



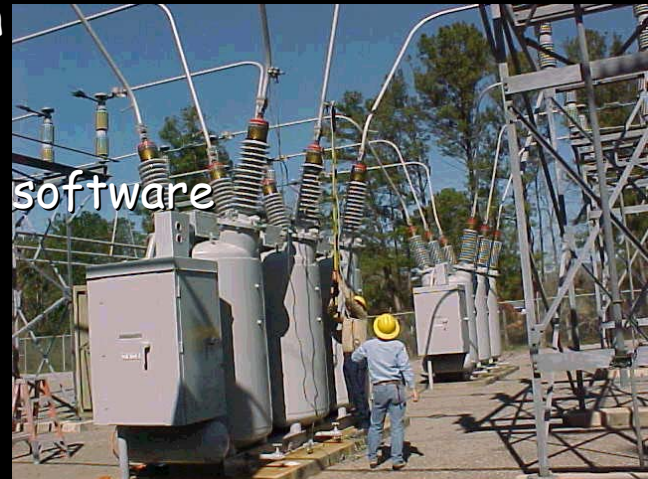
TIME-TRAVEL TESTS ALABAMA



timing tests - Alabama - Rev. 1 -
20-03-2006

ZENSOL - Time-travel tests

- Perform timing tests on a 3 contact breaker
 - Breaker preparation for the test
 - Cable installation by the operators
 - Travel transducer kit installation
 - The CBA-32P
 - perform the test with CBA WIN software
 - Conclusion



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ZENSOL - Time-travel tests

- Isolate the breaker thanks to the sectionnors



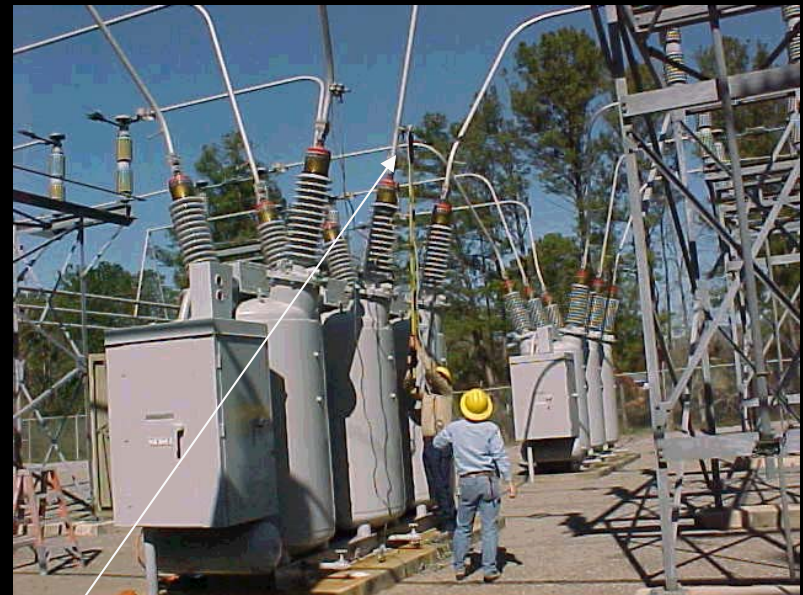
The sectionnors are open

ZENSOL - Time-travel tests

- Ground the breaker



Ground cable



Grounding of
the breaker

ZENSOL - Time-travel tests

- Cable of the CBA-32P Circuit Breaker Analyzer



Extension
cables

Contact cables

Ground cable

Command cable

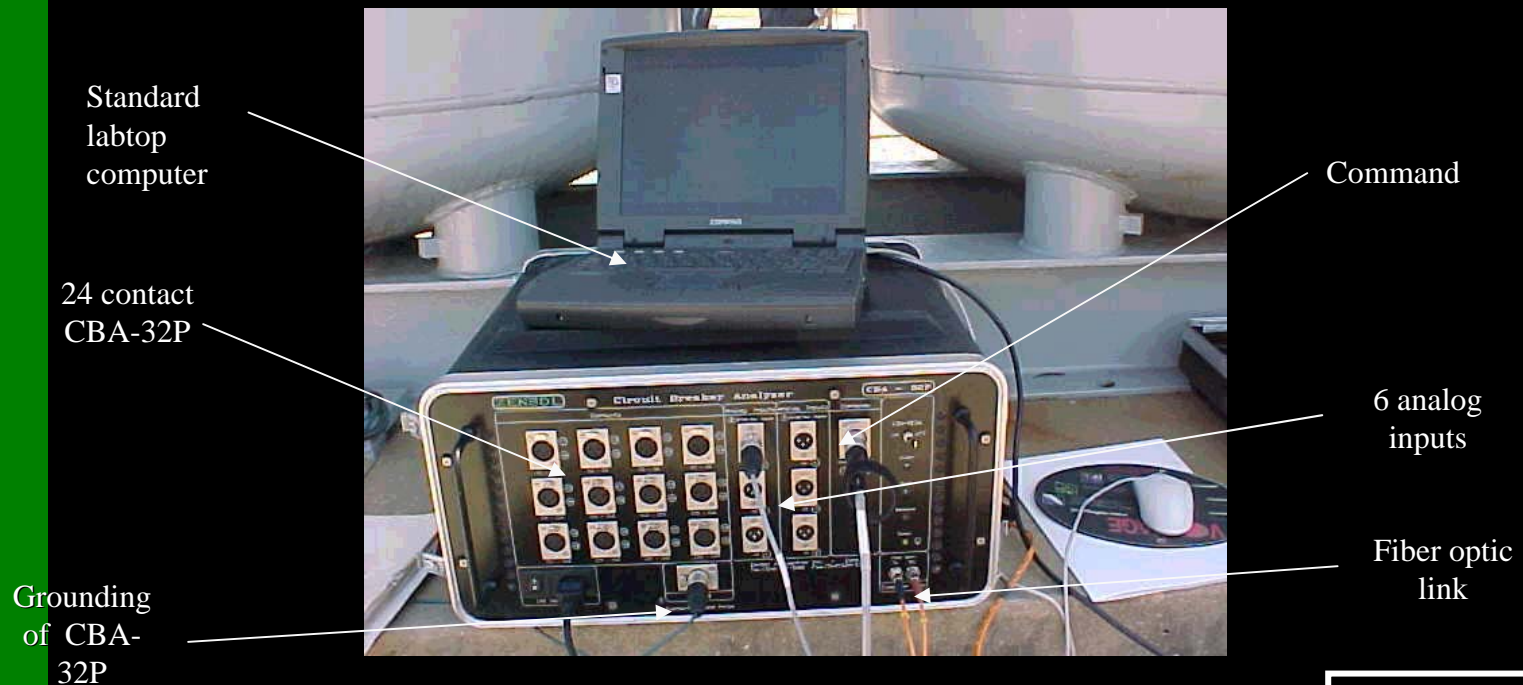
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ZENSOL - Time-travel tests

- The CBA-32P Circuit Breaker Analyzer



ZENSOL - Time-travel tests

- Installation of CBA-32P Circuit Breaker Analyzer



Breaker with 3 separate tanks

Control cabinet

computer



CBA-32P

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ZENSOL - Time-travel tests

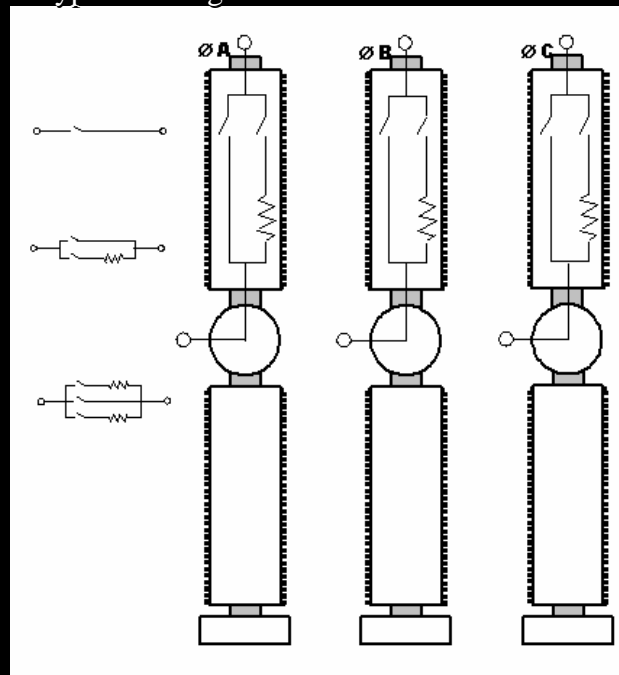
- Contact connections

Typical configuration of a 3 contact breaker

Simple contact

Resistive contact

Double resistive contact



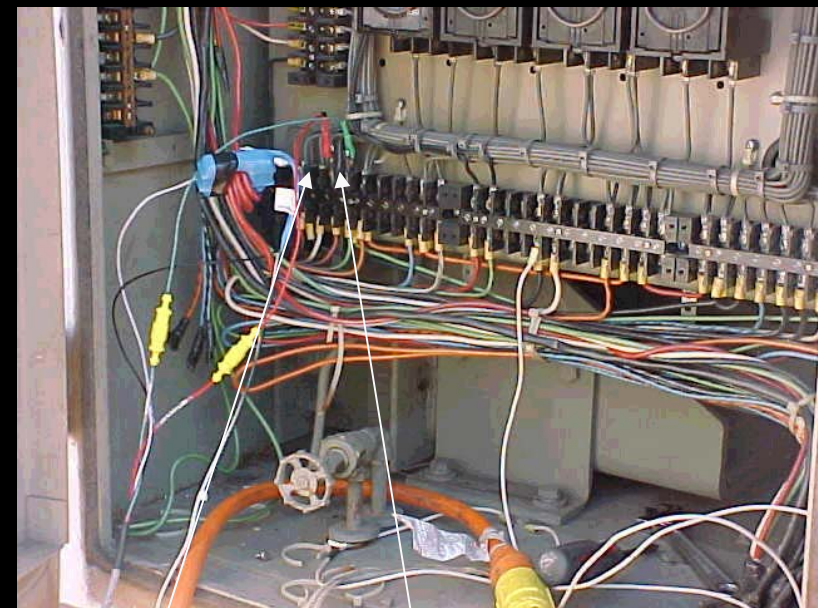
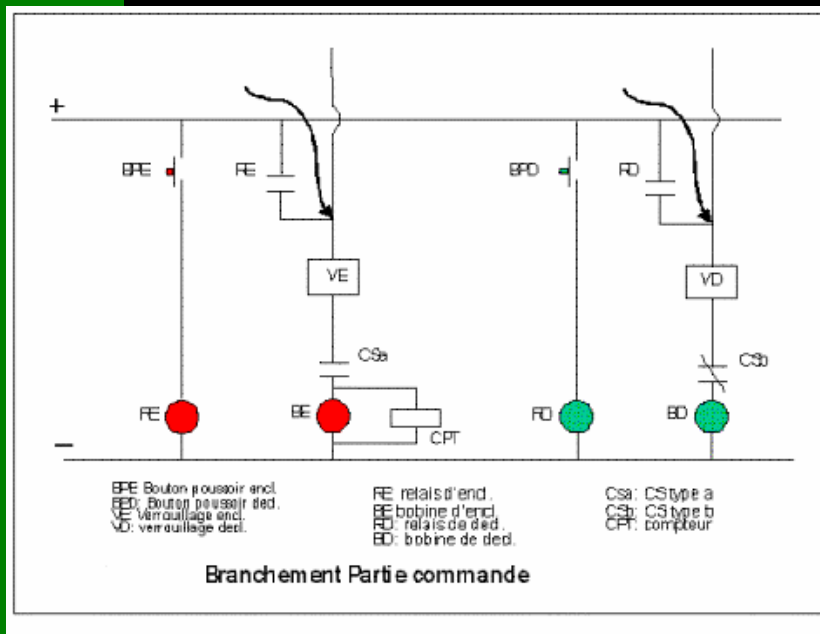
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ZENSOL - Time-travel tests

- Command connections



Ouverture des contacts

Fermeture des contacts

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ZENSOL - Time-travel tests

- Travel transducer kit installation



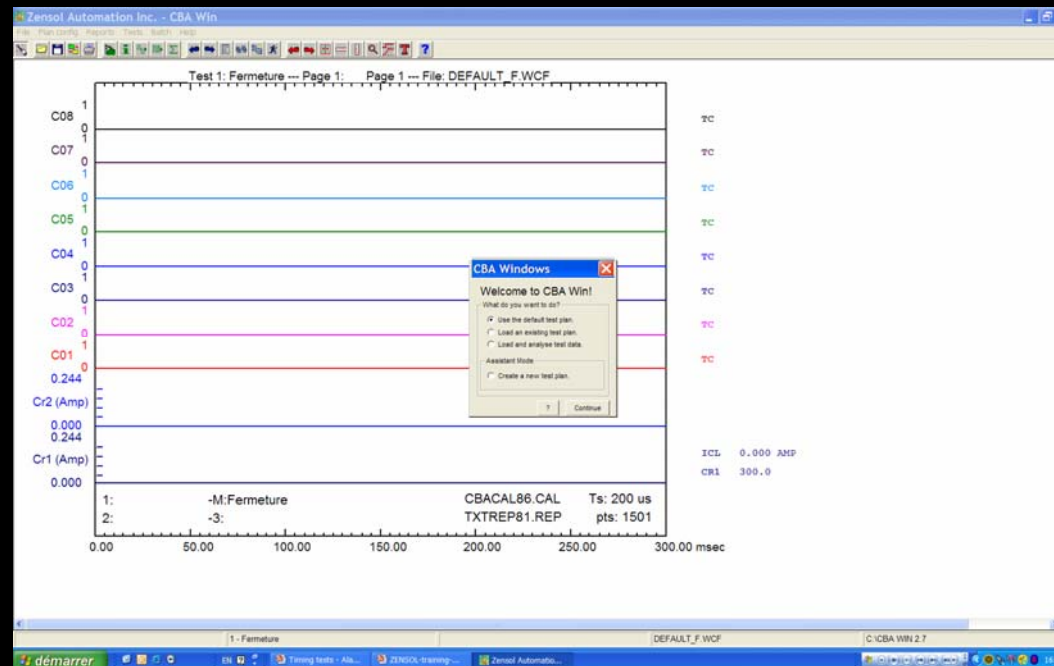
Linear travel
transducer



Mechanical basis allowing
the positioning of the
transducer on the breaker

ZENSOL - Time-travel tests

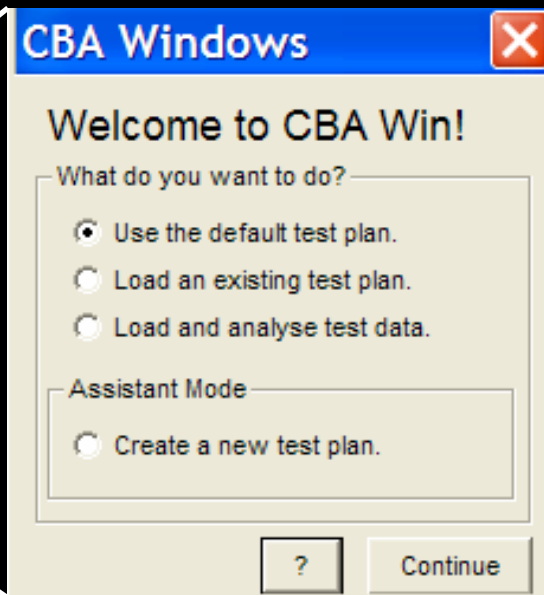
NOW
YOU ARE READY TO DO A TEST !



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20-03-2006

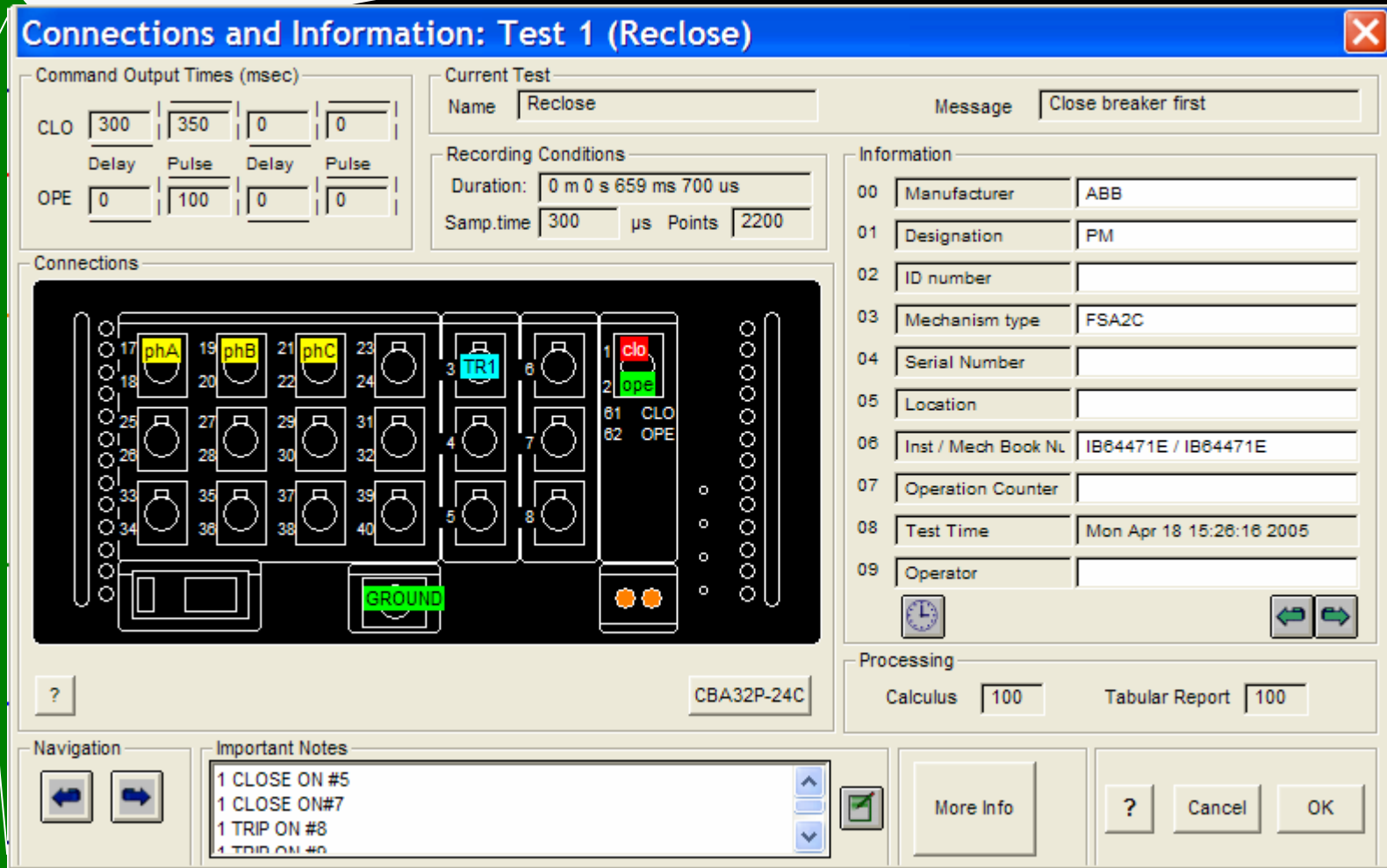
ZENSOL - Time-travel tests

- load a test plan from CBA WIN software



**TEST PLAN
LIBRARY
ALREADY
AVAILABLE IN
THE CBA WIN
SOFTWARE**

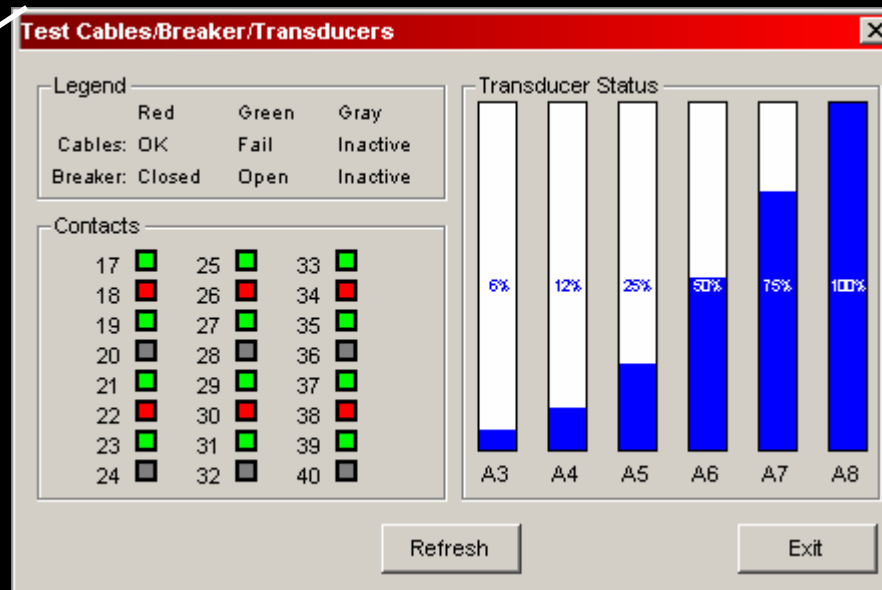
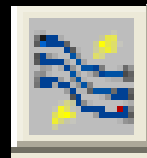
EASY BREAKER CONNECTIONS



The screenshot shows a software window titled "Connections and Information: Test 1 (Reclose)". The interface is divided into several sections:

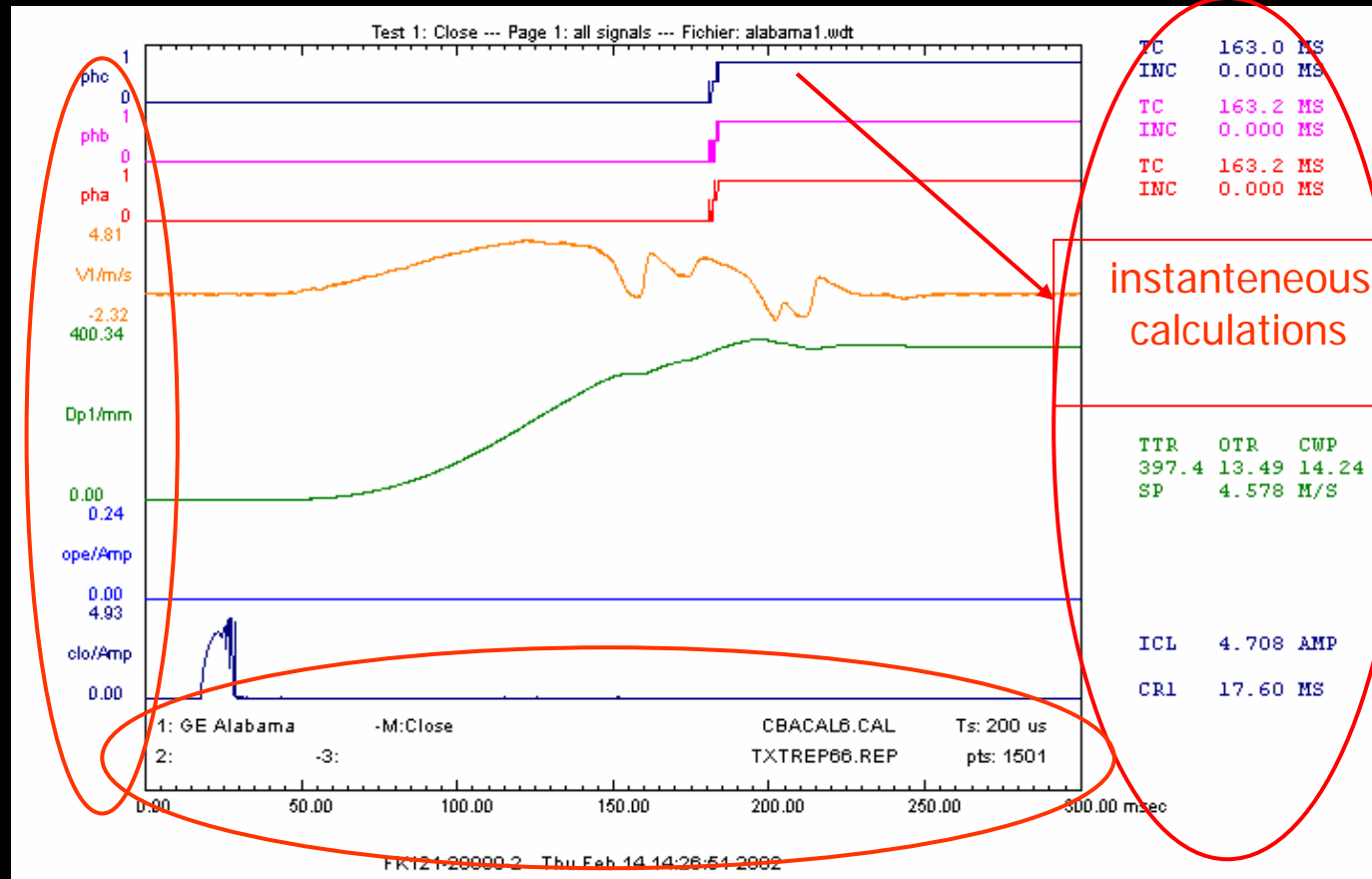
- Command Output Times (msec):** A grid for configuring CLO and OPE commands with Delay and Pulse values.
- Current Test:** Name "Reclose" and Message "Close breaker first".
- Recording Conditions:** Duration "0 m 0 s 659 ms 700 us" and Samp.time "300 μs Points 2200".
- Information:** A table with fields for Manufacturer (ABB), Designation (PM), ID number, Mechanism type (FSA2C), Serial Number, Location, Inst / Mech Book Nl (IB64471E / IB64471E), Operation Counter, Test Time (Mon Apr 18 15:26:16 2005), and Operator.
- Connections:** A diagram of a breaker terminal block with 40 terminals. Terminals 17-21 are labeled phA, phB, phC. Terminal 3 is labeled TRI. Terminals 1 and 2 are labeled clo and ope. A GROUND terminal is highlighted in green. A label "CBA32P-24C" is visible below the diagram.
- Processing:** Calculus and Tabular Report settings, both set to 100.
- Important Notes:** A list of test results: "1 CLOSE ON #5", "1 CLOSE ON #7", "1 TRIP ON #8", "1 TRIP ON #9".
- Navigation:** Back and forward arrows.
- Buttons:** More Info, Cancel, and OK.

EASY TEST CABLES



ZENSOL - Time-travel tests

- Test : Close



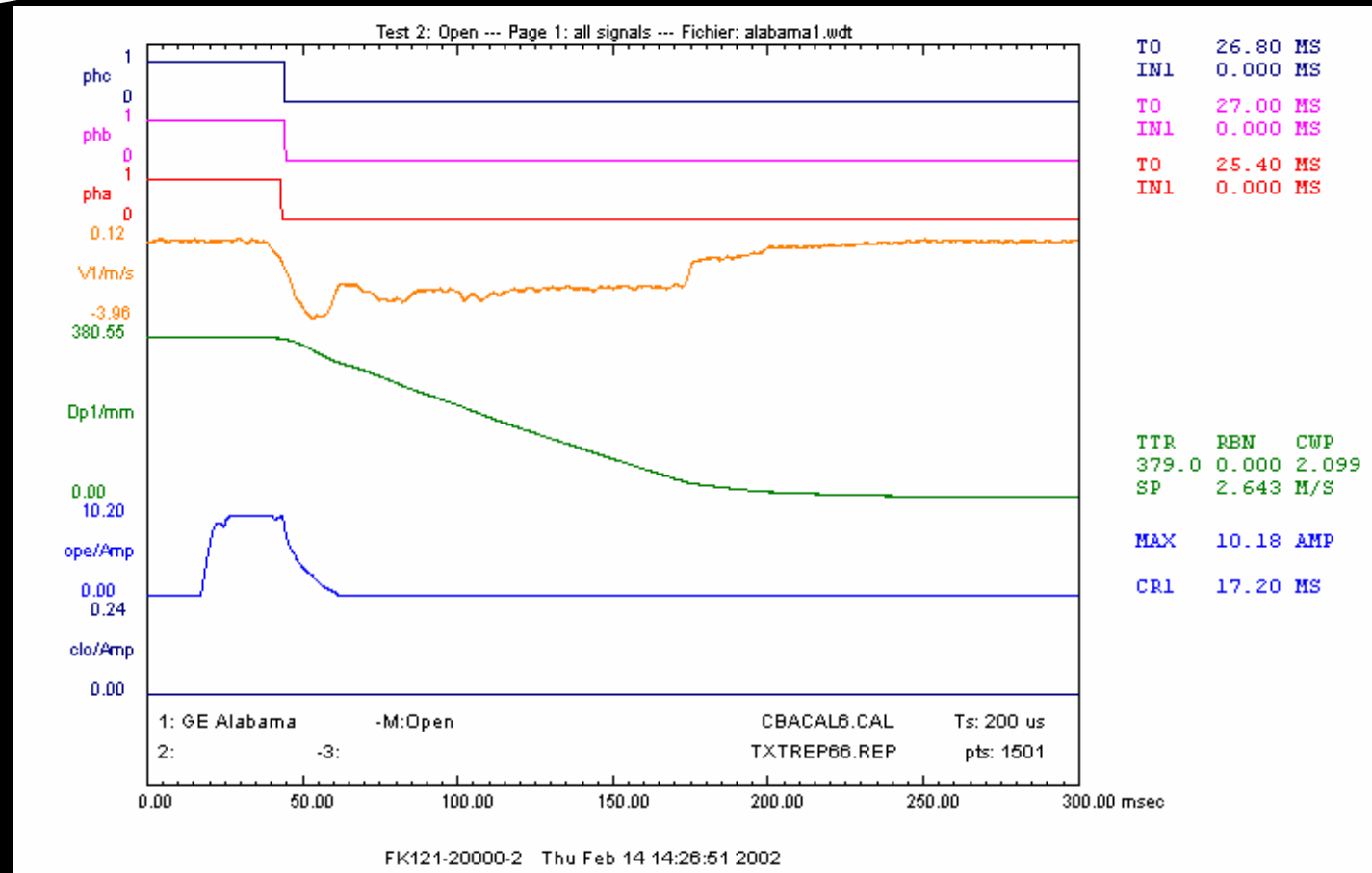
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ZENSOL - Time-travel tests

- Test : TRIP



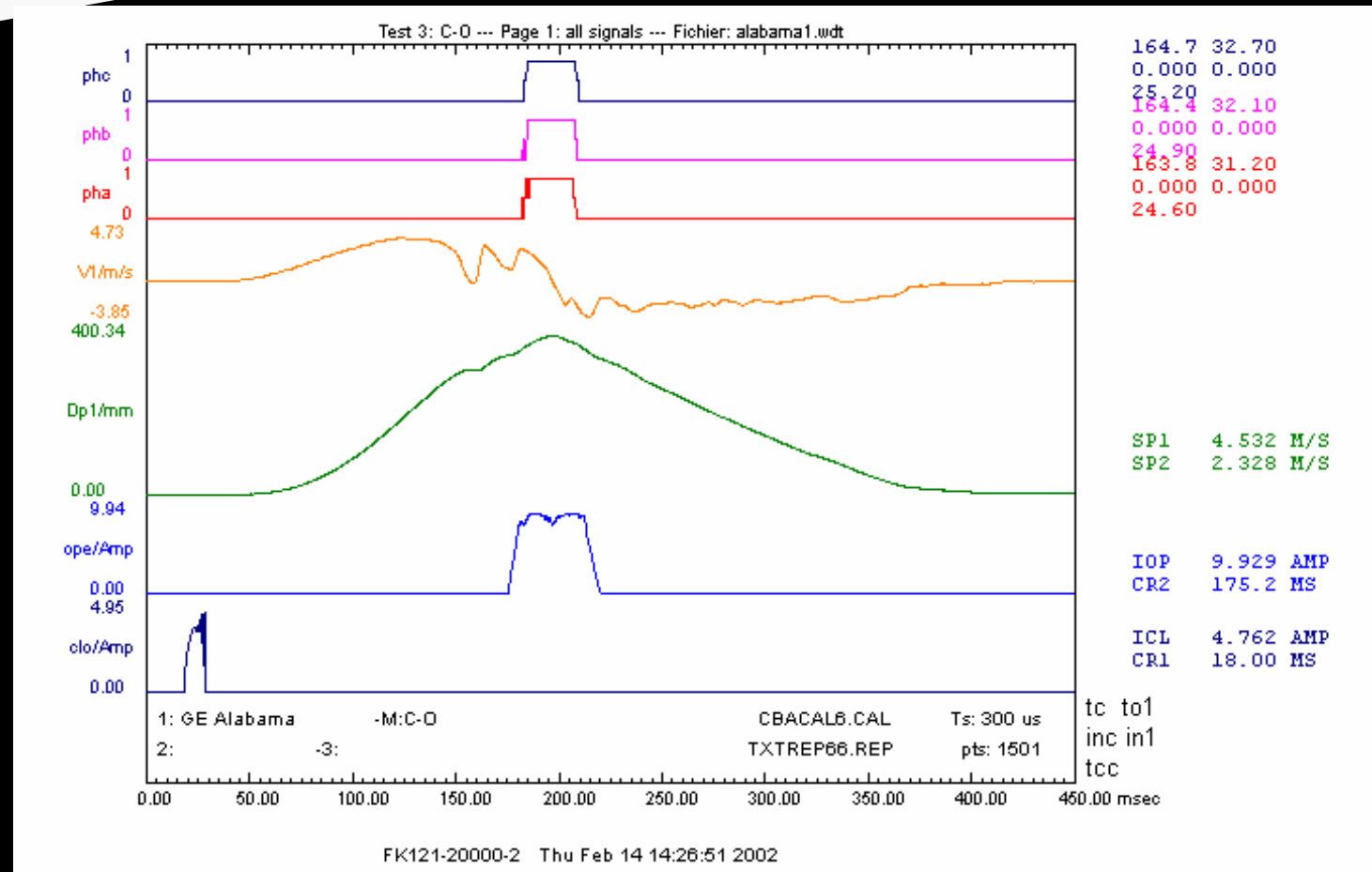
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ZENSOL - Time-travel tests

- Test : TRIP FREE



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ZENSOL - Time-travel tests

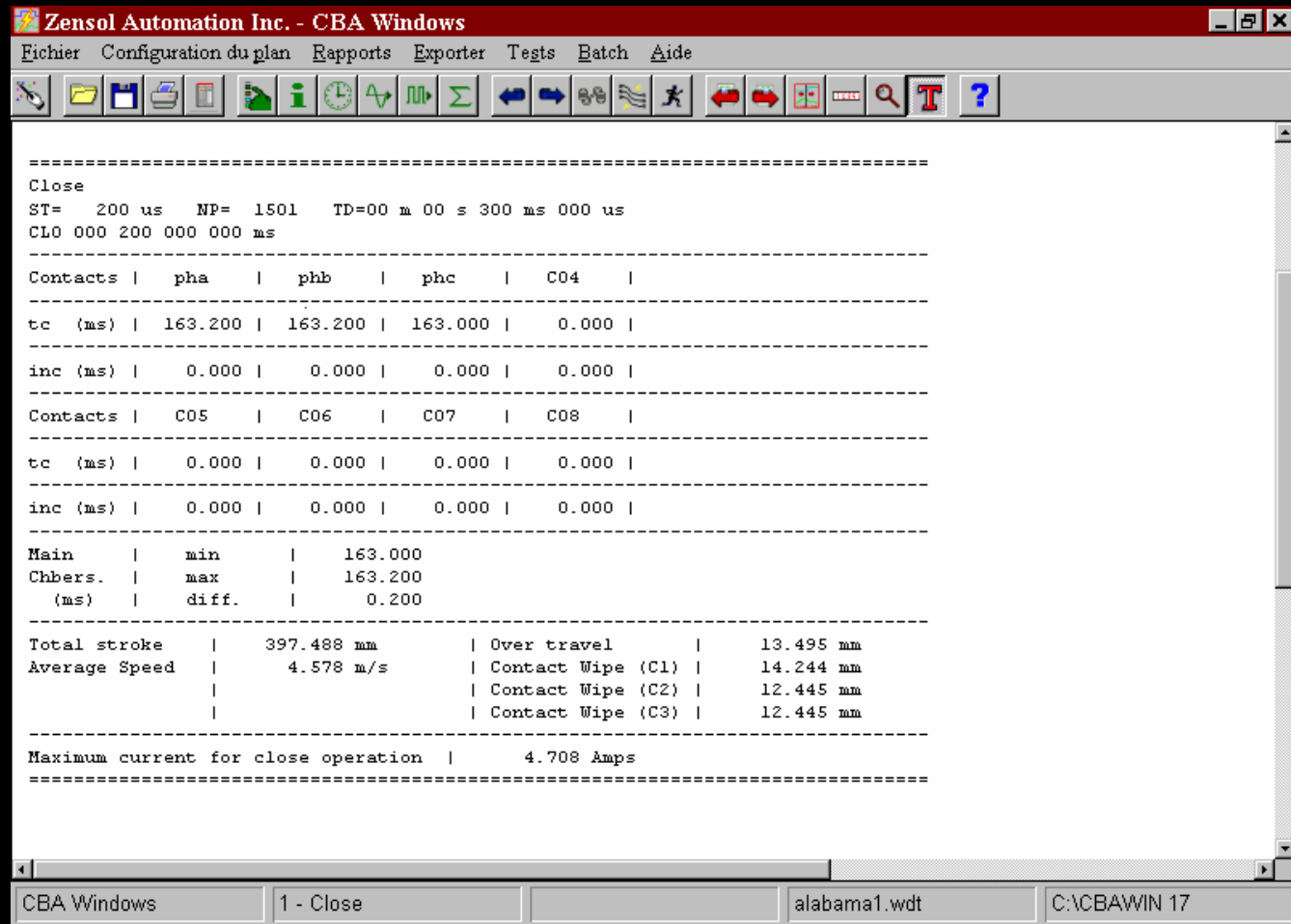
- Possibility of programming and performing up to 30 tests per file !

The screenshot shows the 'Test configuration: Test 1 (Close) (Active)' dialog box. The 'Plan' section is circled, showing 'Number of active tests: 3 of 30 available tests'. The 'Information' section shows 'Test name: Close' and 'Test message:'. The 'Recording Conditions' section shows 'Test duration: 0 m 0 s 600 ms 0 us T', 'Sampling time: 200 94 min, 32000 max i (µs)', and 'Total points: 3001 10 min, 32000 max n=(T/i)+1'. The 'Output Timing (msec)' section shows 'Close' and 'Open' timing parameters. The 'Navigation' section shows left and right arrow buttons. The 'OK' and 'Cancel' buttons are at the bottom right.

Section	Parameter	Value
Current Test	No.	1
	Active/Inactive	<input checked="" type="checkbox"/> Active <input type="checkbox"/> Inactive
Information	Test name	Close
	Test message	
Recording Conditions	Test duration	0 m 0 s 600 ms 0 us T
	Sampling time	200 94 min, 32000 max i (µs)
	Total points	3001 10 min, 32000 max n=(T/i)+1
Output Timing (msec)	Close	0 Delay, 50 Pulse, 0 Delay, 0 Pulse, 50 Total
	Open	0 Delay, 0 Pulse, 0 Delay, 0 Pulse, 0 Total

ZENSOL - Time-travel tests

- Tabular report



The screenshot shows a software window titled "Zensol Automation Inc. - CBA Windows" with a menu bar (Fichier, Configuration du plan, Rapports, Exporter, Tests, Batch, Aide) and a toolbar. The main area displays a tabular report for a "Close" test. The report includes parameters like ST= 200 us, NP= 1501, TD=00 m 00 s 300 ms 000 us, and CLO 000 200 000 000 ms. It contains two tables of timing data for contacts pha, phb, phc, C04 and C05, C06, C07, C08. Summary statistics include Total stroke (397.488 mm), Average Speed (4.578 m/s), and Maximum current for close operation (4.708 Amps).

```
=====  
Close  
ST= 200 us  NP= 1501  TD=00 m 00 s 300 ms 000 us  
CLO 000 200 000 000 ms  
-----  
Contacts | pha | phb | phc | C04 |  
-----  
tc (ms) | 163.200 | 163.200 | 163.000 | 0.000 |  
-----  
inc (ms) | 0.000 | 0.000 | 0.000 | 0.000 |  
-----  
Contacts | C05 | C06 | C07 | C08 |  
-----  
tc (ms) | 0.000 | 0.000 | 0.000 | 0.000 |  
-----  
inc (ms) | 0.000 | 0.000 | 0.000 | 0.000 |  
-----  
Main | min | 163.000  
Chbers. | max | 163.200  
(ms) | diff. | 0.200  
-----  
Total stroke | 397.488 mm | Over travel | 13.495 mm  
Average Speed | 4.578 m/s | Contact Wipe (C1) | 14.244 mm  
| | Contact Wipe (C2) | 12.445 mm  
| | Contact Wipe (C3) | 12.445 mm  
-----  
Maximum current for close operation | 4.708 Amps  
=====
```

ZENSOL - Time-travel tests

- Tabular report (continued)

```
Zensol Automation Inc. - CBA Windows
Fichier Configuration du plan Rappports Exporter Tests Batch Aide
=====
Open
ST= 200 us NP= 1501 TD=00 m 00 s 300 ms 000 us
OPE 000 200 000 000 ms
-----
Contacts | pha | phb | phc | C04 |
-----
tol (ms) | 25.400 | 27.000 | 26.800 | 0.000 |
-----
inl (ms) | 0.000 | 0.000 | 0.000 | 0.000 |
-----
Contacts | C05 | C06 | C07 | C08 |
-----
tol (ms) | 0.000 | 0.000 | 0.000 | 0.000 |
-----
inl (ms) | 0.000 | 0.000 | 0.000 | 0.000 |
-----
Main | min | 25.400
chbers. | max | 27.000
(ms) | diff. | 1.600
-----
Total stroke | 379.046 mm | Rebound | 0.000 mm
Average speed | 2.643 m/s | Contact wipe | 2.099 mm
-----
Maximum current for open operation | 10.183 Amps
=====
```

CBA Windows

1 - Close

alabama1.wdt

C:\CBAWIN 17

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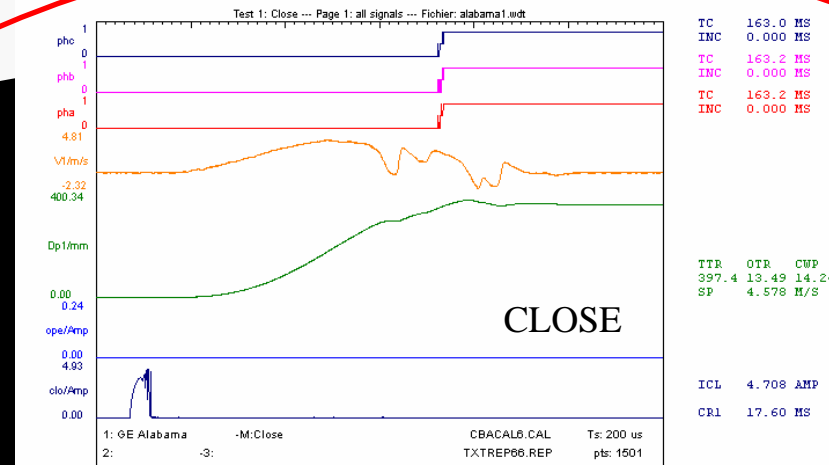
PREVIOUS

HOW TO SAVE TEST RESULTS ?

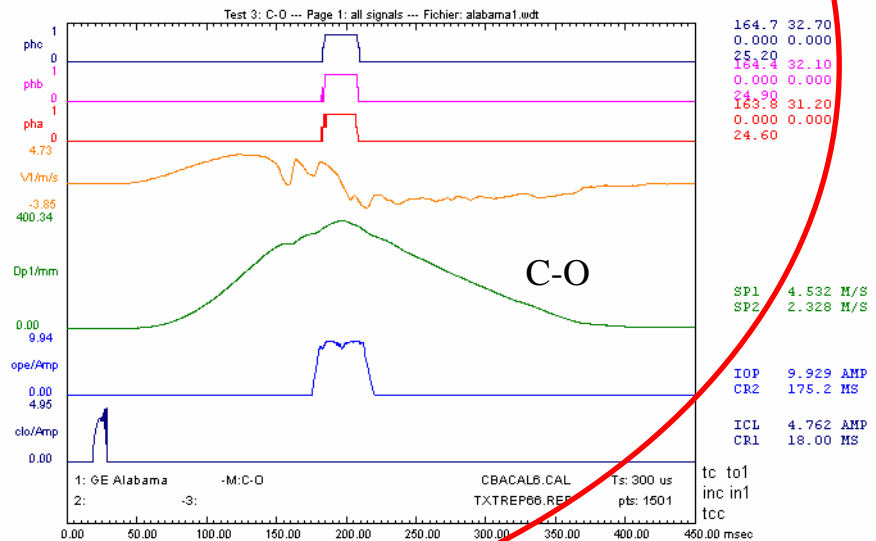
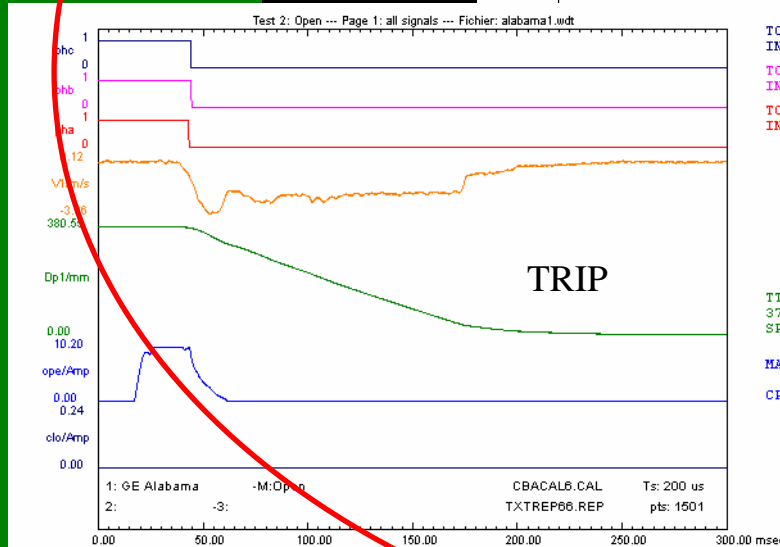


**ONE FILE =>
ALABAMA.
WDT**

**Up to 30 tests
in one file**



**+ TABULAR
REPORT**



FK121-20000-2 Thu Feb 14 14:06:51 2002

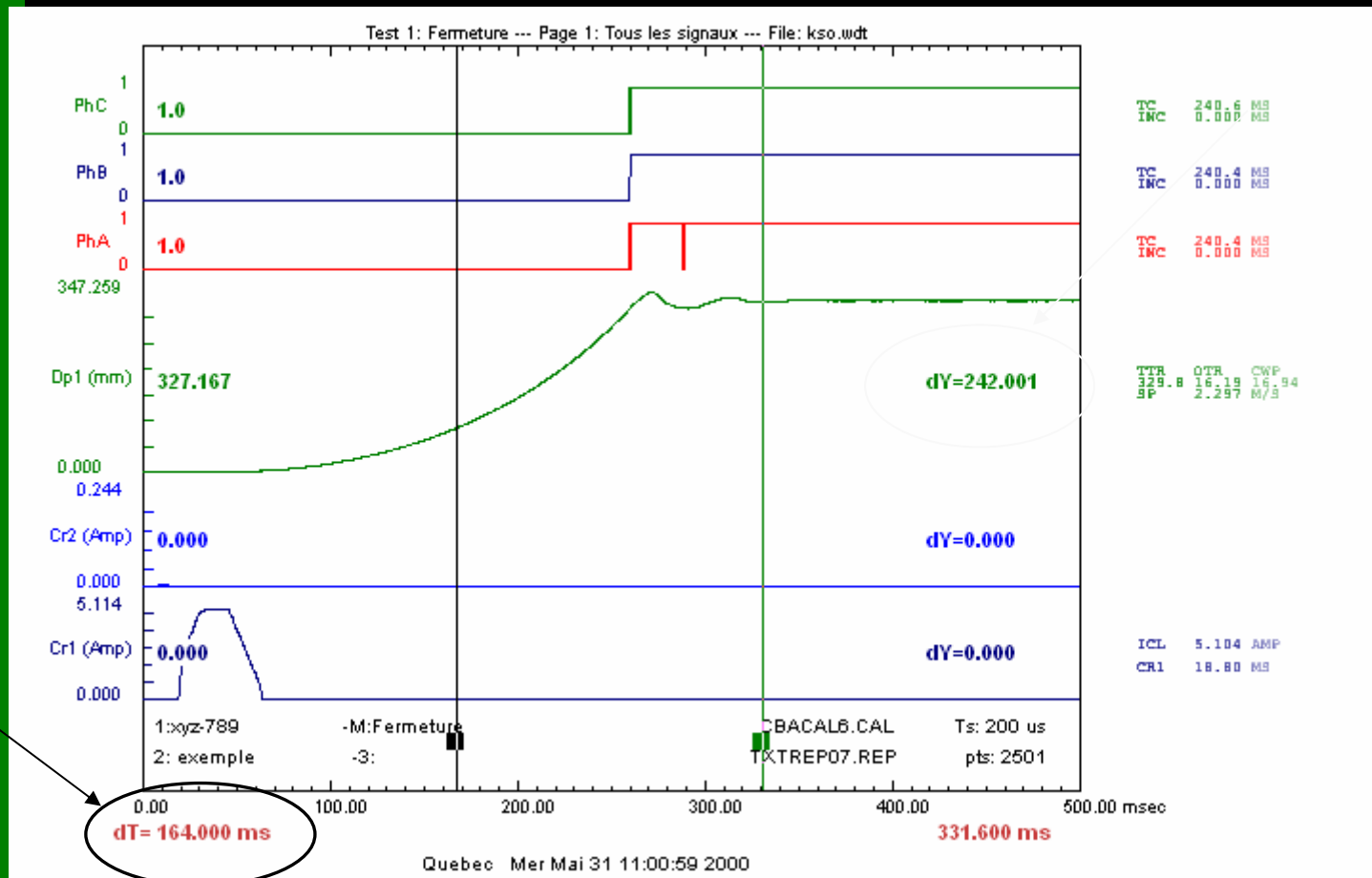
FK121-20000-2 Thu Feb 14 14:06:51 2002

ZENSOL - Time-travel tests

NOW
YOU ARE READY TO ANALYZE YOUR
RESULTS !

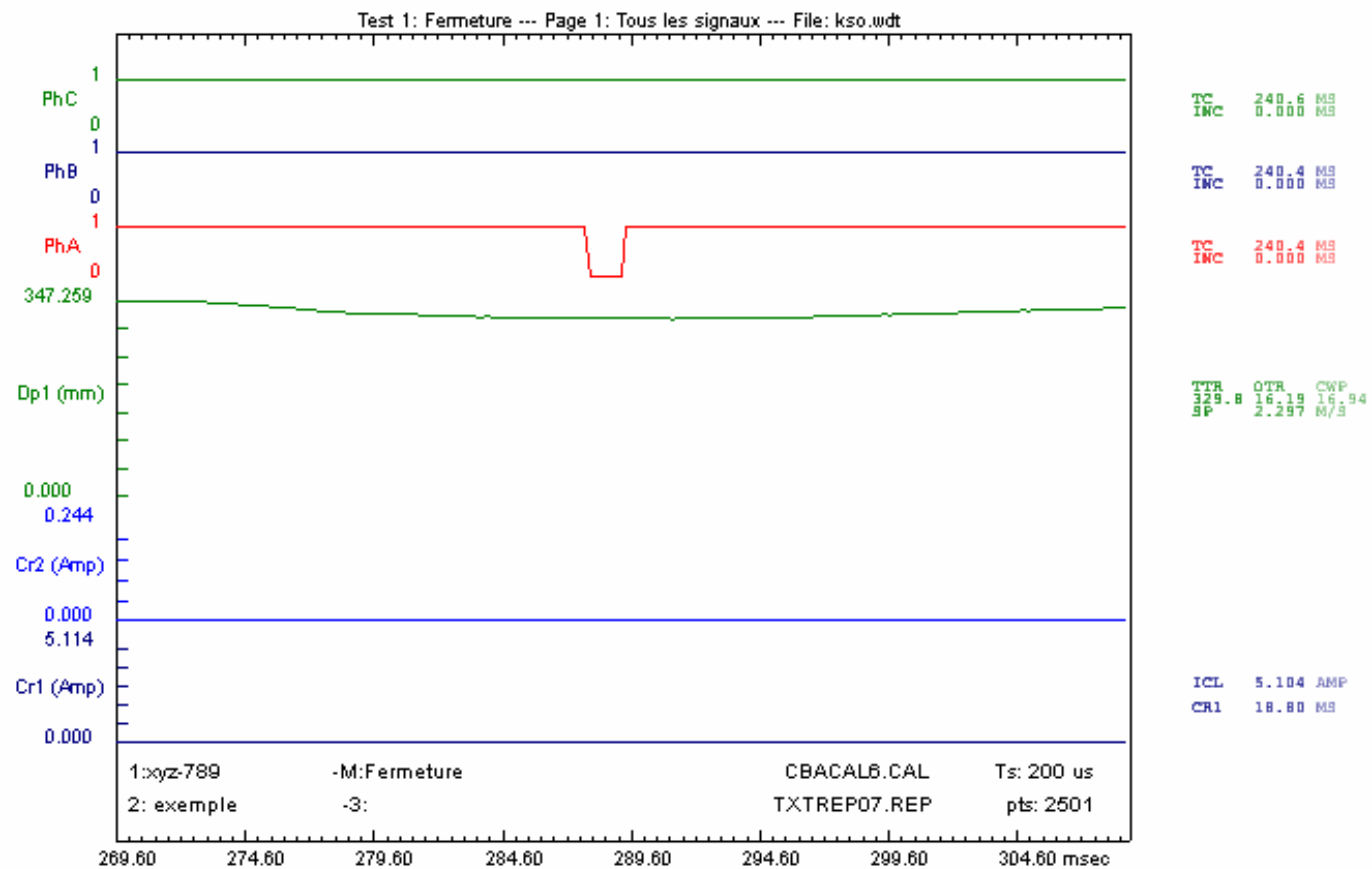
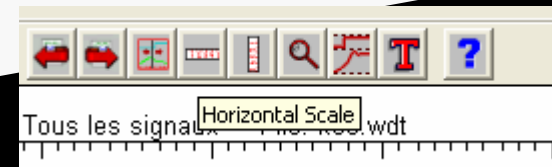
GRAPHIC TOOLS

HORIZONTAL EXAMINE



GRAPHIC TOOLS

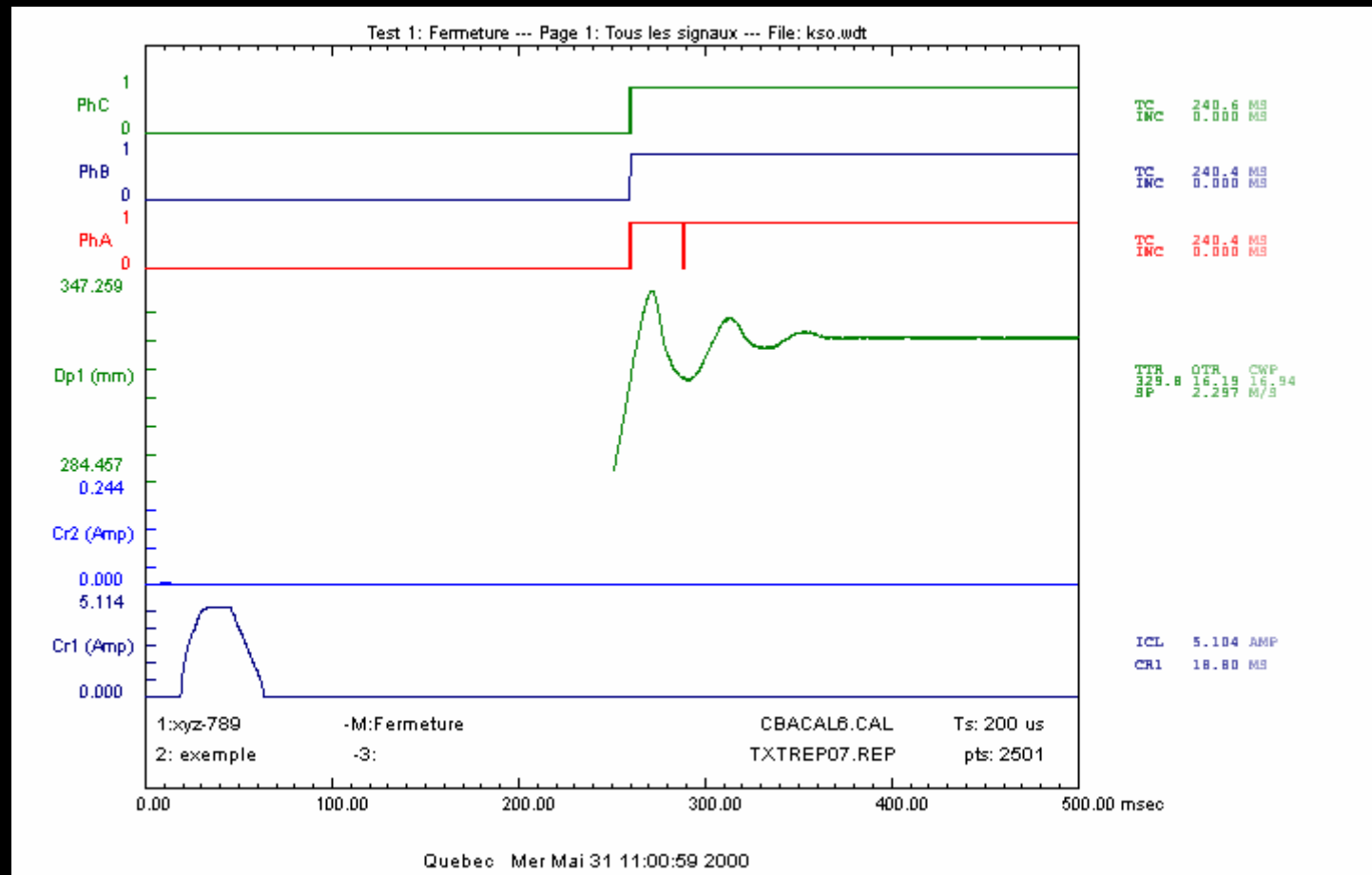
HORIZONTAL SCALE



Quebec Mer Mai 31 11:00:59 2000

GRAPHIC TOOLS

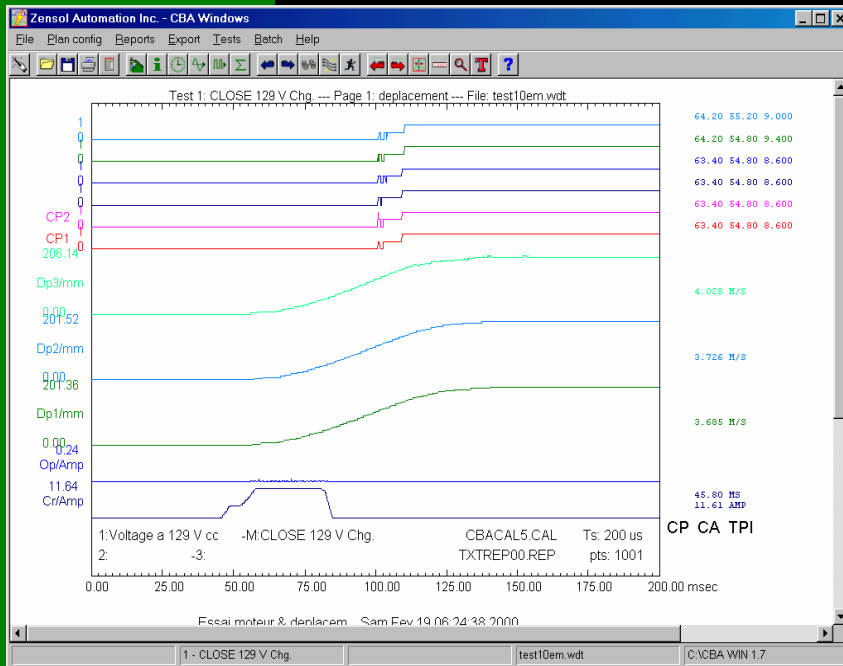
VERTICAL SCALE



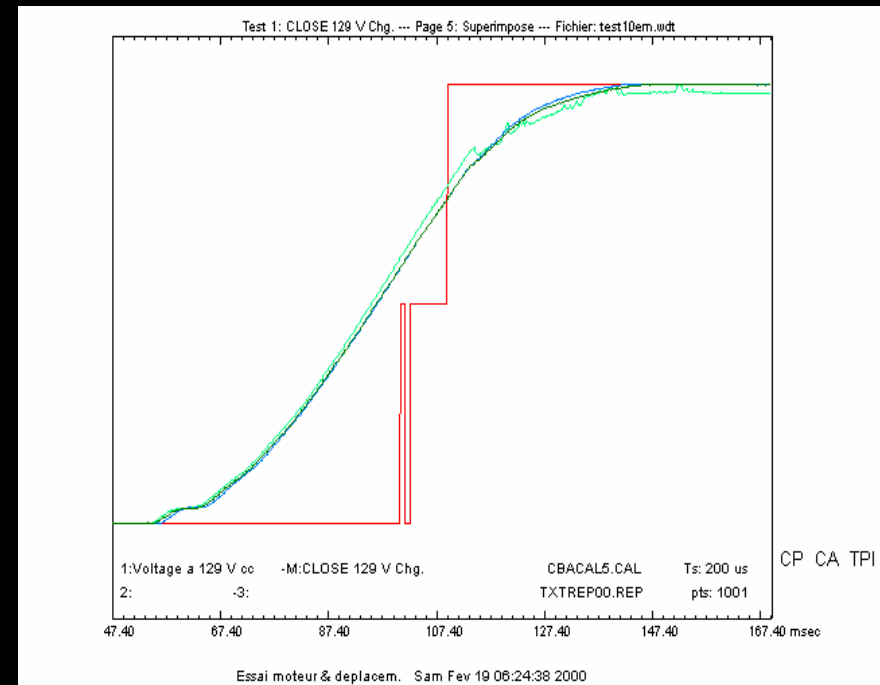
Quebec Mer Mai 31 11:00:59 2000

GRAPHIC TOOLS SUPERIMPOSING

without
superimposing

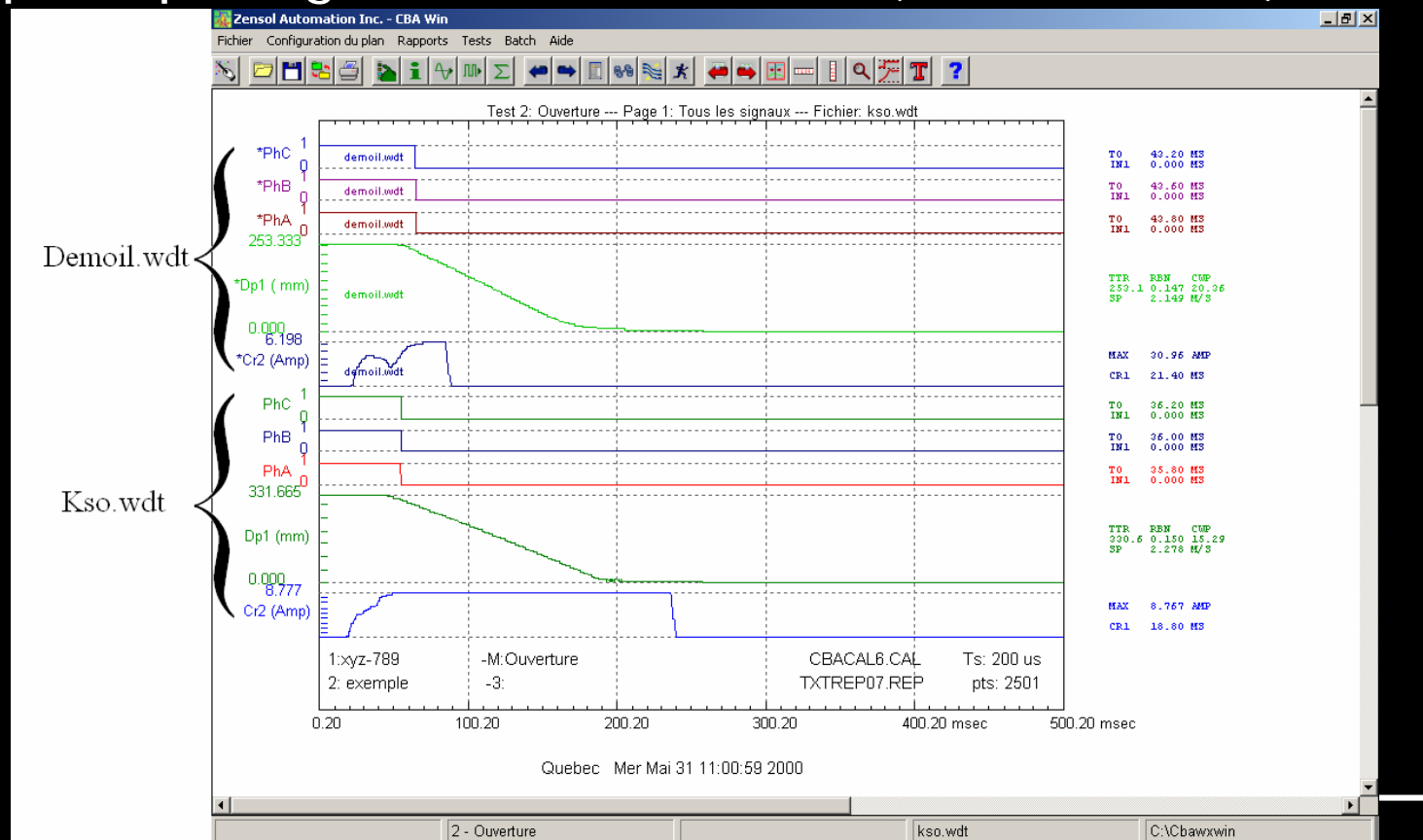


with
superimposing



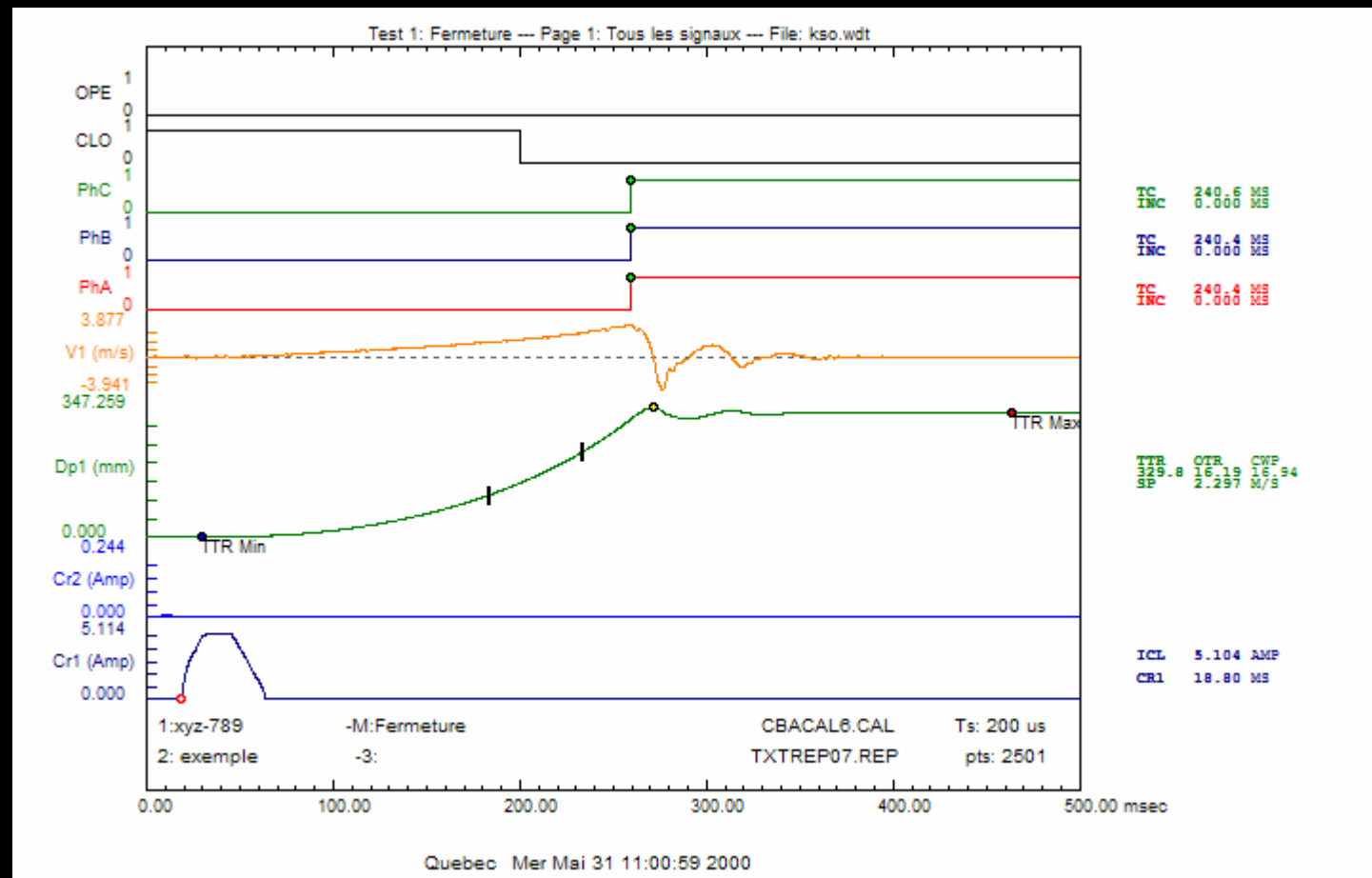
GRAPHIC TOOLS SUPERIMPOSING

- superimposing between two tests (different files)



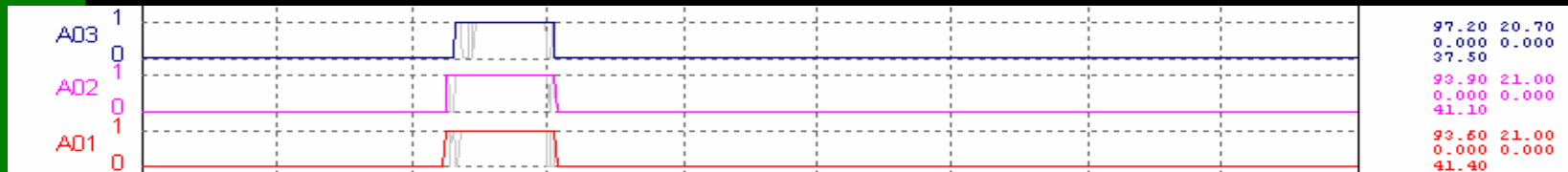
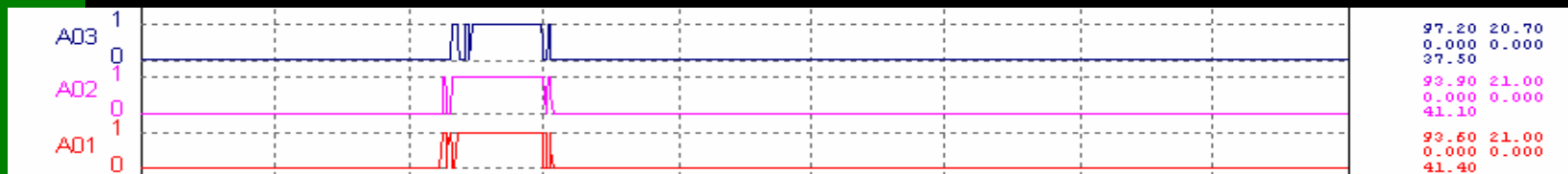
GRAPHIC DISPLAY OF CALCULATIONS

KSO EXAMPLE



GRAPHIC FILTER

Filter based on the calculations
 – do not alter the data



ON-LINE SOFTWARE MANUAL



The screenshot displays the Zensol Auto software interface. A help window titled "Aide de Windows" is open, showing a "Button Bar Overview" section. The background shows a data plot with various channels labeled OPE, CLO, C08, C07, C06, C05, C04, C03, C02, C01, Cr2 (Amp), and Cr1 (Amp). The help window text reads:

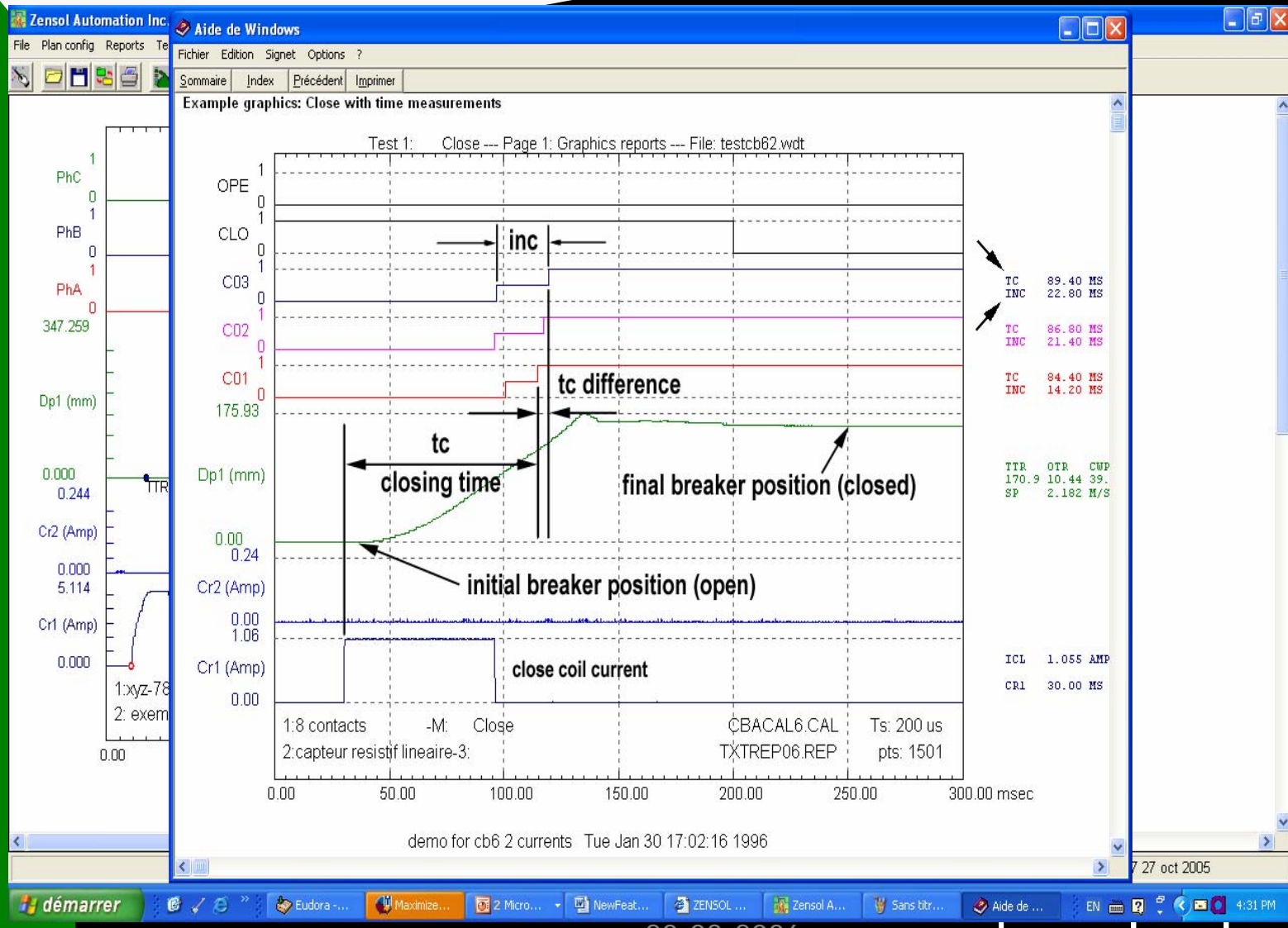
Button Bar Overview

The button bar is located at the top of the graphics area and contains the most often used functions of the software:

First group: [Assistant Mode](#)
Second group: Files and Printing
Third group: Plan configuration
Fourth group: Performing tests
Fifth group: Graphics tools and reports
Last group: Help

The Windows taskbar at the bottom shows the "démarrer" button, system tray icons, and the time "13:23".

ON-LINE TIMING THEORY



ZENSOL - Time-travel tests

FOR FURTHER TESTS, DEMO
UNITS AVAILABLE !



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20-03-2006

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