

# Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

## PORTING A SIMULATION FROM THE IBM WORLD TO THE MACINTOSH WORLD

David J. Fritzsche, University of Portland  
Richard V. Cotter, University of Oregon

### ABSTRACT

The issues examined are 1. Which platform is best for developmental work? 2. How can you physically transfer code from one platform to the other? And 3. What modifications in code need to be made before the simulation will run on a Mac?

### WHICH PLATFORM?

Our discussion is limited to the use of QuickBASIC from Microsoft on both platforms. BASIC is the language used for most microcomputer based simulations, and QuickBASIC is the most popular version of BASIC in use.

The platform of choice for initial development is dependent upon the stage of development of the QuickBASIC language for each computer. Currently the IBM version of QuickBASIC is more advanced than the Mac version. This is not surprising, as QuickBASIC for the 113>1 has gone through four versions while QuickBASIC for the Mac is in its initial version. The difference between the two may disappear when the second version of QuickBASIC for the Mac is released. QuickBASIC for both machines support mice. On the 'IBM, a mouse is mandatory. On the IBM, a mouse is desirable.

Several features which make the IBM version attractive include the ability to split the edit window into two windows showing different parts of the program simultaneously, the viewing of subprograms as separate sections of the main program, and a history record feature which records the last 20 lines of code executed. You can step through the 20 records either backward or forward. The random access file handling for the IBM is also more advanced and thus easier to use. Keyboard commands let the user move more easily through the file when not using a mouse. Finally, QuickBASIC for the IBM includes an excellent help system.

The Macintosh version's search menu offers a Jump To option which allows you to go to any line of the source code by entering the number of the line in the associated dialog box. Compiler errors include line numbers even if the statements do not have numbers. And, of course, the Mac's graphics are easier to use.

### PHYSICALLY TRANSFERRING THE CODE

There are several ways to transfer code between IBM compatible and Macintosh computers. One can simply retype the code into the other computer from a source code program listing. A second method is to use a translator package such as MaLinkPlus offered by Datavitz. A third method is to obtain a special disk drive and board which connect to a Mac II or a Mac SE. The last method, if you have access to a Macintosh with a FDHD floppy disk drive and a 3 1/2-inch disk drive on an IBM compatible computer, is to use the Mac Apple File exchange utility.

### CODE MODIFICATIONS

While there are some slight differences in the standard BASIC code, most of the QuickBASIC code written on IBM compatible machines will run without modification on the

Mac. However, there are significant differences in the input/output sections of code.

### Disk Drives

If you are using sequential access files, the file handling statements are identical for both platforms. However, you may need to alter file path names if they are included in the program where MS-DOS uses root and subdirectory designations, the Mac operating system uses volume names, folders and applications and documents. (An application is a program while a document consists of text or numerical data.)

Random access file statements for the Mac are identical to the random access statements for the IBM in QuickBASIC version 3. Numeric data must be converted to string data using MKD\$, MKI\$ or MKL\$ statements. In addition, a new random access file may not be opened directly. Instead, you must first open a new file as a sequential access file and then close the file. Then the file may be opened as a random access file. Path specifications are the same as those discussed above for sequential access files.

### Screen

The Macintosh does not contain a text mode. All output to the Macintosh screen is in graphics mode. Graphics, including text, are developed using Quick-Draw, a part of the Macintosh Toolbox. Other parts of the Toolbox may be invoked to create the output you desire, but the actual output is drawn by Quick-Draw.

Graphics output developed on the IBM will have to be completely rewritten to run on the Macintosh. Likewise, are extensions to QuickBASIC for the IBM such as the assembly routines from Micro-Help will not function on the Mac.

The Macintosh Toolbox should be used to insure that applications adhere to the standard Macintosh user interface, and thus users will not have to learn new procedures for accessing, and using the program. There also should be no unpleasant surprises when a new version of the Macintosh operating system is introduced. The Toolbox makes use of Macintosh RPN and thus saves code in the application program. The Macintosh Toolbox may be accessed from QuickBASIC in three ways. First the Toolbox may be accessed using built-in QuickBASIC commands. Second, the Toolbox may be accessed through libraries. Third, the Toolbox may be accessed by using QuickBASIC's Toolbox statement.

The built-in QuickBASIC commands used to access the Toolbox will likely be sufficient to handle most simulation needs. The first step in building the user interface with the Mac is to create custom menus where needed. This is done using MENU statements. Following the menu creation, a window is opened using the WINDOW statement. Once the window has been opened, the data entry screen can be created. This is done by using EDIT FIELD statements to create data fields and PRINT statements to provide informative text.

