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Using a One-Record Lookup Database (and Related Tricks)

TOM MARCELLUS



Application in
ONLINE Edition

The Quick Answer

The Do-It-Yourself Guide to Q&A

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While back I did a some programming for a *Quick Answer* subscriber who was developing a Q&A 5.0 application to track public school students. One of the data entry tasks he wanted to simplify and goof-proof was getting details about the school—specifically the school name, address, city, zip and phone number—into a student’s record when adding it to the STUDENTS database. This school-related data was required as the application was designed to track a special category of students at the school district level.

He recognized that a pop-up selection list of schools would be the best way to eliminate keystrokes and typos. When the cursor arrived in the School Name field, a list of schools in the student’s district (stored in another database) would appear courtesy of the XUserselect command. Once the user selected the school, the corresponding Address, City, Zip and Phone fields for that school could be auto-filled by XLookups.

Piece of cake, normally—but there was one small catch in this instance. Because of how the application would be distributed and used by the school districts, and other considerations, The SCHOOLS database had to be a *single record* containing *all* the data on *all* the schools in the district. (Each district would receive a *different* SCHOOLS database.) Fortunately, no district had more than 12 schools, and there was no problem storing data on up to 12 schools in the one record. So from this standpoint, it was perfectly doable. (See Figure 1.) The problem was how to construct the pick-list of schools to display in STUDENTS and how to XLookup the data on the selected school when the lookup database was a single record containing up to 12 schools.

Option 1—Build the pick-list on-the-fly

Neither of the two approaches I’ll show you are precisely the way we originally solved the problem, but they’re close enough. The first one performs a series of @XLookups to retrieve all the school names in the

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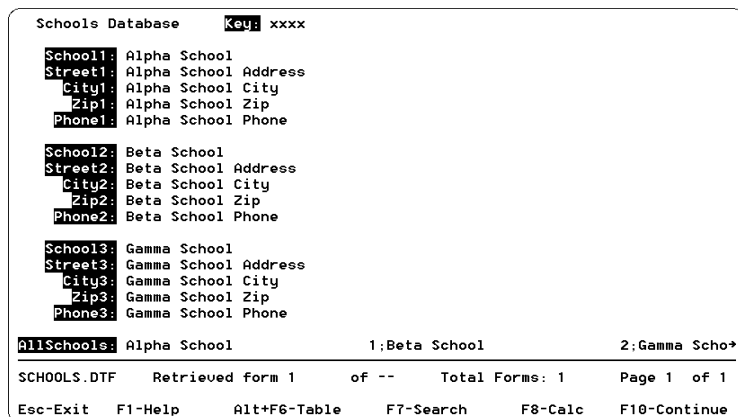


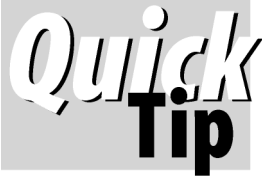
Figure 1. The SCHOOLS database record. There’s only one record in this database and it contains all the schools and their addresses for the district. (This sample database contains only three schools.)

external SCHOOLS record. It then builds the appropriate selection list from those values and displays the list. The second approach relies on an extra field and programming in the SCHOOLS database so that only one @XLookup from STUDENTS (instead of 12) is required to build the selection list.

Here’s the programming in STUDENTS for the first approach. Field #100 is the School or School Name field:

```
<#100: If #100 = "" then {
If @XLu("Schools", "xxxx",
"Key","School1") <> "" then
#100 = @XLu("Schools","xxxx", "Key",
"School1")
```

Continues on page 3



Goodbye to Crashes and Corruption

We've developed a variety of Q&A 4.0 and 5.0 applications at our busy 25-workstation title company, but over the past year or so we've been plagued by an increasing number of PC crashes and database corruption problems.

We thought it was a Q&A issue—particularly with corrupted Q&A 5.0 databases that didn't Recover as well as our Q&A 4.0 databases. Eventually, though, the following clues helped us track down the *real* culprit:

- Our satellite offices were using copies of some of the same databases but weren't experiencing similar crashes or database corruption problems.
- About 90 per cent of all the crashes were occurring on one particular workstation. In an effort to isolate the problem, we replaced virtually everything on this PC, including the network card and cable. Finally, we replaced the PC itself. But that workstation continued to crash far more frequently than any of the others.
- A noticeable increase in database problems occurred during a recent blizzard in our area that caused widespread brownouts.

Acting on these clues, we began adding Uninterruptible Power Supplies (UPS's) to our system. After putting one on each of our three network hubs (concentrators), the incidence of corruption dropped dramatically. And when we installed one on the PC where

most of the crashes were occurring, they abruptly ceased. (The UPS on this PC "beeps" regularly, indicating it's compensating for power deficits in that circuit.)

We thought the power in our office was clean and uniform because it never went down. But it was the *brownouts* that were killing us—and they were occurring more often on just *one* circuit. Today, we have a UPS on every PC, hub and server on the network and crashes and corruption are a thing of the past. And with the prices of UPS's around \$90.00, equipping our entire network with them didn't break the bank.

Mike Bell,
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Letters

Latest Acrobat Reader 4.0 Improves Viewing, Printing

I wanted to let you know that since the November 1999 issue of *The Quick Answer* Online Edition, the graphics (screen shots) have not printed well at all on my LaserJet and DeskJet printers and haven't looked very good on-screen, either. Recently, I went to Adobe's web site at www.adobe.com/products/acrobat/readstep.html and downloaded the latest Acrobat Reader 4.05 free. After uninstalling my older version (3.01), and installing the new one, I was able to print all recent issues (since November 1999) with excellent results.

You might want to inform your Download Edition

subscribers that updating their Acrobat Reader may improve the quality of the newsletter's graphics, both on-screen and when printed.

T.J. Shufflin

T.J. generously proofreads The Quick Answer for us each month as well as updates The Quick Answer Index Database—so we can't have him suffering eye strain! As he points out, be sure to uninstall any older version of Reader before installing the new version. Also, see the new version's README file for any notes that might apply to your PC or printer. —T.M.



Editor / Publisher
Tom Marcellus

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One-Record Lookup. . . cont'd from page 1

```
+ @Txt(15, " ") + "1" + ";" ;

If @XLu("Schools", "xxxx", "Key", "School2") <> "" then
#100 = #100 + @XLu("Schools", "xxxx", "Key", "School2")
+ @Txt(15, " ") + "2" + ";" ;

If @XLu("Schools", "xxxx", "Key", "School3") <> "" then
#100 = #100 + @XLu("Schools", "xxxx", "Key", "School3")
+ @Txt(15, " ") + "3" + ";" ;

REM "Similar statements for remaining schools";

If @Right (#100,1) = ";" then #100 = @Repllas(#100,
";", "");
@Color(#100,3,3);
#100 = @Right(@Userselect(#100), 1);
@Color(#100,7,1);
Street = @XLu("Schools", "xxxx", "Key", "Street" +
@Str(#100));
City = @XLu("Schools", "xxxx", "Key", "City" +
@Str(#100));
Zip = @XLu("Schools", "xxxx", "Key", "Zip" + @Str(#100));
Phone = @XLu("Schools", "xxxx", "Key", "Phone" +
@Str(#100));
#100 = @XLu("Schools", "xxxx", "Key", "School" +
@Str(#100));

Goto ... }
```

This program is in two distinct parts. The first part (up to the REM statement) retrieves the data used to construct the pick-list of school names. The second part displays the list, then retrieves the address and phone data that correspond to the selected school.

The program starts by checking to see if the School field in the current record is empty. (It won't execute unless it is.) It then performs a series of @XLookups, moving through the external SCHOOLS record and retrieving through the school name from each set of school fields (named *School1*, *School2*, *School3*, and so forth). Each @XLookup relies on a hard-coded *xxxx* to create a match on the external SCHOOLS field named *Key*. The *xxxx* could be any value. The important thing is that it can be hard-coded in the @XLookup because the external database contains only one record. Of course, the external field named *Key* must be a Speedy field and must contain *xxxx*.

Special list entry construction

To avoid blank lines in the schools selection list, every @XLookup after the first one checks to make sure the pertinent school field isn't empty. For each one that isn't, the program returns the school name, adds 15 spaces to it, adds the school number to the end of that string, then tacks on a semicolon. So, after the first three schools have been looked up in this fashion, you have a string value in the *School* field in STUDENTS that looks something like this:

```
School Name      1;School Name      2;School Name      3;
```

Tacking on the 15 spaces causes the number of the school (1, 2, 3 and so on) to be part of the selection but off the right edge of the list and thus invisible. (A Userselect/

XUserselect list displays only the first 19 characters of any selection.) This way the user sees the school names on the list but doesn't see the numbers that connect them to corresponding set of fields in the external SCHOOLS record.

The added semicolon between each school is simply the standard separator character for Userselect list entries.

Lookups galore

As you can see, there are *lots* of @XLookups going on here. On a standalone PC or relatively fast network, you probably won't notice much of a delay between the moment you arrive in the School field and the display of the list. On a heavily-burdened network, though, you'll experience a lag. Still, as we've pointed out in these pages, multiple @XLookups can be much faster over a network than a single XLookup retrieving data from multiple external fields. (See November 1998, p. 10 for a brief discussion of this.)

Constructing and displaying the list

With the list of schools now in the Schools field, the second part of the program takes over. The first thing it does is remove any trailing semicolon from the string value (which would add a blank line to the top of the School selection list). Next—and this is optional but a nice touch—the program temporarily changes the color of the target *School* field to contrast with the form's background color, so the user knows which field is to be filled from the list. This is done in a way that actually hides the field's intermediate value (the string of schools and their numbers), which would otherwise look odd sitting there in the field. In this case, the *form's* background color is the standard Q&A dark blue. Temporarily changing the School field's background and text colors to 3 and 3, respectively—@Color(#100, 3, 3)—displays turquoise text in a turquoise field. The result is that the field itself is highlighted in a nicely contrasting color but any text in it remains invisible.

Retrieving the data

Now the pick-list displays. (See Figure 2.) When you select a school, the program initially returns just the

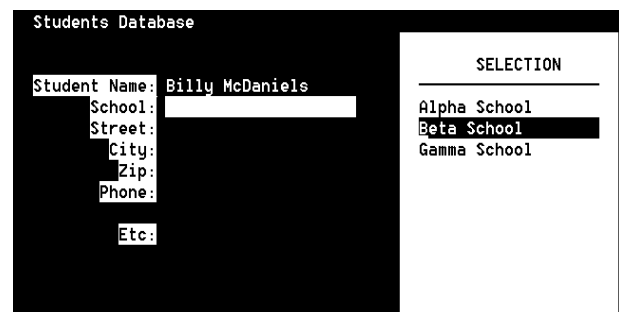


Figure 2. When the cursor enters the School field, its colors are changed by the programming and the pick-list is displayed. This makes it visually easy to connect the selection list with the field it's tied to and hides the temporary value stored in the field.

school number (1, 2, 3, etc.) to the School field. This number is then tacked onto the Street, City, Zip, Phone, and School field references in the subsequent @XLookups so that Q&A knows to retrieve, in the case of School2, the data from the Street2, City2, Zip2, Phone2 and School2 fields in the SCHOOLS record. The school name is looked up last because it will replace the "2" in the School field and thus prevent any further XLookups to the School2-related fields.

At this point, the School fields in the STUDENTS record have all been filled and the School field has been reset to its original color—the same color as the rest of the fields on the form. (See Figure 3.)

Option 2—Prebuild the pick-list

As I mentioned earlier, there's another way to get the same result with far fewer @XLookups. (Online Subscribers, see STUDENTS2.DTF)

In SCHOOLS, you add an extra field and program it as an on-record-exit field to create and store a string value consisting of the list of schools and their numbers. (See the AllSchools field at the bottom of Figure 1.) Such a string would look like this:

```
Alpha School 1;Beta School 2;Gamma School 3; etc.
```

You then retrieve this *one* multi-value string into the School field in STUDENTS instead of having to cycle through *all* the SCHOOLS fields with @XLookups. The on-record-exit program in SCHOOLS would look like this:

```
#200: If School1 <> "" Then
      AllSchools = School1 + @Txt(15, " ") + "1" + ";";

If School2 <> "" Then
AllSchools = AllSchools + School2 + @Txt(15, " ") + "2" +
";";

If School3 <> "" Then
AllSchools = AllSchools + School3 + @Txt(15, " ") + "3" +
";" ;

REM "Similar statements for remaining schools";

If @Right(AllSchools, 1) = ";" Then
AllSchools = @Repllas(AllSchools, ";", "")
```

To assign a field as the on-record-exit field, press

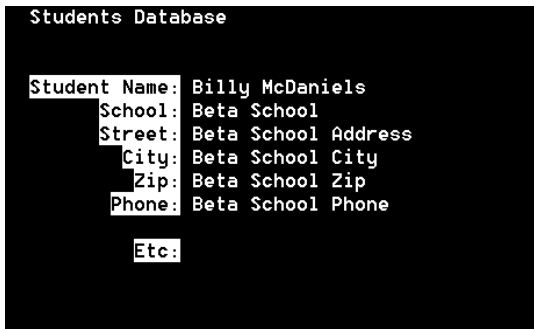


Figure 3. Once the school has been selected, the rest of the fields are filled by @XLookups and the School field's color reverts to the database's regular field color scheme.

Shift-F8 at the Program Spec, type the field ID number (in this case, 200) on the *On Exit* line, then press F10.

Now you can simplify the earlier STUDENTS program along these lines:

```
<#100: if #100 = "" then {

#100 = @XLu("Schools","xxxx", "Key", "AllSchools");
@Color(#100,3,3);
#100 = @Right(@Userselect(#100), 1);
@Color(#100,7,1);
Street = @XLu("Schools", "xxxx", "Key", "Street" +
@Str(#100));
City = @XLu("Schools", "xxxx", "Key", "City" +
@Str(#100));
```

Concludes on page 12

How to Ensure a One-Record Database Stays That Way

If you use a one-record lookup database in an application, you have to guard against someone inadvertently adding *other* records. Why?—because when Q&A executes an XLookup to that database, it will latch onto the first matching record it finds and it might *not* be the right one.

One way to prevent a new record from being added to a database is to add the original record, then place a program like the following in the first field:

```
< If @Add then {
@Msgbox("", "You can't add records to this
database.", "");
@Exit }
```

In the case of the shipping address database that *would* contain multiple records (though just one record per customer) you could limit the addition of any new records to, say, the database administrator. Such a program might look like this:

```
< If @Add and @UserID <> "Sandra" then {
@Msgbox(" ", "Only Sandra can add records to this
database.", ""); @Exit }
```

This way, others could update *existing* records (changing or adding shipping addresses for existing customers), but only Sandra could add a *new* record.

Another way to prevent adding records to a database is to make every field in it read-only (File / Design / Program / Read Only fields). This doesn't prevent XLookups, just data entry. In Search/Update mode, you'll be able to view but not change the records. To add a new record or edit an existing one, you'd have to temporarily remove the read-only status.

Making all fields read-only is a great way to make a read-only database whose records can be searched and viewed (but not changed) by anyone without their having to enter a user ID and password.

An Algorithm for Parsing Multi-Value Strings

Handy reusable programming routines like this can be made practically "plug-n-play"

Application in
ONLINE Edition

An *algorithm* is a specific set of well-defined mathematical or logical procedures that can be followed to solve a problem in a finite number of steps the same way every time. Knowing that a certain kind of data manipulation problem can be solved by an algorithm can make programming go much faster. Here's a case in point.

Two useful programming techniques (in any programming language) are *concatenating* (combining) separate values into a single data string, and *parsing* (taking apart) such strings. For example, you might need to combine the contents of several fields into a single multi-value string that can be passed in one operation or command to another record, database, or external program via an XLookup, Post, Q&A 5.0's clipboard, or a saved disk file. At the destination, you'll then want the multi-value string *parsed* or broken back down into its original component values for distribution.

There are various methods for creating multi-value strings. The one I'll show uses a *separator* character to isolate each value in the string. Characters such as the pipe ("|") or caret ("^") are commonly used as separators because they aren't likely to occur anywhere in the values themselves. The caret can be particularly useful because it creates a small amount of space between the values, making the string easier to decipher at a glance.

Suppose you need to pass (to some other location) a string comprised of a person's name, street, city, state, and zip, like this, with a caret between each value:

```
Bill Jones^1844 Elm St^Claremont^MI^48563
```

A Q&A program to create such a string (assuming these were all valid field names) would look like this:

```
String = Name + "^" + Street + "^" + City + "^" + State + "^" + @Str(Zip)
```

Okay, but what do *algorithms* have to do with this? Consider the following program in a field named *String to Parse*:

```
> Field1 = @Left(String to Parse,
@Instr(String to Parse, "^") -1);
```

```
String to Parse = @Mid(String to Parse,
@Instr(String to Parse, "^") +1, 32000);
```

```
Field2 = @Left(String to Parse,
@Instr(String to Parse, "^") -1);
```

```
String to Parse = @Mid(String to Parse,
@Instr(String to Parse, "^") +1, 32000);
```

```
Field3 = @Left(String to Parse,
@Instr(String to Parse, "^") -1);
```

```
String to Parse = @Mid(String to Parse,
@Instr(String to Parse, "^") +1, 32000);
```

```
Field4 = @Left(String to Parse,
@Instr(String to Parse, "^") -1);
```

```
String to Parse = @Mid(String to Parse,
@Instr(String to Parse, "^") +1, 32000);
```

```
Field5 = String to Parse
```

This string parsing routine works by (1) placing the first value (up to the first caret) in the first field, (2) effectively deleting the string through the first caret, then (3) repeating these two steps until the string has been fully parsed and its values properly distributed.

What makes a routine like this a kind of algorithm is that every *String to Parse = @Mid...* statement is identical and that the number of these statements required will always equal *the number of individual values in the string, minus 1* (which also equals the number of separators in the string). Also, notice that every other statement is identical except for the field name, and that the final statement (*Field5 = String to Parse*) will always be the same.

Here's the kicker:

Even if the string value were comprised of 10, 20, or more separate values, and regardless of the length of any of the individual values within the larger string, the programming to parse the string would always follow the same pattern, making this algorithm potentially useful in a variety of string parsing situations.

The database included in this month's download file for Online Edition subscribers is named PARSE.DTF and can be used in Q&A for DOS 4.0 or 5.0 or Q&A for Windows.



EDITED BY GORDON MEIGS
AND WILLIAM HALPERN



Isolating and Marking Duplicate Records

I have two problems. I use both Q&A 4.0 for DOS and Q&A 4.0 for Windows. We record multiple sales of the same property for tax office purposes. This gives me multiple records on each property where the key fields are the tax parcel number and date of sale. For certain reports, I need a database that includes just the first or last record for each property, or I need a list of properties that have only been recorded once and have never been resold. I thought I could use Q&A's *Remove Duplicate Records* feature to accomplish this. The first problem is that Q&A for Windows doesn't seem to have this feature. The second problem is that even though I can remove duplicate records using Q&A for DOS, I would like to be able to mark them first so that I can choose which ones to remove. Is there any way to accomplish this?

Dennis

Q&A for Windows lacks this very useful feature and even though Q&A for DOS *can* remove duplicate records, it gives you no way to specify which of the dupes to actually remove. However, as long as you have a single field on which you can search for duplicate records, there's a solution in either version. You'll have to perform a multi-step process, but the result will give you what you need.

First, add two new fields to your database—one named *RecNum* (for *record number*) and one named *Dupe* (for *duplicate*). Make *RecNum* Speedy. For the purpose of illustration, let's say your tax parcel number field is named *TPI#*.

Next, perform a Mass Update to assign the record number. Do it this way:

Sort the records in ascending tax parcel number order (1,AS) and descending Date of Sale order (2,DS). This will give the most recent sale the lowest number for each property.

At the Update Spec, type #1 = @Number in the *RecNum* field.

When this Mass Update has finished, run a second Mass Update this way:

Sort the records in ascending *RecNum* order (1AS).

At the Update Spec, type the following program in the *TPI#* field:

```
#10: If @XLu(@Filename, Recnum-1, "Recnum",
" TPI#") = TPI# then Dupe = "X"
```

During this second Mass Update, Q&A compares the previous record's number to the Tax Parcel numbers. If they're the same, Q&A marks the record as a dupe. This will work even if there are multiple sales for a given property. Now that you have the records marked, you can easily find the dupes and exclude them, use them as data points in reports, delete them if you wish, find the latest sales for each property (records *not* marked as dupes), and so forth.

Note: If you ever have to determine the duplicity of records based on multiple fields, as long as you can concatenate them into a new Speedy field of 16 or fewer digits, you can use a process similar to the one we've just covered.

Generate Text Files On-the-Fly for Word Merge

I'm trying to use the following program in the *Print* field of my database to generate a DOS text file for use as a mail merge data file in Microsoft Word 97. I've followed *The Quick Answer* on how to do this and there is no difference in the way I'm using @Shell with the Echo command. Here's my program:

```
> Print =
"LastName" + ";" + "FirstName" + ";" + "DOB" + ";"
+ "Address" + ";" + "Country" + ";" + "Postcode" + ";"
+ "Nationality" + ";" + "PassportNo" + ";" + "Start Date"
+ ";"
+ "Function" + ";" + "BasicSalary" + "]" + "
" + LastName + ";" + FirstName + ";" + @Str(DOB) + ";"
+ Address + ";" + Country + ";" + Postcode + ";" +
Nationality + ";"
+ PassportNo + ";" + @Str(Start Date) + ";" + Function +
";"
+ @Str(BasicSalary) + "]" ;
```

```
Print =@Shell(
"Echo " + Print + " > C:\QA5\PAKTEMP\TESTMRG.TXT ")
```



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. 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.

The program overwrites Testmrg.txt each time, but for some reason the data is not being passed to the file. Is there some limitation I'm running into?

Vernon Tan

Tom Marcellus answers. . .

Actually, there is quite a difference in the way you're trying to use @Shell and Echo in your program and Yes, there *is* a limitation you're running into. First of all, you're trying to pass far too much data to the text file; the limit is about 120 characters per @Shell/Echo command. Look at the examples in *The Quick Answer*—“Post On-the-Fly to a Text File” (November 1997), “Exporting Data to Windows Programs” (December 1997) and Passing Field Values to a DOS Text File (March 2000)—and you'll see that only a name and address or just a few fields of data are being passed to the text file this way. Your program shows that you are trying to generate a text file that contains a header line (the field names) *as well as* the data from those selected fields (using the “|” character as the record delimiter). Although you can get MS Word to use a file like this for a mail merge, it's far too much data for a single @Shell/Echo command to generate. Your header line alone (shown below) is 110 characters:

```
LastName;FirstName;DOB;Address;Country;Postcode;  
Nationality;PassportNo;StartDate;Function;BasicSalary
```

What's more, I'm suspicious of your *Address* field. If this is a *multi-line* field containing a street address, city, and state or province with *carriage returns*, then this might cause the program to bomb all by itself.

Following are some options that could help you get the result you're after. The first two are subject to the 120 characters-per-@Shell/Echo-command limitation; the third one isn't:

- Create and use a separate fixed header file and use @Shell/Echo to pass just the variable data (not the field names) to the text file. When setting up your merge, tell Word which file contains the field names (the *header* file) and which contains the data. You only have to do this once. Thereafter, Word will remember which two files to use.
- Use @Shell with the *append-to-file* command. Two right angle brackets (“>>”) instead of one tell DOS to *append* any passed text to the file rather than overwrite it. An initial @Shell command could use *Echo >* to overwrite the file with the header (field names), while a second one could use *Echo >>* to append the data (from the fields) as the file's second line. This would allow you to specify the one file as both the header file *and* data file in Word.
- Another technique that will get you the same result (but with a far greater capacity) uses Q&A 5.0's External

Programs feature instead of @Shell. (See “Merge-Print Invoices and Other Complex Forms In Your Windows Word Processor” in the August 1998 issue.) This technique *also* generates a text file on-the-fly (with both data and header), but with the difference that there's no limit to the amount of data you can pass to the file.

The Interminable ‘Large Hard Drive’ Issue

I've used Q&A 5.0 for about four years now. About two months ago, I ported all my applications over to Q&A 4.06 for Windows and everything seems to be running fine. My computer is a 266Mhz Pentium I, with a 6.4G (FAT 32) hard drive with no smaller partitions. Should I be concerned about data corruption?

Lynn Wakefield

Here we go again! People keep reporting that they're running Q&A successfully on a hard drive that's larger than 2G. It's true—it *can* be done. I even ran a test on my own system and was able to run every version of Q&A successfully in a large partition—that is, for a while. However, after I got enough files or fragmentation on my hard drive to exceed 2G—*Boom!*—corruption began appearing in the databases. Normally, this corruption appears as system errors in the 05-06 range, or as missing records or searches that yield strange results. The database index file seems to take the hit. The fix can be as simple as removing then replacing the Speedy fields or as serious as having to re-create the database from scratch. There is currently no way to safely circumvent the 2G limit with *any* version of Q&A. With Q&A for DOS you can use Lesspace.com to avoid having to partition the drive. But with Q&A for Windows, you have no choice but to create a smaller hard drive partition and install Q&A into it. Remember, when you resolve this problem by creating a smaller hard drive partition, you must make sure that not only your database files but also your temporary files use this partition.

The Interminable ‘Expanded Memory’ Issue

Recently, I was redesigning a Q&A 5.0 database that originally had 564 fields. When I got to 633 fields, Q&A began giving me “Not enough memory” messages. I'm running Q&A in Windows 95 and my Config.sys file contains the following lines. Any ideas?

```
Device=c:\windows\himem.sys /TESTMEM:OFF  
Device=c:\windows\emm386.exe NOEMS x=D000-D7FF
```

Doug Gardner

As we've said time and again, Q&A—particularly Q&A 5.0—needs *Expanded* memory. Your problem is due to the

Concludes on page 11

Data Retrieval Basics

ALEC MULVEY

Getting the data IN the database is one thing. Getting it OUT is another matter altogether.



So you've designed your database and entered the data. What now? Well, you're going to want to get at that data—to print it out, view it, change it, analyze it. A characteristic of Q&A is that whenever you perform almost any database-related task, you're presented with the Retrieve Spec, a screen that looks like your data entry form but serves the opposite function—as a means to get data *out of* rather than put data *into* the database. As you already know, searching in Q&A is pretty easy, which is why we all like it. This month, I'll quickly go through the basics of using the Retrieve Spec, then finish off by showing you a few more advanced tricks.

The Retrieve Spec

Q&A works on the "Query by Example" system. That is, the Retrieve Spec is a blank form. You type an *example* of what you want and run the *query* by pressing F10. So, to find customers in *Chicago*, you select File / Search / Update, type "chicago" (without the quotes) in the city field and press F10. Q&A finds the first such record it comes to and awaits further instructions. Pressing F10 finds and displays the next "Chicago" record. Pressing F9 returns you to the previous record.

..AND.. Searches

To find just persons named *Capone* in Chicago you would type, additionally, "capone" (without quotes) in the last name field and press F10. Q&A would then show you the (smaller) subset of records that meet *both* criteria.

An important point to remember is this: *More Criteria = Fewer records.*

This means that the more fields you fill in at the Retrieve Spec, the more you are restricting or narrowing the search, and the fewer records Q&A will retrieve.

Notes on using the Retrieve Spec

- Each search is a *new* search of the entire database. Q&A does not search an "answer set." (In other words, Q&A doesn't search just the results of the last search).
- Q&A is not case-sensitive. That is, it makes no difference whether you use UPPER or lower case in the Retrieve Spec, or a combination of the two. (It is possible to perform a case-sensitive search, but that's outside the scope of this article.)

- Searching on an indexed field will be faster, often dramatically faster, than on a field that is not indexed. In Q&A, an indexed field is called a *Speedy* field.
- Q&A retrieves records in the order it finds them in the database. This usually results in a random order. Q&A might display retrieved records in the order in which they were added to the database, but this will hold true only for very small databases.
- If you want retrieved records to display in a particular order, you must specify a *Sort Spec* in addition to a Retrieve Spec. I'll cover this later.
- At the bottom of the screen Q&A shows "*Retrieved form (x) of (y). Total forms (z).*" where *x* is the first, second, etc. form (record) Q&A finds, *y* is the total number retrieved by the search, and *z* is the total number of records in the database.
- The *.. of — Forms* number is only known to Q&A when it has searched the whole database—that is, after you have pressed F10 for the last time and Q&A reports "*No more records...*" Exceptions to this are if you sort the records (in which case Q&A has to find all matching records first) and if the searched fields is indexed (*Speedy*).
- You can switch to Table View by pressing Alt-F6. This displays the records in a spreadsheet-like format and makes Q&A retrieve 17 records at a time as you press the Page Down key.
- You can press Ctrl-End to display the last matching record in the database. Pressing Ctrl-Home returns you to the first record in the "stack" of retrieved records.
- Any changes you make to the data are saved each time you press F10 or F9.
- You can press F1 at any Retrieve Spec for help on retrieving records.

Staying in Search mode

Once you've found a certain set of records, you don't need to return to the File menu to perform a new search. You can press F7 at any time and Q&A will return you to the Retrieve Spec with all your previous criteria retained. This can be a terrific time-saver. Suppose, for example, that you have entries in the Retrieve Spec in three or four fields and you want to repeatedly change just one of them. You can do one search, edit the records, then "F7" back to the Retrieve Spec, change the Spec as necessary, then repeat the search.

Use of the F7 key in this way can catch you out, though. It's easy to overlook something like a "Y" in an inconspicuous field in the middle of page 4 and wonder why you can't find the records you want! Fortunately, there's a "middle way." If you press F7 to return to the Retrieve Spec and press F3 to clear it, you're then off on a new search. Remember that any sort you've specified is *not* cleared when you press F3 to clear the Retrieve Spec.

Entering Search Criteria

The table below shows some examples of Q&A's retrieval syntax: Note the two special symbols: "/" for NOT, and "=" for empty, blank.

Field Type	Enter This...	To Retrieve...
Text, Keyword	smith	Smith
Date (US convention. See Note)	Sep 14 99 or 9/14/99 or september 14 1999 or 9.14.99 or 9-14-99 or 14sep99 or 9 14 99	September 14, 1999
Number	1236	1,236
Money	856.92	\$856.92
All	/ London	NOT London
All	/ 1236	NOT 1236
All	=	Field is empty
All	/ =	Field NOT empty

Notes on Date searches

- The examples above assume the US convention of mm/dd/yyyy. If a European date format such as dd/mm/yyyy is used, then adjust the search criteria to match.
- The Year can be omitted on date retrievals if it is the current year. For example, "Sep 14" will, as I write this, be taken by Q&A to mean September 14, 2000.
- If the century is omitted in the Retrieve Spec, Q&A always adds 1900. Y2K programming which works when viewing a record does not work in the Retrieve Spec. Consequently you *must* type the year in the full yyyy format unless it's the current year. Remember: *Specify the year in full if the date is not in the current year, or not at all if the date is in the current year.*

Wildcard Retrieval

A wildcard character is one that represents a group of unspecified characters. There are two Wildcards in Q&A:

- ? Represents any single character
- .. Represents any character(s), or none

The table at the top of the next column shows some uses of the wildcard characters at the Retrieve Spec to perform searches.

Field Type	Enter This...	To Retrieve...
Text, Keyword	sm?th	Smith; Smyth
Text, Keyword	smi..	Smith; Smithers; Smiley, etc.
Text, Keyword	..son	Wilson; Carson; Peterson, etc.
Text, Keyword	b..er	Butcher; Bonner; Bellringer, etc.
Text, Keyword	.. city (NB space)	Atlantic City; New York City But NOT tenacity; City Road
Text, Keyword	..London..	London; City of London; London Road
Text	01?1-..	Phone numbers beginning, e.g. 0171- or 0181- (London)
All	Max5 or Max 5	The five greatest values. If text field, the five nearest end of alphabet
All	Min10	The 10 lowest values. If a text field, the 10 nearest start of alphabet

Notes on use of "Max"

- Use of *Max* and *Min* give you a sorted stack of records.
- Max* when used without a number is treated as *MAX 1*
- Min 5* will retrieve the five lowest *entries*. Blanks will be disregarded

Searching Keyword Fields

Keyword fields are special. Each entry, when correctly separated by semicolons, behaves as if it were the only entry. So, the double-period wildcard character (..) isn't required as long as you are specifying the *complete* value.

Typing "tennis" in the Hobbies field, finds this record:

Hobbies: **golf; tennis; sailboarding**

You can still use wildcards, however, if required. Typing sk.. in the Hobbies field finds these records:

Hobbies: **skating; tennis; chess**

Hobbies: **aerobics; golf; skiing**

Number Ranges

As well as the standard arithmetic operators such as > (greater than), Q&A allows the use of the double-period (..) to indicate to and from. Some examples are shown in the table at the top of the next page.

Note that contrary to common usage, it is *not* necessary to use the mathematical operators ">" and "<" when using ".." syntax in numerical range retrievals. For example, using 250..300 as a retrieval criterion is the same as using:

>=250..<=300 or >249..<301

More Complex Searches

"OR" in one Field

You can perform "either/or" searches in a field by separating the criteria by a semicolon (";") The second table on the next page shows a few examples.

In this case, *more criteria = more records*. That is, the

Field Type	Enter This...	To Retrieve...
All	<2000	Less than 2,000
All	>jul 14 99	Dates from 15 July 1999
All	>=jan 1 2000	Dates from Jan 1 2000
All	>16:45	After 4:45 pm
All	>Davies..<Edwards	All words between these two in a telephone directory
N, M, D, H **	178..	Greater than or equal to 178
- " -	..2000	Less than or equal to 2000
- " -	250..300	All values in 250 to 300 range
- " -	Jan 1 2000..	From 1 January 2000 onwards
- " -	Mar 18..jul 4 or 3/18 .. 7/4	Dates from March 18 through July 4 in current year
** N = Number; M = Money; D = Date; H = Time (Hours) Field		

longer the list of search patterns in one field, the *less restrictive* the search, and the *more* records you'll get.

Field Type	Enter This...	To Retrieve...
All	London; Manchester	London OR Manchester
All	June 23 99; June 23 2000	either of these dates, but none in between
All	sm.. ; da..	Names beginning with SM or DA

"OR" across Fields

If you want to search for, say, all the records where the Town is Reading *OR* the County is Berkshire, this cannot be accommodated using the techniques shown above. You must use a special retrieval "switch" that temporarily changes Q&A's search logic to an Either/Or Search:

1. Display the Retrieve Spec and enter your restrictions.
2. Press *Ctrl-F7* to display the Search Options Dialog box.

```
Select those records which >DO< DO NOT
meet >ALL< ANY of the restrictions.
```

3. Change the setting from *ALL* to *ANY*.
4. Press F10 to continue.

Q&A 5.0 has a minor bug in the Search Options dialog box. When you change the search logic, the *DO NOT* is highlighted as well as the *DO*. However, the one you select is indicated and it functions as it should.

Saving Retrieve Specs

You might put together quite a complex Retrieve Spec with criteria in several fields. This would typically be done by starting with a basic search, seeing what it

produces, pressing F7 to return to the Retrieve Spec and adding to it and repeating this until you finally get the exact set of records you require. At this stage, the smart thing to do is to press F7 to return to the Retrieve Spec and save it by pressing Shift-F8.

Notes

- A saved Retrieve Spec can be assigned a name of up to 31 characters. It can include spaces, punctuation marks and mixed capitalization.
- At the Retrieve Spec, pressing Alt-F8 displays a list of saved retrieves.
- At the list of saved retrieves, all the familiar "list management" facilities are available, such as F8-*rename*. The bottom of the screen shows the options.
- The early printing of the Q&A 4.0 manual incorrectly states that the search logic parameter (Ctrl-F7) is *not* stored with a saved retrieve. It is.

Retrieving records in sorted order

Q&A does not store database records in sorted order. In fact, it's futile to try to get Q&A to do so. (Q&A has its own internal rules for storing records in the database.) You sort on retrieval instead. As I mentioned earlier, unless you sort the retrieved records, expect them to appear in random order. Whenever you see the Retrieve Spec (apart from in reports where sorting is handled in the Column/Sort Spec) you are one keystroke (F8) away from the Sort Spec. At the Sort Spec, you enter *1AS* into the field you want to sort by in ascending order (A to Z or 0 to 9), *2AS* for the secondary sort field, and so on.

Notes

- Use *DS* for a *descending* sort (Z to A or 9 to 0).
- Sorting on a second field is only relevant where you would have duplicate values in the first field. For example, you could sort first by state (*1AS*), then by town (*2AS*) and then perhaps by Last Name (*3AS*).
- You can save and recall Sort Specs in the same way as Retrieve Specs. This isn't normally very useful except when automating procedures with macros.
- You can press F1 at the Sort Spec for help on sorting.

Conclusion

Searching in Q&A is easy. The techniques I've described represent only a small portion of a wealth of querying tools. For example, more sophisticated searches are available by using programming logic in the Retrieve Spec. Any retrieve that is worth saving can be saved in seconds. That's why we like Q&A so much!

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@Help... cont'd from page 7

fact that you're not providing any Expanded memory for Q&A to work with. This is confirmed by the "NOEMS" statement in the second line of your Config.sys file. Your Config.sys file should look like this:

```
Device=c:\windows\himem.sys /TESTMEM:OFF
Device=c:\windows\emm386.exe RAM x=D000-D7FF
DOS=High,UMB
```

After you've added these lines and rebooted your PC, check your Q&A desktop shortcut's Properties / Memory tab settings to make sure they're correct. They should be set as follows:

```
Conventional: Total = Auto
Initial Environment = 1024
Expanded Memory: Total = 1024
Extended Memory: Total = 1024
MS-DOS Protected Mode Memory: Total = Auto
```

Do these things and your memory-related problems should vanish. You can check available memory for Q&A by pressing Ctrl-F3 at Q&A's Main Menu.

Preview Mode in Q&A Win Merge Printing

My question refers to merge-printing in Q&A for Windows. In Write, after I select File / Print Merge / Preview and specify my retrieval and sort parameters, Q&A starts printing my merge letters to the screen like in Print Preview. My choices are *Next page* or *Print*, which sends only the page on the screen to the printer. There is no selection to print the entire job to the printer. This defeats the purpose of merge-printing. I have 387 letters to print. What do I do?

Wayne

The reason this is happening is that you are *initially* selecting *Preview* rather than *Print* or *OK*. You've told Q&A to send the results to the screen for your review before printing. Drop the *Preview* and Q&A will print your merge-documents directly to the printer.

QABACKUP Can Restore Old Files

Five years ago I created a database in Q&A 4.0 for DOS. Before changing computers and moving to Q&A for Windows, I saved this infrequently-used database onto stiffies using Q&A for DOS' QABAKUP utility. I've had no need to update this database until recently, but now I can't find anything in Q&A for Windows that will restore it for me. Any help or advice would be much appreciated as this info is urgently required.

Alison Coughlan, South Africa

For those of you who don't know (which included us until we asked our British associate Alec Mulvey), a *stiffy* is not one of Alison's coworkers, but refers to a 3.5-inch floppy.

As we've said many times, QABACKUP is *not* Y2K compliant. (See, for example, the December 1999 issue.) However, this applies only when you are using it with files that have been created or modified after December 31, 1999. If you have some old files that were backed up with QABACKUP before the New Year, you can still use it to restore those files to your current system. Then, however you must retire QABACKUPEXE for good. Also, remember that QABACKUP does not come with Q&A for Windows, so you will have to find your old Q&A for DOS 4.0 copy of the program. Copy it to your hard drive and go to a DOS prompt, in a window, and run the program to restore your files. When you've restored your old files, Q&A for Windows will automatically update them. If you can't find QABACKUP, call us and we'll email you a copy.

Preventing 'Generations' Problem

I use Q&A 5.0. I've read your articles about the "generations" problem with Q&A databases and even encountered it once when I had to use QEXTRACT to extract the data from a severely damaged database. I wound up with several ASCII files with different structures and had a very difficult time trying to import these back into a fresh database design. I don't ever want to go through *that* again. So, my concern is that all the data in my database stays the same generation even after I've added, deleted or moved fields in Redesign. Is there an easy way to do this?

Tim Bothwell

Yes—you can run what's called a "null Mass Update" to bring all the records in a database up to the current generation. Whenever you redesign a database by adding, deleting, or just moving fields around, the changes effect any *new* records added from that point on—they become a new generation. Existing records remember their old field structure, even though Q&A is kind enough to display them in the new structure. This usually doesn't present a problem unless you have a serious crash and need to extract the data using Symantec's QEXTRACT (available on the Freebies page at www.quickanswer.com). In this case, the utility will extract the old records in the old field structure (one output file) and newer records in the later structure (one or more *additional* output files with the fields often in a *different* order). This makes it difficult, if not impossible, to import the data back into a healthy database. The additional small step of Mass Updating the database after adding, deleting or moving fields takes care of the generation problem. Simply run a Mass Update leaving the *Retrieve Spec* and *Update Spec* blank, and Q&A will bring all the records up to the latest generation. For articles and tips on the generations issue, check the Topic Index or TJ's Index Database at www.quickanswer.com.

Bill Halpern and Gordon Meigs own Professional Computer Technology Associates in Newtown, Pennsylvania, 215-598-8440, www.pcta-usa.com, email pcta@comcat.com.

One-Record Lookup... cont'd from page 4

```
Zip = @XLu("Schools", "xxxx", "Key", "Zip" + @Str(#100));
Phone = @XLu("Schools", "xxxx", "Key", "Phone" +
@Str(#100));
#100 = @XLu("Schools", "xxxx", "Key", "School" +
@Str(#100));
Goto ... }
```

Other uses

Elements of the techniques I've covered in this article could be adapted for use in other applications, such as where some customers might have a central office or billing address but different shipping addresses. In this case, your CUSTOMER database would contain one record for each customer as expected, and you'd have a separate database containing shipping addresses—one record per customer, but with enough fields to handle up to, say, a dozen different shipping addresses, if that's the most you might have for any customer.

When creating a sales order, the customer's billing address would be retrieved from the main CUSTOMER database, but the shipping address would be selected from a pick-list of shipping addresses for that customer using a technique very much like the ones covered in this article.

In this case, the address database wouldn't be a *one-record* address database like the earlier example. Instead, it would contain one record for *each customer*, with each record able to store multiple shipping addresses. Accordingly, the link (key) field in this database would be the customer ID rather than the *xxxx* as in the earlier examples. In other words, instead of hard-coding the *xxxx* external key field value into your @XLookups, you'd reference the field containing the customer ID that would connect the correct address record to the customer for whom you're creating the sales order. Once you've made that connection, you'd simply cycle through the addresses in that matching external record to pull in the data to construct your shipping address selection list, using a technique like the ones I've covered.

The most obvious limitation of an approach like this is that as soon as one customer has one more shipping address than allowed by the number of fields in the address database, you have to redesign the database to add another set of address fields. But this won't be an issue if no customer would ever have more than a few shipping addresses.

Tom Marcellus is editor of *The Quick Answer*.

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