DOSIMETER CHARGER

A Dosimeter Charger is used to charge or "ZERO" the Dosimeter.

OPERATION OF DOSIMETER AND CHARGER

1. Point the dosimeter at a source of light (figure 4) —even a match, a candle or a flashlight will do— and observe the position of the hairline indicator. If the line is visible and positioned less than mid-scale, record reading. If the line is at or above mid-scale or not visible, the dosimeter must be rezeroed. To re-zero, a dosimeter charger is required.

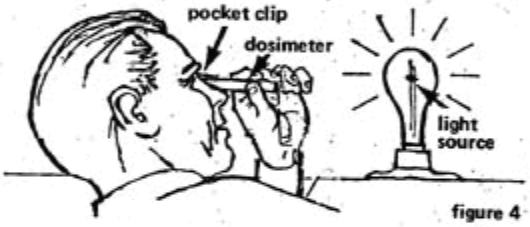

figure 4

2. To operate the Dosimeter Charger, loosen thumb-screw in the top or bottom center of the charger with a coin such as a dime and remove bottom case. Install battery (in correct way, +and–) and reassemble.

3. Position the charger on a flat surface such as a table. Unscrew the cap on the charging contact and place end of the dosimeter opposite pocket clip and eye piece on charging contact of charger. (See fig. 5)

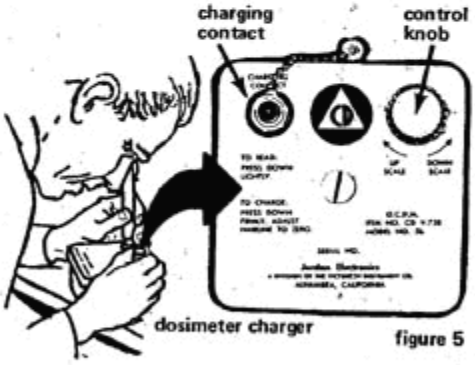

figure 5

4. Apply downward pressure and you should see a meter scale and a line while looking through the dosimeter. If no line is visible, rotate the control knob, located in the upper right hand corner (figure 5), until a line appears.

5. Set line to or near zero (figure 6) by turning control knob (figure 5).

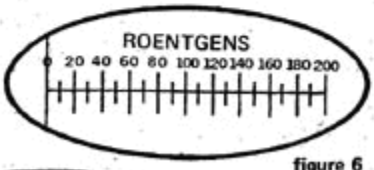

figure 6

6. To read dosimeter at any time -- point at source of light and observe setting by looking through dosimeter (figure 4). Reading of figure 7 is 75 Roentgens. Your accumulated exposure in Roentgens is this number less the initial reading you recorded.

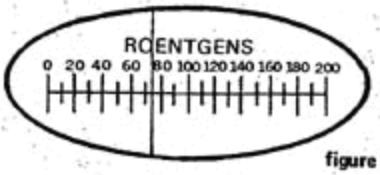

figure 7

The "Operating and Maintenance Instructions", that come with each CD V-750/756 charger, explains how to zero your dosimeter with the charger. However, something we hadn't seen addressed in them, is that the fiber image may shift slightly when the dosimeter is removed from the charger. This hairline "kick" is a common occurrence, particularly on the lower-range dosimeters. Simply repeat the charging procedure until a zero reading is obtained. If this is difficult, a poor ground condition at the charging pedestal is likely. This condition may be more pronounced if the charger has not been used for a period of time.

Dosimeters can be defective, too, like any instrument. Electrical leakage in dosimeters creates movement or drift of the fiber from an initial setting OR towards an up-scale reading without the presence of radiation. There can be half-a-dozen reasons why, but typically it is caused by contaminates in the manufacturing process, outgassing of internal components, such as plastics, or broken hermetic seals allowing humidity intrusion. FEMA current requirements for field dosimeters is for electrical leakage to not exceed 5% of full scale for a 50 degree C five day test. (Maximum leakage limit is 1% of full scale per day.) The test procedure requirements are quite a bit more involved than just slow cooking them for five days, but that's the primary objective to encourage failure in any units prone to these problems. Any dosimeters failing to meet this standard are considered defective and should be repaired.

Dosimeters need to also then be tested for accuracy by being exposed to a known radiation source that should hit midscale on their particular range. (Dosimeters are not completely linear and the only provided calibration points are always midscale.) FEMA specifications require that dosimeters should respond to within plus or minus 10% of true dose. But, because the calibrator 'box' geometry (positioning) and radiation scatter components makes absolute calibration impossible, they allow a deviation as great as 15%. Also, as an expediency, because they recognize that even dosimeters that are off by plus or minus 25% still provide valuable information, they also permit a label denoting a correction factor, but you need to keep in mind that dosimeters are not perfectly linear.

The prescribed procedure for radiation exposure testing of dosimeters is much more involved than calibrating a survey meter, both time-wise and in required operator participation setting it up and monitoring it throughout its duration. KI4U utilizes a specially designed rotating carousel within the CD V-794 calibrator as specified by FEMA to achieve the correct and uniform mid-scale radiation exposure for this test. If any are then found to not pass that radiation exposure test they can't then be easily calibrated (adjusted) or fixed. (It can be done with the right equipment, it's just a very involved chore.) Agencies normally just relegate them to a *'do it sometime much later'* repair box or auction them off to unsuspecting bidders.

However, those that do pass the electrical leakage test and also the radiation exposure accuracy test, should be held in high confidence of performing accurately and reliably in the field. The logic of preferring a high-range dosimeter rather than a low-range dosimeter is the same as for survey meters. We offer one model of high-range

dosimeter (CD V-742) and they will all have been both successfully electrical leakage tested AND radiation exposure accuracy tested. They will have a certification sticker indicating such on them.