

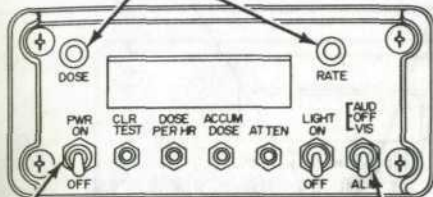
CHAPTER 2 OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF CONTROLS AND INDICATORS

1. EQUIPMENT CONTROLS AND INDICATORS

TOGGLE SWITCHES AND ALARM LIGHTS

RATE AND DOSE LIGHTS - Illuminate when dose rate or accumulated dose alarm set points are exceeded and alarm is set to VIS.



POWER - Turns unit ON or OFF.

THREE-POSITION ALARM

- OFF (center) - NO alarm occurs.
- AUD (top) - Alarm sounds when either alarm set point is exceeded.
- VIS (bottom) - RATE or DOSE light illuminates when either alarm set point is exceeded.

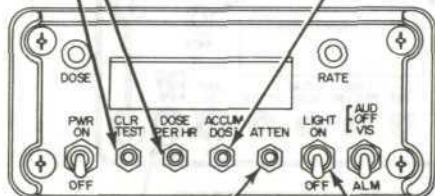
b. PUSHBUTTONS

CLEAR/TEST - Pressed to start operating test; used with other buttons to perform various test functions.

DOSE PER HOUR - Used with other buttons to:

- Set dose rate alarm.
- Display dose rate alarm set point
- Clear accumulated dose.

ACCUMULATED DOSE - Pressed to display accumulated dose; used with other buttons to perform various functions.

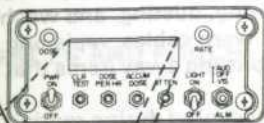


LIGHT - Turns display light on or off.

ATTENUATION - Press to display dose external to vehicle when vehicle mounted; used with **CLR/TEST** button to read attenuation factor.

DIGITAL DISPLAY

LOW-BATTERY INDICATOR - /hr flashes when approximately 10 hours of battery life is left. (Flashing remains displayed until batteries die.)



DECIMAL INDICATORS

DIGIT (NUMERAL SEGMENTS) - Activated with decimal point indicators and range unit to give radiation reading.

DOSE UNITS - Proper symbol (μGy , cGy , Gy) activated automatically according to radiation reading.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. PREVENTIVE MAINTENANCE

Preventive maintenance consists of routine checks of the equipment before and after each mission, or at any time they are necessary. Routine checks include cleaning, dusting, and washing the set; checking for worn cables; replacing receptacle covers; and putting away items that are not used.

Problems discovered during routine maintenance should be referred to organizational maintenance.

2-3. ROUTINE CHECKS

Routine checks to be made of the radiac set are:

- Check all connecting cables, receptacles, and plugs for cracks and breaks.

CAUTION

Turn unit off before disconnecting or reconnecting probe.

- Check that cable receptacle pins are unbroken and straight. There should be three pins in the vehicle mount receptacle on the back of the radiacmeter and six in the receptacle located on the probe.

CONTROL AND DISPLAY PANEL

Check for loose or broken display lights or light covers.

Inspect panel toggle switches and pushbuttons for ease of movement or evidence of mechanical damage.

OUTSIDE SURFACES AND POUCH

Remove dust, moisture, and loose dirt from outside surfaces of radiacmeter and probe with clean soft cloth.

Remove grease, fungus, and ground-in dirt from equipment pouch.

BATTERIES

Inspect battery well gasket (see para 2-4a). Refer radiac set to higher level of maintenance only if gasket will no longer seal.

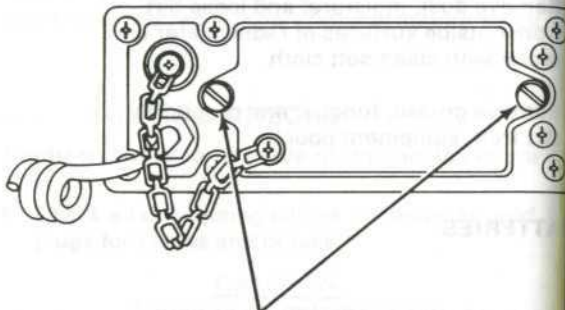
Inspect battery contacts; remove any corrosion using pencil eraser.

Section III. OPERATION UNDER USUAL CONDITIONS

2-4. ASSEMBLY AND PREPARATION FOR USE

a. BATTERY INSTALLATION/REPLACEMENT

- (1) Make sure **PWR** switch is **OFF** (down).



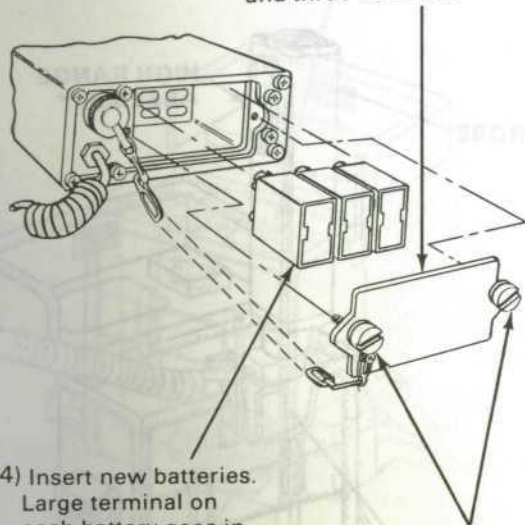
- (2) Loosen, but do not remove, captive screws.

2-6

CAUTION

When batteries are removed from the radiac set memory is retained for only 5 minutes.

- (3) Remove battery well cover and three batteries.



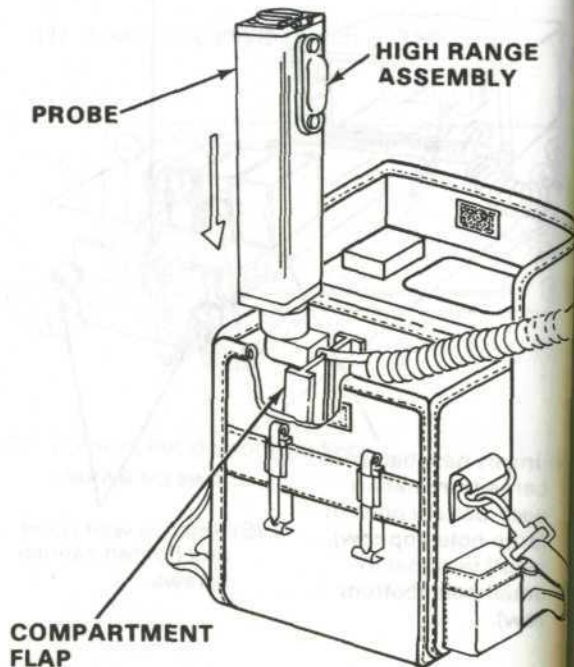
- (4) Insert new batteries. Large terminal on each battery goes in large hole (top row), small terminal in small hole (bottom row).

- (5) Replace well cover and tighten captive screws.

2-7

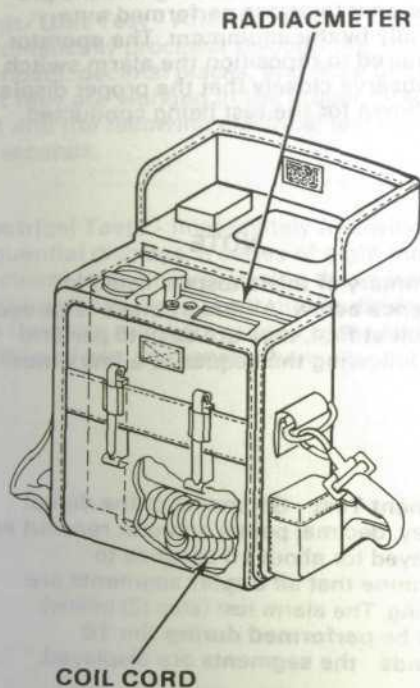
b. INSTALLING RADIAC SET IN POUCH

- (1) Orient pouch so that top cover is open and away from you. Install probe in the left compartment by passing the straight section of the coil cord nearest the probe connector through the opening in the compartment flaps. (Note the orientation of the high range assembly.) Push probe to the bottom of pouch.



2-8

- (2) Store coil cord at the bottom of the right hand compartment. Install radiacmeter directly above coil cord as shown.



2-9

C. PREOPERATIONAL TEST EXPLANATION

Before each mission, a series of pre-operational tests must be performed to make sure that the radiac set is operating. The radiac set is self-testing and the pre-operational tests are performed automatically by the equipment. The operator is required to reposition the alarm switch and observe closely that the proper displays are shown for the test being conducted.

NOTE

A summary of these tests is listed in sequence below. Although these tests seem difficult at first, they are easy to perform after following the sequence a few times.

- (1) **Segment Test** - Segments of the digital display, decimal points and unit readout are displayed for about 10 seconds to determine that all display segments are working. The alarm test (step (2) below), **must be performed during the 10 seconds** the segments are displayed.

Alarm Test - Operator switches **ALM** to all positions to check that the alarm sounds and shuts off and that the lights work at the proper times.

Digit/Unit Test - After the segment test, the unit automatically proceeds through the sequence of numbers, decimal places, and dose units to test that they are working in the proper order. This test and the following electrical tests take about 60 seconds.

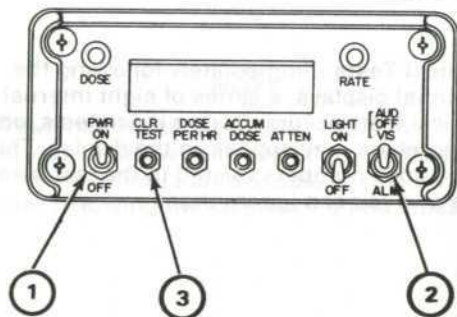
Electrical Tests - Immediately following the sequential displays, a series of eight internal electrical tests occurs. During these tests, one-digit numbers may appear on the display. These are the code numbers related to the test being made and you can ignore them.

NOTE

All of the following paragraphs must be read before starting test procedures.

d. PREOPERATIONAL TEST PROCEDURES

- (1) Set **PWR** to **ON** (up).
- (2) Set **ALM** switch to **AUD** (up).
- (3) Press and hold **CLR/TEST** button until alarm sounds 2 seconds, then release.



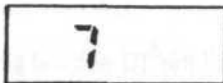
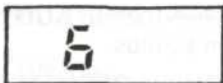
- (4) When segment display appears, check that your display is exactly as shown here, and then perform all of step (5) **within 10 seconds**



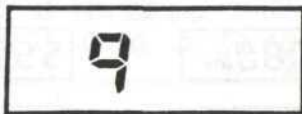
- (5) Set **ALM** switch to **OFF** (center). Alarm sound stops.
Set **ALM** switch to **VIS** (down). **RATE** and **DOSE** lights come on.
Set **ALM** switch back to **AUD** (up). Lights go out, alarm sounds.
Set **ALM** switch to **OFF** (center).
- (6) At the end of the 10-second segment test, the digit/unit test begins with three zeros and the sequence shown. Check each display in the sequence for correctness of all characters, including decimals.



- (7) During the electrical tests that start immediately after the 999Gy display, you may see one-digit codes on the display. You can ignore these codes.



- (8) If all tests are OK, after 10 to 60 seconds, flashing 9 appears with the pulsating alarm. When you see the flashing 9, proceed to step (10) below.



FLASHING

- (9) If there is a fault discovered during this test a flashing 0 appears and the alarm pulsates. Turn unit OFF.



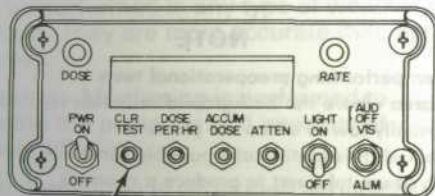
FLASHING

- (10) Press and release CLR/TEST button.

Preoperational tests are complete. Display again shows the three zeros (a) and then indicates dose rate, which is variable (b). Radiac set is ready for normal operation.



(reading will vary)



CLR/TEST
BUTTON

- (11) If any of the following events occur during the preoperational tests, turn unit **OFF** and send to organizational maintenance for repair.

- Power does not come on (step 1).
- Alarm does not sound (step 3).
- Decimal points, dose units, or any segment of the display are not in position or otherwise not exactly as shown (step 4).
- Alarm does not turn off (step 5).
- **RATE** and/or **DOSE** lights do not come on (step 5).
- Alarm does not turn on again (step 5).
- Digit/unit test are not displayed in entirety, in sequence exactly as shown (step 6).
- The electrical tests end with the display showing a flashing 0 (step 9).

NOTE

When performing preoperational tests in an area where the background radiation is unusually low or when the probe is shielded, it is statistically possible for the high range tube not to produce a count in the time allowed in the test. This will cause a flashing zero to appear when in fact no fault exists. If the numeral 7 appears prior to a flashing zero, repeat the preoperational test. If a flashing 9 appears on the retest no fault exists. If the flashing zero repeats, refer the unit to maintenance.

5. EQUIPMENT APPLICATIONS

There are three methods used to locate radiological contamination - Surveying, Monitoring, and Ground Radiological Reconnaissance:

Surveying - Surveys are conducted to find the extent and intensity of contamination. There are two types, aerial and ground.

NOTE

To perform aerial surveys, auxiliary equipment is required which is not supplied with the AN/VDR-2.

- Aerial surveys cover a large area faster than other methods. They are more flexible and require fewer personnel and less exposure of personnel.
- Ground surveys use unit equipment and can be performed in any type of weather or at night. They are more accurate than aerial surveys.

Monitoring - Monitoring is performed to determine the presence and intensity of residual radiation.

- Area monitoring is performed periodically or continuously to provide early warning and useful radiological data.
- Personnel, food, and equipment monitoring is performed to detect beta and low levels of gamma radiation.