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THERATRON 780 OPERATOR'S MANUAL
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THERATRON 780
cobalt 60 teletherapy unit
OPERATOR'S MANUAL

EDITION 14
OCTOBER 1981
STOCK NO. 2M001934



ATOMIC ENERGY OF CANADA LIMITED
● COMMERCIAL PRODUCTS

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RECORD OF REVISIONS

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5.6.5 Treatment Timer

- A. Test the timer monthly as follows. If any specified performance criterion is not met, discontinue use of the unit.

Withou a patient, set up the unit for a FIX treatment (Ref. Section 4.4) and perform the following operations. If the timer does not respond as specified, discontinue its use and call a service agent.

- (1) Enter any SET TIME and start treatment (Ref. Section 4.5).
- (2) Interrupt treatment and check that timer behaves as described in Section 4.5, F.
- (3) Resume treatment.
- (4) Terminate treatment and check that timer behaves as described in Section 4.5,G. Do not reset timer. Record SET TIME and EXPOSURE displays.
- (5) Turn off external electrical power supply. Press any timer key to determine SET TIME and EXPOSURE. Check that they agree with the readings recorded in Step (4), above (if not see Section B).
- (6) Restore electrical power to the unit. Check that timer behaves as described in Section 4.7,C.

B. Replace the backup batteries (G.E. XKCF 450 ST or K01A111AA GT3) every six months, as follows:

- (1) Turn power off at main isolating switch.
- (2) Remove console back cover.
- (3) Withdraw printed circuit board and remove batteries.
- (4) Fit new batteries, making sure that polarity is correct, as marked on battery holder.
- (5) Replace printed circuit board in timer.

WARNING

ENSURE THAT BATTERY PCB IS FULLY INSERTED INTO ITS SOCKET. THE TOP OF THE PCB WILL BE LEVEL WITH OR BELOW THE TOP OF ITS GUIDE RAILS WHEN PROPERLY INSTALLED.

IF THE PCB IS NOT PROPERLY INSTALLED, THE TIMER MAY NOT OPERATE AND UNWANTED RADIATION MAY BE DELIVERED TO PERSONNEL.

- (6) Replace console cover.
- (7) Switch power on at main isolating switch.
- (8) When display decimal points stop flashing, perform monthly test described above.

5.6.6 Unit Motion Control Tests

Test the controls as follows. If any specified performance criterion is not met, discontinue use of the unit.

A. Operate the arm, head, collimator and couch motions. Check that:

(1) Each motion operates over its specified range (Ref. Tables 1.2 and 1.3).

(2) Each motion operates smoothly.

(3) When a motion is selected on the hand control body, the selection pushbutton is illuminated.

B. Check that the arm rotates smoothly when operated using the console SET UP pushbutton. The SET UP pushbutton should be illuminated when depressed and should spring out, causing arm motion to stop, immediately finger pressure is removed. The CW and CCW pushbuttons should be illuminated when depressed. The arm position circular scale and digital readout should agree within 1 degree at any arm position.

5.6.7 Arm and Couch Drive Belts

Check for tension and wear. The tension in each timing belt must be sufficient that it cannot slip off its pulleys and that its teeth are positively engaged in the pulley sprockets. The belts must be free of cuts, nicks and frayed surfaces. If the belts are loose or worn, discontinue use of the unit.

WARNING

KEEP HANDS CLEAR OF DRIVE MECHANISMS IF OPERATING MOTIONS DURING THIS TEST. TOUCHING THE MECHANISMS MAY CAUSE INJURY.

5.7 CONTAMINATION TEST PROCEDURE

The unit contains radioactive materials in the form of encapsulated cobalt-60 and depleted uranium shielding which are subject to the regulations of the competent authority. This section describes a routine wipe test used for the detection of removable contamination.

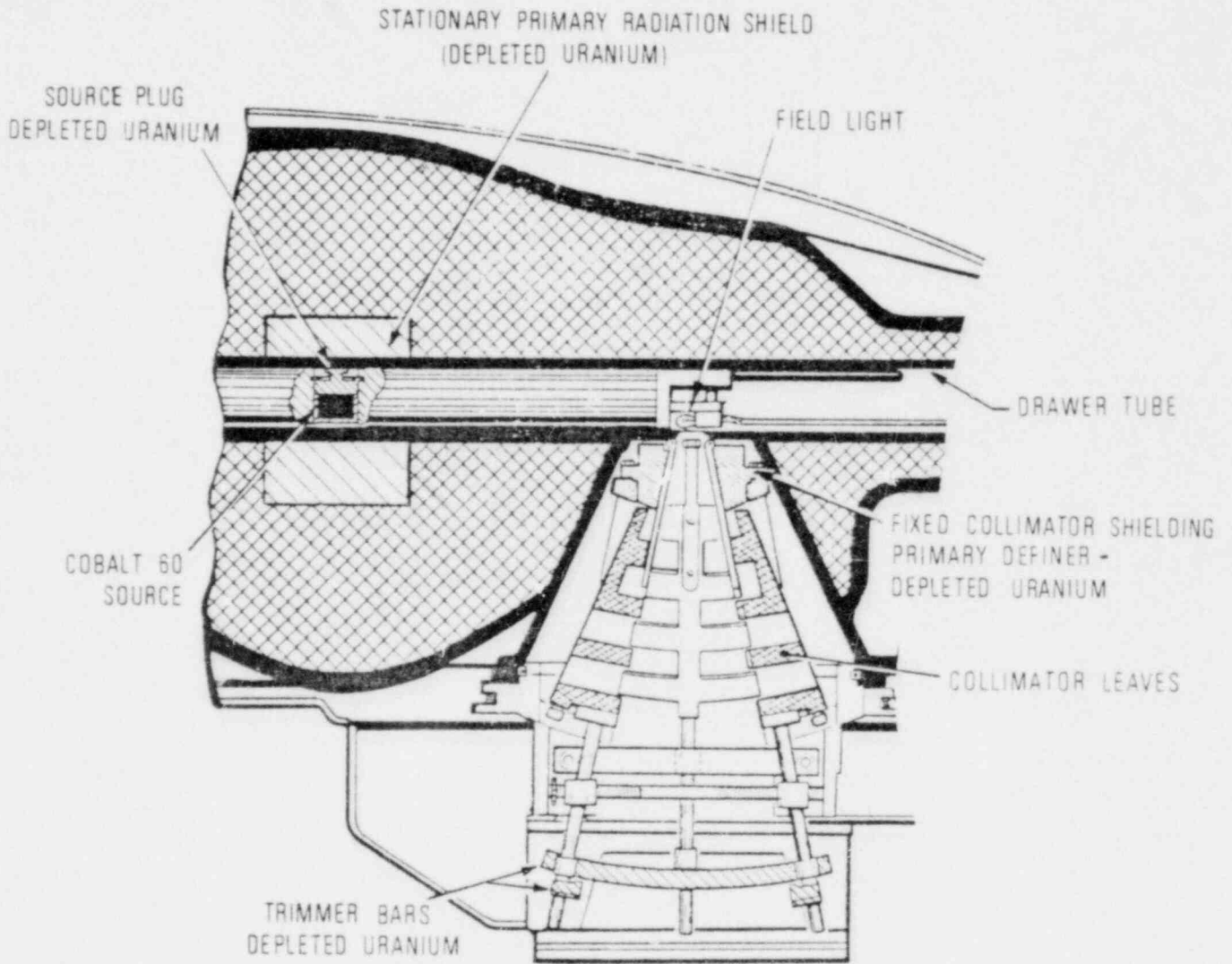
This test must be performed every six months, or more frequently if so required by the competent authority.

NOTE

Contamination tests must be performed by persons trained and experienced in contamination testing. Some competent authorities specify that these tests must be made by specially licensed personnel.

5.7.1 Wiping

- A. Be sure source is in BEAM OFF position. Rotate stretcher from unit and rotate arm to 90 or 270 degree position. Position head for easy access to inside of collimator.
- B. Fully open collimator leaves. Switch off main power supply and remove top head cover.



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Fig. 5.1. Head and Collimator

C. Wipe each of the following areas (Fig. 5.1) with separate 3 inch (7 cm) diameter high wet strength filter papers, slightly moistened with water:

- (1) Inside of head drawer tube
- (2) Primary definer
- (3) Inside surface of collimator leaves
- (4) 45 cm trimmer bars
- (5) Accessory trimmers
- (6) Uranium beam shaping blocks
- (7) Top of stretcher

NOTE

Be careful not to damage collimator cross-wires or beam defining light bulb when performing wipe tests.

5.7.2 Counting

A. A suitable instrument is the Berthold Rato-F Survey Meter, as used by AECL-CP Service Representatives. With beta window open a typical background is 20 to 30 counts per minute. With this background subtracted the net count rate accuracy is ± 5 counts per minute. The limit of detection may be considered to be 5 counts per minute or, using the efficiencies shown below, less than 0.0006 microcuries cobalt-60 or less than 0.0001 microcuries uranium-238.