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# Normalize Your Data for Easier Reporting

TOM MARCELLUS

Having trouble getting the reports you need from a database with line-item-like fields? Here's a three-step process that puts an end to the frustration.

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**D**URING September's Q&A Masters Seminar in Washington, D.C., an attendee brought up a problem he was having with reports. His database, similar to the one shown in **Figure 1**, tracked donors and their donations. The form was good for data entry and record viewing because all the donation dates and amounts were right there in each donor's record. The difficulty was in generating donation analysis reports, such as donations by date range or amount range, or by the particular projects to which people donated. He just couldn't come up with a report design that would break down the information these ways.

The problem, in a nutshell, was that the data in this database wasn't *normalized*.

According to *The Computer Desktop Encyclopedia*, "Normalization in relational database management [is] a process that breaks down data into record groups for efficient processing."

But what does this mean?

Well, if you were using a *relational* database manager to track donors and donations, you'd have *two* databases—one with a record for each donor (name, address, phone number and so forth) and another with a record of each donation. You'd link the *donation* records to the *donor* records using the Donor ID, so that when viewing any donor's record, his or her donations would appear in the view even though they were in another database. (See the sidebar, "Go Normal from the Get-Go" on page 5.)

Q&A isn't relational, though, so people assume they should store everything about a subject in one database. This usually works well until the need to *analyze* (compartmentalize) the data arises.

You have the same problem with invoices and other kinds of *line-item* databases. Ideally, the invoice header information (Customer ID, invoice

number, date, terms, total invoice amount, etc.) should be in one file, and the *line-items* (each product, description, price, quantity, and

extended amount) along with the invoice number as the linking field, should be in a separate file. This way, if you need a report to show *sales by product* over a time period, it's easy to get because the data in the second file is, for all practical purposes, *normalized*.

If you try to design a simple *Sales by product* report in an invoice database that stores *all* the data, you'll immediately come face-to-face with a problem. If the database contains, say, 10 lines (for 10 different items ordered), the sale of any item—*Product X*, for example—could be

Date	Amt	Project
Date1: 03/05/1998	Amt1: \$100.00	Project1: Legal
Date2: 04/15/1998	Amt2: \$50.00	Project2: Books
Date3: 06/22/1998	Amt3: \$25.00	Project3: Publicity
Date4: 07/19/1998	Amt4: \$100.00	Project4: Legal
Date5: 08/30/1998	Amt5: \$30.00	Project5: Books
Date6: -	Amt6: -	Project6: -
Date7: -	Amt7: -	Project7: -
Date8: -	Amt8: -	Project8: -
Date9: -	Amt9: -	Project9: -
Date10: -	Amt10: -	Project10: -

Total: \$305.00

**Figure 1.** A database that tracks donors and multiple donations. This design with a series of line-item fields (like a table) isn't normalized, making it difficult to analyze the donation data across all the records in the database.

# The Quick Answer

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on line 6 of one invoice, line 1 of the next invoice, and line 10 of yet another invoice. Just try to create a report that gives you the total sales of *Product X*.

You're screwed.

### Normalization techniques

Experienced Q&A users know almost instinctively that to get columnar or crosstab reports of items from a multi-line-item database, they first have to normalize the data. This means getting the line-items into a separate database where they can then create and run their reports.

One of the most common ways of doing this is to use Q&A's *Copy Selected Records* feature to copy each line-item from each record in the original database to the second database. Even with a macro, this is a tangled approach because you first have to copy line-item #1 from all the records to the second database, then go back and copy line-item #2 from all the records, repeating the process for each additional line-item in the database.

Using an *export* technique doesn't simplify things. You have to export the line-item #1 data from all the records, turn around and export the line-item #2 data from all the records, and repeat the process for each additional line-item. You then have to import the resulting export files into the second database.

Other techniques designed to produce similar results exist, but they're all relatively complicated. I believe I have a far simpler way to do it.

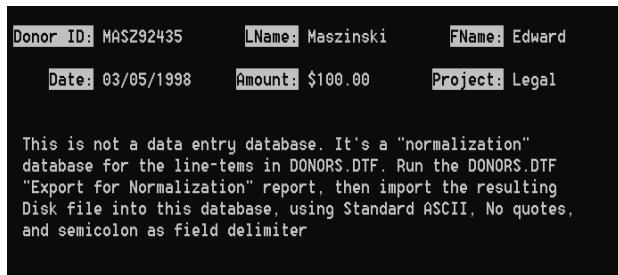
### Back to donors and donations

Take the Donors database shown in Figure 1. Each line in the line-items area shows donation date (Date1 through Date10), amount (Amt1 through Amt10), and the project donated to (Project1 through Project10). The database also includes a Donor ID field and first and last name fields.

During data entry, the operator simply moves down to the next available line and enters the data on the newly received donation.

### Step 1—Create the normalized database

To normalize the data, you'll need a separate database along the lines of the one shown in Figure 2. This one



**Figure 2.** A database for normalizing donation data in Donors.dtf. This database contains one record per donation, so you can run any kind of columnar or crosstab report to get the answers you need.

(I'll call it *Donos.dtf*) includes fields for the Donor ID, Last Name, First Name, Date, Amount, and Project. The fields should be in the same order as their counterparts in the Donors database. This way, the normalization process I'll show you won't require a Merge Spec. Be sure to assign the same field formats (Text, Money, Date, etc.) to these fields as in the Donors database.

### Step 2—Design a special Donors report

It might seem ironic, but you'll use a *report* to normalize the data you ultimately want to analyze in reports.

To extract the individual donation information from Donors, you'll need a derived column report you can name *Export for Normalization*. Figure 3 on the next page shows the Column/Sort Spec, and Table 1 shows the column Headings, Formulas, and Column Specs for the derived columns. Notice that all the fields and columns, except for the final derived column, are invisible and numbered in a way that makes them readily identifiable.

This Q&A 4.0 report contains 13 derived columns. Columns 3 through 12 are essentially the same—that is, there's one derived column for each line in the line-items area of the Donors database. I'll come back to these in a moment.

The first derived column (#4) simply creates a semicolon field delimiter using @Chr(59). This will be used to separate the individual field values in the output file this report will generate.

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The second derived column (#5) combines the Donor ID, LName, and FName fields, separating each with a semicolon (returned by the preceding column #4).

The third derived column (#13) prints conditionally with the following formula:

```
@Txt(#10<>"",#5+@Str(#10)+#4+@Str(#11)+#4+#12+
@Txt(100," ")
```

The formula tells Q&A to do this:

*If column #10 (the Date1 field in the record) isn't blank, print column #5 (Donor ID;LName;FName;) add the Date1 field plus a semicolon, add the Amt1 field plus a semicolon, add the Project1 field, and finally add 100 spaces.*

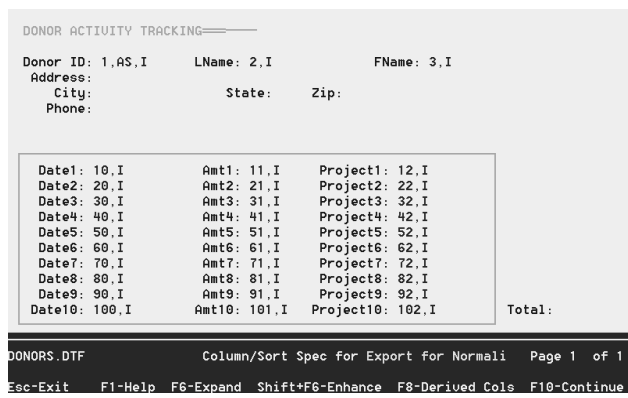
Output from this column would be as follows if Paul Jones' first donation on September 22, 1998 of \$100.00 was earmarked for the Legal fund:

```
JONE929;Jones;Paul;1998/09/22;100;Legal
```

The same logic is used in derived columns 4 through 12. These check the Date2 field, the Date3 field and so on, respectively, in the record being processed to see if it contains a value. If it does, that entire line-item is included with the Donor ID, name, date, amount, and project.

The @Txt(100, " ") at the end of each derived column's formula forces Q&A to break and start a new line at that point. If you're beginning to get the picture, you probably realize that what the report is creating is an importable Standard ASCII file containing donation data from all the Donor records in one fell swoop.

Finally, we get to the last derived column— #1000. This one's formula combines all the previous line-item derived columns (#13, #23, #33, etc., through #103) into a single column. Because all the previous columns force a line break at the end of each line-item, when column #1000 prints, the output printed to disk will look like this, without a heading or the dashed separator line suppressed by the HS(\ ) command:



**Figure 3.** Column/Sort Spec for the *Export for Normalization* report. All the fields are invisible. The line-item fields are incrementally numbered for easy identification.

```
ABLE67855;Able;John;1997/04/19;100;Legal
ABLE67855;Able;John;1997/07/12;200;Publicity
ABLE67855;Able;John;1998/01/02;50;Books
ABLE67855;Able;John;1998/03/06;25;Printing
ANDE92926;Anderson;James;1998/01/04;100;Books
ARON13244;Aron;Elizabeth;1998/03/17;100;Legal
ARON13244;Aron;Elizabeth;1998/09/22;50;Publicity
ASTO2344;Astor;Jeffrey;1998/03/05;100;Legal
ASTO2344;Astor;Jeffrey;1998/07/19;100;Printing
ASTO2344;Astor;Jeffrey;1998/08/30;30;Books
etc. . .
```

Here, in a single step, you've generated an inclusive Standard ASCII file you can now import into Donos.dtf. All you have to do is run this *Export for Normalization* report. The output file requires no "clean-up" in Write—a real advantage because if the file contained thousands of line-items, you couldn't display it in Write.

### Step 3—Importing the file into Donos.dtf

The final step is the easiest of all. You simply import the file into your Donos database as a Standard ASCII file with no quotes and semicolon as the field delimiter, and you're ready to run your normalized columnar or crosstab reports.

### Automating

To automate the process in Q&A 4.0 or 5.0, all you need is a macro that removes existing records from Donos, prints the *Export for Normalization* report to disk, and imports the resulting disk file into Donos.

If you're using Q&A for Windows, you can design the same Donos database and *Export for Normalization* report, but you'll need to set up a printer in Windows that prints

HEADING	COLUMN FORMULA	SPEC
Semicolon field delimiter	@Chr(59)	4,I
Donor ID, LName, FName	#1 + #4 + #2 + #4 + #3 + #4	5,I
Date1, Amt1, Project1	@Txt(#10<>"",#5+@Str(#10)+#4+@Str(#11)+#4+#12+@Txt(100," "))	13,I
Date2, Amt2, Project2	@Txt(#20<>"",#5+@Str(#20)+#4+@Str(#21)+#4+#22+@Txt(100," "))	23,I
Date3, Amt3, Project3	@Txt(#30<>"",#5+@Str(#30)+#4+@Str(#31)+#4+#32+@Txt(100," "))	33,I
Date4, Amt4, Project4	@Txt(#40<>"",#5+@Str(#40)+#4+@Str(#41)+#4+#42+@Txt(100," "))	43,I
Date5, Amt5, Project5	@Txt(#50<>"",#5+@Str(#50)+#4+@Str(#51)+#4+#52+@Txt(100," "))	53,I
Date6, Amt6, Project6	@Txt(#60<>"",#5+@Str(#60)+#4+@Str(#61)+#4+#62+@Txt(100," "))	63,I
Date7, Amt7, Project7	@Txt(#70<>"",#5+@Str(#70)+#4+@Str(#71)+#4+#72+@Txt(100," "))	73,I
Date8, Amt8, Project8	@Txt(#80<>"",#5+@Str(#80)+#4+@Str(#81)+#4+#82+@Txt(100," "))	83,I
Date9, Amt9, Project9	@Txt(#90<>"",#5+@Str(#90)+#4+@Str(#91)+#4+#92+@Txt(100," "))	93,I
Date10, Amt10, Project10	@Txt(#100<>"",#5+@Str(#100)+#4+@Str(#101)+#4+#102+@Txt(100," "))	103,I
	! #13+#23+#33+#43+#53+#63+#73+#83+#93+#103	1000,HS(\ )

**Table 1.** Derived column Headings, Formulas, and Column Specs for the *Export for Normalization* report. Don't forget the exclamation point in the final column.

generic text only to file. You won't be able to automate the entire process, but you can automate each of the three steps with a script to take most of the work out of it.

### Final notes

The *Export for Normalization* report I've shown uses 13 of the available 16 derived columns. This means that the technique (in Q&A 4.0) can accommodate a line-item database containing only up to 13 lines of three fields.

Another thing. Q&A 4.0's derived columns limit you to 67-character formulas, whereas your formulas can be much longer in Q&A for Windows and Q&A 5.0. In these latter versions, you could use formulas like the following to place up to three line-items in a single derived column:

```
@Txt(#10<>"",#5+@Str(#10)+#4+@Str(#11)+#4+#12+
@Txt(100," ") +
@Txt(#20<>"",#5+@Str(#20)+#4+@Str(#21)+#4+#22+
```

```
@Txt(100," ") +
@Txt(#30<>"",#5+@Str(#30)+#4+@Str(#31)+#4+#32+
@Txt(100," ")
```

This way, you could accommodate a database containing up to 39 line-items.

For databases with more line-items (or with several line-item groups), John Dow has beefed up his DTFDATA utility to extract the information to an importable ASCII file. Contact John at [www.johntdow.com](http://www.johntdow.com) for more info.

Tom Marcellus is the editor of *The Quick Answer*.

The six Q&A 4.0 databases featured in this article, Donors.dtf and Donos.dtf, Donors1.dtf and Donos1.dtf, Shopping.dtf and Crosstab.dtf—including the reports—are in the download file for Online Subscribers. These databases can also be used in Q&A for Windows, though Q&A Win doesn't support crosstab reports.

## Normalizing for Crosstab Analysis

Many Q&A databases, even if they aren't of the line-item variety, don't lend themselves well to crosstab reports because they aren't normalized. Take a simple shopping log database like this (courtesy of John Dow):

```
Date: Oct 3, 1998
Shopper: John

Fruit: $10.00
Veggies: $12.35
Grains: $4.50
Dairy: $6.00
Meat: $10.00
Dessert: $2.80
```

This design is good for data entry because you simply add a record that shows how much you spent on each food category during your trip to the market.

But suppose you have *several* shoppers in the family—John, Mary and Tom—and you want to know, for any time period, who spent how much on which food categories along with the totals. A report like this would tell the story:

Food Category	Person			Total Amount Spent
	John	Mary	Tom	
Dairy	\$8.34	\$42.05	\$37.49	\$87.88
Dessert	\$3.00	\$47.29	\$6.94	\$57.23
Fruit	\$17.99	\$49.33	\$17.00	\$84.32
Grains	\$8.84	\$341.67	\$34.56	\$385.07
Meat	\$18.22	\$191.45	\$23.00	\$232.67
Vegetables	\$2.33	\$28.99	\$16.48	\$47.80
<b>Total Amount Spent</b>	<b>\$58.72</b>	<b>\$700.78</b>	<b>\$135.47</b>	<b>\$894.97</b>

This kind of crosstab report is a snap in Q&A for DOS, *but not until you normalize the data in Shopping.dtf*—that is, get it into a database with *one* record for *each* food category and amount spent *per person per market trip*, like this:

```
Date: Oct 3, 1998
Person: John
Food Category: Fruit
Amount Spent: $10.35
```

To do this, you can use a report to extract the data from Shopping.dtf, then import the resulting file into a normalized database (Crosstab.dtf). In Shopping.dtf, number the fields 1 through 8 at the Column/Sort Spec, and make them invisible. Your first two derived columns should look like these:

```
Heading: Date & Shopper
Formula: @Str(#1) + ";" + #2 + ";"
Column Spec: 10,I
```

```
Heading: Fruit
Formula: @Txt(#3 <> "", #10 + "Fruit" + ";" + @Str(#3) +
@Txt(100," "))
Column Spec: 11,I
```

Create five more derived columns just like this last one, with headings *Veggies*, *Grains*, *Dairy*, *Meat*, and *Dessert*. For the Veggies column, change the two occurrences of #3 in the formula to #4, change *Fruit* to *Veggies*, and change the column number from 11 to 12. Do likewise for the other four food category columns. Your last derived column should be this:

```
Heading: !
Formula: #11 + #12 + #13 + #14 + #15 + #16
Column Spec: 20,HS(\ )
```

Print the report to a file named Shoppers.doc, remove any records in Crosstab.dtf, then import Shoppers.doc into it, specifying *semicolon* as the field delimiter.

To print the crosstab report shown above, make **Person** the *COL* field, **Food Category** the *ROW* field, and **Amount Spent** the *SUMMARY* field. (Use the Retrieve Spec to specify the date range to analyze.) And that's all there is to it.

# Go 'Normal' from the Get-Go

If you design your application right from the start with data normalized in mind, you'll have several advantages:

1. You won't have to take additional steps to normalize the data before you can run reports on it.
2. Your databases will stay smaller and nimbler because you're not storing so much data in them. (You're parsing out data storage between two or more databases.)
3. You avoid the risk of running out of lines and having to add more to the database. (You've got room for 10 donations and somebody makes an 11th. What are you going to do?)

Our donors/donations example is a good candidate for a normalization strategy. First let's take the donations database (Donos.dtf). Copy it to Donos1.dtf, and add a 16-character Speedy, Read-only Text field to it named **Rec No**. Add the following program to Rec No:

```
#100: If Rec No = "" Then  
Rec No = Donor ID + @Right("00000" + @Str(@Number), 5)
```

Make this an On-Record Exit program by pressing F8 and typing 100 on the On record exit field ID line. It will create a unique sequential record number for each donation. For example, adding a record for Ed Maszinski (whose Donor ID is MASZ92435) will fill Rec No with MASZ9243500001 if it's the first record in the database. The next donation will get a 00002 suffix tacked onto its Donor ID, and so on. Be advised that this scheme depends on your Donor IDs being unique and Donos1 containing no more than 99,999 donation records.

Now, for the Donors database. Copy it to Donors1.dtf and remove the line-items area of the form. Add these three fields in the following order and program them as shown:

**View Donations?:** Yes/No field. Name it **View Donations**

**Rec No:** Text field

**Donations:** Text field

**View Donations:**

```
> If View donations <> "Y" Then CHome  
Else { Clear(Donations); Rec No = "99999";  
Rec No =  
@XLR("Donos1", Donor ID + @Str(Rec No), "Rec No",  
"Rec No") };  
If @Left(Rec No, @Len(Donor ID)) <> Donor ID Then  
{ @Msg("No donations!"); Clear(View Donations, Rec  
No); CHome }  
Else Donations =  
@XLu("Donos1", Rec No, "Rec No", @Str("Date"))  
+ " $" +  
@XLu("Donos1", Rec No, "Rec No", @Str("Amount"))  
+ " " +  
@XLu("Donos1", Rec No, "Rec No", "Project");  
Goto Rec No
```

**Rec No:**

```
< If View Donations <> "Y" Then CHome  
Else { Rec No = @Right(Rec No, 5);  
Rec No = @Right("00000" + @Str(Rec No -1), 5);  
  
Rec No =  
@XLR("Donos1", Donor ID + @Str(Rec No), "Rec No",  
"Rec No") };  
If @Left(Rec No, @Len(Donor ID)) <> Donor ID Then  
{ @Msg("Donation data retrieved. Press F6 to view");  
Clear(View donations, Rec No); Goto Donations }  
Else Donations = Donations + " [carriage return here]  
"  
+  
@XLu("Donos1", Rec No, "Rec No", @Str("Date"))  
+ " $" +  
@XLu("Donos1", Rec No, "Rec No", @Str("Amount"))  
+ " " +  
@XLu("Donos1", Rec No, "Rec No", "Project");  
Goto Rec No
```

**Donations:**

```
> Clear(Donations); CHome
```

Now, you'll add your donations to the Donos1 database. To view any donor's donation history, you'll simply pull up the main Donor1 record, enter "Y" in the **View Donations** field, and there it is!

## Quick Tip

# Don't Bypass Those Shortcuts!

DOS

It was clear to me at the September Q&A User Group Bash that some folks have forgotten about Q&A's

shortcut keys and the Bypass menu.

To switch from Search/Update mode to the Program Spec, press **Shift-F9, P**.

**Shift-F9** displays the Bypass menu (shown below), which has options to go to most of the Customize and Program Specs with a keystroke.

To go to the Retrieve Spec from most any

Spec, including the Program Spec and Add Data, press **F7**.

Although **F7** is a handy way to quickly switch to viewing data again—*watch out*—it works in *all* the Program/Customize Specs, and it's easy to inadvertently terminate your custom help session, for example, by accidentally pressing **F7**!

Alec Mulvey

```
F-Frmt R-Rstrct I-Initl T-Templ P-Prgrm L-Lkup H-Help N-Nau Prog
```



EDITED BY GORDON MEIGS  
AND WILLIAM HALPERN



### Q&A Screen Changed After Win 98 Upgrade **DOS**

I recently started using Windows 98. Now, when running Q&A in a window, about an inch shows above the taskbar (at the bottom of the screen). I didn't have this gap with Windows 95. What do I do?

Herman Sears, via the Internet

The "problem" you report has nothing to do with Q&A or Windows. Most likely, when you started with Windows 98 you did one or more of the following: (1) you changed monitors or video cards, (2) you switched to a higher screen resolution, (3) you changed your display fonts for your Q&A window, or (4) you switched from full screen to a window mode. Whatever you did, the source of the irritation is a display issue. If you're used to running Q&A in full screen mode, simply start your "short" copy of Q&A and press Alt-Enter. Windows will instantly put Q&A in full screen mode. If you exit Q&A while still in this mode, Windows 98 will remember it and start Q&A in full screen mode the next time. Remember, though, in full screen mode you lose the Windows toolbar and the ability to do things such as copying, cutting, and pasting to and from the Windows Clipboard and changing your Q&A properties on the fly.

### Can't Have Toolbar in Full Screen Mode **DOS**

Sometimes when I'm running Q&A in a window, it's too small, so I click on the toolbar's full screen icon (the one with the four small arrows). Q&A switches to full screen but I lose the toolbar! How do I get the toolbar back?

Herman Sears, via the Internet

The short answer is, *in full screen mode, you can't*. The size of your Q&A window depends on two factors: (1) the setting of your display resolution (600x480, 800x600, 1024x768, or 1152x964) via the Control Panel and (2) the display font type and size you've selected in your Q&A shortcut's properties. Chances are you can find some combination of these settings that will give you a window you'll find pleasing to the eye. When you run Q&A in a

window, the DOS program toolbar at the top gives you fast access to your Q&A shortcut's properties as well as to cutting, copying, and pasting to/from the Windows Clipboard. You can also click on the full screen icon and Q&A will switch to full screen and look just like it does in DOS. The only drawback is that you lose the Windows toolbar in full screen mode. What's more, unless you switch Q&A back to window mode (by pressing Alt-Enter) before you exit Q&A, Q&A will start in full screen mode the next time.

### Write Won't Print the Day of the Week **DOS**

I'm trying to get Q&A to print the variable day of the week (Monday, for example) in a Write document I'm using as a quick fax cover sheet. If I use the `*@Date(n)*` print command, I can print any of the 20 available date formats, which is fine. But I also want to include the day of the week, like this: *Monday, September 14, 1998*. I tried using the following program in the document: `*Pg {@Dow$(*@Date*)}* but it didn't work. When I replace the *@Date* with a date field from a database, it prints the day-of-week (Monday, for example) just fine. But I don't want to do it that way because this is a simple document not tied to a database merge file. What do you suggest?`

Danski, via the Internet

You seem to have stumbled on a real anomaly — Q&A won't execute the `@Dow$` command without a merge file. Here's a workaround you can use.

Include in your Write document the following program and merge field:

```
*Pg {@Dow$(@Date)}*, *@Date(11)*
```

Press F2 for the Print Options screen. Move to the last line — *Name of merge file* — press Enter, and select any database. Then press F9 to save your changes.

Now press F2 and F10 to print your letter. When the Retrieve Spec appears, type *max* in any field and press F10. Q&A will report that it will merge the document with one record from the database. Ignore this. Press Enter,



## Stumped?

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

and your plain letter with the day of the week spelled out (Thursday, November 12, 1998, for example) will print with no merge.

## Change Color Schemes On-the-Fly DOS

I thought I'd seen a reference somewhere about an easy way to change database screen colors from Q&A's default. I use Q&A 5.0 on a notebook computer. The dark blue background can make it hard to view records without upping my screen's brightness to the max, which really shortens battery life.

Bill MacAlpine, via the Internet

Although Q&A gives you no way to change all your databases' screen colors at once, we use two macros to toggle any database between the "Q&A 4.0 Standard" color scheme for our clients (the first macro shown below) and the color scheme we prefer. All it takes is pressing Alt-X or Alt-Z. Both macros start at the Q&A Main menu and pause for you to select the database. You can use these macros as they are, or modify them to toggle between any two color schemes.

```
<begdef><altx><name>"QA4<sp>Default"<vidon><esc><esc><esc>
FDC<capsf4><enter><wait><enter><enter><C<f8>S<f8>B<f10><f8>
FTurquoise<enter><enter>Blue<enter><f10><f8>GBLue<enter><enter>
White <enter><f10><f10><esc><esc><esc><enddef>
*
<begdef><altz><name>"My<sp>Default<sp>Color<sp>Scheme"<vidon>
<esc><esc><esc><esc>FDC<capsf4><enter><wait><enter><enter><C<f8><enter>
<f7><altf7><dn><dn><dn><enter><tab><left><enter><f10><f8>F<dn>
Blue<up><tab><left><enter><up>White<f10><f8>F<tab><rgt>
<enter><f10><f8>A<altf8><altf7><dn><dn><enter><tab><left>
<enter><left><rgt><dn><f10><ctrlf8><f8>GYellow<enter><left>
<enter><f10><f10><esc><esc><esc><enddef>
*
```

## "Not Enough Memory..." Revisited DOS

We've been using Q&A 5.0 for some time now and have recently changed to a laser printer. Now when I do a Search or use Write with my database, I get a *Not enough memory...* message. The database is 15M and I've increased memory to 32M and made it Expanded. My free hard disk space is 600M. Free Expanded memory is 30M. And still out-of-memory problems! When I press Ctrl-F3 from the Main menu, the System Information screen shows the following:

Conventional memory Q&A: 520MB  
Expanded Memory: 0 MB

Q&A is running on a network. If I ask the system for Expanded memory, it says it has 30M. Can you help!

Johan Briel, via the Internet

Though your message contains confusing information, the printer you're using, the size of the database, the free disk space, and the free Expanded memory amount are all extraneous to your problem. What is important is the information on the last two lines of your System Information screen. They tell us that you do *not* have Q&A set up properly for Windows 95/98 or even DOS. If you did, the last three lines would look very similar to this and you'd have plenty of memory:

	DOS/TSR	Q&A	FREE	TOTAL
14. Conventional memory.....	34K	602K	0K	636K
15. Expanded memory (EMS).....	0K	128K	896K	1024K
16. Extended memory (XMS).....	0K	3K	1020K	1020K

These lines are from a system with 64M RAM running on a network, but they should be the same for a system with only 32M RAM. We routinely work with some very complex databases magnitudes larger than the one you're dealing with and we have no out-of-memory problems. The memory these lines report is critical to Q&A no matter where it's running. It's obvious that your Config.sys and Autoexec.bat files aren't properly set up, since you're getting only 520M of conventional memory. It's also obvious that your Config.sys file and/or your Windows shortcut are incorrect or you'd be getting 128K of Expanded memory and at least 3K of Extended memory for Q&A. Without these memory values, Q&A *most definitely* will give you out-of-memory errors. We're amazed that you've been able to run Q&A successfully up to this point. Find out how to set up Q&A properly by visiting *The Quick Answer Web site's Q&A Tips* page at [www.quickanswer.com](http://www.quickanswer.com).

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## @Update

The September 1998 article, "Gargantuan Hard Disks" (p. 10) reported that PartitionMagic won't repartition hard disks larger than 8G. However, the just-released version 4.0 *will*.

Q&A needs a 2G or smaller partition in which to run, and PartitionMagic can create one on any size hard disk without destroying the data that's already there. Contact PowerQuest at 800-379-2566 or [www.powerquest.com](http://www.powerquest.com).

## @Update

Have you visited *The Quick Answer's Web site* lately? You should. You'll find a host of new Q&A goodies, including free downloads, specialty databases, and a page that discusses Q&A printer drivers and using printer control codes to access features in your printer that the Q&A printer driver you're using doesn't support. Visit us soon at ...

[www.quickanswer.com](http://www.quickanswer.com)



# Surf the Web from Q&A!

IZZY GINDI

Oh, c'mon—a Web site manager in a database? You bet. And Q&A can even connect you to your favorite sites with a mouse click.



The first program assigns a sequential number to each record you add to the database.

In the second program, your path to Internet Explorer (iExplore.exe) might be different. Just remember, when typing subdirectories and filenames in Q&A to use the eight-character DOS abbreviation. For example, the *Progra~1* subdirectory in the above program is actually the *Program Files* subdirectory in Windows 95/98.

Add any other fields and programming you want.

**A**S you take greater advantage of the Internet, chances are you'll accumulate a variety of favorite Web sites. Although your browser lets you save their addresses in a menu-like list, that list can quickly grow and soon become a royal pain to keep organized.

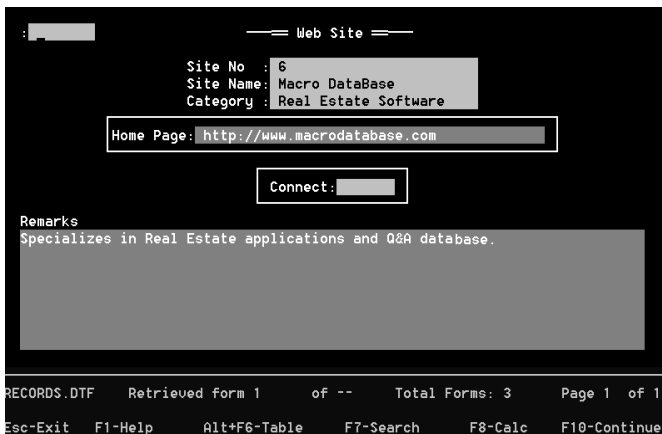
A sensible alternative is to store your favorite Web addresses (URLs) in a Q&A 5.0 database, and add programming to automatically start your browser and take you directly to the site. This way, you can categorize your Web site records to make retrieving them and connecting to sites a snap. And you can include multi-line fields for notes or reminders—even a field you can use to paste data you copy from Web pages,

The database I designed for this is a simple one-page affair shown in Figure 1. All the fields are text. To connect to a Web site, you simply type the address in the Home Page field, then press Enter or click the Connect button. If you have a record for a site you want to revisit, all you have to do is display it and click the Connect button. When you're done surfing and close your browser, you're back in the Q&A record where you started.

## Programming

You need to program just two fields—**Site No** (site number) and **Connect**:

```
< If Site No = "" then Site No = @Number ; Goto Site Name
< Connect = @Shell("C:\Progra~1\intern~1\iExplore.exe " +
Home Page); Connect = "" ; Chome
```



**Figure 1.** This database starts your browser and goes to the Web address in the record. The Remarks field is for notes or text copied from the site.

## Copying and pasting

To copy and paste (via Windows' Clipboard) from a Web page into your Q&A record, Q&A must be running in a window. You copy text from the Web site by highlighting it with your mouse then clicking Edit / Copy on your browser's menu bar (or pressing Ctrl-C).

To paste the copied text into your Q&A record, click the Q&A button on the taskbar at the bottom of the screen to bring Q&A to the foreground. Click in the Remarks field, then click the Paste icon on the toolbar at the top of the Q&A window (not shown in Figure 1). To return to the Web page, click the browser's button on the taskbar.

You can add more multi-line fields to your database if you need more room for remarks or pasted Web text. And you can always expand a field with F6 to get more room.

Just remember that in your Q&A 5.0's shortcut Properties *Misc* tab, *Fast Pasting* must be off (unchecked). Otherwise, you'll paste garbage into Q&A.

Izzy Gindi lives in Hanover, Ontario, Canada where he designs Q&A applications for himself and clients. 519-364-3536, fax 519-364-6181, izygingi@log.on.ca. The database in this article is available for download free of charge from Izzy's Web site at <http://www.macrodatabse.com>.

*[Here are a few ways I customized Izzy's database for my own use. The "Home" field in the top left of the form just got in the way during retrievals, so I deleted it. I nixed the Site No field as well. I made Category larger and formatted it for Keywords to accommodate multiple entries. I renamed Home Page simply Page because I like to go directly to a specific page at many of the sites I visit. I added an auto-filled date field to show the date of my last visit. Finally, I modified the programming to include the "http://www." that's always part of the URLs I frequent. Here's my Connect field's program:*

```
< Connect =
@Shell("C:\Progra~1\Plus!\Micros~1\iExplore.exe http://
www. " + Page) ;
```

*The program also works with Netscape (Netscape.exe). —Ed.]*

# How to Recognize, Repair and Prevent Database Corruption, Part 1

ALEC MULVEY



**D**ATABASE corruption is the unseen enemy lurking in the shadows when you're working in Q&A. It's probably the most common cause of data loss – and it's getting more prevalent. In this two-part article, you'll learn how to recognize a corrupt database, what you can do about it, and how to prevent it.

## What is database corruption?

Database corruption is damage to a Q&A database that upsets its integrity and usually impairs its functionality. Database corruption isn't confined to Q&A. Databases of all kinds suffer corruption. That's why you'll find equivalents to Q&A's *Recover Database* facilities in other database management programs.

## What causes corruption?

There are many ways a database can become corrupt. Some are user-related, others aren't. There are hardware and/or environmental causes such as these:

- Hard disk error
- Memory error
- Network error
- Power glitch (power loss, dip, or surge)
- Lightning

User actions like these can corrupt a database:

- Rebooting or switching off PC when a database is open.
- PC crashing (freezing) when a database is open.

With Q&A 5.0 there are additional causes of corruption:

- Upgrading a Q&A 4.0 database to Q&A 5.0 without performing a few preliminaries. (I'll cover this next month.)
- Copying the database design only, without first resaving all Specs.
- Expanding a Retrieve Spec field during a mailmerge or mailing label operation if default fonts have been saved for the word processor (Write).

Of these, the most common cause of corruption is the PC being switched off when a database is open. This can

be a user turning off the PC or a power loss or system crash. The latter cause is more common these days as more people are running Q&A under various flavors of Windows, though it's becoming less common as later versions of Windows become more stable (one application crashing is less likely to require a reboot).

Another frequent cause of database corruption these days is network users running Q&A in Windows and inadvertently starting multiple Q&A sessions. With another Q&A session running in the background, a database can be left open and exposed to corruption all day. On one occasion, I saw a user with *eight* Q&A sessions going at once! And the user tried to deny it!

## How do you recognize corruption?

A corrupt database will usually (but not always) show symptoms – sometimes extreme symptoms such as one or more of the following:

- Database can't be searched, causing a system error.
- Not all records can be retrieved.
- Unable to perform various tasks such as Recover Database or Copy Database.
- Hugely overblown database file size.

Intermediate symptoms like these might appear:

- Uncertainty as to how many records in the database.
- Error messages when creating new reports, for example.
- Thrown back to Main menu and password cleared when attempting, for example, to access the Program or Restrict Specs.

You might see "Mild" symptoms like the following:

- Report doesn't print – *No records found* message.
- Spurious characters in data fields or Retrieve Specs.
- Database file inexplicably omitted from backup.

A database can show no symptoms at all and still be corrupted. Ironically, the most dramatic symptoms can be the result of minor damage while the most innocuous symptoms can be evidence of irreparable corruption. A database that can't even be searched might be fully repaired by recovering it. On the other hand, a very

severely damaged database might show no ill effects during day to day use, but be damaged beyond recovery, copying, or modification.

### What can you do about corruption?

**Rule No. 1** – When you suspect a database is damaged:

**Set aside any old backups of the database – DO NOT overwrite them. Then, make a new backup of the database and put it in a safe place.**

This way you're always working on a copy, or have a backup copy available in case any of your actions further damage the database (which is quite likely).

It's *absolutely vital* to frequently backup your databases. Each day, or several times a day, you should backup all the data you can't afford to lose or re-enter. What's more, you should *retain older backups* (don't just overwrite one backup with another) in case a database has gone bad over time without you noticing it. One day, all your attempts at a recovery might fail, and all you'll have is your most recent viable backup. By *viable* I mean that which can be effectively restored. So you should perform test restores periodically to ensure your backups are okay.

The data recovery options available to you depend on what tools you have.

You can always run Recover (File / Utilities / Recover database). This is the primary tool for most users. It often remedies database problems.

Recovery will either run its course and tell you *Recovery was successful*, or it will fail. If it fails, it will either hang or terminate with the message, *Recovery failed - use a backup copy of the database*. Attempting Recovery on a badly damaged database might crash Q&A, or it might not even allow Recovery to start.

If Recovery succeeds, immediately make a new backup of the database and keep it in a safe place.

Unfortunately, a "successful" recovery is no guarantee of a sound database (though it's a good start). Be especially suspicious if Recovery seems to proceed too fast for the file size (for example, 10 seconds for an indexed 5M database). If Recovery fails, the database is almost certainly wrecked. In this case, delete the file from your hard drive, make another copy of your backup file, then try Recovery again – up to three times. If all attempts fail, try some of the other methods I'll suggest.

Once Recovery is started, it can't be stopped. If the file is large and your PC is slow, it's wise to copy the file to a local disk or a faster PC first. Recovering a large database on a slow network can take hours. You'll also need sufficient free disk space to perform a Recovery – at least twice the size of the database plus its index file.

Recovery is done in phases. Phase 1 is fairly fast. Phase 2 is usually very quick, especially if there aren't many reports. Phase 3 is related to the amount of data and number of indexed fields. For an "untaught" database, it's usually the slowest. If there are no indexed fields, then

Phase 3 is instantaneous. Phases 4 to 8 relate to the Intelligent Assistant and Query Guide. If these are untaught, then these phases are omitted. If the Query Guide or Intelligent Assistant has been taught, then phase 3 is omitted and the slow phases come later.

### Repairing indexes

Some database corruption problems have to do with indexing (Speedy fields). A quick check is to retrieve all the records, then move to the last record by pressing Ctrl-End. The record number on the status line should equal the total number of records. If it doesn't, then the indexing is faulty. Recovery will often fix indexing problems. If it doesn't, you can reindex the database or replace the index file. To reindex the file:

1. Go to the Speed-up Spec ( File / Design / Customize / Speed up Searches).
2. Make a note of which fields are indexed.
3. Clear the Spec with F3, then press F10 to save it.
4. Return to the Spec and index no more than two fields at a time, starting with the most important field(s) first.

The reason for indexing the database two fields at a time is that Q&A handles the exercise more efficiently this way. The first field to be indexed should be the one that defines a unique value for each record – a *key* field. Every database should have such a field.

To replace a damaged index file (or to use a Q&A database with a missing index file) do the following. (Let's say the database with the damaged index file is named Badindex.dtf):

1. Outside of Q&A, delete Badindex.idx
2. Outside of Q&A, make a copy of the .idx file belonging to any other database, naming it Badindex.idx. (The database won't be usable at this stage. Attempting to browse it will produce a system error.)
3. In Q&A, Recover Badindex.dtf

The database should now spring back to life with its former indexing. (The Speedy fields Spec is stored in the .dtf file.) If you don't have another database, simply create a one-field database for the purpose.

The tasks of deleting the index file and renaming an index file from another database can't be done in Q&A's File module because there Q&A performs file management tasks on the .dtf and .idx files in tandem. (You can do it in Q&A only by using Main menu Utilities / DOS File Facilities.) Because of the risk of accidentally deleting the database itself, it's safer to perform these tasks using your favorite file manager (for example, Windows 3.1 File Manager, or Windows 95/98 Explorer).

Symantec technical notes on this subject describe a very much more complicated procedure, but you'll find that the above will do the trick.

## Copying the database

In Q&A 4.0, copying the database can be a useful repair tool. It should be done *after* a successful Recovery and so, by definition, *after* you've made a backup:

1. Select File / Copy / Copy Design only.
2. Specify a new name for the database copy. (For example, copy *Customer* to *Custom2*.)
3. Select File / Copy / Copy Selected Records and copy all the records to the new database.

This rebuilds the database in its entirety.

*Do not* do this on a Q&A 5.0 database without first opening and saving all the Specs associated with the database. (See next month's concluding installment.)

The copy database's properties will be identical to the original one with a single exception — its sharing mode will default to *Automatic*. So this might need to be reset to *Allow* (File / Design File / Secure a File / Declare Sharing Mode) if the database is used on a peer-to-peer network.

## Saving Specs

Corruption can reside in various parts of the database — in the data or the database structure. Within the structure, corruption is most commonly found in reports, Print Specs, and some of the Specs on the Customize menu. If you find or suspect corruption and the above techniques don't work, try opening and resaving each of these Specs. For reports and Print Specs, this means going through each of the three stages, then declining the offer to print. You might find you get an error message at a particular Spec and can't save it. In this case, you've found your corruption and clearing that Spec is the solution. On the other hand, opening the damaged Spec can crash Q&A. In this case (say it's a corrupted report), you'll have to delete the report (assuming Q&A will let you) or use some other means to repair the database.

That's about all you can do if all you have is Q&A. However, there are other tools available.

## Extract the data with a utility

QEXTRACT is a Symantec utility you can download from *The Quick Answer's* Web site. It lets you extract the data, form design and programming from a Q&A database. (It works with all versions of Q&A from 3.0 onward.)

When you run QEXTRACT, you're told it's a *beta* version. Well, it's been a "beta" version forever, so don't worry about this — it *is* the latest version!

QEXTRACT respects Q&A security, so you'll need to provide a valid user ID and password to extract data from a secured database.

QEXTRACT lets you extract the data from a database into an ASCII file. It also lets you extract the form design and programming into respective ASCII files. If you were to rebuild a database from these, you'd still lose your field formatting, Navigation Spec, any saved Retrieve Specs, Reports, Print Specs, Speedy fields, Custom Help, Restrict

Spec, and so on. What's more, the programming, though extracted, can't easily be transferred back to the database — plan on retyping most of it from a printout of the ASCII file. So, relying on QEXTRACT to perform a complete recovery is unwise.

QEXTRACT has three further shortcomings.

It usually extracts somewhat fewer than all the records. Of course, you don't know how many records are missing or which ones!

If you've redesigned the database, QEXTRACT will create one output file for each *generation* (see the sidebar below) named 86.STR, 89.STR, and so on, indicating the number of fields. These will need to be separately imported into a rebuilt database using Merge Specs.

Worse still, if two generations of the database have the same number of fields (say if two fields swap places), then records saved in each of these generations will go to a single file. Since an ASCII file is simply a list of field values (first field, second field, and so on), the data entered into, say, the 9th field will depend on which was the 9th field at the time the data was entered. You might not realize that some of the fields QEXTRACT extracted have actually been *transposed*.

This likelihood of (minor) data loss and risk of data transposition renders QEXTRACT unsuitable as a reliable data extraction tool.

So far we've looked at several ways of handling a corrupted Q&A database. First, using the facilities built into Q&A itself, then using a utility program. Once you've exhausted these you don't have to give up, but you'll need to get out your checkbook. Next month, we'll look at these options, as well as some additional ways to maintain the health of your databases.

Alec Mulvey owns Keyword Training & Consultancy based in Ascot, near London, England. Alec has been building Q&A applications and performing data recovery for nine years, and is the current president of the (Inter)National Q&A User Group. Keyword Training is also the UK distributor for the International English edition of Q&A (the "Definitive Edition" CD-ROM) and also John Dow's Utilities. Fax +44-1344-884-111, email [alec@keywordtraining.com](mailto:alec@keywordtraining.com), <http://www.keywordtraining.com>.

## What's a Database "Generation"?

When you make a change to a database design, the new version of the database isn't just the current version of the database as far as Q&A is concerned. Q&A separately stores each set of changes to the database design—the generation information—in the .dtf file. It's clear that the more generations there are, the more information Q&A has to remember, and the greater the risk that Q&A will get confused over them at some stage.

# Quick Tip

## Modernize that Old Printer Driver

DOS

When using an older Q&A printer driver with your new printer, you can teach that old dog new tricks.

I have an HP DeskJet 870Cse. Like all modern DeskJets, the 870Cse's internal fonts are *scaleable* to any point size.

But because there's no Q&A driver for the 870Cse, I've been using the old DeskJet 550C Q&A driver. Problem is, it doesn't contain any scaleable font descriptions—they're all *fixed* point sizes. Among the *Univers* descriptions, for example, there's no 9, 11, or 13 point size, and the largest one is a measly 14 points. What I really wanted was a *Universe Bold* font I could scale to *any* point size. Now I have it. You can, too. Here's how.

1. From Q&A's Main menu, select Utilities / Modify font file, and press Enter on the Font File Name line. From the list of printer drivers, select the HPDJ550C.FNT file.
2. Press F-10 to move through the font descriptions until you

came to the one named *Univers 14 Pt Bold*. Press Shift-F5 to make a copy of it.

3. Change the name on the copy to *Univers Bld Scaleable* and change its abbreviation to *UNBldS*.
4. Move to the *On codes* line and change the **14** in the printer control code to \* (replace the 14 with an asterisk).
5. Move to the *Point Size* line and change the **14** to **S** (for Scaleable), then press Shift-F10 to save your changes.

You now have a scaleable Universe Bold font you can use in your Q&A documents. (You can scale other proportional fonts the same way. Monospace fonts like Courier and Letter Gothic can be scaled, too, but the technique differs.) The new font description will appear at the end of your font selection list. Ignore any Q&A complaints that the new font has "...characters that are too small."

Tom Marcellus

▶ Have you found a way to tweak a Q&A printer driver (or use printer control codes) to access features in your modern printer? We'd like to hear from you.

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