Wayne Mitzen
7839 Sabre Ct. Manassas, VA 20109

http://www.ajawamnet.com
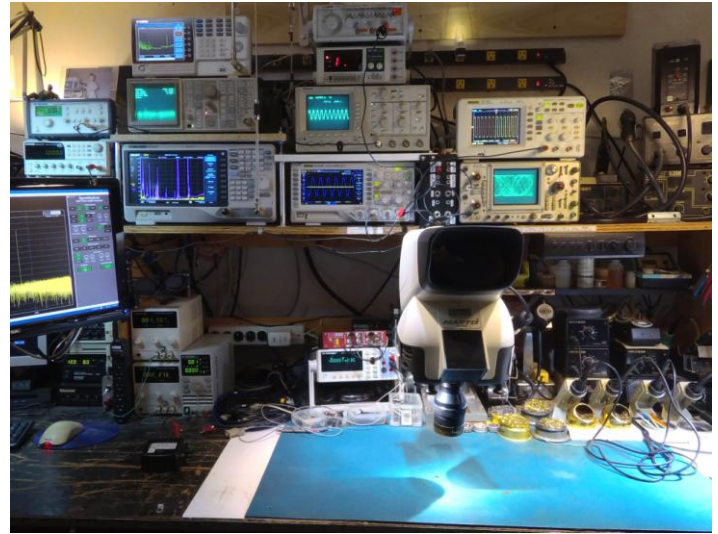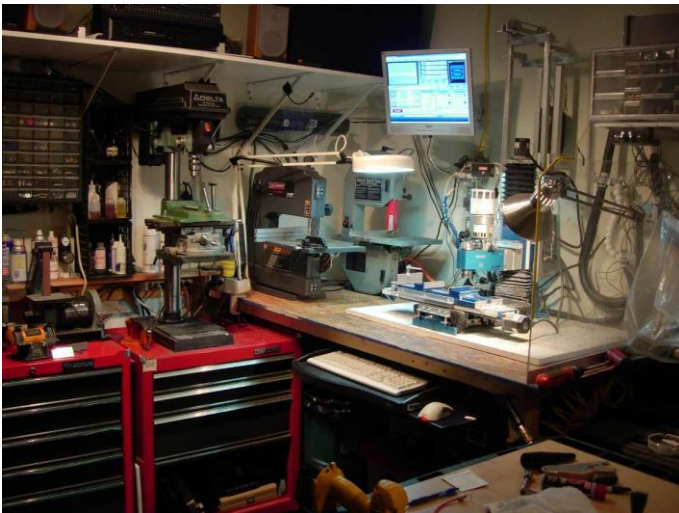
lab/shop: (703) 392-6911
email: ajawamnet@ajawamnet.com

Over 30 years of design experience - I have a full lab here in Northern Virginia and can assist in the design, assembly, and testing of any project. If you're looking for someone that can deliver in-budget and within schedule, feel free to give me a call at 703-618-2430 (cell phone) or you can email ajawamnet@gmail.com.

I have SMT rework systems as well as a full CNC shop for rapid turnaround of those projects. I also have large 3D printing capability in-house.

I can perform the electrical and mechanical design, then actually deliver working proto/EAP devices in the target form-factor. These include mixed mode analog and high-speed digital designs as well as SMPS products.

I have experience in getting designs through various EMI tests including specifications such as MIL-STD-461 and FCC Part 15. I can perform pre-certification testing for radiated and conducted emissions.

I have been published in trade magazines as well as academic journals.

I work well under pressure, have completed jobs over holidays just to get my customers products out the door. For the last 15 years, I've completed an average of 130 designs per year - all to the satisfaction of my customers.

One of the first designs I did was for the original IBM XT, running DOS 1.1; it was for the video CGA adapter. At the time, there were no clones, no reference designs on developer.intel.com (the internet wasn't really even accessible to common-folk), and the main method to layout multi-layer PC boards was to use Bishop Graphics 4:1 tape up (red and blue decals on velum). My device allowed the use of these early PC's with the various projection and video production systems that were available in 1984. These were sold to various Westinghouse divisions, as well as many universities (one of the first devices installed at CMU's Technology Center), large corporations and financial institutions. We generated over $11mil in one year.

Since 1990, I was one of the early proponents of using the emerging EDA tools, one of which was the original ORCAD family of DOS based products, as well as

Over 3,000 designs completed with Altium since 1995

A Traditional resume/work history can be found in the next section

doing some of the first 3D modeling with AutoCAD version 10. After the fiasco of the ORCAD port to Windows, I switched to Protel (version 3) and have since used Altium's line of products; though I am still proficient in ORCAD as well as a myriad of other EDA/CAD tools.

All of the 3000+ products I've designed since then typically consist of digital, RF, and analog (full SPICE modeling) topologies used in various applications with support for programmable logic, various uC an uP architectures including low-power embedded designs.
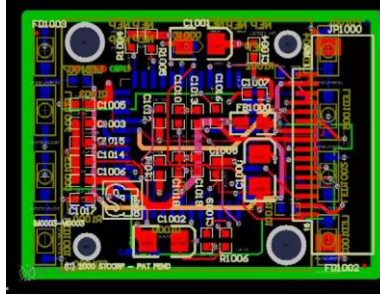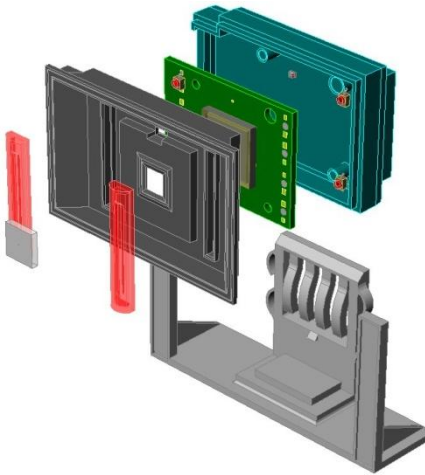

I've pioneered development in many areas, including some of the first ISM-based RF devices and I was one of the first to embrace the use of CMOS imagers in commercial applications. I hold a patent for a company I co-founded (**Inventor, USPAT 6,208,266** for Remote data acquisition and processing system) that used some of the first CMOS imagers available from Motorola, FUGA, Omnivision, VLSI Vision.

If you look at this page:
http://www.ajawamnet.com/amnet/index.html
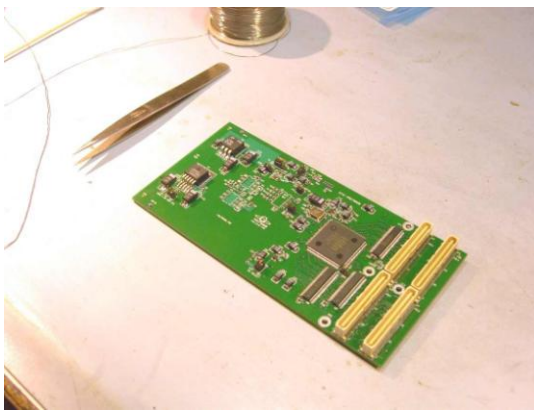
you'll notice that this is one of the first embodiments of what is now known as the "Internet of Things". Wireless transmission of small, autonomous devices to servers on the Internet utilizing web pages and portals to present collected data, as well as manage endpoint devices regardless of scale and geographic location. In fact, if you look at the patent citations you'll see a list over 120 subsequent patents that reference what we were doing back in the late 1990's. Also note that the first enclosures for the prototypes were 3D printed using SLA driven from CAD 3D models – well before 3D printing was common place.

I'm also on other patents for technology such as one for a secure device used by governments and industry to allow uni-directional transfer of data between networks (also known as cross domain systems) (**Inventor, USPAT 8,250,235**) as well as one for wireless intrusion detection (**Inventor, USPAT 7,778,606**) with that device making the cover of Government Computer News (I can provide a PDF re-print of the GCN article if necessary).

On the above mentioned patent, as well as the other patent applications pending (you can Google my full name in quotes or do an advanced search on uspto.gov - IN/mitzen) I was the lead designer; in fact all of the patents contain MPEP- class drawings derived from my original design documentation.

I've also developed many products for military applications (part of the team that won an award for
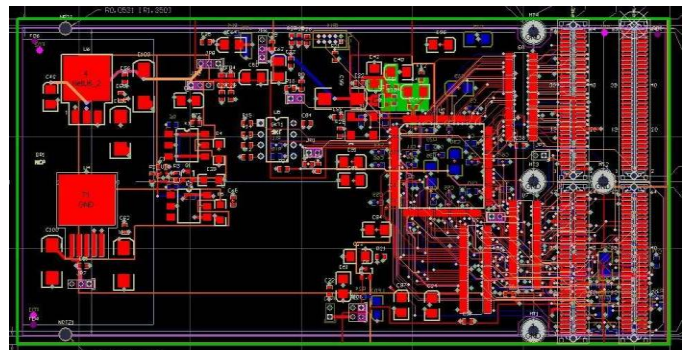
A Traditional resume/work history can be found in the next section

precision munitions - see https://en.wikipedia.org/wiki/Lockheed_MC-130#MC-130W_Dragon_Spear), medical devices/IEC60601, RFID tags and readers, satellite hardware/NASA compliant (i.e... TML; J-STD), some of the first high power LED designs, industrial automation, telecommunications-ICRI/RF, core network, and network-based security (IDS, firewall, crypto) appliances and various HDI designs. All in all I've designed well over 500 products in the past eight years with number probably at 3000 for the entire 30 years of experience in product design. Not in a cursory capacity, but usually in "concept to production" capacities.

I have numerous references, a lot of them in the DC area. I recently won accolades as being one of the best full turnkey PCB design services in the US - this from a firm with engineers in the business for over 40 years. Here are a few direct quotes from some of my recent client's emails to me:

"You're the best PCB guy I've worked with in (ahem!) 40 years of getting boards laid out. (But let's keep that number our little secret.)"

"Much thanks to Wayne for making the 'complex" - user friendly! I will process the invoice for services upon receipt."
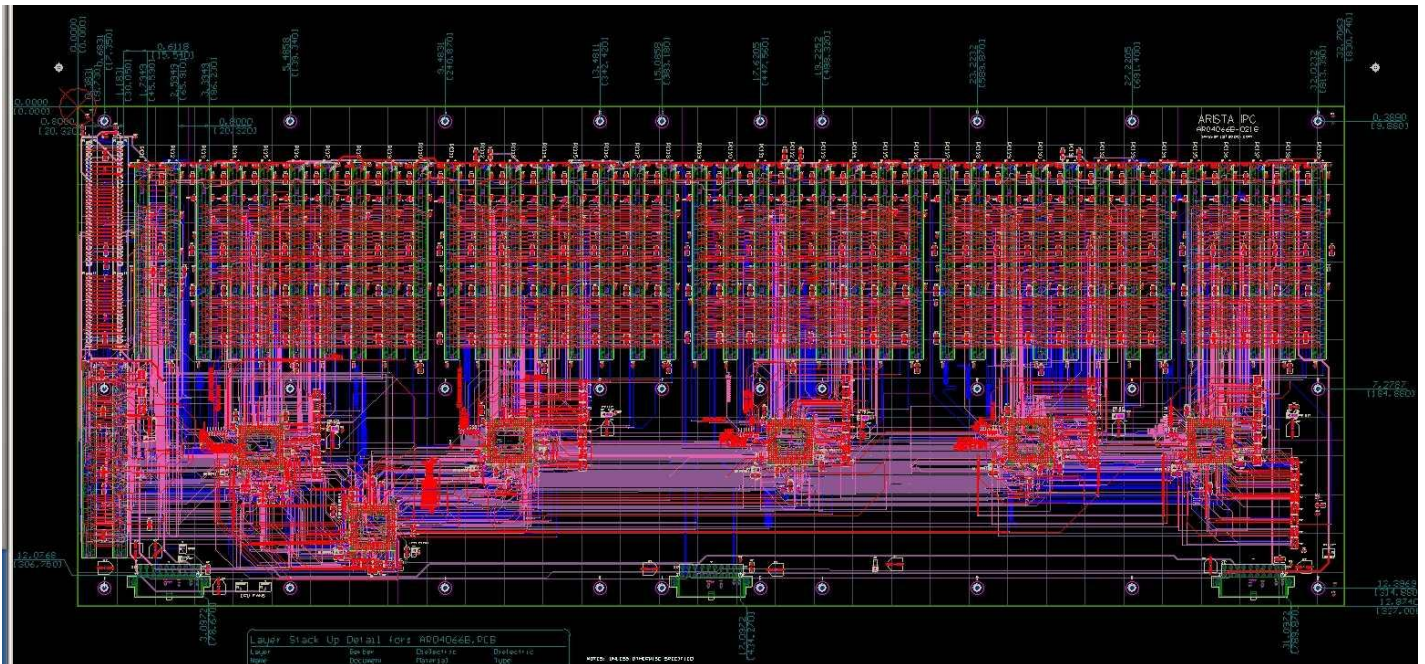
"... but because we have had so many instances of other people who have done software for us that didn't quite work. It has been a real blessing to [company name] to have worked with you, and Wayne (duuude) on the hardware side, on our projects over the last year or two. You guys give us a lot of confidence in the things that we are trying to do."

As an example - on my Product Development webpage, at the bottom you'll see a very large 10 layer high speed PCB Design for an OC48 packet processor.
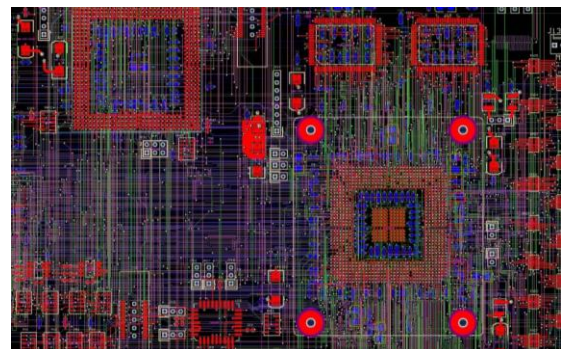
A Traditional resume/work history can be found in the next section

Here's a link to an Acrobat file of the composite plot:

http://www.ajawamnet.com/ajawam1/g010707d.pdf

This was a 19 page schematic and as mentioned, 10 layers with significant LVPECL nets with numerous layout constraints for impedance of dozens of differential pairs, 5 clock domains all running at 150MHz or more, and 18 split planes, each filtered and regulated. I turned that job in less than 10 days. I have lots of these samples, if you'd like more.

One of the techniques I use that made it possible to deliver that in such as short period of time is my method of using staging tables to generate schematic symbols DIRECTLY from the manufacturers PDF datasheets. No chance of mis-keying pin names and numbers. If the datasheet is right, so is my schematic.
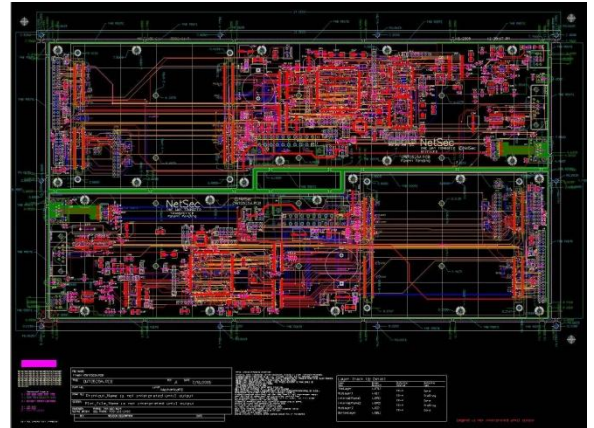
This is especially handy when doing parts like the 600 pin Intel IXF6048 framer, shown on the above PDF example.

>>Mechanical Design<<

Also have over 20 years of experience in 3D modeling and all forms of CAD design. I have and own over 20 various, licensed programs such as Solidworks, AutoCAD Mechanical, and various software tools used with my mid-sized 4-axis CNC machine.

I typically deliver EDWG's to clients for verification of design intent and to insure that the overall product meets their criteria. Simply put an EDWG is a zip file that contains an executable viewer with the 3D model data that does NOT require any installation or other software to be present on the clients machine. You simple extract the EDWG file, execute the extracted file and enjoy. You can then rotate the model, zoom in/out, or hide/make transparent any part of the model. Very cool stuff.

An EDWG sample of a recent chassis design can be found at:

http://www.ajawamnet.com/ajawam5/owt0320-dual.zip

This is an interesting example of some of the 200 turnkey designs I've done. Typically when asked to do a full design for a product, I drive it from the desired mechanical form down to the component level. A photo of the completed design is shown here.

A Traditional resume/work history can be found in the next section

Another EDWG sample can be found at: http://www.ajawamnet.com/ajawam5/FA2-ASSY.zip

A photo of the completed design is shown here.

Again, this was a "rush job" for a local D.C.-based firm that needed a hardened enclosure for use on military HumVee's. It required a water-tight enclosure for use with wireless equipment and had to have provisions for shore power as well as 24VDC with internal gel-cel battery backup. I also designed the majority of the internal electronics. The entire design (mechanical and electrical) as well as supplying OER, INC in Reston, VA with shop/fab files, and supplying gerber files for PC Board fab, took less than 10 days. We built the first prototypes within two days of receiving the fabricated parts/PCB's.

This is where my acumen with both the practical considerations of the product as a whole determines the success of my projects and I have to say (and can provide references) that one comment I always get is:

"Wow, worked first time - everything fits..."

In fact, a lot of the mechanical vendors I've used in the past, comment on how error-free the entire packaging is.

A prime example of an innovative injection mold design; where again, everything fit on the first run of parts is located at:

http://www.ajawamnet.com/ajawam2/ev0034.zip

This device was made to enclose one of the products for the patent previously mentioned. It had to withstand full submersion, and maintain operation for over 10 years. It also had to cost less than $30.00 USD so as to provide a positive ROI to the utility over 5 years.
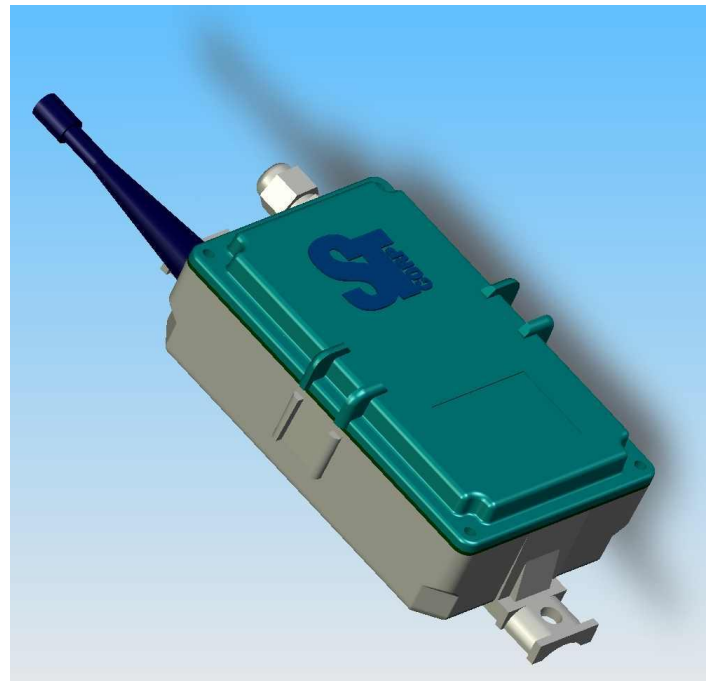
Having it all fit and work the first time as well as meet all the design requirements was critical to the accelerated delivery schedule proposed by the customers. I was able to accomplish this with time to spare.

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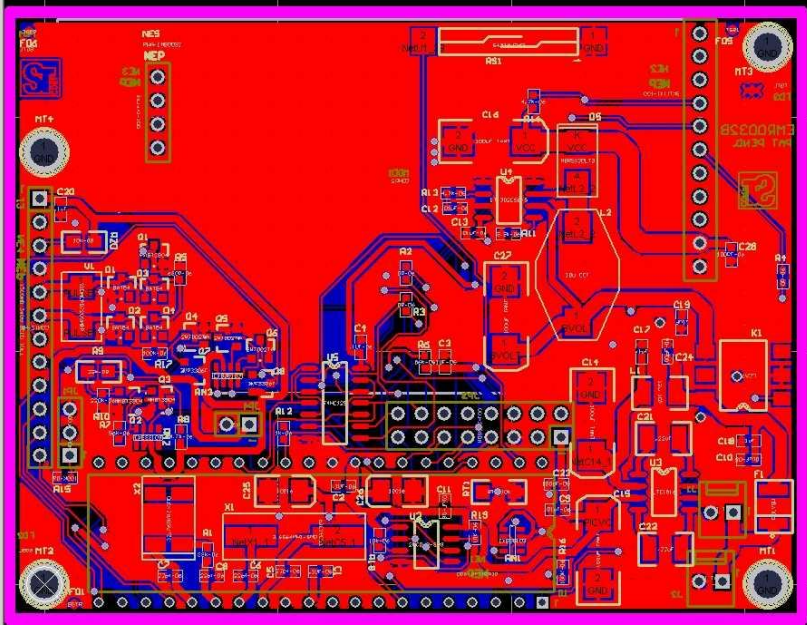
This is due to my 18+ years of experience, taming many CAD disciplines and software suites into a seamless tool-chain that provides directly driven PC board mechanicals/footprints from various mechanical CAD tools.

A lot of this has to do with many of the smaller, budget-limited projects I've completed, where I'm charged with not only designing the product, but also delivering working prototypes with little or no funding.

>>CNC Machining and Prototypes<<

So, in essence, I built my own lab, soup to nuts, everything I'd need to do this. Not only can I do the package (or a lot of times use modified COTS enclosures) and electronic design, but I can get it fabbed inexpensively, hand build the first few (even 700 SMT parts is no problem), load code, test it and deliver an actual working product. In summary, I believe my hands-on approach lends itself to something that can actually be produced and marketed.

As to my CNC shop, the following are some links to video samples of my machine:

Milling a COT's enclosure for use in an avionics prototype (electronics designed in-house):
http://www.ajawamnet.com/ajawam5/DSCN0860.avi

Cutting a pocket for use in a thermal solution for Hi Powered RF design (electronics designed in-house and by others):
http://www.ajawamnet.com/ajawam5/pocket.avi

Milling a 2" block for use in a mechanical subsystem:
http://www.ajawamnet.com/ajawam5/2inblks.avi

More samples can be supplied, and feel free to visit my webpage for a web version of this document:
http://www.ajawamnet.com/

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email: ajawamnet@ajawamnet.com

A list of licensed software
currently used in-house for the past 25 years:

ORCAD
Altium Designer/365
Mathsoft
MulitSim
Quartus
Tina
Waveformer Pro
Solidworks
AutoCAD
Visual Mill Professional
CamBam
Metacut
Cura
And over 300 various EDA/RF/Mechanical
programs for tasks including FEA, RF
Simulation, PCB signal integrity and
mathematics.

Equipment:
Various Tektronix's Oscilloscopes
Various Rigol and Siglent Oscilloscopes
Tektronix, Instek, and Siglent Spectrum Analysers
Various PC-based Logic Analysers
Multiple vendors Vector Network Analyzers
Signal Hound 4.4GHz Signal Analyzer/
Dataq data acquisition systems
Mantis Stereo Inspection Viewers
Hakko Thruhole/SMT rework
Various BGA rework centers from APE with split-vision
and fully-programmable ramp-soak-reflow
Arch E size (42") color plotter
A full machine shop with lathe and mill including a
specially modified CNC –
22x10x10 (X-Y-Z) work envelope with 4th axis
Large envelope (400mm x 300mm x300mm) 3D FDM
printer
Laser cutter with 12 x 22 work envelope
Full away kit with complete set of test equipment
(oscilloscopes, spectrum and vector network analyzers,
tools and soldering/hotair rework systems for on-site
troubleshooting, debug, and repair.

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Objective: To excel in the areas of product design and development of electronics for consumer, military, aerospace, and industrial sectors, including microcontrollers, microprocessors, DSP, wired and wireless modems/chipsets, FPGA/PLD, imaging (CCD and CMOS/APS). I also specialize in the design of precision analog circuitry including instrumentation/control, RF integration, and telecommunication solutions. All phases of 3D/solid/surface modeling for use in mechanical and architectural disciplines.

Skills and Abilities: OVER 30 years of experience. *Fast learner especially in the areas of mechanical and electrical engineering software. Autodidactic and resourceful, self-starter but also a team player. Very good troubleshooting skills. Mechanically inclined which allows me to also build the products and execute ECO's. Good understanding of manufacturing and production.*

Experienced with: Electrical design *- Analog and digital circuit design and simulation using Protel/Altium (27 years), Cadence/ORCAD, PADS, and many other EDA tools for schematic capture, PCB layout, and HDL's, RF and wireless product integration, Manufacturing and DFM procedures for production and assembly, Rapid prototyping of PCB's including SMT and logic devices including FPGA/PLD development, Agency approvals (UL, CS, FCC, IEC), as well as many MIL Standards*

Mechanical design *- Solidworks and AutoCAD/Mechanical Desktop, SLA and FDM creation for prototype fabrication for proof-of-concept and advanced marketing, IGES/ACIS/STL conversions to G-Code using Visual Mill, Metacut. Operation of multi-axis CNC machines using MACH 3.*

Feel free to ask for references… if not mentioned, all work included interfacing with manufacturing and fabricators of various disciplines. I can also provide many references to various CM's, fabricators, and PCB houses. The one remark I get most is it's done right the first time...

Work History – Full Time Positions

Hart Technologies, Manassas, VA 2009 - PRESENT
Lead hardware designer for all hardware that was developed at Hart in support of the Seaport DoD contract for NAVSEA. Was a main part of the team that won the Perry Award for Precision Munitions [s*ee attached appendix*]; I was sole designer of all of the PCB hardware for launching various "items" on the AC-130x platforms.

This system was featured on an episode of the Discovery Military Channel's "Deadliest Tech – AC-130W" https://www.youtube.com/watch?v=6FvmWBx6BLw and this: https://www.youtube.com/watch?v=YNli7tNKxgA

In addition to this I've designed over 40 different PCB assemblies for use in various platforms - all mixed mode designs with high level of complexity utilizing various microprocessors, microcontrollers, analog interfaces and various digital I/O. I was the sole hardware designer on various projects, including the development of a system that emulates over 900 signals based on UDP streams.

Use Altium, Cadence and various digital and analog design tools, as well as FEA and simulators for development of schematic designs and PCB layouts with stack ups spanning over 30 layers and heavy (>2oz) copper. I've utilized various microprocessors (Intel, NXP/ATMEL/QUALCOMM ARM A cores, etc...) and microcontrollers, including the latest ARM M/R cores such as the ST Microdevices STM series (including ARM M4 and M7 cores), Atmel SAM3/E70, all of the AVR series 8 bit, TI Cortex and Stellaris, TI TMS/OMAP, NXP iMX Kinetis LPC and RT, many Microchip PIC variants. Designed various ML/AI products using Google TPU, NVIDIA Xavier, and Qualcomm Snapdragon microprocessors. Designs included microcontroller/base-band/RF devices including those from companies like Nordic Semiconductor. I designed multiple SMPS power and as well as RF and HDI/High Speed (greater than 6GHz) products. Designed over a dozen Ethernet switch products, including managed and unmanaged.

Utilize various protocols including PCI/PCIe, HDMI, DP, hardened USB 2/3, hardened 10/100/1000 Ethernet, various fiber including SFP transceivers, custom multi and single mode protocols using various line codes, CAN Bus, MIL-STD-1553/1760, RS232/422/485, CSI, SPI, SSI/Stegmann for encoders/resolvers, high speed differential, DDR3-5, and various flash/SRAM/DRAM based systems.

Provide full manufacturing documents as well as interface with software developers. Led integration of software firmware including bring up and full system testing and troubleshooting. Provide troubleshooting services for junior engineers and system integrators, as well production issues. Hand build prototypes.

Lead testing of all products for environmental and EMI (ie MIL-STD-810,800,465) as well as integration with all external system hardware. Performed thermal management testing as well as systems for use in verifying mechanical integrity for shake/vibe/environmental applications.

Use Solidworks and Autocad for mechanical aspects of over 30 enclosures and subassemblies. Utilize various toolpath generation and CAM programs like Visual Mill and for use with in-house CNC machining of mechanical apparatus and enclosures. Utilize Cura for use with 3D printing preparation General consulting with regard to various aspects of manufacturability and product lifecycle.

Bluefin Innovations, North Potomac, Sterling, VA 20166 2022-PRESENT
Hardware Design/Engineering
Assist with the design of various systems, including those used for detection of various materials, with applications such as mass spectrometry utilizing Altium for Capture/PCB layout and various EDA tools for PCB Layout including PCB's for high voltage applications. Assist with card cage design and 3D modeling for high voltage (>6kV) insulators for PCB mount HV connections. Assist with conceptualizing advanced packaging of existing products.

Applied Technovations/Fast Product Development North Potomac, MD 2006-PRESENT
Hardware Design/Engineering
Developed over 20 products including the WICE system for Redstone Arsenal/TDME. This was completed in 6 months from FAT through FQT acceptance. Designed hardware for Welch Allyn used in tying medical devices to HIPAA-compliant networks while maintaining patient barrier as per IEC 60601. Developed hardware for telemetry systems used at various military installations. Developed wearable system for use in neurological diagnostics. Designed various charging systems for military applications.

Use Altium, Cadence, and multiple analog/digital simulation suites for development of schematic and PCB designs with PCB stack ups spanning over 20 layers and utilize various FEA tools for design verification as well post layout simulations. Utilized various microprocessors (ARM A cores, Intel,) as well as various 8-32 bit microcontrollers. Designed multiple SMPS and DC-DC converters. Lead development efforts for various military and commercial security projects utilizing RFID, USB 2/3, 10/100/1000 Ethernet, CAN Bus, RS232/422/485, SPI, and J1708, J1587, J1939, DDR3-5 and various flash/SRAM/DRAM based systems.

Lead testing of all products for environmental and EMI (ie MIL-STD-810,800,465, IEC, FCC, UL) as well as integration with all external system hardware. Performed thermal management testing as well as systems for use in verifying mechanical integrity for shake/vibe/environmental applications. Designed two dozen enclosures using Solidworks and Autocad. Utilize various toolpath generation and CAM programs like Visual Mill and for use with in-house CNC machining. Utilize Cura for use with 3D printing preparation

Led integration of software firmware including bring up and full system testing and troubleshooting. Provide troubleshooting services for junior engineers and system integrators, as well production issues. General consulting with regard to various aspects of manufacturability and product lifecycle. Hand build prototypes.
http://www.fast-product-development.com/team.html

Verizon Business (formerly MCI/Netsec), Herndon VA 1999-2007
Network Security Engineer/Senior Hardware Engineer
Responsibilities include network hardware development for use in security services. Used Altium/Protel, Solidworks, Autocad, Multisim, and multiple analog design suites for development of specialized embedded hardware for high speed networks including ATM/Sonet and ADSL devices for VPN, firewalls, network intrusion detection and network management. Schematic and PCB designs include high-speed communication processors (Intel - including high speed network IXP processors, NXP), SHARC and TI DSP and network interfaces for Ethernet, WiFi and fiber. Lead designer for various products including wireless intrusion systems, crypto accelerators (AES), border devices, supervisory computer security products. Assisted with the design of FPGA devices for use in secure domain guards. Utilized various protocols including PCI, USB 2, 10/100/1000 Ethernet, back scatter RFID, various fiber including multimode transceivers, custom multi and single mode protocols using various line codes, CAN Bus, MIL-STD-1553/1760, RS232/422/485, CSI, SPI, DDR2,LVPECL. Design custom PHYs for use in custom line codes.

Provide full manufacturing documents as well as interface with software developers. Led integration of software firmware including bring up and full system testing and troubleshooting. Provide troubleshooting services as well as solving production issues. Utilized various CAM tools for CNC of custom/prototype enclosures. Awarded patents: https://patents.google.com/patent/US7778606B2 and https://patents.google.com/patent/US8250235B2

Amnet Data Communications, Inc / ST Corp Hopkinton, Massachusetts 1995-2002
Co-Founder & Senior Engineer
Chief responsibilities are product conceptualization and development, design and layout of product electronics and mechanical packaging for production of hardware used in ITSP (Internet Telemetry Service Provider) systems and networks, FPGA and microcontroller hardware design and layout, design of imaging devices including CCD and CMOS/APS sensors. Schematic design and PCB layout for integrated wired and wireless/RF hardware for use in TCP/IP, PCS/GSM, POTS, and network architectures using Protel and ORCAD/PADS. Utilized various protocols including PCI, ISA,PC104, USB 10/100 Ethernet, custom multi and single mode protocols using various line codes, CAN Bus, RS232/422/485, SPI, and specialized telemetry protocols.

Utilized Protel and ORCAD/PADS for schematic and PCB design using various microprocessors (AMD, Intel) and micro controllers including 6805/6811, 8051, some of the first Atmel AVR 8 bit, many Microchip PIC variants. Utilized external flash and high speed SRAM memories. Used FPGA's with high speed SRAM for use in ruggedized military applications

Designed all of the enclosures including some of the first 3D printing in 1996. Used Solidworks and Autocad for design of IJ and Vacuum production molds as well as test fixtures. Designed various solar and wind charging systems for NiMH, and Lithium batteries.

Provided full manufacturing documents as well as interface with software developers. Led integration of software firmware including bring up and full system testing and troubleshooting. Provide troubleshooting services for junior engineers and system integrators, as well production issues.

Lead testing of all products for environmental and EMI (UL, FCC) as well as integration with all external system hardware. Performed thermal management testing as well as systems for use in verifying mechanical integrity outdoor applications.

Designed one of the first IoT systems - Inventor, USPAT 6,208,266 for Remote data acquisition and processing system.

Stern Enterprises Pittsburgh, Pennsylvania 1988-1996
Engineering Contractor
Used manual layout techniques (Bishop Graphics tape up) for the design and layout of microcontroller-based control systems for use in large HVAC/boiler systems. Design and fabrication of fire alarm control system interface to automatic door release systems to comply with local and state fire codes. Also generated retail planning, LOD and site drawings for many different retail and commercial accounts.

OPUS ONE, Inc. Pittsburgh, Pennsylvania 1982-1988
Engineering/NSM
Used manual layout techniques (Bishop Graphics tape up) for the design and engineering of custom conference room and educational A/V electronics, developed products for the emerging teleconference and data presentations market including some of the first CGA PC interfaces which generated $1.2M in sales during an 11 month span of time. This included supervision of all phases of design, installation and debugging of various types of telecommunication equipment including uplink and downlink satellite systems servicing clients such as Mellon Bank, Westinghouse, Mobay Chemical, Dow Corning. Developed analog circuitry and filters for use in non-destructive (ultrasonic) testing.

http://www.ajawamnet.com

Work History – Independent Contract Positions

Please note this is a partial history…

Scanogen, Inc, Windsor Mills, MD 2023-Present

Develop hardware designs for Single MOLecule Tethering (SMOLT) medical devices. This includes solid modeling for concept and prototyping as well as all PCB's using Altium. Assist with prototype and assembly for sample illumination as well as manage fabrication and assembly of prototype PCB's.

Lilli, Thousand Oaks, CA, 2023-Present

Assist in the development of a consumer hydration device. Schematic capture and PCB layout of electromechanical system utilizing wireless interconnection between nodes. Assist mechanical engineering in producing tight tolerance, PCB-mounted mechanisms for servo control of dispensing subsystem. Even with very open ended requirements, delivered design and manufacturing files for first prototype in less than a month.

Pivot Technologies, Inc, Washington, D.C. 2019-Present

Utilize Altium, Solidworks, and Autocad for the design of schematic and PCB hardware for retail RF camera system based on ESP-32, including all mechanical and electrical components; produce prototypes in-house for deployment that on first run are still in the field. , Utilize various protocols including USB 2/3, 10/100/1000 Ethernet, GSM 4/5, custom WiFi hardware. Provided full thermal testing and documentation for harsh environments

Provide full manufacturing documents as well as interface with software developers. Led integration of software firmware including bring up and full system testing and troubleshooting. Provide troubleshooting services as well as solving production issues. Utilized various CAM tools for CNC of custom/prototype enclosures. General consulting with regard to various aspects of manufacturability and product lifecycle.

Labrador Technologies, Inc. Manassas, VA 2012-Present

Utilize Altium, Solidworks, and Autocad for contract design of schematics and PCB's used in critical hi-powered LED lighting applications (marine, commercial/industrial) including navigation indicators, hi-powered searchlights (>100,000mcd), NYC Subway, and bay lighting. Utilized various CAM tools for in-house CNC machining. Design of mechanical enclosures and mounting hardware. Provide full manufacturing documents as well as interface with software developers. Led integration of software firmware including bring up and full system testing and troubleshooting. Provide troubleshooting services as well as solving production issues. General consulting with regard to various aspects of manufacturability and product lifecycle.

Communication-Applied Technologies, Reston, VA 2000-Present
Utilize Altium, Solidworks, and Autocad for contract design of schematics and PCB's for various communication systems for ICRI and hazardous environments. Designs included uC, uP, mixed analog and digital as well as a fair amount of RF layouts. Have completed well over 300 design spins of various subsystems, providing full electronic manufacturing/fabrication packages as well as a few hand-builds.

Provide full manufacturing documents as well as interface with software developers. Led integration of software firmware including bring up and full system testing and troubleshooting. Provide troubleshooting services as well as solving production issues. Utilized various CAM tools for CNC of custom/prototype enclosures.

Design of mechanical enclosures and fabricate standalone ad rack mount chassis including CNC of front panels and mounting hardware. General consulting with regard to various aspects of manufacturability and product lifecycle.

American Circuits, Inc., Charlotte, NC 2016-Present
Utilize Altium, Cadence/ORCAD for the design and layout for various PCB assemblies for volume contract manufacturing. Assist with resolution of design and fabrication issues for ACI clients with regards to DFM and DFT. Review and redesign of existing ACI client products due to part obsolescence and updates Provide full manufacturing documentation as well as solving production issues.

PreAct Technologies, Inc, Ashburn, VA. 2023
Assist in the design of LIDAR products including PCB design for Mohave wireless and power management. Assist mechanical engineering with placement and packaging for electronics. Completed in approx. 3 months.

Stout Systems, Ann Arbor, MI 2022-2023
Contract engineering using Altium for high speed design of > 4GHz systems. Schematic capture as well as PCB layout.

Global Technologies Group Inc., Alexandria, VA 2000-2019
Utilized Protel/Altium for schematic and PCB design of the Powercrypt line of crypto accelerators in both PCI and PMC formats. Total design and layout of system as well as providing full electronic manufacturing packages used by various CM's in the DC area. Also performed handbuilds of the first of each design. Provided full manufacturing documentation as well as solving production issues. General consulting with regard to various aspects of manufacturability and product lifecycle.

TesTex, Inc, Pittsburgh, PA 2017-2018
Utilized Altium and Solidworks as well as various other EDA and CAD tools for the schematic and PCB design of handheld devices for use in NDT, PCB design and layout, including all SMPS and digital/display subsystems. Designed enclosures for IJ molding. Provided full manufacturing documentation as well as solving production issues. General consulting with regard to various aspects of manufacturability and product lifecycle.

Maryland Aerospace, Crofton, MD, 2009-2015
Used Solidworks and Altium for Mechanical and electrical schematic design and PCB layout of various Cubesat components such as flight hardware, image acquisition boards for positional tracking, power bus control and conditioning, thruster drive circuitry, and reaction wheel control. Utilized Arm A and M core hardware as well as various FPGA and analog topologies. 3D modeling of PCB assemblies for driving layout. Test fixture design for use in various environmental and vacuum chambers.

Redzone Robotics, Pittsburgh, PA - 2008
Designed schematics and PCB using Altium for SOLO project. Designed systems for motor drive, SBC, and hi-powered LED lighting. Assisted with mechanicals. Provided full manufacturing documentation as well as solving production issues. General consulting with regard to various aspects of manufacturability and product lifecycle. https://www.youtube.com/watch?v=V75m79nsBTM

WAI and Associates, Crystal River, FL 2006-2012
Utilized Protel/Altium for the design of some of the first TEN's units as well as biometric devices. Designed telemetry devices for companies like Neptune. WAI is a certified ATMEL developer. Designed hardware for some of the first Cubsats used in academia for various colleges and universities. Utilize various protocols USB 2, 10/100 Ethernet, custom multi and single mode protocols using various line codes, CAN Bus, RS232/422/485, SPI, and RFID. Provided full manufacturing documentation as well as solving production issues.

CADRE Engineering Herndon VA (now Total Embedded, Sterling, VA) 2000-2011
Various projects including embedded PICMG backplanes, StrongARM based design for handheld, wireless inventory control system utilizing RFID tags (designed PCB's for both endpoints). Provided full manufacturing packages as well as interfacing and providing industrial designers the necessary models for use in concurrent enclosure design

Frederick Engineering, Columbia, MD 2000-2009
Schematic design and PCB layout using Protel for telecomm testing equipment. Provided full e-doc for manufacturing and fabrication, including redesigns of existing products.

Fulcrum Technologies, Reston, VA 2004-2005
Used Protel for the schematic and PCB design of power supply and enclosure for agile PLL system used in electronic warfare. Provided full design services as well as electronic documentation for fabrication and manufacturing. Performed prototype enclosure design and fabrication.

SuperTek, Inc., Fairfax, VA 2003-2004
Total design of hardened wireless system for use in first responder and military applications; Protel schematic and PCB designs included power supply with auto selection of shore or 12/24VDC as well as lead acid back-up; designed lead acid charger, full turnkey solution including enclosure design in less than 3 weeks. Provided mfg. files for both fabrication of multiple PCB's and enclosure. Provided 4 handbuilds that performed to spec on first turn of system.

YDI incorporated, Merrifield, VA 2002-2004
Used Protel for the schematic and PCB design of various systems used for 802.x wireless products including system used in NYC to convert phone booths to access points – did that in less than 1 week. Provided a plethora of manufacturing files to so many various vendors that I can't recall the total number of different formats I had to generate.

Lane Poor Music Co., Fall Rivers, MA 1998-2001
Consultant – Embedded Electronics Development
Used Protel for the design and development of various analog and digital devices for sale in the professional audio marketplace. Designed and prototyped a line of very low powered pre-amps, equalizers, and other circuitry for use with magnetic pickups in on-board instrument applications to complement the existing LPMC product line.

Elliott Turbo Machinery, Inc. Jeannette, PA 1998-1999
Cad System Administration Support
Responsibilities included support of Anvil 1000/5000, AutoCAD (R14) and Pro E workstations on various platforms including Windows (NT/95/3.11) and Unix. Assisted in the development of various databases for use in CAD management of over 300 users. Developed in-house methods for manuals and interface to MRP/BOM systems consistent with in-house Lotus Notes server database. Troubleshoot and rectify network/hardware anomalies and user training. Developed various Access and ODBC-compliant databases.

The Birmingham Group Pittsburgh, Pennsylvania 1994-1996
CAD Contractor
3D CAD designs suing AutoCAD for use by Heinz, GE, Weight-Watchers, and others during large-scale stockholder conventions, conferences and special events, 3D visualizations for use in planning such events and generated working 2D drawings for use by the SE teams.

Mulberry Street Recorders 1997:
Contract Engineering
Redesign and layout of large audio production facility. Produced 3D models and renderings for room design acoustical analysis and equipment installation/wiring, generated working drawings for use by contractors.

QSC, Inc. Pittsburgh, Pennsylvania 1989-1996
Consultant/Contract Engineering
Design and layout telecommunication systems for use in the US and Saudi Arabia; remote alarm and telecommunication system design; designed custom computer systems and hardware for use in bid specification of large utility contracts.

WYEP-FM, Pittsburgh, Pennsylvania 1987-1993:
Consulting Engineer
System design, troubleshooting and service of all phases of broadcast technical requirements including operator training on new systems; physical plant layout and documentation. Design of site survey for legal proceedings concerning proposed new transmitter facility using Autocad version 10 for 3D modeling. See http://www.ajawamnet.com/ajawam4/trans.dwg

Other clients in the broadcast/production industry:

WMYG-FM (WRRK-FM) 1987-1988: Design and installation of new 35 kW transmitter plant, operator training and education, rectify all interference complaints with a 100% success rate. all phases of technical operations of studios, STL, and transmitter sites; **WYDD-FM 1987:** assisted Comsult Inc. in the design and installation of new transmission equipment after fire swept through the previous plant, assisted with the troubleshooting and repair of transit damaged equipment; **WJLY-AM 1987-1988**: represented Comsult engineering in all emergency and many non-emergency repairs, operator training on all studio, production, and transmitter equipment; **WDUQ-FM 1987**: repair and troubleshooting of automated tape reproduction equipment, repair to production studio tape machines and audio gear.

ALPHASTAR RECORDING STUDIOS 1987-1988: supervised the construction and installation of the twenty-four track automated studio, debugging of vendor and manufacturer errors in said system; redesign of audio equipment wiring and room using CAD and manual drafting techniques; design, installation and debugging of new A/B roll video editing system (including 3D computer graphics); operator training and education, setup logging systems and other non-technical related matters; repairs of all equipment various non-A/V related technical work in facilities.

BLUE DIAMOND STUDIOS 1987-1988: warranty and non-warranty repairs to existing systems, design and implementation of various processing gear, operation of studios and operator training, technical consultant.

CZ SOUND 1987-1988: engineering services, technical bench work on the development, design and repair of sophisticated audio systems, assisted in the design of systems for the Three Rivers Regatta and the Pittsburgh Symphony at the Point, stage management and live production of various national and local musical acts including Maureen McGovern, Grover Washington Jr., Ramsey Lewis, Wynton Marsalis, Arlo Guthrie.

EVERGREEN RECORDING STUDIOS 1987-1988: troubleshooting and repair of all equipment, rewired entire facility after equipment was hacked apart with saws during a foiled burglary attempt.

AUDIOEXCHANGE STUDIOS 1987-1988: repair massive system flaws and failures due to poor equipment design and construction; operations and operator training.

THE AVRx SYSTEM FOR CONSUMER SERVICE 1987: designed and marketed system for the repair of consumer appliances and electronic products, designed system hardware and software for diagnostics.

THE PITTSBURGH COTTON CLUB/ILLUSIONS NIGHTCLUB/HEAVEN 1990-1996: Consultant three different times in the design and installation of sound and lighting systems, Consultant in the design and installation of specialized equipment for use in three-phase control of a 24,000 watt sound and +300,000 watt lighting system. Redesigned and re-engineered system after original vendor was fired from job; redesigned and rewired entire installation and secured registered engineers for structure. Redesign of system for use for live broadcasts of national acts

db MAGAZINE 1987: published various technical subjects concerning audio production and techniques

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Benchmark 'Dragon Spear' program earns William J. Perry Award

By Capt. Kristen D. Duncan, Air Force Special Operations Command Public Affairs / Published March 02, 2011

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FORT WALTON BEACH, Fla. -- A model U.S. Special Operations Command acquisition and development program was recently honored during the Precision Strike Association annual review at the Emerald Coast Conference Center in Fort Walton Beach, Fla.

The 'Project Dragon Spear Joint Acquisition Task Force' received the 15th annual William J. Perry Award, recognizing public
or private sector leadership or achievement that results in significant contributions to the development of precision strike systems.

Developed by Air Force Special Operations Command, 'Dragon Spear' is the roll-on, roll-off Precision Strike Package used on MC-130W aircraft in AFSOC's inventory. This capability allows aircrew to provide precision strike weaponry on the battlefield, as well as dual high-definition Intelligence, Reconnaissance and Surveillance targeting sensors, multiple video uplinks, downlinks and communications advancements.

Increasing mission capability and protecting Special Operations Forces and Coalition ground forces, this provides a multi-person mission operations console with the means to launch stand-off precision guided munitions.

"In a great team effort, you did great things - saving lives, literally every day, and getting bad guys, literally every day," said James Geurts, USSOCOM deputy director for acquisition, to the program team members during the presentation. "Continue to expand your thinking."

According to the award citation, the Dragon Spear program delivered the capability ahead of schedule, under cost and with greater capability than first theorized. The team's innovative and unconventional approach enabled the fielding of next generation precision strike capabilities in months and at 20 percent unit cost. Eight MC-130W aircraft were delivered just 15 months after production funding was approved and several more will be fielded by the summer - completing the line-up.

Admiral Eric T. Olson, USSOCOM commander, used the example of Dragon Spear as a benchmark on how other programs within AFSOC and USSOCOM should work, said David Torraca, AFSOC Plans and Requirements, AC-130 and MC-130W 'Combat Spear' strike requirements.

"Lt. Gen. (Donny) Wurster (AFSOC commander) and the (Plans and Requirements) leadership have also been on board and supported the program fully, which helped with the speed of the program," said Mr. Torraca. "Concept to deployment happened in 15 months, which is a testament to AFSOC's agility and fiscal responsibility."

Project Dragon Spear Joint Acquisition Task Force's technical excellence and response to USSOCOM needs makes this team an exceptionally worthy recipient of this award, said Erik Ballinger, the PSA annual review event chair who works for ATK, an aerospace and defense supplier company.

Deployed since November 2010, the MC-130W is operated by the 73rd Special Operations Squadron, assigned to Cannon Air Force Base, N.M. They have provided the Dragon Spear combat capability to units supporting Operations ENDURING FREEDOM and NEW DAWN daily with highly effective ISR and armed over watch capability.

The Dragon Spear team helped USSOCOM and the Department of Defense meet other requirements, such as the U.S. Marine Corps' Harvest Hawk program. The roll-on, roll-off standoff precision guided munition kit provided the Marine's with a similar over watch and precision strike capability.

USSOCOM first stood up the program's acquisition task force to meet its urgent need for precision strike on the battlefield.

"Future acquisition needs will and should follow this model, and the AC-130H recapitalization with AC-130J's will follow it," Mr. Torraca said. "AC-recap is going to use the same (Joint Acquisition Task Force) construct, and the Capabilities Development Document is being written using the Dragon Spear example."

In addition to the AFSOC Plans and Requirements office, members of AFSOC Operations, Logistics and the 18th Flight Test Squadron were also involved with the fielding of Dragon Spear.

The award is named in honor of former Secretary of Defense Dr. Perry (1994 to 1997). Previous recipients include a former vice president and two of the U.S. Air Force's weapons programs from neighboring Air Armament Center at Eglin Air Force