The **ROI Report** command (see Section 4.1.7) can be used with this function to produce a semi-quantitative nuclide list for the spectrum.

4.3.5. Peak Info

This command operates when the marker is positioned in a peak or in an area marked as an ROI. It displays the following information in a pop-up box and on the Supplementary Information Line (Fig. 60):

- If the spectrum is not calibrated, the centroid channel, FWHM, FW1/xM (all in channels), gross area, net area, and net-area uncertainty are displayed for the ROI.

- If the spectrum is calibrated, the centroid channel, FWHM, FW1/xM in channels and calibration units (e.g., energy), library "best match" energy and activity, gross area, net area, and net-area uncertainty are displayed for the ROI.

Fig. 60. Peak Info Beneath Marker and Above Peak.

NOTE If the marker is in an ROI, peak information is displayed whether or not the area is a detectable peak. If no ROI is marked, MAESTRO performs a peak fit, using the current **Peak Search** settings (Section 4.3.4) with the marker position as the centroid. If a peak is detected, its information is displayed (otherwise a "could not fit peak properly" message is displayed).

If the Detector is acquiring data, the values displayed are continuously updated.

To close the pop-up box, click it or press **<Esc>**.

This command is duplicated by double-clicking the mouse in the ROI or with the **Peak Info** command on the right-mouse-button menu.
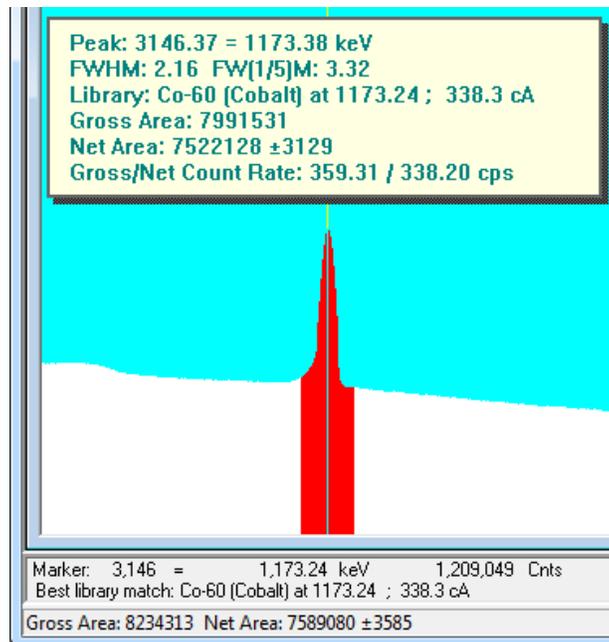
4.3.5.1. Calculation

The program subtracts the calculated background, channel by channel, and attempts a least-squares fit of a Gaussian function to the remaining data. If unsuccessful, it displays "Could Not Properly Fit Peak." If successful, the centroid is based on the fitted function. The reported widths are linearly interpolated between the background-subtracted channels. The spectrum components used in the background calculation are illustrated in see Fig. 61.

The background on the low channel side of the peak is the average of the first n channels of the ROI, where n is the number of background points selected on the dialog under **Acquire/Settings...** (Section 4.3.1.3). The channel number for this background point is the midpoint fractional channel of the n points. The background on the high channel side of the peak is the average of the last n channels of the ROI. The channel number for this background point is also the midpoint fractional channel of the n points. These $(n-1)$ points on each side of the peak form the end points of the straight-line background.
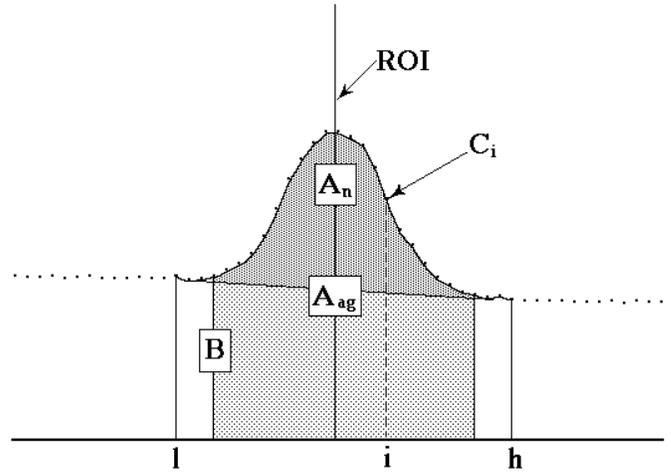

Fig. 61. Calculation Details.

The background is given by the following:

$$B = \left(\sum_{i=l}^{l+(n-1)} C_i + \sum_{i=h-(n-1)}^{h} C_i \right) \frac{h - l + 1}{2n} \tag{17}$$

where:

B	=	the background area
l	=	the ROI low limit
h	=	the ROI high limit
C_i	=	the contents of channel i
n	=	the number of background points

The gross area is the sum of all the channels marked by the ROI according to the following:

$$A_g = \sum_{i=l}^{h} C_i \tag{18}$$

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where:

A_g = the gross counts in the ROI
l = the ROI low limit
h = the ROI high limit
C_i = the contents of channel i

The adjusted gross area is the sum of all the channels marked by the ROI but not used in the background according to the following:

$$A_{ag} = \sum_{i=l+n}^{h-n} C_i \tag{19}$$

where:

A_{ag} = the adjusted gross counts in the ROI
l = the ROI low limit
h = the ROI high limit
C_i = the contents of channel i
n = the number of background points

The net area is the adjusted gross area minus the adjusted calculated background, as follows:

$$A_n = A_{ag} - \frac{B\,(h-l-(n-1))}{(h-l+1)} \tag{20}$$

The uncertainty in the net area is the square root of the sum of the squares of the uncertainty in the adjusted gross area and the weighted error of the adjusted background. The background uncertainty is weighted by the ratio of the adjusted peak width to the number of channels used to calculate the adjusted background. Therefore, net peak-area uncertainty is given by:

$$\sigma_{An} = \sqrt{A_{ag} + B\left(\frac{h-l-(n-1)}{2n}\right)\left(\frac{h-l-(n-1)}{h-l+1}\right)} \tag{21}$$

where:

A_{ag} = the adjusted gross area
A_n = the net area
B = the background area
l = the ROI low limit
h = the ROI high limit
n = the number of background points

The counting activity, *cA*, is calculated as:

$$cA \;=\; \left(\frac{100.0}{Percent} \right) * \left(\frac{Net\ Counts}{Live\ Time} \right) \tag{22}$$

where:

    Percent   = Gammas per 100 disintegrations (from library list)
    Net Counts   = Net counts in the peak
    Live Time   = Live time in seconds

4.3.6. Input Count Rate

This command is supported by most newer ORTEC
MCBs (and disabled for unsupported units), and displays
or hides the input count rate indicator (Fig. 62) in the upper
left corner of the spectrum window (this is the input count
rate, not the number of processed pulses). Note that if the
full spectrum view is positioned in the same corner, it can
obscure the Input Count Rate box. This command is also on the right-mouse-button menu.

Fig. 62. Input Count Rate Display in Expanded Spectrum View.

4.3.7. Sum

The **Sum** function performs its calculation as follows, and displays the sum on the Marker
Information Line:

1. If the marker is not in an ROI, the
   counts in all data channels in the buffer
   (e.g., channel 1 to the maximum channel
   currently selected) are summed.

2. If the marker is in an ROI, the sum of
   the data channels in the ROI is shown on
   the display. This is the same as the gross
   counts in the **Peak Info** display, but can
   be used on wider ROIs.

3. You can also sum a region by marking
   it with a rubber rectangle, then selecting
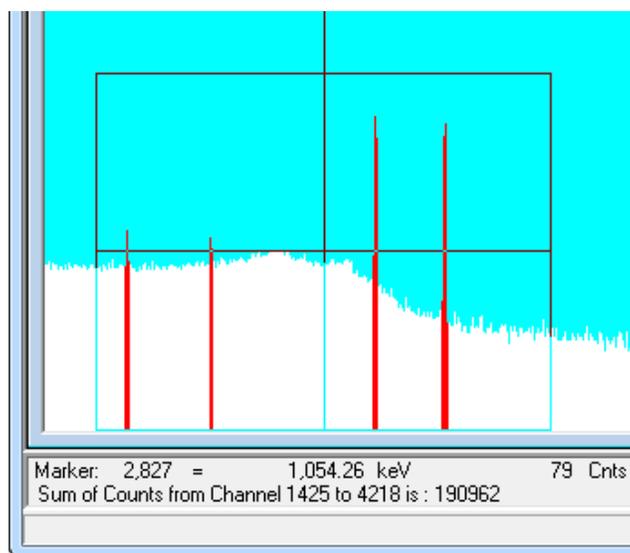   **Sum**. This is illustrated in Fig. 63.

Fig. 63. Summing the Channels Within a Rubber Rectangle.