Synchronizing Q&A Database Records

JOHN DOW

T HERE is no menu command in Q&A for synchronizing Q&A databases record by record. In this two-part article (Part 2 next month) I'll show you several procedures for doing it. My focus will be on techniques using Q&A 5.0 for DOS. If you use Q&A 4.0 for DOS or Q&A for Windows, see the sidebar on page 5.

In this discussion, I'll assume you have a copy of a customer-type database in two or more cities (the same design), where each record contains information about a customer. I'll also assume that the records in these databases need to be synchronized on a weekly basis. The synchronization I'll describe is based on a date and time stamp. If more than one database contains a copy of the same record, the one that's more recent is to be kept and the other(s) discarded.

Why synchronize? By what rules?

Q&A is very slow when accessing remote databases because it isn't client/server-based like the coming Q&A successor database from Lantica Software. What this means is that if you have a home office in one city and want to access data in another city remotely, you can't unless you use a program such as LapLink or PCAnywhere.

For some situations, that's not acceptable. You might need the super-fast response that a local Q&A database provides. Perhaps you just don't want the hassle of connecting when it's time to access the database.

But if you have copies of the same database in different cities and want to allow changes at all cities, how do you keep them synchronized?

Let's say we have three cities: a home office in Pittsburgh (PIT) and satellite offices in Los Angeles (LAX) and Houston (HOU). We want to have the same database in all three places and allow daily changes. On a regular basis (for the sake of discussion, let's say every week) we want to synchronize them.

Our rules for synchronizing are these:

- If a new record is added at any city, distribute it to the other cities.

- If an existing record is changed at more than one city, distribute the more recent copy to the other cities.

Sending databases from city to city

To synchronize, you need to have all the data in one place. I'm assuming you'd send the entire database back and forth. However, you might prefer to extract the data to send instead. That would involve more steps, so I won't discuss doing it that way. In your particular situation, you might prefer this approach. Just remember that Q&A doesn't preserve all characters in the data when it exports to standard ASCII; My DTFDATA and DTFDOCTR programs, however, do preserve all the characters, including embedded carriage returns.

Maintaining unique record identifiers

Synchronization record by record requires that each record be uniquely identifiable. You might think that's easy to do. Just use @Number to assign

a number to each record. However, we want to allow all users in all our cities to add new records. Using @Number imposes a burden on us as designers because we have to ensure that the same new number is not assigned to records in different cities. For example, it would not be good to assign the new number 1234 to customer Smith at LAX and the same number 1234 to customer Jones at PIT.

You can make sure that @Number assigns numbers in different ranges at

You Don't Quit!

Q&Aers might remind you of pit bulls. Once they've sunk their teeth into something, it's practically impossible to pry them loose. Take the reader who wrote last month to report that his favorite Q&A backup utility (which we reported had flunked the Year 2000 test) was back working just fine in 2001! (See the *News Flash* below.)

And after we'd repeatedly told you to forget about using Q&A for Windows on a Windows NT or 2000 machine, here comes John Dow with a patch. (See the *News Flash* below.)

As you learned last month, the new Q&A-compatible database from Lantica Software (www.lantica.com) is scheduled to arrive before year's end. So, beginning this month we're featuring a new "Sesame Seeds" column to help you get a leg up on the coming transition to the new product.

Oh, and you'll see that we've changed *The Quick Answer's* look a bit to cut down on the shaded backgrounds. This will help Download Edition readers save ink or tonor when printing their issues.

—**TOM MARCELLUS**

News FLASH! Q&A for Windows Now Running on Windows NT/2000 Systems!

FOR ANYONE STRUGGLING with the issue of what to do with your Q&A for Windows files now that the boss has insisted on giving you a brand new Windows 2000 workstation, there has been only one answer—upgrade to Q&A 5.0 for DOS and open your databases. But of course your boss has also insisted that no DOS programs will be allowed in the workplace. So how do you keep working with Q&A?

Everybody tip your hat to **John Dow**. He has developed a patch for Q&A for Windows—for both versions 4.01 and 4.06—that so far seems to allow Q&A for Windows to run successfully on an NT or 2000 platform. Neither John nor *The Quick Answer* can guarantee the performance of this patch. We have only had the time to do limited testing, though it seems to be extremely stable. We have seen no problems with the patch but still warn that you will be using this patch at your own risk. Make sure that you have backups of your data before you install it. The patch is available for free download from John's Web site at www.johntdow.com.

News FLASH! *Back to the Future*—QABACKUP Found to Be Y2K+1 Compliant!

MANY READERS HAVE LAMENTED the fact that QABACKUP, the backup utility that comes with Q&A for DOS, no longer worked after December 31, 1999. (See the December 1999 issue.) It was a really nifty little program for backing up Q&A database and document files to multiple floppies. We've told you that QABACKUP was not Y2K compliant and there was no hope for a fix. That's still the case.

However, it's now 2001, not 2000, and surprise, surprise, QABACKUP works with files dated on or after 1/1/2001! Yes, you can start using the utility again with some simple precautions. **(1)** Make sure that you've accessed *all* your databases at least once since the turn of the year to ensure they're dated properly. **(2)** Since QABACKUP will also backup and read your Q&A document files, make sure that you open each of them and re-save them so that they also have a date of 01/01/2001 or later. These steps are critical and will give you back your favorite backup utility.

If you've deleted QABACKUP.EXE in despair, you'll find it on the "Free Downloads" page at www.quickanswer.com.

different cities. Thus, new records at LAX could be numbered 1000 and up, while new records at PIT could be numbered 2000 and up. But there are problems with this.

If you synchronize by creating a master database and then distributing it to the satellite cities, the @Number settings will all be the same and they'll have to be reset every week at the satellite cities.

If you make a mistake and set the @Number wrong, you wouldn't necessarily notice right away and the results could be grave.

One solution is to use my DTFMERGE program to maintain the @Number value. As part of preparing the satellite database after it is received at the home office, the program could extract the @Number value and save it in a file. Then when the synchronized database is ready to be returned to the satellite office, DTFMERGE could restore the @Number value. (Another feature of DTFMERGE is its ability to save and restore database Sharing Mode settings.)

Another solution is to guarantee that the unique record identifiers assigned at different cities cannot possibly be the same. This uniqueness is guaranteed by prefixing the city code (LAX or PIT) to the record identifier. At the time a record is added, the next higher identifier number is computed by doing an XLookupR, as shown in the programming example below.

For example, records added at LAX have identifiers like LAX00001, LAX00002, and so forth. Records added at PIT have identifiers like PIT00001.

For this to work, the programming in the database has to "know" which city it's in. But how is a database to know whether it's at the LAX office or the PIT office? Remember, the same database is in use at both cities because it's synchronized then distributed. Therefore you can't build this fact into the database design.

The solution is the famous "one record database" that finds so many useful purposes. In our case, that database is C:\LOCINFO.DTF. The three C:\LOCINFO.DTF databases all have one record with RECORDNO = "1". The values of the other fields are:

Location	LocID	TimeZone
Pittsburgh	PIT	0
Houston	HOU	1
Los Angeles	LAX	3

Once this database is properly setup and stored on each workstation, any Q&A database can easily determine where it is located and how to adjust the time. Notice that Pittsburgh is the home office, so its time zone is 0 and the other cities are set to adjust to Pittsburgh time. All date and time stamp values will be in Pittsburgh time.

Here's the programming for the unique record ID. It uses two fields. **LocID** gets either "LAX," "PIT" or "HOU" (from the C:\LOCINFO.DTF database). The other

field, **RecID**, gets a value like "LAX02323" or "PIT00331" or "HOU00231." The number assigned is always one more than the highest record currently in the database.

```
If @Add And Recid = "" Then {
    Locid =
@Xlookup("C:\Locinfo","1","Recordno","Locid");
    Recid =
@Xlookupr(@Fn,Locid+"zzzzz","Recid","Recid");
    If @Left(Recid,3) <> Locid Then {
        Recid = Locid + "00001";
    } Else {
        Recid = Locid + @Right("00000" +
@Str(@Right(Recid,5)+1) ,5);
    };
};
```

The database has to be initialized of course so that every record has a unique value in **RecID**. You could use a Mass Update with programming like this to set the **RecID** field:

```
#1 = "Old" + @Right("00000" + @Str(@Number) ,5);
```

One final word about this scheme. It's not safe if you have more than one workstation at a given city. There is a slim chance that two people could simultaneously create a new record at the exact same moment. Suppose the highest record ID was PIT12345. Both would compute PIT12346 as the next number. You'd have a duplicate record identifier. The odds of this are very small and you might consider it an acceptable risk. As a precaution, you could run some procedure to look for duplicates prior to the synchronization itself. (DTFDATA is particularly handy for finding duplicates.)

Date and time stamp

Just as we need a single field that uniquely identifies each record, we also need a single field that indicates the effective date and time for the record to be used to determine which copy of a record is most recent.

The database has a field called **DTS** (date and time stamp) which is set as follows every time a record is added or modified.

```
#9999:
If @Add Or @Modified Then {
Timezone = @Xlookup("C:\Qacities","1","Record
Number","Timezone");

If Timezone < 0 Then {
If @Tonumber(@Time) < -(60 * Timezone) Then {
Dts = @Str(@Date-1) + " " + @Str(@Time + 60 *
(24+Timezone))
} Else {
Dts = @Str(@Date) + " " + @Str(@Time + 60 *
Timezone);
};
} Else If Timezone > 0 Then {
If @Tonumber(@Time) + 60 * Timezone > 24 * 60 Then
{
Dts = @Str(@Date+1) + " " + @Str(@Time + 60 * (24-
Timezone))
} Else {
Dts = @Str(@Date) + " " + @Str(@Time + 60 *
```

```
Timezone);
};
} Else {
Dts = @Str(@Date) + " " + @Str(@Time);
};
};
```

This is the On-Record-Exit field program. (Press F8 in the Program Spec to set this.) The programming looks pretty hairy because it adjusts for time zone differences. The logic is able to handle date changes if needed. For example: 10 PM in Pittsburgh is 3 AM of the next day in London, because there's a five hour difference.

Unfortunately Q&A 4.0 doesn't allow you to test to see if a record was modified, so you'll have to delete the *If @Add Or @Modified Then…* statement and the matching closing brace from the code as shown. The unfortunate result is that the date and time stamp will be set even if you just view the record.

A word of caution: make sure your computer is set to the correct date and time.

First approach—synchronizing two at a time
We now have databases with guaranteed unique record identifiers and time zone-adjusted date and time stamps. Here's a procedure that can be used if you only have two cities, or if you have more cities but customers don't move from satellite city to satellite city. (See below for synchronization procedures to be used if customers move between cities or have accounts in multiple cities).

With this two-city model, synchronization is done between each satellite city and the home city. This simplifies the synchronization task because it is sufficient to synchronize the home office in turn with each of the satellites. It is not necessary to compare each of the satellite offices to each other.

With three cities, we would need to do only two synchronizations. There is one we don't have to do.

| Synchronize: | Los Angeles and Pittsburgh |
| | Houston and Pittsburgh |

Do not synchronize: Los Angeles and Houston

With five cities, we would need to do only four synchronizations. There are six we don't have to do.

Synchronize:	Los Angeles and Pittsburgh
	Boston and Pittsburgh
	Chicago and Pittsburgh
	Houston and Pittsburgh

Do not synchronize:	Los Angeles and Boston
	Los Angeles and Chicago
	Los Angeles and Houston
	Boston and Chicago
	Boston and Houston
	Houston and Chicago

With more cities, the number we don't have to do rises rapidly. Thus, with 10 cities, we need to do only 10 pairs and there are 35 pairs we don't have to worry about.

(If I remember my math, that's 45, the combination of 10 things taken two at a time, less the 10 we need to do.) With 20 cities, we'd still only do 20 and not need to do 170.

Send the satellite database(s) to the home city, presumably via e-mail. Then run the procedure (described below) which compares the satellite and home versions of the database and makes any adjustments (such as copying appropriate records from one to another and removing the old record while keeping the new). Do this for each satellite database.

A copy of the newly updated master database is then sent back to the satellite city(ies) to be used for the next week until it's time to synchronize again.

Synchronizing databases two at a time
This procedure calls for records that are new to the LAX database to be copied to the PIT database. Records that exist in both are to be copied from LAX to PIT but only if the date and time stamps shows that the record was added or modified at LAX more recently than at PIT.

This selective copying is implemented by first deleting the records that should not be copied, then copying all those that remain.

The records to be removed from the LAX database are records that exist in both, where the PIT date and time stamp is the same as or newer than the LAX date and time stamp. A stored Retrieve Spec named "Remove from LAX (match PIT)" looks like this:

```
{@XLU("PIT",Recid,"Recid","DTS") >= DTS}
```

This is all there is to the Retrieve Spec. It can be placed in any field.

Notice that this programming omits the path to the PIT database, so it requires that the "Q&A Database files" setting under Utilities / Global Options is set to point to the directory where the LAX and PIT databases are located.

You should recover the database after removing these records. Q&A apparently has a bug in handling a database from which nearly all the records have been removed. Recovering the database rebuilds the IDX (index) file and resolves the issue.

A similar procedure is needed to remove records from PIT if the same record exits in LAX and is newer in LAX. Here's the Retrieve Spec, named "Remove from PIT (match LAX)":

```
{@XLU("LAX",Recid,"Recid","DTS") > DTS}
```

Each pair of databases to be synchronized needs this pair of Retrieve Specs. For the three cities PIT, LAX, and HOU, you should have the following stored Retrieve Specs:

```
Remove from HOU (match PIT)
Remove from LAX (match PIT)
Remove from PIT (match HOU)
Remove from PIT (match LAX)
```

If you have 10 satellite offices, each would be synchronized to the home office only, so you'd have 20 Retrieve Specs. All 20 would be in all databases, even if not needed, because all 10 databases are identically the same (except their names differ).

The complete procedure to synchronize PIT (home office) and LAX (satellite) is:

1. In LAX satellite office, zip LAX.DTF/.IDX database and e-mail to PIT;

2. Receive database file (LAX.DTF) from satellite office at LAX;

3. Remove records from the satellite database (LAX.DTF);

4. Recover the satellite database (LAX.DTF);

5. Remove records from the home office database (PIT.DTF);

6. Copy all remaining records from satellite to home office (LAX.DTF to PIT.DTF);

7. Copy PIT.DTF and PIT.IDX to LAX.DTF and LAX.IDX, zip and return to LAX office.

8. In LAX office, unzip LAX database over existing one.

Next month, in Part 2, I'll cover the procedures for synchronizing databases from more than two cities at the same time using Q&A or DTFDATA, and wrap things up with some concluding remarks.

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What about Q&A 4.0?

Unfortunately, Q&A 4 doesn't allow you to test to see if a record was modified, so you'll have to delete the *If @Add or @Modified Then…* statement and the matching closing brace from the code as shown. The unfortunate result is that the date and time stamp will be set even if you just view the record.

For Q&A 4 (DOS or Windows), you can create your own @Modified equivalent. You'll have to decide which fields, if changed, should trigger the @Modified effect. Add another field to the database; it's called "OriginalData" in my example here. Put programming like #9000 shown below into a field and make it the On-Record-Entry field program. (In the Program Spec, press F8 to set the record entry and exit fields).

```
#9000:OriginalData = #10 + ";" + #30 + ";"
+ @Str(#100);
```

On entry to the record, this will set OriginalData to a string which includes the values of all the fields you consider triggers. In this case, fields #10, #30, and #100 are all trigger fields. Field #100 is either a date or a numeric or money field, which is why @STR() is used for it. (If you don't do this, Q&A will try to add everything, rather than concatenate the fields as strings.

Put programming like #9999 shown here and make it the record exit field. The test shown here is equivalent to Q&A 5's *If @Add Or @Modified Then…*:

```
#9999:If OriginalData <> #10 + ";" + #30 + ";" +
@Str(#100) Then {
  << same as for Q&A 5 >>};
#9999 = "";
```

I suggest that you initially make the **OriginalData** field visible so that you can make sure you are using @Str() for all the fields that need it. Create a record that has a value for each of the trigger fields. Make sure that OriginalData isn't set to "0" but looks something like this: "DOW;JOHN;2001/02/09." After you're sure it's working, you can hide OriginalData by moving it to a back page or making it very small. It can also be read only.

Quick Tip

Delete the Rightmost Characters

You might have tried using a statement like *#2 = #2 - @Right(#2, 3)* to delete the specified number of characters from the end of a text field value. As I recently found out, it doesn't work. The following statement, however, does the trick:

```
#2 = @Repllas(#2, @Right(#2,3), "")
```

This will, for example, change **T-Joint-03** to **T-Joint**.

Peter A. Venuto

*[Another statement that achieves the same result is **#2 = @Left(#2, @Len(#2) –3)**. —Ed.]*

@Help

EDITED BY WILLIAM HALPERN

Crosstab Report Printing in the New Century

I've been having some severe problems with my crosstab reports in Q&A 4.0 for DOS. I can print them to screen and/or preview them, but then if I print them to the printer, all data from January 2000 or later prints as zeros. Do you have any ideas or fixes?

John

This is a Y2K-related bug that was never resolved. It appears in both Q&A 4.0 and 5.0 for DOS. We've addressed it here (see the June 2000 issue) with a workaround that includes formatting the report's date fields in a special way. On some computers, this will work. But the overall problem has to do with certain processors (computers) and crosstab reports that sort by date and include records with 2000 or later dates. If you preview or print the report to screen everything is fine. If you print it *directly* to the printer without first printing it to screen or previewing it, everything is fine. However, if you preview to screen or print preview and *then* redirect to the printer, all 2000 data and beyond will appear as blanks or zeros. In this case, you must exit the report and print it again, this time with no screen preview of any kind. This is the only *sure-fire* workaround we know of.

Number Sorting Problems

I have a database of about 2800 records that I cannot get to sort properly. Here's what happens. From the Retrieve Spec, I go the Sort Spec by pressing F8 and then use 1AS, 2AS and 3AS in three fields. Where I've specified an ascending sort on the 2AS field that contains numbers, I get three unnumbered records before I get the record with a "1" in that field. Then I get the number "11" record followed by the number 101 record, and so on. My other five databases sort as they should in all fields. This isn't a new problem. I used to get this same behavior in Q&A 3.0 and 4.0. I had hoped it would be remedied in Q&A 5.0 but it isn't.

Sammy

The solution here is very simple but involves an underlying issue that should be understood by anyone who uses a database. Databases sort different types of fields differently. If a field is a *text* field, the database will sort on it, ascending or descending, on a character-by-character basis. In other words, the database engine looks at the first character and sorts all the records by that character. For all records where there's a tie (the first character is the same), it then re-sorts these by the second character and so on until it reaches the end of all characters. It's also important to realize that in an ascending sort on a text field, records with blank sorted fields will be placed at the top of the stack and numbers will come before letters. So, in a *text* formatted field, 2 would come after 11 and 125 would come before 9.

In contrast, if the sorted field is a true *number* field (formatted for numbers rather than text at the Format Spec), then the database engine will sort the data in each field according to its whole numeric value. This means that 9 will come before 11 and before 222. But you have to realize that you cannot enter anything but numbers in a *number* type field.

Your problem is that the field you're sorting on is formatted for *text* values even though you've filled it with numbers. (Text fields allow the entry of any character that you can type from the keyboard.) What's more, you haven't filled all your records with data. The fix is simple. Use Q&A's Design / Customize / Format values screen to change the field in question to a *number* field rather than a *text* field, then search your database for all records with no entry in that field ("=" in the Retrieve Spec) and add the appropriate number.

There is one exception to this numeric-sorting-on-a text-field rule: A text field *will* sort numbers correctly if the numbers are all the same length such as Zip Codes or social security numbers. (Technically, though, such "numbers" are not really *numbers* since you'd never perform any arithmetic on them.) This opens the door to "numeric" sorting on auto-incremented fields such as a sequential new customer ID field. The trick here is to pad the "numbers" with leading zeroes so they are all of the same length, as in 00001, 00002…00101, 00102 and so forth. You can have programming add the leading zeroes for you. See the *Quick*Tip on page 11.

'Divide' Errors Revisited

(Editor's Note: Although we've addressed this issue before, readers continue to ask questions about it. So we feel the solutions bear repeating.)

1. I can't install my copy of Q&A 4.0 on a new computer. I'm using the original disks but Q&A keeps giving me a "divide" error when I tell it I want to install to drive C:.

2. I have successfully installed Q&A 5.0 on a new computer but when I try to run it I get a "divide" error.

While the two errors seem to be the same, the cause is different. In the first case, Q&A 4.0 DOS, the error is caused by the fact that the install program for Q&A 4.0 can't read or otherwise address a hard drive partition that's larger than 2G. The only way to successfully install Q&A 4.0 is to (1) partition the drive so that there's a partition smaller than 2G and install Q&A into that partition, or (2) find a way to just copy your program files from another computer to the new hard drive (network connection, LapLink or PCanywhere, or zipped to floppies) and thus bypassing Q&A's install program. In this way you can install 4.0 into a large partition and it will run. Remember, though, if you do this you *must* use Lesspace.com with Q&A to make sure that Q&A does not corrupt your data.

In the second case, the issue is not with the drive size but with the processor speed. Q&A 5.0 as supplied by Symantec can't address processors with a clock speed in excess of 200MHz. Even though it will successfully install on faster machines, it will not run because its internal timing routine can't handle the processor speed. The creator of Q&A 5.0, Andreas Goebel, wrote a patch for the program and has provided it for all users at no cost. It's called Speedfix.exe and is available on most Q&A-related Web sites for free download. Running Speedfix one time patches the QA1.EXE file and fixes the timing issue. Again, though, this does not change the issue of large hard drives and you *must* use Lesspace or run Q&A in a smaller-than-2G partition.

Q&A DOS Causes Windows Printing Errors

I just installed Q&A 4.0 for DOS on a new Windows 98SE machine with an HP LaserJet 1100 printer. Every time I try to print I get the Windows error: "*This program has performed an illegal operation and will be shut down…*" I haven't been able to fix the problem even after trying all the different combinations of printers in Q&A. What gives?

<div align="right">Paul</div>

I'm trying to print to an Epson Stylus 800 from Q&A 5.0 DOS in Windows Me and I keep getting Windows system errors. How can I print from Q&A?

<div align="right">Bill</div>

And so on with different printers and different operating systems from other users.

Let's put this problem in perspective. The issue is not with Q&A. The problem is that certain combinations of printers, drivers, operating systems and printer cables cause a Windows error when trying to print from DOS. You can prove this by typing *copy c:\autoexec.bat LPT1:* on the command line and pressing Enter. You should get the same error. The right way to fix this is to get the latest drivers from the printer manufacturer for your particular operating system. Make sure that you are not printing through another device's connection, such as a scanner, that is not compatible with that printer. Ensure that your printer cable is correct for your printer. Even with all these things done, you might still have the problem because the combinations of causes are so many and so complex. Fortunately, there's a general solution.

Open your Printers folder in Windows Control Panel or from the Windows Start / Settings menu. Select the offending printer and right-click on it. From the shortcut menu, select *Properties.* In the Properties, click on the *Details* tab and then the *Port Settings* button. You'll see two check marks: *Spool MS-DOS Printing* and *Check Post State Before Printing.* Click in both of these boxes to deselect them. Click OK to close all of the printer windows and re-boot your computer. When it reboots, recheck the printer settings to make sure they took. Q&A should now print without causing a Windows error as should other DOS programs. The one drawback is that on large print jobs, with spooling turned off, you will not be able to use Q&A until the printer is done printing. But for most users this is the lesser of two evils and the easiest way to fix the problem.

Q&A for DOS Screen Inexplicably Freezes

I run Q&A for DOS 5.0 in Windows 98 on a network. Every so often, for no apparent reason, my Q&A screen just freezes and no keystrokes or mouse clicks have any effect.

<div align="right">Clem</div>

We just happened to be in your office when this very thing occurred. You were running Q&A in full screen mode with a database record onscreen when Q&A suddenly locked up. However, when we pressed Alt-Enter to put Q&A in a window, it unfroze—as if nothing had happened—but we also noticed something else. Switching Q&A into a window revealed that Windows had just displayed a pop-up notification alerting you to an incoming internal email message from your supervisor. *That's* what caused your screen to freeze. Once you began routinely running Q&A for DOS in a window, the problem vanished.

<div align="right">Tom Marcellus</div>

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Q&A Basics

Have Q&A 'Press the Keys' for You—Part 2

ALEC MULVEY

LAST month, in Part 1 of this article, I showed you how to create a new macro file and start recording macros. I suggested that you could record two simple macros for opening your favourite databases in Search/Update and Add Data modes. To refresh your memory, here's how you'd go about creating a macro to open a database in Search/Update mode:

1. Load your macro file. If it is not already loaded at start-up, press Shift-F2 for the Macro menu and select *Get Macros.*

2. At the Q&A Main menu, press Shift-F2 and select *Define Macro.*

3. Type the macro identifier or key-combination, for example, Alt-A.

4. Select *File / Search/Update* and press Shift-F4 to clear the database name prompt.

5. Type in the database filename and press Enter.

6. If you like, press Tab to move to your usual search field, such as a last name or company name field.

7. Press Shift-F2 to end macro recording.

8. Type a name for the macro, such as *Search Customer.*

9. Press F10 to confirm, then F10 again (or Enter) to save the macro to the macro file.

The reason why you must *always* do steps 4 and 5 above is so Q&A always looks for the database in the default database directory as specified at the *Utilities / Set Global Options* screen. The last database you used (which Q&A will place on the filename prompt line by default) may have been in some odd location.

It's unreliable to have a macro select a file from Q&A's List of Files screen. Today, the pertinent file might be the fourth file on the list, but tomorrow it might be the fifth. Typing the database name ensures you always get the right file, no matter how many others you may have.

Having your macro automatically Tab to a particular field saves you from having to do so, but bear in mind that if you should redesign your database (add, delete, or move fields around), the cursor might wind up in the wrong field.

Controlling macro execution

As I stated last month, I consider it important to control how macros are started. Macros that can be invoked with shortcut key-combinations such as Alt-A can be disasters waiting in the wings.

Consider a macro that performs some actions that include the keystroke sequence *F3 Y*. This might be a valid delete command when the macro runs *as intended*. But suppose the macro has the key combination Ctrl-R. You could be typing something, go to press Shift-R and accidentally press Ctrl-R. The macro would be activated and who knows what *F3* followed by the confirming *Y* will do? It could be a valuable record or even worse. If done at the List of Files screen it could permanently delete an entire database! You really can't be too careful.

Even an innocuous keystroke like *spacebar* can be dangerous. For example, spacebar will toggle the default *No* option in Q&A's Delete dialog box to *Yes*. So *F3 Spacebar Enter* can be an extremely hazardous combination. Bear in mind that any keystrokes that do nothing in a runaway macro are ignored, so a macro containing a sequence such as *F3 Spacebar Enter* could contain any number of other keystrokes between those three and still do its damage.

The solution is simple. If you don't use shortcut key-combinations but instead start your macros from a menu, you know exactly where they are starting. Furthermore, you can only place a maximum of six macros (or external programs) on Q&A's Main menu, but once you create your own custom menus, the sky's the limit.

Creating a Custom Menu

A lot has been written in *The Quick Answer* over the years about custom menus—some good, some bad. This might have scared you away from them, but it shouldn't. Follow what I show you here, ignore the rest, and you'll be okay!

Let's start with a simple *Search* menu. I use one of these myself. It simply gives me a selection list of databases I frequently need to search. It's really easy to create and you can have one too. Here's how it's done.

First of all, make a list of the databases you'll want on your new *Search* menu. Let's say they are the following:

```
CUSTOMER.DTF
INVOICE.DTF
SUPPLIER.DTF
PERSONAL.DTF
```

Next, follow these steps:

1. Press Shift-F2 for the Macro menu.

2. Select *M - Create Menu.*

3. The list of existing Menus (if any) will appear. (See Figure 1.) Select — *New menu —.* (See Figure 2.)

4. At the menu definition screen (which has the highfalutin' name, *Application Menu Options)*, enter *SEARCH MENU* for the Menu Name.

5. Then, ignoring the other options, move down to the *Menu Title* line and type the name *SEARCH …* (*SEARCH* followed by a space and three periods.)

6. Move to the *Item 1* line and in the first column type the name of the first database. In our example, it's *CUSTOMER.* (You don't need the .DTF extension.) Whatever you type here will appear on the menu.

7. You can now press F2 to preview the menu. (Press Esc to close the preview.)

8. Press F10 twice to save the new menu to the macro file, then press Esc to close the Macro menu.

You must *not* press F2 (Preview Menu) at step 7 above *until* there's at least one menu item on it. There's a bug in Q&A (almost the only one in Q&A 4.0) whereby Q&A can crash if you try to preview an empty custom menu. Also, when you save your custom menu in Step 8, notice that you are asked to save it to the *macro* file. Custom menus are actually macros and are stored in the macro file.

So, what have we got?—a new custom menu! It has a name, a title for Q&A to display at the top of the menu and one item on it. But it doesn't work because there are as yet no macros in it. And there's also one additional problem. How do you display this menu?

When Q&A 4.0 arrived in 1991, this missing bit of essential data was a hot topic. Though fulsome descriptions of custom menus appeared in the *Application Programming Tools Manual* (APT), it didn't mention how to display your first custom menu! This has no doubt contributed to the reason why custom menus are not used as often as they ought to be.

Displaying your custom menu
It's easy really to display a custom menu. You simply record a macro
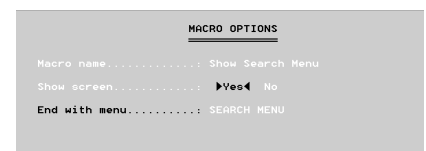
that does *nothing*! You specify in the macro, though, that on completion it should display your custom menu instead of the underlying Q&A menu. Here are the steps:

1. Press Shift-F2 and select *D - Define Macro.*

2. Type a macro key-combination such as Alt-S. (The letter can be anything but it must be preceded by *Alt.*)

3. Press Shift-F2 again to end macro recording. (Yes, *before* you've added anything to the macro!)

4. In the Macro Options box, for the macro name, overtype *<alts>* with *Show Search Menu.*

5. Move down to the *End with Menu* option.

6. Type the menu name, or press Alt-F7 to display a list of menus and select your new *Search* Menu.

7. Press F10 twice to save the macro to the macro file. (See Figure 3.)

Now, whenever you press Alt-S, your Search menu will appear. The thing to do now is install your Alt-S macro on the Q&A Main menu as described last month. The parameters are:

```
Alternate Program: ALT S
Menu Selection: Search Menu
```

This need be your only Alternate Program, and the only macro with a key-combination. All your other macros can be run from this menu or from other menus accessed from this one. A custom menu item can be a macro or *a call to display another menu*, so you can create a cascading menu structure. The *APT Manual* also discusses at length what are called *Replacement Menus*, where you create your own menus to be used in place of Q&A's native ones. But you can ignore all this, at least for now.

Recording the macros
When you're proficient, you can edit your existing custom menu macros (they require only an extra *Esc* at the beginning) but for now we'll just record the macros afresh.

When recording any macro, it's vital to consider the *context* of where they start. For macros to be run from a custom menu, the starting point is, of course, the custom menu. So open the menu in the usual way, by selecting *Search Menu* from Q&A's Main menu. You'll see the menu you created earlier, with its single menu item.
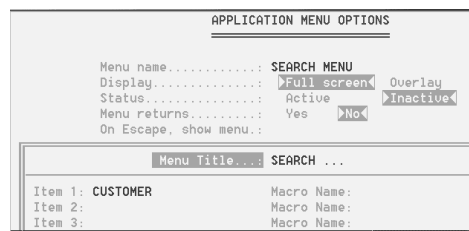

Figure 1. The Macros / Menu Names list.

Figure 2. The Menu Definition screen. No macros on the menu yet.

Figure 3. Saving the Alt-S macro to display the Search Menu.

Next, press Shift-F2 and record the macro to take you to the Retrieve Spec of the database in question. Your first keystroke will be *Esc* to clear the custom menu and return to the Q&A Main menu. In fact, a couple of extra *Esc* keystrokes here will do no harm and can overcome some minor menu issues we don't need to go into here.

For all these macros you do *not* want a key-combination—just press Enter when prompted.

When naming your macros, never accept Q&A's default macro "name" of the key-combination or a number such as *#043*—always type a meaningful name such as *Search CUSTOMER*, or *Add an Invoice.* Leave the *End with Menu* line blank (except for the macro that displays your first Custom Menu).

Adding Macros to the Custom Menu

Once you have all the macros recorded, you can return to your custom menu and complete it.

1. Press Shift-F2 and select *M - Create Menu.*

2. Select *Search Menu* and press Enter.

3. For each database search, enter the database name in the first column and the macro name in the second. You don't have to type the macro name: when your cursor is in the right-hand (Macro Name) column, press Alt-F7 and Q&A will display a selection list of both macros *and* menus. Select one from the list. (See Figure 4.)

4. You can preview the menu by pressing F2 at any time. (See Figure 5.)

5. Press F10 to close this screen, press Enter or F10 to save the macro file, then press Esc to close the Macro menu.

6. Display the menu and test it.

> **TIP**—If you find your custom menu is not working at all, go to the Menu Definition screen and make sure that *Status* is not set to *Inactive* (as it is in Figure 4.) Custom menus will not work unless set to *Active.*

Enhancing the menu items

You have now a fully-working custom menu. To search, you display this menu, select one of the items and press Enter. The Menu can be made even easier to use by assigning a *hot-key* to each macro name. To do so, return to
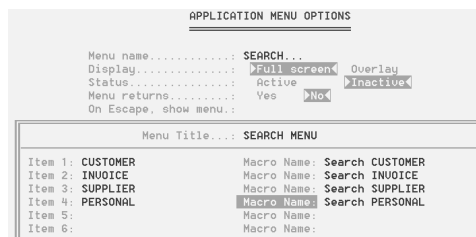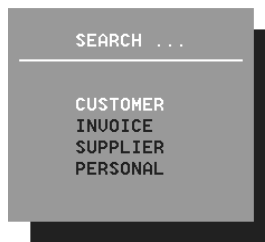
the menu design screen and prefix the items in the first column with a unique letter or a number. Letters look classier, but it might be hard to find up to nine letters that are both unique and meaningful. Numbers are of course straightforward. Figure 6 shows both options.

Conclusion

If you're not overly ambitious with custom menus, they can be great time-savers and are quick and easy to set up. A well-designed custom menu structure can enable totally untrained staff to enter data, search for records, print reports and even perform month-end routines with ease and—most importantly—*safely*.

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Easier Macro File Editing

Last month I suggested that you name your macro file(s) with a .MAC filename extension. What you can then do, for convenience, is associate this file extension with Windows' Notepad text editor so you can view or edit your macro files in a Windows environment. (This is a handy tool for database administrators who often need to edit macro files.)

To do this, browse in Windows Explorer or My Computer, find a .MAC macro file and double-click on it. Assuming .MAC is not associated with any other program (unlikely), Windows will display a File Association dialog box.

Select *Notepad* as the program to use, ensure *Always use this program* is checked, and add a suitable description. Thereafter you will see a Notepad icon alongside your .MAC files and you can double-click on them to open them in Notepad. Since Notepad files are saved as plain text files, you won't need to select any special save options as in Q&A.


```
        Menu Title...: KEYWORD SALES

Item 1: 1 Add New Sales       Macro Name: Add New Sales
Item 2: 2 Search SALES.dtf    Macro Name: Search SALES.dtf
Item 3: 3 View Sales by Mth   Macro Name: View Sales by Month
Item 4: 4 View GP by Mth      Macro Name: View GP by Month
Item 5: 5 Outstanding Invoices Macro Name: Outstanding Invoices
Item 6:                       Macro Name:
```

Figure 6. *Above:* Menu Items with numeric hot-keys. You press *4* to run the *View GP by Month* macro, for example. *Below:* Menu Items with alpha hot-keys. You press *I* for *QAINDEX*, for example.

```
        Menu Title...: SEARCH ...

Item 1: K - KEYWORD        Macro Name: Search KEYWORD.dtf
Item 2: Q - Q&ANSMAN       Macro Name: Search Q&ANSMAN database
Item 3: I - QAINDEX        Macro Name: Search QAINDEX database
Item 4: B - QABUG          Macro Name: Search QABUG database
Item 5: C - QACD           Macro Name: Search QACD
Item 6: T - TODAY          Macro Name: Search Today
Item 7: R - QUEST. REPLIES Macro Name: Search REPLY
Item 8: A - AMSEARCH       Macro Name: Search AMSEARCH
Item 9:                    Macro Name:
```


Figure 4. Menu items and their macros, previously recorded.

Figure 5. The completed Search Menu.

Sesame Seeds

Field Types and Data Entry—Q&A vs. 'Sesame'

We begin a new feature this month to preview the coming Q&A successor product from Lantica Software, code-named "Sesame." Visit Lantica's new Web site at www.lantica.com

ONE of the principal differences between Sesame and Q&A will be apparent as soon as you design your first database or import a Q&A database into Sesame. In Q&A, certain field types are "loosely" defined. For example, in date fields you can enter a valid date—or anything else you want. In the latter case, Q&A will give you a warning message that it can't reformat the entry to a valid date, but will allow you to keep it if you want. Likewise, in a Speedy-Unique field, Q&A will let you enter a non-unique value simply by overriding the warning. The same thing in time fields.

In Sesame this won't be the case. Date fields will accept only entries that are recognizable (or can be reformatted) as valid dates; unique fields will accept only unique values; and time fields will accept only valid times of day. You might feel that such "tight" restrictions are a step backwards. We feel it's the right way to go. Here's why.

If you force "September 00" into a date field in Q&A, you have just rendered that record invalid whenever that date field is used in a Retrieve Spec for a record search, report, or the like. In other words, if you then search for all your invoices dated August 1, 2000 or later, the "September 00" record will not be included. Since it's an invalid date format, Q&A can't find it. The same holds true for time fields.

If you force duplicate unique field entries and that field is used as the external key value in an XLookup from another database, Q&A is liable to retrieve information from a record other than the one you want. Q&A will retrieve the information from the first matching record it finds, and since the record order can vary from use to use, there's no way you can be sure which record that will be.

The Sesame team feels that data integrity is far more important than the ability to enter data haphazardly. In Sesame, if you need a field where you can store anything, simply define the field type as "text" rather than "date" or "time" and Sesame will let you enter whatever you want.

Quick Tip

Start Getting Ready for 'Sesame'

With Lantica's new Q&A-successor database "Sesame" scheduled to arrive toward the end of this year, it's not too early to start thinking about converting your Q&A databases. Like all other databases on the market, Sesame has much tighter "data typing" than Q&A. This means, in a nutshell, that Date fields have to contain valid dates, Yes/No fields have to contain "Y" or "N," and so forth. Q&A will accept entries such as "N/A" in a Date field, or "maybe" in a Yes/No field, but Sesame won't. So it might behoove you to start checking your databases for entries that aren't correctly formatted for the data type of the field.

It's easy to find such entries. The special search code **/..** (forward slash-period-period) will find all "incorrectly formatted" entries in Number, Date, Time, Money and Yes/No fields. If you find there are very many, you might need to create other fields and move the data to them. Of course, you will then benefit from having Date fields, for example, that behave like actual Date fields, with all entries valid, retrievable, and sorting correctly.

Alec Mulvey

Quick Tip

Zero-Fill Leading Spaces in a Text Field

When text fields that store numeric values (such as check numbers or work order, purchase order or invoice numbers) must be padded with leading zeroes, you can use the following program to simplify data entry. The program works with text fields of any width. Simply type (or have @Number generate) the number, press Enter, and the field will be automatically padded with the appropriate number of leading zeroes. In the following sample program, if **Field6** is six characters wide and you enter *25*,

Q&A places *000025* in the field:

```
> Field6 = @Text(@Width(Field6)-@Len(Field6), "0")
+ Field6
```

Because this technique produces numbers that are always the same length, it gives you the added advantage of being able to sort the field in numerical order.

News FLASH!

New Utility Simplifies Creating Q&A Data Source Files for MS Word Docs

JOHN DOW, creator of DTFDATA, DTFWIN, and a host of other utilities for use with all versions of Q&A, has just released a new Q&A data extraction program that's expressly designed for merging Q&A data with Microsoft Word documents.

DTFWORD, a scaled-down and less expensive version of DTFDATA, was the direct result of things John learned at the January International Q&A Users Conference.

"This program came about because people at the conference made it clear that putting field names into a file created by DTFDATA would make it much more convenient. I was also convinced that DTFDATA would be easier to use if it created a QAX file for you, complete with options and a complete list of field names for the particular database.

Therefore I created DTFWORD and added a /NAMES option to export field names, and a /MAKEQAX option to create a QAX file. There are several templates it uses for creating a QAX file. For DTFWORD, there is a WORD.TAX file that is shipped as the default."

DTFWORD is designed to be very easy to use. You just type **EXPORT DBNAME** and a wizard guides you through a simple process that generates a ready-to-use file you can immediately specify as a Merge Data Source file in Word or Access.

The wizard creates a list of all the fields in the database. You select which fields you want. You can optionally change the order of the fields you do want.

By default, all records are exported. You can add record selection criterion if you wish.

The data is then exported to a plain text file that includes field names, ready for importing into another program without any additional "cleanup."

If you want to do the same export again at a later time, your list of fields and selection criterion are saved to a file that you can reuse time and again.

While the basic logic for extracting data is the same in DTFWORD as in DTFDATA, DTFWORD is limited to 20 fields and can only create standard comma/quote-delimited files.

John has a demo of DTFWORD available at his Web site at www.johntdow.com .

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