Change-Point Analyzer 2.3 Validation Package

Contains reproductions of the following two documents:

Report Number: TE-03-1

Protocol Number: TE-03-1

Original documents and supporting evidence are on file at:

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Change-Point Analyzer 2.3 Validation Final Report

Report Number: TE-03-1

Approvals:

Wayne A Taylor — 10/21/03

Dr. Wayne A. Taylor
Study Director — Date

Ann B. Taylor — 10/21/03

Ann B. Taylor
President — Date

Change-Point Analyzer 2.3
Validation Final Report

Report Number: TE-03-1

1.0 Summary

The purpose of this document is to report the results of executing the Validation Protocol TE-03-1 for version 2.3 of the Change-Point Analyzer software package for use under Windows 95, Windows 2000 and Windows XP. These operating systems are representative of the different 32-bit Windows operating systems.

All test met their acceptance criteria on each of three machines with different operating systems installed. The validation is complete and passes.

2.0 Background

Change-Point Analyzer 2.3 is a software application used to identify single and multiple shifts in a set of time-ordered data. For each change detected, a description of the shift is provided including the magnitude of the shift, the confidence that a shift occurred and estimates of when the shift occurred. This application consists of a single 32-bit executable file (Change-Point Analyzer.exe) developed using Borland C++ Builder for Windows 95 and higher. The application utilizes no dynamic link library (.dll) files. Associated with the application is an Add-In for EXCEL that automates the cutting and pasting of data from Microsoft EXCEL and automatically invokes the application.

3.0 Test Procedure

The complete set of tests below was run on three machines, one with Windows 95, one with Windows 2000 and the other with Windows XP. None of the machines were used for any of the software development or preliminary testing.

The validation tests were organized into four distinct sections. A summary of the different tests appears in the table below. The purpose of each test is to demonstrate that one or more features of the application are functioning correctly. Successful completion of all tests demonstrates that the software is suitable for its intended use.

Test	Purpose
Kernel	Demonstrates the functionality of the kernel by challenging critical aspects of the mathematical core functionality to ensure that calculations are correctly executed.
User Interface	Demonstrates that the program user interface operates correctly for both entering data and outputting results.

	Includes verifying range of inputs and proper detection and handling of illegal values.
Trade Deficit	Demonstrates that the program meets user requirements when a data set consisting of one observation per time period is entered by typing, cutting and pasting, or using the EXCEL Add-In. The data used in this test represents US Trade Deficit data (in billions of $) for the period January, 1987 through December, 1988.
Burst Data	Demonstrates that the program meets user requirements when a dataset consisting of multiple observations per time period is entered by typing, cutting and pasting, and using the EXCEL Add-In. The data used is actual production data. The response analyzed is the force required to rupture a beverage can. Three cans were sampled from a can manufacturing line every half hour for a 15 hour period of time.

4.0 Documentation of Results

The results were documented for each operating system on a copy of the Computer Test Results Summary Form provided in the protocol. These forms are attachments 1-3. These forms document whether the tests passed and the file names and dates containing the documented evidence. These files have all been saved as part of the overall documentation package. Attachments 4-6 contain examples of the evidence files. The following files are shown:

Attachment 4: XP Kernal.doc - showing the kernel test results on XP system.

Attachment 5: XP Trade Deficit Manual Entry.doc - showing the results of executing the manual entry section for the Trade Deficit data on the XP system.

Attachment 6: XP Burst Manual Entry.doc - showing the results of executing the manual entry section for the Burst data on the XP system.

An example of the User Interface files is not shown because they are very lengthy. The other Kernal, Trade Deficit and Burst files appear similar to the examples shown.

Attachment 1:

Computer Test Results Summary Form

For Windows XP System

Computer Test Results Summary Form

DOCUMENTATION OF SETUP:

Computer:	Make:	Sony
	Model:	PCG-SR5K(UC)
	Serial Number:	28311630 3205492
	Type CPU:	x86 Family 6 Model 8 Step. 3 Intel
Operating	Name:	XP Professional
System:	Version:	5.1.2600 Service Pack 1 Build 2600

Files:	Change-Point Analyzer.exe	Date/Time:	10/8/2003 4:48 AM
	Change-Point Analyzer.xla	Date/Time:	4/8/2000 5:58 PM
	EXCEL	Version:	2002
	Word	Version:	2002
	TestProgram.exe	Date/Time:	10/8/03 4:50 AM

File Evidence Saved In:	Name:	XP Install.doc
	Date/Time:	10/20/03 4:01 PM
Person Performing Setup:	Name:	Wayne A. Taylor
	Signature:	
	Date:	10/20/03

Operating System Name: XP Professional

DOCUMENTATION OF PERFORMANCE OF TESTS:

Test	Documentation	Results
Kernel	File Name:	XP Kernel.doc
	Last Date/Time Modified:	10/20/03 4:18 PM
	All test Cases Pass?	(yes) no
	Tester Name:	Wayne A. Taylor
	Tester Signature:	Wayne A Taylor
	Tester Signature Date:	10/20/03
	Verifier Name:	Ann B Taylor
	Verifier Signature:	Ann B. Taylor
	Verifier Signature Date:	10/21/03
User Interface	File Name	XP Interface.doc
	Last Date/Time Modified	10/20/03 11:39 PM
	All test Cases Pass?	(yes) no
	Tester Name:	Wayne A. Taylor
	Tester Signature:	Wayne A Taylor
	Tester Signature Date:	10/20/03
	Verifier Name:	Ann B Taylor
	Verifier Signature:	Ann B. Taylor
	Verifier Signature Date:	10/21/03

Operating System Name: XP Professional

DOCUMENTATION OF PERFORMANCE OF TESTS (Continued):

Trade Deficit Data: **Data Typed**	Saved Word File	XP Trade Deficit Manual Entry.doc
	Date/Time of File:	10/20/03 4:58 PM
	Saved cpa File	XP Trade Deficit Manual Entry.cpa
	Date/Time of File:	10/20/03 5:01 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/20/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Trade Deficit Data: **Data Pasted**	Saved Word File	XP Trade Deficit Copy Paste.doc
	Date/Time of File:	10/20/03 7:04 PM
	Saved cpa File	XP Trade Deficit Copy Paste.cpa
	Date/Time of File:	10/20/03 7:06 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/20/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Trade Deficit Data: **EXCEL Add-In**	Saved Word File	XP Trade Deficit EXCEL Add-In.doc
	Date/Time of File:	10/20/03 7:41 PM
	Saved cpa File	XP Trade Deficit EXCEL Add-In.cpa
	Date/Time of File:	10/20/03 7:38 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/20/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03

Operating System Name: XP Professional

DOCUMENTATION OF PERFORMANCE OF TESTS (Continued):

Burst Data: **Data Typed**	Saved Word File	XP Burst Manual Entry.doc
	Date/Time of File:	10/20/03 8:04 PM
	Saved cpa File	XP Burst Manual Entry.cpa
	Date/Time of File:	10/20/03 8:03 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/20/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Burst Data: **Data Pasted**	Saved Word File	XP Burst Copy Paste.doc
	Date/Time of File:	10/20/03 8:42 PM
	Saved cpa File	XP Burst Copy Paste.cpa
	Date/Time of File:	10/20/03 8:43 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/20/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Burst Data: **EXCEL Add-In**	Saved Word File	XP Burst EXCEL Add-In.doc
	Date/Time of File:	10/20/03 8:59 PM
	Saved cpa File	XP Burst EXCEL Add-In.cpa
	Date/Time of File:	10/20/03 9:02 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/20/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03

DOCUMENTATION OF FINAL RESULTS FOR COMPUTER:

All Test Cases for Computer Pass? (yes) no

Signature: Ann B Taylor Date: 10/21/03

Attachment 2:

Computer Test Results Summary Form

For Windows 2000 System

Computer Test Results Summary Form

DOCUMENTATION OF SETUP:

Computer:	Make:	Gateway
	Model:	TABOR_II
	Serial Number:	0013083162
	Type CPU:	x86 Family 6 Model 7 Step. 2 Intel
Operating	Name:	2000 Professional
System:	Version:	5.0.2195 Service Pack 4 Build 2195

Files:	Change-Point Analyzer.exe	Date/Time:	10/8/2003 4:48 AM
	Change-Point Analyzer.xla	Date/Time:	4/8/2000 5:58 PM
	EXCEL	Version:	2000 SR-1
	Word	Version:	2000 SR-1
	TestProgram.exe	Date/Time:	10/8/03 4:50 AM

File Evidence Saved In:	Name:	2000 Install.doc
	Date/Time:	10/15/03 3:04 PM

Person Performing Setup:	Name:	Wayne A. Taylor
	Signature:	
	Date:	10/15/03

Operating System Name: 2000 Professional

DOCUMENTATION OF PERFORMANCE OF TESTS:

Test	Documentation	Results
Kernel	File Name:	2000 Kernel.doc
	Last Date/Time Modified:	10/15/03 3:09 PM
	All test Cases Pass?	(yes) no
	Tester Name:	Wayne A. Taylor
	Tester Signature:	Wm a Tyl
	Tester Signature Date:	10/20/03
	Verifier Name:	Ann B Taylor
	Verifier Signature:	Ann B. Taylor
	Verifier Signature Date:	10/21/03
User Interface	File Name	XP Interface.doc
	Last Date/Time Modified	10/20/03 9:52 AM
	All test Cases Pass?	(yes) no
	Tester Name:	Wayne A. Taylor
	Tester Signature:	Wm a Tyl
	Tester Signature Date:	10/20/03
	Verifier Name:	Ann B Taylor
	Verifier Signature:	Ann B. Taylor
	Verifier Signature Date:	10/21/03

Operating System Name: 2000 Professional

DOCUMENTATION OF PERFORMANCE OF TESTS (Continued):

Trade Deficit Data: **Data Typed**	Saved Word File	2000 Trade Deficit Manual Entry.doc
	Date/Time of File:	10/15/03 4:08 PM
	Saved cpa File	2000 Trade Deficit Manual Entry.cpa
	Date/Time of File:	10/15/03 4:09 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	10/15/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Trade Deficit Data: **Data Pasted**	Saved Word File	2000 Trade Deficit Copy Paste.doc
	Date/Time of File:	10/15/03 7:46 PM
	Saved cpa File	2000 Trade Deficit Copy Paste.cpa
	Date/Time of File:	10/15/03 7:45 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	10/15/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Trade Deficit Data: **EXCEL Add-In**	Saved Word File	2000 Trade Deficit EXCEL Add-In.doc
	Date/Time of File:	10/15/03 8:30 PM
	Saved cpa File	2000 Trade Deficit EXCEL Add-In.cpa
	Date/Time of File:	10/15/03 8:31 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	10/15/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03

Operating System Name: 2000 Professional

DOCUMENTATION OF PERFORMANCE OF TESTS (Continued):

Burst Data: **Data Typed**	Saved Word File	2000 Burst Manual Entry.doc
	Date/Time of File:	10/15/03 9:09 PM
	Saved cpa File	2000 Burst Manual Entry.cpa
	Date/Time of File:	10/15/03 9:10 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/15/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Burst Data: **Data Pasted**	Saved Word File	2000 Burst Copy Paste.doc
	Date/Time of File:	10/15/03 9:38 PM
	Saved cpa File	2000 Burst Copy Paste.cpa
	Date/Time of File:	10/15/03 9:38 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/15/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Burst Data: **EXCEL Add-In**	Saved Word File	2000 Burst EXCEL Add-In.doc
	Date/Time of File:	10/15/03 9:54 PM
	Saved cpa File	2000 Burst EXCEL Add-In.cpa
	Date/Time of File:	10/15/03 9:55 PM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/15/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03

DOCUMENTATION OF FINAL RESULTS FOR COMPUTER:

All Test Cases for Computer Pass? (yes) no

Signature: Ann B. Taylor Date: 10/21/03

Attachment 3:

Computer Test Results Summary Form

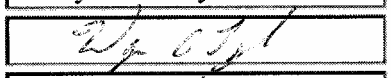
For Windows 95 System

Computer Test Results Summary Form

DOCUMENTATION OF SETUP:

Computer:	Make:	Gateway 2000
	Model:	Pentium Pro
	Serial Number:	0008848840
	Type CPU:	Pentium Pro
Operating	Name:	Wndows 95
System:	Version:	4.00.950.8

Files:	Change-Point Analyzer.exe	Date/Time:	10/8/2003 4:48 AM
	Change-Point Analyzer.xla	Date/Time:	4/8/2000 5:58 PM
	EXCEL	Version:	2000
	Word	Version:	2000
	TestProgram.exe	Date/Time:	10/8/03 4:50 AM

File Evidence Saved In:	Name:	95 Install.doc
	Date/Time:	10/21/03 7:49 AM
Person Performing Setup:	Name:	Wayne A. Taylor
	Signature:	
	Date:	10/21/03

Operating System Name: Windows 95

DOCUMENTATION OF PERFORMANCE OF TESTS:

Test	Documentation	Results
Kernel	File Name:	95 Kernel.doc
	Last Date/Time Modified:	10/21/03 8:12 AM
	All test Cases Pass?	(yes) no
	Tester Name:	Wayne A. Taylor
	Tester Signature:	Wayne A Taylor
	Tester Signature Date:	10/21/03
	Verifier Name:	Ann B Taylor
	Verifier Signature:	Ann B. Taylor
	Verifier Signature Date:	10/21/03
User Interface	File Name	95 Interface.doc
	Last Date/Time Modified	10/21/03 1:03 PM
	All test Cases Pass?	(yes) no
	Tester Name:	Wayne A. Taylor
	Tester Signature:	Wayne A Taylor
	Tester Signature Date:	10/21/03
	Verifier Name:	Ann B Taylor
	Verifier Signature:	Ann B. Taylor
	Verifier Signature Date:	10/21/03

Operating System Name: Windows 95

DOCUMENTATION OF PERFORMANCE OF TESTS (Continued):

Trade Deficit Data: **Data Typed**	Saved Word File	95 Trade Deficit Manual Entry.doc
	Date/Time of File:	10/21/03 8:22 AM
	Saved cpa File	95 Trade Deficit Manual Entry.cpa
	Date/Time of File:	10/21/03 8:23 AM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/21/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Trade Deficit Data: **Data Pasted**	Saved Word File	95 Trade Deficit Copy Paste.doc
	Date/Time of File:	10/21/03 8:42 AM
	Saved cpa File	95 Trade Deficit Copy Paste.cpa
	Date/Time of File:	10/21/03 8:44 AM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/21/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Trade Deficit Data: **EXCEL Add-In**	Saved Word File	95 Trade Deficit EXCEL Add-In.doc
	Date/Time of File:	10/21/03 8:55 AM
	Saved cpa File	95 Trade Deficit EXCEL Add-In.cpa
	Date/Time of File:	10/21/03 8:57 AM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/21/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03

Operating System Name: Windows 95

DOCUMENTATION OF PERFORMANCE OF TESTS (Continued):

Burst Data: **Data Typed**	Saved Word File	95 Burst Manual Entry.doc
	Date/Time of File:	10/21/03 9:05 AM
	Saved cpa File	95 Burst Manual Entry.cpa
	Date/Time of File:	10/21/03 9:06 AM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/21/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Burst Data: **Data Pasted**	Saved Word File	95 Burst Copy Paste.doc
	Date/Time of File:	10/21/03 9:10 AM
	Saved cpa File	95 Burst Copy Paste.cpa
	Date/Time of File:	10/21/03 9:11 AM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/21/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03
Burst Data: **EXCEL Add-In**	Saved Word File	95 Burst EXCEL Add-In.doc
	Date/Time of File:	10/21/03 9:28 AM
	Saved cpa File	95 Burst EXCEL Add-In.cpa
	Date/Time of File:	10/21/03 9:30 AM
	All Test Cases Pass?	(yes) no
	Signature of Person Running Tests (With Date)	[signature] 10/21/03
	Signature of Person Verifying Results (With Date)	Ann B. Taylor 10/21/03

DOCUMENTATION OF FINAL RESULTS FOR COMPUTER:

All Test Cases for Computer Pass? (yes) no

Signature: Ann B. Taylor Date: 10/21/03

Attachment 4:

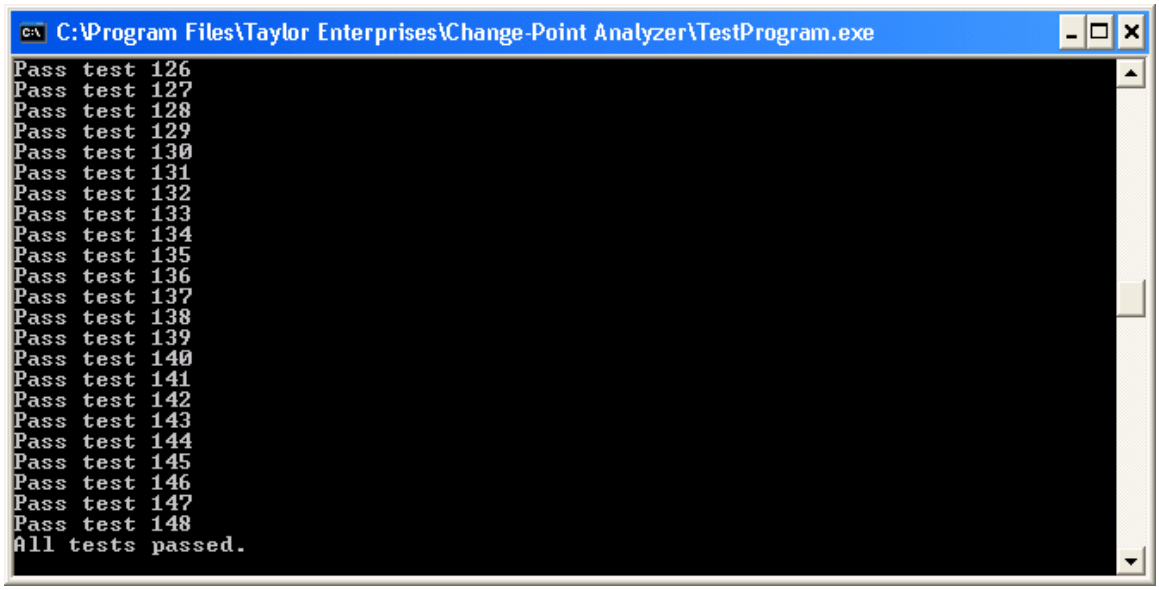
XP Kernal.doc

Change-Point Analyzer 2.3 Validation

XP System

Kernel Evidence

Screen Shot After Ran:



Copy of Program Output:

Pass test 1
Pass test 2
Pass test 3
Pass test 4
Pass test 5
Pass test 6
Pass test 7
Pass test 8
Pass test 9
Pass test 10
Pass test 11
Pass test 12
Pass test 13
Pass test 14
Pass test 15
Pass test 16
Pass test 17

Pass test 18
Pass test 19
Pass test 20
Pass test 21
Pass test 22
Pass test 23
Pass test 24
Pass test 25
Pass test 26
Pass test 27
Pass test 28
Pass test 29
Pass test 30
Pass test 31
Pass test 32
Pass test 33
Pass test 34
Pass test 35
Pass test 36
Pass test 37
Pass test 38
Pass test 39
Pass test 40
Pass test 41
Pass test 42
Pass test 43
Pass test 44
Pass test 45
Pass test 46
Pass test 47
Pass test 48
Pass test 49
Pass test 50
Pass test 51
Pass test 52
Pass test 53
Pass test 54
Pass test 55
Pass test 56
Pass test 57
Pass test 58
Pass test 59
Pass test 60
Pass test 61
Pass test 62
Pass test 63

Pass test 64
Pass test 65
Pass test 66
Pass test 67
Pass test 68
Pass test 69
Pass test 70
Pass test 71
Pass test 72
Pass test 73
Pass test 74
Pass test 75
Pass test 76
Pass test 77
Pass test 78
Pass test 79
Pass test 80
Pass test 81
Pass test 82
Pass test 83
Pass test 84
Pass test 85
Pass test 86
Pass test 87
Pass test 88
Pass test 89
Pass test 90
Pass test 91
Pass test 92
Pass test 93
Pass test 94
Pass test 95
Pass test 96
Pass test 97
Pass test 98
Pass test 99
Pass test 100
Pass test 101
Pass test 102
Pass test 103
Pass test 104
Pass test 105
Pass test 106
Pass test 107
Pass test 108
Pass test 109

Pass test 110
Pass test 111
Pass test 112
Pass test 113
Pass test 114
Pass test 115
Pass test 116
Pass test 117
Pass test 118
Pass test 119
Pass test 120
Pass test 121
Pass test 122
Pass test 123
Pass test 124
Pass test 125
Pass test 126
Pass test 127
Pass test 128
Pass test 129
Pass test 130
Pass test 131
Pass test 132
Pass test 133
Pass test 134
Pass test 135
Pass test 136
Pass test 137
Pass test 138
Pass test 139
Pass test 140
Pass test 141
Pass test 142
Pass test 143
Pass test 144
Pass test 145
Pass test 146
Pass test 147
Pass test 148
All tests passed.

Attachment 5:

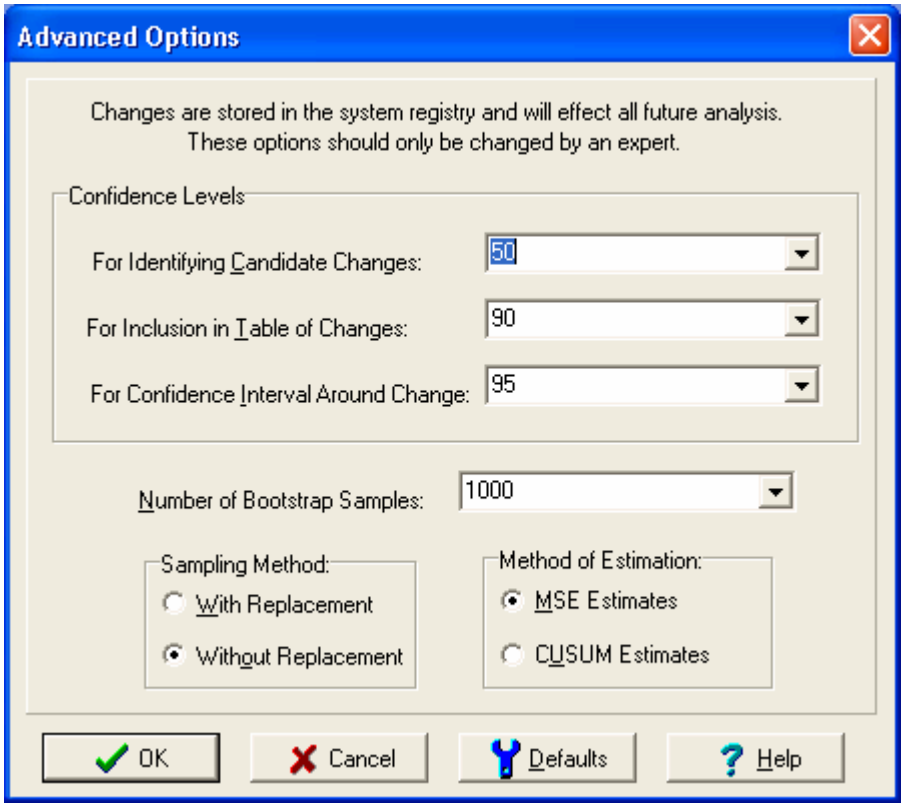
XP Trade Deficit Manual Entry.doc

Change-Point Analyzer 2.3 Validation

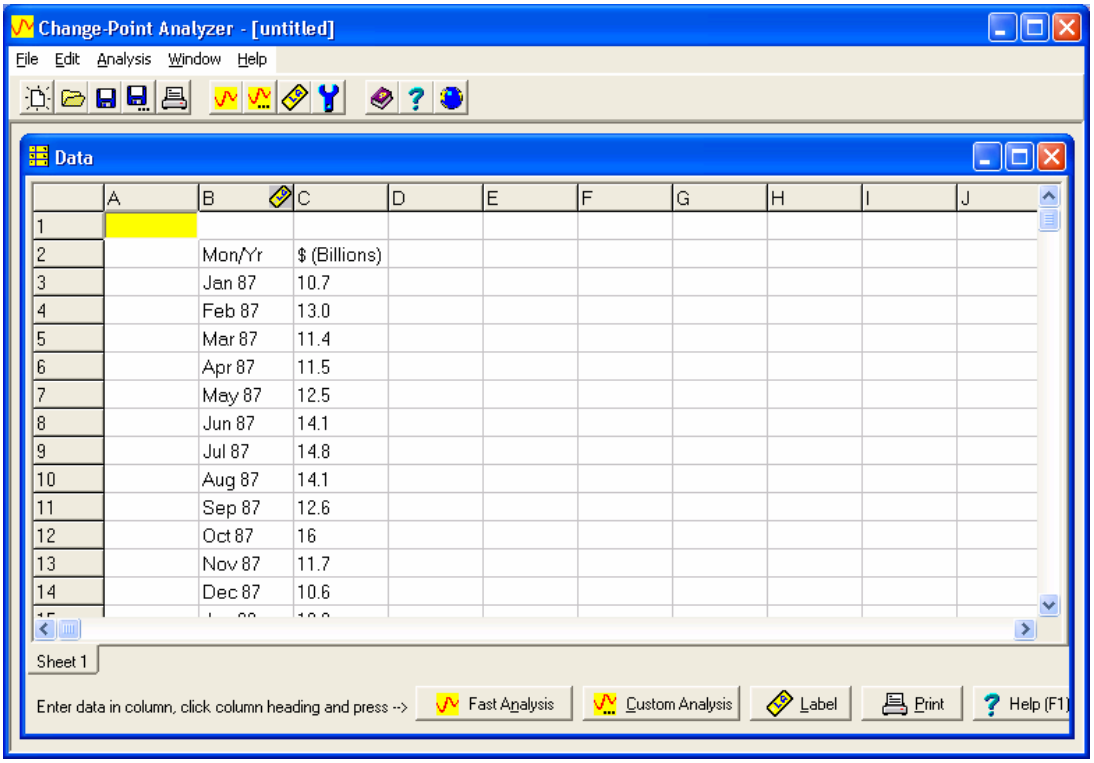
XP System

Trade Deficit Manual Entry Evidence

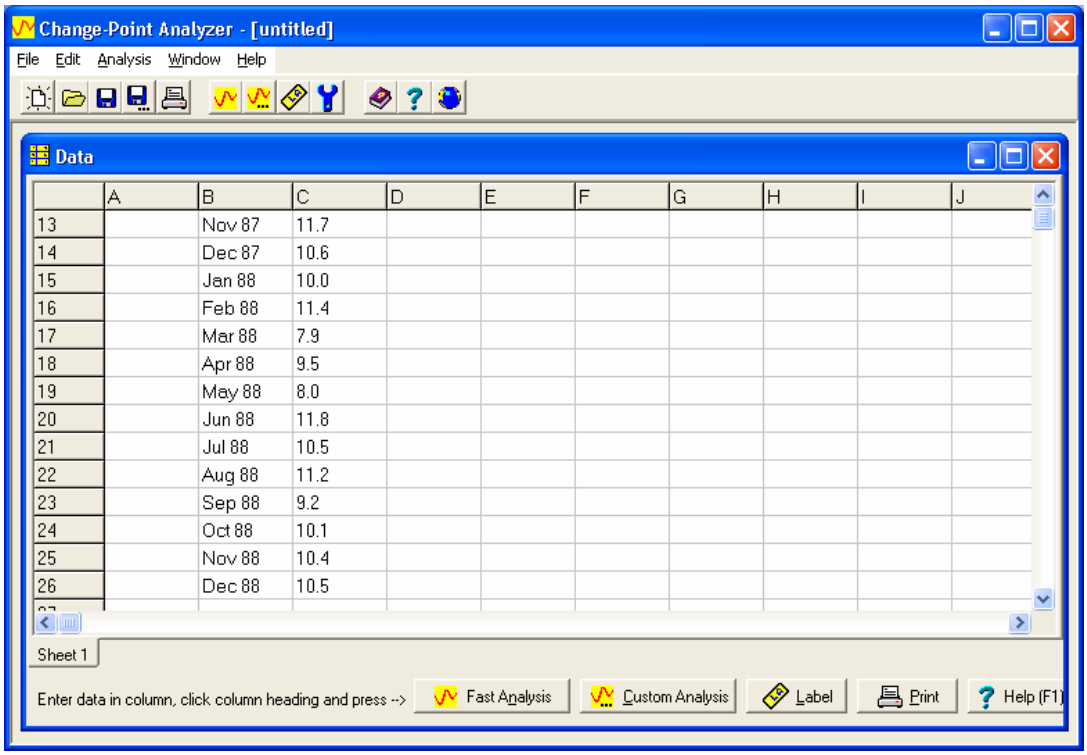
5.1.2:



5.1.5:

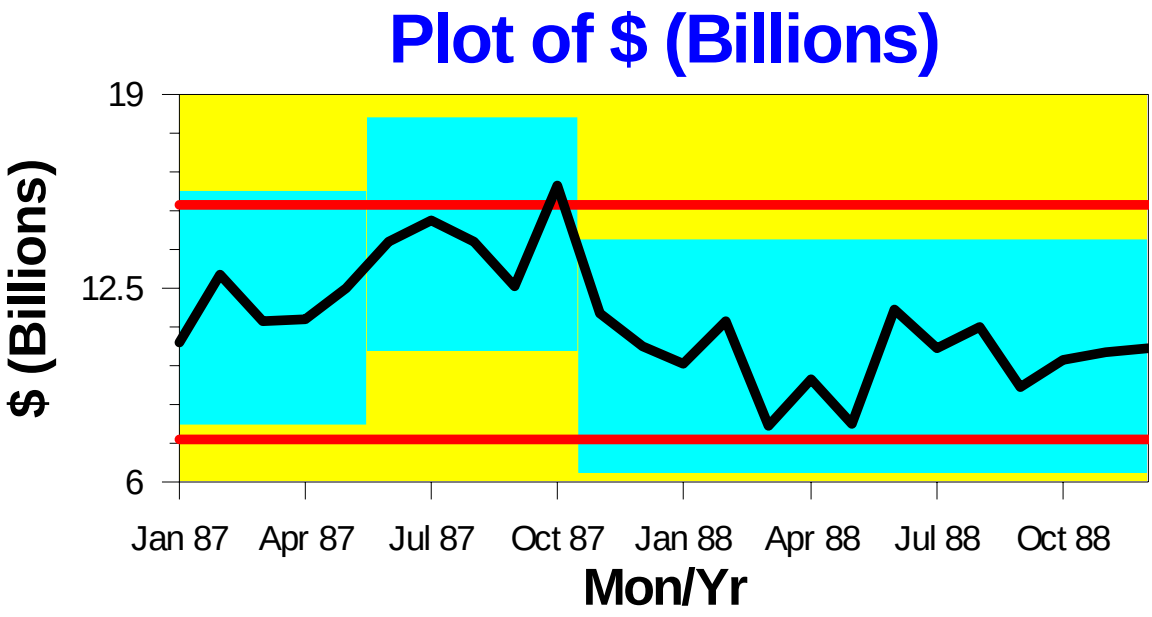


	A	B	C	D	E	F	G	H	I	J
1										
2		Mon/Yr	$ (Billions)							
3		Jan 87	10.7							
4		Feb 87	13.0							
5		Mar 87	11.4							
6		Apr 87	11.5							
7		May 87	12.5							
8		Jun 87	14.1							
9		Jul 87	14.8							
10		Aug 87	14.1							
11		Sep 87	12.6							
12		Oct 87	16							
13		Nov 87	11.7							
14		Dec 87	10.6							



	A	B	C	D	E	F	G	H	I	J
13		Nov 87	11.7							
14		Dec 87	10.6							
15		Jan 88	10.0							
16		Feb 88	11.4							
17		Mar 88	7.9							
18		Apr 88	9.5							
19		May 88	8.0							
20		Jun 88	11.8							
21		Jul 88	10.5							
22		Aug 88	11.2							
23		Sep 88	9.2							
24		Oct 88	10.1							
25		Nov 88	10.4							
26		Dec 88	10.5							

5.4.1: Plot - Values Tab



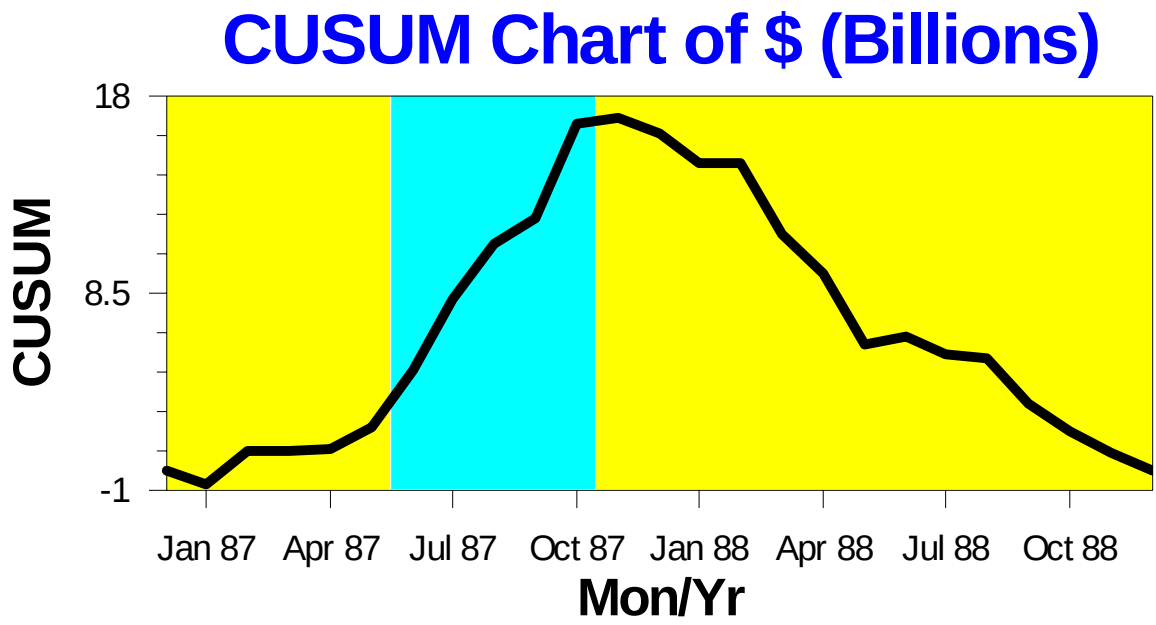
5.4.3: Table Changes - Values Tab

Table of Significant Changes for $ (Billions)

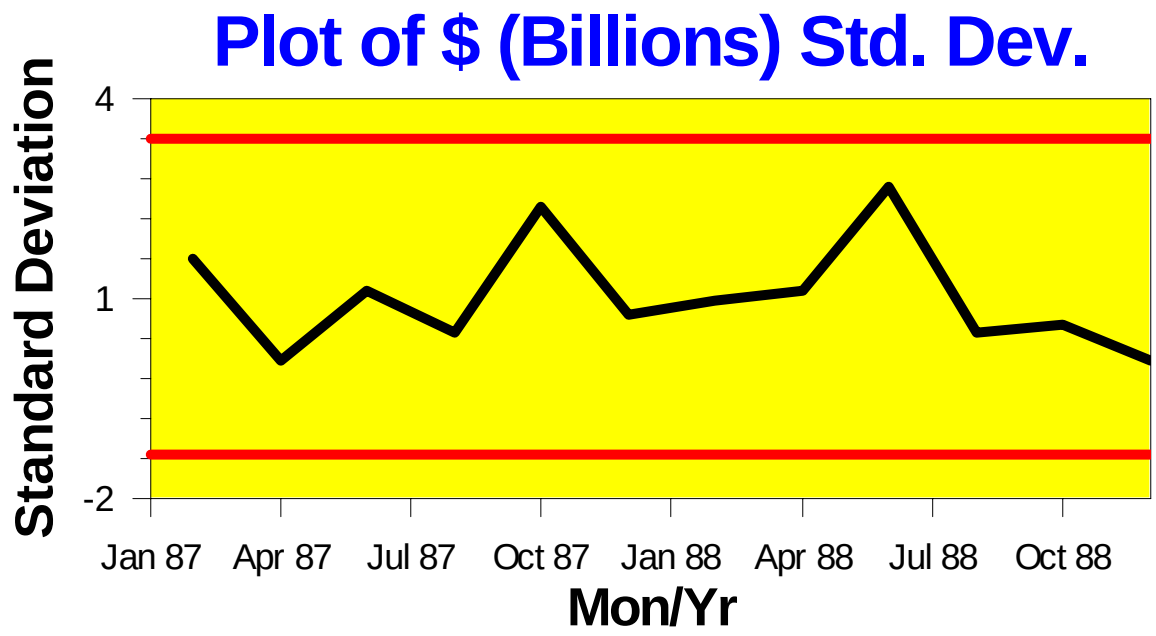
Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

Mon/Yr	Confidence Interval	Conf. Level	From	To	Level
Jun 87	(May 87, Jul 87)	92%	11.82	14.32	2
Nov 87	(Nov 87, Nov 87)	100%	14.32	10.2	1

5.4.5: CUSUM - Values Tab



5.4.6: Plot – Variation Tab



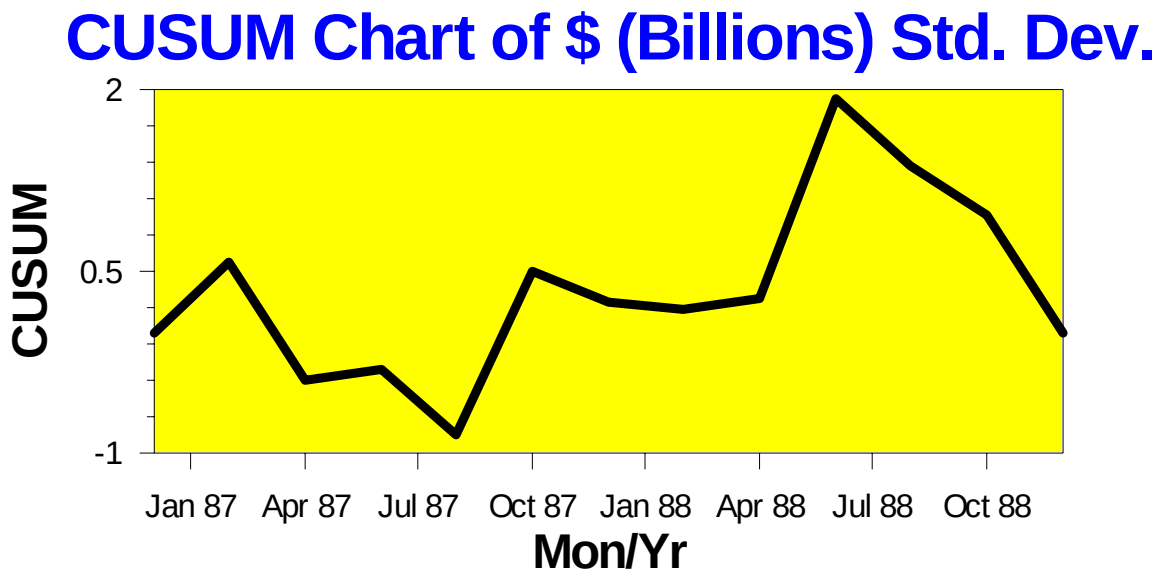
5.4.7: Table Changes - Variation Tab

No Significant Changes for $ (Billions) Standard Deviation

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

Estimated Standard Deviation = 1.3104476

5.4.8: CUSUM - Variation Tab



5.4.9: Assumptions Tab

Assumptions Verified

No departure from any of the assumptions was found.

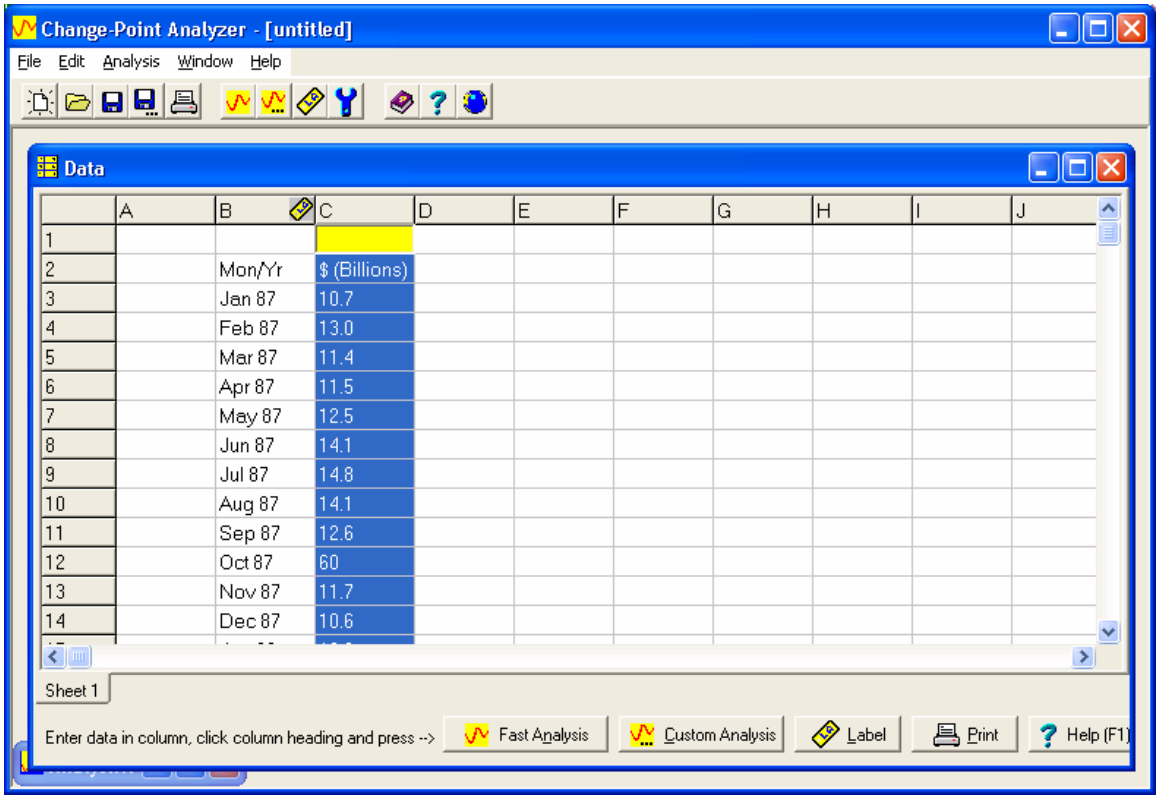
5.4.11: Table Changes – Variation Tab for the Average Standard Deviation

No Significant Changes for $ (Billions) Standard Deviation

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

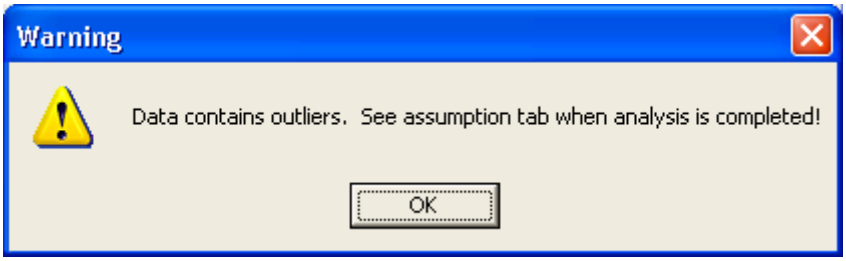
Estimated Standard Deviation = 1.3071847

5.4.12: Modified Data



	A	B	C	D	E	F	G	H	I	J
1										
2		Mon/Yr	$ (Billions)							
3		Jan 87	10.7							
4		Feb 87	13.0							
5		Mar 87	11.4							
6		Apr 87	11.5							
7		May 87	12.5							
8		Jun 87	14.1							
9		Jul 87	14.8							
10		Aug 87	14.1							
11		Sep 87	12.6							
12		Oct 87	60							
13		Nov 87	11.7							
14		Dec 87	10.6							

5.4.13: Warning Message



5.4.14: Table Changes – Values Tab when Outlier/Violation of Assumption

Table of Significant Changes for $ (Billions)

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

Mon/Yr	Confidence Interval	Conf. Level	From	To	Level
Nov 87	(Feb 87, Nov 87)	100%	17.47	10.2	3

5.4.15: Assumptions Tab when Outlier/Violation of Assumption

Outliers Detected

The data appears to contain one or more outliers. While a change-point analysis is robust to outliers, the outliers create added variation in the data making it more difficult to detect the changes. You may get better results by performing a custom analysis on the ranks of the values. (Click Custom Analysis button and check Ranks check box)

5.4.18: Table Changes – Values Tab for Custom Analysis Test

Table of Significant Changes for $ (Billions)

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates, Analyze Ranks

Mon/Yr	Confidence Interval	Conf. Level	From	To	Level
May 87	(Mar 87, Aug 87)	92%	11.65	19.971	2
Dec 87	(Dec 87, Feb 88)	100%	19.971	10.085	1

Attachment 6:

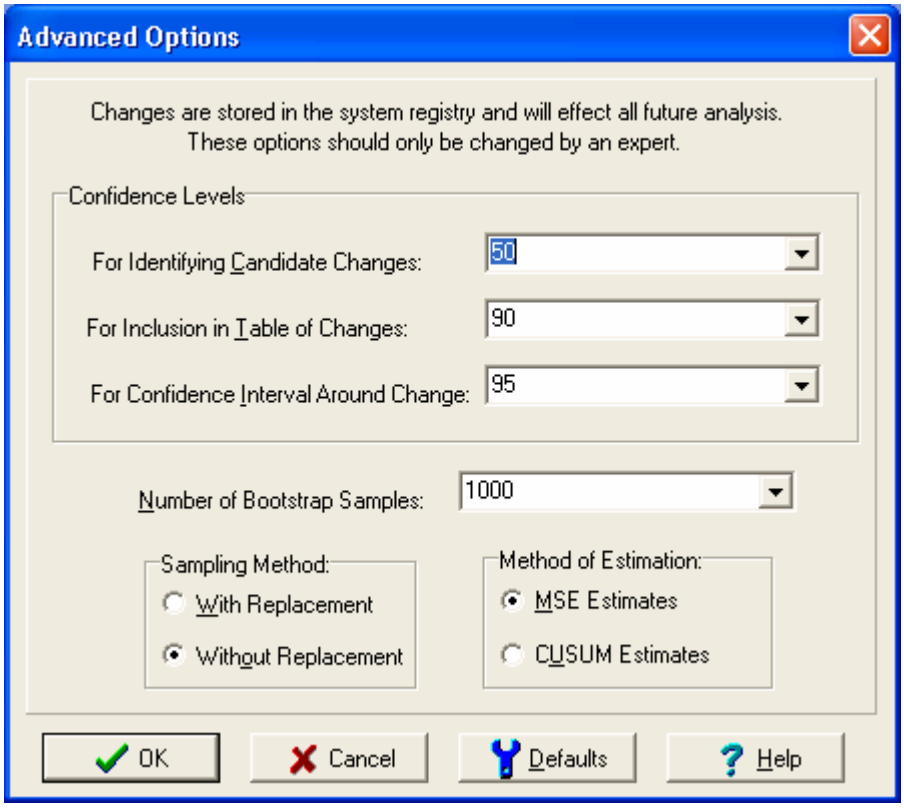
XP Burst Manual Entry.doc

Change-Point Analyzer 2.3 Validation

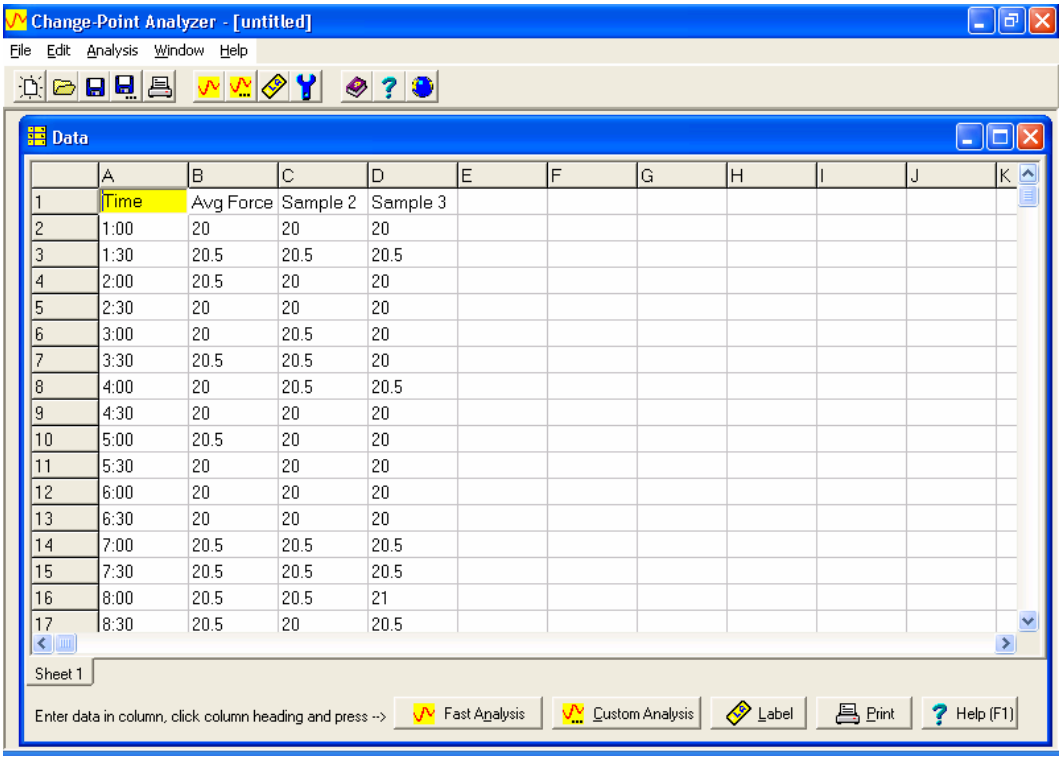
XP System

Burst Manual Entry Evidence

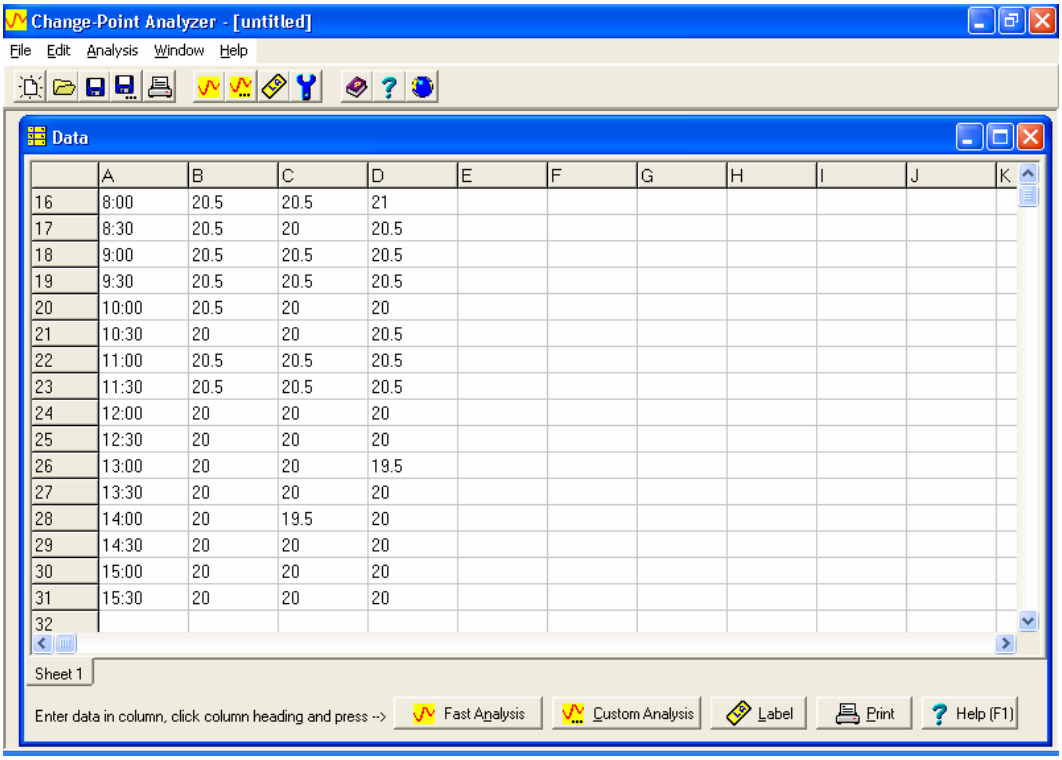
6.1.2:



6.1.5:

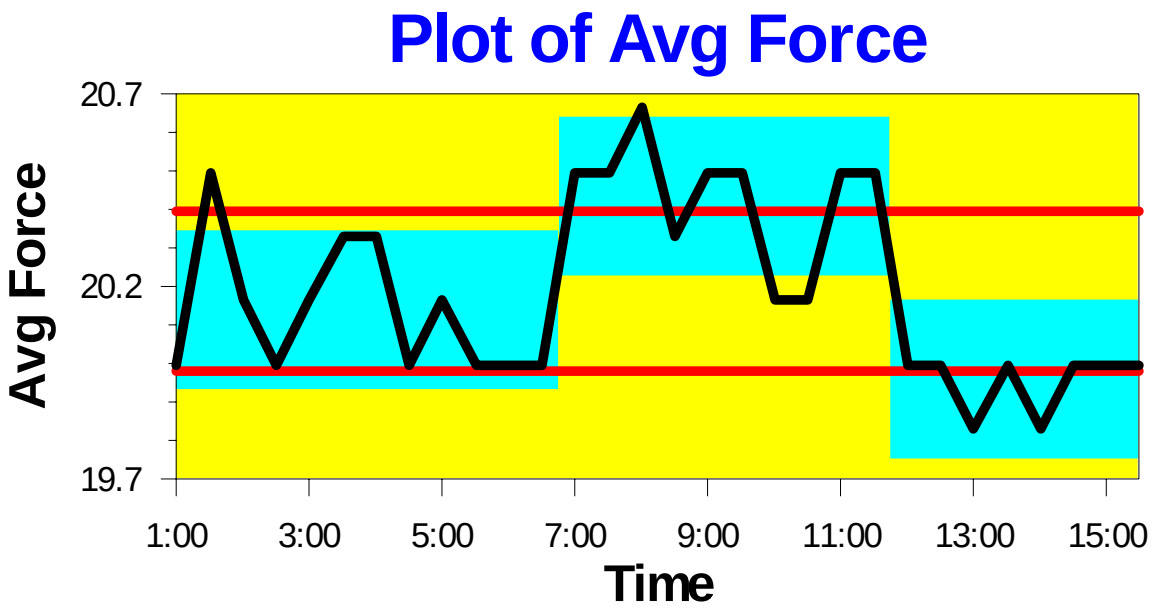


	A	B	C	D	E	F	G	H	I	J	K
1	Time	Avg Force	Sample 2	Sample 3							
2	1:00	20	20	20							
3	1:30	20.5	20.5	20.5							
4	2:00	20.5	20	20							
5	2:30	20	20	20							
6	3:00	20	20.5	20							
7	3:30	20.5	20.5	20							
8	4:00	20	20.5	20.5							
9	4:30	20	20	20							
10	5:00	20.5	20	20							
11	5:30	20	20	20							
12	6:00	20	20	20							
13	6:30	20	20	20							
14	7:00	20.5	20.5	20.5							
15	7:30	20.5	20.5	20.5							
16	8:00	20.5	20.5	21							
17	8:30	20.5	20	20.5							



	A	B	C	D	E	F	G	H	I	J	K
16	8:00	20.5	20.5	21							
17	8:30	20.5	20	20.5							
18	9:00	20.5	20.5	20.5							
19	9:30	20.5	20.5	20.5							
20	10:00	20.5	20	20							
21	10:30	20	20	20.5							
22	11:00	20.5	20.5	20.5							
23	11:30	20.5	20.5	20.5							
24	12:00	20	20	20							
25	12:30	20	20	20							
26	13:00	20	20	19.5							
27	13:30	20	20	20							
28	14:00	20	19.5	20							
29	14:30	20	20	20							
30	15:00	20	20	20							
31	15:30	20	20	20							
32											

6.4.1: Plot - Values Tab



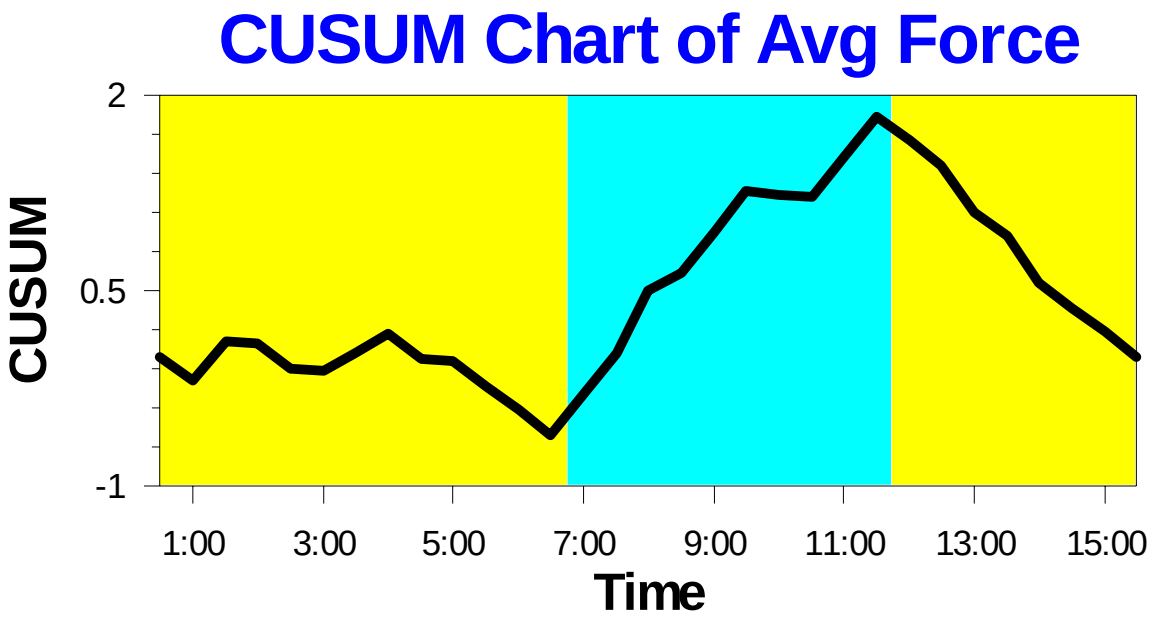
6.4.3: Table Changes - Values Tab

Table of Significant Changes for Avg Force

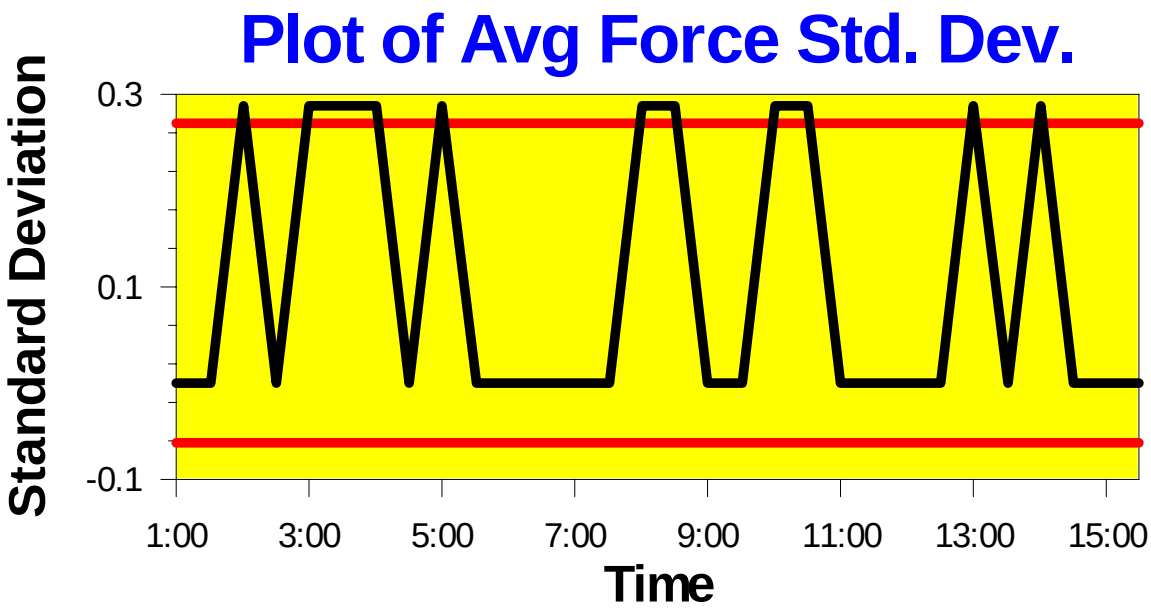
Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

Time	Confidence Interval	Conf. Level	From	To	Level
7:00	(5:00, 8:30)	97%	20.139	20.433	2
12:00	(11:30, 12:00)	100%	20.433	19.958	1

6.4.5: CUSUM - Values Tab



6.4.6: Plot – Variation Tab



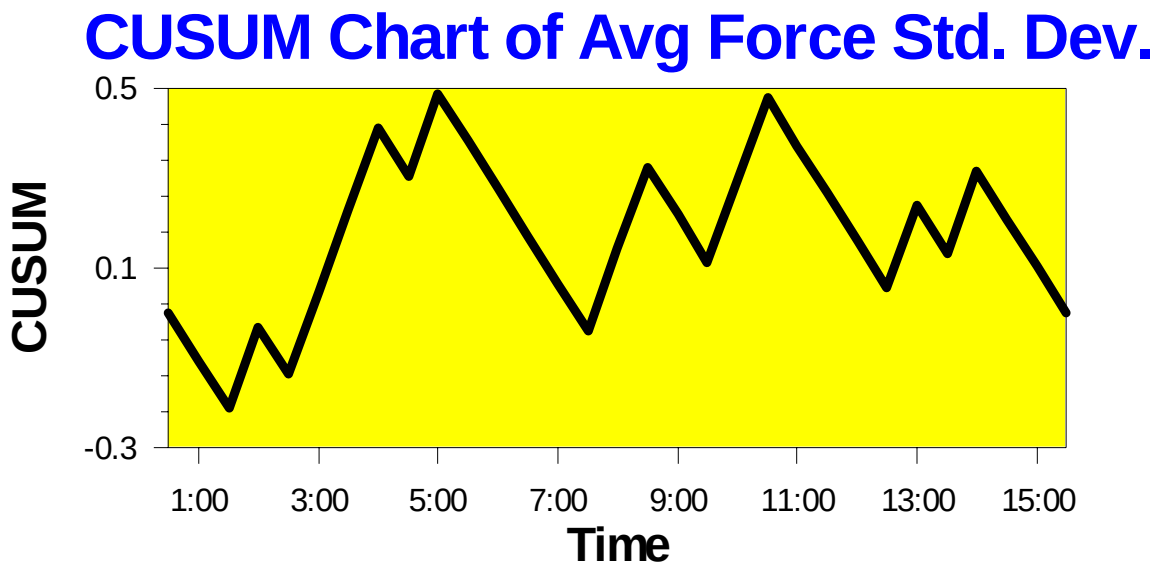
6.4.7: Table Changes - Variation Tab

No Significant Changes for Avg Force Standard Deviation

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

Estimated Standard Deviation = 0.11943617

6.4.8: CUSUM - Variation Tab



6.4.9: Assumptions Tab

Assumptions Verified

No departure from any of the assumptions was found.

Change-Point Analyzer 2.3 Validation Protocol

Protocol Number: TE-03-1

Approvals:

Dr. Wayne A. Taylor
Study Director

10/12/03
Date

Ann B. Taylor
President

10/12/03
Date

Change-Point Analyzer 2.3
Validation Protocol

Protocol Number: TE-03-1

1.0 Introduction

1.1 Change-Point Analyzer 2.3 is a software application used to identify single and multiple shifts in a set of time-ordered data. For each change detected, a description of the shift is provided including the magnitude of the shift, the confidence that a shift occurred and estimates of when the shift occurred. This application consists of a single 32-bit executable file (Change-Point Analyzer.exe) developed using Borland C++ Builder for Windows 95 and higher. The application utilizes no dynamic link library (.dll) files. Associated with the application is an Add-In for EXCEL that automates the cutting and pasting of data from Microsoft EXCEL and automatically invokes the application.

1.2 The purpose of this document is to describe the validation of Change-Point Analyzer 2.3 and the associated EXCEL Add-In for use under Windows 95, Windows 2000 and Windows XP. All other aspects of EXCEL functionality are considered outside the scope of this validation.

1.3 The validation is organized into four distinct sections. A summary of the approach used appears in the table below and each test is described more fully in the text that follows. The purpose of each test is to demonstrate that one or more features of the application are functioning correctly. Successful completion of all tests will demonstrate that the software is suitable for its intended use.

Test	Purpose
Kernel	Demonstrates the functionality of the kernel by challenging critical aspects of the mathematical core functionality to ensure that calculations are correctly executed.
User Interface	Demonstrates that the program user interface operates correctly for both entering data and outputting results. Includes verifying range of inputs and proper detection and handling of illegal values.
Trade Deficit	Demonstrates that the program meets user requirements when a data set consisting of one observation per time period is entered by typing, cutting and pasting, or using the EXCEL Add-In across a variety of Windows operating systems. The data used in this test represents US Trade Deficit data (in billions of $) for the period January, 1987 through December, 1988. It is from Donald Wheeler's book Understanding Variation.
Burst Data	Demonstrates that the program meets user requirements when a dataset consisting of multiple observations per time period is entered by typing, cutting and pasting, and using the EXCEL Add-In across a variety of Windows operating systems. The data used is actual production data. The response analyzed is the force required to rupture a beverage can. Three cans were sampled from a can manufacturing line every half hour for a 15 hour period of time.

1.4 The Kernel and User Interface tests serve to verify that the application functions properly below the system level. The kernel testing includes testing of every subroutine in the kernel to

confirm proper operation. The User Interface test is used to demonstrate that each window, dialog box, menu, toolbar, etc., functions correctly.

1.5 The Trade Deficit and Burst Data tests are performed at the system level. They demonstrate that the application meets the basic user requirements when used on a variety of operating systems:

1.6 User Requirements defined for Change-Point Analyzer v2.3

1. Change-Point Analyzer shall allow the input of data
    a. By directly typing data into program
    b. By pasting data from the clipboard
    c. By highlighting the data in EXCEL and using the EXCEL Add-In
2. Change-Point Analyzer shall identify the shifts (changes) in a time ordered set of data including.
    a. Shifts (changes) in the average
    b. Shifts (changes) in the variation
3. Change-Point Analyzer shall calculate a confidence level for each identified change.
4. Change-Point Analyzer shall estimate a confidence interval for when the change occurred for each identified change.
5. Change-Point Analyzer shall provide a graphical display of the data set being evaluated.
6. Change-Point Analyzer shall display upper and lower control limits on the graphical display of the data set being evaluated.
    a. For a single observation per time period, control limits shall be displayed in an "Individuals Chart" format
    b. For multiple observations per a time period, control limits shall be displayed in an "Xbar-S" format
7. Change-Point Analyzer shall indicate the identified changes on the background of the graphical display.
8. Change-Point Analyzer shall display in tabular format the row/column or label, confidence level and confidence interval associated with each change.
9. Change-Point Analyzer shall display the associated cumulative sum of the data set being evaluated.
10. Change-Point Analyzer shall allow the printing of graphical and tabular displays.
11. Change-Point Analyzer shall allow the copying of graphical and tabular displays into the clipboard in graphics format
12. Change-Point Analyzer shall have the ability to indicate the underlying assumptions for performing an analysis have been
    a. verified
    b. violated
13. Change-Point Analyzer shall have the ability to suggest an alternative analysis approach in the event an underlying assumption for the analysis is determined to have been violated.
14. Change-Point Analyzer shall have the ability to perform a custom analysis.

2.0 Resources

2.1 All testing will be performed at the facilities of Taylor Enterprises, Inc. (TEI), Libertyville, IL USA

2.2 All individuals performing the testing described below shall have a thorough knowledge of Change-Point Analyzer v2.3 and be proficient in its use.

2.3 The file Change-Point Analyzer 2.3 Test Cases.doc must be available for use during the user interface testing described in Section 4.0. This file describes the individual test cases that will be manually executed to demonstrate that the application properly handles the full range of valid and invalid inputs.

2.4 The validation tests described in the following sections are to be repeated on three different computers: one with each of the Windows 95, Windows 2000 and Windows XP operating systems installed. Capture the following information for each computer on a copy of the Computer Test Results Summary Form (found at the end of this protocol):

- Computer hardware make, model, serial number and CPU
- Operating System including exact version number

2.5 Since the application does use any dynamic link libraries that could conflict with other applications, no other software is required or restricted from the machines.

2.6 Prior to execution of the testing described in the following sections, the following software shall be installed on each of the three computers:

a. The Change-Point Analyzer software shall be installed using the installation procedure included with the software. For each installation, the last modified date and last modified time attributes for each of the following files shall be captured in a Word file as well as recorded on the corresponding Computer Test Results Summary Form (found at the end of this protocol) and shall match the following information:

- Change-Point Analyzer.exe 10/8/2003 4:48 AM
- Change-Point Analyzer.xla 4/8/2000 5:58 PM

b. A version of the Microsoft EXCEL and Word software packages shall be installed on each machine. EXCEL and Word 2000 shall be installed on the Windows 95 and 2000 machines. EXCEL and Word XP shall be installed on the Windows XP machine. Also activate on each machine the EXCEL Add-In (Change-Point Analyzer.xla) installed on the machine along with the software. Use the Add-In menu item on the Tools menu of EXCEL. EXCEL will be used to execute certain test cases. Word will be used to capture the results of the testing for documentation. Capture the following information for each computer in a Word file as well as record it on the corresponding Computer Test Results Summary Form:

- Version of EXCEL including exact build
- Version of Word including exact build

c. A proprietary, TEI developed file (TestProgram.exe) shall be installed by copying the file onto each of the test computers. This file contains a set of automated test cases used to test the functionality of the Kernel. For each installation, the last modified date and last modified time the following files shall be captured in a Word file as well as recorded on the corresponding Computer Test Results Summary Form and shall match the following information:

- TestProgram.exe 10/8/2003 4:50 AM

2.7 Record the name, date and time of the file containing the objective evidence of the required items along with the name, signature and date of the person performing the installation of the files identified in 2.6a-d on the corresponding Computer Test Results Summary Form.

3.0 Testing of the Kernel

3.1 Initiate testing of the Kernel on each instrument by running the TestProgram.exe file installed in Step 2.6c.

3.2 As the computer automatically executes each test, the corresponding test number and test status (Pass or Fail) of each individual test will be displayed. The program stops if any test fails. To be considered successful, all of the tests defined in TestProgram.exe must pass. Upon successful completion of all tests in the TestProgram.exe file, the program will display a message that all test cases pass. For each computer, obtain a screen capture of this message, and save the results in a unique Word file.

3.3 For each computer, document the following in the Kernel test section of the corresponding Computer Test Results Summary Form:

a. the file name, last modified date and last modified time attributes of the file created in Step 3.2

b. indicate whether all cases met the acceptance criteria (i.e., passed successfully)

c. the name, signature and date of the person performing the testing

d. the name, signature and date of the person verifying that the Kernel testing was successful

4.0 Testing of the User Interface

4.1 Manually execute each test case described in the file Change-Point Analyzer 2.3 Test Cases.doc on each computer. As each test is executed on a computer, document a reference to the test being performed, a screen capture of the display showing the test was successful (if feasible to do so), and an indication of the test outcome (Pass or Fail) in a unique Word file. To be considered successful, all of the tests defined in the Change-Point Analyzer 2.3.doc file must pass. Repeat for all test cases defined in the Change-Point Analyzer 2.3 Test Cases.doc, appending the information to the Word file as each test is concluded.

4.2 Upon successful completion of all User Interface testing performed on each computer, document the following in the User Interface Test section of the corresponding Computer Test Results Summary Form

a. the file name, last modified date and last modified time attributes of the file created in Step 4.1

b. indicate whether all test cases met the acceptance criteria (i.e., passed successfully)

c. the name, signature and date of the person performing the testing

d. the name, signature and date of the person verifying the User Interface testing was successful

5.0 Trade Deficit Analysis

The following tests will demonstrate that Change-Point Analyzer v2.3 meets the user requirements defined in Section 1 for analysis of data sets containing a single observation per time interval. Testing will be performed on each hardware/operating system combination, and will include each of the three methods used to input the data for analysis – manual data entry, copy/paste from the clipboard, and entry of data into Excel and use of the Excel Add In to launch the application from within Excel. For all testing, the following data (US Trade Deficit, 1987 – 1988, in billions of dollars) is used.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1987	10.7	13.0	11.4	11.5	12.5	14.1	14.8	14.1	12.6	16.0	11.7	10.6
1988	10.0	11.4	7.9	9.5	8.0	11.8	10.5	11.2	9.2	10.1	10.4	10.5

5.1 Manual Data Entry

5.1.1. Using Word, create a document file with a unique filename for use in capturing the data required for this test.

5.1.2. Launch Change-Point Analyzer v2.3 (CPA). From the Menu Bar, select Analysis, followed by Advanced Options. On the Advanced Options window, verify that the Confidence Level for Change is set to 90, the Confidence for Confidence Interval is set to 95, the Number of Bootstrap samples is set to 1000, and the Without Replacement Sampling Method has been selected. Make changes if needed, then copy the window into the document file created in 5.1.1. Near the image copied into the document file note the hardware/operating system in use, the data input approach, and the version of Excel used (if applicable).

5.1.3. On the Advanced Options window of CPA, select OK to close the window.

5.1.4. With the Data window displayed, enter the following data into the designated cells of the worksheet.

Cell ID	Value		Cell ID	Value		Cell ID	Value
B2	Mon/Yr		B19	May 88		C11	12.6
B3	Jan 87		B20	Jun 88		C12	16.0
B4	Feb 87		B21	Jul 88		C13	11.7
B5	Mar 87		B22	Aug 88		C14	10.6
B6	Apr 87		B23	Sep 88		C15	10.0
B7	May 87		B24	Oct 88		C16	11.4
B8	Jun 87		B25	Nov 88		C17	7.9
B9	Jul 87		B26	Dec 88		C18	9.5
B10	Aug 87		C2	$ (Billions)		C19	8.0
B11	Sep 87		C3	10.7		C20	11.8
B12	Oct 87		C4	13.0		C21	10.5
B13	Nov 87		C5	11.4		C22	11.2
B14	Dec 87		C6	11.5		C23	9.2
B15	Jan 88		C7	12.5		C24	10.1
B16	Feb 88		C8	14.1		C25	10.4
B17	Mar 88		C9	14.8		C26	10.5
B18	Apr 88		C10	14.1			

5.1.5. After all data has been entered, select Column B as the label row, then copy the Data Window showing all entered data into the document file. (It may be necessary to scroll the display and copy two screen images to the document file in order to capture all data.) Near the images copied into the document file note an indication that this is the data used in the manual data entry test. Save the document file.

5.1.6. Returning to CPA, highlight Column C and select Fast Analysis.

5.1.7. Proceed to Section 5.4 and follow the instructions to perform the testing.

5.2 Copy/Paste from the Clipboard

5.2.1. Using Word, create a document file with a unique filename for use in capturing the data required for this test.

5.2.2. Launch Change-Point Analyzer v2.3 (CPA). From the Menu Bar, select Analysis, followed by Advanced Options. On the Advanced Options window, verify that the Confidence Level for Change is set to 90, the Confidence for Confidence Interval is set to 95, the Number of Bootstrap samples is set to 1000, and the Without Replacement Sampling Method has been selected. Make changes if needed, then copy the window into the document file created in 5.1.1. Near the image copied into the document file note the hardware/operating system in use, the data input approach, and the version of Excel used (if applicable).

5.2.3. On the Advanced Options window of CPA, select OK to close the window.

5.2.4. Open Windows Notepad and type the following where (Tab) means to press the tab key and (Enter) means to press the Enter key:

```
Month (Tab) Jan '87 (Tab) Feb '87 (Tab) Mar '87
      (Tab) Apr '87 (Tab) May '87 (Tab) Jun '87
      (Tab) Jul '87 (Tab) Aug '87 (Tab) Sep '87
      (Tab) Oct '87 (Tab) Nov '87 (Tab) Dec '87
      (Tab) Jan '88 (Tab) Feb '88 (Tab) Mar '88
      (Tab) Apr '88 (Tab) May '88 (Tab) Jun '88
      (Tab) Jul '88 (Tab) Aug '88 (Tab) Sep '88
      (Tab) Oct '88 (Tab) Nov '88 (Tab) Dec '88
      (Enter)

Trade Deficit (Tab) 10.7 (Tab) 13 (Tab) 11.4 (Tab)
      11.5 (Tab) 12.5 (Tab) 14.1 (Tab) 14.8 (Tab)
      14.1 (Tab) 12.6 (Tab) 16 (Tab) 11.7 (Tab)
      10.6 (Tab) 10 (Tab) 11.4 (Tab) 7.9 (Tab)
      9.5 (Tab) 8 (Tab) 11.8 (Tab) 10.5 (Tab)
      11.2 (Tab) 9.2 (Tab) 10.1 (Tab) 10.4 (Tab)
      10.5 (Enter)
```

5.2.5. Highlight all the data in Notepad using the Edit/Select All menu item. Then perform an Edit/Copy operation to place the data in the clipboard.

5.2.6. Go to CPA and highlight cell B2 in an empty Data window. Then select Edit/Paste menu item to add the data to in CPA.

5.2.7. After the data has been pasted, identify the label row as Row 2, and then copy the Data Window showing all entered data into the document file. (It may be necessary to scroll the display and copy two screen images to the document file in order to capture all data.) Near

the images copied into the document file note an indication that this is the data used in the manual data entry test. Save the document.

5.2.8. Returning to CPA, highlight the Row 3 containing the data for the analysis and select Fast Analysis.

5.2.9. Proceed to Section 5.4 and follow the instructions to perform the analysis.

5.3 Use of the Excel Add-In

5.3.1. Using Word, create a document file with a unique filename for use in capturing the data required for this test.

5.3.2. Launch Change-Point Analyzer v2.3 (CPA). From the Menu Bar, select Analysis, followed by Advanced Options. On the Advanced Options window, verify that the Confidence Level for Change is set to 90, the Confidence for Confidence Interval is set to 95, the Number of Bootstrap samples is set to 1000, and the Without Replacement Sampling Method has been selected. Make changes if needed, then copy the window into the document file created in 5.1.1. Near the image copied into the document file note the hardware/operating system in use, the data input approach, and the version of Excel used (if applicable).

5.3.3. On the Advanced Options window of CPA, select OK to close the window.

5.3.4. Launch the version of Excel into which the CPA Add-In has been installed. Enter the data shown in 5.1.4 into the specified cells of Excel.

5.3.5. After all data has been entered into EXCEL, select Column B as the label row by highlighting it and selecting the Tools/CPA – Select Column or Row for Labels menu item. Then highlight Column C containing the data and select the Tools/Change-Point Analysis menu item to perform the analysis. Change-Point Analyzer is automatically started. Copy the Data Window showing all entered data into the document file. (It may be necessary to scroll the display and copy two screen images to the document file in order to capture all data.) Near the images copied into the document file note an indication that this is the data used in the Add-In entry test. Save the document file.

5.3.6. Proceed to Section 5.4 and follow the instructions to perform the testing.

5.4 Analysis of Trade Deficit Data

5.4.1. With the Plot – Values tab displayed, copy the contents into the document file. Near the copied image, indicate that this is the median Plot Values tab, Step 5.4.1. Save the document file.

5.4.2. Return to the Plot – Values tab. Print the Plot - Values graph. Record on the printout that this is the Plot – Values printout, Step 5.4.2.

5.4.3. Select the Table Changes – Values tab. Copy the contents into the document file. Near the image, indicate that this is the Table Changes - Values tab, Step 5.4.3. Save the document file.

5.4.4. Return to the Table Changes – Values tab. Print the Table Changes – Values graph. Record on the printout that this is the Table Changes – Values printout, Step 5.4.4.

5.4.5. Select the CUSUM – Values tab. Copy the contents into the document file. Near the image, indicate that this is the CUSUM - Values tab, Step 5.4.5. Save the document file.

5.4.6. Select the Plot – Variation tab. Copy the contents into the document file. Near the image, indicate that this is the Plot – Variation tab, Step 5.4.6. Save the document file.

5.4.7. Select the Table Changes - Variation tab. Copy the contents into the document file. Near the image, indicate that this is the Table Changes – Variation tab for the Median Estimated Standard Deviation, Step 5.4.7. Save the document.

5.4.8. Select the CUSUM – Variation tab. Copy the contents into the document file. Near the image, indicate that this is the CUSUM – Variation tab, Step 5.4.8. Save the document file.

5.4.9. Select the Assumptions tab. Copy the contents into document file. Near the image, indicate that this is the Assumptions tab, Step 5.4.9. Save the document file.

5.4.10. Return to the Plot – Variation tab. Place the cursor over the graph and perform a right-click to display an options menu. Select the Use Average Standard Deviation option from the menu, and then close the menu.

5.4.11. Select the Table Changes – Variation tab. Copy the contents into the document file. Near the image, indicate that this is the Table Changes – Variation tab for the average Estimated Standard Deviation, Step 5.4.11. Save the document.

5.4.12. Minimize the Analysis Results window. In the source data, modify the value for October, 1987 from 16 to 60.

5.4.13. Repeat the analysis as a Fast Analysis. When the warning message indicating that the data contains outliers is displayed, copy the warning message into the document file. Near the image, indicate that this is the warning message, Step 5.4.13. Save the document.

5.4.14. Return to CPA, and acknowledge the warning message. Select the Table Changes – Values tab. Copy the contents into the document file. Near the image, indicate that this is the Table Changes – Value tab for the outlier/violation of assumptions test, Step 5.4.14. Save the document.

5.4.15. Select the Assumptions tab. Copy the contents into the document file. Near the image, indicate that this is the Assumptions tab for the outlier/violation of assumptions test, Step 5.4.15. Save the document.

5.4.16. Minimize the Analysis Results window and display the Data window. Click on the Custom Analysis button. When the Custom Analysis window is displayed, select the Handling Violations of Assumptions tab.

5.4.17. In the Custom Analysis window, Handling Violations of Assumptions tab, Outlier section of the form, click on the Analyze Ranks check box, then select OK.

5.4.18. When the analysis is complete, select the Table Changes – Values tab. Copy the contents into the document file. Near the image, indicate that this is the Table Changes – Values tab for the Custom Analysis test, Step 5.4.18. Save the document file.

5.4.19. Save the CPA analysis in a .cpa file with a unique identifier.

5.4.20. Complete the Computer Tests Results Summary Form section for the hardware/operating system used in the section for the data input approach used for the Trade Deficit analysis.

5.5 Evaluation of Trade Deficit Data

Perform the following evaluation of the data obtained in Section 5.4. If any of the following criteria are not met, the test shall be considered a failed test.

Table Changes – Values tab, Step 5.4.3

5.5.1. Data was successfully entered into CPA, regardless of the method used (Requirement 1)
5.5.2. The table was successfully copied to the document file (Requirement 11).
5.5.3. Two change records are identified in the table (Requirements 2a, 8)
5.5.4. A Level 2 change occurred in Jun 87, (Requirement 8)
5.5.5. The Level 2 change shows Confidence Interval of (May 87, Jul 87); (Requirement 4)
5.5.6. The Level 2 change shows a Conf Level in the range of 90 – 92 % (inclusive); (Requirement 3)
5.5.7. The Level 2 change which demonstrates a shift in the average Trade Deficit From 11.82 To 14.32 (Requirement 2a)
5.5.8. A Level 1 change which occurred in Nov 87, (Requirement 8)
5.5.9. The Level 1 change shows a Confidence Interval of (Nov 87, Nov 87); (Requirement 4)
5.5.10. The Level 1 change shows a Conf Level in the range of 99 – 100 % (inclusive); (Requirement 3)
5.5.11. The Level 1 change demonstrates a shift in the average Trade Deficit From 14.32 To 10.2 (Requirement 2a)

Plot – Values tab, Step 5.4.1

5.5.12. The graph was successfully copied to the document file (Requirement #11)
5.5.13. The data entered into CPA is graphically displayed (Requirement #5).
5.5.14. An upper control limit of 15.32 displayed as a horizontal bar across the graph (Requirement #6a; Due to the limited resolution of the graph, this appears just above the tic mark for 15.1)
5.5.15. A lower control limit of 7.47 is displayed as a horizontal bar across the graph (Requirement #6b; Due to the limited resolution of the graph, this appears just above the tic mark for 7.3)
5.5.16. The changes identified in 5.5.4 through 5.5.11 are indicated as darkened background areas (rectangles) upon which the data points are superimposed (Requirement #7)
5.5.17. The vertical Mon/Yr values marking the boundaries of the rectangles match those from 5.5.4 and 5.5.8 (within the associated Confidence Interval)

Plot – Values graph, Step 5.4.2

5.5.18. The Plot Values graph printed in 5.4.2 contains the same format and content of the Plot Values tab saved to the document file in 5.4.1 (Requirement #10)

Table Changes – Values graph, Step 5.4.4

5.5.19. The Table Changes - Values graph printed in 5.4.4 contains the same format and content of the Table Changes - Values tab saved to the document file in 5.4.3 (Requirement 10)

CUSUM – Values tab, Step 5.4.5

Note – (the cumulative sum (CUSUM) values derived from the Trade Deficit data here are calculated by the application, but not reported. They are only displayed in graphical format. To facilitate evaluation, the CUSUM values are reproduced in Appendix I).

5.5.20. The CUSUM values are graphically displayed. (Requirement #9)

5.5.21. The Mon/Yr values identified in 5.5.4 and 5.5.8 are indicated (within the associated Confidence Interval) as a darkened background area (rectangle) upon which the CUSUM data points are superimposed. (Requirement #9)

Table Changes – Variation tab, Step 5.4.7

5.5.22. The (average) Estimated Standard Deviation is shown as 1.3104476 (Requirement # 2b)

Plot - Variation tab, Step 5.4.6

Note – (the standard deviation values used here are generated by pairing the first point with the second, the third with the forth and so on. They are displayed in graphical format only and not reported. To facilitate evaluation, the standard deviation values used to generate the graph are reproduced in Appendix II).

5.5.23. The data shown in Appendix II is graphically displayed (Requirement # 2b)

CUSUM - Variation tab, Step 5.4.8

Note – (the values used here are generated by performing a CUSUM of the standard deviations in Appendix II. They are displayed in graphical format only and not reported. To facilitate evaluation, the standard deviation values used to generate the graph are reproduced in Appendix III).

5.5.24. The data shown in Appendix III are shown (Requirement # 2b)

Assumptions tab, Step 5.4.9

5.5.25. The text shown on the Assumptions tab indicates that the assumptions for the analysis have been verified. (Requirement #12a)

Table Changes – Variation tab, Step 5.4.11

5.5.26. The (average) Estimated Standard Deviation is shown as 1.3071847 (Requirement 2b)

Warning Message, Step 5.4.13

5.5.27. The message displayed indicates that outlier detection has occurred, and directs the user to the Assumptions at the conclusion of the analysis (Requirement 12b, 13)

Table Changes – Values tab, Step 5.4.14

5.5.28. A single change is identified in the table (Requirement 2 and 8)

Assumptions tab, Step 5.4.15

5.5.29. The text shown on the Assumptions tab indicates that outlier detection has occurred, and suggests a custom analysis on the ranks of the values. (Requirement #12b; Note – outlier detection is a violation of the analysis assumptions.)

Table Changes - Values tab, Step 5.4.18

5.5.30. Two changes are identified in the table (Requirements 2a, 8 and 14.)

6.0 Burst Data Analysis

The following tests will demonstrate that Change-Point Analyzer v2.3 meets the user requirements defined in Section 1 for analysis of data sets containing multiple observations per time interval. Testing will be performed on each hardware/operating system combination, and will include each of the three methods used to input the data for analysis – manual data entry, copy/paste from the clipboard, and entry of data into Excel and use of the Excel Add In to launch the application from within Excel. For all testing, the following data (burst strength of containers sampled at various times during the production run) is used.

Time	Sample 1	Sample 2	Sample 3
1:00	20	20	20
1:30	20.5	20.5	20.5
2:00	20.5	20	20
2:30	20	20	20
3:00	20	20.5	20
3:30	20.5	20.5	20
4:00	20	20.5	20.5
4:30	20	20	20
5:00	20.5	20	20
5:30	20	20	20
6:00	20	20	20
6:30	20	20	20
7:00	20.5	20.5	20.5
7:30	20.5	20.5	20.5
8:00	20.5	20.5	21
8:30	20.5	20	20.5
9:00	20.5	20.5	20.5
9:30	20.5	20.5	20.5
10:00	20.5	20	20
10:30	20	20	20.5
11:00	20.5	20.5	20.5
11:30	20.5	20.5	20.5
12:00	20	20	20
12:30	20	20	20
13:00	20	20	19.5
13:30	20	20	20
14:00	20	19.5	20
14:30	20	20	20
15:00	20	20	20
15:30	20	20	20

6.1. Manual Data Entry

6.1.1. Using Word, create a document file with a unique filename for use in capturing the data required for this test.

6.1.2. Launch Change-Point Analyzer v2.3 (CPA). From the Menu Bar, select Analysis, followed by Advanced Options. On the Advanced Options window, verify that the Confidence Level

for Change is set to 90, the Confidence for Confidence Interval is set to 95, the Number of Bootstrap samples is set to 1000, and the Without Replacement Sampling Method has been selected. Make changes if needed, then copy the window into the document file created in 6.1.1. Near the image copied into the document file note the hardware/operating system in use, the data input approach, and the version of Excel used (if applicable).

6.1.3. On the Advanced Options window of CPA, select OK to close the window.

6.1.4. With the Data window displayed, enter the following data into the designated cells of the worksheet.

Row/Col	A	B	C	D
1	**Time**	**Avg Force**	**Sample 2**	**Sample 3**
2	1:00	20	20	20
3	1:30	20.5	20.5	20.5
4	2:00	20.5	20	20
5	2:30	20	20	20
6	3:00	20	20.5	20
7	3:30	20.5	20.5	20
8	4:00	20	20.5	20.5
9	4:30	20	20	20
10	5:00	20.5	20	20
11	5:30	20	20	20
12	6:00	20	20	20
13	6:30	20	20	20
14	7:00	20.5	20.5	20.5
15	7:30	20.5	20.5	20.5
16	8:00	20.5	20.5	21
17	8:30	20.5	20	20.5
18	9:00	20.5	20.5	20.5
19	9:30	20.5	20.5	20.5
20	10:00	20.5	20	20
21	10:30	20	20	20.5
22	11:00	20.5	20.5	20.5
23	11:30	20.5	20.5	20.5
24	12:00	20	20	20
25	12:30	20	20	20
26	13:00	20	20	19.5
27	13:30	20	20	20
28	14:00	20	19.5	20
29	14:30	20	20	20
30	15:00	20	20	20
31	15:30	20	20	20

6.1.5. After all data has been entered, select column A as the label column, then copy the Data Window showing all entered data into the document file. (It may be necessary to scroll the display and copy multiple screen images to the document file in order to capture all data.)

Near the images copied into the document file note an indication that this is the data used in the manual data entry test. Save the document file.

6.1.6. Returning to CPA, highlight columns B-D and select Fast Analysis.

6.1.7. Proceed to Section 6.4 and follow the instructions to perform the testing.

6.2. Copy/Paste from the Clipboard

6.2.1. Using Word, create a document file with a unique filename for use in capturing the data required for this test.

6.2.2. Launch Change-Point Analyzer v2.3 (CPA). From the Menu Bar, select Analysis, followed by Advanced Options. On the Advanced Options window, verify that the Confidence Level for Change is set to 90, the Confidence for Confidence Interval is set to 95, the Number of Bootstrap samples is set to 1000, and the Without Replacement Sampling Method has been selected. Make changes if needed, then copy the window into the document file created in 5.1.1. Near the image copied into the document file note the hardware/operating system in use, the data input approach, and the version of Excel used (if applicable).

6.2.3. On the Advanced Options window of CPA, select OK to close the window.

6.2.4. Open Windows Notepad and type the following where (Tab) means to press the tab key and (Enter) means to press the Enter key:

Time	(Tab)	Avg Force	(Tab)	Sample 2	(Tab)	Sample 3	(Enter)
1:00	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
1:30	(Tab)	20.5	(Tab)	20.5	(Tab)	20.5	(Enter)
2:00	(Tab)	20.5	(Tab)	20	(Tab)	20	(Enter)
2:30	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
3:00	(Tab)	20	(Tab)	20.5	(Tab)	20	(Enter)
3:30	(Tab)	20.5	(Tab)	20.5	(Tab)	20	(Enter)
4:00	(Tab)	20	(Tab)	20.5	(Tab)	20.5	(Enter)
4:30	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
5:00	(Tab)	20.5	(Tab)	20	(Tab)	20	(Enter)
5:30	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
6:00	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
6:30	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
7:00	(Tab)	20.5	(Tab)	20.5	(Tab)	20.5	(Enter)
7:30	(Tab)	20.5	(Tab)	20.5	(Tab)	20.5	(Enter)
8:00	(Tab)	20.5	(Tab)	20.5	(Tab)	21	(Enter)
8:30	(Tab)	20.5	(Tab)	20	(Tab)	20.5	(Enter)
9:00	(Tab)	20.5	(Tab)	20.5	(Tab)	20.5	(Enter)
9:30	(Tab)	20.5	(Tab)	20.5	(Tab)	20.5	(Enter)
10:00	(Tab)	20.5	(Tab)	20	(Tab)	20	(Enter)
10:30	(Tab)	20	(Tab)	20	(Tab)	20.5	(Enter)
11:00	(Tab)	20.5	(Tab)	20.5	(Tab)	20.5	(Enter)
11:30	(Tab)	20.5	(Tab)	20.5	(Tab)	20.5	(Enter)
12:00	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
12:30	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
13:00	(Tab)	20	(Tab)	20	(Tab)	19.5	(Enter)
13:30	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
14:00	(Tab)	20	(Tab)	19.5	(Tab)	20	(Enter)
14:30	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
15:00	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)
15:30	(Tab)	20	(Tab)	20	(Tab)	20	(Enter)

6.2.5. Highlight all the data in Notepad using the Edit/Select All menu item. Then perform an Edit/Copy operation to place the data in the clipboard.

6.2.6. Go to CPA and highlight cell A1 in an empty Data window. Then select Edit/Paste menu item to add the data to in CPA.

6.2.7. After the data has been pasted, identify the label column as Column A, then copy the Data Window showing all entered data into the document file. (It may be necessary to scroll the display and copy two screen images to the document file in order to capture all data.) Near the images copied into the document file note an indication that this is the data used in the manual data entry test. Save the document.

6.2.8. Returning to CPA, highlight columns B-D containing the data for the analysis and select Fast Analysis.

6.2.9. Proceed to Section 6.4 and follow the instructions to perform the analysis.

6.3. Use of the Excel Add-In

6.3.1. Using Word, create a document file with a unique filename for use in capturing the data required for this test.

6.3.2. Launch Change-Point Analyzer v2.3 (CPA). From the Menu Bar, select Analysis, followed by Advanced Options. On the Advanced Options window, verify that the Confidence Level for Change is set to 90, the Confidence for Confidence Interval is set to 95, the Number of Bootstrap samples is set to 1000, and the Without Replacement Sampling Method has been selected. Make changes if needed, then copy the window into the document file created in 5.1.1. Near the image copied into the document file note the hardware/operating system in use, the data input approach, and the version of Excel used (if applicable).

6.3.3. On the Advanced Options window of CPA, select OK to close the window.

6.3.4. Launch the version of Excel into which the CPA Add-In has been installed. Enter the data shown in 6.1.4 into the specified cells of EXCEL.

6.3.5. After all data has been entered into EXCEL, select Column A as the label row by highlighting it and selecting the Tools/CPA – Select Column or Row for Labels menu item. Then highlight Columns B-D containing the data and select the Tools/Change-Point Analysis menu item to perform the analysis. Change-Point Analyzer is automatically started. Copy the Data Window showing all entered data into the document file. (It may be necessary to scroll the display and copy two screen images to the document file in order to capture all data.) Near the images copied into the document file note an indication that this is the data used in the Add-In entry test. Save the document file.

6.3.6. Proceed to Section 5.4 and follow the instructions to perform the testing.

6.4. Analysis of Burst Data

6.4.1. With the Plot – Values tab displayed, copy the contents into the document file. Near the copied image, indicate that this is the average Plot Values tab, Step 6.4.1. Save the document file.

6.4.2. Return to the Plot – Values tab. Print the Plot - Values graph. Record on the printout that this is the Plot – Values printout, Step 6.4.2.

6.4.3. Select the Table Changes – Values tab. Copy the contents into the document file. Near the image, indicate that this is the Table Changes - Values tab, Step 6.4.3. Save the document file.

6.4.4. Return to the Table Changes – Values tab. Print the Table Changes – Values graph. Record on the printout that this is the Table Changes – Values printout, Step 6.4.4.

6.4.5. Select the CUSUM – Values tab. Copy the contents into the document file. Near the image, indicate that this is the CUSUM - Values tab, Step 6.4.5. Save the document file.

6.4.6. Select the Plot – Variation tab. Copy the contents into the document file. Near the image, indicate that this is the Plot – Variation tab, Step 6.4.6. Save the document.

6.4.7. Select the Table Changes - Variation tab. Copy the contents into the document file. Near the image, indicate that this is the Table Changes – Variation tab for the Average Estimated Standard Deviation, Step 6.4.7. Save the document.

6.4.8. Select the CUSUM – Variation tab. Copy the contents into the document file. Near the image, indicate that this is the CUSUM – Variation tab, Step 6.4.8. Save the document.

6.4.9. Select the Assumptions tab. Copy the contents into document file. Near the image, indicate that this is the Assumptions tab, Step 6.4.9. Save the document.

6.4.10. Save the CPA analysis in a .cpa file with a unique identifier.

6.4.11. Complete the Computer Tests Results Summary Form section for the hardware/operating system used in the section for the data input approach used for the Burst analysis.

6.5. Evaluation of Burst Data

Perform the following evaluation of the data obtained in Section 6.4. If any of the following criteria are not met, the test shall be considered a failed test.

Table Changes – Values tab, Step 6.4.3

6.5.1. Data was successfully entered into CPA, regardless of the method used (Requirement 1)
6.5.2. The table was successfully copied to the document file (Requirement 11).
6.5.3. Two change records are identified in the table (Requirements 2a, 8)
6.5.4. A Level 2 change occurred at 7:00, (Requirement 8)
6.5.5. The Level 2 change shows Confidence Interval of (5:00, 8:30); (Requirement 4)
6.5.6. The Level 2 change shows a Conf Level of in the range of 96 – 98 % (inclusive); (Requirement 3)
6.5.7. The Level 2 change which demonstrates a shift in the average Burst Data From 20.139 To 20.433 (Requirement 2a)
6.5.8. A Level 1 change which occurred at 12:00, (Requirement 8)
6.5.9. The Level 1 change shows a Confidence Interval of (11:30, 12:00); (Requirement 4)
6.5.10. The Level 1 change shows a Conf Level of in the range of 99 – 100 % (inclusive); (Requirement 3)
6.5.11. The Level 1 change demonstrates a shift in the average Burst Data From 20.433 To 19.958 (Requirement 2a)

Plot – Values tab, Step 6.4.1

Note – (the average derived from the Burst Data here are calculated by the application, but not reported. They are only displayed in graphical format. To facilitate evaluation, the averages are reproduced in Appendix IV).

6.5.12. The graph was successfully copied to the document file (Requirement #11)
6.5.13. The data entered into CPA is graphically displayed (Requirement #5).
6.5.14. An upper control limit of 20.433 displayed as a horizontal bar across the graph (Requirement #6a; Due to the limited resolution of the graph, this appears just above the tic mark for 20.4)
6.5.15. A lower control limit of 19.958 is displayed as a horizontal bar across the graph (Requirement #6b; Due to the limited resolution of the graph, this appears just below the tic mark for 20.0)
6.5.16. The changes identified in 5.5.4 through 5.5.11 are indicated as darkened background areas (rectangles) upon which the data points are superimposed (Requirement #7)
6.5.17. The vertical Mon/Yr values marking the boundaries of the rectangles match those from 5.5.4 and 5.5.8 (within the associated Confidence Interval)

Plot – Values graph, Step 6.4.2

6.5.18. The Plot Values graph printed in 6.4.2 contains the same format and content of the Plot Values tab saved to the document file in 6.4.1 (Requirement #10)

Table Changes – Values graph, Step 6.4.4

6.5.19. The Table Changes - Values graph printed in 6.4.4 contains the same format and content of the Table Changes - Values tab saved to the document file in 6.4.3 (Requirement 10)

CUSUM – Values tab, Step 6.4.5

Note – (the cumulative sum (CUSUM) values derived from the Burst Data average are calculated by the application, but not reported. They are only displayed in graphical format. To facilitate evaluation, the CUSUM values are reproduced in Appendix V).

6.5.20. The CUSUM values are graphically displayed. (Requirement #9)

6.5.21. The time values identified in 6.5.4 and 6.5.8 are indicated (within the associated Confidence Interval) as a darkened background area (rectangle) upon which the CUSUM data points are superimposed. (Requirement #9)

Table Changes – Variation tab, Step 6.4.7

6.5.22. The median Estimated Standard Deviation is shown as 0.11943617 (Requirement # 2b)

Plot - Variation tab, Step 6.4.6

Note – (the standard deviations derived from the Burst Data here are calculated by the application, but not reported. They are only displayed in graphical format. To facilitate evaluation, the standard deviations are reproduced in Appendix VI).

6.5.23. The data shown in Appendix VI is graphically displayed (Requirement #2b)

CUSUM - Variation tab, Step 6.4.8

Note – (Note – (the cumulative sum (CUSUM) values derived from the Burst Data standard deviations are calculated by the application, but not reported. They are only displayed in graphical format. To facilitate evaluation, the CUSUM values are reproduced in Appendix VII).

6.5.24. The data shown in Appendix VII are shown (Requirement #2b)

Assumptions tab, Step 6.4.9

6.5.25. The text shown on the Assumptions tab indicates that the assumptions for the analysis have been verified. (Requirement #12a)

Appendix I:
CUSUM of Trade Deficit Data

	0.000
Jan '87	-0.696
Feb '87	0.908
Mar '87	0.913
Apr '87	1.017
May '87	2.121
Jun '87	4.825
Jul '87	8.229
Aug '87	10.933
Sep '87	12.138
Oct '87	16.742
Nov '87	17.046
Dec '87	16.250
Jan '88	14.854
Feb '88	14.858
Mar '88	11.363
Apr '88	9.467
May '88	6.071
Jun '88	6.475
Jul '88	5.579
Aug '88	5.383
Sep '88	3.188
Oct '88	1.892
Nov '88	0.896
Dec '88	0.000

Appendix II:
Standard Deviations for Trade Deficit Data

Feb '87	1.626
Apr '87	0.071
Jun '87	1.131
Aug '87	0.495
Oct '87	2.404
Dec '87	0.778
Feb '88	0.990
Apr '88	1.131
Jun '88	2.687
Aug '88	0.495
Oct '88	0.636
Dec '88	0.071

Appendix III:
CUSUM for Standard Deviations of Trade Deficit Data

	0.000
Feb '87	0.583
Apr '87	-0.389
Jun '87	-0.301
Aug '87	-0.849
Oct '87	0.513
Dec '87	0.247
Feb '88	0.194
Apr '88	0.283
Jun '88	1.927
Aug '88	1.379
Oct '88	0.972
Dec '88	0.000

Appendix IV:
Averages of Burst Data

1:00	20
1:30	20.5
2:00	20.16667
2:30	20
3:00	20.16667
3:30	20.33333
4:00	20.33333
4:30	20
5:00	20.16667
5:30	20
6:00	20
6:30	20
7:00	20.5
7:30	20.5
8:00	20.66667
8:30	20.33333
9:00	20.5
9:30	20.5
10:00	20.16667
10:30	20.16667
11:00	20.5
11:30	20.5
12:00	20
12:30	20
13:00	19.83333
13:30	20
14:00	19.83333
14:30	20
15:00	20
15:30	20

Appendix V:
CUSUM of Averages of Burst Data

	0.000
1:00	-0.189
1:30	0.122
2:00	0.100
2:30	-0.089
3:00	-0.111
3:30	0.033
4:00	0.178
4:30	-0.011
5:00	-0.033
5:30	-0.222
6:00	-0.411
6:30	-0.600
7:00	-0.289
7:30	0.022
8:00	0.500
8:30	0.644
9:00	0.956
9:30	1.267
10:00	1.244
10:30	1.222
11:00	1.533
11:30	1.844
12:00	1.656
12:30	1.467
13:00	1.111
13:30	0.922
14:00	0.567
14:30	0.378
15:00	0.189
15:30	0.000

Appendix VI:
Standard Deviations for Burst Data

1:00	0
1:30	0
2:00	0.288675
2:30	0
3:00	0.288675
3:30	0.288675
4:00	0.288675
4:30	0
5:00	0.288675
5:30	0
6:00	0
6:30	0
7:00	0
7:30	0
8:00	0.288675
8:30	0.288675
9:00	0
9:30	0
10:00	0.288675
10:30	0.288675
11:00	0
11:30	0
12:00	0
12:30	0
13:00	0.288675
13:30	0
14:00	0.288675
14:30	0
15:00	0
15:30	0

Appendix VII:
CUSUM for Standard Deviations of Burst Data

	0.000
1:00	-0.106
1:30	-0.212
2:00	-0.029
2:30	-0.135
3:00	0.048
3:30	0.231
4:00	0.414
4:30	0.308
5:00	0.491
5:30	0.385
6:00	0.279
6:30	0.173
7:00	0.067
7:30	-0.038
8:00	0.144
8:30	0.327
9:00	0.221
9:30	0.115
10:00	0.298
10:30	0.481
11:00	0.375
11:30	0.269
12:00	0.164
12:30	0.058
13:00	0.241
13:30	0.135
14:00	0.318
14:30	0.212
15:00	0.106
15:30	0.000

Computer Test Results Summary Form

DOCUMENTATION OF SETUP:

Computer:	Make:	
	Model:	
	Serial Number:	
	Type CPU:	
Operating	Name:	
System:	Version:	

Files:	Change-Point Analyzer.exe	Date/Time:	
	Change-Point Analyzer.xla	Date/Time:	
	EXCEL	Version:	
	Word	Version:	
	TestProgram.exe	Date/Time:	

File Evidence Saved In:	Name:	
	Date/Time:	
Person Performing Setup:	Name:	
	Signature:	
	Date:	

Operating System Name:

DOCUMENTATION OF PERFORMANCE OF TESTS:

Test	Documentation	Results
Kernel	File Name:	
	Last Date/Time Modified:	
	All test Cases Pass?	yes no
	Tester Name:	
	Tester Signature:	
	Tester Signature Date:	
	Verifier Name:	
	Verifier Signature:	
	Verifier Signature Date:	
User Interface	File Name	
	Last Date/Time Modified	
	All test Cases Pass?	yes no
	Tester Name:	
	Tester Signature:	
	Tester Signature Date:	
	Verifier Name:	
	Verifier Signature:	
	Verifier Signature Date:	

Operating System Name:

DOCUMENTATION OF PERFORMANCE OF TESTS (Continued):

Trade Deficit Data: **Data Typed**	Saved Word File	
	Date/Time of File:	
	Saved cpa File	
	Date/Time of File:	
	All Test Cases Pass?	yes no
	Signature of Person Running Tests (With Date)	
	Signature of Person Verifying Results (With Date)	
Trade Deficit Data: **Data Pasted**	Saved Word File	
	Date/Time of File:	
	Saved cpa File	
	Date/Time of File:	
	All Test Cases Pass?	yes no
	Signature of Person Running Tests (With Date)	
	Signature of Person Verifying Results (With Date)	
Trade Deficit Data: **EXCEL Add-In**	Saved Word File	
	Date/Time of File:	
	Saved cpa File	
	Date/Time of File:	
	All Test Cases Pass?	yes no
	Signature of Person Running Tests (With Date)	
	Signature of Person Verifying Results (With Date)	

Operating System Name: _____

DOCUMENTATION OF PERFORMANCE OF TESTS (Continued):

Burst Data: **Data Typed**	Saved Word File	
	Date/Time of File:	
	Saved cpa File	
	Date/Time of File:	
	All Test Cases Pass?	yes no
	Signature of Person Running Tests (With Date)	
	Signature of Person Verifying Results (With Date)	
Burst Data: **Data Pasted**	Saved Word File	
	Date/Time of File:	
	Saved cpa File	
	Date/Time of File:	
	All Test Cases Pass?	yes no
	Signature of Person Running Tests (With Date)	
	Signature of Person Verifying Results (With Date)	
Burst Data: **EXCEL Add-In**	Saved Word File	
	Date/Time of File:	
	Saved cpa File	
	Date/Time of File:	
	All Test Cases Pass?	yes no
	Signature of Person Running Tests (With Date)	
	Signature of Person Verifying Results (With Date)	

DOCUMENTATION OF FINAL RESULTS FOR COMPUTER:

All Test Cases for Computer Pass? yes no

Signature: _____ Date: _____