Representative Emission Profiles for Cu Foil (from MCA) for ~20,000 to ~150,000 cps output counts per detector channel and 2 μsec shaping time

Each element (diode) is 1 mm x 1mm and the arrangement is in a 20 x 20 square. There is a hole in the middle of the array for beam pass-through omitting a 4 x 4 array (hence there are 384 elements). This hole can be used for normal incidence measurements with a modified detector casing.

Fig. 1. View of detector showing pass through hole.

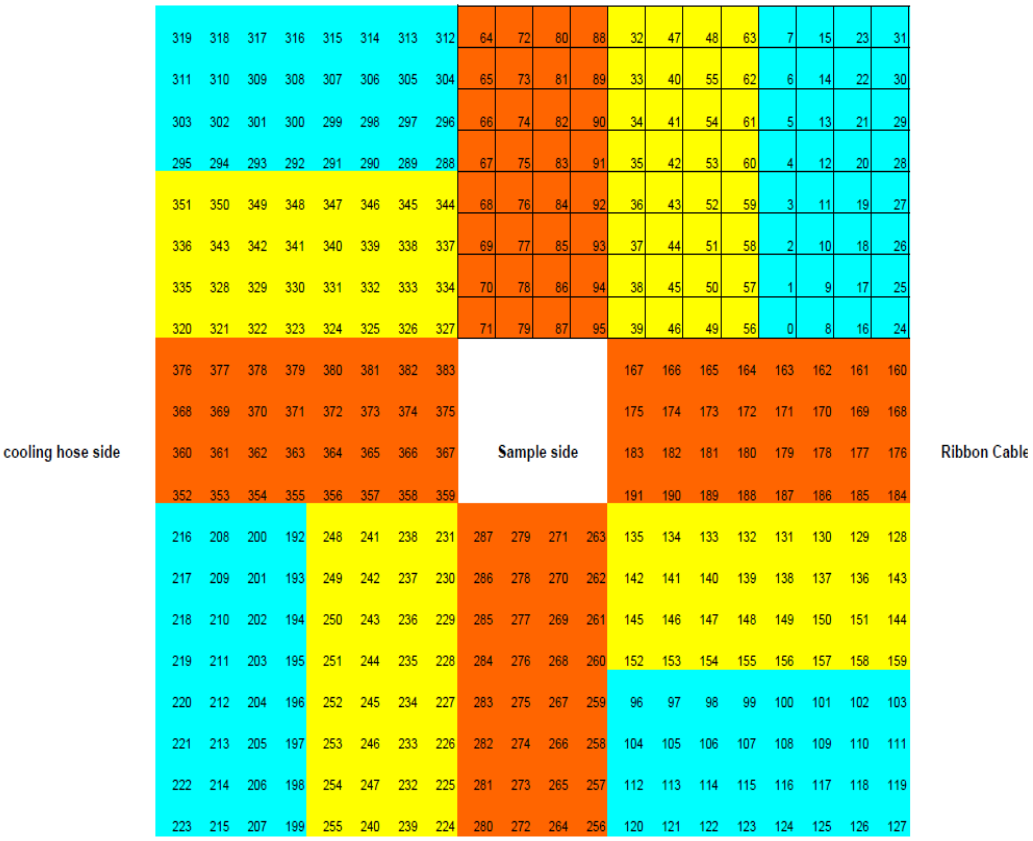
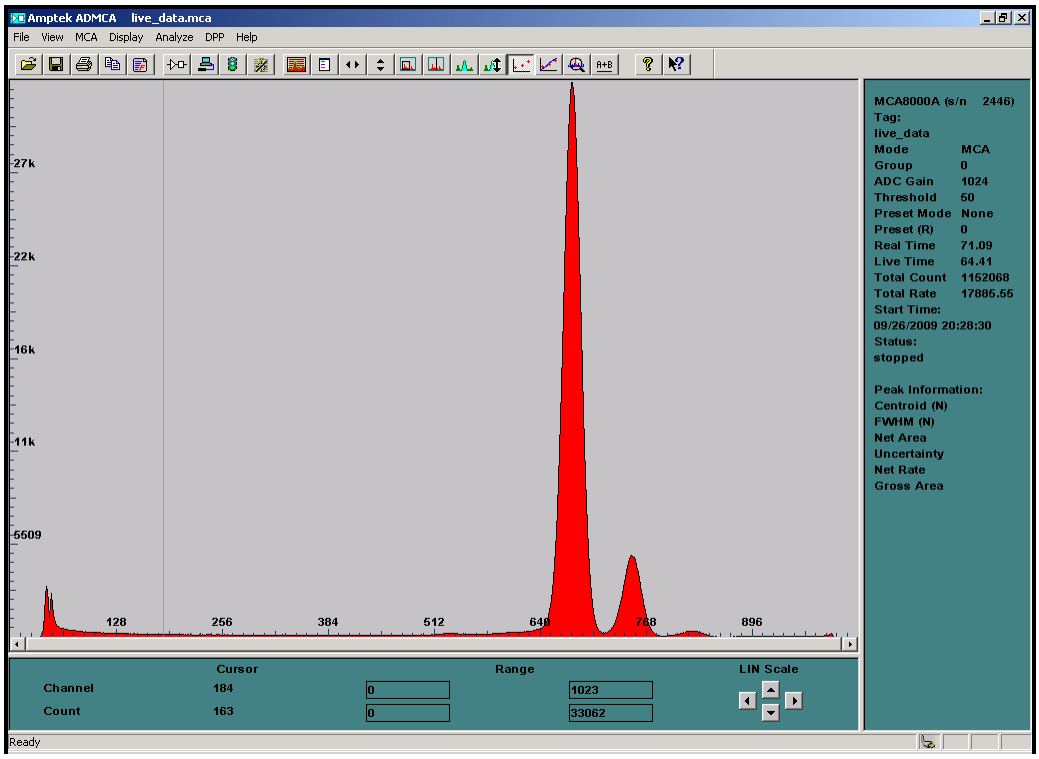


Fig. 2. Schematic of layout with elements labeled.

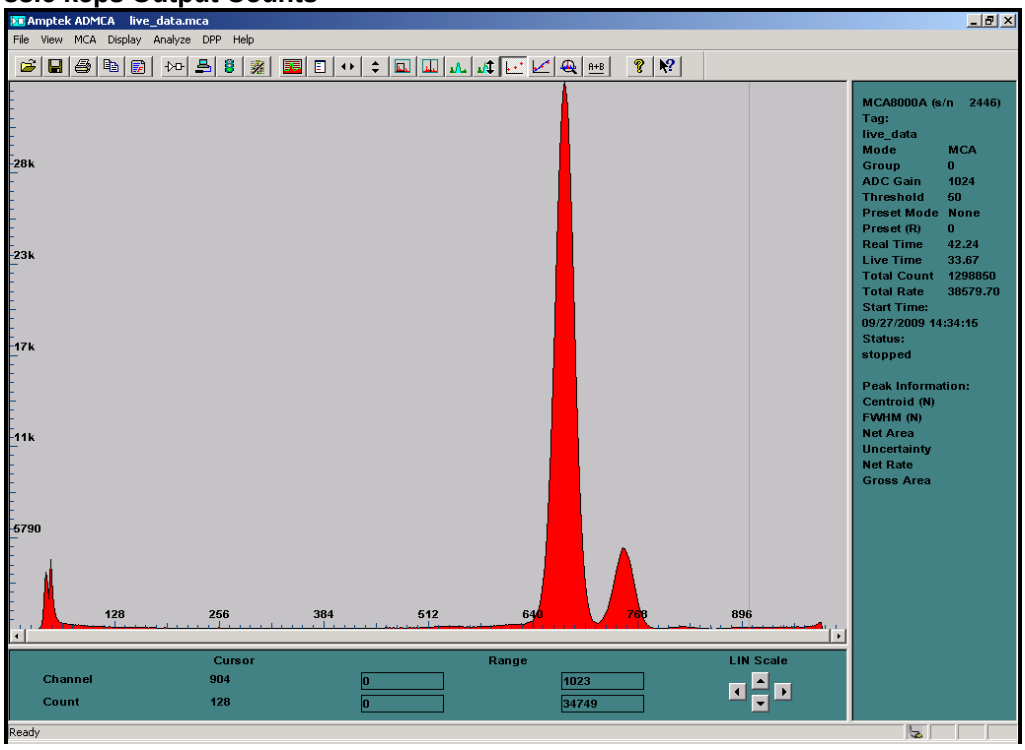
Cu Kα and Kβ emission lines from Cu Foil follow for representative detector channels. The channels examined are: 1, 3, 4, 6, 41, 43, 53, 77, 94, 103, 106, 116, 119, 121, 125, 137, 143, 155, 160, 193, 196, 199, 209, 212, 223, 234, 235, 238, 241, 295, 296, 300, 305, 306, 312, 316, 319, 324 and 327. The MCA screen shots follow. Note the “Total rate” for the output counts for the given channel.

Detector Element=1 Shaping Time = 2 μsec

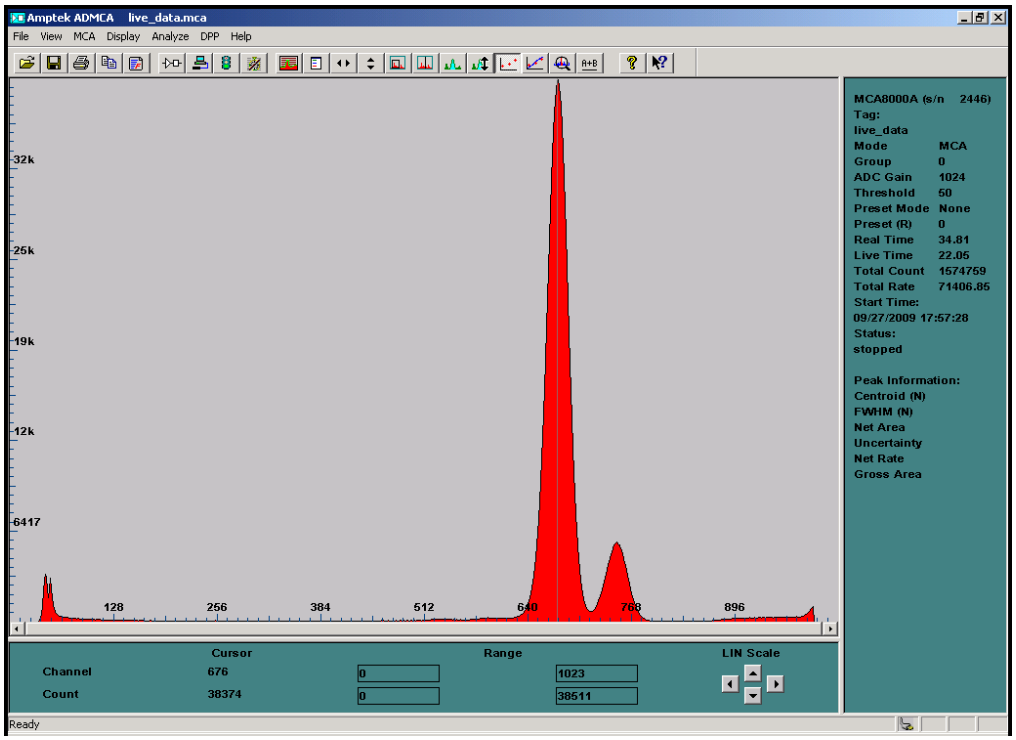
17.8 kcps Output Counts



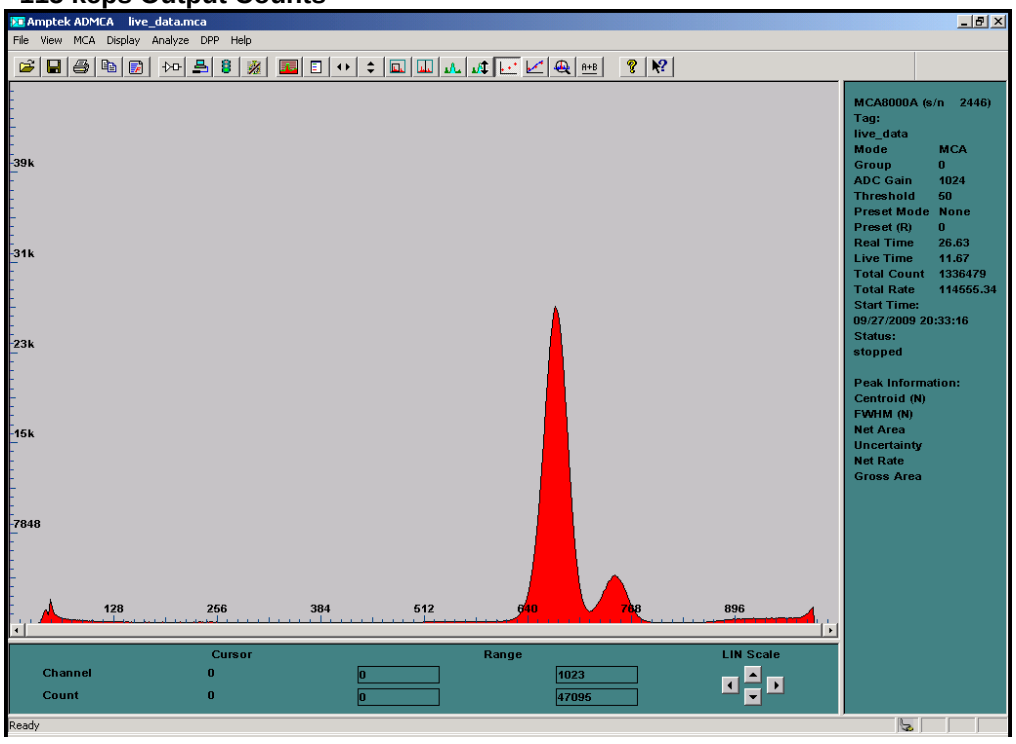
38.6 kcps Output Counts



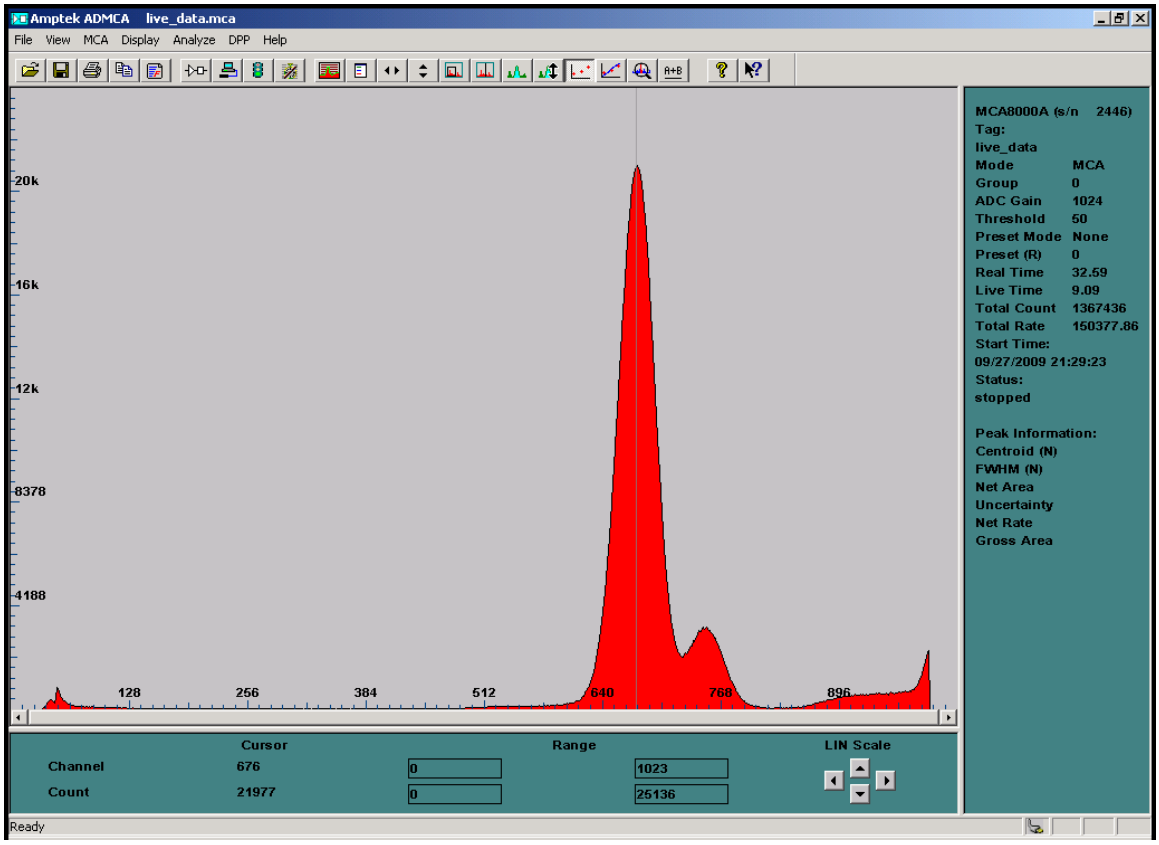
71.4 kcps Output Counts



~115 kcps Output Counts

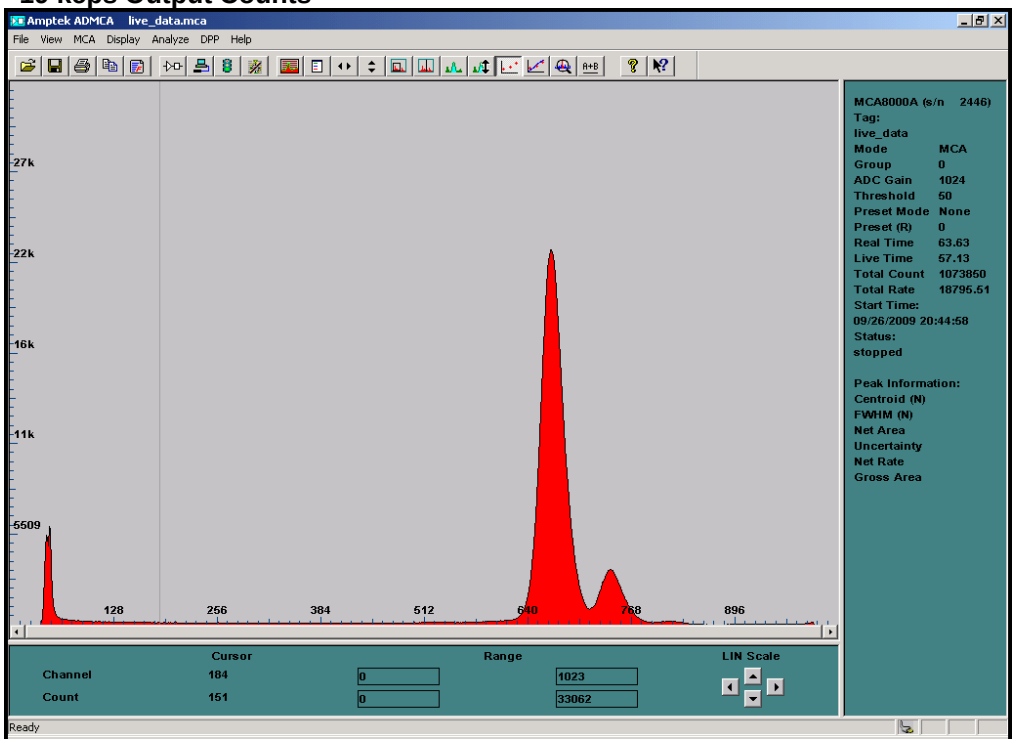


~150 kcps Output Counts

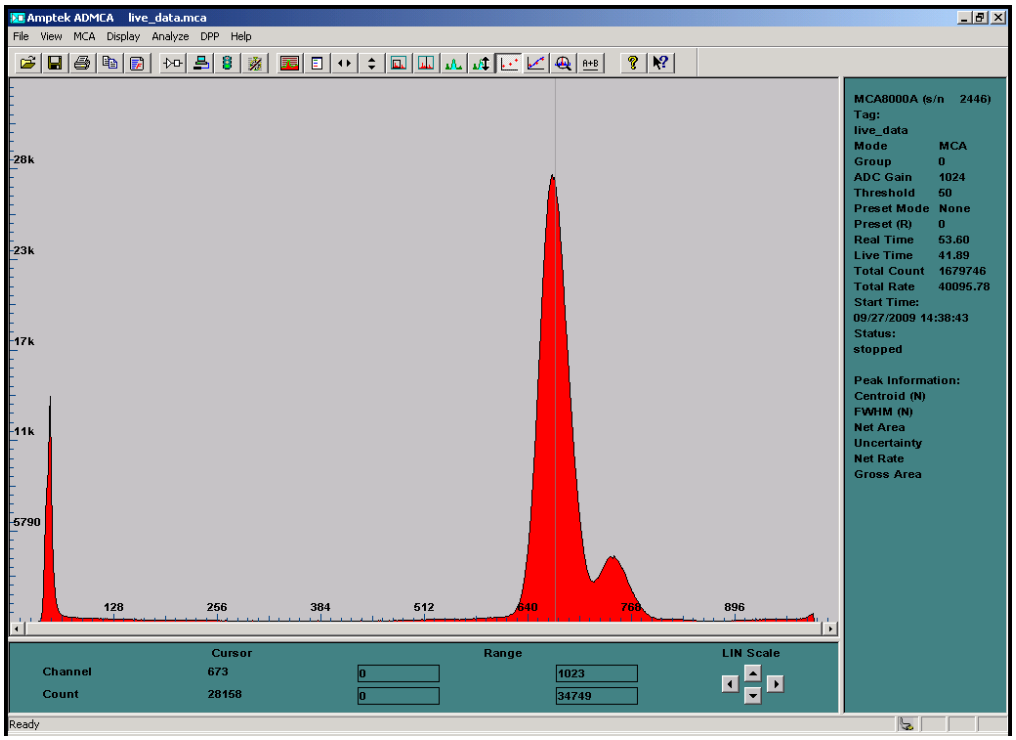


Detector Element= 3 Shaping Time = 2 μsec

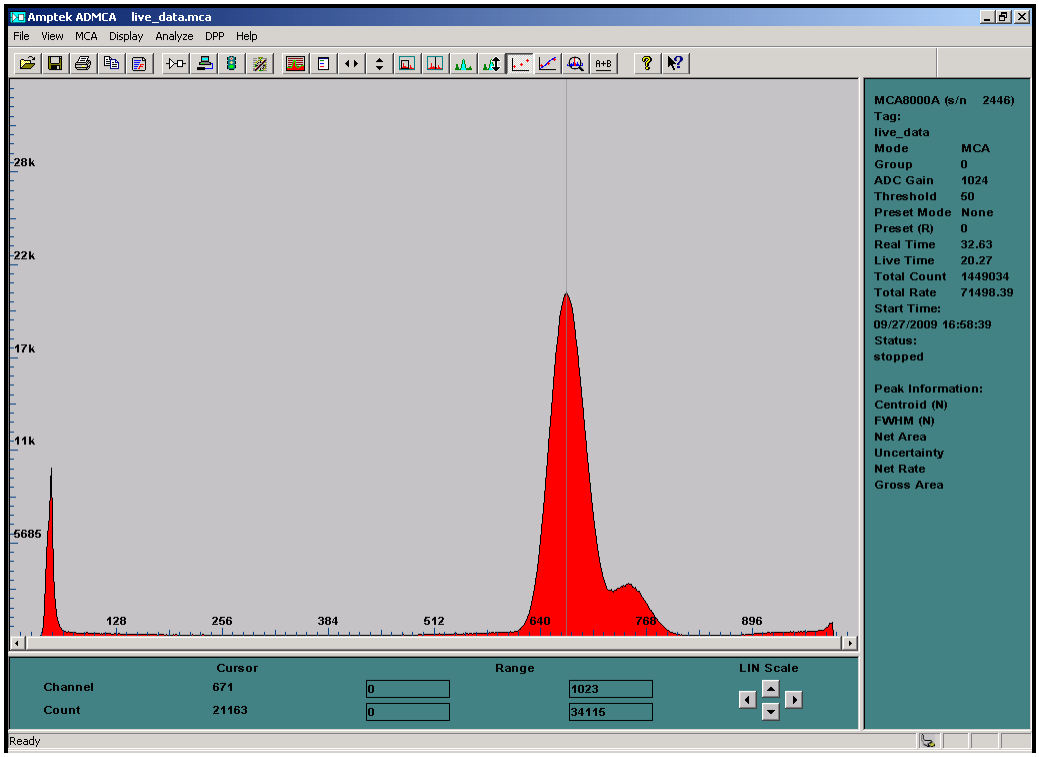
~19 kcps Output Counts



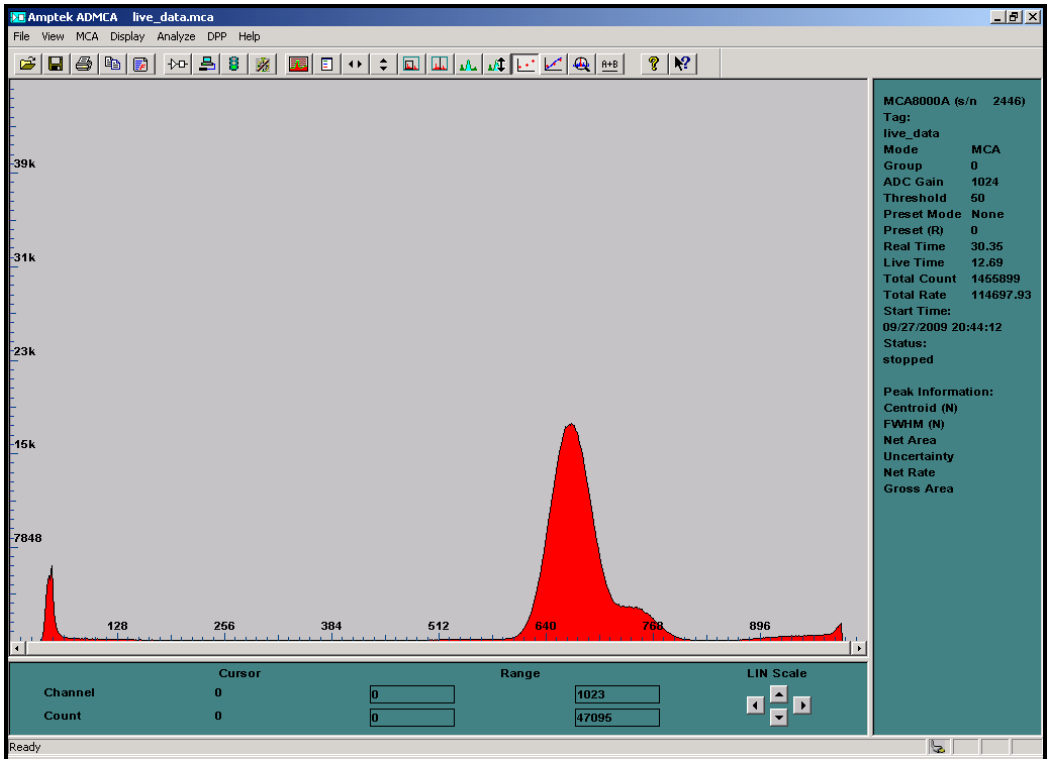
~40 kcps Output Counts



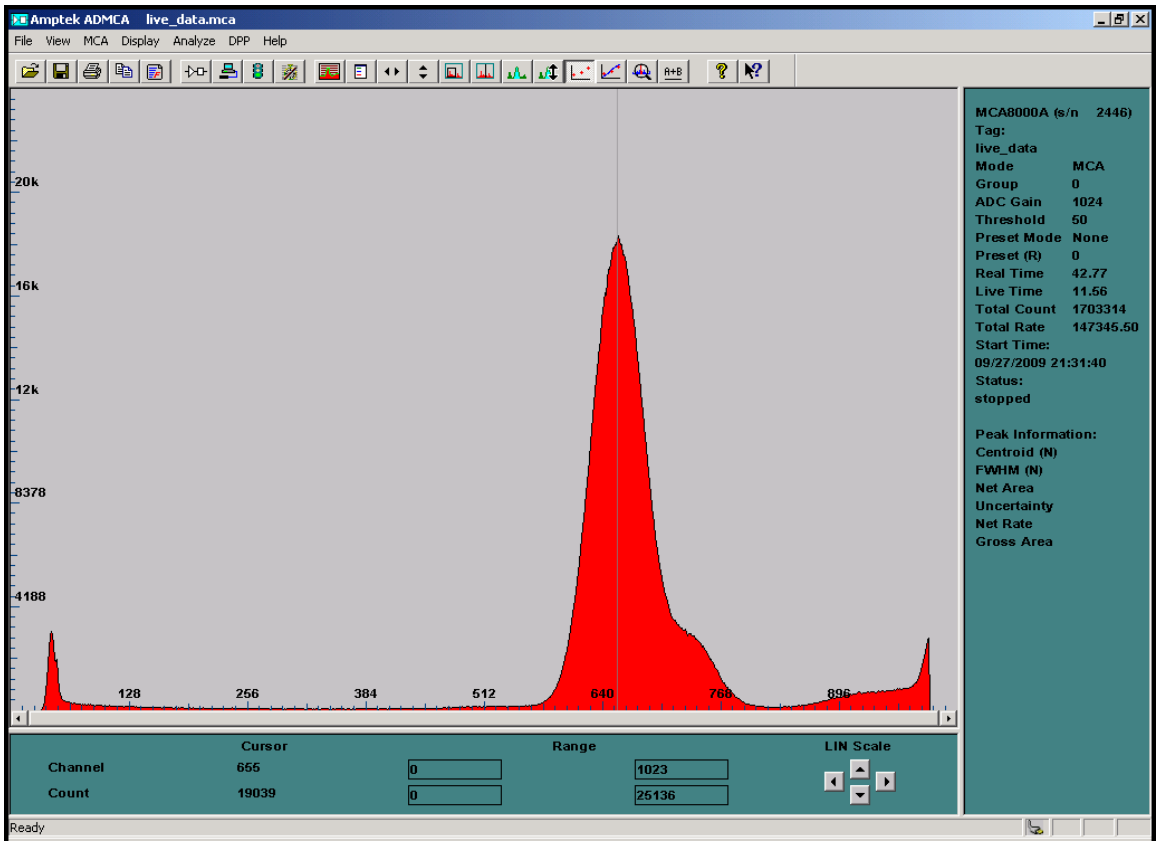
~71 kcps Output Counts



~114 kcps Output Counts

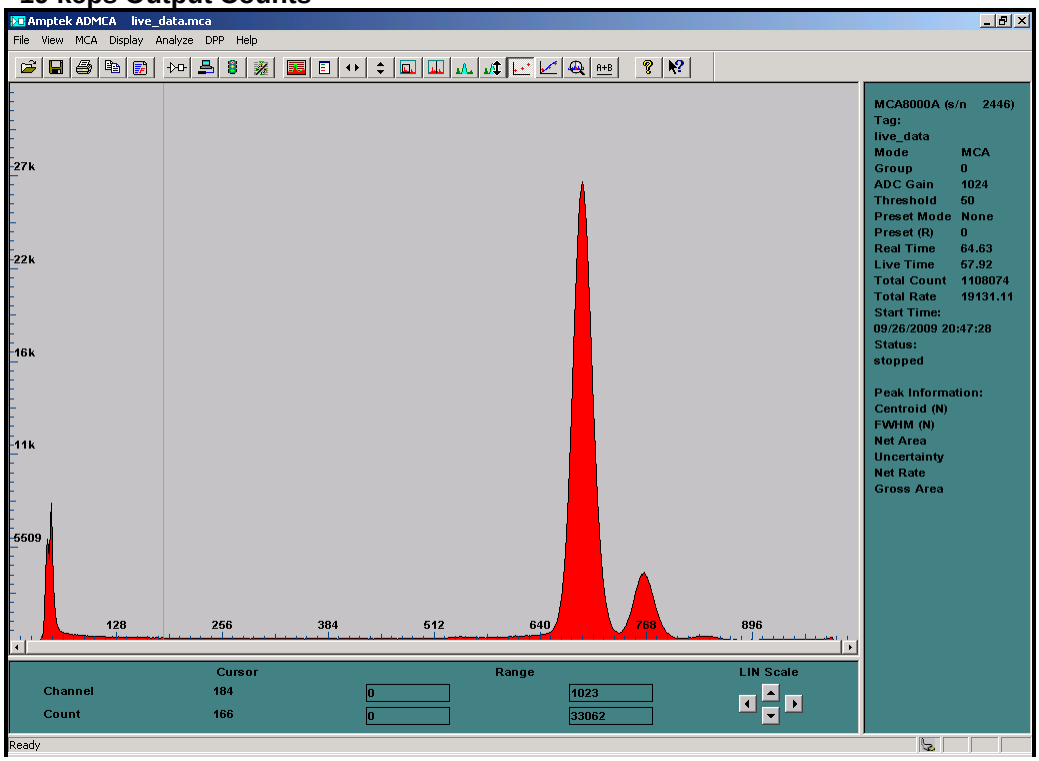


~147 kcps Output Counts

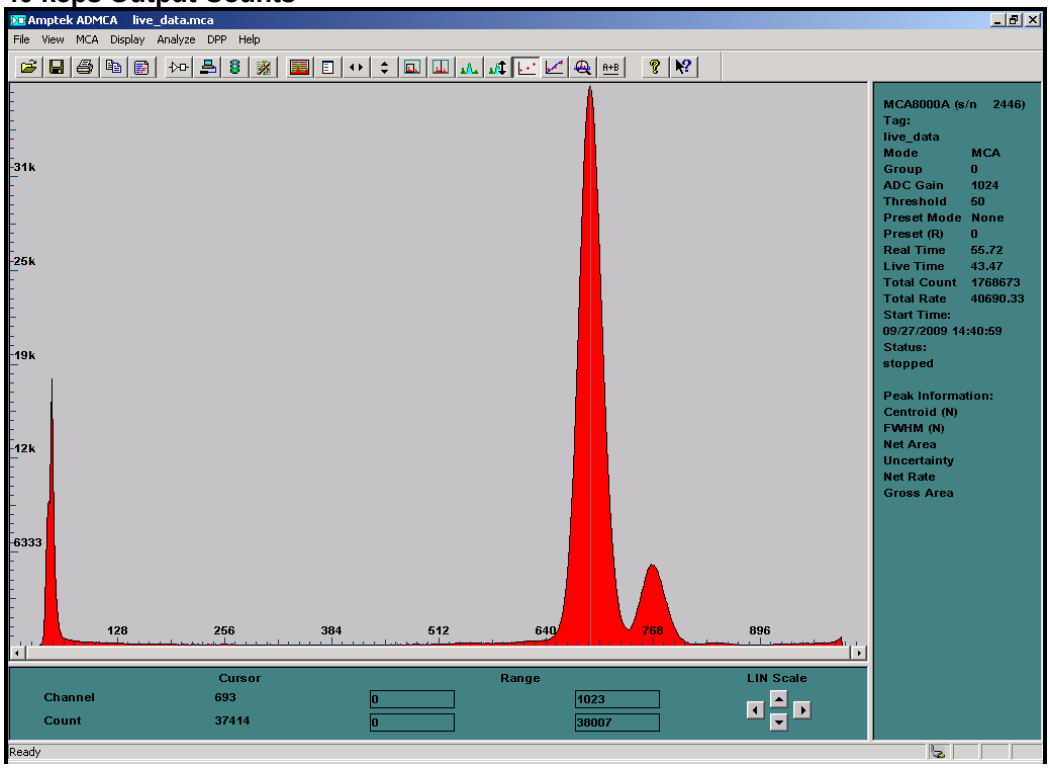


Detector Element=4 Shaping Time = 2 μsec

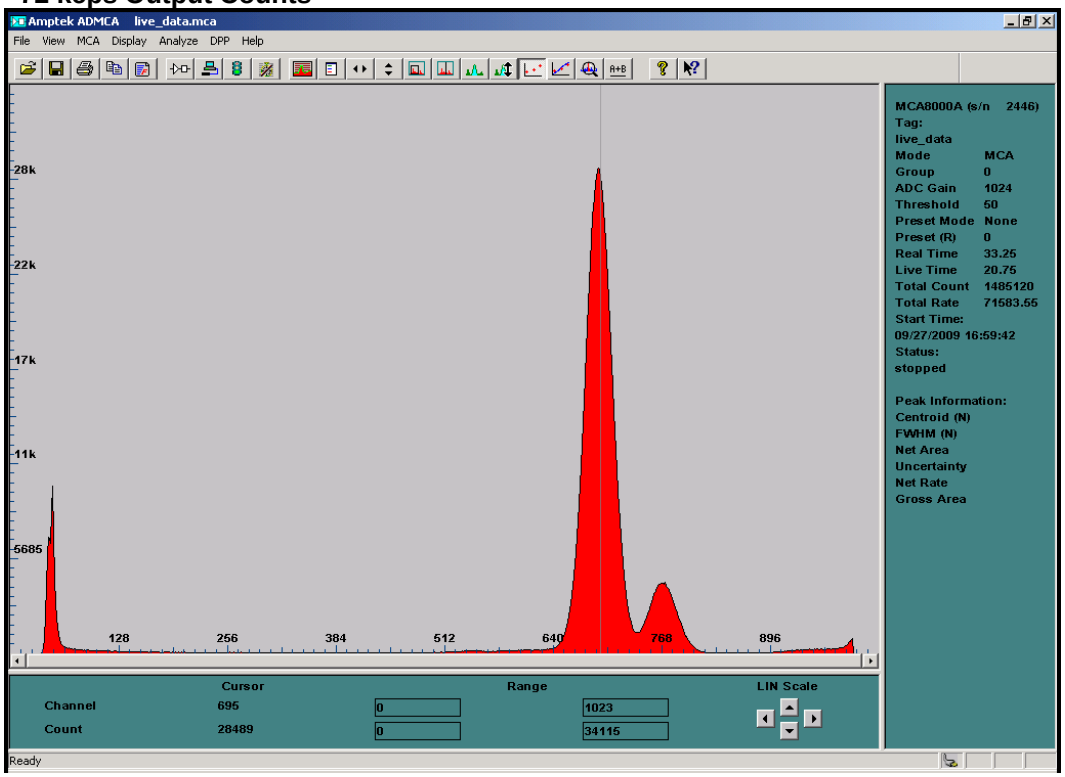
~19 kcps Output Counts



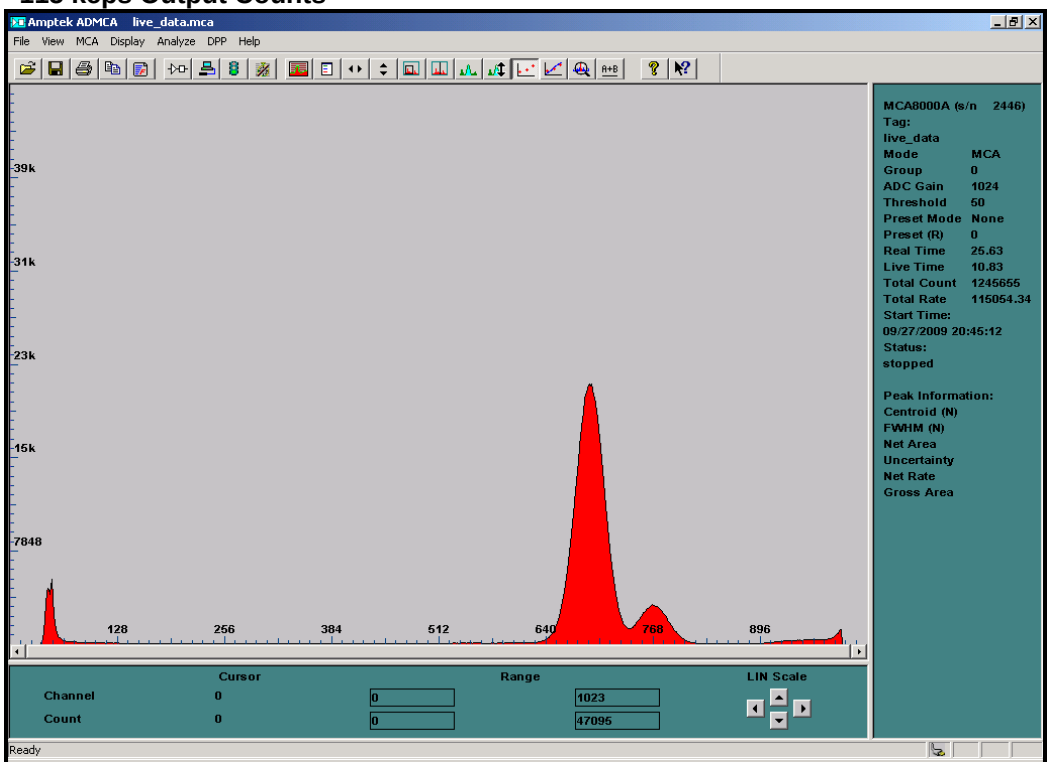
40 kcps Output Counts



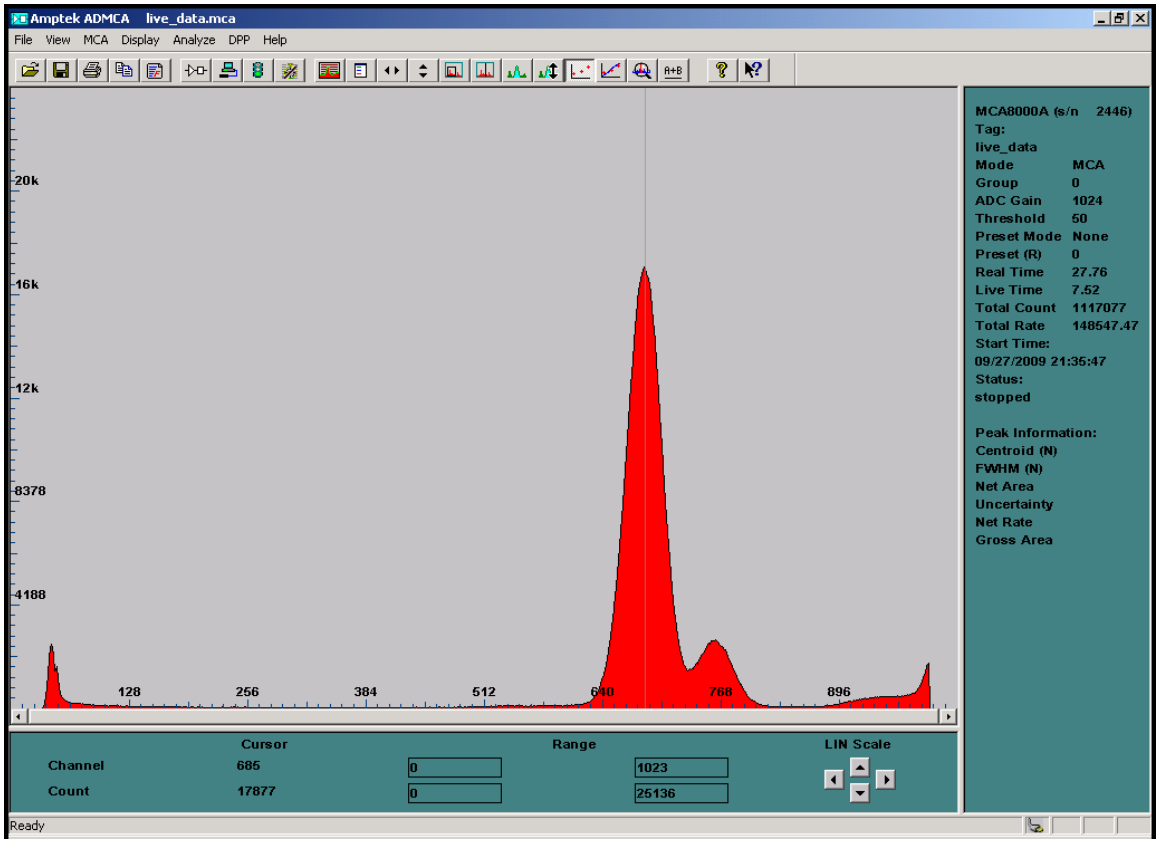
~72 kcps Output Counts



~115 kcps Output Counts

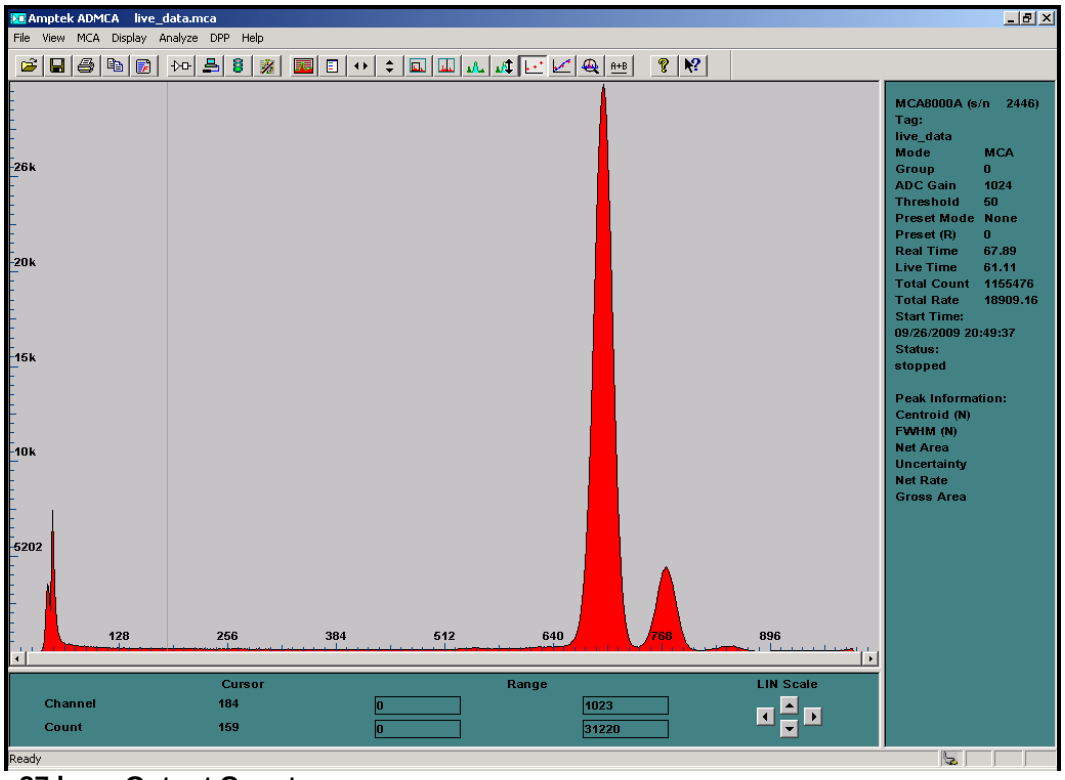


~148 kcps Output Counts

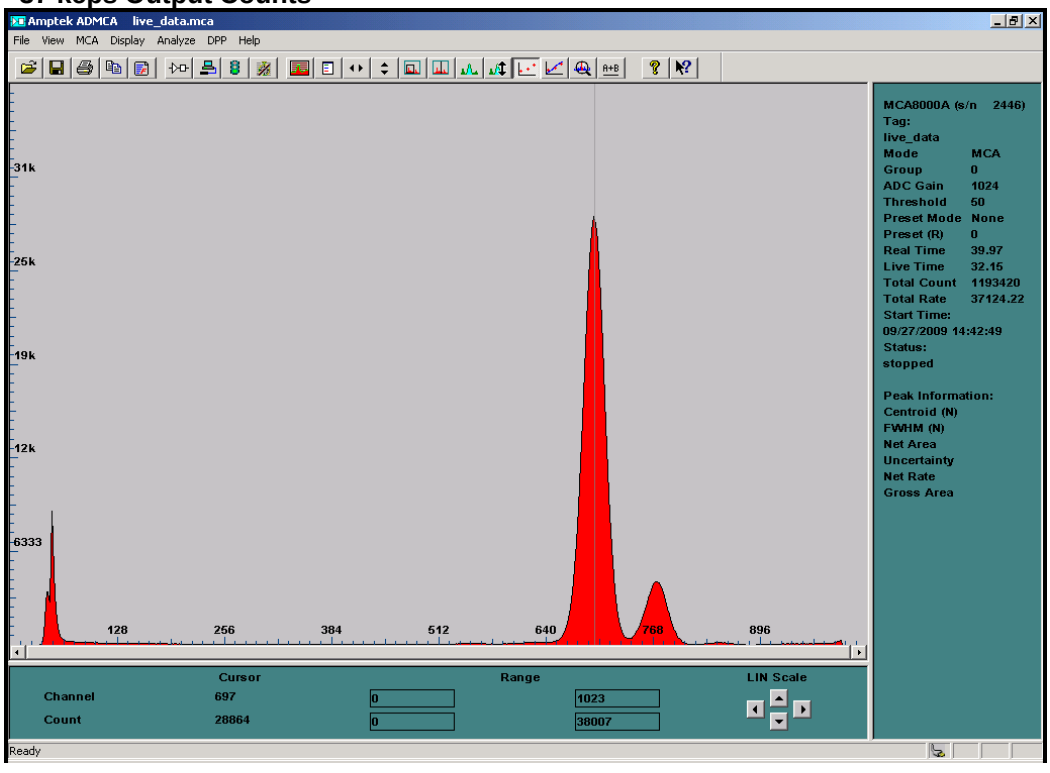


Detector Element=6 Shaping Time = 2 μsec

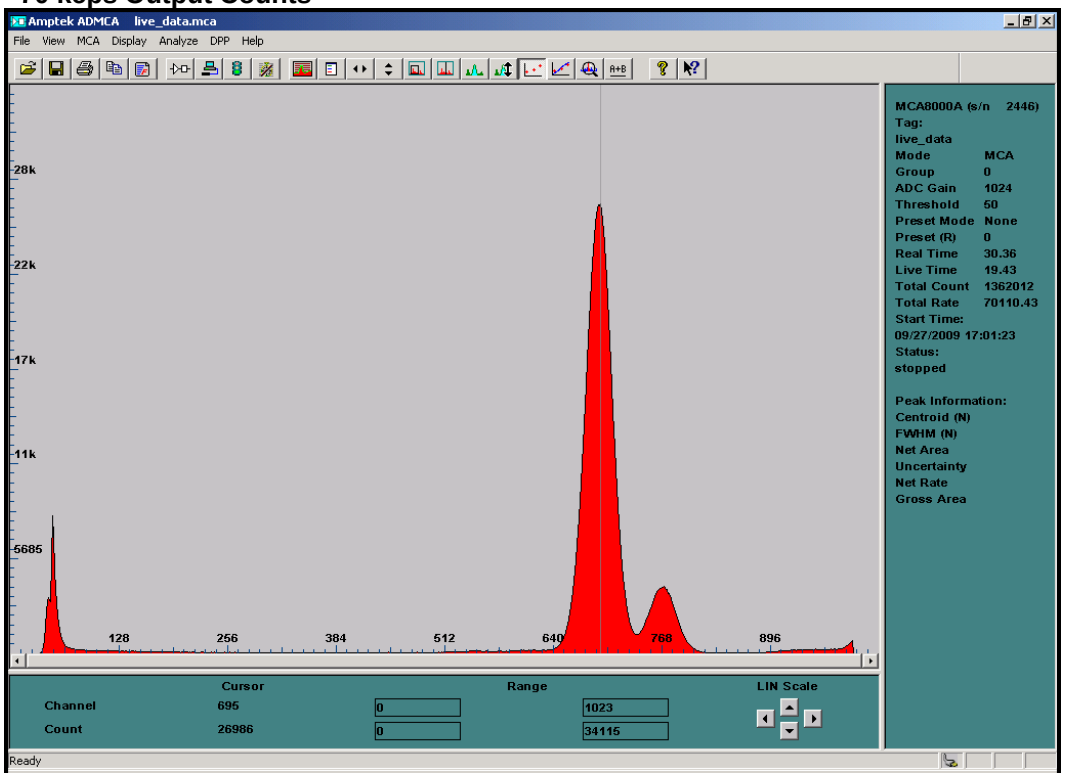
~19 kcps Output Counts



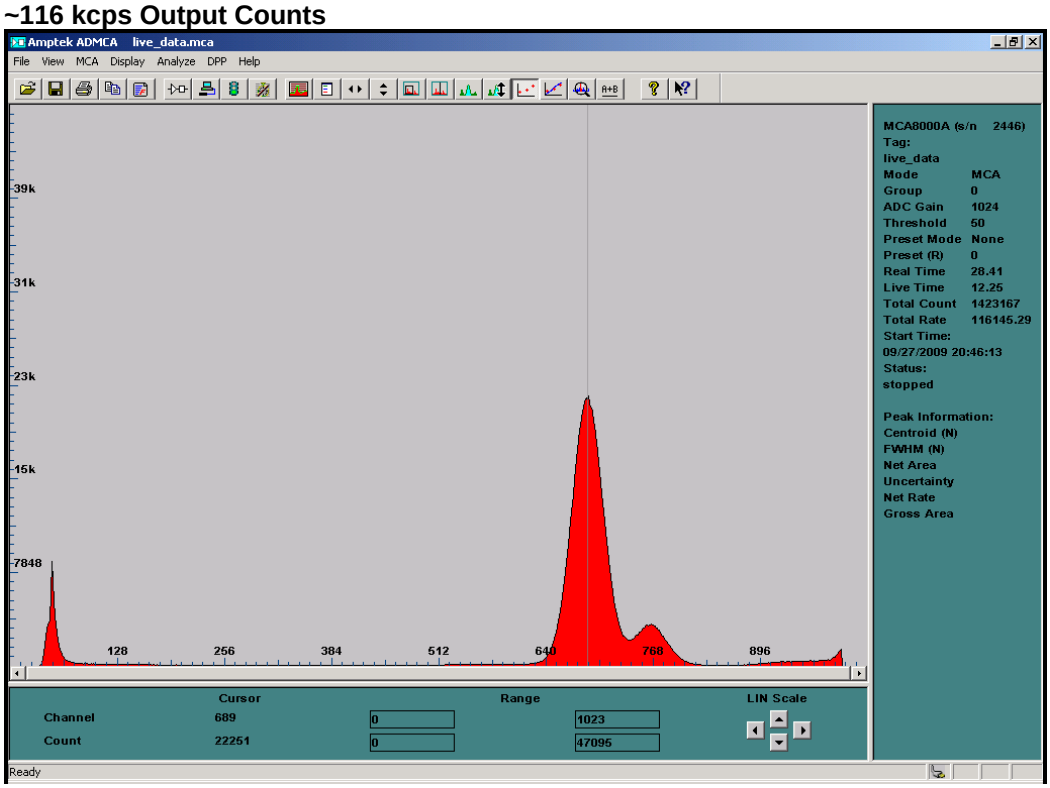
~37 kcps Output Counts



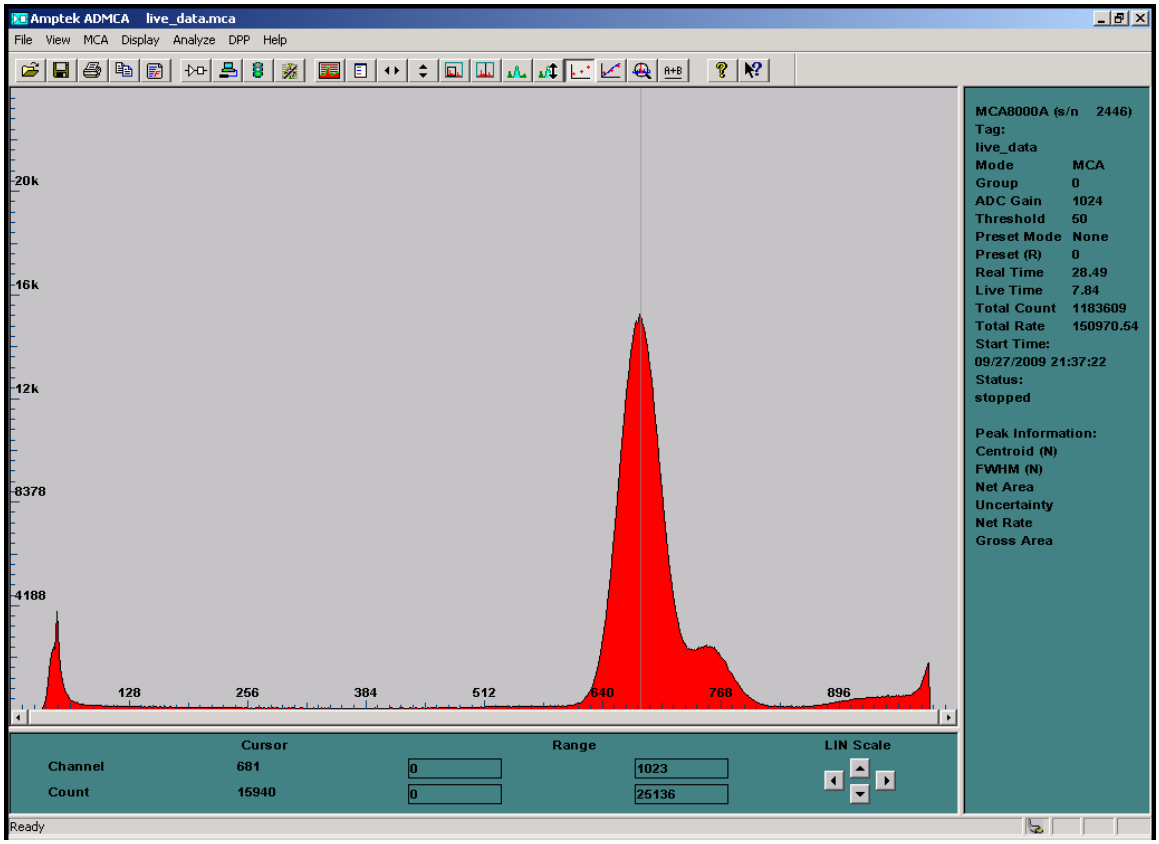
~70 kcps Output Counts



~116 kcps Output Counts

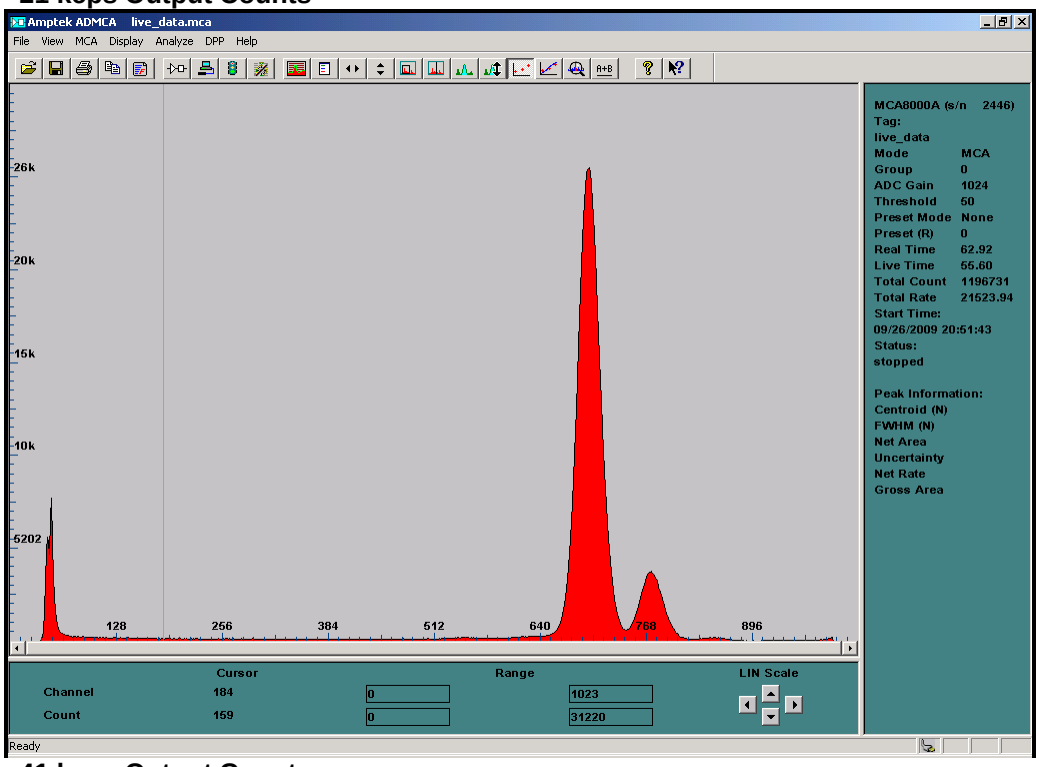


~151 kcps Output Counts

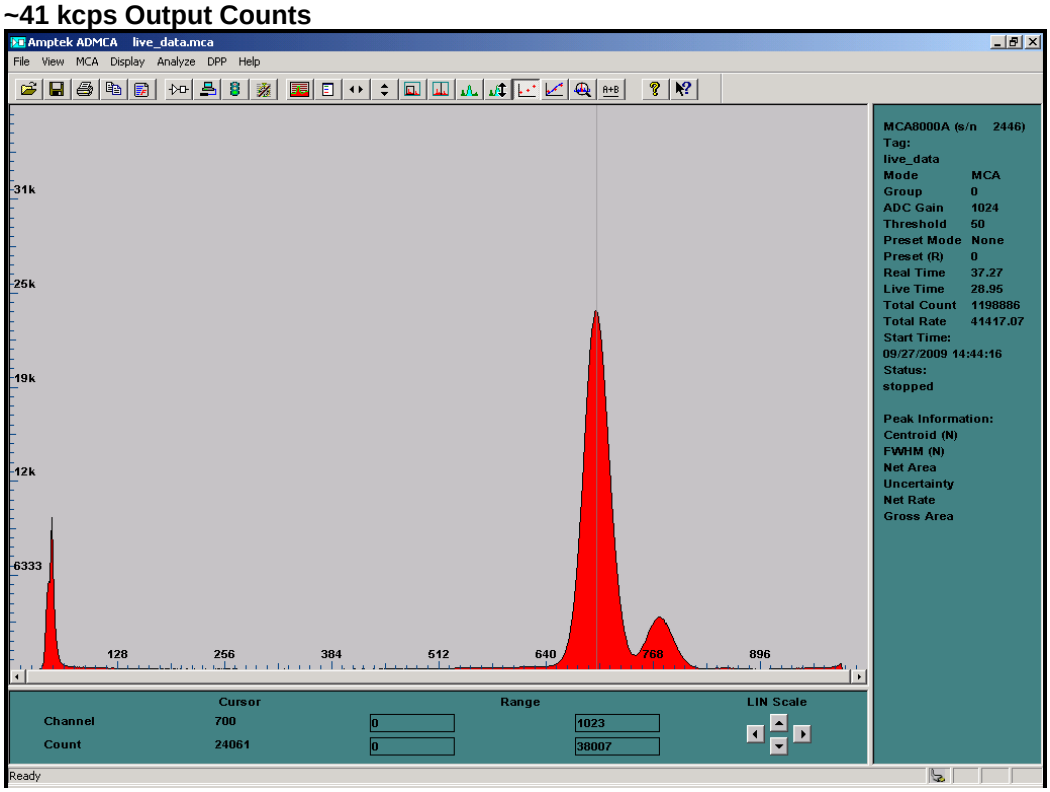

Amptek ADMCA live_data.mca
File View MCA Display Analyze DPP Help
20k
16k
12k
8378
4188
128
256
384
512
640
768
896
MCA8000A (s/n 2446)
Tag:
live_data
Mode MCA
Group 0
ADC Gain 1024
Threshold 50
Preset Mode None
Preset (R) 0
Real Time 28.49
Live Time 7.84
Total Count 1183609
Total Rate 150970.54
Start Time:
09/27/2009 21:37:22
Status:
stopped
Peak Information:
Centroid (N)
FWHM (N)
Net Area
Uncertainty
Net Rate
Gross Area
Cursor
Range
LIN Scale
Channel 681 0 1023
Count 15940 0 25136
Ready

Detector Element=41 Shaping Time = 2 μsec

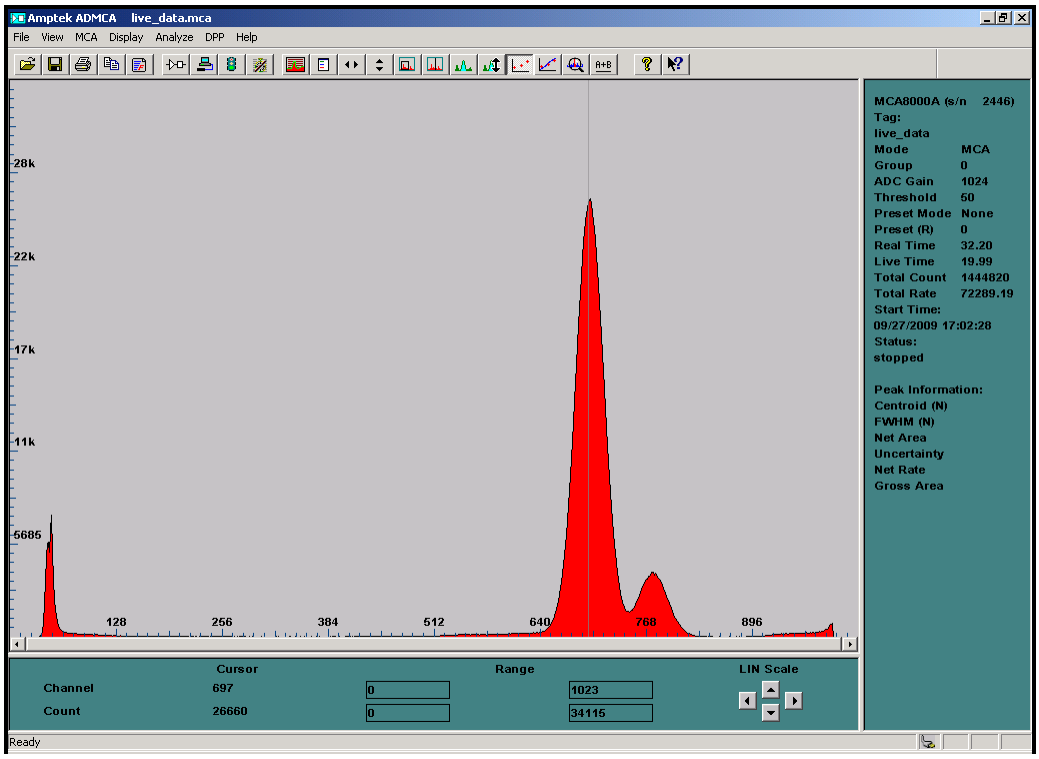
~21 kcps Output Counts



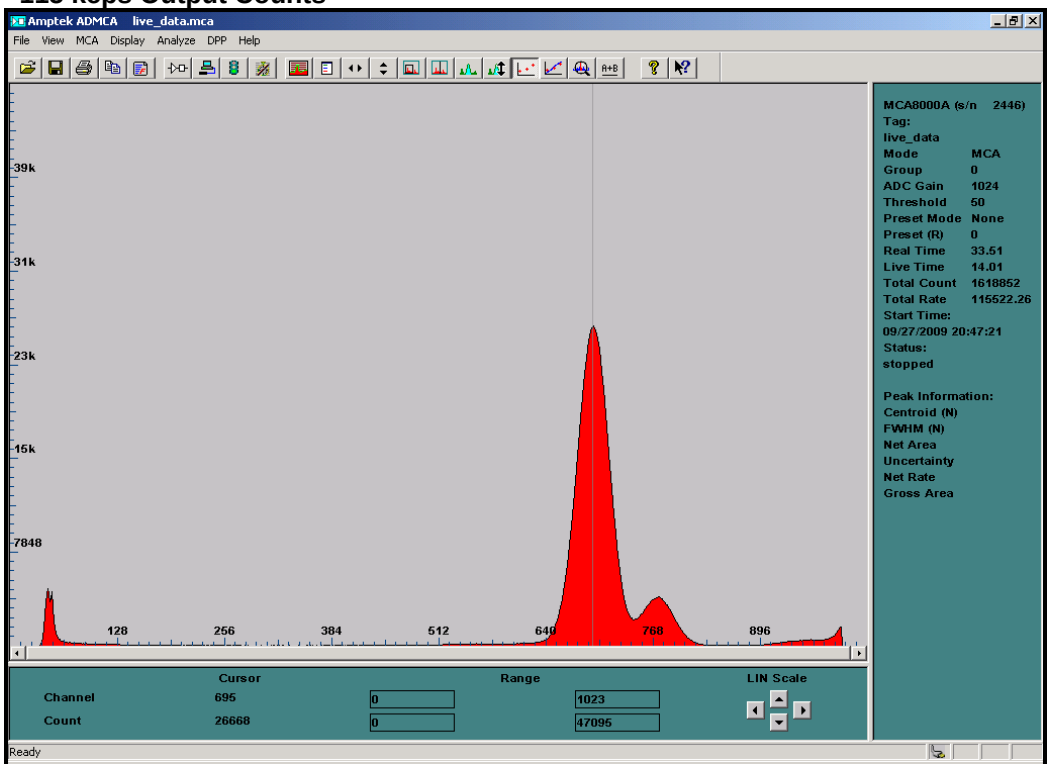
~41 kcps Output Counts



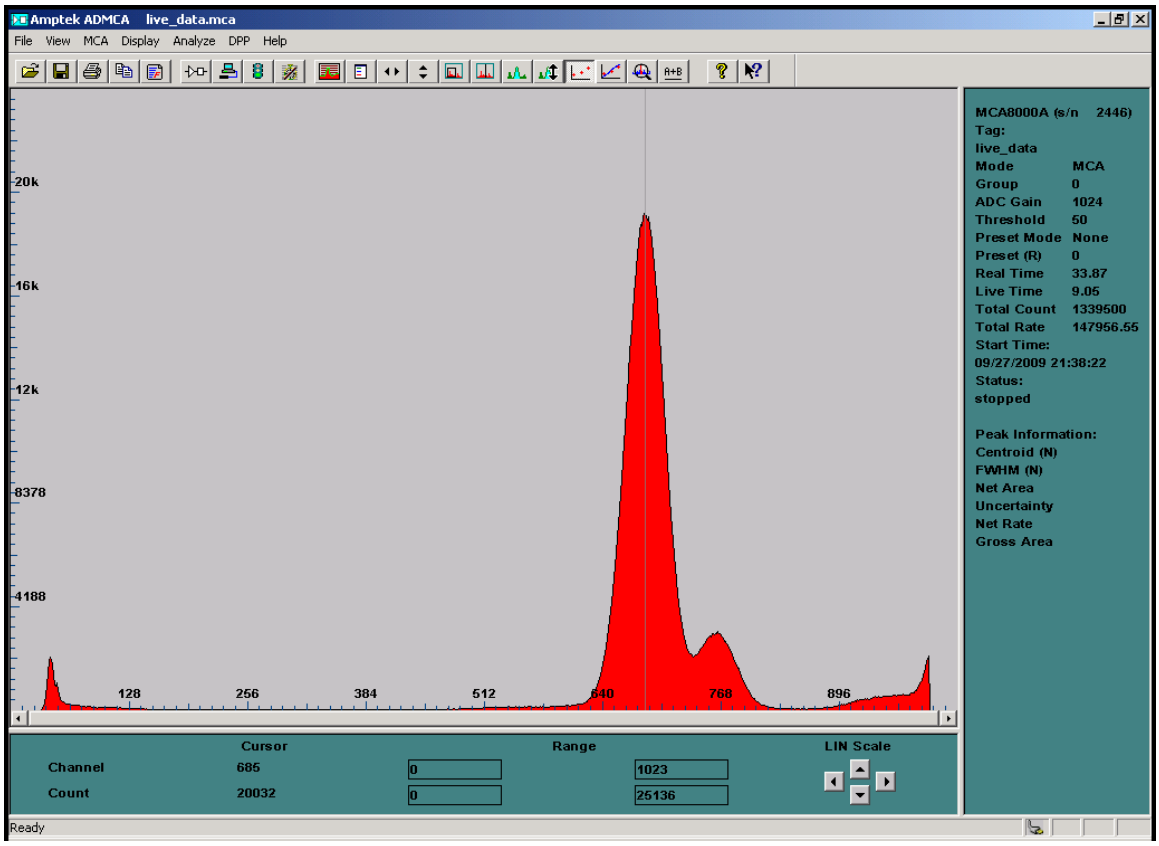
~72 kcps Output Counts



~115 kcps Output Counts

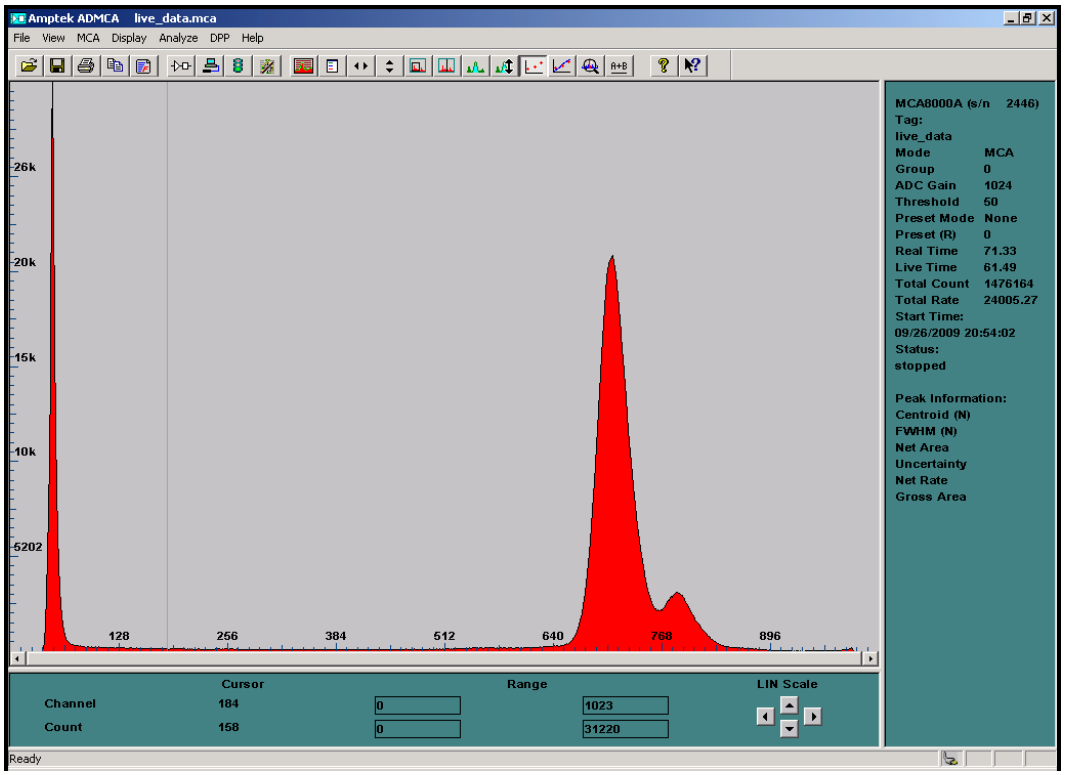


~148 kcps Output Counts

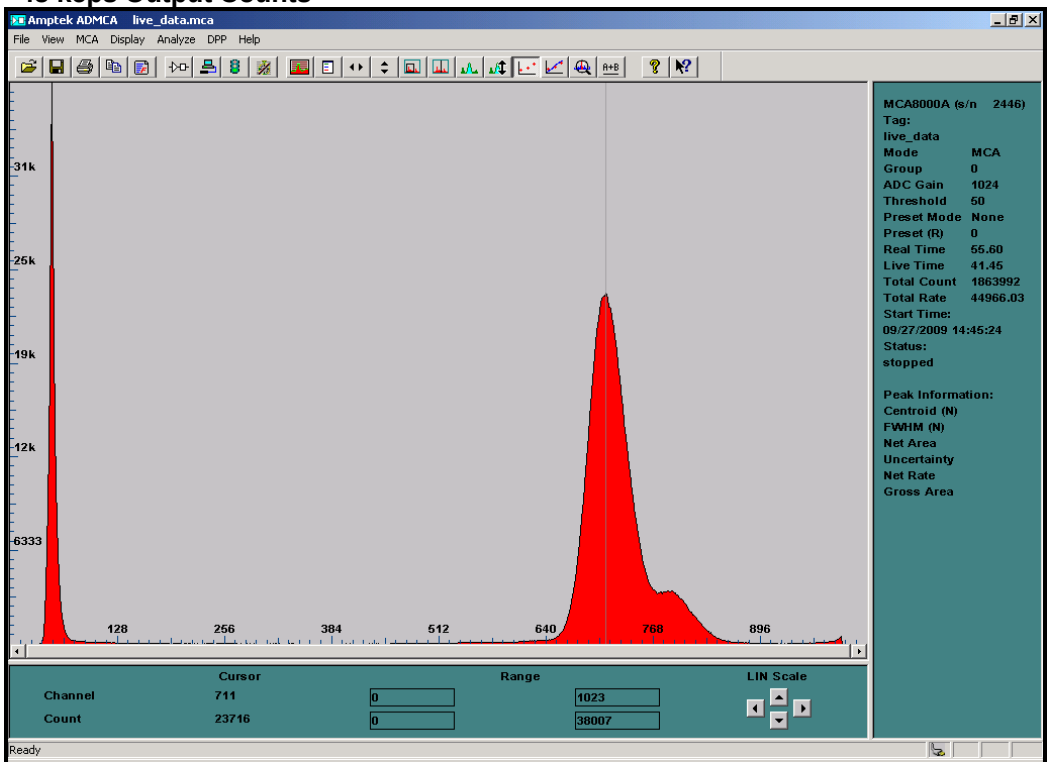


Detector Element=43 Shaping Time = 2 μsec

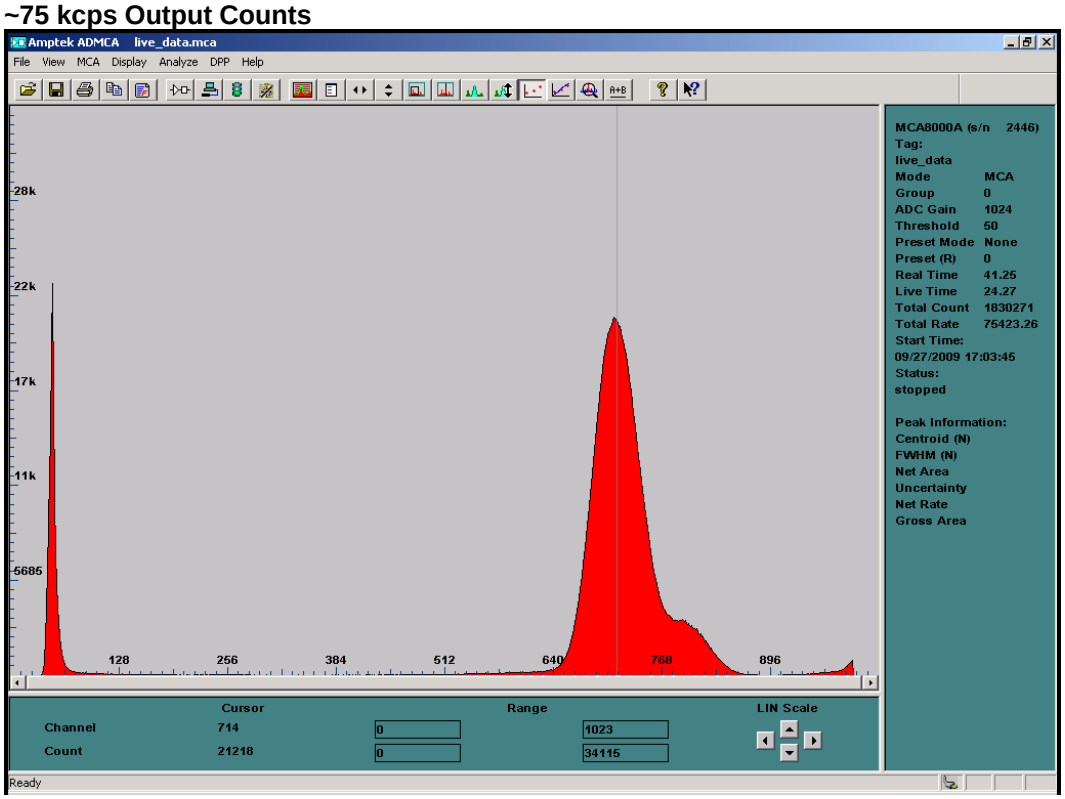
~24 kcps Output Counts



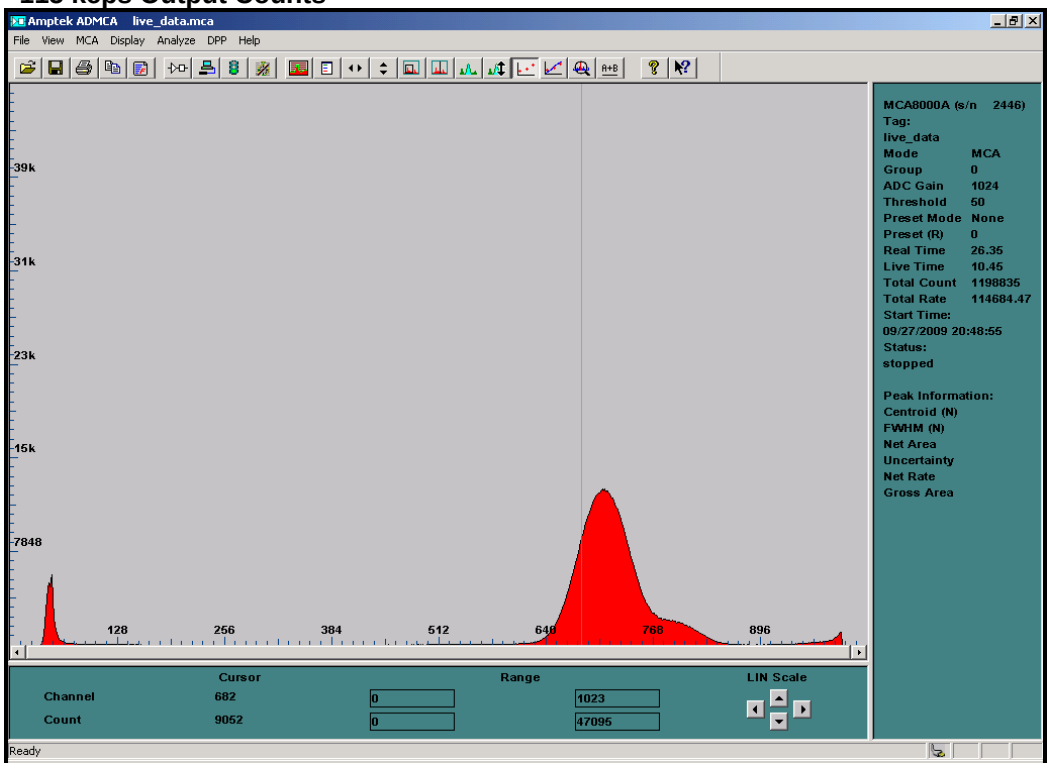
~45 kcps Output Counts



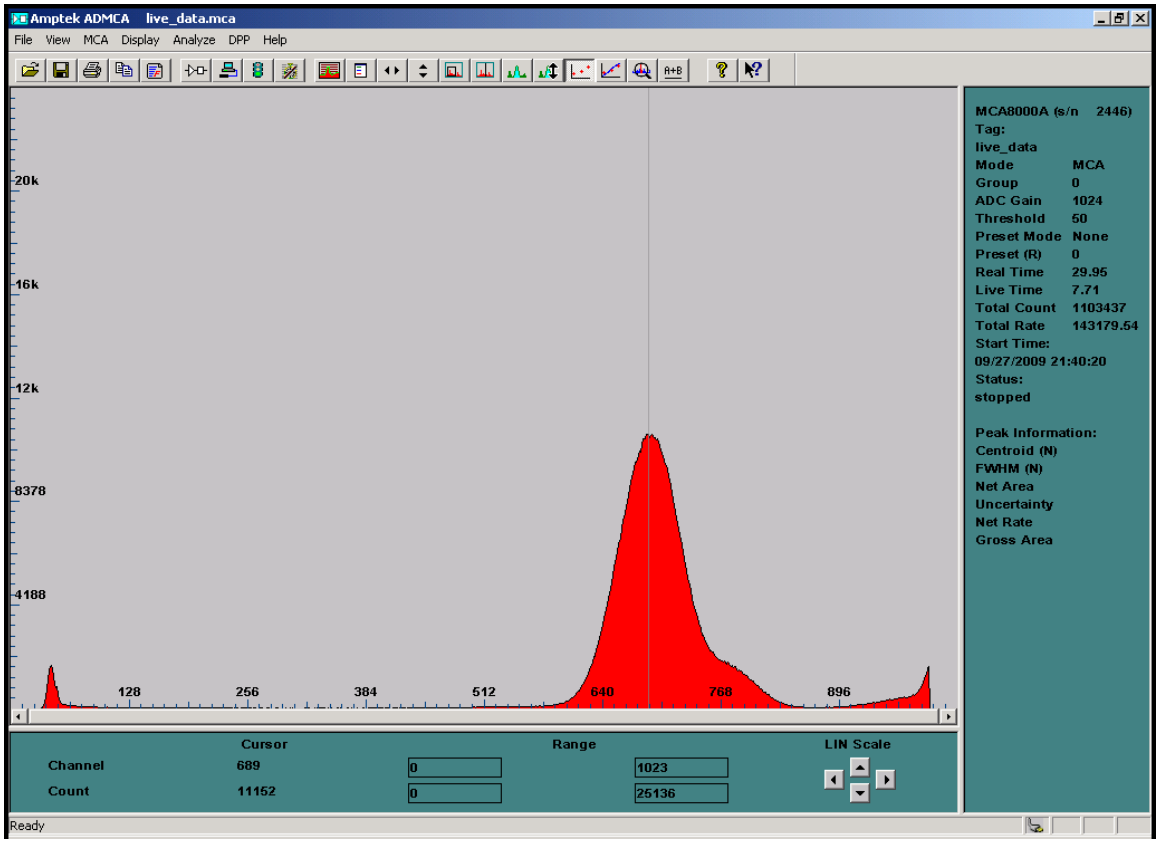
~75 kcps Output Counts



~115 kcps Output Counts

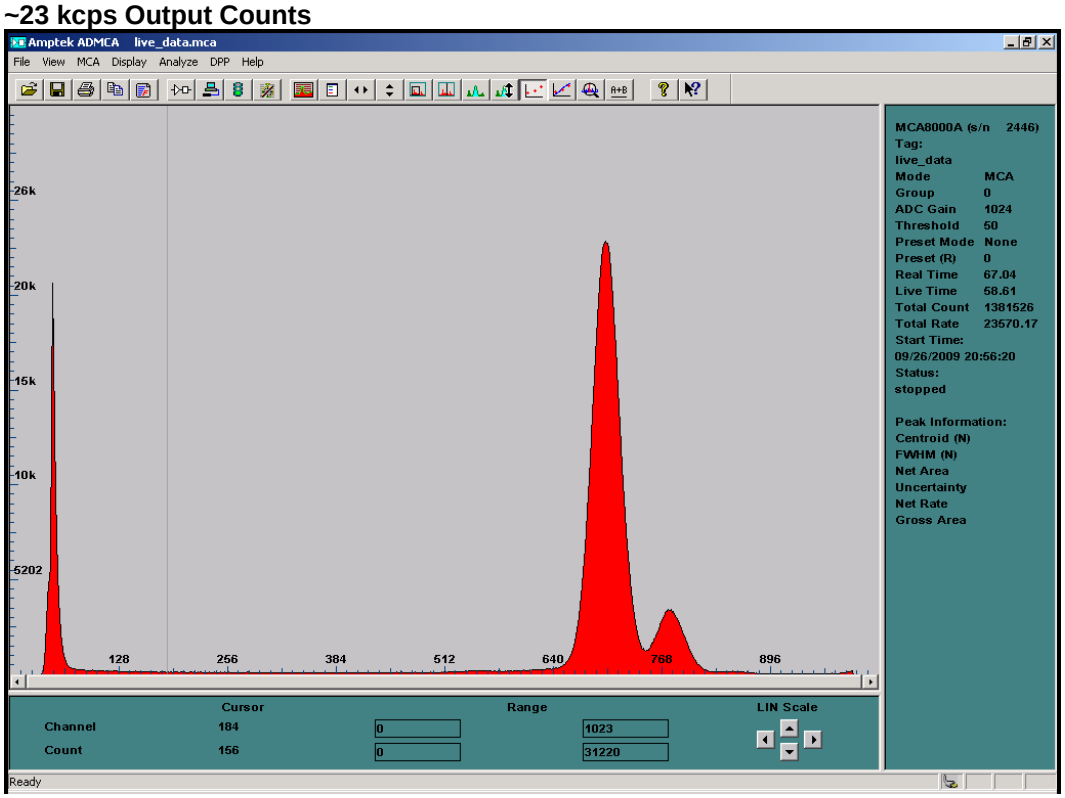


~143 kcps Output Counts

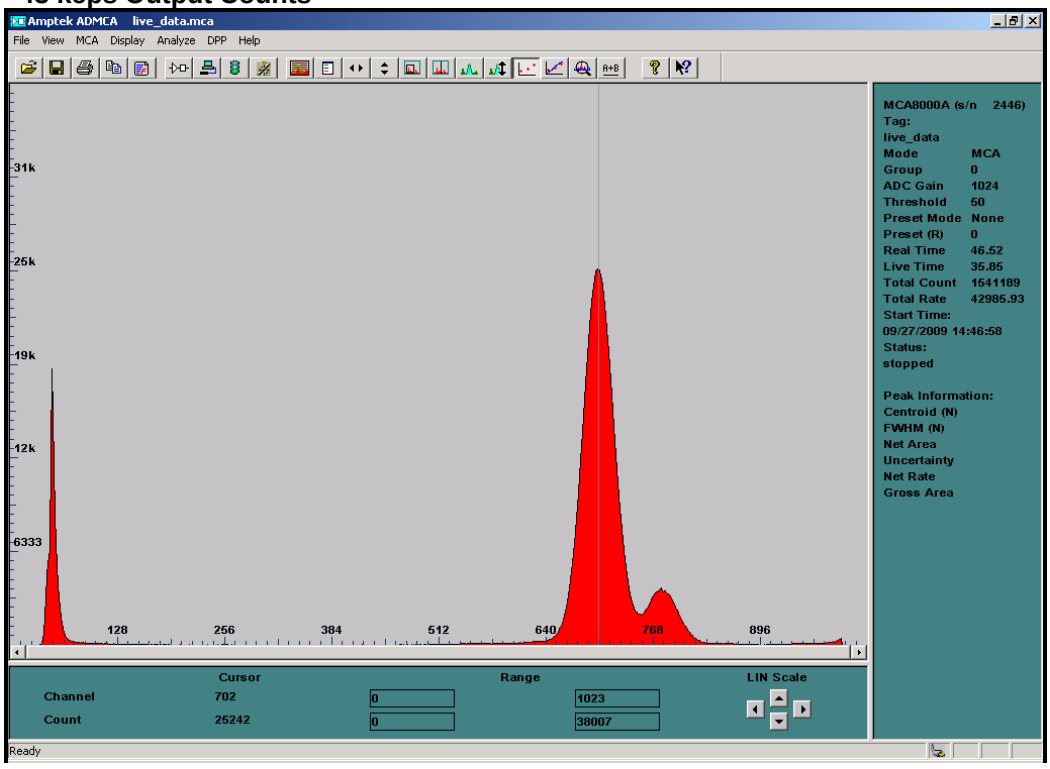


Detector Element=53 Shaping Time = 2 μsec

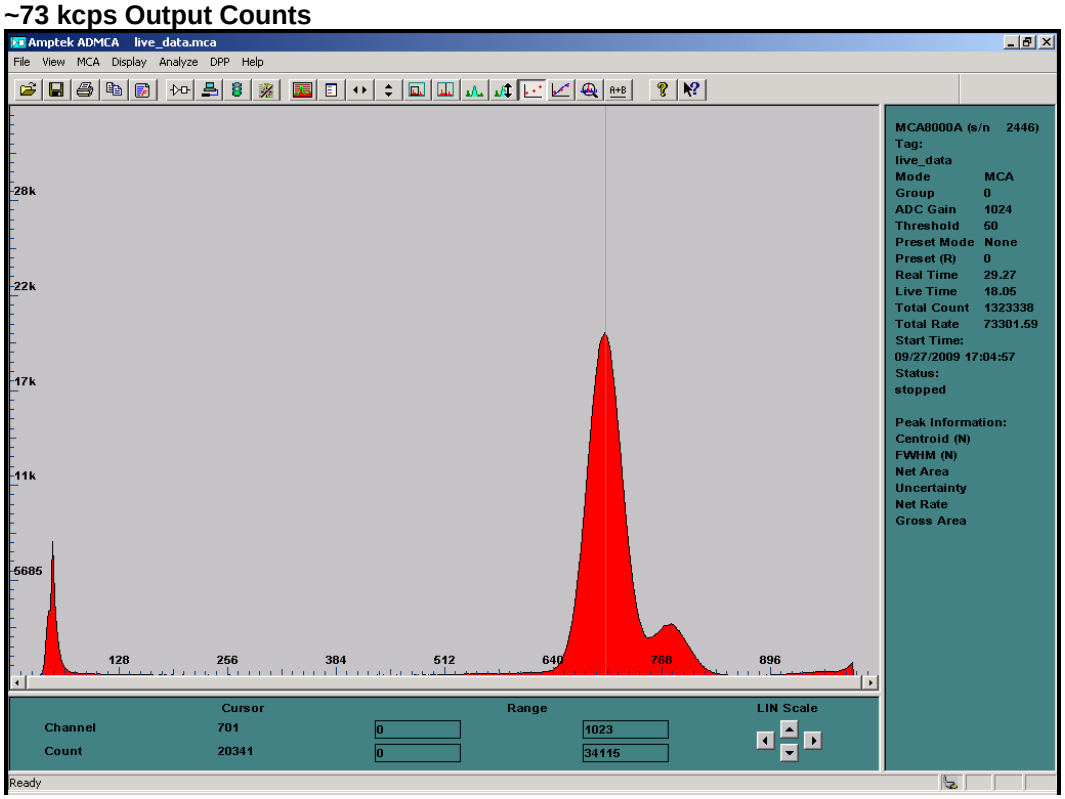
~23 kcps Output Counts



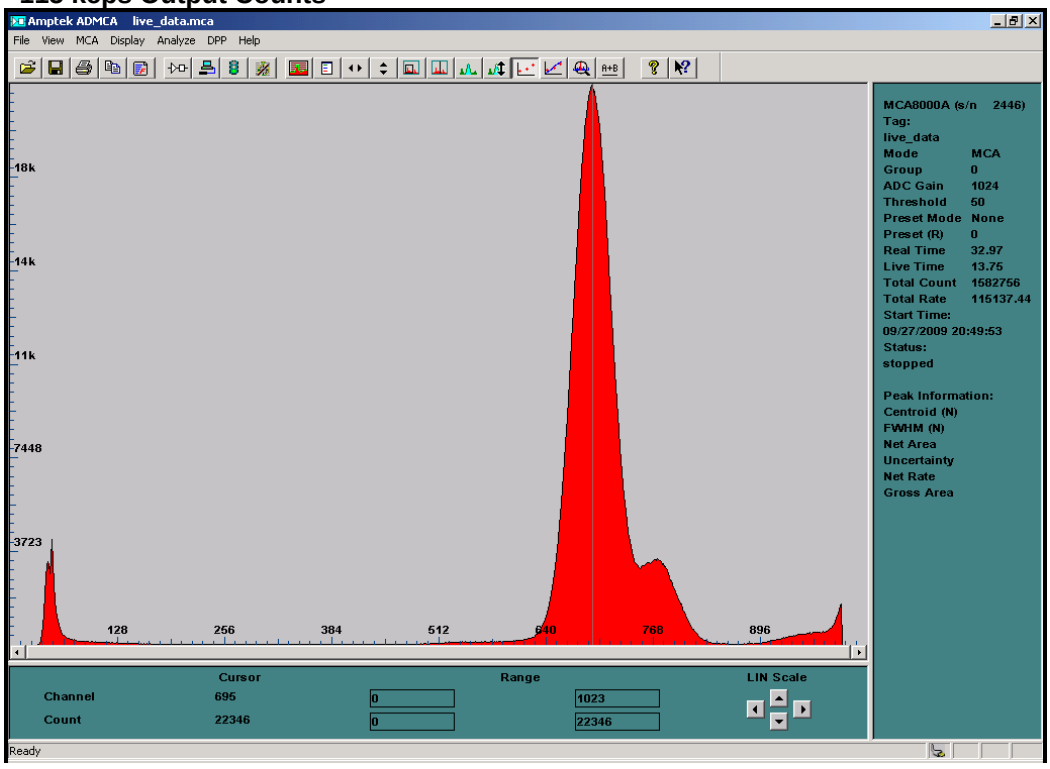
~43 kcps Output Counts



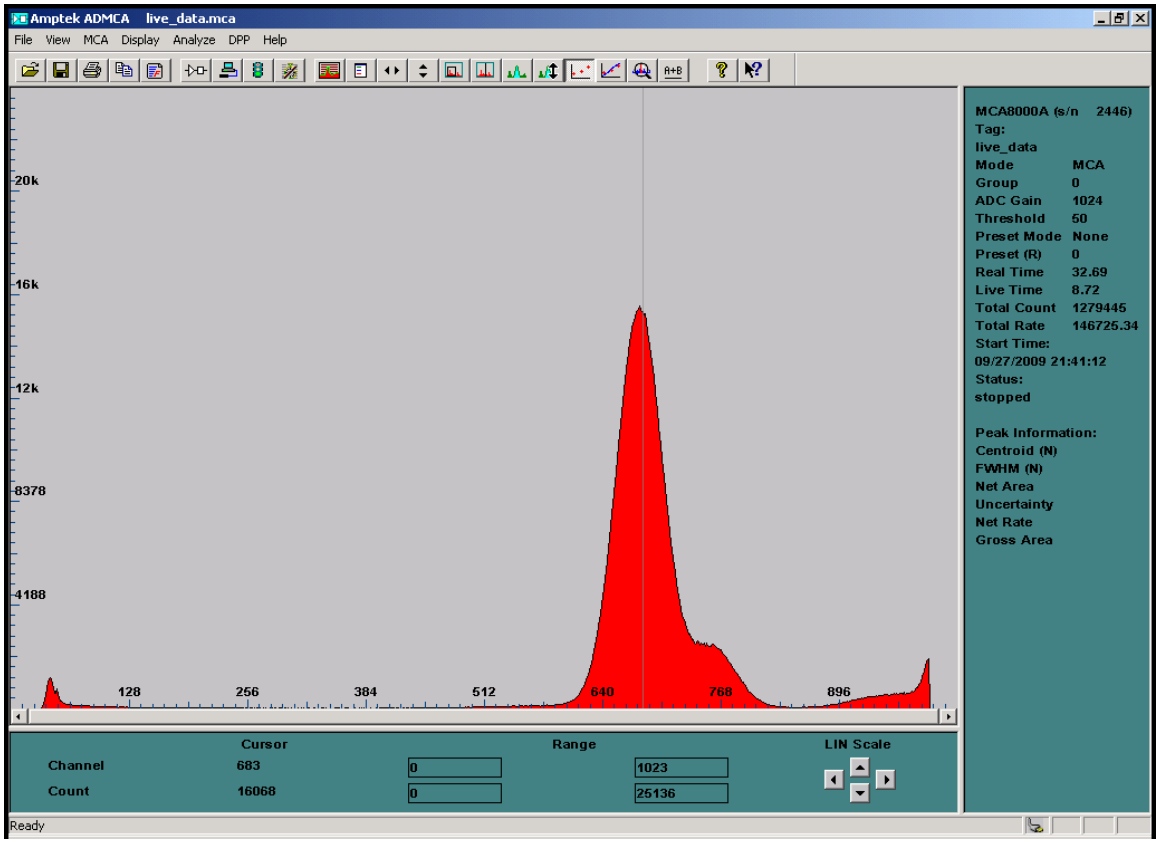
~73 kcps Output Counts



~115 kcps Output Counts

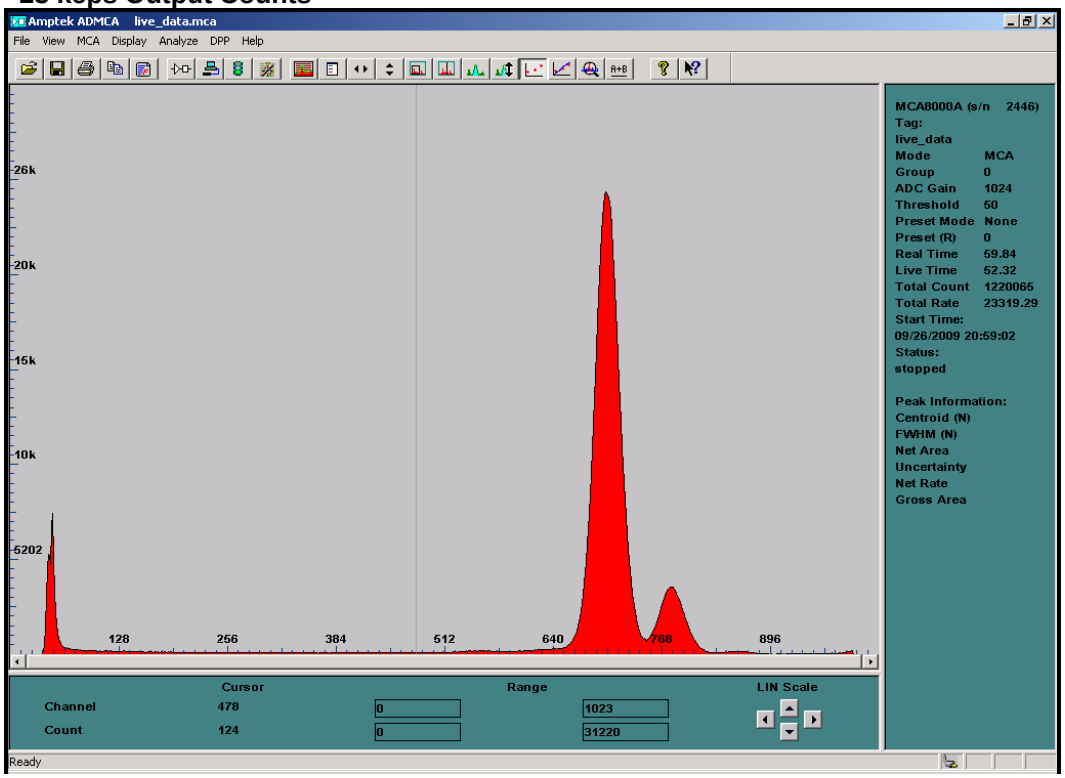


~146 kcps Output Counts

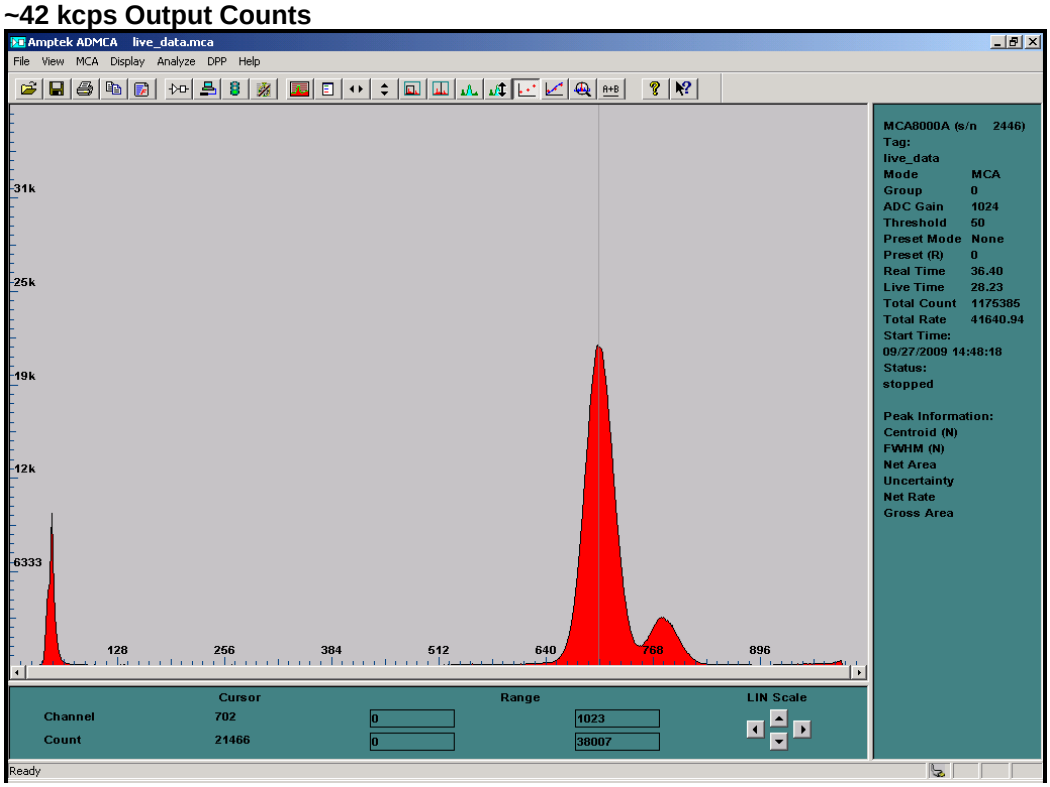


Detector Element=77 Shaping Time = 2 μsec

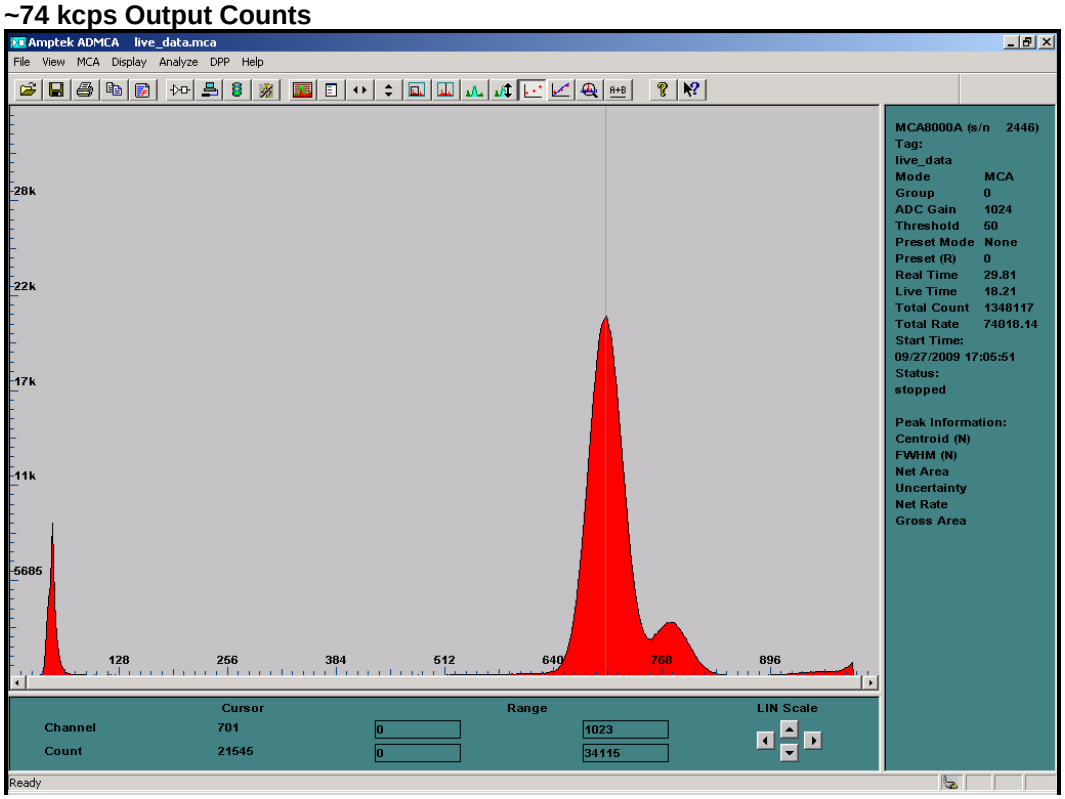
~23 kcps Output Counts



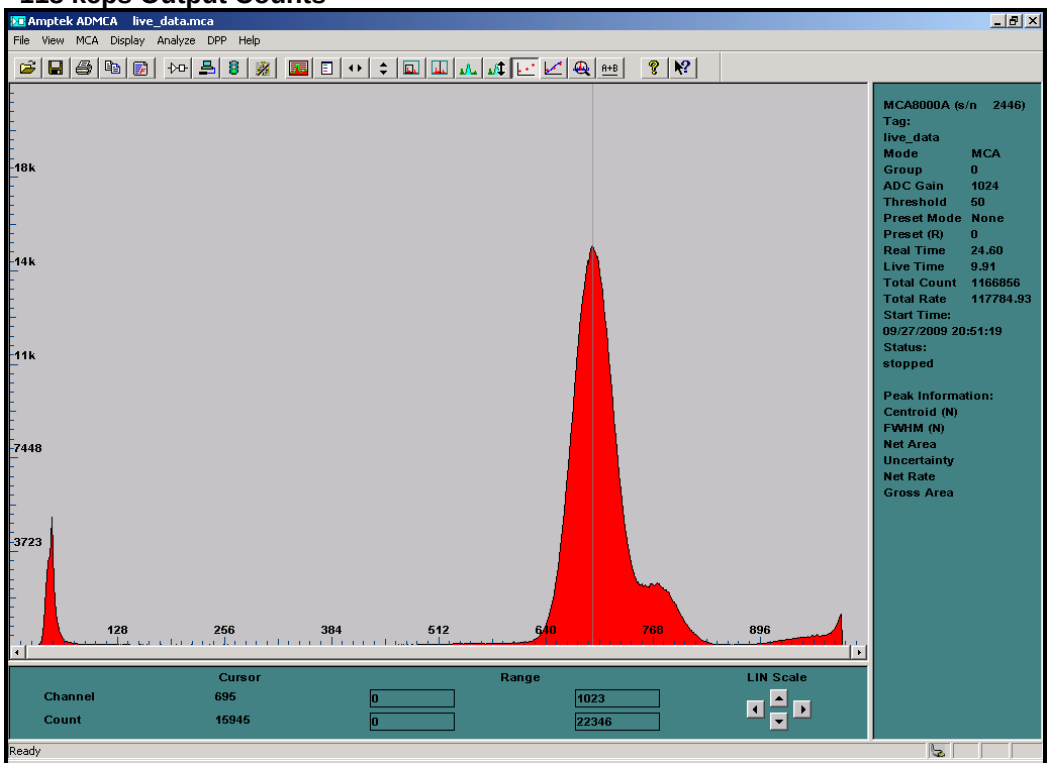
~42 kcps Output Counts



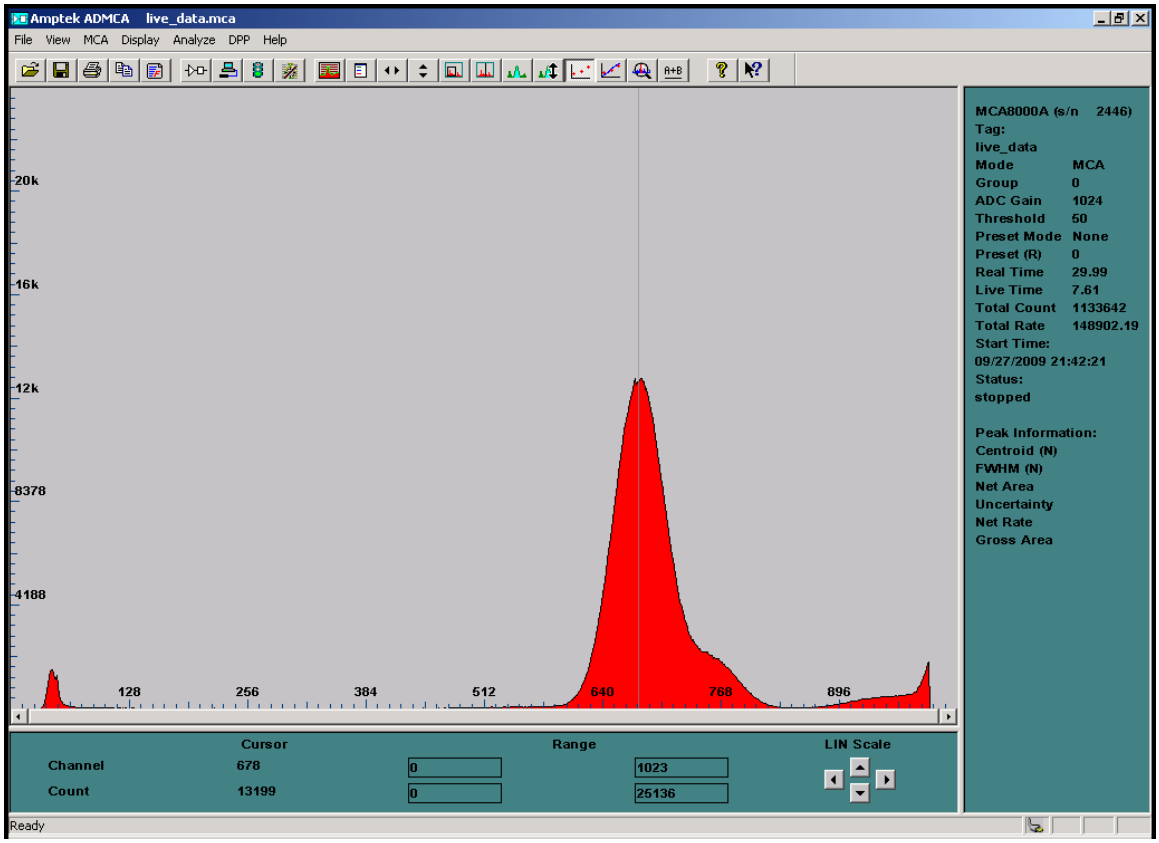
~74 kcps Output Counts



~118 kcps Output Counts

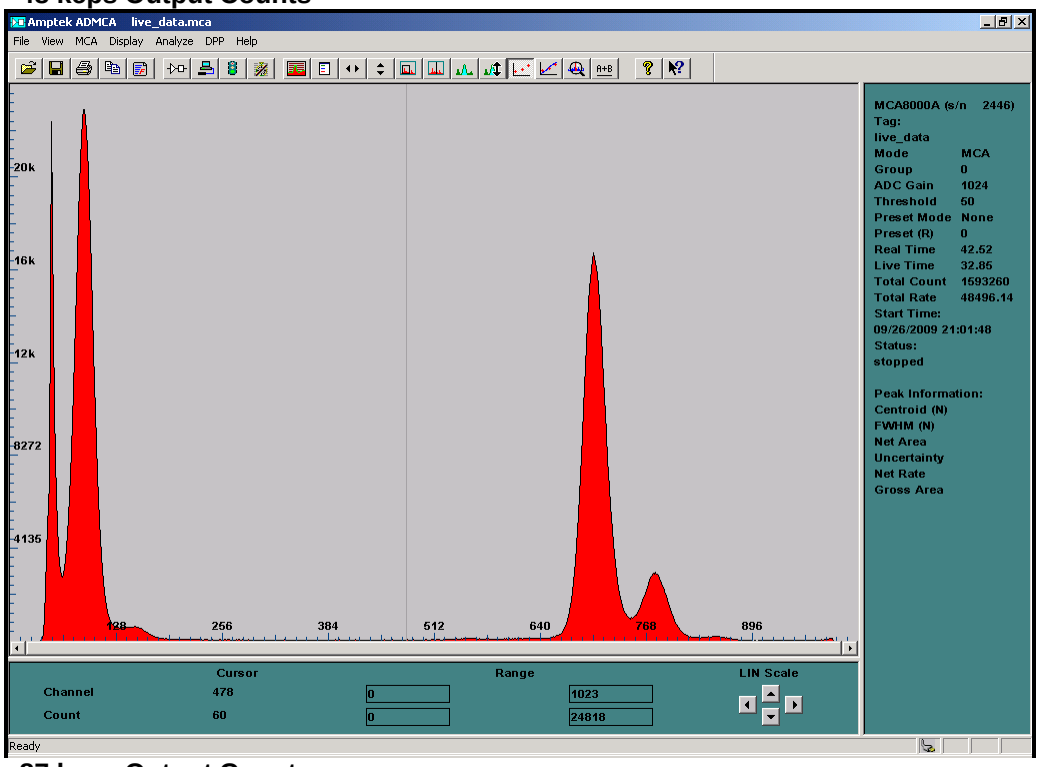


~148 kcps Output Counts

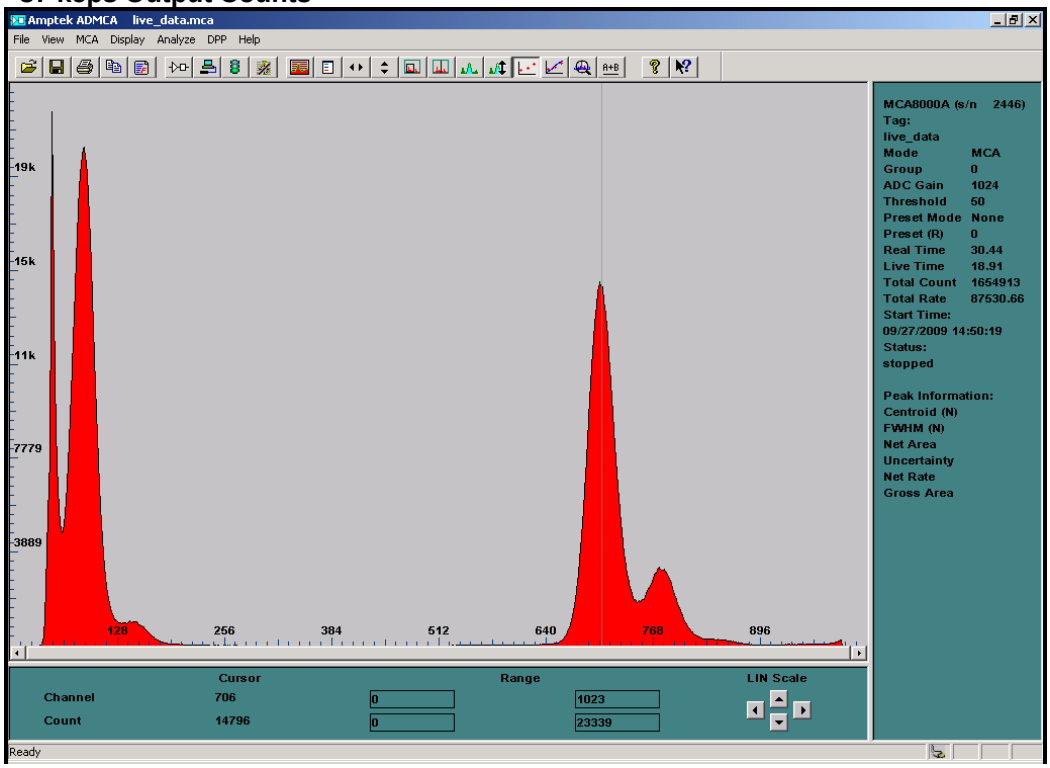


Detector Element=94 Shaping Time = 2 μsec

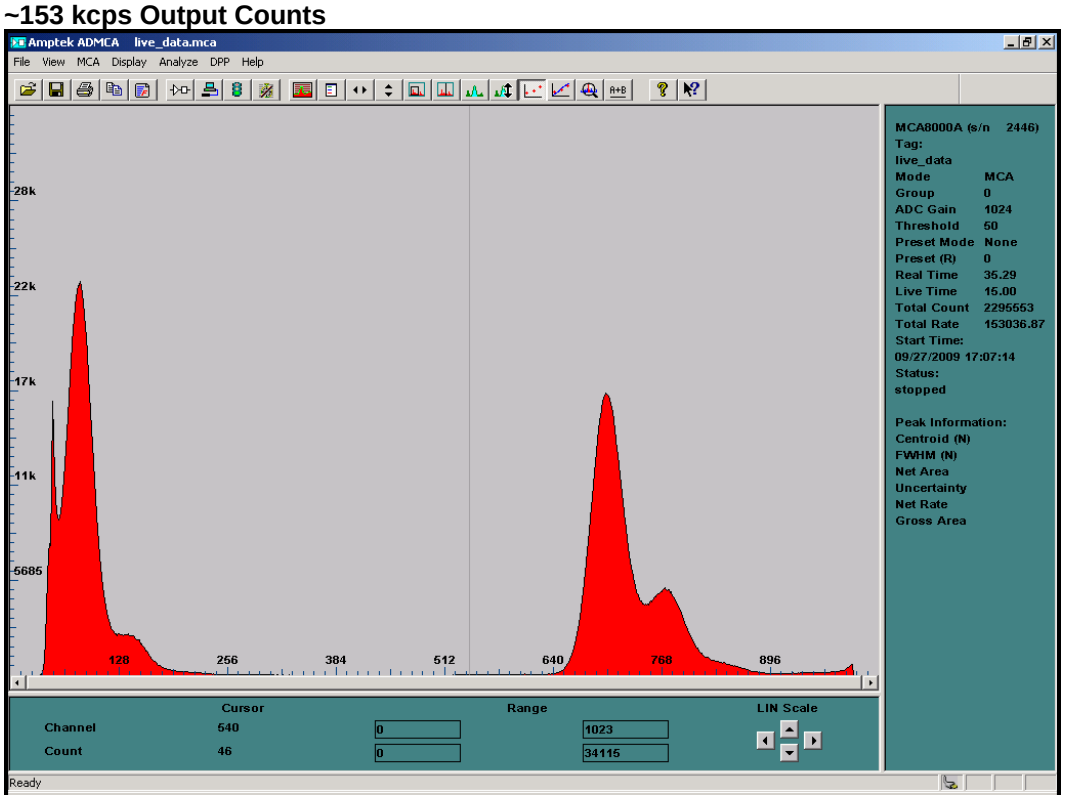
~48 kcps Output Counts



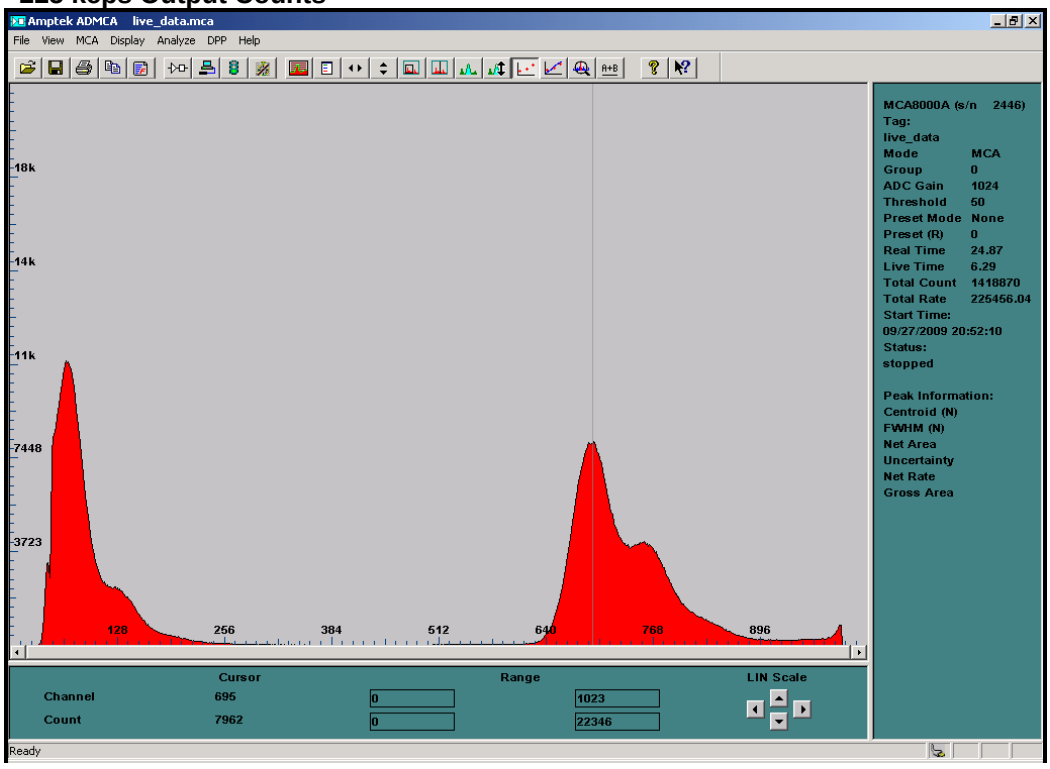
~87 kcps Output Counts



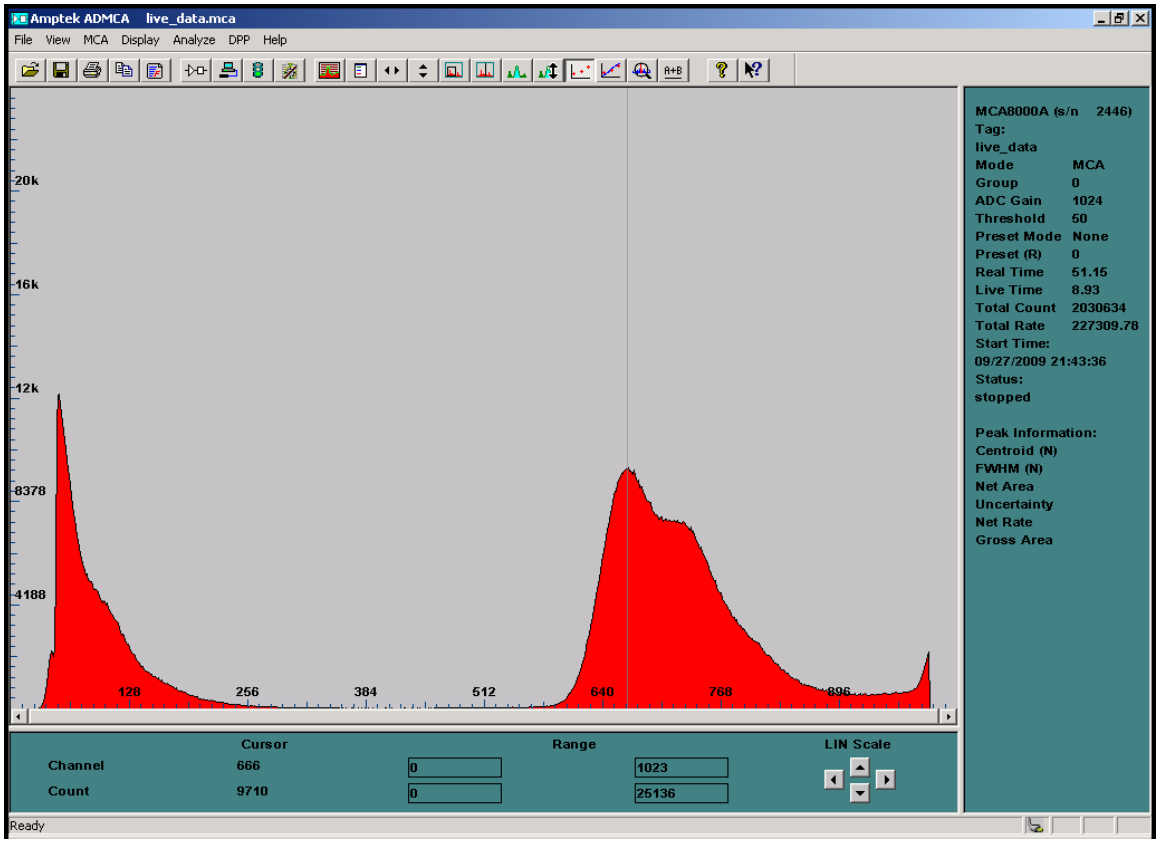
~153 kcps Output Counts



~225 kcps Output Counts

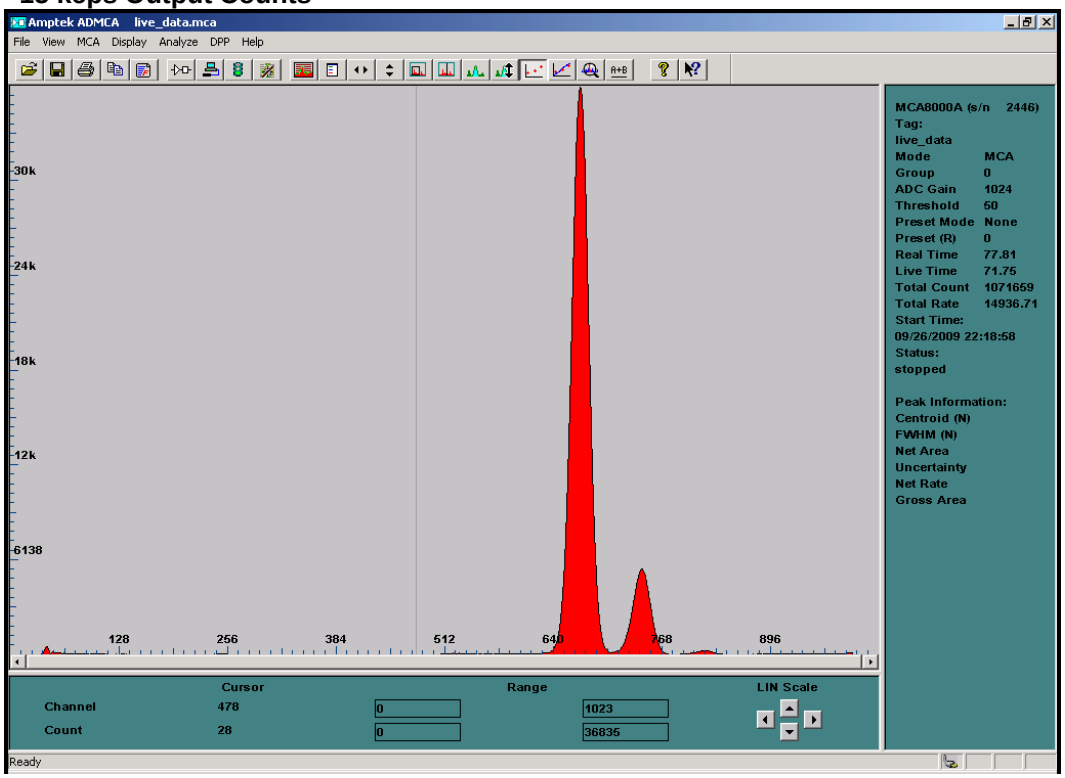


~227 kcps Output Counts

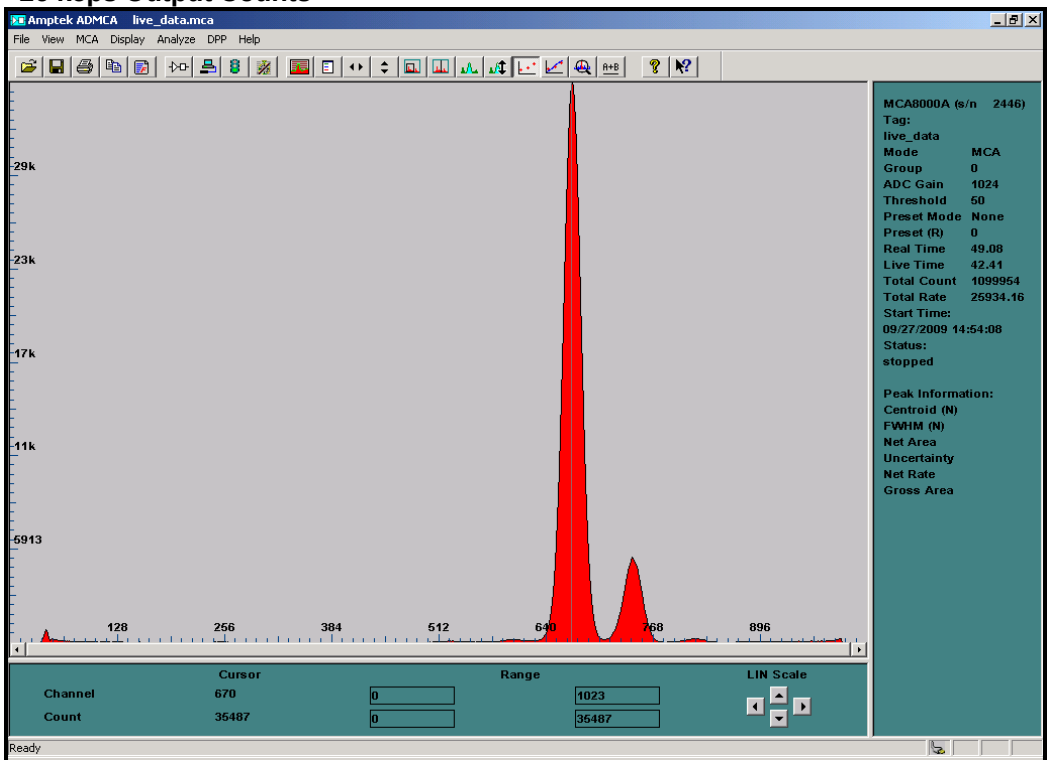


Detector Element=103 Shaping Time = 2 μsec

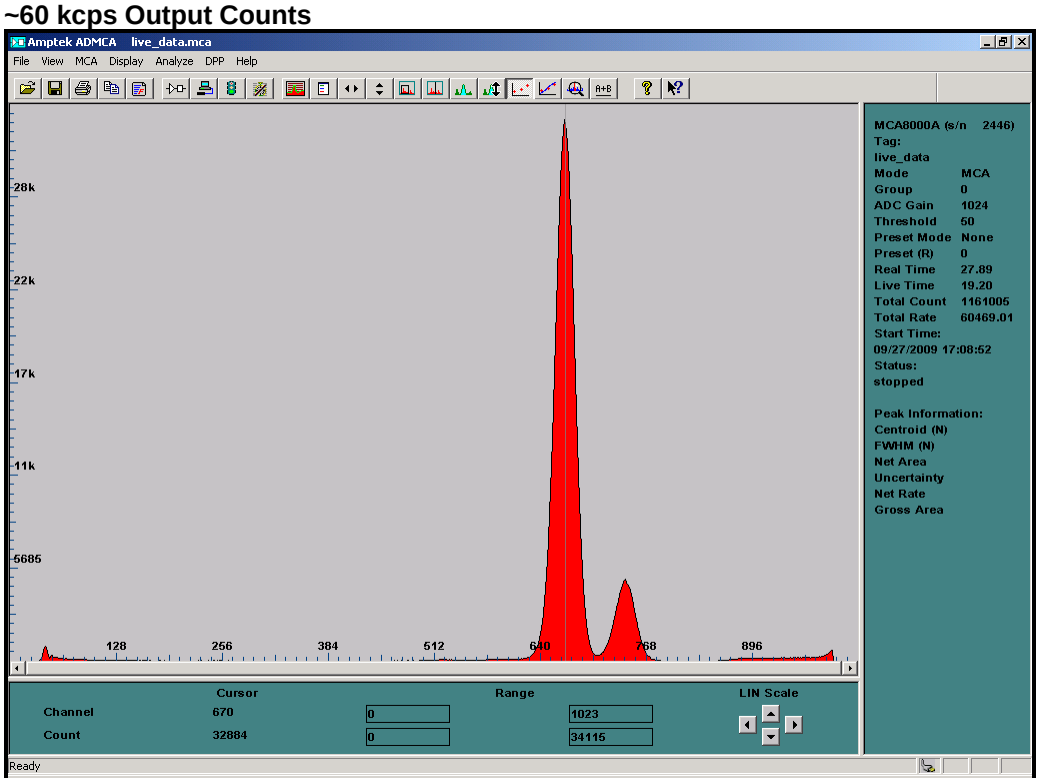
~15 kcps Output Counts



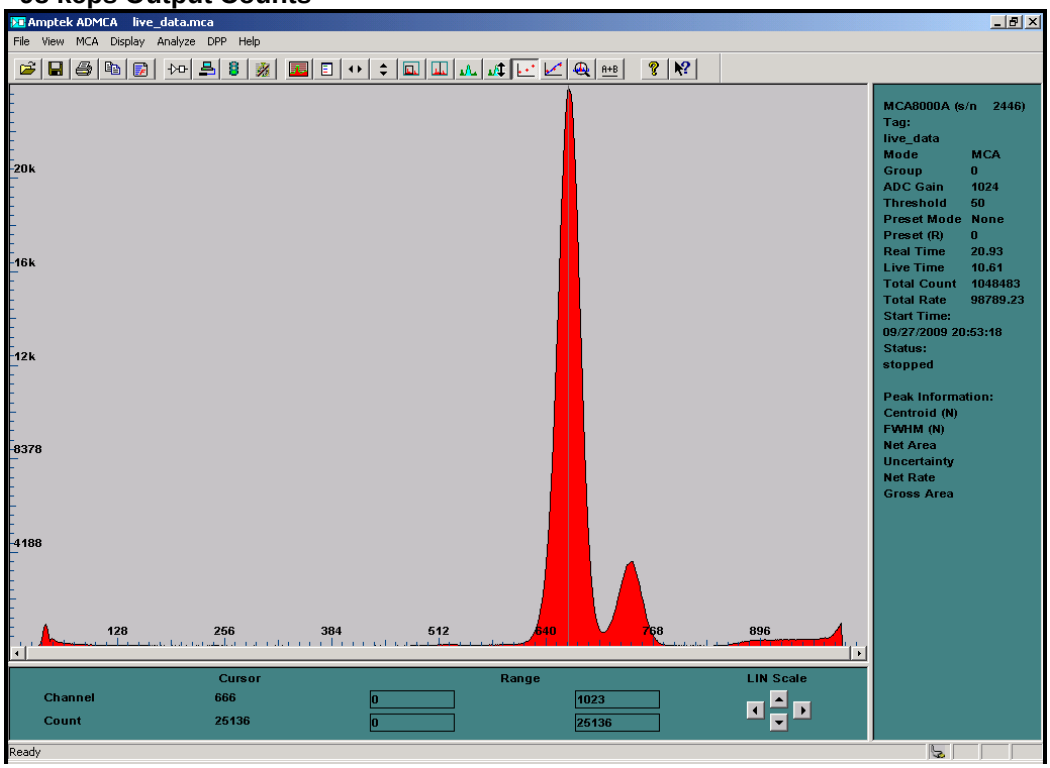
~26 kcps Output Counts



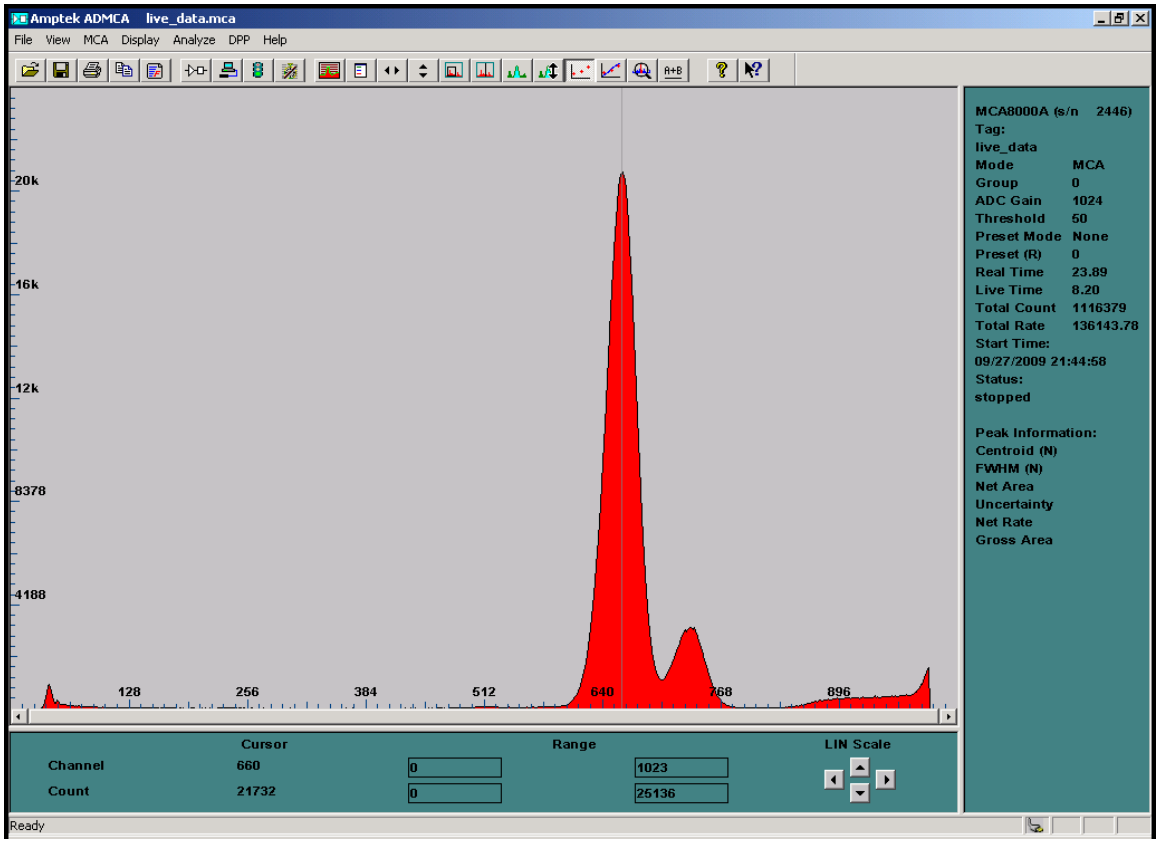
~60 kcps Output Counts



~98 kcps Output Counts

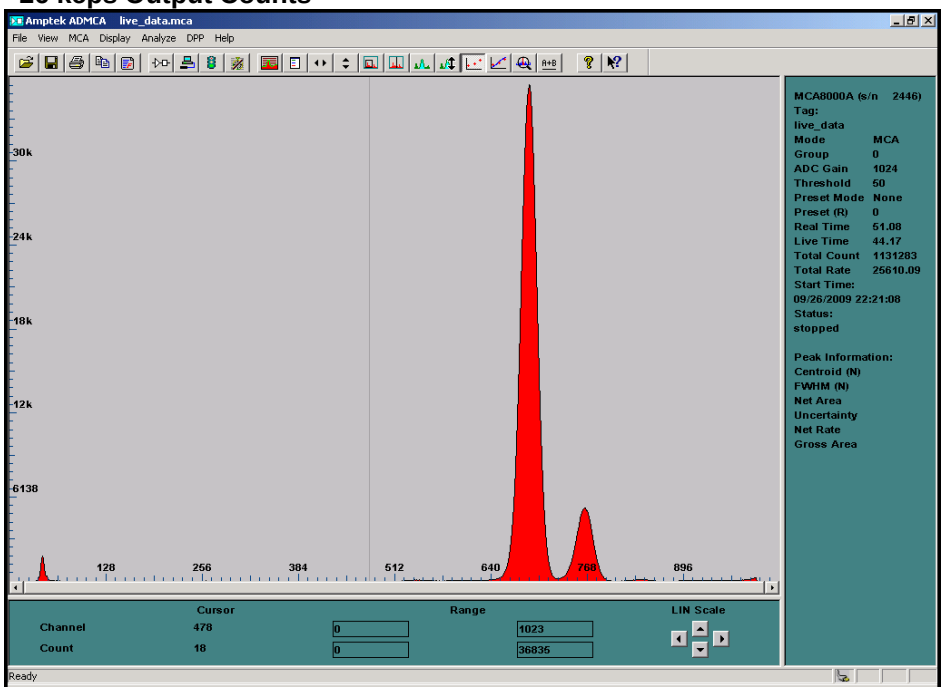


~136 kcps Output Counts

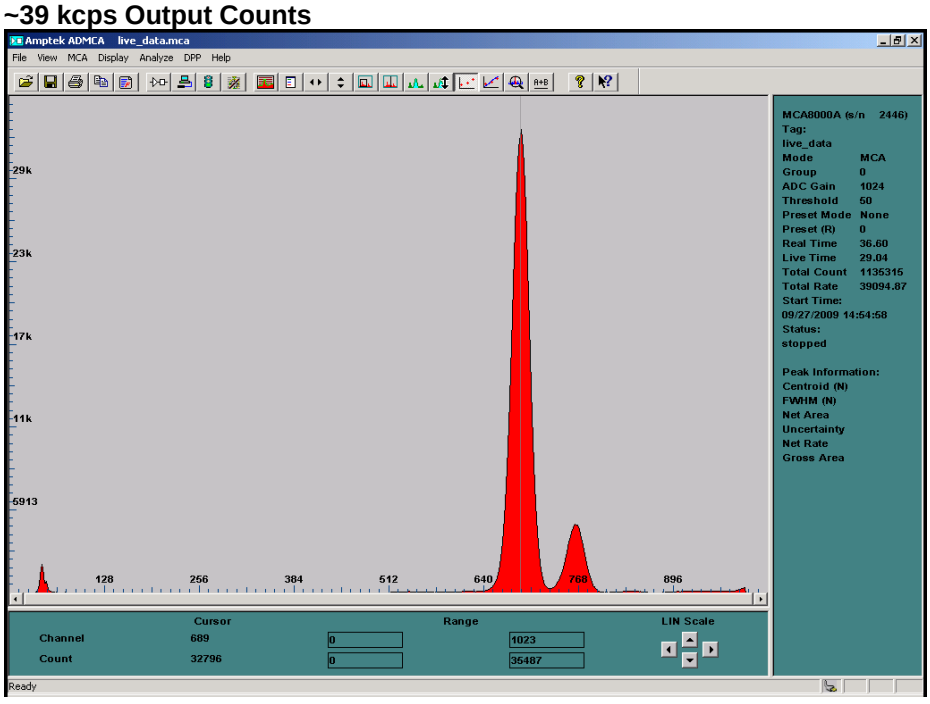


Detector Element=106 Shaping Time = 2 μsec

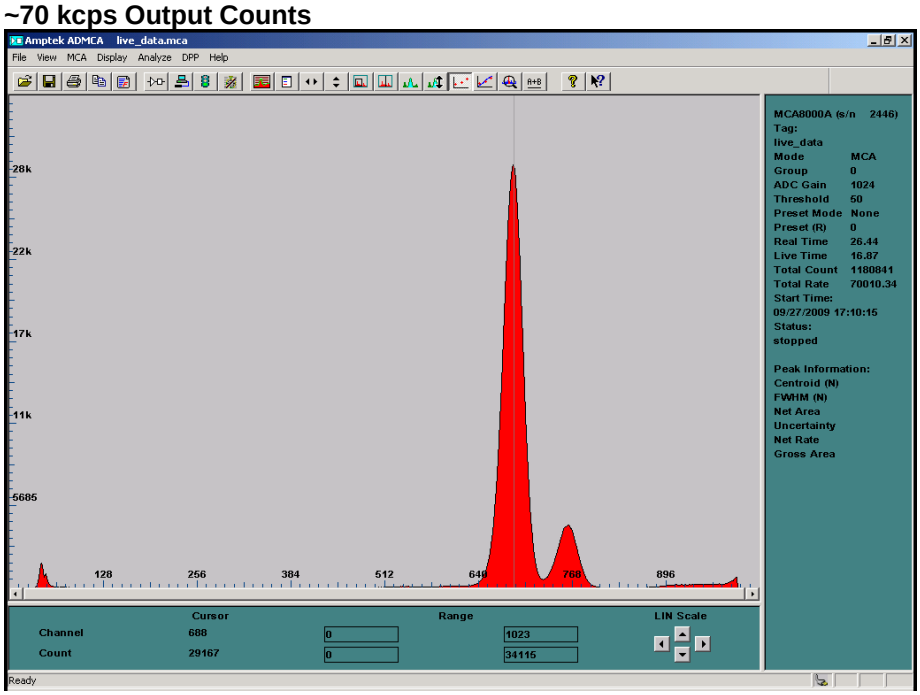
~26 kcps Output Counts



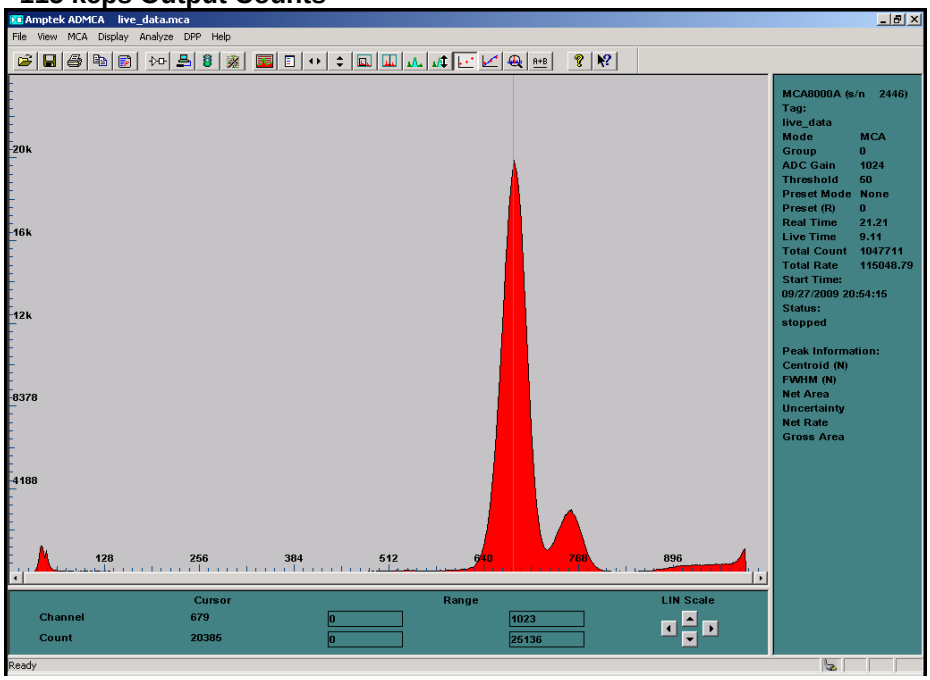
~39 kcps Output Counts



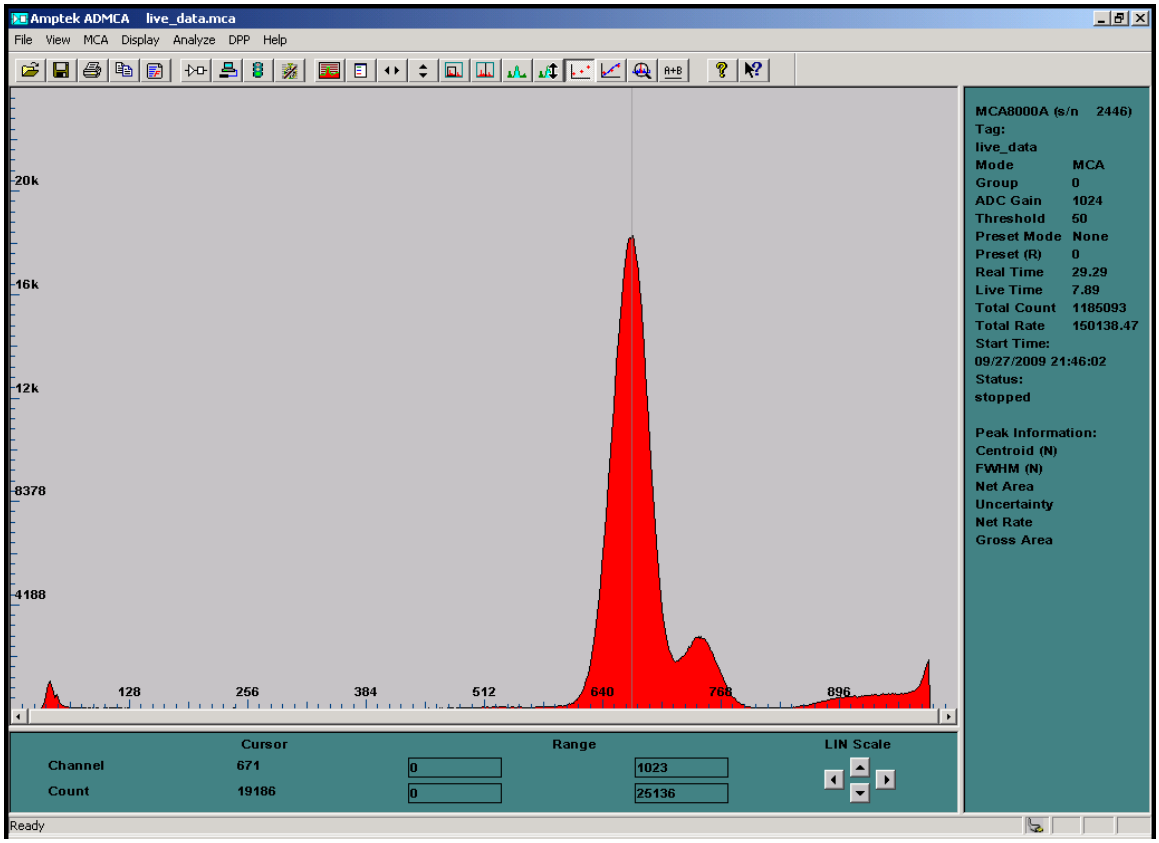
~70 kcps Output Counts



~115 kcps Output Counts

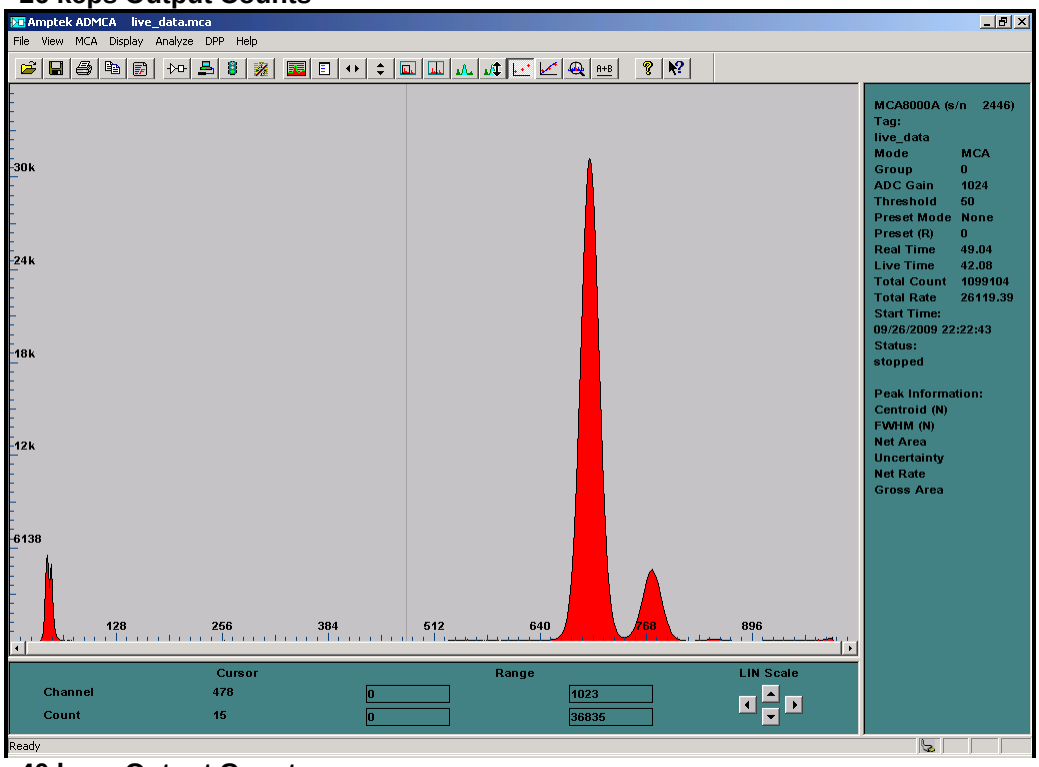


~150 kcps Output Counts

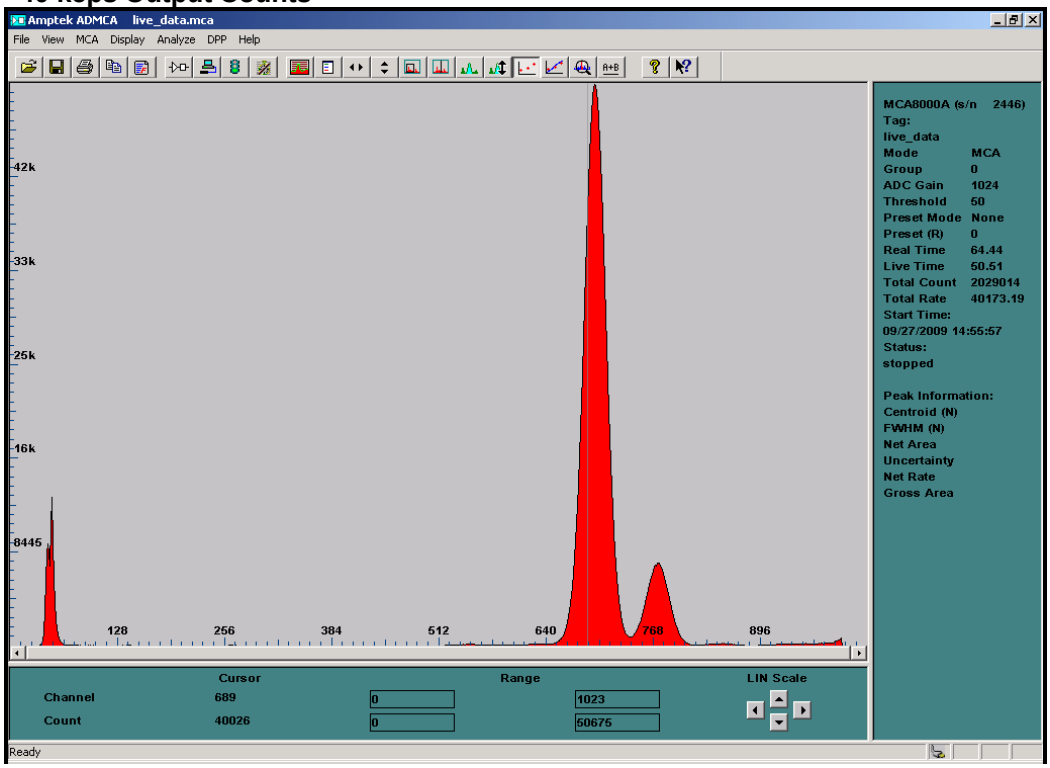


Detector Element=116 Shaping Time = 2 μsec

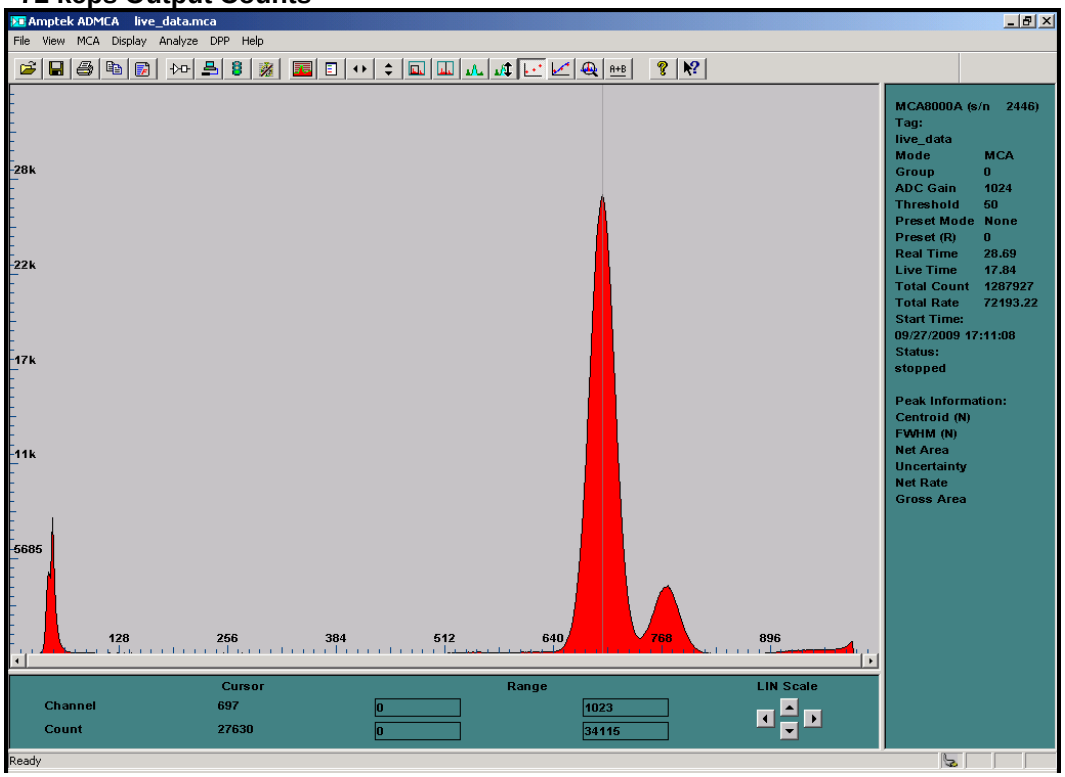
~26 kcps Output Counts



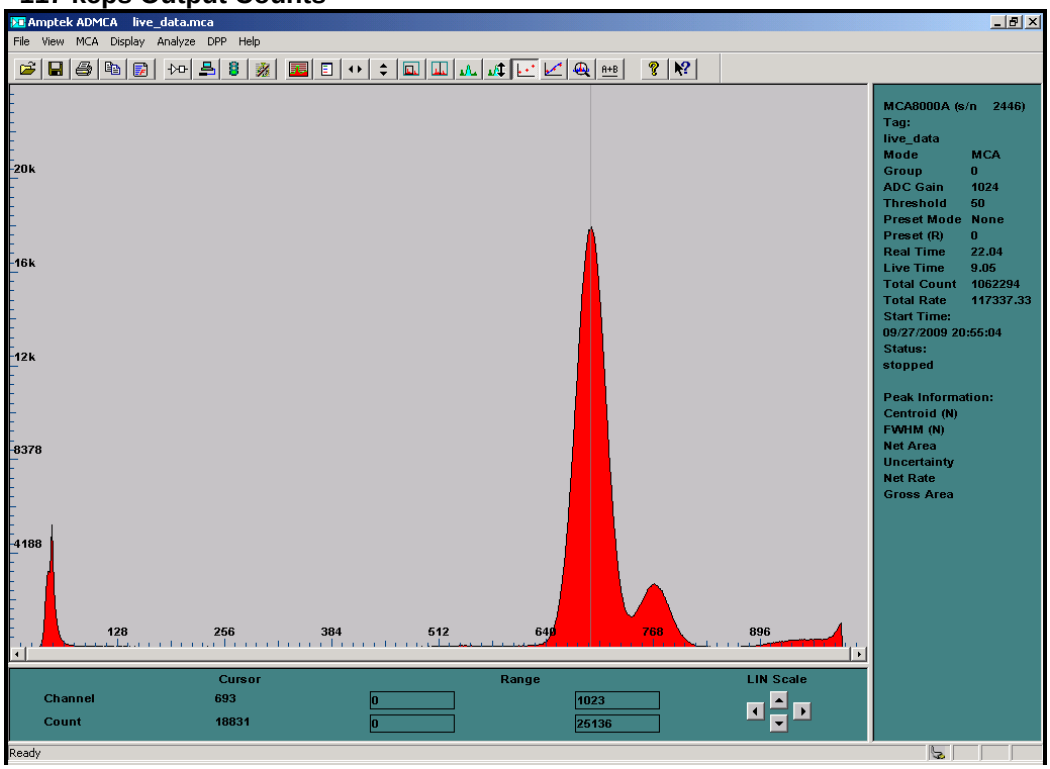
~40 kcps Output Counts



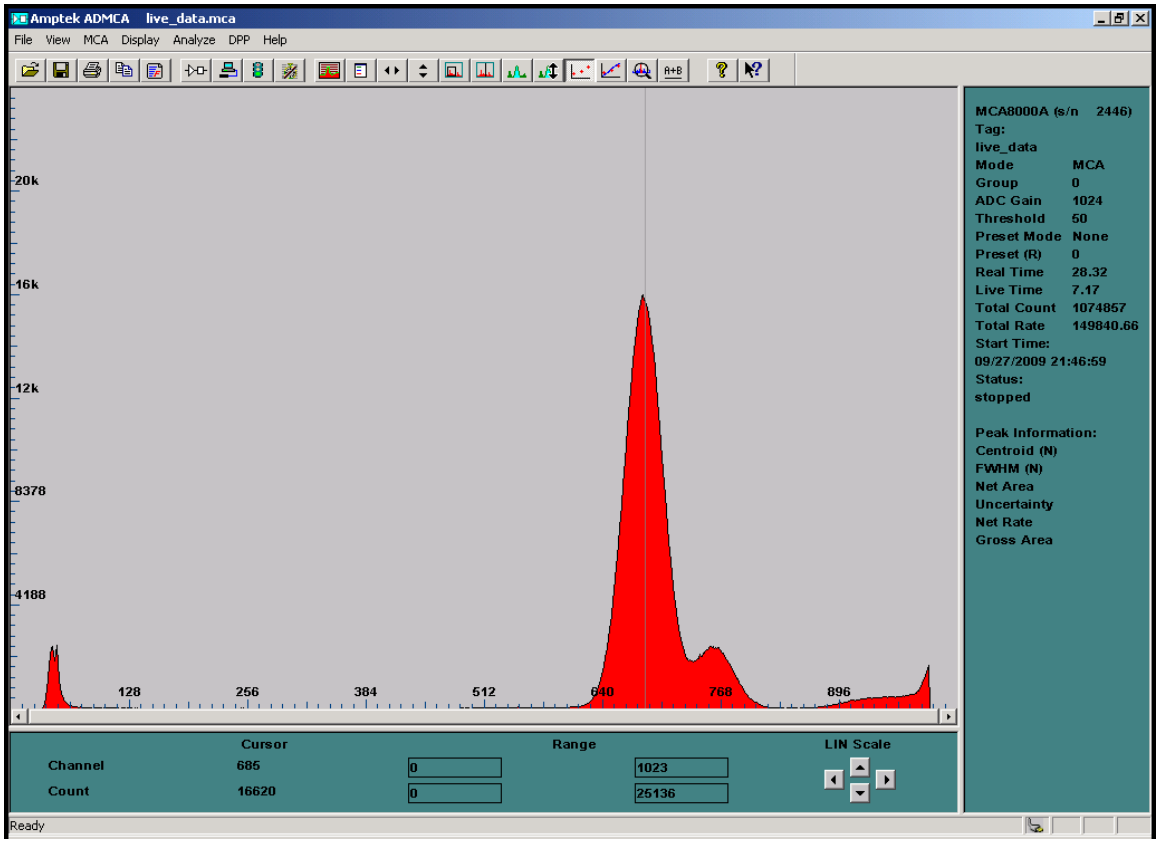
~72 kcps Output Counts



~117 kcps Output Counts

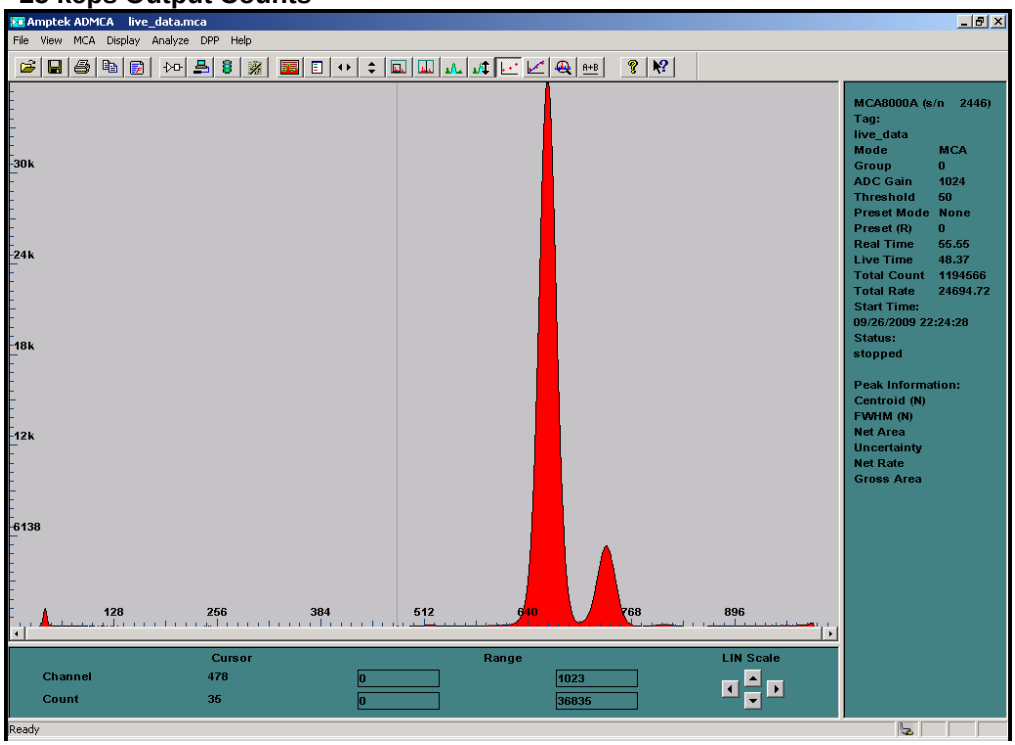


~150 kcps Output Counts

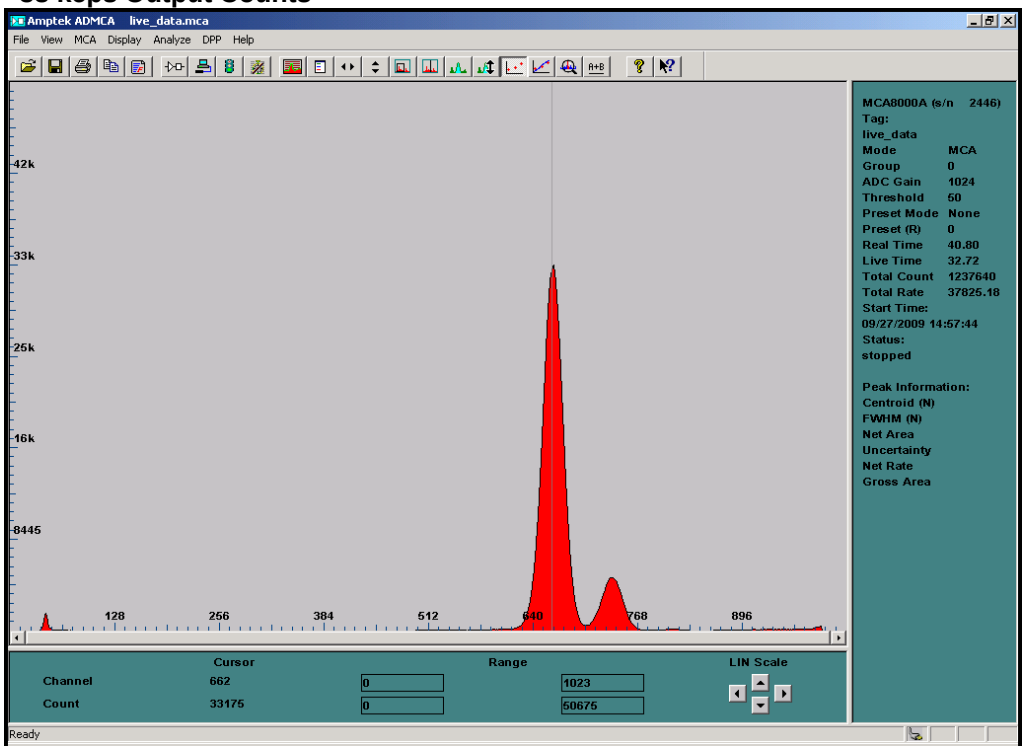


Detector Element=119 Shaping Time = 2 μsec

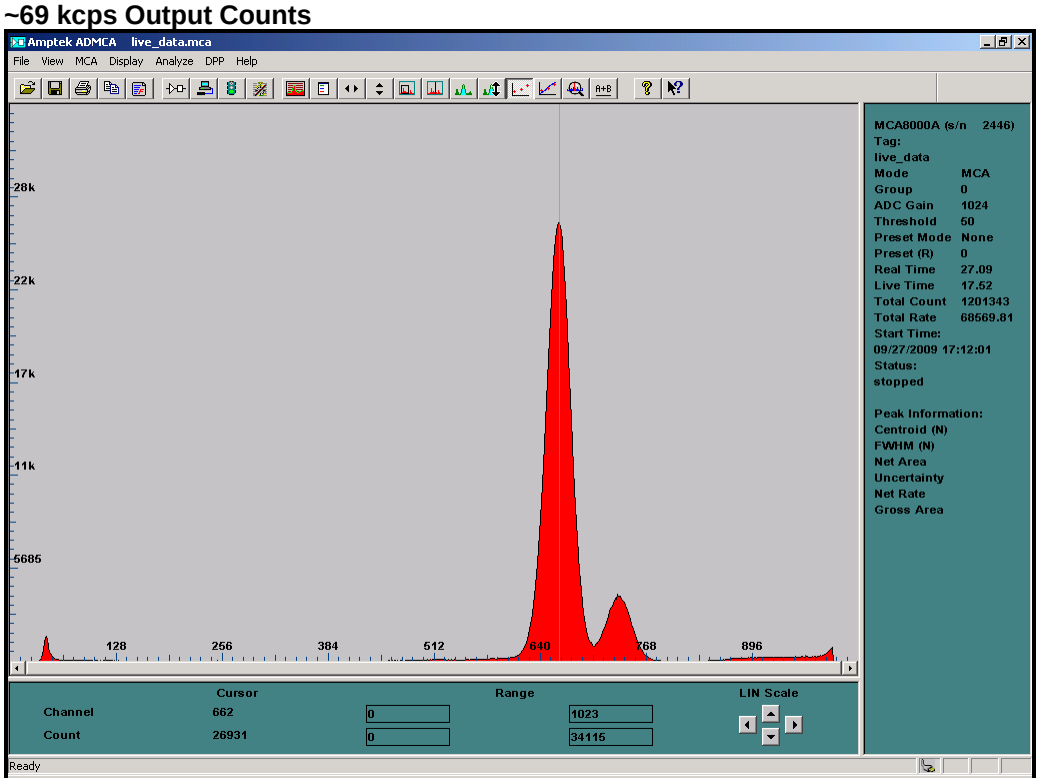
~25 kcps Output Counts



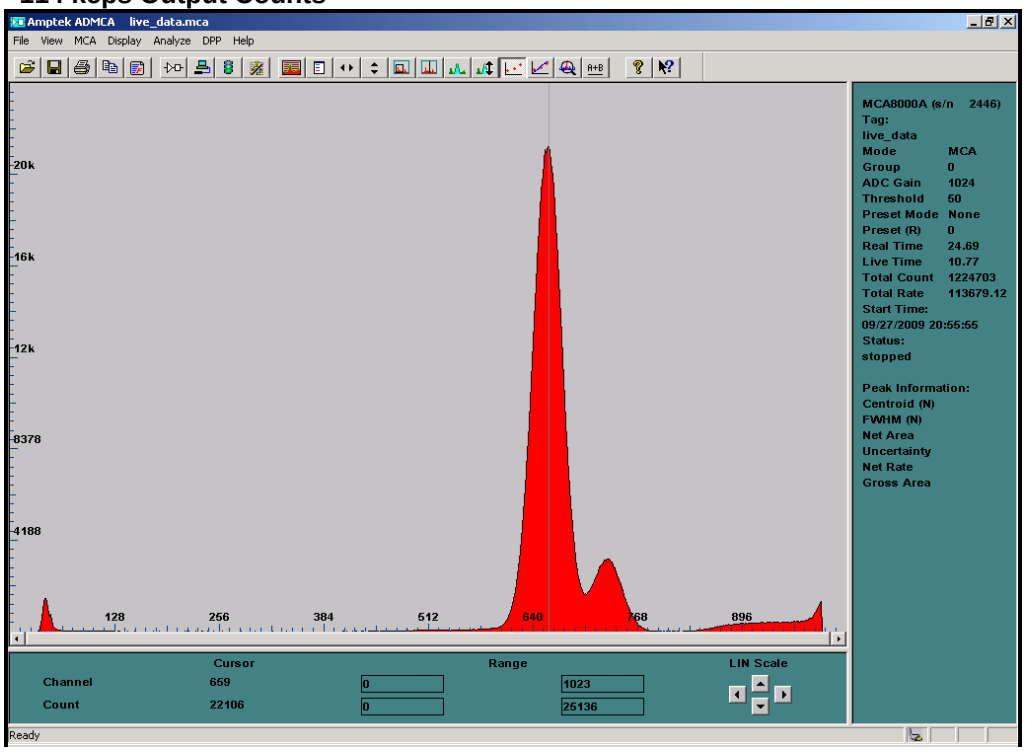
~38 kcps Output Counts



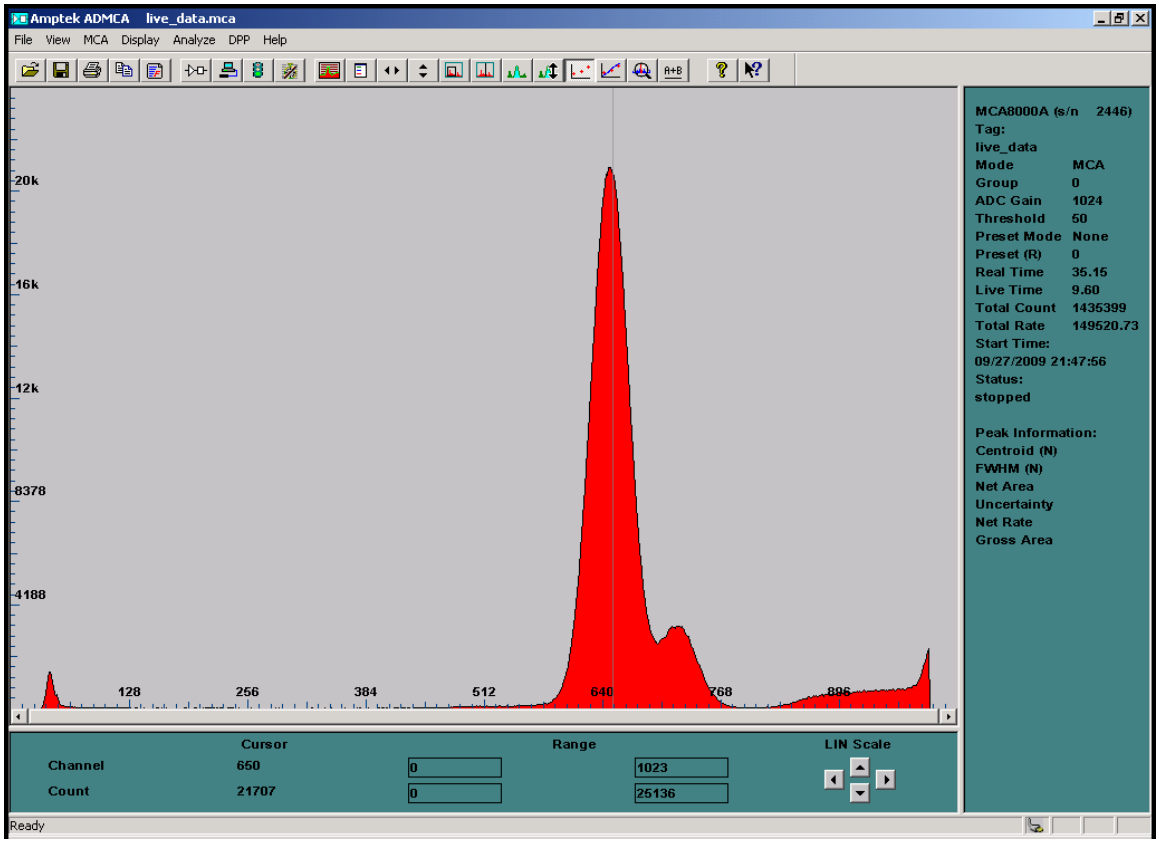
~69 kcps Output Counts



~114 kcps Output Counts

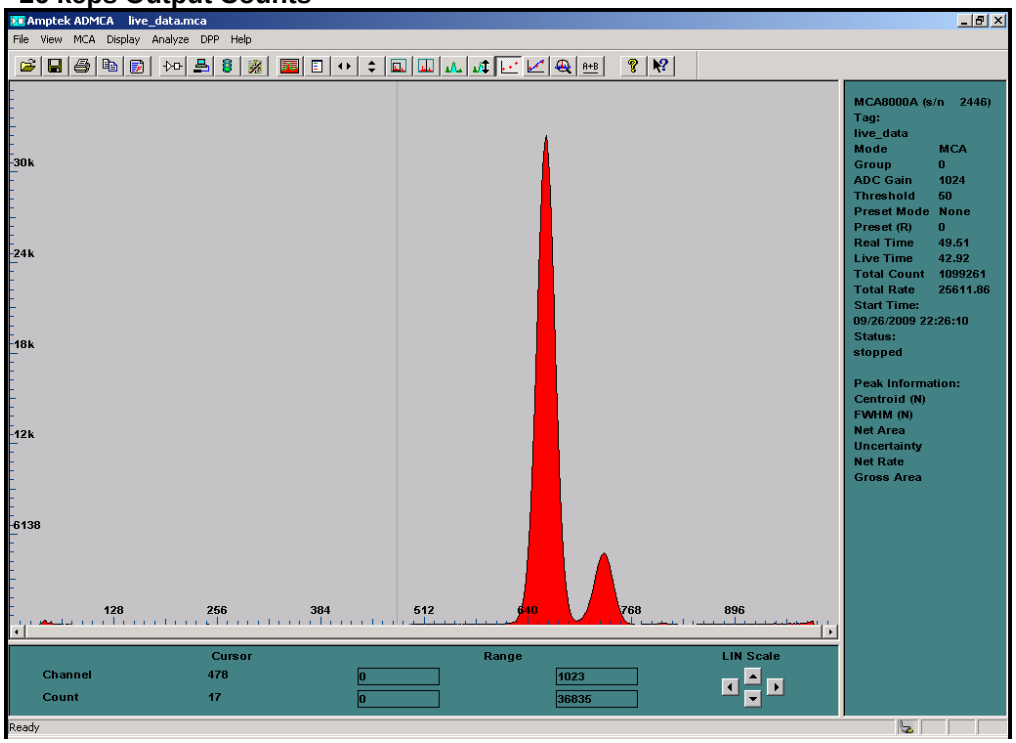


~150 kcps Output Counts

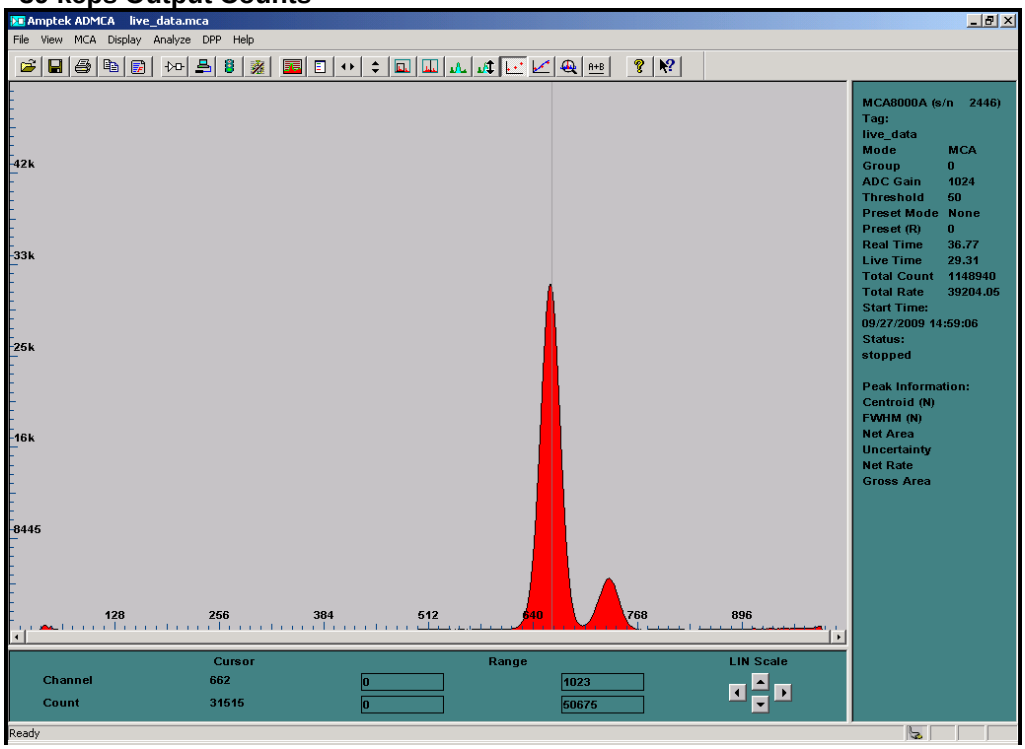


Detector Element=121 Shaping Time = 2 μsec

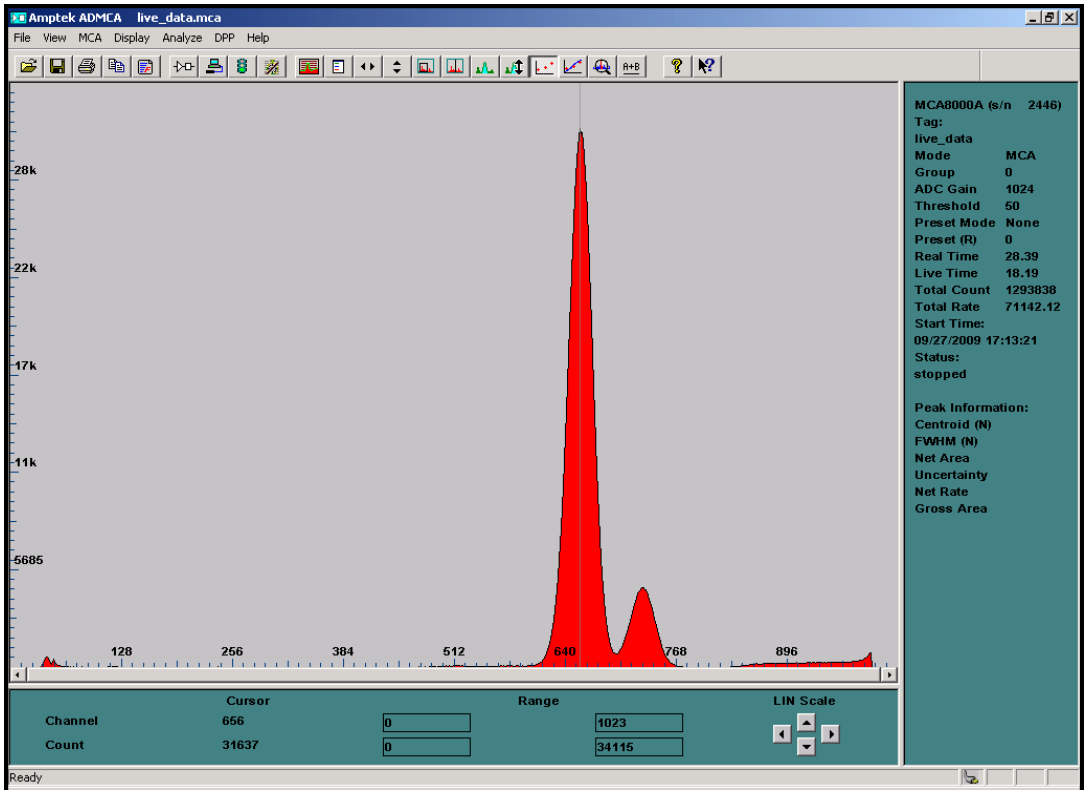
~26 kcps Output Counts



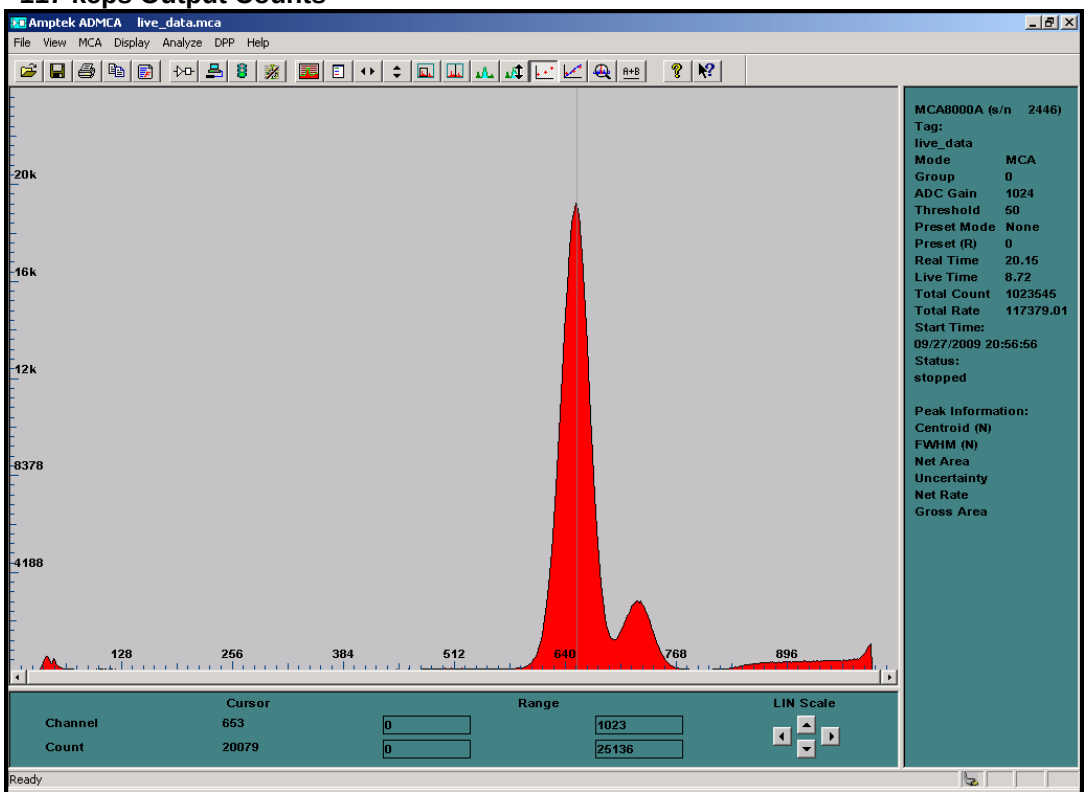
~39 kcps Output Counts



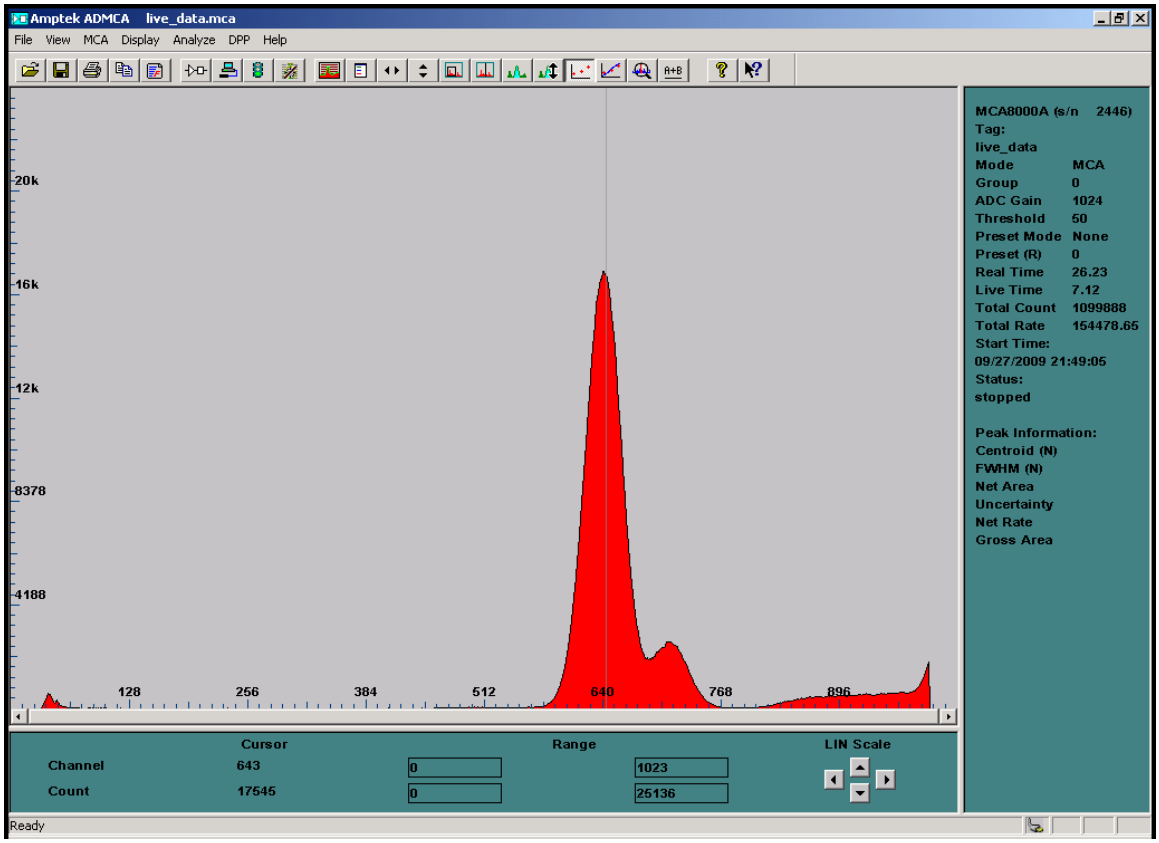
~71 kcps Output Counts



~117 kcps Output Counts

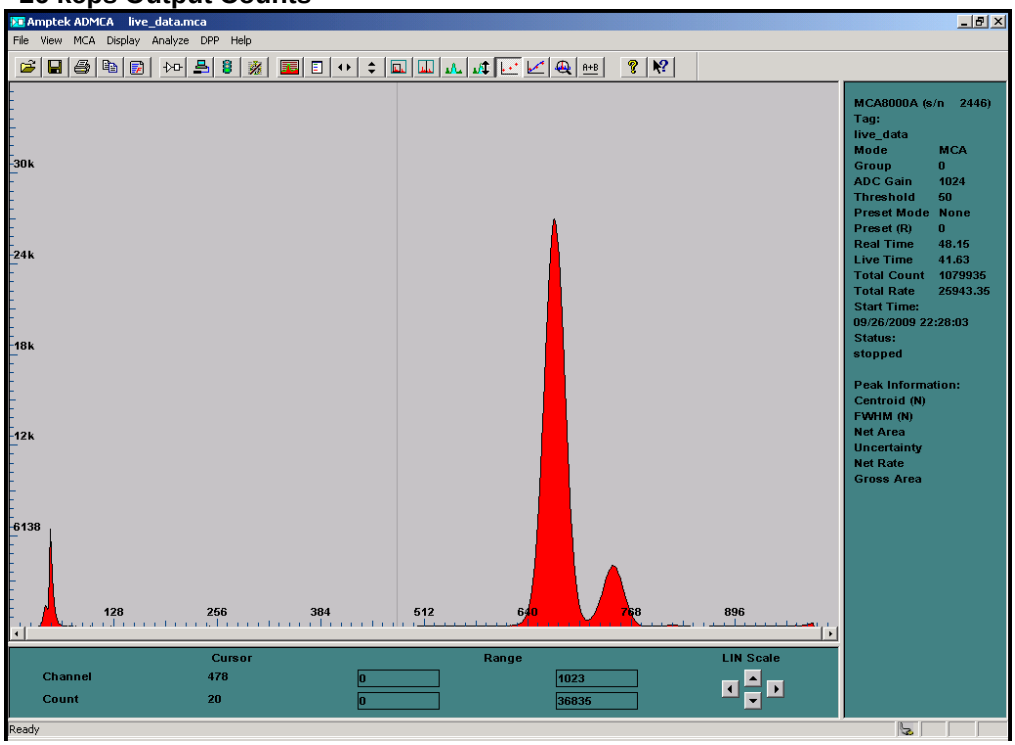


~154 kcps Output Counts

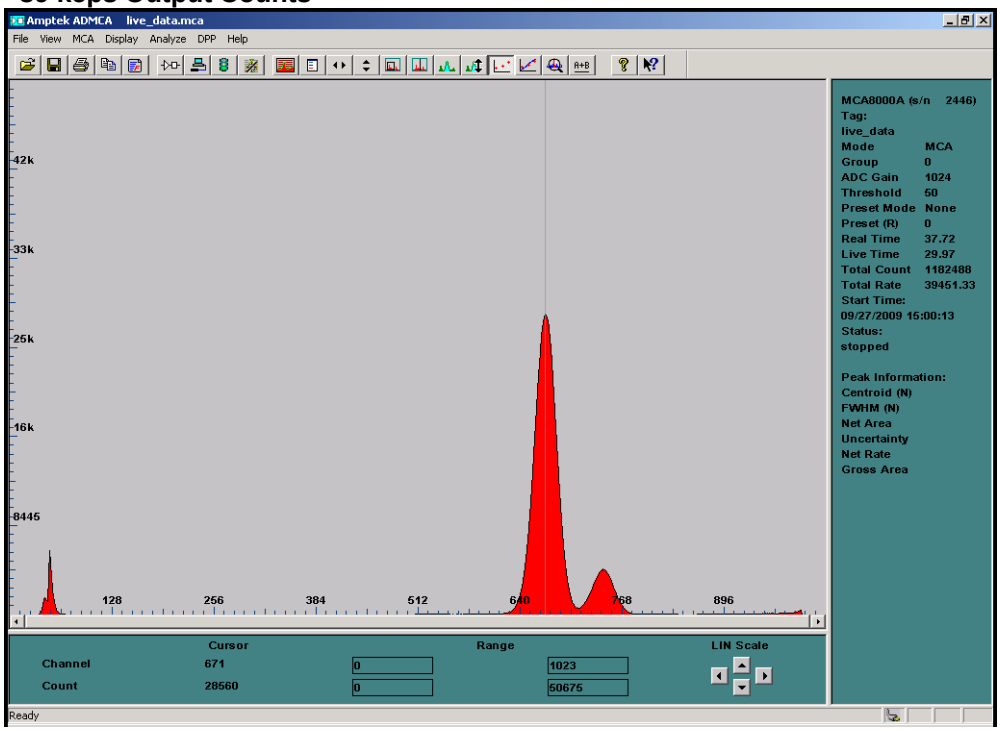


Detector Element=125 Shaping Time = 2 μsec

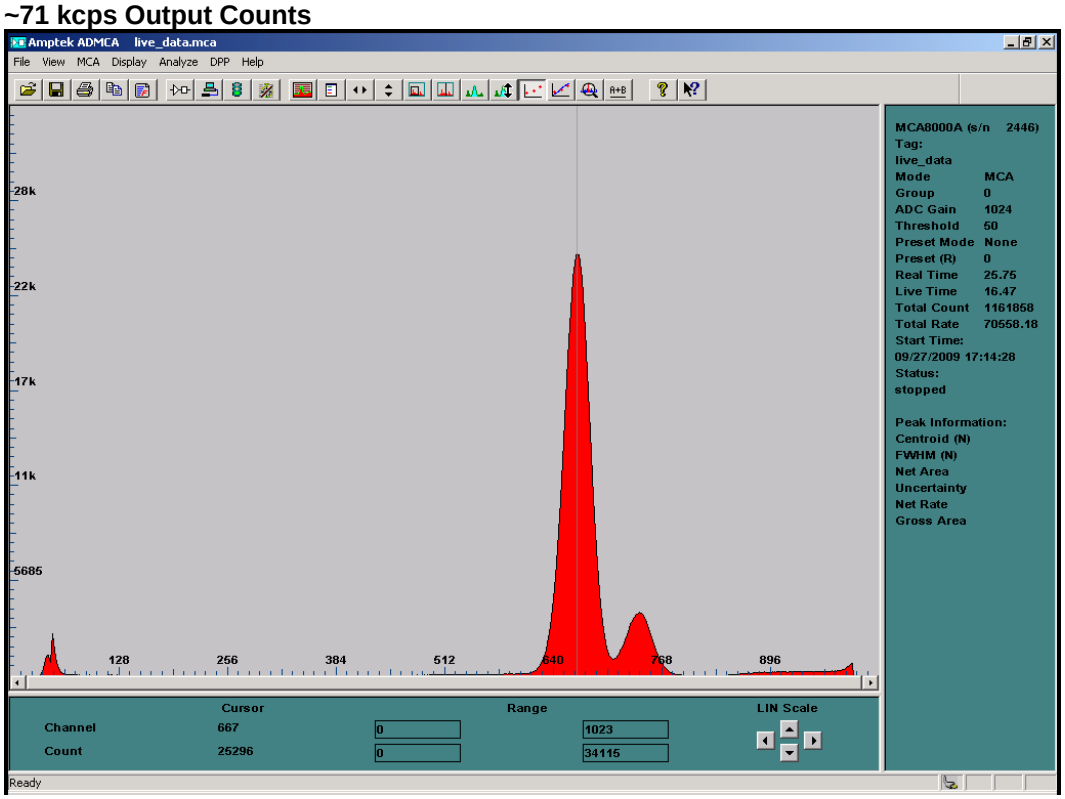
~26 kcps Output Counts



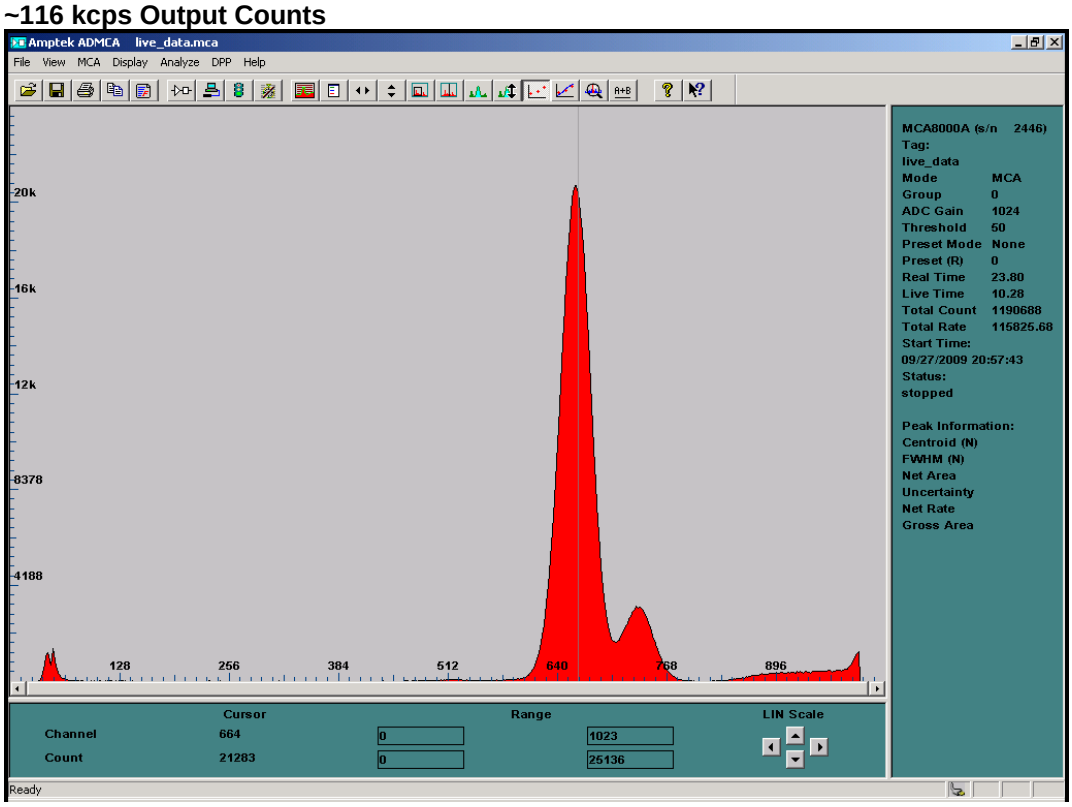
~39 kcps Output Counts



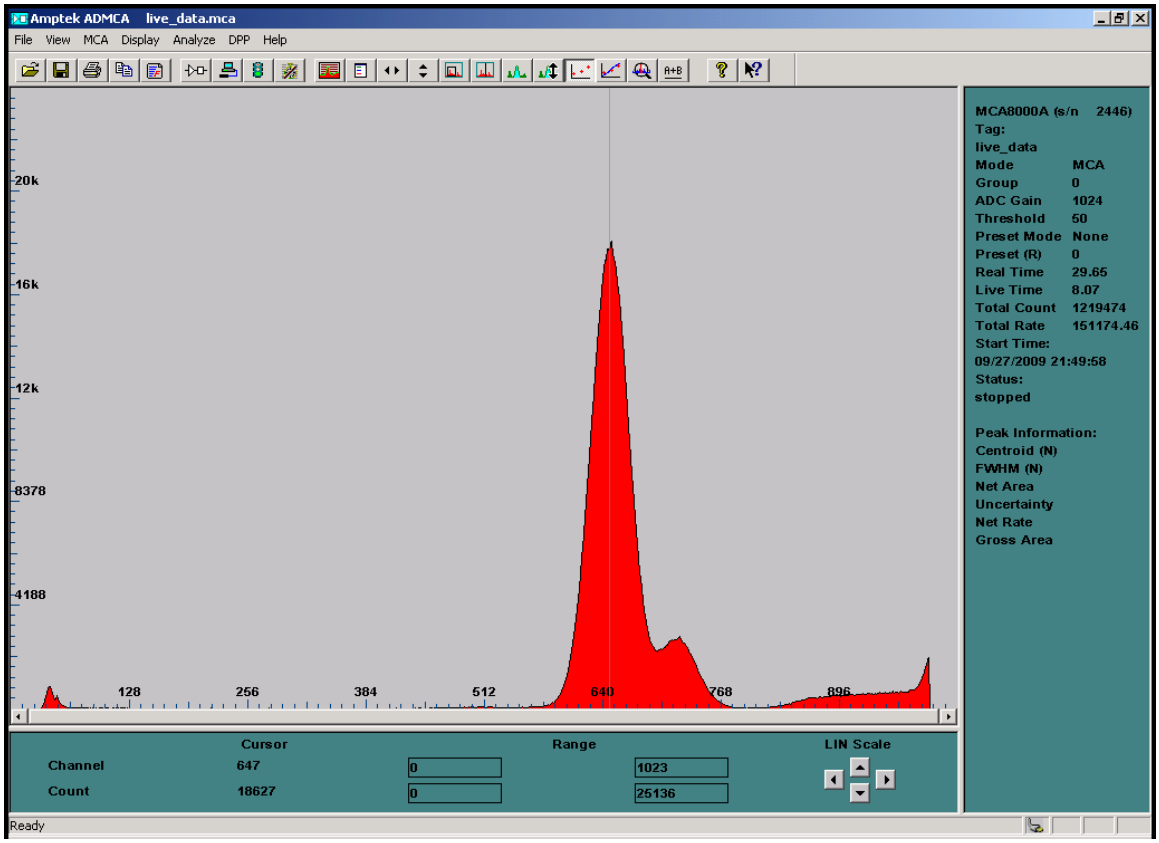
~71 kcps Output Counts



~116 kcps Output Counts

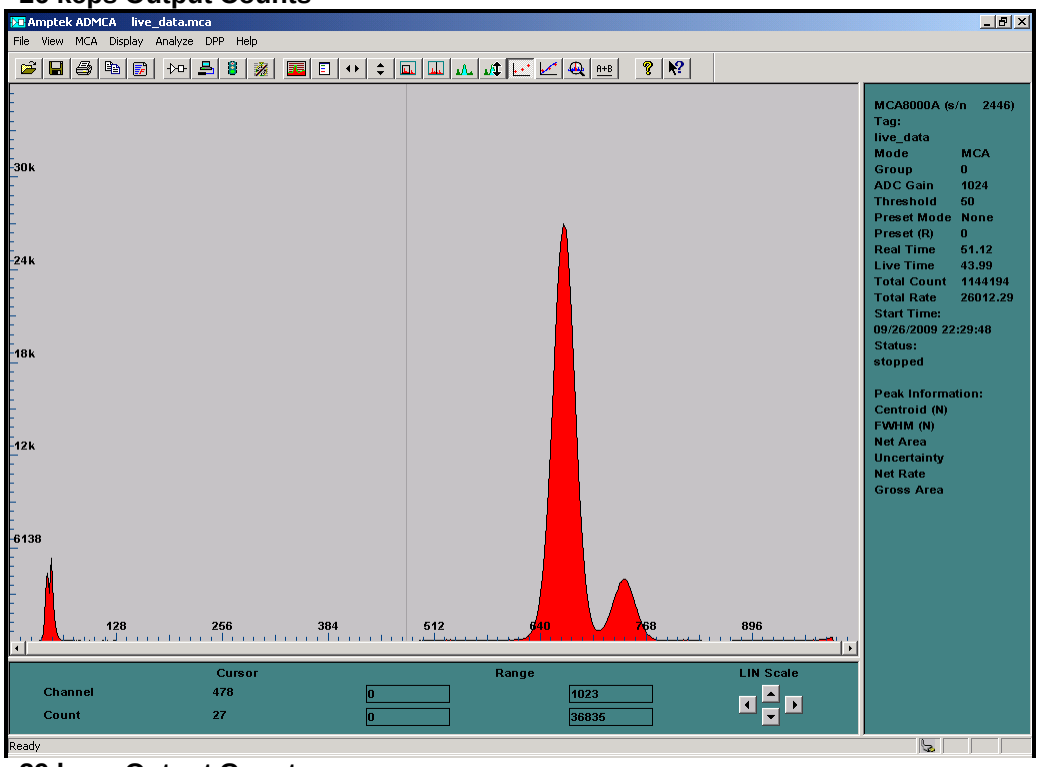


~151 kcps Output Counts

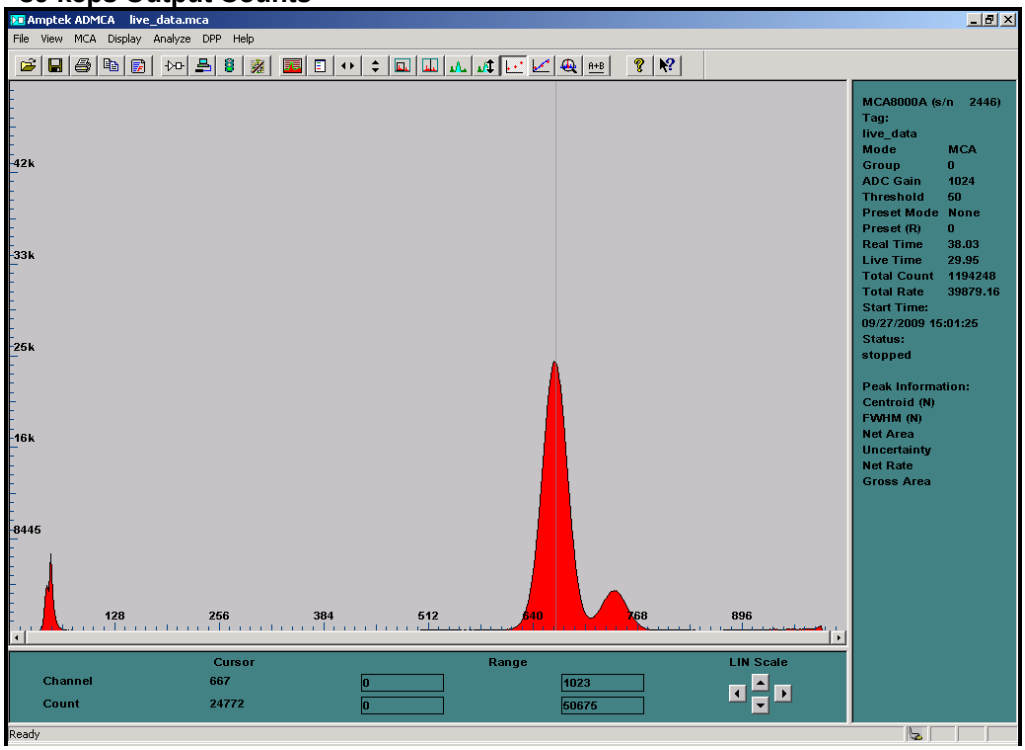


Detector Element=137 Shaping Time = 2 μsec

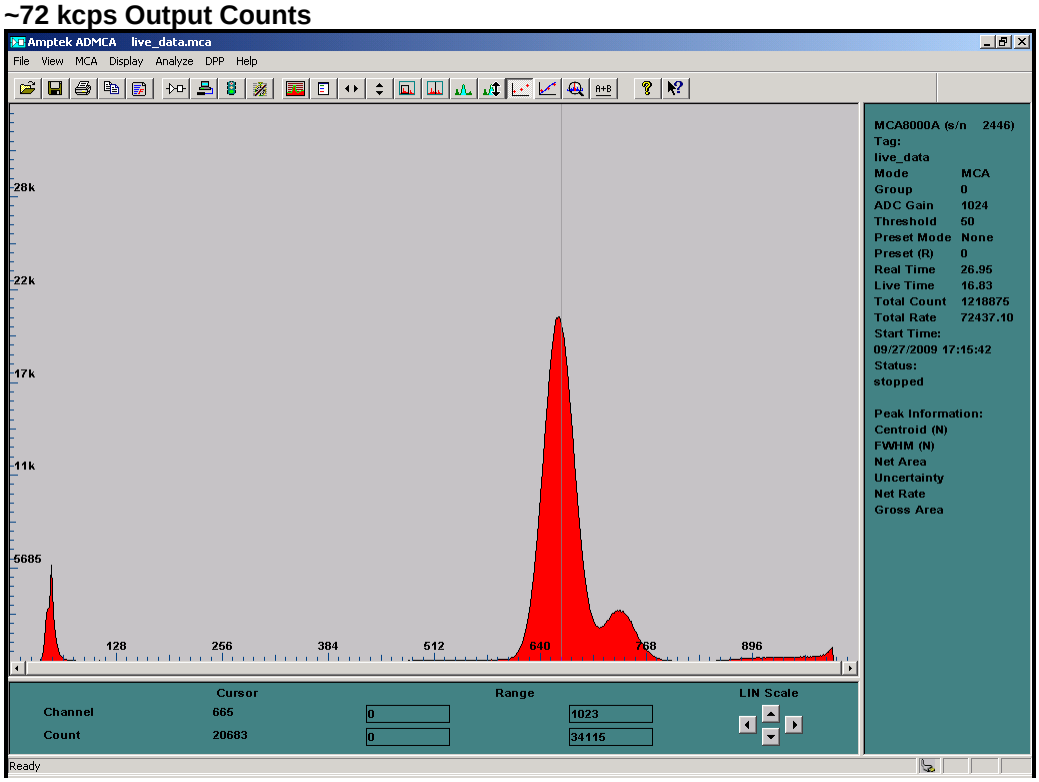
~26 kcps Output Counts



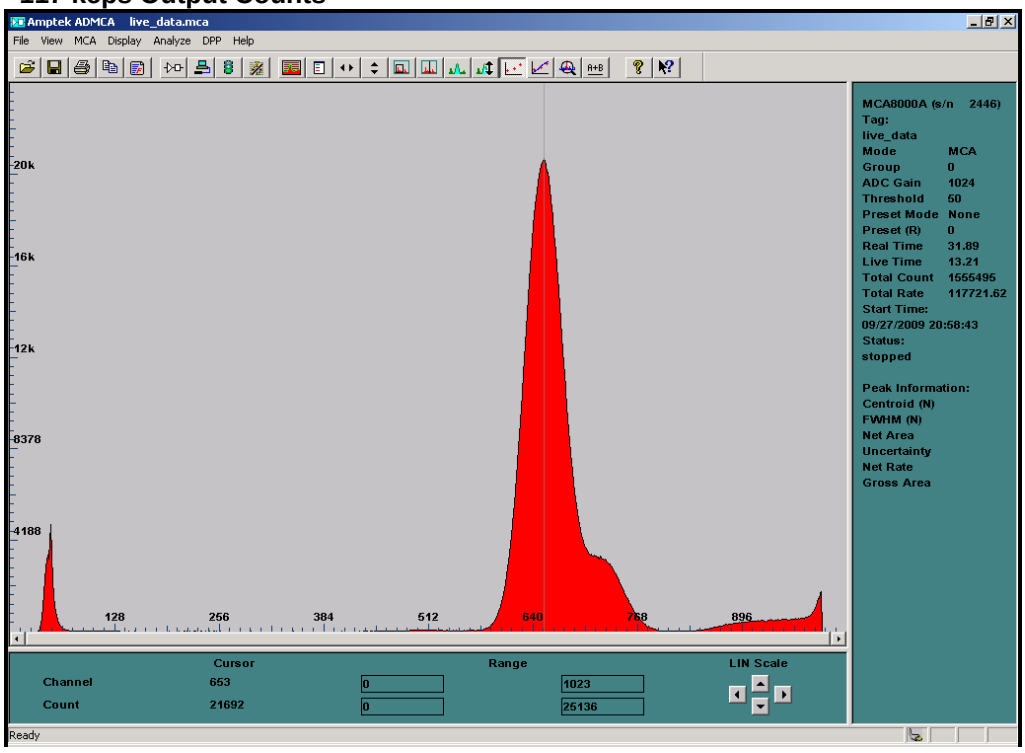
~39 kcps Output Counts



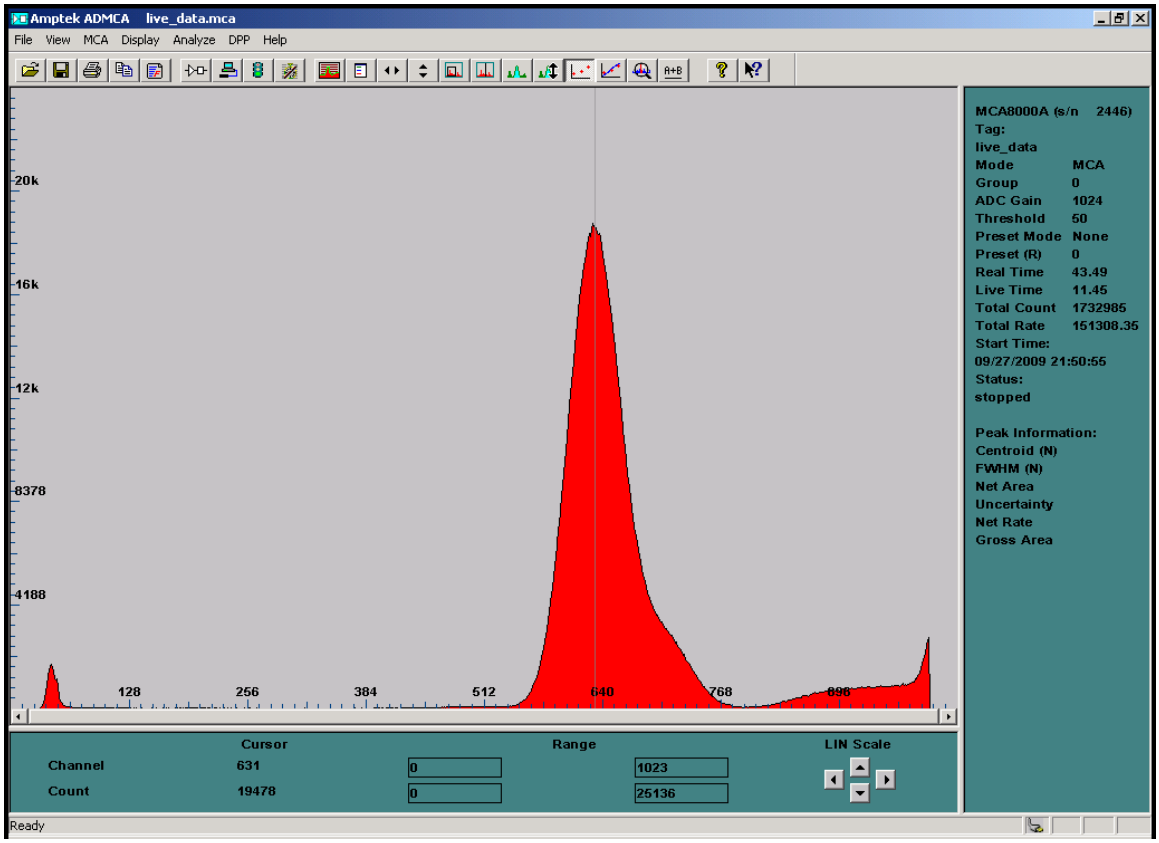
~72 kcps Output Counts



~117 kcps Output Counts

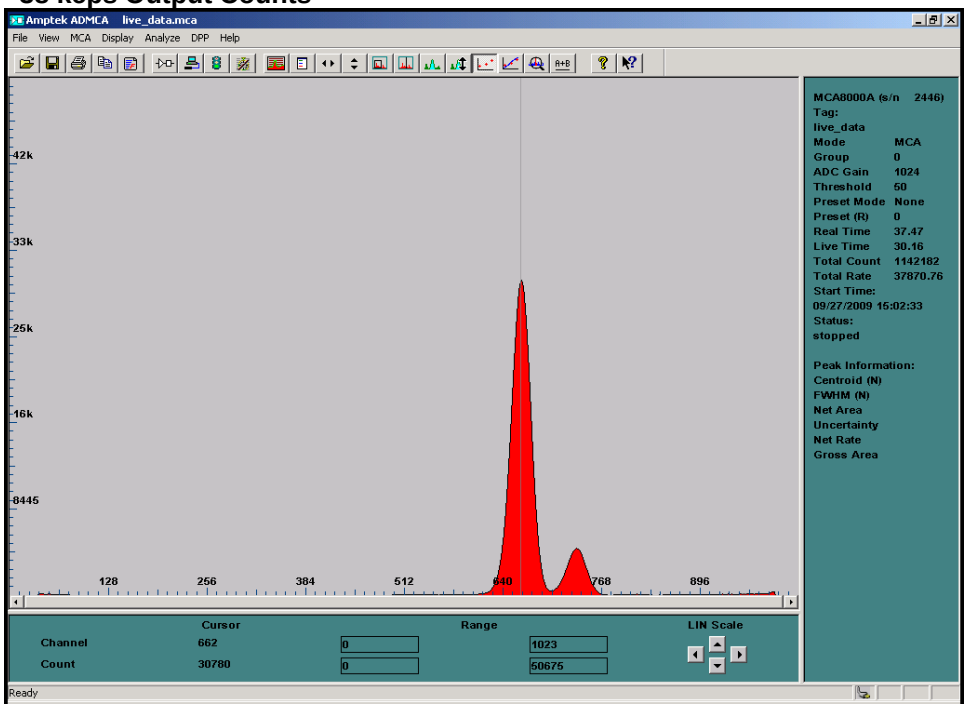


~151 kcps Output Counts

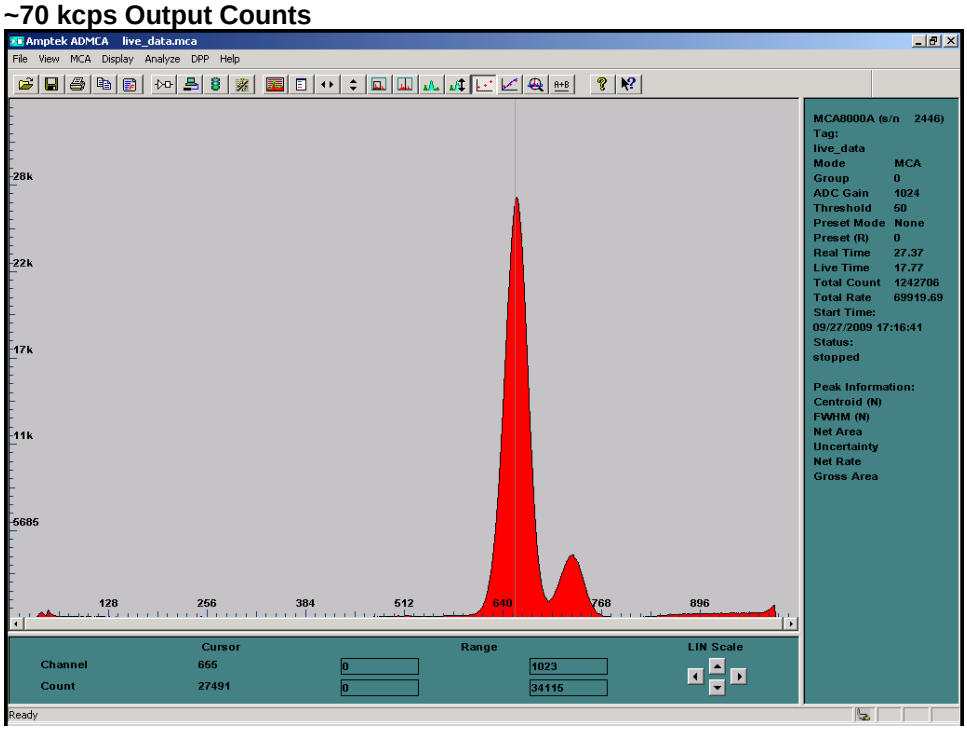


Detector Element=143 Shaping Time = 2 μsec

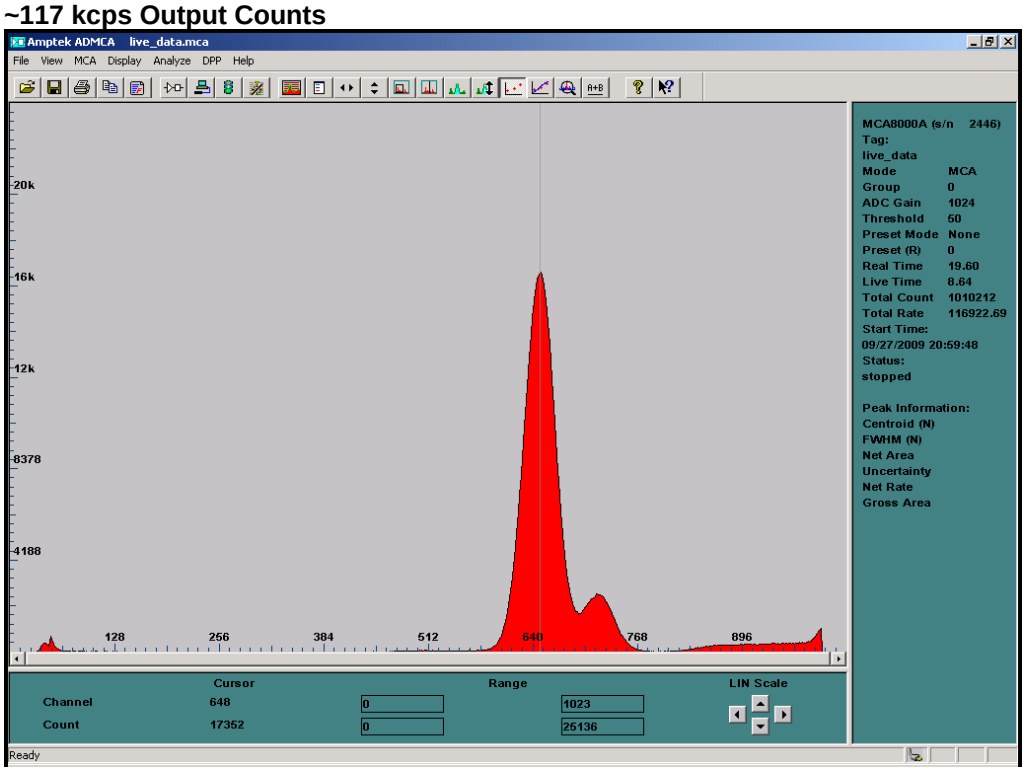
~38 kcps Output Counts



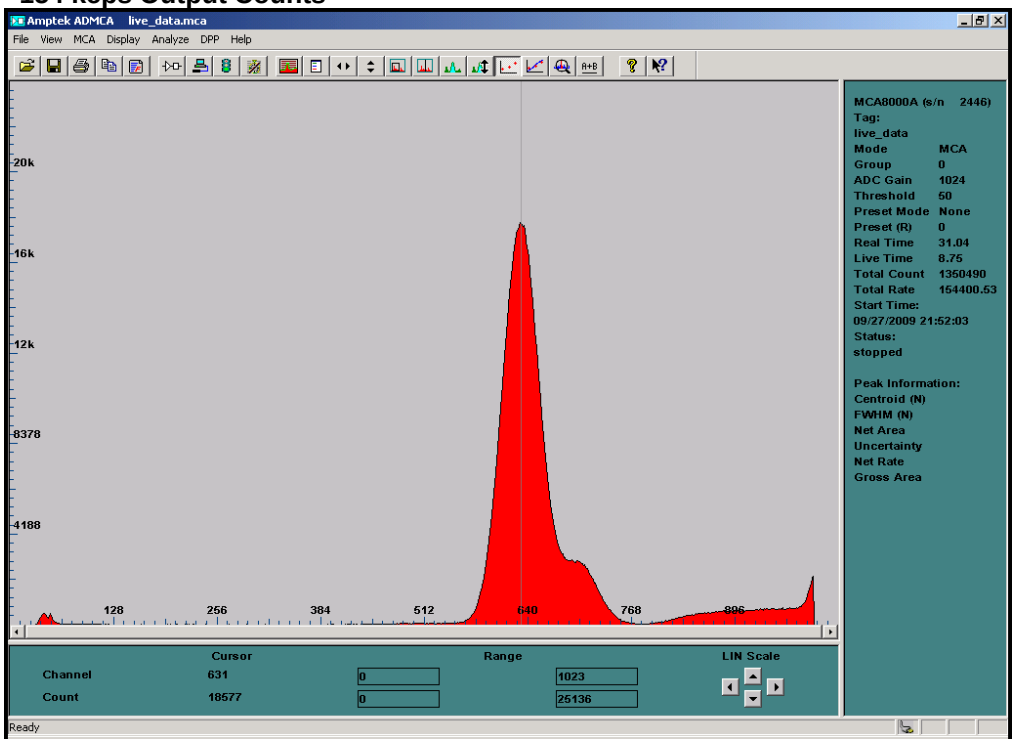
~70 kcps Output Counts



~117 kcps Output Counts

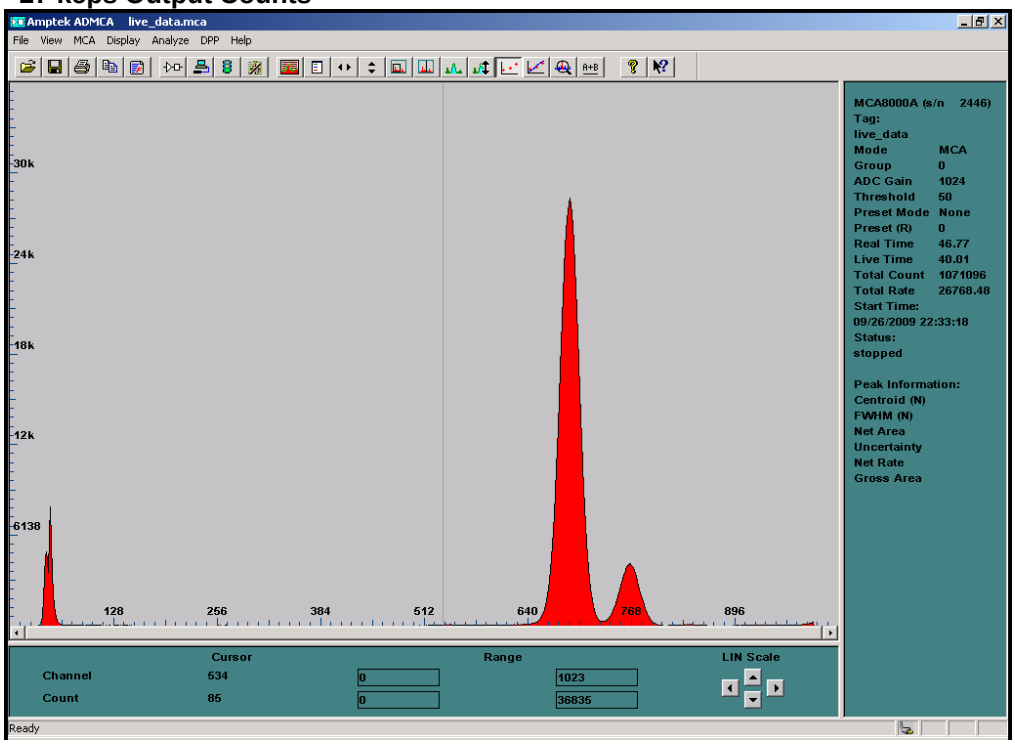


~154 kcps Output Counts

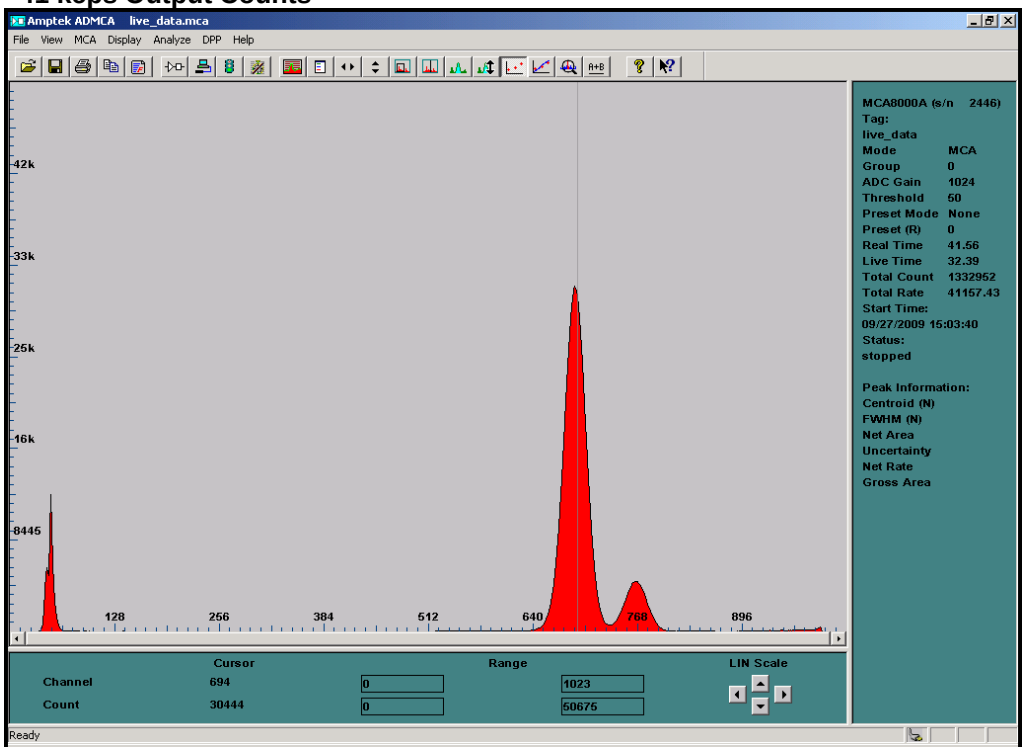


Detector Element=155 Shaping Time = 2 μsec

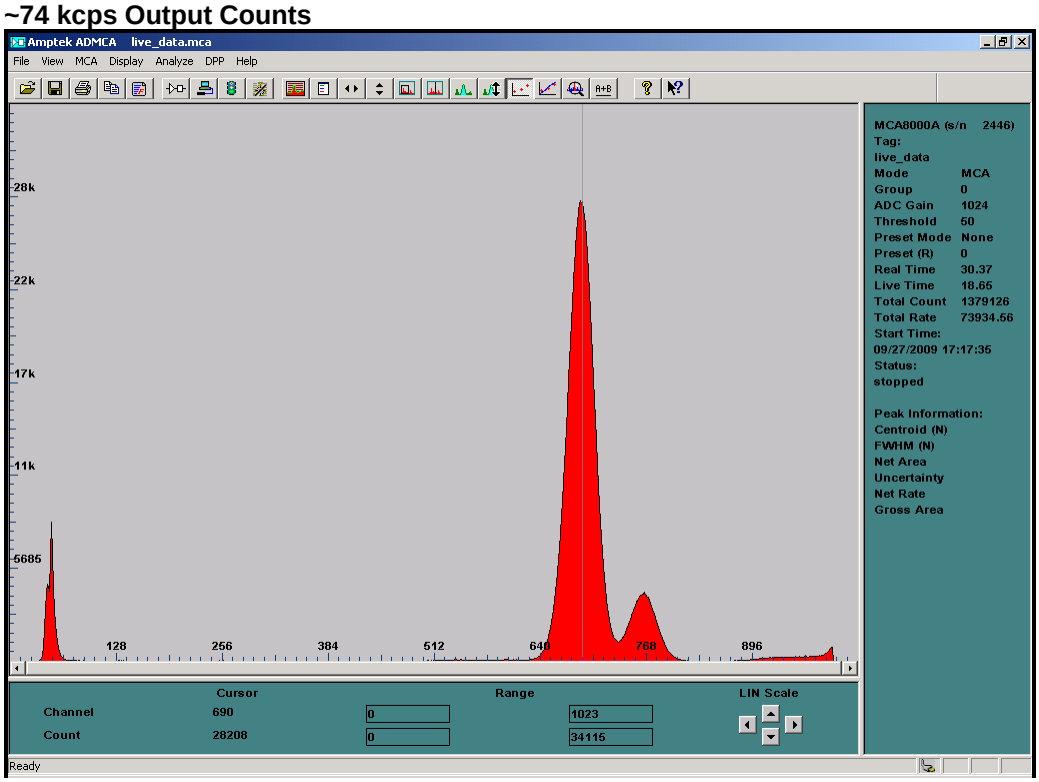
~27 kcps Output Counts



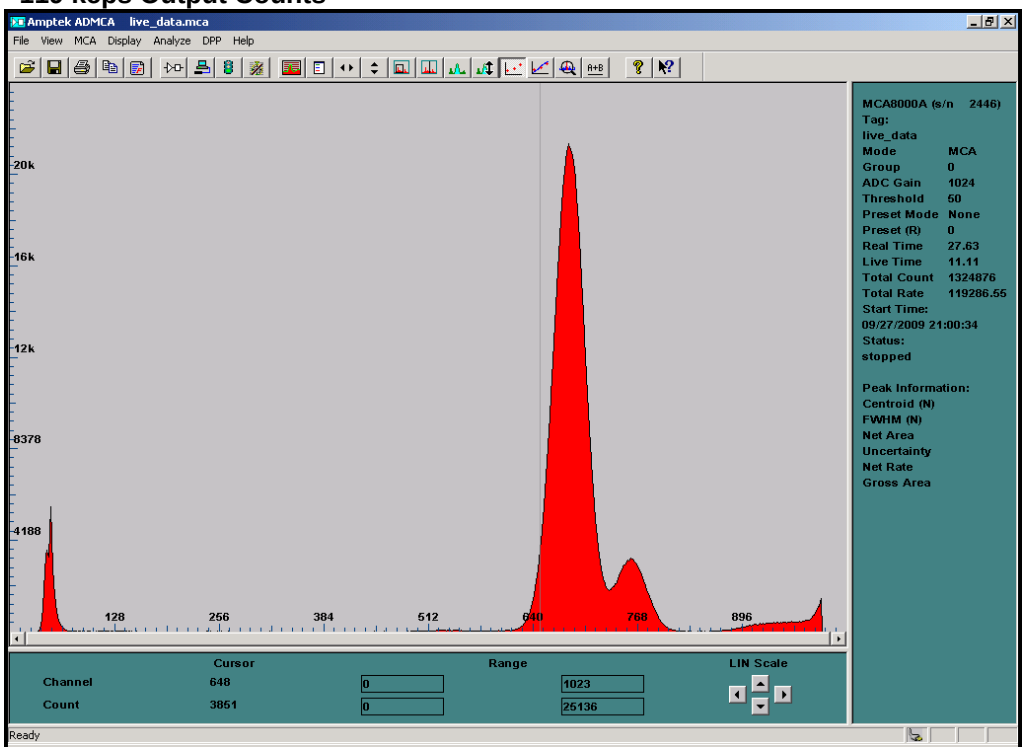
~41 kcps Output Counts



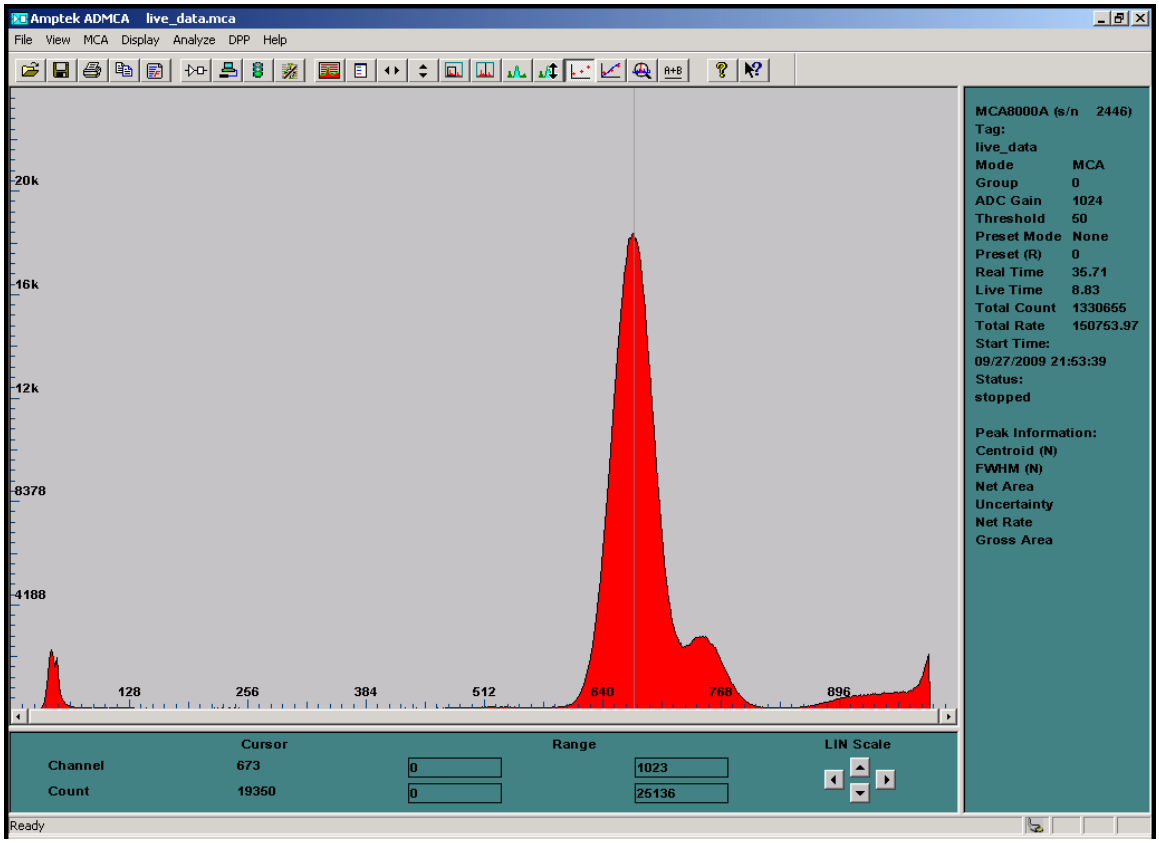
~74 kcps Output Counts



~119 kcps Output Counts

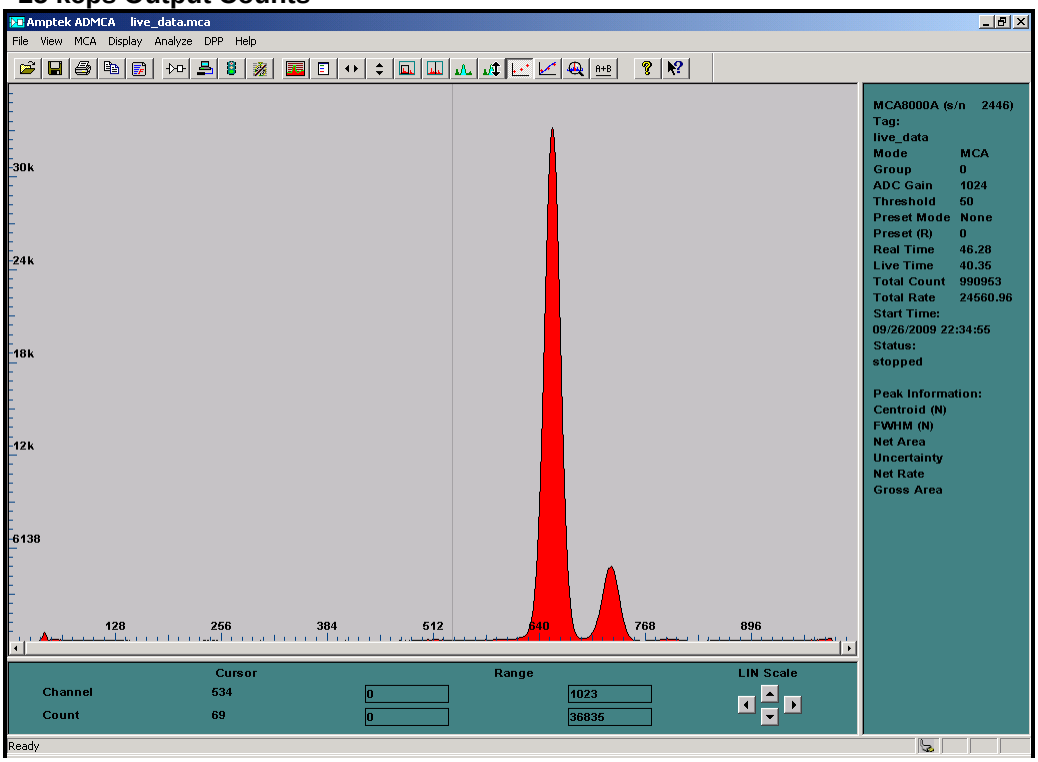


~151 kcps Output Counts

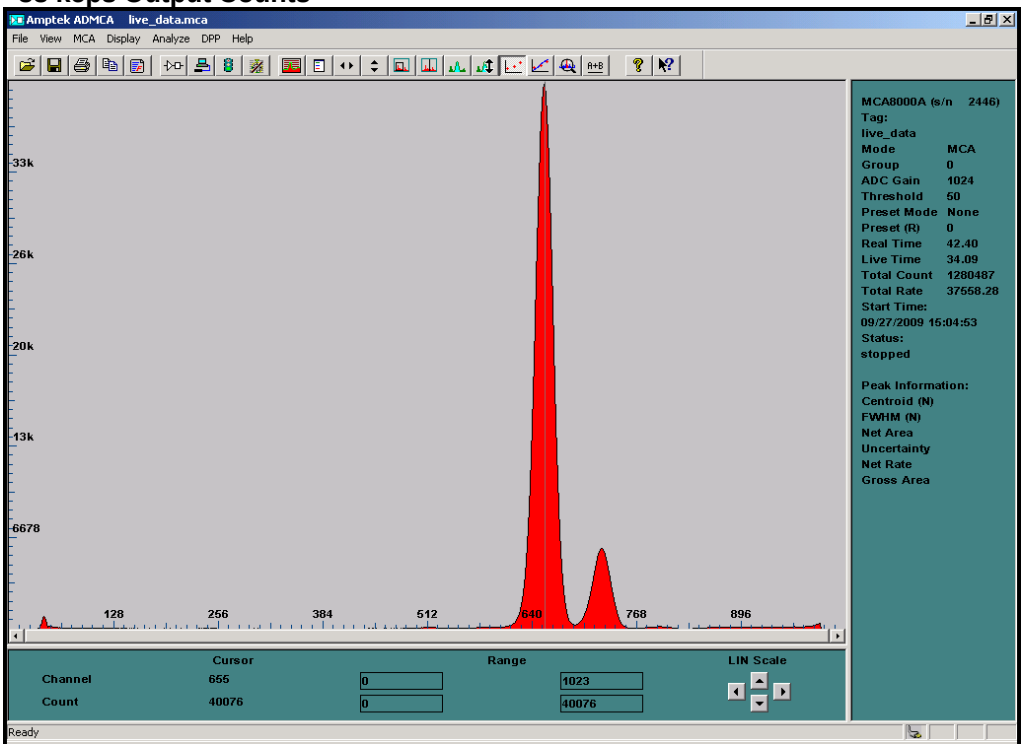


Detector Element=160 Shaping Time = 2 μsec

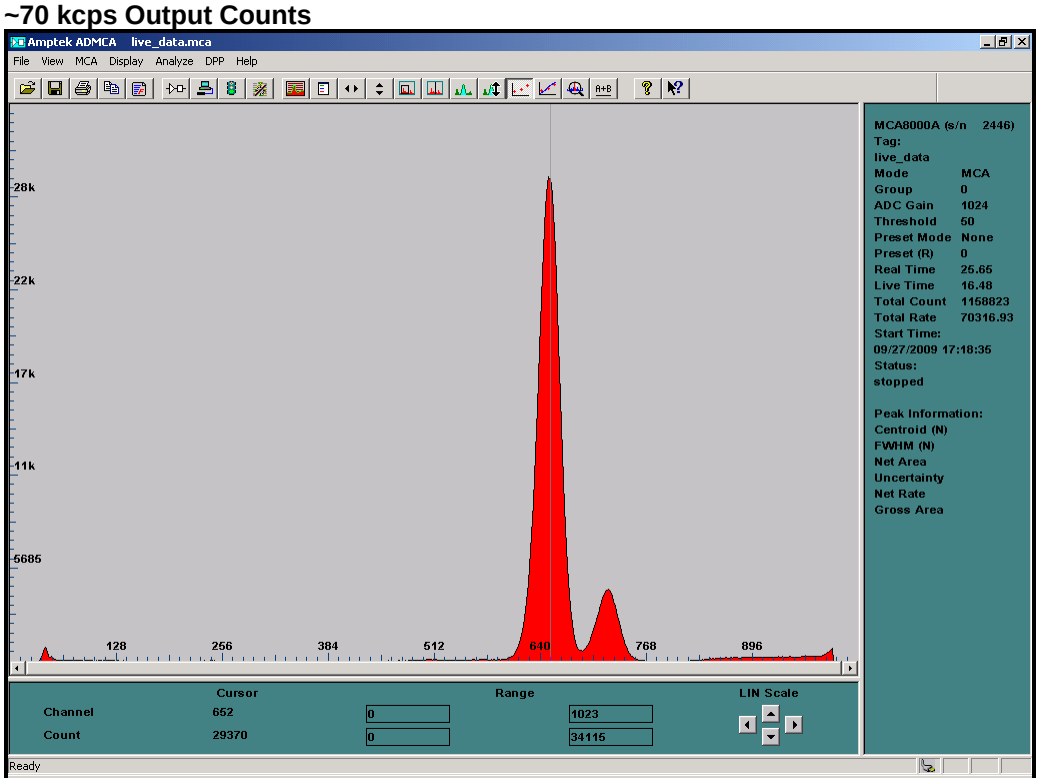
~25 kcps Output Counts



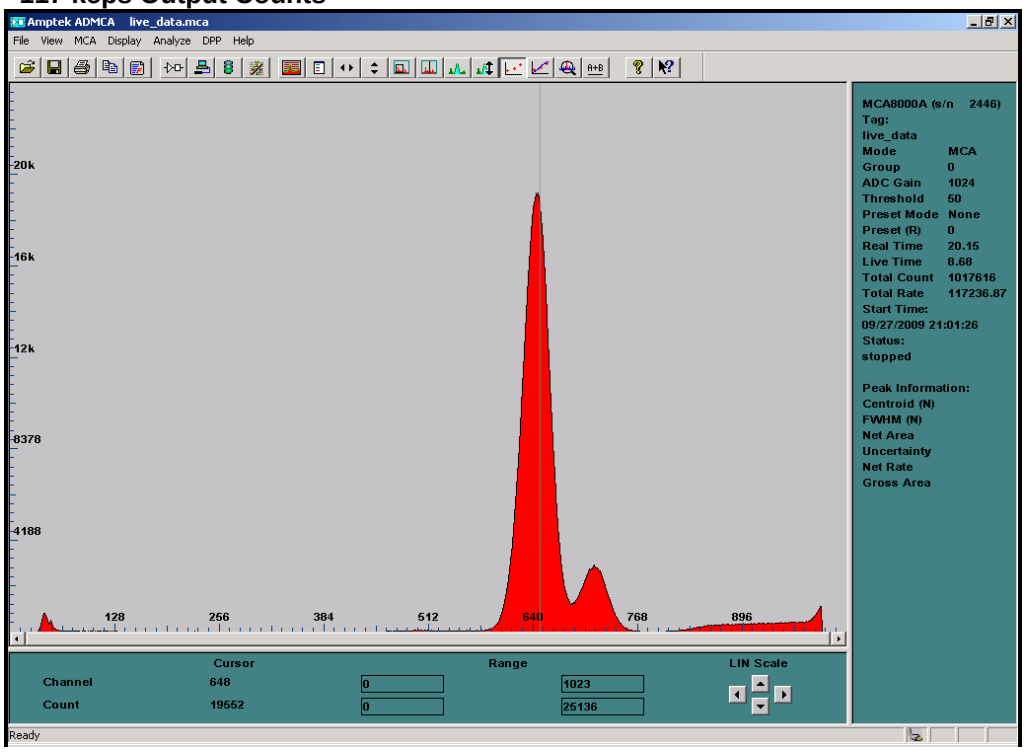
~38 kcps Output Counts



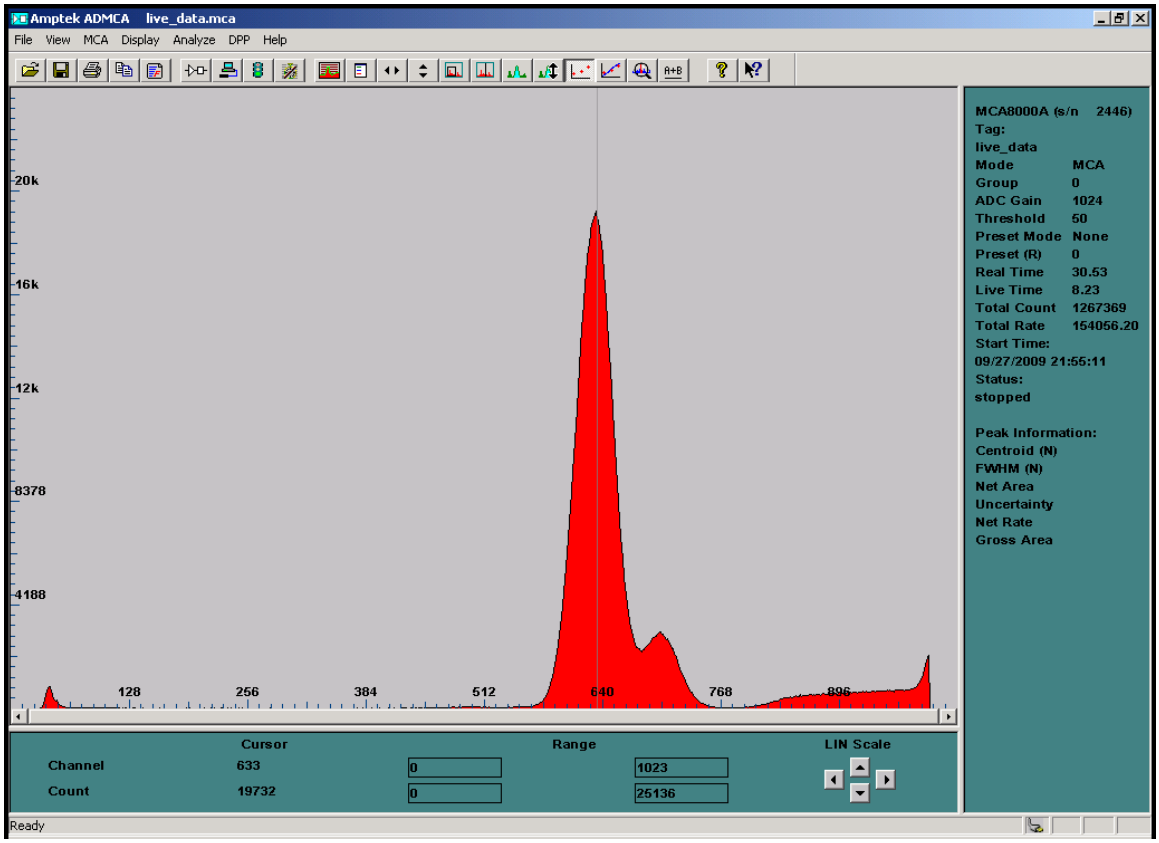
~70 kcps Output Counts



~117 kcps Output Counts

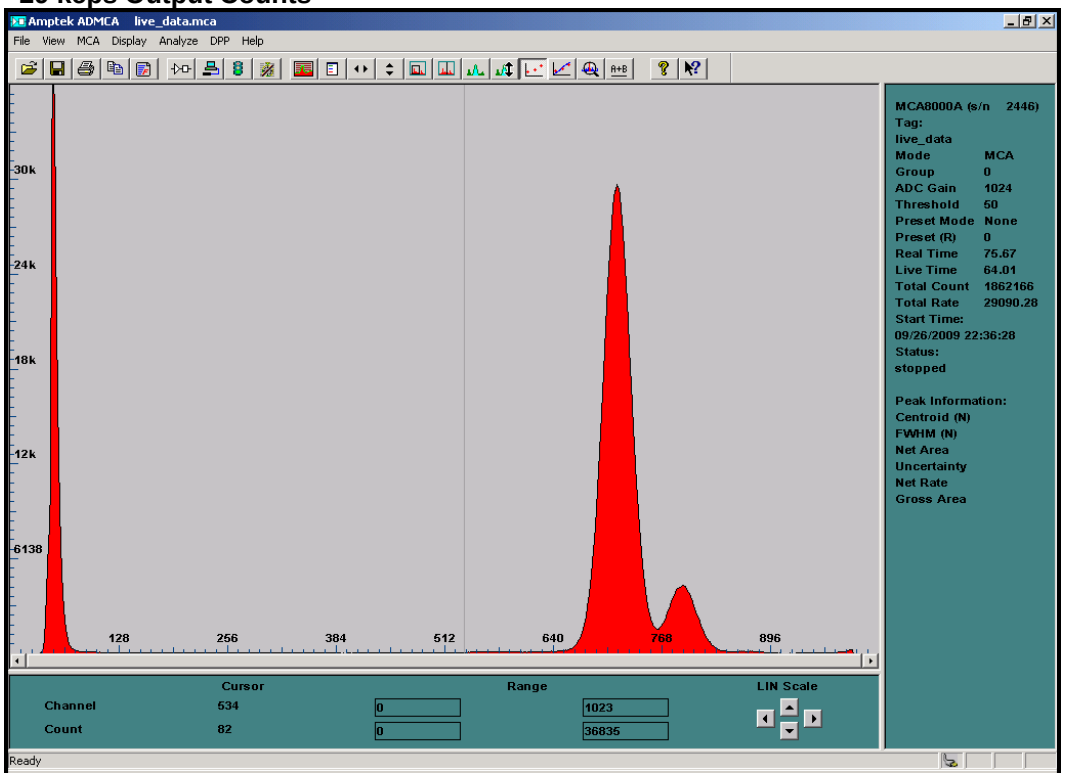


~154 kcps Output Counts

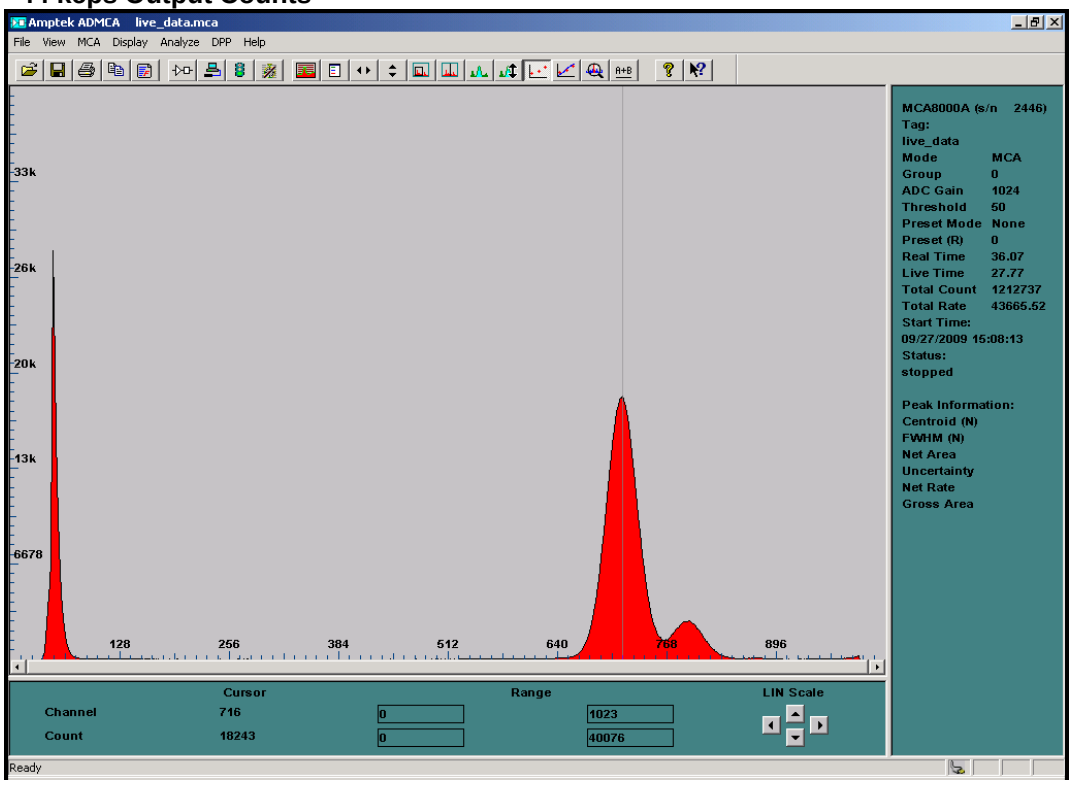


Detector Element=193 Shaping Time = 2 μsec

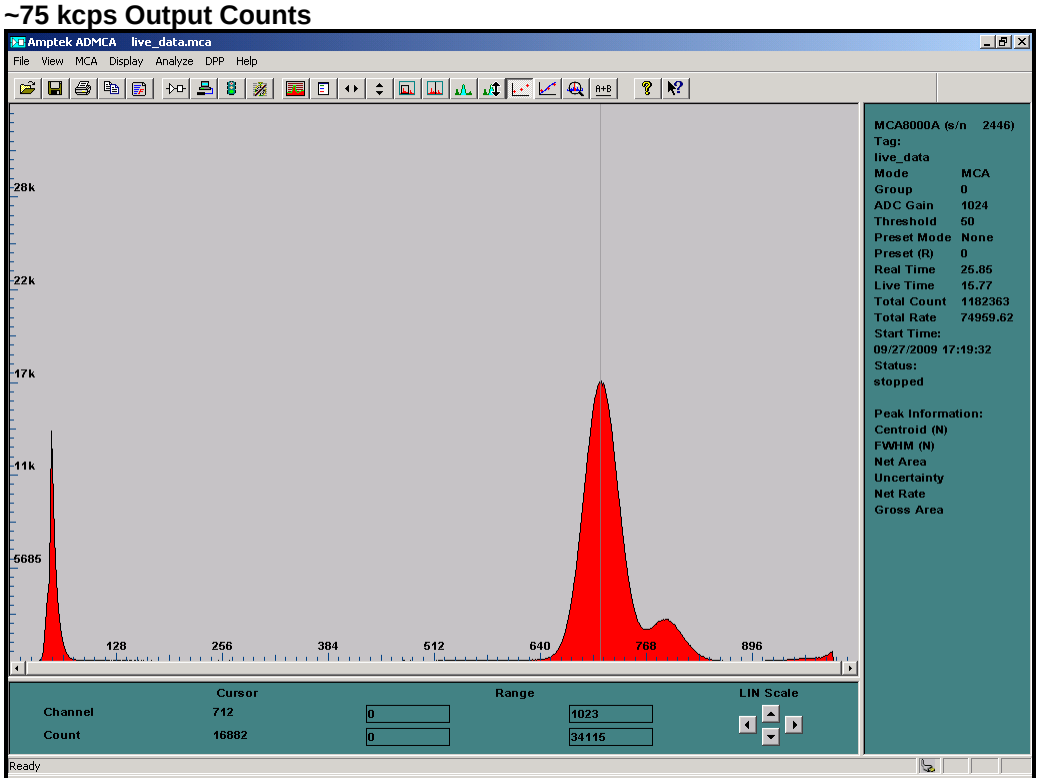
~29 kcps Output Counts



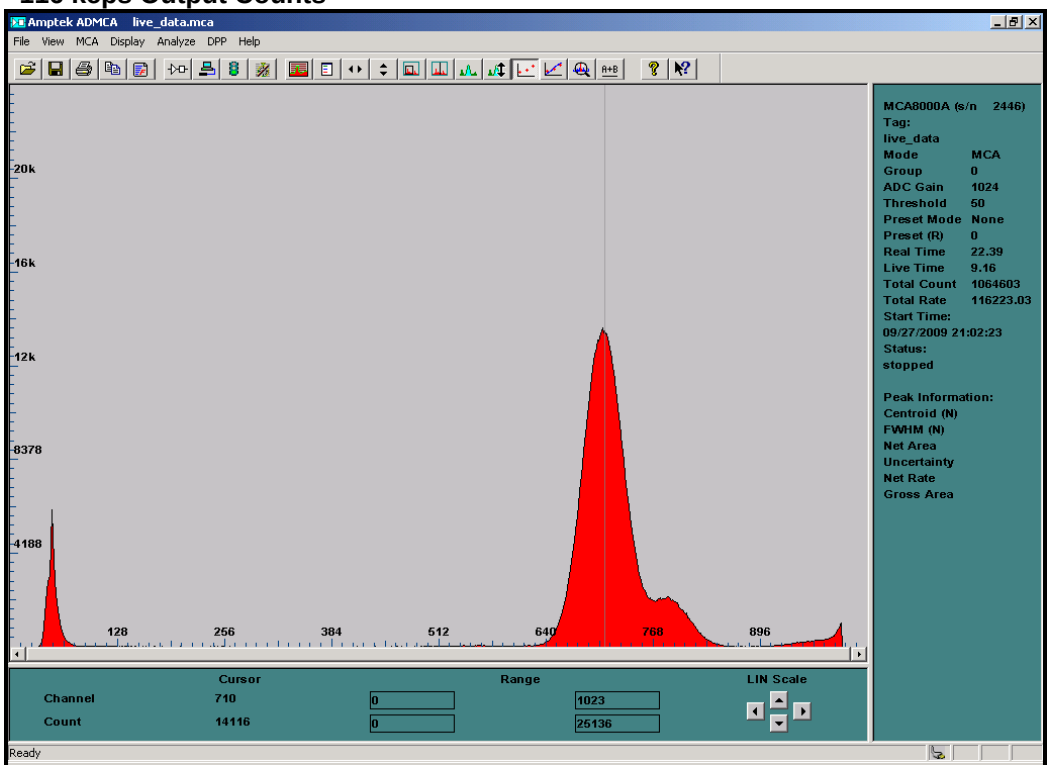
~44 kcps Output Counts



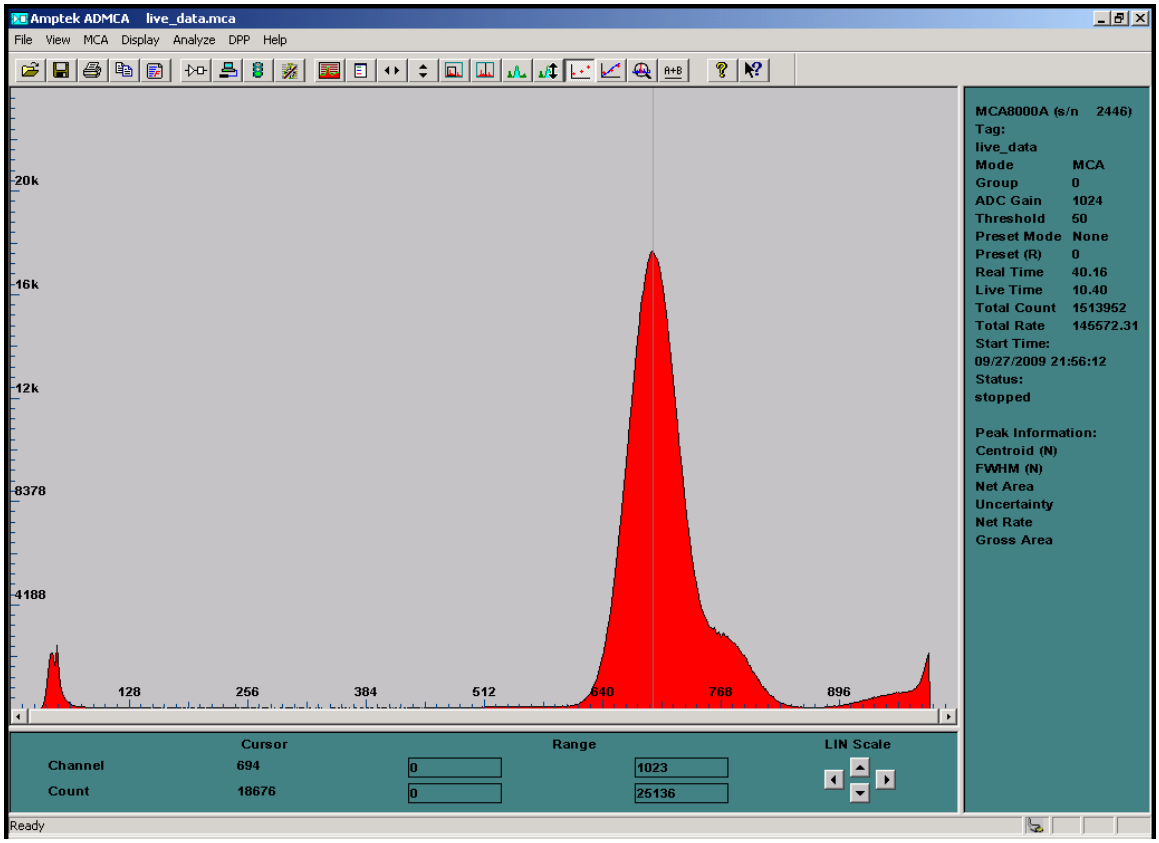
~75 kcps Output Counts



~116 kcps Output Counts

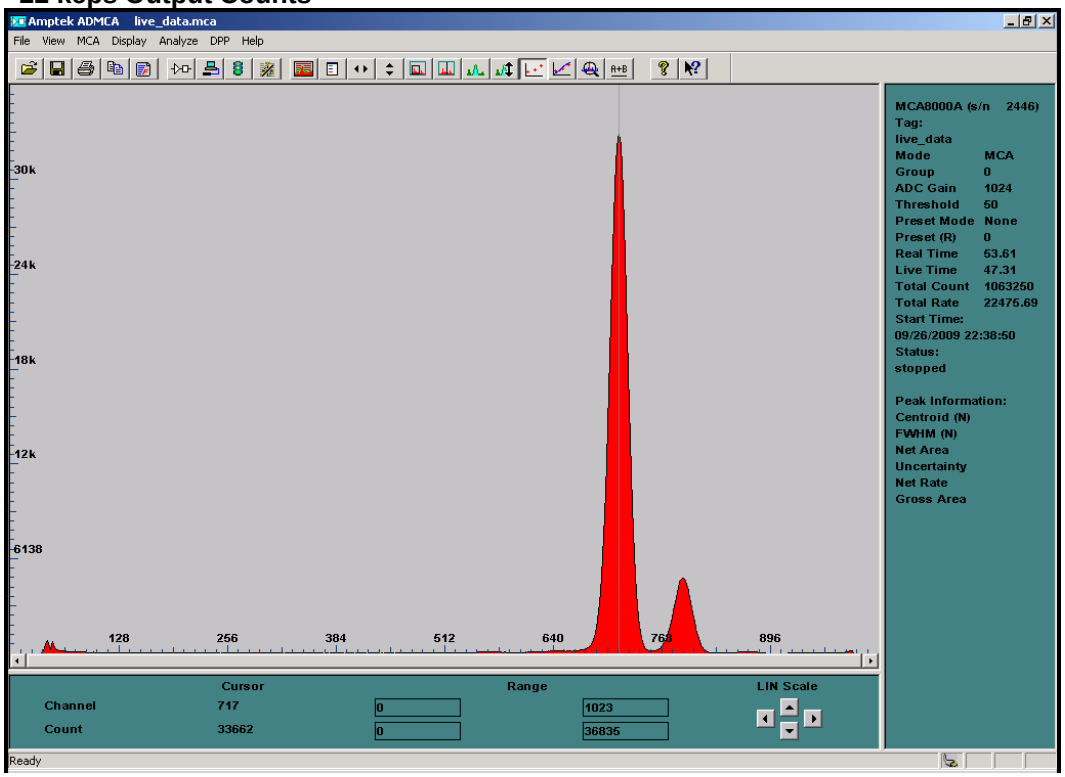


~146 kcps Output Counts

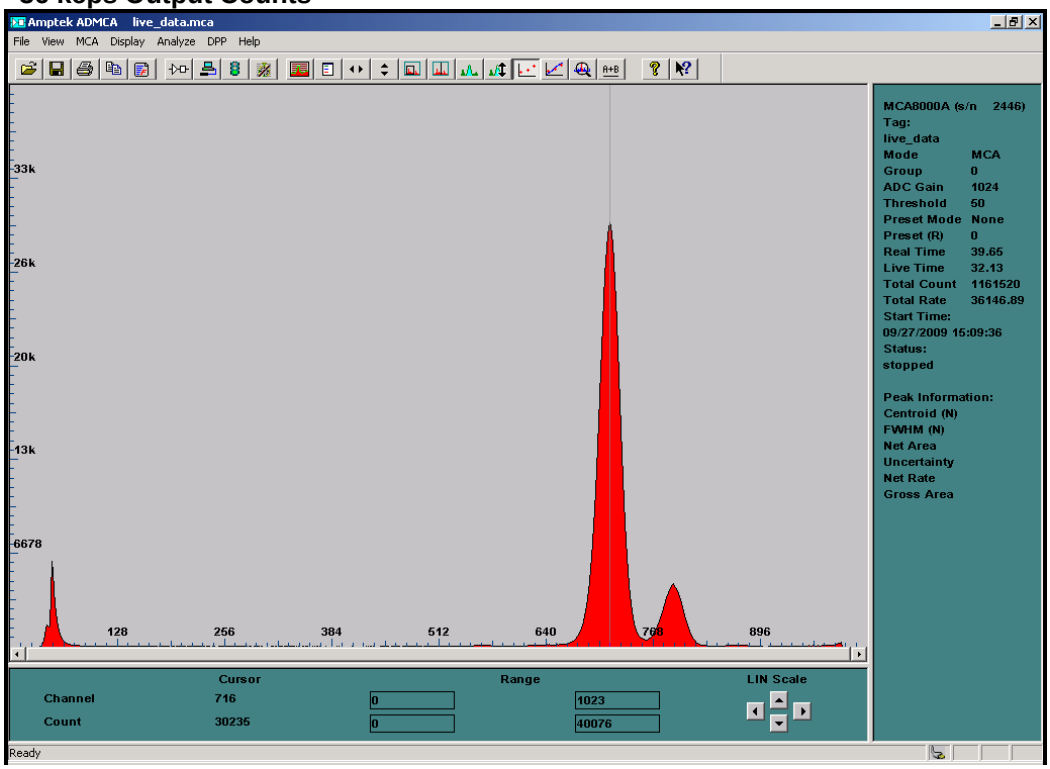


Detector Element=196 Shaping Time = 2 μsec

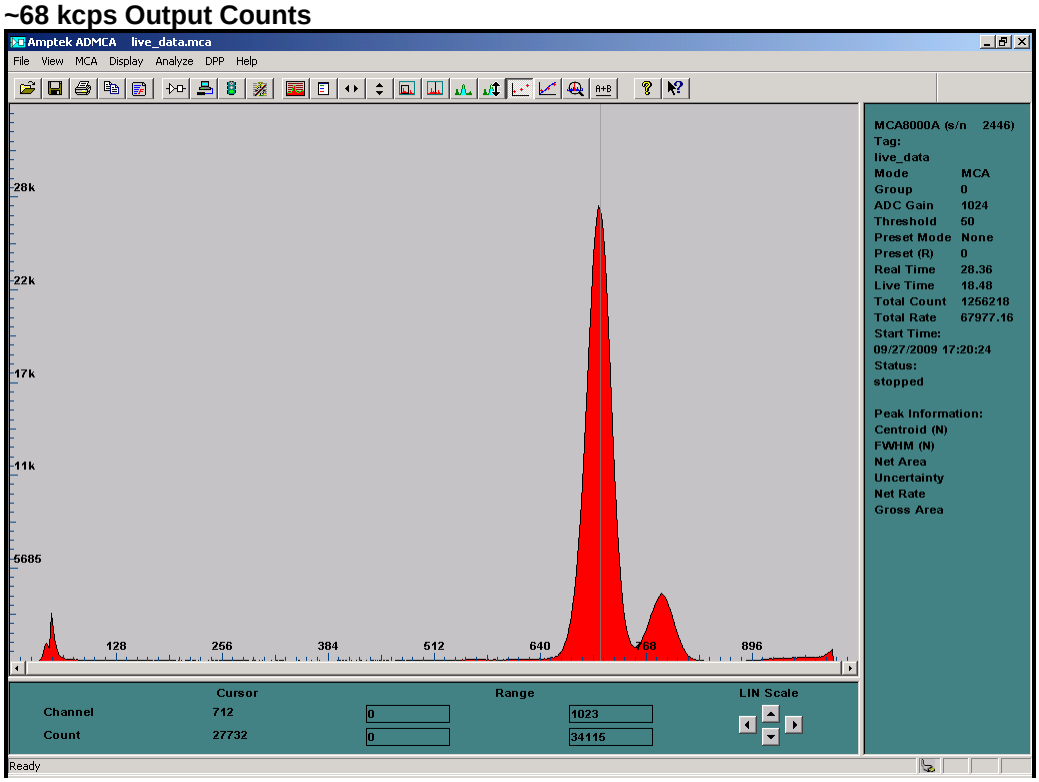
~22 kcps Output Counts



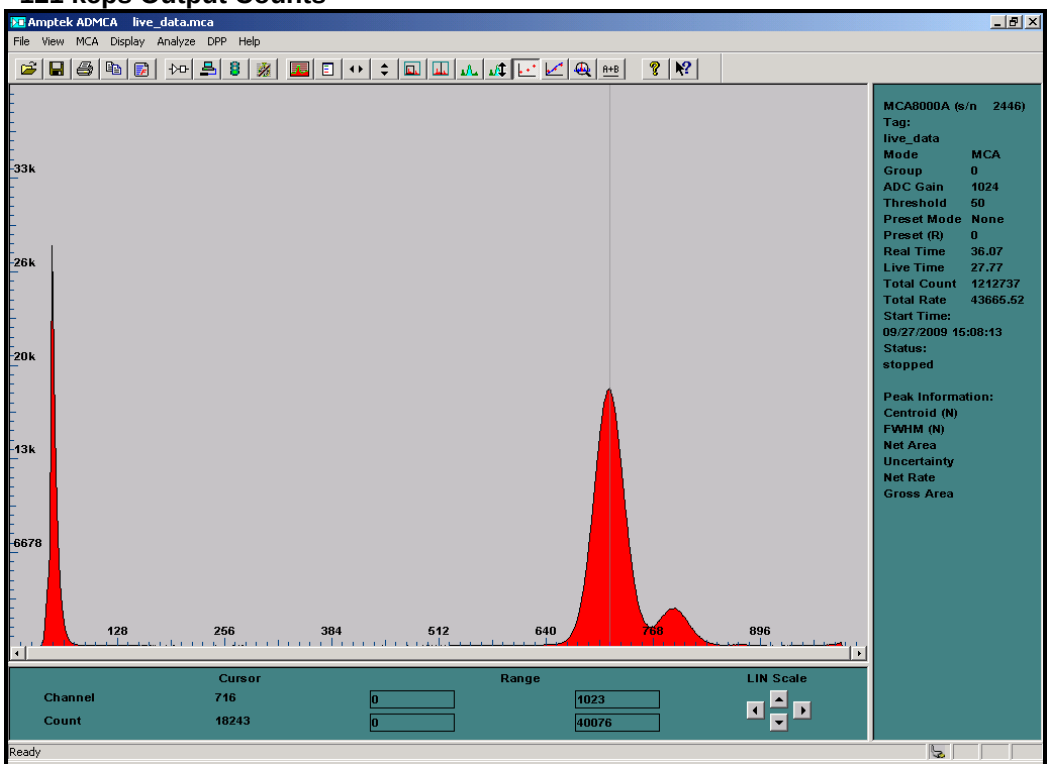
~36 kcps Output Counts



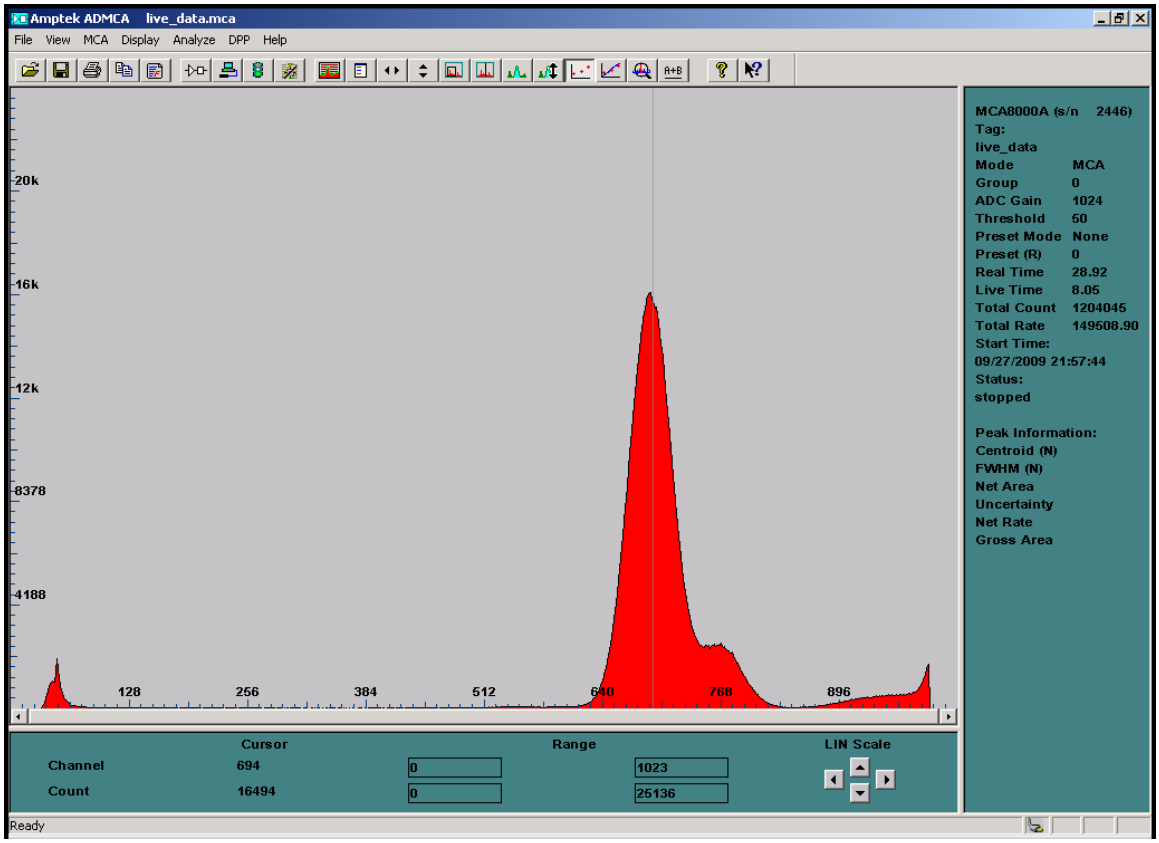
~68 kcps Output Counts



~121 kcps Output Counts

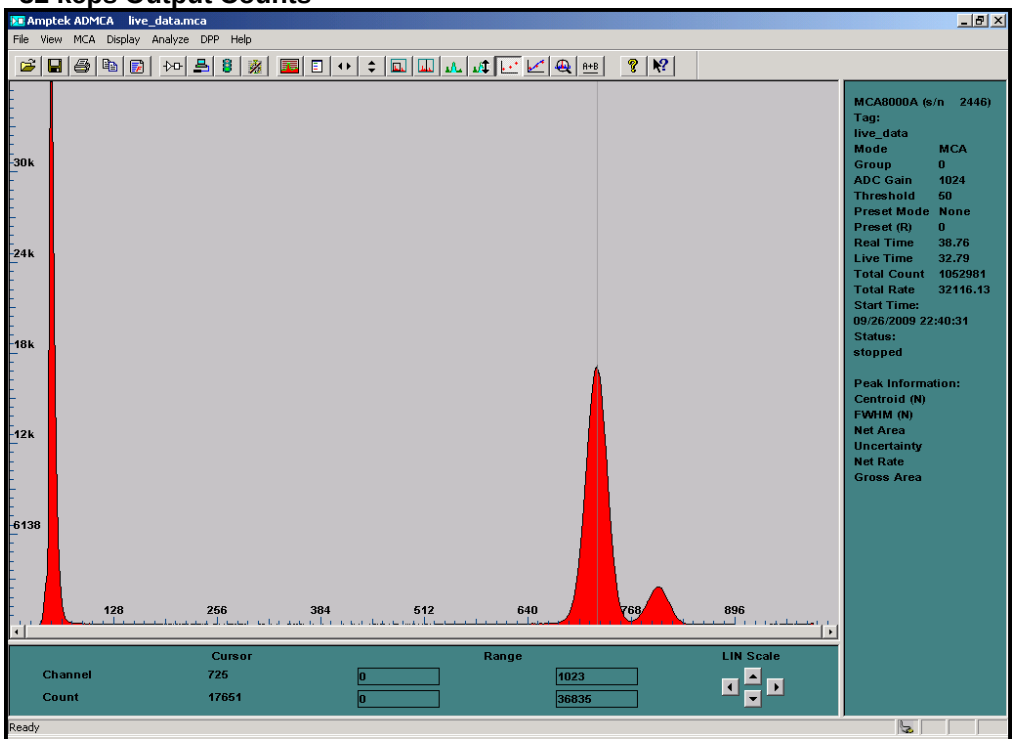


~150 kcps Output Counts

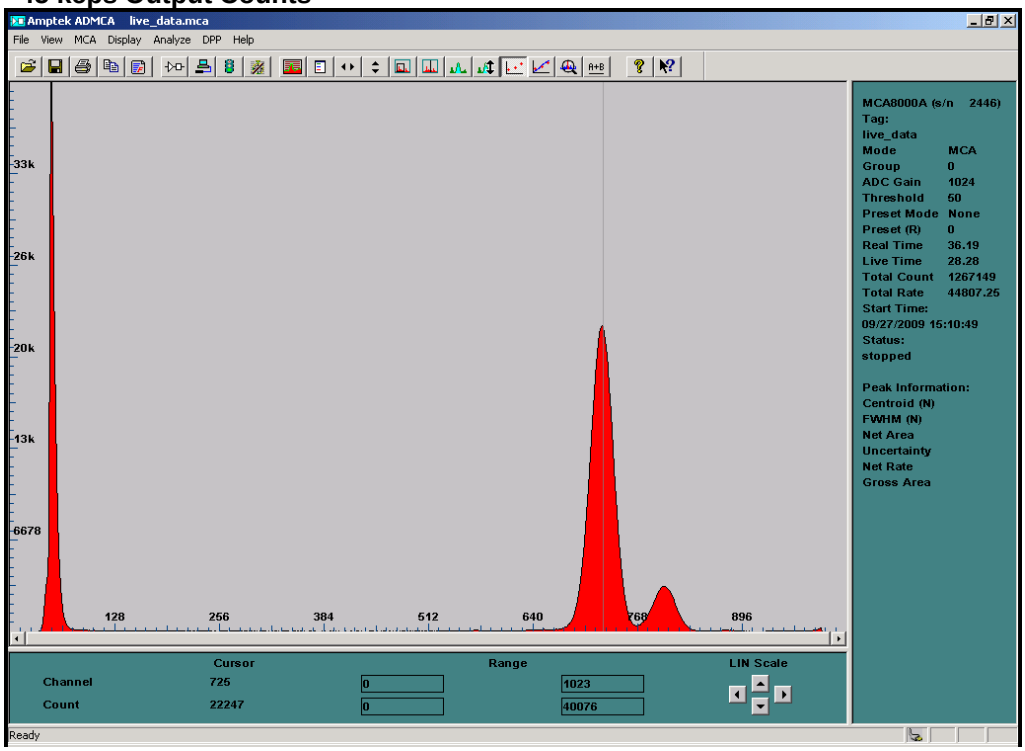


Detector Element=199 Shaping Time = 2 μsec

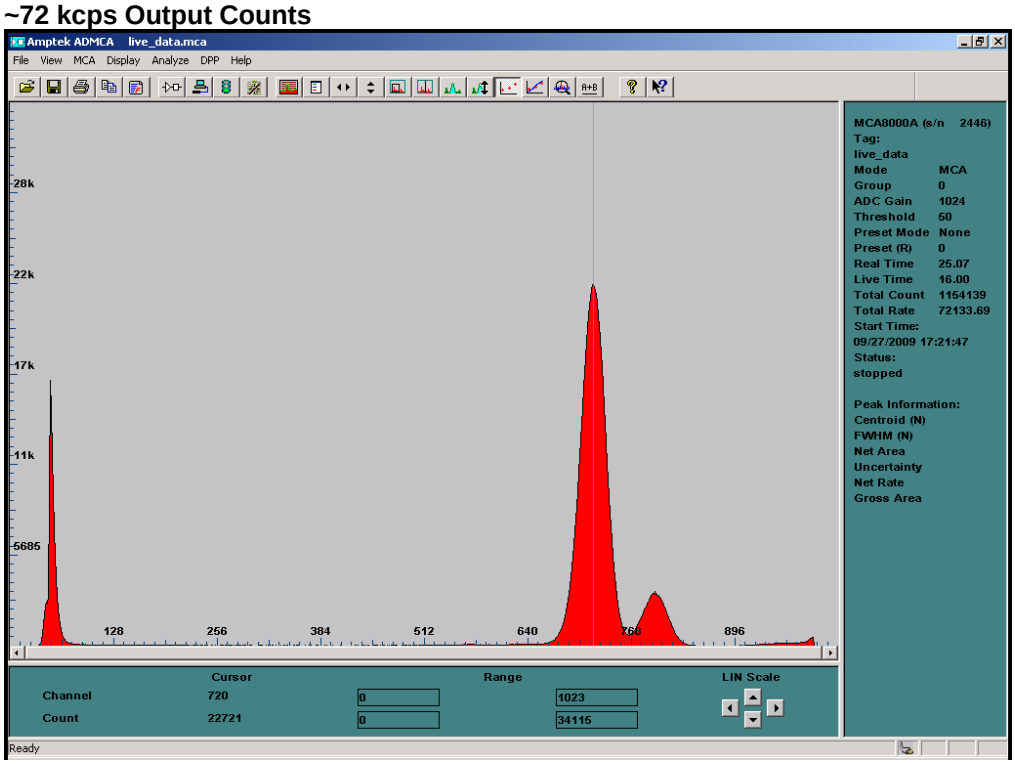
~32 kcps Output Counts



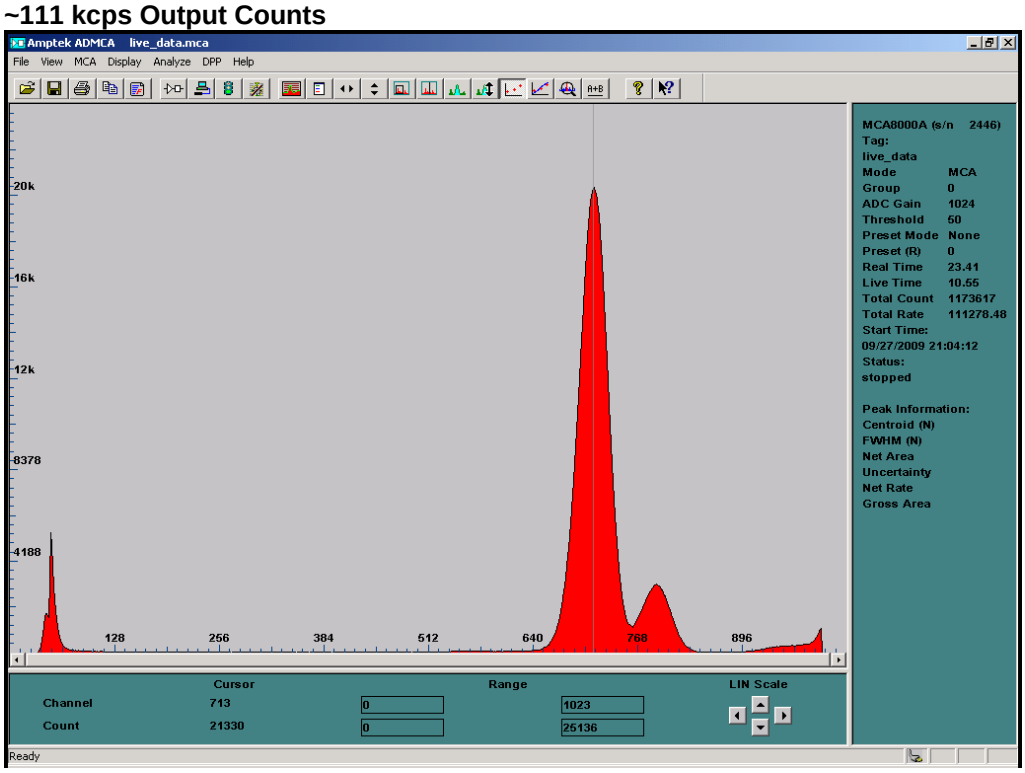
~45 kcps Output Counts



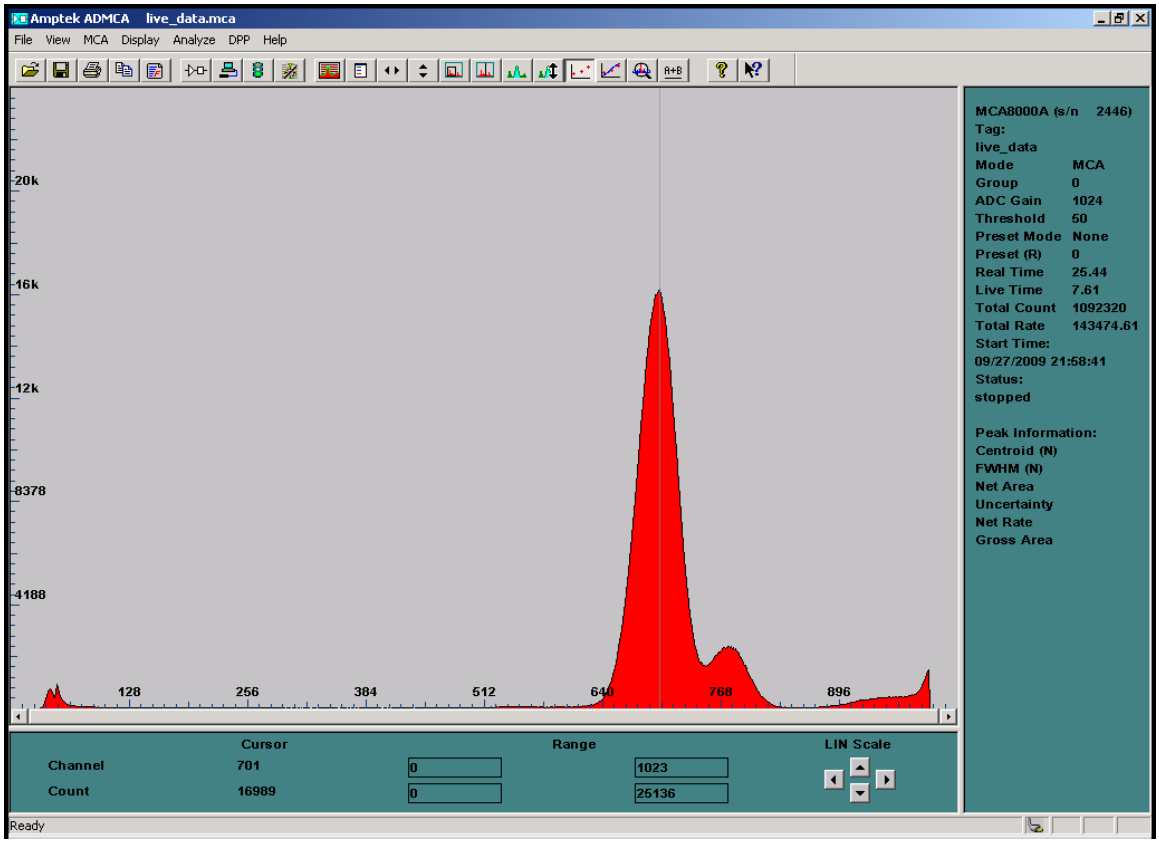
~72 kcps Output Counts



~111 kcps Output Counts

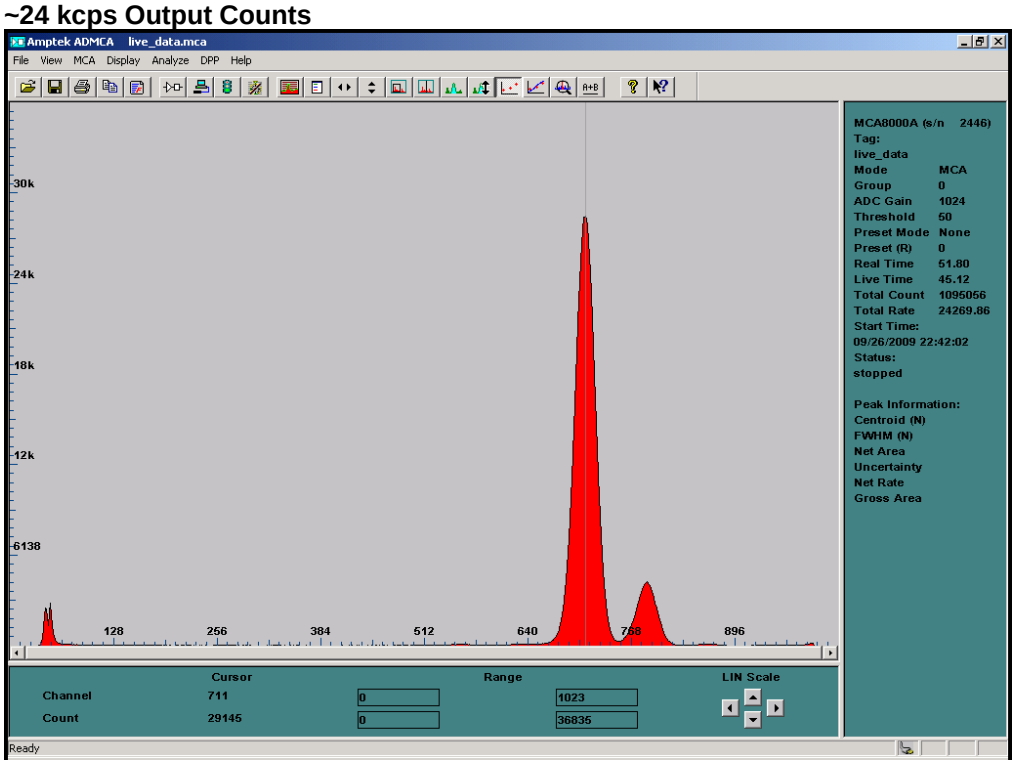


~143 kcps Output Counts

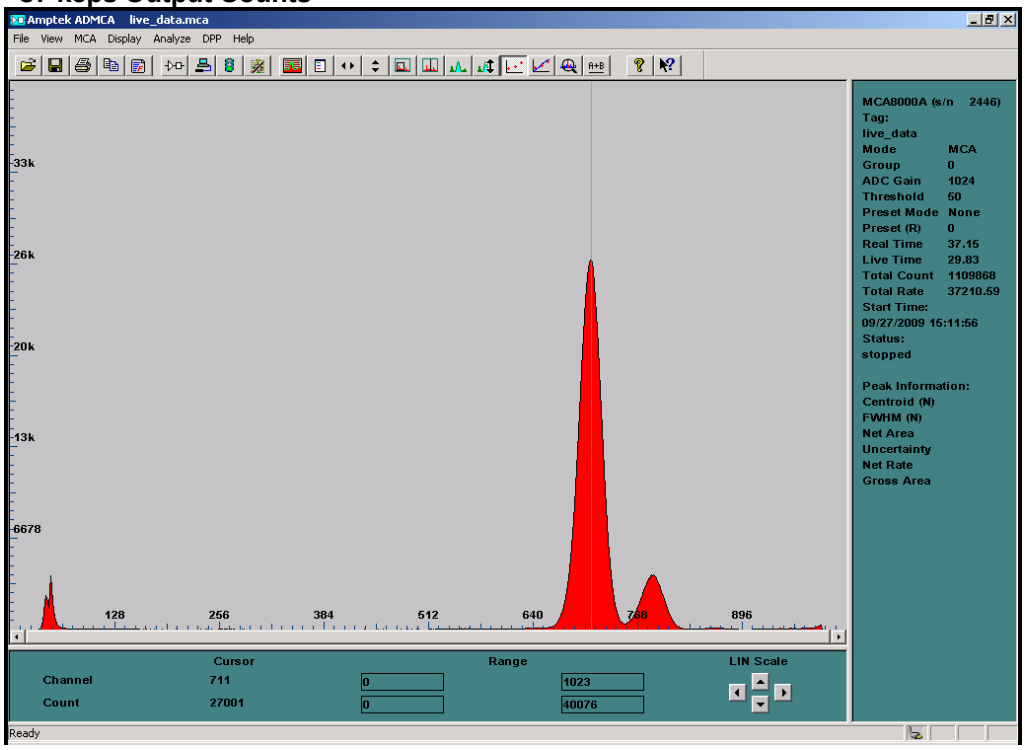


Detector Element=209 Shaping Time = 2 μsec

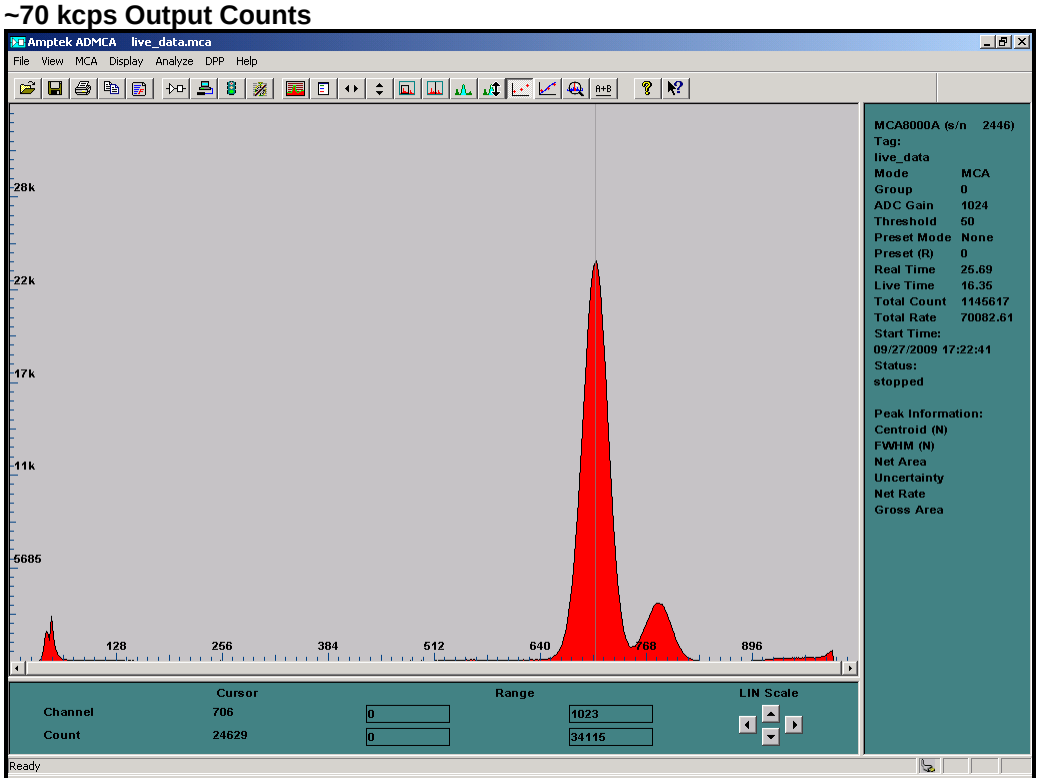
~24 kcps Output Counts



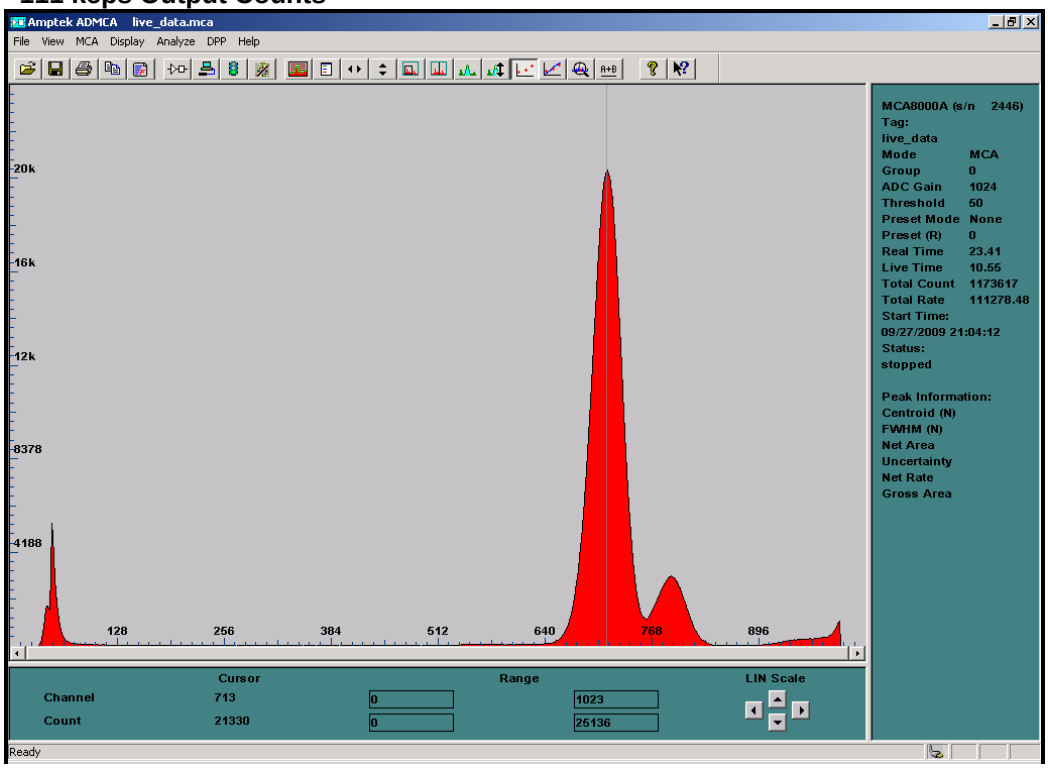
~37 kcps Output Counts



~70 kcps Output Counts

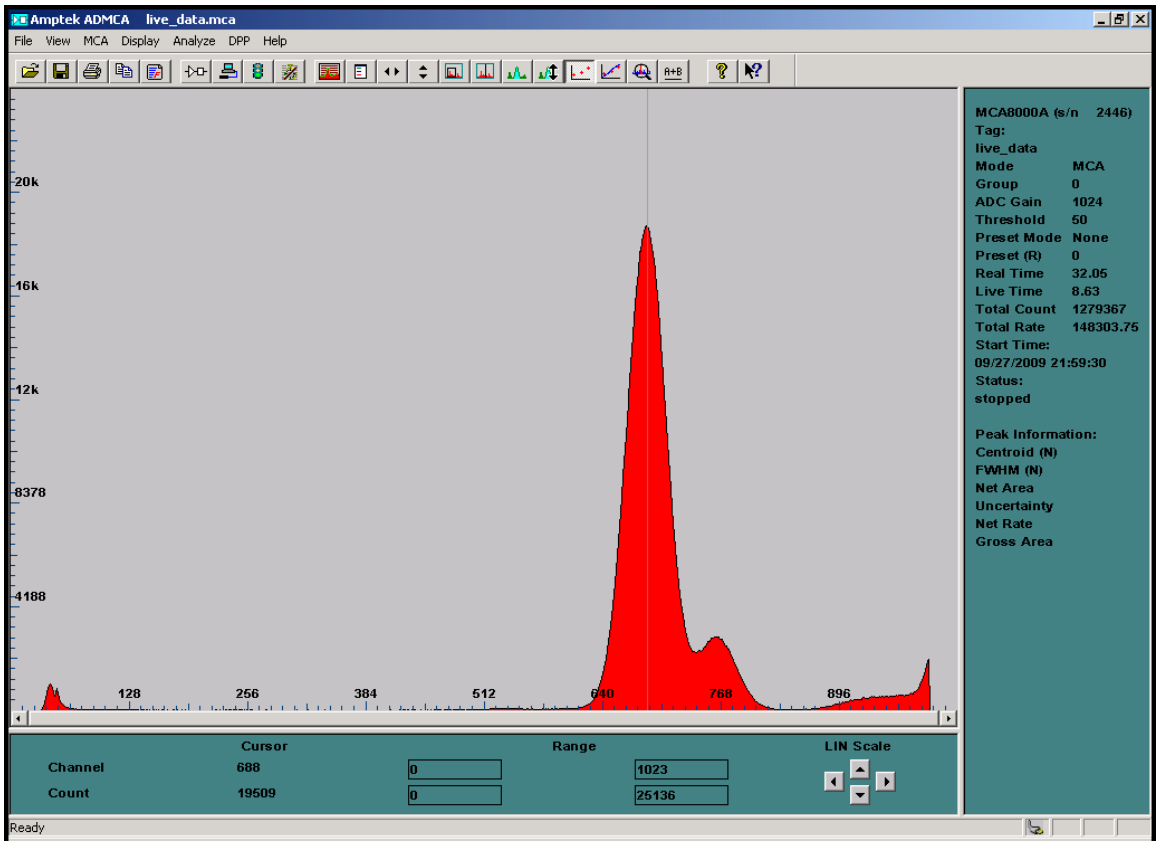


~111 kcps Output Counts



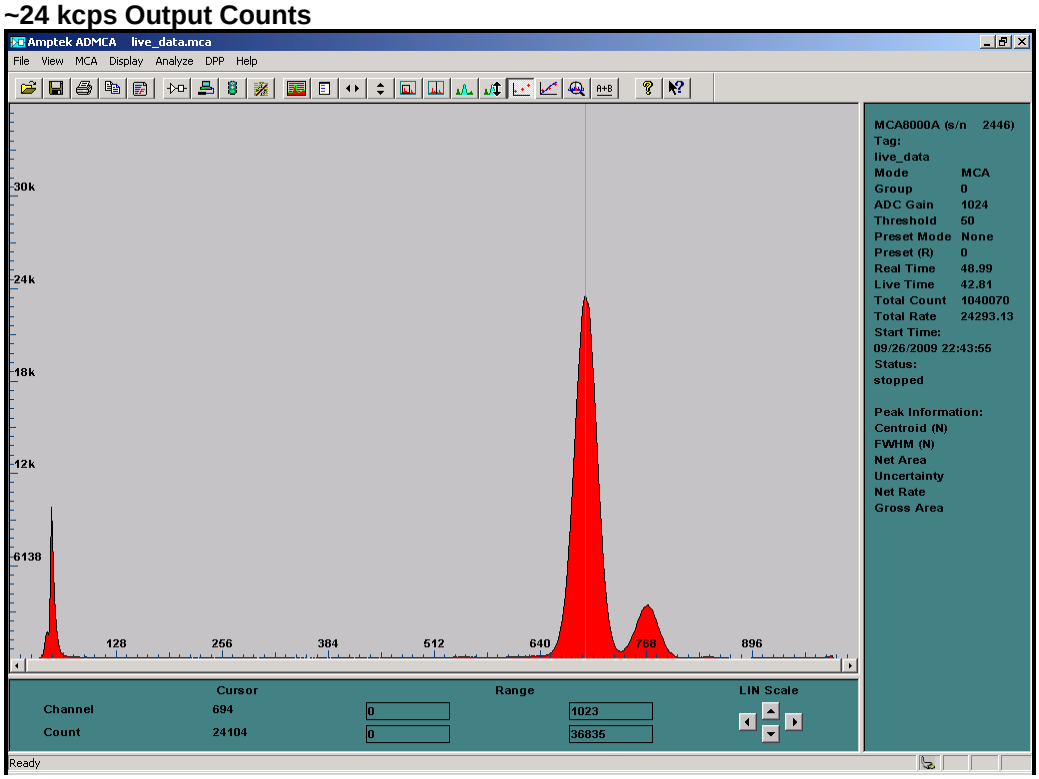
]

~148 kcps Output Counts

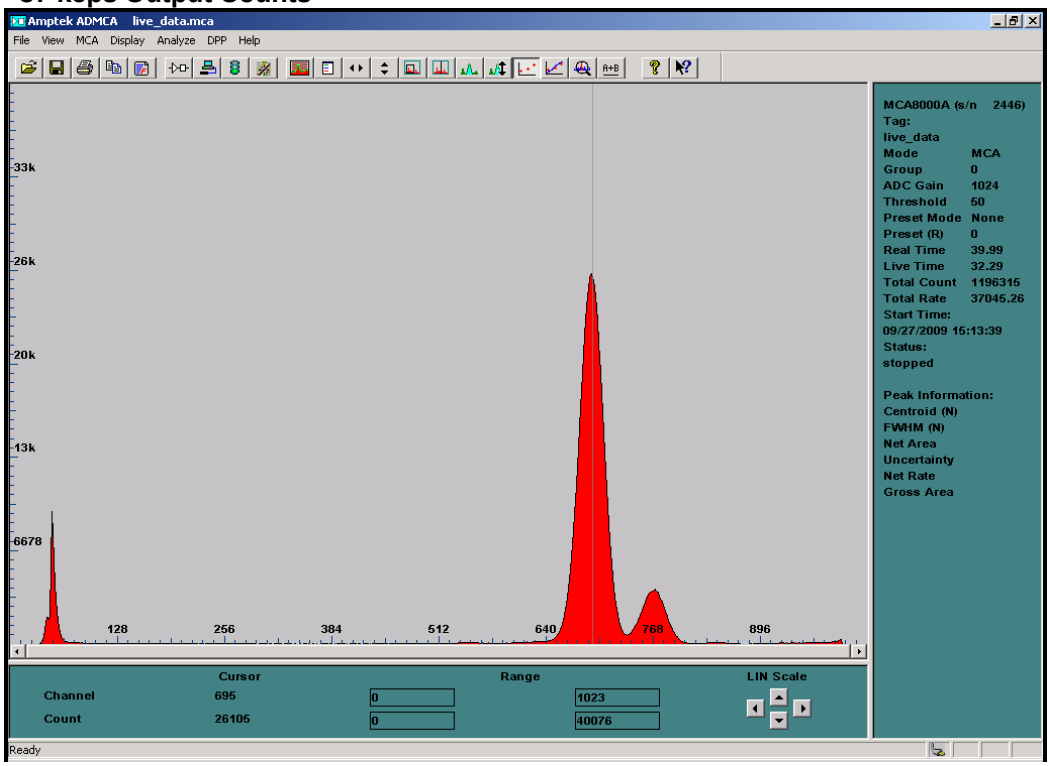


Detector Element=212 Shaping Time = 2 μsec

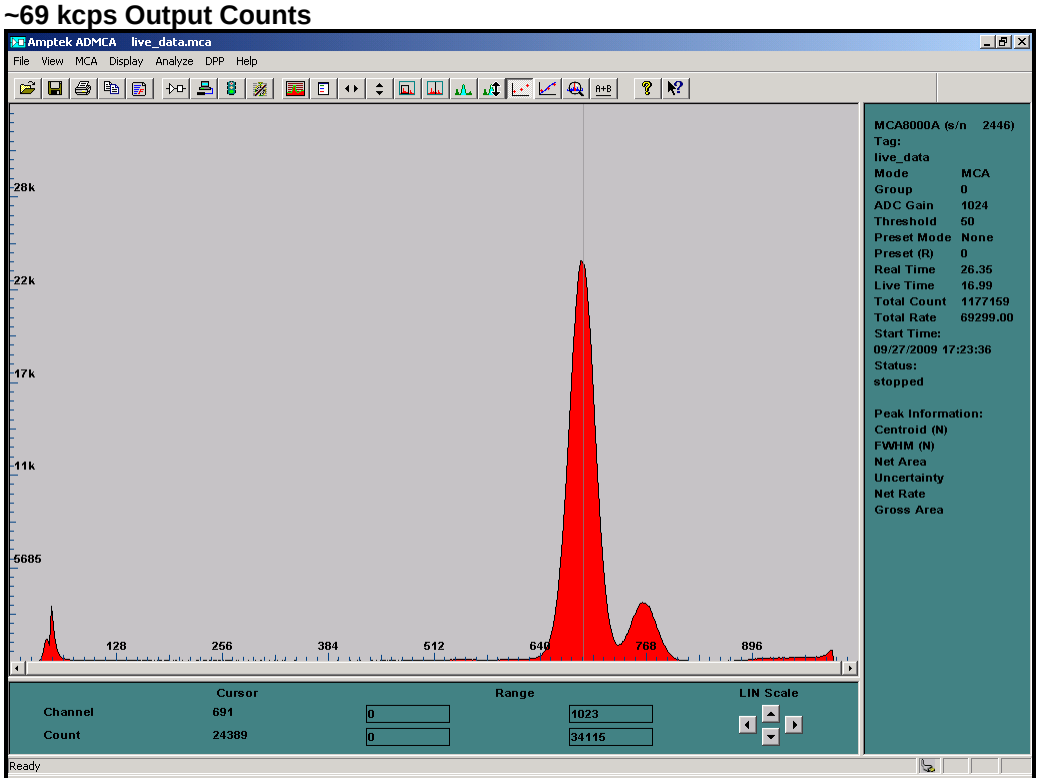
~24 kcps Output Counts



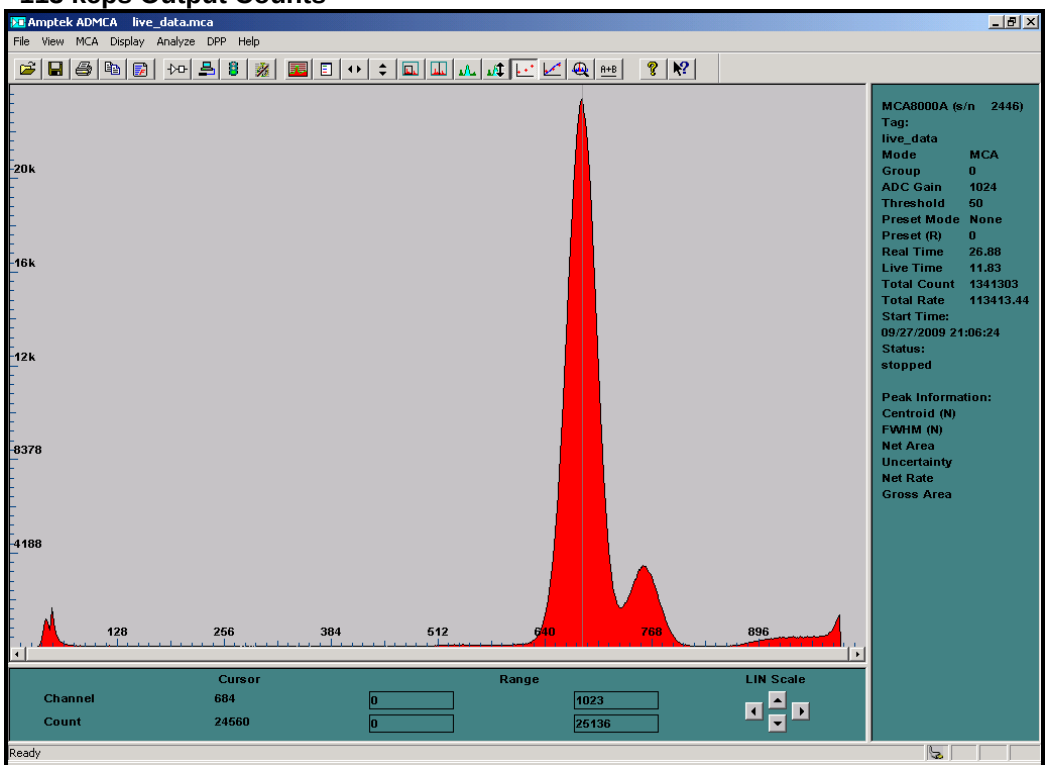
~37 kcps Output Counts



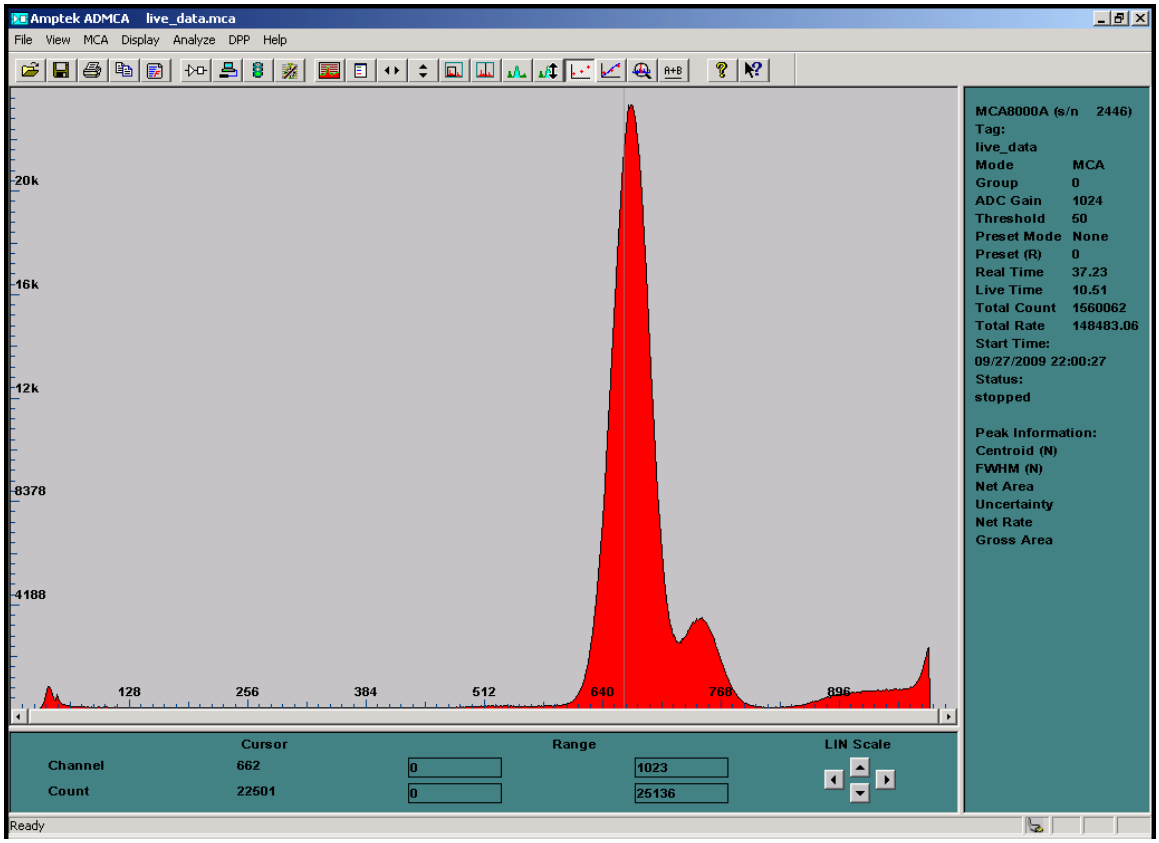
~69 kcps Output Counts



~113 kcps Output Counts

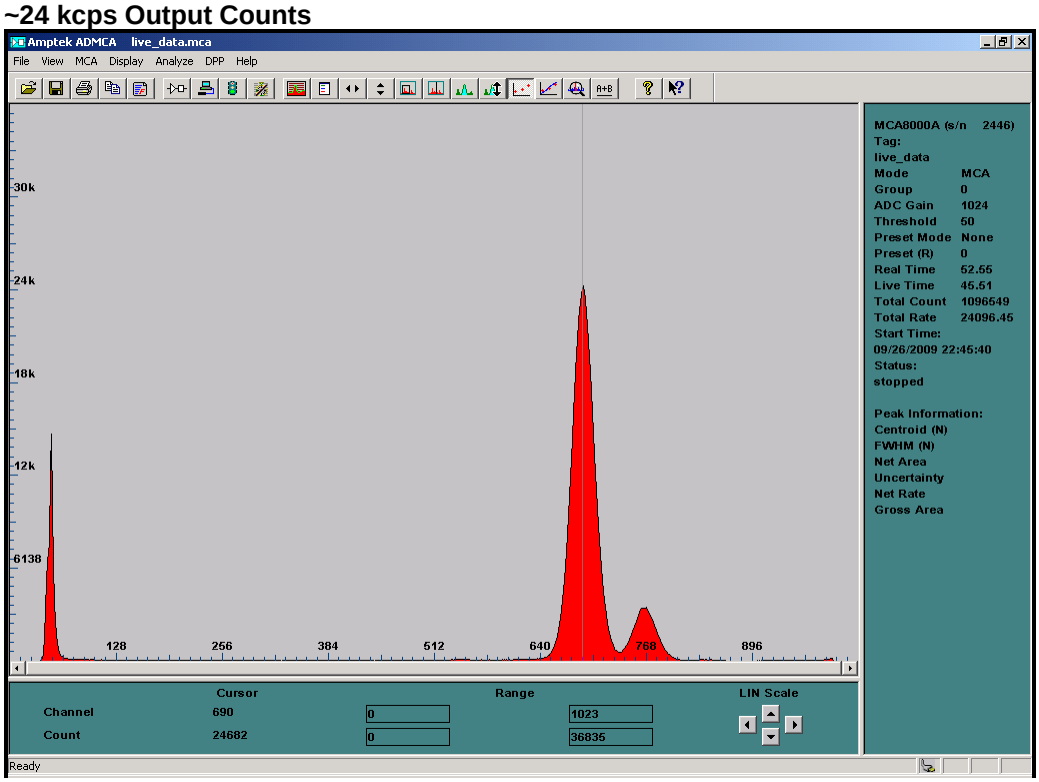


~148 kcps Output Counts

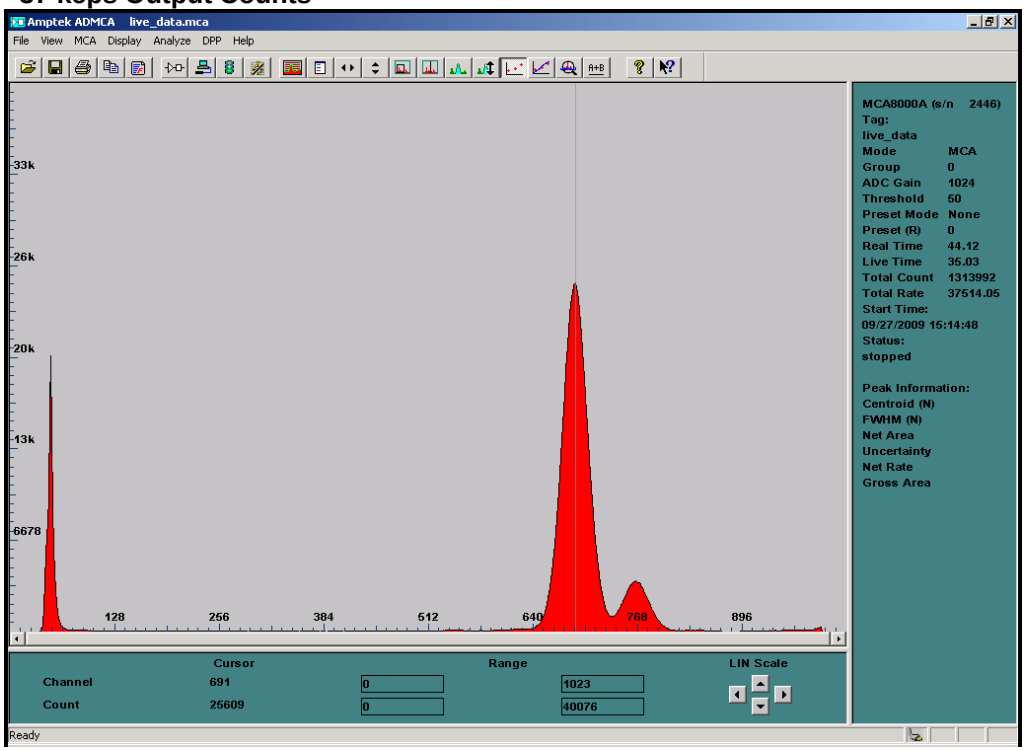


Detector Element=223 Shaping Time = 2 μsec

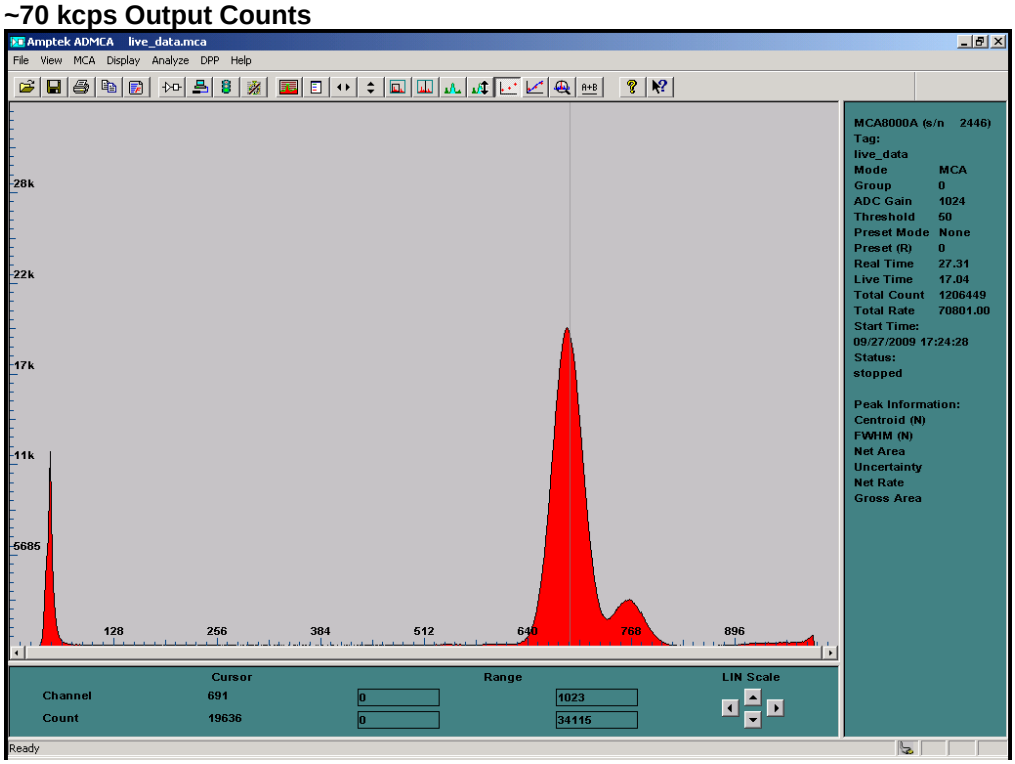
~24 kcps Output Counts



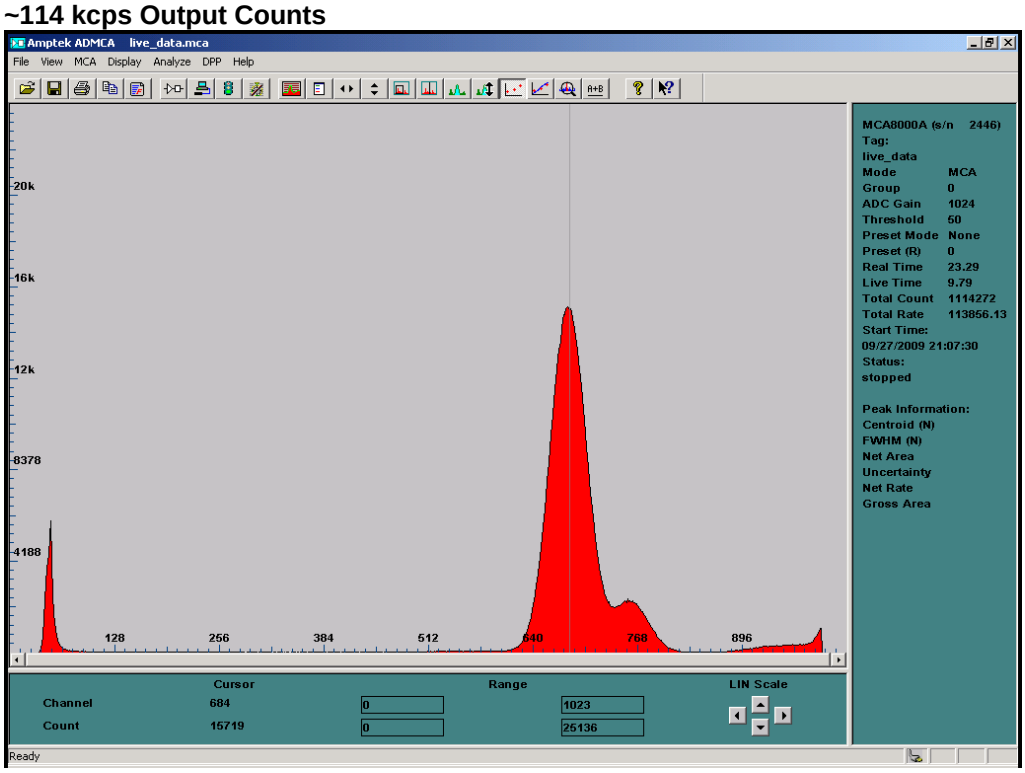
~37 kcps Output Counts



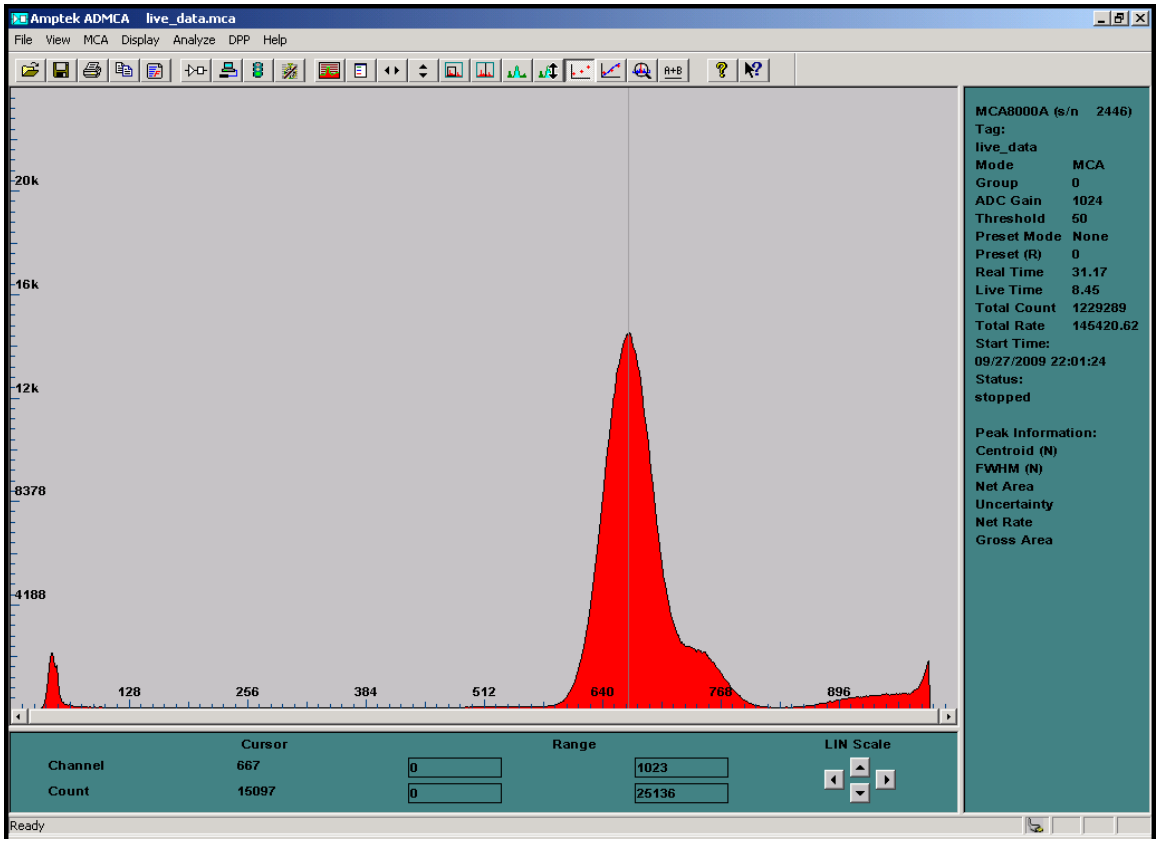
~70 kcps Output Counts



~114 kcps Output Counts

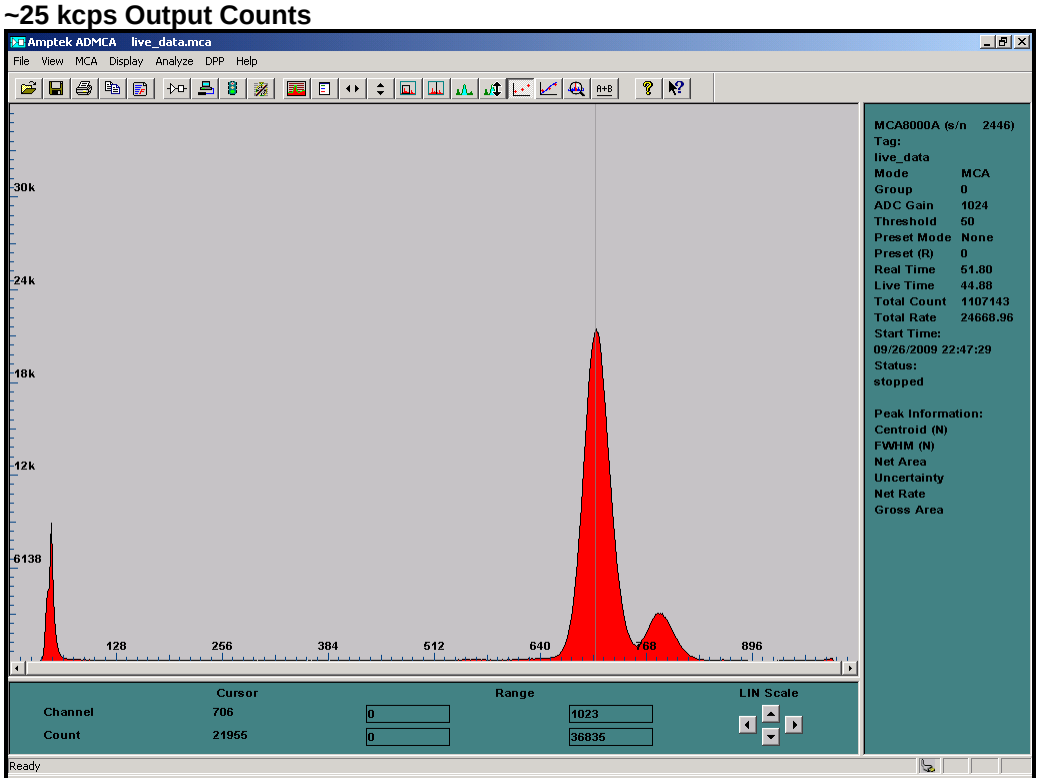


~145 kcps Output Counts

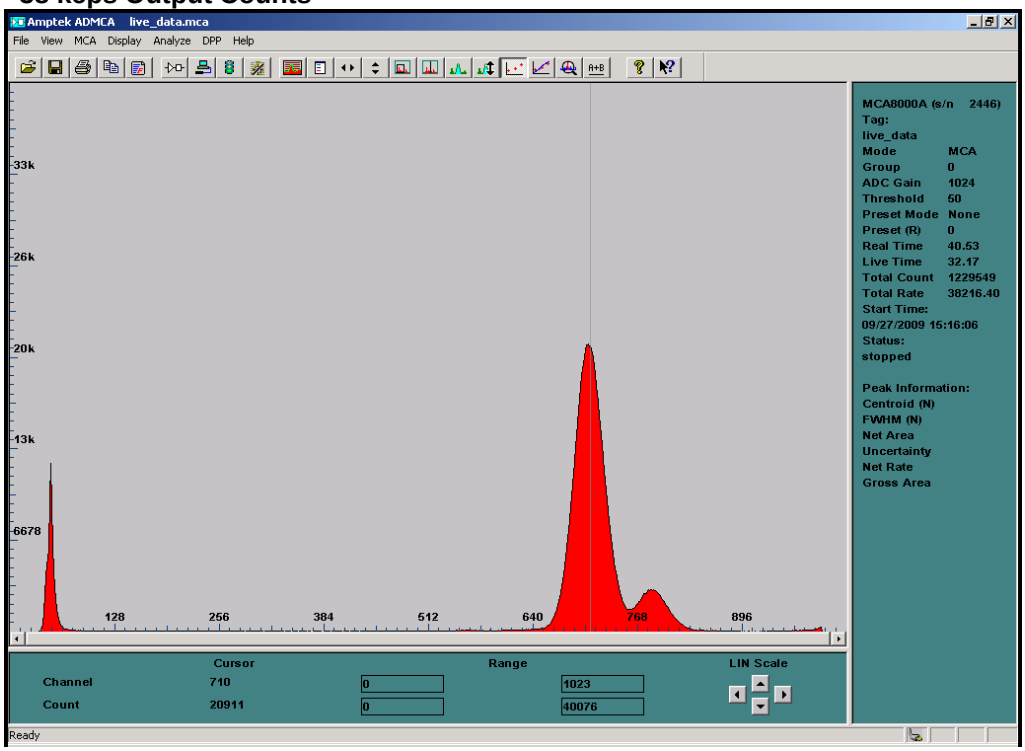


Detector Element=234 Shaping Time = 2 μsec

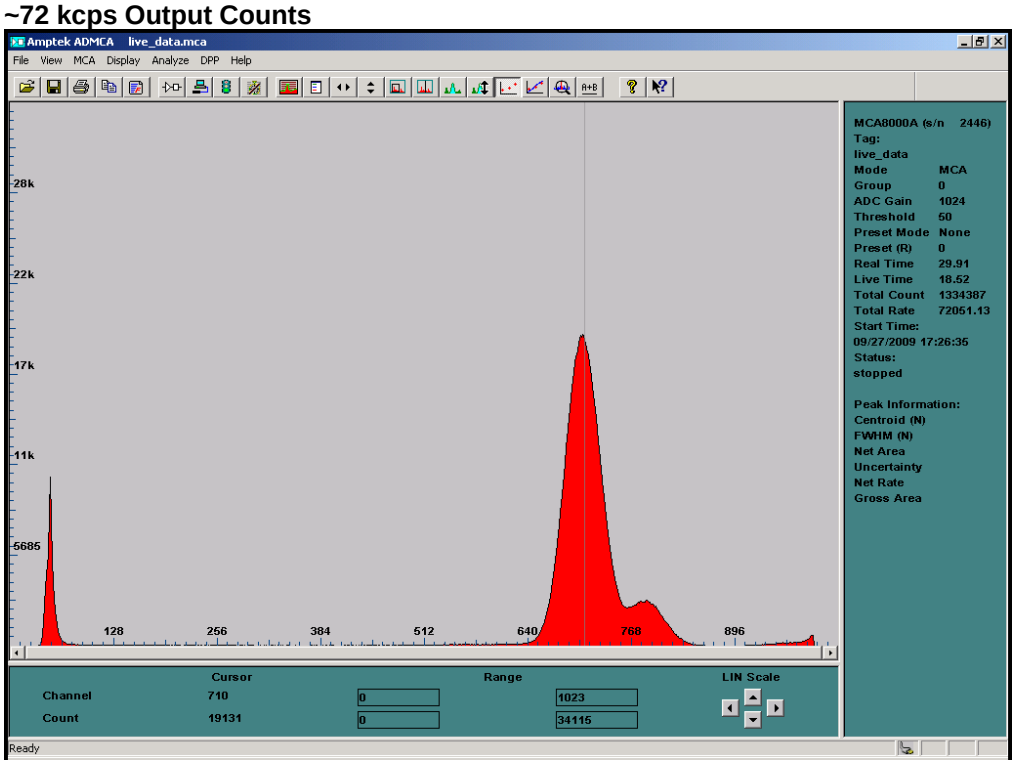
~25 kcps Output Counts



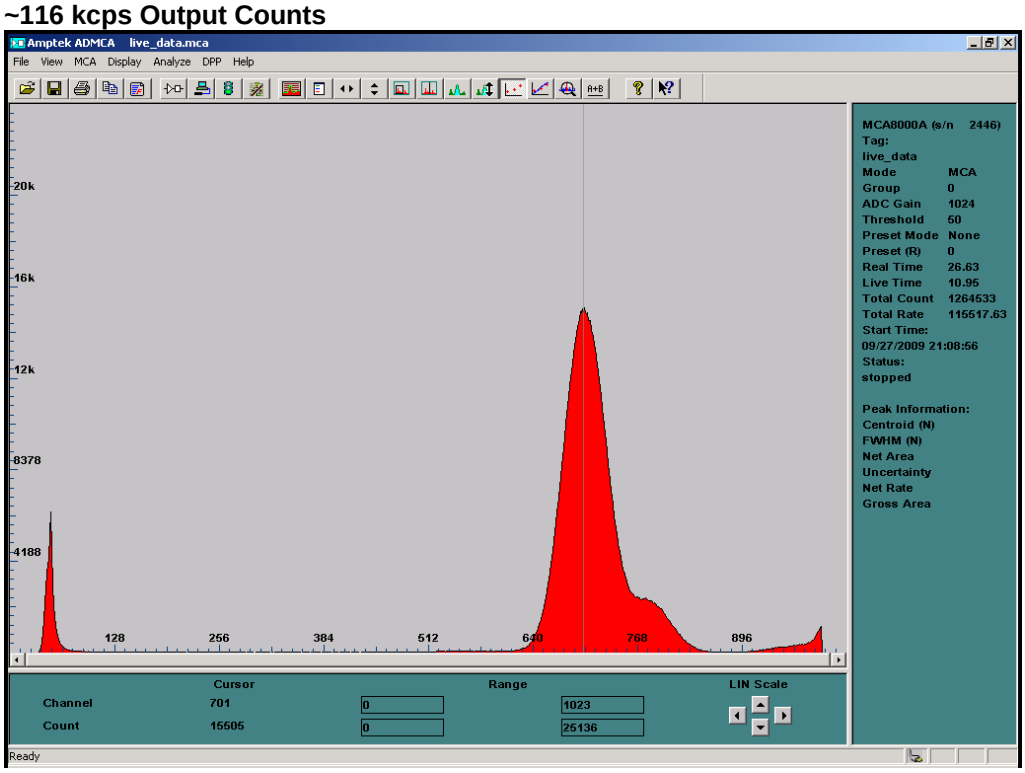
~38 kcps Output Counts



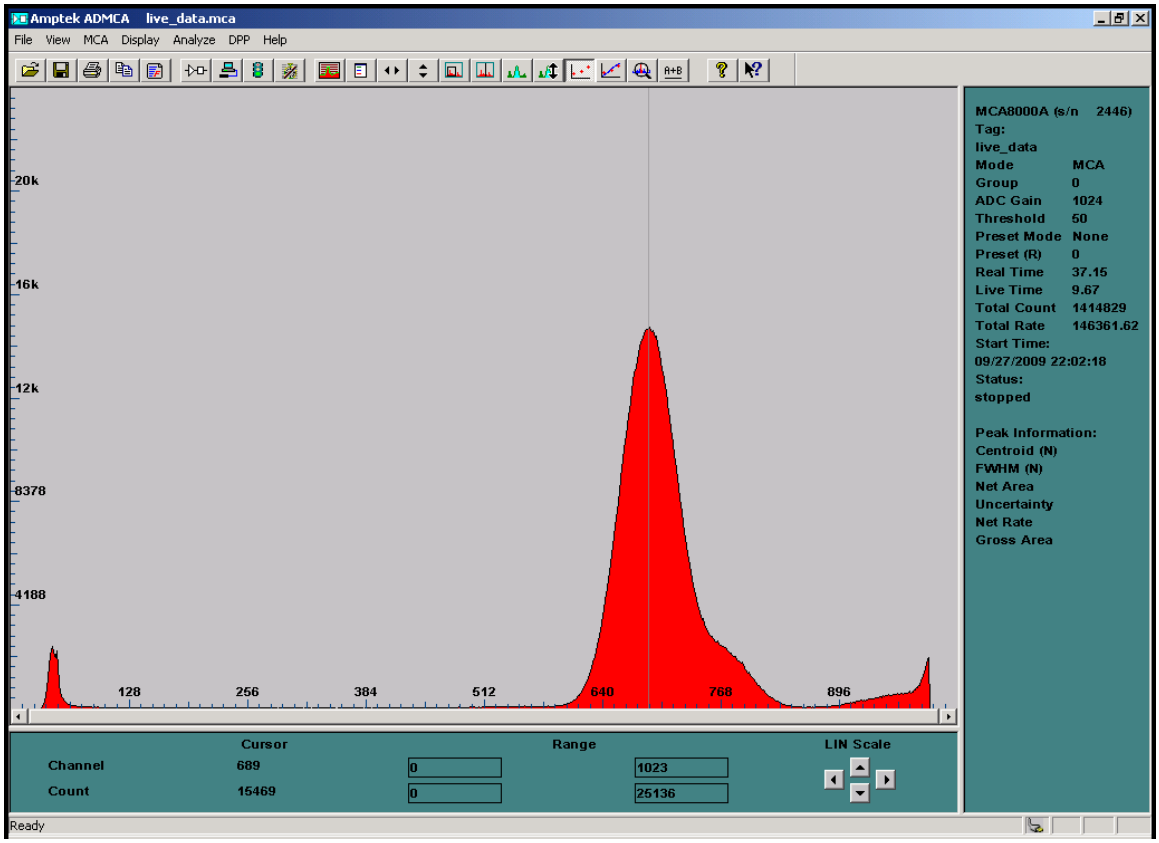
~72 kcps Output Counts



~116 kcps Output Counts

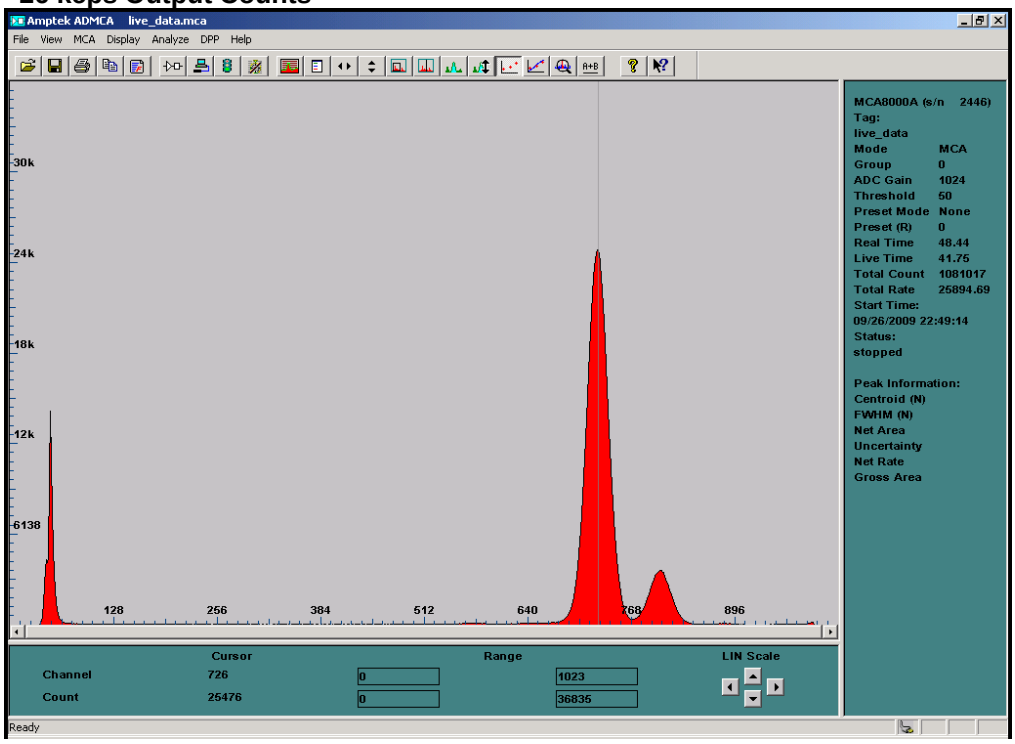


~146 kcps Output Counts

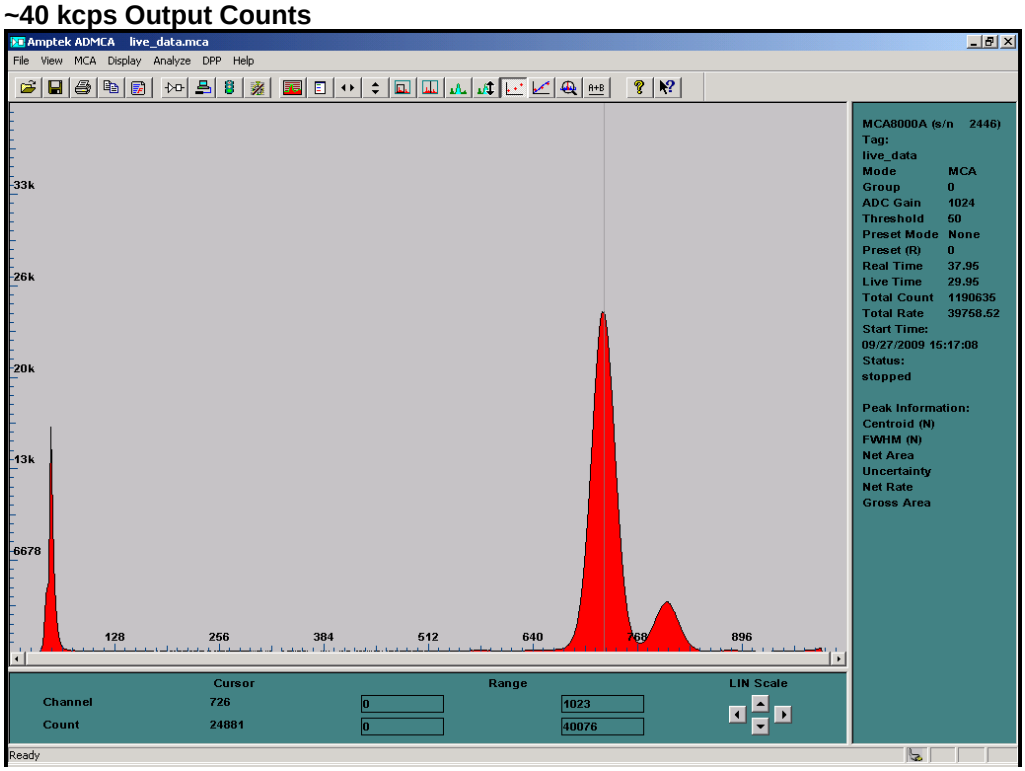


Detector Element=235 Shaping Time = 2 μsec

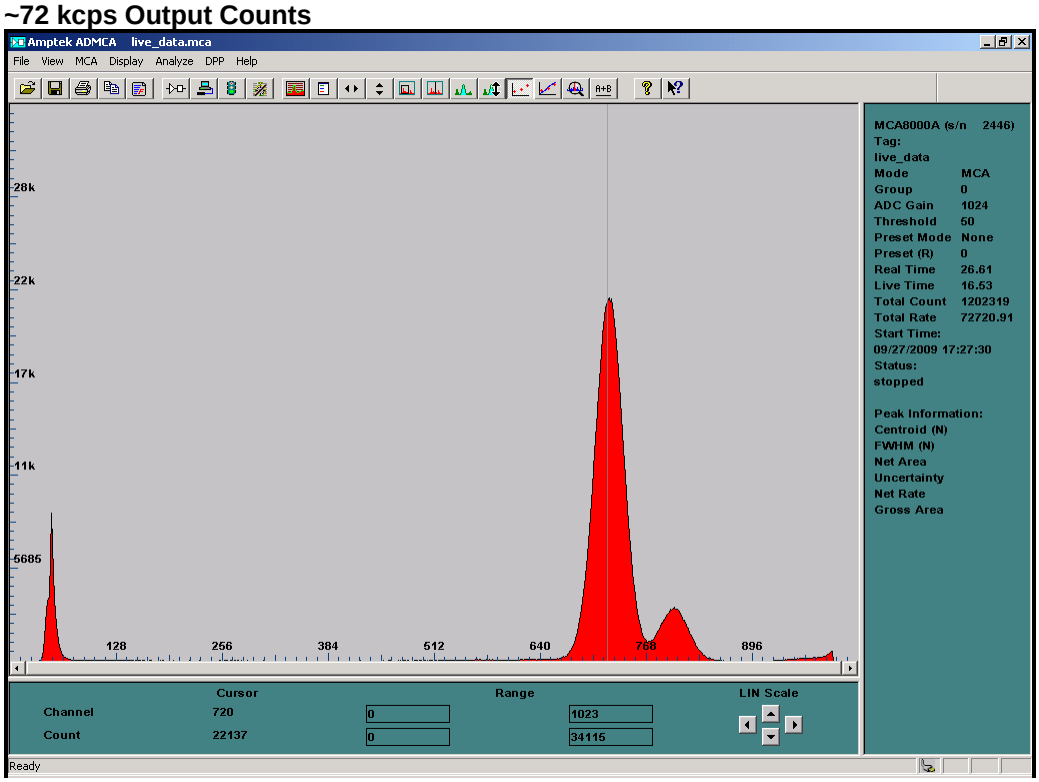
~26 kcps Output Counts



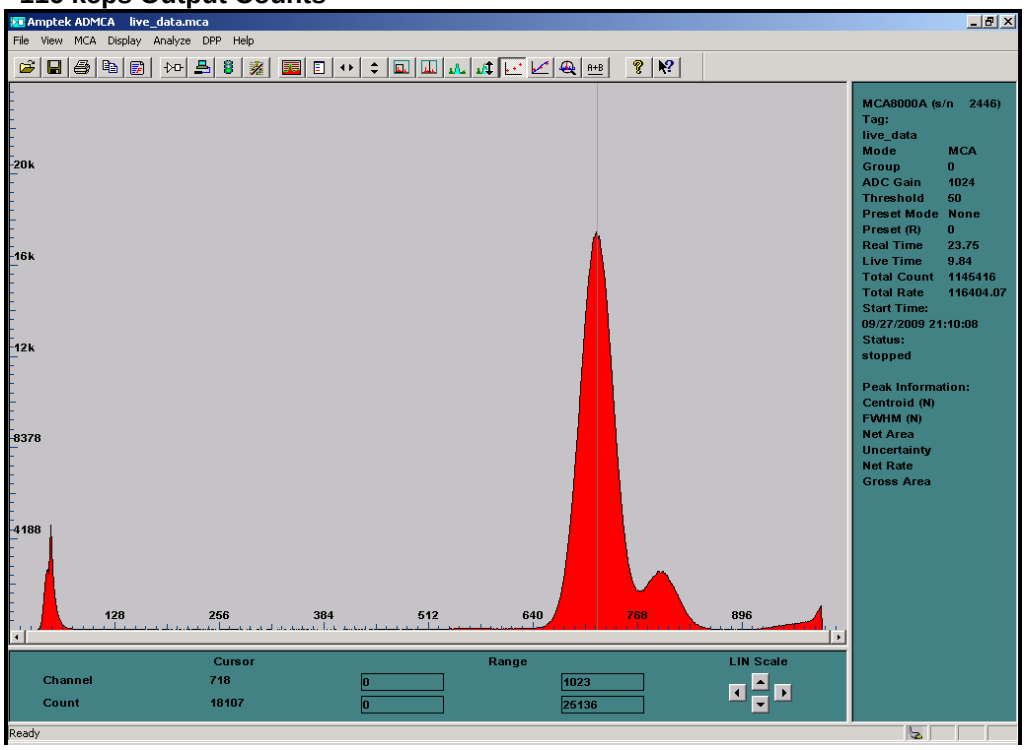
~40 kcps Output Counts



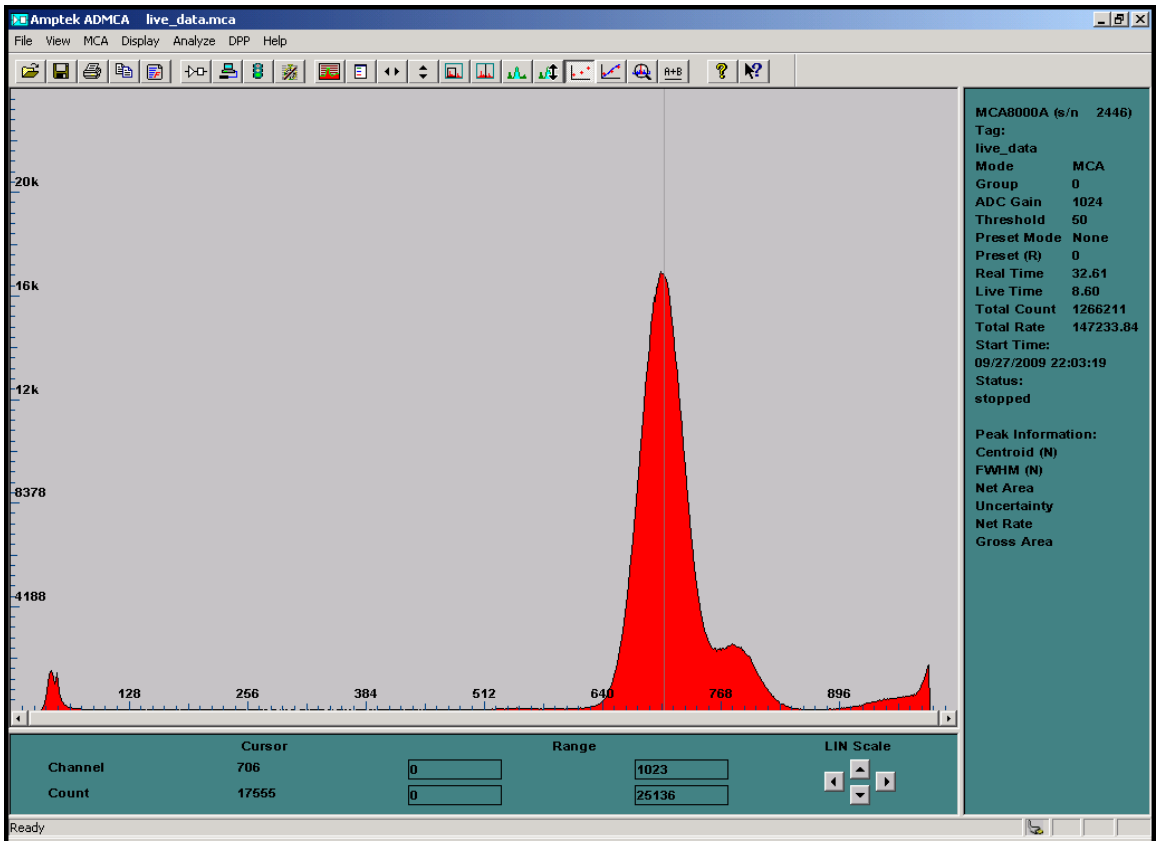
~72 kcps Output Counts



~116 kcps Output Counts

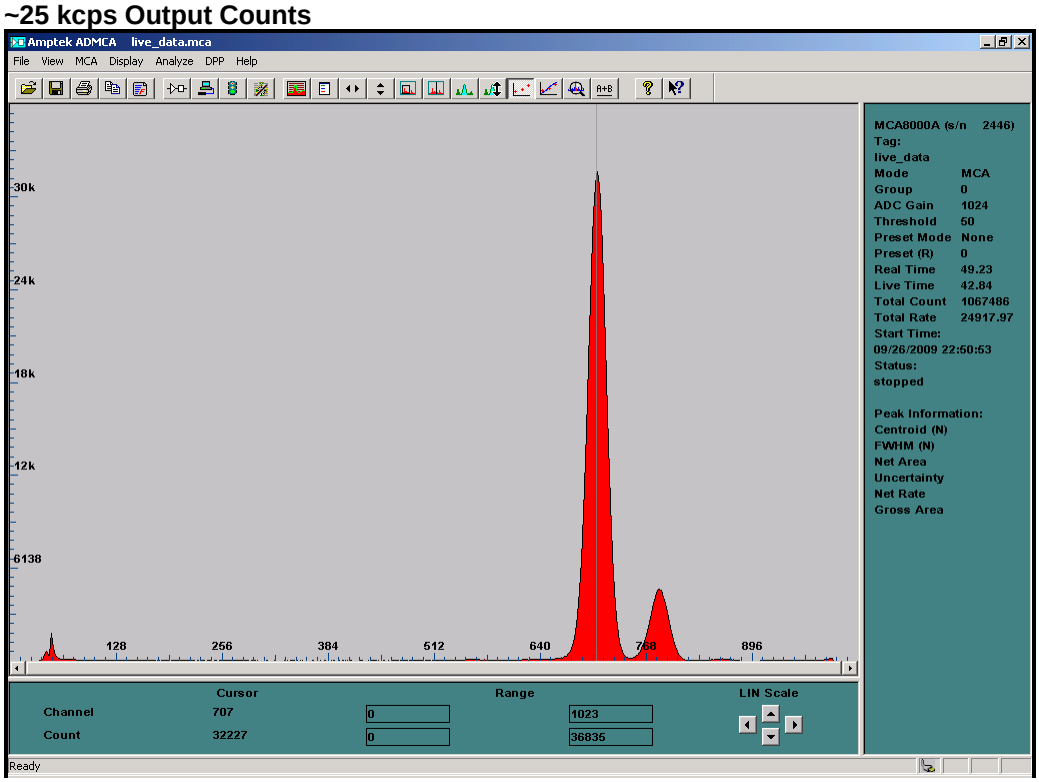


~147 kcps Output Counts

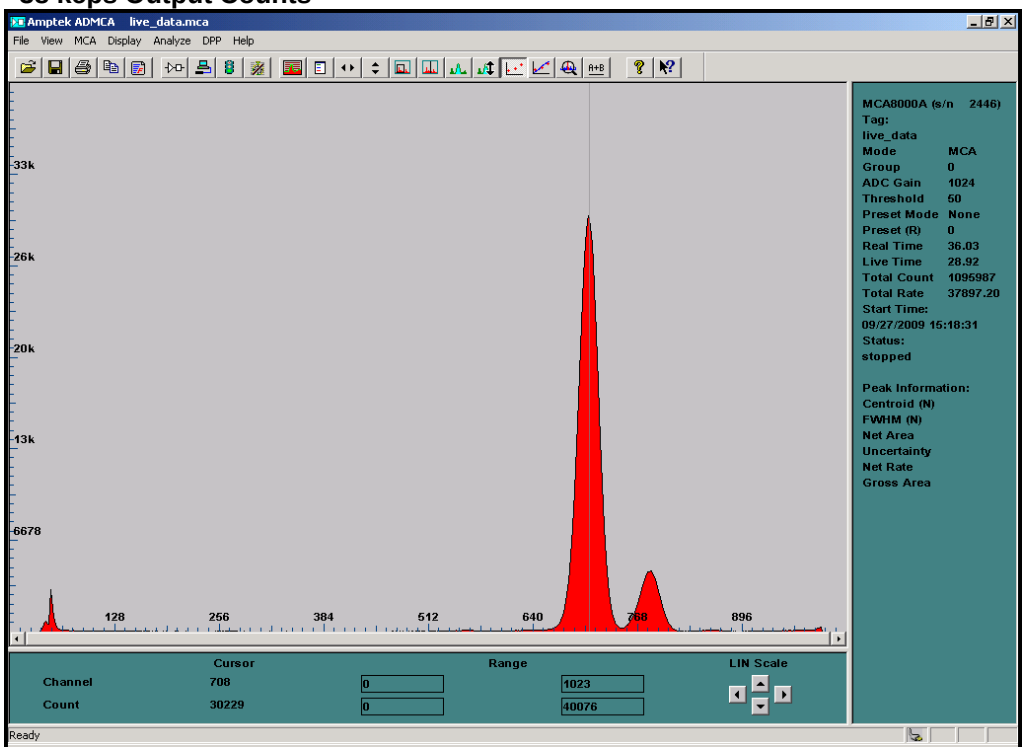


Detector Element=238 Shaping Time = 2 μsec

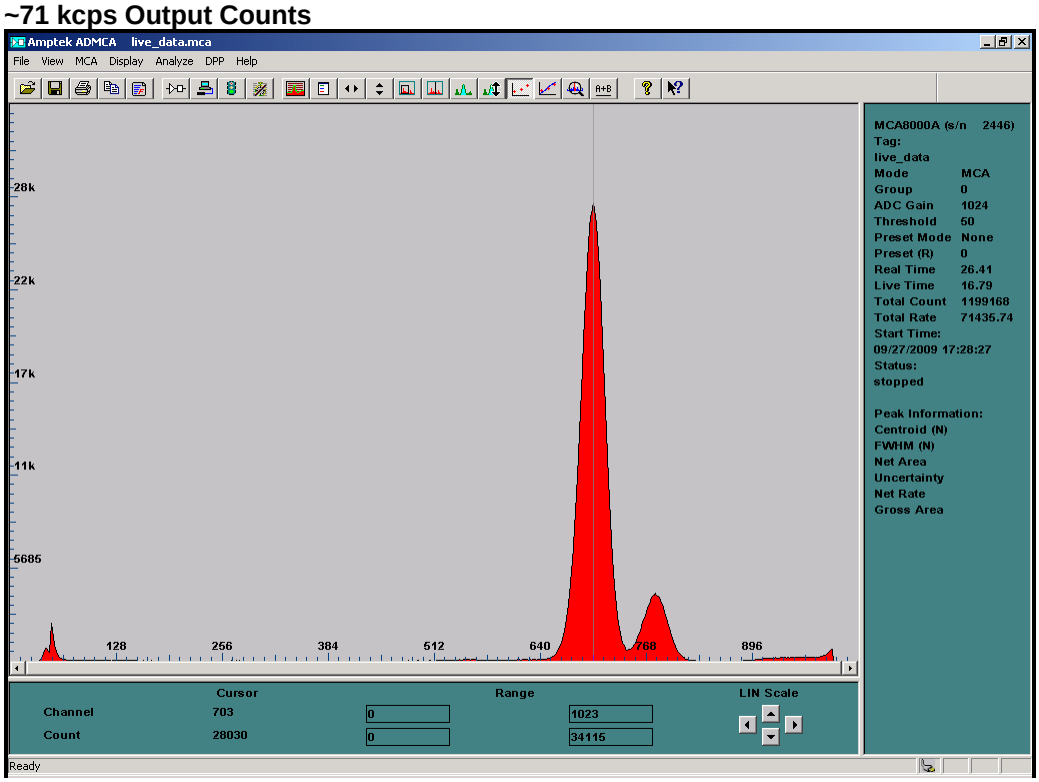
~25 kcps Output Counts



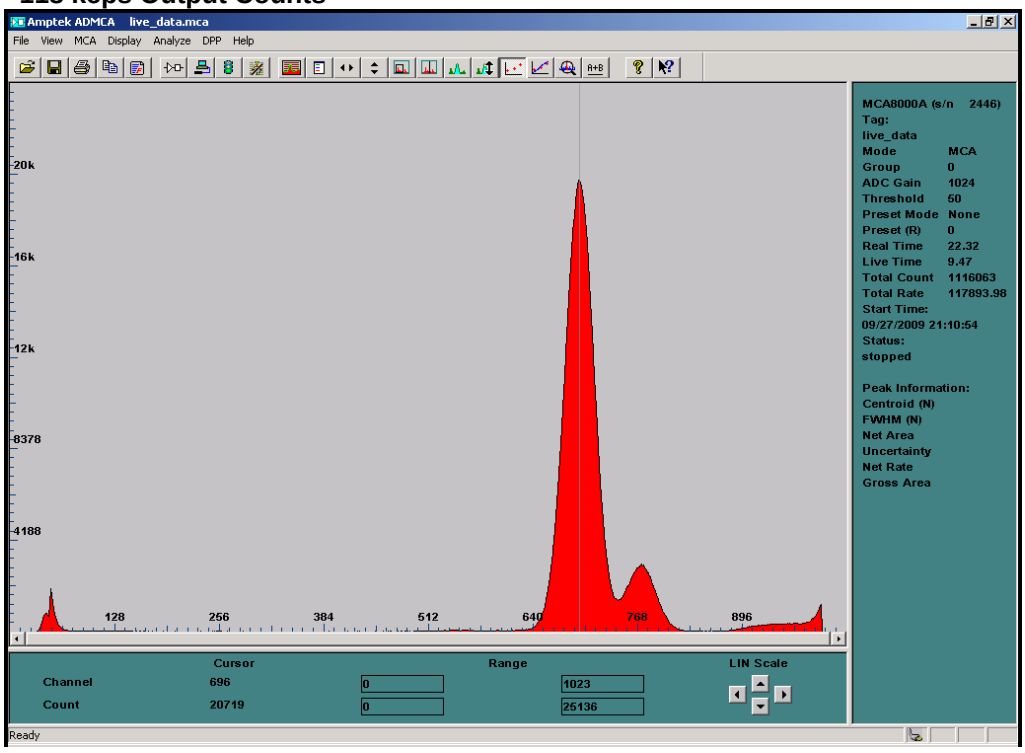
~38 kcps Output Counts



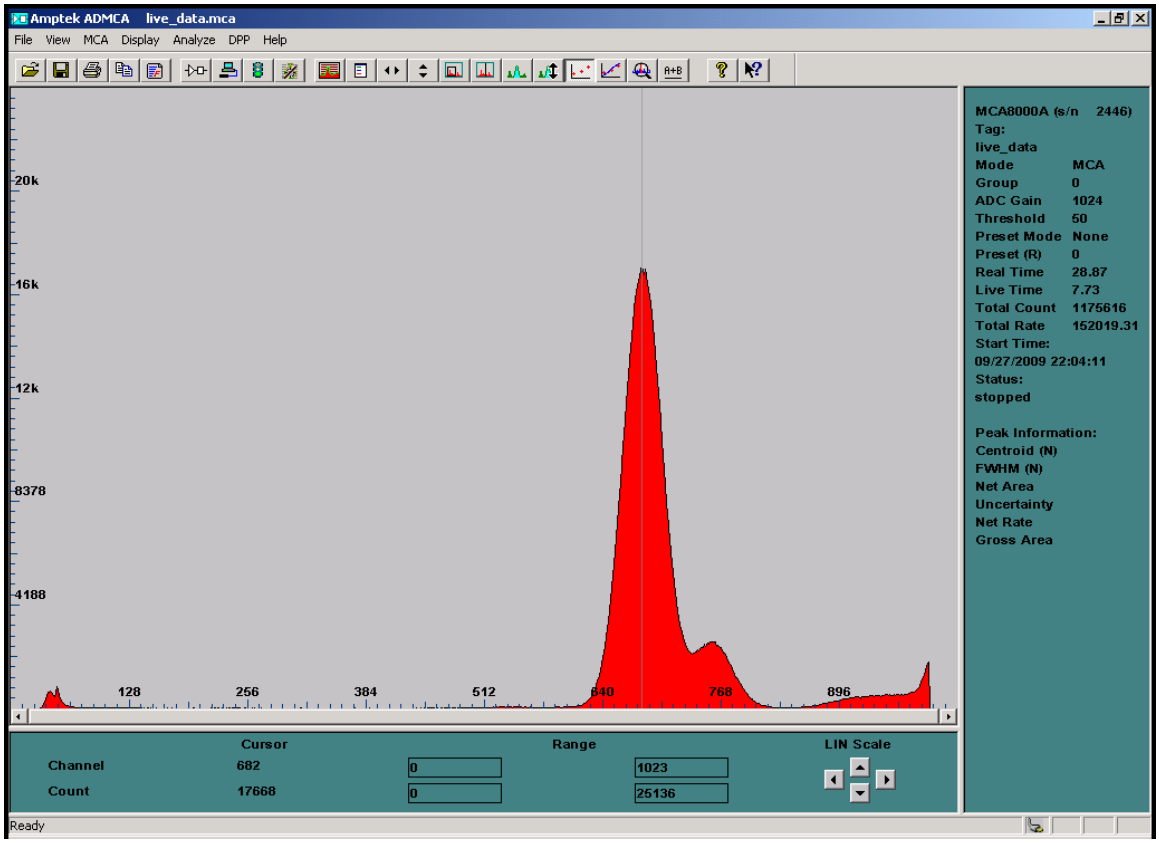
~71 kcps Output Counts



~118 kcps Output Counts

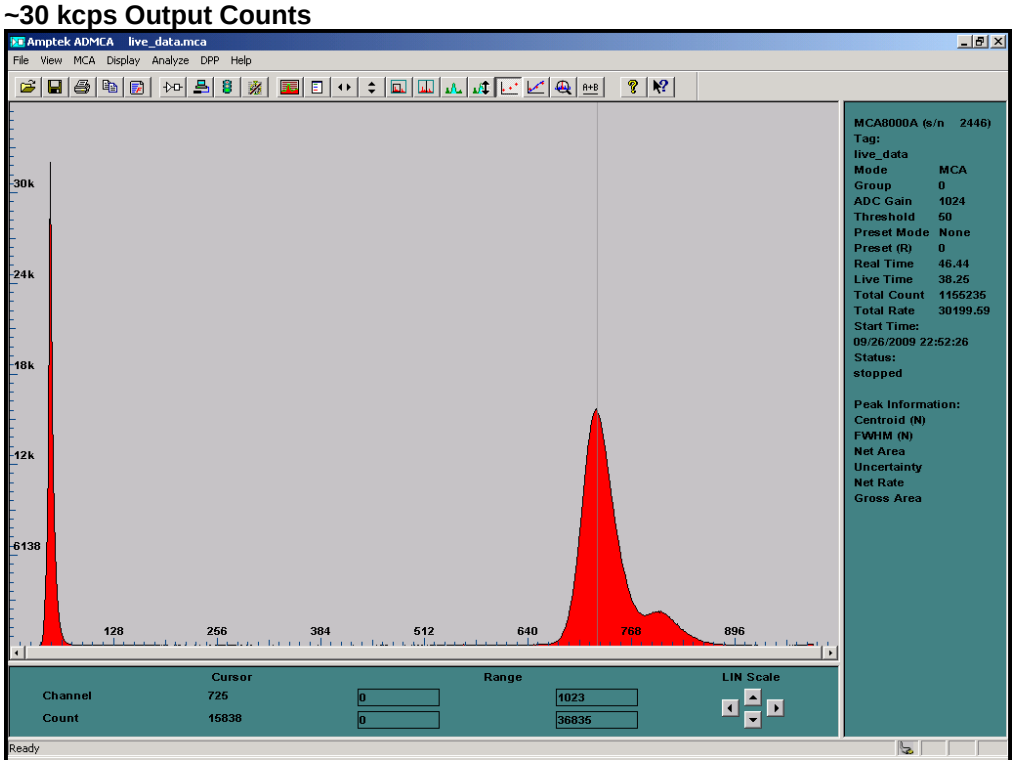


~152 kcps Output Counts

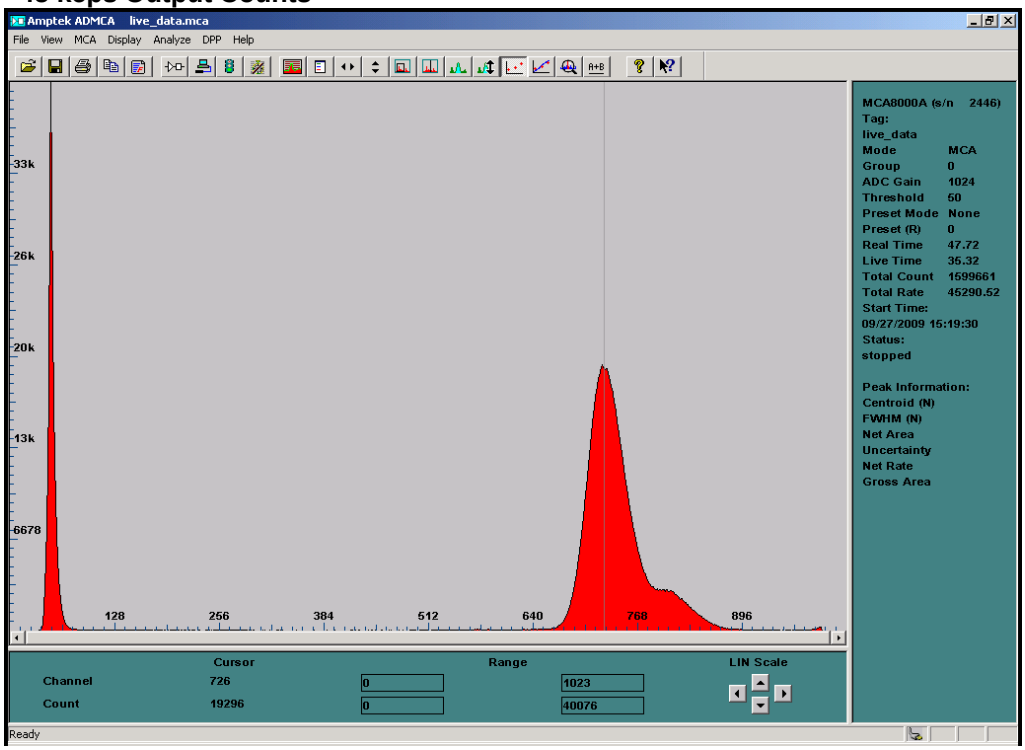


Detector Element=241 Shaping Time = 2 μsec

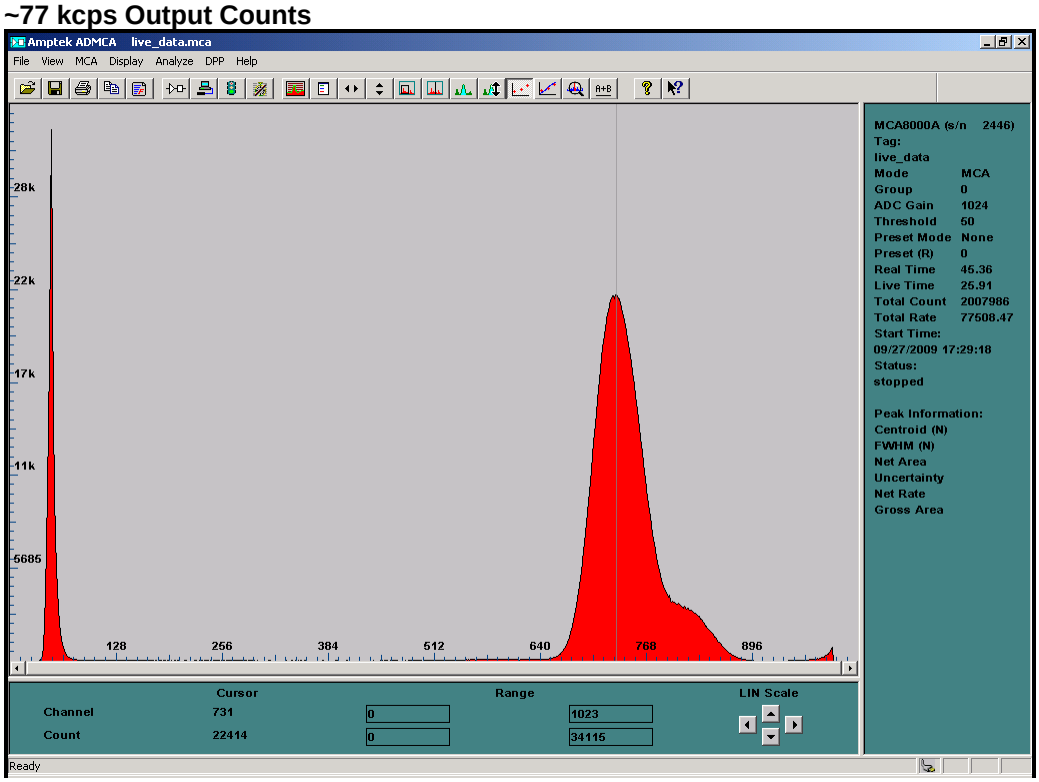
~30 kcps Output Counts



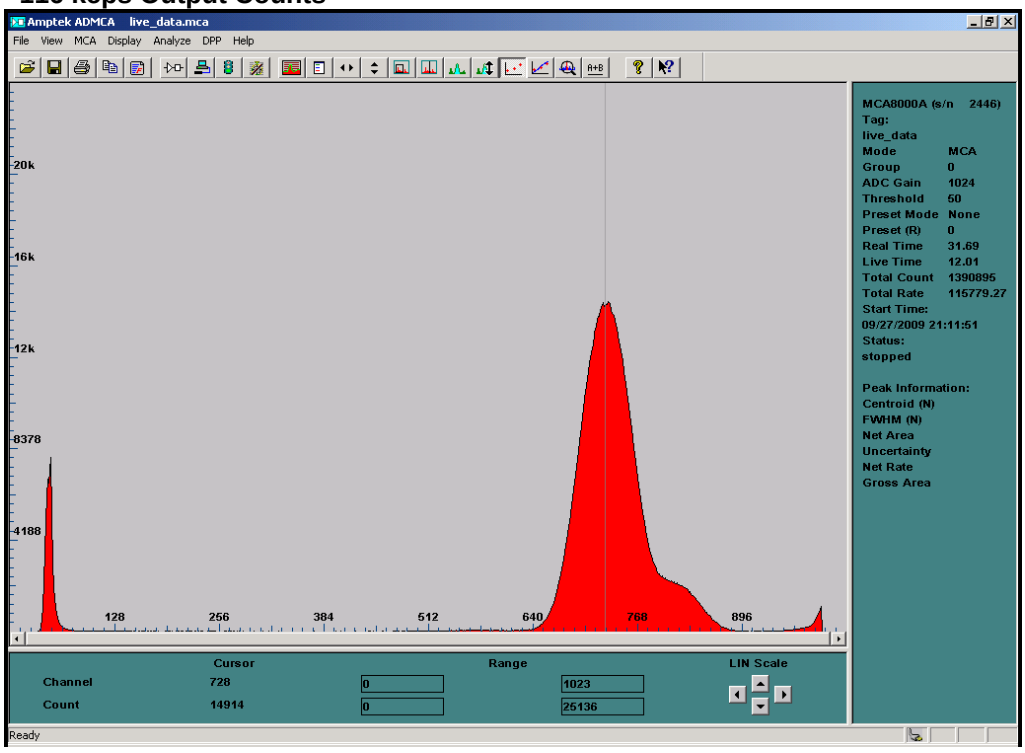
~45 kcps Output Counts



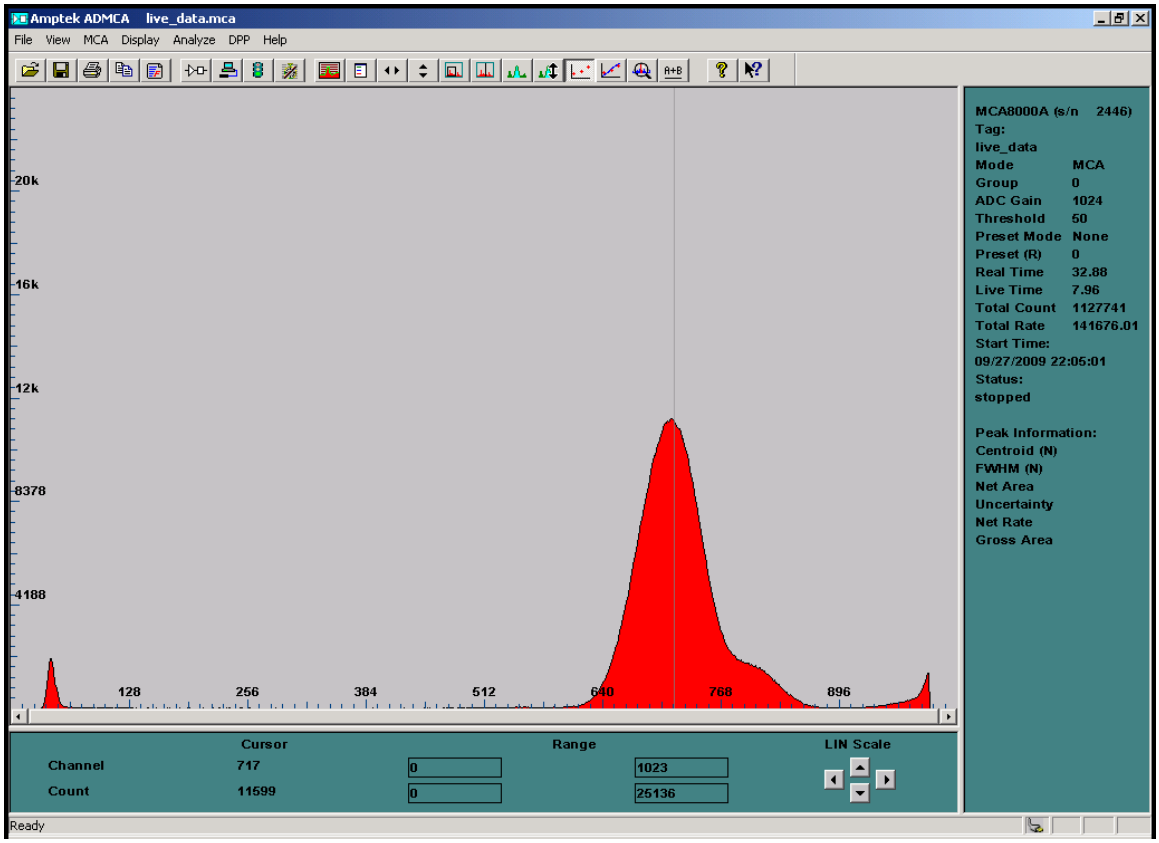
~77 kcps Output Counts



~116 kcps Output Counts

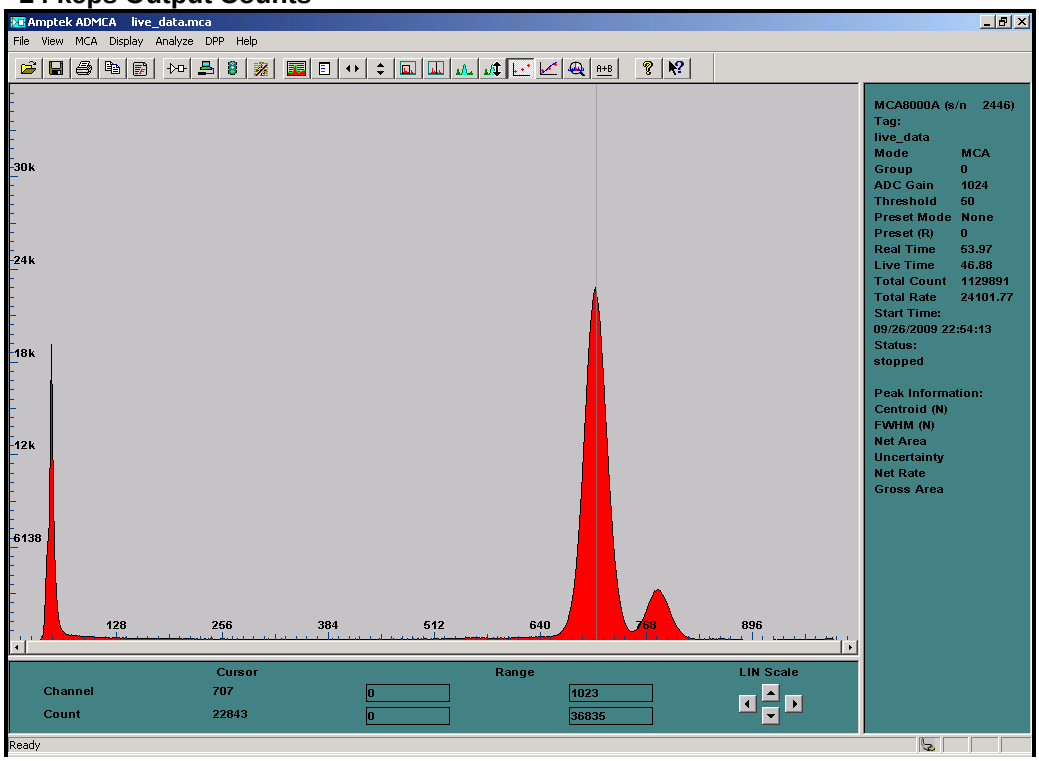


~142 kcps Output Counts

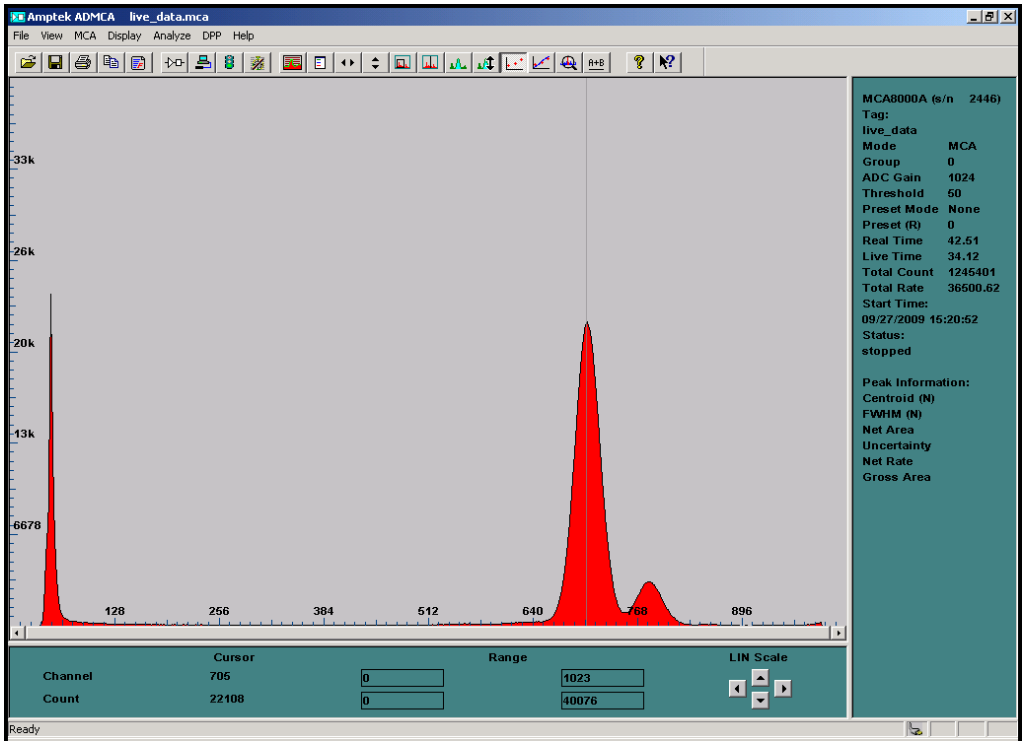


Detector Element=295 Shaping Time = 2 mu sec

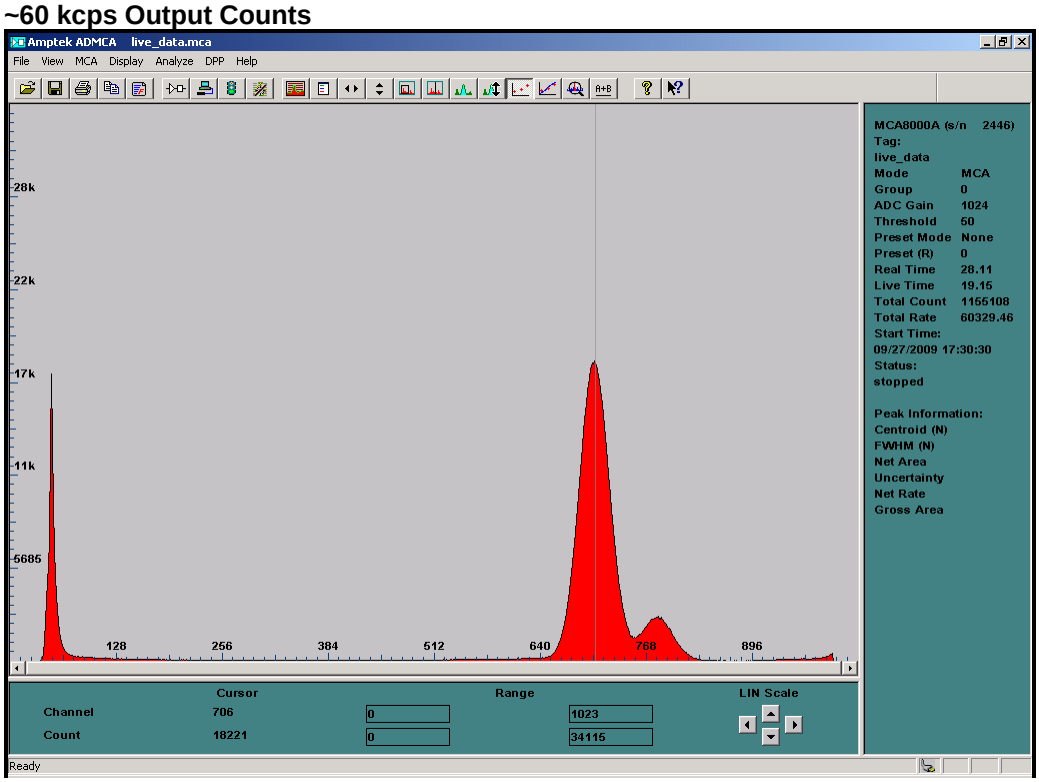
~24 kcps Output Counts



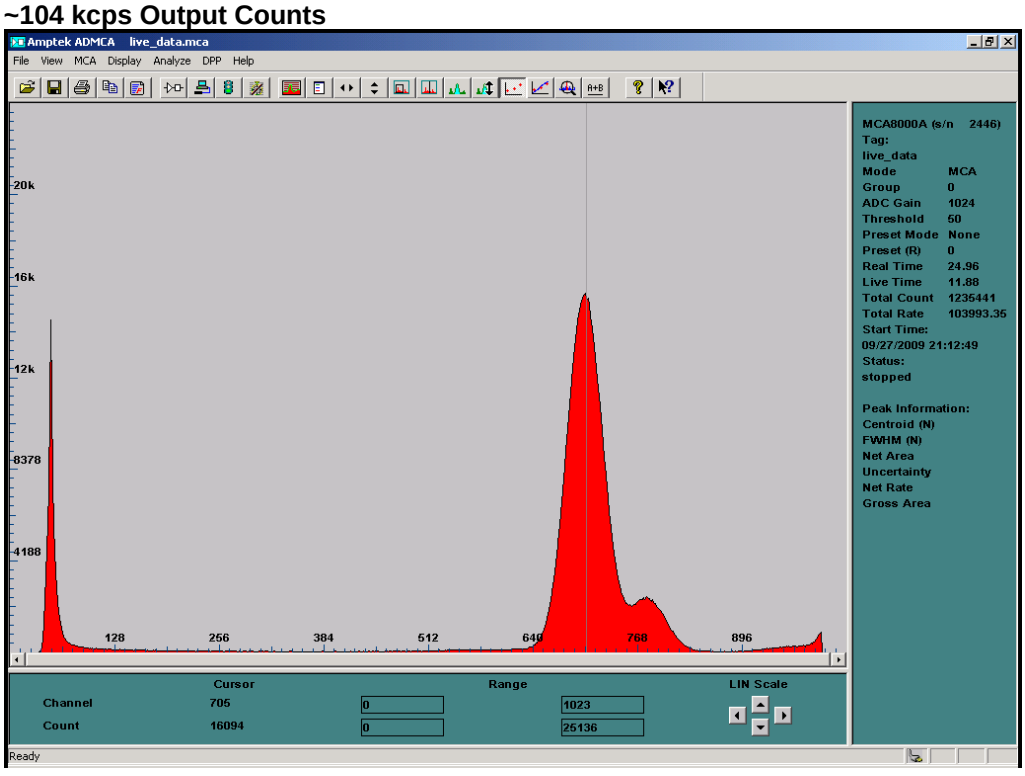
~37 kcps Output Counts



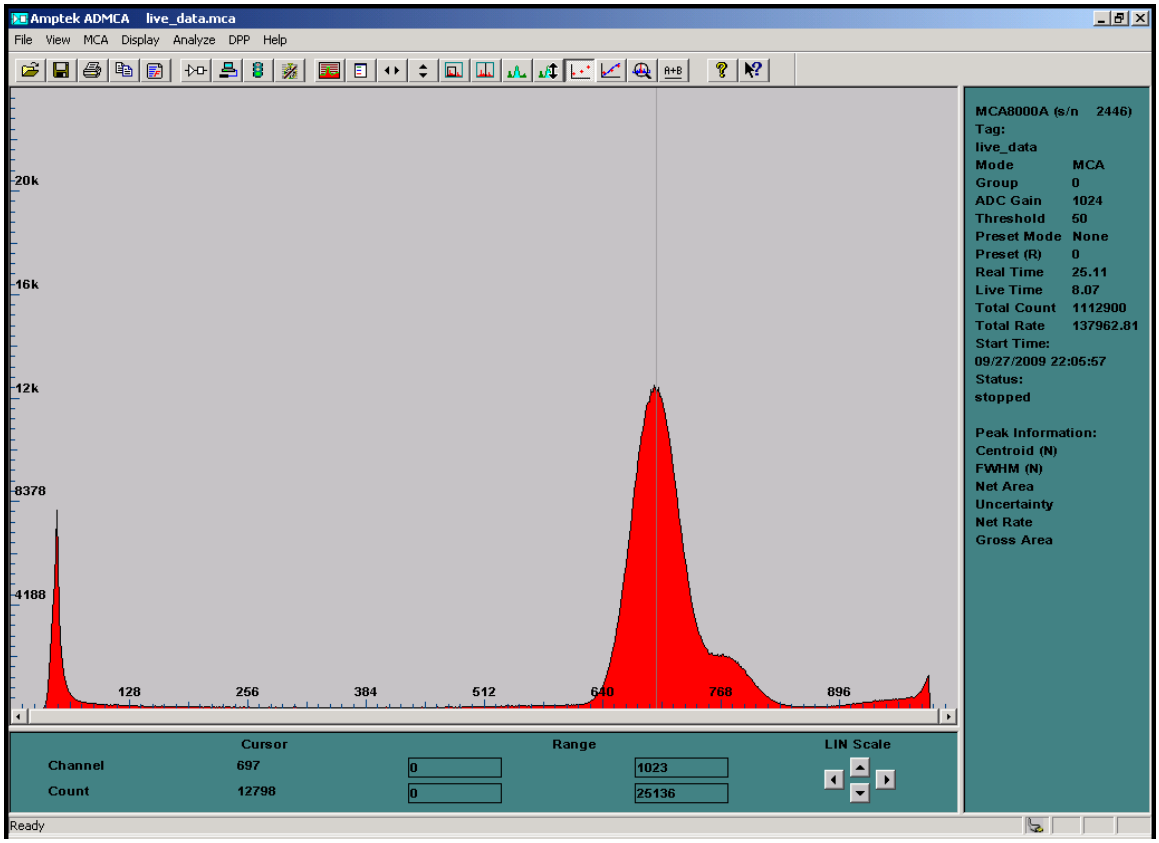
~60 kcps Output Counts



~104 kcps Output Counts

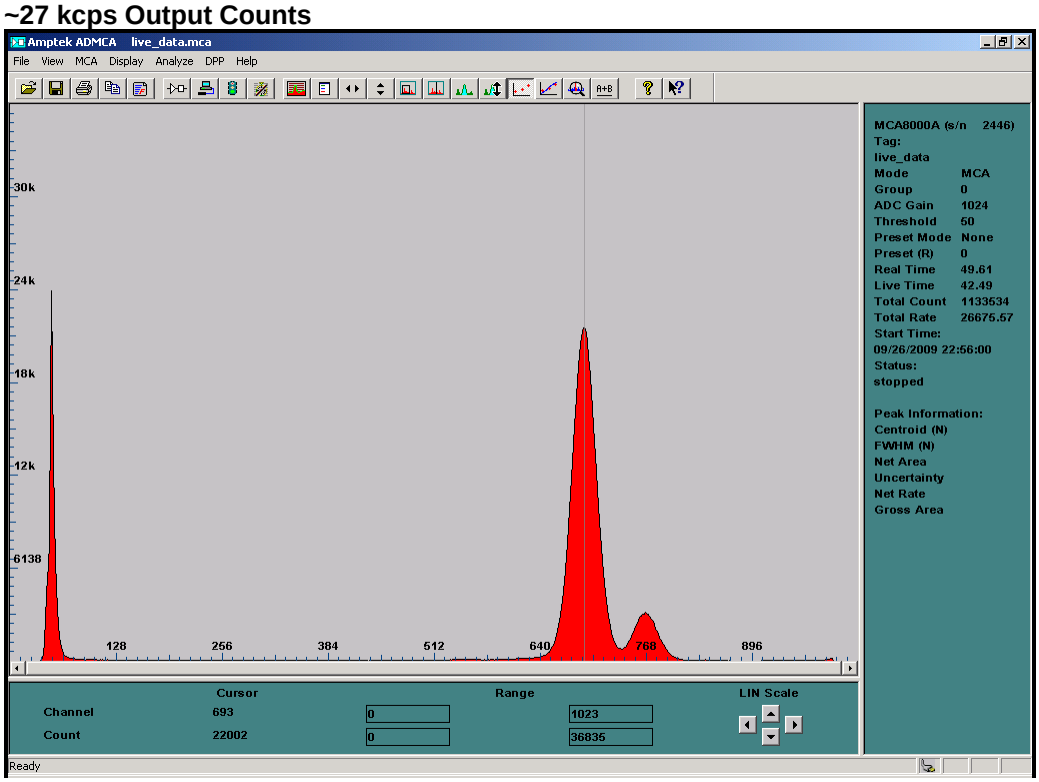


~138 kcps Output Counts

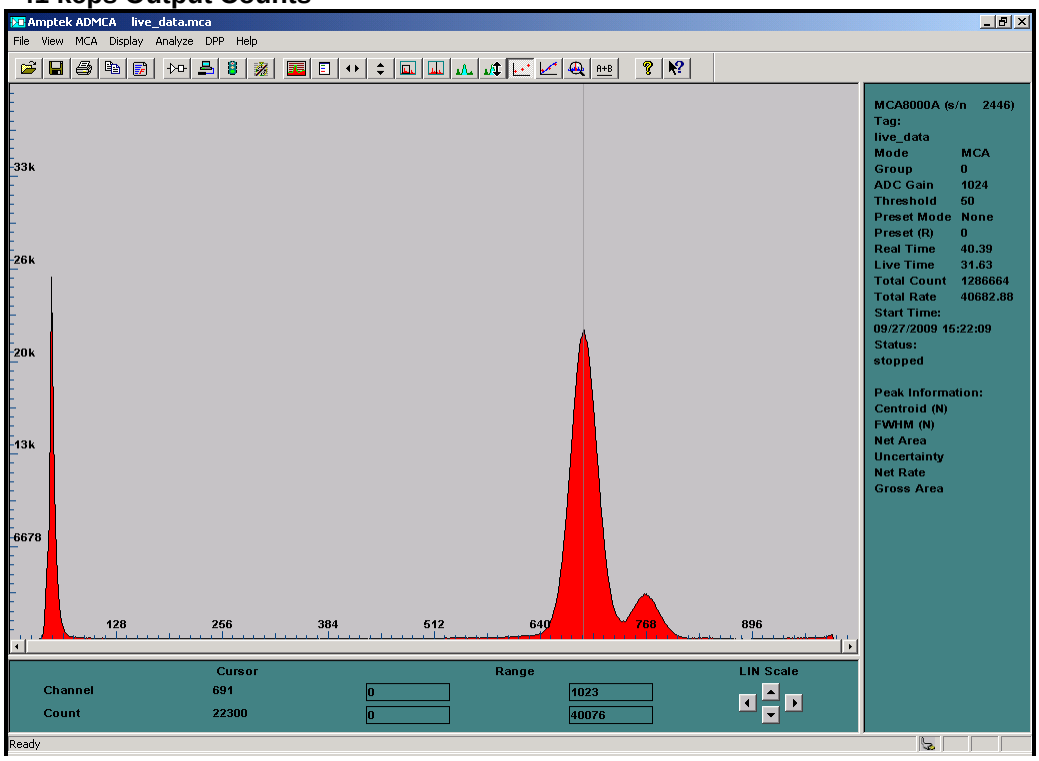


Detector Element=296 Shaping Time = 2 μsec

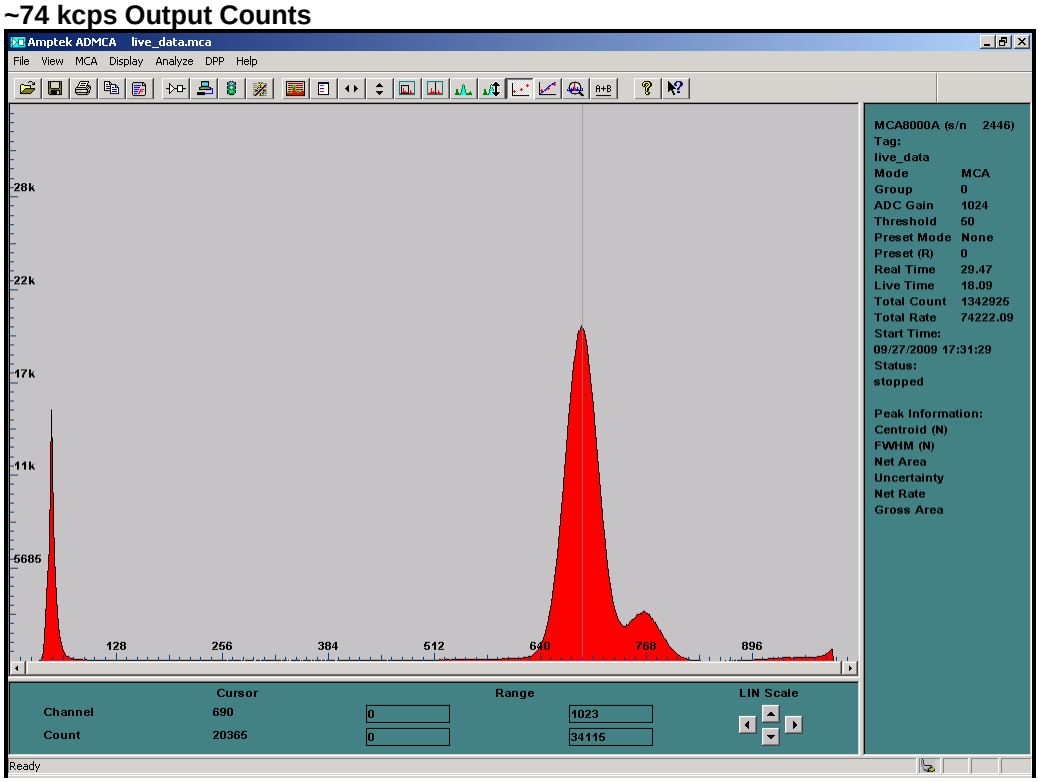
~27 kcps Output Counts



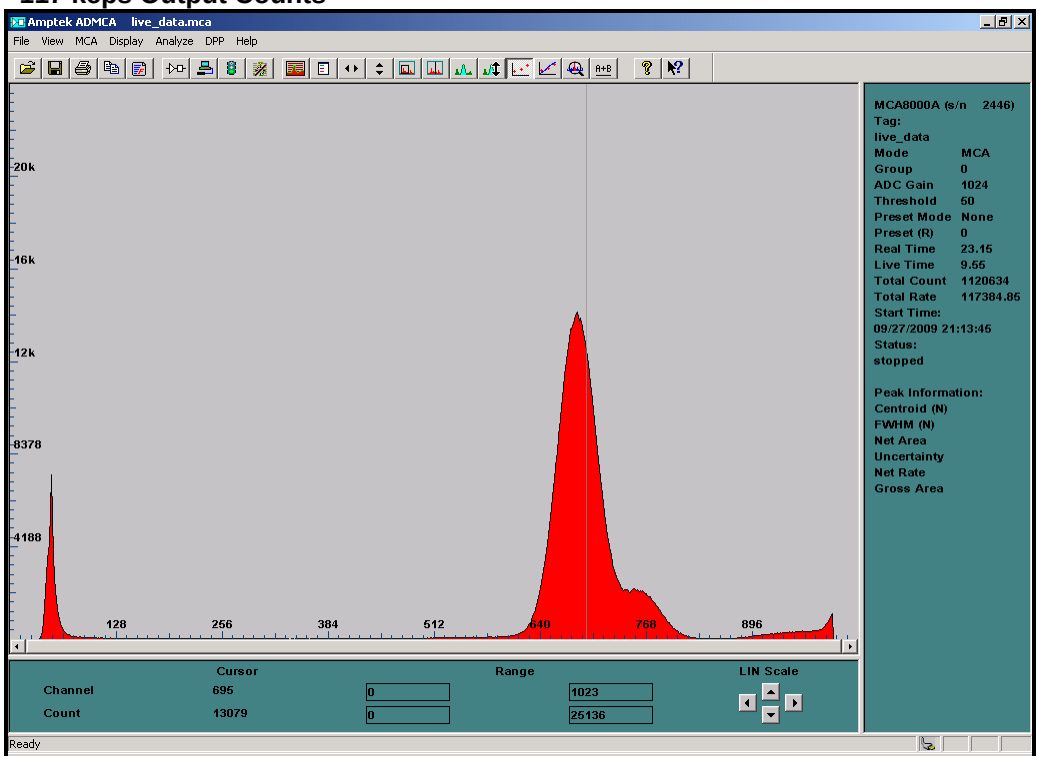
~41 kcps Output Counts



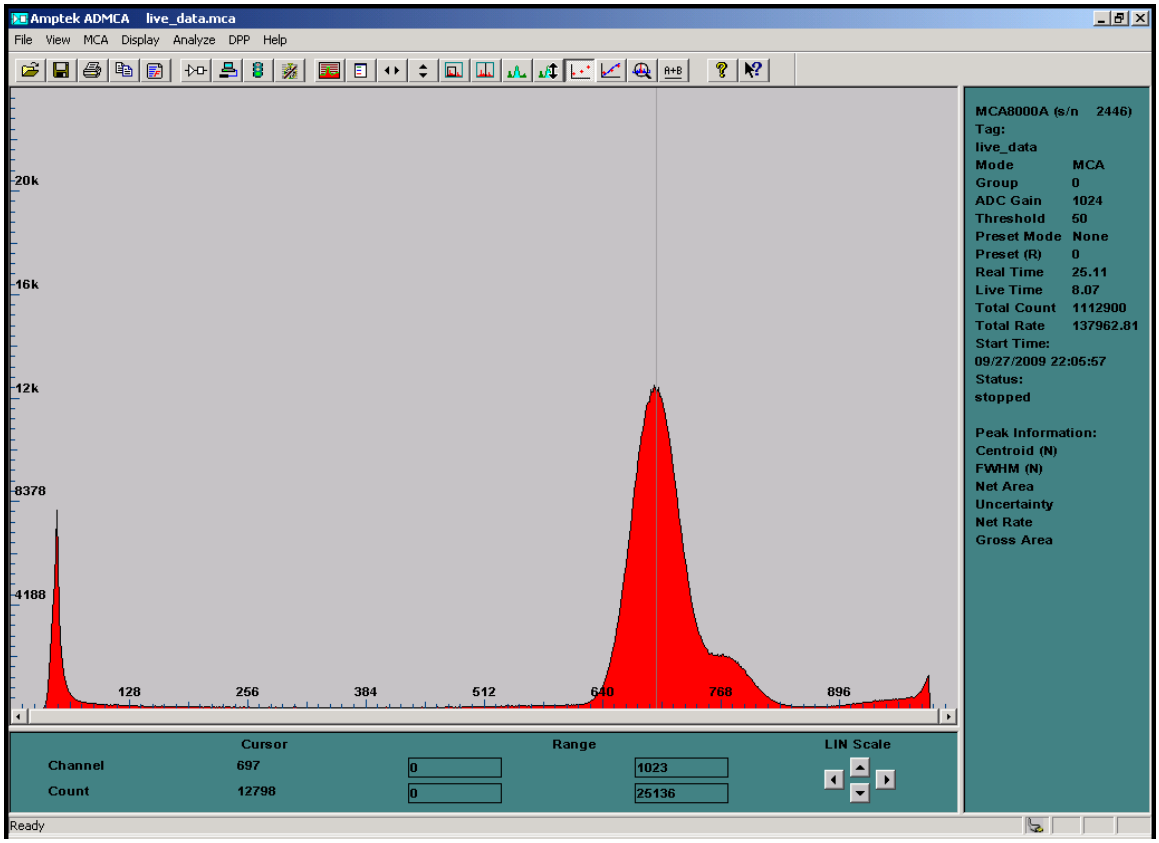
~74 kcps Output Counts



~117 kcps Output Counts

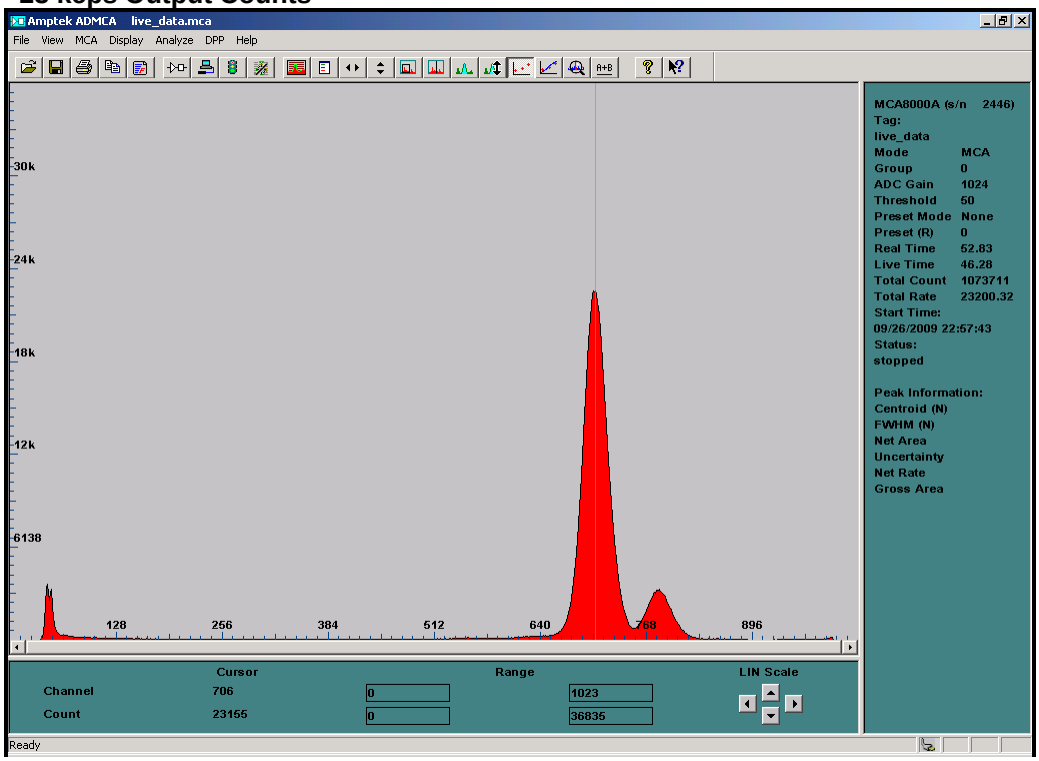


~137 kcps Output Counts

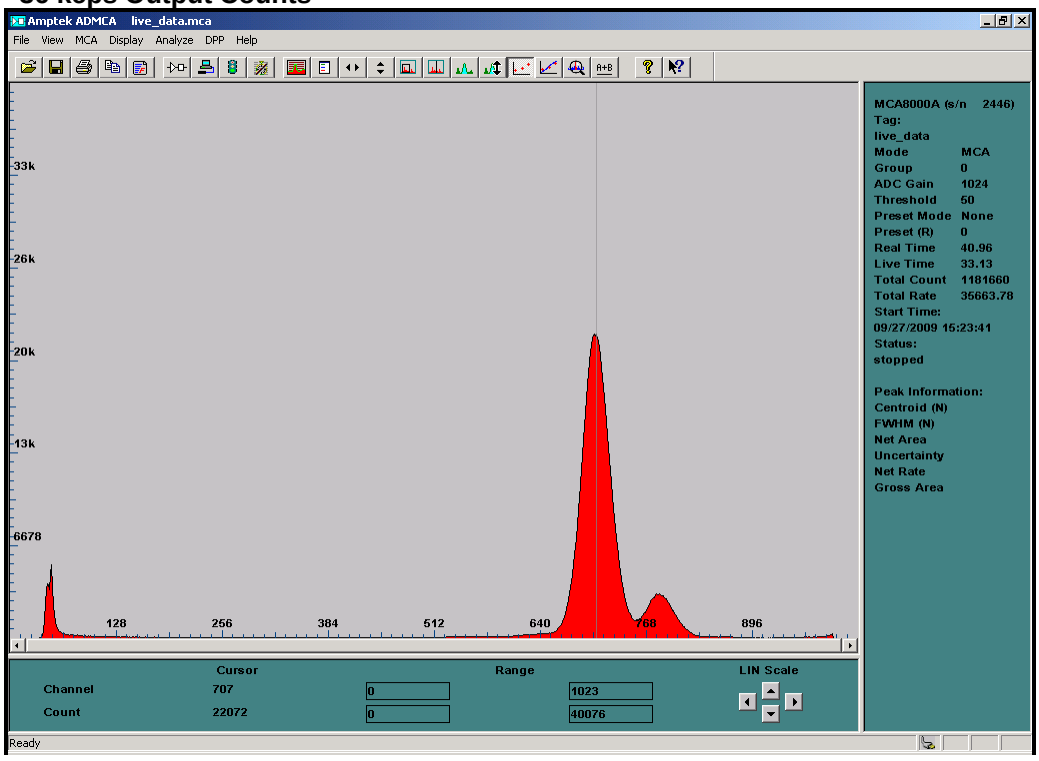


Detector Element=300 Shaping Time = 2 μsec

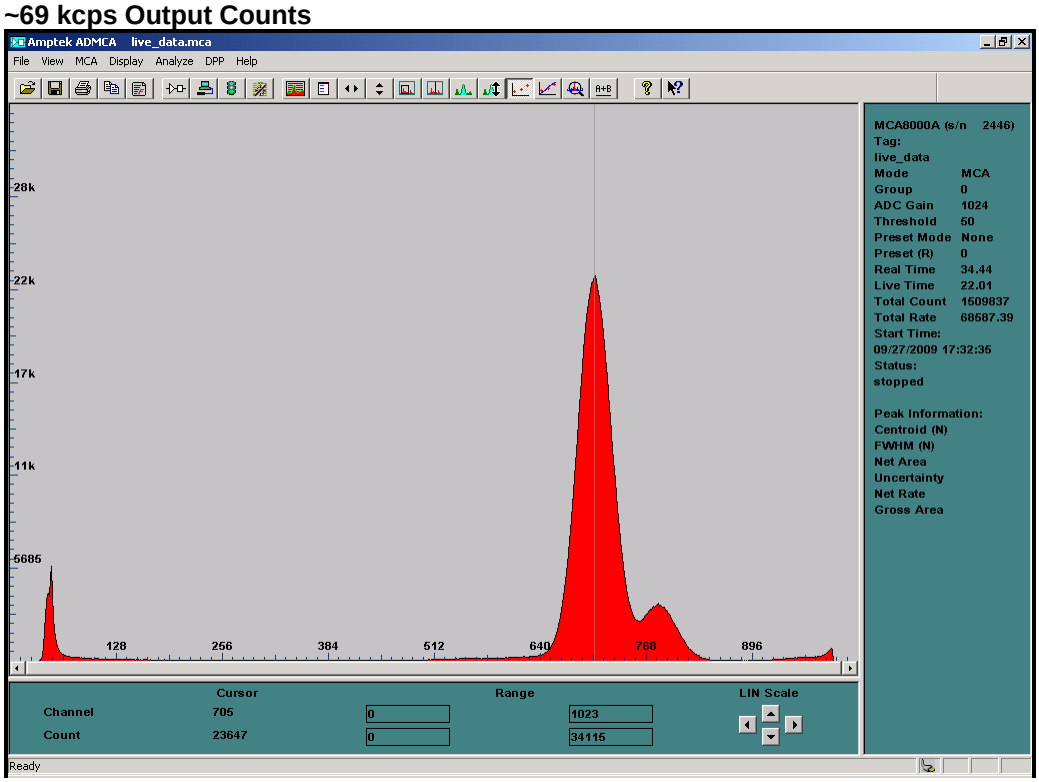
~23 kcps Output Counts



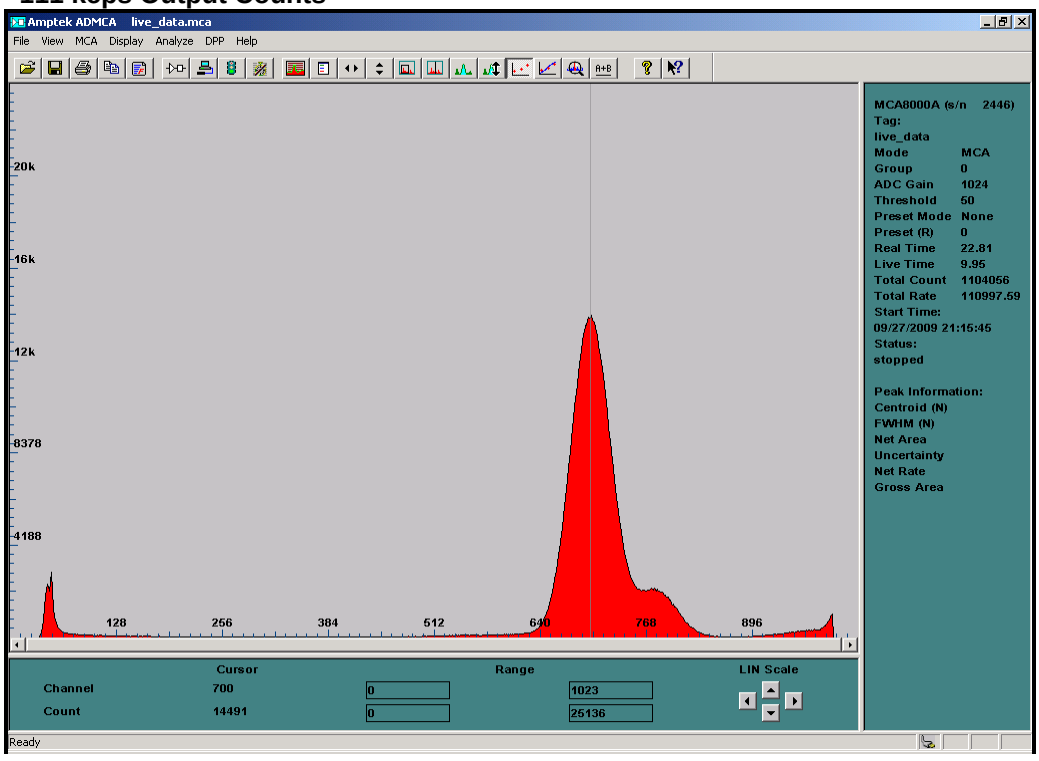
~36 kcps Output Counts



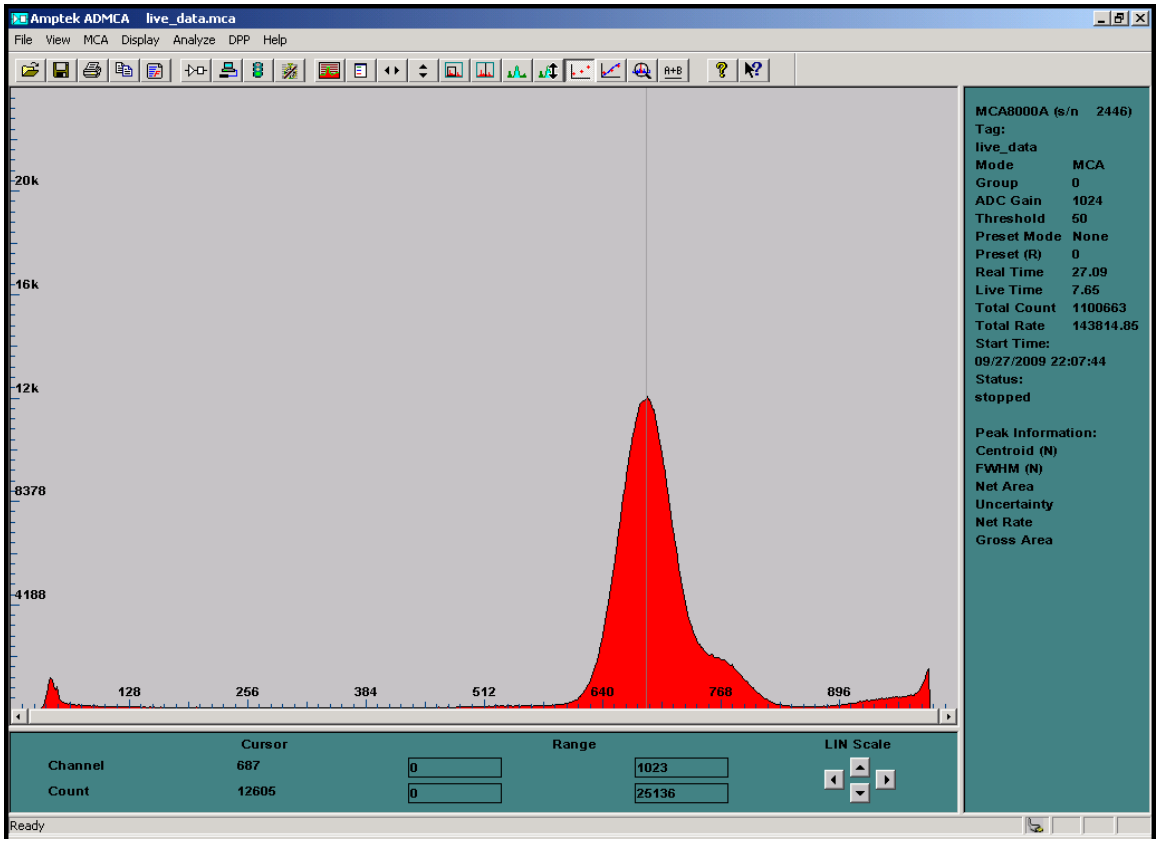
~69 kcps Output Counts



~111 kcps Output Counts

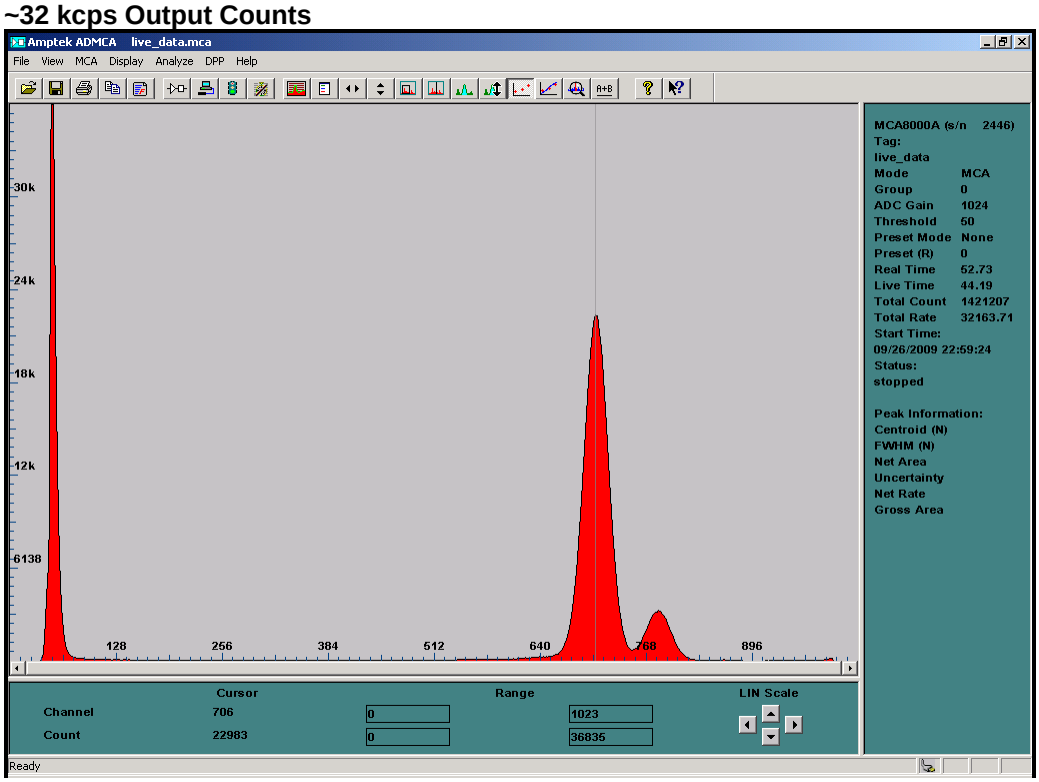


~144 kcps Output Counts

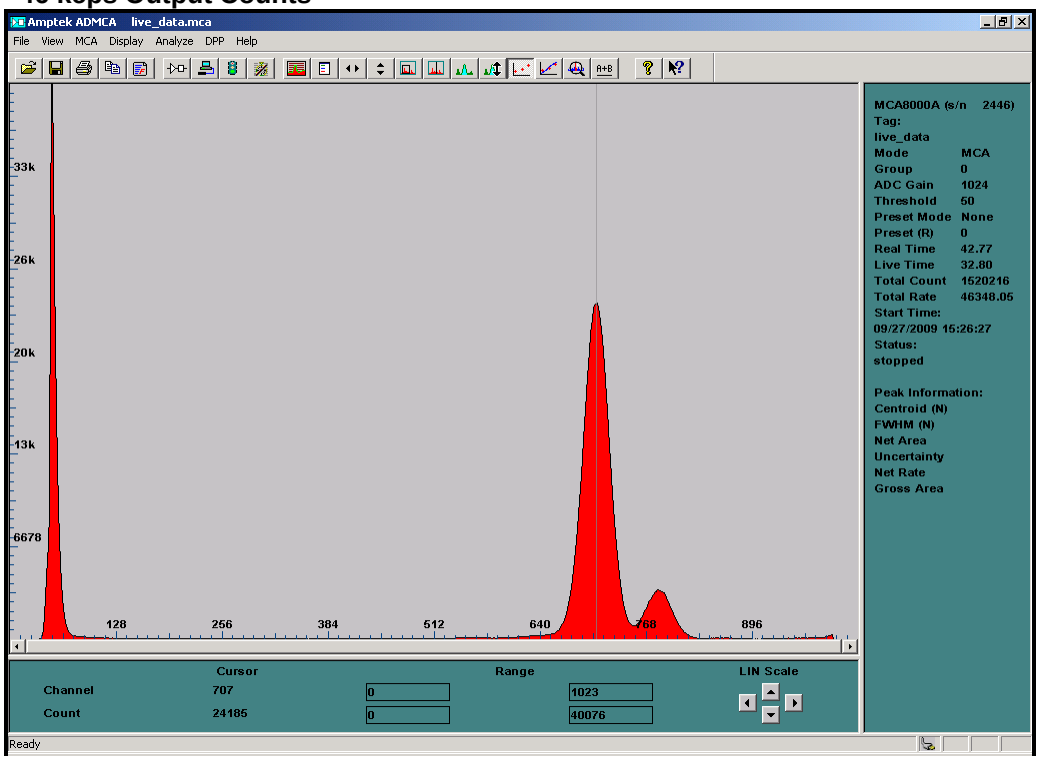


Detector Element=305 Shaping Time = 2 μsec

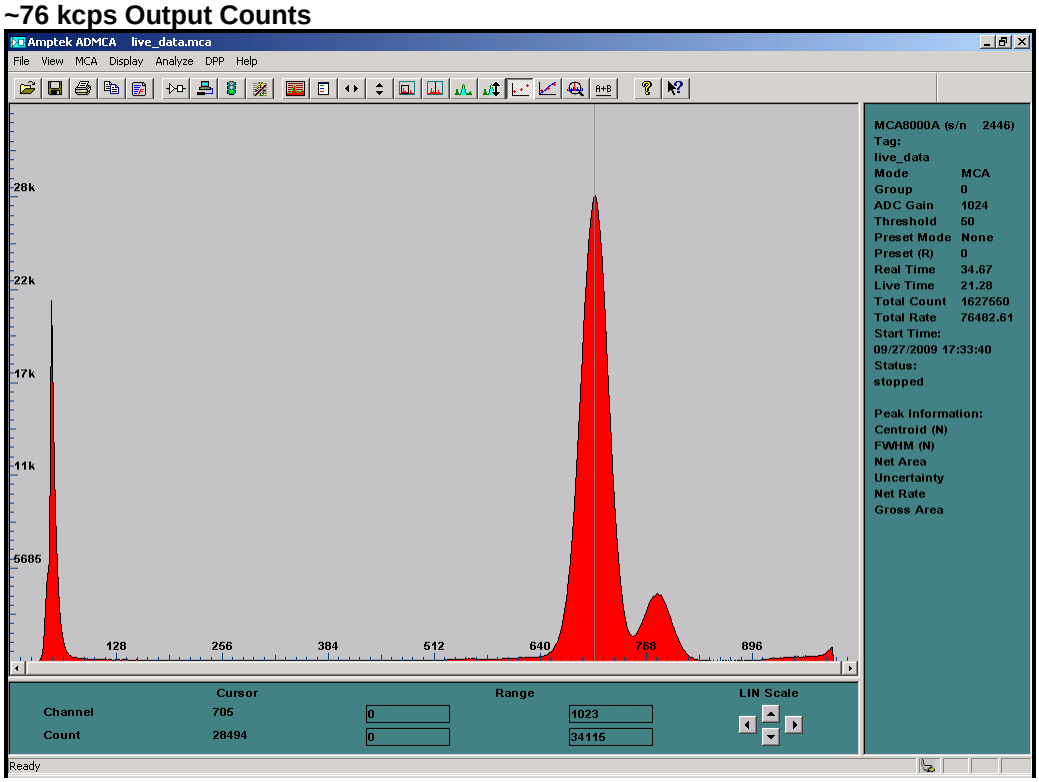
~32 kcps Output Counts



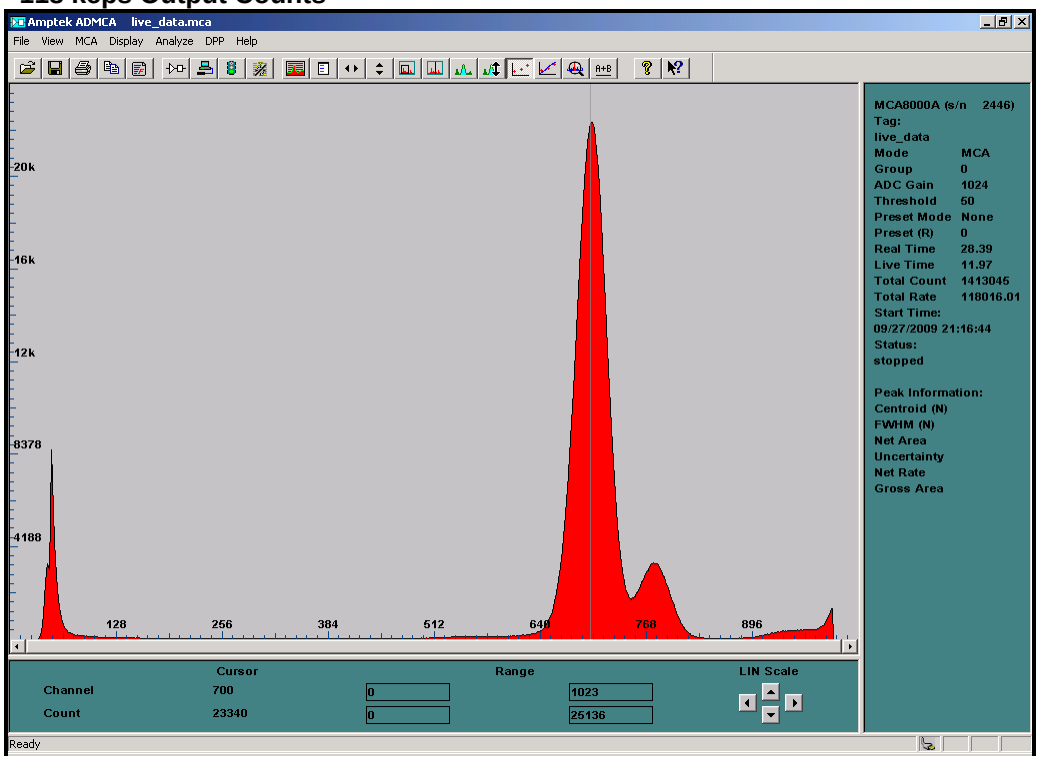
~46 kcps Output Counts



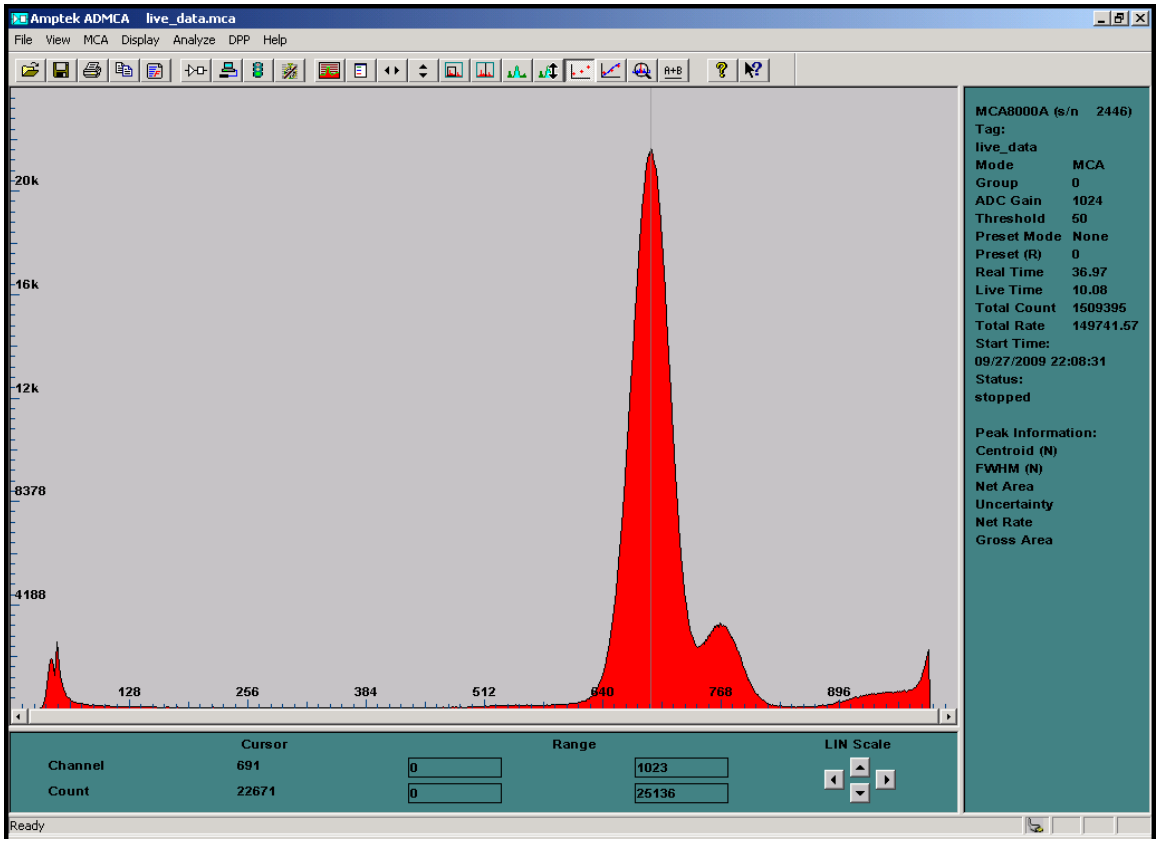
~76 kcps Output Counts



~118 kcps Output Counts

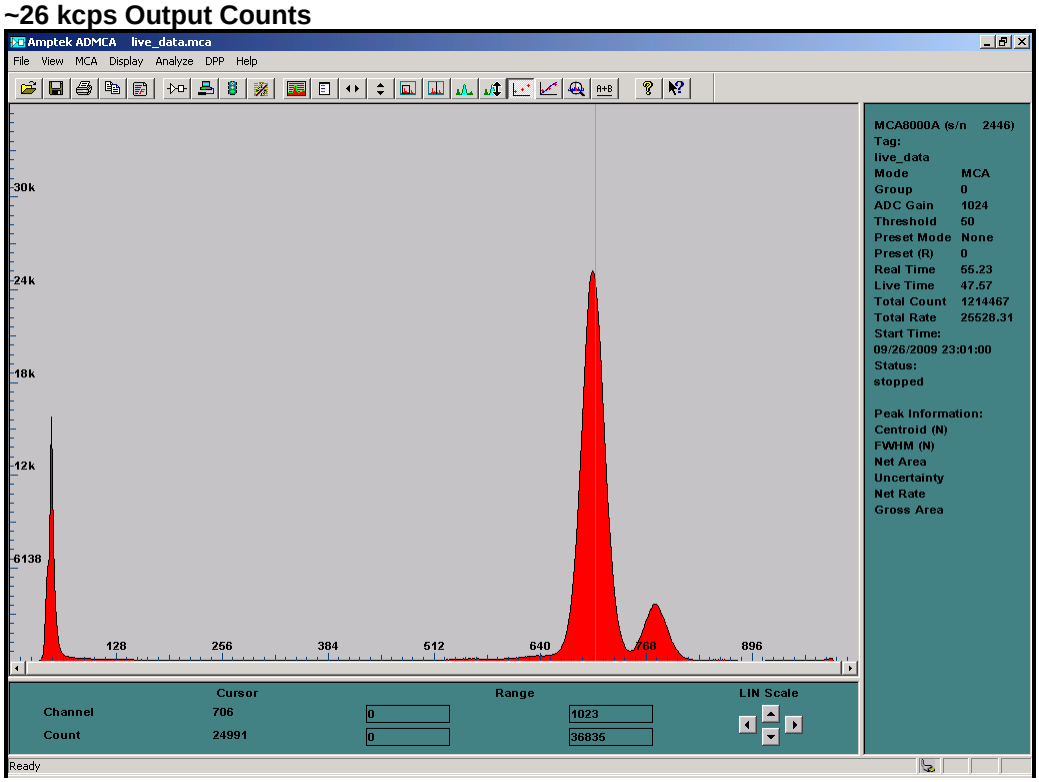


~149 kcps Output Counts

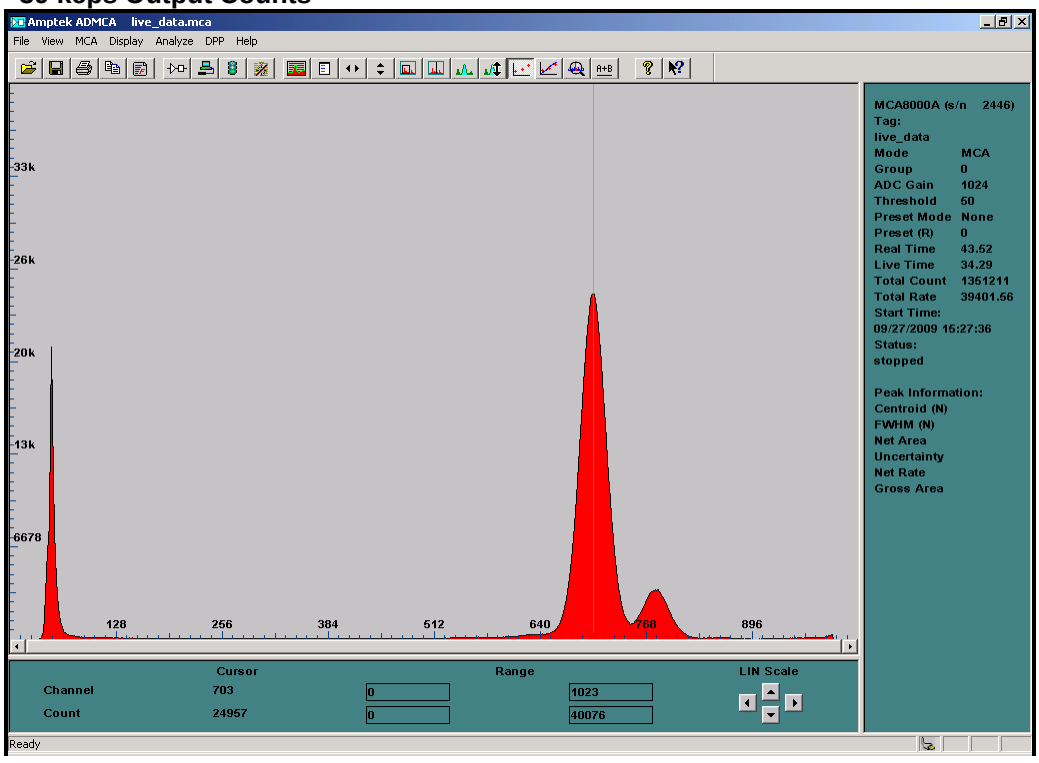


Detector Element=306 Shaping Time = 2 μsec

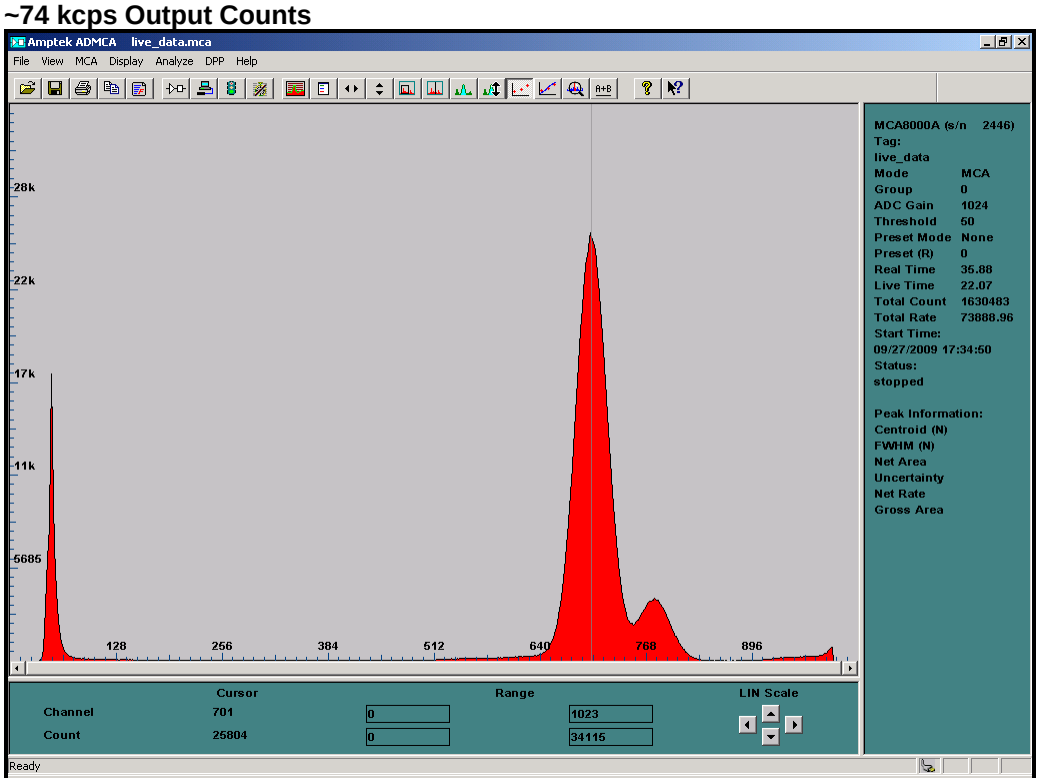
~26 kcps Output Counts



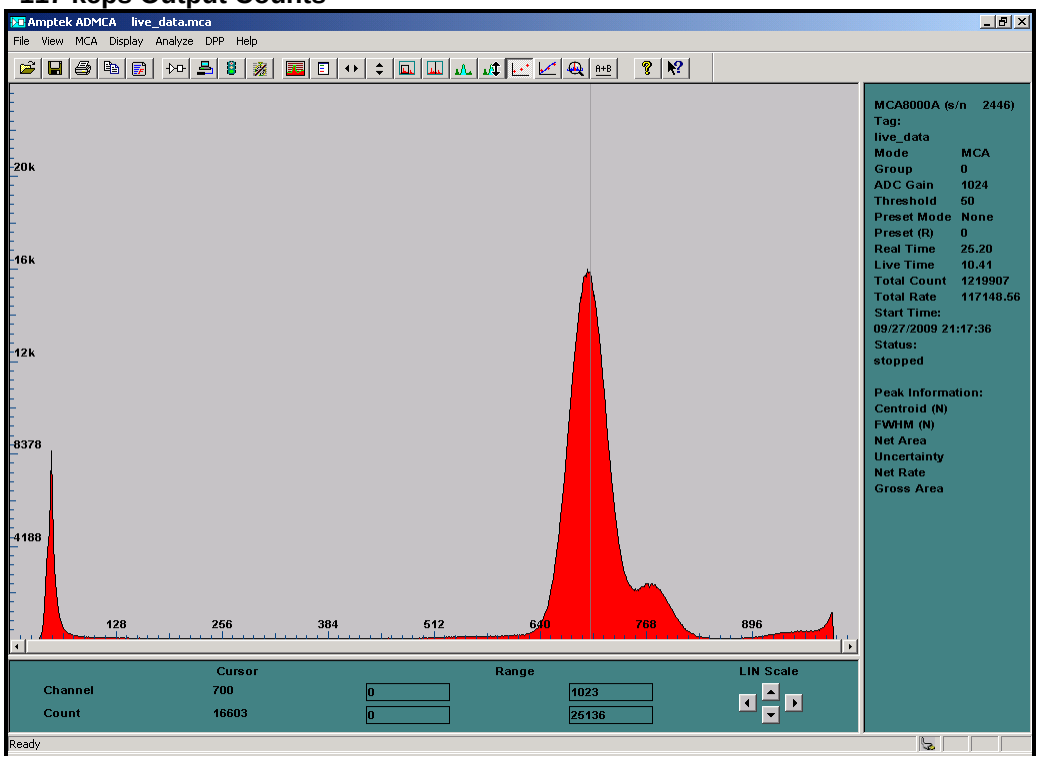
~39 kcps Output Counts



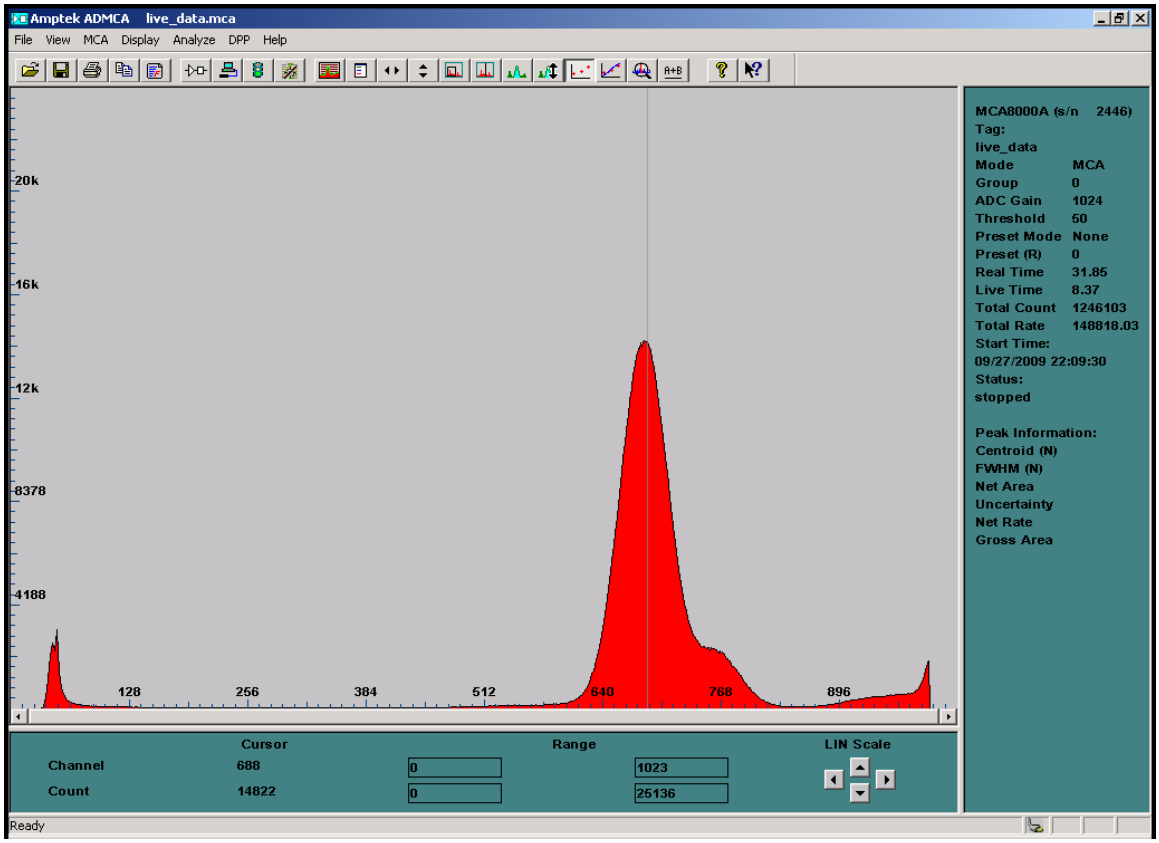
~74 kcps Output Counts



~117 kcps Output Counts

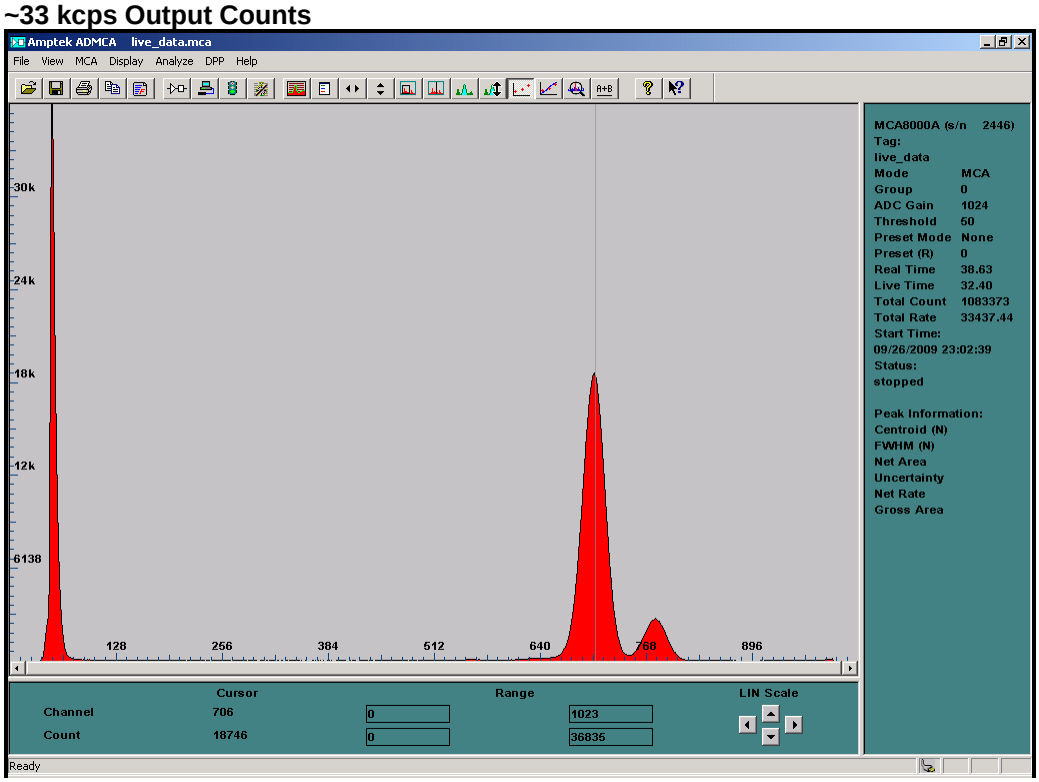


~149 kcps Output Counts

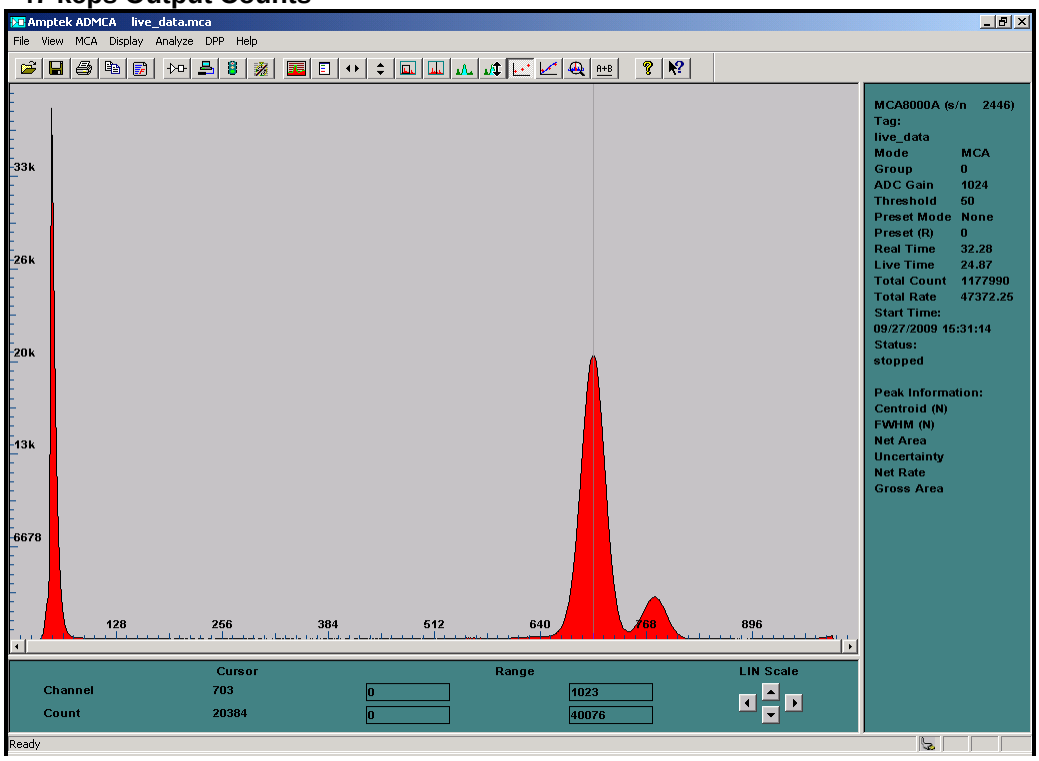


Detector Element=312 Shaping Time = 2 μsec

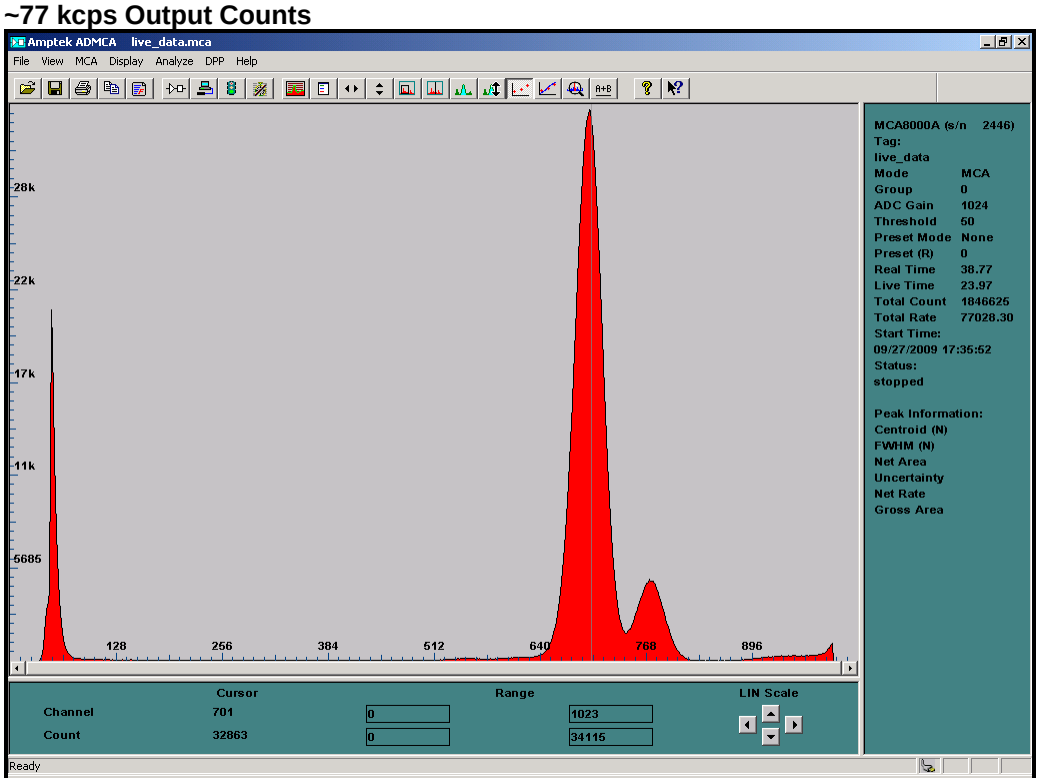
~33 kcps Output Counts



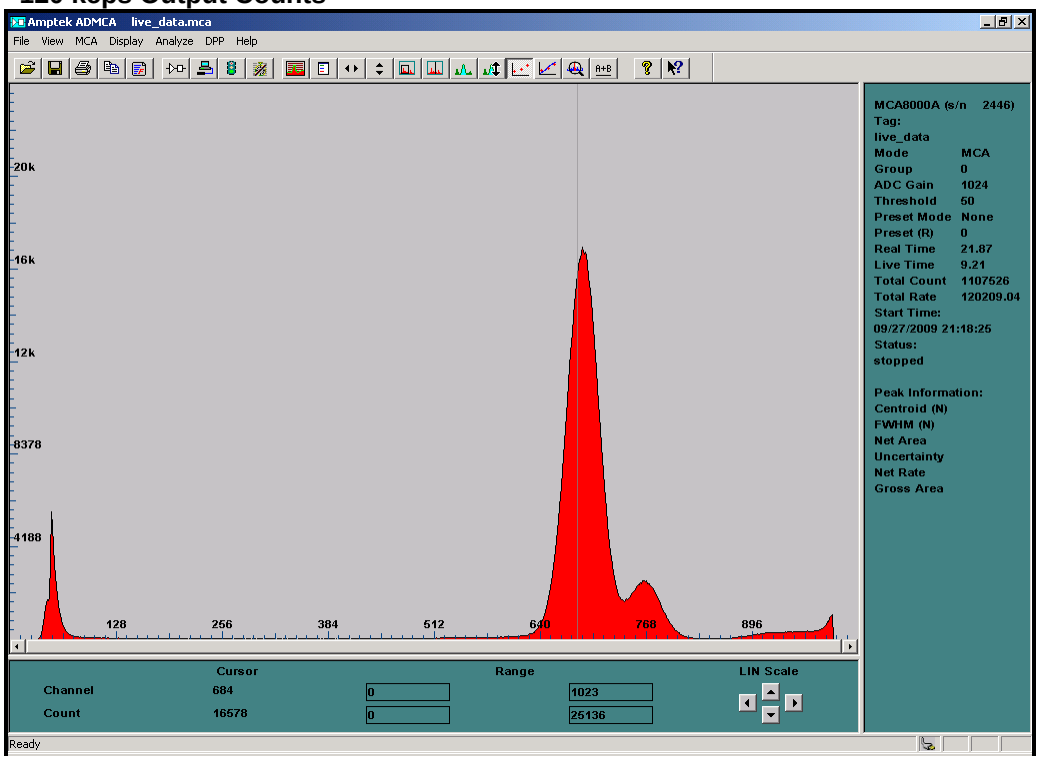
~47 kcps Output Counts



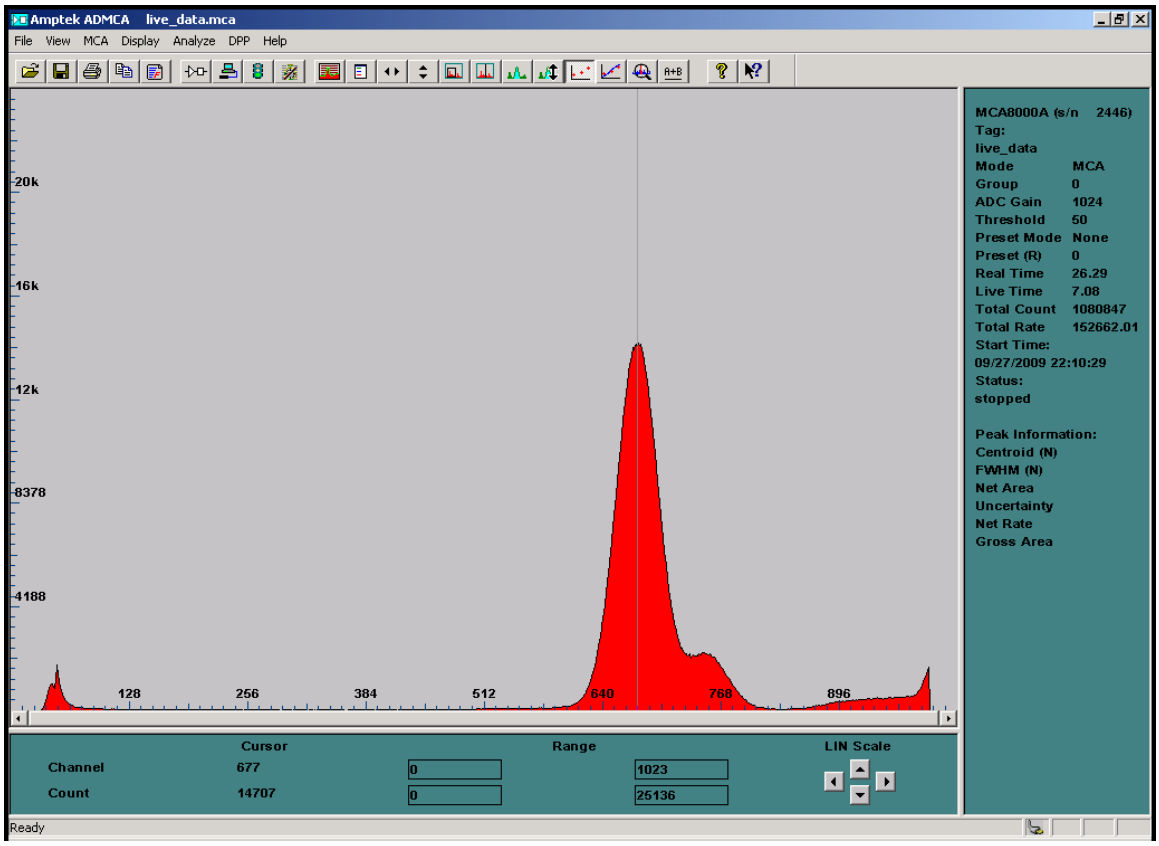
~77 kcps Output Counts



~120 kcps Output Counts

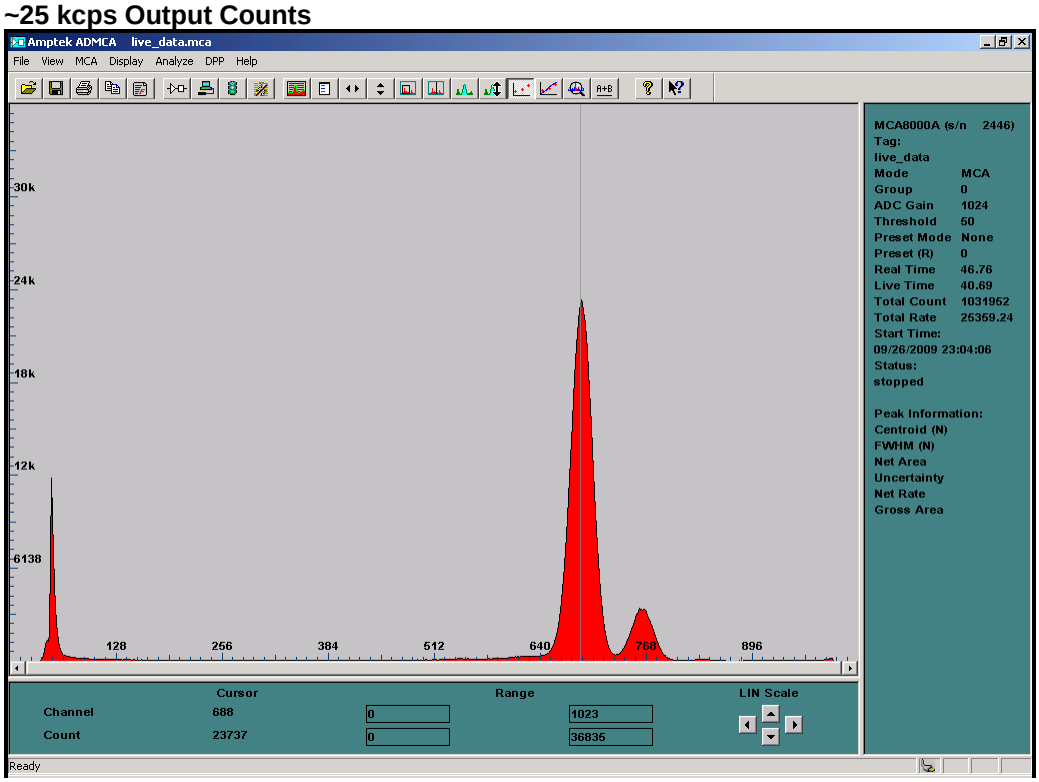


~153 kcps Output Counts

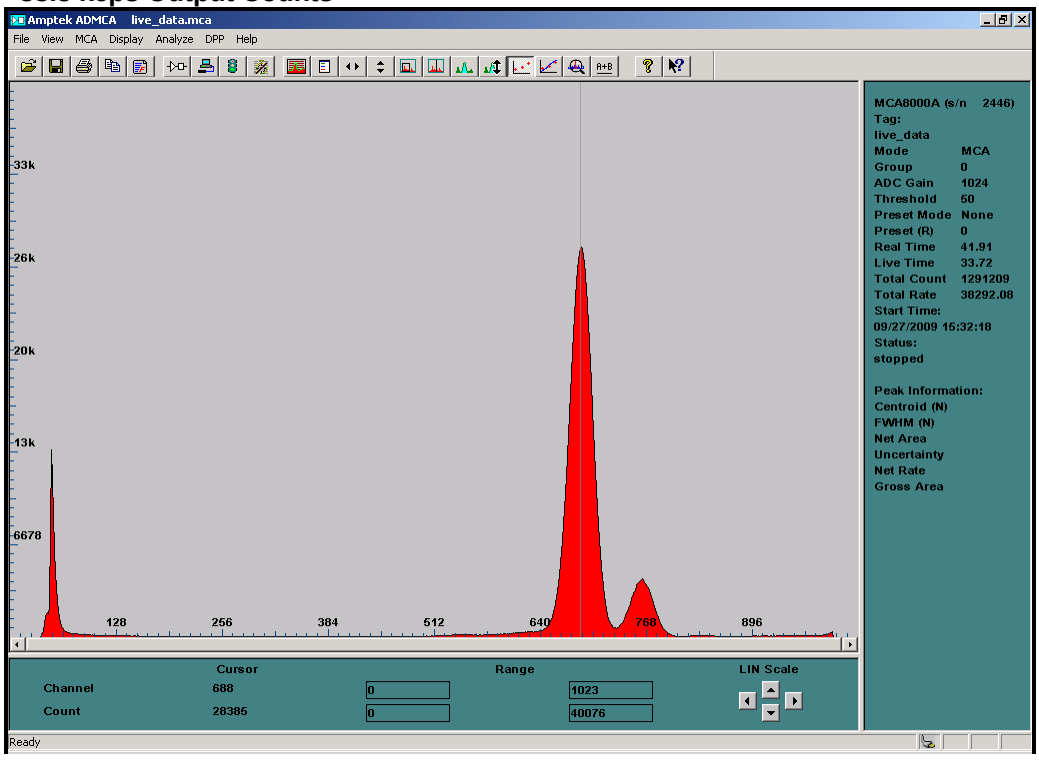


Detector Element=316 Shaping Time = 2 μsec

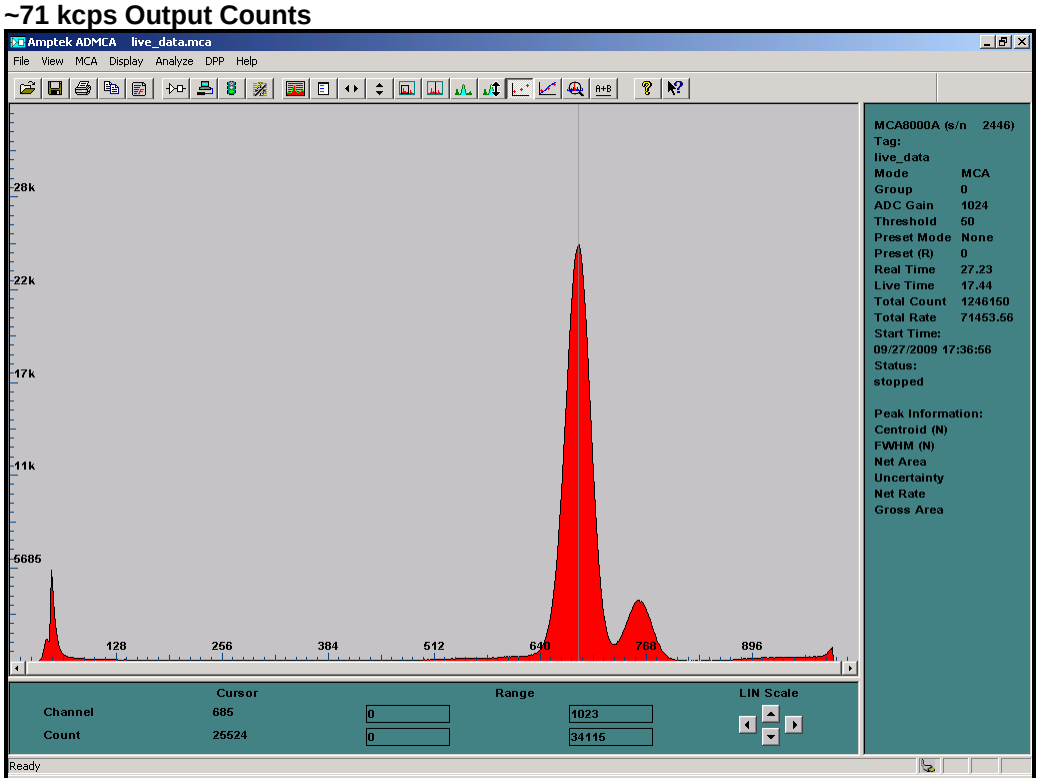
~25 kcps Output Counts



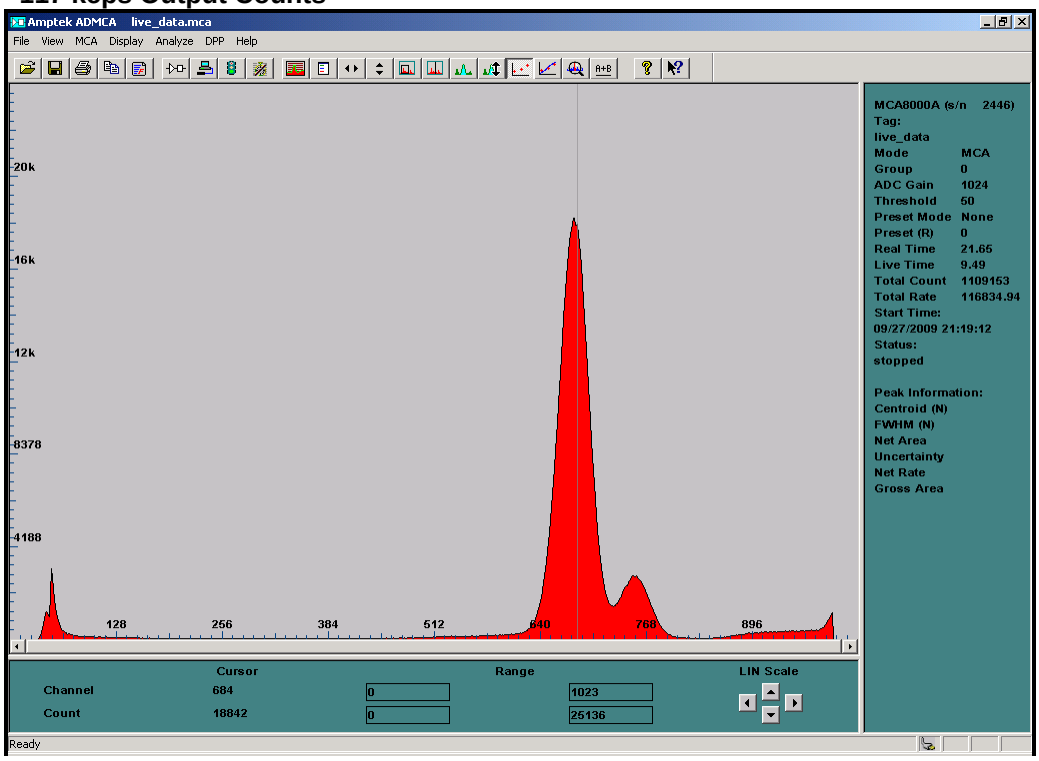
~38.3 kcps Output Counts



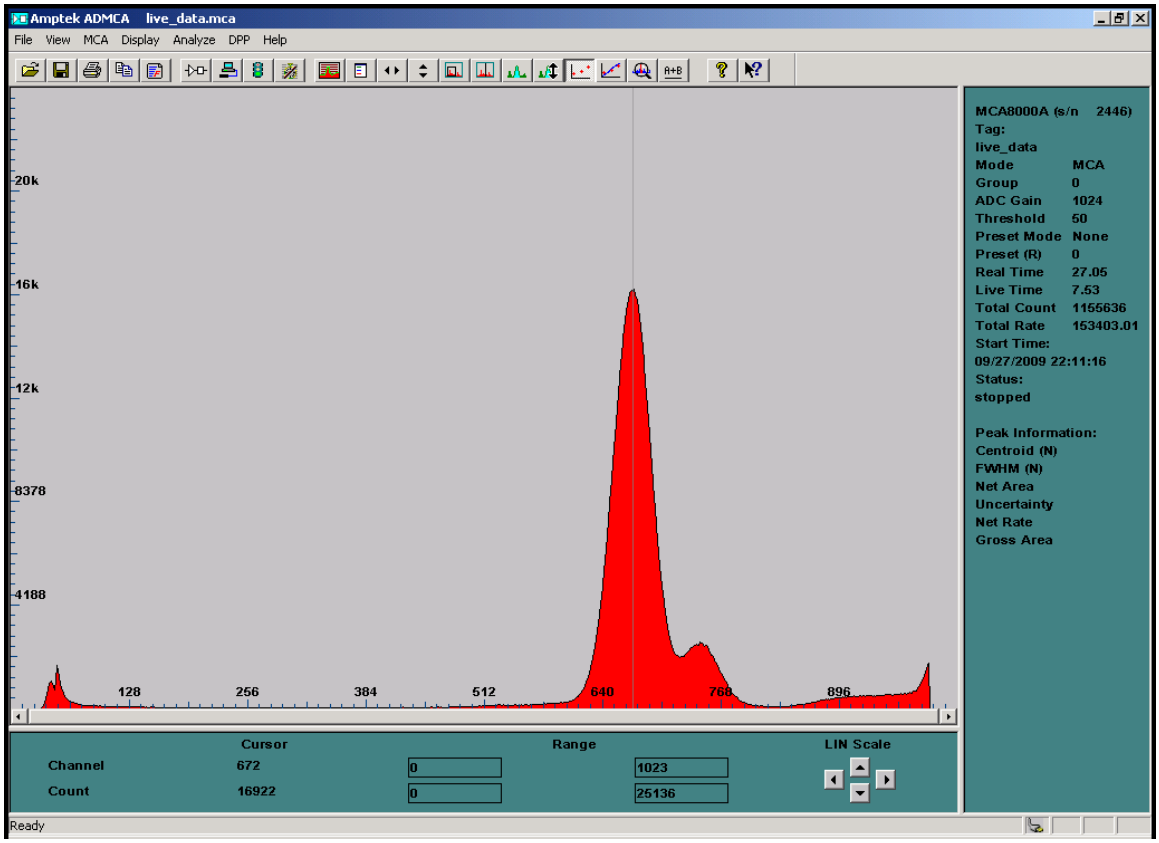
~71 kcps Output Counts



~117 kcps Output Counts

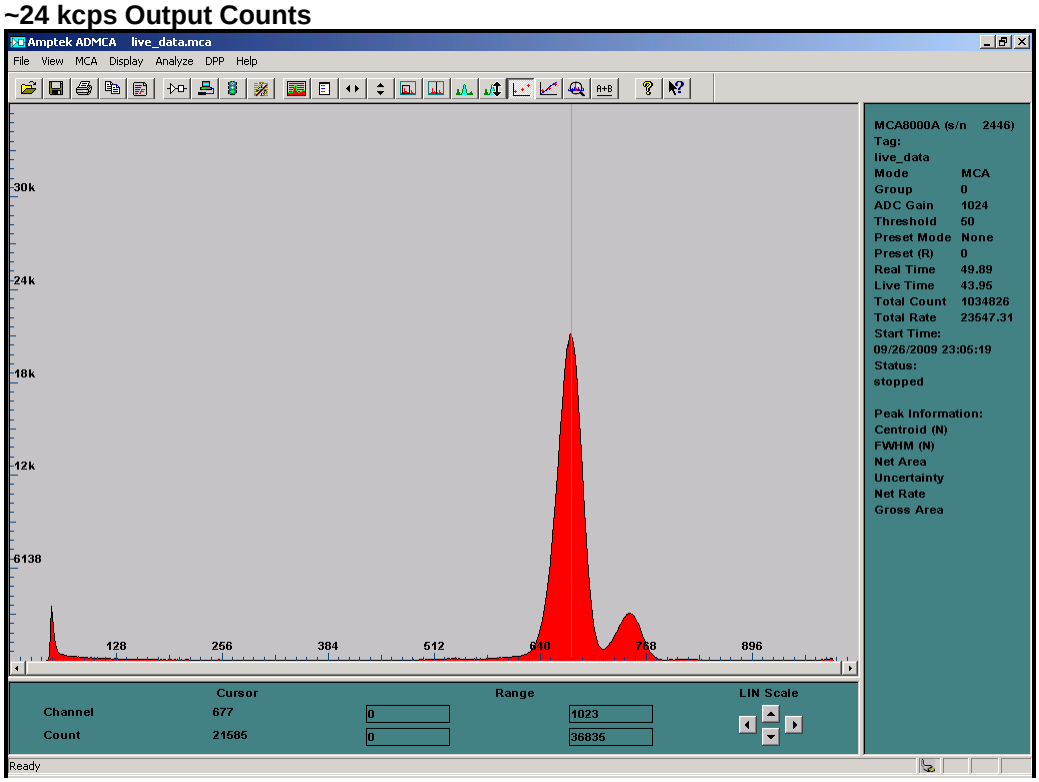


~153 kcps Output Counts

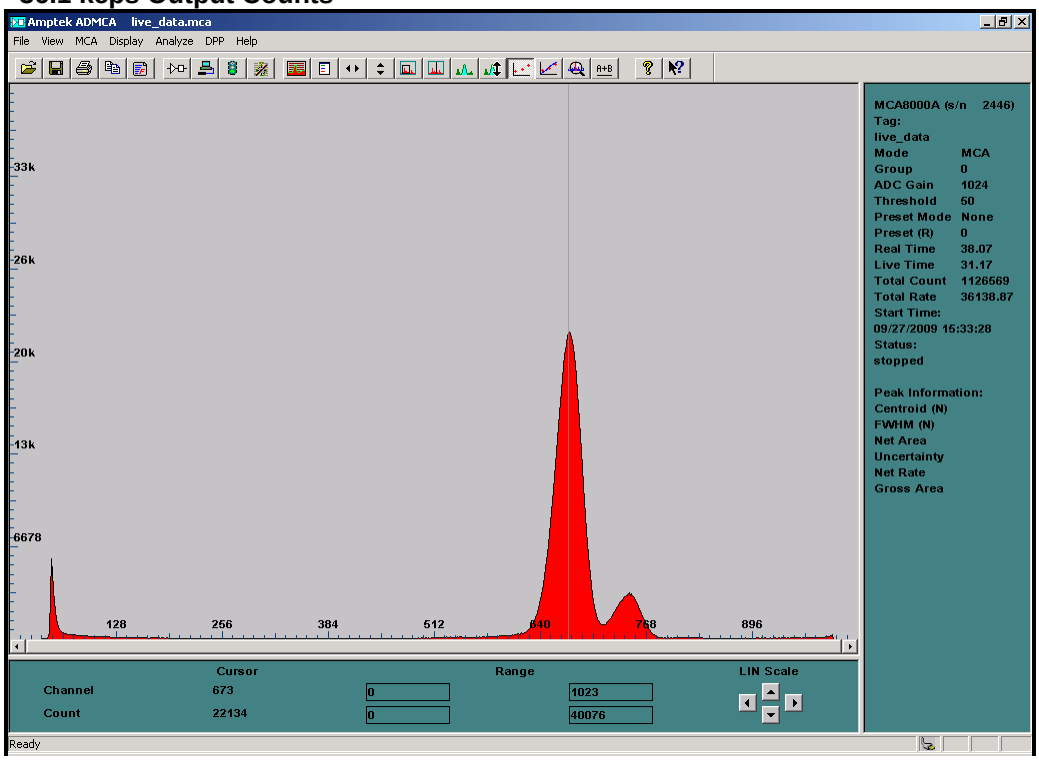


Detector Element=319 Shaping Time = 2 μsec

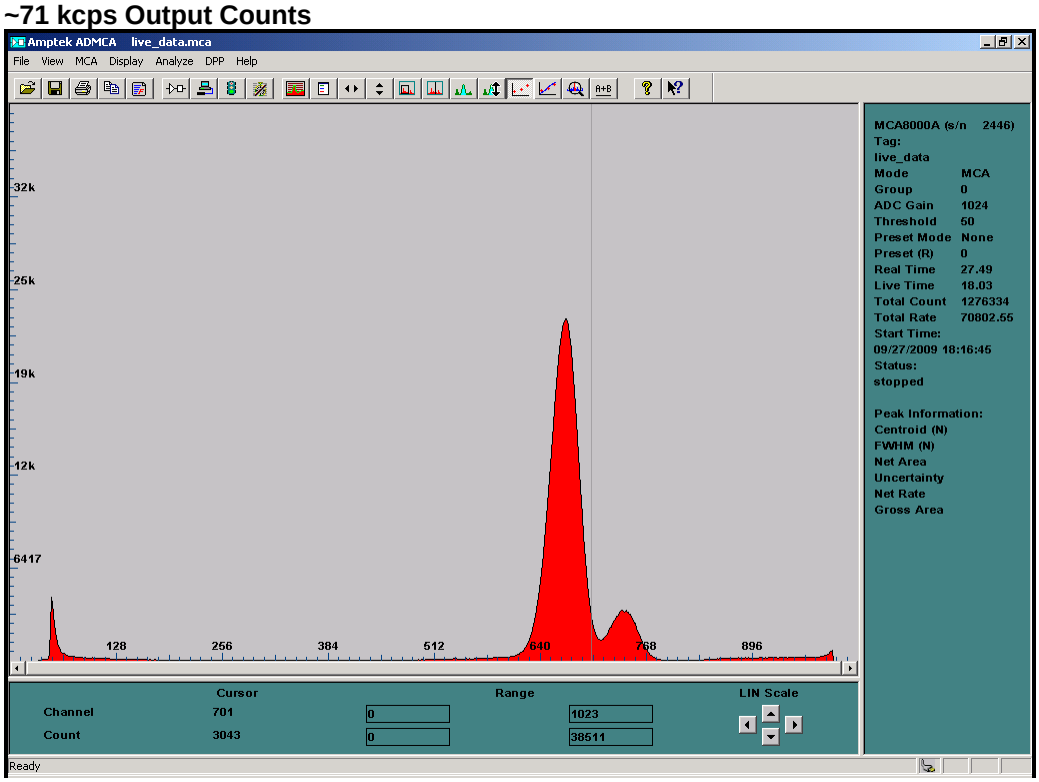
~24 kcps Output Counts



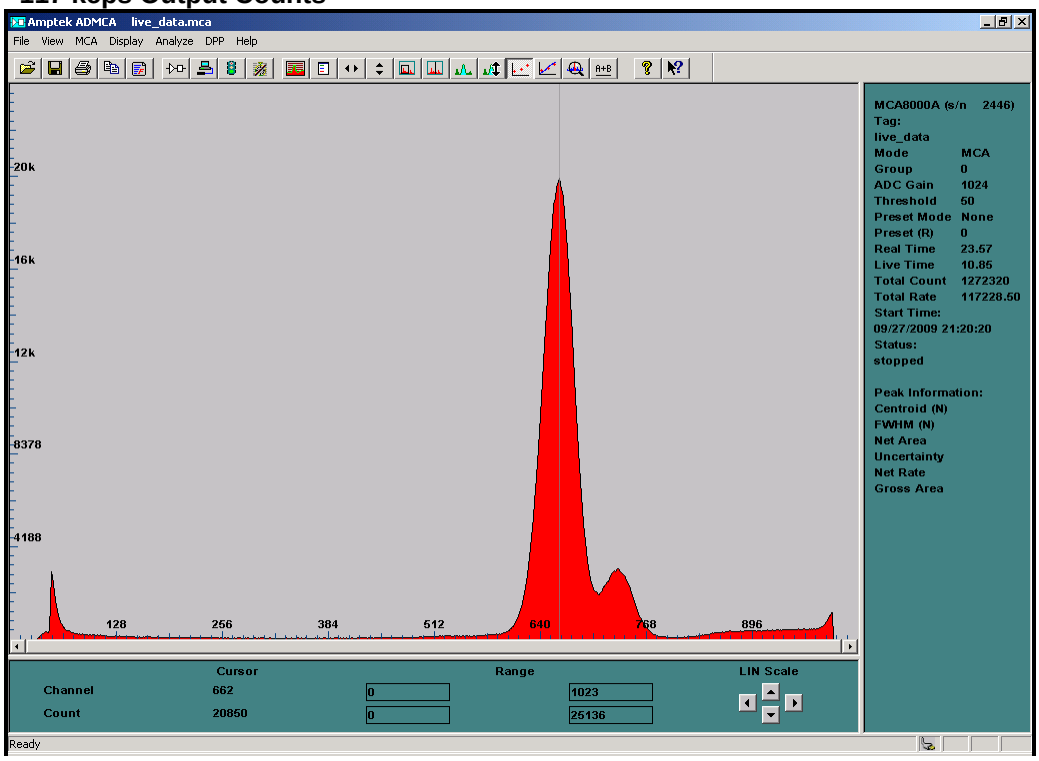
~36.1 kcps Output Counts



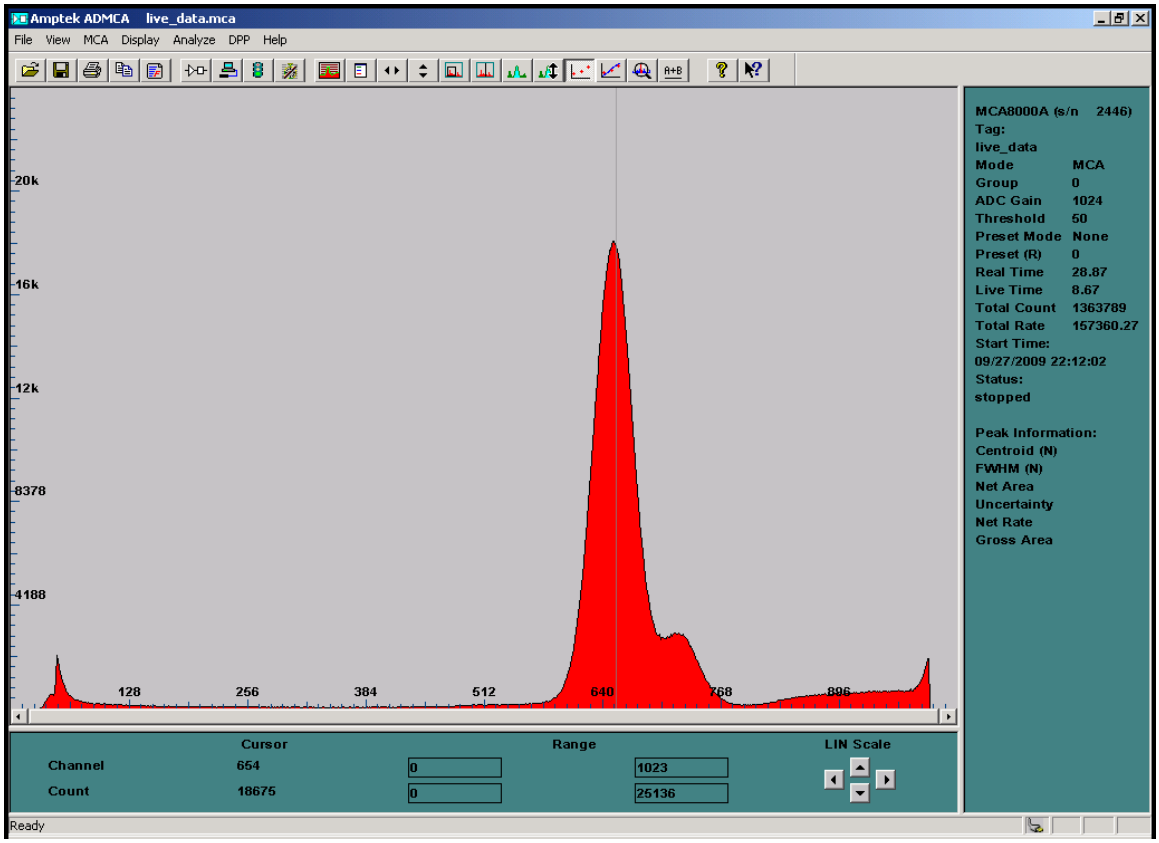
~71 kcps Output Counts



~117 kcps Output Counts

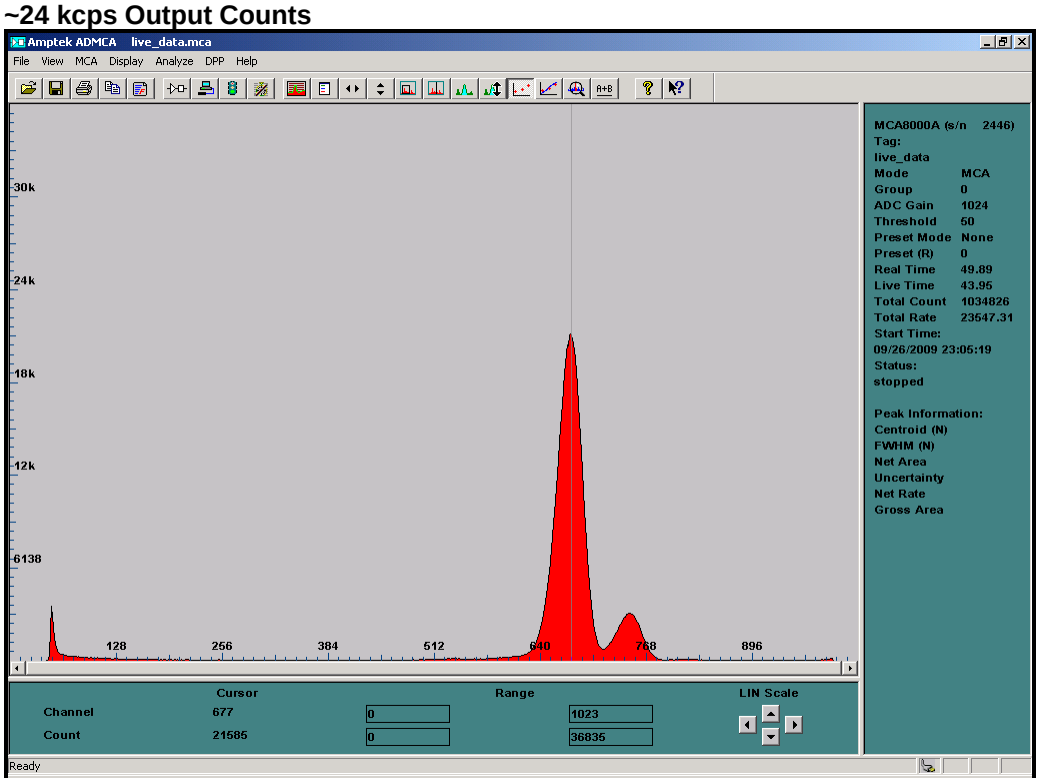


~136 kcps Output Counts

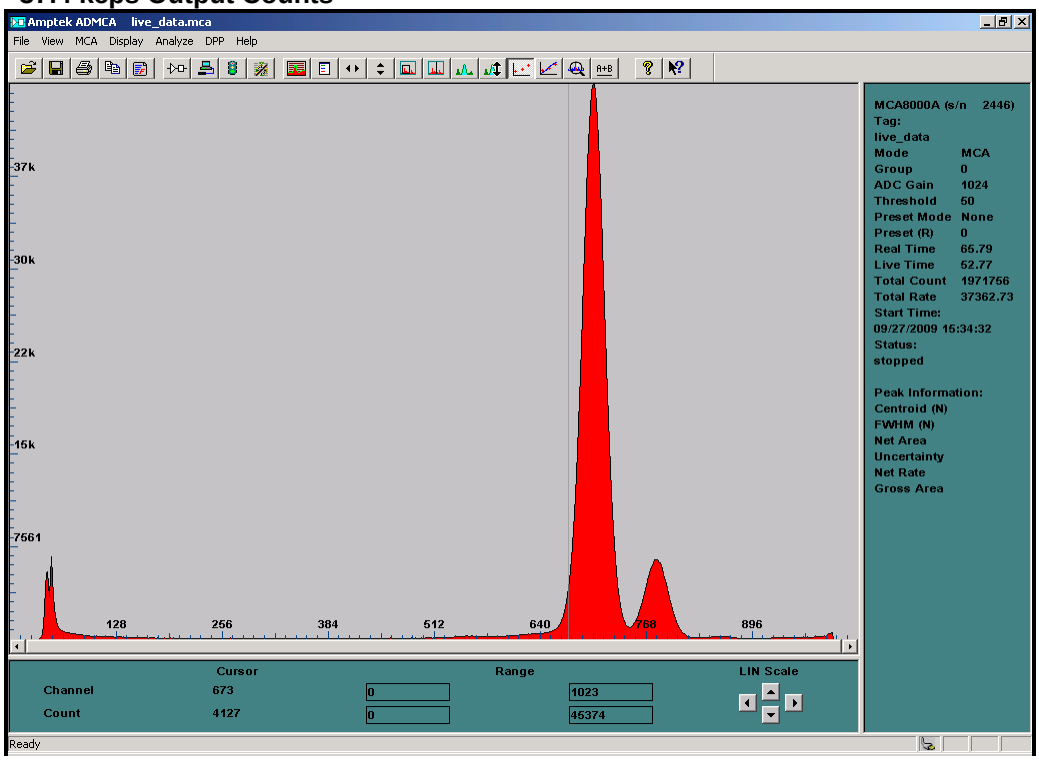


Detector Element=324 Shaping Time = 2 μsec

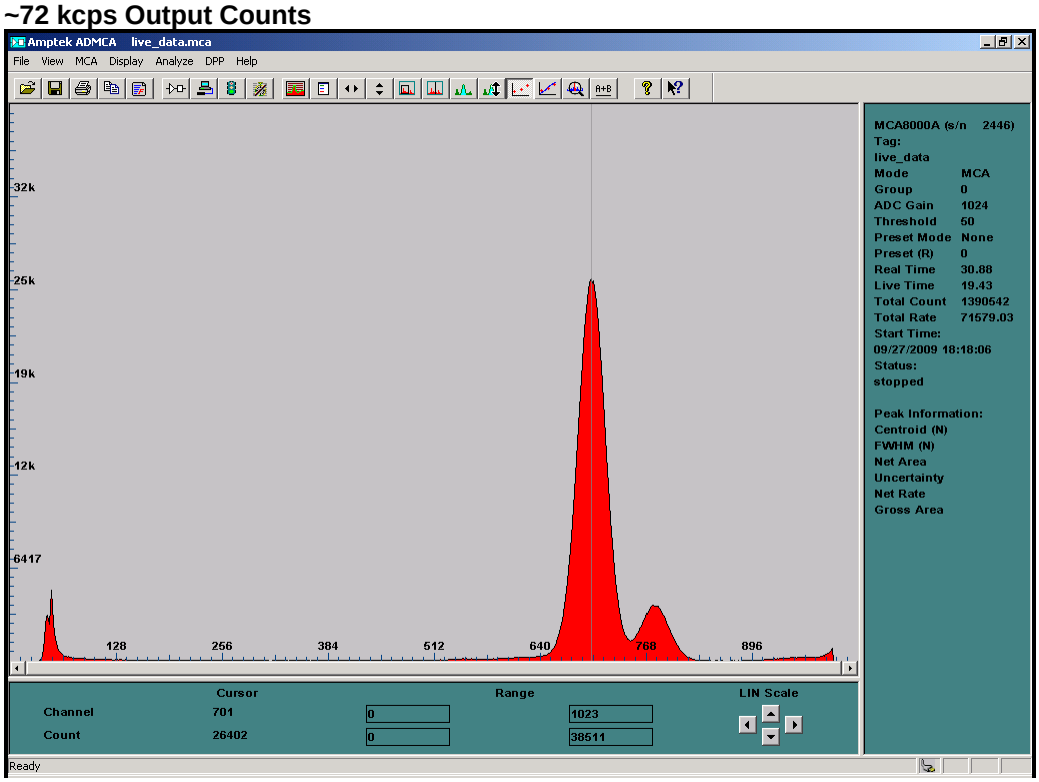
~24 kcps Output Counts



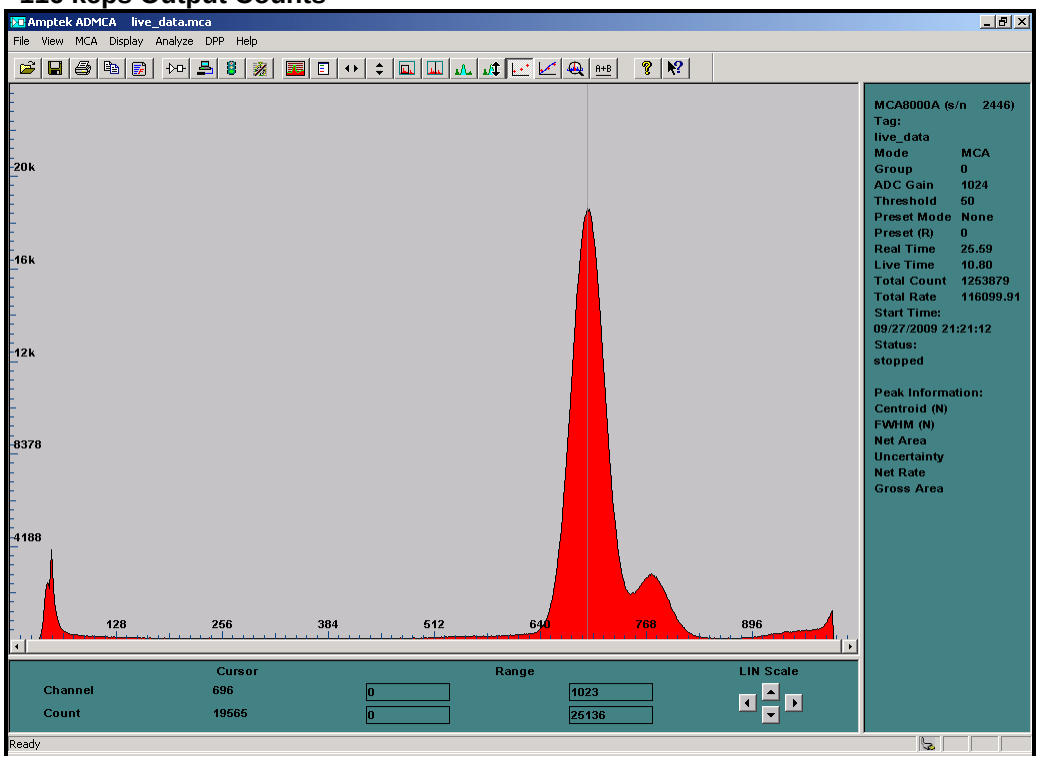
~37.4 kcps Output Counts



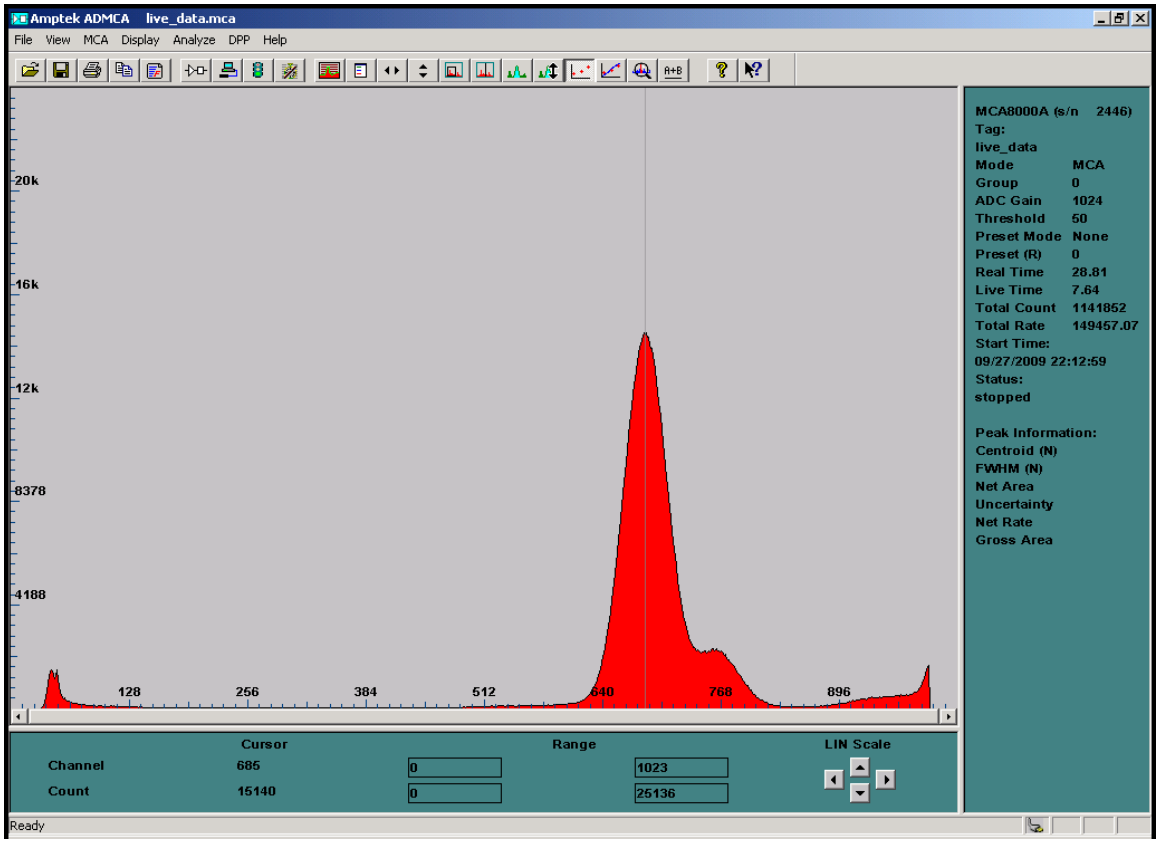
~72 kcps Output Counts



~116 kcps Output Counts

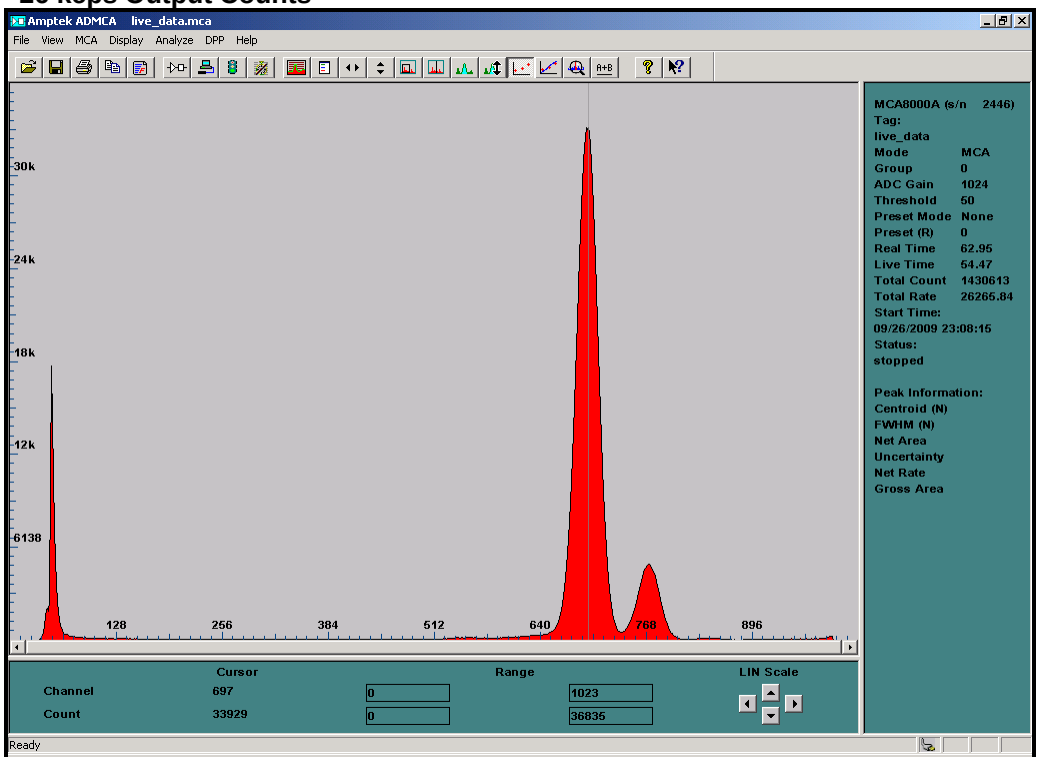


~149 kcps Output Counts

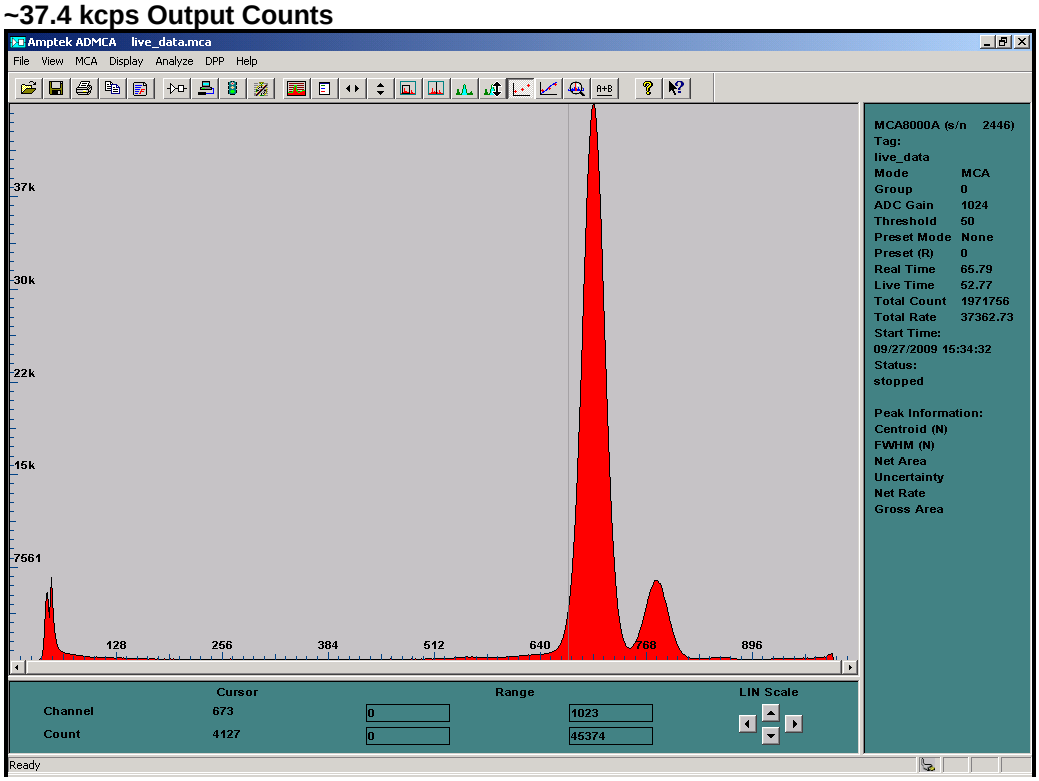


Detector Element=327 Shaping Time = 2 μsec

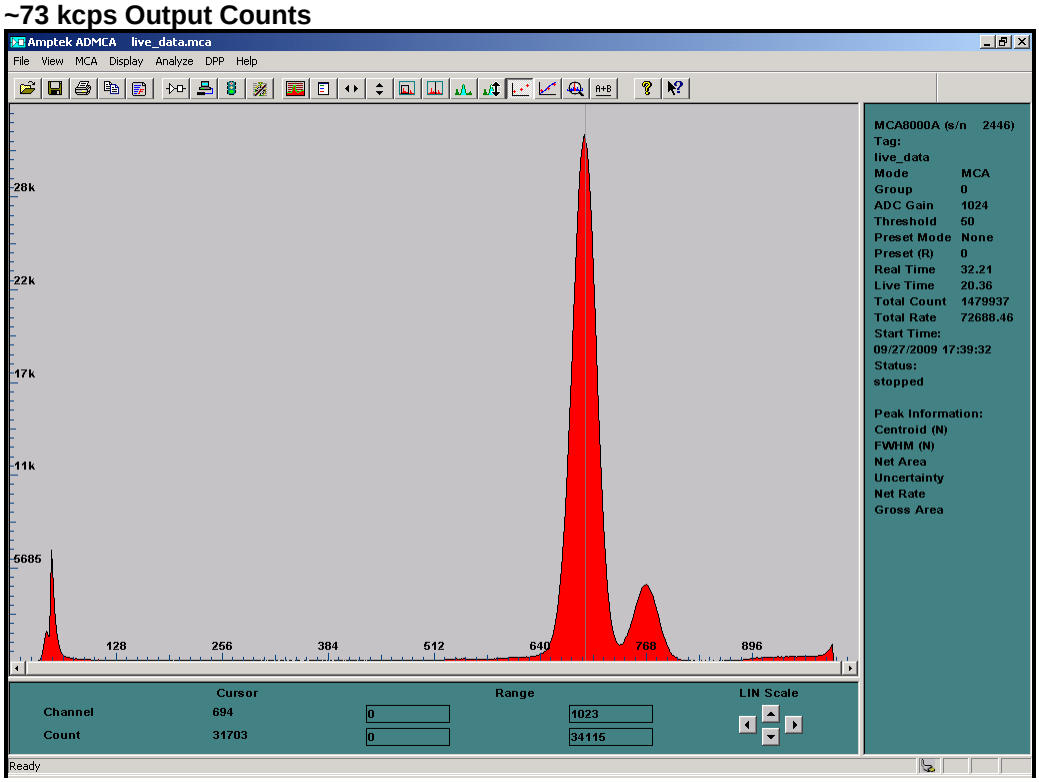
~26 kcps Output Counts



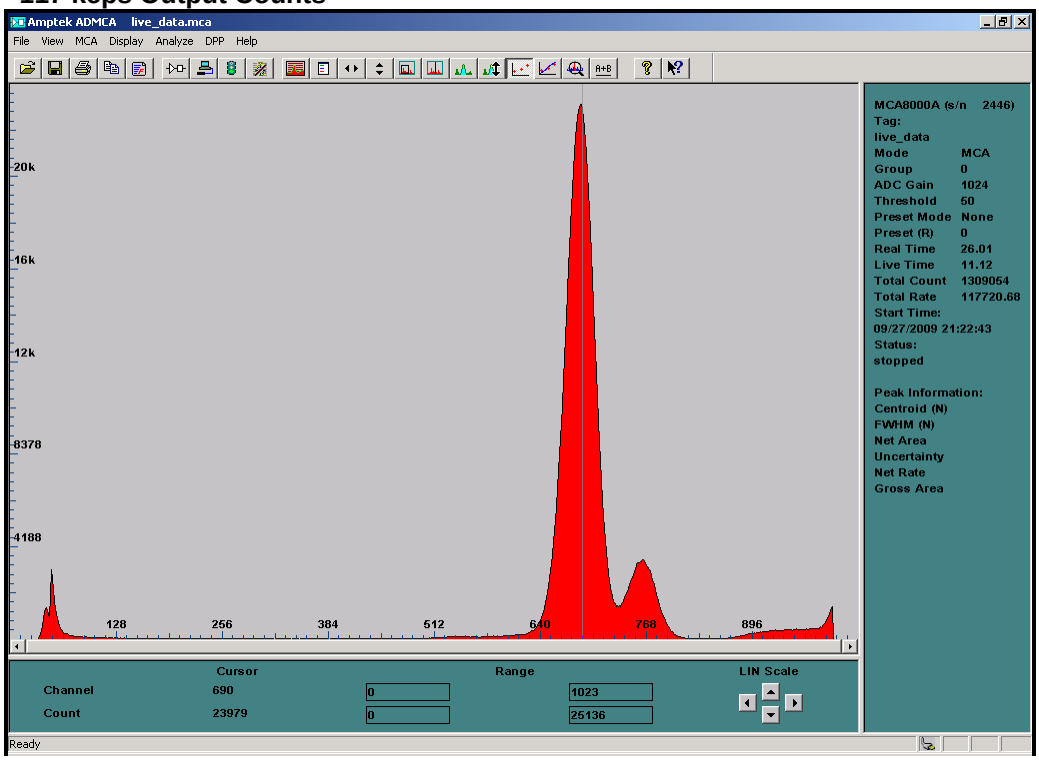
~37.4 kcps Output Counts



~73 kcps Output Counts



~117 kcps Output Counts



~149 kcps Output Counts