

# Software Regression Testing

LT Alex Hoover

COMOPTEVFOR

Monday, January 13, 2003

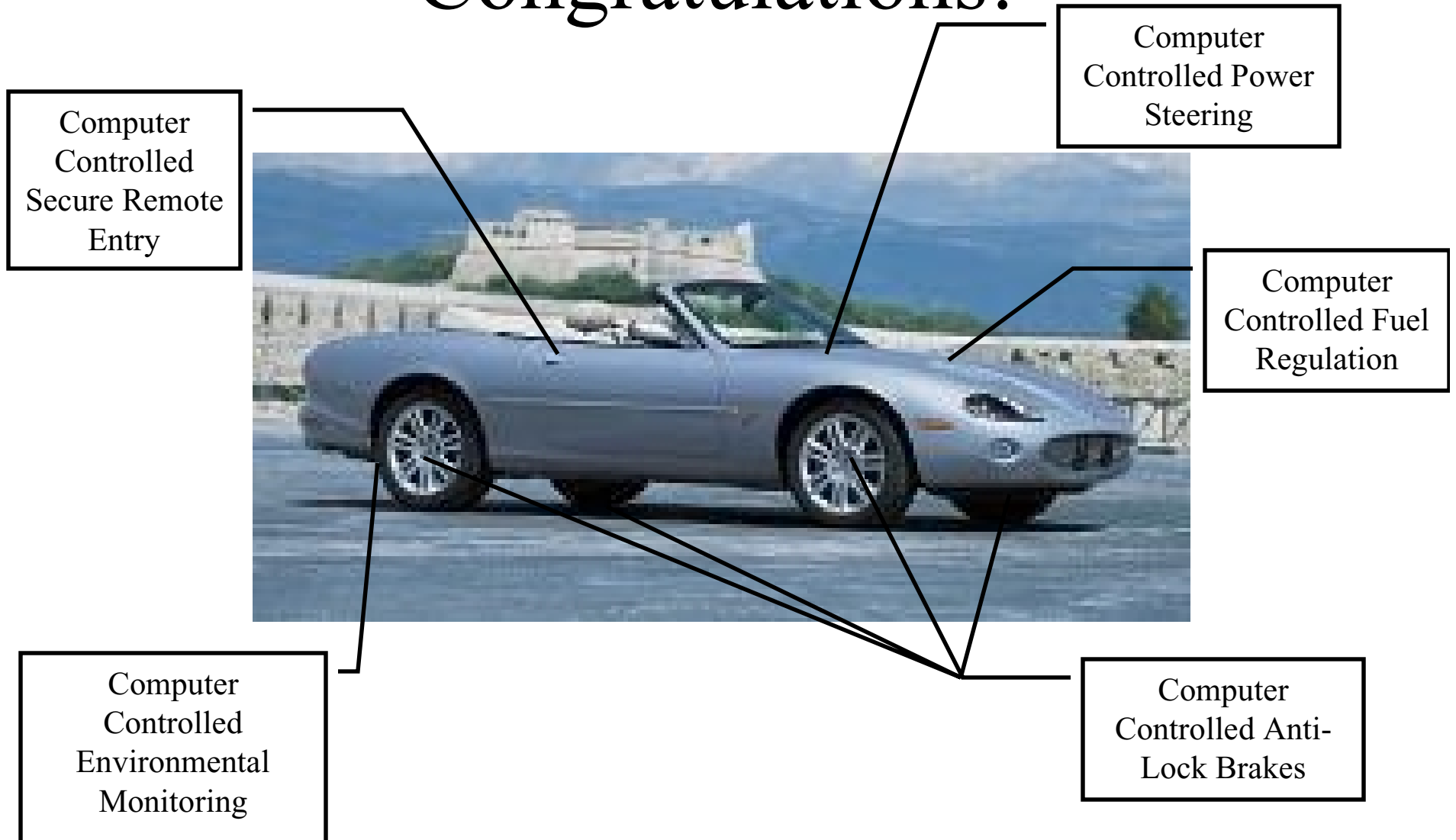
# Report Documentation Page

Form Approved  
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>13 JAN 2003</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2003 to 00-00-2003</b>	
4. TITLE AND SUBTITLE <b>Software Registration Testing</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Commander Operational Test &amp; Evaluation Force (COMOPTEVFOR), Code 83,7970 Diven Street, Norfolk, VA, 23505</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

# Congratulations!



# Testing ...

Computer  
Controlled  
Secure Remote  
Entry



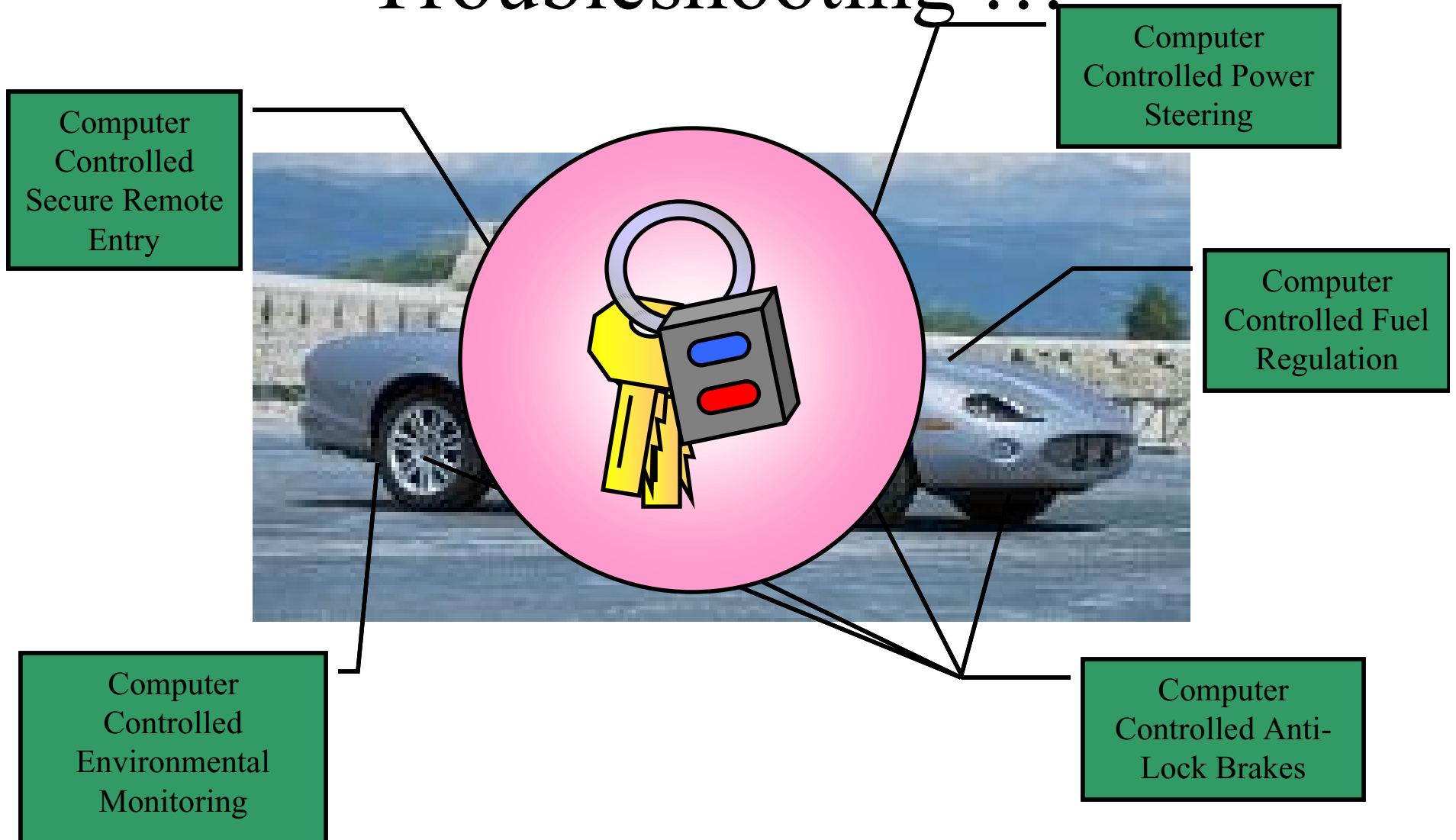
Computer  
Controlled Power  
Steering

Computer  
Controlled Fuel  
Regulation

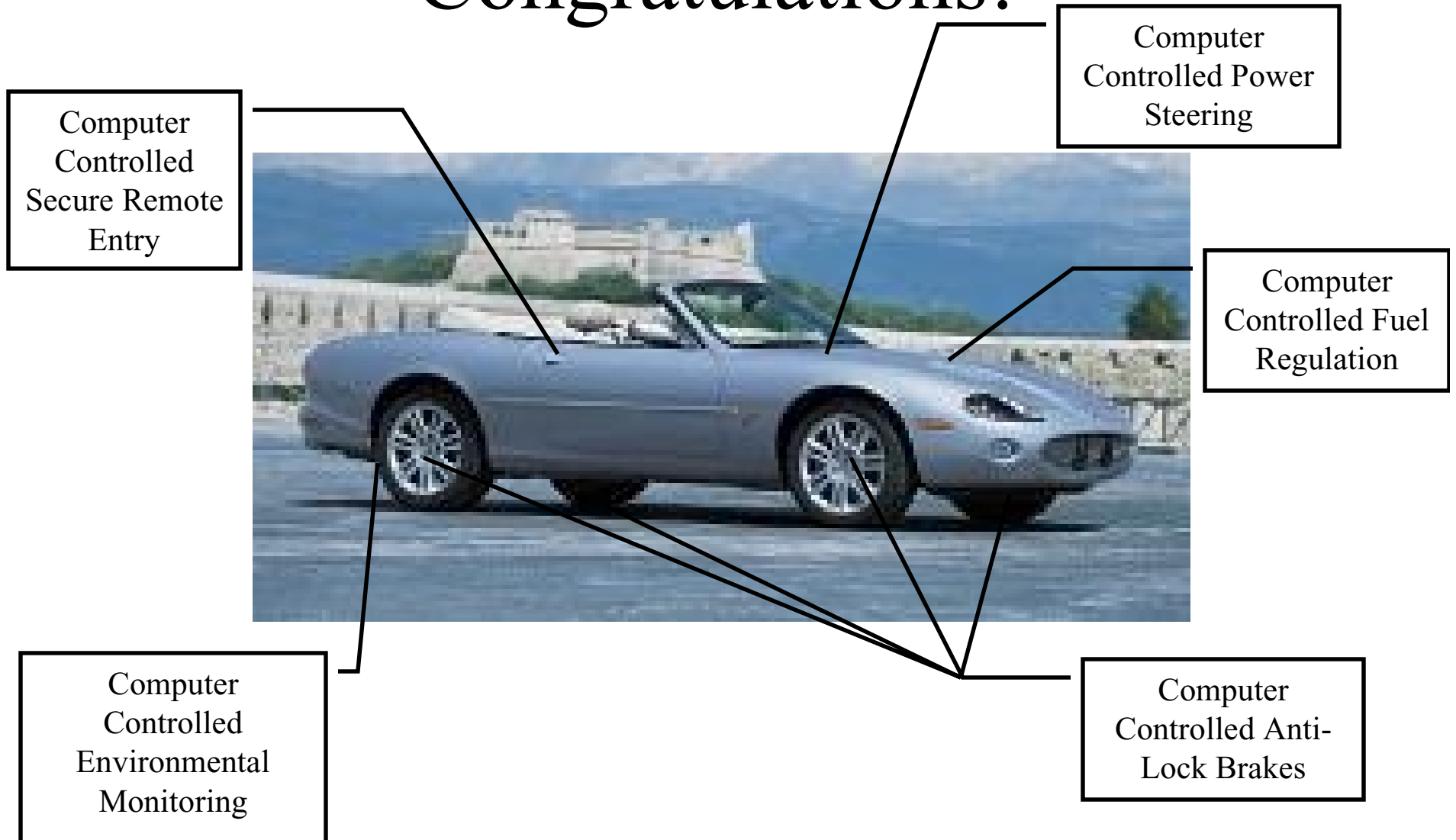
Computer  
Controlled  
Environmental  
Monitoring

Computer  
Controlled Anti-  
Lock Brakes

# Troubleshooting ...



# Congratulations!



# Testing ...

Computer  
Controlled  
Secure Remote  
Entry



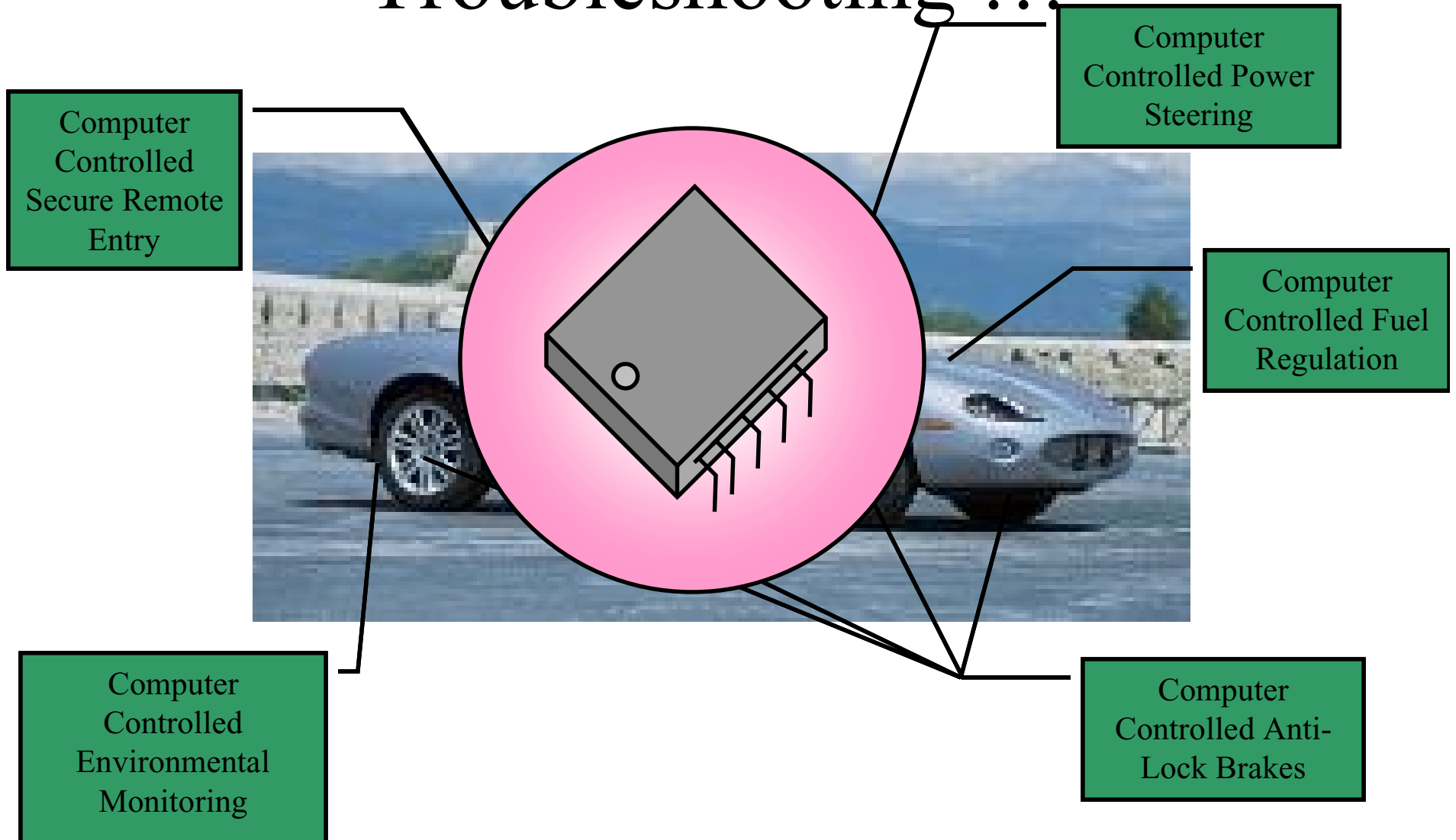
Computer  
Controlled Power  
Steering

Computer  
Controlled Fuel  
Regulation

Computer  
Controlled  
Environmental  
Monitoring

Computer  
Controlled Anti-  
Lock Brakes

# Troubleshooting ...



# Premise

The degree of regression testing required for a system is not proportional to the failure corrected, but to the extent of the change applied to correct the failure.

# Measuring Extent of Change

- Traditional Methods
  - SLOC
  - SPR Opening/Closure Rate
  - Interface Tracing
- Proposal
  - Functional Decomposition and Synthesis
  - Total Architectural Change

# Functional Dependency

- Functional Entities Exist at Multiple Levels of Resolution
- Entity-Relationship Views are Isomorphic with Hierarchies
- Hierarchies Can Establish “Order of Effect” Relationships Among Entities

# Substantive Change

- Changes in Scope
- Changes in Nature
- Changes in Range
- Changes in Behavior

# Tracing Change to Test Cases

- Dimensions of Testing
  - Breadth
  - Depth
- Dimensions of Change
  - Order
  - Substance

$$B \times D \triangleq O \times S$$

# Questions

LT Alex Hoover

Code 83

COMOPTEVFOR

7970 Diven Street

Norfolk, VA 23505

757 282-5546

hoovera@cotf.navy.mil

757 489-8246

757 739-2359

sagh@bigfoot.com