

*MPAR Industry Perspective:
Technical Update*

Mr. Jay Kralovec



Government Communications Systems (GCS)



Defense Communications Electronics (DCE)

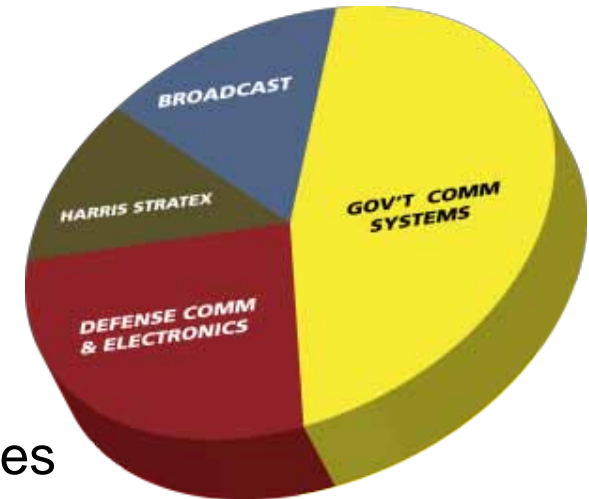


Broadcast Communications



Harris IT Services

- Founded in 1895
- Headquartered in Melbourne, Florida
- \$5 billion in sales
- 15,000 employees
- Serving customers in more than 150 countries

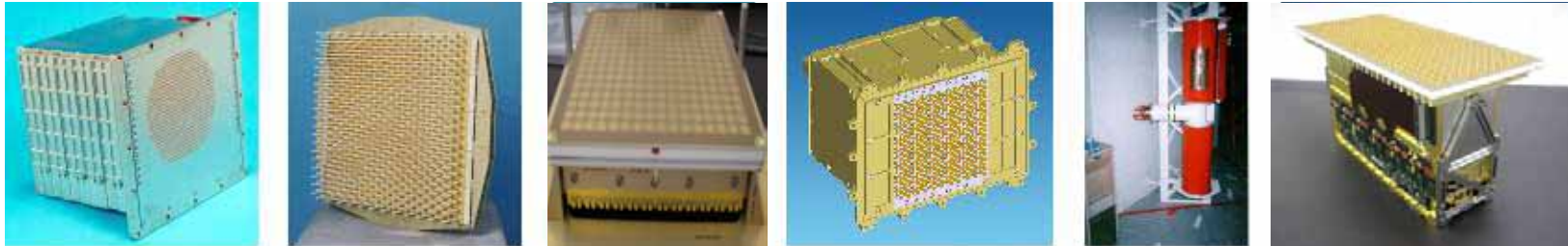


Harris is a large company offering a wide variety of communications and information processing products, systems and services to government and commercial clients

Harris Phased Array Heritage



SPACE/OTHER



AIRBORNE



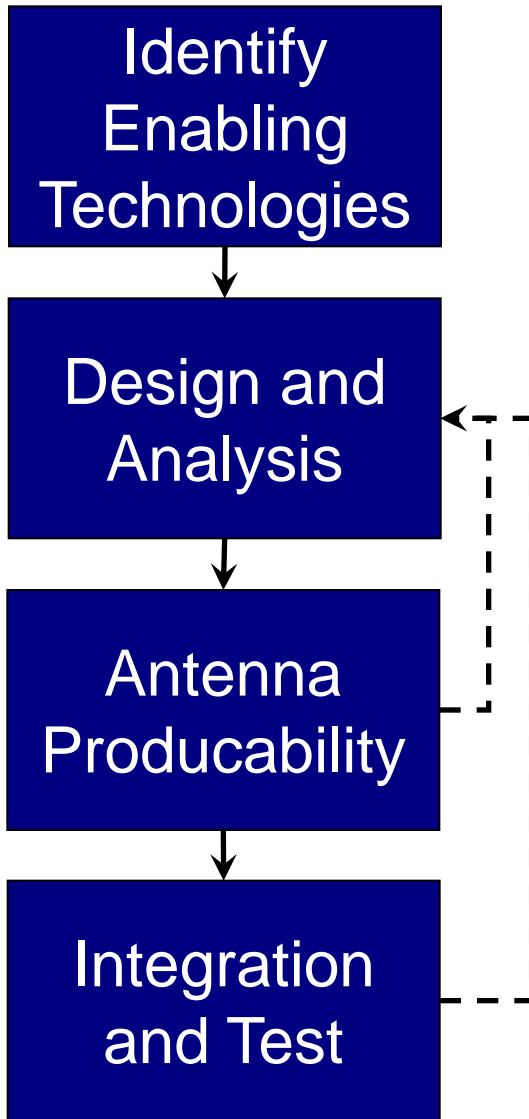
MOBILE



GROUND



Over 25 years experience with design, integration, and test of ground, airborne, and spaceborne phased arrays.



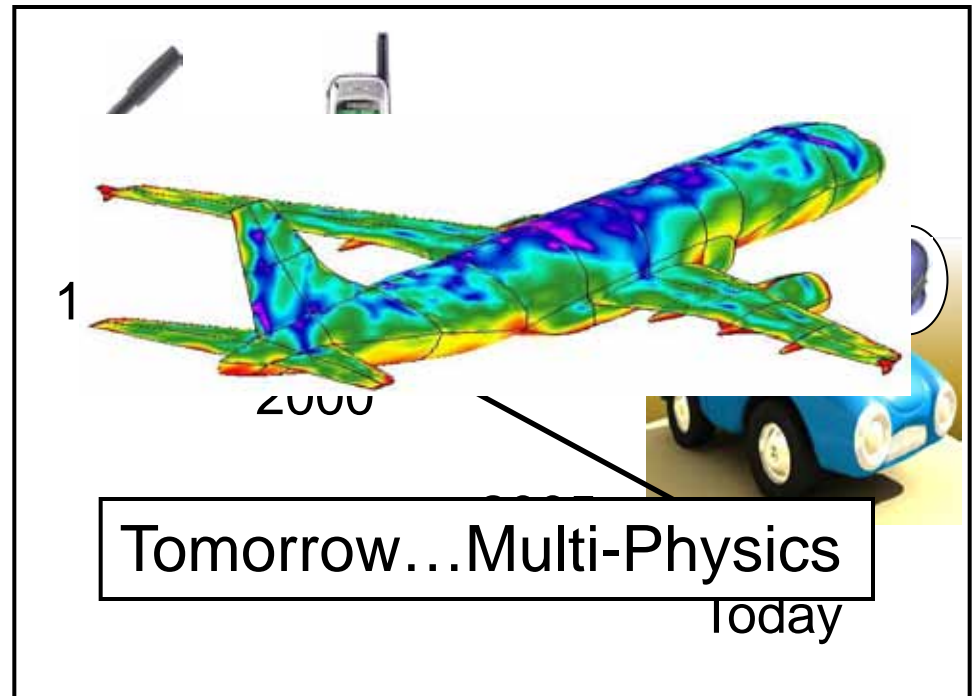
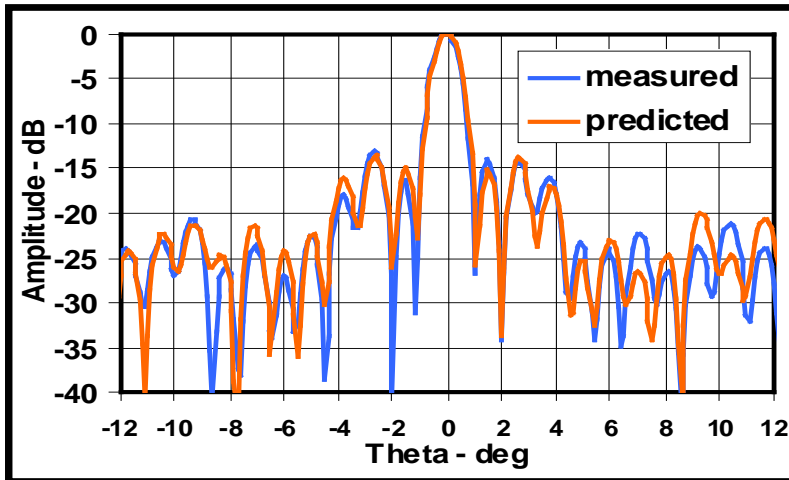
- Study the possibilities.
- Put the pencil to the paper!
- Can we really build that?
- Plug and play?

Each Phase Has Potential To Impact Overall System And Schedule Performance

- Key technologies required to support an MPAR implementation exist
- Continuing incremental improvements in performance and producibility will influence system affordability

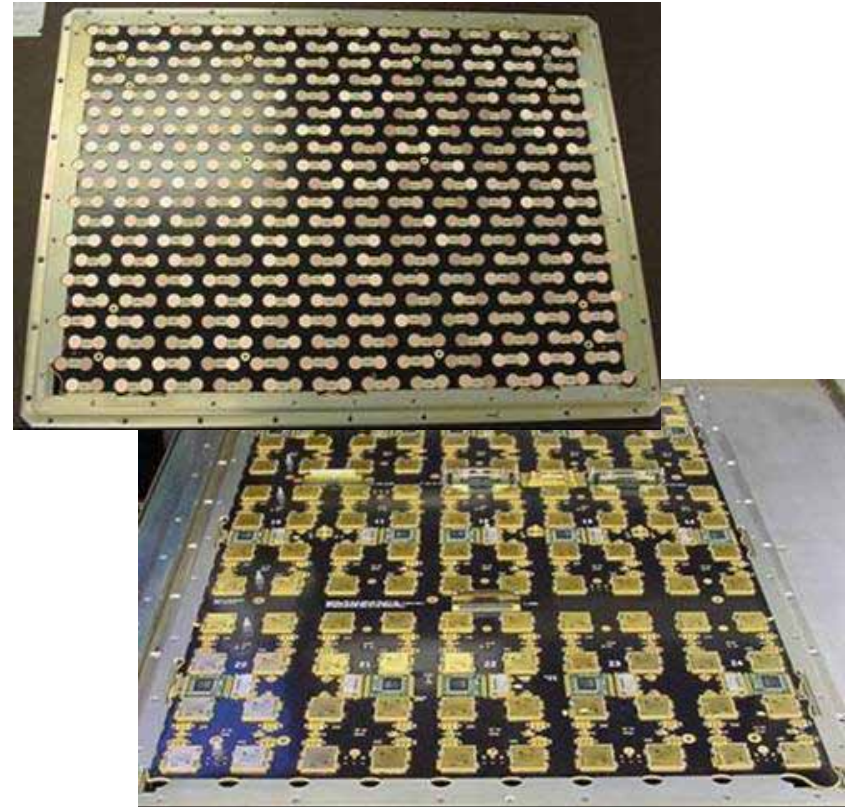
Technology Area	Current State
Beamformer Electronics	<ul style="list-style-type: none">• New processes coming on-line• Increasing efficiency, sensitivity and bandwidth• Higher packaging density
Integrated Sub-Apertures	<ul style="list-style-type: none">• Designs taking advantage of standard Circuit Card production methods• Reduction of part counts and hand labor• Integration of components into board layers

- Advances in scientific computing are focusing on networking architectures and software improvements.
 - Speed \uparrow \rightarrow Analysis Time \downarrow
 - Memory \uparrow \rightarrow Problem Size \uparrow

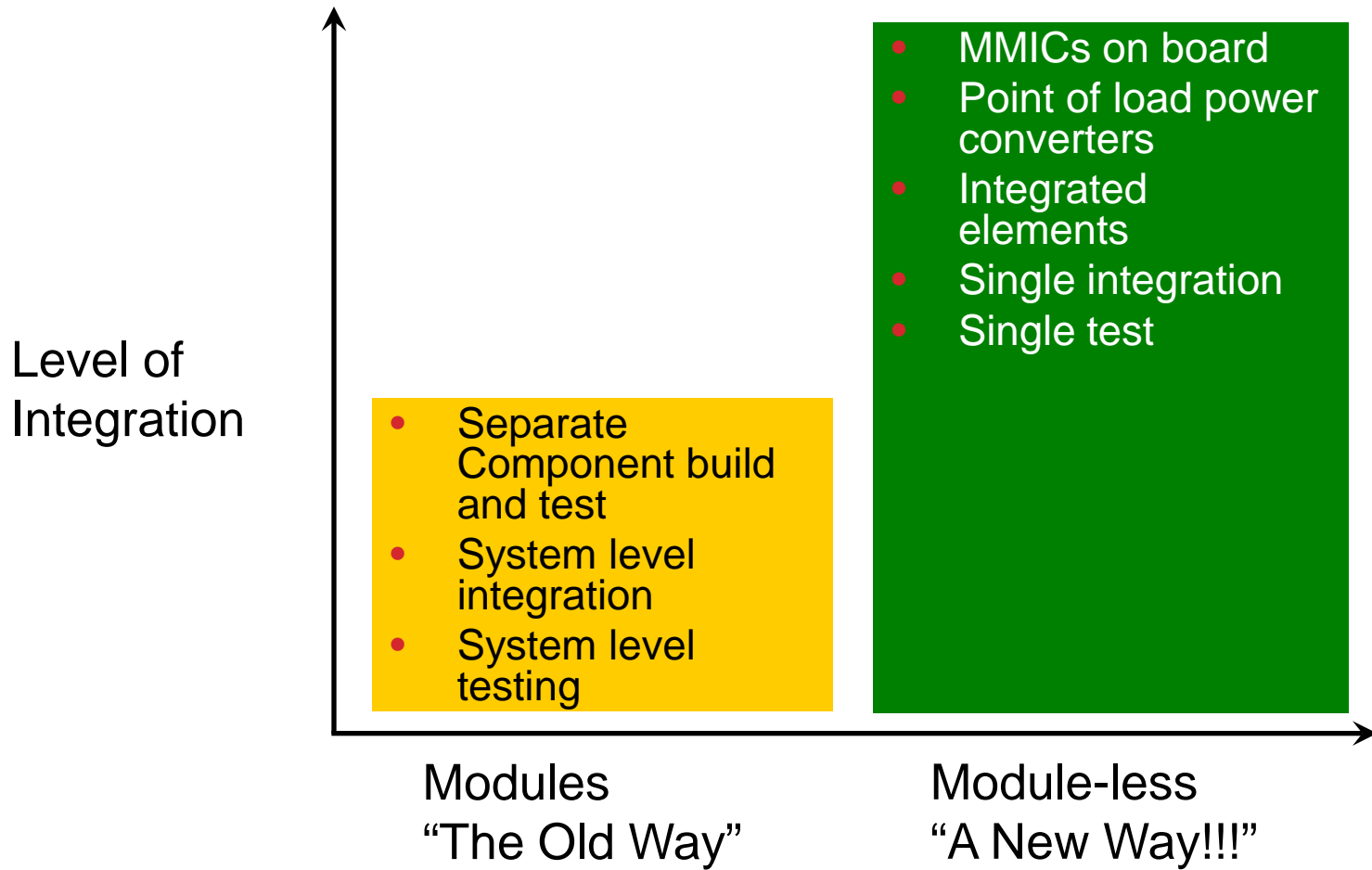


Improved analysis leads to greater first pass success!

- Surface Mount Technology (SMT) incorporated with Circuit Card Assembly (CCA) packaging
- Modular design for expansion and flexibility
- Embedded beamforming, power, and control distribution networks
- Multi-chip module (MCM) or chip-on-board electronics
- Printed radiating elements



RF Module Technology: More or Less???

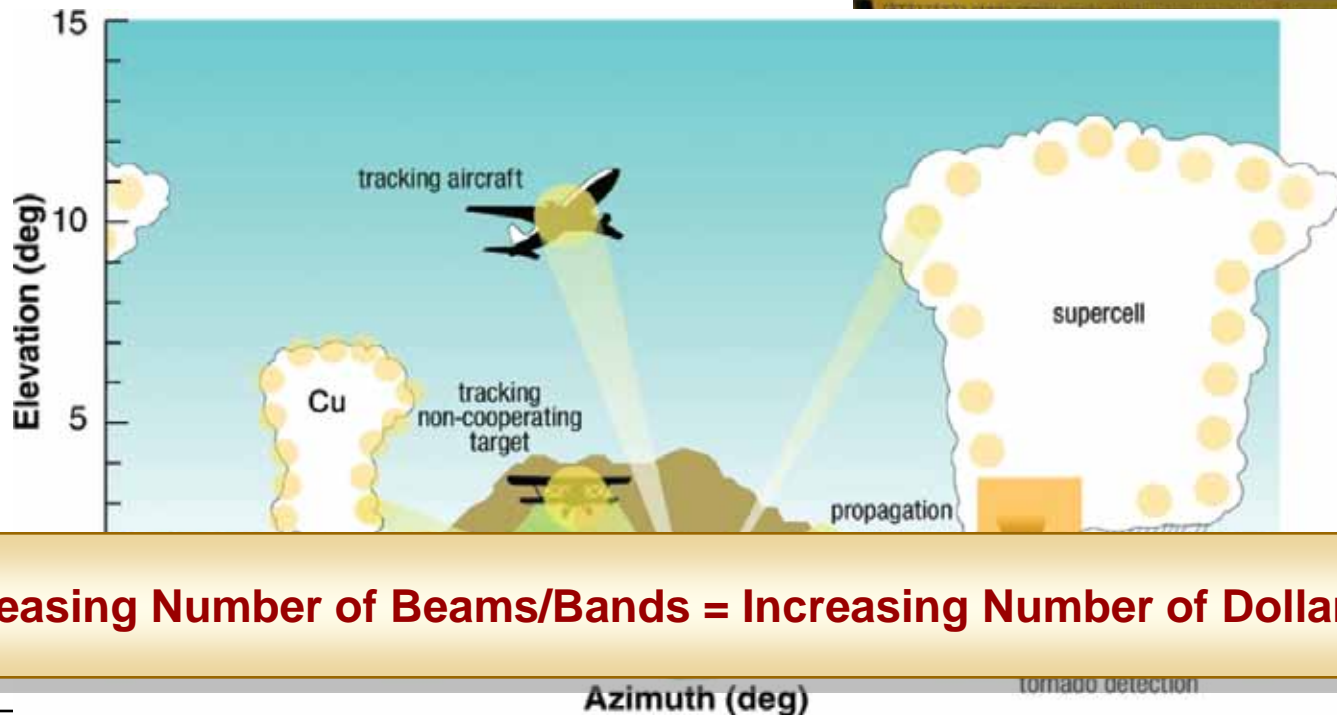


Sub-Aperture Integration And Test Is A Significant Driver To Large Scale Phased Array Affordability And First Pass Success!

Resulting Performance



- Multiple beams
 - Single beams used for tracking
 - Clusters of beams scanning weather features
- Dual band (or wide band) performance



Increasing Number of Beams/Bands = Increasing Number of Dollars!

- Key technologies/processes exists
- Efficient design and analysis tools improve first pass success
- Improved producability leads to affordability
- Automation helps keep the ball rolling

Harris Corporation Has The Required Capability And Enthusiastic Interest In Supporting MPAR Development