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# Programming for Interoperability



JOHN DOW

Want to use your databases in Q&A for DOS and Q&A for Windows? Feel free. But be aware of the potential pitfalls.

**A**NYONE who has migrated (or attempted to) from Q&A for DOS to Q&A for Windows can recite the problems with Q&A for Windows—no product-wide macro capabilities, no crosstab reports, no posting, and so on. That's by comparison to Q&A 4.0 for DOS. (For more on what to expect when moving to Q&A for Windows from Q&A 4.0 for DOS, see "Q&A for Windows—Yes, No, and Maybe" in the December 1993 issue.) Compare it to Q&A 5.0 for DOS, and it gets much worse, since Q&A 5.0 sports a host of new programming capabilities that leave Q&A for Windows in the dust.

So why would anyone want to use Q&A Windows? Well, for many, its GUI interface simply looks a lot nicer. It has a more feature-rich WYSIWYG word processor. It doesn't suffer from Q&A for DOS' printer driver problem (since it uses Windows' printer resources). And it includes a powerful free-form report designer.

But these advantages aren't usually enough to outweigh the disadvantages—particularly the lack of macros. That's why I developed my DTFWIN program with a built-in scripting language. (See the sidebar on page 3.) With the ability to write scripts and with other features included in DTFWIN, anything you can do in Q&A 5.0 DOS you can now do in Q&A for Windows—as long as you have DTFWIN there to help.

In this article, I'll discuss how you can take a Q&A 5.0 for DOS database and make it functional in Q&A for Windows. And I'll show you how to do this so that the database can remain a viable Q&A 5.0 DOS database as well (the cross-platform or *interoperability* issue).

Taking a Q&A 4.0 for DOS database to Q&A for Windows is easier since the programming features are the same in both products. In fact, the task is merely a subset of what I'll discuss here, so I won't comment further on it. Also, you could create a database from scratch and the issues would be virtually the same as those in converting an existing database.

## Q&A for DOS pages vs. Q&A for Windows forms

DOS programs usually look very different than their Windows counterparts. This holds true for Q&A for DOS compared to Q&A for Windows. Before discussing design considerations, here's a quick review of these differences. It's all very relevant to how they are to be programmed.

- Q&A for DOS permits up to 10 "screen pages" of information per database. You can move from page to page by pressing various keys (Home, End, Page Up, Page Down). You can also have programming perform a Goto or Gosub to a field on another page.
- These 10 pages as seen by Q&A for Windows constitute just one "form." When you open a Q&A for DOS database in Q&A for Windows 4.06 the first time (it's best to complete your design before doing this), it displays what it calls the "Master Form." This is a fairly faithful rendition of the

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Q&A for DOS screen pages, but the "pages" formatting disappears—they all run together like one lengthy document. You can move around a Q&A for Windows form using keys as well as the scroll bar. And if navigation programming transfers control to another field, the form will scroll to make the field visible.

One of the advantages of Q&A for Windows is that you can have up to 300 forms for any database. The rules for Q&A for Windows forms are as follows:

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## Quick Tip

# Quick Delete During Data Updates

If you find yourself repeatedly hitting the *Delete* key when updating fields, you're working too hard. Suppose you're updating addresses. A **Street** field might contain *4355 West Somerset Blvd*, which you have to replace with *PO Box 255*. Most people will type the new street address over the old one, then "machine gun" the *Delete* key to remove the rest of the old address. In this example, you'd have to hit *Delete* 13 times!

Of course you could always press *Shift-F4* to delete the old street first, then type the new one in the empty field. But this won't work if the address extends beyond the visible field width. In such a case, you'd have to press *F6* to expand the field before you could type or delete anything.

A handy shortcut that works in any case is a macro that "presses" these keys in an unexpanded text field:

**F6, F3, End, F10, F6**

You could assign a hot-key such as *Ctrl-Del* (5.0 only) to this macro. You simply type the new entry over the longer old one, then press *Ctrl-Del* to zap what's left of the old value. If the value extends beyond the field, *Ctrl-Del* will clear it so you can type in the new value in the empty field.

## Quick Tip

# Indenting Second Report Line

Sometimes I come across an obscure yet standard Q&A feature which I had either overlooked or forgotten. This was the case when I had to print columnar reports which often had long text entries in one field that frequently wrapped onto subsequent lines. I chanced across a formatting option that indents the second and subsequent lines in what's called a "hanging indent." (You find this format in *The Quick Answer* where paragraphs are bulleted or numbered.)

Suppose a field named **Comments** is column 25 and is to be 30 characters wide. To indent, you enter this at the Column/Sort spec:

**Comments: 25, H(30:2)**

This indents the second and subsequent lines by two

characters, which I think looks neat. If you're using a proportional-spaced font such as Times, you're better off using absolute measurements, like this:

**Comments: 25, H(3":0.25")**

As far as I can tell, you need to specify a column width in order to get the indent.

**Alec Mulvey**

## Quick Tip

# Play Sound Files Faster

In the August 1999 issue ("Play Windows Sound Files in Q&A"), we tell how to play a Windows WAV or MIDI file from a Q&A 5.0 database record.

Instead of using the WAV file player that comes with Windows, you'll get faster plays using WAV.EXE, a freeware

program you can download from [www.basicguru.com/cmdtools](http://www.basicguru.com/cmdtools). The following @Shell program plays the WAV file named in the **SoundFile** field faster because there's no player screen to display. (The */q* switch suppresses the credits. Your paths will probably differ):

```
#10 = @Shell("c:\qa\wav.exe c:\wavfiles\" + SoundFile + " /q")
```

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# Interoperability...cont'd from page 1

- In Q&A for Windows, there must be a Master Form containing *all* the fields in the database. The other forms can include only those fields you want as long as no field occurs more than once in any form.
- You can actually have a form with no fields at all—just buttons, for example. (For an example, see “Moving to Q&A for Windows” in the May 1995 issue.)
- Each form can have its own Navigation Spec. (Only one Program Spec per database, though.)
- Each form can have a tab order that controls movement between fields.

With a complex Q&A for DOS database, you might find it necessary to cram a lot of fields into each page to make them all fit. You will find that when you open the database in Q&A for Windows, you can't fit so many fields onto a form of the same size. I'm not quite sure why this is. Just moving a form design straight from Q&A for DOS to Q&A for Windows, you can wind up with something that isn't very eye-pleasing in Q&A for Windows. So you might need to do some redesigning to improve the appearance. In doing this, you can make the form look quite attractive with field spacing in tiny increments, fonts and sizes, lines, boxes, colors, and so forth. If the database is really crammed with fields, the Q&A for Windows Master Form will look crammed. You can always go to a smaller font size, but then the form becomes hard to read.

I worked with a complicated Q&A for DOS database that included seven tightly packed pages of fields. The Q&A for Windows version of the database had 28 forms.

To give a simplified example, Figure 1 shows a very basic order entry database as viewed in Q&A 5.0 for DOS. (This database is included with my DTFWIN demo.)

Figures 2 and 3 (next page) show the two forms for

Item	Stock #	Description	Qty	Price	Cost
Item 1	0003	Cheese Burgers with Bacon	5	\$2.50	\$12.50
Item 2					
Item 3					
Item 4					
Item 5					
<b>Total</b>					\$12.50

Figure 1. A very simple Q&A for DOS order entry form.

the same database as displayed in Q&A for Windows. The first form (Figure 2) is named *Header* because it includes only the header information for the order (the customer and date). But there's a button on the form the user can click to display the *Details* form containing the line-item information, order total, and so forth. (See Figure 2.) The *Details* form is where the user completes the order by selecting the items and entering quantities.

This database is perhaps too simple to be typical or make a good example. Also, I've made the forms very small because it's designed for a VGA monitor and in my demo I also display two other databases below this one. I doubt that you'd want to use such small forms. Still, from this you should be able to visualize that a Q&A for Windows form with "white space" looks better than one that's as cluttered as many users allow Q&A for DOS pages to be. And that's my point.

## Q&A DOS Macros vs. Q&A Win Scripts vs. DTFWIN Scripts

You create a Q&A for DOS macro by recording keystrokes. Having done that, you can save the macro to a file and later edit it if need be. A macro can do anything you want *within* Q&A except load a different macro file. (You can't use a macro to exit from Q&A, run some other program, and then return to Q&A). Macros are "dumb," which means that Q&A plays back the keystrokes exactly as recorded in them even if something unexpected is encountered making those keystrokes no longer appropriate.

Q&A for Windows scripts aren't recorded but are built by selecting actions and items (such as reports and Mass Updates) from lists. They aren't as flexible as Q&A for DOS macros. If something you want to do isn't on the list of available actions, you can't script it. Like a Q&A for DOS macro, a script works only within Q&A for Windows (though only with the database in which it was created). Script elements are actions, not keystrokes, so they're not as "dumb" as Q&A for DOS macros, though I wouldn't go so far as to call them "smart."

DTFWIN scripts are created by typing them into a file. Like a Q&A for DOS macro, they can play keystrokes. Like a Q&A for Windows script, they can perform various actions (so they, too, aren't entirely "dumb"). They can be invoked under program control in the Q&A for Windows database on start up, by making a menu selection, or by clicking on a button. I expect future enhancements to provide the ability in scripts to test conditions to decide what to do, at which time they could properly be called "smart." DTFWIN scripts are not limited to Q&A but can work with any Windows program.

## Navigation programming in Q&A DOS and Q&A Win

If you divide up your Q&A for Windows database into multiple forms, not all fields will be on each of the forms. This can make programming very interesting, *er*, exasperating.

I recommend that you discipline your database development along the following lines:

- If at all possible, change your Q&A for DOS programming so that you don't use the Navigation Spec. Instead, have your main Program Spec programming control the flow between related fields. Use on-field-exit programming as far as possible.
- Navigation in a Q&A for Windows form goes left to right, top to bottom, the same as a Q&A for DOS form. However, in some cases you will be better served by explicitly (with programming) jumping to the field that should be next rather than relying on its position on the page. Why? Because Q&A for Windows field positioning might not match the Q&A for DOS positioning. In Q&A for Windows, several fields might look like they're on the same row, but if one of them is a single pixel higher than the others, default tab navigation (and thus the programs in the fields) will be executed out of order!
- When you design the Q&A for Windows version of the database, you can create a Navigation Spec for each form to make sure that control flows correctly between the sets of fields that you've made co-dependent by virtue of your programming in the Program Spec. Because the Program Spec uses on-field-exit execution most of the time (if you follow my recommendation), the on-field-entry option is available for the Navigation Spec.

I recall a Q&A for Windows database that gave me a hard time when I tried to figure out what was going wrong. With a Program Spec, Navigation Specs, and read-only fields, control just wasn't going to the field I thought it should, and I couldn't spot the glitch. Since Q&A for Windows doesn't have a Q&A 5.0 for DOS @Msgbox equivalent (which temporarily interrupts programming execution and navigation), I couldn't display some

informative text with a pause long enough to spot where the problem was occurring. (@Msg's information is too fleeting.) So to find out how control was bouncing around from field to field, I temporarily added a new field to the database named "Trace." In each of several key fields, I added statements like this:

```
Trace = Trace + "Here I Am In Field XYZ/";
```

I used the slash as a marker between each field's text just to make it easy to read. I put this field at the bottom of each form I was having a problem with, and made the field large enough so that its value could easily be seen even if it didn't have the focus. (In Windows parlance, a data field has the *focus* when the cursor is in it.)

Having done this, I could easily see what was going on and was able to correct the problem straightaway.

## New Q&A 5.0 for DOS features don't work in Q&A for Windows

Much of the advantage of Q&A 5.0 for DOS lies in its variety of new programming statements that don't exist in Q&A 4.0 for DOS or Windows. The README.WIN file (in the QAWIN directory) that comes with Q&A 5.0 for DOS says the following:

*The new programming commands in Q&A 5.0 for DOS, e.g. XPOST, are not supported by Q&A 4.06. However, if you try to execute a programming command such as this under Q&A 4.06 for Windows, the system issues a warning and the command is ignored.*

I haven't found this to be true. Q&A for Windows seems to "blow-up" when it encounters one of the new Q&A 5.0 programming commands. I tested Rem and @Msgbox. In both cases, I got a *General Protection Fault in QADBENG.DLL*. Then, when I attempted to restart Q&A Windows 4.06, I was greeted with an *Application Error, call to undefined Dynalink* error message.

What's more, you can't use new Q&A 5.0 for DOS programming commands and save the Program Spec in Q&A for Windows. Q&A for Windows doesn't understand these commands and displays error messages. So you have to do all your programming in Q&A 5.0 for DOS.

The following is a list (complete, I believe) of all the

Figure 2. The Q&A for Windows Header form.

Figure 3. The Q&A for Windows Detail form.

Q&A 5.0 for DOS commands that throw Q&A for Windows into a tizzy:

**@Askuser, @Color, @Exit, @Fedit, @Insert, @Macro,  
@Modified, @Msgbox, @Play, Rem, @Save, @Shell,  
@Userselect, Userselect, Xpost Xpostr, @Xuserselect,  
Xuserselect, @Xuserselectr, Xuserselectr**

You must alter your Q&A 5.0 programming to explicitly avoid these statements when using the database in Q&A for Windows. You can do this using the following construct:

```
If @Platform = "DOS" Then {  
  do Q&A 5 DOS things here  
} else {  
  do Q&A Windows things here  
};
```

You can also test for `@Platform = "WIN"`.

### A poor man's @Msgbox for Q&A for Windows

You can display messages by placing the text to be displayed into a field (perhaps via an @XLookup) and then going to that field. You can of course do this with a Q&A for DOS 5.0 database also, using @Fedit so that a window opens up (the field expands) where the text is visible. But why do that when you have @Msgbox?

However, with Q&A for Windows (without benefit of DTFWIN), the technique I'm about to describe might serve your needs quite nicely. Define a field to hold the messages. Set the color for the field and its border to match the background. (This way, if the field is blank, it will be invisible.) Position the field in the center of the screen, or wherever you want the message to appear. Then use Q&A for Windows' *Arrange / Send to back* command so that the field is behind everything else. When you have your program fill it with some text and Goto it, it will suddenly appear on top of everything else.

Set your on-field-exit program so that when you press Tab or Enter, the field will clear itself and navigation will continue to the next appropriate field. (You could use the same field for different messages, and have your program test the content of the message to determine where to go next.)

### Using DTFDATA and DTFTALK with Q&A 5.0 DOS vs. using DTFWIN with Q&A for Windows

To use some of the features of DTFWIN, the database needs a special field for communicating back and forth between the database and the DTFWIN program. Without going into great detail here, essentially what you do is put a command into the field and then have your program Goto it. This enables DTFWIN to "see" the field, read the command, and do whatever you want done. This technique is typically used to display message boxes, to post, to launch other applications, and the like.

You can use the "invisible field" technique I described

to make the DTFWIN field invisible on the form.

In the following example, I show how to use DTFDATA/DTFTALK to perform a customer search in Q&A for DOS, and how to simultaneously use DTFWIN to do the same customer search when using the database in Q&A for Windows. Here, I show only the programming in the customer ID field and the DTFWIN field. I don't show the programming in the DTFDATA field (which is a "black box" you needn't look inside) or the various support files. The purpose here is just to show the structure of things, not the details.

The CustomerID field contains the following program:

```
>#10:  
If @Update or CustomerID <> "" then  
  goto CustomerName;  
  
If @Platform = "DOS" Then {  
  Several fields are set here to define the  
  lookup. There is standard code in the DTFDATA  
  field that uses these fields to implement a  
  customer lookup based on the customer name.  
  Goto DTFDATA;  
} else {  
  DTFWIN = "DO GLB=CUSTOMER.QAX";  
  Goto DTFWIN;  
};
```

You can see that when using the database in Q&A for DOS, the lookup is handled by the code in the DTFDATA field. If using Q&A for Windows, the lookup is handled by the DTFWIN program based on specifications in the QAX file. Having done the lookup, the following programming in the DTFWIN field is executed on-field-exit:

```
If @Left(Dtfwin,20) = "Did Glb=Customer.qax" Then  
{  
  Customerid = @Mid(Dtfwin,22,4);  
  Dtfwin = "";  
  If Customerid = "Esc" Then {  
    Customerid = "";  
    Dtfwin = "Do Script=Deleterecord";  
    Goto Dtfwin;  
  };  
  Customername =  
  Xlookup(@Replace(@Fn,"Order.dtf",  
  "Customer.dtf"),  
  Customerid,"Customerid","Lastname");  
  Goto Orderdate;  
};
```

Whereas the DTFWIN field is set to "Do Glb....," after the list box appears and is closed by the user, DTFWIN sets the field to "Did Glb..." and then sends an Enter keystroke to trigger the on-field-exit program in the database. The customer ID that was selected is obtained using `@Mid(Dtfwin,22,4)`. If it comes back with an "Esc," it means that the user selected Cancel instead of making a selection. This causes the *Deleterecord* script to be executed. (The script is defined in the WINDEMO.INI

*Concludes on page 11*



EDITED BY GORDON MEIGS AND WILLIAM HALPERN



### Y2K—One More Time

(Since most of our calls are about Y2K compatibility issues, we thought it would be helpful to publish this. Remember, you can get all the information about Y2K on the [www.quickanswer.com](http://www.quickanswer.com) web site.)

I spoke with you briefly about Q&A 4.0 for DOS and Y2K compatibility. You indicated that it's Y2K ready as long as you use a global database date format that includes the full four-digit year (and it says so in the article on the Web page at [www.quickanswer.com](http://www.quickanswer.com)) and as long as you type in all four digits for the year. However, if user types in only two digits, let's say 01 for 2001, it displays 1901 instead of 2001, even if even the computer's system clock is set at 2000. Is there a patch available that will recognize the year 2000 (from the system clock) so I don't have to type all four digits for the year? In other words, I would like to be able to type "02" for year "2002" and have Q&A interpret it as the year 2002.

Yon Lee via email

You are correct in your analysis of the way Q&A treats dates. There is no automatic workaround (or patch) to accommodate two-digit year entry. However, you can include a program like the following in your database date fields. This program tells Q&A to assume that any date prior to 1941 you enter in the date field is a 21st century date. (Q&A adds 36,525 days or 100 years to the date.) This way, you can enter something like "7/15/01" and, when you leave the field, Q&A will automatically change the date to 7/15/2001 and store it accordingly.

```
>#10: If DateField < "01/01/1941" Then
      DateField = DateField + 36525
```

Just be sure you've selected a four-digit-year date format for the database.

### Windows NT Networking and Q&A 5.0

(We've reported that Q&A 4.0 and 5.0 for DOS can be run from an NT server with the condition that the databases are in a

server hard drive partition that's less than 2G. (Preferably, the drive should be formatted as a DOS FAT partition rather than an NT NTFS partition.) Yet we keep getting many questions like the following.)

For more than 10 years we have been using Q&A with very few problems. We currently are using it on our network (with a Windows NT server) with Windows 95 and Windows 98 clients. Most of the Windows 95 clients are 66 or 166Mhz PCs with one sporting a 350Mhz AMD K-6 processor. The one Windows 98 PC also has a 350Mhz AMD processor. We have Network Packs for 16 users. Q&A (the program files as well as the databases) resides on my server and the clients access this application using the following local batch file as recommended by Symantec:

```
K: (Network Drive)
CD\QA QA -PC:\XXXXX -YM1 (XXXXX = personal config.
                        directory)
```

This setup works for us except for an occasional (one or two times a week) system error that's we remedy by having all users exit Q&A (which resets the user count) and recovering the data base. This isn't the real reason for my inquiry, but I wouldn't mind it if someone could lead me in the right direction as to whether or not this is fixable. (I've just assumed that the statement from Symantec regarding Q&A for DOS non-compatibility with Windows is the cause.)

In the last few weeks we've been trying to replace some of our workstations with new systems. We've purchased Dell XPS T450 systems that have Windows 98 (Second Edition) pre-installed, Pentium III processors (450Mhz), and 13GB Hard Drives. When I try to run the batch file to access Q&A I received a DOS *divide error*. After surfing the net I found several suggestions about this problem but all seemed to be directed for local application issues. I understand that Q&A doesn't recognize hard drives larger than 1.96G and that Q&A 5.0 can't cope with the new processor speeds. I'd rather not partition my server drive and would prefer instead to use the LESSPACE.COM utility. I would also like to know this: If I apply the Speedfix patch to



## Stumped?

Send your Q&A questions to @Help, The Quick Answer, Marble Publications, Inc., 1927A Harbor Blvd, Costa Mesa, CA 92627 or email to [mailbox@quickanswer.com](mailto:mailbox@quickanswer.com). Include your name, address, phone, and your Q&A version number (and whether DOS or Windows) and a detailed description of the problem. We'll publish those questions we feel are of general reader interest; individual responses aren't possible.

remedy the processor speed problem, will it affect my network performance? I did try LESSPACE.COM in my batch file, but I'm still getting divide errors. I'm getting desperate and would appreciate any help I can get on these issues.

Lindsey Pierce via the Internet

Just as you've stated, the problem of *divide error* or *overflow* is absolutely being caused by the lack of the Speedfix patch. Even though Q&A resides on your server, it's running in your local machines' memory. Just think of your server as another hard drive in your local system. Apply the Speedfix patch to the QA1.EXE file on the network drive. *It will not affect network performance. It will not slow down your server or workstation.* It simply updates the timing routines in Q&A to accommodate today's faster processors. It is a totally *internal* Q&A 5.0 patch.

As for LESSPACE.COM, read the text file that comes with it. You will have to modify your batch file, changing it to something like this:

```
K:
CD\QA
lesspace      (Make sure that there is a copy of
               the lesspace program in the network
               QA directory)
qa -pc:\xxxxxx (Leave out the -VM1 switch which
                disables expanded memory)
```

This should solve your problems—even the errors with the personal path info being written to a large drive.

**Another tip:** We've found that Q&A runs much better on an NT server if you set up the server with a *very* large cache (four to five times the NT recommended level) and if you set your Q&A databases to *Allow* rather than *Automatic* at the File / Design a File / Secure a File / Declare Sharing Mode screen.

**And one last bit of advice:** The server should be rebooted weekly as part of a standard maintenance procedure. NT servers have severe kernel memory leaks when running DOS programs and will lock up if not occasionally rebooted. Depending on the number of users in a given database at a given time, the performance should run from excellent to good. But the likelihood of "network busy" messages increases as you go longer between reboots with more users.

One *possible* solution to the memory leaks problem (we've conducted only limited tests) is to download and install MEMTURBO from Silicon Prairie Software. This utility seems to effectively manage the physical RAM as well as the memory leaks. It's advertised to work in Windows 9x and Windows NT. You can get it free for a 30 day trial (\$19.00 to register) from [www.wugnet.com](http://www.wugnet.com) or [www.memturbo.com](http://www.memturbo.com). Just remember that we've tested this product only on a limited basis. We'll keep you posted as we learn more about it.

## Q&A Databases on CD's?

What about the use of Read/Write CD's with Q&A databases? I'm considering purchasing one of these drives. I have many

very large databases that I use almost exclusively to look up data. If I put these databases on a Read/Write CD, can Q&A handle them? I know Q&A needs to open and close its databases, so regular read-only CD's won't work.

John Horn

You are correct in that Q&A needs to open and write to a database file even if the only thing you're doing is viewing a record. (Remember, Q&A updates the database with the last time and date it was accessed.) This isn't possible on any kind of CD. R/W CD's are different from regular CD's in that they can be erased and rewritten, *but not on-the-fly* as with a regular storage device such as a hard drive. If you need occasional access to large databases, get an Iomega ZIP or JAZ drive instead. These work like regular drives even though their disks are removable.

## Can a RAM Disk Speed Operations?

I would like to see an evaluation of the use of RAMDISK to speed up processing during disk-intensive operations on large Q&A databases. Some people say a RAM disk won't do any good, but it seems to me that it would help.

John Horn

The use of a RAM disk (writing to and reading from a virtual disk in memory instead of the physical hard drive) might well speed up certain database-related operations, but we recommend against it for a number of reasons. The first is stability. Any kind of lock-up or system failure will result in all of your data being vaporized! Secondly, you have to be very careful setting up your RAM disk. Its size is critical. To do you any good, it would have to be large enough to store not only your database, but also any temporary files Q&A creates during operations such as mass updates, merges, record copying, and posting. (These temporary files can sometimes grow to be temporarily very large.) And lastly, if you forget to copy the updated database back to the hard drive before exiting Q&A (or Windows crashes before you've copied the file) you'll lose all your changes.

## Problems After Changing System and Printer

All of my reports are set up to print to an Epson LQ-570 dot matrix printer. With my new computer (and an Epson Stylus 640 printer), I didn't change any of my Print Specs and continue to print to the 570 printer. What happens now is that a line or two of the report will lose a space, causing incorrect alignment. Also, the complete footer does not always print on the page. Sometimes it gets bumped to the next page. Moreover, after a report prints, there will occasionally be mysterious letters or other garbage that will print on the next blank page. What are the solutions?

Jerry Via the Internet

Concludes on page 10

# Q&A 'Time Clock' Tracks Everyone's On-the-Job Hours



**TOM MARCELLUS**

Need an easy, efficient and tamper-proof way to track employees' time for payroll?

Application in ONLINE Edition



assigned a User ID and password and granted no rights in this database except to enter/edit data (which the program prevents them from doing, as you'll see). Employees were assured that changing their User ID for this database or revealing their password to another would result in death by slow strangulation from a giant spider, where permitted by law.

I added a *Clock In/Out* selection to Q&A's Main menu as a fast, easy way of performing this task. To clock in or out, the employee simply clicks on *Clock In/Out*. Q&A prompts for their User ID and password, and the record is displayed, pre-filled with the date and pertinent user information. If it's the first clock-in of the day for this user, a new record is created. Otherwise, the earlier record is retrieved, more on which later.

An @Askuser box asks the person (by name) if he or she would like to clock-in or out. (The database knows which is next.) If the user answers "Yes," the time of day is placed in the appropriate **Time In** or **Time Out** field, the user is thanked via an @Msgbox and returned to the Main menu. If the user answers "No," he or she is returned to the Main menu with no other action having taken place.

There is no user interaction whatever in the database except to answer "Yes" or "No," and press Enter to put away the confirming @Msgbox and exit.

Figure 2 (next page) shows the first step of a typical clock-in after returning from lunch, and Figure 3 shows the screen after the user answers "Yes."

**A** COUPLE of months ago I installed a 13-user Q&A 5.0 network (an upgrade from Q&A 4.0) in a modern fast-paced office. Employees at this company spend the bulk of their workday on their PC's and are paid hourly. Previously, they had recorded their daily arrival and departure times using a kind of honor system and handwritten log or time sheet.

The boss wanted to automate that. She wanted to know if a shared Q&A database could be made to work like a time clock that employees could use to "punch in and out" – up to four times each day for lunch and other breaks – and from which she could run reports to assist her with weekly payroll. The "Time Clock" application had to meet these requirements:

- Clocking in and out had to be brainlessly easy. No typing other than to supply a valid User ID and password. (This application can be adapted to a setup where all users clock-in/out from the same computer. More on this later.)
- Steps had to be taken to prevent employees from clocking each other in or out.
- The application had to be tamper-proof so that employees couldn't "modify" their actual in and out times or daily total or otherwise "beat the system." Programming was to take care of everything including recognizing the employee, recording the in or out time (using the system clock) and keeping a total of hours worked so far during day.
- The database had to include a convenient way for the supervisor alone to edit records as necessary.

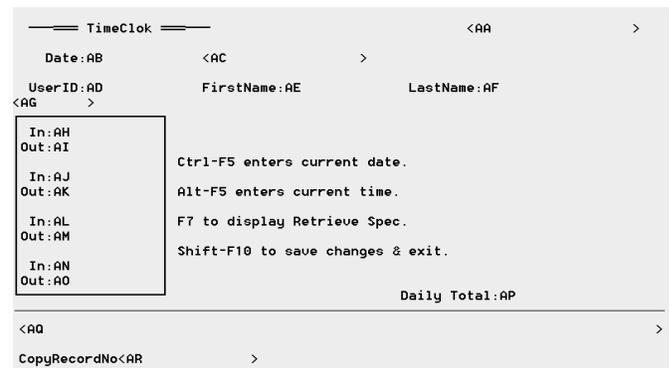
## Design and functionality

The database design we settled on is a rather simple one-page (plus two lines) affair. Figure 1 shows what it looks like on the design screen. The strategy I adopted involved adding one record to the file per day per employee. This way, the record itself wouldn't be overly complex and the number of records in the database would remain relatively low even over a long period of time.

Using Access Control Forms, each employee was

## Programming

More than anything else, the programming reveals how the database performs its magic. In the following section, I'll list each field along with its format and program, then follow with a brief explanation of its role in the database:



**Figure 1.** The Timeclok.dtf database at the design screen.

**RecordNo**—Text, Read-only, Speedy, first field in the database.

**Date**—Date, Read-Only, On-Record-Entry field

```
< #10: If @Add Then If
  @UserID <> "Tom"
  Then {
    Date = @Date;
    UserID = @UserID;
    RecordNo = @Replace(@Date, "/", "") + UserID;
    FirstName = @Lu(UserID, 1);
    LastName = @Lu(UserID, 2);
    Day of Week = @Dow$(Date);
    If @XLookup(@Fn, RecordNo, "RecordNo", "RecordNo") <> ""
    Then { CopyRecordNo = RecordNo; Goto CopyRecordNo }
    Else @Msg("")
  }
}
```

As you've probably guessed, "Tom" is the database administrator. (The only one able to edit records). This program executes on-record-entry. It fills the **Date**, **UserID**, **RecordNo**, **FirstName**, **LastName**, and **Day of Week** fields. The first and last names are retrieved from the Lookup Table, which is in the following format:

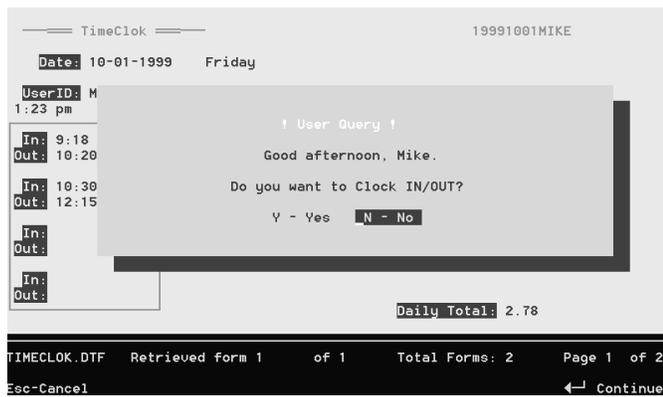
UserID	First Name	Last Name
Mike	Mike	Bell
Alec	Alec	Mulvey
Gordon	Gordon	Meigs
Erika	Erika	Yoxall

Central to the functionality of the database is the RecordNo and how it's generated. It's simply the date, stripped of its slashes ("/") with the UserID tacked on to the end of it. The program uses this value to check for a duplicate value in an existing record. (If the user has already clocked in today.) If there's a duplicate, it means *that* record should be used instead of generating a new one, and the programming retrieves it, as you'll see.

**Day of Week, UserID, FirstName, LastName**—Text, Read-Only

**Time**—Text

```
< IF @Add Then If
@UserID = "Tom"
```



**Figure 2.** The user (Mike, in this case) clicks on "Clock In/Out" on the Main menu, enters their User ID and password, then sees this screen.

```
Then {
  @Msgbox("Hello, " + @UserID + ".", "I'll switch to Search
mode so you can", "find and optionally edit record(s).");
  @Macro("F7")
};

If @UserID <> "Tom" Then {

  If @Left(@Time, @Instr(@Time, ":") - 1) < 12 Then {
    Time = @Str(@Time) + " am";
    If @Askuser("Good morning, " + FirstName + ".", "Do
you want to Clock IN/OUT?") Then Goto Time In1 else
    @Macro("Esc Out") }

  Else If @Left(@Time, @Instr(@Time, ":") - 1) >= 12 Then {
    Time = @Str(@Left(@Time, 2) - 12) + ":" + @Right(@Time,
2) + " pm";
    If @Askuser("Good afternoon, " + FirstName + ".", "Do
you want to Clock IN/OUT?") Then Goto Time In1 else
    @Macro("Esc Out") } }
}
```

If the user is "Tom," the program switches to Search/Update mode via the @Macro("F7") so Tom can find, view and optionally edit anyone's record(s). (Only User "Tom" can do this.) Otherwise, the user is greeted with a message and prompted to clock-in/out. (There's a separate routine for morning and afternoon.) If the user doesn't want to clock-in/out, the @Macro("Esc Out") returns them to the Main menu. Here are the two macros:

```
<begdef><nokey><name>"F7"<vidoff><f7><tab><ctrlf5><enddef>
<begdef><nokey><name>"Esc<sp>Out"<vidoff><esc>y<enddef>
```

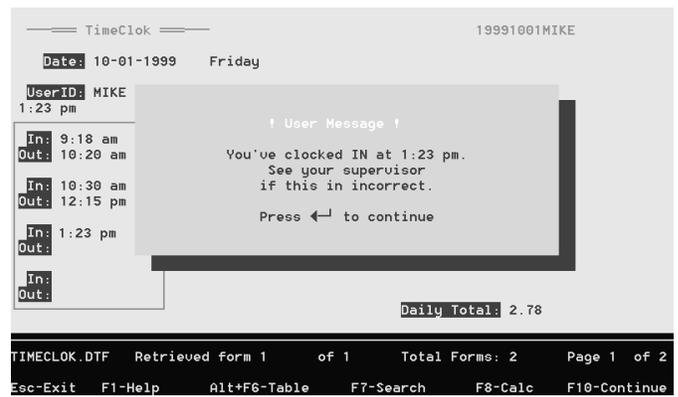
The "F7" macro additionally inserts the current date as a default on the assumption that the supervisor is most likely to be interested in a record from today.

**Time In1**—Hours

```
< If Time In1 <> "" Then Goto Time Out1;

  If @UserID <> "Tom" Then
  { Time In1 = @Time;
    @Msgbox("You've clocked in at " + Time + ".", "See
your supervisor", "if this in incorrect."); @Exit };
}
```

We're now in the first of the time (Hours) fields. If this one is filled, the program moves to the next one (Time Out1), and continues to do so until it reaches the next empty time field. When it does, it fills the field with the



**Figure 3.** Having answered "Yes" to clock-in or out, this @Msgbox appears and the employee is returned to the Main menu.

## @Help...cont'd from page 7

You aren't clear as to whether you're using the same Q&A LQ-570 printer driver to print to the Stylus 640, or if you're still printing to the LQ-570 but with the Stylus 640 merely attached to your system. The Stylus 640 is a color inkjet printer that Epson lists as DOS compatible. But dot matrix and inkjet printers are fundamentally different in the way they process printing jobs. So if you're attempting the former, using a dot matrix printer driver to print to an inkjet printer just doesn't make sense. Here are some tips:

- If you're printing to the Stylus 640, try the Stylus drivers that come with Q&A 5.0. If you're using Q&A 4.0, you can download the latest (5.0) drivers from the Freebies page at [www.quickanswer.com](http://www.quickanswer.com). They work in Q&A 4.0. If none of the Stylus drivers pan out, try the HP DeskJet 550 and 550C drivers.
- Find out from Epson if your Stylus 640 supports a non-Epson emulation. (The manual that came with the printer might tell you.) The emulation mode might give you a clue as to which Q&A printer drivers to try.
- As for the garbage page, did you change operating systems? The printer drivers in Windows 98 (they play a role in this) are sometimes different from those in Windows 95. What was fine in one might not work the same in the other. If you're printing to a local (non-network) printer, try going into the Printer Control Panel in Windows and changing the spooling for MS-DOS printing so that Windows does *not* spool the

output but sends it directly to the printer.

- Download the latest set of drivers for your printer and operating system from Epson's Web site, but only after checking the above items.

The best way to get good printing from Q&A for DOS is to use one of the printers listed in Q&A's Install Printer screens or to purchase a printer that supports the HP PCL language (PCL3 through 5 for inkjets, PCL5 for lasers). It need not be an HP printer, but it should support HP PCL emulation. For example, our Okidata OL-810e laser printer acts just like an HP LaserJet IV and prints perfectly using Q&A's HPLASER4.FNT driver. Tom Marcellus has told us that his HP DeskJet 870Cse prints fine, including colors, using Q&A's HPDJ550C.FNT driver. Inkjet printers designed *only* for Windows printing (such as HP's DeskJet 700 series) will likely *not* print satisfactorily in Q&A for DOS. But many inkjets will print fine using Q&A's HPDJ550.FNT (or 550C.FNT) driver.

For anyone contemplating purchasing a new printer for use with Q&A for DOS, first, make absolutely sure that the printer supports printing from DOS programs. Buy the printer from an outlet that will allow you to return it for any reason for a refund, credit, or exchange, and test it with various Q&A printer drivers. There are too many good, modern printers out there that will print fine in Q&A for DOS to waste money on one that won't.

Bill Halpern and Gordon Meigs own Professional Computer Technology Associates in Newtown, Pennsylvania, 215-598-8440, [www.pcta-usa.com](http://www.pcta-usa.com), email [pcta@comcat.com](mailto:pcta@comcat.com).

## Time Clock...cont'd from page 9

current time and lets the user know at what time of day they've clocked in/out. The final @Exit saves the record and exits the database.

### Time Out1—Hours

```
< If Time Out1 <> "" Then Goto Time In2;
    If @UserID <> "Tom" Then
    { Time Out1 = @Time;
      @Msgbox("You've clocked OUT at " + Time + ".", "See
your supervisor", "if this is incorrect."); @Exit }
}
```

The remaining Time In and Time Out fields (Time In2, 3, and 4, and Time Out2, 3, and 4) contain the same programs except for the field references. Only the final time field, Time Out4, differs in that it contains no Goto:

```
< If @UserID <> "Tom" Then
{ Time Out4 = @Time;
  @Msgbox("You've clocked OUT at " + Time + ".", "See
your supervisor", "if
this is incorrect."); @Exit }
```

### Daily Total—N2, Read-Only, On-Record-Exit field

```
#100:
Daily Total =
(Time Out1 - Time In1) +
(Time Out2 - Time In2) +
(Time Out3 - Time In3) +
(Time Out4 - Time In4);

Daily Total = Daily Total / 60;

If Daily Total < 1 then Clear(Daily Total);
#"Times In/Out" = #"Times In/Out" + " " + @Str(@Time);
Clear(Time)
```

This program is set to execute on-record-exit. It keeps a running total of the number of hours worked during the day. The statement that fills the Times In/Out field was originally designed as a kind of cross-check to discover if the record had been altered after the fact. Later, it proved unnecessary.

### Times In/Out—Text (screenwide)

```
< If @UserID <> "Tom" Then Goto Time In1
```

*Continues on page 12*

## Interoperability... cont'd from page 5

file.) Otherwise, an @Xlookup is performed to get the customer name from the Customer database and control resumes at the OrderDate field.

### Using a button instead of @Askuser

In the Q&A 5.0 DOS version of the database, @Askuser is employed to see if the user wants to post the order. If he says "Yes," the program continues with the posting logic, otherwise navigation goes elsewhere. The Q&A for Windows version has a button that says "Post." When clicked, it goes to the PrepareToPost field which simply continues with the posting logic (skipping over the @Askuser required by the Q&A for DOS code).

It is possible to use fields in a Q&A DOS database to emulate a button you can click. If you like, you can do that and make the DOS and Windows versions more compatible in the user interface. However, the "button field" in Q&A for DOS is really a version 5.0 technique, because 5.0 lets you apply a contrasting text color to the "button" (the field) and in turn color the field different than the form's background, making the assembly look and work like a real single-click button. Moreover, in 5.0 you can attach an on-field-entry @Macro command to a button field, so that clicking on the button can do virtually anything you want anywhere in Q&A. (See "Streamline Tasks with Custom Windows-like Gadgets" in the January 1996 issue and "More Windows-Like Gadgets" in the August 1996 issue.)

### Conversion strategy

When preparing a Q&A 5.0 for DOS database for use in Q&A for Windows, I recommend the following approach:

- First, using Q&A 5.0, change the programming so that any of the Q&A 5.0-specific programming statements listed above are enclosed in *If @Platform = "DOS"* conditionals.
- Having done this, you should be able to open the database in Q&A for Windows and move through the fields without causing an abort. Of course, some critical parts of the programming won't work at all in Q&A for Windows, but they should still work in Q&A for DOS.
- Next, copy the Q&A for Windows Master Form to a temporary form and then bit by bit copy off parts of it to make your new forms. I suggest making a copy of the Master Form because you might want to delete parts of the copy as you go along, or rearrange it for data entry or viewing convenience. It's always best to leave the Master Form alone. For one thing, it may be big and slow to access. Your copy can be chopped into big pieces to make editing easier and faster.
- Having designed a number of smaller forms, add scripts

and buttons for navigation between forms. (Q&A for Windows "scripts" work like Q&A for DOS macros, except that a script can function only inside of the database in which it was recorded.) You might want to create a form that's just a menu — that is, a collection of buttons that jump to other forms.

- With the basic forms in place, add special fields to each one as needed, including the DTFWIN field if you're using DTFWIN. Then add a Navigation Spec to each form to supplement the navigation logic in your main Program Spec.
- Finally, add the DTFWIN logic as needed. This would include setting the field, going to it, and having DTFWIN recognize the value returned and doing whatever is appropriate for your application at that point, including setting other fields and performing a Goto to resume the navigation flow.
- At some point along the way you will want to dress up each form to look as nice as possible. You don't want to do that too early so you have to do it again due to changes you make later. But you don't want to do it too late, because aesthetics may tell you what changes to make changes as well.

John Dow is a Q&A developer and creator of a stable of utilities and add-on programs for Q&A. Visit his Web site at [www.johntdow.com](http://www.johntdow.com) for more information on his products and downloadable demonstration versions of them. Email [jtd@pgh.net](mailto:jtd@pgh.net).

*For a review of an early version of John's DTFWIN program, see "Q&A for Windows Add-On Revs Up Multi-Database Apps" in the September 1998 issue.*

## Making Q&A DOS Databases Interoperable with Q&A Win

Whether you're using Q&A 4.0 or 5.0 for DOS, you can make your databases fully accessible in Q&A for Windows.

For Q&A 4.0 for DOS, you need the QAUP.EXE interoperability patch. It's available for download from the Q&A Users Group site at [www.qaug.com/qainfo.htm](http://www.qaug.com/qainfo.htm).

If you're using Q&A 5.0, you'll find its interoperability patch and information on how to apply it in the \QAWIN subdirectory under your main Q&A program files directory (assuming you performed a standard Q&A 5.0 installation).

You can purchase Q&A 5.0 or Q&A for Windows from Professional Computer Technology Associates (PCTA), 215-598-8440, [www.pcta-usa.com](http://www.pcta-usa.com), email [pcta@comcat.com](mailto:pcta@comcat.com).

## Time Clock...cont'd from page 10

This field and program were initially designed to block access to the CopyRecordNo field by all but user "Tom" and store a string value as a cross-check against the Time In and Time Out fields. It later proved unnecessary.

### CopyRecordNo—Text

```
< @Macro("Get Todays Record")
```

Recall that the on-record-entry program (in the **Date** field) copies the RecordNo here and transfers control if the @XLookup for a duplicate RecordNo succeeds. The *Get Todays Record* macro gets that previous record:

```
<begdef><nokey><name>"Get<sp>Todays<sp>Record"<vidoff><f11><f7><f12><f10><enddef>
```

The macro simply copies the record number to the clipboard, brings up the Retrieve Spec, pastes the record number into the RecordNo field and "presses" F10.

### The one-PC scenario

To use a single PC on which *everyone* clocks-in and -out, simply have your macros take the additional step of clearing the UserID and password (Shift-F6) on returning to the Main menu. Replace all @Exit commands with an

@Macro that saves the record (Shift-F10), escapes to the Main menu, and clears the UserID/password.

### Reports

The supervisor needed just two reports to start—*Time Sheet by Date* and *Time Sheet by Employee*. The Column/Sort Spec for *Time Sheet by Date* shows, by date within the specified date range, each employee's clock-in/out times and total daily hours:

```
Date: 1,AS,R
UserID: 2,AS,CS

In: 3,H(In)
Out: 4,H(Out)

In: 5,H(In)
Out: 6,H(Out)

In: 7,H(In)
Out: 8,H(Out)

In: 9,H(In)
Out: 10,H(Out)

Daily Total: 11,H(Total),ST,T
```

The download file for Online Edition subscribers includes the TIMECLOCK.DTF database featured in this article. The Admin UserID and password are "TOM" and "ADVelper"

The *Time Sheet by Employee* report's Column/Sort Spec is the same except that the sorted fields are reversed:

```
Date: 2,AS,CS
UserID: 1,AS,R
```

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