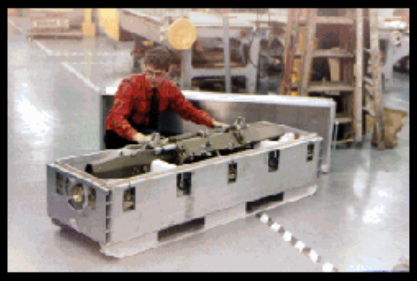
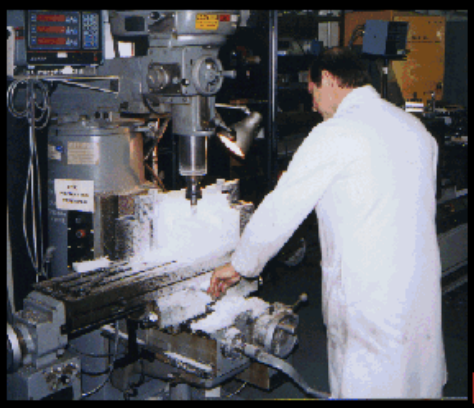
Special Anniversary Issue

Air Force Packaging Technology and Engineering Facility

1997 Annual Report





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UNITED STATES AIR FORCE

1947 - 1997


AFPTEF Salutes
the Air Force
50th Anniversary

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DEPARTMENT OF THE AIR FORCE
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Air Force Packaging Technology and Engineering

1997 Annual Report
Special Anniversary Issue

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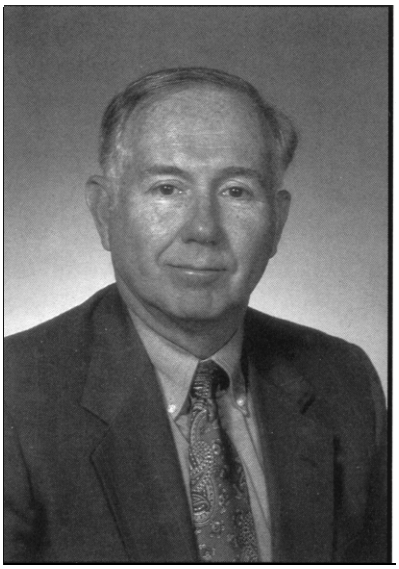
50 Years of Air Force Tradition and Excellence
45 Years of AFPTEF Heritage



The Golden Anniversary of the Air Force was celebrated throughout 1997. The packaging community also celebrated an important milestone with the 45th Anniversary of the Air Force Packaging Technology and Engineering Facility. AFPTEF has been growing and serving the Air Force, DoD and other Government agencies since 1952. Numerous accomplishments were reached throughout those 45 years and our heritage is outlined in detail in this special anniversary issue. As you turn the pages and read the accompanying articles, you will see the accomplishments achieved by the AFPTEF staff.

Our Design Branch engineers have been very busy working on new containers to protect high-value items for the Air Force, Army and NASA. These containers ensure that the items are offered superior packaging protection and are operational when they are needed. During 1997, we provided support to WR-ALC at the request of their Commander, Major General Rondall Smith. It had come to Maj. Gen. Smith's attention that some B-52 avionics were experiencing high failure rates. An AFPTEF team began an investigation and found that insufficient packaging of the items was a major contributing factor to the problem. As a result of our work, the items are now packaged in our engineered containers and the failure rate has decreased significantly. Mission support is improved by a continuous flow of serviceable parts. This is an excellent example of how AFPTEF can provide rapid support, performance, function and value to solve your packaging problems. Protection is paramount.

Our Materials Branch engineers also had a very busy year. Their first function was to support the design engineers in testing our vast range of container designs. This alone provided a great amount of work. Additionally, we began a new relationship with DLA to provide POP testing support. This relationship provided a challenge to our test engineers. The time frames required by DLA were tight and had to be met. The staff met the challenge and provided DLA with superior service to meet timing targets.

The Policy Branch had their usually busy year. They provided an updated revision to AFJMAN 24-204, "Preparing Hazardous Materials for Military Air Shipments," to the field. This revision provided better instructions to assist field personnel in transporting hazardous materials on military aircraft. Also, the Policy group were very busy working with the various Major Commands (MAJCOMS) to provide assistance with Technical Specialist training. Their immediate service to their customers again was outstanding!

As an Air Force Packaging *Center of Excellence,* we concentrate on military packaging technology and combat readiness to provide the warfighter with fully combat capable spare parts to "Keep 'Em Flying." Meeting that unique challenge requires dedicated professionals. At AFPTEF, people are our greatest asset. The people at AFPTEF set a worldwide standard of excellence throughout the Air Force. I am extremely proud to be part of such a distinguished group of professionals who are dedicated to ensuring the combat readiness and sustainability of the greatest Air Force in the world. Yes, we've certainly come a long way over the years. Join me as we salute our Air Force on 50 years and AFPTEF on 45 years of *Flying High!*

Leslie K. Clarke III

ADMINISTRATION UPDATE

by Sherry L. Buchanan

A freshly painted container with intricate shiny latches hangs from a hoist while one of the model makers attaches wheel assemblies. Lights flash as an automated machine hovers over space-aged plastic drilling holes and cutting pieces for a specialized container. Numbers flash across a computer display while drill bits twirl to the correct size in order to drill multiple holes to specified widths and depths. Using new technology, model makers can fabricate parts for space age containers in a fraction of the time it would take using the machinery of ten years ago. Model makers must stay abreast of advancing technology to provide precision and quality crafted containers. That means acquiring the latest machines and equipment.

We must inventory and track all of these machines and equipment. One whirring, buzzing, bumping, flashing machine looks about the same as another to those unfamiliar with their intricacies. They are mysteries without a name. In conducting our annual equipment inventory, a great deal of time was necessary to identify, locate and label each piece. This involved the assistance of our engineers and model makers. To improve this labor-intensive task, we initiated an effort to photograph each piece of equipment using a digital camera. We downloaded each picture from the camera and saved it as a high quality digital image file. We can then print the pictures for a notebook collection and/or save them in a computer file. The next step is to attach the collection of numbers and words used by the equipment managers to identify equipment. For example "0028 sub 3417 PHRTA6CNC1 Servo Rotary TA U" is the HAAS VF-3 milling machine mentioned above that drills various sized holes automatically as directed by a computer program. But who would have known except possibly the machinist who uses the machine?

The advantages and benefits gained by this initiative will help us identify, inventory, and control the nearly 300 pieces of equipment that AFPTEF uses to build world class containers. This photo record will help differentiate between equipment with the same Federal Stock Class (FSC). Tracking of newer equipment as it replaces older equipment will be easier. By reviewing these digital images, custodians can accurately identify items for turn-in to DRMO or release to other AF organizations. This endeavor saves time and increases the efficiency and productivity of the equipment managers. Engineers and model makers can spend their time designing and producing quality containers instead of administrative duties. Modern technology again makes a tedious, mundane task easier.

F-22, RAPTOR

EARTH OBSERVING SYSTEM (EOS) AM-1 TRANSPORTATION SYSTEM

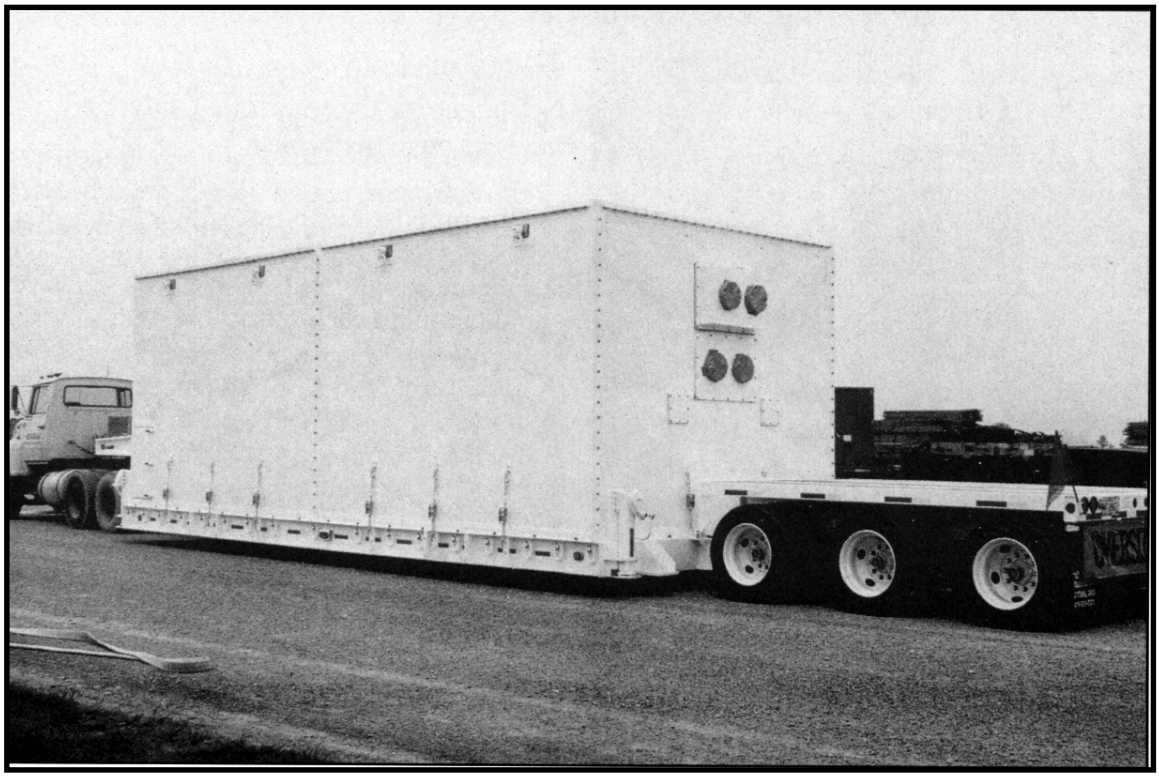
by Robbin L. Miller

The AFPTEF, in support of the NASA Earth Observing System (EOS) AM-1 Satellite Program, successfully developed a transportation system for the EOS AM-1 Satellite and MAGE adapter. The integrated system consists of a double-drop frame modular trailer, a slingable five-sided aluminum cover, an environmental control system (ECS), purge gas system, strongback holding fixture, and contamination bag and frame structure. The detachable center drop section of the modular trailer serves as the mounting platform for the strongback, contamination bag/frame system and aluminum cover. AFPTEF also designed a lift beam system for removal and placement of the aluminum cover.

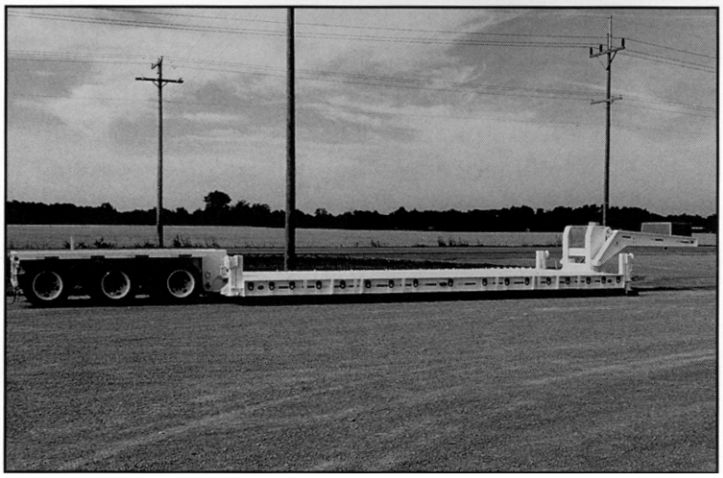
During over the road and C-5 transportation the satellite and MAGE adapter will be mounted horizontally, cantilevered from the strongback fixture. The contamination bag, sealed to the center trailer section, will enclose the spacecraft and MAGE adapter. The entire configuration will then be enclosed by the aluminum cover structure. This system, with the aid of the ECS, will create an environmentally controlled chamber for the spacecraft and MAGE adapter.

AFPTEF began the project in January of 1996 and delivered the completed trailer/container system to NASA on 8 September 1997, one month ahead of schedule. NASA will install the environmental control system (ECS) and dry air purge system onto the deck of the rear bogie at their facility.

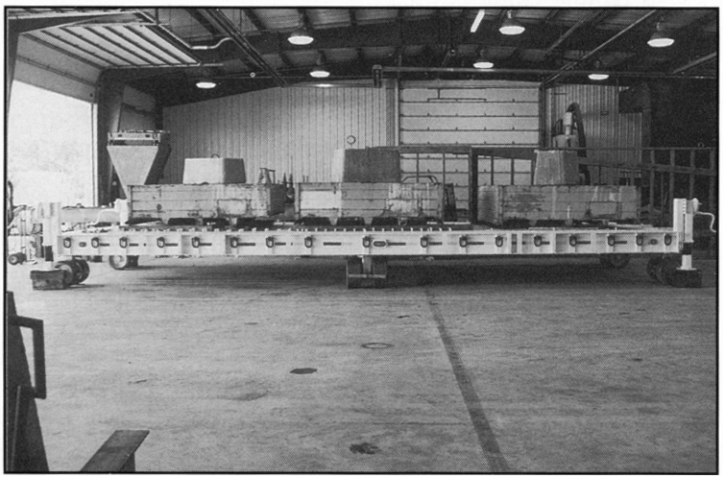
A C-5 fit test is scheduled for December 1997. The entire transportation system loaded with a mock satellite will be loaded and flown on a C-5 aircraft. This test is being performed not only to determine requirements for loading and unloading the transportation system but also to obtain satellite shock and vibration data during flight and landing. The results of this data will determine the optimum loading location in the C-5 for transport. The satellite's scheduled launch is May 1998.



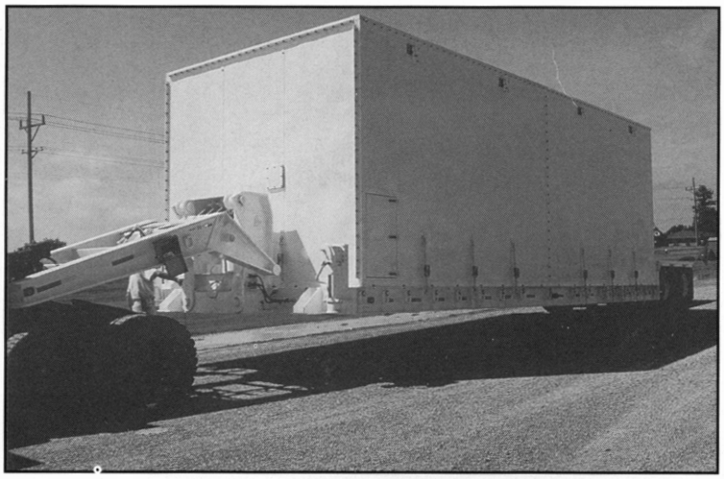
EOS AM-1 transportation system



EOS AM-1 modular trailer



EOS AM-1 modular trailer load test



EOS AM-1 trailer hydraulic lift test

EOS AM-1 MODULAR TRAILER

by Robbin L. Miller

AFPTEF worked with NASA and Lockheed Martin (Satellite Designer) to develop the specification for the design and procurement of the modular, double drop frame trailer. The specification covered all design, fabrication, and test requirements. A contract was awarded to Nelson Manufacturing of Ottawa, Ohio in November of 1996. All design concerns such as structure stiffness, weight, and clean room compatibility, were resolved during the design reviews. The finished, fully assembled trailer is 58'-10" long, 13'-8" wide at the center drop section, and 8'-6" wide at the front and rear decks and weighs 42,000 pounds (without a tractor). The center drop section deck height is a nominal 20", however, the ground clearance can be adjusted minimally by increasing or releasing air from the air ride suspension system. Larger adjustments to alleviate cresting while ramp loading the system on to the C-5 aircraft can be accomplished using the gooseneck hydraulic lift mechanism. This system can raise the front end of the trailer as high as 30" off the ground.

Qualification and acceptance testing took place at Nelson during the week of 14 July 1997. The following tests were performed:

- Superimposed load test with a factor of safety of 2.
- Fit/connectivity tests, gooseneck and rear bogie to trailer and to each other.
- Caster and air bearing pad fit test.
- Loaded system lift test using the manual trailer jacks and hydraulic lift system.
- Tie down ring pull test, 10,000 pounds.
- Over the road maneuverability test.

The trailer passed all tests and therefore, was approved and accepted. Nelson maintained storage of the unit until AFPTEF was ready to install the aluminum cover (see associated article).

EOS AM-1 CONTAINER

by Robbin L. Miller

The EOS AM-1 container consists of a five-sided aluminum cover which fastens to the center drop section of the modular trailer. The center drop section serves as the base structure of the container and is used to mount the cover, strongback or satellite holding fixture and the contamination frame and bag.

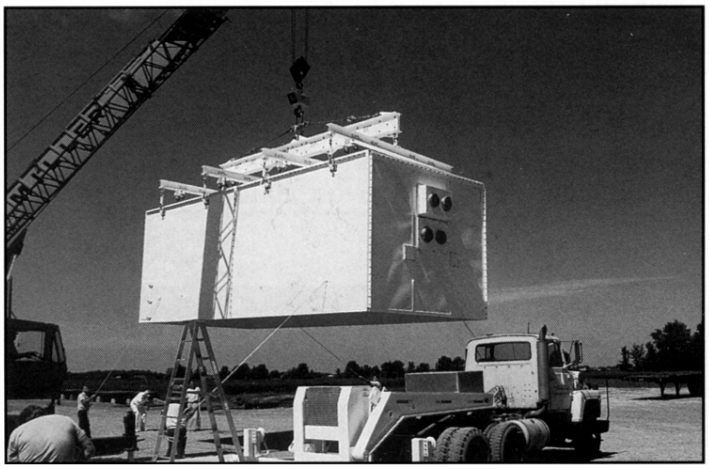
AFPTEF fabricated eight panels, that when bolted together form the five sided cover. It was determined that the cover structure would be stronger and easier to assemble using this panel type construction. Each of the panels were fabricated by welding an aluminum extrusion/tube frame structure together, tack welding aluminum sheet to one side, filling the voids with foam insulation, then using a structural adhesive and rivets to place the enclosing aluminum sheet. After the panel was put together we sealed the first sheet and outside sheet using a structural adhesive. Once a preliminary fit test was performed by assembling all eight panels into a cover, they were transported to Nelson Manufacturing in Ottawa Ohio for painting. The panels were painted with a special clean room compatible paint.

Once the panels were painted and given time to dry, AFPTEF personnel traveled to Ottawa to assemble the cover and construct it's mating surface to the trailer deck. We began the process by bolting the water-lip rail and physical stop rail into place on the center section of the modular trailer. Once these were in place and positioned properly, the panels where placed in-between the rails for positioning one at a time and bolted together. It took 356 bolt, washer and lock washer sets to fully assemble all eight panels into the five-sided cover. Once the cover panels were assembled we installed the remainder of the hardware for use and operation, such as the straps for latching the cover to the trailer deck, all port covers, ECS vents, and cover guide posts brackets. The fully assembled cover is 31'-4" long, 13'-4" wide, 11'-2" tall and weighs 6,500 pounds.

Once the cover assembly was completed, the container (cover/ trailer deck assembly) was subjected to the following tests:

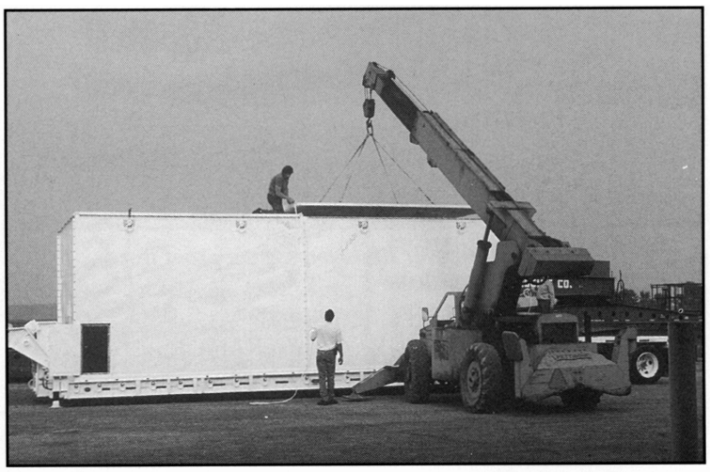
- Cover Lift Ring Pull Test, 20,000 pounds.
- Lift Test, using the lift beam system.
- Rain Test, for seam leakage.

The cover successfully passed all tests and was accepted by NASA. The cover/trailer assembly was delivered to NASA on 8 September 1997.



EOS AM-1 container cover lift test

EOS AM-1 container cover rain test



EOS AM-1 container cover assembly

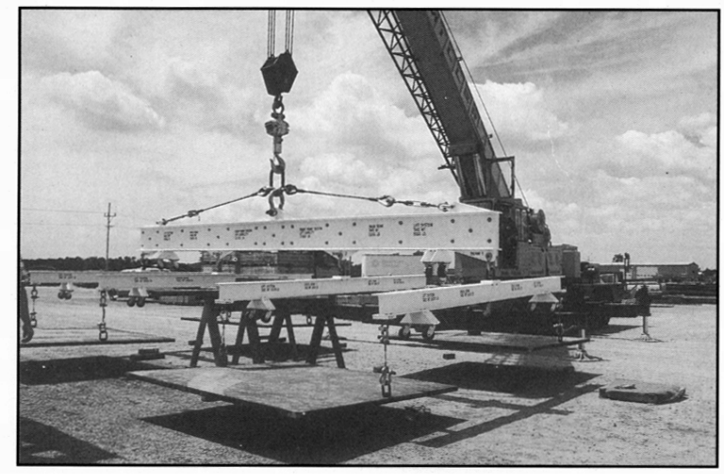
EOS AM-1 COVER LIFT BEAM SYSTEM

by Robbin L. Miller

In order for AFPTEF to meet program cover lift requirements of limited lift height, 20,000 pound crane load capacity, and most importantly not to put a bending load on the cover, a specialized lift system had to be designed. The specially designed lift beam system consists of one main beam and four smaller cross beams and allows an eight point lift on the cover which virtually eliminates any bending loads.

AFPTEF designed the lift beam structure and contracted out the fabrication and testing. The system (main beam) is 25' long, 14'-3" wide (cross beam length), and is approximately 8'-8" tall from crane lift point to cover lift point and weighs 7,000 pounds.

The lift beam system was proof tested by lifting 20,000 pounds, a factor of safety of 2, using an eight point lift. The lift beam system held that weight for 1 hour without any deflection. The beam system passed and was accepted by NASA. The system was delivered with the container.



EOS AM-1 cover lift beam system proof test

C-17 AIRCRAFT SEATS MODIFICATION

by Caroline Buckey

In June of 1997, the C-17 System Program Office requested assistance from AFPTEF engineering and fabrication support in the modification of the C-17 Loadmaster/Observer Aircraft Seat. The engineering support includes designing the modifications, updating the drawings, and acting as a technical consultant on the aircraft seat flammability tests. The drawings and the flammability test reports will be completed by December 1997. Fabrication support includes modifying approximately 100 aircraft seats and their packaging to meet the new requirements. The C-17 loadmaster/observer seats required fabrication modification after developmental testing. This involved removing one side brace, relocating the seat belt harness and associated hardware. The fabrication will be completed by March, 1998.

C-17 aircraft seats packaged in crate

Modified C-17 aircraft seat

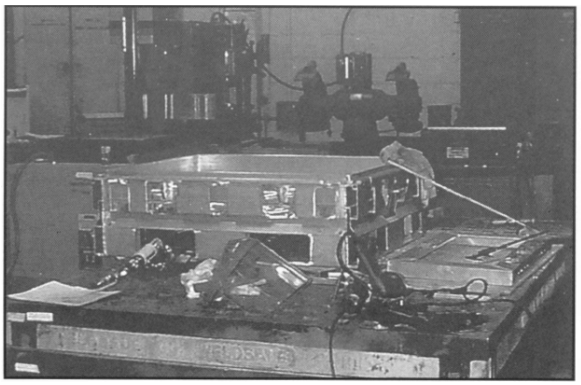
B-52 ALQ-172 LRU CONTAINERS

by Robbin L. Miller

The B-52 System Program Office at Robins AFB (WR-ALC/LNRB) requested the AFPTEF to assist them in solving a packaging problem in which their B-52 line replaceable units (LRU's) were being damaged during transportation to the field units. The repair shop at WR-ALC would send out a working LRU to the field, either Minot AFB ND, Barksdale AFB LA, or a Special Operations Force (SOF) Unit at Hurlburt AFB FL, and when it arrived it was no longer in serviceable condition. This problem was causing shortages of serviceable units which affected aircraft readiness, not to mention the cost of repeated repairs to the same units just to have them damaged before they could be used.

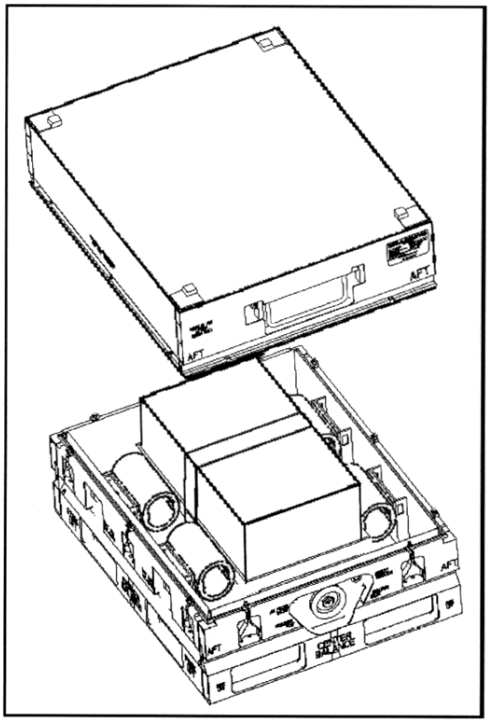
AFPTEF personnel traveled to WR-ALC to investigate the problem. The entire repair, packaging, and transportation cycle was reviewed. After research into the problem it was determined that the items' fragility levels were much lower than the current documented fragility levels. The fragility levels were determined to be 15 G's and not the 20 and 40 G's currently being used in package design.

We approached this problem as two-fold, first, immediately redesign the current short-life containers to reduce damage as much as possible, and then design new containers to solve the problems permanently. We worked with the packaging group at WR-ALC in the redesign of the current short-life containers (wood and fiberboard boxes) to lower their fragility levels. We then began the design and development process for an aluminum, engineered container for long term support.



B-52 ALQ-172 LRU container fabrication

After initial testing of the engineered container, using a polyurethane foam shock mitigation system, it was determined that the foam cushion system would only protect the two heaviest LRU's. The six lighter ones would require a coil mount shock mitigation system. It is very difficult to protect an item to 15 G's using foam cushions as the shock mitigation system (current containers), especially in subzero temperatures. The cradle and shock mount system is being designed to fit into a one size fits all exterior container. This will aid in stacking the containers for deployment and reduce the number of containers in inventory. The engineered container will protect the items from physical damage due to shock and vibration as well as environmental damage from moisture and contamination. It will also reduce the packaging process by eliminating all dunnage such as barrier bags and blocking and bracing pieces currently used in the short-life containers. The engineered containers will allow the users to place the item directly onto the cradle system, secure it with the restraints, and close the cover using the quick release latches.



B-52 ALQ-172 LRU container conceptual drawing

An additional asset of the user-friendly engineered container, is that it can stay with the item from the repair shop to the aircraft and eliminate all the current handling equipment. Once the backlog of repairable LRU's is eliminated, the engineered container also satisfies the long-term storage requirement. The engineered designs should be complete and ready for procurement by early 1998.

250AH LITHIUM BATTERY CONTAINERS

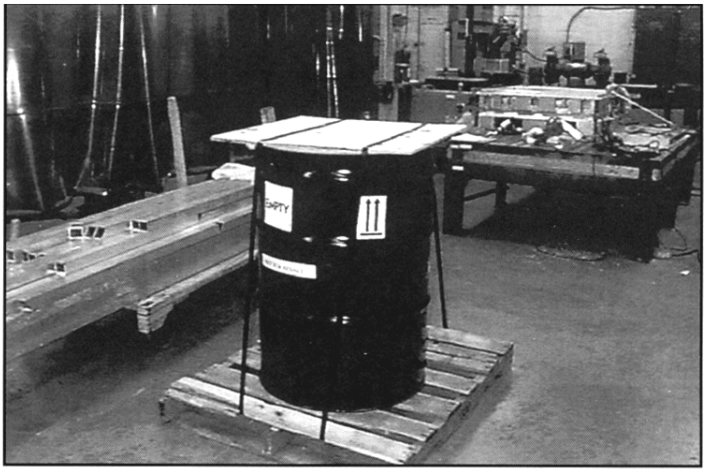
by Keith Vossler

The Martin-Marietta Corporation in conjunction with SAFT of France developed lithium batteries that needed to be transported from Poitiers, France to Cape Canaveral, Florida. The Aerospace Corporation designed a Lexan/Aluminum handling fixture to satisfy the requirements and AFPTEF developed the container and cushioning system. Six fixtures and container systems were fabricated and delivered.

Each battery had to be shipped separately inside an 85 gallon steel drum which was UN certified for shipment of hazardous materials. The cushioning system was designed to attenuate shock to 30 G's.

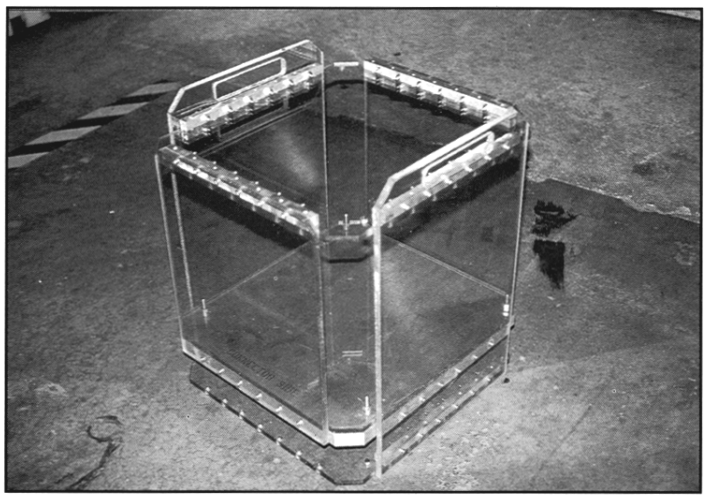
The AFPTEF was requested to repair four of the fixtures and container systems which were missing parts or the parts were worn out. These four fixtures and container systems were brought back into design specification and returned to Poitiers, France for additional battery shipments.

An additional six fixtures and container systems were fabricated and shipped to Pointiers, France in December 1998. Six battery cell adapter plates were also constructed and shipped.

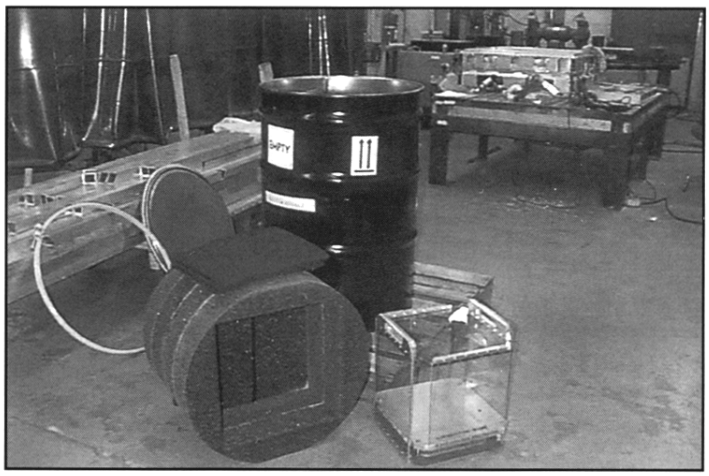


Lithium battery drum container

Carolyn Buckey and Keith Vossler unpacking lithium battery fixture



Lithium battery holding fixture



Lithium battery cushioning and fixture

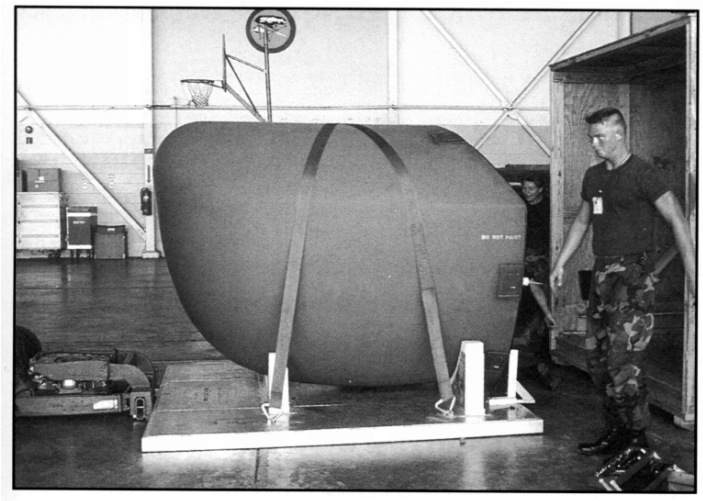
C-130 COMBAT TALON II NOSE RADOME CONTAINER PROCUREMENT

by Keith Vossler

The AFPTEF developed an overseas shipping and storage container for the Combat Talon II (CT II) Nose Radome. CT II is a modified C-130 aircraft designed for special operations. The container is a pressure treated lumber design with an aluminum structural frame to support the nose radome during shipping and storage. The container also houses two aluminum pallets for handling the nose radome. One pallet is used for removing the nose radome from the container and the other is used for handling the damaged nose radome and placing it back in the container. The damaged nose radome can then be shipped for repairs without additional damage.

The CT II System Program Office requested AFPTEF's assistance in procurement of ten additional nose radome containers. The AFPTEF updated the data package, developed the Statement of Work (SOW), evaluated contract proposals, and participated in the first article test.

The contract was awarded to the Champion Company, Springfield, Ohio. Container delivery is scheduled to begin in December 1997.



CT II Nose Radome

NATIONAL AIR INTELLIGENCE CENTER (NAIC) CONTAINERS

by Keith Vossler

The National Air Intelligence Center (NAIC) contacted AFPTEF for engineering assistance. NAIC had a requirement for five commercial transit cases to be modified for specific electronic equipment. In addition, they requested that the cases be configured so that the electronic equipment could be removed and other electronic equipment installed.

The AFPTEF conducted a market survey and determined that a 19 inch (483 mm) wide Electronic Industries Association (EIA) rack, mounted in a transit case, would meet NAIC requirements. A 19 inch EIA rack is mounted at the front and back of each case. The case ends are removable and secured with twist-lock latches. The case length between the racks is 22 inches (559 mm). Rack height is 5U (8 3/4 inches(222 mm)). Case body length is 24 inches (610 mm). Overall case dimensions are approximately 31 L x 24 1/4 W x 14 5/8 H inches (787 L x 616 W x 372 H mm).

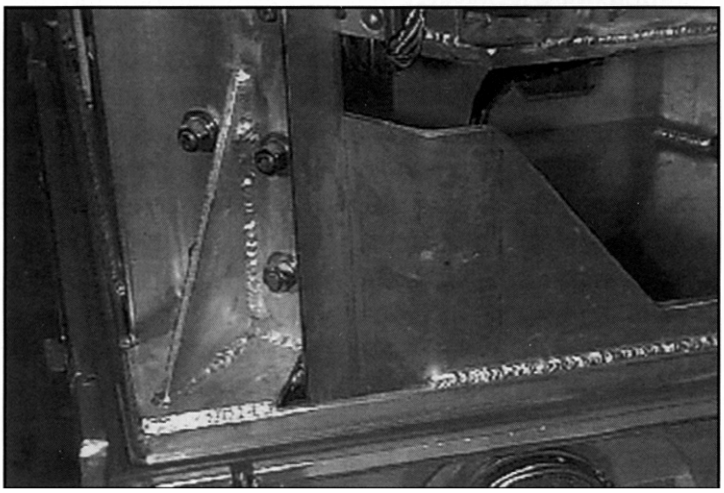
Cases are constructed of 3/8 inch (10 mm) plywood covered with an 0.09 inch (2.3 mm) fiberglass laminate. Two spring-loaded rubber-covered handles are located on each side of the case body. The non-sealing container has an aluminum tongue-and-groove valance. The shock mounting system consists of two inch urethane foam.

Rack mounted slides for electronic equipment were installed in two cases. A fixed shelf was installed in one case. A plate was attached to the front rack in two of the cases. Five cases were procured and modified. The cases were delivered to the NAIC in July 1997.

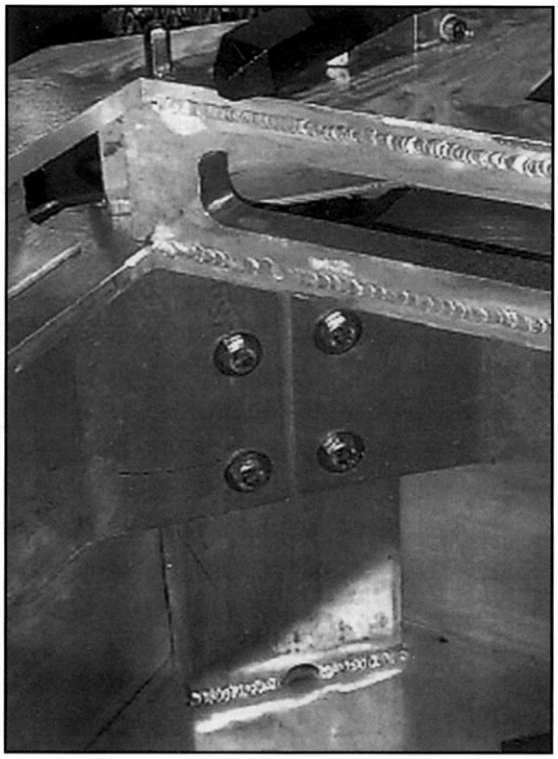
BRADLEY FIGHTING VEHICLE INTEGRATED SIGHT UNIT CONTAINER

by Robbin L. Miller

This project was initiated to design, fabricate, test and provide a production drawing package for the MICOM-ISU container for the US Army Missile Command (MICOM) CCAWS Project Office (SFAE-MSL-CC-LO) located at Redstone Arsenal, Alabama. The container is designed to hold one of three items: the Integrated Sight Unit (ISU), the ISU with BELRF, or the IBAS Target Acquisition System (TAS). The ISU is an item that has been in the field for many years. The BELRF is a new attachment for the ISU, and the TAS is a completely new item designed to replace the ISU.



External view of Cradle Support Structure



Internal View of Cradle Support Structure

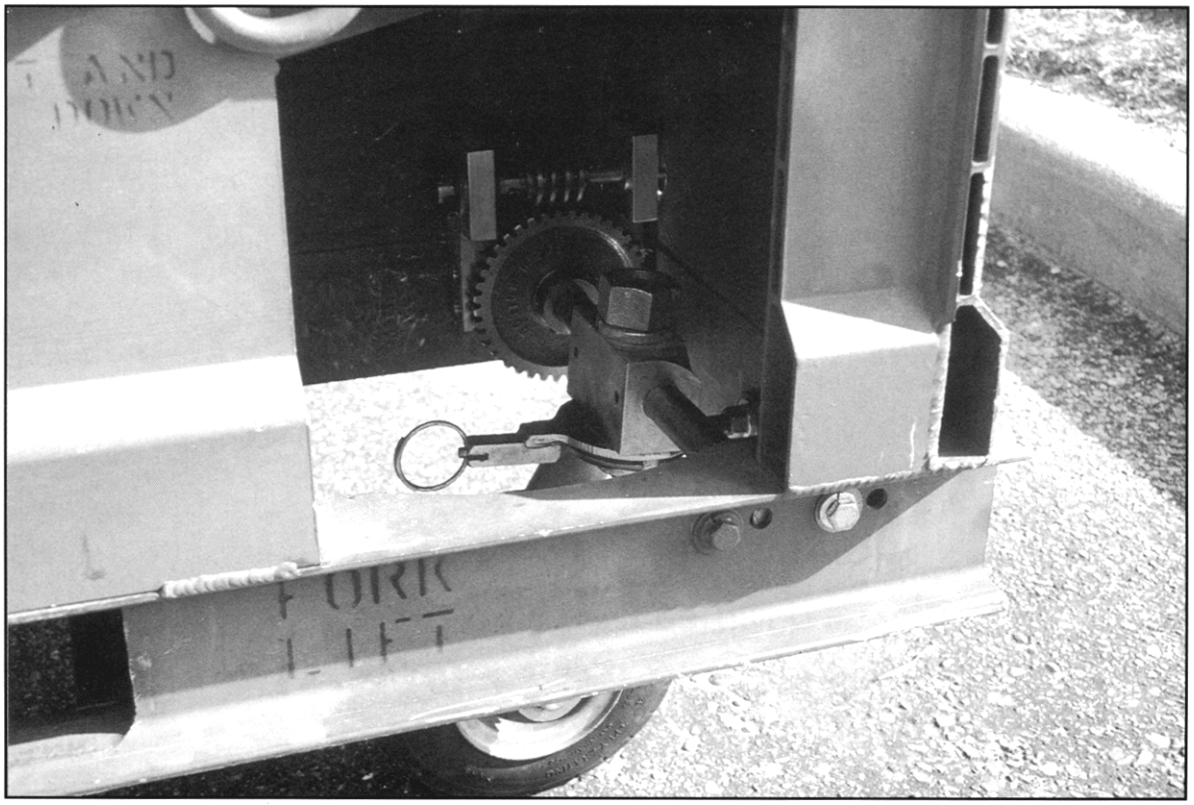
The container utilizes standard AFPTEF extrusion designs. This is an unpainted, welded, controlled breathing, aluminum container. It is a low base design with an internal cradle system that is mounted to the base via four stainless steel cable or flex mounts. Elastomeric shock mounts were tested for this application, but due to the weight of the suspended item and the severity of the vibration tests, the steel flex mounts were chosen. Also, due to the severe vibration requirements (below), the support structure for the cradle was extraordinarily. These design requirements became evident following several failures during the vibration testing at Redstone Technical Test Center.

The vibration tests (above) were performed at the Army Redstone Arsenal test facility because AFPTEF does not have the necessary equipment to perform the required horizontal random vibration or vibration at temperature extremes. Except for the AFPTEF triaxial item accelerometer the instrumentation and equipment were furnished by Redstone Arsenal. A total of 6 test sequences were run: Two test types according to tables 514.4-AI (32 minutes) and AII (40 minutes), on each of three mutually perpendicular axes (vertical, longitudinal, and transverse) at a temperature extreme of 71°C. For the vertical tests the container bottom was fastened rigidly to a vibration table surface oriented to vibrate vertically. For the longitudinal and transverse tests the container bottom was placed on a slip table and the appropriate side fastened rigidly to a vibration table oriented to vibrate horizontally. Full test descriptions, data and conclusions are available in Special Report SR-RD-TE-97-42 from Redstone Technical Test Center, STERT-TE-P, Attn: Leah Green, Redstone Arsenal, Alabama 35898.

ADVERSE WEATHER AERIAL DELIVERY SYSTEM (AWADS) APQ-175 KA-BAND ANTENNA CONTAINER WHEEL MODIFICATION

by Robbin L. Miller

The AFPTEF was requested by the C-130 System Program Office at WR-ALC to provide engineering support in redesigning the wheels on their APQ-175 antenna containers. The container is an aluminum extruded design with a special design feature of wheels for mobility while on the flight-line. The fact that the container has it's own mobility capability built in, eliminates the need for a special piece of ground support equipment. AFPTEF's redesigned wheels allow the field unit personnel to raise and lower the container without the aid of a forklift and without having to reach into the wheel well to manually adjust the wheel height. AFPTEF was to modify the 24 AWAD antenna containers as they were rotated through the supply system. All units have been modified and are successfully being used in the field.



Adverse Weather Aerial Delivery System (AWADS) container wheel modification

ADVERSE WEATHER AERIAL DELIVERY SYSTEM APQ-175 CONTAINER TESTING

by David Filsinger

The AFPTEF Materials & Testing Branch performed qualification testing of the APQ-175 LRU family of containers, AFPTEF project number 94-P-122, for production release by AFMC LSO/LOP. The APQ-175 LRU containers are sealed, reusable, aluminum containers engineered for physical and environmental protection for the APQ-175 Radar Data Processor (RDP), the APQ-175 X-Band Receiver-Transmitter (XRT) and the APQ-175 Ka-Band Receiver-Transmitter (KRT) during transportation and storage. The tests were conducted in accordance with MIL-STD-648A and FED-STD-101C.

Adverse Weather Aerial Delivery System (AWADS) APQ-175 container test

DEFENSE LOGISTICS AGENCY FIBERBOARD PERFORMANCE ORIENTED PACKAGING TESTING

by Susan J. Misra

The AFPTEF, in response to a request from the DLA Operations Support Office, is conducting Performance Oriented Packaging (POP) testing of fiberboard combination packages of various sizes and configurations. We are testing Groups I, II, and III packages for surface modes only. The testing consists of the drop test, one-hour repetitive shock test, stack test, and Cobb test. Information from this testing will be placed in DLA's "PC POP" computer program on the World Wide Web for use by the DoD hazardous-packaging community.

FLEXIBLE FUEL BAG PERFORMANCE ORIENTED PACKAGING TESTING

by Larry Wood

AFPTEF responded to a field request from Ft. Campbell KY requesting performance of the required U.S. and International transportation regulatory requirement tests on sample flexible fuel bags. The contents are to be JP-8 Jet Fuel, which was established to be in 49 CFR Packing Group II. One each bag was supplied for testing, plus a proposed exterior container (Rubbermaid tote box).

The stack test on the Rubbermaid container was based on the 18 gallon quantity. The container failed this test. Permission was granted by the requesting activity to perform the 15 PSI pressure test on the 18 Gallon bag and it failed the pressure test.

AFPTEF researched and identified commercial open head drums capable of meeting the 49 CFR requirements for the Group II liquid and recommended these to the requesting activity. A copy of the test report and recommended containers is available upon request.

Failed Bag with 2 x 4 inserted in torn seam.

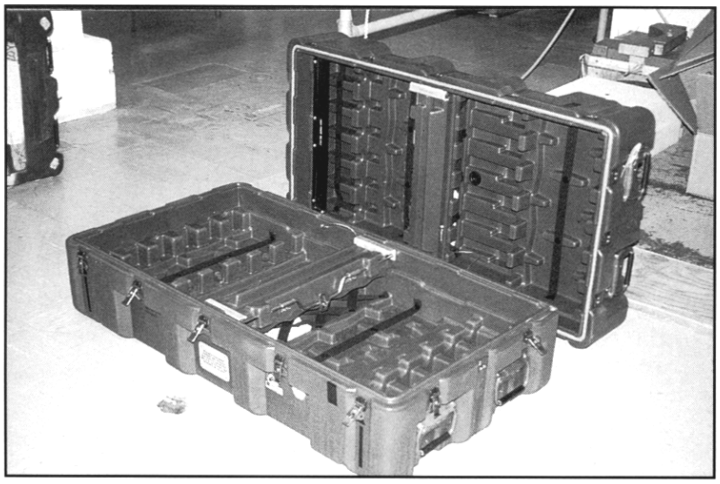
M-16 CONTAINER FIRST ARTICLE TESTING

by Caroline Buckey and David Filsinger

WR-ALC/LKAA requested the AFPTEF to perform first article testing on Contract No. FD2060-96-42801. The contract is a reprocurement of the M-16 containers with Zero Corporation of Monson, MA as the manufacturer of the containers.

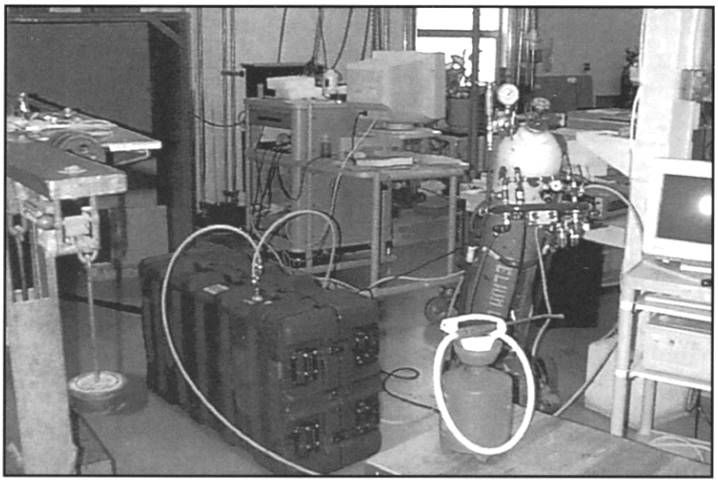
AFPTEF tested the containers in accordance with a previous test plan in conjunction with the M-16 container drawings. The test plan included inspection tests, fit tests, leak testing, drop testing, superimposed-load testing, cover-handle pull testing, and vibration testing.

Interior view of M-16 rifles in used container

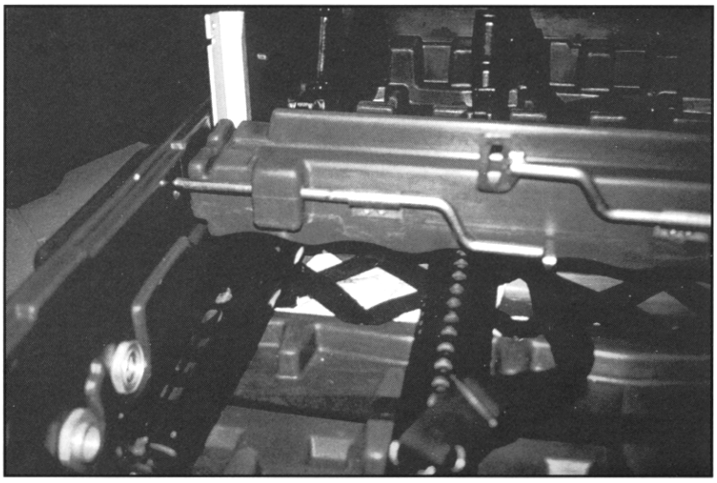


Interior view of new M-16 container

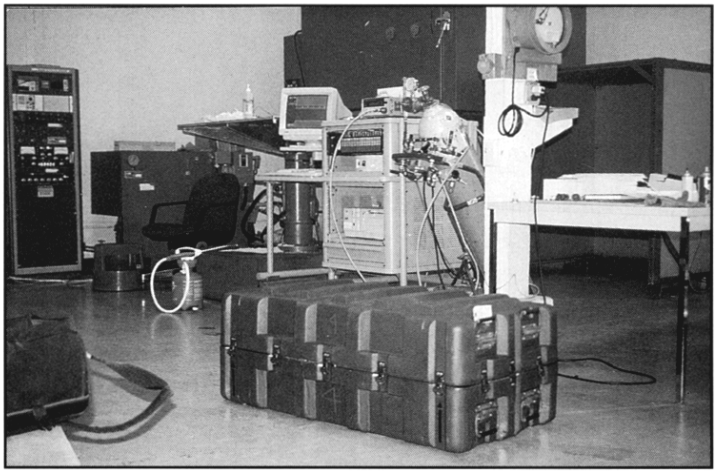
AFPTEF and WR-ALC/LKAA decided to stop testing after the leak tests, because the container had failed the leak test, and because there were fit problems with the restraining bar. Testing will resume after Zero has modified the container to correct the deficiencies.



M-16 container undergoing first article leak/pressure test



M-16 container fit check



M-16 container undergoing first article leak/pressure test

DEFENSE AMMUNITION PACKAGING COUNCIL CUSHION RESEARCH

by Caroline Buckey

In response to the Defense Ammunition Packaging Council (DAPC), AFPTEF commenced DAPC Project J3, "Development of Improved Anti-static Cushioning Materials and Dynamic Performance Testing for Ammunition Containers. This is a joint-service project managed by the AFPTEF and coordinated with the US Army Packaging Division, Picatinny Arsenal, NJ, the Packaging Handling, Storage and Transportability Center at Naval Weapons Station Earle, NJ and the US Marine Corps, Naval Surface Warfare Center, Crane IN.

This year's research consisted of development of cushion curves for anti-static, non-ozone-depleting and non-flammable cushion materials. Container designers will use the cushion curves to determine the cost, type and amount of cushioning needed in the containers to protect the item. Lansmont Corporation is performing the cushion curve testing. To date, they have data and cushion curves on seven of ten materials. The rest of the material data will be completed by January 1998. AFPTEF is analyzing the data and we will determine if the material is suitable for use by the DoD community. If a material proves to be useful, we will update the Package Designer Program and Military Handbook 304, Package Cushion Design.

ENVIRONMENTAL TEST CHAMBER ACQUISITION

by Keith Vossler

The AFPTEF has completed acquisition of an replacement environmental test chamber to perform shipping and storage container conditioning.

Chamber temperature and humidity control is in accordance with MIL-STD-810E, Method 501.3 - High Temperature (I-3.2.e, relative humidity control not necessary), Method 502.3 - Low Temperature, and Method 507.3 - Humidity. Chamber operational temperature range is from -65 to +185° F (-54 to +85° C). Relative humidity can be controlled per, from 20 to 95 percent. Chamber interior dimensions are 15 L x 8 W x 9 H feet (4.6 x 23.4 x 2.7 m).

The chamber is equipped with a two-and-one-half ton (2268 kg) hoist and can accommodate containers up to 10,000 lb. (4536 kg)with use of a forklift.

ADHESIVE-SEALABLE BARRIER MATERIAL TESTING FOR SMALL BUSINESS INNOVATION RESEARCH (SBIR)

by Susan J. Evans

This year AFPTEF continued research for SBIR to identify an easily sealed, recyclable barrier material and/or closure method that approaches or meets the requirements of MIL-B-131 and MIL-B-117. Two contractors were awarded Phase I contracts in June 1997.

The Phase I contracts should result in a choice of new barrier materials and closure/sealing methods that can be used to make barrier bags that meet or exceed the requirements of MIL-B-117. These bags will be useable in the field without the use of additional equipment (such as heat sealers) and will form a strong, complete seal even in the presence of dirt. Reusability and easy recyclability will also make these bags more environmentally friendly than bags made of MIL-B-131.

Phase II proposals were recently requested of the Phase I contractors. Depending on availability of funding, Phase II contracts should be awarded by March 1998. One or both contractors may be selected for Phase II contracts, depending on the evaluation of their proposals. Phase II end products should include final selection of barrier materials and closure methods, and test results for sealed barrier bags using the proposed material and sealing method. Field test results at selected DOD warehouses and activities will be reported. Field testing will include ease of use and how readily the material and method may be formed into sealed barrier bags that meet requirements.

CHIEFS OF AFPTEF:

1952	*Mr W. D. Long*
1952-1955	*Col Rudolph Fink*
1955-1958	*Mr Ralph D. Herring*
1958-1959	*Mr C. E. Kerr*
1959-1961	*Capt Frank L. Weber*
1961-1962	*Capt Paul L. Peoples*
1962-1967	*Capt Neal Crosson*
1967	*Capt Edward Pratt*
1967-1971	*Lt Col Keith F. McElwain*
1972-1973	*Col W.R. Eichelberger*
1973-1974	*Col Walter J. Felker*
1974-1976	*Lt Col Duane C. Oberg*
1976-1987	*Mr Jack E. Thompson*
1988-1993	*Mr Charlie P. Edmonson*
1993-Present	*Mr Leslie K. Clarke III*

MISSION STATEMENTS:

1963

Accomplish Packaging Research and Engineering Program for the U.S. Air Force

1964

Provide within the Department of the Air Force a specialized organization with a packaging engineering capability. This will encompass the investigation, development, testing, evaluation and application of packaging materials,containers, methods and techniques in order to assure dynamic engineering and technical progress in Air Force packaging.

1968

Provide to the Department of the Air Force a single packaging engineering capability and test facility that will be available to all Major Air Commands.

1977

The Air Force Packaging Evaluation Agency provides the Department of the Air Force with a packaging engineering capability that is available to all Major Air Commands and to certain other federal agencies. To assure dynamic engineering and technical progress in packaging, the AFPEA investigates, designs, develops, tests, and evaluates containers, materials, methods, and techniques to insure that logistics packaging requirements are included and life cycle costs are considered.

1980

The Air Force Packaging Evaluation Agency provides the Department of the Air Force with a packaging engineering capability that is available to all Major Air Commands and to certain other federal agencies. To assure dynamic engineering and technical progress in packaging, the AFPEA investigates, designs, develops, tests, and evaluates containers, materials, methods, and techniques. It provides integrated logistics support planning for acquisition programs and assistance to program managers for packaging and transportability requirements.

1990

Provide Air Force packaging engineering capability. Assure technical progress in packaging.

1991

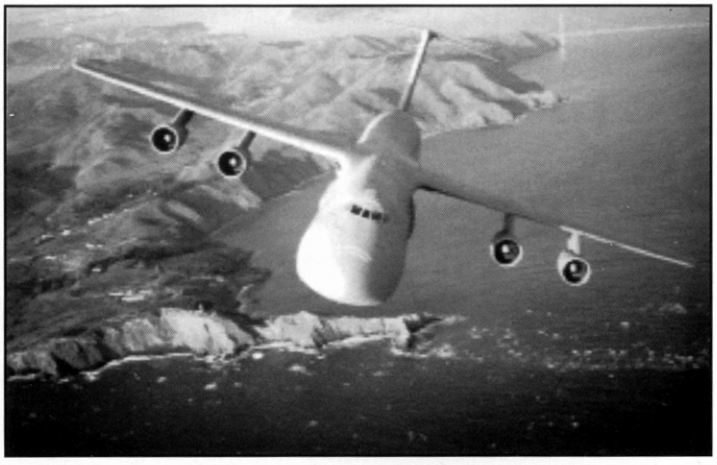
The Air Force Packaging Evaluation Agency provides the Department of the Air Force with a packaging engineering capability and policy guidance and direction on packaging and hazardous materials available to all Major Commands, other DoD activities, and certain other federal agencies. To assure dynamic engineering and technical progress in packaging, the AFPEA investigates, designs, develops, tests, and evaluates containers, materials, methods, and techniques.

1992-Present

The mission of the Air Force Packaging Evaluation Activity is to satisfy our customers' packaging needs in times of peace and war. We do this through management of DoD-wide packaging and hazardous materials policies and programs, container design programs, test and evaluation of containers and materials, and engineering support. We promote continuous improvement of our processes, procedures, methods and policies. Our challenge is to reduce customers' packaging life cycle costs while maintaining quality and environmental sensitivity in our changing global posture.

OUR VISION:

*AFPTEF people building a world-class packaging engineering **Center of Excellence** by providing cost-effective, timely and flexible packaging products and services into the 21st century.*



GUIDING PRINCIPLES:

• We are committed to providing quality service.

We will meet or exceed our clients' needs and, through quality service and programs, help them develop viable and lasting solutions to their problems.

We will be open to change, respond to emergent needs and exercise good judgment and common sense to do a thorough job in everything we do.

• We value our clients. We will:

- provide a solutions-oriented atmosphere that encourages our clients to achieve and sustain technological superiority.

- maintain appropriate and effective communications with commands; and

- work closely and constructively to develop and maintain relationships and alliances with our customers: a team-building philosophy.

• We value our staff.

We will provide our staff with the training, education, and other tools necessary to attain the highest levels of effectiveness and professionalism throughout the organization.

• We are committed to scientific progress for Air Force packaging.

We will provide direct engineering support with air commands in the development of advanced packaging designs and containers for new Air Force weapons systems.

THE HISTORY OF AFPEA/AFPTEF "CELEBRATING OUR 45TH ANNIVERSARY"

by Larry A. Wood

In commemoration of the AFPEA/AFPTEF 45th anniversary we have prepared a short synopsis of our organizational history. This chronology depicts the stormy transitions that the organization has undergone in the years since formation. As a unit, it was formed at WPAFB, moved to Brookley AFB and finally moved back to WPAFB in 1967. This process was then followed by numerous reorganizations, organizational name changes and several contracting out studies.

Prior to 1952, the packaging function was the Packaging Branch, Engineering Standards Division at Wright Field and had been organized under the Army Air Corps. This organization was in existence by about September 1944, as reported by Mr. Al Olevitch, a former employee. Mr. Olevitch was a 2nd. Lieutenant assigned to this organization to work on corrosion problems. On 21 Apr 1952 The Air Material Command (AMC) Organizational Directive 20-670 established the "Packaging Division" of the AFSC Materials Laboratory. This action placed the Packaging Facility one step below laboratory status. In 1955 the Packaging Engineering Section was formed at Brookley AFB. Although some personnel transfers occurred, the organization was largely staffed by Brookley personnel. On 6 Oct 1959 The Packaging Engineering function was formally delegated to ARDC Brookley AFB (MOAMA), per AFR 71-1. And on 22 May 1964 was established as a Named Activity - "Air Force Packaging Evaluation Agency" at Brookley AFB, per Special Order G-29.

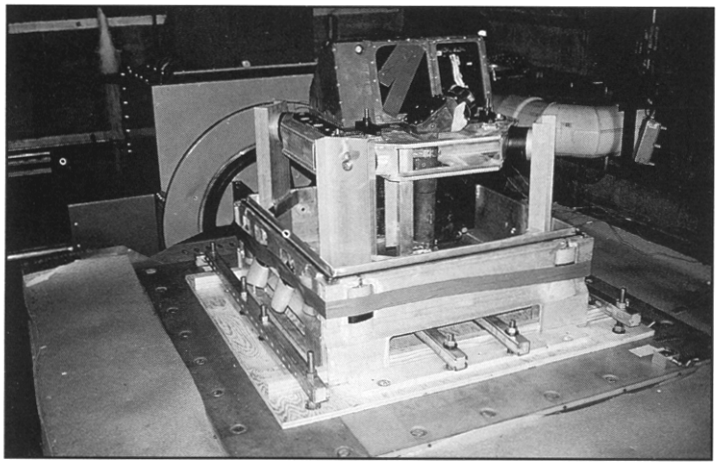
AFPEA was transferred to WPAFB (HQ AFLC) on 6 July 1967. Although this action really began in 1966, the process required considerable time and effort. When Brookley was being decommissioned, a study was begun to assess the value and best location for the unit. The competed study identified the organization as of significant value to be retained and recommended that the work be assigned to a location of importance. The decision to transfer AFPEA to HQ AFLC, WPAFB was based on a few important considerations. It needed to be at a higher organization level to be more effective in carrying out the mission. While at Brookley, AFPEA primarily did work for Brookley. The need to serve a greater customer base was a primary consideration. The proximity of other important Air Force organizations at WPAFB, such as the Materials Lab to provide technical support was also a consideration. Also, a location near the major System Program Offices (SPOs) would provide opportunities to work engineering solutions for new weapon systems early in the development phase.

The transfer took from 1966 to 1970 to complete and attain operational status. A hard dollar cost of $350,000 for facilities renovation was expended. The loss of effectiveness resulting from the move cannot be accurately calculated. Total losses have been estimated to exceed $20 million, mostly due to programs that were adversely impacted by lack of AFPEA support during the move. Additional losses were personnel reassignment, transfer and subsequent rehiring. Of the 41 Brookley employees, only 5 elected to move to WPAFB and two of these people moved back south

within a short time. This required a complete rehiring and organizational rebuilding.

After AFPEA moved to Wright-Patterson many SPO projects were begun. Our most notable projects during the early years were:

Ground Launch Cruise War Reserve Supply Kit
Flexible Engine Container Development
Fire Retardant Fiberboard Containers Evaluation
F-15/A-10 Nested Fuel Tank Container Evaluation
F-16 Fire Control Radar System Reusable Fiberglass Shipping Containers Evaluation
Air Launch Cruise Missile Engine Containers Evaluation/Redign
F-15 LN-31 Inertial Measurement Unit Containers Improvement
Laser Acquisition Electronic Units Reusable Containers Evaluation
F-15 ASN-108 Displacement Gyro Containers Evaluation
F-11 Navigation Computer Handling Aid Design
F-15 Core Engine (F-100-PW-100) Module Container
Developed First Self-Contained Transportation Recorder



During the 1980s, AFPEA was reassigned several times. The two most notable changes were to HQ Air Force Logistics Command (AFLC) by Special Order GA-24, and reassignment to the Air Force Distribution Agency (AFDA) on 16 Feb 1987. The redesignation from Agency to Activity was directed by Special Order GA-11, dated 19 Feb 1987. It was not acceptable to have one Agency working for another Agency.

The mid-1980s saw a major shift in AFPEA workload from just solving problems to pro-actively seeking out Program Office needs and providing specific design solutions for them. This began a new era where we were able to prevent packaging problems instead of trying to field-fix existing containers. Our 1980s projects included:

C-5A Displacement Gyro Packaging and Shipping Analysis
T-38 Displacement Gyro Pack Redesign
F-105 Pitch Rate Gyro Pack Evaluation/Redesign
ALS 30MM CNU-332/E Container Qualification Testing
Air/Ground Launched Cruise Missile Navigation Container Evaluation
MK-82 Bombs Vibration Testing
Ground Launched Cruise Missile War Reserve Supply Kit Container
Maverick Missile CNU-263/E Container Testing (Swiss Air Force)
F-15 Conformal Fuel Tank Container Design Support
F-4/F-15 Redesigned 600-Gallon Fuel Tank Bi-Pac Container Evaluation and Testing
C-130 Combat Talon II KU-Band Antenna CNU-459/E Container Testing
C-130 Combat Talon II Nose Radome Container Design
M-16 Weapons Container Engineering Support
Maverick Missile CNU-399/425 Container Testing
Maverick Missile CNU-445 Container Testing
MSA Biological Chemical Mask Container Testing
F-16 LANTIRN Pod Container Program Design Support

On 1 Jul 1991 the Packaging Policy office was reassigned as a branch of AFPEA and physically moved into Building 70. Even though the Policy group had been co-located with AFPEA in Building 70 during the 1967-1975 timeframe, it was separately managed. This reassignment marks the first merger of these two packaging functions within the Air Force. Concurrently the Air Force restructuring changed the office symbol from HQ AFLC/DSTZ to HQ AFLC/LGTP.

On 1 Jul 1992, Air Force Materiel Command (AFMC) was formed by consolidating the missions,

talents, and expertise of both AFLC and Air Force Systems Command (AFSC). AFPEA officially ended on 1 Oct 94, when the Air Force formed the AFMC Logistics Support Office (LSO) and we were renamed AFPTEF. During the 1990s we greatly expanded our design capability with parametric computer design systems and rapid prototyping. The prototyping was greatly assisted by the addition of numerical-control machining equipment with computer linking. The container testing was also upgraded with the purchase of nearly $1M of new chambers, vibration tables and ancillary test equipment. This put AFPTEF in the position of being one of the best equipped organizations of its type in the government. Notable projects worked on in the 1990s have included:

Transportable Collective Protection System Container System
Department of Transportation Steel Drum Analysis
CNU-502/E Container Qualification Testing
F-15 Windshield Coating Ultra-Violet Radiation Testing (Desert Storm Support)
Department of Justice Steel Drum Testing
F-15 Canopy Container Design and Testing
DoD Flammable Hazard Investigation Incident Management
U. S. Air Force Family of Munitions Containers Design and Testing
MILSTAR Container Group Qualifications Testing
B-52 ALQ-172 LRU Multiple Container Designs and Qualification Testing
U.S. Postal Service Mail Trays Evaluation
United Nations Special Fuels Drum for Transport of Nitic Acid POP Testing
B-1 Oxygen Analyzer Transportation Testing
Air Force Radio and Television Service Video Tape Container Qualification Testing
NASA Lithium Battery Container Design and Transporation Support
NASA Hubble Space Telescope Flight Support System Container Design and Testing
C-17 Crash Recovery Air Bags Container Design and Testing
U. S. Army ATCOM Aviation Spare Parts Containers Design and Testing
U. S. Army MICOM Bradley Fighting Vehicle Integrated Sight Unit Container Design/Testing
JOINT STARS Remote Transportable Memory Modules Transit Case Design and Testing
United Nations Foreign Munitions Containers POP Testing
NASA Earth Observing System Container Design and Testing
United Nations/DLA Hazardous Materials Containers POP Testing

The AFPTEF history is rich with past experience and capability. There are many DoD organizations and programs that we have had positive influences upon. Many customers have repeatedly requested follow on support. Our future will be focused on supporting these valuable customers and searching for ways to support new ones.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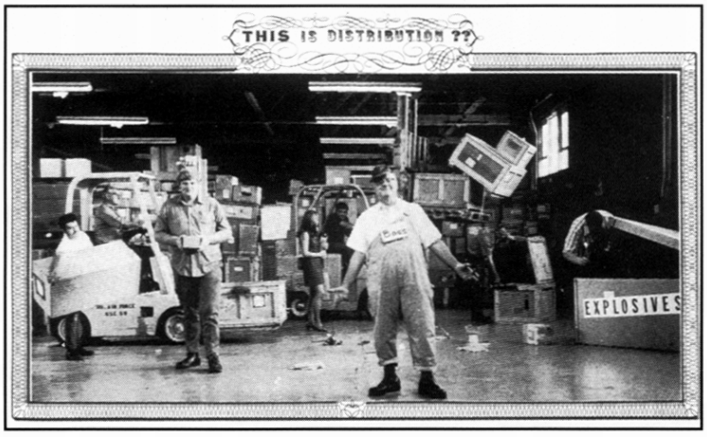
AFJMAN 24-204, PREPARING HAZARDOUS MATERIALS FOR MILITARY AIR SHIPMENTS

by Duane Pfund

A revision to joint service manual, AFJMAN 24-204, dated 1 March 1997 was distributed in July 1997. To allow time for distribution, a transition period to 1 October 1997 was authorized. This revision incorporated major changes to Title 49 CFR and the United Nations Recommendations. Among the more significant were changes to the dangerous goods listing, explosive packaging, training, and addition of the hazardous substance reportable quantity table. Additionally, we focused on modifying and clarifying areas unique to our military operations. The passenger movement criteria was restructured under a major effort to reevaluate how and under what circumstances we move passengers with hazardous cargo. Although this revision allows us to maintain pace with changes in the commercial sector, constant revision is inevitable.

Frequent changes in commercial transport requirements continue to be driven by incidents, technology, public interest, and political motivations. Also, we will continue to concentrate on improving our internal processes by focusing on those areas unique to military air transport of hazardous materials. Forums such as the Hazardous Material Packaging and Transportation Conference provide us an opportunity to interact with all levels of the system and receive feedback from our customers. Our goal is to work with the publications system to reduce the amount of time between revisions, striving for future revision cycle of two-three years.



PACKAGING POLICY

by Michael Werneke

There are many new initiatives taking place that will affect packaging well into the new decade. These initiatives such as the packaging single process initiatives, downsizing, and outsourcing will require constant attention. It is imperative that Air Force packaging personnel work to ensure these new processes still provide the field user packaging that will protect the item (under military conditions when necessary) at the least cost. This has always been and will continue to be our primary objective. We must continue to identify and justify if necessary the need for military packing and preservation requirements. Through the outstanding efforts of all we still have the tools such as MIL-STD-2073-1C and MIL-STD 129 to accomplish this task.

Our office is committed to providing the support you need to accomplish this task. We are continually trying to find new ways to improve our communications and service to our customers. However, we need your help. You are the ones who first identify problems with the process or see ways of improving the process. Only through this type feedback from the field can we truly improve the Air Force packaging process.

Our office can provide expertise on packaging policy, hazardous materials policy, packaging data systems, and packaging and hazardous materials training requirements. You can continue to find valuable information at our two web sites:

http://www.afmc.wpafb.af.mil/Hazmat and http:/packweb.wpafb.af.mil.

As always, if you have any questions or comments please contact anyone in our office or myself.

PACKAGING EXCELLENCE AWARD NOMINATION

by Joan Walker

Our Air Force Packaging Policy office (AFMC LSO/LOPP) is a nominee for the Packaging Excellence Award. This award, created by the Defense Packaging Policy Group, is sponsored by the Office of the Under Secretary of Defense. It was established to increase interest in packaging development, productivity, and efficiency throughout the Department of Defense (DoD), and to improve the overall visibility of DoD packaging functions and accomplishments.

Packaging Policy is a nominee for their creation of the Hazardous Materiel Bulletin Board System (HAZMAT BBS). The web site address is:

http://www.afmc.wpafb.af.mil/Hazmat

The HAZMAT BBS provides an avenue to access hazardous material guidance, clarifications and interpretations of policy, and the PACK YACK information newsletter. Also, digitized images of DOT-Exemptions, Certificates of Equivalency, and Competent Authority Approval documents all reside in the bulletin board, and are available for viewing 24 hours a day.

Packaging Policy is known for proactive packaging programs, such as the HAZMAT BBS, which enhances packaging information transfer to the war fighters and decision makers around the world. This system has global application and is accessed by the Air Force, the U.S. Army, the Navy, the Marine Corps, and the Defense Logistics Agency on a daily basis.

The HAZMAT BBS Team recognized the criticality and difficulty of providing urgent and timely information at all organization levels. The Team undertook the enormously complex tasks of organizing and applying the resources of the Internet to the job of making the HAZMAT BBS system constant, comprehensible and useable toward mission support. The Team's insight and leadership enables customers to solve various problems in a single, integrated approach.

Packaging Policy is proud to be nominated for such a prestigious award, and is dedicated to the goals of packaging development, productivity, and efficiency throughout DoD.

AIR FORCE REUSABLE CONTAINER PROGRAM

by Darryl K. Meade

Savings in logistics costs are being realized by the Air Force Reusable Container Program. By taking maximum advantage of reusing and reclaiming the universally designed reusable containers, packaging costs are reduced. This program is designed to pay minimum cost in packaging and maintaining high levels of protection for assets during storage or shipment. AFI 67-1 and AFI 24-202 outlines responsibilities and overall implementation guidelines for establishing and executing an effective Reusable Container Program. These instructions establishes Air Force-wide reporting procedures and special holding accounts for reusable containers.

F-15C maintenance personnel with the 27th Fighter Squadron unpack equipment and supplies in long-life reusable containers

A key advantage of reusable containers is versatility. Thousands of serviceable and repairable parts require special containers for shipment to repair activities. Containers must maintain a high rate of reuse due to the nature and value of these items and DoD's diverse logistical requirements. About 90% of the items assigned to fastpacks are either in the slide or star type pack. The remarkable versatility of fastpacks is evident when you have over 10,000 line items which can be packed in 4 sizes of slide packs. Consequently, new acquisitions of expensive containers are minimized, labor and materiel costs are reduced, and mission support is enhanced through the continuous flow of serviceable parts. The Reusable Container Program is a efficient and effective program to satisfy the most demanding packaging requirements.

The benefits of reusable containers are apparent in mobility and sustainment operations. For example, F-15C maintenance personnel with the 27th Fighter Squadron at Langley Air Force Base, VA, pack up equipment and supplies preparing for their move to Prince Sultan Air Base, Saudi Arabia. U.S. and coalition forces in Dhahran are involved in Operation Desert Focus, the movement of aircraft and personnel to Prince Sultan Air Base, Saudi Arabia. These forces are flying in support of Operation Southern Watch, which enforces the United Nations-sanctioned no-fly zone below the 32nd parallel in Iraq.

With assigned reusable containers, you know exactly how much space or footprint you need for each pallet position and you can pre-plan accordingly. If you are using a variety of different containers, you would not know what sizes you needed. Reusable containers lends themselves to standardization — shipping a consistent quantity in a consistent way. Standard containers sizes allow full cube utilization of the container, pallet and aircraft fuselage. All of which leads to reduced transportation costs. Standardization ensures your advance load-planning pays off. You know specifically what sizes of containers your parts will be packed in so you can execute load-planning and pallet positioning in the most space effective and efficient manner possible. Assets are offered superior packaging protection and performance in the toughest conditions.

F-15C maintenance personnel with the 27th Fighter Squadron move equipment and supplies in long-life reusable containers

AFPTEF provides a central resource where people can tap our expertise for packaging engineering design, modification, test and evaluation capabilities. Air Force personnel, in particular the reusable container monitors, are to be commended for their proactive efforts in this effective program. Their work saves Air Force funds and provides superior protection and performance of our spare parts — essential to accomplish mission objectives.

HAZARDOUS MATERIAL PACKAGING & TRANSPORTATION WORKSHOP

18-20 November 1997

By Joan Walker

It was hard to believe that two years had gone by since our last conference, but once again, it was time for another Hazardous Material Packaging and Transportation Workshop. After weeks of planning and coordinating, we decided to host the conference at the Crowne Plaza Hotel in Dayton, Ohio. Based upon the responses from our attendees, the majority considered the facilities to be outstanding. And I must quickly add that our conference was an outstanding success also.

We were most happy to greet attendees from around the world who represented every branch of the armed services, and we also had representatives from the Defense Logistics Agency too. This interesting mix added a special dimension to the conference and from it came many informative briefings and discussions.

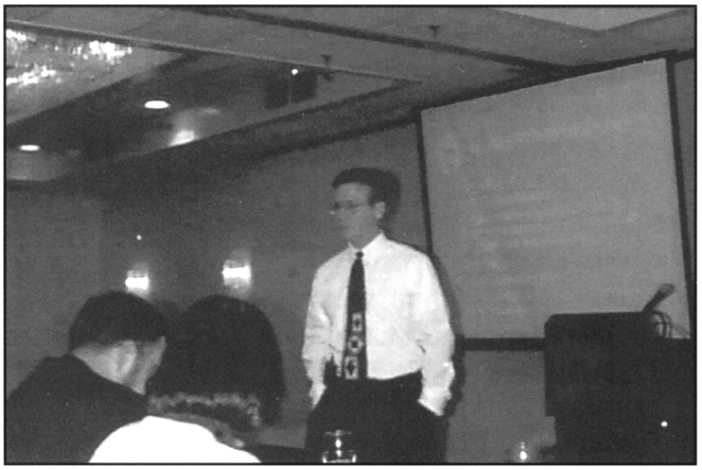
Of course most attendees were there to focus on information pertaining to the preparation of hazardous material for military airlift. Mr. Duane Pfund of our Packaging Policy office enlightened the group with a briefing on this broad topic, and included a comprehensive outline of his completed revision of AFJMAN 24-204. The goal is to publish future revisions every two to three years, and input from our attendees will assist Mr. Pfund in those endeavors.

A wide range of topics were briefed during the three-day conference and a sampling of those subjects includes Department of Transportation issues, the mission of HQ DA/DALO-TSP which is the Army authority for Hazmat transportation, Hazmat training, the Hazardous Material Information System, PC-POP III system that contains DoD POP tested and approved packaging configurations, our HAZMAT Bulletin Board System, and Special Packaging Instruction Development and Distribution System. All topics were well received and generated many rousing debates throughout the duration of the conference.

Be sure to look for more detailed conference information and hazmat information on our web site. The web site address is

http://www.afmc.wpafb.af.mil/Hazmat.

Workgroup discussion on hazmat issues.



Mr. Duane Pfund enlightens the group.

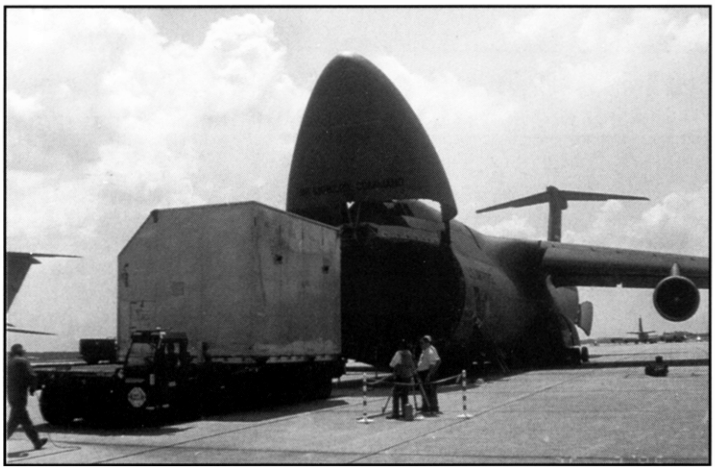
A well-informed audience.

AFPTEF'S DESIGN BRANCH

by Ted Hinds

The AFPTEF's Design Branch works as a team to make sure our customers get what they want and has just completed our busiest year. Team members are empowered to take whatever action necessary to get the work done. The engineers and model makers adjust priorities according to customers needs. The following is a brief description of how customers projects are handled.

The Design Branch has a project review every Tuesday at 0900 during our weekly scheduled staff meeting. The purpose of the staff meeting is to allow cross fertilization of ideas and exchange of information. Marketing leads are discussed to make sure that our customers concerns and inquiries are addressed in a timely fashion. The staff meeting allows the team to discuss the need to follow up with our customers to make sure their concerns have been resolved. Each project is discussed in detail with an excellent exchange of information between the team members. Shop priorities are established based on project schedules. engineering status, and availability of materials. The team members share information freely. Items which come up most often are funds status, problems procuring certain items and trends they have identified that may adversely impact them.



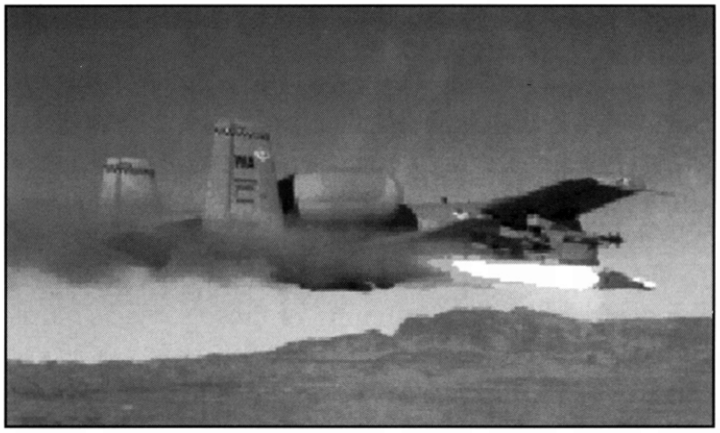
AFPTEF's Design Branch containers offer supior packaging protection, performance, function and value. Shown here is our design-engineered container for the NASA Hubble Space Telescope Flight Support System being loaded on a C-5A Galaxy

AFPTEF HOSTS PACKAGING DESIGN COURSE

by Caroline Buckey

The AFPTEF hosted an on-site session of the Army School of Military Packaging Technology (SMPT) 8B-F16 "Package Cushion Design" class. Wright-Patt Campus provided the classroom while AFPTEF provided the laboratory room and equipment along with technical assistance from the AFPTEF Engineering Staff to facilitate instruction. The two-week course was taught by Mr. John Antal and Mr. Joe Wise from SMPT. The 13 students who attended the course were from SA-ALC, DSCC-Columbus, and AFPTEF.

This was the first time in many years that SMPT has offered this class outside of their own facility at Aberdeen Proving Ground in Aberdeen, Maryland. The two-week course requires a comprehensive list of packaging equipment; including a Vibration Table, a Salt-Spray Chamber, a Container Drop Tester, a Cushion Drop Tester, a Universal Tension-Compression tester, a Mullen-Burst Tester, a Beach-Puncture Tester, a Tear Tester, a Flex Tester and several other pieces. AFPTEF is one of only a few laboratories in the world outfitted with the necessary equipment to teach this course.

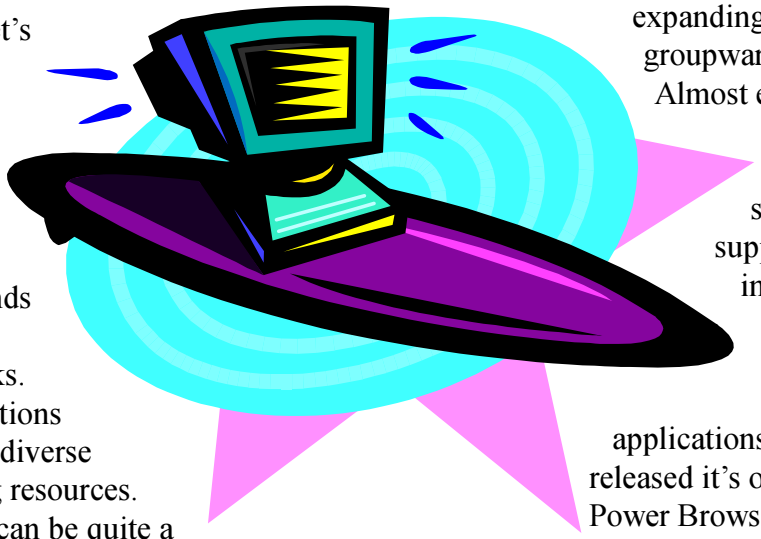


A-10 missile launch

OFFICE AUTOMATION (OA) AND COMPUTER SYSTEMS

By Darryl K. Meade

"Internet", "intranet", what's the difference? By now, you should be well aware that the Internet is the world's biggest collection of inter-connected networks. The most important recent development, of course, is the rapid proliferation of the Internet and the World-Wide-Web (WWW). The ready availability of low-cost Web browsers and servers for nearly every CPU and operating system makes it practical to build attractive, graphically-based, cross-platform applications in a manner unthought of just a few years ago. Through the Internet, organizations are receiving and sending information all over the planet.



It seems that the Internet's open protocols and applications have proven to be universally useful over a mixture of networks, server platforms and workstations. That sounds an awful lot like most enterprise-wide networks. We've all seen organizations trying to integrate their diverse collection of computing resources. We also know that this can be quite a challenging task for most organizations. On the server side, there is a significant investment in legacy systems and many flavors of Unix solutions. For the client workstations, you have windows and Mac advocates each pushing for their workstation.

With all this diversity, how are organizations going to build a cohesive information infrastructure? This is where the Internet's technology shines. Intranet is the latest term to describe when the Internet's protocols and applications are used, not for accessing the vast resources on the Internet, but for moving information within an organization's boundaries. Organizations who have focused on using the Internet for external purposes, are now realizing that these same applications can also be used internally. Almost all the organizations I have worked with are making significant amounts of information available through internal web pages.

Sandia National Laboratories has developed an extensive intranet with every major department having its own home page. Sandia has a diverse set of server platforms and client workstations. It was this diversity in operating systems that made a web-based solution so attractive, because the web servers and clients ran on all different platforms.

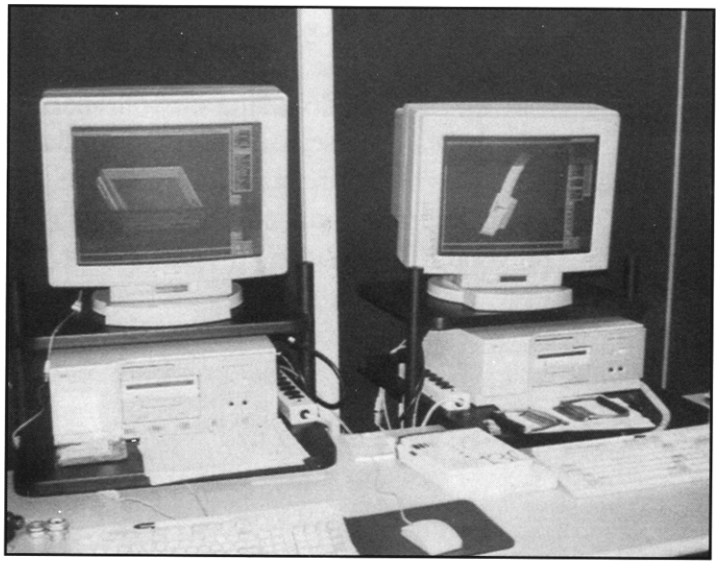
Traditional groupware applications are becoming web-capable, and web technology is rapidly expanding to incorporate traditional groupware functions. Almost every major vendor from IBM, MicroSoft, Novell and Oracle are making sure that their products support web protocols. This inclusion of web functionality is occurring on both the server and client side of most major groupware applications. Oracle, for example, has released it's own web browsers called Power Browser and WebServer - both with strong support for Oracle's databases. IBM/Lotus' InterNotes Web Publisher automatically publishes Notes documents and forms to the Web, translates them to HTML and captures information from forms submitted via the Web, incorporating it into Notes applications.

The internet and intranet world will lead to a more flexible future that will enable people to put the building blocks together in a way that's meaningful to communications infrastructure.

SOLIDS-MODELING SYSTEMS

by Robbin L. Miller

The AFPTEF was able to purchase a new engineering work station this year for use in the design and development of containers. The new system, a Hewlett Packard C200 model, was benchmarked against the systems we currently have in-house. The new system was able to perform the same design tasks in 1/10 the time. We hope to be able to replace our older systems with the newer models within the next year or so. We recently upgraded our PRO-E, 3-D solids modeling software to version 18.0. We also added a new analysis/optimization software module offered by Parametric Technologies called Mechanica. Mechanica works in the PRO-E environment and allows the PRO-E model to be used directly in the analyses. The big highlight of the software is that it completes the meshing and convergence automatically. This new module will allow our engineers (even the non-FEA users) to model parts and determine failures and eliminate them before their ever fabricated.



Solids-Modeling AutoCad workstations

HAZARDOUS MATERIALS INFORMATION SYSTEM

by Tonita L. H. Davis

The Hazardous Material Information System (HMIS) is a central repository for Material Safety Data Sheets (MSDS) on hazardous materials purchased by the Federal Government. This information is distributed quarterly. If you desire to get on the CD-ROM distribution, contact your service focal point. The program manager for HMIS is DLA/DLSC located at Battle Creek MI and the functional manager is DLA/DSCR at Richmond, VA.

The development operation for the website is contracted out to DLA/DSDC and the Navy. Even though HMIS will be accessible through the internet, the CD-ROM product will continue to be distributed. Just like the CD-ROM product, the on-line version will have the following search options: manufacturer's product identify (part number/trade name), NSN or LSN, CAGE Code, company name, Chemical Abstract Services (CAS) number or a combination of fields search. The system allows the user to do a wild card search such as inputting partial information. To date, a search can not be performed using universal product code (UPC). Explosives are not included in HMIS. To get the current status on the availability of the HMIS website, you may go to the following website:

www.dlsc.dla.mil.

The schedule is to have the HMIS operational and on-line for all users in March 1998.

AIR FORCE HAZARDOUS MATERIALS BULLETIN BOARD SYSTEM

by Darryl K. Meade

We made considerable progress in 1997 in our efforts to capitalize on the efficiencies and capabilities provided by automated systems, in particular the ever-expanding World Wide Web. The HAZMAT BBS provides an additional avenue for access to hazardous material information and contains clarification and interpretation messages issued by our packaging policy office. In addition, digitized images of DOT Exemptions, Certificates of Equivalency and Competent Approval Authority documents are available for viewing. The AFJMAN 24-204 revision is available for download. The HAZMAT BBS is accessible 24 hours a day. Come check out the HAZMAT BBS at:

www.afmc.wpafb.af.mil/Hazmat

The HAZMAT BBS facilitates proper packaging of military iar shipments of hazardous materials and enhances packaging information transfer to the warfighters and decision makers who need it the most. The HAZMAT BBS is used world-wide by the Air Force, Army, Navy, Marine Corps and DLA. They rely on the integrity of the system for their day-to-day mission.

"PACKWEB"

by Carey Scott Gravenstine

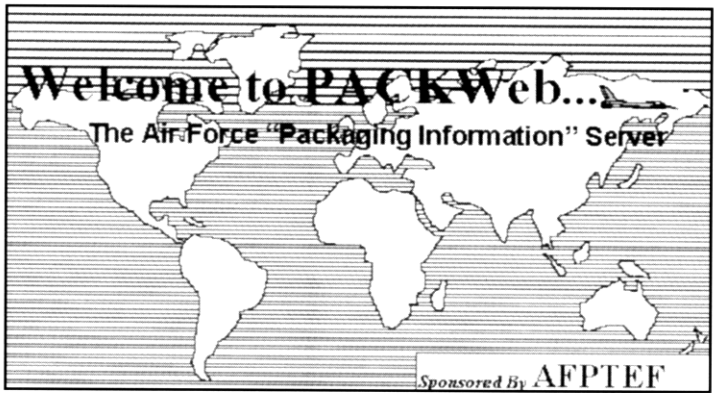
"PACKWeb", provides information that relates to the Special Packaging Instruction Development and Distribution System (SPIDDS), the HAZMAT BBS, AF Packaging POCs, AFPTEF Engineering reports, and Tri-Service Coordination which includes efforts from the Container Design Working Group, the Cost/ Container Data Base and a Vendor Listing specific to container design. Additional packaging information is also available with pointers to the efforts from other Services.

The customer can click and review a world of packaging information at URL:

http://packweb.wpafb.af.mil

or

http://www.packweb.wpafb.af.mil.



AF SPECIAL PACKAGING INSTRUCTION DEVELOPMENT AND DISTRIBUTION SYSTEM, (SPIDDS)

by Carey Scott Gravenstine

The Special Packaging Instruction (SPI) Development and Distribution System (SPIDDS) started as an AF initiative designed to support the AF and DoD customer in getting critical packaging information in a timely fashion (Ref. AFPTEF Annual Reports 1993 pg. 27, 1994 pg. 20-21, 1995 pg. 17, and 1996 pg. 25).

SPIDDS and the AF SPI Team support over 10,000 AF SPIs for "distribution". With our main focus on "you the customer" we are making access to AF SPIs easy and available any time, any day, from anywhere. To prove it we took such philosophy and put to work structured around three basic mechanisms:

1. Our customers can find the SPIDDS "home page", where SPIs are conveniently formatted in the MS Word, at:

http://packweb.wpafb.af.mil/spidds

2. Customers can also use a basic file transfer process (FTP) to get the very same SPI formatted in MS Word. Connection can be made to:

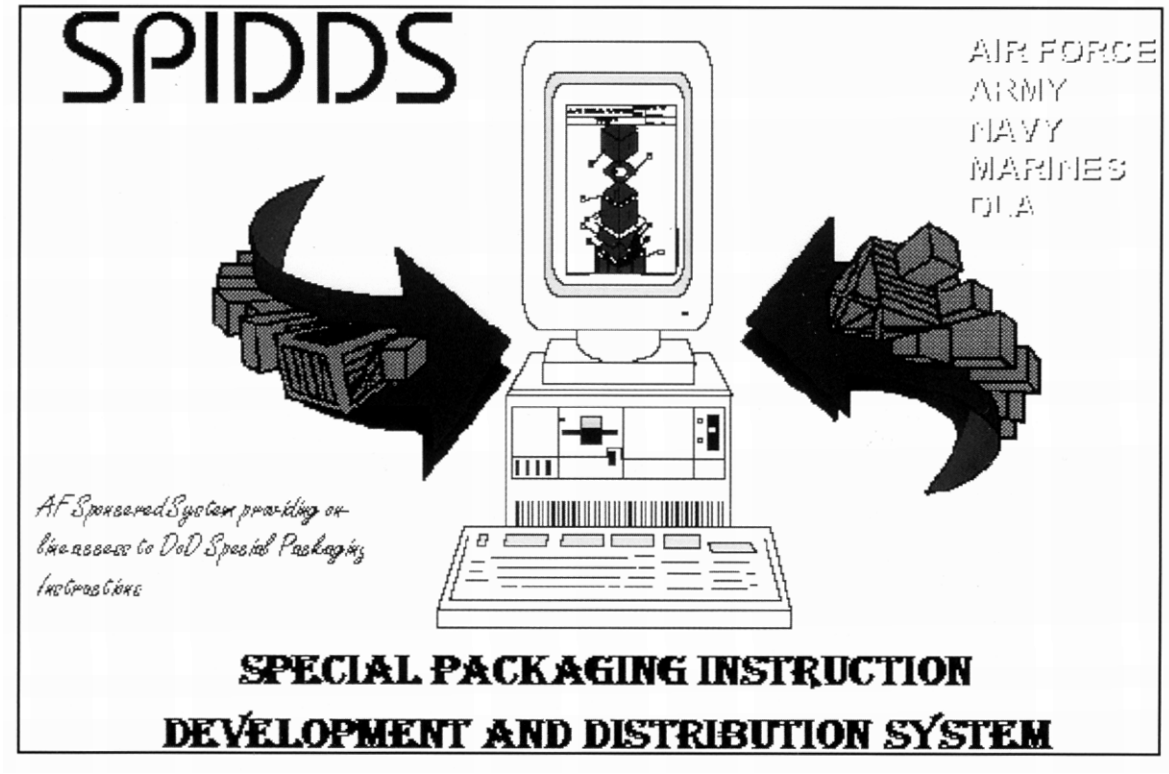
ftp://packweb.wpafb.af.mil

userid "anonymous" and your EM address for a password to obtain access.

3. Most customers though still do not have computer connectivity, therefore, we have created the "simplest way" to get a SPI. And it is called "SPIbyFAX". Customers can dial, using their touch tone phone, DSN 986-1860 or Commercial (937) 656-1860, answer a few questions and the system will fax SPIs on demand. Again, the very same MS Word formatted SPIs.

Beginning in the 2nd quarter of FY98 all AF SPIs will be available by SPI/NSN cross reference search. Just another improvement to help expedite how our customers can get Special Packaging Instructions.

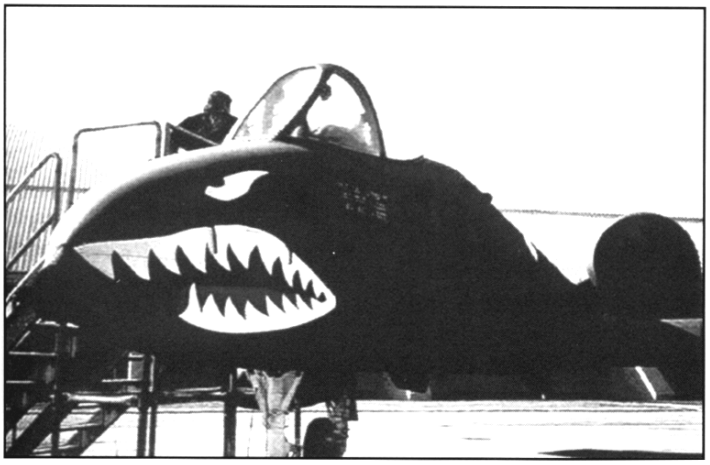
From the SPI Team: Thanks for your support.



CONTAINER DESIGN WORKING GROUP (CDWG) TEAM

by Ted Hinds

The Container Design Working Group (CDWG) Team has made some significant progress in working to standardize container hardware, container design, and ensure a crossfeed of information between the services. The team met two times during 1997 and worked on various projects. The CDWG Team completed work on the Pressure Relief Valve and the Humidity Indicator Specifications. We forwarded the documents to the Society of Automotive Engineers (SAE) EG-1D subcommittee on Packaging, Handling, and Transportability for formatting and review. The SAE EG-1D subcommittee completed work on and released the Air Filling Valves Specification AS5017 and the Desiccant Port and Desiccant Holder Specification AS5135. These specification documents have been coordinated with and adopted by DoD.



A-10 Warthog

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

by Ted Hinds

The AFPTEF participated in the EG-1D subcommittee on Packaging, Handling, and Transportability. The AFPTEF solicits your assistance in reviewing documents and identification of new projects such as ground support equipment, including containers, traitors, etc. that would provide a benefit to both DoD and private industry. During the past year the committee worked on the following documents:

ARP1967, Container, Shipping & Storage Aircraft Engines and Modules, Reusable: This document has been adopted by DoD. This document can be used as a baseline for all container designs. The document can be tailored to meet program requirements by reviewing the document and writing a one or two page statement or work. This eliminates the need to write a new specification for each new container design. SAE ARP 1967 can be used replace MIL-C-5584 and MIL-C-4150 which have been canceled.

AS5017, Air Filling Valves: The SAE EG-1D Subcommittee completed work on and released the Air Filling Valves Specification AS5017. The document has been coordinated with and adopted by DoD. The Air Filling Valve is used on reusable engineered containers. It allows the container to be pressure tested without having to remover the cover. This test is done to allow verification of the containers ability to hold pressure.

AS5135, Desiccant Ports and Desiccant Holder: The SAE EG-1D subcommittee completed work on and released the Desiccant Port and Desiccant Holder Specification AS5135. The document has been coordinated with and adopted by DoD. The desiccant port is used to provide ready access to the desiccant inside the container in lieu of removing the container cover.

AFPTEF STANDARDIZATION WORLD

by Caroline Buckey

The Standardization World has changed much in the last few years. The Military Standardization and Simplification Reform Group which is comprised of DOD Standardization Representatives has spear-headed a movement to reduce, and in the case of the AF, to eliminate Detail Specifications. Many of these Detail Specifications were either canceled, transformed into performance specifications, transferred to DLA, or converted to Industry Standards.

This past year our standardization activity updated preparing activity documents, reviewed and coordinated on many other DOD standardization documents and issues. We also participated in the MSSR Workshops and Video-teleconferences so we could keep up with the many changes in the Standardization World.

F-22 Raptor

Below is a listing of the preparing activity document transactions from the past year:

- ***MIL-PRF-83671B — Completed***
- ***MIL-HDBK-304C — Completed***
- ***Polyethylene CIDS to replace PPP-C-1752, which was canceled. — Completed***
- ***A-A-59135 — "Packaging Material, Sheet"***
- ***A-A-59136 — " Cushioning Material, Packaging, Closed Cell Foam Plank"***
- ***DOD Adoption of SAE ARP1967 — Completed***
- ***DOD Adoption of SAE AS5017 — Completed***
- ***DOD Adoption of SAE AS5135 — Completed***
- ***MIL-C-83669 Transfer to DLA — Completed***
- ***MIL-B-8111 Cancellation — Completed***
- ***MIL-C-4150 Cancellation — Completed***
- ***MIL-C-9897 Inactivation for New Design — Completed***
- ***MIL-V-27166 Inactivation for New Design — Completed***
- ***MIL-B-26195 Inactivation for New Design — Completed***
- ***MIL-I-26860 Inactivation for New Design — Completed***
- ***MIL-C-9897 Inactivation for New Design — Completed***

For a complete listing and status of our documents see the Specifications Section on Pack Web Home Page at:

http://packweb.wpafb.af.mil/specs/index.htm.

AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM) COMMITTEE D-10

by Keith A. Vossler

The AFPTEF is represented on the American Society For Testing and Materials, ASTM, Committee D-10 on Packaging. The scope of this committee is the promotion of knowledge in, and the development of standards for packaging. Standards include terminology, practices, test methods, specifications, guides and classifications (including dimensions). AFPTEF is a voting member of the committee and reviews the ballots for Division I, General, and Division II, Shipping Containers, for issues affecting the Air Force. A few of the D-10 Subcommittees and Task Groups AFPTEF has been active in during the past year are listed below. The ASTM/DoD Federal Agencies Packaging Liaison Group addresses mutual government/industry packaging issues. The Group is identifying and prioritizing which government packaging specifications should be converted to ASTM specifications. A decision has been made to convert MIL-B-117, Bags, Sleeves, and Tubing to an ASTM Specification. PPP-C-2020, chemicals, Liquid, Dry, and Paste: Packaging of, is currently in the conversion process. The D10.26 Subcommittee on Shipping Containers is converting several Military and Federal container specifications into ASTM specifications. The following documents will go to ASTM subcommittee and main committee ballot concurrently in January 1998:

- ***PPP-B-576 - Wood-cleated Panelboard Boxes***
- ***PPP-B-587 - Wirebound Pallet Type Wood Boxes***
- ***MIL-C-9897 - Slotted Angle, Steel or Aluminum Crates, For Lightweight Airframe Components and Bulky Items,***
- ***MIL-B-26195 - Load-bearing Base, Skidded, Wood-cleated Boxes***

The following documents are scheduled for ASTM subcommittee ballot before the April 1998 meeting:

- *MIL-B-46506 - Wood Ammunition Packing Boxes*
- *MIL-C-52950 - Open and Covered Wood Crates*
- *MIL-C-52950, Crates, Wood, Open and Covered, has been released as ASTM D6039/D6039M, Standard Specification for Crates, Wood, Open and Covered.*
- *MIL-STD-731 - Quality of Wood Members for Containers and Pallets, will be release as an ASTM Standard by the end of 1997.*

The AFPTEF was co-task group chair of the D 1596 (Dynamic Shock Cushioning) Test Method revision as part of the D10.13 Subcommittee on Interior Packaging. The test method was updated and a precision and bias statement developed. The test method passed main committee ballot and is not scheduled for revision for five years. The task group was disbanded and will reactivate if technical issues need to be addressed, or prior to the next document revision.

B-2 Bomber

MIL-HDBK-304 REVISION

by Caroline Buckey

AFPTEF completed the revision of MIL-HDBK-304 on 1 Jun 97. MIL-HDBK-304C, Package Cushioning Design, is the primary document for the design of package cushioning for the Department of Defense. MIL-HDBK-304C brings the previous 1978 edition up-to-date technically and makes it more user-friendly. The document was pared down from 500 pages to 100 pages. MIL-HDBK-304C is a military textbook used by the School of Military Packaging Technology, military packaging engineers, industry designers, and universities.

The following are some of the changes in this revision:

• *Conversion to both English and Metric Units*

• *The Sections have been arranged in a Six-Step Design Approach*

• *Previous version's Chapter 5 (MIL-C-26861 - Ramifications in Cushioning Design) has been deleted*

•*The cushion curves in the appendices are now computerized*

•*Figures have been incorporated into the text*

•*Reflects changes to the Cushion Design Computer Program now called "Package Designer"*

•*An Index has been added*

MIL-HDBK-304C
1 June 1997
SUPERSEDING
MIL-HDBK-304B
31 October 1978

DEPARTMENT OF DEFENSE HANDBOOK

PACKAGE CUSHIONING DESIGN

This handbook is for guidance only. Do not cite this document as a requirement.

AMSC N/A

AREA PACK

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

F-15 Eagle

ASTM/DOD/FEDERAL AGENCIES LIAISON GROUP ON PACKAGING PARTNERSHIP BEFORE IT WAS POLITICALLY CORRECT

THE FIRST 20 YEARS: A SHORT HISTORY

DEDICATED TO BOB MCGILL

The ASTM/DoD/Federal Agencies Liaison Group on Packaging was founded in 1978 for the purpose of identifying, examining, and actively encouraging development of non-Government standardization documents in the packaging area capable of satisfying DoD's, as well as industry's, requirements. The kernel of the idea that became the Liaison Group began with a discussion between two old friends, one the head of the packaging office at the Army's Communications-Electronics Command, and the other from industry, who worked closely with DoD packaging people and who was active in ASTM Committee D-10 on Packaging. The idea was that both the military and the private sector could benefit if there were a means for DoD and industry to regularly get together for discussions of mutual concerns. The upshot of this discussion was the attendance by the heads of military packaging offices at the Fall 1977 D-10 meeting in Philadelphia. This meeting resulted in a decision to organize a formal liaison group consisting of D-10 representatives and DoD packaging people. Douglas Reeves of the Defense Materials Specifications and Standards Office was enlisted to facilitate DoD's formal involvement through the DoD Standardization Program, which would provide high level visibility to the effort within DoD.

A meeting was held at ASTM Headquarters in Philadelphia on April 11, 1978 involving D-10 Chairman Chester Gaynes, Mr. Reeves, and others to discuss the formation of a liaison group. Shortly following this meeting, Mr. Gaynes sent a letter to Mr. Reeves advising that he had appointed Caryl Twitchell to represent the Society as the ASTM co-chairman of the liaison group, with Harlan Behrendt and Fred Ostrem to be members representing D-10. Upon receipt of this information, Doug Reeves' boss, Lester Fox, Director of the Defense Materials Specifications and Standards Office (DMSSO), sent a letter to the Army's Packaging, Storage and Containerization Center at Tobyhanna, PA directing that the Center establish and chair the DoD segment of the group. The Packaging, Storage, and Containerization Center was the logical choice, since the Center was assigned as the DoD manager of the PACK Area of the Defense Standardization and Specification Program, which included all military and federal standardization documents dealing with packaging.

Each of the Services and the Defense Logistics Agency was asked to provide a member of the new group. The General Services Administration was invited to participate, because that agency had worked with ASTM in the past. Citing inadequate resources to support the activity, they declined at that time to be a participant. DoD representatives were Mike Noll, representing Army and the DoD co-chairman, Howell Brissey of the Defense Logistics Agency, Matthew Venetos from the Air Force, and Mike Bebel representing the Navy. Betty Preston of the ASTM staff was assigned to serve as the Society's liaison representative.

ASTM/DOD/FEDERAL AGENCIES LIAISON GROUP ON PACKAGING ORIGINAL PERMANENT MEMBERSHIP

Caryl E. Twitchell, 3M Company
Fred Ostrem, GATX
Harlan Behrendt, Blocksom & Company
Michael W. Noll, Army
Howell E. Brissey, Defense Logistics Agency
Matthew Venetos, Air Force
Michael Bebel, Navy

The first formal meeting of the Liaison Group took place at Tobyhanna, PA on July 28 - 29, 1978. In addition to the official group members, Douglas Reeves, Robert McGill (later D-10 chairman) and Rolland Seely attended as guests. At this meeting, two proposed ASTM specifications, covering metal and plastic strapping materials, were discussed as possible replacements for existing Government documents on these materials. Thus began the work of the

Liaison Group. The two resulting specifications, D 3950 and D 3953 are in use today as DoD adopted standards, and the corresponding Government documents have long since been canceled. A companion Standard Guide was later developed to be used in conjunction with either of the material specifications to provide information on the use/application of the strapping materials.

As early as 1972, the DoD packaging community had recognized that there was a great deal of interest in the Government's use of commercial products and services. It was known that the Office of Management and Budget was finalizing its Circular A-119, *Federal Participation in the Development and Use of Voluntary Consensus Standards*, and it was becoming apparent that there would be a hard push for the military to institute programs to take advantage of non-Government documents describing commercially available products and services. The DoD packaging policy community acknowledged the need for a more modern approach and made a major change in military packaging policy by eliminating what had been known as "level C." This was the very minimum military packaging (frequently only remarked vendor packaging) and it was replaced by a new category called "commercial packaging."

It became obvious immediately that there had to be guidelines for this type of packaging to prevent an influx of bulk-packed or unpreserved materiel into the military distribution system. The Army, the DoD lead for policy development, requested approval from GSA, the Government agency responsible for all federal specifications and standards, to develop a federal standard to establish these guidelines. After a great deal of consideration, GSA granted approval for the development of Federal Standard No. 356, *Commercial Packaging of Supplies and Equipment*. Following publication of the standard, GSA became unconvinced that there was truly a need for this type of document. That agency had, for many years, purchased commercial products and services routinely, and had seen no need for any such packaging document. (One reason was that much GSA materiel is distributed within the continental United States, directly to users, with little or no redistribution. DoD, however, has a world wide distribution system, and its materiel may be stored and reshipped many times, often to areas with limited or nonexistent storage facilities.) Also, GSA was struggling with policies, such as the Paperwork Reduction Act of 1974, that mandated the elimination of many documents that were considered unneeded. As a result, they canceled Fed. Std. No. 356 without replacement. The DoD still believed that guidelines were necessary, and proceeded to develop a military standard (MIL-STD-1188) to fill the need.

The Liaison Group took note of this standard, and proposed that it be redeveloped as an ASTM document that could be used by both the private sector and the military.
The proposal was taken to the Technical Steering subcommittee of D-10, where it was approved and the task assigned to Subcommittee D-10.14 on Closure and Reinforcement. The result was D 3951, *Standard Practice for Commercial Packaging*. A complete list of ASTM standards that have resulted from the efforts of the Liaison Group appears at the end of this narrative.

The Liaison Group immediately flourished. As time went on and military interest in non-Government standards grew, largely because of mandates such as OMB Circular A-119, the meetings of the group attracted an increasing number of curious onlookers. Many of the visitors were dubious of what the group was doing, but somehow seemed to know that this was the wave of the future. As the group continued to expand, the General Services Administration began to participate intermittently , finally becoming a "regular" at every meeting. Other civil agencies of the Government began to participate as well, including the Federal Aviation Administration, the Department of Agriculture, and others. In 1989, the group approved changing its name to recognize this expanded Government participation, and is now known as the ASTM/DoD/Federal Agencies Liaison Group on Packaging.

The increased involvement of Government personnel is apparent when one compares recent attendance to that of the meetings in the early years. The Liaison

Group continued to facilitate the initiation of new work for D-10 and other ASTM committees. Having had success with the two ASTM standards for strapping materials, other conversions of Government specifications for specific materials were undertaken. As time went on, more materials and item documents were inducted into D-10 and other committees to serve as the basis for ASTM documents. Among these are specifications for fiberboard sheet stock, packaging tapes, fabrication specifications for fiberboard and wood boxes, wood and metal crates, and many others. As can be seen, the work load of D-10 has been augmented substantially through the efforts of the Liaison Group

Since 1994 the Liaison Group has experienced a notable increase in its activity as the result of the Secretary of Defense's Acquisition Reform Initiatives. This program is an outgrowth of the National Performance Review, and a major component of its initiatives was a total reform of the specifications and standards program within DoD. The goal of this effort was to significantly reduce the number of military specifications and standards and streamline the DoD document inventory. Large numbers of military documents were canceled without replacement between 1994 and 1997. These included many packaging specifications and standards that were used daily by DoD and contractor personnel in the preparation of military supplies for shipment or storage. The cancellation of such a large body of critical packaging documents would have had a tremendous negative impact had it not been for the fact that ASTM standards were available in many cases to fill the need. It was very much to the credit of the packaging community of DoD and the private sector that there had been the foresight to begin transitioning to non-Government standards in the 1970s. The efforts of the ASTM/DoD/Federal Agencies Liaison Group, D-10 and other ASTM committees, have prevented the turbulence of Acquisition Reform from severely impacting the packaging of DoD materiel. The work of the Liaison Group continues today, with new proposals brought to the table at each meeting. In some cases, the proposals are referred to committees other than D-10, when they deal more directly with a specific commodity or process than with the general subject area of packaging. The fact is, nonetheless, that the Liaison Group continues to serve the packaging community well in its role as an entry point for recommendations for standards in areas where needs exist.

This short history of the ASTM/DoD/Federal Agencies Liaison Group on Packaging was prepared for distribution at the April 1998 meeting of Committee D-10 on Packaging in Atlanta, Georgia.

Thanks to every one who has been involved in the Liaison Group since its inception. Special thanks to the Society for supporting the activities of the Group and to D-10 for providing the forum for the concept to become reality.

GENE R. GRANT
Standardization Program Manager,
LOGSA Packaging, Storage, &
Containerization Center

ARTHUR H. CATLIN
Customer Technical Liaison,
Inland Paperboard & Packaging Inc.

ACKNOWLEDGMENT

This brief history of the ASTM/DoD/Federal Agencies Liaison Group on Packaging was prepared with the input and assistance of the following people: Alex Perritt, Caryl Twitchell, Bob Brickey, Tim Jensen, Chester Gaynes, Al McKinlay, Art Catlin, Sam Lamberta, and D-10 Staff Manager Tom O'Toole.

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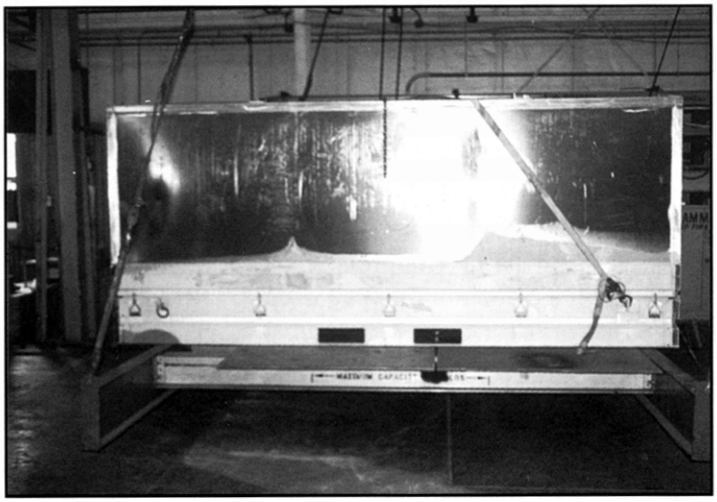
C-17 CRASH RECOVERY AIR BAGS CONTAINER

by Robbin L. Miller

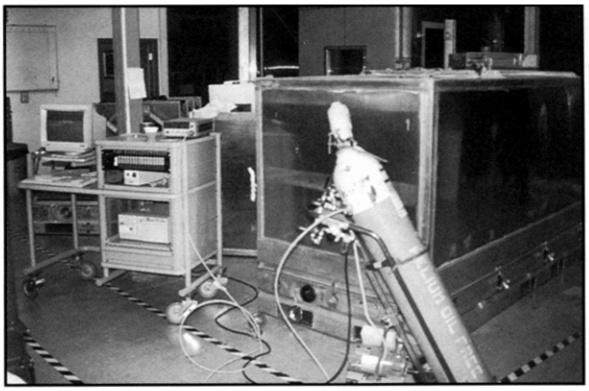
The San Antonio Air Logistics Center's Aerospace Support Equipment Directorate, SA-ALC/LDEE requested AFPTEF to design and fabricate containers for the new crash recovery air bags they were procuring for the C-17 program. The bag systems were being shipped in wood crates and were being damaged frequently. Once the prototype container was designed and qualified, SA-ALC/LDEE requested us to assist them once again by fabricating a short run of containers to meet the crash recovery team's first site activation requirement.

AFPTEF fabricated fourteen C-17 crash recovery airbag containers for 437 MXS/LGSMA at Charleston AFB, SC. All fourteen containers were fabricated in less than one year so that the units first site activation requirements could be met. Prior to transporting the containers to the field, each container successfully passed a quality control tests. The tests consisted of a visual inspection, measurement and a leak test. The field unit can now store the air bag systems in the containers outside and free up valuable warehouse space.

AFPTEF is working with other crash recovery teams in obtaining the new air bag systems and new containers.

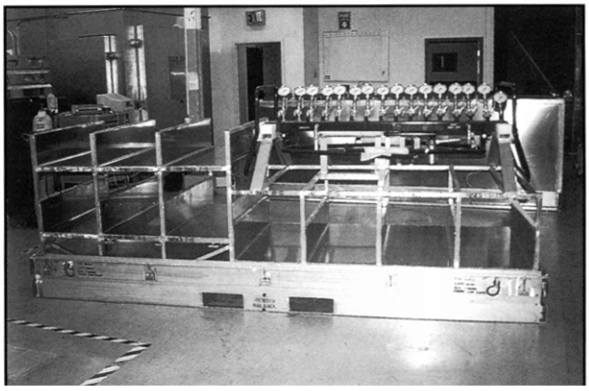


C-17 crash recovery airbag container pendulum impact test

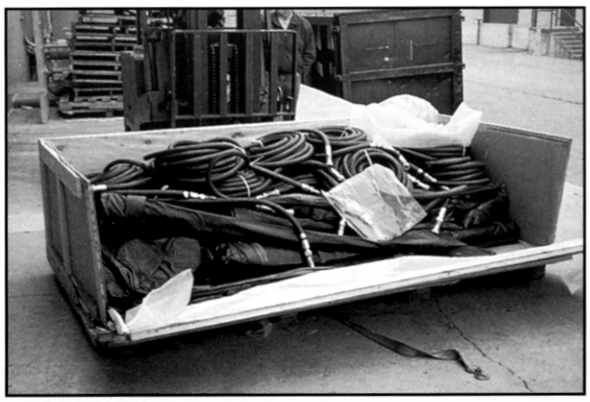


C-17 crash recovery airbag container undergoing pressure/leak testing

C-17 crash recovery airbag container cradle with hoses and airbags



C-17 crash recovery airbag container cradling structure (side view)



Wooden crate with C-17 crash recovery hoses and airbags. Any old port in a storm?

MODEL MAKERS WORLD

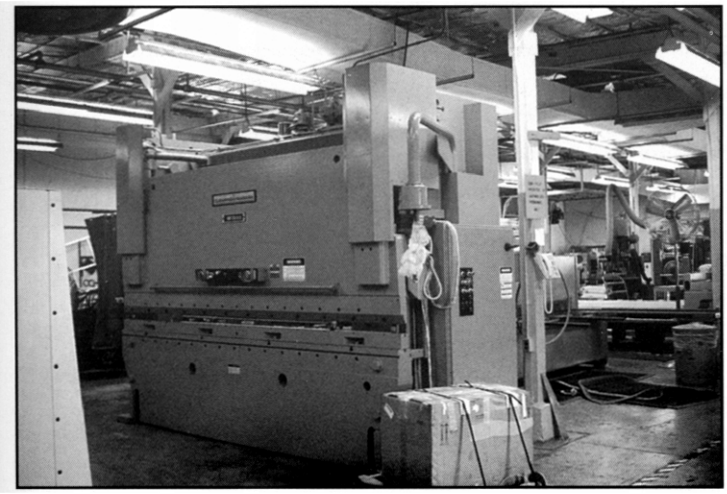
by Don Vance, Larry Hatter and Joe Hofele

The AFPTEF understands and appreciates precision and quality. Both are hallmarks of the AFPTEF name. From design to fabrication to engineering, AFPTEF sets the standard for excellence.

The AFPTEF's model makers had an exceptionally busy, yet rewarding year. Larry Hatter provided the support necessary to fabricate the framing system used in the C17 Airbag Crash Recovery System Container. Larry also worked modifications of the C-17 load crew trainer seat.

Joe Hofele provided the support necessary to fabricate the framing system used in the C-17 Airbag Crash Recovery System Container. The AFPTEF produced 14 containers for the C-17 System Program Office in order to meet first site activation requirements.

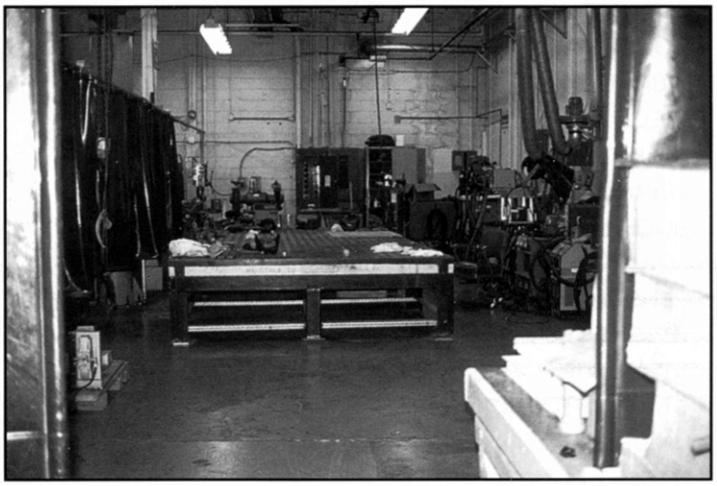
Joe Hofele welding the C-17 crash recovery airbag cradling structure



Press brake

Don Vance and Joe Hofele teamed up to fabricate the cover for the NASA EOS trailer. They fabricated the largest trailer cover (31ft x 13ft x 11ft) ever produced by AFPTEF. Each side-wall and cover consisted of two sections joined together in the center. Each of the eight sections of the cover were fabricated individually and then bolted together as a final assembly. There were approximately 150 drawings in the data package.

Don Vance orders the state-of-the-art machinery and shop supplies needed to sustain operations at the current level. In addition, he provides guidance and instructs our auxiliary help provided by the Reserve Unit on base and is AFPTEF's Real Property Building Manager (RPBM). The Reserve Unit provided over 200 man days of support toward our efforts.



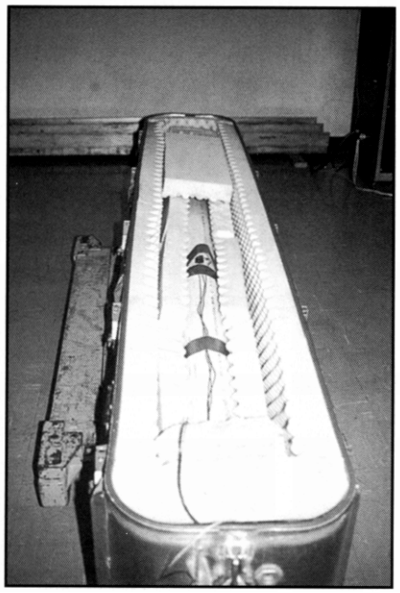
AFPTEF Fabrication workarea

AFPTEF Fabrication shop

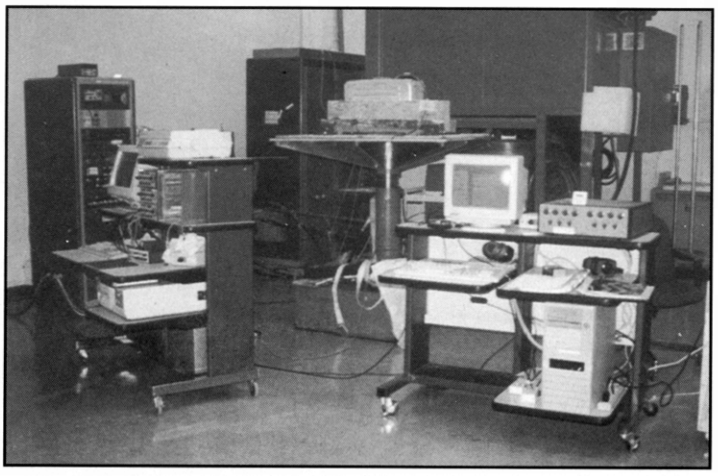
AFPTEF Capabilities and Test Facilities

CONTAINER TESTS

- EXAMINATION OF PRODUCT
- INSTRUMENTATION
- HOISTING STRENGTH TEST (SINGLE RING)
- TIE-DOWN TEST
- HOISTING STRENGTH TEST (FOUR RING)
- STACKING TEST
- HANDLE PULL TEST
- COVER LIFT TEST
- FORKLIFT HANDLING TEST
- PUSH/TOW TEST
- HIGH TEMP/HUMIDITY STACKING TEST
- LATCH STRENGTH TEST
- ROUGH HANDLING TEST (HOT & COLD)
- CONDUCTIVE TEST
- VIBRATION RESONANT DWELL
- LEAK TEST
- VIBRATION REPETITIVE SHOCK
- FORM/FIT TEST
- PENDULUM IMPACT
- WEIGHT TEST
- STRUCTURAL PRESSURE/VACUUM TEST
- STAND-OFF TEST
- UN DROP TESTS (ALL FIVE)
- GASKET PULL TEST
- UN STACKING TEST (HIGH TEMP)



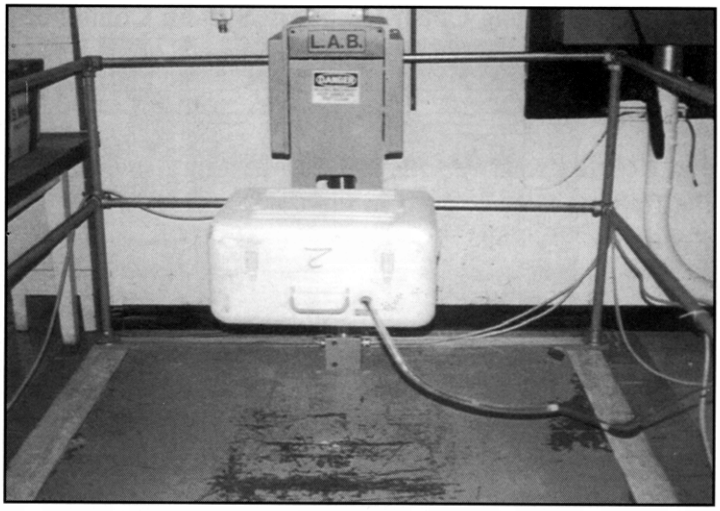
Fragility testing



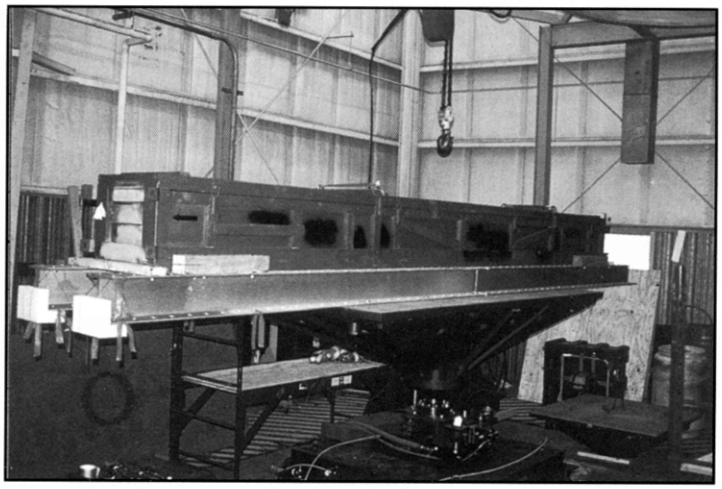
Vibration test

CUSHION MATERIAL TESTS

- ELECTRO STATIC DECAY (ESD)
- CREEP
- COMPRESSIVE SET
- COMBUSTIBILITY
- DYNAMIC CUSHIONING
- PLIABILITY
- WATER ABSORPTION
- HYDROLYTIC STABILITY
- LOAD DEFLECTION/COMPRESSIVE STRENGTH



Flat drop test



Vibration Performance Oriented Packaging (POP) testing

AFPTEF Capabilities and Test Facilities

FACILITIES AND TEST EQUIPMENT:

1. LOW TEMPERATURE WALK-IN ENVIRONMENTAL CHAMBER: (OPERATIONAL AUG 96)

TEMPERATURE RANGE:	-65 to +185 degrees Fahrenheit (F) (-53.9 TO +85 degrees C)
HUMIDITY RANGE:	20 TO 95 percent (Limited by +68 degree F (+20 degree C) dry bulb temperature and +40 degree F (+4.5 degree C) dew point
INSIDE DIMENSIONS:	8 feet (2.44m) width x 15 feet (4.57m) depth x 9 feet (2.74m) height
DOOR OPENING:	6 feet (1.83m) width x 6 feet (1.83m) height
HOIST CAPACITY:	5000 pounds (2268 kg)

2. VIBRATION EQUIPMENT:

a. VIBRATION TABLE (SERVO-HYDRAULIC): (OPERATIONAL JUNE 96)

TABLE SIZES:	48 length x 48 width (121.92 cm length x 121.92 cm width) 120 length x 48 width (3048 cm length x 121.92 cm width)
FREQUENCY RANGE:	48 x 48: 5Hz to 200 Hz 120 x 48: 5 Hz to 95Hz
AMPLITUDE RANGE:	.02 to 1.0 Double Amplitude (DA)
MAXIMUM LOAD:	48 x 48: 2000 pounds (907.18 kg) 120 x 48: 1000 pounds (453.59 kg)

b. VIBRATION TABLE (SERVO-HYDRAULIC):

TABLE SIZE:	48 length x 48 width (122 cm length x 122 cm width)
FREQUENCY RANGE:	1 to 200 Hertz
AMPLITUDE RANGE:	0 to 6 DA
MAXIMUM FORCE RATING:	6000 pounds peak sine (2722 Kg)
ENVIRONMENTAL CHAMBER:	–40 to +140 degrees F (–40 to 60 degrees C)

3. TEMPERATURE/HUMIDITY WALK-IN ENVIRONMENTAL CHAMBER:

TEMPERATURE RANGE:	–65 to +185 degrees F (–53.9 to +85 degrees) C
HUMIDITY RANGE:	20 to 95 percent (Limited by +68 degree F (+20 degree C) dry bulb temperature and +40 degree F (+4.5 degree C) dew point
INSIDE DIMENSIONS:	10 feet (3.05m) width x 16 feet (4.88m) depth x 9 feet 6 inches (2.90m) height
DOOR OPENING:	10 feet (3.05m) x 9 feet 6 inches (2.90m) height
HOIST CAPACITY:	5000 pounds (2268 kg)

4. PENDULUM IMPACT TESTER:

CAPACITY:	5000 pounds (2268 kg)
CONTAINER MAXIMUM SIZE:	104 width x 216 length x 144 height (263 cm width x 549cm length x 366 cm height)

5. RAIN/SALT-FOG/WIND WALK-IN ENVIRONMENTAL CHAMBER:

TEMPERATURE RANGE:	Ambient
RAIN CAPABILITY:	2 or 5 inch (5 or 13 cm) rain/hour
SALT-FOG CAPABILITY:	5 percent salt solution by weight
WIND VELOCITY:	40 miles per hour (64 km/hour)
INSIDE DIMENSIONS:	76 width x 160 length x 78 height (193 cm width x 432 cm length x 198 cm height)
DOOR OPENING:	62 width x 79 height (157 cm width x 201 cm height)

6. ALTITUDE CHAMBER:

TEMPERATURE RANGE:	–100 to +350 degrees F (–73.3 to +177 degrees C)
ALTITUDE:	Site Elevation to 100,000 feet (30,667m)
INSIDE DIMENSIONS:	48 width x 48 length x 48 height (122 cm width x 122 cm length x 122 cm height)

7. THERMAL OVEN:

TEMPERATURE RANGE:	+100 to +500 degrees F (+40 to +260 degrees C)
INSIDE DIMENSIONS:	48 width x 117 length x 60 height (122 cm width x 297 cm length x 152 cm height)
DOOR OPENING:	48 width x 60 height (122 cm width x 152 cm height)

8. DYNAMIC CUSHION TESTER (HARDIGG TYPE):

CUSHION SIZE:	8 x 8 (20 cm x 20 cm)
DROP HEIGHT:	90 maximum (229 cm)
STATIC STRESS RANGE:	065 to 1.6 pounds per square inch
LIFT SYSTEM:	Variable speed electric motor
GUIDE BEARINGS:	Linear ball and radial ball

9. DYNAMIC CUSHION TESTERS (LANSMONT MODEL 23), (2 DIFFERENT BEARINGS: SLEEVE BEARING PLATEN & LINEAR BALL BEARING PLATEN):

CUSHION SIZE:	8 x 8 (20 cm x 20 cm)
DROP HEIGHT:	60 (150 cm)
STATIC STRESS RANGE:	.065 to 1.6 pounds per square inch
LIFT SYSTEM:	Electric motor
GUIDE BEARINGS	Linear ball
BRAKES	Air operated

10. PROGRAMMABLE SHOCK TESTER:

TABLE SIZE:	24 x 24 (61 cm x 61 cm)
TABLE WEIGHT:	235 pounds (107 Kg)
SPECIMEN WEIGHT:	600 pounds maximum (272 Kg)
LIFT SYSTEM:	Hydraulic
GUIDE BEARINGS:	Bronze
WAVE FORM LIMITS:	Half sine - 600 Gs at 2 ms
	Sawtooth - 100 Gs at 4 ms
	Square wave - 200 Gs at 2 ms
	Trapezoid - 200 Gs at 5 ms

11. CONTAINER DROP TESTER:

CONTAINER SIZE:	20 x 24 maximum (51 cm x 61 cm)
CONTAINER WEIGHT:	80 pounds maximum (36 Kg)
DROP HEIGHT RANGE:	12 to 84 (30 to 213 cm)

12. XENON ARC, WATER-COOLED, LIGHT-EXPOSURE APPARATUS

LIGHT SOURCE:	3500 Watt Water Cooled Long Arc Xenon Lamp
TEMPERATURE CONTROLS:	Automatic, Digital Set Point Black Panel/Dry Bulb
HUMIDITY CONTROLS:	Automatic, Digital Set Point Wet Bulb Depression/Condition Water

Meets the requirements for ASTM G-26, Standard Practice for Operating Light-Exposure Apparatus (Xenon Arc Type) with and without water for exposure of nonmetallic materials.

13. UVCON ULTRAVIOLET/CONDENSATION SCREENING DEVICE

TEMPERATURE RANGE:	50 to 95 degree C
LIGHT SOURCE:	8-40 Watt Fluorescent Lamps
SAMPLE SIZE:	26 Holders for Samples Up to 3'' x 12'' (8 cm x 30 cm)

Meets requirements for ASTM G53, Recommended Practice for Operating Light and Water-Exposure Apparatus, and ASTM D4329, Operating Light and Water-Exposure Apparatus.

14. CONSTANT TEMPERATURE/HUMIDITY CABINET

TEMPERATURE RANGE:	18 to 93 degree C (O to 200 degree F)
HUMIDITY RANGE:	5% to 99% RH
INNER DIMENSIONS:	26 x 25 x 18 (66.04 cm x 63.5 cm x 45.72 cm)

15. ELECTROSTATIC DECAY (ESD) TEST AREA:

a. TEST CHAMBER:

TEMPERATURE RANGE:	Ambient
HUMIDITY RANGE:	8 to 15 percent
DIMENSIONS:	36 length x 24 width x 18 height (91 cm length x 61 cm width x 46 cm height)
DOOR OPENING:	12 x 12 (30 cm x 30 cm)
CONTROL:	Passive and active “Desiccant” systems

b. STATIC DECAY METER:

PEAK CHARGE:	±5Kv
DECAY TIMER:	0.01 to 99.99 seconds
SAMPLE SIZE:	3 x 5 (8 cm x 13 cm)
TEST METHOD:	Federal Test Method Standard 101C, Method 4046

c. KEITHLEY ELECTROMETER:

RANGE:	100 ohms full scale to 10^{14} ohms in twenty-five linear 1x and 3x ranges
ACCURACY:	±3 percent of full scale on 100 to 10^{10} ohm ranges using the largest available multiplier setting; ±5 percent of full scale on 3 x 10 ohm ranges.

16. DIGITAL PRESSURE/VACUUM MANOMETERS (2)

RANGE:	–15 to +30 PSI
ACCURACY:	±0.03% of reading +0.01% of full scale

17. PORTABLE COMBUSTIBLE GAS INDICATOR

CALIBRATED FOR:	Isobutane, R142b, HFC 152a
RANGE:	0-1000% Lower Explosive Limit (LEL)
INITIAL SETTING:	10% Lower Explosive Limit (LEL)

18. UNIVERSAL TENSILE/COMPRESSION TESTING MACHINE

CAPACITY:	35,27 oz to 30,000 pounds (1000 g - 13607.77 kg)
CROSSHEAD TRAVEL:	42.51 in (107.95 cm)
CROSSHEAD SPEED:	0.006 in/min to 40 in/min (0.015 cm/min to 101.6 cm/min)
WIDTH BETWEEN COLUMNS:	25.0 in (63.5 cm)
FULL LOAD CAPACITY:	up to 4 in/min (10.16 cm/min); 25% of load capacity thereafter
ENVIRONMENTAL CHAMBER:	-250 to 600 degrees F (-156.7 C to 315.6 C)
INTERIOR DIMENSIONS:	14 width x 14 depth x 34 height (35.56 cm x 35.56 cm x 86.36 cm)

19. TIE DOWN/HANDLE PULL TESTER

MAXIMUM FORCE RATING:	6,500 pounds per Actuator (4 Actuators)
ELECTRONIC READOUTS:	Forces from 100 to 10,000 +/- 10 pounds
CONTAINER SIZE:	Tester adjustable, Maximum 10 feet x 20 feet without special adaptation

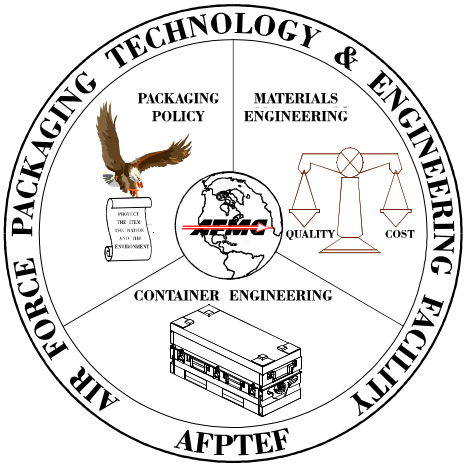
20. PORTABLE HIGH/LOW TEMPERATURE CHEST

TEMPERATURE RANGE:	–85°F to +140°F (–65°C to +60°C)
INSIDE DIMENSIONS:	13 width x 25 length x 14 depth (37.02 cm x 63.5 cm x 35.56 cm)

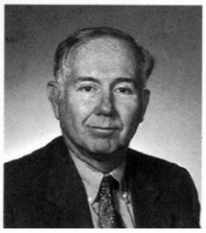
21. SALT/FOG CABINET

INTERNAL VOLUME:	68 ft^3
TEMPERATURE RANGE:	–80° F to +160° F (–26° C to +71° C)

PROGRAMMABLE
EXTERNAL COLLECTION PACKAGE AND MIXING TANK FOR UNINTERRUPTED TESTING



Team AFPTEF



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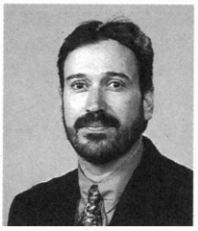

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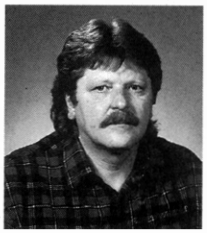

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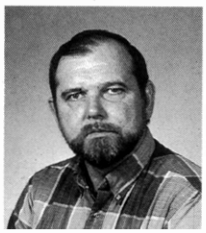

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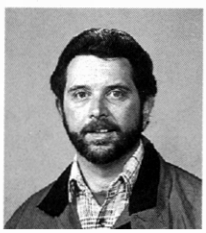

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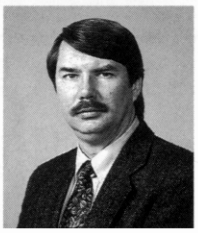

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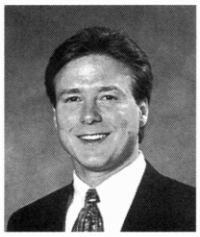

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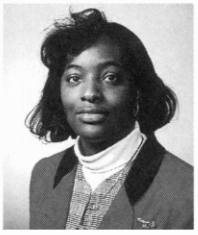

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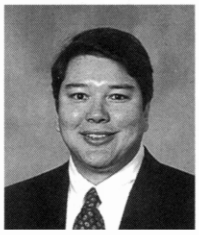

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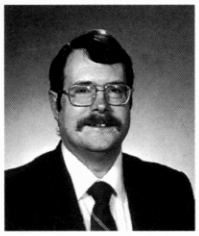

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Air Force Materiel Command
Logistics Support Office
**AFMC LSO Organizational Directory

February 1997

Headquarters Air Force Materiel Command (AFMC)
Wright-Patterson Air Force Base, Ohio 45433-5006
Commercial (937) - 257 - (plus last four digits) DSN 787 - (plus last four digits)

LOGISTICS SUPPORT OFFICE (AFMC LSO/LO)
Chief - H. English, GM-15
Bldg 262 Rm B-117 72069
Secretary - Betty Foster

LOGISTICS ENVIRONMENTAL OFFICE (LO-EV)
Chief - D. Meredith, GS-13
Bldg 262 P-107I 73487

AIR FORCE AUTOMATIC IDENTIFICATION TECH PROG MGMT DIVISION (LOA)
Chief - M. Reboulet, GM-13
Bldg 262 P- 109J 74118

AIR FORCE MATERIALS HANDLING ENGINEERING DIVISION (LOE)
Chief - M. Greer, GM-14
Bldg 262 P-107F 73078
Secretary - Teresa Oglesby

- **ENGINEERING A BRANCH (LOEA)** — Chief - D. Hartman, GM-13, Bldg 262 P-107G 73078
- **ENGINEERING B BRANCH (LOEB)** — Chief - T. Madden, GM-13, Bldg 262 P-107G 73078
- **ENGINEERING C BRANCH (LOEC)** — Chief - Vacant, Bldg 262 P-106F 73078
- **PROGRAM RESOURCES BRANCH (LOER)** — Act Ch - D. Hunt, GM-13, Bldg 262 P-109-H 72613

INTEGRATION OFFICE (LOG)
All authorizations are matrixed to HQ AFMC/LGN

AIR FORCE PACKAGING TECHNOLOGY AND ENGINEERING FACILITY (LOP)
Chief - L. Clarke, GM-14
Bldg 70 72638
Assistant -Rosemary Vaughan

- **DESIGN BRANCH (LOPD)** — Chief - T. Hinds, GM-13, Bldg 70 73120
- **MATERIALS BRANCH (LOPM)** — Chief - L. Wood, GM-13, Bldg 70 74519
- **PACKAGING POLICY BRANCH (LOPP)** — Chief -M. Werneke, GM-13, Bldg 70 77166

SYSTEMS MANAGEMENT DIVISION (LOS)
All authorizations are matrixed to HQ AFMC/LGI

- **DET 3, WPLO* BAYONNE NJ (LOTCB)** — Chief -E. Clark, GS-11, DSN: 247-5972
- **DET 1, WPLO* OAKLAND CA (LOTCO)** — Chief -B. Sundquist, GS-11, DSN: 859-2011
- **DET 2, WPLO* SEATTLE WA (LOTCS)** — Chief -Vacant, DSN: 744-3116

AIR FORCE CARGO MOVEMENT DIVISION (LOT)
Chief - R. Reed, GM-14
Bldg 262 P-15Q 74315
Secretary - Carolyn Kugle

- **AF SHIPPER SERVICE CONTROL OFFICE (LOTA)** — Chief - Vacant, Bldg 262 P-14R 74351
- **CARGO MANAGEMENT BRANCH (LOTC)** — Act Chief -R. Tirey, GM-13, Bldg 262 P-14R 74814
- **MGMT AND EQUIP PROGRAM (MEEP) (LOTM)** — Chief -J. Detweiler, GM-13, Eglin AFB FL 872-217(226)

**This directory was developed for identifying the "operating" functions in AFMC LSO and does not necessarily reflect approved organizational structures on the Unit Manpower Document.

Approved:

JOYCE E. LEHMKUHL, Chief
Human Resource Management Office

*Water Port Logistics Office (WPLO)

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