

It's Curtains for QABACKUP



ALEC MULVEY

When the 20th century is gone, Q&A's own backup utility will go a goner too. Fortunately, there are other—perhaps better—backup options out there.

DOS

ALTHOUGH Q&A for DOS itself is in pretty good shape for the year 2000, unfortunately the same can't be said for the Symantec backup utility—QABACKUP—that comes bundled with it.

Supplied with Q&A for DOS 4.0 and 5.0, QABACKUP gives you an easy way to backup (in compressed form) Q&A databases and documents to floppy disks, a Zip drive, or another hard drive. It has many strengths, including data compression, the ability to backup files across multiple floppy disks, easy file selection, and generally good reliability.

It has weaknesses, too. For one, it backs up only Q&A databases and write documents and not other types of Q&A files that should be backed up routinely. Moreover, the intuitiveness of its interface is arguable. I often find files created with QABACKUP on the hard disks of my clients' PC's, a sure sign that the person using the utility to backup their files didn't successfully specify the floppy drive as the target. What's more, since QABACKUP is an external program and not part of Q&A proper, you can't automate it with macros.

But these weaknesses pale in comparison to the one huge flaw that will become painfully evident if you try to use QABACKUP after the turn of the century—it simply can't handle 21st century dates. Figure 1 shows the problem with QABACKUP's interface. Dates after "99" cause the file list to wrap to a new line.

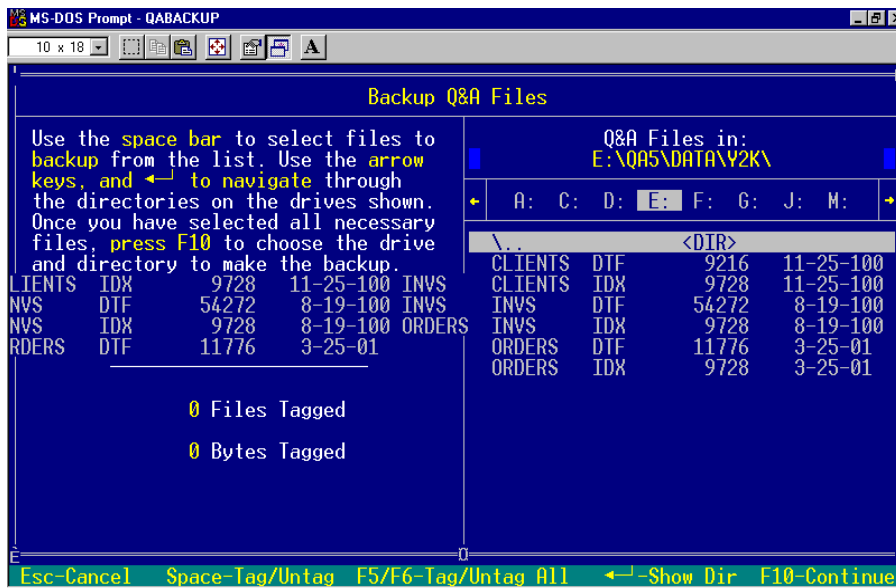


Figure 1. No workaround or fix for QABACKUP's inherent year-2000 problem. Files with 21st century dates cause the file list to wrap which, in turn, can cause QABACKUP to lock up and crash your computer.

The Quick Answer

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With just a few databases (as shown in Figure 1), you can still get QABACKUP to work. But once you have half a dozen files displayed, QABACKUP will lock up. You might be able to remedy the situation by pressing Escape or Ctrl-C repeatedly, but you're just as likely to suffer a system crash. In short, folks, December 31, 1999 marks the end of the road for QABACKUP. After that, you'd be well-advised to find another backup solution.

Where to go from here

If you've been depending on QABACKUP, there's no cause for panic. You have a choice of backup utilities that do as good a job as—or even a better job—than QABACKUP. And the interesting thing is that these alternative utilities weren't strictly designed for backing up per se, but simply to shrink files for copying onto limited-capacity floppy disks or to reduce transfer times when downloading from (or uploading to) electronic bulletin boards.

For example, if you run Windows 95 or later and feel at home with Windows file managers, the solution for you might be WINZIP from Nico Mak Inc. An evaluation copy of Winzip 7.0 can be downloaded from www.winzip.com. The file is a 980K self-extracting executable—simply run it to extract the files.

WINZIP is wonderfully easy to use. The help files are excellent, and a tutorial along with frequently-asked questions are included in the download. I won't say any more about WINZIP here except that if you haven't got it—get it! But do the decent thing and pay to get a registered copy rather than continuing to use the evaluation copy. It costs only \$29. If you're using Windows 3.1, there's a 16-bit version (WINZIP 6.3) that can be downloaded from the same Web site.

An old standby

If, like me, you've always liked QABACKUP, but been frustrated that you can't automate the backup process—there's an option you might like even better. Instead of using WINZIP, which is excellent for click-and-drag manual archiving (backing up), use good ol' PKZIP from PKWare Inc. PKZIP has been available in a DOS version since 1989. You run it old-the-fashioned way—from the DOS command line (in DOS, or in a DOS window or in full-screen mode in Windows). This is both its weakness and its strength. For although typing commands in DOS is far from user-friendly, the fact is that those commands can be placed in a batch file and thus automated. I'll show you how.

First you need to get hold of PKZIP. The latest version for DOS is 2.50, and you can download it from PKWare's Web site at www.pkware.com. The download file, PK250DOS.EXE is a 200K self-extracting zip file so, again, you simply run it to extract the program

Continues next page

Time's running out!

The *Quick Answer's* **Q&A Year 2000 Pack** includes everything you need to ensure your computers, databases, reports, saved specs, other Q&A-related files—and *Q&A itself*—are 100% ready for the 21st Century. The **Pack** includes a 30-page printed guide and two diskettes. For more information, visit our **Q&A Year 2000 Pack** Web page at www.quickanswer.com/y2k.htm

Letters

I just read the November 1999 issue and noticed the tip from Cliff Sobin on regularly using Copy Design Only. It might be a good idea to remind people in big bold letters that this can destroy multi-generational QA 5.0 databases, especially

since he suggests doing it when making design changes, which is what makes a multi-generational QA 5.0 database!

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files. You can download the evaluation shareware version free. Registration costs \$46.

PKZIP is a remarkably rich little program. The online manual that comes with it runs to over 100 pages! To get you started, I'll mention just a few of PKZIP's many options and features.

Using PKZIP

A potential problem with running DOS programs is the *path*. For simplicity, I suggest you place PKZIPLEXE and PKUNZIPLEXE (the program to create a compressed zip file, and the one to unzip it) in the same directory as your Q&A databases. In the following examples, I'll assume that directory is C:\QA5\DATA.

The basic syntax for PKZIP is as follows:

```
PKZIP <archive filename to be created> <file(s) to be archived> [any switches]
```

So, to back up all the files in C:\QA5\DATA to an archive file named QADATA.ZIP on the A: drive, the command line would be this:

```
PKZIP A:\QADATA.ZIP C:\QA5\DATA\*.*
```

(Strictly speaking, neither the ".zip" nor the "C:\QA5\DATA" are required. The "zip" filename extension will automatically be added if you don't supply it, and running PKZIP from C:\QA5\DATA with the "*.*" DOS wildcard is a shorthand way of including all the files in the current directory.)

"But my databases won't fit on a floppy!"

Chances are the database(s) you'll want to back up won't fit on a 1.44M floppy. No problem. Firstly, PKZIP compresses Q&A database files by about 67 per cent (to about a third of their normal size), so you'll be able to fit 4 to 5M of files on a single floppy disk. Secondly, you can turn on PKZIP's *Disk Spanning* feature by using the *-&* switch. This way, if the zip file is too large for one diskette, PKZIP just prompts you for more diskettes as needed.

"I don't want to back up all my databases"

This is a common scenario. You want to ignore old or seldom-used databases and back up only the few that are the most active. This is where the power of using a batch file to start PKZIP comes into play. You can create a text file that lists the files you want to back up, name this file whatever you want, and instruct PKZIP to refer to it as the backup specification file. The list file can contain as many lines as you want, you can use full pathnames to specify files in directories other than the default one, and you can also specify wildcards. What's more, the files can be *any* files, not just databases, so you can also back up your QALABEL.OVL mailing label file, your QA.CFG configuration file, and your default QAMACRO.ASC or other macro file(s).

(These additional Q&A files aren't large, so rather

than compress them, you could add DOS Copy command lines to your batch file to simply *copy* them to the diskette. This way, they'll be easier to restore if needed. If you do this, though, be careful if you're using PKZIP's *Disk Span* or *Wipe* switches. Copy these files only *after* zipping the databases so they'll wind up in the leftover space on the final diskette.)

Here's a sample backup file list. It assumes, again, that PKZIP is in the C:\QA5\DATA directory:

```
; This is the PKZIP List File
; of databases to back up.
QAINDEX.*
KEYWORD.*
WINCLIP.*
C:\QA5\QALABEL.OVL
C:\QA5\QA.CFG
C:\QA5\QAMACRO.ASC
```

Take care that you always back up *both* the .DTF file AND the .IDX file. Remember, only Q&A knows that these files always go together!

You can name the file list file whatever you want. (I'll call this one PKLIST.TXT.) It must be a plain text (ASCII) file. You can create it using Windows Notepad, DOS Edit.com, or Q&A Write. If you use Write, be sure to save the file to ASCII format by pressing Ctrl-F8. Though not mandatory, it's best to store this file in the same directory as PKZIP—C:\QA5\DATA in our example. You can then start PKZIP with the switch *@filename* (for example, *@PKLIST.TXT*—no dash in front of the "@" symbol for this switch).

Here are a few more switches (selected from the dozens available) that you might find useful with PKZIP. Use lower case letters for these switches:

-rp Search for matching files in any sub-directories as well, and store the pathnames. This allows files to be restored to their original locations. PKUNZIP will create the restore directories as necessary. More on this later.

-& The all-important *disk spanning* switch that allows zip files to be larger than a single floppy disk.

-&w Disk spanning and also *wipe* (erase) the disk automatically prior to creating the new zip file. This is what QABACKUP does. Without the *-w* switch, any files already on the diskette will be retained, restricting capacity.

This stage is where it becomes wise to run PKZIP not directly, but via a DOS batch file. A batch file is also a text or ASCII file that you can create in Q&A write. You can name the batch file anything you like, but it must have a .BAT filename extension.

Here's an example of a batch file named PKBACKUP.BAT

```
@ECHO OFF
CD\QA5\DATA
CLS
ECHO.
ECHO  ** PLEASE INSERT A DISK IN DRIVE A: THEN
PAUSE
ECHO.
PKZIP A:\QADATA.ZIP @PKLIST.TXT -rp -&w
```

This batch file starts by prompting you to insert the first diskette. It then runs the PKZIP program in C:\QA5\DATA, backing up all files specified in the PKLIST.TXT file described earlier to the archive file QADATA.ZIP on the A: drive. Any matching files in any subdirectories of C:\QA5\DATA (or any other paths specified in the list file) will also be included, and the pathnames are stored in the archive so that the directory structure can be recreated (when restoring) if necessary. Finally, the *-&w* switch turns disk spanning on and erases all diskettes before copying the new zip file to them. (A lengthier version of this batch file, with an extra pause to warn that the diskettes will be wiped, is included in the download file for *Quick Answer* Online Edition subscribers.)

As each file is archived (compressed and saved), PKZIP lists it on-screen along with the amount of compression.

Convenient backing up

For convenience, you can create a shortcut on your Windows desktop to run the batch file. Another way to run your PKZIP backup routine is to place the batch file on Q&A's Main menu as an Alternate Program (Utilities / Set Alternate Programs). To use the earlier example, your Alternate Program would look like this:

```
Alternate Program: C:\QA5\DATA\PKBACKUP.BAT
Menu Selection:   Backup Files
```

Restoring from Zip files

PKZIP's restore program is named PKUNZIP.EXE. It's syntax is the same as PKZIP:

```
PKUNZIP <archive to be unzipped> <destination>
[any switches]
```

The destination can be a drive or a complete path. The switches likely to be used are fewer, and include these:

- d Restore directory structure (only valid if *-rp* was used when zipping)
- o Overwrite files without confirmation.

The *-o* option will cause PKUNZIP to overwrite any files that already exist in the target directory *without prompting for an OK*. When this option is *not* specified, PKUNZIP will pause if it attempts to extract a file that already exists and prompt you with a message like this:

```
PKUNZIP: Warning! File [filename] already exists.
Overwrite (y/n/a/r)?
```

Possible responses are *Yes*, *No*, *Overwrite All*, and *Rename*.

This option offers tremendous control when restoring files to your hard drive. You can perform a "full" restore yet be selective about which files to unzip. You can even assign a new name to a database file as it's being unzipped. Just be sure you give the .DTF and .IDX files the same name.

A sample restore command might look like this :

```
PKUNZIP A:\QADATA.ZIP C:
```

This extracts the files in the QADATA.ZIP file on the diskette in the A: drive, restoring them to the C: drive. When unzipping a multi-diskette archive, PKUNZIP will initially prompt you for the *last* diskette in the set, as that's where PKZIP stored the index when it created the Zip file. The program will then prompt you for each diskette, in turn. Be sure you have your diskettes properly marked in the correct order.

I recommend backing up Q&A databases using PKZIP (because you can automate the process as described earlier). However, for unzipping (restoring) them, I prefer WINZIP's Windows drag-and-drop file manager-like interface. (WINZIP supports PKZIP's file format.)

Conclusion

After December 31, 1999, you should not use QABACKUP to backup your files. Instead, you can use a program like PKZIP. I've described only a fraction of what PKZIP can do. If you're disposed to do so, you can add passwords, move files rather than copy them, display lists of zipped files and selectively add, extract and refresh the files in them. You can draw on a variety of other PKZIP/PKUNZIP options as well.

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Resources

PKZIP

PKWARE Inc.
9025 N. Deerwood Dr.
Brown Deer, WI 53223
Tel: (414)-354-8699
Fax: (414)-354-8559
www.pkware.com

WINZIP

Nico Mak Computing Inc.
PO Box 540
Mansfield, CT 06268
www.winzip.com

How to Program and Use Linked Lists, Part 2

ERIKA YOXALL



This powerful programmer's tool can help simplify development of complex applications



Application in
ONLINE Edition

LAST month, In Part 1 of my Linked Lists series, I talked about the basic structure of linked lists and showed a simple example of how they could be used in Q&A. This month, I'll expand the chain of command database used in Part 1 to demonstrate a more robust use of linked lists. I strongly recommend you download the sample database so you have good examples of how the more complex structure must be laid out in order to work (<http://www.hammerdata.com/Downloads/link2.zip>).

To review, in a linked list structure, each element (or node) has five required elements: *unique node ID*, *Parent*, *Child*, *Previous* and *Next*. Each node also stores whatever other information about that particular element you want to use. In my "chain of command" database, I also store a Name and Rank for each node. When using Q&A to create a linked list structure, each node is simply a record in the database. Each record in LINKLIST becomes a node in the chain of command linked list structure. In Part 1, I only used the Parent element. This created a very simple tree that only went in one direction. When you selected a person, the programming retrieved the parent for that person, then retrieved the parent's parent, and so on, all the way to the top of the chain of command.

Moving on!

For this month, I added three fields to LINKLIST to create LINK2: *Child*, *Previous* and *Next*. All are formatted as text. I entered records into LINK with Parent, Child, Previous and Next values that create a tree, one branch of which looks like the diagram shown below.

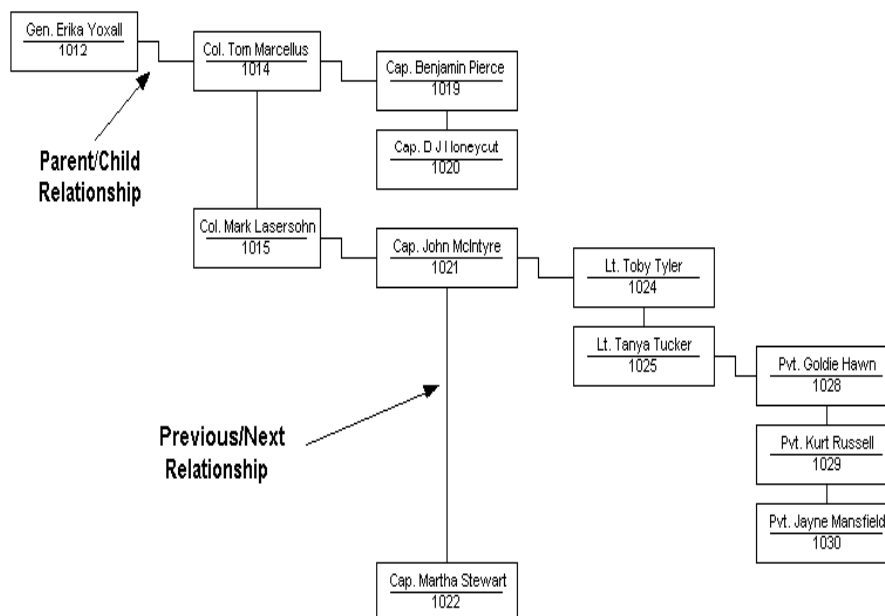
Note that only the first node at any level has a Parent. The other nodes on the same level would use their Previous information to find the first node on their level to find out who their Parent is. No node can have both a Previous and a Parent. No node can have both a Next and a Child. Please take your time looking over the diagram and the sample records in LINK2 to make sure you understand the structure rules. Since all the nodes are the same, linked lists live and die by correct Parent, Child, Previous and Next information.

Using this structure, any person can have an infinite number of people and combinations of ranks above and below him. Normally in Q&A you might design a file that has fields on each record for ten of each kind of rank, just in case you need them. Most of the fields would normally be empty, meaning a tremendous amount of wasted screen real estate and disk space. Using linked lists makes this unnecessary.

The programming

Let's do some programming and see how the information in these nodes can be put to work. To make lookups and visual presentation a bit easier and more efficient, I added two more fields to LINK2: CHAINVALUE—a text field that strings together the Rank, Name and ID; LEVEL—a numeric field that I'll use to indent when I assemble the Chain of Command.

Once you are comfortable with how LINK2 works, make another file (CHAIN2) that you will program to work with the information you entered into LINK2. CHAIN2 will ask you to select a person, then build the entire chain of command to which that



Concludes on page 8



EDITED BY GORDON MEIGS
AND WILLIAM HALPERN



Complex Record Retrieval Criteria for Reports

Our database contains what we call a "date grid" where we record up to five In and five Out dates. At the Retrieve Spec for our period reports, we type the applicable date range in each of the five "Date Out" fields. We then press Ctrl-F7 and tell Q&A to include "all records that meet ANY of the restrictions." At this point, we might want to further restrict the report to one product by typing, say, *computer* in the Product field. But this doesn't work. Because the retrieval option is set to ANY, we get all the records for "computer" regardless of the Date Out date, plus all the records for any products in the specified date range. So instead, we copy all the records with the correct date range to an empty copy of the database, then run our reports there, specifying "computer" in the product field. This is tedious. Is there a way to retrieve the correct records directly from the main database?

Ken Powell via email

You've found a way to get the answers you need but, yes, there is a way to retrieve the records you want directly from the main database. In addition to the usual retrieval parameters and search options, Q&A lets you use program expressions at Retrieve Spec screens. You must place any valid program expression that returns a value inside French braces, like this:

```
={Program Expression}
```

In these expressions, you can refer to other fields by their field names, or you can number the fields to which you want to refer. In your case, type #6 in the Product field, then modify the date range (in the first Date Out field) to read this way:

```
#1:={#1>31dec97and #1<1jan99 and #6="Computer"}
```

Put similar expressions in the other Date Out fields, changing the #1 to #2 for the second Date Out field, #3 for the third Date Out field, and so forth.

Press Ctrl-F7 (in Q&A for Windows, select Retrieve / Options) to set the retrieval options to include records that meet ANY of the restrictions. Since each expression in the date fields includes *and #6="computer"*, you'll get the records you're after.

In addition to using expressions to refer to other fields in the current database, you can use @XLookup functions to refer to fields in external databases.

Include Just the "Current Record" in a Report

In Q&A for Windows, you can attach a script to a button on a form, and have that script run a report. We have a free-form report that prints data from any record in our database to a government form. We are on a network with 15 stations using Q&A. Is there a way for any user to print the report for the record they're currently viewing simply by clicking the button instead of writing down the record's Control Number and manually changing the report's Retrieve Spec?

P. Cox via email

Yes, but since the report is saved with an attached Retrieve Spec, you need a way to tell Q&A what record a user was on when they clicked the report-printing button.

In Q&A for DOS 5.0, you could have a macro move to the record ID field, copy the ID to Q&A's clipboard, and print the report by having the macro paste the record ID into the same field at the report Retrieve Spec. On the other hand, Q&A for DOS doesn't have free-form report capabilities and isn't as well-suited as Q&A for Windows for tasks such as printing to complex forms.

To create an on-the-fly record identifier on your Q&A for Windows database, add a field I'll call Index. Place the field, without a label, in a convenient spot on the form near the script button that prints the free-form report. To the right of it, place text instructions such as *Click here, then click XX Form button*. Create another no-label field named Userid, where you can store the user's User ID (from Database Structure / Security / Users and Groups).

You can use an on-field-entry program in the Index field to generate a number that's higher than any of the



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.

other records in the database. Using a combination of the current date and current time, you can get a number that will increment once every minute—so the limit here is that a given user cannot, by this method, print two or more forms during the same minute. (Q&A doesn't have a time function that returns seconds.)

Here's the on-entry program for the Index field:

```
<#99: #1 = @UserID; #99 = (10*(@Date-@D(1999/01/01)) + (.01*@Time))
```

Next, go to the *XX Form* report design, and add a Retrieve Spec with *Max1* in the Index field and the program expression *={@userid}* in the Userid field. When user Jane clicks on the Index field, then clicks the *Print XX Form* button, this retrieve will get the record with the highest Index with "Jane" in the Userid field. When Mike does the same thing (even at the same time), his PC will print the form for the record with the highest Index value and "Mike" in the Userid field. All 15 users can print the specific record they're viewing. The only limitation is that no person can print more than record one during a given minute (though theoretically all 15 users could print individual records during the same minute).

Getting Correct Report Subtotals

I have a business where I take orders from clients for different services each day, then contract these out to various subcontractors. I'd like to have a columnar report that shows me what I'm charging my clients along with how much I'm paying for each subcontracted service (by type of service) on a monthly basis. I've tried sorting by date with a month break, but I get totals by date. And I can't seem to get a summary by type of service.

Bart via email

If the kind of report you're looking for is like this (only one month in this example), then the solution is pretty straightforward:

YEAR/MO	JOB TYPE	COST	PRICE
199906	HOME INSPECTION-HH		
	Total:	\$2,540.00	\$4,710.00
	HOME REINSPECT-HR		
	Total:	\$750.00	\$1,850.00
	MITIGATION ESTIMATE-ME		
	Total:	\$400.00	\$700.00
	RADON ATD-RA		
	Total:	\$125.00	\$250.00
	RADON CHARCOAL CANNISTER		
	Total:	\$709.00	\$1,140.00
	RADON CRM (MONITOR)-RR		
	Total:	\$25.00	\$95.00
	SEPTIC OPEN TANK TEST-QQ		
	Total:	\$354.00	\$725.00
	SEPTIC REINSPECTION-SN		
	Total:	\$160.00	\$560.00
	Total:	\$5,063.00	\$10,030.00

If you use a normal date sort along with a month break, you'll get the same answers, but they won't be

broken down by type of service since the date is the primary sort. However, if you use a derived column to create a pseudo date field that contains just the year and the month, and sort on *that*, you'll get just what you're looking for.

At the report Column/Sort spec, type *1,I* in the Date Ordered field. This will make the field invisible. (It won't print but will be available for calculations.) Next, type *20,AS* in the Job Type field, *30,ST,T* in the Cost field, and *40,ST,T* in the Price field. Press F8 to get to the Derived Columns Spec and create a derived column like this:

```
Heading: YEAR/MO
Formula No. 1: @Str(@Lt(#1,4))+@Str(@Mid(#1,6,2))
Column/Sort Spec: 2,AS
```

Q&A stores dates in the YYYY/MM/DD format. Accordingly, this derived column creates a new sort field for the report based only on the year and month of the service. The *20,AS* in the Job Type field performs a secondary sort by type of job. The *ST,T* in each of the money fields subtotals by the previous sorted field (Job Type) and the prior sort (Year/Month) and grand totals are provided at the end of the report. Remember to set the report to print *Totals Only* at the Print Options screen so all the detail doesn't print. You could also add an *SC* (subcount) to the end of one of the cost fields so that you could see how many jobs were included in each of the subtotals.

As an alternative, you could also design two Crosstab reports to get the same information (you can only summarize by price or cost, not both). Just set the Grouping Spec (F7) for the date field to *@Month*.

Repeating Values and Single-Spacing Sorted Reports

In my columnar report, when I sort one of my columns (a product ID number) in ascending order, the report prints double-spaced. When I remove the AS from the Column/Sort Spec, it prints single-spaced, like I want but doesn't sort. How to I get an ascending sort and single-spacing? Secondly, when I sort this product ID number column, I would like the product ID number to show every time, even when it's repeated. Right now, repeated product ID numbers don't print.

Marlin Penton via email

Try adding a *,CS,R* after the *AS* in the Column/Sort Spec. The *CS* tells Q&A to cancel calculations based on the sort (when the value in the sorted column changes) and should prevent the double-spacing. The *R* tells Q&A to repeat duplicate values in the sorted column.

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Linked Lists...cont'd from page 5

person belongs, regardless of where in the chain that person falls.

CHAIN needs the following nine text fields:

HOME—a one-character field in the top left corner for the cursor
NAME, RANK, ID

BUILDCHAIN—performs the bulk of the programming

CHAIPTOP—temporary placeholder for use by BUILDCHAIN

CHAINPLACE—temporary placeholder for use by BUILDCHAIN

CHAINOFCOMMAND—a multi-line field

As before, only two fields need programming:

```
<NAME:
ID = @UserselectR("LINK2","NAME","ID","A","ZZZ");
XLookup("LINK2",ID,"ID","NAME",NAME,"RANK",RANK);
CHAINOFCOMMAND = ""; BUILDCHAIN = ID; DIRECTION = "UP";
GoTo BUILDCHAIN
```

The above program offers you a selection list of all the people in LINK2. Once you choose one, it fills in the ID, NAME and RANK fields, blanks out CHAINOFCOMMAND, initializes BUILDCHAIN with your selected ID, sets DIRECTION and transfers programming control to BUILDCHAIN to finish the job.

The rest of the programming is in BUILDCHAIN. Because of the complexity of the logic, comments marked with *** are interspersed with the code. You will need to delete these comments before pasting this code into Q&A:

```
<BUILDCHAIN:
*** The "UP" loop traces back along the tree to find the top of the selected branch.
If DIRECTION = "UP" Then
{
*** See if the current BUILDCHAIN ID has a Previous value. If so, update BUILDCHAIN and loop.
  If @XLookup("LINK2",BUILDCHAIN,"ID","PREVIOUS") <> "NONE" And @XLookup("LINK2",BUILDCHAIN,"ID","LEVEL") > 0 Then {
BUILDCHAIN = XLookup("LINK2",BUILDCHAIN,"ID","PREVIOUS");
GoTo BUILDCHAIN
}
*** If the current BUILDCHAIN ID has no Previous value, see if it has a Parent value. If so, update BUILDCHAIN and loop.
  Else If @XLookup("LINK2",BUILDCHAIN,"ID","PARENT") <> "NONE" Then
  {
BUILDCHAIN =
@XLookup("LINK2",BUILDCHAIN,"ID","PARENT");
GoTo BUILDCHAIN
}
Else
*** When you find a node/record that has no Previous and no Parent, it is the top of the chain. Set DIRECTION and CHAIPTOP. Loop.
  {
DIRECTION = "DOWN";
CHAIPTOP = BUILDCHAIN;
GoTo BUILDCHAIN
}
};

*** Since the "UP" loop set DIRECTION to "DOWN", the next set of loops will run the "DOWN" code. The "DOWN" code runs recursively through the nodes, assembling the complete chain of command.
If DIRECTION = "DOWN" Then
{
*** Check for the Do No Print character (~). If it's not there, print the current CHAINVALUE (Rank + Name + ID)
```

```
with the correct indent. Otherwise, don't print anything and delete the Do Not Print character.
  If @Left(CHAINPLACE,1) <> "~" Then
CHAINOFCOMMAND = CHAINOFCOMMAND + "
" + @Txt(@XLookup("LINK2",BUILDCHAIN,"ID","LEVEL")," ")
+ @XLookup("LINK2",BUILDCHAIN,"ID","CHAINVALUE")
  Else
CHAINPLACE = @Del(CHAINPLACE,1,1);

*** See if the current BUILDCHAIN ID has a Child value. If so, set CHAINPLACE so we can come back to this spot in the tree. Update BUILDCHAIN and loop.
  If @XLookup("LINK2",BUILDCHAIN,"ID","CHILD") <> "NONE" Then
  {
CHAINPLACE = @Str(BUILDCHAIN) + @Str(CHAINPLACE);
BUILDCHAIN =
@XLookup("LINK2",BUILDCHAIN,"ID","CHILD");
GoTo BUILDCHAIN
}

*** If the current BUILDCHAIN ID has no Child value and we are not at the top of our tree, see if there is a Next value. If so, update BUILDCHAIN and loop.
  Else If BUILDCHAIN <> CHAIPTOP And
@XLookup("LINK2",BUILDCHAIN,"ID","NEXT") <> "NONE" Then
  {
BUILDCHAIN =
@XLookup("LINK2",BUILDCHAIN,"ID","NEXT");
GoTo BUILDCHAIN
}
Else
*** If there is no Next value or Child value, then we are at the end of this branch. Use CHAINPLACE to get to the next branch.
  {
If CHAIPTOP <> @Left(CHAINPLACE,4) Then
  {
*** If the next branch has somewhere to go, follow it. Otherwise, use the Do Not Print character to prevent CHAINVALUE from being printed again and loop to try the next branch.
  If @XLookup("LINK2",@Left(CHAINPLACE,4),"ID","NEXT") <> "NONE" Then
  {
BUILDCHAIN =
@XLookup("LINK2",@Left(CHAINPLACE,4),"ID","NEXT");
CHAINPLACE = @Del(CHAINPLACE,1,4);
} Else {
CHAINPLACE = @Del(CHAINPLACE,1,4);
CHAINPLACE = "~" + @Str(CHAINPLACE) } }
Else
*** If we have run through all the branches, we're done!
DIRECTION = "DONE";
GoTo BUILDCHAIN } };

*** If we're done, put the cursor in the upper left corner of the screen.
If DIRECTION = "DONE" Then {
GoTo HOME
}
}
```

Now, add a record to CHAIN2, select a name and watch it build the entire chain of command. If you use my sample databases, you'll find that each name you select builds one of two possible command trees.

This technique is so simple and so flexible that it can be very confusing. Take your time, look at how the data fits together and you will find it starting to make sense!

Next month, I'll finish up this series with an inventory example where the records/nodes being used are not as similar to each other as the chain of command examples. That's where linked lists really shine!

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The Nuts & Bolts Of Converting to Q&A for Windows, Part 1

JOHN DOW



ARE you a Q&A expert who has never touched Q&A for Windows but are debating whether to take the plunge? Perhaps your boss or a client is pressuring you to convert everything to the graphical Windows interface. If so, this article is for you. It will cover some things you need to think about for Q&A for Windows that are simply not important when using Q&A FOR DOS. It will also tell you about some skills you need to acquire and techniques you can use. My goal is to jump-start your efforts so it will take you less time to get up to speed than it did me.

Why Windows?

First, why consider Q&A for Windows? Everyone knows that it doesn't have macros and cross tab reports. And when Q&A 5.0 came along with enhancements like @Userselect and @Shell, Q&A for Windows was just left in the dust.

The main advantage of Q&A for Windows is that it has a graphical user interface (GUI) so it looks nicer and people can perform actions and get around by clicking on buttons and things. Many applications don't need the features that Q&A 5.0 offers and don't use macros, so Q&A for Windows has been working very well for them. For those who need this additional power, my DTFWIN program can more than make up the shortfall between Q&A 4.0 and Q&A 5.0. So converting from Q&A for DOS may be something you're considering more seriously now than ever before.

Another advantage of Q&A for Windows is that it has no special memory needs. It doesn't use Expanded Memory as the DOS versions do. As a result, it's easier to install and maintain on workstations.

Can you recommend Q&A for Windows in good conscience to your decision maker (whether it's you, your boss, or your client)? Is it reliable? There are in fact many people using it and they're not calling me or on the message board with lots of problems. My guess is that Q&A for Windows is just as stable as Q&A 4.0 for DOS. It's known to have a compatibility problem with Windows NT and Windows 2000 running on the workstation (I hope at some point to find a fix, but so far no such luck) and occasionally someone reports a problem, typically trying to run a particular report. I don't know much about the Millenium, which is the next Windows in the 95, 98 family,

but I assume there won't be any more problems there than with 95 and 98.

Q&A for Windows has far fewer problems with large drives than Q&A for DOS does - the only confirmed instance I know of is on my own computer with a 9G partition. Q&A for DOS is completely unusable with databases on this drive (unless, of course, I run Lesspace.com), but Q&A for Windows only seems to complain when copying the design. Because you will probably work with your databases with both Q&A for DOS and Q&A for Windows, make sure you conform to the DOS requirements. You could probably use Lesspace to keep Q&A for DOS happy and simply not use Q&A for Windows to copy the design. (TSR's are irrelevant for Windows programs.)

Beginning the conversion from Q&A for DOS to Q&A for Windows

I'm assuming you have a fully developed application using Q&A for DOS. Creating a database from scratch with Q&A for Windows is not the subject of this article. Let's now begin the process of turning your Q&A for DOS database into a double platform database—one you can use in both Q&A for DOS and Q&A for Windows.

First and very important: backup the database! It's probably a good idea to back it up frequently as you work on it. It only takes a moment. You might make a design change that you wish you hadn't, and since Q&A for Windows can only undo your most recent edit, it would be very nice to be able to go back to where you were 10 or 15 minutes ago.

Open the database in Q&A for Windows. If you're working with Q&A 4.0, Q&A for Windows 4.01 will give you a warning that you have to upgrade Q&A for DOS to a certain date executable otherwise you won't be able to access the database any more using Q&A for DOS. Go ahead and tell it that you want to convert the database. If your version Q&A for DOS needs to be upgraded, you can download Symantec's free "Interoperability Patch" from several Q&A-related Web sites, including mine (www.johntdow.com). Q&A 5.0 doesn't need this patch, so if you open a Q&A for DOS 5 database with Q&A for Windows 4.06, you won't receive any warning.

Having opened the database, you will see a newly created "Master Form." This is Q&A for Windows' attempt at converting your database from DOS to Windows. At this point the database has actually been

converted—it's just not a very esthetically pleasing design unless your database's design is very basic. But you can lookup data, add records, run reports and do mass updates, just as you can with Q&A for DOS.

The task now is to apply some creativity and good taste to turn this newly created Windows database into a masterpiece worthy of your good name. Where to begin? How about with the line draw characters that are often found in Q&A for DOS databases?

Q&A for DOS databases often include lines and boxes to provide a structure for the database form's pages. You will notice in the automatically created Master Form that these have been converted into thin lines. You will also notice that they don't look very eye-pleasing. They're too thin, and the text and fields are not in the same font as before. It's all quite different. There are better ways of providing structure for forms (which I will discuss later), so you will want to remove all these line draw lines at this point.

There are two ways of doing removing the lines.

The first way is to use your mouse to select each line or line segment, then press the Delete key. If there are a lot of lines, this could take time. The second way is to use DTFSPÉCS to speed up this process. Both techniques are described next. Then I'll come back to getting rid of the lines.

Selecting items with the mouse

Selecting items (sometimes called "objects") with the mouse is something you'll have to do many many times in Q&A for Windows. Here are a couple things you should know about selecting items that will eliminate a lot of frustration.

- To select a single item on the form, you just put the cursor directly over it and click the left mouse button once. Watch out if the form is complicated, because sometimes text items are larger than they appear and you can inadvertently select the wrong item. When an item is selected, little black squares appear at its corners.
- To select multiple items, you press and hold the Shift key while clicking on each item in turn. This isn't a standard by any stretch. For most Windows programs, you hold down the Control key instead.
- It can be difficult to select an item because you have to position the mouse directly on it. This is particularly difficult with a line because it's so thin. You might have to click and move the mouse a tiny bit and click again, and again, and again. With fields and other items that are "thick" enough, there's another problem; sometimes Q&A for Windows doesn't recognize your click and you have to click several times before an item is selected.

To avoid this multiple-click annoyance, start with the mouse to the side of the item (but not on top of any other

item) hold down the left button while dragging the mouse onto the item, then release the button. This will select the item every time. If it's a line, start to one side of it, drag across the line, then release the button. If you're selecting multiple items, you can drag the mouse over more than one in a single movement. You can also keep the Shift key depressed while doing this multiple times. You can actually select 50 or 100 items at once by holding down the Shift key and carefully dragging the mouse over one or more item at a time. In some cases you might use a dragging movement that draws a box around more than one item, but often it's sufficient just to drag the mouse in a straight motion across one or more items.

The few times Q&A for Windows has crashed on me while redesigning a form is when I've been selecting a large number of items. It's a good idea to run a backup before doing this.

With this dragging technique, you can't start with the mouse on top of an item because when you drag the mouse you'll move the item. Should this happen by mistake, before you release the Shift key, press the Esc key and the move will be canceled. If you don't catch it in time, pressing Ctrl-Z will undo the last operation.

Selecting items with DTFSPÉCS

Q&A for Windows does not have an edit choice to "Select all lines" or "Select all fields." in some cases, those choices would be a real time-saver.

For example, after I had been working on the design of a particular database, my client wanted the fields in a larger font. The database was a large one, with hundreds of fields. Selecting the fields would have been very time consuming. Although you can easily select more than one item at a time by dragging a "box" around them, this unfortunately selects all items in the scope, not just the ones you want. For example, text serving as fields labels would be selected along with the fields, and their font size would also be changed. This is probably not what you want.

To make it easier and quicker to select a large number of items at once, especially when they're intermingled with other items that should not be selected, I enhanced DTFSPÉCS so that it can move multiple items away from other items. Items to be moved are selected by type.

Using DTFSPÉCS to change the font size of all the fields in the database, I was able to do the following: With one command I moved all fields on all forms 15 inches to the right. It took just a few seconds. I then opened the database in Q&A for Windows, went to each form, clicked the slider bar to go to the right, drew a single rectangle that enclosed all the fields, and changed the font size. I was able to do the entire database in about 10 minutes. A single command with DTFSPÉCS moved all the fields 15 inches to the left, back to their original positions.

Removing the lines

Back now to converting the form.

If you don't use DTFSPACES, use the techniques I described earlier to select and delete all lines from the master form. If you use DTFSPACES, move all the lines to the right, then open the database in Q&A for Windows, select all the lines, and delete them with one keystroke.

Stop and plan

Now we have a database with a master form that has been purged of any lines but has all the fields and their labels on one unusable master form.

It's time to plan what the database should look like. Here is where it might be necessary to delve into activities that will seem foreign to Q&A for DOS experts. With a DOS database, you have to fit all the fields into 10 screen pages. You can PageUp and PageDown to move from page to page. You can use navigation programming to take you from page 1 directly to page 5 if you want. But you're quite limited in what you can do when designing the screens

In contrast, Q&A for Windows allows you to define what are called "forms." A form is similar to the set of 10 pages in Q&A for DOS. Each form can contain all the fields in the database, though it need not. A form could be three feet wide and seven feet high, in which case you'd need to use the scroll bars extensively to see it all. Actually, I don't recommend designing forms larger than your monitor, because in general scrolling is awkward. Never mind the fact that forms can be huge, here's the real difference between Q&A for DOS and Q&A for Windows—you can have as many as 300 of these forms for a single database!

Let me clarify. You can design forms that give you different subsets of the fields in the database. These forms can be targeted at specific tasks that users perform. You have tremendous flexibility in the way you present the information.

The point is that a Q&A for Windows database gives you, the developer, far more freedom than you have in Q&A for DOS. So what do you do with all that freedom?

You have to impose structure, that's what you do. Based on an analysis of the data in the database, you have to decide on a structure. Because you have more freedom than you do with a Q&A for DOS database form, this could actually require more effort than designing a DOS database.

Having developed a structure, you then create a set of forms that divide up and present the data within the confines of that structure.

Imposing Windows structure on a DOS database

To put some meat on these rather general statements, I'll offer a fictitious but typical database. For my business, let's say I have a customer database. But I keep far more information about my customers than just their names and addresses. I interact extensively with my customers

over a long period of time, so I learn a lot about them. I actually learn about some of their interests and family members. And I get new customers from existing customers. So my customer database has information about a customer's current address and his previous address, up to six family members, up to 10 referrals, and space for seven current and former positions. To summarize, I have the following subsets of data:

Type Of Data	Repetitions	Dos Pages	Form Names
Name and other basic information	1	1	Main
Address	2	1	Address 1,2
Family member	6	2	Family 1-6
Referral (2 per page)	10	3-7	Referral 1-10
Position (3 per page)	7	8-10	Position 1-3
Total	26	10	

In a Q&A DOS database, this information would all appear on 10 or fewer pages. If you just use a single form (that looks like the Q&A for DOS database pages glued together—the bottom of one page to the top of the next one), you'd have to scroll to see all the information. It looks much better to split out the data into separate forms, each with a relatively small part of the total.

Not only will you want to split out the information, you'll probably want to split it out so that each form isn't too crammed with information. For some reason, you can comfortably fit more fields into a DOS page than will fit nicely onto a Windows form that uses the same amount of monitor space. I don't really know why this is and you might disagree when you try it. However, for the purpose of this discussion, I'm going to plan for each of the repetitions above to be on its own form.

The information that fits into 10 Q&A for DOS pages and that can be accessed rapidly by pressing PageUp and PageDown now is on 26 forms that you can't access by repeatedly pressing a couple keys. This is why it's necessary to have a structure.

The structure

The structure I created for the forms in this database is shown below as an outline.

```

Main
  Addresses
    Address 1
    Address 2
  Family members
    Family 1
    Family 2
    Family 3
    Family 4
    Family 5
    Family 6
  Referrals
    Referral 1
    Referral 2
    Referral 3
    Referral 4
    Referral 5
    Referral 6
    Referral 7
    Referral 8
    Referral 9
  
```

Referral 10
 Positions
 Position 1
 Position 2
 Position 3
 Position 4
 Position 5
 Position 6
 Position 7

If an outline doesn't turn you on, another way you could represent the structure would be with the main form at the center of a hub, and surrounding it could be the different types of information (addresses, family members, and so on). It's up to you to decide the appropriate structure for your data and for your business rules and work flow.

Unfortunately, Q&A for Windows doesn't provide any structure for the 300 forms it supports. It only gives you the ability to select them from a list by name.

Even though Q&A for Windows doesn't provide a mechanism for showing structure, you can easily build such a mechanism by creating a "menu" form. A menu form is a strange beast by DOS standards. It's a form that has no fields. Instead, it has a set of buttons that take the user to the various forms. Figure 1 shows an example of a menu form for my sample customer database.

Because you create a menu form with any appearance you want, you can graphically portray a structure very clearly on the menu. My example hints at an outline. It's a

hierarchical or tree structure, but doesn't include lines or use any other visual technique to make the structure explicit, though you could certainly add such elements.

In addition to the menu, there's another way of representing the structure. You can put buttons on each form to link to the other forms. That's where we'll pick up the discussion in next month's concluding Part 2.

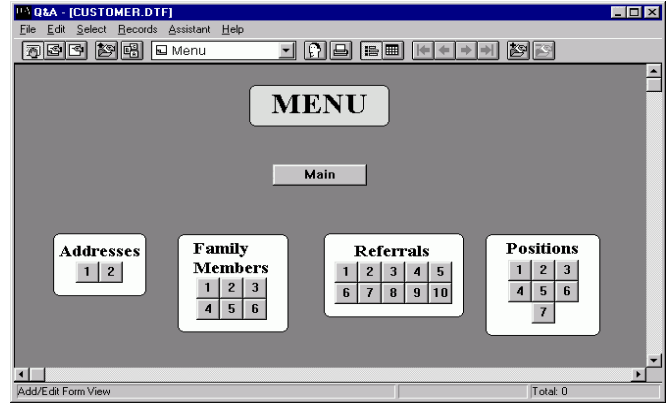


Figure 1. A menu form that contains nothing but clickable form-retrieval buttons.

John Dow is a Q&A developer and creator of a host of utilities and add-on programs for Q&A. Demo versions of many of his utilities can be downloaded from his Web site at www.johntdow.com.

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