which sets up two direction communication between the FoxPro data base handling software and the ACCESS emulator software. The communications routine having set up the connection goes through step by step the masks of session choosing screens, giving the password and choosing the cargo system. After setting up the PC-Cargo System communications, MRS sines in to the system (using its own sine code e.g. 9999PC) and working with this sine code until sine off. Finishing its duty, before disconnecting the communication sines off regularly.

### 2.3 Handling of irregularities occurring in communications

MRS running its download communications functions continuously communicates with the cargo mainframe therefore longer than usual response time and longer system down periods are not allowed. Due to the big differences between the speed of the PC and the communications channels and to reduce the stand by times the real time processing of freshly downloaded data takes place. In case of slow responses not even this procedure helps to fill in the stand by times therefore a time out value can be defined. If the time out value is reached the procedure is halted. The user can set a time value when the MRS should automatically start trying to regain the connection again.

### 3. AWB DATABASE DOWNLOAD

#### 3.1 Basis of download

The download is based on the MODIFICATION 336 (Management Reports-Download AWB Format) which provides special machine readable, downloadable screen formats. The site selection files are configured by the download field names, than referring to these names downloads the data.

The formats used are:

- Formatted AWB display
- Formatted manifest display
- Formatted booking list display

#### 3.2 Timing of download

The download is started by a built in timer but can also be done manually. The built in timer can be set to a

- daily fix time value operation or
- to repeat the operation in every given hour - several times a day.

The daily download can be set to e.g. midnight and second option can be used if the number of AWBs or the speed of response time force the user to avoid the night operation.

#### 3.3 Downloadable data fields

Every data field can be downloaded to the database which is included in MOD 336 specification. Later in case of mainframe modifications the new data fields can also be included in the download without modifying and recompiling MRS due to the flexible structure of selection menus. The downloadable fields are defined on one hand by the database and on the other hand by the download configuration table. These two must be in harmony because the fields specified in the configuration file are the same what was described in the database structure. If it is not true (e.g. because the user changes the downloadable fields within the statistical period) than either a new database must be created which has the same structure as the new downloadable field set or the existing database should be amended. If the user deletes one field from the configuration table the system will delete that field also from the database to protect the homogeneity of the database. In such cases the system offers to the user the option of backup data base creation, but leaves it optional. The user can decide if he is willing to store several megabyte extra databases on his storage drives.

### 3.4 Interpretation of downloaded data

The parameters of all downloadable fields are held in a table which contains their description irrespective to the selected downloadable fields. Contains the field identifiers, the field (part-field) length and the evaluation methods. The way how a field is evaluated defining in the same time the set of actions (manipulations) that can be used in association with that field.

Possible types:

- Text: string of characters  
can be used as a parameter of sorting, searching, filtering, data grouping...
- Numeric: fixed point number  
can be used for calculations, sorting, searching, filtering...
- Logical: it's value can be 0 or 1 (True & False)  
can be used in expressions to make decisions
- Memo: text without important meaning which could be or should be evaluated.

## 4. SECONDARY DATABASES AND THEIR SOURCES

Apart from the AWB database which plays a central part, to prepare the reports required by the user it is essential to have such additional databases that has a certain relation with the AWB database. These data/databases can be entered either manually by the user or using the import function (section 11) can be imported from other data bases.

### 4.1 Forwarder and special rates database

To make the system able to calculate the net revenues and profits it is required to have the cargo agency agreements data for re-evaluating the rate data of the AWBs. The forwarder database identifies the agents by names and by IATA numbers. In each agent database the user can define an air waybill number stock or the IATA number if the discount is general for all the shipments of that agent. The degree of discount can be entered in percentage or as a weight dependent net value. The period of validity and the excluded special handling code holder shipments or nature of goods descriptions can also be entered here.

Structure of AGENT database.

<u>Field name:</u>	<u>Type</u>	<u>Length</u>	<u>Description</u>
AG_NAME	String	!!!!	Full name of agent
AG_IATA	String	30	Agent IATA number

Structure of SPECIAL RATING database.

<u>Field name:</u>	<u>Type</u>	<u>Length</u>	<u>Description</u>
AG_IATA	String	!!!!	Agent IATA number
F_STOCK	Numeric	11	First AWB number in stock
L_STOCK	Numeric	11	Last AWB number in stock
VALID_F	Date	3	Valid from date
VALID_T	Date	30	Valid till date
FROM_R	String	3	Departing city
TO_R	String	3	Destination city
SPEC_H	String	?	Valid special handling codes
COMMOD	String	?	Valid commodities
PEC_D	Numeric	3.3	X % discount to be used
NET_C	Numeric	8.3	Fix net charge to be used
CURR	String	3	Currency of net charge

The length of SPEC\_H and COMMOD is depends on the configured amount of special handling codes and commodities in the users partition in the Cargo System.

#### 4.2 Distances database

For FTK calculation, there is no distance data in the AWB therefore the distances of city pairs must be subtracted from an other database. This table contains the city pairs and their distances in kilometres.

Database structure:

<u>Field name:</u>	<u>Type</u>	<u>Length</u>	<u>Description</u>
FROM	String	3	First point
TO	String	3	Second point
DISTANCE	Numeric	6	Distance between points in km.

#### 4.3 Aircraft types database

If in the cargo system the aircraft weight and volume capacity data for each flight are not fully updated the load-factor calculation will produce false values. In such cases better results can be reached if MRS works with standard values instead of those downloaded from the cargo system.

This table contains the 3 letter codes of the aircraft types, the full type description and standard capacity figures.

Database structure:

<u>Field name:</u>	<u>Type</u>	<u>Length</u>	<u>Description</u>
AC_SHORT	String	3	Aircrafts 3 letter code
AC_FULL	String	30	Aircrafts full name
CAPACITY	Numeric	6	Standard available capacity
VOLUME	Numeric	5	Standard available volume



## 5. USERS

User is every person who has the right to view, modify or subtract data from MRS. In MRS there must be one supervisor (but may be several supervisors), who is entitled to perform all the actions without restrictions. If only one user has this authorisation, he can not be deleted until someone else is entered.

### 5.1 Defining new users

New user can be entered only by the supervisor and his level of authorisation (user rights) must be defined at the same time. Later the supervisor can modify the rights of each user.

### 5.2 User rights

The levels of user authorisation (user levels), and the rights linked to each level can be defined freely by the supervisor. The levels are marked with numbers and their number is unlimited. To help define each user level, there is a table which contains all the windows and all buttons of each window. The user can define which is the lowest authorisation level number that is required to use a certain button.

## 6. AWB DATABASE MAINTENANCE

AWB database maintenance includes all the actions for manual intervention to the databases.

### 6.1 Displaying AWB databases

Lists the chosen database in a window, allow free browsing, moving among the fields and records and depending on the authorisation level let the user modify them too.

### 6.2 Entering new AWB record manually

Opens the APPEND window and allow the user to enter new AWB record(s).

### 6.3 Moving and selecting within the database

It is possible to skip to record number (n) or to move forward or backwards (n) records.

### 6.4 Searching in the database

This facility will find the next occurrence of a value of any field within the structure of the database.

## 7. AWB DATABASE QUERY

The query functions are performing selections, sorting, groupings within the database. The output may be a new database or a displayed list.

### 7.1 Preparing new query methods

The parameters of queries are stored in a file. To prepare new query methods the user should use the NEW QUERY menu item. In a query method we may define the followings:

- which fields should be included in the query
- by which field are we going to sort the database and within that what should be the hierarchy
- which record groups should be drawn together to one record
- conditions of the query (included records)
- conditions of the query (excluded records)

### 7.2 Using the existing query methods

The user may use again a saved query with the OPEN QUERY menu item. The only one condition is that the database must contain all the fields which are defined in the query.

### 7.3 Sorting

There is the facility of sorting database by one or more database-fields. User can specify ascending and descending field by field sorting. The sorted database is the basis of report generation.

## 8. REPORT PREPARATION

The difference between the query and the report is that in query the user can only select or sort a group of records while in the report he may unimpededly design the format of the report.

The report consists of three main components:

- Page header (appearing on the top of each page)
- Detail (appearing at each record)
- Page footer (appearing on the bottom of each page)

and of unlimited number of sub-components:

- Group header (data appearing at the beginning of each group)
- Group footer (data appearing at the end of each group)

Data may mean in each category the full usable object set, numeric action (e.g. sum of a specified field, average of specified field, number of records in group). The group means a sequence of records which group parameter is the same.

### 8.1 Preparing new report formats

Menu item NEW REPORT should be used for new report format preparation.

Pre-set values:

- black on white
- only the three main components are created.

### 8.2 Using an existing format

Having open a database, the user may use a saved report format if all the fields are represented in the database.

### 8.3 User objects

The user may utilise for report preparation:

- the full set of fonts
- contents of fields
- box drawing tool
- Ellipse drawing tool
- imported pictures (Windows BITMAP)
- internal variables (e.g. DATE, TIME, PAGE\_NO...)

## 9. DISPLAYS

### 9.1 Spreadsheet (browse)

MRS may display the database and the results of queries in spreadsheet format. Depending on his level of authorisation, the user may alter the data here.

### 9.2 Graphics

MRS may also display the database and the results of queries in graphical format. The list of chart types can be found in the attachment.

## 10. OUTPUTS

The files containing database or database related information may be saved to any drives created by DOS. The creation of backup file may be set (MRS always requests the confirmation of the user before creating them).

The user may print to any of the printers installed to MS WINDOWS or to file.

## 11. INTERFACE CAPABILITIES

The filling or refreshment of secondary databases (see section 4.) may be done from standard format ASCII files. The necessary fields should be converted to character text (using the sequence and parameters of the listed structure without the separator character) to pass over to MRS.