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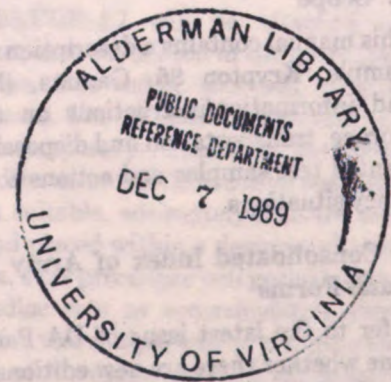
***TM 11-6665-361-10**

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

**OPERATOR'S MANUAL
RADIOACTIVE TEST SAMPLE, KRYPTON 85, GAMMA
MX-7338/PDR-27

Headquarters, Department of the Army, Washington, DC
1 June 1986

**CAUTION
RADIOACTIVE MATERIAL**

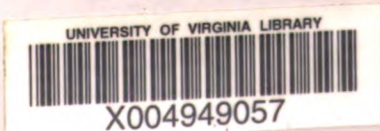


KRYPTON 85

The MX-7338/PDR-27R contains 5 millicuries (mCi) of Krypton 85 (Kr 85).

Exercise caution while using this equipment and follow safe procedures in handling, storage and disposal contained in this manual.

- This manual supersedes TM 3-6665-264-10, 17 July 1985.
- This manual covers all models of MX-7338/PDR-27.



WARNINGS

- Avoid prolonged, unnecessary contact with the MX-7338/PDR-27 Radioactive Test Sample; do not unchain the test sample from the carrying case except for disposal purposes or when shipping the AN/PDR-27 Radiac Set for calibration.
- Handle the MX-7338/PDR-27 by the flat (inactive) end only. Protect stored radioactive test sample against unauthorized removal.

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SECTION I. GENERAL

1. Scope

This manual contains a description of Radioactive Test Sample, Krypton 85, Gamma, (MX-7338/PDR-27) and information/instructions on the use, handling, storage, transportation and disposal of damaged or unwanted test samples and actions to be taken in emergency situations.

2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

3. Maintenance Forms, Records, and Reports

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

b. Report of Packaging and Handling Deficiencies.

Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

4. Reporting Errors and Recommending Improvements

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, NJ 07703-5007 with a copy furnished to the CECOM Safety Office, ATTN: AMSEL-SF-MR, Fort Mon-

mouth, NJ 07703-5024. In either case, a reply will be furnished direct to you.

5. Use

The radioactive test sample is used solely as a check source to determine if an AN/PDR-27 Radiac Set is functioning properly. Detailed instructions for using the radioactive test sample are given in the technical manuals (TMs) for the Radiac Set AN/PDR-27.

NOTE

The MX-7338/PDR-27 replaces the MX-1083/PDR-27 Radioactive Test Sample.

6. Authorization for Issue

The Radioactive Test Sample, Krypton 85, Gamma, MX-7338/PDR-27, (hereinafter referred to as either the MX-7338/PDR-27 or the Radioactive Test Sample), is issued throughout the Department of the Army (DA) and various Department of Defense (DOD) installations/activities without a specific license being required by the user. This is made possible based upon commitments set forth in US Nuclear Regulatory Commission (NRC) Byproduct Material License No. 29-01022-11 issued to CECOM. Information required by the NRC license and regulations is provided as follows:

a. *Radiation Protection.* Users of the MX-7338/PDR-27 should refer to this TM for instructions on control, safe handling, inspection, storage, disposition, emergency situations and transportation. Instructions for the proper use of the MX-7338/PDR-27 in conjunction with the AN/PDR-27 Radiac Sets are contained in the TM's associated with the radiac sets. These publications satisfy the radiation protection requirements set forth in NRC regulations (Title 10, Chapter 1, Code of Federal Regulations, Parts 19 and 20) (10 CFR Parts 19 and 20).

b. *Notice to Employees.* The NRC requires that users of licensed material post Form NRC 3, Notice to Employees. For reasons of practicality, tactical (field) use of the AN/PDR-27 Radiac Sets precludes posting of this form, as required by the NRC. Therefore, to fulfill posting requirements, Form NRC 3, Notice to Employees, will be posted at MX-7338/PDR-27 permanent storage locations. A copy of Form NRC 3 is contained at the back of this manual.

c. *Section 206, "Energy Reorganization Act of*

1974," (10 CFR 21). Contained in the back of this manual, shall be posted in the same manner as Form NRC 3.

d. *Reporting of Defects and Noncompliance Actions.* The regulations contained in 10 CFR Part 21, establish procedures and requirements for implementation of Section 206 of the Energy Reorganization Act of 1974. Reporting of defects and noncompliance should be made through appropriate radiological command channels to the CECOM Safety Office. Notification shall be made within 24 hours following the discovery of defects or noncompliance.

e. *NRC License.* NRC Byproduct Material License No. 29-01022-11 and related documents are held by the CECOM Safety Office at Fort Monmouth, NJ. MX-7338/PDR-27 users may request further information on these documents by contacting:

Commander
US Army Communications-Electronics
Command and Fort Monmouth
ATTN: AMSEL-SF-MR
Fort Monmouth, NJ 07703-5024
or calling AUTOVON 955-4427.

7. Supervision and Control

a. The accountability, storage, and disposal of the radioactive test samples shall be under the guidance of the installation or activity (local) radiation protection officer (RPO), who will assure the radiological safety of all such functions. The items must be stored in established, properly placarded radiation controlled areas and secured against unauthorized use or removal.

b. Each MX-7338/PDR-27 will be attached by chain to the radiac set case and stored in the space provided within the case. The radiac sets will then be stored in a secured area. For off-post calibration, the RPO may authorize temporary removal of the radioactive test samples. The removed radioactive test samples will be stored in a suitable, adequately shielded and labeled container and placed within a designated radiation controlled area. This procedure will permit transportation of the radiac sets as nonradioactive shipments. The radioactive test sample will be reattached to the case upon return of the radiac set from the calibration facility. In all instances, adequate control and personnel radiation protection shall be maintained.

SECTION II. DESCRIPTION AND DATA

8. Description

The MX-7338/PDR-27 (fig. 1) is an aluminum wand approximately 3/8 inch in diameter and 5 inches in length. A sealed radioactive source containing approximately 5 mCi of Kr 85 is sealed in the cylindrical or ac-

tive end (4) of the wand; the active end is painted purple. An identification tag (1) is attached to the flattened or inactive end (3) of the wand by a D-ring (2); the inactive end is marked MX-7338/PDR-27. The D-ring is also used to attach the radioactive test sam-

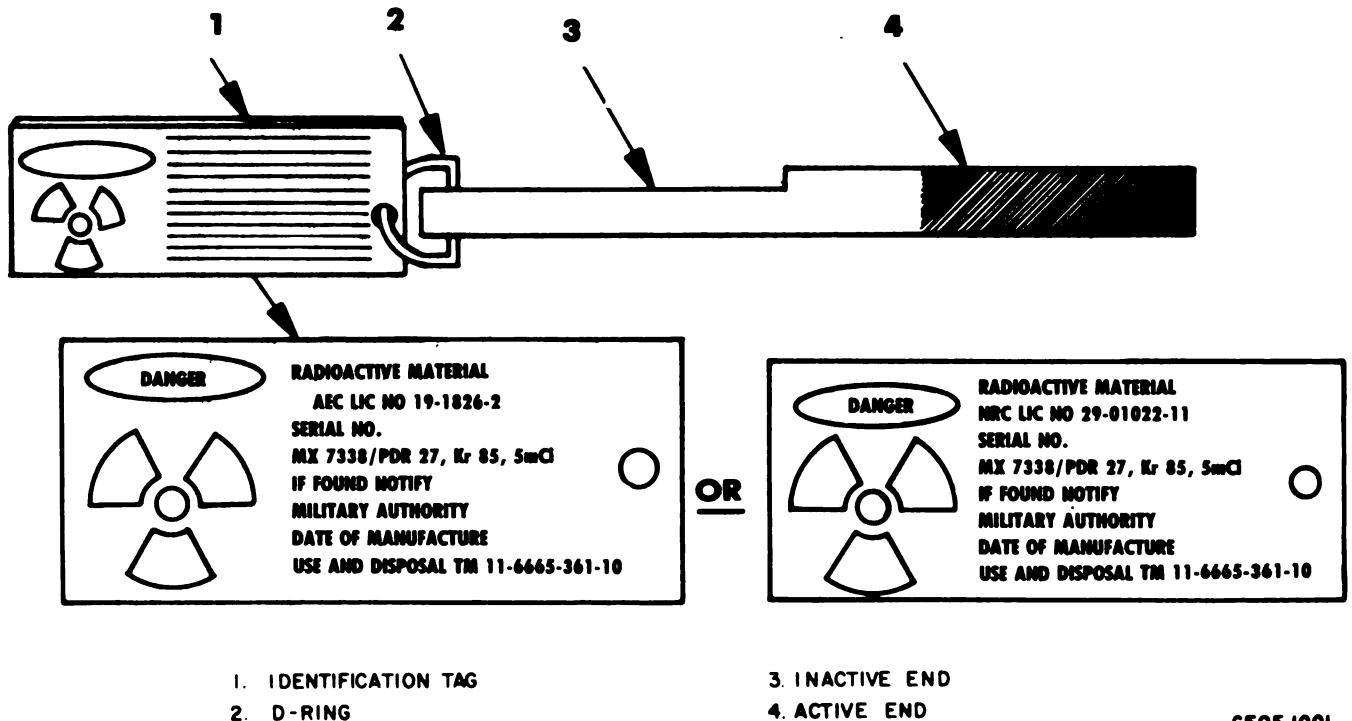


Figure 1. MX-7338/PDR-27 Radioactive Test Sample.

ple to a chain in the carrying case of Radiac Set AN/PDR-27. While not in use, the MX-7338/PDR-27 is stored in a well in the carrying case.

NOTE

The logistical and license management responsibilities for the MX-7338/PDR-27 Radioactive Test Sample is assigned to CECOM under NRC License Number 29-01022-11. All new procurements made by CECOM will reflect this transition and incorporate NRC License Number 29-01022-11 on the identification tag attached to the test sample. Procurements made prior to the management transition in-

corporate AEC License Number 19-1826-2 on the identification tag. The NRC has exempted CECOM from exchanging identification tags on those test samples possessed under previous procurements. Therefore, identification tags attached to test samples may bear either of the two license authorization numbers.

9. Radioactive Material Data

Radioactive material Kr-85.
 Type of radiation Gamma.
 Activity (approx) 5 millicuries.
 Half-life 10 years.

SECTION III. INSPECTION FOR LEAKS

10. General

If the MX-7338/PDR-27 develops a leak because of gross damage or deterioration, Krypton 85 will dissipate into the air and will not cause surface contamination.

11. Inspection

Inspect the MX-7338/PDR-27 upon issue and use to make sure that it is not damaged or deteriorated and that the meter reading on the 50 mR/hr scale of the AN/PDR-27, utilizing the small probe, is at least 10

mR/hr. This procedure is accomplished by placing the active (purple) end of the MX-7338/PDR-27 Radioactive Test Sample in direct parallel contact with the center portion of the small probe. If the meter reading is below 10 mR/hr, double check the functioning of the instrument without the radioactive test sample using the procedure given in the TM's for the appropriate AN/PDR-27 Radiac Set. If the recheck still indicates that the MX-7338/PDR-27 may be defective, open the D-ring, remove and dispose of the MX-7338/PDR-27 and identification tag as directed in paragraph 14.

SECTION IV. STORAGE

12. General

The MX-7338/PDR-27 are not individually controlled items as defined in Army Regulation (AR) 385-11. Loss of a radioactive test sample must be reported as described in paragraph 15c. Unwanted or unserviceable radioactive test samples must be disposed of as described in paragraph 14. Stored radioactive test samples must be in properly placarded radiation con-

trolled areas and secured against unauthorized removal.

13. Bulk Storage

Bulk storage is at depots designated by the National Inventory Control Point (NICP). These depots will be equipped with storage and disposal facilities for radioactive materials and supported by a health physicist or a qualified RPO.

SECTION V. DISPOSITION OF UNWANTED OR UNSERVICEABLE RADIOACTIVE TEST SAMPLES

14. Disposition of Test Samples

The NICP reviews reports of excess, unwanted or unserviceable MX-7338/PDR-27 Radioactive Test Samples that are submitted through appropriate command channels for disposition determination. Disposition instructions are provided by the NICP for serviceability, turn-in or disposal of the item as radioactive waste.

NOTE

Although the meter reads greater than 10 mR/hr when checked with an AN/PDR-27 Radiac Set, the radioactive test sample is considered unserviceable if the identification tag is damaged, unreadable, or missing, or if the aluminum wand is crushed or corroded.

SECTION VI. EMERGENCY SITUATIONS AND ACTIONS TO BE TAKEN

15. Loss of Test Sample

a. Attempt to recover the test sample.

(1) Review records to determine the responsible individual.

(2) Make a physical survey of the suspect area.

b. Revise procedures as necessary to prevent recurrence.

c. If the radioactive test sample is not recovered, report the loss immediately through command channels to the major command Radioactive Material Control Point (RMCP) indicating the serial number of the missing MX-7338/PDR-27, the circumstances involved, and procedures taken to prevent recurrence. The RMCP will immediately forward this notification to Commander, US Army Communications-Electronics Command, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024.

16. Internal Exposure of Personnel

Internal exposure of personnel due to ingestion, in-

halation, or absorption of radioactive material, generally associated with damaged or leaking sources, does not apply to the MX-7338/PDR-27 because Krypton 85 is an inert gas.

17. External Exposure of Personnel

a. External overexposure can occur if the test sample is in direct contact with the individual for periods of time longer than that required for normal use.

b. The following actions are required if a known or suspected overexposure occurs:

(1) Seek advice from the medical officer.

(2) Contact the local RPO.

(3) Correct procedures to prevent recurrence.

(4) Notify responsible commands and Commander, US Army Communications-Electronics Command, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024.

SECTION VII. TRANSPORTATION

18. Transportation of MX-7338/PDR-27 Radioactive Test Sample

a. The MX-7338/PDR-27 requires shipment in accordance with the requirements of the US Department of Transportation (DOT) as set forth in 49 CFR, AR 385-11 and NRC License 29-01022-11.

b. Shipment of the MX-7338/PDR-27 can be made as: Radioactive Material, Limited Quantity, N.O.S., UN 2910. The shipment is exempt from specification

packaging, shipping papers, certification, marking, and labeling requirements in accordance with 49 CFR 173.421 provided that the following conditions are fulfilled:

(1) The MX-7338/PDR-27 must be shipped in a strong tight package (49 CFR 173.421a).

(2) The exposure rate at the package surface must be less than 0.5 mR/hr.

(3) The shipping package must be certified as

being acceptable for transportation by having a notice enclosed in, or on the package, included with the packing list, or otherwise forwarded with the package. This notice must include the name of the consignor (sender) or consignee (receiver) and the statement: "This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted Radioactive Material, Limited Quantity, N.O.S., UN2910."

(4) The outside of the inner packaging or, if there is no inner packaging, the outside of the packaging itself must bear the marking "Radioactive."

(5) The results of the radiation survey and "NRC License Number 29-01022-11" must be annotated on the shipping records (AR 385-11, paragraph 4-1a).

c. Shipment of the MX-7338/PDR-27, when incorporated into the AN/PDR-27, Radiac Set will qualify as: Radioactive Material, Instruments and Articles, UN 2911, and is exempt from specification packaging, shipping papers, certification, marking, and labeling requirements in accordance with 49 CFR 173.422 provided that the following conditions are fulfilled:

(1) The exposure rate at the package surface must be less than 0.5 mR/hr.

(2) The shipping package must be certified as being acceptable for transportation by having a notice enclosed in, or on the package, included with the packing list, or otherwise forwarded with the package. This notice must include the name of the consignor (sender) or consignee (receiver) and the statement: "This package conforms to the conditions and limitations specified in 49 CFR 173.422 for excepted Radioactive Material, Instruments and Articles, UN2911."

(3) Results of the radiation survey and "NRC License Number 29-01022-11" must be annotated on the shipping records (AR 385-11, paragraph 4-1a).

d. Mailing of the MX-7338/PDR-27 by the US Postal Service is permitted for those shipments which may be classified as limited quantities of radioactive materials or excepted instruments, articles and devices as prescribed in 49 CFR 173.421, 173.422 or 173.424, provided that the activity content of any package, instrument or article does not exceed one-tenth the activity limits specified in 49 CFR 173.423. Based on this, shipment of single quantities of MX-7338/PDR-27 Radioactive Test Samples or single quantities of AN/PDR-27 Radiac Sets incorporating the MX-7338/PDR-27 Radioactive Test Sample is permitted by US Postal Service regulations provided that the requirements stipulated in subparagraphs *b* and *c* above are complied with.

NOTE

Transportation requirements are continually being reviewed and revised with respect to the movement of hazardous materials. If questions regarding the proper transport of radioactive materials should arise, contact your local Radiation Protection Officer or the CECOM Safety Office (AV 955-4427) for assistance.

APPENDIX A

REFERENCES

- AR 40-14** Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials (DLAR 1000-28).
- AR 385-11** Ionizing Radiation Protection (Licensing, Control, Transportation, Disposal, Radiation Safety).
- AR 385-30** Safety Color Code Marking and Signs.
- DA PAM 310-1** Consolidated Index of Army Publications and Blank Forms.
- DA PAM 738-750** The Army Maintenance Management System (TAMMS).
- MIL-STD-129H** Marking for Shipment and Storage.
- TM 11-6665-209-10** Operator's Manual, Radiac Sets AN/PDR-27J (NSN 6665-00-543-1435), AN/PDR-27L (NSN 6665-00-856-3456) and AN/PDR-27Q (NSN 6665-00-017-8903).
- TM 11-6665-224-15** Operator's, Organizational, DS, GS, and Depot Maintenance Manual Radiac Set AN/PDR-27P (NSN 6665-00-975-7222).
- TM 11-6665-228-15** Operator's, Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tools List, Radiac Set AN/PDR-27G.
- TM 11-6665-230-15** Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts and Special Tools List), Radiac Set AN/PDR-27R (NSN 6665-00-961-0846).
- TM 11-6665-249-14** Operator's Organizational, Direct Support, and General Support Maintenance Manual for Radiac Set AN/PDR-27S (NSN 6665-01-080-4418).
- Title 10, Code of Federal Regulations, Parts 19, 20 and 21.**
- Title 49, Code of Federal Regulations.**

PUBLIC LAW 93-438

93rd CONGRESS, H.R. 11510

OCTOBER 11, 1974

AN ACT

To reorganize and consolidate certain functions of the Federal Government in a new Energy Research and Development Administration and in a new Nuclear Regulatory Commission in order to promote more efficient management of such functions.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

SHORT TITLE

Section 1. This Act may be cited as the "Energy Reorganization Act of 1974".

NON COMPLIANCE

Section 206. (a) Any individual director, or responsible officer of a firm constructing, owning, operating, or supplying the components of any facility or activity which is licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954 as amended, or pursuant to this Act, who obtains information reasonably indicating that such facility or activity or basic components supplied to such facility or activity--

(1) fails to comply with the Atomic Energy Act of 1954 as amended, or any applicable rule, regulation, order, or license of the Commission relating to substantial safety hazards, or

(2) contains a defect which could create a substantial safety hazard, as defined by regulations which the Commission shall promulgate, shall immediately notify the Commission of such failure to comply, or of such defect, unless such person has actual knowledge that the Commission has been adequately informed to such defect or failure to comply.

(b) Any person who knowingly and consciously fails to provide the notice required by subsection (a) of this section shall be subject to a civil penalty in an amount equal to the amount provided by section 234 of the Atomic Energy Act of 1954, as amended.

(c) The requirements of this section shall be prominently posted on the premises of any facility licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended.

(d) The Commission is authorized to conduct such reasonable inspections and other enforcement activities as needed to insure compliance with the provisions of this section.

INSTRUCTIONS FOR NRC FORM 3

Please find enclosed three copies of NRC Form 3, "Notice to Employees", which is required by 10 CFR 19.11(c) and 10 CFR 30.7, 40.7, 50.7 and 70.7 to be posted by each NRC licensee, permittee, and applicant. NRC licensees, permittees, and applicants must have the NRC Form 3 posted in those areas utilized by their employees and contractors and subcontractors.

NRC Form 3 is written in the form of simple questions and answers that paraphrase relevant statutes and regulations. This will help employees of its licensees, permittees, applicants, and of their contractors, subcontractors, and vendors, to clearly understand their responsibilities and rights, and those of the NRC and the Department of Labor, on matters related to public health and safety and employee protection from discrimination.

NRC Form 3 should be posted at locations sufficient to permit employees to observe a copy on the way to or from their place of work. NRC Form 3 must remain posted while the application for a permit or license is pending, during the term of the permit or license, and for 30 days after the termination of the license.

By Order of the Secretary of the Army:

JOHN A. WICKHAM JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

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DISCRIMINATED?

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DISCRIMINATED FROM

been discriminated safety concerns complaint with labor. Your coming or discrimination 30 days of the

Administration

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Department of
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WHAT CAN THE LABOR DEPARTMENT DO?

The Department of Labor will notify the employer that a complaint has been filed and will investigate the case.

If the Department of Labor finds that your employer has unlawfully discriminated against you, it may order you to be reinstated, receive back pay, or be compensated for any injury suffered as a result of the discrimination.

WHAT WILL THE NRC DO?

The NRC may assist the Department of Labor in its investigation. NRC may conduct its own investigation where necessary to determine whether unlawful discrimination has prevented the free flow of information to the Commission. Also, if the NRC or Department of Labor finds that unlawful discrimination has occurred, the NRC may issue a Notice of Violation to your employer, impose a fine, or suspend, modify, or revoke your employer's NRC license.

IS

t telephone calls from regulations.

Regional Offices

ADDRESS	TELEPHONE
atory Commission 19406	215 337-5000
atory Commission I.W., Suite 2900	404 221-4503
atory Commission id 37	312 790-5500
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