

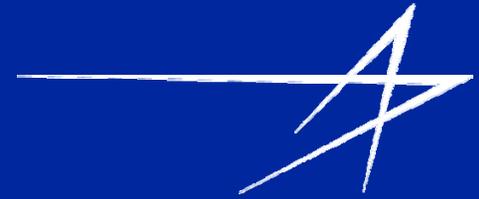
International Metrology Interoperability Summit

***Gaithersburg, Maryland
28 March 2006***



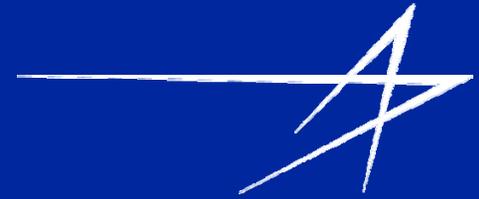
***Ray Admire
Lead CMM Programmer
Quality & Mission Success***

Lockheed Corporation



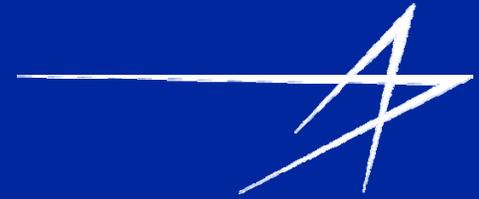
- **Business Areas:**
 - **Aeronautics**
 - **Electronic Systems**
 - **Information & Technology Services**
 - **Integrated Systems & Solutions**
 - **Space Systems**
- **Employees: 135,000 employees throughout the world**
- **Operations: 939 facilities in 457 cities and 45 states throughout the U.S.**
 - **Internationally, business locations in 56 nations and territories**

Metrology Systems



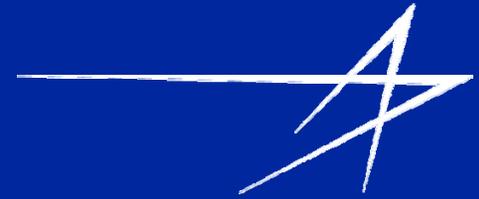
- **CNC Probe Systems:**
 - Browne & Sharpe
 - G & L
 - LK
 - Mitutoyo
 - Carl Zeiss
- **Manual/Portable Probe Systems:**
 - Faro
 - Romer
- **Laser Trackers**
 - Lieca
 - API
 - SMX
- **Vision Systems**
 - Nikon
 - OGP

Metrology Software



- **Automated Probe Systems**
 - B&S PC DMIS
 - IMS Virtual DMIS
 - Metrologic SILMA-XG & CimStation Inspection
 - LK Studio
 - Zeiss Calypso
- **Manual/Portable Probe Systems:**
 - Faro
 - Romer
- **Laser Trackers**
 - Lieca
 - API
 - SMX
- **Vision Systems**
 - Nikon Virtual Automeasure
 - Nikon Automeasure
 - Nikon Profiler
 - OGP

Aeronautics

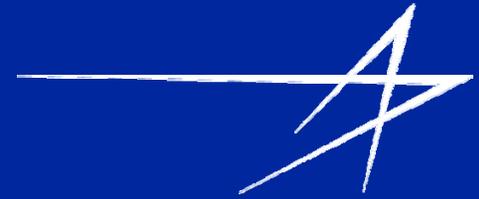


- CATIA Based CAD
- >2700 DMIS Based Programs throughout the sector
- LK machines are running IMS VIRTUAL-DMIS
- B&S machine is running PC-DMIS.

Software's are somewhat compatible however there are differences.

To solve this condition we develop our programs in CATIA using MSC CATCMM, which is a CATIA based inspection tool software. This allows us to use one system for offline program development and post to any of the type machines as needed.

Missiles & Fire Control

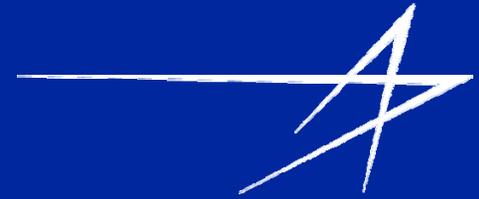


- Pro-Engineer Based CAD
- >450 DMIS Based Programs throughout the sector
- LK, B&S, G&L & (1) Carl Zeiss is running LK Studio
- Carl Zeiss run UMES-UX and Calypso

Currently No Interoperability Successes

To solve this condition we have changed out controllers on several machines to allow other manufacturer's software to drive systems.

Translations?



- Why Translations are not viable options for us?
 - Can't move programs forwards and backwards between programming and metrology software
 - Programs modified during proof out process can't be reclaimed back in programming software

Successful Interoperability?



- Website?
 - HTML
 - Mac
 - Windows
 - Portable Devices

Why are we unsuccessful with Interoperability?

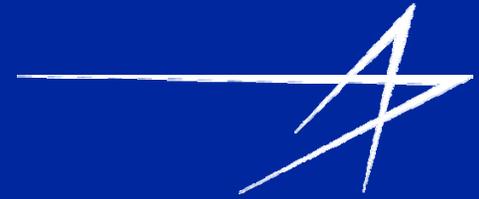
DMIS

I++

STEP & AP2XX

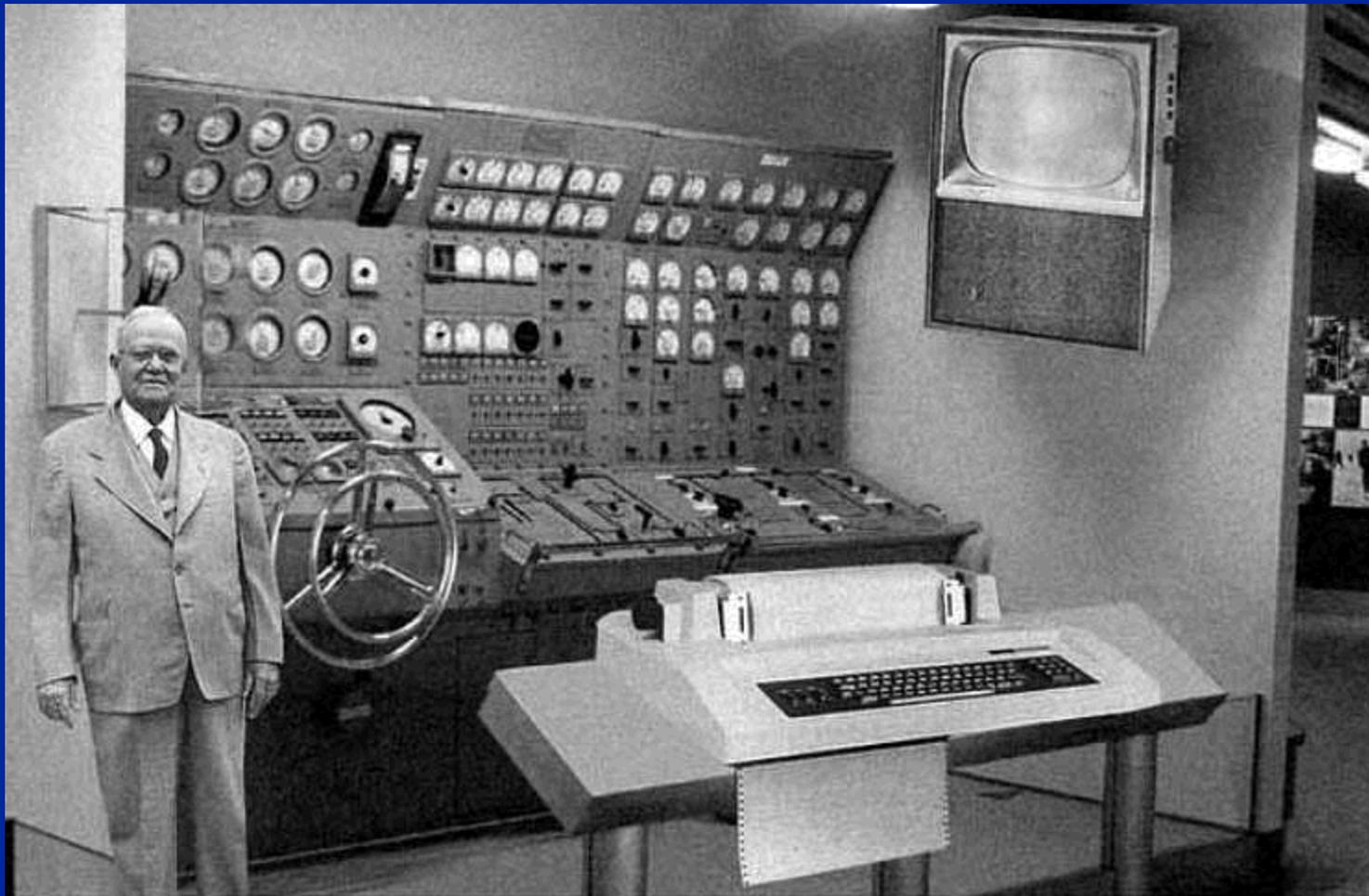
- Probe CMM's
- Tracker's
- Portable CMM's
- Vision Systems

What is the Cost?



- What is the cost of interoperability?
- What is the cost of your business for not implementing interoperability?

Picture from 1954 Popular Mechanics Magazine...



Scientists from the RAND Corporation have created this model to illustrate how a "home computer" could look like in the year 2004. However the needed technology will not be economically feasible for the average home. Also the scientists readily admit that the computer will require not yet invented technology to actually work, but 50 years from now scientific progress is expected to solve these problems. With teletype interface and the Fortran language, the computer will be easy to use.

Past, Present and Future?



- 3-5-10 Years ago

- Technology
- Software
- Hardware

- What standards are missing or lacking to keep us from going forward with your business plan?

Where are you?



