Modular Multifunctional Information Transfer System (MMITS) Task Group

The Modular Multifunctional Information Transfer System Task Group conducted its initial meeting on 13 March 1996 at the TASC office in Arlington, Virginia. The task group is an outgrowth of the SPEAKeasy radio program and is oriented toward establishing hardware and software interface standards for use in the development of an open system radio architecture. In attendance were approximately 100 individuals representing DOD, defense contractors, and commercial organizations. The intent is to organize as a VITA/VSO task group.

Introduction: Mr. Wayne Bonser

Mr. Wayne Bonser of the United States Air Force Rome Laboratory presented some background information on the need for a MMITS task group and on the goals for the group. Mr. Bonser is the project manager for the SPEAKeasy Radio program. He began by noting that fifteen years ago, communications equipments were developed independently by each of the military services to suit their unique service mission. These independent efforts were loosely coordinated to ensure that the resulting hardware had interoperable modes where such modes were needed. At that time each program developed its own hardware to perform basic equipment functions. Today, resources are not available to allow such redundant development efforts and that has necessitated a new development culture. Today, the desire is to construct systems from common modules and the focus is on reducing the life-cycle cost of DOD systems. In addition to the need for interoperability in a military environment, there is also a need for interoperability in the National Institute of Justice community between civil emergency and disaster relief organizations which has created a requirement for a flexible radio that can operate with multiple waveforms on multiple frequencies.

The following three strategies are being pursued to reduce the acquisition and sustainment costs of DOD systems. First, DOD must leverage the commercial base. To accomplish this, DOD must change its primary system acquisition role from that of developer to that of an integrator of commercially available components. This strategy is supported by a second strategy of encouraging the development of dual-use technology. The intent is to focus DOD investment to facilitate the design of components that provide a military capability based on civilian technology. Third, the military must support the development of products designed for dual use from the outset.

Keynote: Open Systems Joint Task Force (OSJTF) Mr. H. Leonard Burke

The vision for the OSJTF is to establish an open systems approach that will move DOD from the role of system developer/producer into the role of systems integrator and user.

After discussing the mission of the OSJTF, Mr. Burke began by stating that there are many current definitions of what constitutes an open system. However, he continued, an open system can generally be described as a system that has many suppliers, many customers or users, a long-life architecture, and the ability to easily incorporate technology upgrades. The IBM PC and its many clones provide an excellent example of an open system.

An open systems approach begins with a business strategy that facilitates the incorporation of commercially available technology into DOD systems. This strategy is focused on meeting operational needs at the lowest life-cycle cost, and on facilitating sustainment and growth. Both reuse and the use of commercial hardware and software are emphasized, as is continuing market research to remain on top of the available state-of-the-art.

An open systems approach is based on an architecture and on broadly supported published interface standards. The architecture issues have to be addressed from an operational perspective by the end-users, from a technical perspective by industry, and from a system perspective by the acquisition organization. Much of the work of

pursuing such an approach is spent on defining interfaces consistent with interchangeability of component form, fit, and function.

It is important to note that an open systems approach is not a cookbook from which developers can select a methodology for obtaining the blessings of open systems. Nor is an open systems approach a panacea for system developers. An open systems approach is not risk free and should not be thought of as an end in itself.

To assist programs in evaluating the "openness" of their approach, the OSJTF has published an Open Guide, the intent of which is to assist program managers in determining the provisions their program has made to integrate commercial products, via open system standards, into the procurement process for their system.

Mr. Burke also provided information on DOD efforts to produce a Joint Technical Architecture (JTA), a draft of which is to be published in April 1996. The JTA is a profile of standards from the DOD TAFIM, and provides the minimum set of standards needed to ensure interoperability.

The OS JTF has organized a Committee on Open Electronic Standards (COES) to investigate weapons system architectures. To date, the principal work of the COES has been in defining weapons system domains. A key criterion in identifying a domain is that a domain has to belong to somebody;someone must be responsible for it. Two kinds of domains exist. System domains are characterized by distinctive domain product lines. The OS JTF is identifying system domains. Technology domains are characterized by distinctive technologies. Technology domains are owned by industry.

SPEAKeasy Radio Background: Mr. Wayne Bonser

SPEAKeasy is a joint program of the Air Force, the Army, and DARPA, with some Navy involvement. Mr. Bonser is the program manager, Mr. Donald Upmal is the Army program manager, and Mr. Frank Schrenk is the DARPA program manager. The program is in its second phase. The Phase I SPEAKeasy prototype was developed by Hazeltine and demonstrated multiband operation, programmability, and voice bridging during JWID 95. Development is now proceeding on Phase II. The Phase II prime contractor is Motorola, with Lockheed/Sanders and ITT as subcontractors.

The SPEAKeasy program is developing a radio using an open architecture to allow the incorporation of multiple waveforms at multiple frequencies in the same physical unit. SPEAKeasy requirements include the ability to communicate with legacy nodes on multiple frequency bands using multiple waveforms. Mr. Bonser described the concept of a reprogrammable radio and methods of re-programming. He presented a block diagram illustrating the architecture of the SPEAKeasy radio as a candidate architecture for MMITS. He then pointed out the opportunities that adoption of an open architecture creates for vendors.

VITA/VSO: Mr. Robert (Bob) McKee

VITA/VSO is an acronym in two parts. VITA stands for VME Industry Trade Association. VSO stands for VITA Standards Organization. VITA/VSO promulgates standards as a member of the American National Standards Institute (ANSI).

Mr. McKee presented some background on VITA/VSO and the VITA/VSO standards proposal and adoption process. The intent of VITA/VSO is to define and publish open interface standards and to make these standards available to industry as expeditiously as possible.

Mr. McKee is chairman of the VITA/VSO Board-Level Live Insertion Forum and used the efforts of that forum as an example of the VITA/VSO standards development process.

The power to develop standards is vested in the members of VITA/VSO. Any single member can establish a VSO Study Group to explore and develop consensus for a standard in a particular area. In the case of board-level live insertion, both the military and commercial telecommunications companies had a need for such a standard.

When consensus is established concerning the need for a standard, a VSO Task Group is formed to develop it. A VSO Task Group consists of at least three corporate members chartered to develop a standard within a defined . Task Group members may establish interface standards, but they do not relinquish rights to their corporate intellectual property or proprietary data.

Standards are adopted using a canvassing procedure within the VSO. An ANSI canvass is conducted at the same time as the VITA/VSO canvass, resulting in approval as an ANSI standard. The PCI forum is currently going through the VITA/VSO to get the PCI standard through the ANSI balloting process. Any standard accredited by ANSI is automatically submitted to ISO.

Review and Discussion of Documents: Mr. Allan Margulies

Prior to discussing the contents of the draft vision statement, mission statement, and charter for the MMITS forum, Mr. Margulies announced that copies of a Bell South request for information on software defined radios were available in the lobby.

After reviewing the contents of the foundation documents, which had been distributed prior to the meeting several members were concerned about possible linkages between MMITS and the SPEAKeasy program. Specific questions concerned whether the MMITS timeline corresponds to the SPEAKeasy Phase II schedule. Mr. Bonser replied that the MMITS and SPEAKeasy schedules are and will remain independent. When asked if SPEAKeasy Phase II is a prototype for the MITTS architecture, Mr. Bonser replied that even though Motorola will brief the SPEAKeasy architecture, this architecture is not yet final. He also suggested that the MMITS Task Group could use Speakeasy as the point of departure for developing open system standards for a modular reprogrammable radio.

Election of Provisional Officers: Mr. Wayne Bonser

The MMITS Forum will have two officers, a chairman and a vice chairman. It is anticipated that these officers will serve for the next two meetings, a period of approximately six months, at which time permanent officers will be elected.

The following three persons were presented as nominees. The person obtaining the most votes to become interim chairman. The one obtaining the second most votes to become interim vice-chairman.

Mr. James Hoffmeyer, Department of Commerce, NTIA/ITS.N1, Boulder, CO.
Mr. Joe Mitola, MITRE, McLean, VA.
Mr. Ed Cornell, Department of Transportation, Federal Aviation Administration, Office of Communications, Navigation, and Surveillance Air/Ground Communications Product Team

Voting was by secret ballot. Mr. Mitola was elected chairman. Mr. Hoffmeyer was elected vice chairman.

Chairman's Remarks: Mr. Joe Mitola

Mr. Mitola presented his vision of MMITS forum goals in three areas.

In the business area, the goals of the forum are two-fold. First, the forum must work to leverage the commercial-industrial base to develop the boards, boxes, and modules needed to produce a MMITS. Second, the forum must seek to obtain the benefits of competition and open standards in the production of MMITS equipment.

In the technology area, the forum must remain abreast of global technical developments, and the high evolution of the state-of-the-art.

In the standards area, the MMITS Forum must seek the implementation of standards that are both timely and testable.

Specific tasks to achieve these goals include defining the scope of MMITS, developing a MMITS architecture and identifying core and backbone standards applicable to MMITS.

SPEAKeasy Phase II Radio: Dr. Bruce Fette, MOTOROLA

The SPEAKeasy Phase II Radio is being fabricated by an integrated product team consisting of Motorola, ITT, and Sanders. The product is to operate on frequencies from 2 MHz to 2 GHz, and to be programmable for waveform, COMSEC, vocoding, multi-media, and networking. The use of commercial hardware and software is emphasized.

Key ideas within the product team include the concept that "one architecture fits all." and "commercial spin-in and spin-out." The first idea is intended to decouple radio performance from the radio architecture. The second idea is to allow the radio to incorporate technology updates without major modifications. The objective is to allow the infusion of new technology into an existing radio.

The program has adopted a model-year demonstration philosophy and the first model year will include extensive use of commercial off the shelf technology including: motherboard, digital signal processing, I/O cards, and a laptop computer for the user interface. In addition, it is planned that the SPEAKeasy Phase II radio will be demonstrated as part of FORCE 21, JWID 97 and JWID 98.

Dr. Fette stated that the radio was being built using a modular, open hardware and software environment, bus adaptation and industry accepted interface standards, and it will have a bus-independent design. The issues to be addressed include: module partitioning, electrical interfaces, vendor independence, applications standards, and the SPEAKeasy testbed.

Establishment of Technical Working Groups: Joe Mitola, Jim Hoffmeyer

Initial discussion centered on the ramifications of becoming a VITA/VSO task group. Mr. Mark Cummings of enVia stated that his company is not a member of VITA and wanted to know the financial implications of becoming one. He particularly wanted to know whether membership in VITA is or will become a pre-requisite to being a member of the MMITS forum. Jim Koser of Berg described the VITA/VSO fee structure as $250 for individuals, $2,500 for corporations, and $12,500 for senior corporate status.

Dr. Fette of Motorola reiterated his severe concerns about the protection of intellectual property rights. His concern is heightened by the fact that Motorola is a large company in which a representative to a VITA/VSO task group might not be aware of all of the protected intellectual property of the company, and might therefore inadvertently disclose something that is protected. He was asked to provide additional wording for paragraph 3.1 of the charter in order to clarify rules on protection of IPR.

Mr. Mark Cummings of enVia has reservations about the ability of VITA/VSO to consider standardizing APIs that lie outside of the VME framework. He recommends that the forum query VITA/VSO about the scope of its interest. Dr. Fette requested that the forum agree on a chartering process before querying VITA.

Mr. Carl Puschak of Lockheed Martin took exception to the need for standards, stating, "We don't know if we need standards yet or not. We've got to know what a MMITS is before we can determine if we need standards." He recommends that the forum produce an operational architecture before developing either a technical or systems architecture. Extensive discussion followed concerning the scope of the architecture.

Dr. Fette of Motorola and Mr. Tilley of Hazeltine are both concerned that the boundaries of MMITS are not crisply defined. The SPEAKeasy functions were presented as a possible point of departure for the definition of an architecture. Mr. Puschak objected strongly, maintaining that these functions themselves were sufficient to define an architecture.

Mr. George Hagn of SRI made a motion to use the SPEAKeasy Phase II architecture and the following functions as the working definition of the scope of the MMITS Task Group, and that a committee be created to refine this list for the next meeting:

Channel Coding
RF Subsystem
Information Security (infosec)
Source Coding
Networking
Control
Air Interface
Wireline Interface
Software Application Programming Interfaces
Power
Applications

The motion was amended to include the revision of the vision statement, mission statement, and charter within the purview of the committee. The motion was seconded and passed on a voice vote without objection.

Mr. Mitola appointed the following people to the committee:

Mark Cummings (chair)	enVia
Bruce Fette	Motorola
Stanley Griswold	ITT
Jim Hoffmeyer	US Department of Commerce
Dennis Weed Federal	Aviation Administration
Wayne Bonser	DOD/Rome Laboratory
Robert Moton	Bell South

Mr. Hoffmeyer presented the following list of possible technical committees for the task group:

Hardware Architecture
Software Architecture
Bus/Interface Definition
RF
Network Interface

User Interface
Input/Output Interface
Infosec

The consensus of the members was that the appointment of technical committees would be premature until the scope of MMITS is defined. Appointment of technical committees was therefore deferred until the next meeting. The next meeting is tentatively scheduled for mid June, possibly in Washington in connection with the AFCEA meeting. In addition to technical committees, the task group is to consider the formation of a business/marketing committee.

Mr. Allan Margulies will publish the minutes of this meeting on the SPEAKeasy home page, along with the list of attendees and the briefing slides.

The meeting adjourned. 19 March 1996