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The most exciting new feature of R:BASE for Windows is the ability to store and display binary files - **B**inary **L**arge **O**bjects or BLOBs. This term refers to binary data as opposed to large ASCII data files (**L**arge **O**bjects or LOBs). The data for VARBIT and VARCHAR data types is stored in the new R:BASE data file, **dbname.RB4**

Data Types for Binary Files:

- VARBIT
- LONG VARBIT
- BITNOTE

Data Types for ASCII Data Files:

- VARCHAR
- LONG VARCHAR

File Formats to Display on a Form or Report:

- BMP
- GIF
- JPG
- PCX
- TIF

Storing Files:

- INSERT
- LOAD

Replacing/Updating Files:

- UPDATE
- [Shift]+[F10] (in forms)

Displaying Files:

- FORMS
- REPORTS
- SHOW VARIABLE

Recreating Files:

- WRITE .variable TO filename

Backup and Unload Files

VARBIT:

- Data type is defined with a fixed length
- Can store a file up to 256 MB in size per row
- Stores binary data files, such as bitmaps, charts, graphs, and logos

LONG VARBIT:

- Data type is defined as a variable length
- Automatically deals with any size binary file

BITNOTE:

- No length is needed
- For very small binary files (less than 4,088 bytes)
- Stores binary data in the **dbname.RB2** file similar to the way NOTE data is stored

VARCHAR:

- Data type is defined with a fixed length.
- You must set the maximum length
- If you set the maximum length to a value over 32,767 characters, the limit is ignored and defaults to 256 MB
- Stores large ASCII files with more data than can be placed in a NOTE data type

LONG VARCHAR:

- Data type is defined as a variable length
- Same as VARCHAR, with a length of 256 MB

- Use the INSERT or LOAD command to add binary objects to your database.
For example:

```
CREATE TABLE Images (Id INTEGER, ImagDesc TEXT 20, ImagData LONG VARBIT)
AUTONUM Id IN Images USING 1,1

INSERT INTO Images (ImagDesc, ImagData) VALUES +
('Description', ['filename.bmp'])
```

- Note that the binary file name is specified in a special format, ['filename.bmp']. This format tells R:BASE for Windows to find the specified file and treat it as BLOB data.
- With VARBIT and VARCHAR data, you are loading a file into one column in one row in a table.
- Once the file is loaded into a VARBIT or VARCHAR data type, you can delete the original file from disk. The data file is now stored within the database.
- A binary large object cannot be edited directly. You can replace the binary large object by using UPDATE command.

- Images and large binary objects cannot be added to a database by using the menu system.
- You can enter or edit a reference to a binary large object by pressing [Shift]+[F10] from a VARBIT or VARCHAR field located on a form to open the Windows common file dialog box. Select the file to be loaded into the field. You do not need to specify the file name in a special format when loading through a form.
- Any binary file can be loaded into a VARBIT column; however, only BMP, GIF, JPG, PCX and TIF formats can be displayed withing R:BASE for Windows forms and reports. In an application program, you can use the SET VARIABLE command to define a variable that is equal to the file name that contains the binary large object.
- Use the SHOW VARIABLE command to display an image. To display an image with the SHOW VARIABLE command, you must use the =w,h option, which defines the width and height of your image.
- To display an entire image in a form or report, the field for the image that is placed on the form or report must be large enough to accommodate the entire image. The image is a fixed size. You cannot reduce the size of your image by reducing the measurements in the =w,h option, or by reducing the size of the field that was placed on the form or report. If you reduce the size of the field on a form or report, the image will be truncated.
- If you use SHOW VARIABLE without =w,h option or the SELECT command, R:BASE for Windows only shows you the file type of the image.
- The original file can be recreated at any time using the WRITE command. This command has been modified in R:BASE for Windows to write binary or large ASCII data to a file. The data is read from the table into a variable, then the variable written to a file. Following process recreates the exact file:


```
SET VARIABLE vbindata LONG VARBIT = ImagData IN Images WHERE Id = 1

WRITE .vbindata TO filename
```
- The BACKUP and UNLOAD commands create a file with .LOB extension for binary large objects, and a file for the data and/or structure.