

Journal

Defense Standardization Program

November 2002/February 2003

Commercial-Military Integration

Sustainment

Interoperability

Readiness

Performance

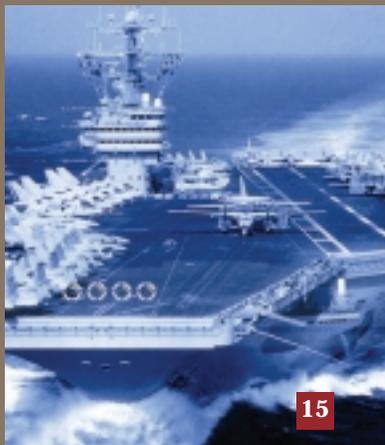
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Someone once described standardization as a “pillow for the non-creative,” implying that programs that rely on standards are asleep when it comes to creativity and innovation, and would prefer to rest on proven technologies rather than risk applying new technologies. In today's environment, such perceptions do not bode well for standardization.

That is unfortunate, because history has shown repeatedly that standardization fosters efficiency, creativity, and innovation. I don't have to go back in history to prove this point. In fact, in a recent *CBS MarketWatch* article, Dell Computer CEO Michael Dell cites standardization as one of the major contributors to his company's financial success. And in the defense business, articles in this issue of the *DSP Journal* clearly illustrate the role that standardization plays in fostering the best that industry can create.

More than 35 partners from government and industry have invested \$3 million to standardize anthropometric measurements. Since humans have been around for quite a while, one might suppose that we would have a pretty good set of standard measurements by now. But anyone who has sat in an uncomfortable car seat for a long trip, bought clothes, or tried to operate a poorly designed piece of machinery knows this is not true. Our warfighters face the same problem every day. Having leading-edge equipment isn't of much value if the operator is so uncomfort-

STANDARDIZATION— THE STUFF THAT DREAMS ARE MADE OF

able that he or she has difficulty using it. It takes time and money to design a new piece of equipment to be human-friendly. But there is a much greater price to pay if human measurements are not considered: safety could be compromised, performance might be reduced, and the equipment may end up having to be redesigned. Because of recent anthropometric standardization efforts, weapon system designers will be able to spend more time focusing on innovative capabilities and less on whether a human can operate and fit comfortably in the equipment.



Gregory E. Saunders
Director, Defense Standardization Program Office

Innovative communication radios are being developed every day; there are more out there than anyone can imagine. Yet an unintended consequence of such boundless innovation is that the operators of the radios cannot communicate with each other. Also, the military services are locked into using costly vendor-specific components. The Joint Tactical Radio System Program Office is leading the way in developing a standardized software communications architecture that will allow warfighters of the future to have unparalleled flexibility in affordable, interoperable communications without inhibiting technological innovation.

The semiconductor industry, as well, is in the midst of fast-paced, massive technological changes. There are problems to be sure, but the problems are manageable—thanks to the cooperative government-industry partnerships that exist through standards committees of the Electronic Industries Alliance, the Government Electronics and Information Technology Association, and other such organizations.

Most people think that standards are about defining requirements and determining

whether the requirements are met. That's part of it, but the most valuable element is the communication among people. There is an unfortunate tendency for organizations to become stovepiped. Ironically, while tools such as the Internet have improved communication capability—that is, facilitated the exchange of information between organizations—communication itself has sometimes suffered. By communication, I mean truly understanding each other's problems and working toward a common solution that has enterprise-wide, national, or even international applications. Standards development committees are among the most efficient and effective ways to foster such meaningful communication. And the standards that come from such efforts allow designers to focus on problems that demand unique solutions, rather than reinventing wheels, tires, and axles.

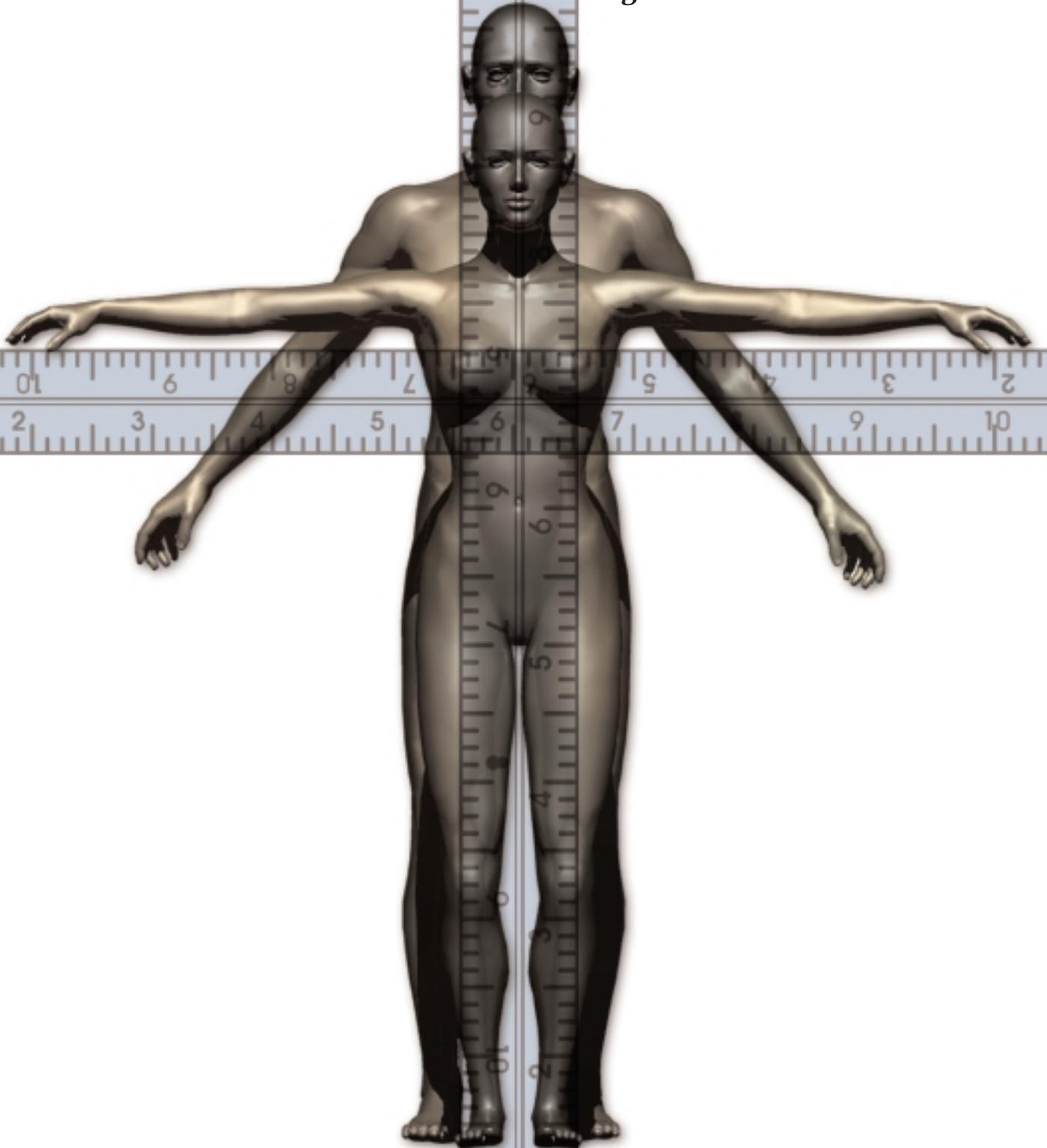
So, does standardization put innovation and creativity to sleep, or does it free designers to dream up new technologies and approaches? You be the judge as you read through the *DSP Journal*—but for me, standardization is the stuff that dreams are made of.



Body Doubles

STANDARDIZING MEASUREMENT OF HUMAN CONTOURS TO IMPROVE FIT

by Lisa Connelly
Defense Standardization Program Office





CAESAR Project at a Glance

Scope

Generate 3-D surface data to revise current anthropometric databases of U.S. and European civilian males and females ages 18 to 65 and of various weights

Objectives

Update and augment current body measurement database by collecting new body measurements of approximately 2,500 U.S. and 2,500 European civilians

Collect, analyze, and report new database in a format useful to scientists and engineers around the world

Benefits

Reduces guesswork about body surface measurements, enabling computer-aided design and rapid prototyping

Alleviates dependency of the measurements on subject's positioning when measured, allowing extraction of almost infinite number and variety of measurements long after scan is made

Is first viable method for capturing 3-D data of subjects in realistic postures

Because it is a noncontact system, reduces measuring differences between measurers, making data sets collected by different groups more comparable

Deliverables

Seventy-three 3-D body landmarks for each subject in two poses

Data extraction software tool, INTEGRATE

Demographic data for each subject (age, data collection location, date, education level, ethnic group, family income in the past year, gender, present occupation)

Documentation and summary statistics for the United States

Three electronic 3-D scans of each subject

Ninety-nine traditional measurements for each subject

an·thro·pom·e·try

(ān'thrə-pom'ī-tré) The study of human body measurements for use in anthropological classification and comparison.

Can you imagine someday finding a suit or dress that fits perfectly? ...a car that's so comfortable you'd love driving for hours? ...a workstation that was designed so that you wouldn't get carpal tunnel syndrome or a backache? Research being completed now may soon make that vision a reality.

Award-winning research engineers from the Air Force's Computerized Anthropometric Research and Design (CARD) Laboratory at Wright-Patterson Air Force Base, in Dayton, OH, are using new, computerized technology to obtain three-dimensional (3-D) laser scans showing the contours of the human body. Their research, which focuses on the civilian population, is being done under the Civilian American and European Surface Anthropometric Resource (CAESAR) project. A database of the different sizes and shapes of people in the population will be invaluable for defining standardized human body measurements,

Dates	Milestones
December 1997	Hold start-up meeting
January 1998	Pilot-test procedures
March 1998	Set up first remote scan
April 1998	Begin data collection in the United States
December 1998	Deliver preliminary data from first site
Summer 1999	Begin data collection in the Netherlands
September 2000	Complete data collection in the United States
September 2000	Complete data collection in the Netherlands
February 2001	Begin data collection in Italy
May 2001	Deliver U.S. data
November 2001	Complete data collection in Italy
July 2002	Deliver Dutch and Italian data

which can in turn be used to improve the design of a wide variety of products. (Anthropometric data on civilians are preferred to data on military people; the latter are mostly young and must pass rigorous physical fitness tests, so they are not representative of the population at large.)

The CAESAR project is the first major study devoted to the civilian population, male and female, in decades. The last comprehensive body measurement survey of civilians was completed in 1941. Sponsored by the U.S. Department of Agriculture, that survey collected anthropometric data on women for use by clothing manufacturers. Clearly, many products such as clothing, car interiors, and furniture are designed using data that are far too old.

A project of this magnitude (with an estimated total cost of \$3 million) can be accomplished only as a joint international effort. The CAESAR project has more than 35 partners from government, industry, and academia. Among them are Boeing, Caterpillar, Ford, General Motors, Lear, Levi Strauss, National Research Council Canada, The Netherlands Organization for Applied Scientific Research, and the Society of Automotive Engineers. The partners, together with the Air Force, contributed funding and other resources.

The idea for the scanner arose in a military project aimed at finding a way to produce faster, cheaper, and better-fitting protective equipment for warfighters. The federal government decided it wanted detailed measurements of people so technicians can design better hardware—from airplanes to night vision goggles.

“Traditionally, we used to measure people with very basic tools, like tape measures and calipers,” says Kathleen M. Robinette, an anthropologist and the director of the CARD Laboratory. “But they don’t provide complete or accurate information and take too much time to use.” So Air Force scientists decided to automate the body-measuring process, eventually moving to full-body 3-D scans.



Some CAESAR Partners

BAE Systems
Bertrand Faure
The Boeing Company
Case Corporation
Caterpillar, Inc.
DaimlerChrysler
Dayton Hudson
Deere and Company
Ford Motor Company
Gap, Inc.
General Motors
Georgia Institute of Technology
Herman Miller
International Truck and Engine Corporation
Jantzen, Inc.
Johnson Controls, Inc.
Laboratory of Accidentology, Biomechanics and Human Behavior
Lear Corporation
Lee Company
Levi Strauss and Company
Lockheed Martin Aeronautical
Magna Interior Systems Engineering
Mazda North American Operations
Mitsubishi Motors Corporation
National Institute for Occupational Safety and Health
National Research Council Canada
The Netherlands Organization for Applied Scientific Research
Nissan Motor Co., Ltd.
Public Technologies Multimedia, Inc.
Sara Lee Knit Products
Sears Manufacturing Company
Society of Automotive Engineers
Transport Canada
Vanity Fair, Inc.
Visteon
Your Fit.com



Data collected
in the CAESAR
project will
shorten design
cycles...

The whole-body scanner—developed for the CARD Laboratory by Cyberware, Inc., of Monterey, CA—captures the shape of the entire human body in 17 seconds with a single scan. The scanner projects a stripe of eye-safe laser light onto the subject, who stands or sits on a platform. Cameras view the laser light to create a precise 3-D digitized image.

“The 3-D scan has so many advantages over the one-dimensional studies that used to be done,” Robinette says. “We get a whole person now—not just a chest circumference and a sleeve length. Instead of constructing 3-D models from measurements, we’ll be able to describe the whole body for the first time.”

Over the 4 years of the survey, which ended in July 2002, the CAESAR project obtained precise body dimensions of 4,431 male and female civilians, 18 to 65 years old, from the United States, the Netherlands, and Italy. The result of that survey is a database of more than 13,000 3-D digitized human models (three scans for each participant). CAESAR also contains 99 traditional body measurements for each participant.

“These data are good for designing anything a body has to fit into,” Robinette says. “You can rotate the image, look at it from different angles, even change aspects of the figure. The more we know about human shapes and sizes, the better we can do in designing safety features for vehicles and equipment to reduce deaths and injuries.”

Designers will be able to use the models in the CAESAR database to compare human physical dimensions and to accurately characterize the variability of people for the cost-effective design of just about anything people wear or operate. They will no longer have to spend time making 3-D models from one-dimensional data, nor rely on measurements that can’t describe the curves, protrusions, and indentations of the body. The data collected in the CAESAR project will shorten design cycles and lower development costs. In fact, one manufacturer said the ability to design around a 3-D human scan will reduce development time by 60 percent.

The data generated in the CAESAR project are already being used in the ground vehicle industry to improve driver positioning

Payoffs for the Warfighter

- Reduced cycle time for acquisitions
- Increased flight safety and operational effectiveness
- Fewer size-related mishaps
- Reduced cost of equipment sizes purchased and stocked
- Improved equipment/system integration resulting in improved warfighter effectiveness
- Increased affordability while expanding accommodation
- Increased system interoperability for planned joint service applications



Pilots occupy aircraft cockpits for long periods of time. Anthropometric research seeks to gain measurements that will ultimately lead to greater comfort and flexibility in the cockpit.

and safety, as well as to optimize interior layouts. The aerospace industry will benefit, because manufacturers will be able to improve provisions for pilots, crew members, and maintenance workers. The clothing industry will use the CAESAR database to improve apparel size and fit.

The Army and Air Force also are benefiting from the project. They are applying the new technology to make a smaller number of uniforms, boots, and flight suits fit a wider range of body types, and to design better aircraft cockpits, parachute harnesses, and other safety equipment. Others are applying the data to design orthotics, custom-fitted shoes and clothing, safety equipment, and innumerable other items.

Medical applications are also numerous. Physicians at the Department of Veterans Affairs are looking at ways to use the 3-D

scanner to make replicas of body parts for prosthetics. For example, the computer can scan an existing body part, then invert the model to make a mirror image for a missing limb.

Other uses for the data are still being explored. “We’re really only scratching the surface of what can be done with this type of 3-D scanning technology,” Robinette explains. “In about 20 years, pilots can come in and get scanned, and in a few hours have a whole customized ensemble fine-tuned for them.”

The CAESAR project may even improve lives around the globe. As an outgrowth of CAESAR, Robinette and her colleagues have started a working group to create a web-based worldwide information system for sharing anthropometric data. The system, called the Worldwide Engineering An-

CAESAR:

[http://www.hec.afrl.af.mil/
cardlab/caesar/](http://www.hec.afrl.af.mil/cardlab/caesar/)

CARD Laboratory:

[http://www.hec.afrl.af.mil/
cardlab/](http://www.hec.afrl.af.mil/cardlab/)



Anthropometric data are collected...by all types of organizations.

thropometry Resource (WEAR), will provide even more data about human bodies and fit.

Anthropometric data are collected and used by all types of organizations for many types of applications. Among those organizations are military departments, universities, hospitals, health statistics departments, apparel companies, furniture manufacturers, automobile manufacturers, safety equipment companies, and aerospace companies. Collecting the data is expensive. However, organizations could reduce their costs if they could exchange anthropometric data rather than collecting new data for new products or new markets. WEAR's aim is to facilitate that exchange.

Standardization is a key issue that the WEAR working group faces. Specifically, for organizations to share anthropometric information effectively, they must standard-

ize their measurement methods. Otherwise, the data they record for the same measurement could vary significantly. For example, a measurement of sitting height taken when a person sits in a relaxed posture can be quite different—by 10 cm (6 inches) or more—from the same measurement taken when the person is sitting erectly. The existence of 3-D scans that capture the whole person may make it possible to adjust for some differences in measuring methods, making a global information system more feasible. Still, using a standard posture when taking measurements would greatly ease the task of searching through, combining, and analyzing data on potentially hundreds of thousands of people.

The WEAR working group must also address many other daunting challenges before a central resource for anthropometric data can become a reality. Among them are the existence of multiple data modalities, the

The WEAR Advantage

WEAR will contrast strongly with what existed previously. It will

- be web-based;
- be comprehensive;
- be international;
- include 3-D shape, fit, and performance data;
- be easier to access information for a large number and variety of users;
- have mechanisms to stay current;
- provide the correct solution obtainable for the problem at hand;
- provide information quickly;
- enable 3-D visualization; and
- have a built-in expert system.

Through WEAR, anthropometry knowledge will become more accessible, more accurate, more efficient, broader in scope, and more usable. WEAR is expected to include not only the latest 3-D surface anthropometric data from all over the world, but also traditional anthropometric data, fit and accommodation information, analytic and software tools, and guidance or intelligent agents for using the information effectively.

need for a massive database, the lack of 3-D object searching technology, differences in measurement terminology, the need for easy accessibility, and ownership issues.

The technology needed to create a central data resource is spread all over the world and across many disciplines. For example, while anthropometry is the domain of anthropologists and mathematicians, most expertise in large image databases resides in the medical community, particularly in radiology. Three-dimensional digitization expertise is found in the physics community. Software engineers and other information technology experts will be needed for building the structure and the interfaces. Furthermore, since the information system needs to be a worldwide resource, participants throughout the world must collaborate from the very start of the process so that new tools developed will work effectively for everyone.

Considering all these issues, Robinette created the WEAR working group to bring together experts from different fields and from around the world to develop a general system concept. The group will identify and develop data models, software tools, and theoretical constructs and principles for the system, and address worldwide sharing issues.

The working group expects to include not only the latest 3-D surface anthropometric data from all over the world, but also traditional anthropometric data, fit and accommodation information, analytic and software tools, and guidance or intelligent agents for using the information effectively. The WEAR working group also hopes to enable registered users to update WEAR continu-

The WEAR Working Group



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ally with new anthropometric data, spreading maintenance costs among numerous organizations and improving the timeliness of the data.

Robinette and her working group are very excited about WEAR. If methods can be developed to exploit its potential, new 3-D surface anthropometry data will prove to be a tremendously valuable global resource.

The Same, But Different

Software Standard Enables Reconfigurable Radios to Have It Both Ways

by Gerry Doempke
ANSER (Analytic Services, Inc.)

It's a daunting puzzle: how can the military services develop radios that meet their unique needs but that also communicate with each other?

Historically, each advance in radio technology spawned a new waveform with a corresponding radio system able to transmit and receive it. This was the norm with hardware-driven technology, and it was acceptable because the number of radio types was small and manageable.

As technological advances accelerated, however, so did the number of types of radios in use. At the same time, by evolving to take advantage of microprocessors, today's radios have actually become small computers, and the software that enables

them to function has become an essential part of the technology.

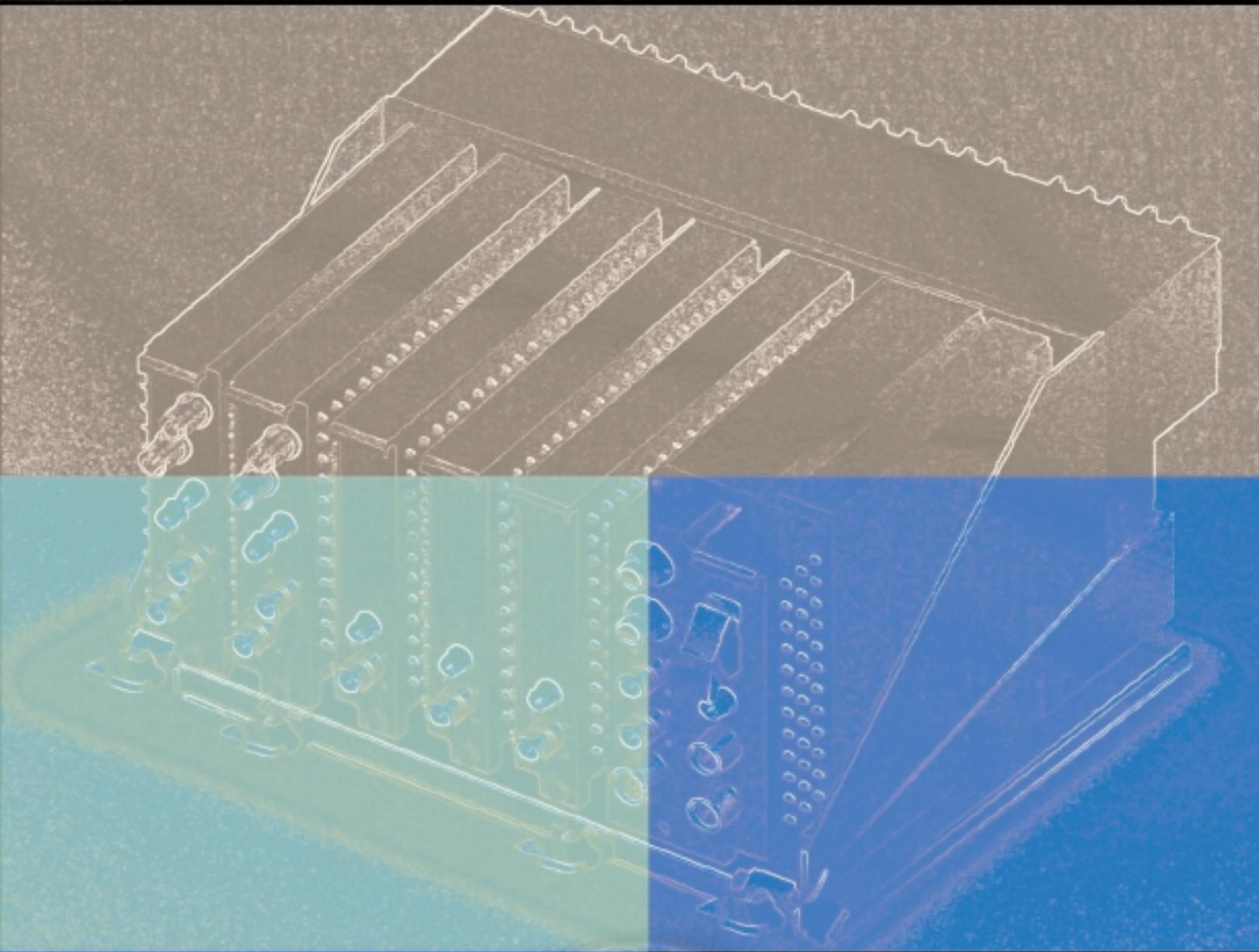
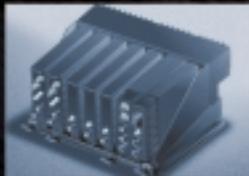
Now, various elements of joint task forces use different combinations of radios, and ships and command posts achieve joint communications by using banks of different radios. Despite these arrays of sophisticated electronic gear, however, stories abound of warfighters using cell phones and family radio systems to bridge communications gaps caused by dissimilar systems. Some multi-band and multifunction radios were developed, but these were just stop-gap attempts. Current DoD radios employ proprietary architectures, with little commonality among the various manufacturers. These result in redundant efforts to develop software, a reliance on vendor-specific hard-

ware components, reduced competition among vendors, and little use of commercial components or technologies, leading to high unit costs and little interoperability.

Joint Vision 2020 requires interoperable communications and data capability for all military services. To accomplish this, the Army, Navy, Air Force, and Marine Corps must operate within a common architecture using standards established by the joint community. Clearly, what is needed is a radio that can operate in multiple modes, and thus operate with all legacy systems.

Software-Defined Radios

The answer is found in developments in "software-defined" radios, or SDRs. Such devices could operate in



all the service- or platform-specific modes, but could also be programmed to operate in new, standardized modes across all DoD systems. In time, as legacy radios are replaced, defense communications could be fully programmable to operate in standardized modes as needed by the warfighter, with flexibility not found in hard-wired technology.

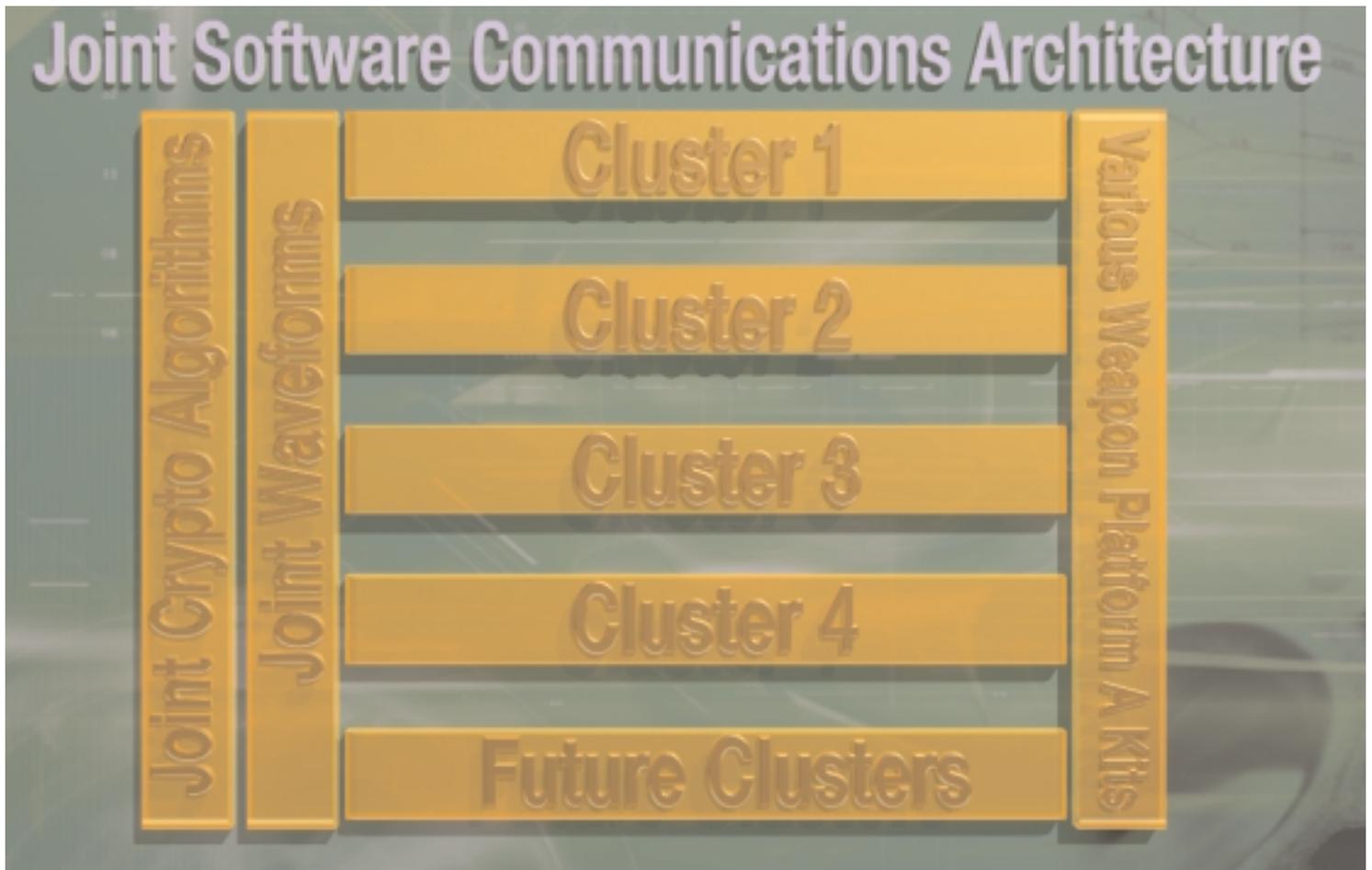
Although they could provide the answer, simply introducing numerous unique software-defined radios would carry forward many of the support

problems of the legacy systems they replace. The solution is a model Software Communications Architecture (SCA) for software-defined radio middleware to allow interoperability between hardware and common application-layer software.

The Joint Tactical Radio System (JTRS) concept involves software-defined radios designed to comply with the SCA, running compliant waveform application software. The result will be a single family of waveform application software to main-

tain. Today's diverse radios will be replaced by a small family of SDRs. Each type of SDR, called a "cluster" (because it is intended to meet a cluster of joint requirements), is defined by size, power, and operating environments, and is led by an appropriate lead service.

The JTRS Joint Program Office (JPO) bears responsibility for establishing and maintaining the SCA and standard waveform applications. To optimize the effectiveness and industry acceptance of the SCA, the office developed the SCA through a two-



step process over 3 years. First the JPO solicited initial architecture definitions from three industry consortia and selected desired features from three architecture definitions. Then it developed and validated the SCA. To do so, it led an industry consortium to develop the specification and build four prototypes. It then guided seven efforts to address particular concerns and verify that independent developers could build compliant products.

Throughout the process, the JPO team sought to maximize industry input from a range of sources, to ensure that industry would use the SCA, while establishing a single standard that would meet government goals. The JPO has worked closely with the SDR Forum (SDRF), an association of more than 130 commercial and military entities, to ensure that the SCA meets their needs. The SDRF Working Group incorporated commercial industry concerns, endorsed the SCA, and forwarded it for endorsement to the Object Management Group, an international commercial standards body of more than 300 member companies.

In addition, the JPO conducted open workshops to promote the SCA, educate developers on technical aspects, inform academia, and solicit comments. Furthermore, the office

developed an open-source implementation of the core framework—the primary middleware component of the SCA—to help vendors use it. The JPO is now preparing a set of industry test tools to assess SCA compliance.

Initial Cluster Variations

With the establishment of the SCA, the joint services proposed the initial JTRS clusters:

- Cluster 1—Ground, Vehicular, and Rotary Wing, led by the Army
- Cluster 2—Handheld, led by the Special Operations Command
- Cluster 3—Maritime and Fixed Site, led by the Navy
- Cluster 4—Airborne Fixed Wing, led by the Air Force.

Participants envision additional clusters for dismounted/backpack devices, airborne command and control, and space-based systems.

To gain the benefits of JTRS, 108 unique legacy waveforms were consolidated into 32 legacy JTRS waveforms. In addition, a new Wideband Networking Waveform will meet future data-handling transmissions. Some of the waveforms will be developed in consonance with the Army-led Cluster 1; JPO-contracted

The JPO team sought to maximize industry input from a range of sources.

efforts will develop the remaining ones.

Key to the JTRS program is the hardware and software certification program. A technical labo-

ratory was established with the Navy Space and Warfare Support Center as the lead laboratory, coordinating the efforts of 12 activities from the military services. The JTRS waveform team submitted statements of objectives, which were expanded into statements of work for the requests for proposals. The Cluster 1 contract was awarded to a team led by The Boeing Company.

The JPO-led waveform acquisition is still in evaluation at the time of this writing. In order to use multiple waveforms securely, a software-defined radio requires software-defined cryptologic hardware and software algorithms. The JPO is responsible for the acquisition and maintenance of these cryptologic components.

How JTRS Will Pay Off

Developing a standardized software architecture for tactical communica-



tions will mean significant cost savings for DoD, for several reasons:

- Sharing waveform software applications among all radio implementations reduces the redundant major costs in SDR acquisition and modification.
- JTRS allows radio frequency-related efforts to move toward standardization independently of their radio components.
- Using common hardware and software components reduces both the logistics tail and life-cycle costs.

- DoD can leverage commercial hardware and software technologies.
- JTRS clusters will help achieve the interoperability goals of Joint Vision 2020.
- The SCA is gaining international and commercial support.
- Coalition partners can take advantage of this enabling technology.

With the establishment of JTRS, battlespace communications and warfighter operations are being transformed into Joint Vision 2020.

Communications will have flexibility, never before known, to change with the evolving patterns of operations. Warfighters will have myriad communications options. Support systems will be significantly simplified with fewer types of radios, all of which use the same waveform application software. Similarly, sharing standard cryptographic components will reduce security support requirements.

Working with Industry to Standardize Semiconductors and Microelectronics

The Defense Supply Center, Columbus, and the Electronic Industries Alliance forge a partnership—and win converts to standardization.

by **Raymond Monnin**, Microelectronics Team,
and **Thomas Hess**, Active Devices Team,
Defense Supply Center, Columbus, OH

Electronics standardization is a proven method for acquisition and sustainment programs to reduce initial and life-cycle costs of DoD systems. To support military customers on critical weapon systems, such standardization requires a partnership among the defense agencies and their industry counterparts. There is no better example of such a cooperative and productive relationship than the one between the Electronic Industries Alliance (EIA) committees on microcircuits and semiconductors and the Defense Supply Center, Columbus (DSCC).

Partners

The industry and government organizations involved in electronics standardization possess a broad range of expertise and thorough familiarity with the economic and technical issues.

The EIA is a national trade organization representing the full spectrum of U.S. manufacturers in the electronics industry. It is a partnership of electronic and technical associations and companies that promote the market development and competitiveness of U.S. high technology.

The JEDEC Solid State Technology Association, formerly known as the Joint Electron Device Engineering Council, is the EIA's standardization body for semiconductor engineering. It is the leading developer of standards for the semiconductor and solid-state industry. More than 1,800 representatives, appointed by over 250 JEDEC member companies, participate in 50 JEDEC committees to meet the needs of every segment of the industry—man-



ufacturers and users alike. The publications and standards that JEDEC generates are accepted throughout the world. JEDEC is a founding sector of EIA.

JEDEC handles issues concerning semiconductors and microcircuits from the standpoint of the producers of those devices. The JC-13 Government Liaison Committee consists of four subcommittees dealing with microcircuits (JC-13.2), discrete devices (JC-13.1), radiation hardness (JC-13.4), and hybrid microcircuits (JC-13.5), as well as numerous task groups for specific issues.

The Government Electronics and Information Technology Association (GEIA) represents the high-technology industry doing business with the federal government. Association members are technology and manufacturing companies in information technology and defense and aerospace electronics. The association provides information to industry on trends and opportunities, as well as premier forecasts of budgets for use by government and industry alike. It facilitates doing business with the federal government through its forecast and standards activity and its numerous

councils and committees. GEIA also serves as the federal market sector of the EIA.

GEIA is the home of the Solid State Devices G-12 Committee, which handles issues of concern from the viewpoint of equipment contractors that use semiconductors and microcircuit devices for military and other ruggedized system production. The committee focuses on achieving and maintaining system performance requirements, including reliability, quality, maintainability, and logistics support. It also maintains a subcommittee focused on space-level parts and numerous task groups on issues such as plastic encapsulated microcircuits and diminishing manufacturing sources and material shortages.

DSCC's Document Standardization Unit is the preparing activity for standardizing these critical technologies for use in high-reliability and ruggedized defense applications. Its activities have included the following DoD documents and programs:

- MIL-PRF-19500, High Reliability Military Specification Program on Semiconductors
- MIL-PRF-38535, High Reliability Military

Specification Program for Monolithic Microcircuits

- MIL-PRF-38534, High Reliability Military Specification Program for Hybrid Microcircuits
- MIL-STD-750, Testing Requirements for Semiconductor Devices
- MIL-STD-883, Testing Requirements for Microcircuit Devices
- Standard Microcircuit Drawing Program for Microcircuit Devices.

DSCC and the other affected defense agencies (participants in the aforementioned programs), along with the JC-13 and G-12 committees, work with the manufacturing and using organizations in industry on all significant issues relating to standardization and reliability of military-critical semiconductors and microcircuits.

Typically, the joint meetings occur three times a year (January, May, and September) and involve a full week's worth of committee and task group meetings. Most task groups consist of participants from each affected organization, with considerable work occurring between meetings via e-mail, teleconferences, and web services.

These meetings are invaluable to the government as forums for discussing the rapidly changing technology of these devices, reliability issues and new test procedures, proposed changes to the DoD standardization programs, and updates to standardization documents.

Successes

Over the last 5 years, this joint effort has resulted in a significant number of changes and advances in the DoD semiconductor and microcircuit programs:

- The transition from a qualified parts list to a qualified manufacturers list. The conversion of MIL-M-38510 to MIL-PRF-38535 and conversion of MIL-S-19500 to MIL-PRF-19500—in other words, conversion of “how-to” documents to performance specifications—are examples of how we allow device manufacturers to qualify processes rather than individual piece parts.
- Enhanced radiation testing for space environments. The effects of enhanced low dose rate environments in space necessitated a new low dose rate test condition for space applications. This new testing will ensure that radiation-hardened parts used in space applications will continue to perform as required.
- Allowance for modification of tests, based on manufacturer's data (best commercial practices). Manufacturers are permitted to optimize tests based on data collected to support test modification or elimination. Test optimization reduces the overall cost of the electronic devices and the weapons system in which they are used.
- Addition of new test methods to MIL-STD-750 to enhance semiconductor reliability. New test methods address reliability issues related to thermal stresses and glass strain. These tests screen devices for potential failures that may affect weapons system performance.
- Addition of three classes to hybrid specification MIL-PRF-38534. The new classes allow for more diverse levels of product reliability, reduced testing, and the use of the manufacturer's commercial test flow.
- Addition of Class N for plastic encapsulated devices to MIL-PRF-38535.

- Addition of new space levels to MIL-PRF-38535 and MIL-PRF-19500 (Class T and JANJ, respectively).
- Addition of plastic semiconductors to MIL-PRF-19500.

Live Issues

In addition to these significant accomplishments, DSCC, JC-13, and G-12 continue to address topics of current concern for the program. The following are some of the issues on the table:

- Using lead-free materials in microcircuits and semiconductors, and the impact on reliability
- Using commercial products and how best to document and standardize them
- Adopting non-government standards to stay current with best practices
- Enhancing web-based systems, by adding features such as new search and reporting capabilities

- Referencing JEDEC-developed standards when appropriate for military usage (for example, JEP-142 on material for hybrid and multichip modules)
- Creating new thermal response and thermal impedance test methods for semiconductors
- Improving test methods, such as scanning acoustical microscopy and corona breakdown for all active devices
- Evaluating how to cover plastic hybrid microcircuit requirements under MIL-PRF-38534.

Impact of Partnership

The results of these joint efforts can be seen in the currency of the defense specifications programs on semiconductors and microcircuits. These programs have a broad impact throughout DoD and industry, and affect virtually every military system in the field and in production.



These defense specifications and standards programs have fostered a cadre of standard parts used in multiple military systems covering a wide scope of applications. Standard microcircuits and semiconductors from these programs support critical aerospace applications for the Navy and Air Force, including aircraft such as the F-14, F-15, F-16, F-18, F-22, C-5, C-17A, C-141, B-1B, B-2, B-52, and AWACS. These same parts are also used extensively in maritime applications for the Navy, including such applications as Los Angeles class submarines and Nimitz class carriers, as well as land-based Army applications such as the 155mm howitzer, M-1 Abrams tank, and Bradley fighting vehicle. Special classes of these parts (Class V in MIL-PRF-38535, JANS in MIL-PRF-19500, Class K in MIL-PRF-38534) also support space and missile applications for the National Aeronautics and Space Administration and the Air Force.

The forum is also used periodically to support the Defense Standardization Program Office by combining meetings of the committees and the Defense Microcircuit Planning Group (DMPG). For example, on September 12, 2002, a DMPG meeting was held in conjunction with the September JC-13 and G-12 meetings. The DMPG meetings discuss standardization and reliability of microcircuits.

The partnership of DSCC, JC-13, and G-12 is a model applicable throughout DoD for involving industry partners and defense agencies in a collaborative effort to standardize key technologies. The results of this partnership are indeed impressive. It has brought about world-class defense specifications and standards in the fast-evolving technologies of semiconductors and microelec-

tronics. The outcome has been standard parts of the highest quality and reliability, for use by our warfighters in the most demanding military applications.

More information on GEIA may be found at www.geia.org, or contact Chris Denham, Vice President for Standards and Technology, via e-mail at cdenham@geia.org or by telephone at (703) 907-7567.

For information about JEDEC and to access its standards online, visit its website at www.jedec.org, or contact Ken McGhee of the JEDEC staff via e-mail at kenm@eia.org or by telephone at (703) 907-7558.

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Mr. Monnin has bachelor's degrees in education and electrical engineering from the University of Dayton and a master's in curriculum and supervision from Wright State University in Dayton, OH. He began his federal service with the Defense Electronics Supply Center in 1986 and moved to DSCC in 1996. He has 16 years of experience with standardization issues in microelectronics. He is currently a supervisory electronics engineer and chief of the Microelectronics Team in the Document Standardization Unit at DSCC.✱



Thomas Hess Sr.

Mr. Hess has a bachelor's degree in electrical systems engineering from Wright State University in Dayton, OH. He began his federal service in 1985 with the Defense Electronics Supply Center and moved to DSCC in 1996. He has 12 years of experience with standardization issues in microelectronics and semiconductors. He is now a supervisory electronics engineer and chief of the active devices team in the Document Standardization Unit at DSCC.✱



CHOOSING COMMERCIAL PASSIVE PARTS FOR MILITARY SYSTEMS

by Michael Rader, Strategic Systems Department,
Naval Surface Warfare Center, Crane Division, Crane, IN

Components known as “passive parts” are necessary constituents of all military electronic circuits. They include capacitors, resistors, and magnetic components (transformers and inductors). Passive parts also include electromechanical relays, quartz crystals, and fuses.

This article explores some broad comparisons between commercial and MilSpec passive parts, considers recent technological changes bearing on their respective advantages, and supplies some guidelines on using com-

mercial parts. These components span a wide range of technologies, materials, and manufacturing processes, so formulating rules that apply across the board is a challenge. However, one can offer some general, practical guidance to assist in the selection of the appropriate passive part for a given application.

CHARACTERISTICS

The term “commercial passive parts” here means any parts that are non-MilSpec. Since commercial applications are so varied, the type and

quality of commercial parts also vary. Product grades typically include consumer, industrial, automotive, and medical.

Commercial passive parts are a good fit for many military applications. They can offer significant advantages in size, cost, and availability, and many are available in extended ranges of value and rating—characteristics that are attractive to circuit designers. The choice is not always so obvious, however, as is evident after examining some of the significant differences



between commercial and MilSpec product lines.

Physical Size

“Surface-mount” technology has brought about a significant emphasis on miniaturization. Surface-mount components mount directly to the copper conductors of the circuit board, thus eliminating the need for wire leads used for interconnection. Capacitor and resistor chips as small as 20 mils by 10 mils (the size of a pencil point) appear commonly in commercial applications. While surface-mount military parts exist, smaller chip sizes (desired for miniaturization) are available only as commercial parts. Currently, the smallest available MilSpec chip is 80 mils by 50 mils.

Testing

In general, commercial products undergo much less testing. This difference can be particularly prohibitive in the area of screening tests such as burn-in, which are rarely done on commercial-grade passive parts. High-end product lines (such as those used for medical applications), however, have generated some rigorous test and screening methods.

Quality

The level of quality and reliability can vary considerably among product grades. In general, suppliers do not recommend consumer-grade components for military applications requiring high reliability. On the other end

Characteristic	Component type	
	Commercial	Full MilSpec
Physical size	Shrinking greatly	Larger than commercial
Testing	Usually no burn-in; limited electrical testing	Burn-in; extensive physical and electrical testing
Quality	Wide variation among vendors and part types	Little variation; must meet minimum standards
Source choice	Numerous; some market consolidation	Few; losing vendors every year
Source location	Domestic and offshore	Domestic and offshore
Price	Less than 20 percent of full MilSpec	Relatively high

of the spectrum, many vendors claim that the parts they supply to the medical industry are as good as MilSpec, if not better.

Many, but not all, commercial passive parts are built on the same manufacturing lines as military parts and use the same raw materials. However, supply lots for commercial components tend to be less traceable, and their pedigree more difficult to acquire.

Depending on the product sector, quality variations can also be significant among suppliers. Indicators such as ISO certification are important to watch for. One of the most common mistakes is to base source selection

primarily on cost and delivery, but leave out a good technical assessment of the supplier’s quality rating.

Component engineering is much more relevant as a part of new equipment design than ever before. The parts management programs used for military programs in the past, though somewhat outdated, are essential in some form in order to make good decisions about part and source selection.

Source Choice

Supplier selection becomes even more critical with commercial passive parts, since no approved source lists exist as with military components. In general, there are fewer passive com-



Guidelines for Going Commercial

Commercial passive parts draw from wide-ranging technologies, materials, and manufacturing processes, so comparisons and choices require particular care. Here are some guideposts:

1 Choose vendors and component grades to meet the application. Look for ISO 9000 certification for vendors, and check into the level of quality screening they perform on the parts you are considering.

2 Both military and commercial-grade suppliers use non-hermetic plastic packaging extensively, but its reliability in general has been good. Hermetic packaging is usually available only for circuits with leaded components, not surface-mount.

3 Use full-MilSpec parts only when requirements so demand. Such parts cost 5 to 100 times more than their commercial-grade counterparts.

4 Most suppliers emphasize commercial-grade parts. Selecting a different grade, for example, high-reliability or MilSpec, may heighten the risk of component obsolescence.

ponent suppliers than before. Consolidation in this market sector in the last several years has been significant.

Reduction in the number of suppliers has been even more acute for military parts: not only are there fewer suppliers, but also many previously approved sources have discontinued their military approvals.

Source Location

Many suppliers are now manufacturing part or all of their products offshore. This is also true with military parts, since there is no longer a prohibition on offshore MilSpec part production. The implications of offshore production of MilSpec parts include the potential for longer delivery times and the difficulty of performing quality audits required by the MilSpecs.

Price

The price advantage for commercial-grade passive parts is significant. Military components can cost 5 to 100 times more than comparable commercial ones. Moreover, the cost of commercial parts continues to fall, because competition is always a factor, whereas a reduction in the use of military parts has frozen or increased their cost. This reduction in use also increases the risk of part obsolescence.

TECHNOLOGY FACTORS

The technologies involved in passive parts are for the most part mature, but some notable changes are occurring. An obvious one is the physical size of components, as discussed above.

Another change concerns packaging, which is far from a merely cosmetic matter. Today, packaging for surface-mount passive parts is non-hermetic and relies on extensive use of plastics. This approach can lead to concerns about tolerance to environmental effects, particularly during the assembly of parts on circuit boards; the soldering and cleaning environments can be among the most adverse field conditions a part will confront. Latent defects introduced at this point are of particular concern. Passive part reliability is generally very good, however, and significant problems are rare in the field.

Technological change is especially noteworthy with respect to capacitors. Both ceramic electrostatics and tantalum and aluminum electrolytics are seeing significant, new materials and manufacturing processes. These new technologies are not making their way into military product lines.

Reliability testing, which has traditionally been performed for military products and has benefited the commercial equivalents, is no longer performed. This leaves reliability demonstration for the new technologies up to the manufacturer, or to field experience. Neither method should be considered good enough for mission-critical, high-reliability military applications. Having good knowledge of and a good working relationship with the suppliers is an essential prerequisite for having quality passive parts

that perform acceptably in military applications.

Another significant change—one that is occurring not only in passive components, but across the commercial electronics industry—is the use of lead-free solder systems. Passive part manufacturers have been converting their commercial products to use lead-free terminations. In most cases the solderable terminations are pure tin. Unfortunately, using pure tin reintroduces the potential for electrically conductive “tin whisker” growth. This type of flaw has been responsible for the loss of millions of dollars worth of military and aerospace hardware. Lead-free alternatives to pure tin are few and usually require significantly higher soldering temperatures, posing yet another issue: the potential for thermal damage to sensitive components.

CONCLUSION

Accepting commercial passives for military systems depends completely on the application and expected performance. Non-mission-critical, environmentally benign military applications are a good fit for commercial passives. In contrast, military or space-grade passive parts remain best for applications that demand high reliability or involve exposure to severe environments. For all applications between those two extremes, part selection should depend on the particular performance and reliability that the system must deliver.



About the Author

Michael Rader



Mr. Rader is an electronics technician with the Strategic Systems Department at the Naval Surface Warfare Center, Crane Division. He has more than 20 years of experience as a passive component specialist in support of a variety of Navy programs. He has also provided technical assistance in the area of passive component applications and test and failure analysis to other government and non-government programs.✱

YOUR RESOURCE: The Parts Standardization and Management Committee

by Michael Goy, Air Force Materiel Command Logistics Support Office, Battle Creek, MI

The Parts Standardization and Management Committee (PSMC) is a joint industry-government working group that advocates commercial and industrial parts standardization, promotes parts management education and training, presents parts management viewpoints to senior leadership, assists in developing cost-effective parts management programs, and is working to establish a standard parts database. It provides a forum on efforts to reduce equipment life-cycle costs by promoting commonality of parts and processes.

Benefits of participating on the committee include

- having a say in the development of parts management policy and documentation,
- enjoying access to forums for discussing the latest changes in acquisition initiatives and practices,
- networking with contacts at all levels of government and industry, and
- increasing your knowledge and awareness through briefings presented by leading government and industry representatives, who introduce innovative tools for developing and maintaining parts management programs.

PSMC participation increases awareness of the tangible benefits of parts management, which include reducing inventory costs, realizing economies of scale through larger volume buys, reducing system life-cycle costs, reducing part and supplier qualification, reducing documentation costs, improving product quality and reliability, and enhancing system supportability.

So what are you waiting for—become a partner! Provide your organization with insight on the latest acquisition practices, and strengthen the PSMC in achieving its objectives. Membership promotes a proactive approach to everyday parts management activities such as standardization, managing obsolescence, using commercial parts, and dealing with process issues. In the transition to an industry-driven parts management process, participating will help your organization achieve the competitive edge necessary in today's acquisition environment.

To become a partner or to just get more information, please contact any of the following PSMC members:

Marketing Chairman: Jamie Gluza (Naval Air Systems Command) at (732) 323-1333
or e-mail jamie.gluza@navy.mil

Military Co-Chair: Dan McLeod (Naval Air Systems Command) at (732) 323-7107
or e-mail daniel.b.mcleod@navy.mil

Government Co-Chair: Sam Merritt (Defense Supply Center Columbus) at (614) 692-3965
or e-mail Samuel.Merritt@dsccl.dla.mil.

You're also invited to visit our website at www.dsccl.dla.mil/psmc, where you'll find information on meeting locations and dates, subcommittees, and membership.

AT YOUR SERVICE: The Hazardous Materials Information Resource System

by Michael Goy, Air Force Materiel Command Logistics Support Office, Battle Creek, MI

The former Hazardous Materials Information System is now the Hazardous Materials Information Resource System (HMIRS).

The Defense Logistics Information Service develops and maintains this automated information system to fulfill the requirement of DoDI 6050.5. It contains complete product records for hazardous materials (HAZMAT) procured and used by DoD, the General Services Administration, and other federal agencies. Through this system, DoD and other federal employees have access to the material safety data sheet (MSDS) for hazardous items in the government inventory.

Value-added information in the system helps users comply with transportation and shipping requirements by providing proper shipping names, hazard classes, and label requirements for shipment nationally or internationally, by any mode of transportation. It also supplies warning information in the format of the DoD Hazard Communication Warning Label.

Other DoD systems use the information in HMIRS for environmental, logistics, and transportation purposes. HMIRS is also the repository for the hazard characteristic code assigned to HAZMAT.

The new HMIRS is a contemporary professional product encompassing four applications:

- **The HMIRS website itself**, with new and improved look and functionality
- **A standalone CD-ROM**, updated periodically, which makes the product record information available to offline users
- **A new document submittal website**, which provides a public location on the Internet for manufacturer, vendor, and government personnel to electronically submit MSDS and manufacturer labels
- **The On-Line Administrator**, an application that controls the entire system, managing all aspects from users to reference tables, product records, and documents.

Access to the website is available to manufacturers, suppliers, and government personnel throughout the world. Online users must complete a short registration to utilize HMIRS, but there is no requirement to register or obtain authorization before using the submittal website. HMIRS is available at <http://www.dlis.dla.mil/hmirs>.

For more information, contact Elaine Chapman, HMIRS program manager, at hmirs@dlis.dla.mil.

Performing Item Reduction Studies Electronically

by Willis Drake
Defense Standardization Program Office



DoD has entered the electronic age in the way it performs item reduction studies (IRSs). On June 26, 2001, it implemented its new Item Reduction Web Site Capability (IRWSC) System.

The IRWSC System allows an item reduction technician to perform an IRS in a fully electronic environment. A paperless environment facilitates the review, coordination, and evaluation of an IRS, so an IRS can be completed faster and with more reliable historical records.

One of the outstanding features of the IRWSC System is that it enables scanning of documents and technical data associated with an IRS. The scanned information is then available and accessible by the reviewers working on IRS projects.

Developing the IRWSC System was a challenge. Among other reasons, it was the first system in the Defense Logistics Agency (DLA) to implement the use of Public Key Infrastructure certificates for security. The IRWSC System received full authority to operate on March 7, 2002; it is among the first DLA websites to obtain that approval status.

After the system was implemented, the Defense Standardization Program Office sponsored the IRWSC Phase 2 Enhancements Project. The enhancements were implemented on June 21, 2002. The functional users consist of the IRWSC Working Group members (Army, Navy, Marine Corps, Air Force, DLA, and General Services Administration) who participated in the identification of the functional enhancements developed by the DLA Systems Integration Office.

Phase 2 enhancements improved the operating efficiency of the IRWSC System, making it faster, more user friendly, and according to system users, "more fun to operate." In addition, the IRWSC System can now generate a Completed Item Reduction Listing after the IRS has been completed.

DoD is saving millions of dollars through its item reduction program. Each item eliminated from the inventory generates a cost savings (or avoidance) of an estimated \$1,495, based on the historical yearly average of items eliminated (Item Standardization Code 3s). DoD eliminates approximately 10,000 items per year, for a total savings of nearly \$15 million.

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Willis Drake

Willis Drake has more than 32 years of service managing programs involving logistics information, supply management, and technical data. He has held key positions at Headquarters, Defense Logistics Agency (DLA). For example, he was the DoD Functional Manager for the Interchangeability and Substitutability Program. He also chaired the DoD joint service Item Reduction Program Integrated Product Team and as the manager of the DLA Item Reduction Program, he advised senior DoD managers on program policy, procedures, and operational concerns. Mr. Drake also was the DLA Defense Performance Review Program Manager, directing four major initiatives under National Performance Review. He is currently a contractor for the Defense Standardization Program Office.✶

LAW EASES INDIVIDUAL MEMBERSHIP IN NON-GOVERNMENTAL STANDARDS BODIES

by Trudie Williams,
Defense Standardization Program Office

Government and industry participation on technical committees that develop non-governmental standards (NGSs) is vital for creating truly consensus documents. For more than 20 years, the DoD has issued policy and guidance encouraging its employees to participate in NGS development. Recent legislation regarding membership fees may make that participation easier.

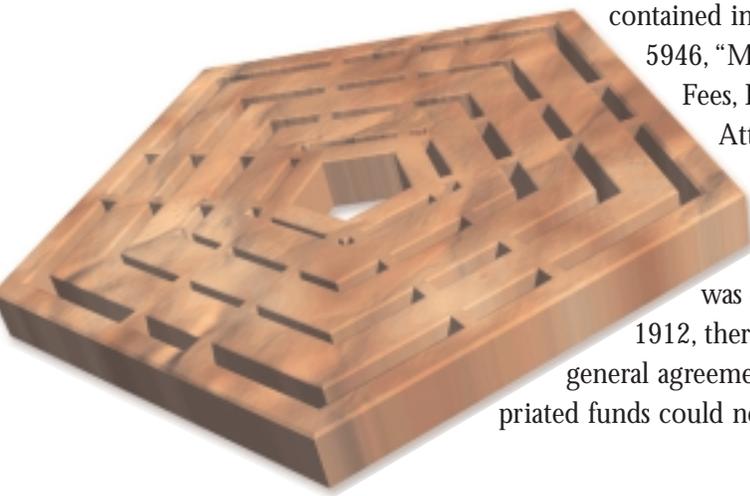
To support ongoing activities, most NGS bodies require all participants, government and industry alike, to pay a fee for taking part in the development of technical documents. DoD has supported such participation to ensure that its interests are considered during document development, but that policy has been somewhat thwarted by a 90-year-old law prohibiting the use of appropriated funds to pay for membership fees or dues.

Specifically, this statutory language is contained in 5 U.S.C. 5946, "Membership Fees, Expenses of Attendance at Meetings; Limitations." Since this law was enacted in 1912, there has been general agreement that appropriated funds could not cover fees

for an individual; however, an entity could purchase an agency or organizational membership in its own name, if this expenditure would further its objectives. Unfortunately, several societies and associations do not offer organizational memberships—only individual memberships, or corporate memberships with higher fees but few or no additional membership privileges. Placing the burden of membership fees on the individual federal employee played a part in discouraging participation.

In response to this longstanding issue, the American National Standards Institute (ANSI) undertook a nearly 6-month effort to initiate a legislative change to protect the ability of federal government employees to attend and participate in standards development activities. The ANSI Amendment, as this change became known, was included in the last DoD authorization bill (S. 1438).

The amendment stipulates that 5 U.S.C. 5946 does not apply when a government employee is participating in agency or department-related NGS activities. This amendment should resolve the funding dilemma within DoD and perhaps help to reverse the loss of federal participation in standards development.



National Metric Week and the U.S. Metric Association (USMA)

Events

Each year, National Metric Week is celebrated to focus attention on the advantages of using the metric system of measurement. This year, it was celebrated October 6–12 (the 10th month of the year and the week containing the 10th day of that month).

The National Council of Teachers of Mathematics (NCTM), in recognition of the metrication efforts of mathematics teachers, started National Metric Week in 1976. In those early years, NCTM celebrated National Metric Week in the spring, usually the week in May containing the 10th day. However, in 1983, NCTM moved the celebration to October—the 10th month. (Information about the celebration is available at the NCTM website: <http://www.nctm.org/meetings/metric-week.htm>.)

Each year in preparation for National Metric Week, all types of metric awareness activities take place in schools throughout the country. USMA assists with those activities by providing teachers and educators with information. That information can be found from links in the teacher/educator section on the USMA home page: <http://www.metric.org>.

The number of hits on the USMA home page increases each year, and it

peaks around National Metric Week. During the last peak, in September 2001, there were nearly 27,000 hits, with 1,800 hits on September 10 alone, nearly a month before National Metric Week.

In addition to the information on its website, the nonprofit USMA has many types of metric supplies and training aids available for sale. Also available is a CD that contains a Metric Bibliography database of more than 14,000 references to articles about the metric system published in English-language magazines and newspapers since the 1940s. The articles referenced in that database contain a vast amount of information about the metric system. The CD also contains an index to articles published since 1966 in USMA's newsletter, *Metric Today*.

Readers are encouraged to visit the USMA website and learn more about the status of metric transition in the United States. If you do not find the metric information you need, you are invited to contact USMA with your questions:

U.S. Metric Association, Inc.
10245 Andasol Avenue
Northridge CA 91325-1504
Phone or fax: (818) 363-5606

2003 Standardization Symposium

Make plans now to attend the March 2003 symposium sponsored by the Defense Standardization Program and Government Electronics and Information Technology Association (GEIA). Our November 2001 event was very successful, and attendees requested repeatedly that we plan another symposium.

The following information will help you plan your attendance:

Date: March 4–6, 2003 (check-in on March 3)
Where: Omni Shoreham Hotel, Washington, DC
Theme: Standardization—Enabling Coalition Interoperability
Keynote Speaker: Allen Beckett, Principal Assistant Deputy Under Secretary of Defense for Logistics & Materiel Readiness
Evening Reception: March 4, 6–8 p.m.
Exhibits: March 4, 8 a.m.–8 p.m.

On March 4, the DSPO will host an awards luncheon, during which the annual standardization awards will be presented.

Watch the DSPO and GEIA websites for further information as it becomes available.



On October 16, the Department of Defense joined with its industry partners and other federal agencies to observe World Standards Day at the U.S. Chamber of Commerce in Washington, DC. The goal of World Standards Day is to raise awareness of the importance of global standardization to the world economy and to promote its role in assisting business, industry, government, and consumers worldwide.

The event is sponsored in the United States by the American National Standards Institute and the National Institute of Standards and Technology. Cohost this year was the Alliance for Telecommunications Industry Solutions. World Standards Day is part of a global celebration organized by the International Organization for Standards, based in Geneva, Switzerland. Events are coordinated and funded by the World Standards Day Committee, consisting of representatives from more than 50 major companies, professional and technical societies, trade associations, standards developing organizations, and government agencies.

At a special U.S. World Standards Day reception and dinner, the winners of the Ronald H. Brown Standards Leadership Award and the World Standards Day Paper Contest were announced.

William M. Daley, president of SBC Communications Inc. and a former Secretary of Commerce, received the Ronald H. Brown Standards Leadership Award. It was presented by Michael A. Brown, head of the Ronald H. Brown Foundation. The award and foundation are named after the late Secretary of Commerce, who died in a 1996 plane crash while on a trade mission to Central Europe. The award recognizes leadership in promoting the important role of standardization in eliminating global barriers to trade. Previous award winners have included chief executives of other major corporations—among them John Deere, The Boeing Company, Marriott Corporation, Tenneco, Ameritech, AMP Inc., Motorola, and Polaroid—and federal agencies such as the Department of Commerce.

The World Standards Day paper contest raises awareness of the importance of standards and presents various perspectives on issues of national and international standards. The first-place award went to Laura E. Hitchcock, senior standards specialist, External Standards Management, The Boeing Company. Her paper, "Standards During Times of Change: Aerospace Strategies for Keeping Standards and Business Linked," dealt with how the aerospace industry is evolving their strategies for the development, man-

agement, and use of standards to successfully respond to and manage change. Joanne R. Overman, president of the Standards Engineering Society, presented the award, which included a check for \$2,500 and a plaque.

The Defense Standardization Program Office (DSPO) provided the reception's featured exhibit, with displays from the Naval Surface Warfare Center, Crane, IN; the Clothing and Textiles Directorate, Defense Supply Center Philadelphia, Defense Logistics Agency; and the Joint Tactical Radio System, headquartered in Arlington, VA. The exhibit also paid tribute to the DSPO's 50th anniversary with a historical timeline, many standardization-related documents from as early as 1949 (prior to the official formation of the DSPO in 1952), and other significant publications. Of special significance was a book of commemorative greetings from major industry and collegiate partners nationwide, including a letter from William J. Perry, the former Secretary of Defense who instituted MilSpec reform.

The photos on the next page were taken at the October 16 evening exhibit and reception.

World Standards Day 2002



Dan Quearry (left), Naval Surface Warfare Center, Crane, IN, explains the Spray Coolant System model to Gregory Saunders, Director, Defense Standardization Program Office, and Laura E. Hitchcock, The Boeing Company. Later in the evening, Ms. Hitchcock won the grand prize for the best World Standards Day paper.



John Tascher (left), Defense Standardization Program Office, enjoys a discussion at the DoD exhibit with Brian Mansir, Logistics Management Institute.



Karim Abdian (left), Army Departmental Standardization Officer, Bill Lee (center), DLA Departmental Standardization Officer, and John Heliotis, AF Departmental Standardization Executive, enjoy the World Standards Day exhibit and reception. All three sponsored exhibits for the DoD main display.



Col. Michael Cox, Joint Tactical Radio System, stands ready to discuss his team's work at the World Standards Day exhibit.



Master Sgt. Cedric Gaskin and Susan Pinto run the Clothing and Textiles Directorate exhibit, featuring the work of the Defense Logistics Agency's Defense Supply Center Philadelphia.



Jon Montgomery (left), an international economist with the International Trade Administration, U.S. Department of Commerce, hears about standardization work at the Clothing and Textile Directorate, Defense Supply Center Philadelphia, from Master Sgt. Cedric Gaskin and Susan Pinto (back to camera).



Sharon Strickland (left), Editor, *Defense Standardization Program Journal*, and the DoD representative on the World Standards Day Committee, with Col. Steven MacLaird, Joint Tactical Radio System, and Susan Pinto, Clothing and Textiles Directorate, Defense Supply Center Philadelphia.

Introducing New Members of the Standardization Community

New Member for DSPO

Donna McMurry recently joined the Defense Standardization Program Office (DSPO). She is replacing Carla Jenkins, who retired on February 1, 2002. Ms. McMurry's background is primarily in Air Force logistics, including supply, maintenance, distribution, information systems, and resource management.

She transferred to DSPO from the Air Staff, where she managed resources for base-level logistics information systems and chaired the Information Fusion Pillar's action officer group for FLOW (Focused Logistics Wargame) 01. Before that, she was a supply chain analyst at the Logistics Management Institute.

During Desert Shield/Storm, Ms. McMurry served as a branch chief at Tinker Air Force Base, OK, overseeing materiel management for strategic aircraft engines worldwide. When she was the Air Force Support Panel's point of contact, she coordinated the programming of \$8.3 billion total obligation authority for logistics programs.

Ms. McMurry also has worked as a supply systems analyst in the former Defense Spares Initiatives Office; an acquisition logistics specialist at Wright-Patterson Air Force Base, Dayton, OH; and a supply cataloger in her home town of Battle Creek, MI.

New Air Force Standardization Officer

Robert "Scott" Kuhnen is the new Air Force Command Standardization Officer. He replaces Bob Rosell, who served in that capacity for many years and recently left for a 2-year engineering assignment at the Aeronautical Systems Center (ASC).

Mr. Kuhnen is supervisor of ASC's Air Force Research Laboratory Engineering Standards Office at Wright-Patterson Air Force Base, in Dayton, OH. That office administers about 11,000 technical documents, both military and non-government.

Mr. Kuhnen began his career in 1978, editing Air Force Systems Command design handbooks, compilations of design criteria and lessons learned dating to 1917. In 1982, he was appointed to head ASC's Mil-Prime Program, one of the earliest efforts to develop performance-based specifications and standards, precursors to today's Joint Service Specification Guides being developed under the auspices of the Joint Aeronautical Commanders' Group.

In 1987, Mr. Kuhnen became the first Air Force individual recipient of the Defense Standardization Program Outstanding Performance Award. He has served on numerous Air Force and DoD working groups and has been recognized at the highest levels for his creative approaches to technical documentation for the defense community.

the **Good Housekeeping** Award for Women in Government 2002

Kathleen M. Robinette Honored with Good Housekeeping Award for Women in Government

Kathleen M. Robinette, Director of the Air Force's Computerized Anthropometric Research and Design (CARD) Laboratory, Wright-Patterson Air Force Base, Dayton, OH, was honored with a *Good Housekeeping* Award for Women in Government for her work on the Civilian American and European Surface Anthropometric Resource (CAESAR) project. The awards are given annually by *Good Housekeeping* in collaboration with the Center for American Women and Politics. Ms. Robinette, one of 10 winners out of more than 300 nominees this year, received the award on June 12, 2002, at the Library of Congress in Washington, DC.

According to the Center for American Women and Politics, the CAESAR project "exemplifies how government improves people's lives." When asked what it means to receive the award, Ms. Robinette said, "It means recognition for the CAESAR project along with the Air Force Research Lab. This is a tribute to them and scientists that work there."

Ms. Robinette is the principal research anthropologist for the U.S. Air

Force and program manager for the Air Force's engineering anthropometry program. She is one of the leading international experts in engineering anthropometry with 24 years of practical experience. She organized the development and now manages operations of the CARD Laboratory, an unparalleled anthropometrics laboratory that provides research, products, and services to government, industry, and academia throughout the world.

Ms. Robinette managed the development of the world's first automated

three-dimensional (3-D) anthropometric surface digitization system in 1986, and pioneered the development of advanced sizing methods that are being adopted not only within the Department of Defense but by industry as well. She also conceived and assembled, under the auspices of NATO, a multinational working group to document the benefits of the latest anthropometry technology for manufacturing, engineering, and medicine and to plan an international 3-D anthropometric survey. The survey became the CAESAR project.



Kathleen Robinette and the 3-D scanner developed by Cyberware, Inc., for the CAESAR project

Editor's Corner

Sharon Strickland
Defense Standardization Program Journal

Preparation for the 50th anniversary *Journal* is now a memory, but standardization continues to be the stuff that dreams are made of. I hope you will find this issue interesting and informative.

As *Journal* editor, I regularly receive notes from members of our standardization community about retirements (must be that baby boomer thing). Fortunately, I also receive notes about new people. Following is a list of our retiring friends (they will be sorely missed) and an introduction to new people in our community.

Fond Farewells...

Peter Angiola (Defense Contract Management Agency) was an OSD standardization staff engineer and made many contributions. Now Pete is building a lakefront dream house. Happy construction time, Pete!

Herb Egbert (Army Developmental Test Command, Aberdeen Proving Ground, MD) retired October 1 after 32 years of federal service. He is a previous winner of the Defense Standardization Program's Distinguished Achievement Award and a \$5,000 cash prize. Herb said up until 1980 he had no desire to travel overseas because there was so much to see stateside. His first NATO trip was to Germany and Paris, and little did he know that during the next 21 years, he would travel overseas 110 times. Maybe now he can see the U.S.A.!



Anthony Pizzo (NAVAIR Lakehurst) retired after a 30-year government career in specifications and standards that also included his significant contribution as program manager in the development of the ASSIST Program (which received the Navy's first-ever DoD Gold Nugget Award). Tony wrote that he is going to take some time for himself, continue as a bass vocalist in two local choirs, and catch up with home chores.

Pamela Scott (Air Force Engineering Standards Office) recently retired. She started her career in 1965 working for the Southeast Asia Office during the Vietnam War. In the late 1960s and early 1970s, while at the Aerospace Medical Research Lab, she helped create one of the first electronic terrain-simulation maps. In 1979, she joined the Engineering Standards Office and has worked on thousands of documents, primarily for the Engineering Avionics Division and the Air Force Research Laboratory. We wish Pam well as she retires to Florida so that she can be near family and make more visits to her favorite place on earth—Disney World.

Warm Welcomes...

Joe Bucci, Army Developmental Test Command, APG, MD, is the new Army representative to NATO AC/310, Subgroup 3. He is at buccij@dtc.army.mil; phone (410) 278-1342 (DSN 298-1342).

Greg Cecil, formerly of the Defense Finance and Accounting Service, joined the Microelectronics Team and will be working the MIL-PRF-38534 program and Standard Microcircuit Drawing (SMD) program for hybrids.

Curtis Cohen, Army Developmental Test Command, APG, MD, has assumed responsibility for most of Herb Egbert's projects. Curtis was previously with the Patent and Trade-

mark Office. He is working MIL-STD-810 and the French and Australian DEAs. He is at cohenc@dtc.army.mil; phone (410) 278-1376 (DSN 298-1376).

Floyd "Buzz" Crawford joined the Defense Logistics Information Service as a cataloger specializing in U.S. Army parts and supplies. Since Item Reduction Program workers and DoD catalogers often work joint projects, we expect to see Buzz at future joint community meetings. Welcome, Buzz!

Leah Eason, Defense Supply Center Philadelphia, is an Outstanding Scholar Hire and works as a commodity business specialist (with a food technology degree) in the DLA-SS Preparing Activity.

Gene Ebert, formerly with the Defense Supply Center Columbus' Product Verification Program, joined the Electronic Components Team, and will work the military specifications programs on magnetics, tubes, and waveguides (e.g., MIL-PRF-1 and MIL-PRF-27).

Rick Errhalt, Army Fort Huachuca, has taken over Herb Egbert's RTCA responsibilities. He is at errhaltr@epg.army.mil; phone (520) 538-3928 (DSN 879-3928).

Jason Hochstetler, a recent engineering graduate, joined the Active Devices Team, Defense Supply Center Columbus, and will be working the MIL-PRF-19500 semiconductor program.

Lt Col Edward W. Hoffmann, recently replacing Lt Col Bernard Ela, was mobilized for Operation Noble Eagle, and is the new Deputy Division Chief for Command and Control, HQ USAF/XO. He is developing a multidisciplinary team to oversee the acquisition of USAF C2 systems to ensure service, interservice, and coalition interoperability. He implemented a critical action initiatives team composed of highly specialized reserve officers to take short-suspense, high-value issues across the USAF Air Staff. Welcome to Air Force international standardization!

Joe Rodenbeck, formerly of the Naval Warfare Center, joined the Microelectronics Team, Defense Supply Center Columbus, and will be the focal point for the MIL-PRF-38534 hybrid microcircuit program and MIL-STD-883 test methods for microcircuits.

Steve Tanner, NAVAIR, China Lake, CA, is the new Chairman of AC/310 Subgroup 3 and serves as the Methodology Workstream

POC for the UK/US tri-service IEA MOU. He is at tannersn@navair.navy.mil; phone (760) 939-4669 (DSN 437-4669/4667).

Joe Wolak is Picatinny Arsenal's new standardization officer. Stuart Crouse wrote that due to reorganization, Joe replaced him as the PACK area standardization officer and Joe will now be the LOGSA PSCC PM for both domestic and international standards missions. Joe can be reached at (570) 895-6406 (DSN 795-6406). Stuart will assist Joe in specific standardization work but has new assignments. Good luck to both!

Passings

We are deeply saddened to report the death of Connie Henry, a former technical writer at Wright-Patterson Air Force Base Aeronautical Systems Center (ASC). Connie passed away in October.

Connie started her DoD career in August 1966, and moved to the ASC Engineering Standards Office in August 1977. She was very active with several organizations at Wright-Patterson, including the Standards Engineering Society, where at one time or another she held virtually every office at the Dayton chapter.

We extend our sympathies to Connie's family, friends, and colleagues.

Bits and Pieces

Congratulations to **Bruce Carson**, Defense Supply Center, Philadelphia. He was recently presented the Meritorious Civilian Service Award by Brigadier General J. A. Manguel. When Mr. Carson was a DLA intern, our staff had the pleasure of working with him on several projects.

The DSPO welcomes **Major General Mary L. Saunders**, the Defense Logistics Agency's new vice director. General Saunders is a career-long logistician, coming to DLA directly from the Pentagon, where she was the director of supply for the Air Force deputy chief of staff for installations and logistics. General Saunders is well acquainted with the Defense Standardization Program, having commanded the Defense Supply Center Columbus (DSCC) from August 1998 until September 2001. While at DSCC, she accompanied many of the DSCC yearly standardization awards winners to national ceremonies.



Upcoming Issues— Call for Contributors

We are always seeking articles that relate to our themes or other standardization topics. We invite anyone involved in standardization—government employees, military personnel, industry leaders, members of academia, and others—to submit proposed articles for use in the *DSP Journal*. Please let us know if you would like to contribute.

Following are our themes for upcoming issues:

Issue	Theme	Deadline for Articles
July–September 2003	Homeland Security	February 15, 2003
October–December 2003	Voluntary Standards	May 15, 2003
January–March 2004	Army Standardization	August 15, 2003
April–June 2004	Logistics	November 15, 2003
July–September 2004	Standardization and Contracting	February 15, 2004

If you have ideas for articles or want more information, contact Sharon Strickland, J-330, Defense Standardization Program Office, J-3, 8725 John J. Kingman Road, Stop 6233, Fort Belvoir, VA 22060-6221, or e-mail her at sharon_strickland@hq.dla.mil.

Our office reserves the right to modify or reject any submission as deemed appropriate. We will be glad to send out our editorial guidelines and work with any author to get his or her material shaped into an article.

