

## SECTION 1

### BACKGROUND

1.1 This document is the Survey Protocol for Fort Ord, CA, to use in surveying facilities and areas that had operations involving NRC and DA licensed radioactive materials. Release of these facilities and sites for unrestricted use will be requested from the NRC and the State of California following completion of survey.

1.2 The SP follows the format and content specified in the NUREG/CR-5849, Manual for Conducting Radiological Surveys in Support of License Termination, Draft Report for Comment. When the SP is approved by the licensee, it will be submitted to the NRC and the State of California for approval, and also will be made available to the public through local public repositories.

1.3 Summary Description. The following section describes the Fort Ord Post, and usage of radioactive commodities during its operations.

1.3.1 Fort Ord comprises an area of approximately 44 square miles in Northwestern Monterey County. Neighboring cities include Seaside, Marina, Sand City, Del Rey Oaks, Salinas, and Monterey.

1.3.2 Fort Ord was established in 1917 and has served primarily as a training and staging facility for infantry. Between 1947 and since 1975 the installation was a basic training facility. Prior to 1947 and since 1975, the 7th Infantry Division has occupied the Installation. The 7th Infantry became a light infantry division in 1983; the light infantry does not use heavy tanks or heavy armor.

1.3.3 In the early 1960's, Fritzsche Army Airfield was completed and became part of the Fort Ord complex. Currently, there are three major developed areas within Fort Ord; the Main Garrison, the East Garrison, and Fritzsche Army Airfield. Development in these areas includes office complexes, family housing, medical facilities, recreational facilities, warehouses, industrial shops, and training facilities.

1.3.4 Approximately 20,000 acres of Fort Ord are undeveloped and used for training activities. Fort Ord, when active, employed approximately 15,000 active duty military personnel and about 5,000 civilian employees.

1.4 Uses of Radioactive Materials at Fort Ord

1.4.1 There are at least 202 structures on Fort Ord that have used or stored radioactive commodities at some time when the post was active. These uses of radioactive commodities at Fort Ord were limited to those under the control of a specific NRC license, or those authorized and managed under a DA Authorization. As defined by the Army, a radioactive commodity is an item of government property composed in whole or in part of radioactive materials and to which a National Stock Number (NSN) or part number has been assigned. A radioactive commodity is any item in the Department of Defense (DOD) Supply System that contains radioactive materials equal to or in excess of the quantities listed in 10 CFR, Part 20, Appendix C, or contains a specific activity greater than 0.002 microcurie ( $\mu\text{Ci}$ ) per gram of radioactive material and is NRC license exempt. These quantities were established so that control procedures could be published and implemented for the receipt, storage, use, maintenance, transportation and disposal of radioactive commodities in the DOD Supply System. A radioactive commodity should not be confused with a radioactive device, however they are similar in appearance. The DOD has defined a radioactive device as a manufactured article, such as instruments, clocks, electron tubes, apparatus or similar devices having radioactive materials (other than liquids) in a nondispersable form as a component part.

1.4.2 The radioactive commodities used and stored at Fort Ord includes:

| <u>NOMENCLATURE</u>                     | <u>ISOTOPE</u> | <u>LICENSE</u> |
|---|----------------|----------------|
| M4 Front Sight Post Assembly            | H-3            | AMCCOM         |
| Radioluminous Fire Control Device       | H-3            | AMCCOM         |
| Compasses                               | H-3            | TROSCOM        |
| M1 Muzzle Reference Sensor              | H-3            | AMCCOM         |
| M1A1 Collimator                         | H-3            | AMCCOM         |
| L4A1 Quadrant Fire Control Device       | H-3            | AMCCOM         |
| M58 and M59 Light Aiming Post           | H-3            | AMCCOM         |
| M8A1 Diver Watches                      | H-3            | TROSCOM        |
| CAM Chemical Agent Monitor              | Ni-63          | AMCCOM         |
| MX-7338 Radiac Check Source             | Kr-85          | CECOM          |
| UDM/2 Radiac Calibration Set            | Sr-90          | CECOM          |
| M72 Light Antitank Weapon (LAW)         | Pm-147         | AMCCOM         |
| M16A1 Front Sight Post Assembly         | Pm-147         | AMCCOM         |
| Radium Dials/Compasses and Check Source | Ra-226         | DARA           |
| T-55 Aircraft Engine Components         | Th-232         | AVSCOM         |
| Night Vision Devices                    | Th-232         | CECOM          |

INDUSTRIAL RADN SURV PROTOCOL NO. 27-43-E2HU-94, 10 JAN-15 APR 94

|                              |        |        |
|------------------------------|--------|--------|
| Depleted Uranium Munitions   | U-238  | AMCCOM |
| UDM/6 Radiac Calibration Set | Pu-239 | CECOM  |
| MC-1 Moisture Density Tester | Am-241 | TACOM  |
| Chemical Agent Alarm         | Am-241 | AMCCOM |

1.4.3 All radioactive commodities used and stored at Fort Ord were authorized under a specific NRC license or a DA authorization which granted the use of radioactive commodities for world-wide use to the Army and in some cases, other military services in DOD. All radioactive commodities were designed and developed specifically for military use and were designed and developed to accomplish specific assigned missions. As such, each radioactive commodity was subjected to use and environmental factors during the initial design tests to establish and prove the military usefulness and safety of the item. For instance, drop, shock, vibration, temperature extreme tests, altitude, and accelerated weathering tests such as those established in Title 10, Part 32.101 were included as part of the testing protocol.

1.4.4 The use of radioactive materials for diagnostic and therapy at Fort Ord was authorized by NRC Byproduct Material License No. 04-12727-02. USAEHA survey No 28-43-0602-88, Fort Ord, 13-16 June 1988, documents the license termination and closeout survey of the radioactive materials usage areas. The NRC authorized the release of these areas for unrestricted use.

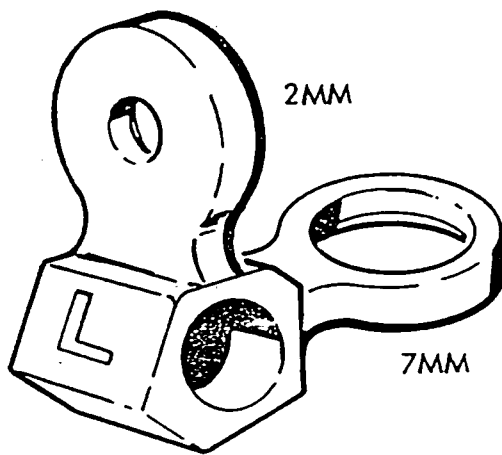
## 1.5 Summary of Outdoor Survey Sites

1.5.1 Ammunition Supply Point (ASP) Yard. The ASP Yard consists of an area of 100 x 30 meter. The area will be evaluated to assess potential radiological contamination that may have been accidentally placed in the yard. All radiological surveys and environmental sampling will be conducted in accordance with NRC, EPA and California State guidance. The ASP Yard will be surveyed to evaluate potential alpha, beta and beta-gamma activities in surface soil. The survey will include instrumentation surveys and environmental samples, such as soil, and if applicable, water and vegetation samples. Radiochemistry laboratory analyses will be performed by USAEHA, Radiochemistry Analysis Branch or its contractor.

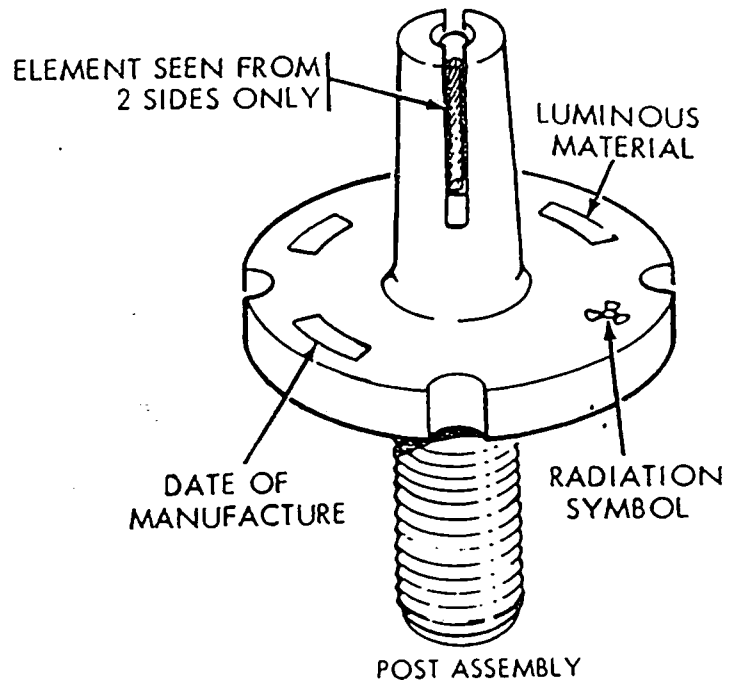
1.5.2 Artillery Wash-Down Area. The artillery wash-down area is an area approximately 300 x 300 meter. The area will be evaluated to assess potential radiological contamination on the wash-down pad, of soil surrounding the pad and drainage streams resulting from water run off.

1.5.3 The Defense Reutilization and Marketing Office (DRMO). The two DRMO demilitarization sites consist of areas about 200 x 100 meter each. Both areas will be evaluated for potential radiological contamination of the soil from radium found in vehicle instrument dials and gauges. All radiological surveys and environmental sampling will be conducted in accordance with EPA guidelines and methodologies. Both areas will be surveyed to evaluate potential contamination from alpha, beta and beta-gamma emitting radioisotopes and specifically radium 226. The survey will include instrumentation surveys and collection of environmental samples. Radiochemistry laboratory support will be provided by USAEHA, Radiochemistry Analysis Branch.

1.6 Some of the radioactive commodities used in the Army are included in the following pages.



REAR SIGHT



Front Sight Post Assemblies  
for M16A1, M16A2 and M4 Rifles

NSN: 1005-00-145-6378 (Pm-147)

NSN: 1005-00-234-1568 (Tritium)

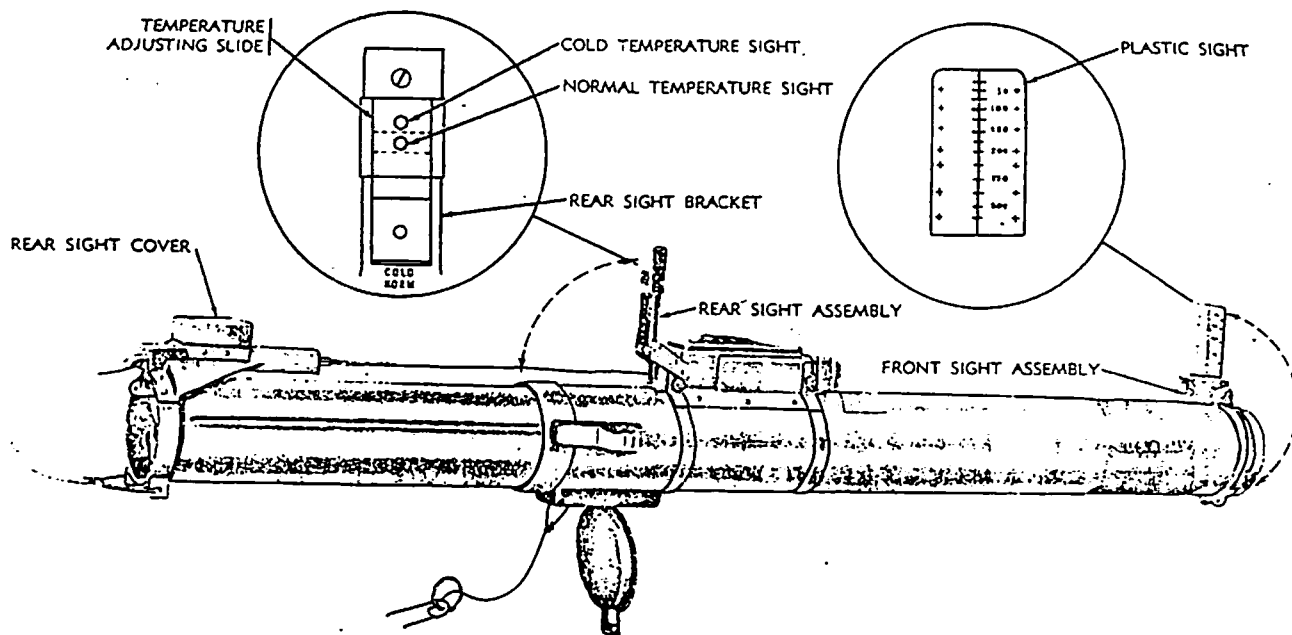
Sources: Pm-147 or H-3

Activity: Pm-147 = 1 mCi/source  
H-3 = 9 mCi/source

Form: Pm-147 = Ceramic microspheres sealed in glass  
H-3 = Gas sealed in glass

NRC License #: BML 12-00722-04

License Manager: AMCCOM



### M72 Light Antitank Weapon (LAW)

NSN: 1340-01-050-8850 (sight only)

Source: Promethium-147 (Pm-147)

Activity: 3 mCi/source

Form: Ceramic microspheres laminated into  
transparent plastic sights

NRC License #: BML 12-00722-07

License Manager: AMCCOM

## DIVING WATCHES

ROLEX

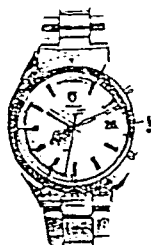


TUDOR



Submariner. Revolving elapsed diving time bezel. Rotar self-winding movement. Guaranteed to 660 ft. (200 metres) under water.

#7019...\$230.00



Date-Master. Self-winding. Guaranteed to 660 ft. (200 metres) under water. Day, date and day of the week written in gold.

#7020...\$190.00



Submariner. Revolving elapsed diving time bezel. Rotar self-winding movement. Guaranteed to 660 ft. (200 metres) under water. With calendar.

#7021...\$248.00

## Zodiac



Super Sea Wolf Automatic. Day-date calendar, black dial with Blaze Orange markings. S.S. case and link band.

#1953...\$225.00



Ladies Sea Wolf. Auto. with calendar. S.S. case and link band.

#2093...\$190.00



Auto. with calendar. Black dial, 3C yellow gold bezel. S.S. and 10K gold-filled band.

#1763...\$212.00



SST Automatic with day-date. Internal bezel, black dial. S.S. case and link band.

#1919...\$215.00



Automatic with day-date calendar, push-button date changer. S.S. case and link band.

#19748 - black dial, grey bezel  
#19749 - white dial, grey bezel  
#19746L - blue dial, blue bezel  
#1974 series...\$150.00



Automatic with calendar. S.S. case and link band.



#1973 - black dial, red bezel  
#19720 - black dial  
#19728L - blue dial  
#1973 series...\$140.00



## Radioluminous Diving Gages and Compasses

NSN: See the attached listing

Source: Tritium (H-3)

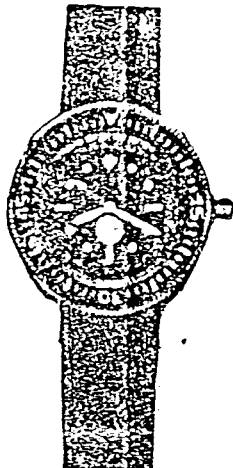
Activities: Range from 60 to 190 mCi/each

Form: Tritium gas sealed in glass ampules

NRC License #: BML 24-12705-01

License Manager: TROSCOM

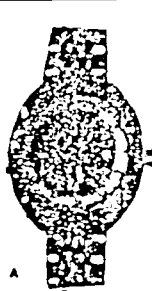
## BLANCPAIN '50 FATHOMS'



17 Jewels  
Automatic Movement  
Antimagnetic  
Stainless Steel Case  
Screw in Crown  
Humidity Indicator  
Tropic Strap

\$210.00

## SKINDIVERS' COLLECTION



A



B



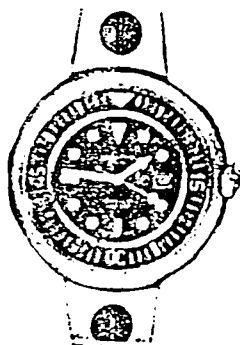
C

### DOXA WATCHES

A 7268 Professional.  
Orange Face \$225.00  
B 7270 Sea Rambler.  
Silver Face \$225.00  
C 7269 Shark Hunter.  
Black Face \$225.00

FEATURES: 17 jeweled, self-winding movement, bored and polished stainless steel casing, tested to 900 feet and 76' below zero, luminous dial markings, scratch-proof, mineral crystal lens, bezel sets easily to indicate maximum no-decompression time

## AQUADIVE WATCHES



### MAN'S MODEL 1065

- One piece stainless steel monobloc case tested to 3,300 feet
- Patented pneumatic shock absorbers
- Screw down crown with double thread and triple seal
- Recessed scratch resistant crystal
- One way ratchet bezel
- 17 Jewel high frequency movement with Incabloc shock protection
- Easy to read Scotchlite dial
- Automatic self winding
- Instant change calendar

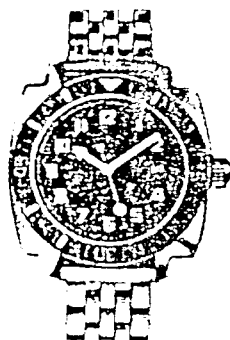
\$205.00



### LADIES MODEL 1070

- Full stainless steel case tested to 3,300 feet
- Screw down crown
- Scratch resistant crystal
- Elapsed time bezel
- 17 Jewel movement with Incabloc shock protection
- Easy to read Scotchlite dial
- Automatic self winding
- Calendar

\$175.00

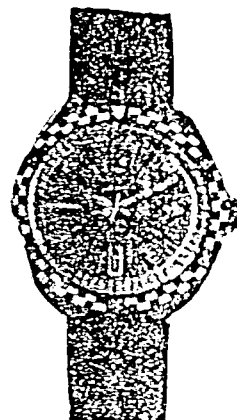


### MAN'S MODEL 1072

- Full stainless steel case tested to 3,300 feet
- Patented pneumatic shock absorbers
- Screw down crown
- Scratch resistant crystal
- One way ratchet bezel
- 17 Jewel high frequency movement with Incabloc shock protection
- Easy to read Scotchlite dial
- Automatic self winding
- Instant change calendar

\$180.00

## BELAIR



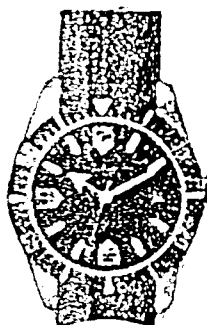
17 Jewel Movement Manual Wind  
Stainless Steel Case  
Calendar Shock Resistant  
Waterproof to 20 Atmospheres  
# 1550 Belair Manual \$52.50

### BELAIR AUTOMATIC

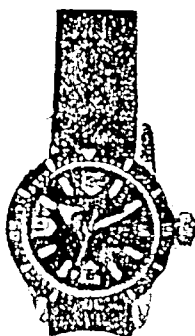


25 Jewel Movement Automatic  
Stainless Steel Case Calendar  
Shock Resistant Anti-magnetic  
Waterproof to 20 Atmospheres  
# 1551 Belair Automatic \$49.50

## BERCONA SPORT WATCHES



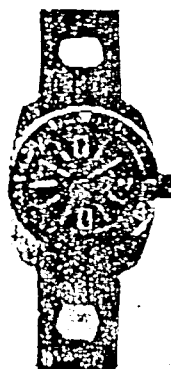
#551 Standard \$17.95



#552 Intermediate \$17.95

Shock Resistant - Waterproof to 150' Maximum Depth

## BELAIR LADIES

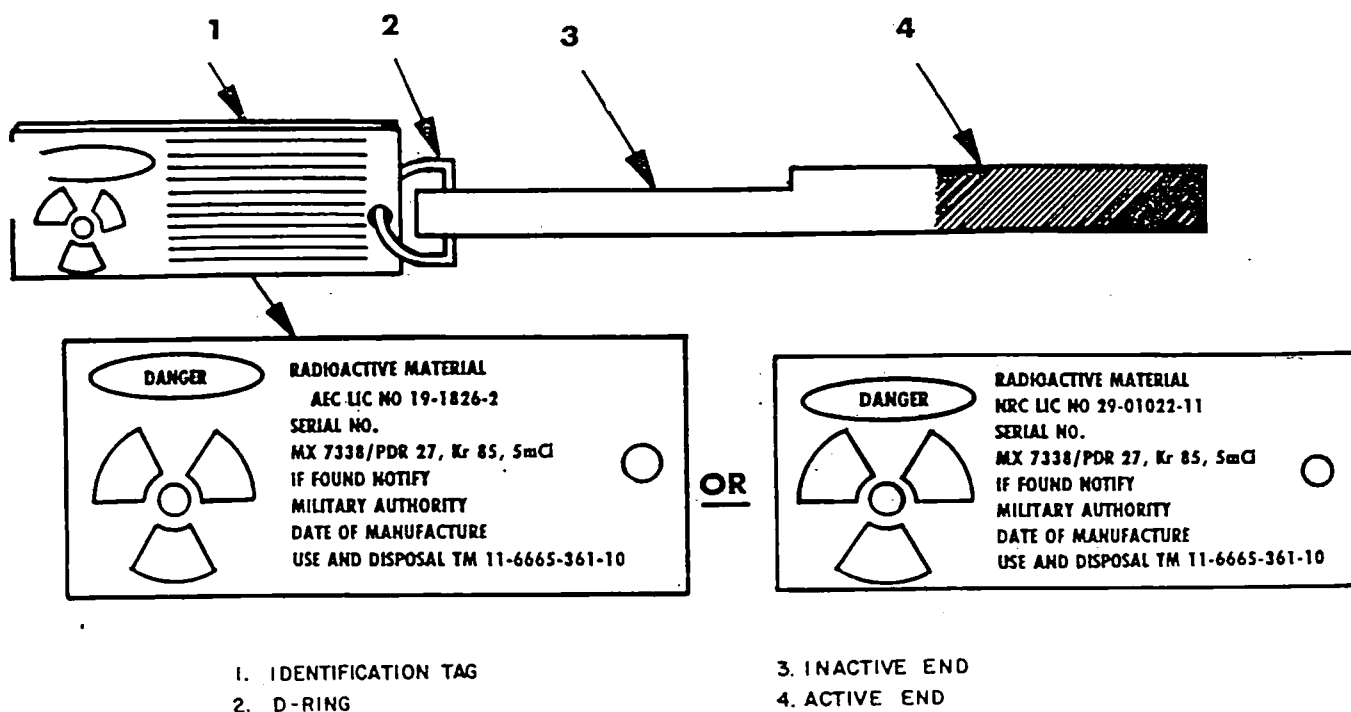


#1560 Ladies watch,  
17 jewels, automatic  
with calendar..\$37.95



Radioluminous Devices Licensed to TROSCOM  
 License 24-12705-01

| <u>Nomenclature</u>   | <u>NSN</u>       | <u>Activity</u> |
|---|------------------|-----------------|
| Compass   | 6605-00-151-5337 | 190 mCi         |
| Compass   | 6605-01-196-6971 | 120 mCi         |
| Compass   | 6605-00-846-7618 | 120 mCi         |
| Compass   | 6605-00-898-2067 | 25 mCi          |
| Meter assembly, Secondary, Closed<br>Circuit SCUBA Set, 4220-97-CL-E-08 |                  | 60 mCi          |



### MX-7338 Radioactive Test Sample

NSN: 6665-00-832-6159

Source: Krypton-85 (Kr-85)

Activity: 5 mCi/each

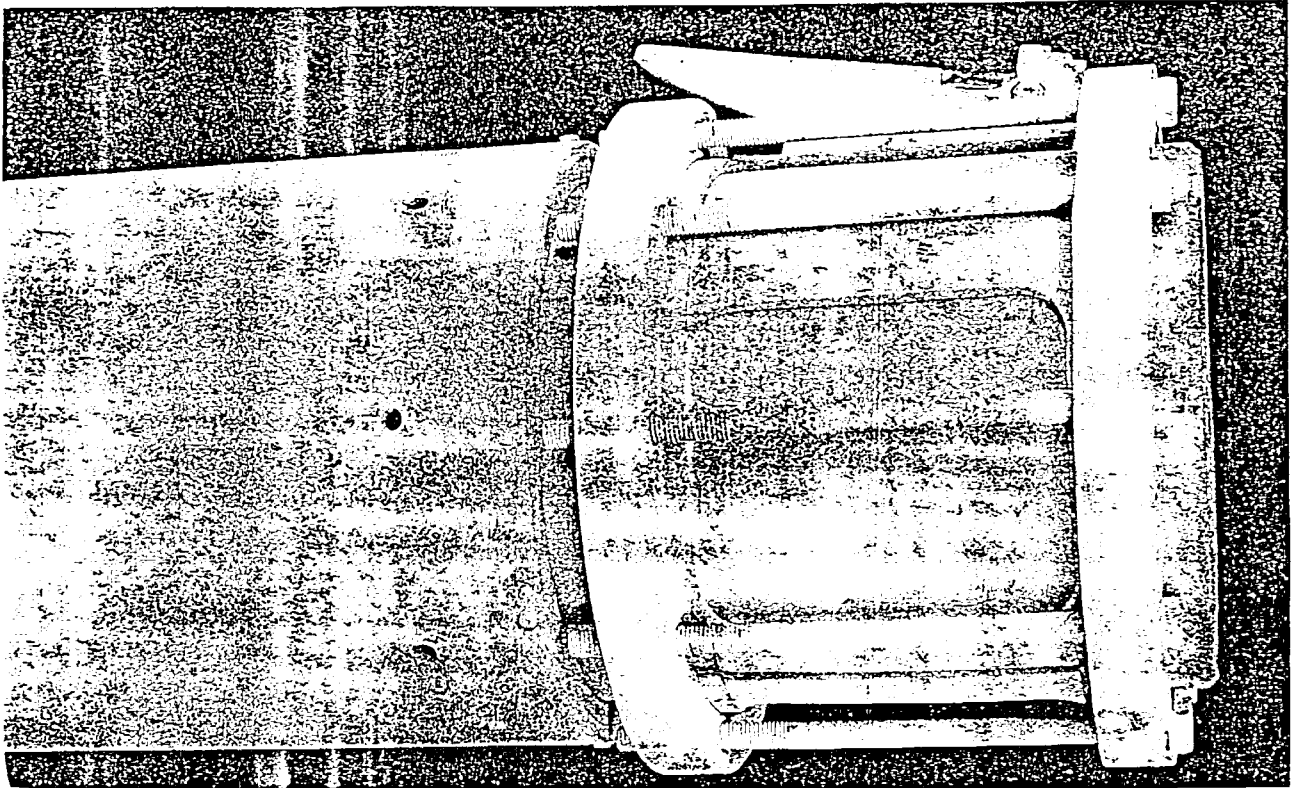
Form: Kr-85 gas sealed in an aluminum metal wand

NRC License #: BML 29-01022-14

License Manager: CECOM

Weapon Systems Equipped With Radioluminous  
Fire Control Devices-NRC License 12-00722-06

1. Howitzer, towed, 8-inch, M115
2. Howitzer, towed, 155mm, M114 Series
3. Howitzer, towed, 155mm, M198
4. Howitzer, towed, 105mm, M204
5. Howitzer, towed, 105mm, M102
6. Howitzer, towed, 105mm, M101 Series
7. Howitzer, self-propelled, 8-inch, M55
8. Howitzer, self-propelled, 8-inch, M110 Series
9. Howitzer, self-propelled, 155mm, M44 Series
10. Howitzer, self-propelled, 155mm, M109 Series
11. Howitzer, self-propelled, 105mm, M52 Series
12. Howitzer, self-propelled, 105mm, M108
13. Howitzer Pack, 75mm, M116
14. Gun, towed, 155mm, M59
15. Gun, towed, British Light Gun, M119
16. Gun, self-propelled, 175mm, M107
17. Gun, self-propelled, 155mm, M53
18. Gun, recoilless, 155mm, M64
19. Gun, recoilless, 120mm, M63
20. Launcher, rocket, 762mm, M33
21. Launcher, rocket, 762mm, M289
22. Launcher, rocket, 155mm, M91
23. Mortar, 61mm, M29
24. Mortar, 60mm, M224
25. Mortar, 4.2-inch, M30 Series



Muzzle Reference Sensor (MRS)

NSN: Several NSN's; LIN-E54166

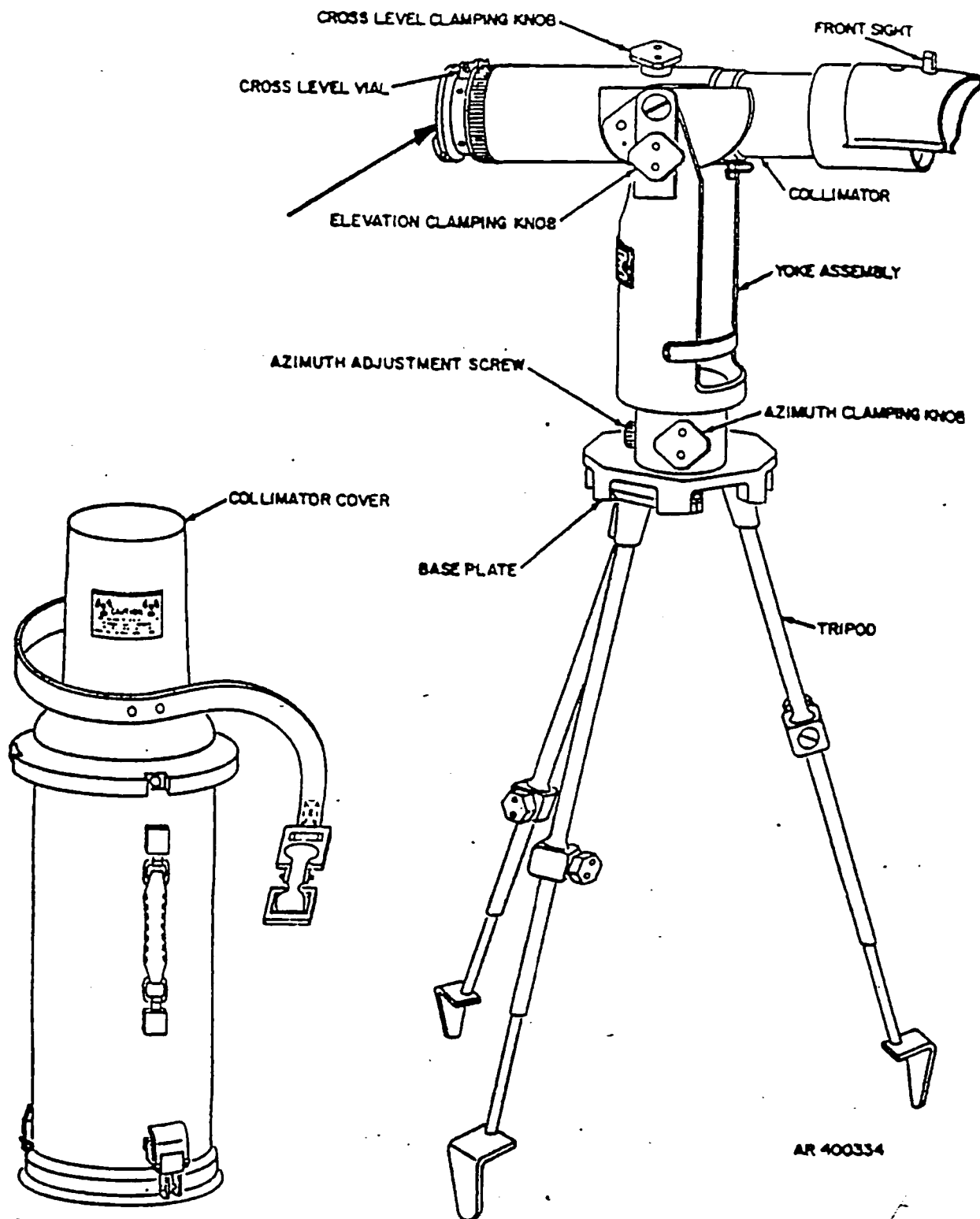
Source: Tritium (H-3)

Activity: 10 Ci/source

Form: Tritium gas

NRC License #: BML 12-00722-06

License Manager: AMCCOM



COLLIMATOR, INFINITY AIMING REFERENCE: M1A1

11739179-1

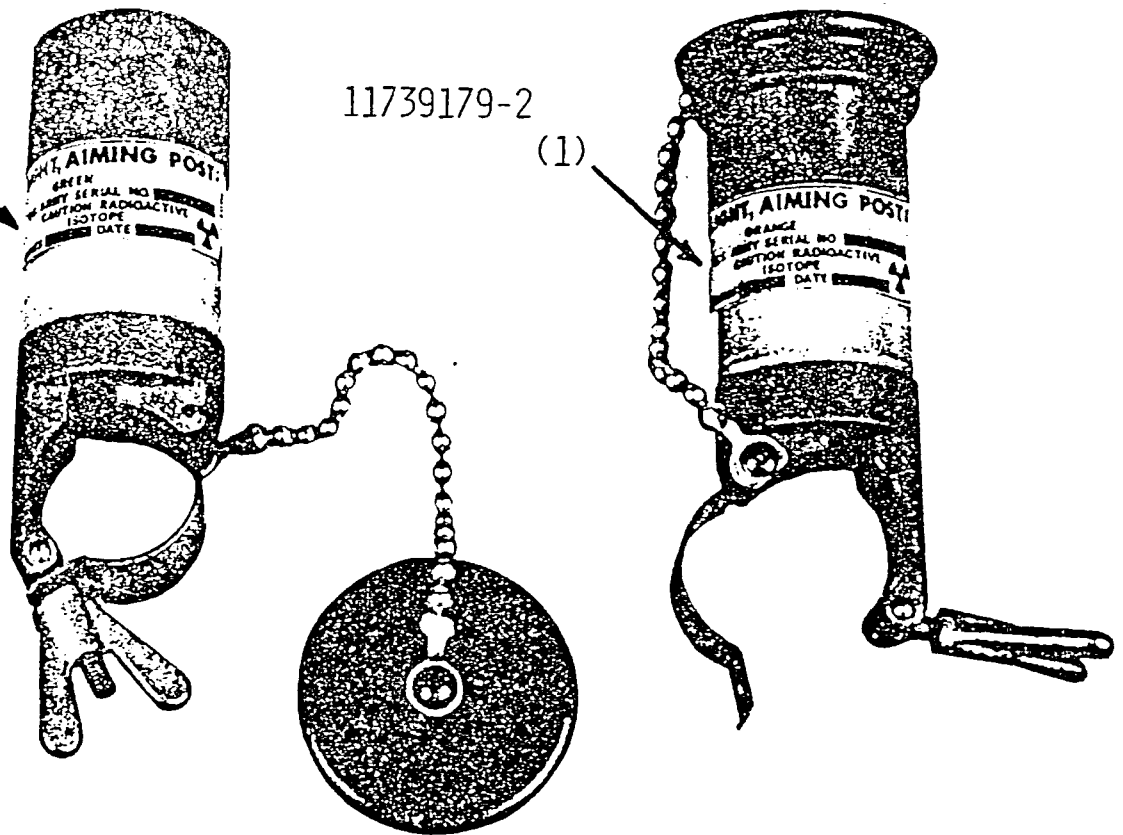
(1)

11739179-2

(1)

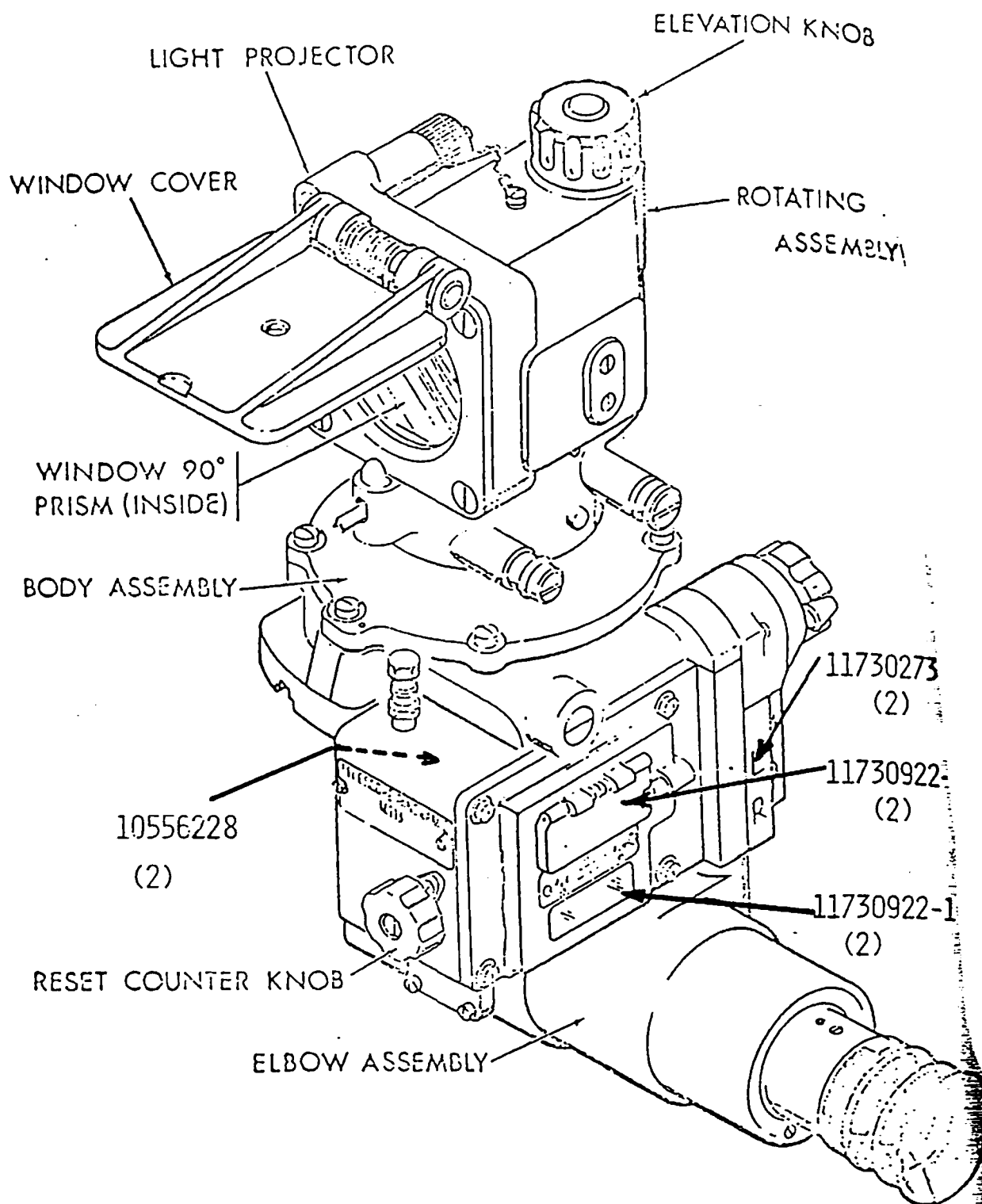
IF FOUND RETURN TO  
A MILITARY BASE  
DISPOSAL PER AR 755-15

THIS PLATE TO  
BE INCLUDED



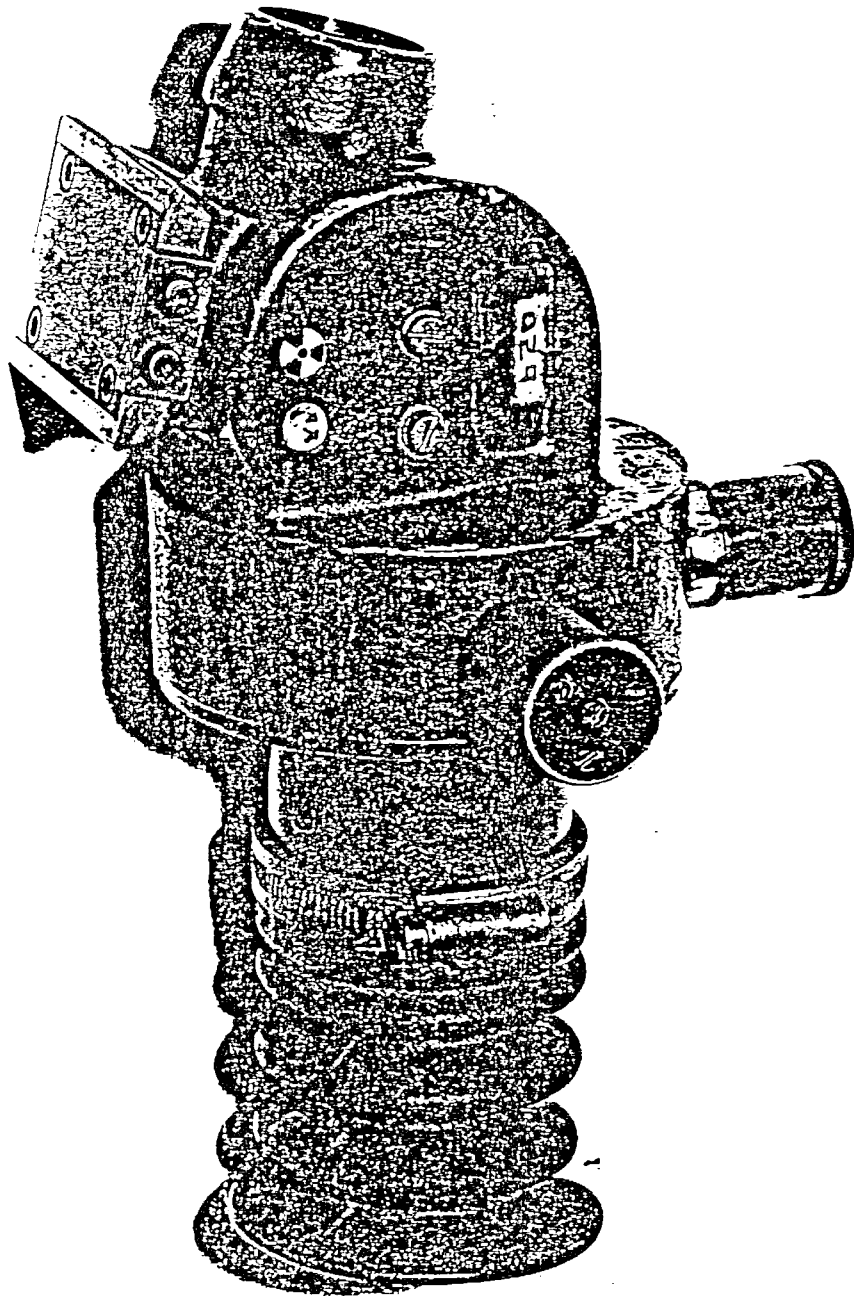
TRITIUM-SEALED IN GLASS SPHERE

LIGHT, AIMING POST: GREEN M58  
LIGHT, AIMING POST: ORANGE M59



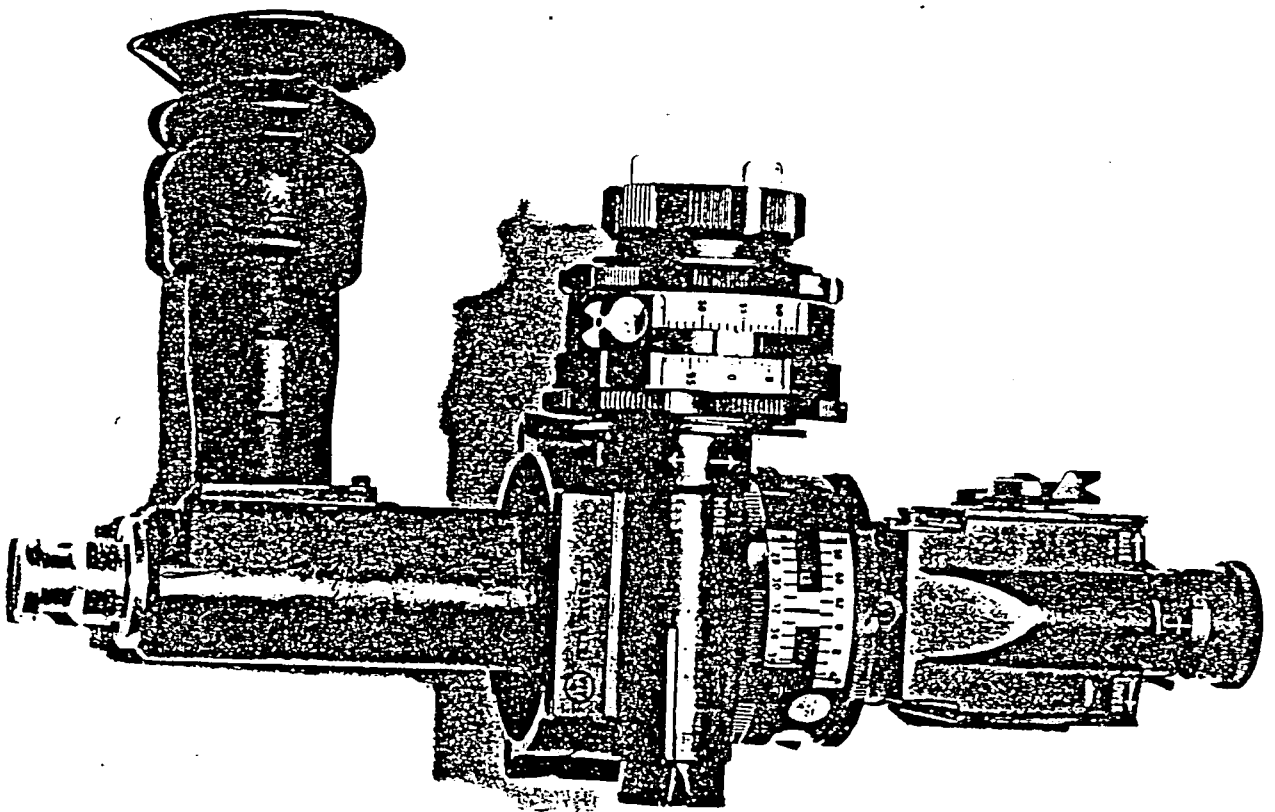
Panoramic Telescope M13A1 (1240-150-8836)  
Radioactive (Left Front View)

L2A1 Telescope, Elbow

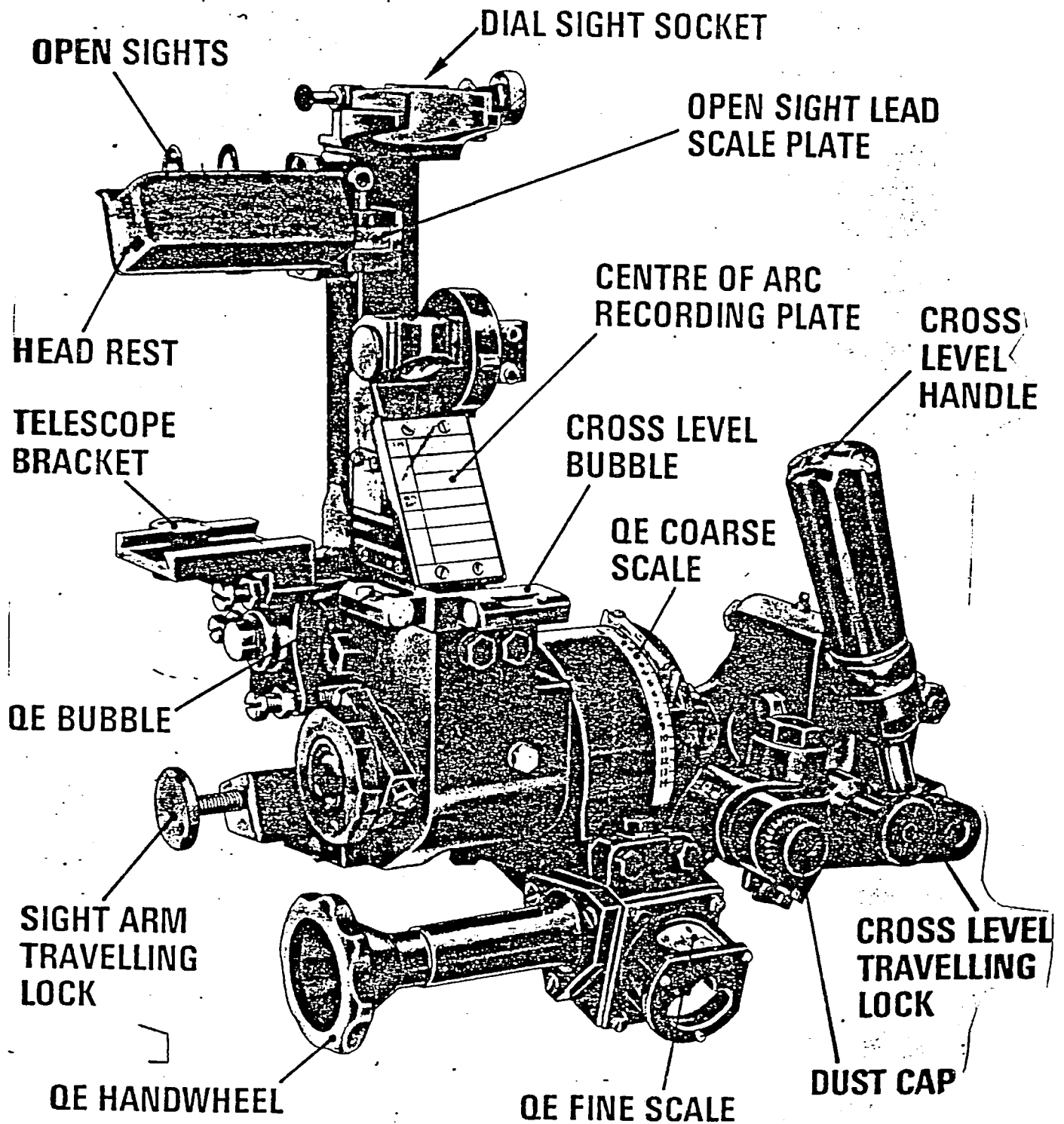




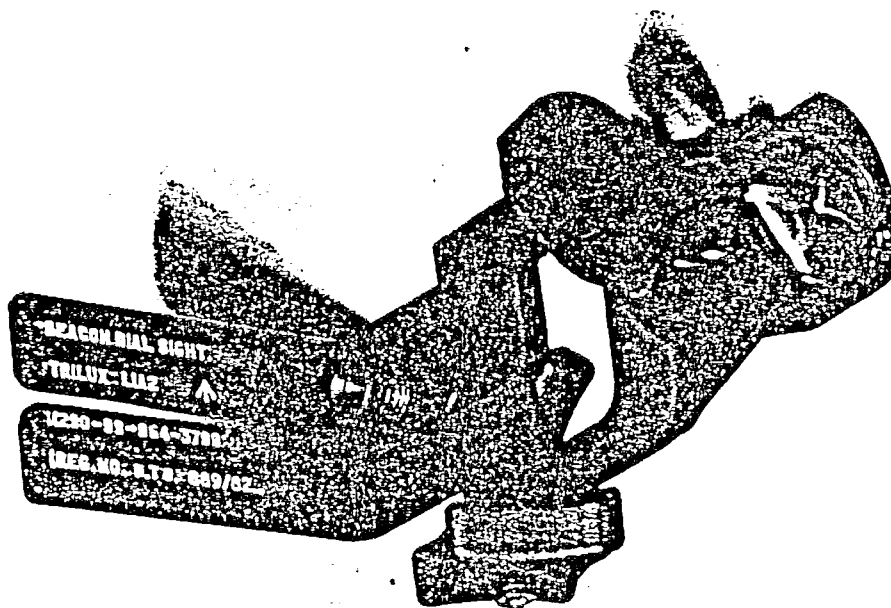
L7A1 Sight, Dial Trilux



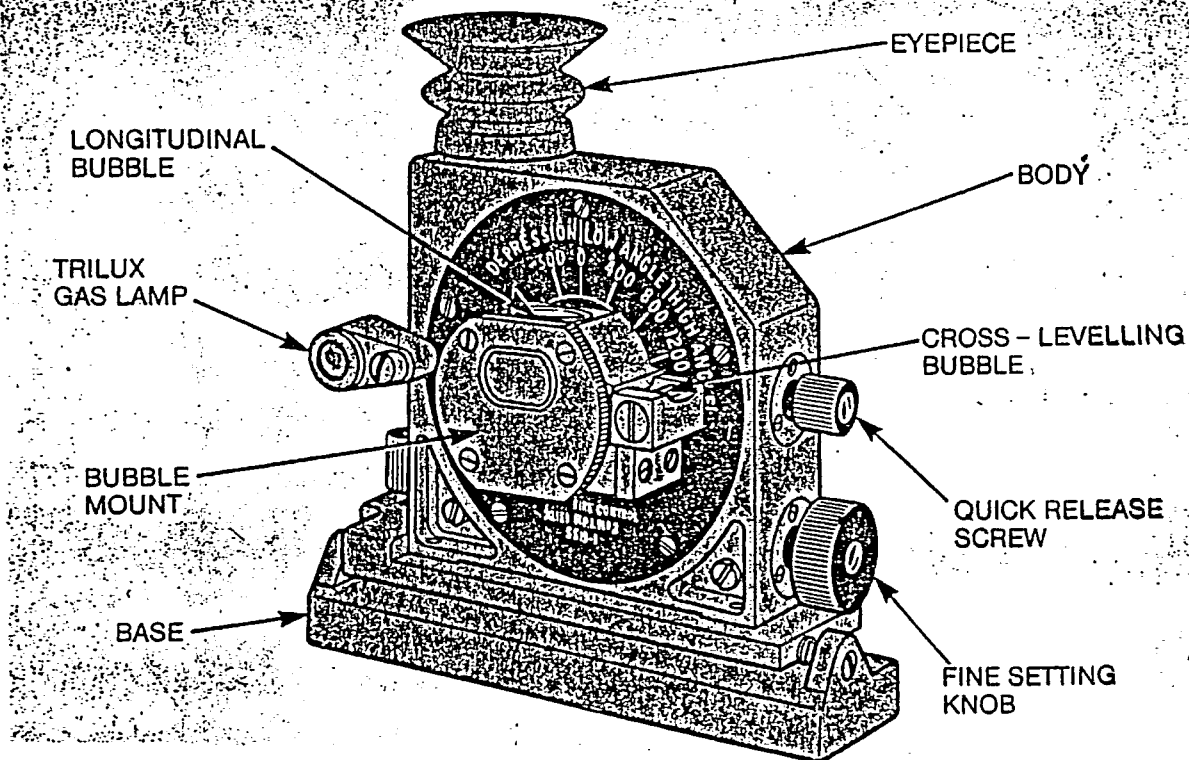
# DIAL SIGHT CARRIER



Beacon Dial Sight L1A2



# Quadrant Fire Control (L4A1)



## Artillery, Howitzer and Mortar Fire Control Components Containing Radioactive Material

NSN: Numerous components and end items (see attached listing)

Source: Tritium (H-3)

Activity: 1.95 Ci

Form: Gas sealed in glass ampules

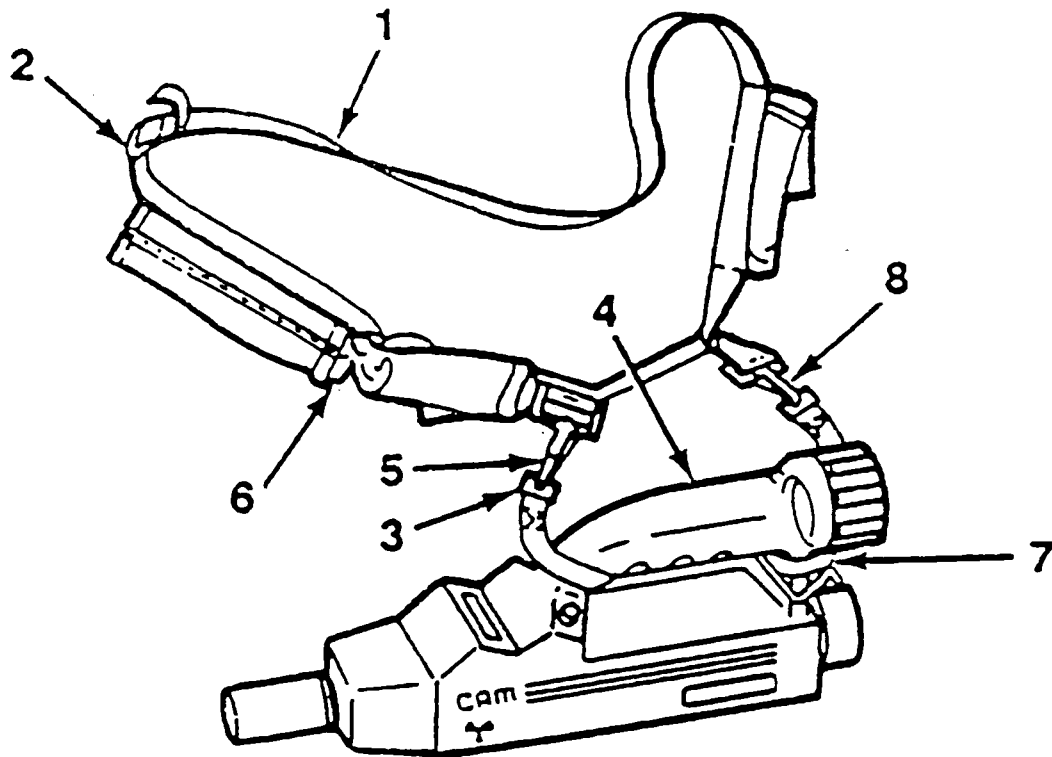
NRC License #: BML 12-00722-04

License Manager: AMCCOM

Note: Some examples of the components listed on the attached listings are as follows

Radioluminous Devices-NRC License 12-00722-06

| <u>DEVICE</u>                         | <u>SOURCES<br/>PER DEVICE</u> | <u>CURIES<br/>PER DEVICE</u> |
|---------------------------------------|-------------------------------|------------------------------|
| M1A1 Collimator                       | 1                             | 10.0                         |
| M1A2 Gunners Quadrant                 | 1                             | 0.075                        |
| M14A1 Quadrant                        | 6                             | 2.15                         |
| M17 Quadrant                          | 5                             | 1.875                        |
| M18 Quadrant                          | 6                             | 1.95                         |
| M58 Aiming Post Light                 | 1                             | 9.0                          |
| M59 Aiming Post Light                 | 1                             | 9.0                          |
| M64/M64A1 Sight Unit                  | 12                            | 6.69                         |
| M113A1 Panoramic Telescope            | 8                             | 4.6                          |
| M114A1 Elbow Telescope                | 4                             | 5.6                          |
| M134A1 Mount Telescope                | 2                             | 0.15                         |
| M137 Panoramic Telescope              | 10                            | 5.1                          |
| M138 Elbow Telescope                  | 2                             | 4.4                          |
| M139 Alignment Device                 | 1                             | 3.0                          |
| M140 Alignment Device                 | 1                             | 3.0                          |
| M171 Mount Telescope                  | 2                             | 0.15                         |
| Range Indicator                       | 4                             | 3.2                          |
| Zone Charge Setter                    | 1                             | 3.0                          |
| L2A1 Elbow Telescope                  | 2                             | 2.2                          |
| L3A1 Dial Sight Carrier               | 4                             | 2.12                         |
| L7A1 Dial Sight                       | 6                             | 2.42                         |
| XM187 Telescope Mount<br>and Quadrant | 6                             | 2.65                         |
| M90Eb Straight Telescope              | 2                             | 1.60                         |
| M137E1 Panoramic Telescope            | 10                            | 5.10                         |



Chemical Agent Monitor

NSN: 6665-01-199-4153

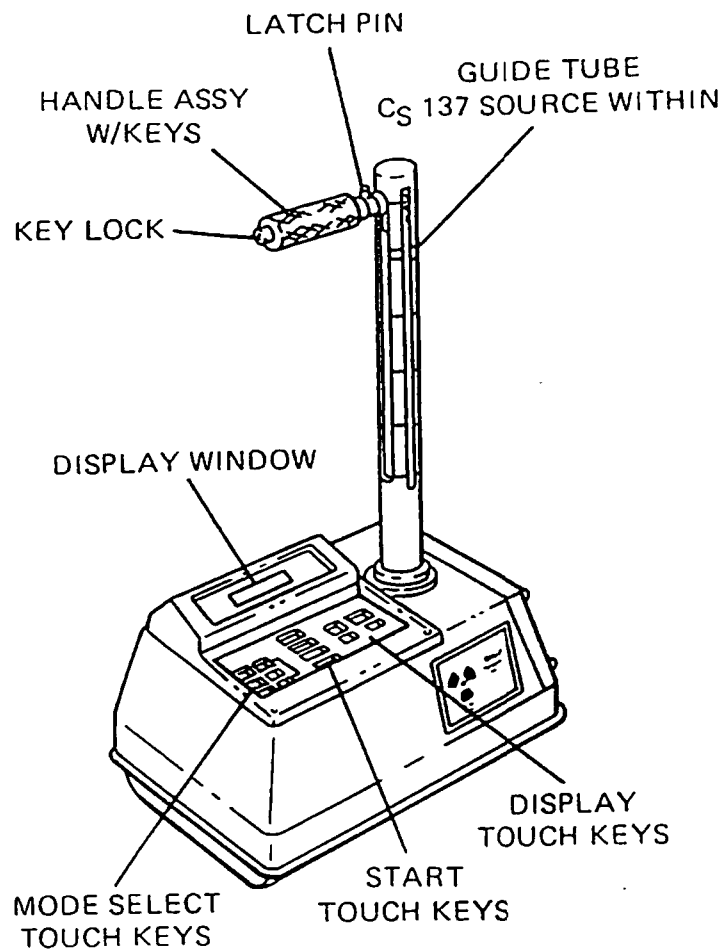
Source: Nickel-63 (Ni-63)

Activity: 10 mCi/source

Form: Plated on brass cylinder

NRC License #: BML 12-00722-14

License Manager: AMCCOM



MC-1 Tester, Density and Moisture  
Nuclear Method

NSN: 6635-01-030-6896

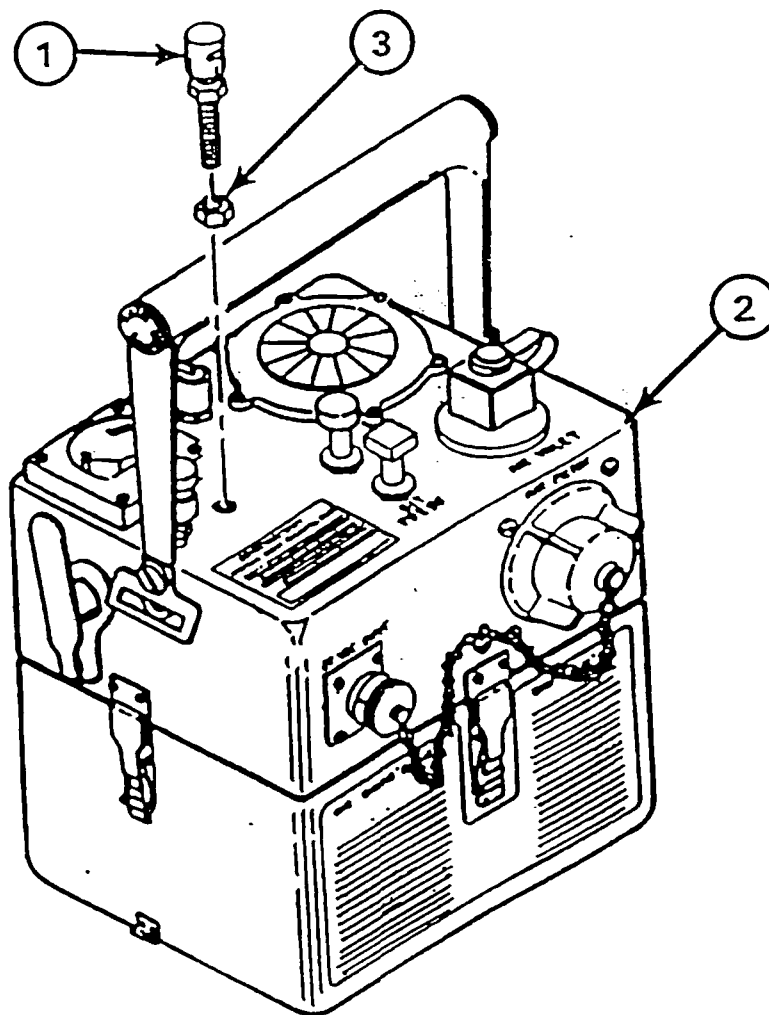
Sources: Cesium-137 (Cs-137)  
Americium-241 (Am-241)

Activities: Cs-137 = 10 mCi/item  
Am-241 = 50 mCi/item

Form: Special form sealed sources

NRC License #: BML 21-01222-05

License Manager: TACOM



M43A1 Chemical Agent Detector

NSN: 6665-01-081-8140

Source: Americium-241 (Am-241)

Activity: 250 uCi/source

Form: Am oxide as a foil

NRC License #: BML 12-00722-13

License Manager: AMCCOM