

# Ken Harp

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## Profile

Technical leadership, visionary innovation and a high degree of foresight combined with broad experience in Commercial and Defense Electronics, Avionics and Network Racked Systems design and development.

## Professional Experience

### Kymeta Corporation, Redmond, WA 01/2016 – Present Staff Mechanical Engineer

First, second and third generation electronics integrated mobile satcom terminal development for land, maritime, airborne and fixed platforms. New technology research and development from concept to sustained production.

- Lead Mechanical Engineer for clean sheet state-of-the-art flat panel satellite terminal designs.
- Thermal management systems architect, structural analyst, designer, coordinator and facilitator.
- Cross-functional technical liaison with product, manufacturing, systems, software and electrical teams.
- Technical mentor and advisor to a team of 7 mechanical engineers.

### Takeo Innovation, LLC, Kirkland, WA 09/2015 – Present Owner / Mechanical Design Engineer

Contract engineer and consultant serving the Greater Seattle, Eastside and adjacent areas.

### Astronics Advanced Electronic Systems, Redmond, WA 04/2008 – 09/2015 Principal Mechanical Engineer

Electronics packaging and electronic power distribution system design, analysis and test for commercial avionics.

- Top to bottom avionics mechanical research, new product design, development and technical leadership.
- Consistently praised as first “through the pipe” with new designs qualified and transitioned to production.
- Lead thermal and structural analyst – from first order hand calculations through comprehensive system level CFD and FEA analyses, associated design validation and environmental qualification testing.
- Mentored team with the development of thermal systems design, structural analysis, and solder joint reliability guidelines, fostering a culture of collaboration and excellence.

### Raytheon Integrated Defense Systems, Keyport, WA, 09/2006–03/2008 Senior Mechanical Engineer

Electronics packaging design, analysis and test for torpedo applications – Mk 54/Mk 48 torpedoes.

- Rapidly identified numerous design changes to restore a halted multimillion dollar program to production.
- Successfully performed extensive environmental qualification testing to vet needed design changes.
- Customer approved formal test reports without reservation and restored program production.

### Northrop Grumman Space Technology, San Diego, CA, 12/2004–08/2006 Mechanical Design Engineer II

Electronics packaging design, analysis and test for military avionics applications – Raptor (F-22), Joint Strike Fighter (F-35) CNI Systems and Apache Longbow (AH-64D) Joint Tactical Radio System (JTRS)

- Performed extensive structural, thermal, CTE and PTH/VIA reliability analyses for new avionics designs.
- Corresponding thermal, vibration, shock and CTE characterization testing of prototype avionics systems.
- Addressed critical program risks by performing successful environmental qualification tests in record time.

### Raytheon Integrated Defense Systems, San Diego, CA, 05/2000–11/2004 Mechanical Systems Engineer II

Electronics packaging design, analysis and test for military shipboard applications – USS San Antonio (LPD-17) Shipboard Wide Area Network (SWAN)

- Lead Mechanical Design Engineer responsible for the integration of numerous rack mounted network server and data storage equipment configurations into ruggedized cabinet assemblies for Navy shipboard use.
- Electronics rack enclosure system and component level thermal and structural analysis, associate system validation and environmental requirements verification and qualification test report development.
- Ethernet and fiber optic cable plant development, mapping and database management.
- Led a team of 5 in completing complex drawing packages within tight schedule and budget constraints.

## Education

University of California, San Diego, B.S. Mechanical Engineering

University of Southern California, Graduate Level Coursework; ME Analysis, EM Theory, Antenna Analysis

United States Navy, Veteran

## Areas of Experience

### Engineering

Mechanical Design Engineering  
 Technological Innovation  
 Research & Development (R&D)  
 Design for Manufacturing/Assembly (DFMA)  
 Design to Cost (DTC)  
 Systems Engineering / Requirements Management  
 Design Verification / Environmental Qualification  
 New Product Development (NPD/NPI)  
 Technical Leadership, Expertise, Oversight

### Design

System Level Mechanical Design  
 Thermal Management  
 Cooling Systems  
 Structural Design  
 Printed Wiring Boards (PWB)  
 Printed Circuit Assemblies (PCA)  
 Electronics Packaging  
 Electronic Components  
 Sheet Metal Design  
 Machined, Extruded, Cast and Formed Part Design  
 Injection Molded Plastics and Foams  
 Electrical Connectors / Interconnects  
 Cable Management (Standard, Coax, Fiber)  
 Power Distribution / High Current Applications  
 Electro-Mechanical Design  
 Human Factors and Ergonomics  
 RF Considerations (Dk, Loss Tangent)  
 Electromagnetic Compatibility (EMC/EMI)  
 Rapid Prototyping  
 Legacy Design Upgrade  
 Test Fixture Design

### Analysis

Finite Element Analysis (FEA)  
 Thermal, Vibration, Shock, Stress & Fatigue  
 Computational Fluid Dynamics (CFD)  
 Thermal Conduction, Natural and Forced  
 Convection, High Altitude, Radiative Effects, Solar  
 Loading, High Current Applications, TECs, Heat  
 Pipes, Vapor Chambers, Liquid Cooling, Solder  
 Joint / PTH / VIA / Board Level Reliability

### Documentation

PWB, PCA, Subassembly Part Drawings  
 Cable and Interconnect Drawings  
 Assembly Drawings and BOMs  
 System Block Diagrams  
 Engineering Change Requests (ECR)  
 Engineering Change Orders (ECO)  
 Full Product Data Management (PDM)

### Test

Temperature, Temperature Variation,  
 Vibration, Shock, Acceleration, Altitude,  
 Humidity, Water Proofness, Fluids Susceptibility,  
 Explosion Proofness, Sand & Dust, Salt Fog/Mist,  
 Solar Loading & UV Exposure  
 Design Verification Test (DVT)  
 Environmental Qualification Test (EQT)  
 Highly Accelerated Life Test & Stress Screen  
 (HALT/HASS), DVT & EQT Plan, Procedure &  
 Report Development

### Products

Avionics & Aerospace  
 Commercial & Industrial Electronics  
 Defense Electronics Systems  
 Racked Network Systems  
 Flat Panel Mobile SatCom Terminals

### Software

SolidWorks (20k+ hours)  
 SolidWorks Simulation  
 SolidWorks Flow Simulation  
 ANSYS Mechanical Workbench / IcePak / Fluent  
 FloTherm  
 PTC Creo  
 CATIA  
 AutoCAD  
 Arena / JIRA / JAMA / DOORS

### Communications

Multidisciplinary Collaboration  
 Requirements Management  
 Formal Design Reviews (PDR, CDR, TRR)  
 Informal Design Reviews (DFMA, DTC/S)  
 Internal & External Presentations  
 Technical Writing & Memoranda  
 Proposal Development  
 Original Design Manufacturer (ODM) Management

### Standards

RTCA DO-160	MIL-STD-810G/H
MIL-STD-202	MIL-STD-167
MIL-S-901D	MIL-HNBK-454
MIL-HNBK-5400	IPC-SM-750
MIL-HNBK-759	IPC-D-279
IPC-TM-650	IPC-2221A
IPC-9701A	IPC-7095
IEC 60529 (IP66/IP67/IP68)	IEC 60068
ARINC 404/600	IEC 60945
ASME Y14.5 GD&T	J-STD-001
EIA-310	ASME Y-14.44