6. WINDOW OPERATION AND ENERGY CALIBRATION PROCEDURES

6.1 General

The M2200 is calibrated at the factory so that 1 turn on the THRESHOLD control is equal to 1 turn on the window dial.

6.2 Equipment Required

- Detectors capable of energy discrimination. Examples used are the Ludlum Models 44-3 and 44-2.

- Known gamma radiation sources. Typical sources are ^{137}Cs (662 keV) and ^{241}Am (60 keV).

6.3 Procedure to Calibrate Threshold to 10 keV/Turn.

- **Initial M2200 control settings**

  - Window ON-OFF switch at OFF

  - Ratemeter RANGE selector switch - X10

  - THRESHOLD dial - 5.50

  - WINDOW dial - 1.00

  - HV dial - 0.00

- **Turn-on**

  - Connect the Model 44-3 detector to the instrument.

  - Turn the power switch to the appropriate power supply.

- **Operation and Calibration**

  - Expose ^{241}Am to detector.

  - Increase the HV setting until the count from the source just starts to count.

  - Switch the window ON-OFF to ON.

  - Increase the HV until the source peaks on the ratemeter. Increase the range switch as needed to prevent the meter from exceeding full scale.

  - The THRESHOLD dial is now calibrated to 10 keV/turn. The WINDOW control may be widened or narrowed without affecting the THRESHOLD setting. (As now calibrated, the instrument will respond only to radiation energies between 55 keV and 65 keV. Adjust the THRESHOLD dial for other energies of interest.

6.4 Procedure to Calibrate Threshold to 100 keV/Turn.

- **Initial M2200 control settings:**

  - Switch the window ON-OFF to OFF.

  - Ratemeter RANGE selector switch - X10

  - THRESHOLD dial - 6.42

  - WINDOW dial - 0.40

  - HV dial - 0.00

  - Connect the Model 44-2 detector to the instrument.

  - Turn the power switch to the appropriate power supply.

- **Operation and Calibration**

  - Expose ^{137}Cs to detector.

  - Increase HV setting until count from source just starts to count.

  - Switch window ON-OFF switch to ON.

  - Increase HV until source peaks on ratemeter. Increase RANGE switch as needed to prevent meter from exceeding full scale.

  - THRESHOLD dial is now calibrated to 100 keV/Turn. The WINDOW control may be widened or narrowed without affecting the threshold setting. (As now calibrated, the instrument will respond only to radiation energies between 642 keV and 682 keV. Adjust THRESHOLD dial for other energies of interest.)

7. DATA OUTPUT

7.1 General

The Model 2200 RS-232 serial port can be connected to a computer or printer for datalogging of the scaler count information. Windows™-based software and cable are supplied with the instrument. The computer software can control the count time, start and stop counting, time/data stamp data, and print or save data. An optional printer may also be purchased to print each scaler reading.

The two-pole dipswitch on the rear chassis underneath the calibration cover controls the RS-232 data. The top switch, labeled "PC" and "PRNTR", controls the type of data. In "PC" mode, data is bi-directional, allowing the computer to start/stop counting. In the "PC" mode, the count time can also be changed by the computer, but only if the count time pushwheels are set to "000". In the "PRNTR" mode, the scaler count is output at the end of each count only. The bottom dipswitch, marked "RECYCLE" and "OFF", allows counting to recycle instead of requiring a manual push of the COUNT button for each cycle. This mode is useful with the optional printer for taking many separate counts.

7.2 Software

- **Prior to Installation of Software:**

Ensure both the computer and the Model 2200 are turned off.

Connect one end of the supplied RS-232 cable to the Model 2200 and connect the other end of the cable to any unused serial port on the back of the computer. (This unused port should be labeled COM1, COM2, COM3, or COM4.)

- **To Install Software:**

1. Insert LMI M2200 Software CD into the CDROM drive. Setup will automatically start. If it does not, double-click on the "setup.exe" file located on the CD.

2. The program will be installed to "C:\Program Files\m2200". An icon in the start menu is created under Start/Programs/Ludlum Measurements, Inc./Model 2200.

3. Prior to running the program, ensure that the Model 2200 is in the "PC" mode and the count time pushwheels are set to"000".