Questionnaire Programming Language 4.1 Y2K Tests

November 22, 1999

Introduction

The Questionnaire Programming Language (QPL) consists of a set of MS/DOS programs that can be used to automate many of the activities involved in gathering and preparing survey data for analysis. Using this software, complex computer-aided telephone interview (CATI) or data-entry programs can be created that are easy to use and provide a high degree of control over what information may be entered. Interviewers can be trained to use the CATI software in only minutes and completed interview records can be edited quickly and accurately. Once a questionnaire program has been written, other QPL system programs can be used to generate formatted questionnaire documents, SPSS or SAS analysis programs, Lotus or dBase data files, or askSam text-based data files.

Version 4.1, released in November 1999, corrects several Y2K bugs and changes the automatic date question type, XDATE, from a 6 to an 8-digit field. (Note: Existing QPL questionnaires must be recompiled to work with this new version because this field change affects the record layout.)

This document summarizes the tests that were performed to demonstrate its Y2K compliance.

Sample Questionnaire Program

All of the tests in this document were performed with the following QPL questionnaire. This questionnaire exercises QPL's date arithmetic functions. This program, DATETEST.DOC, is included with the QPL distribution file, QPL41.EXE (a self-extracting ZIP file).

Figure 1: DATETEST Program Source Code

```
************************************************************
** PROGRAM: DATETEST.DOC                 DATE: 11/15/1999 **
**  AUTHOR: KEVIN DOOLEY, GGD                             **
**                                                        **
**   TITLE: Y2K Test                                      **
**                                                        **
** PURPOSE: Test QPL date questions and functions for     **
**          year-2000 problems.                           **
**                                                        **
**                                                        **
************************************************************
.TITLE    = "QPL 4.1 Y2K Test"
.SUBTITLE = "Version 4.1"
.HEADER   = "QPL Version 4.1 Demonstration, [INDATE]"
.SAVEIF (DONE=1)
.ESCAPE   = DONE

.QUESTION = INDATE, TYPE = XDATE
Today's date.
.ANSWER
.NEXT
```

```
.QUESTION = CDATE, TYPE = LDATE
Computed today's date
.ANSWER
.COMPUTE (DATE)
.NEXT

.QUESTION = INTIME, TYPE = TIME
Starting time.
.ANSWER
.NEXT

.QUESTION = TITLE, TYPE = VOID
.BORDER = RED

         Y2K Test Program

             -- { } --

 Questionnaire Programming Language
           Version 4.1

.ANSWER
Press ENTER to begin...
.NEXT

.QUESTION = INDATE1, TYPE = MULT
Name of today...
.ANSWER
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
.COMPUTE(JDAYOFWEEK(TOJUL(INDATE)))
.NEXT

.QUESTION = INDATE2, TYPE = MULT
Federal holiday...
.ANSWER
Weekday
Weekend
New Year's Eve
Martin Luther King Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veterans Day
Thanksgiving
Christmas
.COMPUTE(JFHOLIDAY(TOJUL(INDATE))+1)
.NEXT
```

```
.QUESTION = INDATE3, TYPE = LDATE
Next date after today...
.ANSWER
.COMPUTE (FROMJUL(TOJUL(INDATE)+1))
.NEXT

.QUESTION = INDATE4, TYPE = NUMBER
Days from today to end of this year...
.ANSWER = 3
.COMPUTE (TOJUL(GYEAR(INDATE)*10000+1231)-TOJUL(INDATE)+1)
.NEXT

.QUESTION = Q1, TYPE = VOID, BORDER=GREEN
         Today's date: [INDATE]
Computed today's date: [CDATE]
          Day of week: [INDATE1]
              Holiday: [INDATE2]
      Tomorrow’s date: [INDATE3]
  Days to end of year: [INDATE4]
.ANSWER
Press ENTER to continue...
.NEXT

.QUESTION = D1, TYPE = LDATE
Enter a date:
.ANSWER
.NEXT

.QUESTION = D1A, TYPE = MULT
Name of date...
.ANSWER = INDATE1
.COMPUTE(JDAYOFWEEK(TOJUL(D1)))
.NEXT

.QUESTION = D1B, TYPE = MULT
Federal holiday on date...
.ANSWER = INDATE2
.COMPUTE(JFHOLIDAY(TOJUL(D1))+1)
.NEXT

.QUESTION = D1C, TYPE = LDATE
Find the next date...
.ANSWER
.COMPUTE (FROMJUL(TOJUL(D1)+1))
.NEXT

.QUESTION = D1D, TYPE = NUMBER
Days from date to end of same year
.ANSWER = 3
.COMPUTE (TOJUL(GYEAR(D1)*10000+1231)- TOJUL(D1)+1)
.NEXT

.QUESTION = D1E, TYPE = VOID
          Your date: [D1]
        Day of week: [D1A]
            Holiday: [D1B]
          Next date: [D1C]
Days to end of year: [D1D]
.ANSWER
Press ENTER to continue...
```

```
.NEXT

.QUESTION = DONE, TYPE = MULT
.BACKGROUND = WHITE, FOREGROUND = BLUE
You have completed this test.

You may now save or erase this record.
.ANSWER
Save answers
Erase answers
.NEXT

.QUESTION = ENDTIME, TYPE = TIME
Time test comleted.
.ANSWER
.NEXT
```

Figure 2: DATETEST Program in Questionnaire Format

```
     C:\QPL\DATETEST.TXT                                    11-22-1999

                             QPL 4.1 Y2K Test
                                Version 4.1



        1. Today's date.
                                                          INDATE 1:1-8
           |__|__|__|__|-|__|__|-|__|__|
            Year          Month   Day


        2. Computed today's date
                                                          CDATE 1:9-16
           |__|__|__|__|-|__|__|-|__|__|
            Year          Month   Day

           COMPUTE DATE


        3. Starting time.
                                                        INTIME 1:17-21
           |__|__|__|__|__|


        4.
                    Y2K Test Program

                        -- { } --

            Questionnaire Programming Language
                      Version 4.1

                                                                 TITLE
           Press ENTER to begin...
```

```
5. Name of today...
                                                  INDATE1 1:22
   (CHECK ONLY ONE ANSWER)

   |__|  1. Sunday
   |__|  2. Monday
   |__|  3. Tuesday
   |__|  4. Wednesday
   |__|  5. Thursday
   |__|  6. Friday
   |__|  7. Saturday

   COMPUTE (JDAYOFWEEK (TOJUL #1))


6. Federal holiday...
                                               INDATE2 1:23-24
   (CHECK ONLY ONE ANSWER)

   |__|  1. Weekday
   |__|  2. Weekend
   |__|  3. New Year's Eve
   |__|  4. Martin Luther King Day
   |__|  5. President's Day
   |__|  6. Memorial Day
   |__|  7. Independence Day
   |__|  8. Labor Day
   |__|  9. Columbus Day
   |__| 10. Veterans Day
   |__| 11. Thanksgiving
   |__| 12. Christmas

   COMPUTE (JFHOLIDAY (TOJUL #1) + 1)


7. Next date after today...
                                               INDATE3 1:25-32
   |__|__|__|__|-|__|__|-|__|__|
    Year          Month    Day

   COMPUTE (FROMJUL (TOJUL #1 + 1))


8. Days from today to end of this year...
                                               INDATE4 1:33-35
   |__|__|__|

   COMPUTE (TOJUL (GYEAR #1 * 10000 + 1231) - TOJUL #1 + 1)


9.          Today's date: #1
   Computed today's date: #2
             Day of week: #5
                 Holiday: #6
        Tommorrow's date: #7
     Days to end of year: #8
                                                            Q1
   Press ENTER to continue...
```

```
10. Enter a date:
                                                          D1 1:36-43
    |__|__|__|__|-|__|__|-|__|__|
     Year          Month   Day


11. Name of date...
                                                            D1A 1:44
    (CHECK ONLY ONE ANSWER)

    |__|  1. Sunday
    |__|  2. Monday
    |__|  3. Tuesday
    |__|  4. Wednesday
    |__|  5. Thursday
    |__|  6. Friday
    |__|  7. Saturday

    COMPUTE (JDAYOFWEEK (TOJUL #10))


12. Federal holiday on date...
                                                         D1B 1:45-46
    (CHECK ONLY ONE ANSWER)

    |__|  1. Weekday
    |__|  2. Weekend
    |__|  3. New Year's Eve
    |__|  4. Martin Luther King Day
    |__|  5. President's Day
    |__|  6. Memorial Day
    |__|  7. Independence Day
    |__|  8. Labor Day
    |__|  9. Columbus Day
    |__| 10. Veterans Day
    |__| 11. Thanksgiving
    |__| 12. Christmas

    COMPUTE (JFHOLIDAY (TOJUL #10) + 1)


13. Find the next date...
                                                         D1C 1:47-54
    |__|__|__|__|-|__|__|-|__|__|
     Year          Month   Day

    COMPUTE (FROMJUL (TOJUL #10 + 1))


14. Days from date to end of same year
                                                         D1D 1:55-57
    |__|__|__|

    COMPUTE (TOJUL (GYEAR #10 * 10000 + 1231) - TOJUL #10 + 1)
```

```
  15.           Your date: #10
              Day of week: #11
                  Holiday: #12
                Next date: #13
      Days to end of year: #14
                                                              D1E
      Press ENTER to continue...


  16. You have completed this test.
      You may now save or erase this record.
                                                        DONE 1:58
      (CHECK ONLY ONE ANSWER)

      |__|  1. Save answers
      |__|  2. Erase answers


  17. Time test completed.
                                                  ENDTIME 1:59-63
      |__|__|__|__|__|

SAVE IF (#16 = 1)
```

QPL System Programs

The QPL system is made up of several programs, each of which performs a particular task in the overall job of writing, delivering, and analyzing a computer-aided telephone interview (CATI) or data entry system. The purpose of each program is summarized in the table below.

Table 1: QPL System Programs

Program	**Function**
COMPILE	Converts a questionnaire program, written as an ASCII text file, to a custom binary format (and given a “.QPL” file name extension). The compiled form of the questionnaire is used by the rest of the system programs.
COLLECT	Executes the questionnaire. Displays questions on the screen one-at-a-time, and records responses in a separate data file.
NCOLLECT	This is the network version of the COLLECT program. It can also share the response data file and calling lists with other interviewers.
MONITOR	Displays the status of calls for all of the interviewers using the NCOLLECT program.
KEYPUNCH	Used to edit and print existing interview results.
CONVERT	Performs various source code and data file conversions. Converts source code into Awk, Basic, SAS, and SPSS programs. Converts data file into command and tab-delimited formats, Lotus and dBase formats, and the main data file from one to another version of the same questionnaire.

Y2K Tests

The QPL Y2K-related tests fall into several categories:

1. correctly obtaining the current date from the operating system,
2. correctly performing date arithmetic, and
3. correctly displaying date information.

QPL programs can get the current date from the operating system either of two ways: First, by using a XDATE question type (which gets the date and stores in an 8-digit field in YYYYMMDD format) without displaying the question to the interviewer. Or second, by computing the answer to a question using the DATE keyword. The sample DATETEST program shown above tests both of these methods.

QPL also has extensive date arithmetic capabilities. It has been designed to handle dates from the year 101 through 9999. It has functions that will determine whether dates in this range are valid dates (it will not, for example, allow invalid dates to be entered in a LDATE question type), the day-of-the-week of any of these dates, federal holidays, days between dates, etc. The sample DATETEST program shown above also tests this date arithmetic.

All of the QPL programs display dates, either on the screen or when printing, as well as generating programs in SAS and SPSS that correctly read and display these dates. The DATETEST program also tests some of these capabilities.

The following tests were performed using the Windows 95 (SR2), Windows 98 2nd Edition, and Windows NT 4.0 operating systems. Earlier operating systems were not tested.

Table 2: Launching Test

Step	Action	Pass	Fail
1	Set computer clock to 12/31/1999		
2	Launch and close each system program. Check date displayed on screen.		
2a	COMPILE datetest.doc		
2b	COLLECT datetest		
2c	NCOLLECT datetest		
2d	MONITOR datetest		
2e	KEYPUNCH datetest		
2f	CONVERT datetest		
3	Set computer clock to 1/1/2000		
4	Launch and close each system program. Check date displayed on screen.		
5a	COMPILE datetest.doc		
5b	COLLECT datetest		
5c	NCOLLECT datetest		
5d	MONITOR datetest		
5e	KEYPUNCH datetest		
5f	CONVERT datetest		
6	Set computer clock to 12/31/2000		
7	Launch and close each system program. Check date displayed on screen.		
7a	COMPILE datetest.doc		
7b	COLLECT datetest		
7c	NCOLLECT datetest		

Step	Action	Pass	Fail
7d	MONITOR datetest		
7e	KEYPUNCH datetest		
7f	CONVERT datetest		
8	Set computer clock to 2/29/2000		
9	Launch and close each system program. Check date displayed on screen.		
9a	COMPILE datetest.doc		
9b	COLLECT datetest		
9c	NCOLLECT datetest		
9d	MONITOR datetest		
9e	KEYPUNCH datetest		
9f	CONVERT datetest		
10	Set computer clock to 12/31/2000		
11	Launch and close each system program. Check date displayed on screen.		
11a	COMPILE datetest.doc		
11b	COLLECT datetest		
11c	NCOLLECT datetest		
11d	MONITOR datetest		
11e	KEYPUNCH datetest		
11f	CONVERT datetest		
12	Set computer clock to 1/1/2001		
13	Launch and close each system program. Check date displayed on screen.		
13a	COMPILE datetest.doc		
13b	COLLECT datetest		
13c	NCOLLECT datetest		
13d	MONITOR datetest		
13e	KEYPUNCH datetest		
13f	CONVERT datetest		
14	Reset system clock to today’s date		

Table 3: Date Arithmetic and Display Test

Step	Action	Pass	Fail
1.	Launch COLLECT datetest		
2.	Check display of today’s date on question Q1		
3.	On question D1, enter the following dates and check the results on D1E (Note: Press PgUp to backup and enter the next date on D1.)		
4.	9/9/1999 - Thursday		
5.	12/31/1999 - Friday		
6.	1/1/2000 – Saturday		
7.	2/29/2000 – Tuesday, leap year, next date is 3/1/2000		
8.	2/30/2000 – Invalid date		
9.	3/1/2000 – Wednesday		
10.	9/30/2000 – Saturday		
11.	10/1/2000 – Sunday (first 7-digit date)		
12.	12/31/2000 – Sunday, next date is 1/1/2001		
13.	9/8/2001 - Saturday		
14.	2/29/2004 – Sunday, leap year		
15.	2/29/2100 – Invalid date (no leap year in years devisable by 100)		
16.	2/29/2400 - Tuesday		
17.	Save the last case and exit the COLLECT program		
18.	Launch NCOLLECT datetest		

Step	Action	Pass	Fail
19.	Check display of today's date on question Q1		
20.	On question D1, enter the following dates and check the results on D1E (Note: Press PgUp to backup and enter the next date on D1.)		
21.	9/9/1999 - Thursday		
22.	12/31/1999 - Friday		
23.	1/1/2000 – Saturday		
24.	2/29/2000 – Tuesday, leap year, next date is 3/1/2000		
25.	2/30/2000 – Invalid date		
26.	3/1/2000 – Wednesday		
27.	9/30/2000 – Saturday		
28.	10/1/2000 – Sunday (first 7-digit date)		
29.	12/31/2000 – Sunday, next date is 1/1/2001		
30.	9/8/2001 - Saturday		
31.	2/29/2004 – Sunday, leap year		
32.	2/29/2100 – Invalid date (no leap year in years devisable by 100)		
33.	2/29/2400 - Tuesday		
34.	Save the last case and exit the NCOLLECT program		
35.	Launch KEYPUNCH datetest		
36.	Check display of today's date on question Q1		
37.	On question D1, enter the following dates and check the results on D1E (Note: Press F2 to display the results at question D1E. Press PgUp to backup and enter the next date on D1.)		
38.	9/9/1999 - Thursday		
39.	12/31/1999 - Friday		
40.	1/1/2000 – Saturday		
41.	2/29/2000 – Tuesday, leap year, next date is 3/1/2000		
42.	2/30/2000 – Invalid date		
43.	3/1/2000 – Wednesday		
44.	9/30/2000 – Saturday		
45.	10/1/2000 – Sunday (first 7-digit date)		
46.	12/31/2000 – Sunday, next date is 1/1/2001		
47.	9/8/2001 - Saturday		
48.	2/29/2004 – Sunday, leap year		
49.	2/29/2100 – Invalid date (no leap year in years divisible by 100)		
50.	2/29/2400 – Tuesday (leap year in years divisible by 400)		
51.	Save the last case and exit the KEYPUNCH program		
52.	Launch MONITOR datetest		
53.	Check display of dates on screen		
54.	Exit MONITOR program		
55.	Launch CONVERT datetest		
56.	Create the follow programs and check date formatting in each program		
57.	Awk		
58.	Basic		
59.	SAS		
60.	SPSS		
61.	Questionnaire text		
62.	cross-reference list		
63.	Convert data to following formats		
64.	Comma delimited		
65.	Tab delimited		
66.	dBase		
67.	Lotus		
68.	askSam		
69.	Exit CONVERT program		