FAB
MIXED-SIGNAL FOUNDRY EXPERTS

Internship – Projects Overview

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  - 10/6/2011

Project 1 : Multi-Trend 2

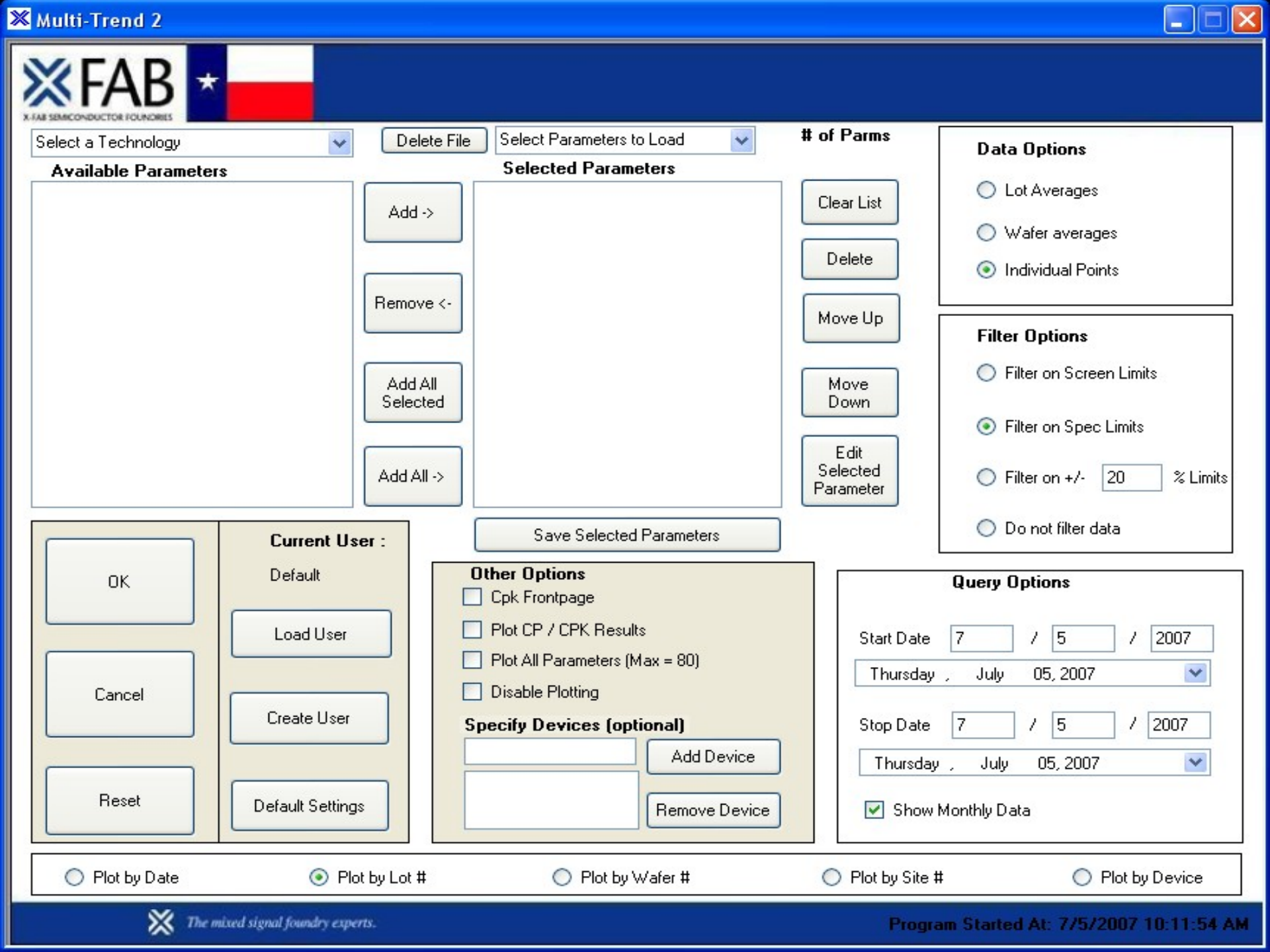
- Purpose: Rewrite the Multi-Trend Program, which was originally written as a Visual Basic macro for MS Excel, to a standalone C# program
- Background: Multi-Trend is a Statistical Analysis Program looking at Cpk trends
- Requirements:
  - C#
  - Original Functionality
  - Added Functionality
  - Time Constraints
  - Clear Coding
  - Full Documentation

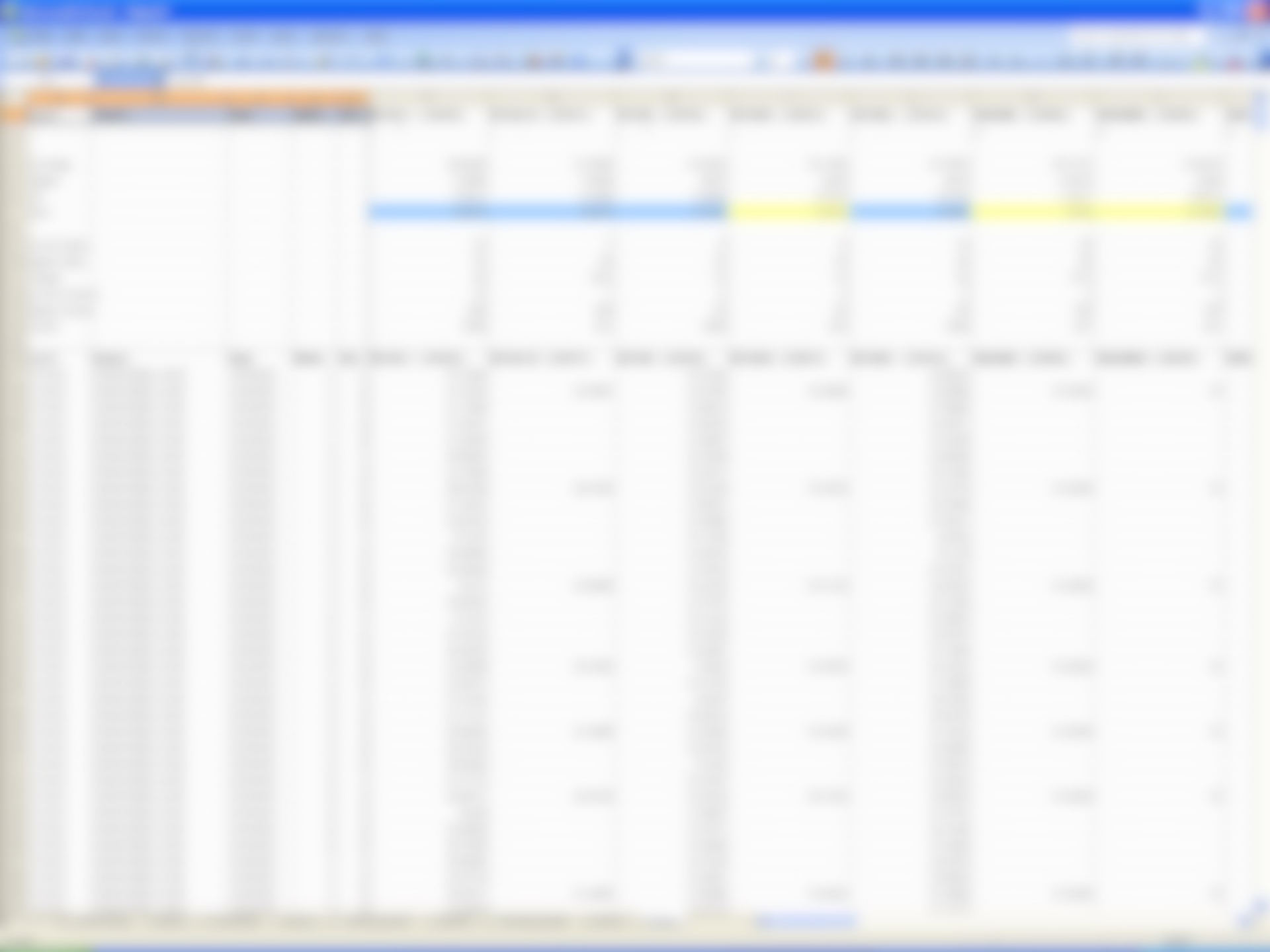
Background

- Cpk: Indicates how many times you can fit three standard deviations of the process between the mean of the process and the nearest specification limit. (Wikipedia)
- Basically, this tells you how centered the mean of the process is compared to ideal conditions.
- Example: Upper Limit = 4, Lower Limit = 2; Mean ideally would be 3. Cpk looks at how close the reality is to the ideal.

How is this accomplished?

- Parametric Testing data is stored on an SQL server
- Testing Parameters are stored by a Technology type and a Name
- After the user selects the options from the main GUI, the SQL server is queried for data
- An Excel spreadsheet is generated with the downloaded data
- This data is analyzed
- If the Cpk of the parameter is below 1.67, the parameter needs to be looked at, and its data points are plotted.


Multi-Trend 2
FAB
X-FAB SEMICONDUCTOR FOUNDRIES
Select a Technology
Delete File
Select Parameters to Load
# of Parms
Available Parameters
Selected Parameters
Add ->
Remove <-
Add All Selected
Add All ->
Clear List
Delete
Move Up
Move Down
Edit Selected Parameter
Data Options
Lot Averages
Wafer averages
Individual Points
Filter Options
Filter on Screen Limits
Filter on Spec Limits
Filter on +/- 20 % Limits
Do not filter data
Save Selected Parameters
OK
Cancel
Reset
Current User :
Default
Load User
Create User
Default Settings
Other Options
Cpk Frontpage
Plot CP / CPK Results
Plot All Parameters (Max = 80)
Disable Plotting
Specify Devices (optional)
Add Device
Remove Device
Query Options
Start Date 7 / 5 / 2007
Thursday , July 05, 2007
Stop Date 7 / 5 / 2007
Thursday , July 05, 2007
Show Monthly Data
Plot by Date
Plot by Lot #
Plot by Wafer #
Plot by Site #
Plot by Device
The mixed signal foundry experts.
Program Started At: 7/5/2007 10:11:54 AM



Project Results

Requirements

- Language: C#
- Original Functionality Kept
- New functionality Added
- Easy to Use
- Full Documentation
- Clear Coding
- Timeline: By July 27th (End of Program)

End-Product

- ✓ Language: C#
- ✓ Original Functionality Successfully maintained
- ✓ Many New Functions Added
- ✓ Easy GUI for low learning Curve
- ✓ Full Documentation: Readme.txt Code Supplement.txt
- ✓ Clear Coding: Full documentation and formatting
- ✓ Completed By July 4th

Conclusion: Project Successful

Project 2: Mapconvert

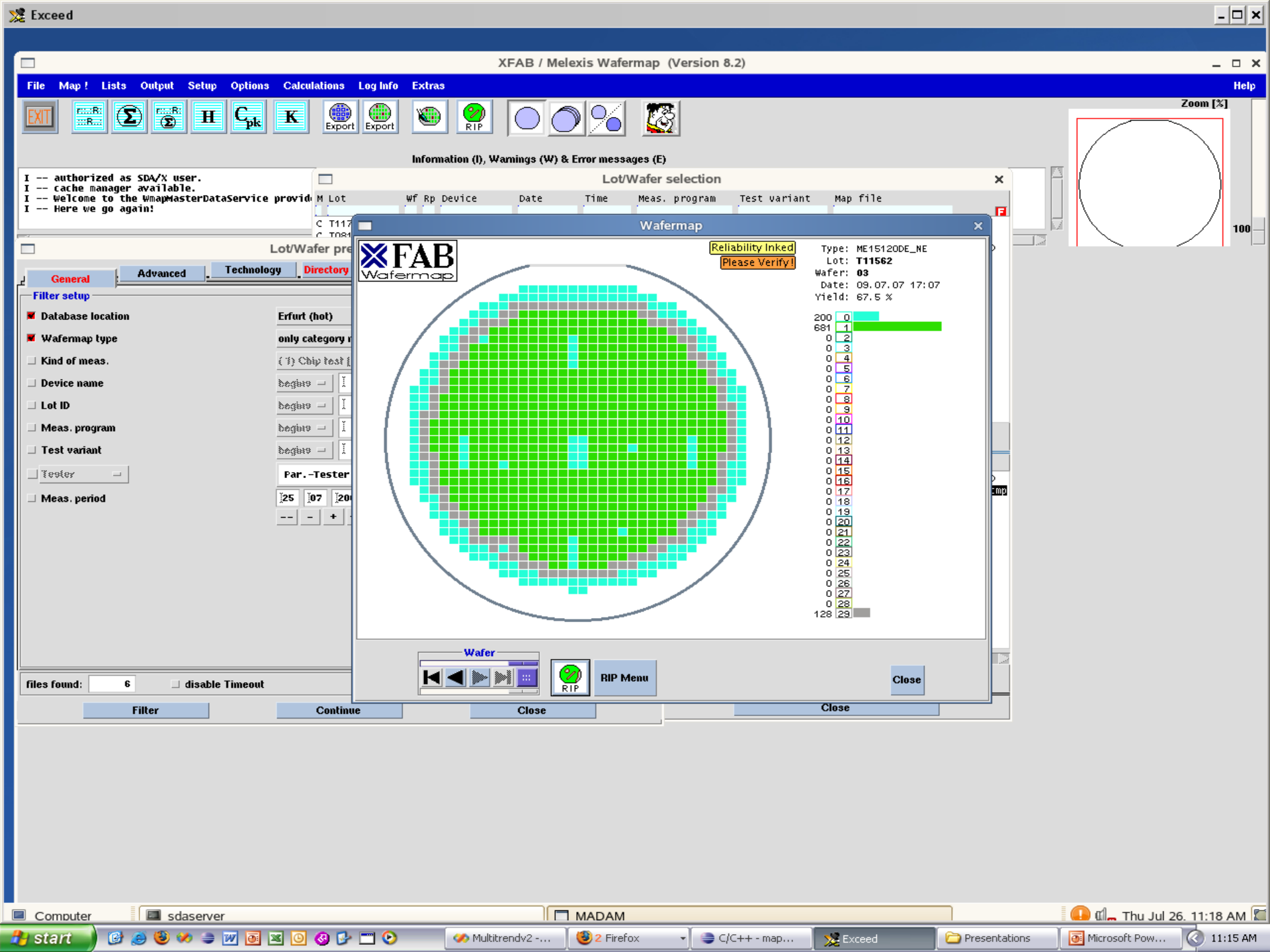
- Purpose: Write a Program that can convert XFab Internal Wafer Map formats to Industry standards and then back again.
- Background: Up until this point, no program of this type has existed.

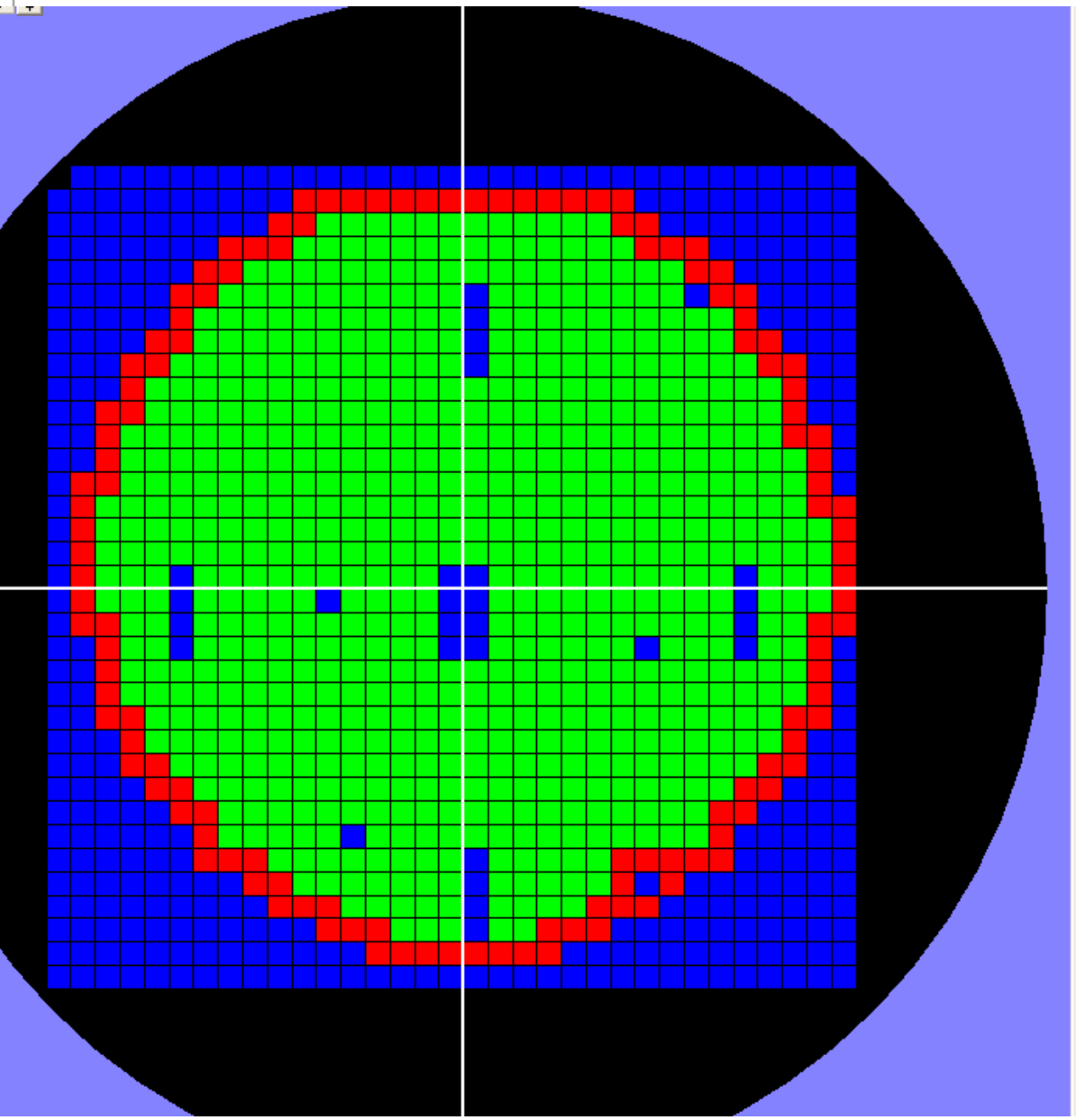
Project Requirements

- Cross Platform C++
- Command Line Required, GUI Optional
  - GUI not necessary, program operation relatively short
- SEMI <-> TH01
- SEMI <-> TH02
- Clear Detailed Comments
- User Documentation
- Converted Files must read correctly into the wafer map viewer programs.

Background Information

- TH0X Formats are Binary Files (no character Delimiters)
- Semi Standard written in XML
- TH02 is a modified TH01 with a longer header
- Wafer Maps are a graphical representation of a Wafer's Pass/Fail characteristics of it's dice.
- Files consist of Headers containing important information followed by die data.


Exceed
XFAB / Melexis Wafermap (Version 8.2)
File Map ! Lists Output Setup Options Calculations Log Info Extras Help
Export Export RIP
Zoom [%]
100
Information (I), Warnings (W) & Error messages (E)
I -- authorized as SDA/X user.
I -- cache manager available.
I -- Welcome to the WmapMasterDataService provid
I -- Here we go again!
Lot/Wafer selection
M Lot Wf Rp Device Date Time Meas. program Test variant Map file
Lot/Wafer pre
General Advanced Technology Directory
Filter setup
Database location Erfurt (hot)
Wafermap type only category
Kind of meas. (1) Chip test
Device name begins
Lot ID begins
Meas. program begins
Test variant begins
Tester Par.-Tester
Meas. period 25 07
files found: 6
disable Timeout
Filter Continue Close
Wafermap
FAB Wafermap
Reliability Inked
Please Verify!
Type: ME15120DE_NE
Lot: T11562
Wafer: 03
Date: 09.07.07 17:07
Yield: 67.5 %
200 0
681 1
0 2
0 3
0 4
0 5
0 6
0 7
0 8
0 9
0 10
0 11
0 12
0 13
0 14
0 15
0 16
0 17
0 18
0 19
0 20
0 21
0 22
0 23
0 24
0 25
0 26
0 27
0 28
128 29
Wafer
RIP
RIP Menu
Close
Close
Computer
sdaserver
MADAM
Thu Jul 26, 11:18 AM
start
Multitrendv2 -...
2 Firefox
C/C++ - map...
Exceed
Presentations
Microsoft Pow...
11:15 AM



Open File | Description | Bins Edit | Exit

Open as Format: Semi_0703 [Open]

Index File Name: C:\Documents and Settings\x1389\Desktop\ripped.xml

Lots

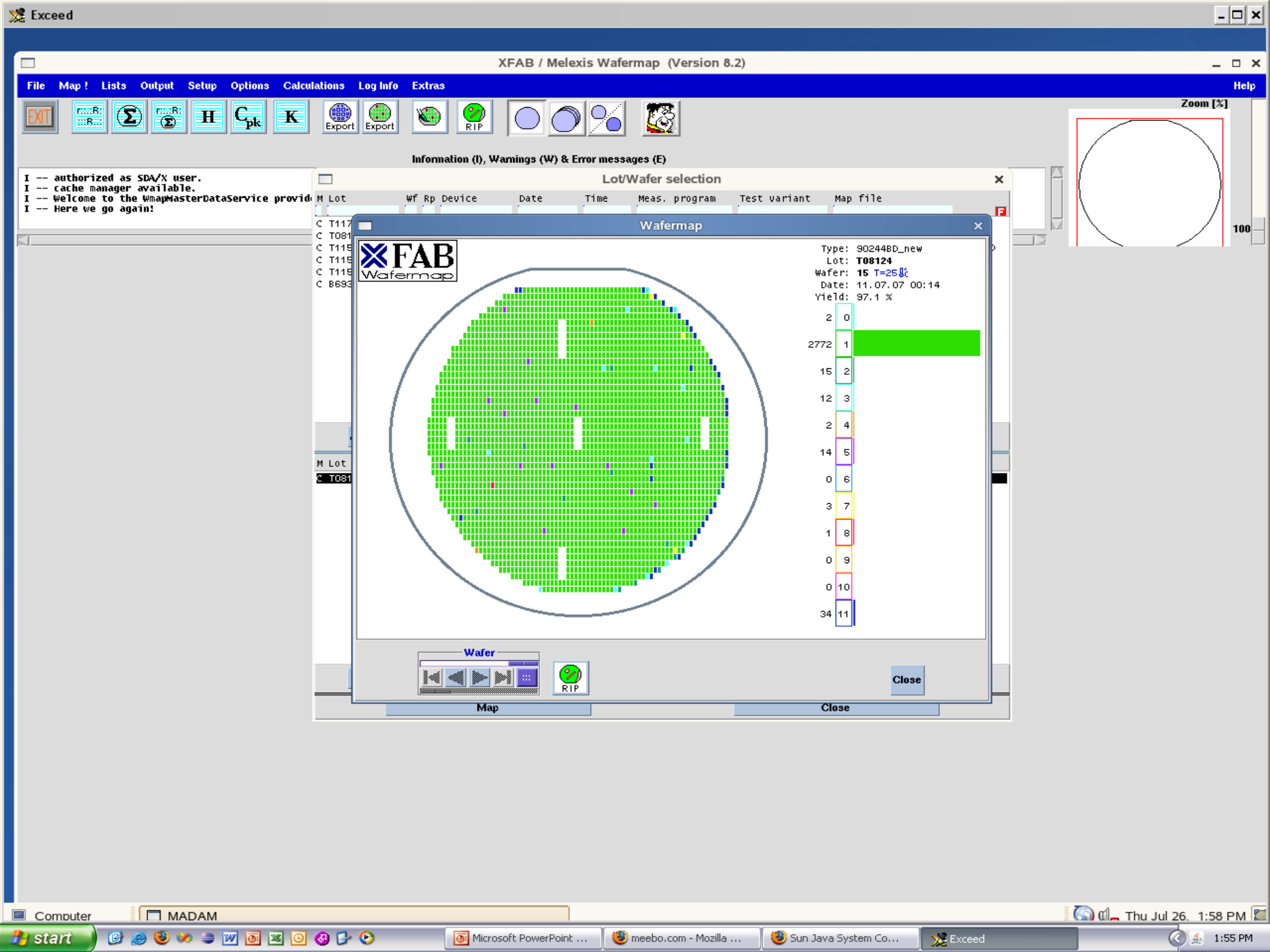
Wafers

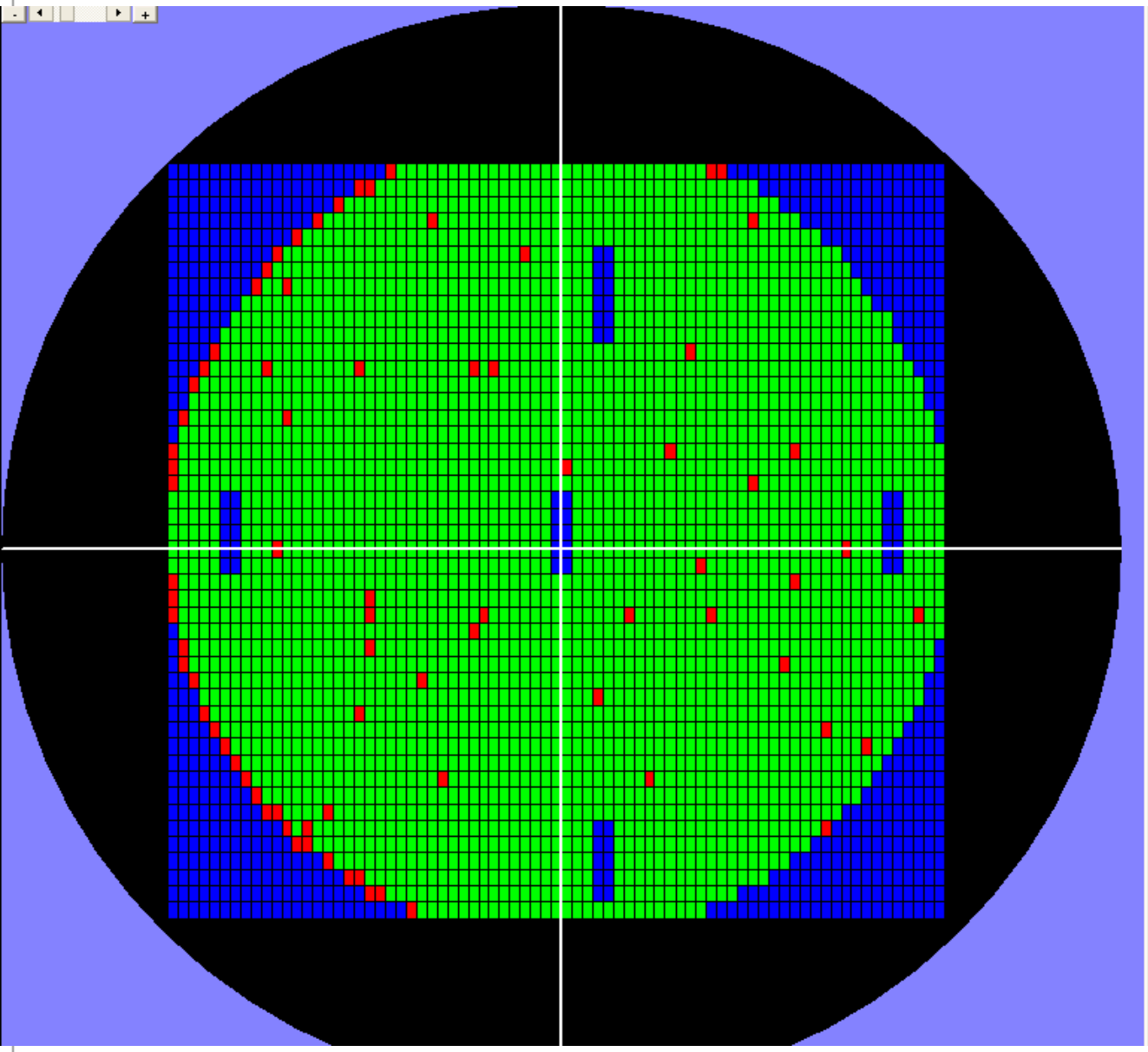
T11562 -03

Show Reference Die Flat Position : Bottom

Bin	Name	Count	Status
32		681	Good
71		128	Defect

All Dies : 809 Good 681 Bad 128


Exceed
XFAB / Melexis Wafermap (Version 8.2)
File Map ! Lists Output Setup Options Calculations Log Info Extras Help
EXIT
Export
Export
RIP
Zoom [%]
100
Information (I), Warnings (W) & Error messages (E)
I -- authorized as SDA/X user.
I -- cache manager available.
I -- Welcome to the WmapMasterDataService provid
I -- Here we go again!
Lot/Wafer selection
M Lot
Wf
Rp
Device
Date
Time
Meas. program
Test variant
Map file
Wafermap
FAB
Wafermap
Type: 90244BD_new
Lot: T08124
Wafer: 15 T=25
Date: 11.07.07 00:14
Yield: 97.1 %
2 0
2772 1
15 2
12 3
2 4
14 5
0 6
3 7
1 8
0 9
0 10
34 11
Wafer
RIP
Close
Map
Close
Computer
MADAM
Thu Jul 26, 1:58 PM
start
Microsoft PowerPoint ...
meebo.com - Mozilla ...
Sun Java System Co...
Exceed
1:55 PM



Open File | Description | Bins Edit | Exit

Open as Format: Semi_0703 | Open

Index File Name: C:\Documents and Settings\x1389\Desktop\c

Lots | Wafers

T08124 -15

Show Reference Die | Flat Position : Bottom

	Bin	Name
	32	
	71	

All Dies : 2826 Good 2748 Bad 78

Project Assessment

Required	Actual
> Cross Platform C++	> Cross Platform C++
> Command Line Required, GUI Optional – GUI not necessary, program operation relatively short	> Command Line interface with minimal User Interface
> SEMI <-> TH01	> SEMI <-> TH01
> SEMI <-> TH02	> SEMI <- TH02
> Clear Detailed Comments	> Full Commenting
> User Documentation	> Readme documentation
> Converted Files must read correctly into the wafer map viewer programs.	> All files read correctly after conversions.

Project Successful

Internship Summary

- All projects successful and on-time
- Results presented to Texas Tech College of Engineering
- Intern was hired on as contract worker with a title of Software Development Engineer.