

T·H·E Quick Answer

The independent monthly guide to Q&A expertise

June 1995

Loops, Arrays, and Bubble Sorting

Attention Q&A developers and power users: You can add variable arrays and loops to your Q&A for DOS and Q&A for Windows database programs to automate tasks you might have thought impossible. Here's a feast of undocumented programming potential that can make Q&A perform like the big boys.

By David E. Dvorin



I recently took on a job that sounded simple at first but quickly became complicated. The client showed me a database form containing invoice-like line-items and told me he wanted the following capabilities and features designed into the database:

- Expandability without programming changes. The client's form contained 10 line-items. Each line included a field for the date, item, description, cost, quantity, and amount. He wanted me to program the database so that he could expand the form at some future date (add more line-items) without having to modify the programming!
- Bubble sorting. The client also wanted the database programmed so that once the line-items were entered, Q&A would sort them by date and by cost within date. I was already staggering as I asked him whether he wanted an

ascending or descending sort. "Just make it user-selectable," he said!

Before I could hope to approach the problem in Q&A, I had to think in terms of general programming tools and concepts. I would need a way to simulate variables and variable arrays and perform loops—programming techniques not directly supported by Q&A. In the end I was able to accomplish the feat utilizing a little-known, but powerful Q&A function, called @Field. I'll show you how @Field works and how you can use it to extend programming functionality.

Variables and variable arrays

A variable is an area of memory where you store a value that can be used in calculations and operations. Though Q&A doesn't support variables in the pure sense, you can make variables out of field values and store them in fields designed for the

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README.1ST

How do you program a multi-line-item database so you can add more line-item fields to it later without having to update the Program Spec? While you're chewing on that, here's another requirement: the program has to sort the line-items by date. It's not getting any easier, is it? Here's the third requirement: the program must accommodate a *user-selectable* ascending or descending sort. Oh, and one more little thing: you have to build in a progress meter to display the program's progress as it reorders the line-items. Got it figured out yet? This is a gut-wrenching task for *any* database, but you can do it all in Q&A 4.0 for DOS and Q&A for Windows—and in a single Program Spec, to boot. **Dave Dvorin** shows you how in an article that bristles with power-programming ideas and techniques.

From the reader feedback we receive it's clear that many of you rely on Q&A to handle mailing list management and automate regular mail merges with letters, envelopes, and labels. Because I do a fair amount of consulting along this line, and because of increasingly stringent postal requirements, I decided to look into postal bar coding to help speed my clients' mail along and even save them a few bucks in postage. While working with a variety of techniques and third-party utilities, I came up with some solutions for Q&A for DOS and Q&A for Windows I think you'll find interesting. Whether you mail a few pieces each month, or a few thousand, you can make your mail travel faster and more reliably—and cheaper than you might have thought.

Q&A User Group Event Set for Mid-September

Plan now to attend the National Q&A User Group's 5th Annual Bash, September 15–17, 1995, just outside Washington D.C. Registration is only \$45 for *The Quick Answer* subscribers (includes user group membership). Hobnob with fellow Q&A enthusiasts, meet and hear top developers, and attend solution-oriented seminars and workshops. Bring your nagging Q&A questions and brilliant solutions. Spend three informative days with a fun-loving user group. Call 301-963-6377 for a fax-back flier containing the details.

Tom Marcellus
Editor

THE Quick Answer

Volume 6, Issue 6

Editor Tom Marcellus
Publisher Michael Bell

The Quick Answer (ISSN 1052-3820) is published monthly (12 times per year) by Marble Publications, Inc., 9717 Delamere Ct., Rockville, MD 20850. Cost of domestic subscriptions: 12 issues, \$79; 24 issues, \$142. Outside the U.S.: 12 issues, \$99; 24 issues, \$172. Single copy price: \$10; outside the U.S., \$12.50. All funds must be in U.S. currency. Back issues are available upon request, for the same price as a single copy.

Second-class postage pending at Rockville, MD. POSTMASTER: Send address changes to *The Quick Answer*, PO Box 9034, Gaithersburg, MD 20898-9034.

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Loops, Arrays, Sorting

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purpose. Consider the following programming statement:

```
If InvoiceDate < @Date - 60 then
    @Msg("This invoice is past due.")
```

In this example, InvoiceDate is being compared to another date to determine if a message should be displayed. The InvoiceDate field acts as a variable, and the date it holds is the value assigned to that variable.

A variable array is a series of variables. The array allows you to refer to the series by one name and use an index number to differentiate between the variables included in the array. For example, a commercial invoicing application would probably create an array for an Amount column, where each line-item's Amount would be referred to as Amount(1), Amount(2), Amount(3), and so forth. You can apply the same concept to Q&A "variables" by using fields named Amount1, Amount2, Amount3, and so forth, instead.

Loop the loop

One way to put arrays to use is to employ looping—a programming technique that repeats a series of actions based on a condition you specify. Loops are found in most programming languages. Loops, like variables, are not directly supported in Q&A, but you can simulate them. Consider the following sample loop:

```
: Initialize
Counter = 0

: Loop
Counter = Counter + 1
Amount(Counter) = Cost(Counter) *
    Quantity(Counter)

If Counter > Max # of Transactions
Then Goto BeyondLoop
Else Goto Loop
```

This isn't a valid Q&A program, but bear with me for a moment.

At the start of the program, I initialize a variable named Counter. In this example, Counter points to the line number that's a line-item.

In the Loop section of the program, I increment Counter and calculate the line-item's Amount by multiplying its Cost and Quantity. Amount, Cost, and Quantity are arrays. I'm using the same name to reference related items, distinguishing them by the

value in Counter. For example, if Counter is 3, then Amount(3) is Cost(3) multiplied by Quantity(3).

If Counter is greater than the maximum number of transactions, then the loop is exited. On the other hand, if Counter is less than or equal to the maximum number of transactions, the program loops back to increment Counter and calculate the next line-item's Amount.

In this sample loop logic, the loop condition is based on whether Counter is greater than the maximum number of transactions. The series of statements increments Counter and calculates each line-item's Amount.

The logic looks great on paper, but how do you turn it into valid Q&A programming code?

@Field to the rescue

The key to converting the loop logic into Q&A programming code is the @Field function. @Field's syntax is @Field(x)—you can abbreviate it @(x)—where x is a field name or field ID number. @Field simply points to field x. Consider the following examples:

1. Amount1 = Cost1 * Quantity1
2. @("Amount" + "1") = @("Cost" + "1") * @("Quantity" + "1")

Both of these statements perform the same action. They both say to store the product of the values in the fields Cost1 and Quantity1 in the field named Amount1. Example 1 is straightforward in that it uses field names. Example 2 isn't so obvious because it uses expressions to build the field names for the @Field functions. Although both programs yield the same result, they differ in how they reference fields. Example 1 is fixed, whereas Example 2 is flexible.

In my project, I couldn't program Example 1. If someone later expanded the form by adding more line-items, the Program Spec would need to be updated accordingly. To achieve the goal of Program Spec independence, I needed to come up with a way of using the Example 2 technique in a loop. To see how I did it, consider this third statement:

3. @("Amount" + @Str(Counter)) = @("Cost" + @Str(Counter)) * @("Quantity" + @Str(Counter))

In Example 3, I replaced the "1" in Example 2 with @Str(Counter). The result is the same, but now the "1" is based on the variable Counter. Using the value in the Counter field, I can make @Field return Amount1, Amount2, Amount3, and so forth, and the same for the Cost and Quantity fields, from line-item to line-item. In other words, @Field's ability to accept an expression as its argument lets me

simulate an array, and I can create a loop to increment that expression. Converting the loop logic I discussed earlier into a valid Q&A program is now possible. Consider this routine:

```
<#1000:
Counter = 0;
Goto Loop

<#1010:
Counter = Counter + 1;
@("Amount" + @Str(Counter)) =
  @("Cost" + @Str(Counter)) * @("Quantity" +
  @Str(Counter));
If Counter > @Lookup(MaxTrans, 1)
then Goto BeyondLoop
else Goto Loop
```

In this program, Counter is field #1000 and Loop is field #1010. BeyondLoop is a field elsewhere on the form. Column 1 of the Lookup Table contains the maximum number of line-items on the form, and the Key value for the @Lookup command is MaxTrans. If MaxTrans is set to 100, the loop will perform the Amount = Cost * Quantity calculations for line-items 1 through 100.

If the client decides to add more line items to the form, he needs to update only these two areas:

1. At the Field Names Spec, assign names to the new fields, following the proper naming convention. In this case, the names are Amount x , Cost x , and Quantity x , where x is the line-item number.
2. In the Lookup Table, update the value for the new maximum number of line-items.

Now that you've seen how loops and arrays can be simulated in a Q&A program, how can you put them to use?

Bubble sorting

As its name suggests, a bubble sort is a sorting technique. In Q&A, it's applicable to sorting items within a record. In my project, the client had a database with several line-items, each with a Date, Item, Description, Cost, Quantity, and Amount field. He wanted these line-items sorted by date and cost, and he wanted the option to select an ascending or descending sort order.

To get moving in the right direction, I turned to the bubble sort example on pages A-14 and A-15 of the Q&A 4.0 *Application Programming Tools Manual* and to the "Power Bubble Sorting" article in the October 1992 issue of *The Quick Answer*. In this article, Mike Bell discussed the following shortcomings of the manual's bubble sorting technique, and how to overcome them:

- The technique sorts only numbers.
- Empty fields are placed first in the sort order.
- The sort can only be performed on one field.
- The technique sorts in descending order only.
- Slow performance

I wrote a new bubble sort routine. By incorporating my variable array technique, I tackled the first three issues. By creating loops, I addressed the last two. But I also had the problem of a multifield sort. I needed to sort by Date and then Cost. If there were two transactions on the same day, the Cost field had to determine the sort order. The manual's bubble sort technique wasn't designed to deal with this.

The bubble sort database

My bubble sort database (BBL_SORT.DTF) is shown in Figures 1 and 2. Though BBL_SORT was created

Figure 1. Page 1 of the BBL_SORT database is for data entry.

Figure 2. Page 2 of the BBL_SORT database contains read-only fields for the programming.

in Q&A 4.0 for DOS, it works in Q&A for Windows as well. Figure 1 shows page 1 of the layout. It looks like a simple invoice with the Ship To and Bill To area and the invoice body containing the line-items. Figure 2 shows page 2 of the database, where the additional fields required to perform the sorting are located.

The key to BBL_SORT is the naming convention for the line-item fields. The first line-item's fields are named Date1, Item1, Desc1, Cost1, Quantity1, and Amount1. The second line-item's fields have the same names but with a "2" suffix, and so on for each of the seven line-items.

Page 2 of the form (see Figure 2) includes what I call transaction or Trans fields—one Trans field for each line-item. These text fields follow the convention for the line-item fields; that is, Trans1, Trans2, Trans3, and so forth. They're used to store the concatenated line-item field values, which I'll describe later.

The remaining page 2 fields are described in Table 1. All fields are formatted for text except Counter and NumOfTrans, which are formatted NO for numbers with zero decimal places. All the page 2 fields are read-only. The Sort field's Navigation Spec is >#1: Goto Sort, and the Restrict Spec for the SortOrder field contains Ascending and Descending.

Table 1. BBL_SORT's page 2 fields.

Number	Name	Description
400	Counter	Holds the current loop value.
410	NumOfTrans	Contains the number of line-items on the invoice.
420	BuildTrans	Concatenates the line-items fields for the Trans fields.
430	Sort	First sort field.
440	Swap	Second sort field.
450	SwapValue	Third sort field.
460	Parse	Parses the Trans fields into their line-item values.
---	Position	Assists in parsing the Trans fields.
---	Length	Assists in parsing the Trans fields.

Programming

Listing 1 is BBL_SORT's Program Spec. The field names correspond to Table 1. An explanation of the status messages displayed at each step during program execution follows the programming:

Listing 1. BBL_SORT Program Spec.

```
Sort Order
>#399:
@Msg("Initializing...");
Clear(AmountTotal, Counter, NumOfTrans, Swap,
      SwapValue);
Goto Counter

Counter
<#400:
```

```
Counter = 1;
NumOfTrans = 0;
AmountTotal = 0;
@Msg("Seeing how many transactions there are...");
Goto NumOfTrans;

NumOfTrans
<#410:
If Counter <= @Lookup("MaxTrans", 1) and
@Len( @("Date" + @Str(Counter)) ) > 0 and
@Len( @("Cost" + @Str(Counter)) ) > 0
then {NumOfTrans = NumOfTrans + 1;
      Counter = Counter + 1;
      Goto NumOfTrans};

Counter = 1;
@Msg("Preparing for sort...");
Goto BuildTrans

BuildTrans
<#420:
If Counter < NumOfTrans + 1
then
{@"Amount" + @Str(Counter)} = @("Cost" +
@Str(Counter)) * @("Qty" + @Str(Counter));
@"Trans" + @Str(Counter) =
"Date=" + @("Date" + @Str(Counter)) +
"Cost=" + @("Cost" + @Str(Counter)) +
"Item=" + @("Item" + @Str(Counter)) +
"Desc=" + @("Desc" + @Str(Counter)) +
"Qty=" + @("Qty" + @Str(Counter)) +
"Amount=" + @("Amount" + @Str(Counter));
AmountTotal = AmountTotal + @("Amount"+
@Str(Counter));
Clear(@("Date" + @Str(Counter)),
@("Item" + @Str(Counter)),
@("Desc" + @Str(Counter)),
@("Cost" + @Str(Counter)),
@("Qty" + @Str(Counter)),
@("Amount" + @Str(Counter)) );
Counter = Counter + 1;
Goto BuildTrans};

Counter = 1;
Swap = "No";
@Msg("Sorting...");
Goto Sort

Sort
<#430:
If (@("Trans" + @Str(Counter)) > @("Trans" +
@Str(Counter+1)) and SortOrder = "Ascending") or
(@("Trans" + @Str(Counter)) < @("Trans" +
@Str(Counter+1))
and SortOrder = "Descending")
then Gosub Swap;
Gosub SwapValue;
If Swap <> "Completed"
then Goto Sort
else {Counter = 1;
@Msg("Inserting sorted transactions...");
Goto Parse}

Swap
<#440:
Swap = "Yes";
SwapValue = @("Trans" + @Str(Counter));
@"Trans" + @Str(Counter) = @("Trans" +
@Str(Counter+1));
@"Trans" + @Str(Counter+1) = SwapValue;
Return

SwapValue
<#450:
If Counter < NumOfTrans - 1
then {Counter = Counter + 1;
      Return}
else {If Swap = "Yes"
      then {Swap = "No";
            Counter = 1;
            Return}}
```

```

        else {Swap = "Completed";
              Return } }

Parse
<#460:
If Counter < NumOfTrans + 1
then
  {Position = @Instr@("Trans" + @Str(Counter)),
    "Date=") + @Len("Date=");
   Length  = @Instr@("Trans" + @Str(Counter)),
    "Cost=") - Position;
   @("Date" + @Str(Counter)) = @Mid@("Trans" +
    @Str(Counter)), Position, Length);

   Position = @Instr@("Trans" + @Str(Counter)),
    "Item=") + @Len("Item=");
   Length  = @Instr@("Trans" + @Str(Counter)),
    "Desc=") - Position;
   @("Item" + @Str(Counter)) = @Mid@("Trans" +
    @Str(Counter)), Position, Length);
   Position = @Instr@("Trans" + @Str(Counter)),
    "Desc=") + @Len("Desc=");
   Length  = @Instr@("Trans" + @Str(Counter)),
    "Qty=") - Position;
   @("Desc" + @Str(Counter)) = @Mid@("Trans" +
    @Str(Counter)), Position, Length);
   Position = @Instr@("Trans" + @Str(Counter)),
    "Cost=") + @Len("Cost=");
   Length  = @Instr@("Trans" + @Str(Counter)),
    "Item=") - Position;
   @("Cost" + @Str(Counter)) = @Mid@("Trans" +
    @Str(Counter)), Position, Length);
   Position = @Instr@("Trans" + @Str(Counter)),
    "Qty=") + @Len("Qty=");
   Length  = @Instr@("Trans" + @Str(Counter)),
    "Amount=") - Position;
   @("Qty" + @Str(Counter)) = @Mid@("Trans" +
    @Str(Counter)), Position, Length);
   Position = @Instr@("Trans" + @Str(Counter)),
    "Amount=") + @Len("Amount=");
   Length  = @Len( @("Trans" + @Str(Counter)) -
    Position + 1;
   @("Amount" + @Str(Counter)) = @TN( @Mid@("Trans" +
    @Str(Counter)), Position, Length );
   Counter = Counter + 1;
   Goto Parse};

@Msg("Sorting completed.");
Goto SortOrder

```

Status messages

Initializing

The Order and Counter field programs are executed, initializing the variables.

Seeing how many transactions there are

The NumOfTrans program executes. Using a loop and the MaxTrans value stored in the Lookup Table, the program checks to see how many line-items there are.

Preparing for sort

The BuildTrans program executes, building the Trans fields by concatenating each line-item's fields (Date, Cost, Item, Description, and Amount). The sorting to follow is performed on the Trans fields.

Sorting

The sort operation is performed by the programs in Sort, Swap, and SwapValue. The Sort field program provides the framework. It calls Swap to swap two Trans fields when their sort order needs to be determined. SwapValue determines what to do once the swap has occurred; it either checks to see if further sorting is required or exits the sort operation and moves to Parse.

Inserting sorted transactions

The Parse program executes. The Trans fields have been sorted, and their strings are now parsed into the corresponding line-item fields on page 1 of the form. (Parsing separates a string value into smaller components—it's the opposite of concatenation.)

Using BBB_SORT

Using BBL_SORT is easy. First, you fill in the header section of the invoice, followed by the line-items. Then, you press Alt-F7 from the SortOrder field to choose the desired sort order. When you exit the SortOrder field, the sorting begins. While the sorting is occurring, BBL_SORT's page 2 is displayed along with the status messages at the bottom of the screen. When the work is done, the program displays the message "Sort completed . . ." and control is returned to the SortOrder field on page 1.

[Curious about how well Dave's database performed, I ran a few quick tests on my 486DX2/50 PC. I found his routine surprisingly nimble for the amount of work it does, which includes calculating the extensions for the Amount fields and totaling the invoice. The routine processed seven line-items in four seconds whether I chose an ascending or descending sort. The performance you'll get depends on your own system's configuration and the number of line-items processed —Ed.]

David Dvorin owns Phoenix Solutions of Hillsborough, New Jersey, which specializes in tailoring off-the-shelf software for a broad range of business needs. His bubble sort database is available as presented in this article or custom configured. 908-281-6272.

Add a Progress Meter to a Loop

For your programs that contain loops, you can keep the user apprised of execution status by incorporating a progress meter into the program. Similar to the built-in progress meter Q&A displays when performing a sort, your programmed meter can display a visual representation of the status of program execution.

I use the @Msg function and the message line at the bottom of the screen to display my progress meter. The technique requires no additional fields but involves some modification to the program containing the loop. BBL_SORT includes three fields with loops: NumOfTrans, BuildTrans, and Parse. I added my progress meter routine to the loop in Parse. The following program replaces the Parse program I described earlier:

```
<#460:
If Counter < NumOfTrans + 1
  then {
    Position = @Instr(@"Trans" + @Str(Counter)),
      "Date=") + @Len("Date=");
    Length = @Instr(@"Trans" + @Str(Counter)),
      "Cost=") - Position;
    @"Date" + @Str(Counter) = @Mid(@"Trans" +
      @Str(Counter)), Position, Length);

    Position = @Instr(@"Trans" + @Str(Counter)),
      "Item=") + @Len("Item=");
    Length = @Instr(@"Trans" + @Str(Counter)),
      "Desc=") - Position;
    @"Item" + @Str(Counter) = @Mid(@"Trans" +
      @Str(Counter)), Position, Length);

    Position = @Instr(@"Trans" + @Str(Counter)),
      "Desc=") + @Len("Desc=");
    Length = @Instr(@"Trans" + @Str(Counter)),
      "Qty=") - Position;
    @"Desc" + @Str(Counter) = @Mid(@"Trans" +
      @Str(Counter)), Position, Length);

    Position = @Instr(@"Trans" + @Str(Counter)),
      "Cost=") + @Len("Cost=");
    Length = @Instr(@"Trans" + @Str(Counter)),
      "Item=") - Position;
    @"Cost" + @Str(Counter) = @Mid(@"Trans" +
      @Str(Counter)), Position, Length);

    Position = @Instr(@"Trans" + @Str(Counter)),
      "Qty=") + @Len("Qty=");
    Length = @Instr(@"Trans" + @Str(Counter)),
      "Amount=") - Position;
    @"Qty" + @Str(Counter) = @Mid(@"Trans" +
      @Str(Counter)), Position, Length);

    Position = @Instr(@"Trans" + @Str(Counter)),
      "Amount=") + @Len("Amount=");
    Length = @Len( @("Trans" + @Str(Counter))
      - Position + 1;
    @"Amount" + @Str(Counter) = @TN( @Mid(@"Trans"
      + @Str(Counter)), Position, Length) );

    @Msg(@Text( @Int( Counter * 40 / NumOfTrans),
      @Chr(178)) + @Text(40 - @Int( Counter * 40
      / NumOfTrans), @Chr(177)) +
      " " + @Str(@Int((Counter * 100) /
      NumOfTrans)) +
      "% - Working on #" + @Str(Counter) + " of " +
      @Str(NumOfTrans) + ".");
```

```
Counter = Counter + 1;
Goto Parse
}
else {@Msg(@Text(40, @Chr(178)) + " 100% -
      Sort completed.");
Goto SortOrder}
```

Using this program, a progress meter appears when you exit the SortOrder field and the parsing step begins. Figure 3 shows what it looks like.

At the heart of the progress meter is the @Text function. @Text's syntax, @Text(n,x), returns a text value consisting of n copies of string x. For example, @Text(3,"*") returns three asterisks.

The meter displays two characters, one for the completed portion of the program, and another for the uncompleted portion. Each portion has its own @Text function. The length of the completed portion is determined by the percentage completed (Period/NumPeriods) multiplied by the meter width of 40. The second portion's length (the uncompleted portion) is the remaining portion of the meter's width, or the difference between the meter width and the length of the completed portion.

I use ASCII character 177—@Chr(177)—for the completed portion, and ASCII character 178—@Chr(178)—for the uncompleted portion. You can use any two ASCII characters you want, but 177 and 178 provide a visibly attractive contrast.

I put a finishing touch on the meter by adding the numerical percentage of completion and other status information. (See Figure 3.) You can customize such messages as you see fit, just keep in mind that @Msg can display only up to 80 characters on the message line.

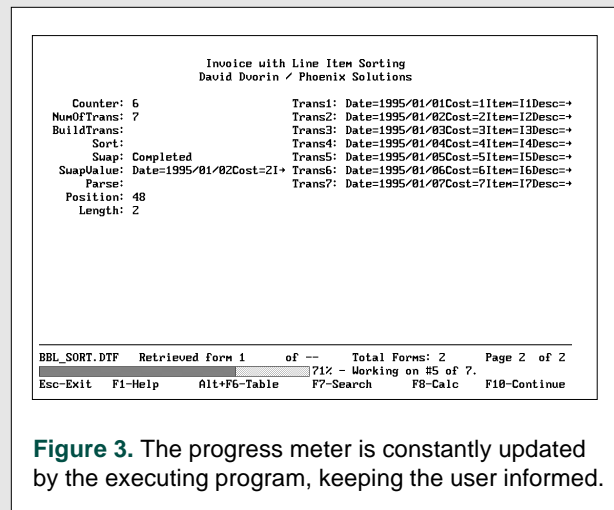


Figure 3. The progress meter is constantly updated by the executing program, keeping the user informed.

Edited by Dave Reid

Combine Fields on a New Line



I use Q&A to store information about patients in our hospital-based HMO. Each record includes the patient's primary physician though that physician's services can be terminated

at any time and a new physician can take over. I want to track the Effective Date and Termination Date of all the primary physicians the patient has used. Currently, I store this information in a History field by inserting a few spaces and a line of asterisks to separate each previous Physician, Effective Date, and Termination Date. I'd like to format the field so that each Physician, Effective Date, and Termination Date automatically begins on a new line in the History field.

Craig Landes, Batavia, Illinois

Figure 1 shows a sample Patient Information form with a History field you can expand (by pressing F6) to view the history of primary physicians. To have Q&A automatically keep the History field up to date, type the following program in the Termination Date field in the Program Spec:

```
>If Termination Date <> "" Then
{
  History = History + "
+ Physician + " - " + @Str(Effective Date)
+ " to " @Str(Termination Date);
  Clear(Physician, Effective Date,
```

```
Termination Date);
Goto Physician;
}
```

The program executes when you type in a Termination Date and exit the field. Q&A appends the data to the end of the History field on the next blank line because of the carriage return between the set of double quotes:

```
History = History + "
" + . . .
```

When you type the program, include a carriage return (press the Enter key) between the double quotes. If you want a blank line between each entry, you can add two carriage returns between the double quotes. The dates Q&A returns to the History field will be in Q&A's internal format; for example, 1995/06/22 for June 22, 1995. The balance of the program clears the three fields and positions the cursor in the Physician field, ready for you to enter the new physician's name and effective date.

[To make the History field easier to read, you can add a programming step to further format the entries. For example, you can add dot leaders between the physician's name and the dates to make the entries align like this:

Michael Roberts MD.....1984/02/01 to 1985/03/18
William Sweet MD.....1985/03/18 to 1987/06/02
Jane Austin MD.....1987/06/02 to 1991/07/12
Percival Westerhaven MD...1991/07/12 to 1994/12/28

Simply replace the dash along with its surrounding quotes with the following expression:

```
@Text(@Width(Physician)-@Len(Physician),".")
```

This expression subtracts the length of the physician's name from the width of the field and fills the remaining spaces with periods.—Ed.]

Sort Reports By Derived Values



I print a report that lists our sales offices around the country. I usually sort the report in Office Number order. Recently, however, we decided to sort first by State, and then by Office Number. I know how to sort the State field (1,AS) and then sort the Office Number within State (2,AS), but I need to sort by the full state name rather than the postal abbreviation. Can Q&A convert the state abbreviations to the full state name for sorting purposes only? I need to leave the state abbreviations in the database for mailings.

Julie Waters, Belvidere, Illinois

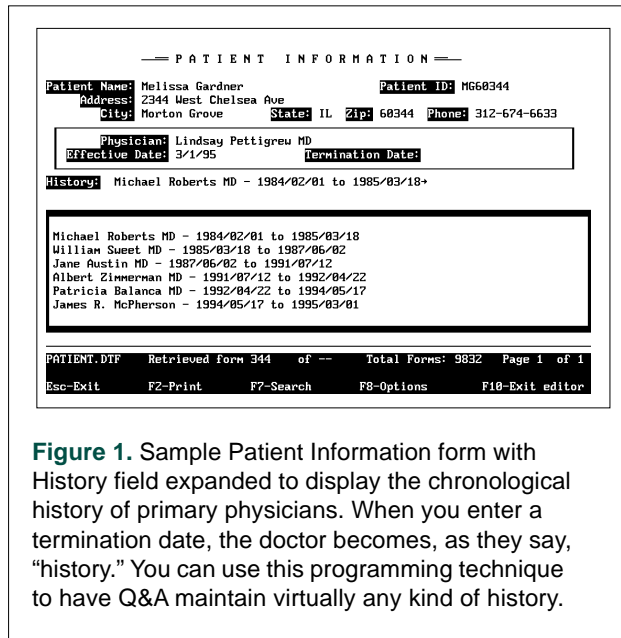


Figure 1. Sample Patient Information form with History field expanded to display the chronological history of primary physicians. When you enter a termination date, the doctor becomes, as they say, "history." You can use this programming technique to have Q&A maintain virtually any kind of history.

You can get exactly what you need by creating a simple Lookup Table for the database. Choose *Edit lookup table* from the Programming menu. In the Key column of the table, type in all the two-letter state abbreviations and fill column 1 with the corresponding state names, like this:

AK	Alaska
AL	Alabama
CA	California
OR	Oregon

The order of the entries doesn't matter, as long as you match the full state names with their correct postal abbreviations. Next, redesign your report by adding the following Derived Column:

```
Heading: State
Formula: @Lookup(State, 1)
Column Spec: 1,AS
```

In the Column/Sort Spec for the report, the Office Number field should be 2,AS. (Unless you want to include the State field elsewhere in your report, it should contain no Column/Sort Spec codes.) When you print the report, Q&A will use your Lookup Table to convert each record's state value (the postal abbreviation) into the full state name, then sort by these names. If a record includes a nonstandard state abbreviation (one that doesn't appear in the Lookup Table), Q&A places it at the beginning of the report. You can then edit the table or change the pertinent record(s) and reprint the report.

Subtotal Time Values



I successfully used a suggestion in the February 1994 issue of *The Quick Answer* (page 9) that explained how to track the time a student spends in a class and display the result in an hours:minutes format. I'd like to use this same approach in a report; that is, I want to subtotal these time values and display the results in the same format.

Aryeh Sherman, Philadelphia, Pennsylvania

The solution you're referring to included two fields: Total Time and Display. The Total Time field stored the number of minutes, and the Display field stored the output formatted as you've indicated. For your report, you'll need to calculate the total for the Total Time field and display the formatted result in another column. You can use the same programming logic that appeared in the February 1994 issue.

Create a report with the following Column/Sort Spec:

```
Student Name: 1,AS
Display: 2
Total Time: 3,ST,I
```

Here, you're subtotaling the Total Time field but making it invisible because you want to display the time in a custom format. Add the following derived columns to format the time value and print it once for each student:

```
Heading: Hours Part
Formula: @Str( @Int( @Total(#3, #1) / 60 ) + ":"
Column Spec: 5,I
```

```
Heading: Minutes Part
Formula: @Right("00"+ @Str( @Mod( @Total(#3, #1), 60)),
2)
Column Spec: 6,I
```

```
Heading: Total Time!In Classes
Formula: @Text(#1<>#50, @Str(#5) + @Str(#6) )
Column Spec: 7
```

```
Heading: Delayed copy of Student Name
Formula: #1
Column Spec: 50,I
```

Columns 5 and 6 calculate and format the hours and minutes for each subtotal. (Column 5 divides the subtotal by 60 and returns the integer portion, while column 6 returns the remainder.) Column 7 combines the two parts and, in conjunction with column 50, forces the value to print only once for each student.

Control Your Alternate Programs



I have a large Q&A 4.0 macro file. Though I've been told not to use Ctrl-key combinations for my macros, I've recently started using them because I ran out of Alt-key combinations. I've encountered only one problem: I can't get Q&A to recognize them for alternate Main menu programs. When I try to use them to launch alternate programs, I receive messages such as "Alternate program: ctrlc cannot be found." What am I doing wrong?

Walt Weaver, Lincoln, Nebraska

Q&A doesn't allow macros with Ctrl-key combinations to be used as alternate program macros. Only Alt-key combinations, such as Alt-A or Alt-D can be used. Therefore, any macro you want to run from the Main menu must be defined with an Alt-key combination. I should point out that Q&A doesn't require you to assign key identifiers to your macros. You can assign names to them instead and run them from custom menus or the List of Macros. You can display the List of Macros from anywhere in Q&A by pressing Alt-F2.

Change Your Default Font in Q&A Write



Is it possible to change the default font in Q&A Write for Windows? I'd like my default font to be 10-point Arial, not 12-point Times New Roman.

Quentin May, Mannheim, Germany

Start Q&A Write so you have a new, untitled document onscreen. From the Edit menu, choose Select. Then, from the submenu, choose All. Pull down the list of fonts and choose Arial. Pull down the list of point sizes and choose 10 point. Then, pull down the File menu and choose Save As. In the Save As dialog box, pull down the Save Files of Type box and select Q&A Write Template. Enter a file name, such as BLANK.QWT, and click OK. Pull down the File menu, choose Preferences, and then choose File from the submenu. In the File Preferences dialog box, click the Select Default Document button.

Again, change the List Files of Type box to Q&A Write Template, select the file named BLANK.QWT, and click OK. Now, when you start a new document, the default font will be 10-point Arial. You can change other default settings for BLANK.QWT, such as its page dimensions. If you do, remember to resave the file as a template.

Dave Reid is a Symantec senior support analyst providing second-level assistance to the technical support reps. He's also the coauthor of *The Q&A 4.0 Wiley Command Reference*, published by John Wiley and Sons and works as an independent Q&A consultant. PO Box 12083, Eugene, OR 97440.



Have a nagging question? Send it to **@Help, The Quick Answer, Marble Publications Inc., PO Box 9034, Gaithersburg, MD 20898-9034 or fax to 301-424-1658**. When writing, please include your name, address, and phone number, along with your Q&A version number (and whether DOS or Windows) and a detailed description of the problem. We will publish those questions we feel are of general reader interest; individual responses are not possible.

QUICKTIP

Avoid Risk to Your Macro File



If you're running Q&A for DOS in Windows, don't attempt to run a Q&A macro containing commands that invoke Windows-specific actions, such as displaying the Task List (Ctrl-Esc), switching to another program (Alt-Tab), or running Q&A in a Window (Alt-

Spacebar or Alt-Enter). If you do, you can blow your macro file clean out of existence.

Tom Marcellus

QUICKTIP

Better Envelope Printing



Q&A for DOS's envelope printing features don't work well with my laser printer, even with added printer control codes. I've found a better way. With my letter displayed, I save it with Shift-F8, move the cursor to the beginning of the name and address block, and run a macro that performs the following steps:

1. Block deletes the address block.
2. "Presses" Esc and gets my landscape formatted document named ENVELOPE.DOC, in which the left margin is set half way across the page, and the cursor is positioned half way down the page.

4. Answers Yes to abandon changes to the previous document.
5. "Presses" Shift-F7 to restore the deleted address block at the optimum position for the envelope.
6. Prints the document to the landscape printer (I place an envelope in the feed tray).
7. Exits ENVELOPE.DOC without saving it, and returns to the Write menu.

I use this macro with every letter I mail.

Roger Skidmore, Isle of Wight, Great Britain.

Easy-to-Use Utilities Make Your Mail Look Better and Travel Faster

Whether you mail a few or a few hundred pieces a week, these utilities work with your Q&A database to print envelopes and labels complete with postal bar codes.

Reviewed by Tom Marcellus



YOU want good-looking, accurately addressed envelopes and mailing labels. And if you can save on postage by adding postal bar codes to your mailing pieces, so much the better. I discovered two Windows add-ons—and a DOS bar coding utility—that expand your options for printing envelopes and labels.

A special font included with POSTools (see the “Resources” sidebar) prints approved Postnet bar codes on your Q&A for Windows output. Another utility, Dazzle Plus, helps you quickly design stunning envelopes and mailing labels. And if you have a modem, you can use its Dial-A-Zip feature to obtain address corrections and delivery point ZIP codes from post office computers. If you use Q&A for DOS and have Windows installed on your PC, you can still use Dazzle Plus. If you don’t have Windows, you can use a terminate-and-stay-resident program (TSR) called BAR_LITE to print postal bar codes on your output. I’ll show you how to get the most from these utilities with both editions of Q&A.

What you need

Postal bar codes on envelopes and labels help speed mail along, ensure accurate delivery, and can earn bulk mail discounts. Getting the nine-digit ZIP+4 or 11-digit delivery point ZIP codes is the first step. If you have a modem, Dazzle Plus’ Dial-A-Zip can do this for you. Another option is to use the post office’s address correction service. You give the post office an ASCII export file of your addresses, and it returns the file with address corrections and delivery point ZIP codes. Other options include commercial address correction services and systems.

Once you have the extended ZIP codes in your database, it’s just a matter of configuring Q&A and the utilities to print the bar codes on your mailing pieces.

Postnet bar code font

Azalea Software’s POSTools creates bar code strings from ZIP codes and comes with a Windows TrueType font you can use to transform those

strings to approved Postnet bar codes. Because you can write a Q&A program to create the bar code strings more efficiently, all you really need from POSTools’ is the bar code font. If you’re on CompuServe, you can download it in a file named ZIPBAR.ZIP. (You can find it in the DTP and ZiffNet file libraries.) The unzipped file contains ZIPCODEB.TTF. Add this file to Windows’ font list via the Control Panel, and the ZipCodeBarCodeTT font will appear on Q&A’s font list.

Calculate the ZIP code check digit

A Postnet bar code includes start and stop bars and bars for the ZIP code’s digits and check digit. To calculate the check digit, add the ZIP code digits, then determine what number must be added to that total to make the next multiple of 10. Marble Publication’s nine-digit ZIP code is 20898-9034. The sum of the digits is 43, the next multiple of 10 is 50, so subtract 43 from 50 to get the check digit of 7.

The ZipCodeBarCodeTT font works with a string value in the format *s+ZIP code+check digit+s*. (Marble’s ZIP code string would be *s2089890347s*.) When you apply the font to a such a string, it’s transformed into the corresponding Postnet bar code.

Let Q&A do the work

Q&A can calculate the ZIP code’s check digit, create the bar code string value, and place it in a field. You simply apply the bar code font to the field and, *voilà*, its value is transformed into the Postnet bar code. I’ll demonstrate using CONTACT.DTF, a ready-to-use database that comes with Q&A for Windows. CONTACT includes a custom Rolodex form (see Figure 1) in addition to a Master form (see Figure 3).

Start by adding a new text field named Barcode to the CONTACT database, then redesign the Rolodex form, centering the Barcode field under the Rolodex card as shown in Figure 1. Size the field to three inches in length, and remove the label so only the field remains. Apply the 16-point ZipCodeBarcodeTT font to it, and a series of boxes will appear in the field.

You can add the Barcode field just to the Master form. (See Figure 3.) This way, the field will be available for use in mail merges without upsetting your custom form's appearance. Also, you don't have to apply the font to the field on the form (the Figure 3 Barcode field contains only the string value)—you can apply it to the merge field in your template.

You can now write the program that calculates the check digit and creates the bar code string value. Type the following program in your Zip Code field:

```
> Zip Code = @Num(Zip Code);
Barcode = @TN(@Left(Zip Code,1))+
@TN(@Mid(Zip Code,2,1)) +
@TN(@Mid(Zip Code,3,1)) +
@TN(@Mid(Zip Code,4,1)) +
@TN(@Mid(Zip Code,5,1)) +
@TN(@Mid(Zip Code,6,1)) +
@TN(@Mid(Zip Code,7,1)) +
@TN(@Mid(Zip Code,8,1)) +
@TN(@Mid(Zip Code,9,1)) +
@TN(@Mid(Zip Code,10,1))+
@TN(@Mid(Zip Code,11,1));
Barcode=@Right(100-Barcode,1);
Barcode = "s" + Zip Code+Barcode + "s";
If @Len(Zip Code) > 5 then
Zip Code = @Left(Zip Code, 5) + "-" +
@Mid(Zip Code,6,6)
```

The program executes when you exit the Zip Code field. It strips the dash from the ZIP code, and calculates the check digit by adding the ZIP code digits and subtracting the rightmost digit of the sum from 100. It then creates the bar code string for the Barcode field and restores the dash.

You can also turn this program into a Mass Update Spec, so all your address records are bar code ready.

To test your program, change to Add/Edit, move to the Zip Code field, type in a Zip+4 or 11-

digit ZIP code, and press Tab. If you've used the bar code font for the Barcode field, the bar code should appear just below the Rolodex form; otherwise, just the string value will appear. You can now add the Barcode field to your merge letter, envelope, or mailing label.

POSTools also comes with a PostScript bar code font, as well as several .EPS and .TIF files containing Facing Identification Marks (FIMs) that you can include on your bar coded envelopes.

Dazzle Plus for dazzling envelopes—and more

Dazzle Plus from Envelope Manager Software helps you create gorgeous envelopes and labels, but does a whole lot more. (See Figure 2.) What makes this Windows program an outstanding value is its powerful Dial-A-Zip feature. With a modem, you can have Dial-A-Zip automatically call a post office computer to obtain online address corrections and 11-digit delivery point ZIP codes for one or 100 or more addresses.

Make Dazzle Plus work with Q&A

To pass the address in the Q&A for Windows record you're viewing to Dazzle Plus, you can use Windows' Clipboard or an export file. The export file option is mandatory if you're using Q&A for DOS or passing multiple addresses.

The tricky part about using the Clipboard is copying the whole address (for example, name, street, city, state, and ZIP code) as a single block. One way to do this is to have Q&A copy the various address fields to a multiline field, even if only temporarily. You can then pass the whole address to Dazzle Plus via the Clipboard.

Follow the installation instructions that come with Dazzle Plus and set it to run minimized. This way, when you start the program, it won't display

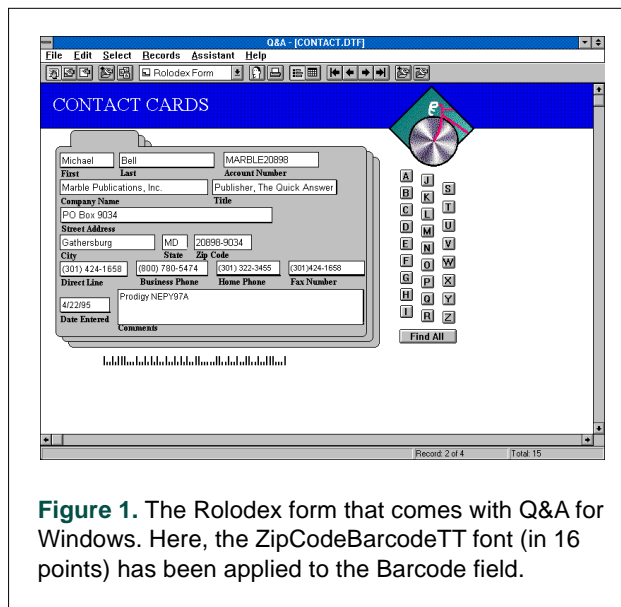


Figure 1. The Rolodex form that comes with Q&A for Windows. Here, the ZipCodeBarcodeTT font (in 16 points) has been applied to the Barcode field.

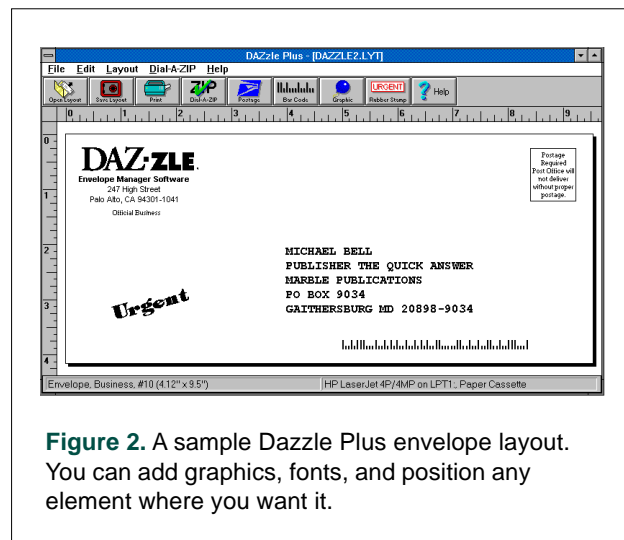


Figure 2. A sample Dazzle Plus envelope layout. You can add graphics, fonts, and position any element where you want it.

but will be available to switch to from Q&A. You can add Dazzle Plus to your Windows StartUp group, so it will start minimized when you start Windows. Your Windows manual tells you how to do this.

Next, consult the documentation that comes with Dazzle Plus to specify your preferences and create your envelope layout. Don't forget to select your printer and modem (if you have one), along with the post office you want Dial-A-Zip to call. When you've got everything working, save the layout and switch to Q&A.

Add the combination address field to your Q&A database. Name it Address Block or something similar. Place it on the form you use to display your address information and size it to about 2-1/2 inches wide and high enough for a five- or six-line address block. (See Figure 3.)

The following program for the Zip Code field copies the address fields to your new multiline field. It assumes your fields are named First, Last, Title, Company, Address, City, State, and Zip Code. To include more or fewer fields, or if your field names are different, modify the program accordingly:

```
> Address Block = First + " "+ Last+"
"+Title+"
"+Company Name+"
"+Street Address+"
"+City+" "+State+" "+Zip Code
```

When typing the program, press Ctrl-Enter at the end of each line, as shown, so that lines 1 through 4 *end* with a double quote, and lines 2 through 5 *begin* with a double quote. This inserts a

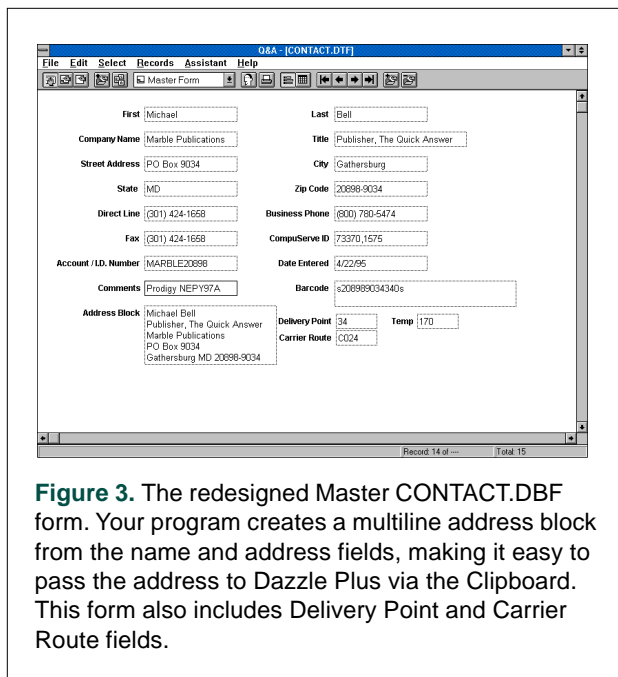


Figure 3. The redesigned Master CONTACT.DBF form. Your program creates a multiline address block from the name and address fields, making it easy to pass the address to Dazzle Plus via the Clipboard. This form also includes Delivery Point and Carrier Route fields.

carriage return between the sets of double quotes so the address data Q&A copies to the Address Block field winds up in the proper format. (See Figure 3.) You can also adapt this program to mass update the database.

Copy an address to Dazzle Plus

To pass the address in the record you're viewing to Dazzle Plus, move to the Address Block field, and highlight the address by dragging the mouse over it. Click on the Edit menu, and select Copy to copy the address to the Clipboard. (You can optionally press Ctrl-Shift-End to highlight the address, and Ctrl-C to copy it to the Clipboard.)

Switch to Dazzle Plus, and your default Dazzle Plus envelope should appear with the Clipboard address already inserted. Click on the Print button to print the envelope, or use Dial-A-Zip to link up with the post office for an address correction.

Print envelopes for multiple addressees

Dazzle Plus accepts a comma-delimited ASCII file. This means you can pass a file of addresses from Q&A for Windows or Q&A for DOS to Dazzle Plus to process with Dial-A-Zip, to batch-print envelopes or labels, or to do both.

Create an export file in Q&A for Windows by choosing Export from the File menu. Specify the fields to be included, and choose the default comma-delimited (with quotes around values) export format. (See Figure 4.) Attach your Retrieve and Sort Specs, run the export, and save the file to DAZZLE.TXT.

Switch to Dazzle Plus, click on its File menu, and choose Print List from File. Select the DAZZLE.TXT export file from the file list, and the Delimited File Options dialog box will appear. (See Figure 5.) Map the fields in your export file to

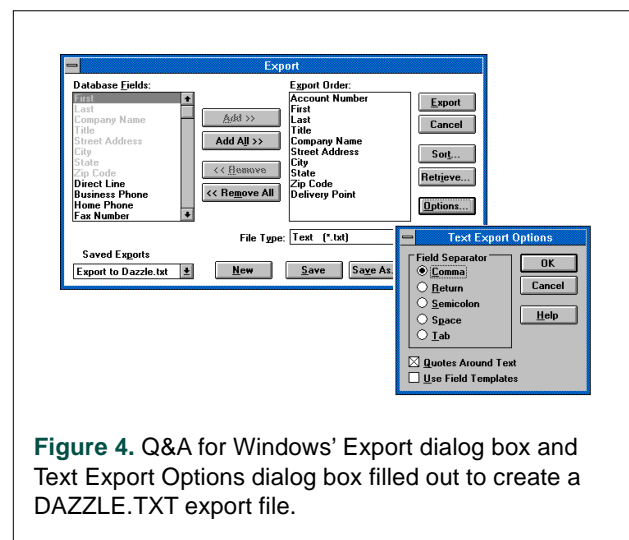


Figure 4. Q&A for Windows' Export dialog box and Text Export Options dialog box filled out to create a DAZZLE.TXT export file.

Dazzle Plus' default fields. (You only have to do this the first time as long as your export file always contains the same fields in the same order.) Click OK to print. Dazzle Plus will save your mapping specification for future use.

Follow the same steps to run Dial-A-Zip on your Q&A export file, except choose Dial-A-Zip List from the Dial-A-Zip pull-down menu. Once the addresses have been corrected, you can print the envelopes (or labels) using the Print List command.

Getting address corrections into your database

When Dial-A-Zip obtains an address correction, it displays the corrected address on the envelope. You can double-click on the address block, highlight the nine-digit ZIP code, and press Ctrl-C to copy it to the Clipboard. You can then switch back to Q&A and paste it into your Zip Code field.

However, there's an advantage to passing addresses (even a single address) to Dazzle Plus via an export file. When you run Dial-A-Zip on the file, it updates the file with any address corrections, adds the ZIP+4 ZIP codes, and optionally the two-digit delivery point codes. This provides you with the means to update the corresponding record(s) in your Q&A database with the full 11-digit delivery point ZIP code(s).

Here's a portion of a comma-delimited Q&A export file with the last field (Delivery Point) empty:

```
"C1534","Tom","Bernstein","25642 Gator Tooth Ln",
"Jaketown","FL","55222",""
"C1213","Annette","Carr","25396 Main St",
"Sacramento","CA","96858",""
"C3244","Tracey","Michaels","333 Santa Cruz Ave",
"Sunnyvale","CA","94566",""
```

Here's the same file after Dial-A-Zip has updated it with ZIP+4 and delivery point codes:

```
"C1534","Tom","Bernstein","25642 Gator Tooth Ln",
"Jaketown","FL","55222-2433","42"
"C1213","Annette","Carr","25396 Main St",
"Sacramento","CA","96858-2334","96"
"C3244","Tracey","Michaels","333 Santa Cruz Ave",
"Sunnyvale","CA","94566-3211","33"
```

By including the customer ID and Delivery Point fields in your Q&A export file, you can import the updated ASCII file back into Q&A to update your addresses. This way, you won't have to run Dial-A-Zip on these addresses the next time you mail to them.

Make your system sing

If you're eager to integrate Q&A with Dazzle Plus and use full delivery point ZIP codes and bar codes, you can configure Q&A to do most of the work. This section tells you how. The techniques described are for Q&A for Windows, but you can adapt them to Q&A for DOS.

Single addresses

For single addresses, add two fields to your database. Name the first one Delivery Point and the second one Temp. Program Temp with the @Number command, and set it to execute on-record-entry. This way, any record you activate will be assigned the highest @Number.

Next, create and save a Retrieve Spec that includes *Max* in the Temp field. Then create and save a comma-delimited (with quotes around text) Export Spec. Include in the Spec your address fields, along with a unique ID field (such as Account Number or Customer ID) and the Delivery Point field. (See Figure 4.) Save the Export Spec to *Export to Dazzle.txt*, run the export, and save the export file to DAZZLE.TXT.

To pass an address to Dazzle Plus, retrieve the pertinent record and click on a field to increment its @Number. From the File menu, choose Export. Select your saved *Export to Dazzle* spec, attach your *Max* Retrieve Spec, and click on Export. Choose DAZZLE.TXT as the export file name, and click on Yes to overwrite it. For what to do next, see the "Using Export Files in Dazzle Plus" and "Passing Corrected Addresses back to Q&A" sections later in this article.

Multiple addresses

To export a group of Q&A addresses to Dazzle Plus, first Retrieve the records you want to include. Then from the File menu, choose Export, select the *Export to Dazzle.txt* Export Spec you created earlier, and attach the *Last Run* Retrieve Spec. The records you just retrieved will be included in the export file. Choose DAZZLE.TXT as the export file name, and click on Yes to overwrite it.

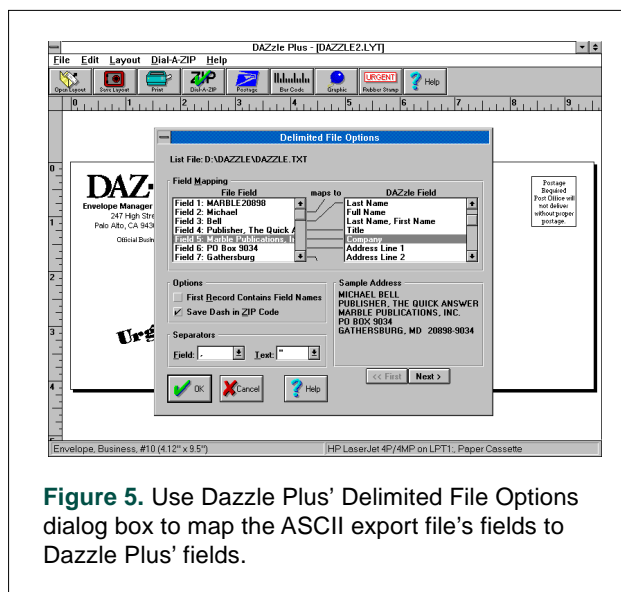


Figure 5. Use Dazzle Plus' Delimited File Options dialog box to map the ASCII export file's fields to Dazzle Plus' fields.

Using export files in Dazzle Plus

Pull down the Dial-A-Zip menu, and select Dial-A-Zip List from File. Select the DAZZLE.TXT export file, and click OK to display the Delimited File Options dialog box. (See Figure 5.) Map the fields in the ASCII export file to Dazzle Plus' fields (if they're not already correctly mapped). Be sure to map the Delivery Point field, but don't map the field that contains the unique record ID. Click OK, and Dazzle Plus will invoke Dial-A-Zip and dial the post office computer.

The Dial-A-Zip process updates your DAZZLE.TXT export file, adding the ZIP+4 and delivery point code. You can now choose Print List from the File menu to print envelopes or labels for the updated addresses in DAZZLE.TXT.

Pass corrected addresses back to Q&A

To import the updated DAZZLE.TXT file back into Q&A to update your address records, you'll need a supplementary database. Create a database named DAZZLE.DTF, with the same fields in the same order as your DAZZLE.TXT export file. Make the Account Number or Customer ID field Speedy.

When the database is ready, select Import from the File menu, and choose DAZZLE.TXT from the file list. At the Import dialog box, click on the Add button repeatedly to map the fields in DAZZLE.TXT to the matching fields in DAZZLE.DTF, then Click OK to run the import.

Update your main address database

You can now mass update your main database using XLookups to DAZZLE.DTF. Run the same Retrieve Spec you used to create your most recent export file, then create, save, and run the following Update Spec, substituting your own field names for those shown:

```
#1: XLookup("Dazzle",Account Number,"
Account Number", "Zip Code",Zip Code,"
Delivery Point",Delivery Point)
```

You can now run a Mass Delete on the DAZZLE.DTF database, or keep adding to it with each export and subsequent import.

Printing in Q&A for Windows

Once your address database contains the ZIP+4 and delivery point codes, you can use POSTools' ZipCodeBarcodeTT font to create complete delivery point bar codes for the envelopes, letters, or labels you print in Q&A. You can use the Zip Code program shown earlier to calculate the check digit and create the bar code string. Modify the program as follows:

```
+ @TN(@Left(Delivery Point,1))
+ @TN(@Mid(Delivery Point,2,1));
Barcode = "s" + Zip Code + Delivery Point +
Barcode + "s"
```

Bar code solutions for Q&A for DOS

If you have Windows installed on your PC, you can use Dazzle Plus to design and print your envelopes and labels and run Dial-A-Zip on your Q&A for DOS addresses. You can then return the corrected addresses and ZIP codes to your Q&A for DOS database as I described earlier.

You can record Q&A macros to automate the export, import, and mass update on your address database. For example, you can run the macro that creates your ASCII export file (with a pause at the Retrieve Spec to select the records to include). Then, you can exit Q&A, start Windows and Dazzle Plus, and run Dial-A-Zip on your export file (optionally printing your envelopes or labels). Finally, you can exit Windows, restart Q&A, and run the macro that imports the updated ASCII file into your supplementary database, followed by the mass update on your main address file.

You can automate the process even further. As its final step, the Q&A macro that creates the export file can run a DOS batch file (as an alternate program) such as the following one (WIN_DAZL.BAT) that starts Windows and Dazzle Plus, and loads your DAZZLE.TXT export file for Dial-A-Zip processing (you can adapt it for printing):

```
cd\windows
win recorder -h^a dazze.rec
```

When you exit Windows, Q&A automatically restarts, and you can run the macro that imports the updated ASCII file into your supplementary database then mass updates your address database.

A Windows Recorder macro (see your Windows manual) automates the Windows part of the task. Record a macro with a Ctrl-A shortcut key (that's the ^a in the batch file—you can use another shortcut key) and save it to a Recorder macro file named DAZZLE.REC (specified in the batch file.) Here are the keystrokes to record in the macro:

```
Ctrl-Esc   Three preliminary commands are
P           required to run the start-up macro.
Enter
Alt-F      Pulls down the File menu.
R          Selects the Run command.
[file spec] Types the path to Dazzle Plus,
           such as c:\dazzle\dazzle.exe.
Enter      Starts Dazzle Plus.
Alt-D      Pulls down the Dial-A-Zip menu.
D          Selects Dial-A-Zip List.
F          Selects from File.
The above three steps can be modified to print
envelopes or labels.
[file spec] Types the path and name of the export
           file, such as c:\qawin\dazzle.txt.
Enter      Displays the Delimited File Options
           dialog box.
```

Though it takes a bit of doing to set this up, the reward is getting lots of work done with just a few keystrokes.

Even without Dazzle Plus, you can still print Postnet bar codes on your Q&A for DOS output using a memory resident bar coding utility such as BAR_LITE. (See the Resources sidebar.) BAR_LITE reads the data stream passed to your printer. When it spots a ZIP+4 ZIP code, it adds the delivery point code (the last two digits of the street or box number) and prints the matching Postnet bar code on the letter, label, or envelope. BAR_LITE runs in conventional or extended memory, it's customizable, and you can load it only when you're ready to print.

If you don't want to use a TSR, Architext sells a downloadable PCL (HP LaserJet and compatibles) Postnet bar code soft font. The font comes in portrait and landscape orientations, and includes a handy download utility. You can use Q&A's QAFONT.EXE utility to append the font's description to your Q&A font description file.

Architext's bar code font operates on a string value the same way as POSTool's ZipCodeBarcode font, except that you use "(" to denote the

start and stop bars. Program your database to calculate the ZIP code check digit and create the bar code string in the format (2089890347(. You can then apply the font to that merge field on your mailing label. Architext also offers the font on a plug-in font cartridge.

Tom Marcellus is editor of *The Quick Answer* and author of *PC World Q&A Bible*, published by IDG Books.

Resources

Architext

121 Interpark Blvd., Suite 208
San Antonio, TX 78216-1808
210-490-2240
Fax 210-490-2242
\$150

BAR_LITE

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