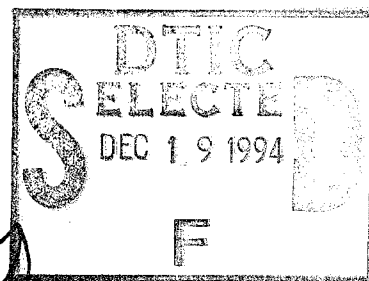


**U.S. Army
Defense Ammunition Center and School
(USADACS)**

**Validation Engineering Division
Capabilities**



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for public release and sale; its
distribution is unlimited.

Savanna, IL

19941214 036

U.S. Army Defense Ammunition Center and School (USADACS)

Test Facilities

This guide was prepared to provide readers with a general description of USADACS test capabilities and facilities.

August 1992

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JOHN L. BYRD, JR.
Director
Defense Ammunition Center and School

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INTRODUCTION

The U.S. Army Defense Ammunition Center and School (USADACS) ammunition logistics validation facilities are located in northwestern Illinois along the Mississippi River. U.S. Army Defense Ammunition Center and School, a tenant on the Savanna Army Depot Activity (SVADA), uses approximately 75 technical, administrative, and operational buildings within this 13,000-acre installation. Its major missions are civilian ammunition training through its Ammunition School, explosives safety support to the Department of the Army (DA) through its Technical Center for Explosives Safety (TCES), assistance to all DA installations in areas of supply, maintenance, transportation through its Logistics Review and Assistance Office, management of two career programs for Quality Assurance Specialists (Ammunition Surveillance) (QASAS) and ammunition managers, as well as its logistics engineering support through its Logistics Engineering Office.

LOGISTICS ENGINEERING OFFICE ORGANIZATION

The Logistics Engineering Office is comprised of the following four divisions:

Maintenance Engineering Division (SMCAC-DEM). Designs, fabricates, prototypes, and verifies safety approval of Ammunition Peculiar Equipment (APE) used in maintenance, surveillance, renovation, and demilitarization operations.

Supply Engineering Division (SMCAC-DES). Designs standard unitization/palletization and storage procedures for DA; fabricates, prototypes ammunition support equipment (ASE); e.g., slings, beams, pallet jacks, etc.; as well as overall modernization of depot supply operations.

Transportation Engineering Division (SMCAC-DET). Designs methods and procedures for the outloading (load, blocking, and bracing) prior to transportation of ammunition by rail, road, and ship in commercial as well as tactical environment.

Validation Engineering Division (SMCAC-DEV). Provides validation/verification of engineering designs and/or procedures developed by the other three divisions, as well as verification of designs outside of USADACS, such as U.S. Army Missile Command (MICOM), U.S. Army Tank-Automotive Command (TACOM), etc. The Validation Engineering Division routinely conducts MIL-STD-1660 verification of unitization/palletization procedures; MIL-STD-810E verification of rail, road, and ship transportability; and MIL-STD-398 APE explosive safety verification. This division also provides extensive instrumentation support to the U.S. Army (USA). A typical example of its unique instrumentation capability included the temperature, humidity, and solar radiation monitoring of ammunition stored in Saudi Arabia (SA) during Operation Desert Shield/Storm in order to assist U.S. Army Armament Research, Development and Engineering Center (ARDEC), Predictive Technology Branch, with serviceability projections.

Unique to the USA is USADACS inhouse capability to accomplish DA priority logistics engineering challenges. An excellent example was "Operation Steel Box" wherein USADACS

manufacturing engineering support at Mainz Army Depot (MZAD) in the Federal Republic of Germany (FRG), internal restraint of the toxic chemical munitions within the SSC, restraint of the SSCs within Military Vans (MILVANS), as well as, all CONUS and host nation validation requirements (transportability and leak testing) which resulted in the successful retrograde operation.

LOGISTICS ENGINEERING OFFICE

SMCAC-DE
BILL ERNST
DSN 585-8922

**SUPPLY
ENGINEERING
DIVISION**

SMCAC-DES
TOM MICHELS
DSN 585-8928

**DESIGN/PROCEDURES
STANDARDS**

- UNIT LOADS
- STORAGE
- HANDLING (ASE)
- STEEL PALLETS
- MODERNIZATION

**MAINTENANCE
ENGINEERING
DIVISION**

SMCAC-DEM
DICK GREEN
DSN 585-8926

**STANDARD AMMUNITION
PECULIAR EQUIPMENT:**

- MAINTENANCE
- SURVEILLANCE
- RENOVATION
- DEMILITARIZATION

**TRANSPORTATION
ENGINEERING
DIVISION**

SMCAC-DET
BILL FRERICHS
DSN 585-8927

**STANDARD OUTLOADING
PROCEDURES:**

- WHOLESALE/RETAIL
- SURFACE/AIR
- JOINT SERVICE

**VALIDATION
ENGINEERING
DIVISION**

SMCAC-DEV
JERRY KROHN
DSN 585-8929

VALIDATION TESTING:

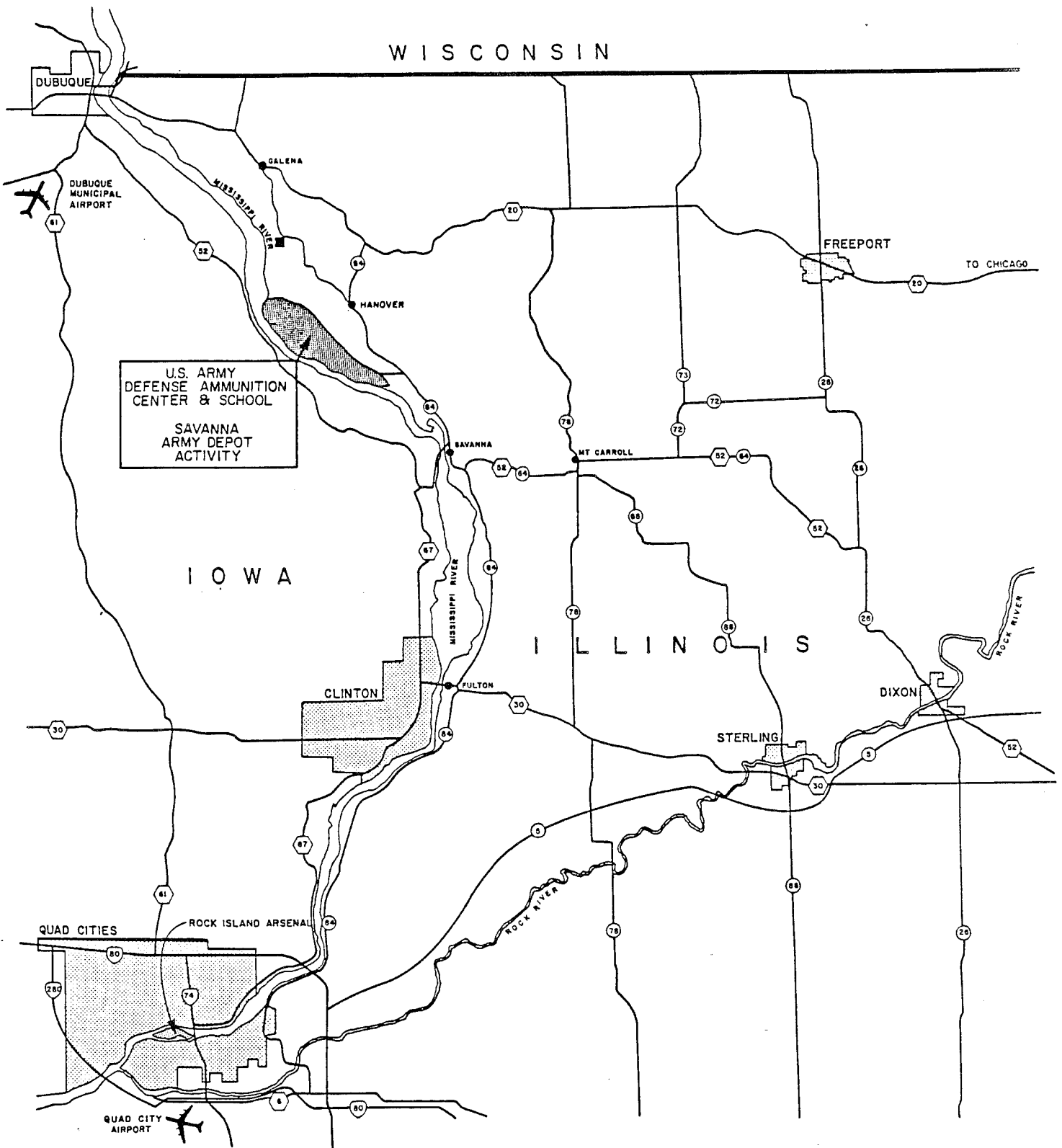
- MIL STD 1660
- MIL STD 810E
- MIL STD 398
- INSTRUMENTATION

MISSION AND SUPPORT PERSONNEL

VALIDATION ENGINEERING DIVISION

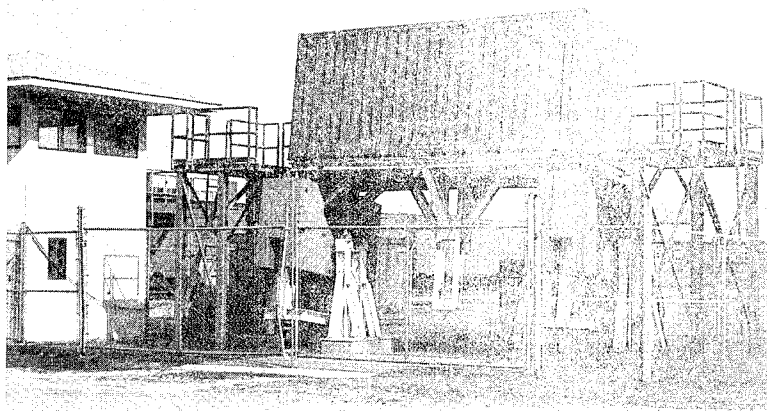
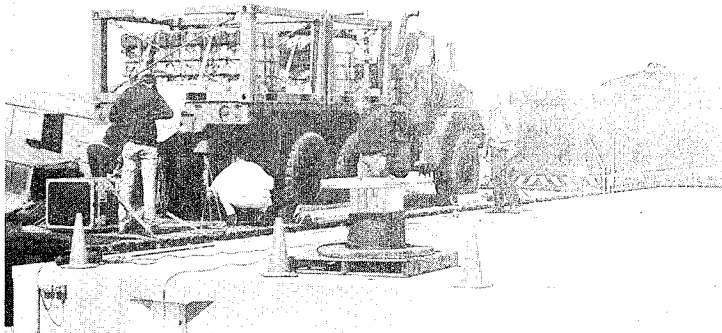
Mission: Perform validation/certification tests to determine that transportation vehicles, blocking and bracing procedures, unitized loads, and Ammunition Peculiar Equipment (APE) meet design and Required Operational Capability (ROC) requirements.

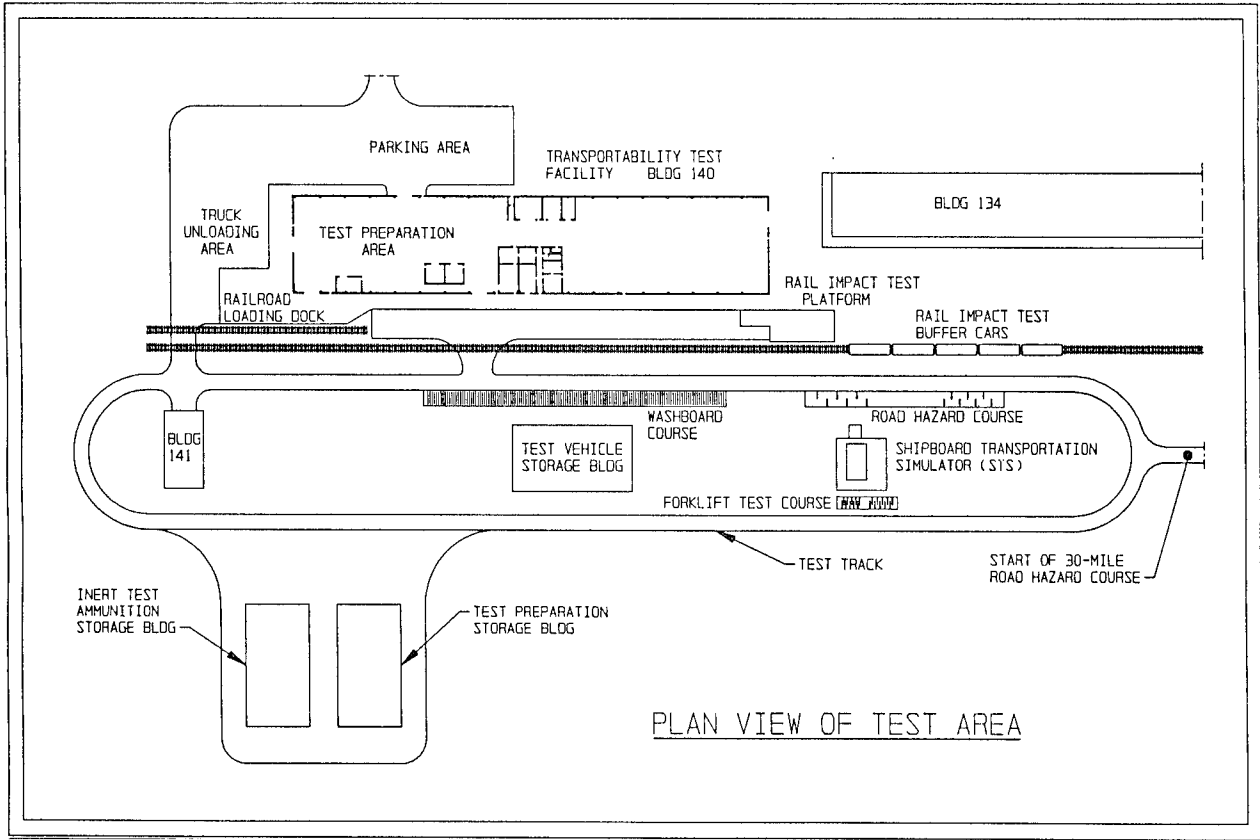
Support:	<i>Personnel:</i>	<i>Title:</i>	<i>DSN/Comm:</i>
	Krohn, Jerome	- Chief	585-8908/815-273-8908
	Thulion, Martha	- Program Assistant	585-8929/815-273-8929
	Meyer, William	- Test Engineer	585-8090/815-273-8090
	Hartman, Quinn	- Test Engineer	585-8992/815-273-8992
	Solberg, Jason	- Test Engineer	585-8079/815-273-8079
	McIntosh, Alfred	- Test Engineer	585-8989/815-273-8989
	Erquitt, Emory	- Equipment Specialist	585-8907/815-273-8907
	Valant, David	- Electronics Technican	585-8988/815-273-8988
	Simmons, Thomas	- Engineering Draftsman	585-8094/815-273-8094
	Von Thun, Steven	- Engineering Draftsman	585-8093/815-273-8093
	Stewart, Sally	- Illustrator	585-8014/815-273-8014



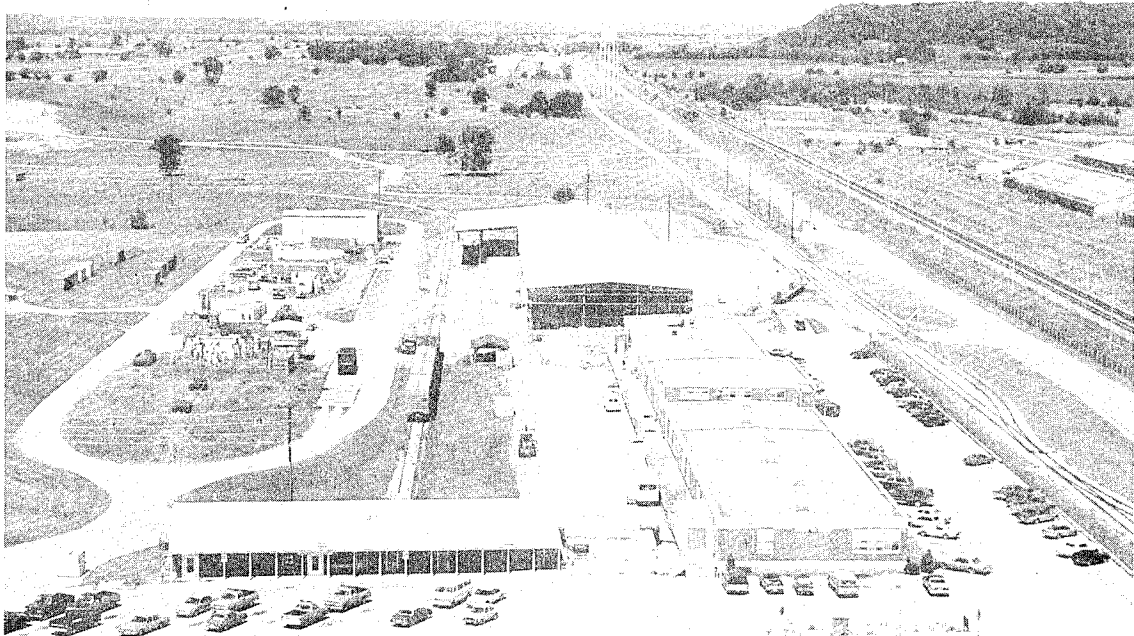
USADACS	TO:	O'HARE INTERNATIONAL AIRPORT	150 MILES
		(CHICAGO, ILLINOIS)	
USADACS	TO:	QUAD CITY AIRPORT	70 MILES
		(ROCK ISLAND, ILLINOIS)	
USADACS	TO:	DUBUQUE MUNICIPAL AIRPORT	45 MILES
		(DUBUQUE, IOWA)	

USADACS Validation Engineering Division Outdoor Test Facilities

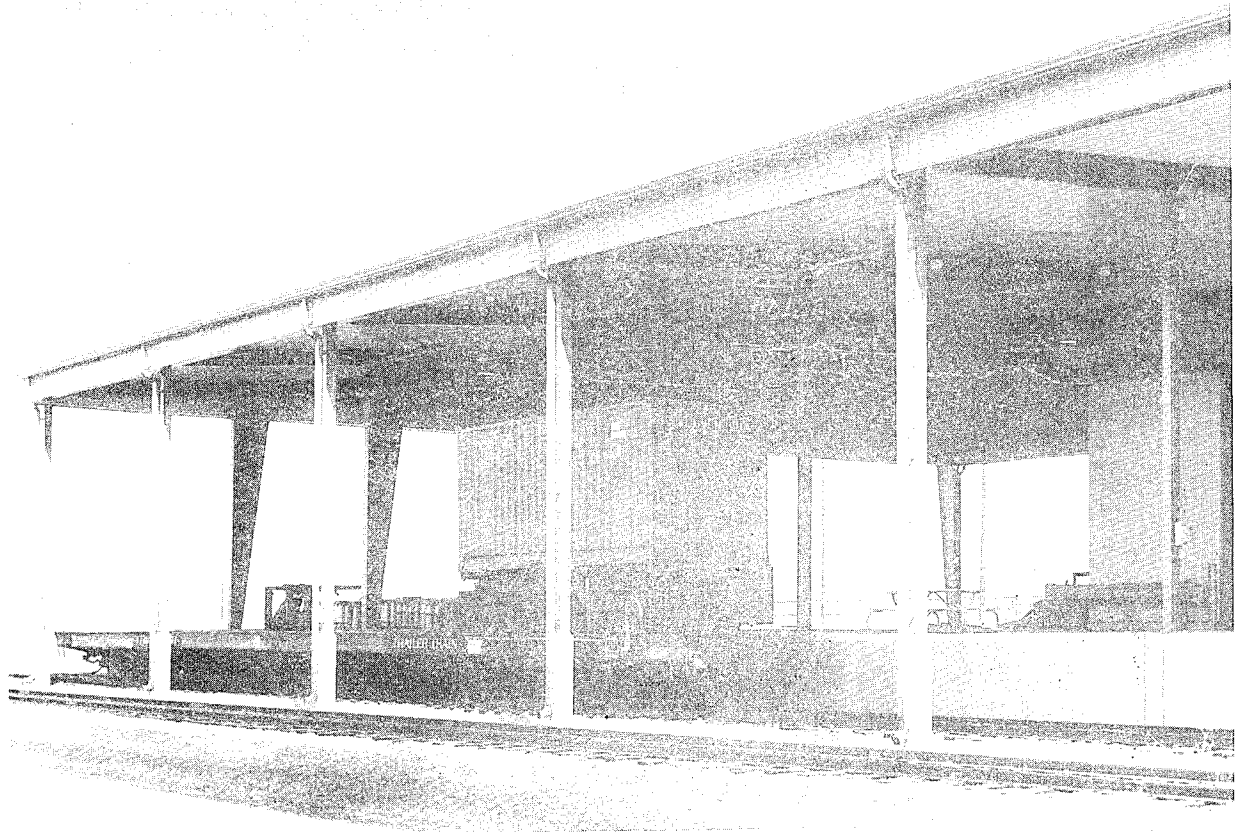




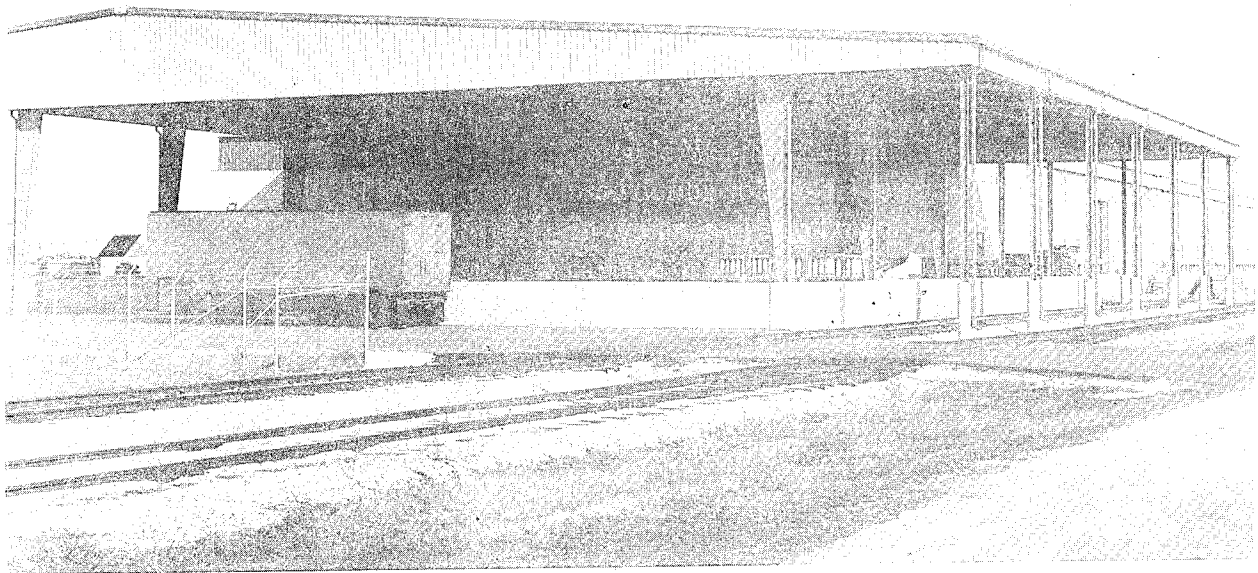
Overall drawing of the majority of USADACS outdoor test facilities.



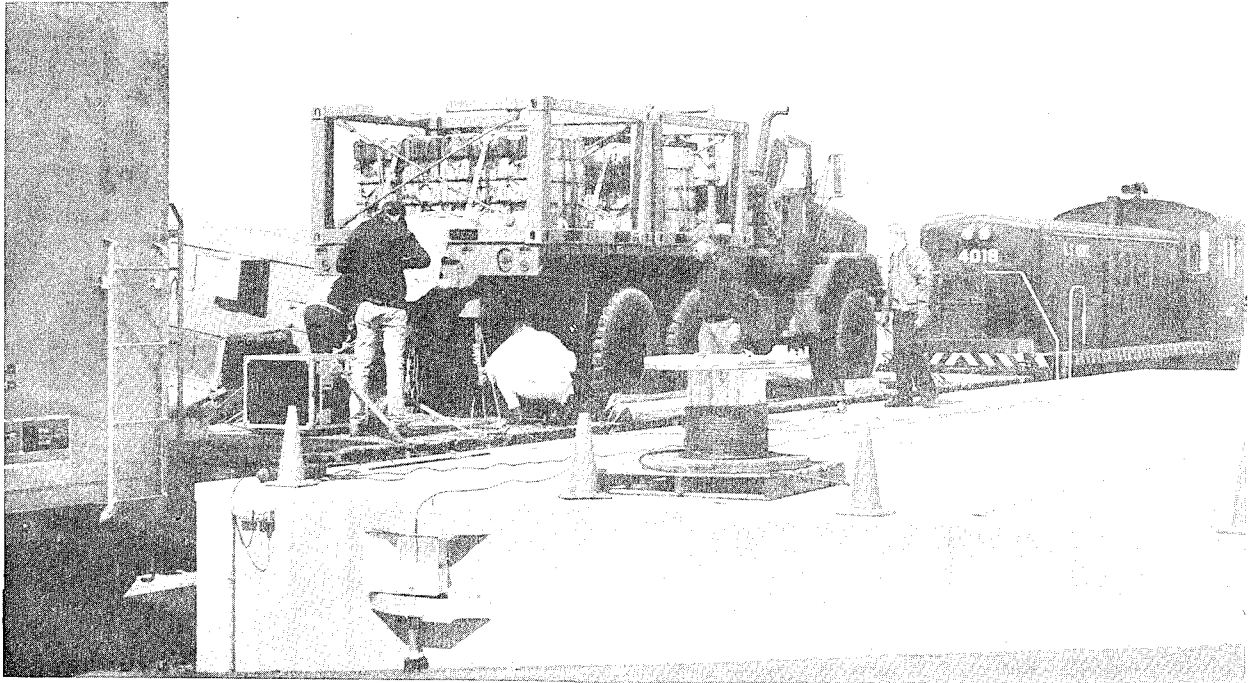
The outdoor test facilities cover approximately 35 acres consisting of the following: Rail Impact Test Course, Road Hazard Course, Washboard Course, Shipboard Transportation Simulator (STS), Forklift Test Course, 30-mile Road Hazard Course, Testing Storage, and open areas used for long-term testing.



Railcar Side-Loading Capabilities. This is the test preparation area for rail impact and road transportability tests. One railcar can be loaded under the shelter during inclement weather.

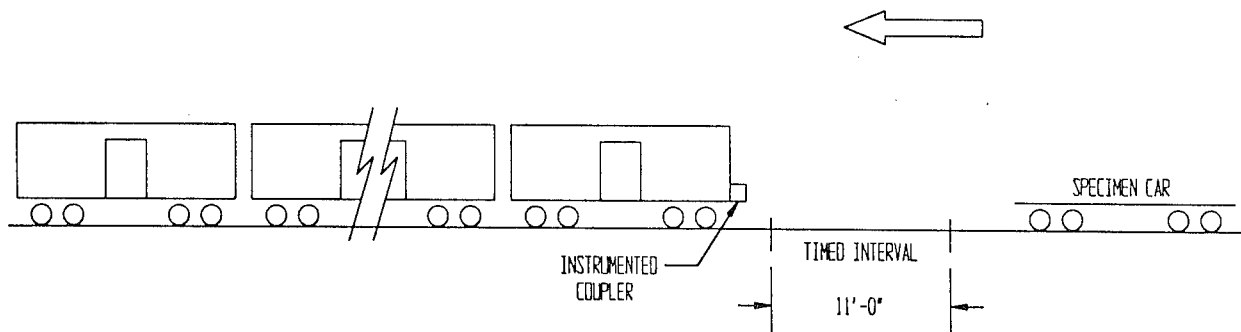


Transportation Testing Facility's dock loading capabilities. In addition to the railcar loading dock, there are also two truck loading docks and a total of 14,000 square feet of docking area.



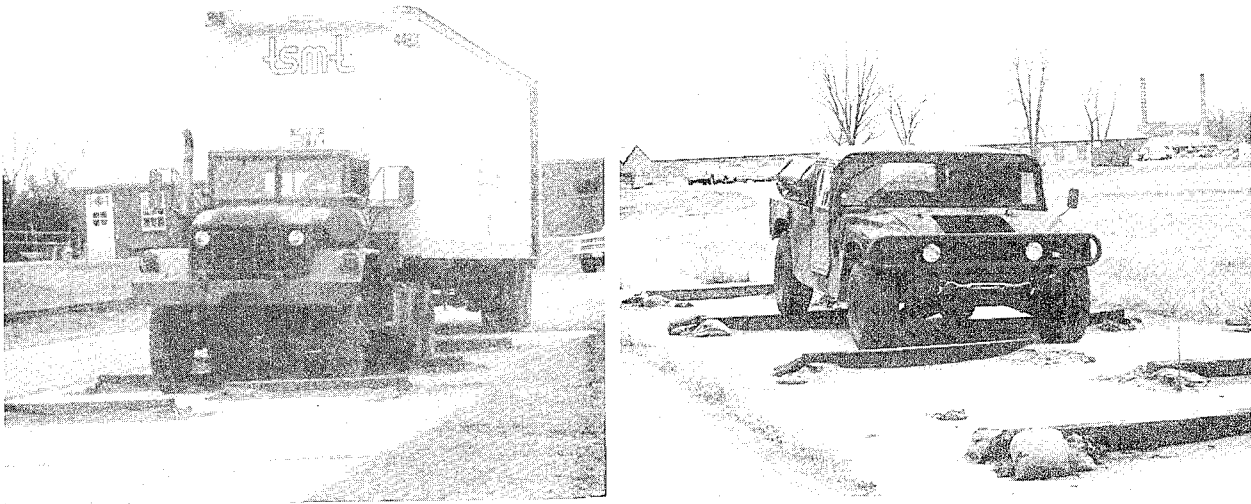
The rail impact test is conducted with five buffer cars representing an anvil with the cars draft gears compressed and air brakes in a set position. The total anvil weight is approximately 250,000 pounds. The specimen car is released by switch engine at speeds of 4, 6, and 8.1 mph. Then the car is reversed and released at 8.1 mph. The timed interval of velocity is between 0 and 11 feet before impact.

**ASSOCIATION OF AMERICAN RAILROADS (AAR)
STANDARD TEST PLAN**

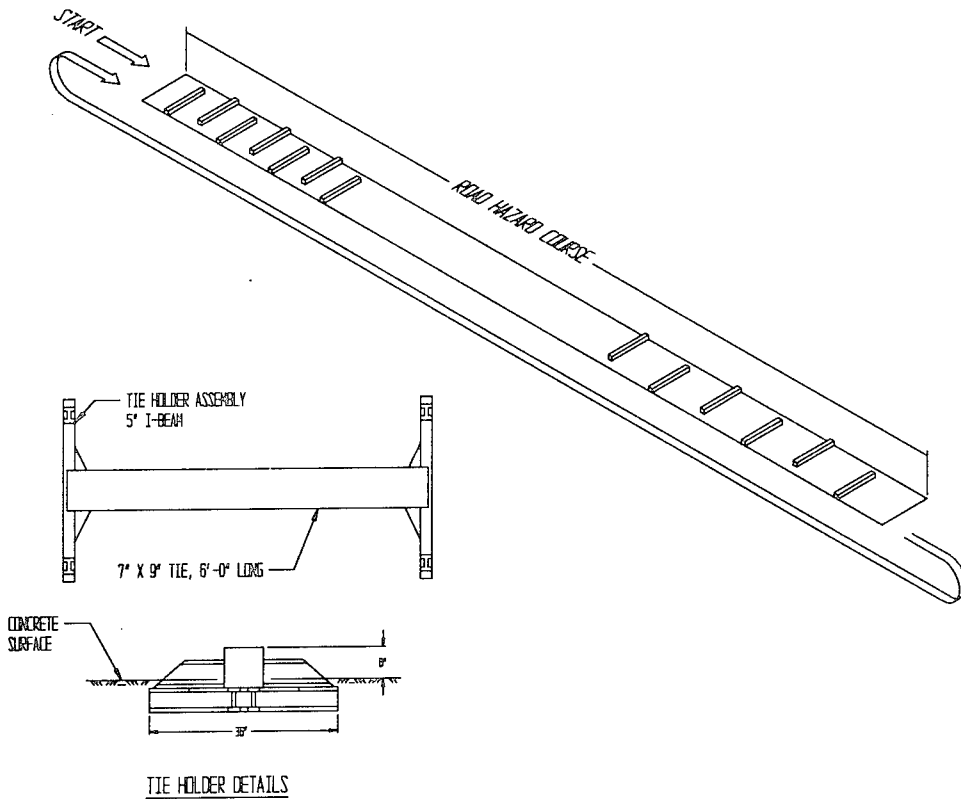


5 BUFFER CARS (ANVIL) WITH DRAFT GEAR
COMPRESSED AND AIR BRAKES IN A SET
POSITION
ANVIL CARS TOTAL WT 250,000 LBS (APPROX)

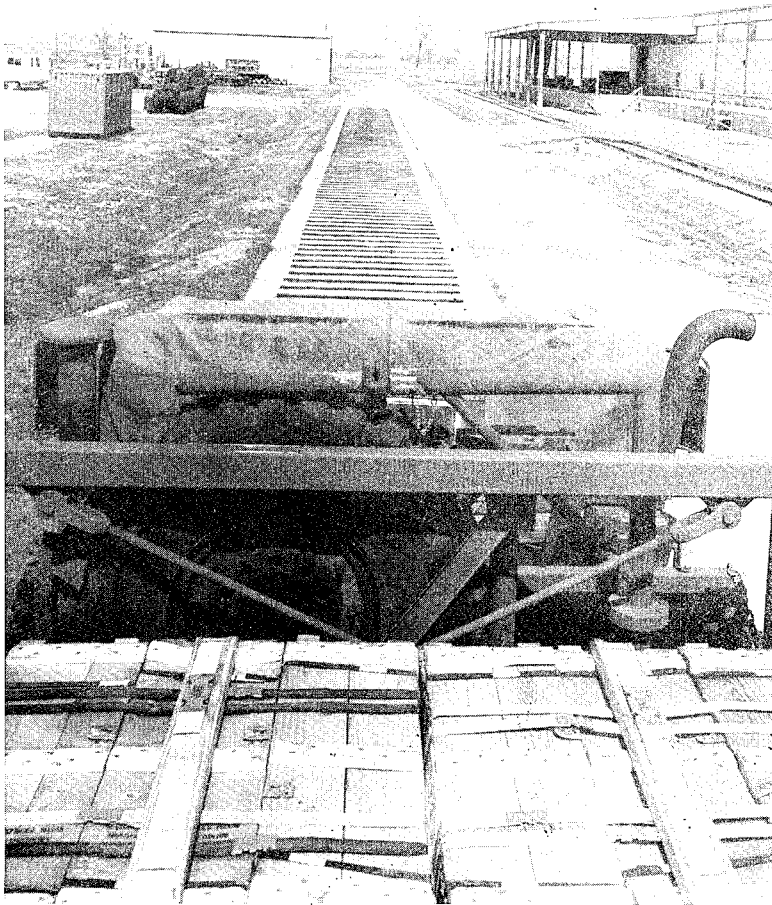
SPECIMEN CAR
IS RELEASED BY
SWITCH ENGINE TO
ATTAIN: IMPACT NO. 1 @ 4 MPH
IMPACT NO. 2 @ 6 MPH
IMPACT NO. 3 @ 8.1 MPH
THEN THE CAR IS REVERSED AND
RELEASED BY SWITCH ENGINE TO
ATTAIN: IMPACT NO 4. @ 8.1 MPH



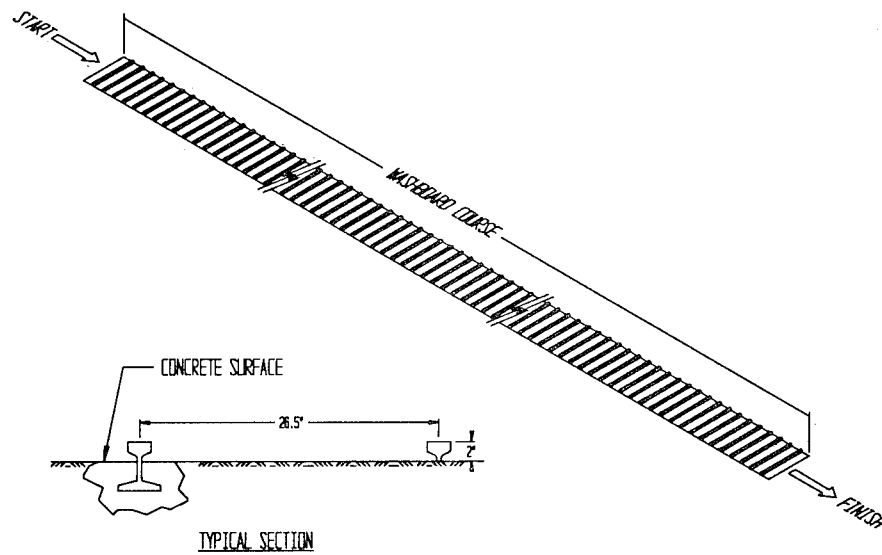
The Hazard Course provides a 200-foot-long segment of concrete-paved road with two series of railroad ties projecting 6 inches above the level of the road surface. The purpose of the Road Hazard Course is to subject a specimen load to violent vertical and side-to-side rolling action. Some sample tests have included Multiple Launch Rocket System (MLRS) container handling with variable-reach forklift and transportation of Military Vans (MILVANS) on semitractor trailers.



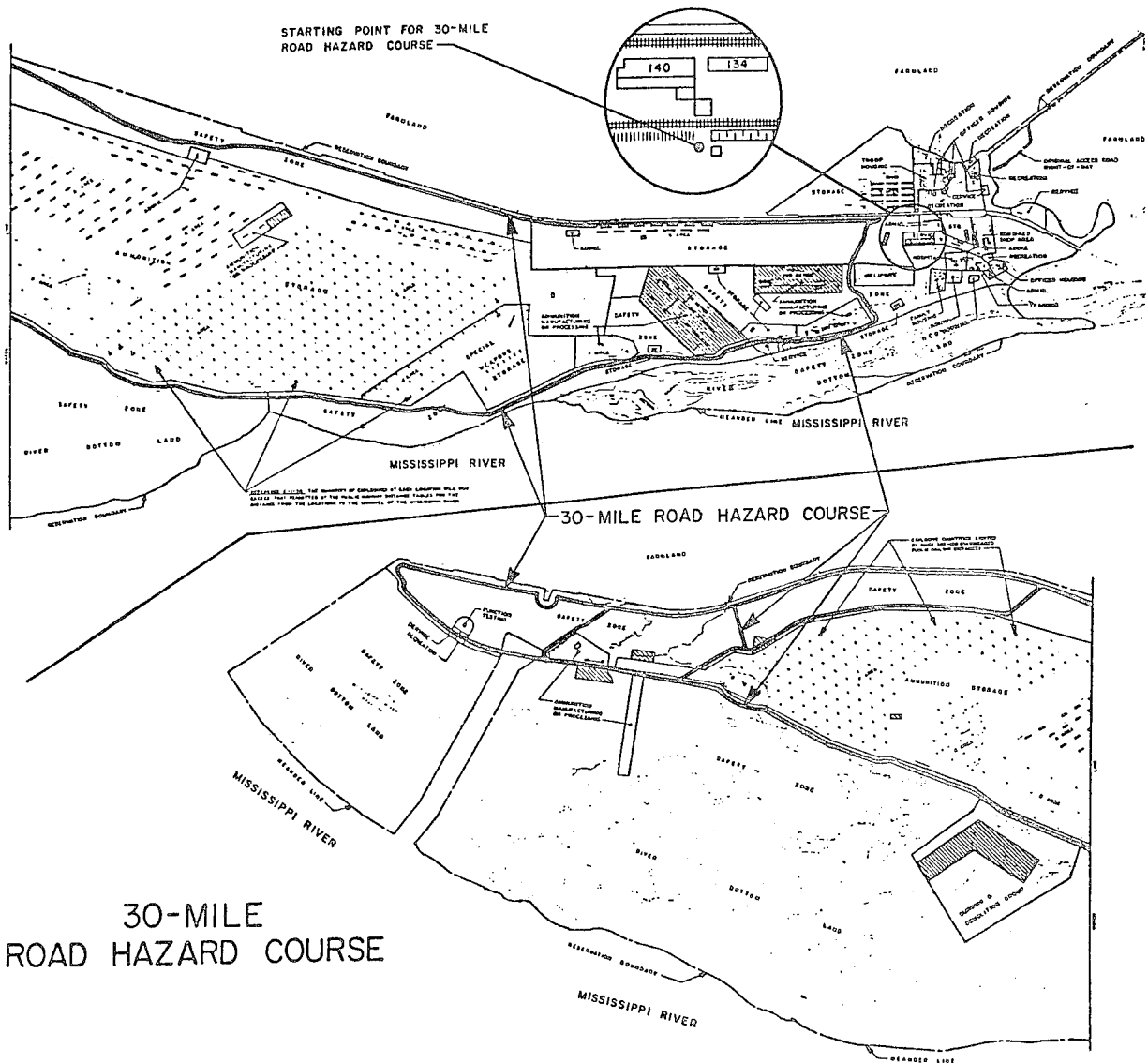
Road Hazard Course Specifications



The Washboard Course is 300 feet long. It is used to test transportability of specimen loads at speeds that produce a resonant frequency of the vehicle's suspension system beneath the load.

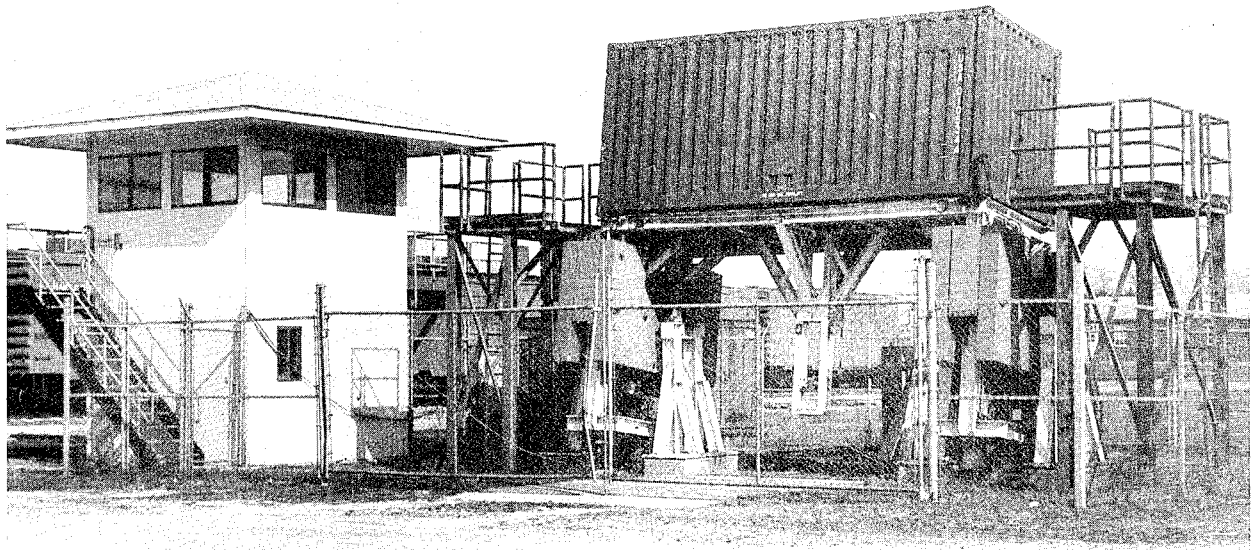


Washboard Course Specifications

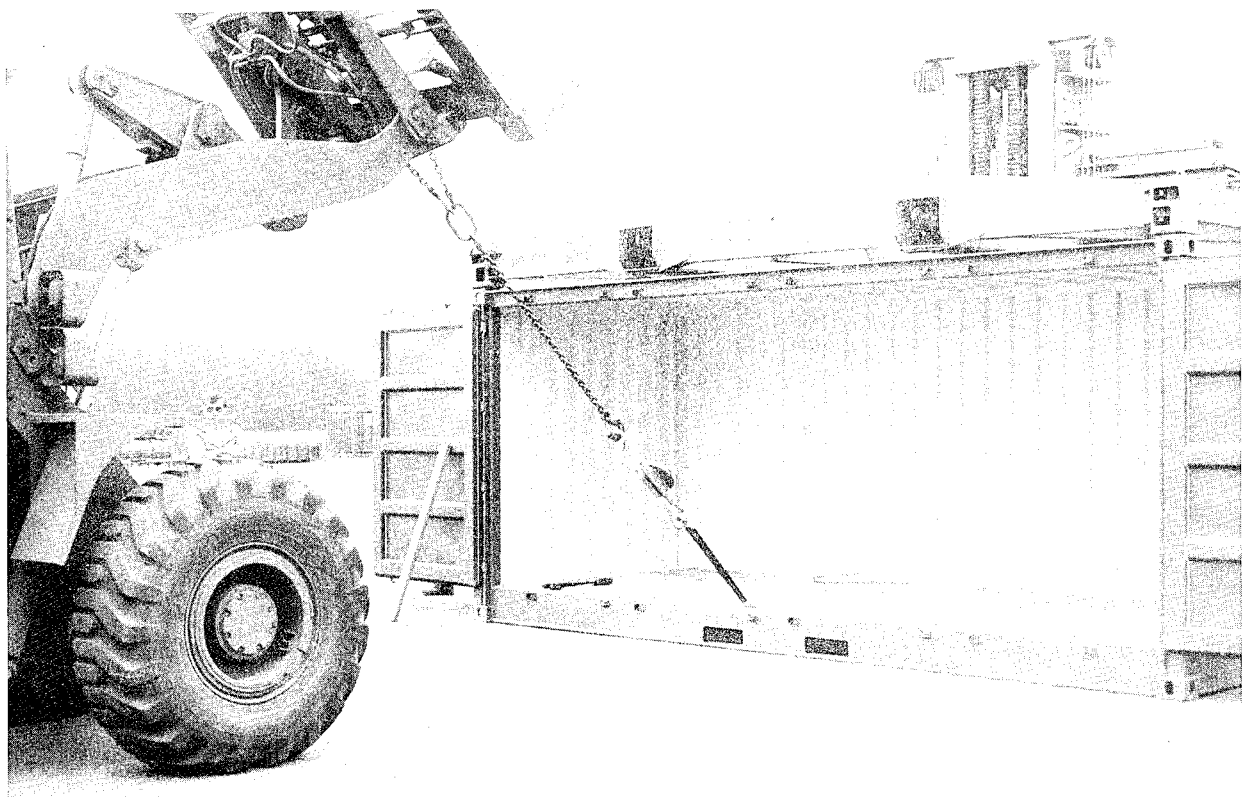


30-MILE
ROAD HAZARD COURSE

The 30-Mile Road Hazard Course involves a combination of roads surfaced with gravel, concrete, and asphalt. The test route includes curves, corners, railroad crossings, cattle guards, stops and starts. The test vehicle travels at maximum speeds suitable for the particular road being traversed. This test allows the tactical vehicle/specimen load to be subjected to three full airbrake stops while traveling in the forward direction and one in the reverse direction while traveling down a 7 degree grade. The first three stops are at 5, 10, and 15 mph, while the stop in the reverse direction is of approximately 5 mph.



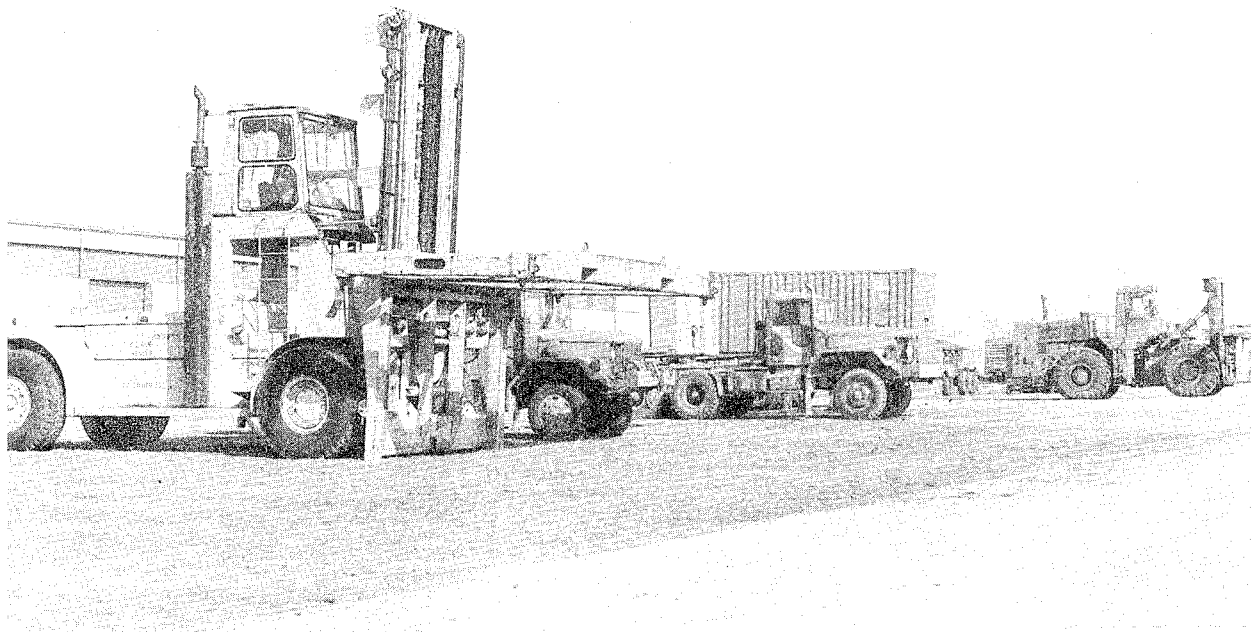
Shipboard Transportation Simulator (STS). This equipment is used to test 20-foot MILVANS and commercial containers. It has a capacity of 40,000 pounds. The STS will simulate shipboard rolls up to 30 degrees on both sides of vertical.

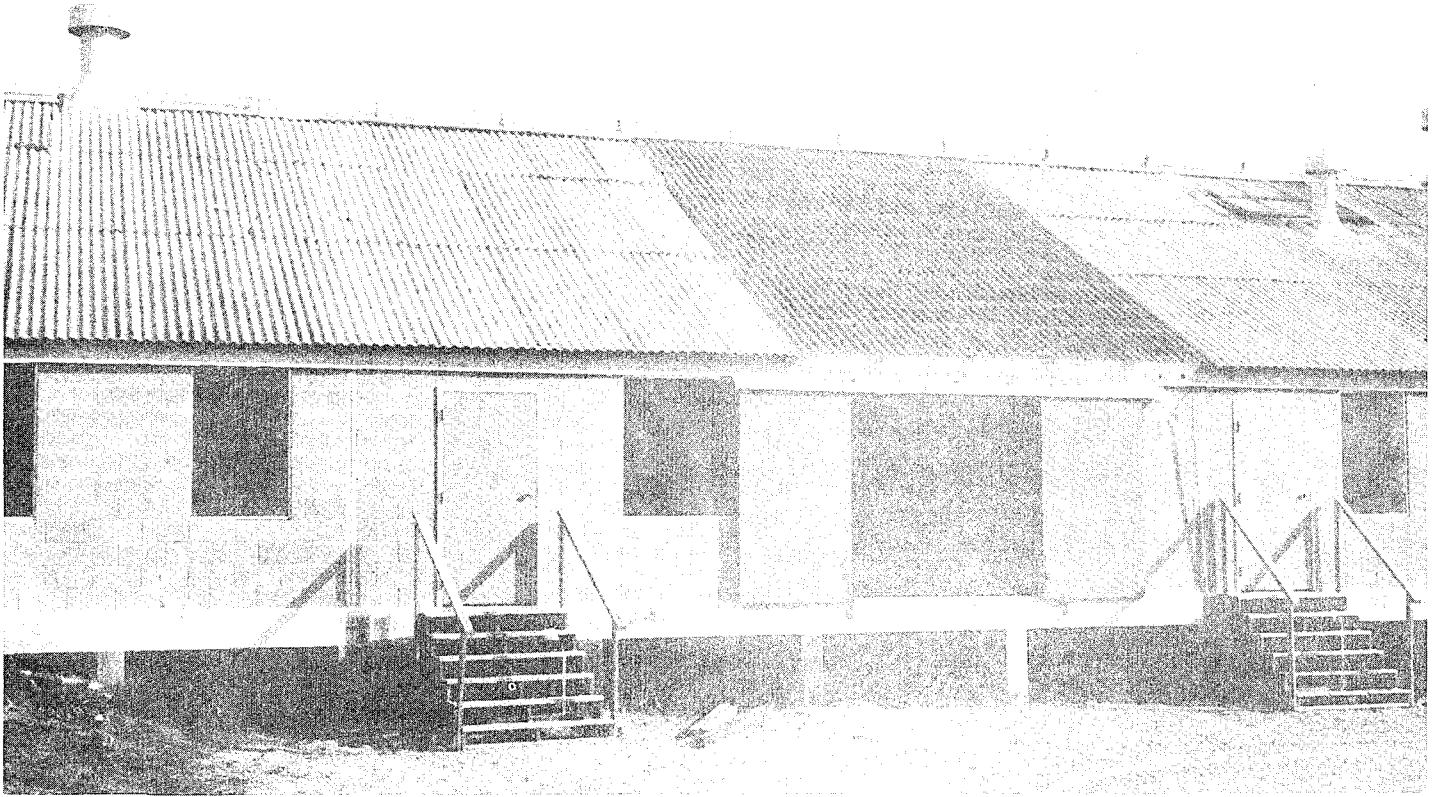


The static pull test is performed with the necessary equipment, including the dynamometer, to measure the required static pull necessary to test the provision at the specified angle. Web straps, metal banding, cargo tiedown provisions, vehicle tiedown provisions, and slinging attachments are pulled to a predetermined tensile force to validate the specimen tested.

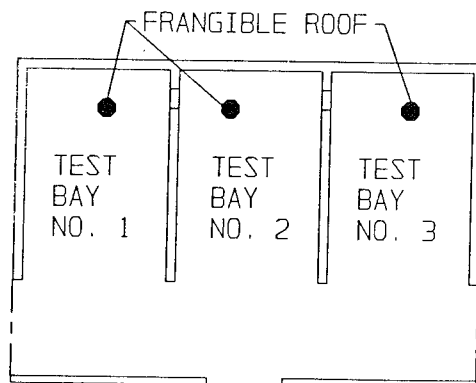


USADACS has numerous material handling equipment (MHE), as well as test vehicles, to conduct road, rail, and shipboard ammunition test simulations. For example, there is the 50,000-pound capacity MILVAN container handler, which is used for stacking and test loading of containers. Another example is the 10,000-pound capacity rough terrain forklift (see appendix for details).

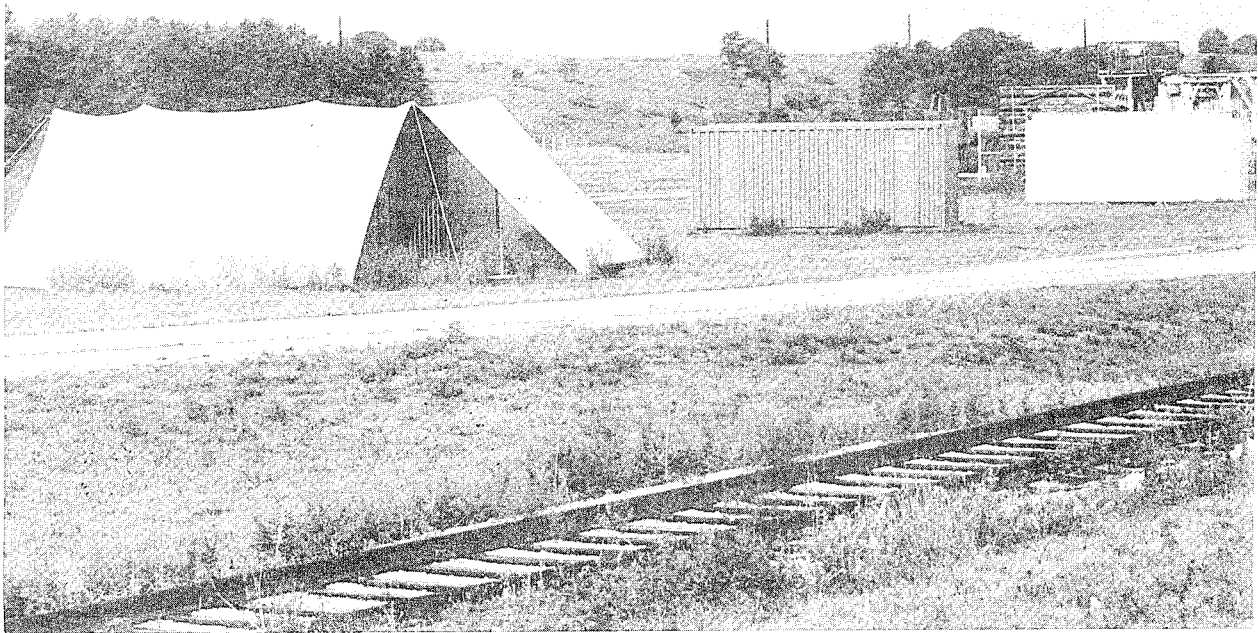




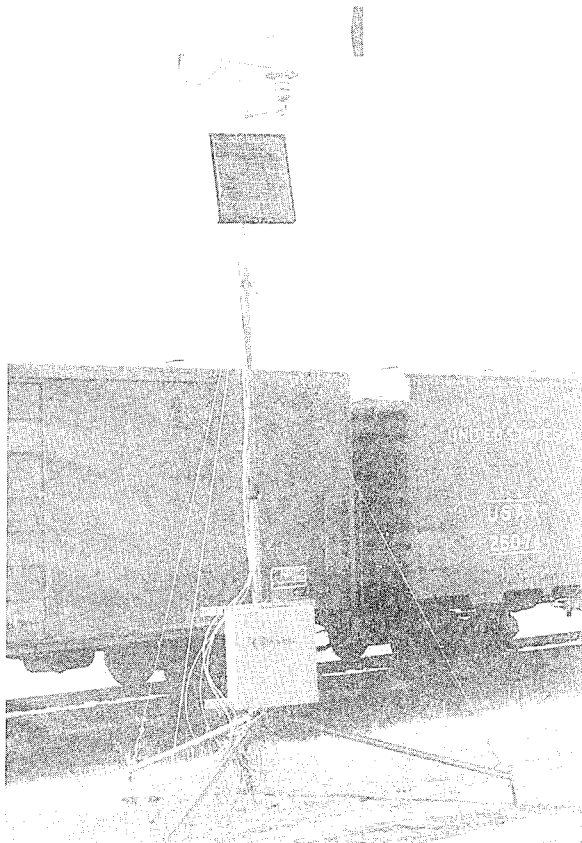
The USADACS Explosive Test Facility is used for testing operational shields designed to protect operating personnel from explosive side on blast overpressure, thermal flux radiation, and schrapnel produced by functioning a controlled amount of explosives in a simulated operational environment. The simulated operational environment is representative of a typical ammunition renovation line utilizing operational bays. This building has three operational bays that meet the physical requirements of MIL-STD-398, Military Standard Shields, Operational for Ammunition Operations, Criteria for Design of and Tests for Acceptance. The explosive limits of the facility are 50 pounds of propellant and 5 pounds of high-explosive material. This facility consists of three test bays with frangible roofing and 12-inch thick, steel-reinforced concrete walls. The test bays have instrumentation to measure blast overpressure, thermal flux, and noise level. It also contains high-speed



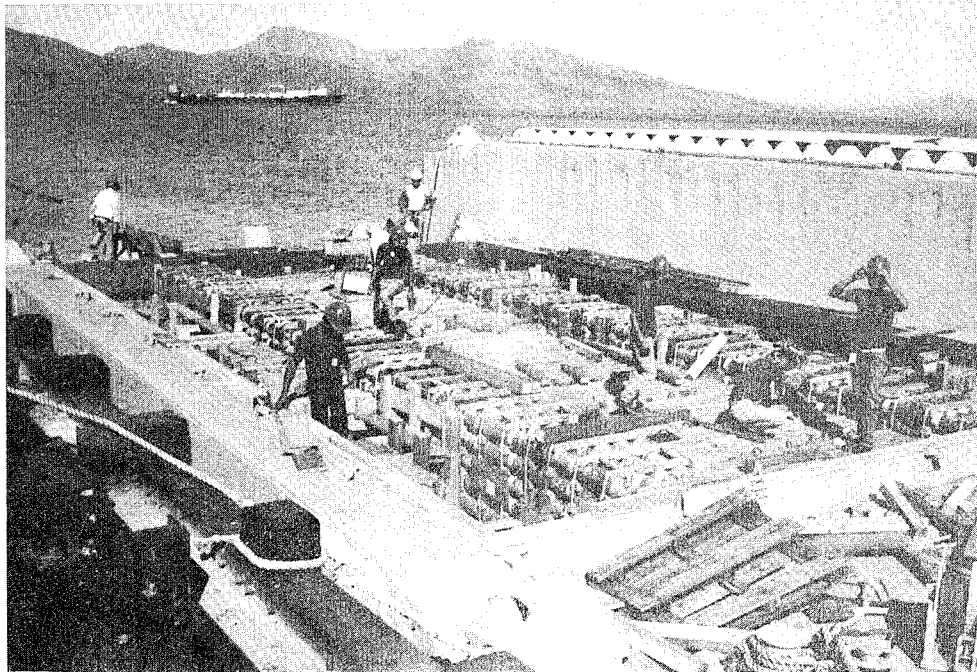
videotape and high-speed motion picture cameras (10,000 fps). USADACS maintains the equipment to perform MIL-STD-398, Military Standard Shields, Operational for Ammunition Operations, Criteria for Design of and Tests for Acceptance, tests on site.



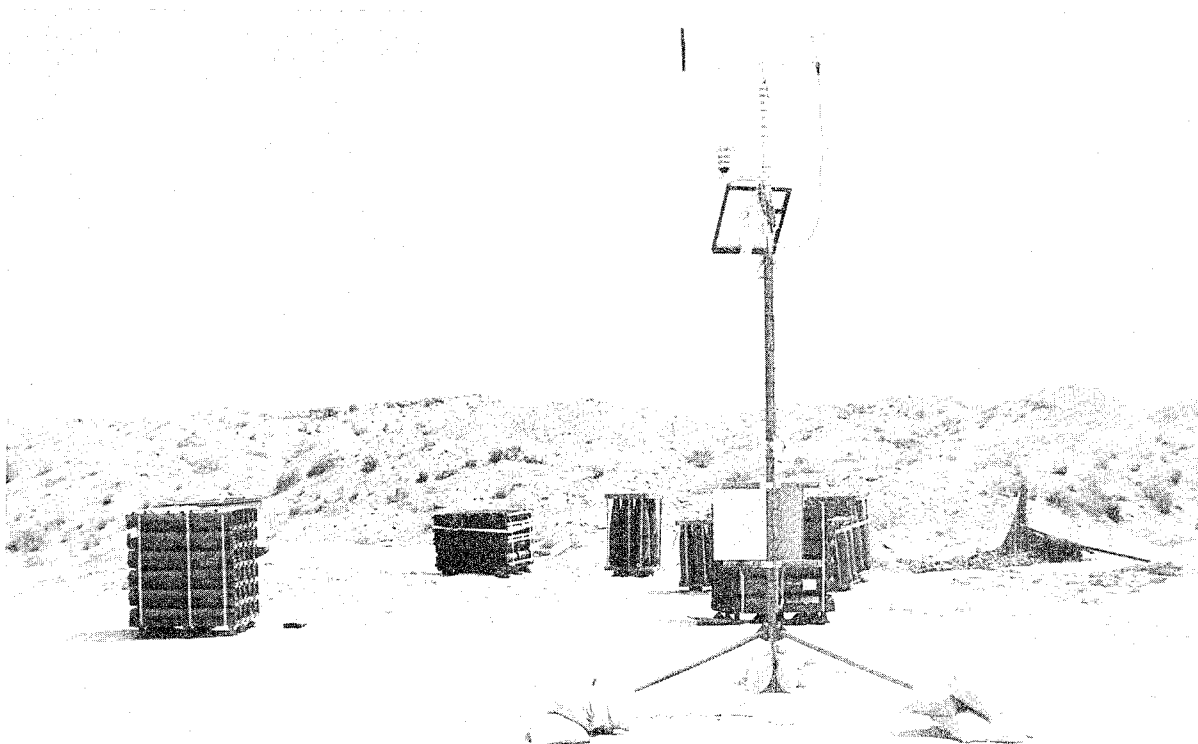
USADACS solar radiation test capabilities. For example, this photo shows one MILVAN protected by a Natick Research, Development and Engineering Center (NRDEC) tarp, another that is unprotected, and yet another that is covered with a Colbrand blanket.



Portable Weather Station. This weather station is used during solar radiation tests to record environmental data on the testing site. It is capable of long-term data recordings without service.



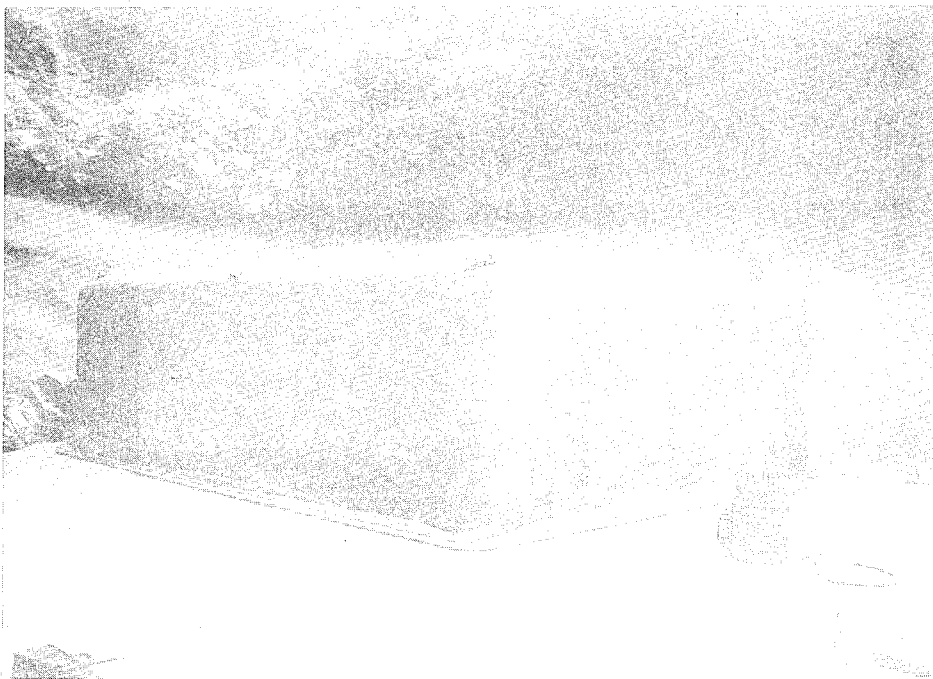
Prepositioned Ammunition Ships Afloat (PREPO). Break bulk PREPO ships have developed corrosion problems due to the salt, high temperature and high humidity environment. Conditions of temperature and humidity with in the ship compartments have been recorded over extended periods of time with data loggers installed by the Validation Engineering Division.



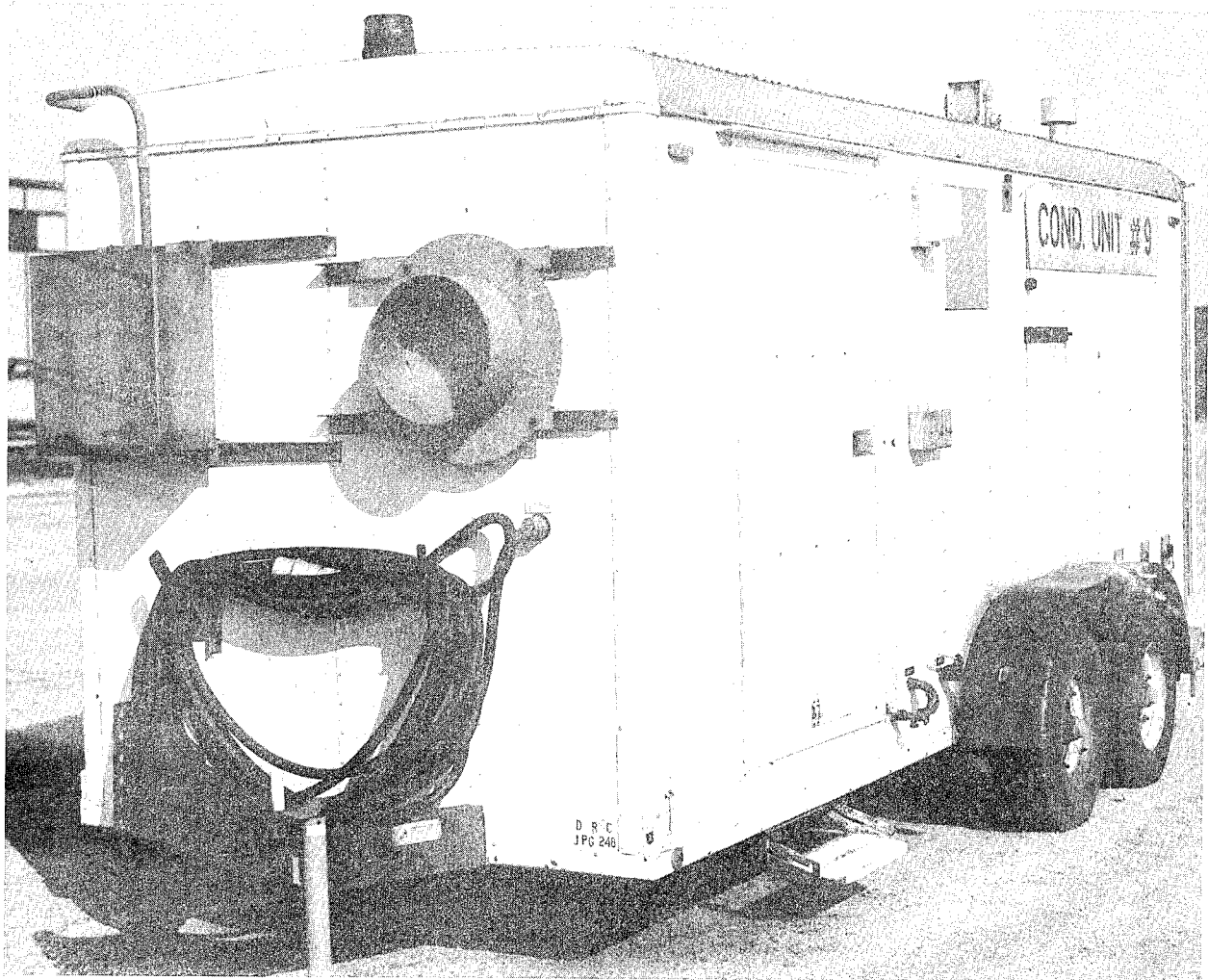
Passive outdoor temperature monitoring of ammunition in Saudi Arabia.



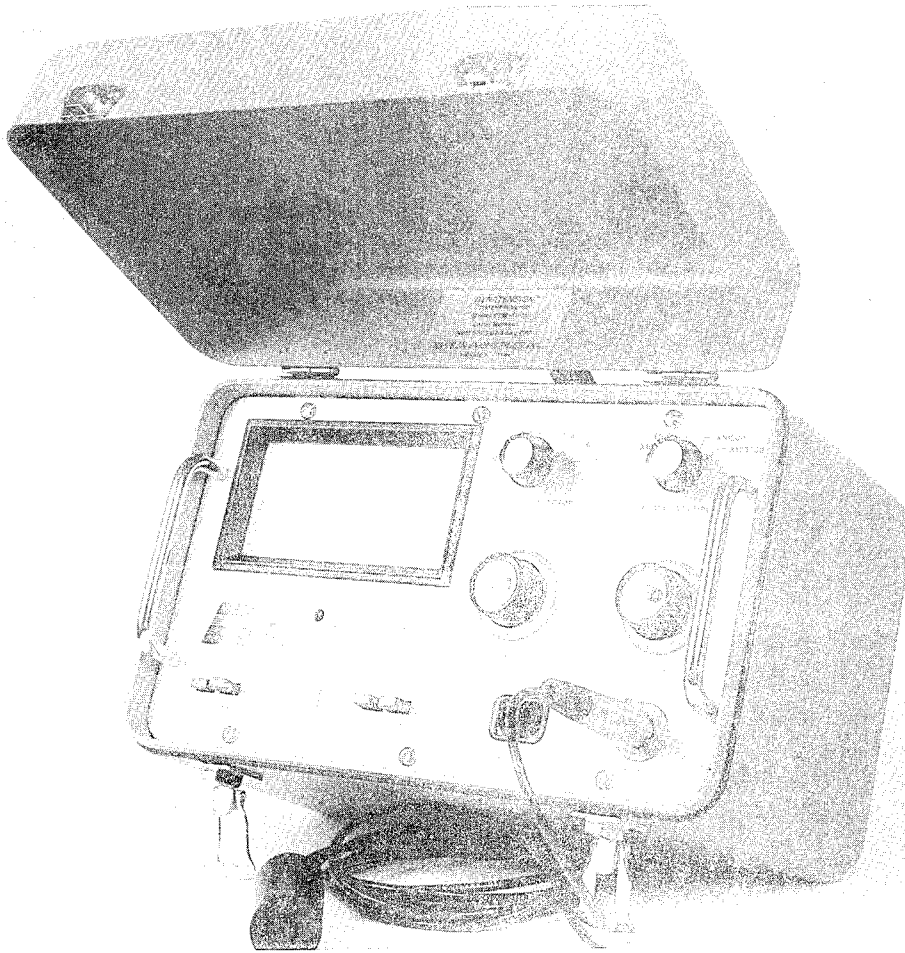
Passive Ammunition Storage System (PASS). Concern about weather induced deterioration of open stored contingency ammunition stocks has resulted in the tasking to monitor temperature/humidity of the conventional ammunition over the long term. Various types of ammunition in various states of open storage are instrumented to obtain actual moisture and temperature to which the rounds are exposed.



The vacuum-sealed airflex shelter is being evaluated to compare the temperature and humidity within the shelter to ambient conditions at the test site in Chibana, Okinawa, Japan.

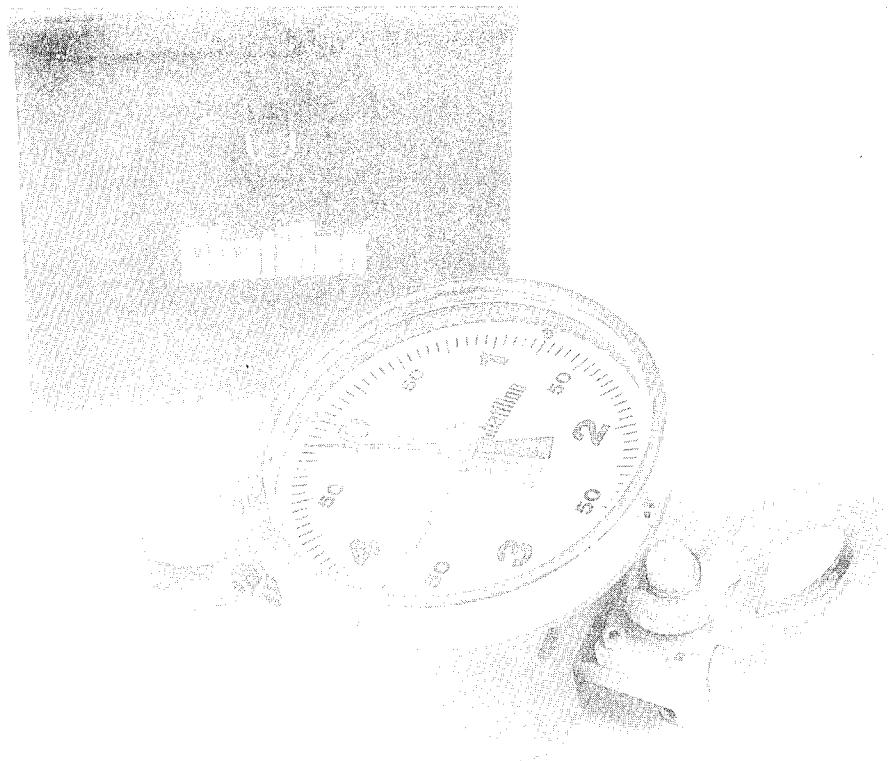


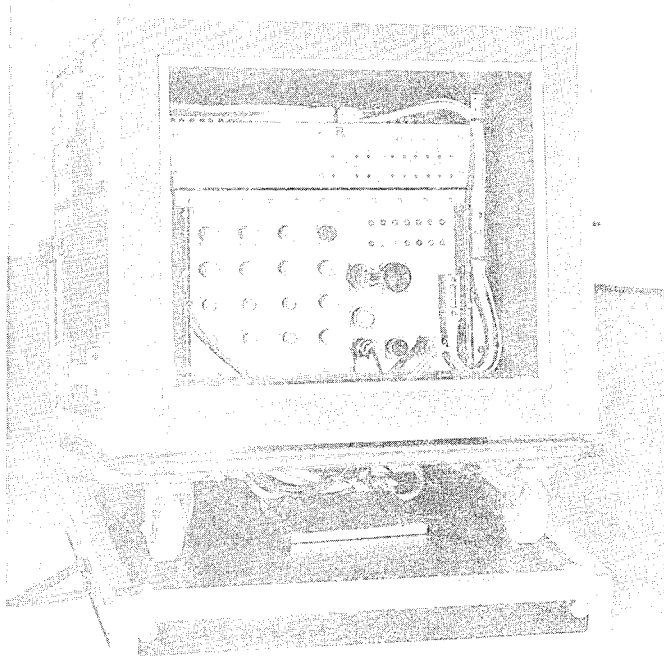
The Outdoor Environmental Pre-Conditioning Chamber is capable of temperature ranges from 270 degrees Fahrenheit to -100 degrees Fahrenheit, with a rate of change decreasing by 40 degrees Fahrenheit per minute. This chamber is portable and is used to simulate extreme environmental temperatures. The chamber can accept samples with maximum dimensions of 60 inches long, 56 inches wide, and 56 inches high.



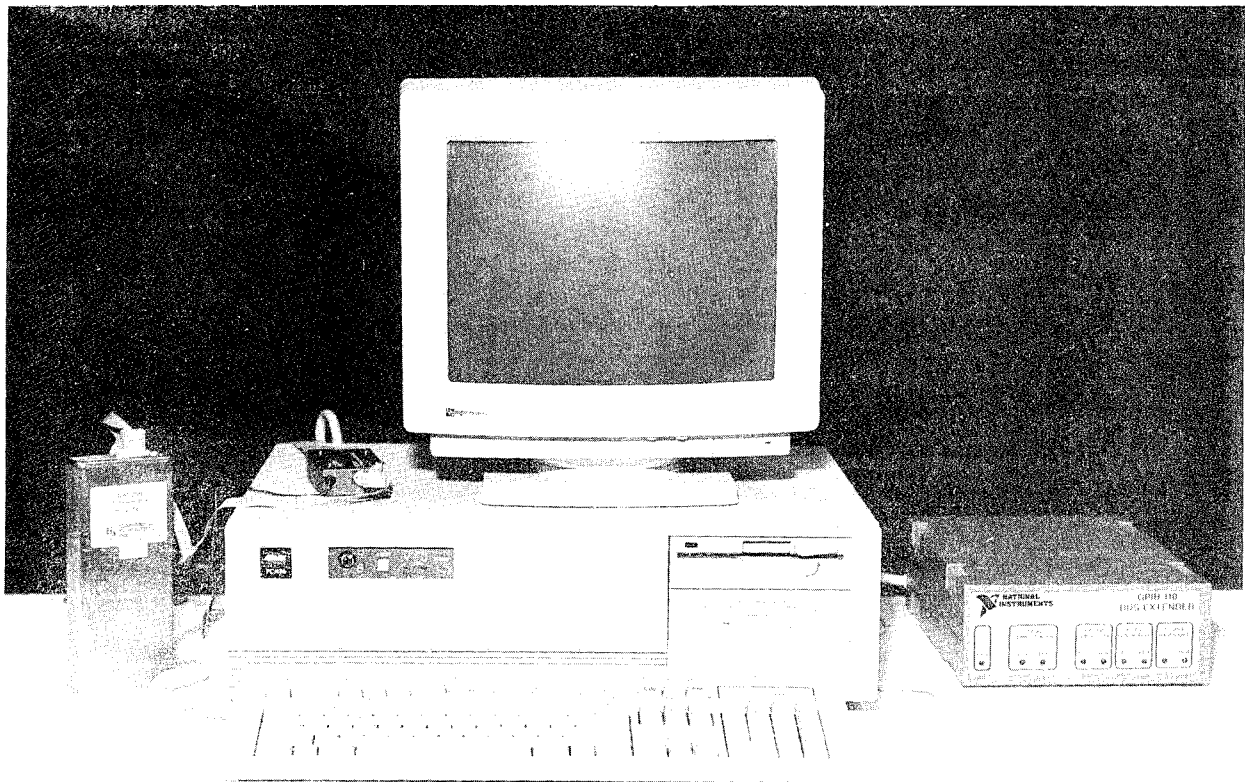
The DynaTension cable tension measuring instrument is used to determine cable tensions both before and after rail impact tests. Its overall tension range is 30 - 4,000,000 pounds and can accept cables with diameters of 1/8-inch up to 8 inches.

This second photo shows one of many Chatillon dynamometers used during cable and pull tests. They range in capacity levels from 5,000 - 50,000 pounds.

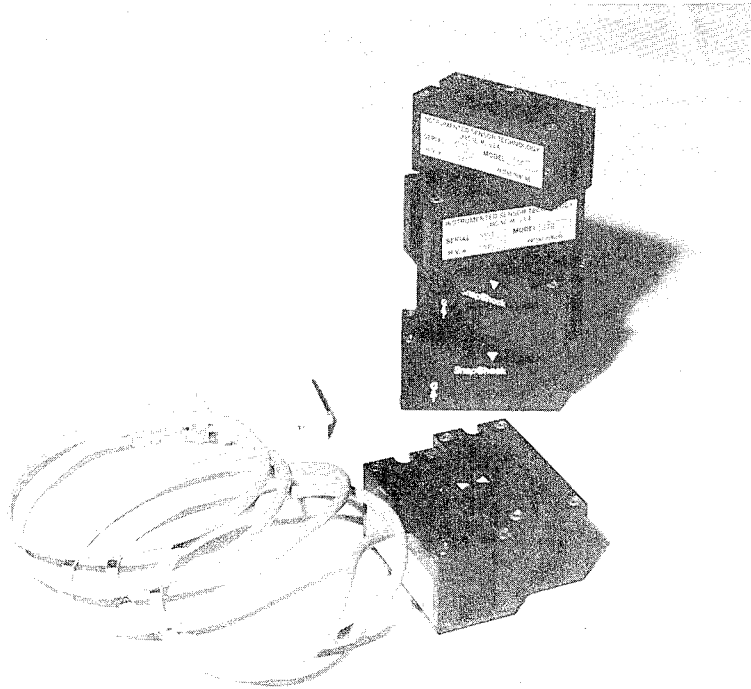




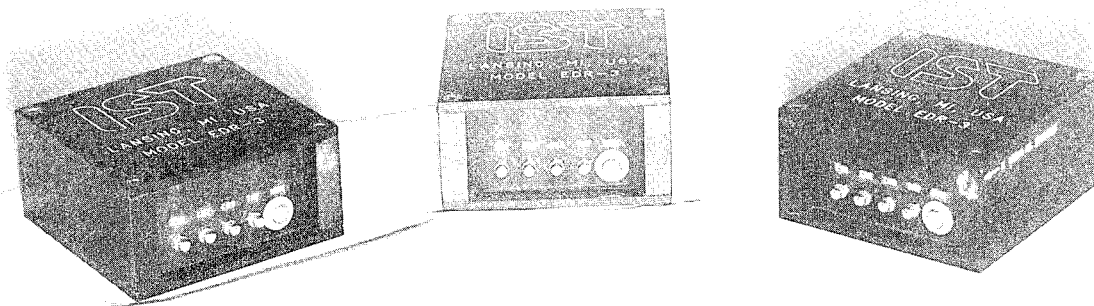
Pacific Scientific High-Speed Data Acquisition System. This unit is capable of recording 256K data points for 16 channels simultaneously at speeds of up to one million samples/second. Two independent acquisition systems give the capability of recording 32 channels of information. This equipment is primarily used in rail, road, ship, and Ammunition Peculiar Equipment (APE) testing requiring high-speed data acquisition.



The 33 MHz 80486 computer downloading system is used to download and graph data from the High-Speed Data Acquisition System at a rate of 2 minutes/channel. Capabilities include custom data and signal analysis, multi-colored/ multi-channeled plots, and world-wide data transmission via Defense Data Network (DDN) Electronic Mail (E-Mail).

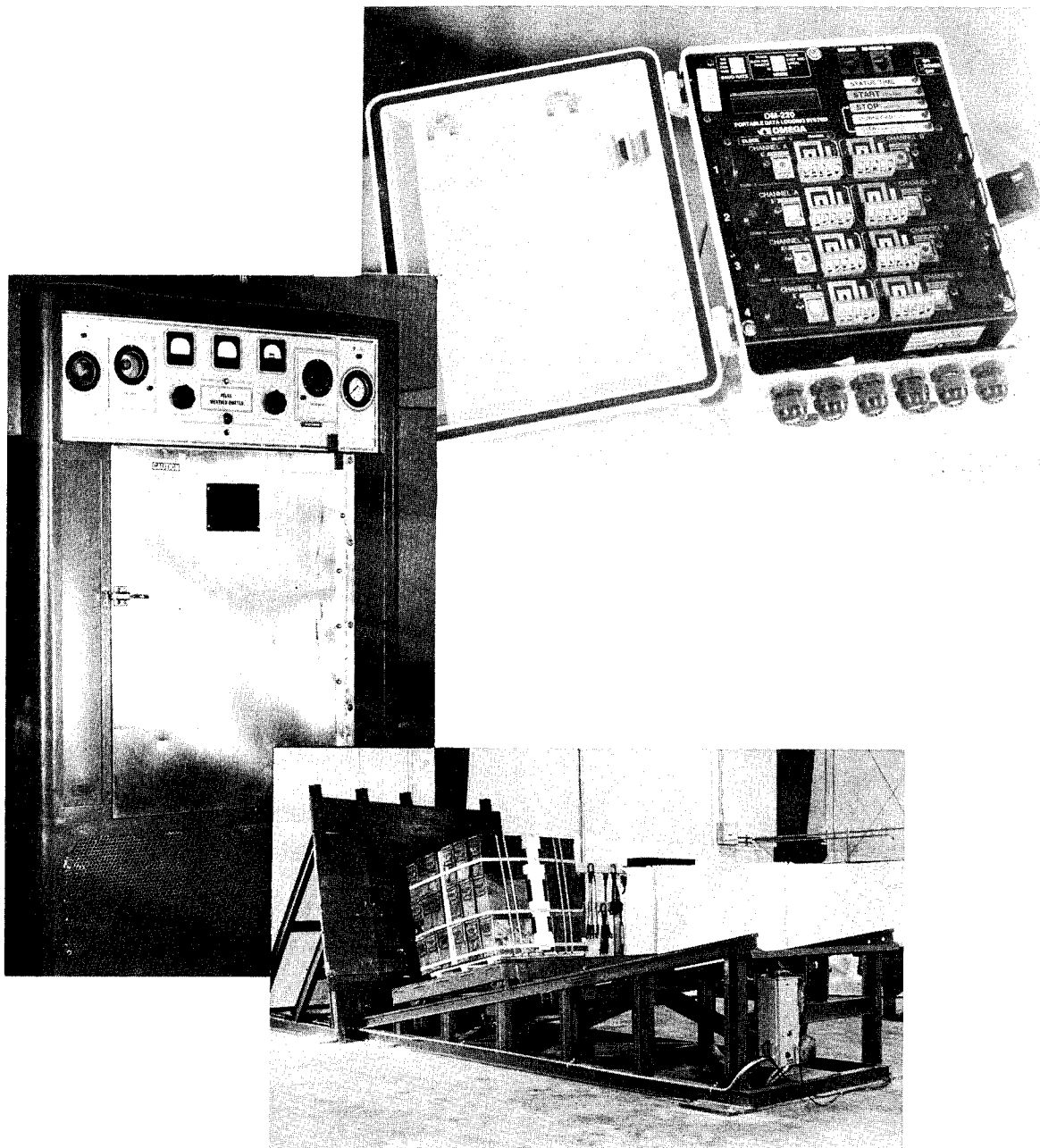


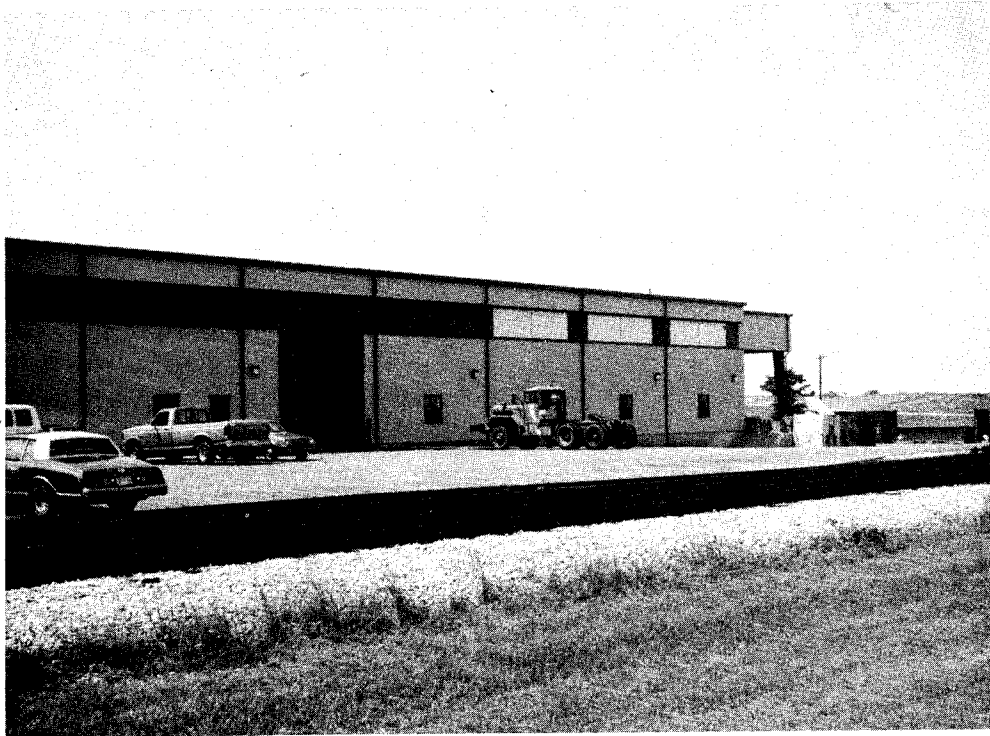
SnapShock Peak Acceleration Data Loggers. Once activated for recording, each of the five data loggers can record up to a maximum of 248 peak-acceleration levels that occur within selected time periods. These time periods can be set up over a range from 0.2 seconds to 31 hours. This corresponds to a total measurement period ranging from 50 seconds to 320 days. Expected battery lives are 20 days for alkaline batteries and 70 days for lithium batteries.



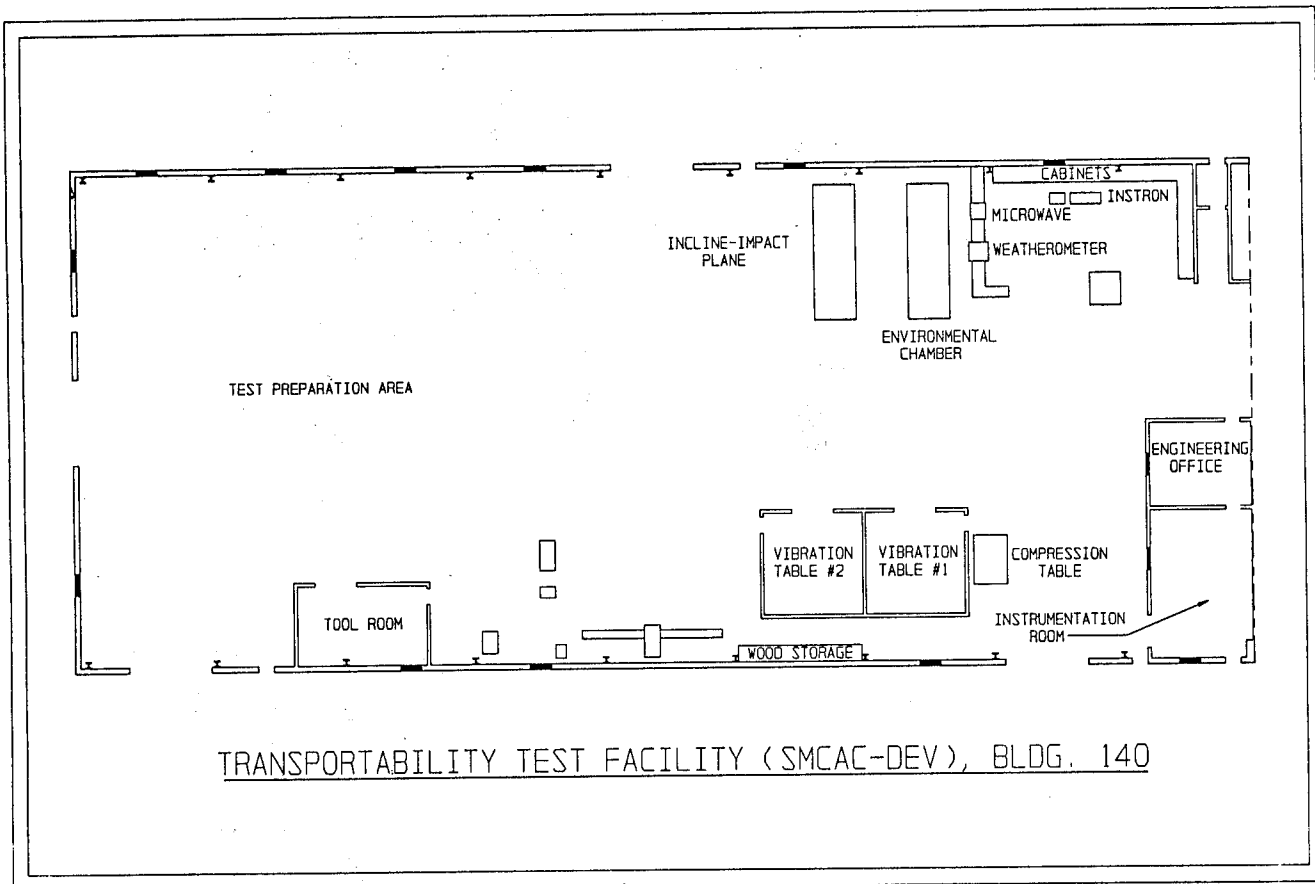
Environmental Data Recorders (EDRs). USADACS has access to three EDR-3 portable digital sensor/recorders. These recorders are designed to measure shock, vibration, temperature, and humidity. The EDR-3s can also be programmed to record only data that exceeds a certain trigger level, or they can also be configured for time-triggered recording. Its maximum event storage capacity is 5,291 events. The battery life expectancy during activation is 16 days. With dimensions of only 4.4- by 4.2- by 2.2-inches, these units can easily be packaged and shipped with a container or load for testing.

USADACS Validation Engineering Division Indoor Test Facilities

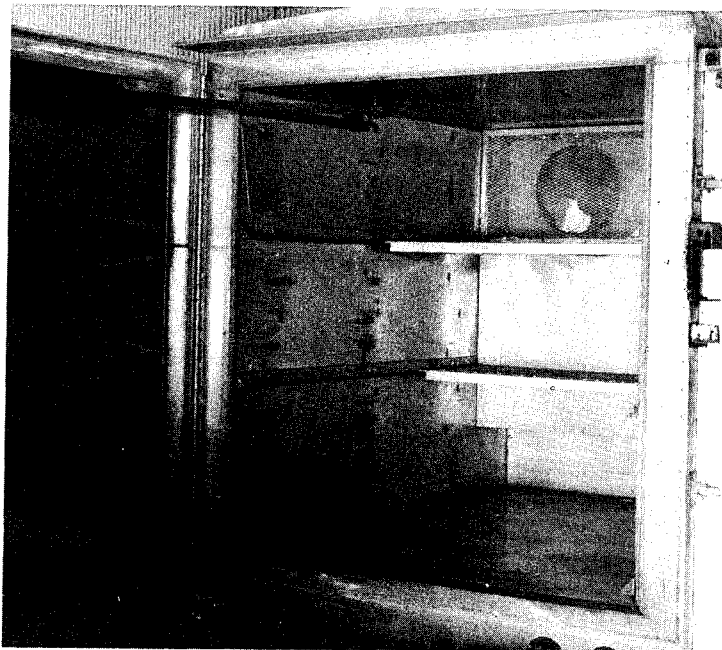
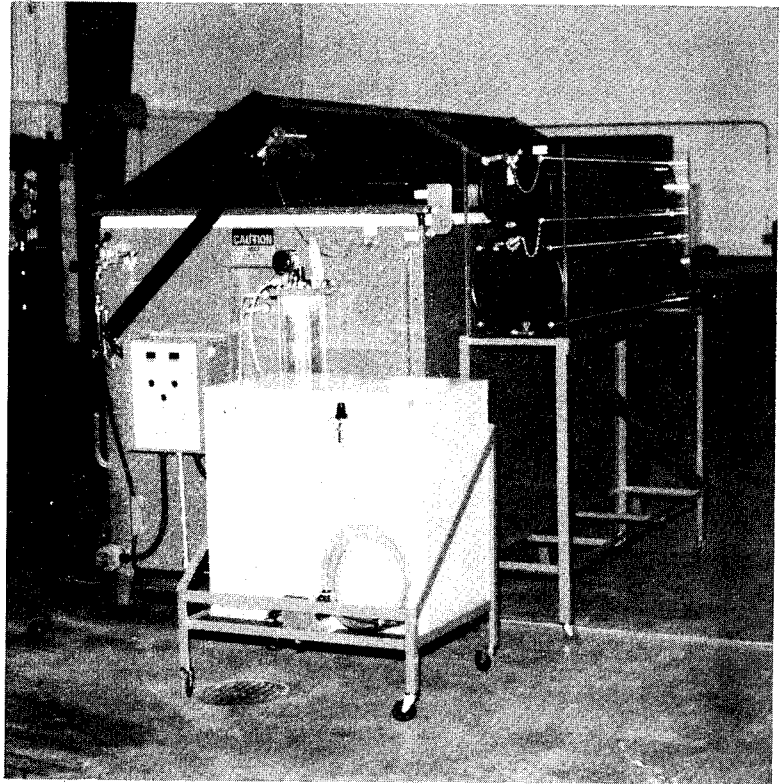




The indoor test facility houses many different types of testing equipment including the Incline-Impact Test, Compression Table, and Vibration Tables, to name a few. This building has power sources of 208-volt, single-phase and 440-volt, 3-phase. Below is a diagram of the indoor testing facility showing some of the testing equipment available.

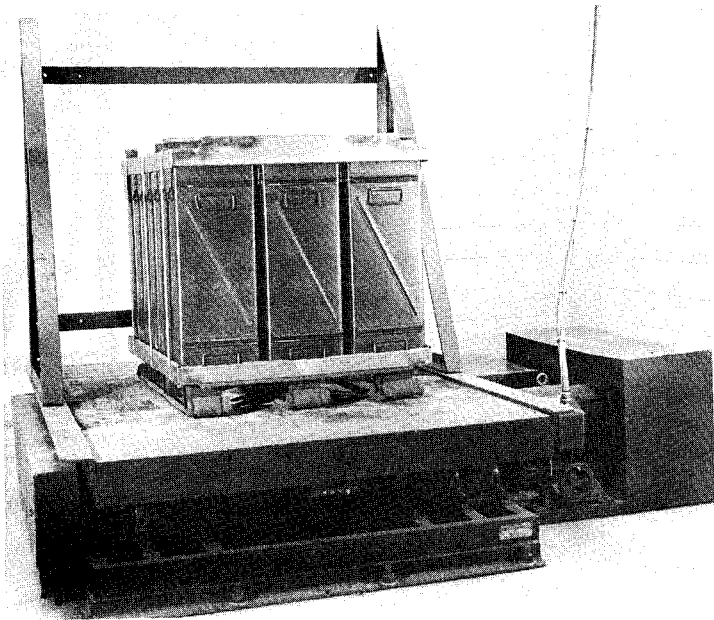


Salt-Fog Chamber. This chamber is capable of accepting test samples with dimensions up to 47 inches wide, 60 inches long, and 54 inches high. This chamber produces a consistently uniform free falling spray mist with uniform collection rates for all accelerated humidity, salt spray, and cass corrosion testing.

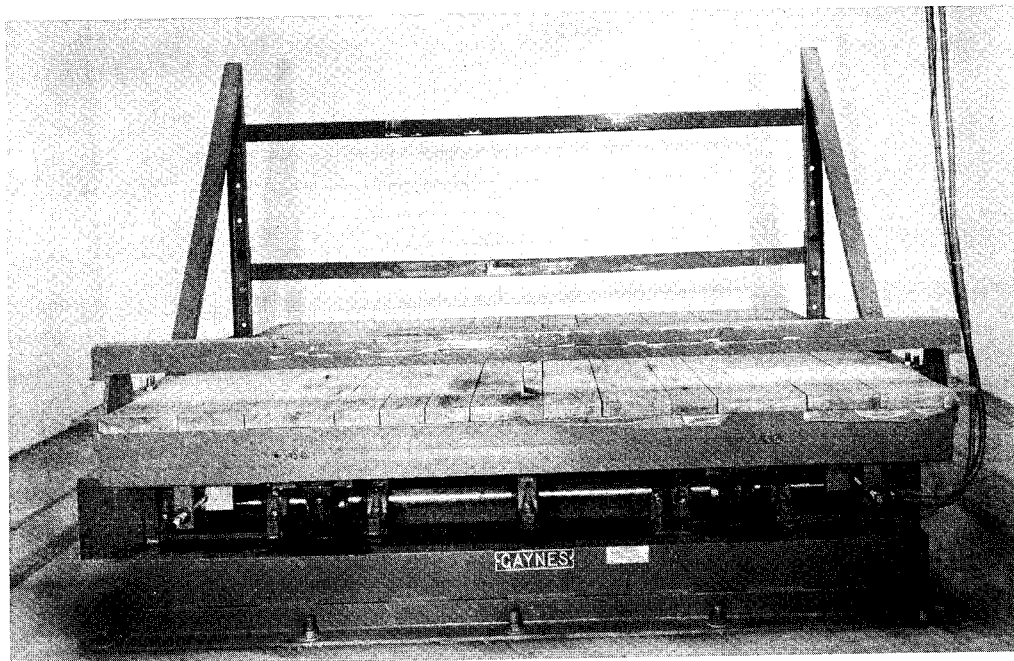


Indoor Environmental Pre-Conditioning Chamber. This environmental chamber is capable of temperature ranges from 270 degrees Fahrenheit to -100 degrees Fahrenheit with a rate of change decreasing by 40 degrees Fahrenheit per minute. It is used to simulate extreme environmental temperatures. The chamber can accept samples with maximum dimensions of 60 inches long, 56 inches wide, and 56 inches high. Typical systems that have been tested in the environmental chamber include the Secondary Steel Container (SSC) for chemical retrograde of ammunition from Europe as well as 40mm ammunition Performance Oriented Packaging (POP) tests.

Low-Frequency Vibration Tables. These tables are used to duplicate loose cargo transportation. Both units are capable of generating low-frequency vibrations of 0-5 hertz (Hz). These tables are used for MIL-STD-1660 tests as well as Performance Oriented Packaging (POP) tests. Typical tests that are capable of being conducted by these vibration tables are 5-gallon chemical decontamination agent POP testing, 81mm mortar on metal pallet, and 120mm tank ammunition in PA116 containers on metal pallet.

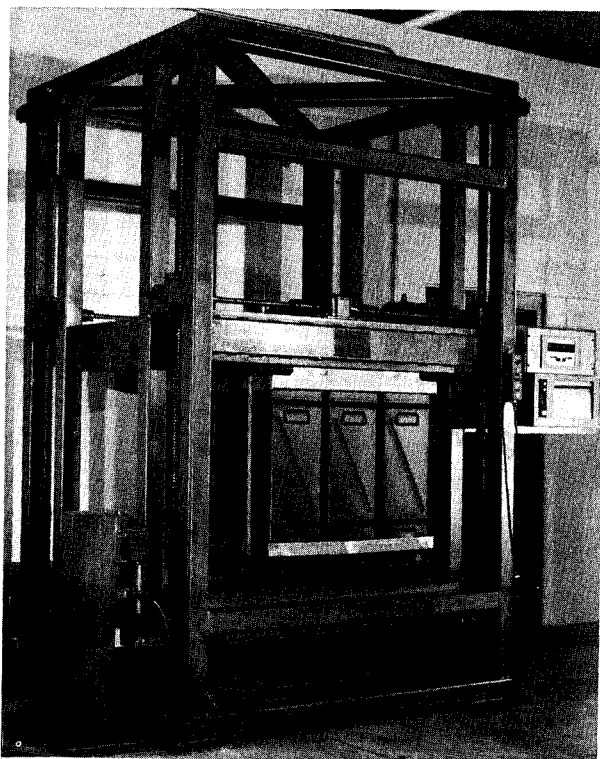
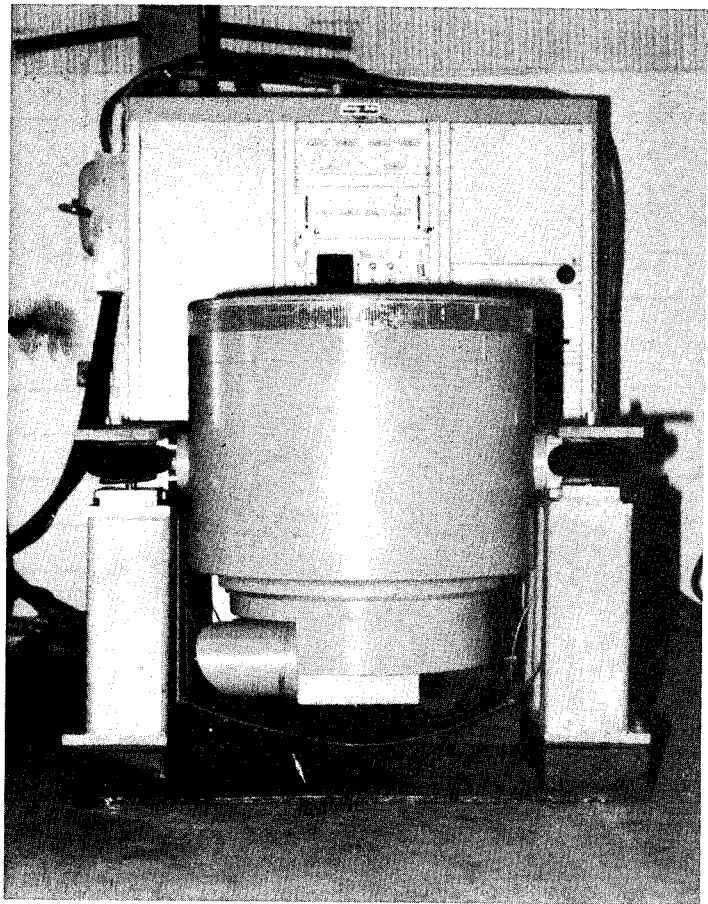


This unit has a 4,000-pound capacity and will accept test samples with dimensions up to 96 inches long, 70 inches wide, and 105 inches high.

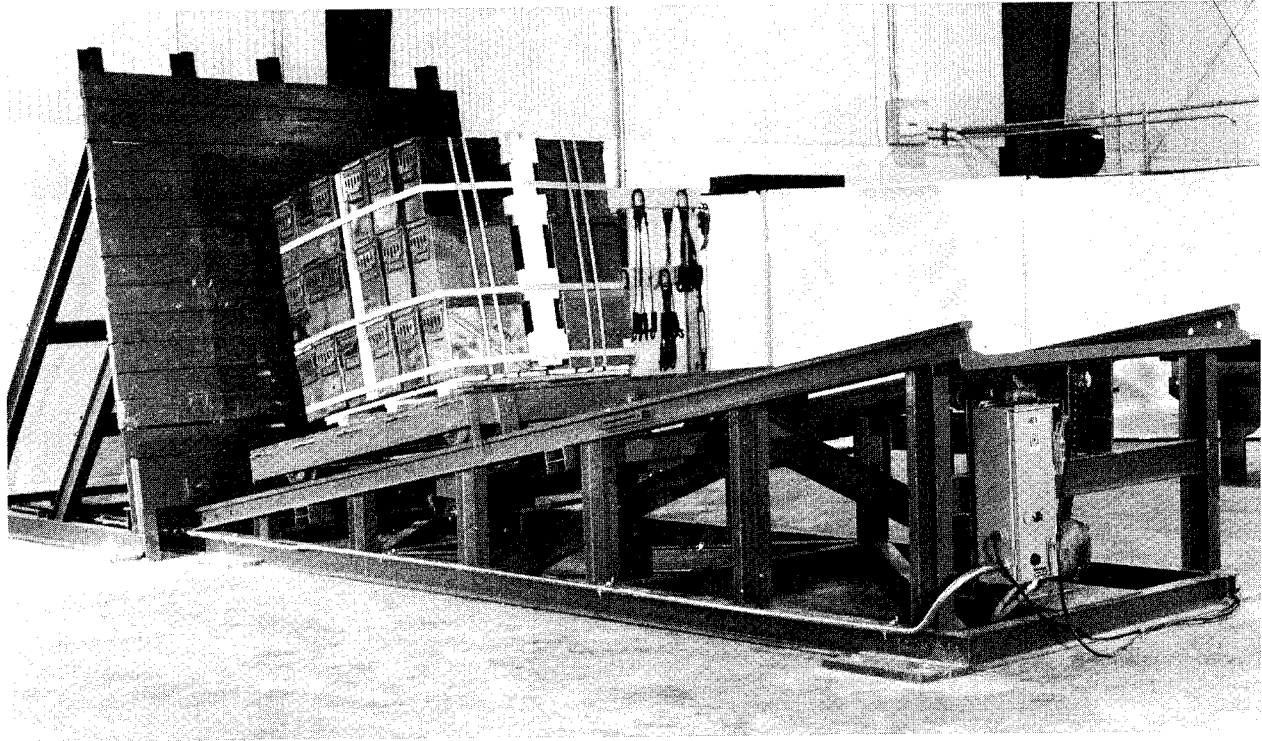


This vibration table has a 6,000-pound capacity and is capable of accepting samples of dimensions up to 96 inches long, 96 inches wide, and 100 inches high. This unit also has the capability of computer programmability causing the frequency to vary during testing.

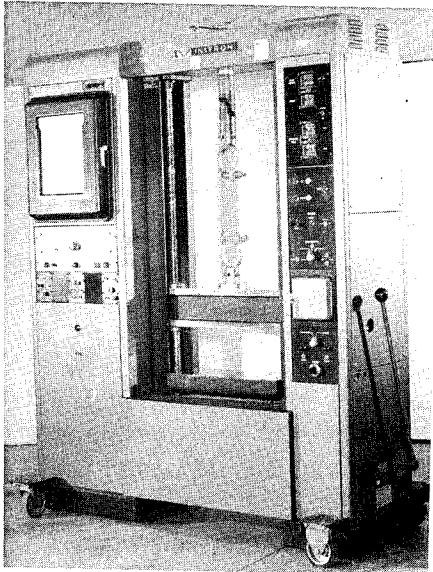
This High-Frequency Vibration Table is capable of administering vibrations between 5 and 5,000 Hz. This unit is water cooled and can accept test loads up to 300 pounds. It has a platform on which many different types of testing fixtures can be mounted. This unit is mainly used to simulate transportation of items by aircraft.



Ormond 50,000-Pound Tension/Compression Table. This table is used for MIL-STD-1660, Design Criteria for Ammunition Unit Loads, tests as well as POP tests. The table can accept samples of 58 inches long, 60-1/2 inches wide, and 72-1/2 inches high. Typical samples tested on the Tension/Compression Table are 120mm tank ammunition in PA116 containers on metal pallet, tension and compression tests of straps and cables up to 50,000 pounds, DS2 5-gallon chemical decontamination agent POP testing, and

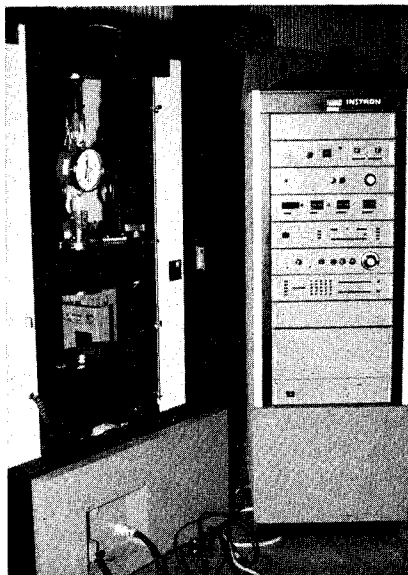
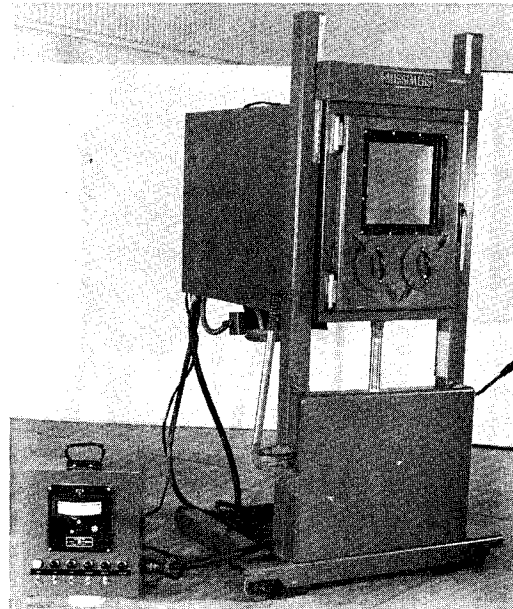


Incline-Plane. This piece of equipment is capable of generating impacts from 7- to 10-feet/second into a stationary wall (see appendix for chart). It is used during MIL-STD-1660 tests to verify transportability of palletized ammunition. The impact table is capable of handling samples up to 6,000 pounds, 71-1/2 inches wide, 72 inches long, and 80 inches high. Typical test samples include 155mm metal Field Artillery Projectile Pallet (FAPP), 40mm containers, and 2.75-inch rocket metal pallet adapters.

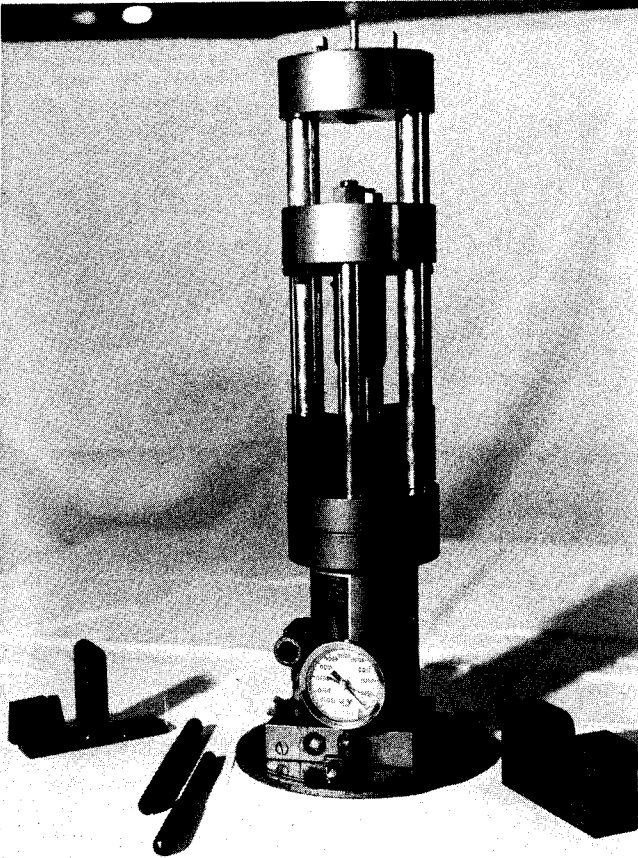


Instron 10,000-pound Tension/Compression Unit. This unit is capable of cyclical repetitive load/unload cycles that duplicate mechanical stresses on materials such as strapping, banding, etc.

Associated Environmental Chamber . This chamber is used with the Instron 10,000-Pound Tension/Compression tester to pre-condition test samples from 400 degrees Fahrenheit to -100 degrees Fahrenheit prior to testing. This chamber can also be used for thermal shock testing. It is capable of dropping from 400 degrees Fahrenheit to -100 degrees Fahrenheit at 26 degrees Fahrenheit per minute. The chamber dimensions are 20 inches high, 20 inches long, and 14 inches wide.

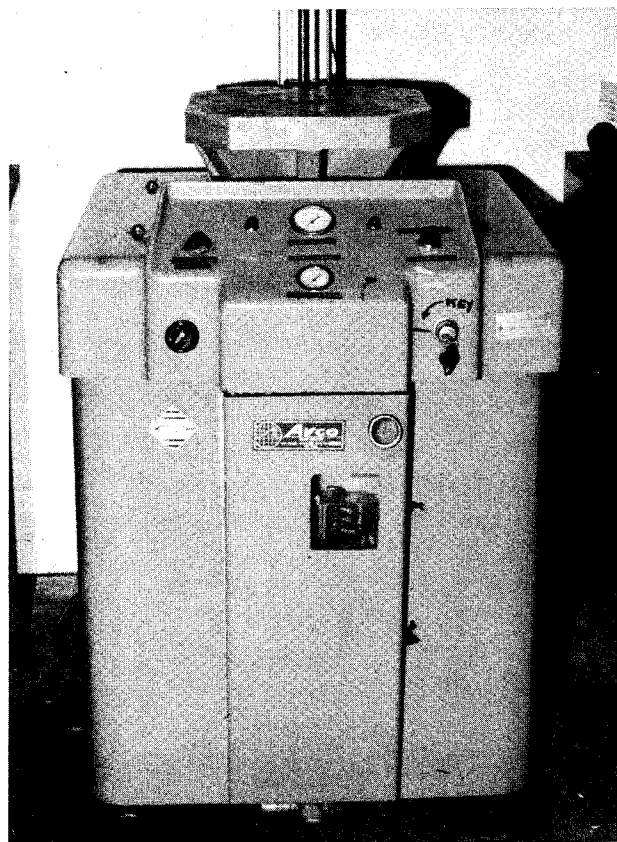


Instron 20,000-Pound Tension/Compression Unit. This unit is also capable of administering repetitive load/unload cycles that duplicate mechanical stresses on materials such as straps and banding. This unit is capable of administering loads up to 20,000 pounds.

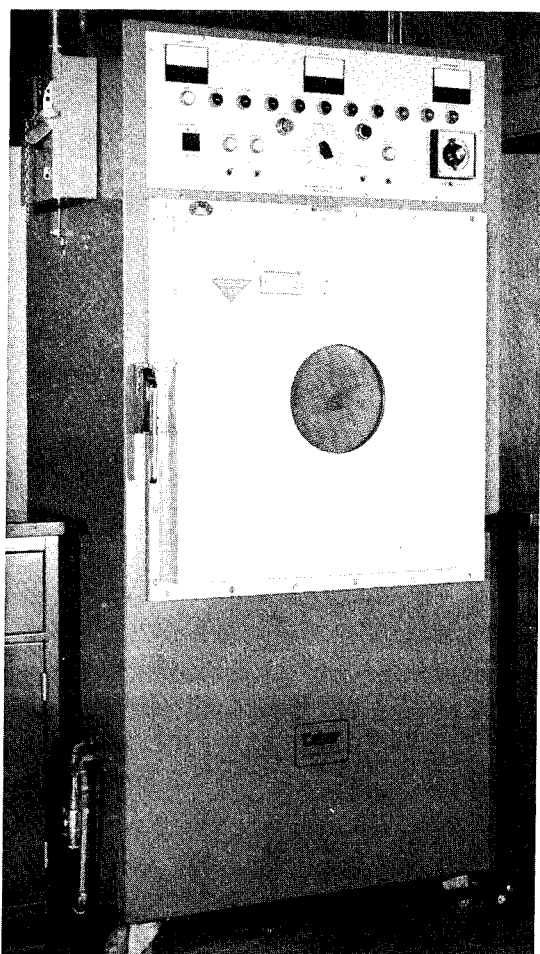
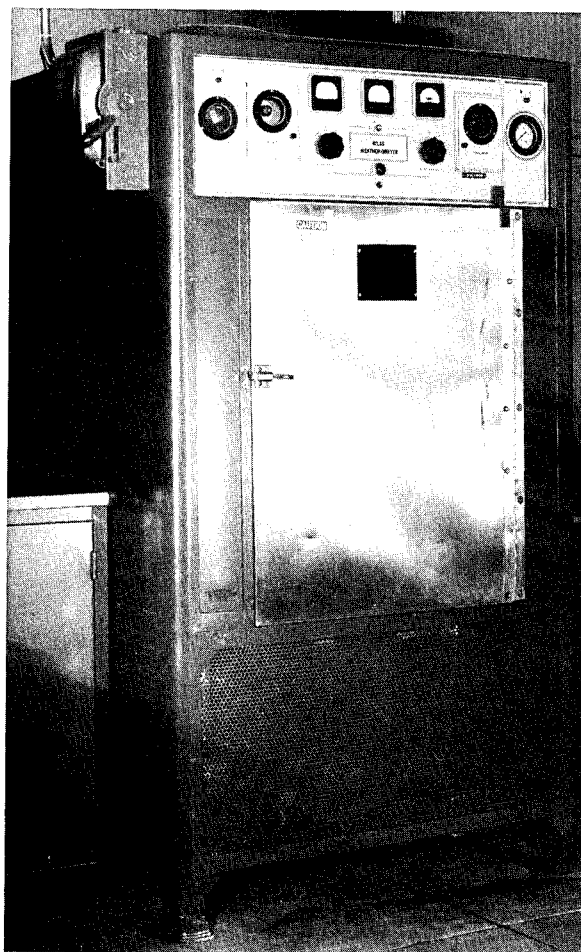


50,000-Pound Weld Tension/Compression Pull Tester. This piece of equipment is mainly used to test weld strength, but it can also be used to test banding and strapping strength. Unlike the Ormond Tension/Compression Table, this tension/compression tester is small and

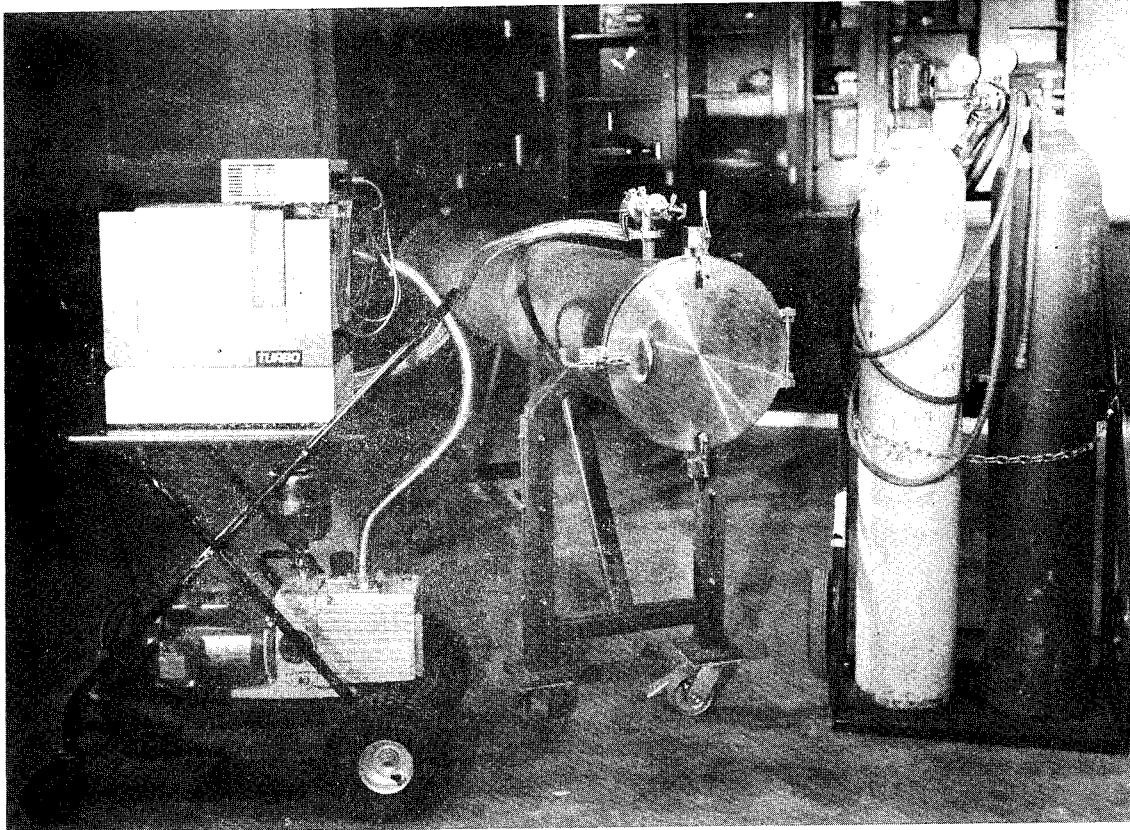
Avco Shock Machine. This shock tester is capable of producing shocks up to 400 g's. This machine has a testing platform of 16 inches long by 16 inches wide with many different tiedown positions.



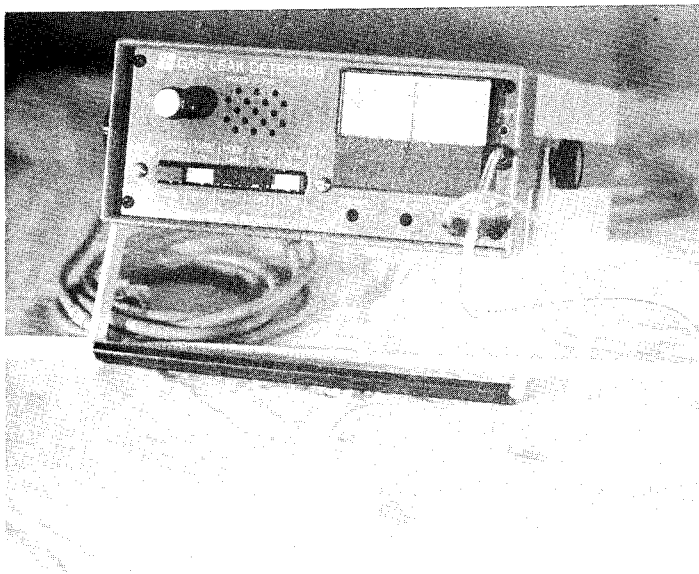
Atlas Weatherometer. This is an ultraviolet (UV) accelerated aging chamber used to simulate sunlight in UV deterioration of ammunition-related items. It has a voltage range of 200-240 volts and a temperature range of 0-40 degrees Celsius. Inside chamber dimensions are 32-1/2 inches high, 40-1/2 inches wide, and 39 inches long. This chamber can accept 54 samples at one time and uses a 3 carbon-arc UV acceleration system. A water conditioning cycle also can be administered every 2 hours. The entire system can be operated in cycles between 1- and 24-hour periods. Typical test items include wooden synthetic components used in related ammunition items.



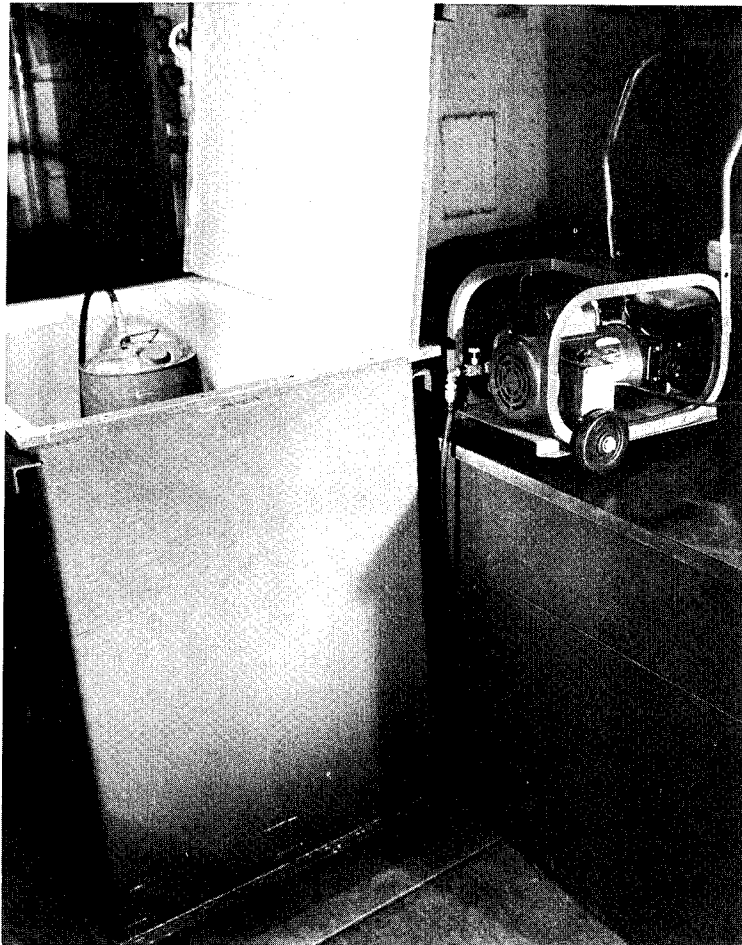
Cober 2.5 KW Microwave Radiation Furnace. This furnace is used for thermal shock testing of ammunition-related items. The furnace oven can accept samples up to 100 pounds with dimensions of 21-1/2 inches high, 22 inches wide, and 24 inches long. The maximum power output into the oven cavity is 2.5 KW and is smoothly adjustable down to 200 watts. Typical test samples include plastic and nonmetallic materials.



Mass Spectrometer and Associated Equipment. This equipment can measure leaks in the 10^{-4} to 10^{-9} cc/he/atm/sec. A hand probe can also be used with accuracy up to 10^{-6} cc/he/atm/sec. The mass spectrometer is used to verify leak integrity of chemical shipping and storage containers. It consists of a 3-pump system, including a rotary pump with a displacement of 400 liters/minute and a rotational speed of 1,725 rpm. From there, the samples go through another internal pump and finally to the Turbovac Pump, which has a pumping speed of 33 to 55 ltr/sec and a rotational speed of 72,000 rpm.

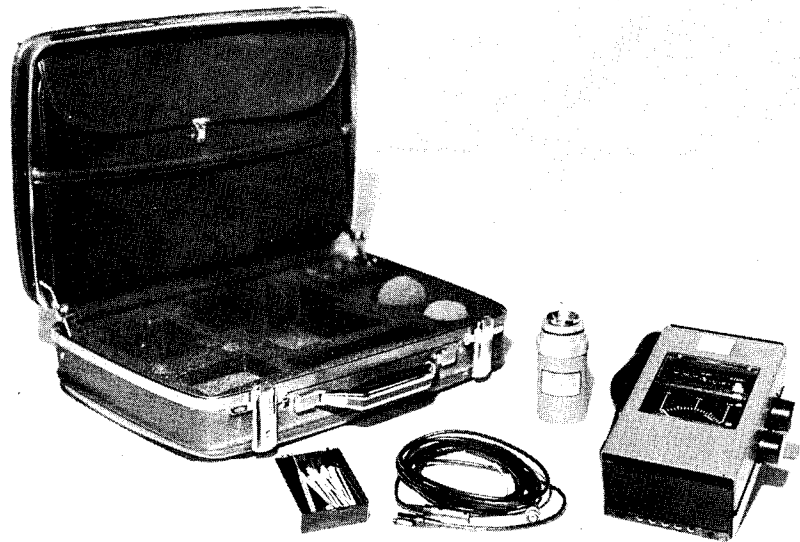


Gallmac Gas Leak Detector. This unit is capable of sensing gas leaks, such as helium, argon, and carbon dioxide, with relative sensitivity minimums of 10^{-5} cc/sec, 10^{-4} cc/sec, and 1.1×10^{-4} cc/sec.



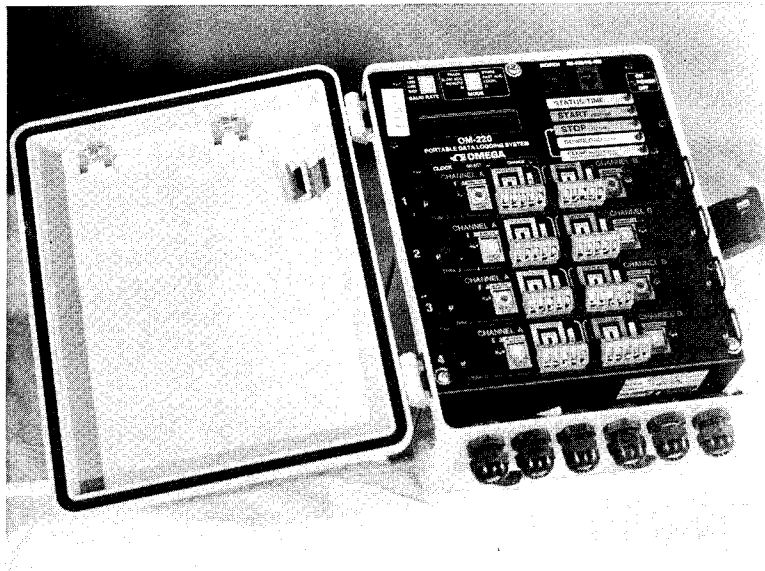
Hydrostatic Test Equipment. This equipment is capable of generating pressures of 10 to 1,000 psi. It is used for POP testing as well as structural integrity of chemical storage and shipping containers. The holding container can accept samples with maximum dimensions of 42 inches high, 41 inches long, and 29-1/2 inches wide.

The Precision Sound-Level Meter and Analyzer. This portable sound analyzer is intended to make precision sound-level measurements and octave band analyses. It is capable of operating for 20 hours on self-contained batteries and record data for later analysis. This sound meter has range levels of 10 to 130 dB with 1-inch microphone and 20 to 140 dB with a 1/2-inch microphone.



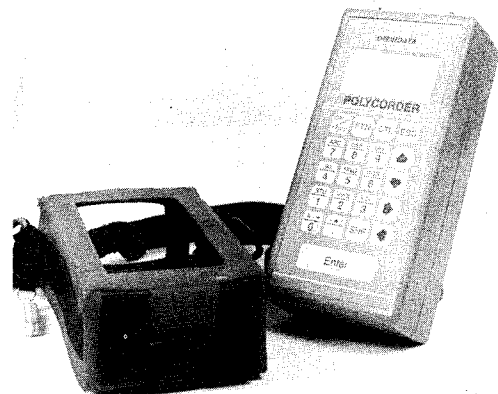
These are a few of the portable data recorders that USADACS has to record long-term storage tests of temperature and humidity on ammunition.

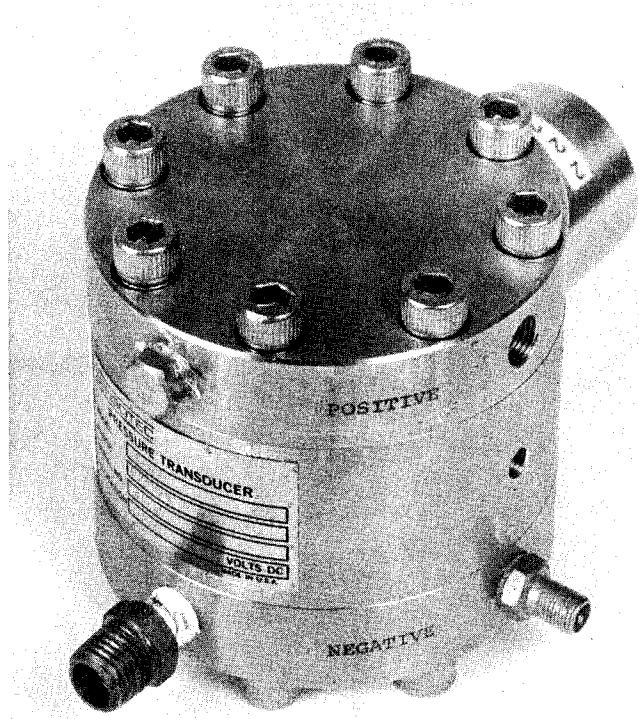
The 21X Micrologger has 978 bytes of allotted program memory. Its maximum rate for fast single-ended measurements with standard software is 256 per second (16 measurements repeated 16 times per second). The 21X is used in compliance with the Campbell Scientific Storage Modules 716 for long-term tests. The SM 716 is equipped with a battery-backed, solid state CMOS Random Access Memory (RAM) in a stainless steel canister containing 716,672 bytes of RAM for data and program storage.



The OM-220 is most commonly used in applications where it is set up onsite for long periods of time. This model is extremely easy to set up and use. It is weatherproof and ready for stand-alone onsite use. The OM-220 also has a one to eight channel 12-month recording capability with a 2-year memory backup.

The Polycorder is an environmentally sealed data acquisition system with a maximum of 448,000 bytes of RAM. It is capable of four programmable digital inputs/outputs and has a built-in RS-232, which allows files to be transferred between the Polycorder, it also contains three types of files including a format file, data file, and program file used to store Polycorder instructions that acquire, store, and manipulate the data.

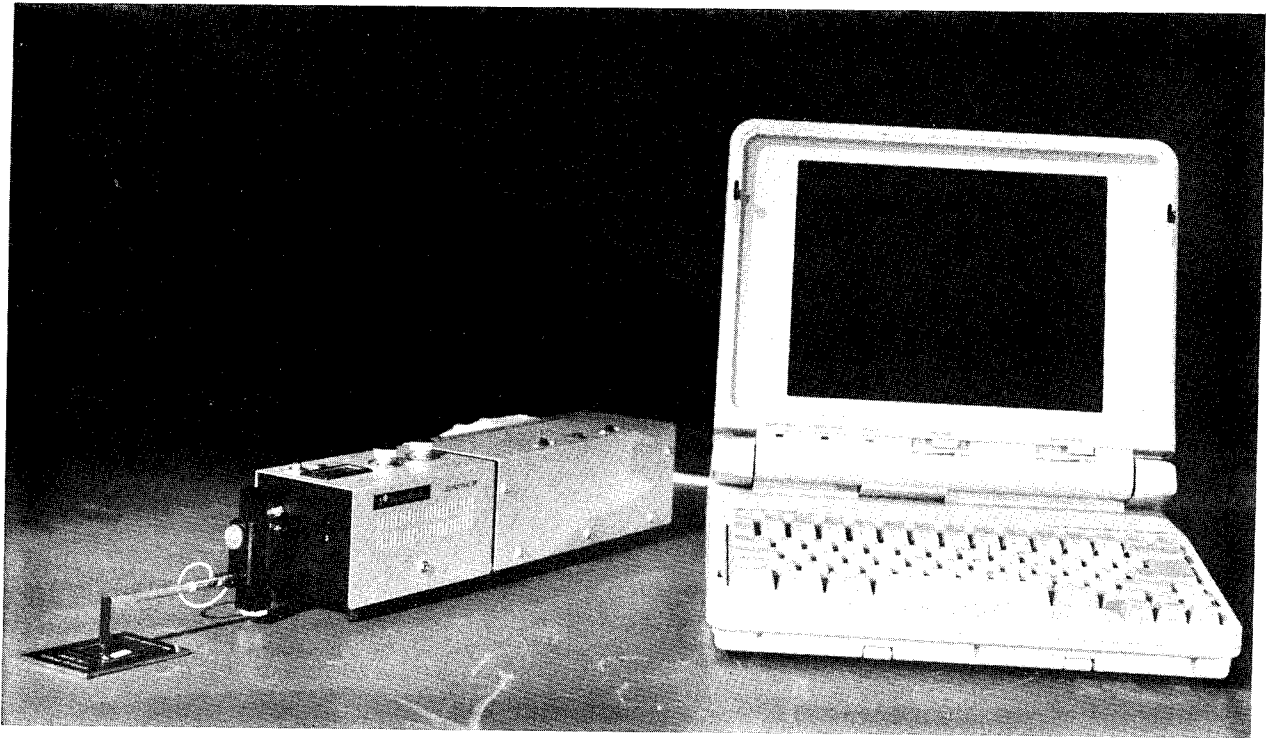




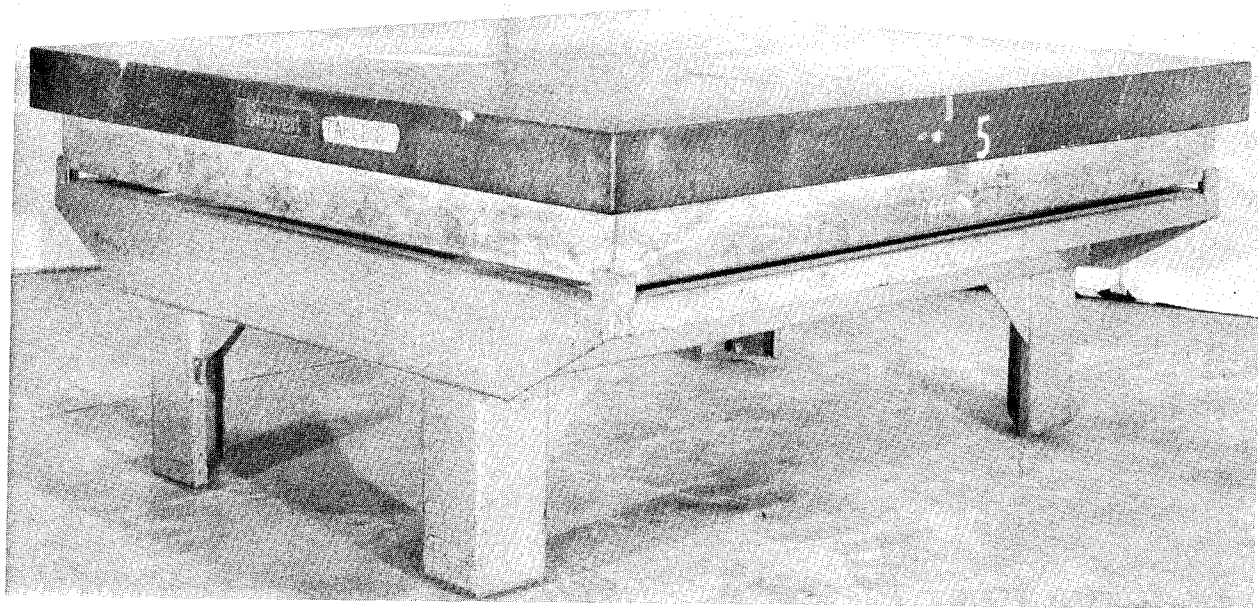
Below is one of a wide range of Sensotec pressure transducers used during precision leak rate testing. This particular pressure transducer has a pressure range from 0.5 to 25.0 psid.

Panametrics ultrasonic thickness gage is used to determine coating thicknesses on ammunition-related items. This gage has a measurement range of 0.05 inches to 20 inches at a rate of 2 measurements per second.





The computer interfaced profilometer is capable of measuring surface imperfections as small as 5 millionths of an inch at speeds of .04 in/sec for measurement and .01 in/sec for recording.

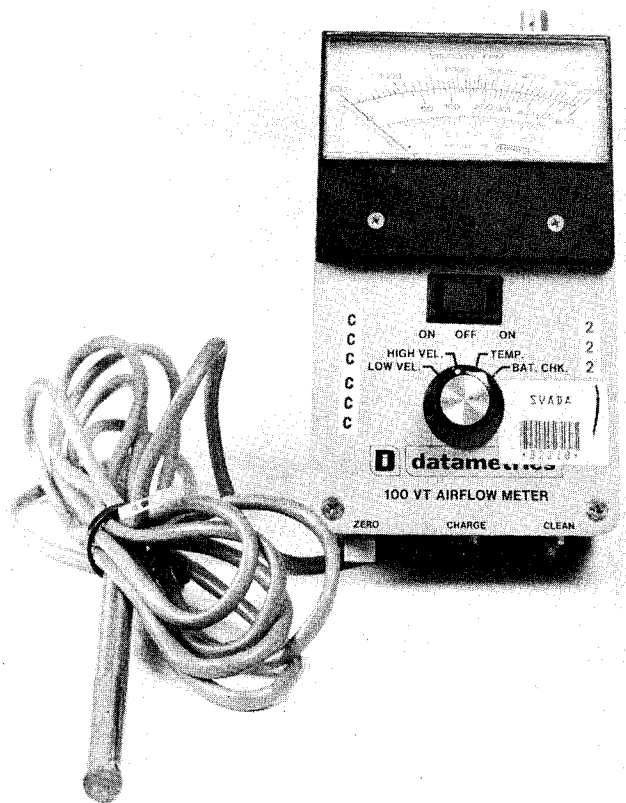


This 96- by 96-inch surface plate is used to inspect test items for any irregularities or warping both before and after testing.



Delmhorst Moisture Detector. This detector determines moisture content of wood and related items used in the shipment and storage of ammunition. It has a detection range of up to 80 percent

Datametrics Air Velocity Meter. This meter is used to measure air flow in shipping and storage containers. It can measure velocities up to 98.43 ft/sec and has a battery operating length up to 7 hours.



APPENDIXES

APPENDIX

POINTS OF CONTACT ADDRESS DIRECTORY

MAILING ADDRESS: Director
U.S. Army Defense Ammunition Center and School
ATTN: SMCAC-DEV (Designated Individual)*
Savanna, IL 61074-9639
* Jerome H. Krohn
* Quinn D. Hartman
* Alfred C. McIntosh, Jr.
* William R. Meyer
* Jason B. Solberg

SHIPPING ADDRESSES:

TRUCK: Transportation Officer
Savanna Army Depot Activity
ATTN: SMCAC-DEV
Savanna, IL 61074-9639
MARK FOR: W81AOR

RAIL: Transportation Officer
Savanna Army Depot Activity
ATTN: SMCAC-DEV
Proving Ground, IL
MARK FOR: W81AOR

MESSAGE ADDRESS: DIR USADACS SAVANNA IL //SMCAC-DEV//

E-MAIL ADDRESS: SMCACDEV@SAVANNA-EMH1.ARMY.MIL

TELEPHONE: 815-273-8929/8908 (commercial)
585-8929/8908 (DSN)

DODAC: UIC: W3GMAA

DODAC OF PROPERTY: W52G2J
BOOK OFFICER AT
SVADA

DATAFAX NO.: 815-273-8811 (commercial)
585-8811 (DSN)

VISITORS GUIDE

GENERAL INFORMATION

Location

The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SMCAC-DEV), located on the Savanna Army Depot Activity (SVADA), approximately seven miles north of Savanna, IL, off Illinois Route 84, performs four distinct testing operations, namely, transportability testing, pallet/laboratory testing, ammunition peculiar equipment (APE) testing, and equipment evaluation and demonstrations. The U.S. Army Defense Ammunition Center and School is generally reached by rental car from either Chicago (155 miles) or Moline (65 miles).

Security Processing

Security badging and issuance of car passes are accomplished at the main gate. You will be requested by the on-duty guard to park in the parking lot on the right immediately after passing through the gate and to return to the guard post to receive a badge and car pass.

Tests are usually unclassified; therefore, security clearance is not required. If the test announcement indicates a security clearance requirement, a letter or message should be sent to Director, U.S. Army Defense Ammunition Center and School, ATTN: SMCAC-DEV, Savanna, IL 61074-9639, with an information copy to SMCAC-AST (Security Manager).

Cameras or any video recording equipment transported on post must be registered at the Security Office in building 132. The Security Office must have make, model, and serial number of video equipment for the issuance of the camera pass. Pass must be turned in to the Security Office upon completion of visit to USADACS.

Reporting

Upon arrival at USADACS and completion of security badging, test attendees should report to the Validation Engineering Division located in the west end of building 134 and report in with the Validation Engineering Division Chief or test engineer.

Government Quarters Availability

Government quarters are not available. There are a number of modern motels available within the immediate area.

Dining Facilities

A dining facility is located on post. A number of restaurants are located within surrounding communities.

Attire

Transportability testing and equipment demonstration/evaluation are conducted at the Transportability Test Facility located behind building 134.

Tests are conducted throughout the year. Test attendees should dress according to the season, since climatic conditions can range from extremely hot and humid in the summer to subzero temperatures in the winter. The temperatures and precipitation information are provided here:

ILLINOIS (QUAD CITIES AREA) WEATHER DATA			
<u>MONTH</u>	Average Daily High (Degrees F.)	Average Daily Low (Degrees F.)	Average Number of Days with at Least .01 Inch of Precipitation
January	30.0	13.0	9
February	34.3	17.0	8
March	45.0	26.4	11
April	61.3	39.8	11
May	72.0	50.2	12
June	81.4	60.2	10
July	85.2	63.8	9
August	83.8	62.0	9
September	76.0	53.2	9
October	66.0	42.8	7
November	48.1	30.2	8
December	34.6	18.5	9

SAFETY IN TESTING

General

Upon arriving at USADACS, all test attendees should contact the test engineer or other persons designated as the point of contact. If test preparations are still in progress, attendees will be directed to a conference room. In most cases, all test preparations will have been accomplished ahead of time, and test attendees will be permitted to proceed to the test area.

Transportability Testing

Before test attendees inspect the test item, they must contact the test engineer or other person designated as point of contact to assure the railcar, trailer, or other test item will not be moved. Test attendees are cautioned not to touch or move test instrumentation.

During performance of test, attendees must observe from a safe distance (at least 25 feet). Attendees must remain at a safe distance until released by the test engineer.

Although a rail impact or a road test may appear to have stopped, the conductor or truck driver may wish to make further movements before permitting visitor inspection. The test engineer will remain in contact with the conductor or truck driver and will await their release of the test load before permitting any visitor inspections.

Safety equipment such as hard hats, safety glasses, etc., will be furnished by USADACS as deemed necessary. Safety shoes, gloves, etc., although not generally required, will be the responsibility of the test attendees.

Pallet/Laboratory Testing

Pallet/Laboratory testing is conducted in the rear one-third of building 140. Test attendees will report to the Validation Engineering Division located in building 134 after completion of security badging.

The assigned test engineer will, after completion of all necessary administrative matters, escort test attendees to the test laboratory in building 140.

Test attendees will comply with the directions of the test engineer. During operation of any test apparatus, test attendees will remain at least 10 feet from the operation.

Safety equipment will be issued when required. Safety glasses are required at all times.

Test attendees are required to wear double ear protection during operation of the vibration table whenever within 25 feet of the test apparatus.

During operation of the tension/compression test in the tension mode, test attendees will remain behind a barricade or the lucite shield per test engineer's direction.

Ammunition Peculiar Equipment (APE)

Ammunition Peculiar Equipment (APE) testing is conducted within the ammunition area. Upon arrival and security badging, attendees will report to either the Validation Engineering Division test engineer or the Maintenance Engineering Division project engineer. These individuals will brief you on the operation, the standing operating procedure (SOP), and other particulars required for safety prior to departing for the test site.

MATERIAL HANDLING EQUIPMENT (MHE) AND SPECIFICATIONS

TRUCK, TRACTOR: 5-Ton, 6x6, W/Winch, W/E

Model Number: M818

Payload: 15,000 lbs.

Towed Load Allowance: 37,500 lbs.

Weight: 20,955 lbs.

TRUCK, TRACTOR: 5-Ton, 6x6, WO/Winch

Model Number: M818

Payload: 15,000 lbs.

Towed Load Allowance: 37,500 lbs.

Weight: 20,290 lbs.

TRUCK, CARGO: 5-Ton, 6x6, Drop Side, W/Winch, W/E

Model Number: M925A1

Payload: 10,000 lbs.

Towed Load Allowance: 15,000 lbs.

Weight: 22,575 lbs.

TRUCK, CARGO: 2-1/2 Ton, 6x6, WO/Winch

Model Number: M35A2

Payload: 10,350 lbs, Off Road: 7,000 lbs.

Towed Load Allowance: 6,000 lbs.

Weight: 13,700 lb

TRUCK, CARGO: 1-1/4 Ton, 6x6, W/E

Model Number: M561

Payload: 2,500 lbs.

Towed Load Allowance: 6,000 lbs.

Weight: 7,300 lbs.

TRUCK, UTILITY: 1-1/4 Ton, 4x4, Cargo/Troop Carrier, HMMWV, W/E

Model Number M998

GVW: 7,500 lbs.

Towed Load Allowance: 3,400 lbs.

Weight: 4,971 lbs.

Amount: 2

TRUCK, CARGO: 1-1/4 Ton, 4x4
Model Number: M1008
Payload: 2,900 lbs.
Towed Load Allowance: 3,000 lbs.
Weight: 5,900 lbs.

TRUCK, CARGO: 10-Ton, 8x8, HEMTT, W/Winch
Model Number: M977
Payload: 22,000 lbs.
Towed Load Allowance: 40,000 lbs.
Weight: 37,857 lbs.

TRUCK, STAKE: Ford flatbed truck
Payload: 15,000 lbs.
Bed Dimensions: 84- x 162-inches
Weight: 7,000 lbs.

TRUCK, CARGO: 10x10, Pallatized Loading System (PLS)
Model Number: XM-1074 GVWR: 84,000 lbs.
GCWR: 134,100 lbs.
Weight: 48,800 lbs.
Amount: 2
* Equiped with 5 PLS flatracks,
which can be attached to MILVANs
for quick load and unload operations.

SEMITRAILER, STAKE: 12-Ton, 4 Wheel
Model Number: M127A2C
Payload: 24,000 lbs.
Bed Dimensions: 96-3/4 x 348-1/4 inches
Weight: 13,840 lbs.

SEMITRAILER, DUAL PURPOSE: 22-1/2 Ton, Breakbulk Container, Transporter
Model Number: M871
Payload: 45,000 lbs.
Bed Dimensions: 96- x 358-inches
Weight: 16,000 lbs.

LIFT, HYSTER: for MILVAN containers
ID Number: 2248B
Lift Capacity: 50,000 lbs.

LIFT, TRUCK: Model Number: H40-XL-MIL
Diesel Engine
Lifting Capacity: 4,000 lbs.
Weight: 8,703 lbs.

LIFT, TRUCK: Gasoline Engine
Model Number: H50H
Lifting Capacity: 4,000 lbs.

LIFT, CHRYSLER: All Terrain Vehicle (ATV), Crab Walking, Side Hill Leveling
ID Number: 2249B
Lift Capacity: 6,000 lbs.

LIFT, ALL-TERRAIN:
Lift Capacity: 10,000 lbs.
Weight: 35,000 lbs.

LIFT, ALL-TERRAIN: MILVAN lift
Model Number: 988B
Lift Capacity: 50,000 lbs.
Weight: 63,000 lbs.

MILVAN, U.S. AIR FORCE (USAF): end-opening
MGW: 44,800 lbs.
Weight: 6,200 lbs.
Amount: 2

MILVAN, USAF: side-opening
MGW: 46,860 lbs.
Weight: 6,050 lbs.
Amount: 5

MILVAN, U.S. ARMY (USA): end-opening
MGW: 44,800 lbs.
Weight: 5,900 lbs.
Amount: 10

1/2-HIGH MILVAN, USA: end-opening
MGW: 52,910 lbs.
Weight 4,775 lbs.

ROLLER PALLET, USA: Used for easy loading/unloading of MLRS containers into MILVANS.
Capacity: 22,000 lbs.

ROLLER PALLET, USA: Used for easy loading/unloading of MLRS containers into MILVANS.
Also, has attachable landing legs for difficult loading/unloading situations.
Capacity: 20,000 lbs.
Amount: 2

ROLLER PALLET, USA: Used for general purpose MILVAN loading.
Capacity: 40,000 lbs.

1/4-RACK, USA: End walls, but not fully enclosed.
MGW: 53,760 lbs.
Weight: 6,085 lbs.

1/2-RACK, USA: End walls, but not fully enclosed.
MGW: 53,760 lbs.

FULL-RACK, USA: End walls, but not fully enclosed.
MGW: 53,760 lbs.
Weight: 7,210 lbs.

VANS, COMMERCIAL:
Dimensions: 20x8x8-feet
MGW: 44,800 lbs.
Weight: 4,100 lbs.
Amount: 3

FULL-RACK, COMMERCIAL: End walls, but not fully enclosed.
MGW: 66,139 lbs.
Weight: 5,732 lbs.

CHASSIS, USA: Used to haul MILVANS by truck to remote locations.
Amount: 5

TYPICAL ITEMS TESTED IN THE PAST

<u>TITLE</u>	<u>NUMBER</u>
1-TON CHEMICAL STORAGE CONTAINER	EVT 30-90
105MM AMMO WOOD BOX ENGINEERING TEST	EVT 04-90
105MM HOWITZER AMMO ADAPTER ASSEMBLIES	DEV 13-87
105MM HOWITZER CARTRIDGES/HORIZONTAL ENGINEERING TEST	EVT 10-89
105MM HOWITZER PLASTIC CONTAINER	EVT 09-89
105MM TANK AMMO IN PA 104 CONTAINERS UNITIZATION TEST	EVT 03-85
120MM BATTALION MORTAR SYSTEM (BMS) MORTAR AMMO TESTING	EVT 01-87
120MM MORTAR LOOSE PROJECTILE RESTRAINT SYSTEM (LPRS) FAT	91-07
120MM MORTAR MIL-STD-1660 TESTS	91-18
120MM TANK AMMO ON STD PALLET SAFETY STRAP EVALUATION	EVT 27-88
120MM TANK AMMO TOPFRAME LIFTING EYE/FORKTINE PROJ	EVT 12-89
120MM TANK AMMO TRAINING ROUND	DEV 10-87
152MM CARTRIDGE DEMIL	EVT 05-83
152MM FUZE REMOVAL FUNCTION TEST	EVT 21-82
155MM BINARY CHEMICAL PROJECTILE M687 PALLETIZED	EVT 33-88
155MM FIRST ARTICLE TEST	EVT 04-88
155MM METAL FIELD ARTILLERY PROJECTILE PALLET RAIL IMPACT	EVT 18-90
155MM PALLET STABILITY TEST	EVT 09-88
155MM PLASTIC PROP CHARGE CNTR LONG-TERM OUTDOOR STORAGE OF	EVT 26-88
155MM PROP CHARGE CNT W/INTER DUNNAGE MIL-STD-1660	EVT 40-87
155MM PROP CHARGE CONTAINERS PLASTIC MIL-STD-1660 TEST	EVT 41-87
155MM READY RACK (FAPC-NOW 155MM PROJECTILE COMPOSITE PAL)	DEV 06-84
2,000-POUND BOMBS IN SIDE-OPENING COMMERCIAL CONTAINER TEST	EVT 22-90
21C FIBER DRUM RAIL IMPACT TEST	91-19
21C FIBER DRUMS, TRANSPORTABILITY TEST	EVT 17-87
25MM CARTRIDGE UNITIZATION TEST	EVT 04-86
30MM AMMUNITION IN CNU-332/E IN 48-FOOT VAN TRAILER	EVT 16-90
30MM BREAKDOWN TEST	EVT 04-85
5-TON DROPSIDE TRUCK TRANSPORTABILITY TEST	EVT 21-87
6,000 GALLON WATER DISTRIBUTOR RAIL IMPACT TEST	EVT 05-90
8-INCH LOOSE PROJECTILE RESTRAINT SYSTEM (LPRS) RESTRAINT NET	92-01
90MM SIMULATED FILLED PROJECTILES UNITIZATION TEST	EVT 32-87
ADP FOR AV	DEV 06-82
ADP FOR DEN EQUIPMENT	DEV 07-82
AEROQUIP CORP SAFETY BAR	EVT 24-87
AIR FLEX AMMO SHELTERS	DEV 06-83
ALLVAN TAUTLINE TRAILER	EVT 27-87
ALUMINUM PREFABRICATED REUSABLE DUNNAGE	EVT 08-89

AMMO LOADED TACTICAL VEHICLES RAPID DEPLOYMENT TEST	EVT 34-89
AMMUNITION CERTIFICATION OF USMC M927A1 TRUCK AND M923A1 TRUCK	92-10
AMMUNITION CONTAINERS (AMCON) TRANSPORTABILITY TESTING	EVT 27-90
ANALYSIS OF COMMERCIAL PRODUCTS	DEV 17-81
ANCRA INTERNATIONAL RIGID RESTRAINT BEAM EVALUATION	EVT 17-90
APE 1028 E004 AUTOMATIC PROPELLANT DRAW-OFF FUNCTION TEST	EVT 17-82
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