

## 5.1.4 SYSTEM GAIN

### 5.1.4.1 NAC FM SYSTEM GAIN CALIBRATION RESULTS

*As reported in Reference 5.1.4.1-1*

**Reference 5.1.4.1-1 - IOM-388-PAG-CCA97-11,"NAC FM Calibration Results: System Gain", C. Avis, September 21, 1997**

#### 5.1.4.1.1 INTRODUCTION

The Narrow-angle Flight Model thermal/vacuum testing included the acquisition of a set of images for determination the system Gain Constants. These Constants characterize the electronics in units of electrons/DN at each of the four gain settings.

Sequences of increasing exposures were taken at temperatures of +5° C and +25° C. Gain 0 and 1 were taken in 4x4 and 2x2 mode respectively and Gain 2 and 3 in 1x1 mode. All +5° C data were taken with Antiblooming 'ON' and the +25° C data were taken with Antiblooming 'OFF'. In addition, Gain 2 at 25° C was also taken with Antiblooming 'ON'.

#### 5.1.4.1.2 METHOD

At each gain setting, one method was used to derive the system Gain Constant and another to extract the ratios of the Constants. The results of each method are compared in the next section.

##### 5.1.4.1.2.1 Method 1 - Signal vs. Noise

Images of the same exposure time were combined to produce signal and noise values at 100 small areas at all available signal levels. Values for Gain Constant and Read Noise Floor were then derived independently at each of these small areas. This was done by solving the following equation using least-squares.

$$N^2 = S/K + R^2$$

where      K    is the System Gain Constant (in electrons/DN)  
               R    is the Read Noise Floor (in DN)  
               S    is the measured signal (in DN)  
               N    is the measured noise (in DN)

The 100 derived values were then compared and any areas giving values more than 2 sigma from the mean were flagged as bad. Global values for K and R were then derived by averaging the values at the remaining good areas.

Method 1 Results

The best fit values for the Gain Constant (K) and Read Noise Floor (R) are tabulated below. Because the value for R is dependent upon the fit to the entire set of data, the following table also includes the noise value of the zero exposure frames of the sequence. This is probably more reliable as a value for the noise floor.

Global values of Gain Constant, Read Noise Floor and zero exposure noise for +25°C:

Gain	Anti-blooming	K (e/dn)	sigma(K)	R (dn)	sigma(R)	Zero Exp. Noise (dn)	Max. Exp. Level Used (# pts)
0	OFF	205.80	15.44	0.41	0.09	0.39	30 (6)
1	OFF	94.47	7.24	0.55	0.24	0.38	320 (11)
2	OFF	29.21	1.29	0.74	0.39	0.60	220 (8)
2	ON	29.09	1.52	0.74	0.38	0.59	220 (8)
3	OFF	12.88	0.53	2.25	0.57	1.21	220 (13)

Global values of Gain Constant, Read Noise Floor and zero exposure noise for +5°C:

Gain	Anti-blooming	K (e/dn)	sigma(K)	R (dn)	sigma(R)	Zero Exp. Noise (dn)	Max. Exp. Level Used (# pts)
0	ON	207.21	15.80	0.34	0.08	0.30	40 (2)
1	ON	100.92	8.79	0.74	0.87	0.41	320 (7)
2	ON	30.27	3.11	0.92	1.86	0.58	320 (6)
3	ON	12.65	1.24	1.36	3.67	1.22	150 (6)

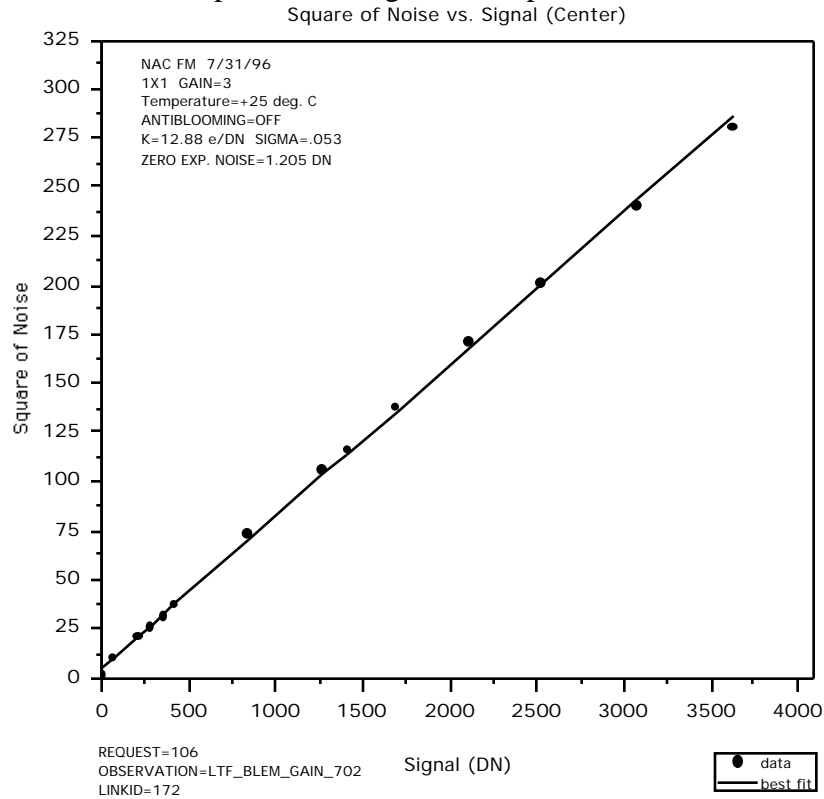
Notes:

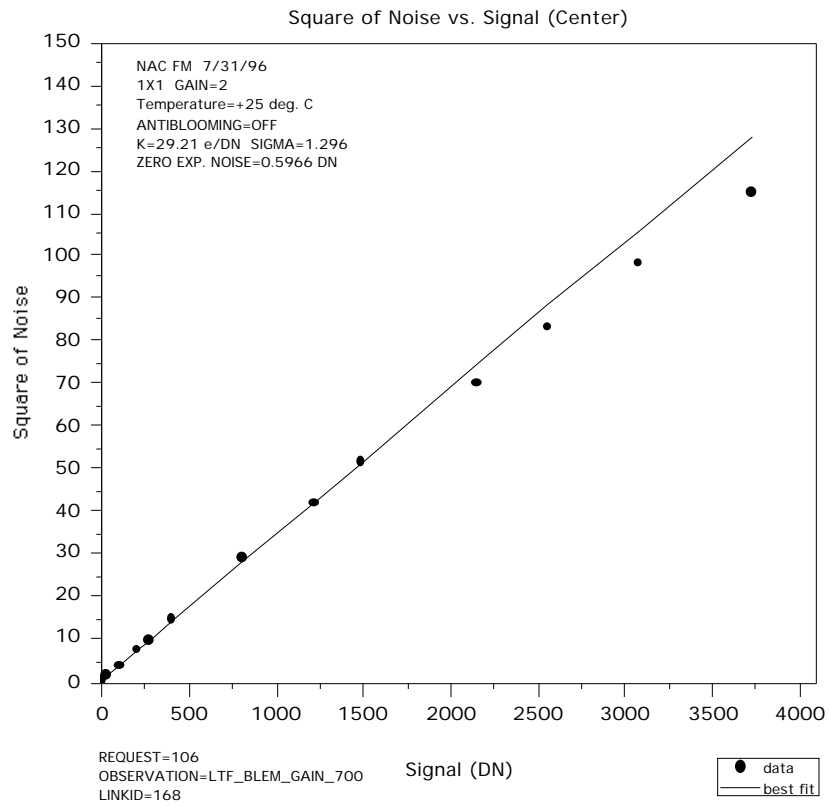
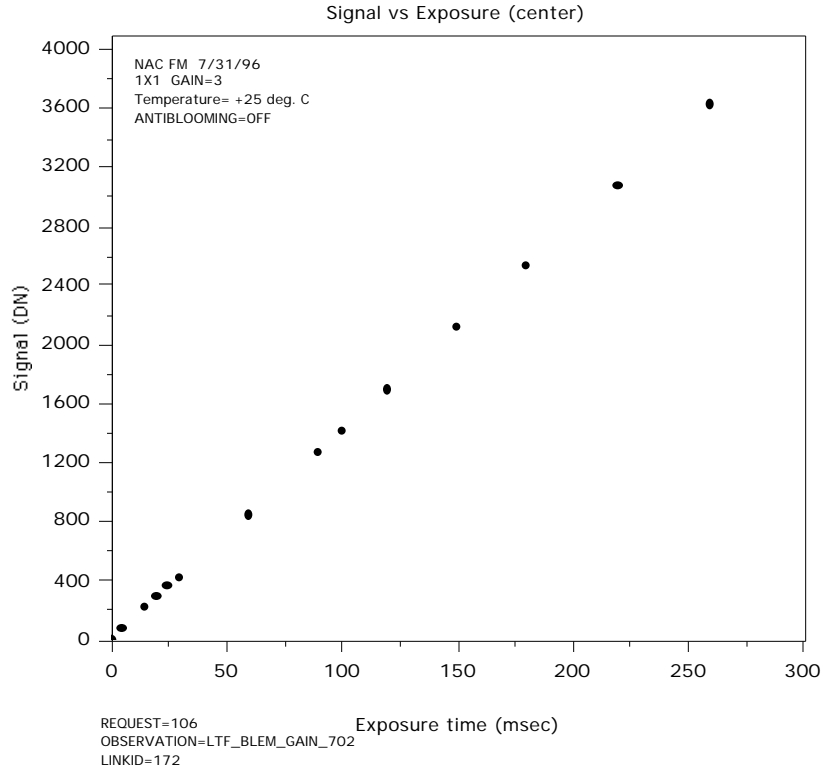
1. Due to linearity and stability problems, the results for Gain 0 were calculated using a maximum exposure time of 30 milliseconds ( for 25° C) and 40 milliseconds (for 5°C).
2. For Gain 1, the two highest (for 25°C ) and the highest (for 5°C ) exposure levels were excluded from the calculation because some nonlinearity was starting to show.
3. For Gain 2, maximum exposure times of 220 milliseconds (for 25° C) and 320 milliseconds (for 5°C ) were used due to nonlinearities.
4. For Gain 3, the highest (for 25°C ) and the two highest (for 5°C ) exposure levels were excluded from the calculation due to nonlinearities.

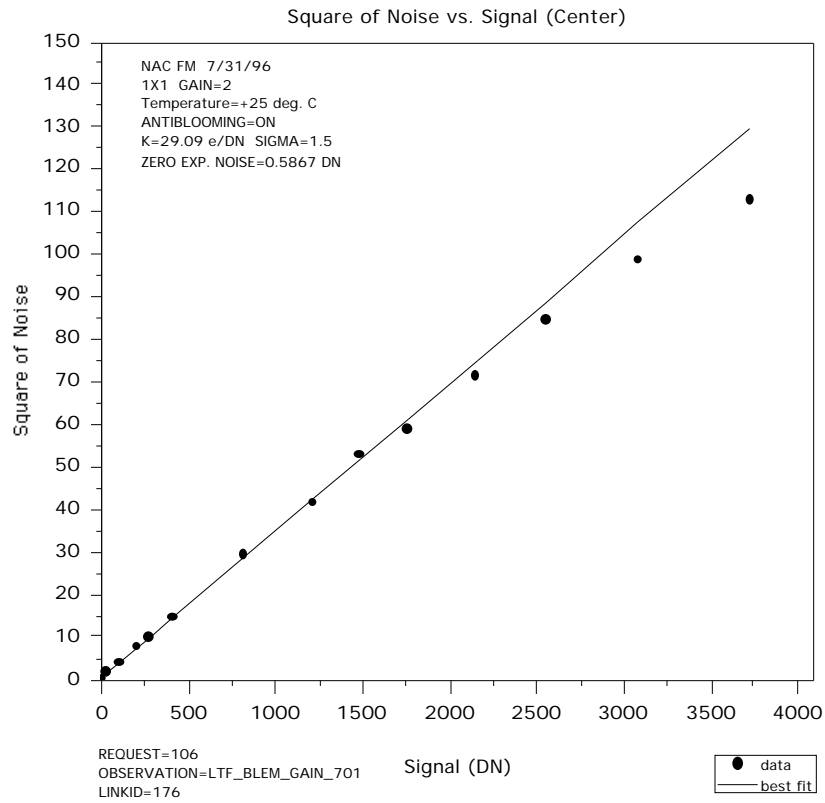
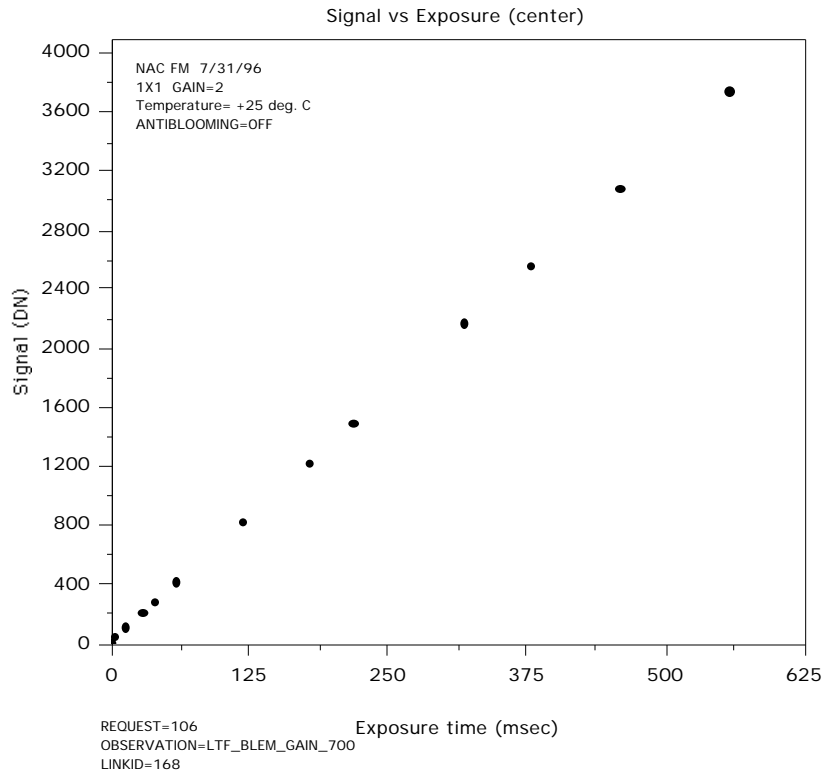
## Conclusions:

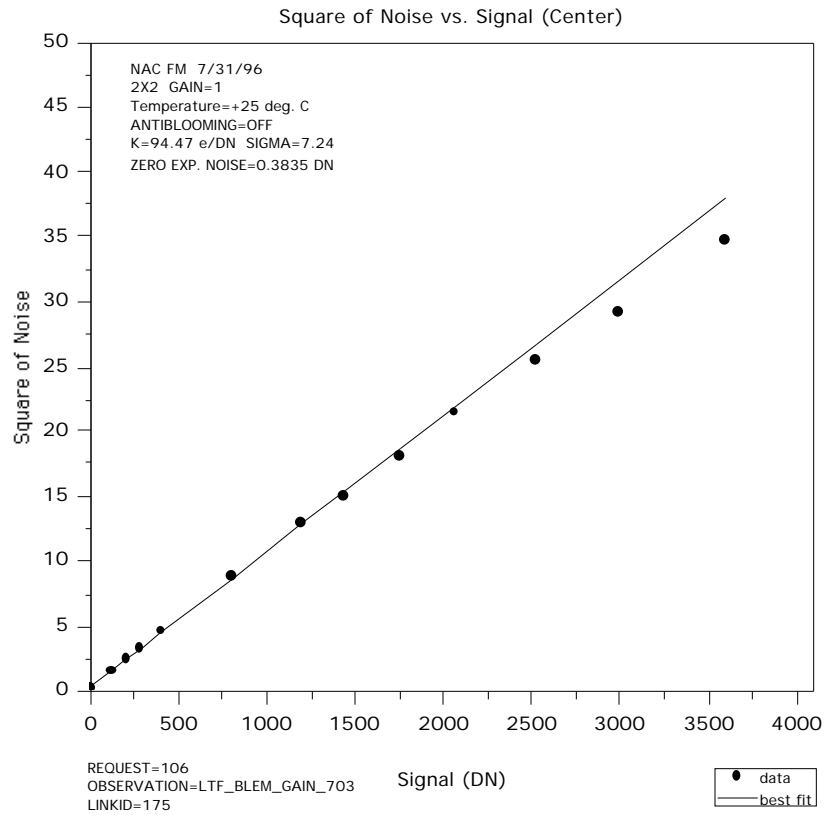
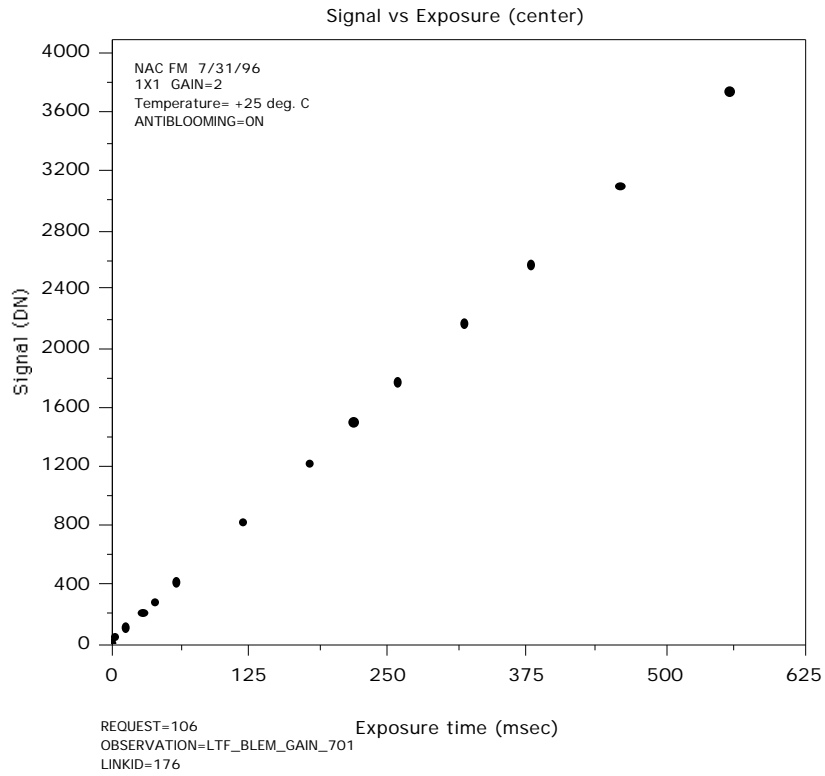
1. Gain state 0 (4x4 mode) has an unusual oscillation in the Signal vs. Noise plot for signal above about 500 DN. This oscillation is not understood.
2. Gain 0 (4x4 mode) at 5°C was calculated using only the lowest two exposure levels because of oscillations and the few exposures at this temperature. Therefore, this result might be suspect.
3. The use of Antiblooming mode had no effect on the Gain Constant value for Gain 2.
4. There is no difference in behavior at the two test temperatures except at Gain 1. This may be due to the combined effect of fewer data points at 5°C and the act of excluding some of them.

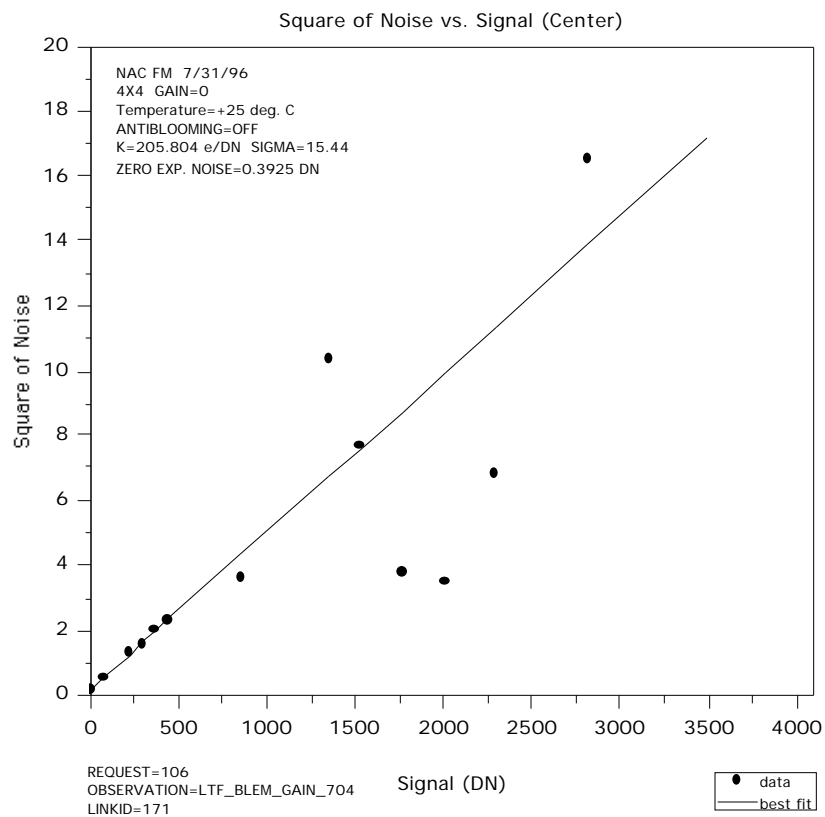
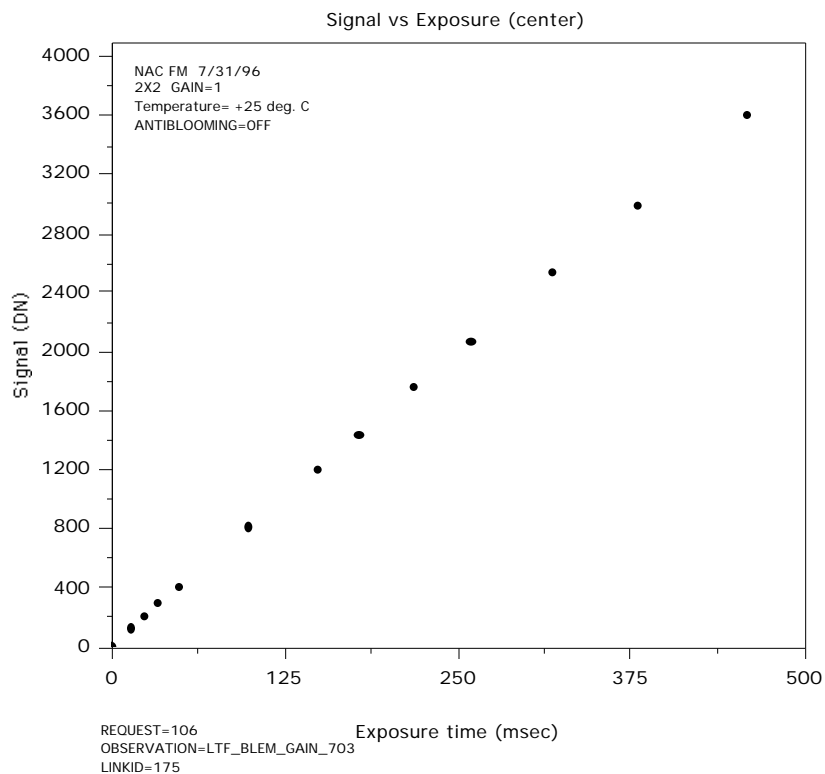
The following plots are for the center region of the image for each gain state. The • symbols are the data points from which the line (the least-squares fit) is derived. Two plots are provided for each gain state. One plot shows  $N^2$  vs.  $S$  so that the fit being plotted is linear. The other plot shows Signal vs. Exposure time.

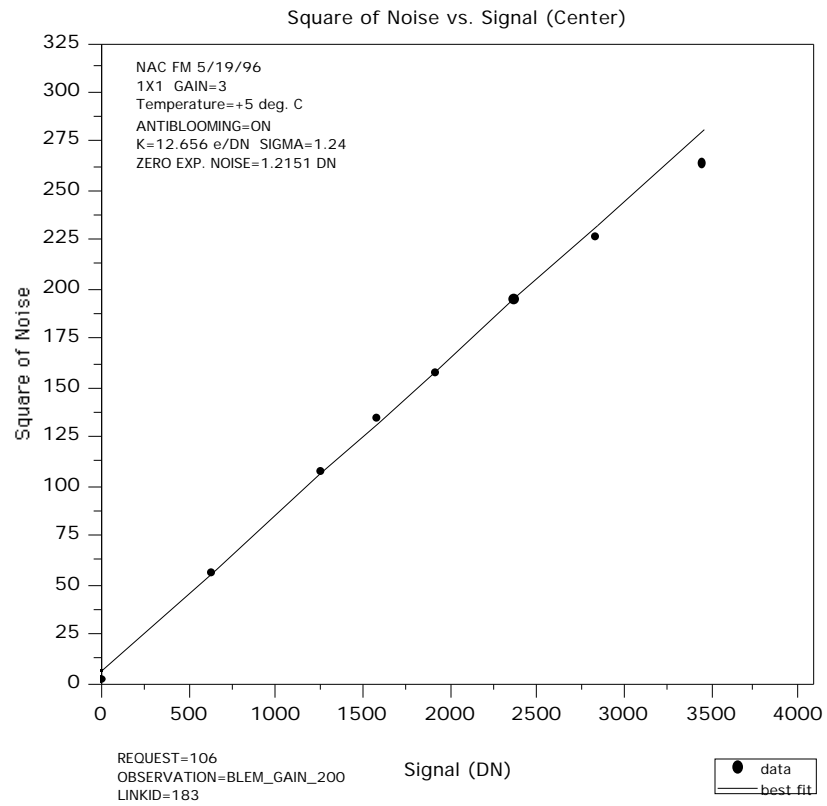
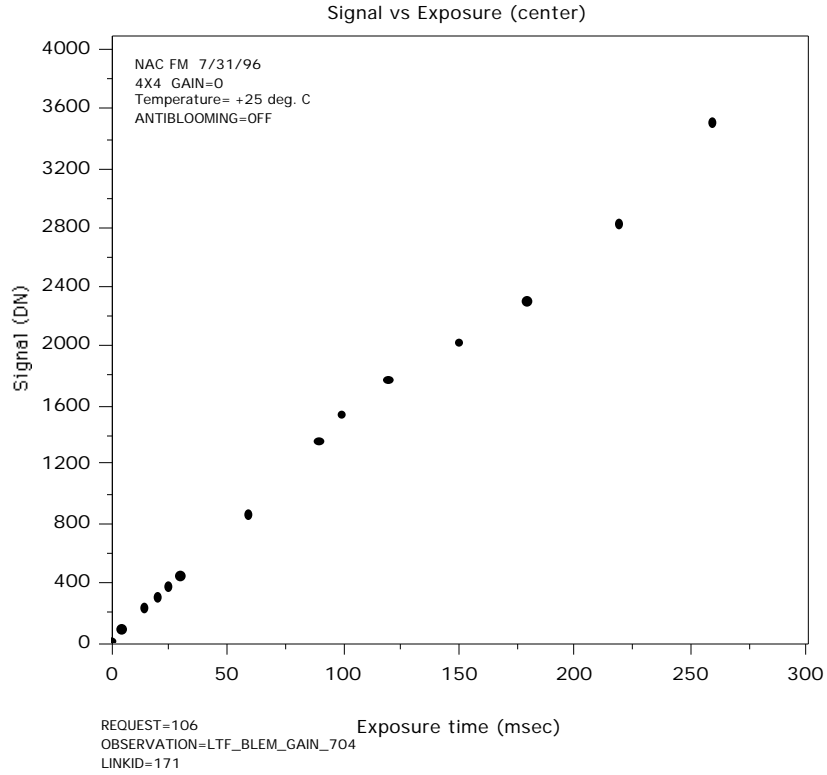




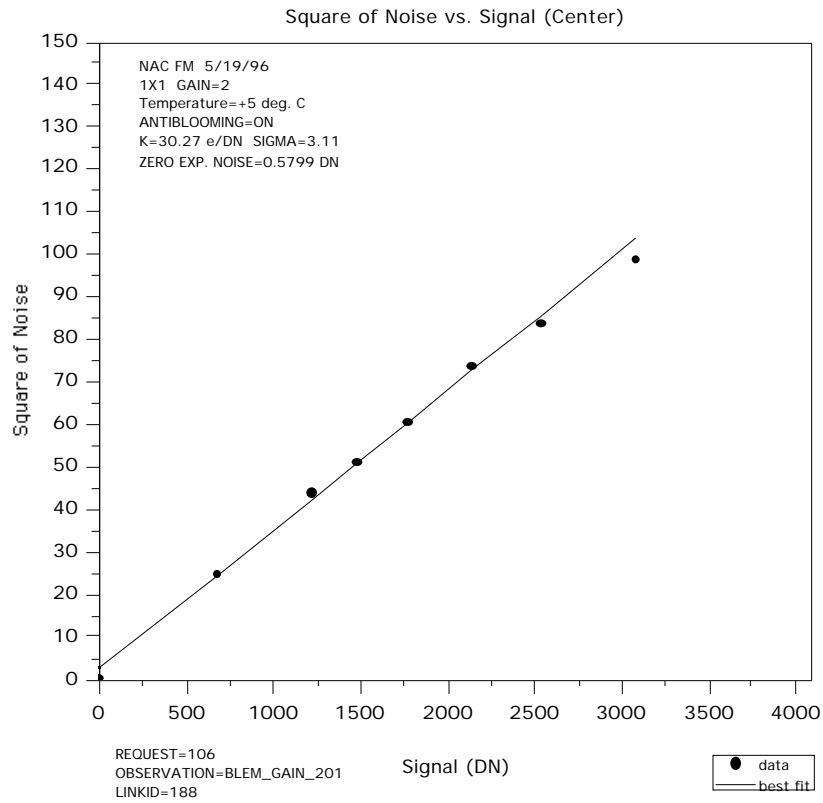
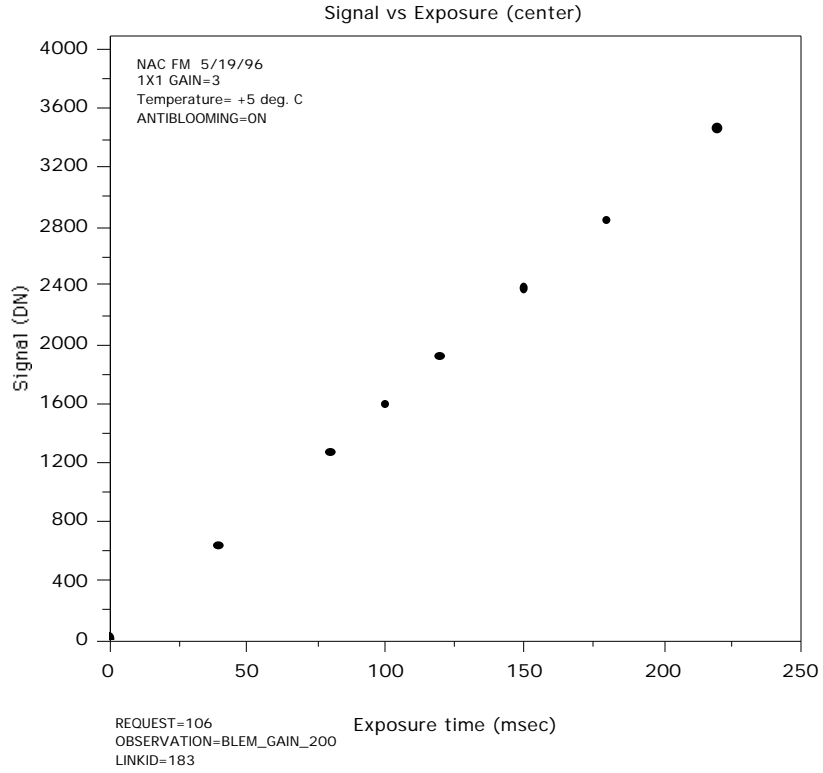


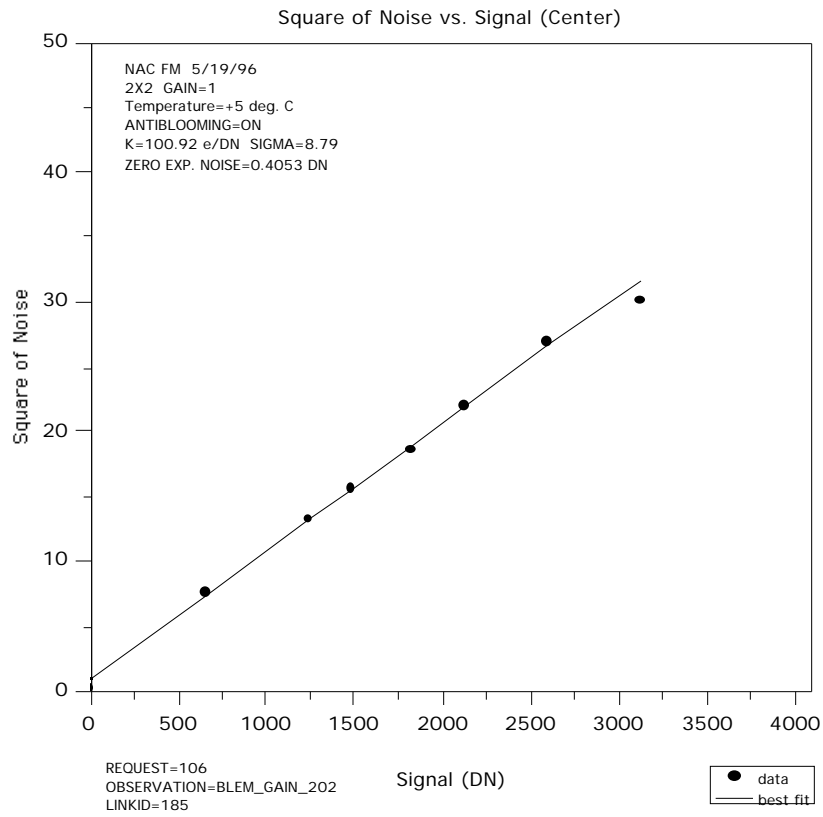
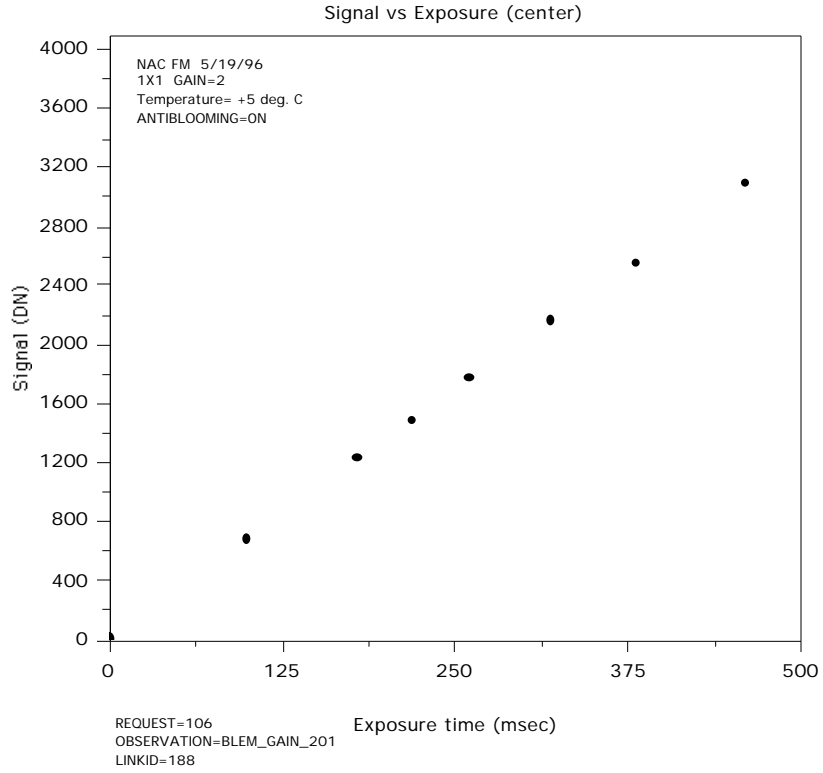


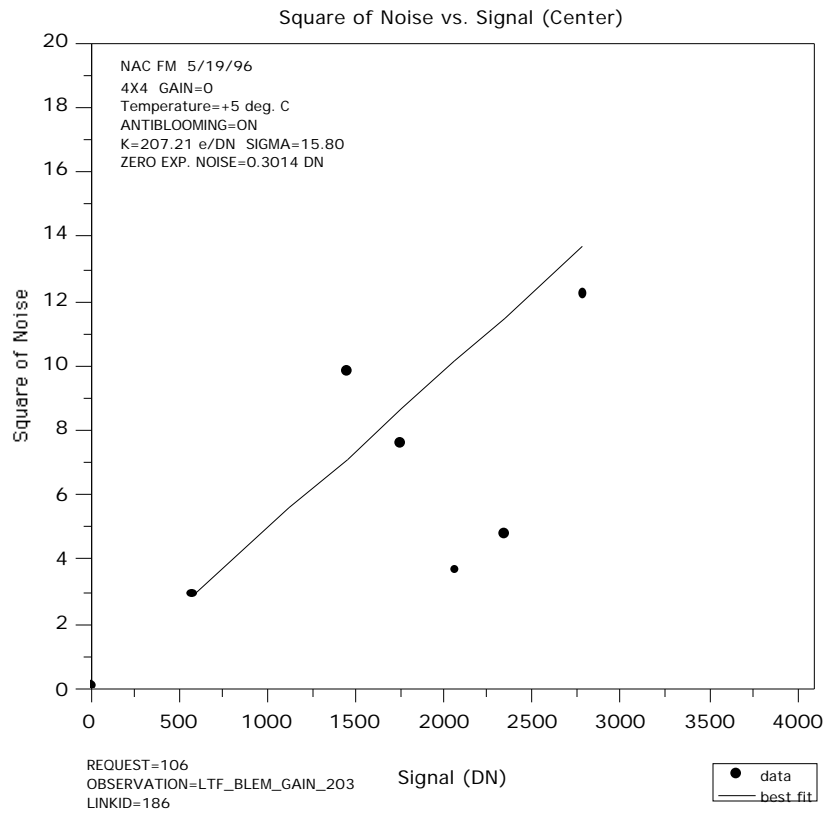
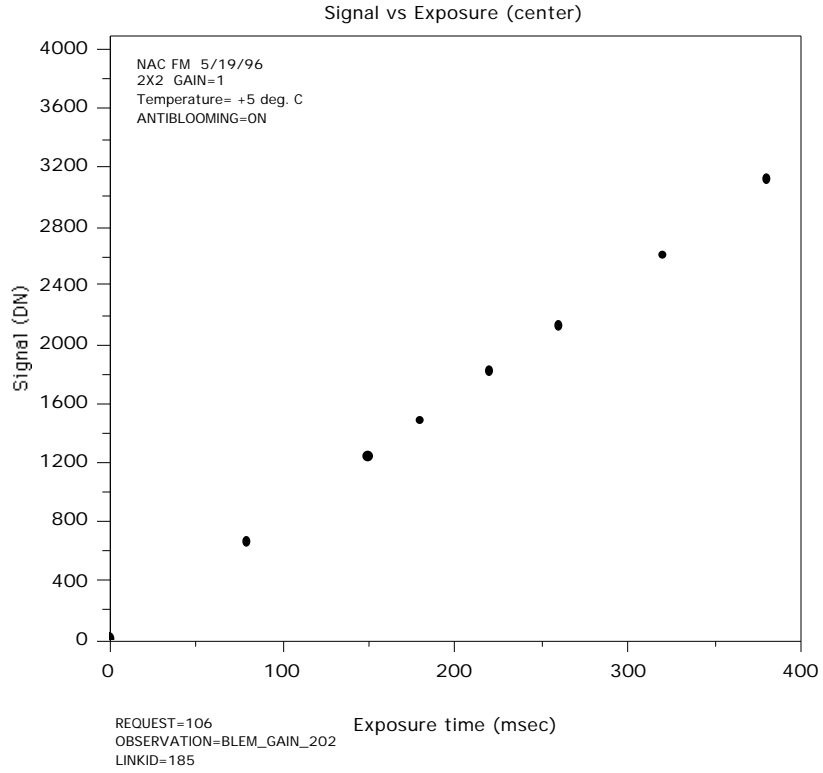


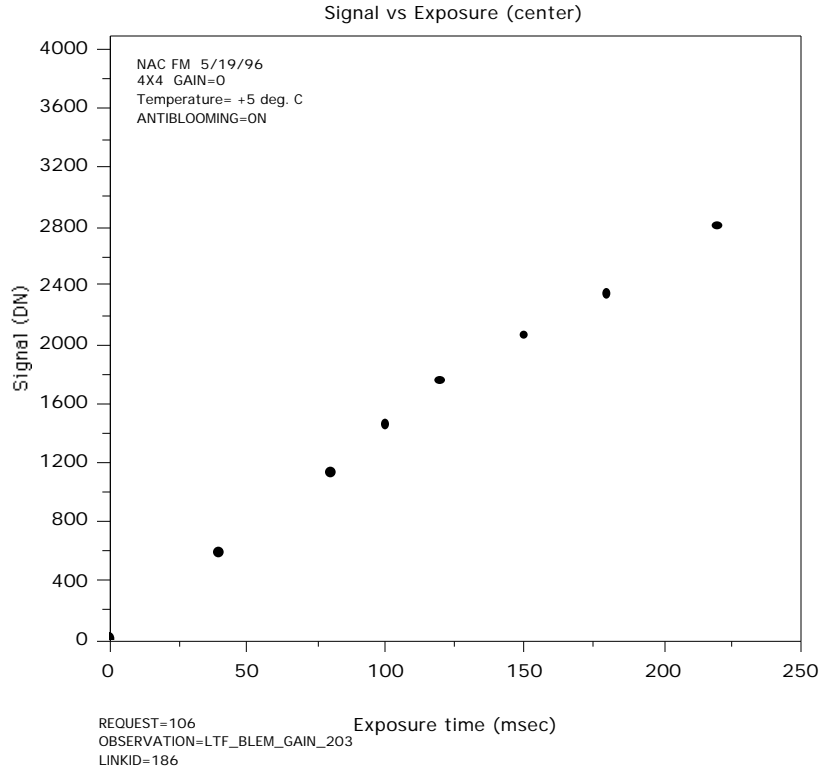












5.1.4.1.2.2 Method 2 - Ratio of Sensitivities

In the characterization of the system sensitivity (see “NAC FM Calibration Results: Sensitivity”, C. Avis, IOM 388-PAG-CCA97-8, 12 March 1997), a best fit slope was fit to a set of points on a plot of Signal vs. ‘Energy’. In this calibration, the Signal was in DN and the ‘Energy’ was in units of picoamp-milliseconds (the source brightness times the exposure time). The sensitivity slopes were calculated at 100 areas of the frame. The 100 values of each gain setting were ratioed and the resulting frame-wide mean ratio is reported below.

	$(DN/pa-msec)_h / (DN/pa-msec)_a$	
Ratio a/b	+ 5° C	+25° C
Gain 0 / Gain 3	18.13	15.77
Gain 1 / Gain 3	7.69	7.13
Gain 2 / Gain 3	2.35	2.09

### 5.1.4.1.2.3 RECONCILIATION OF RESULTS

The Gain 2 Gain Constant value from Method 1 was established as the baseline Gain Constant. The other Gain Constant values tabulated below were derived by multiplying this baseline times the Method 2 ratios.

The estimated error of the derived Gain Constants was produced by the appropriate combination of the errors reported for the Gain 2 Gain Constant and the sensitivity measurements used in Method 2. This error is an upper bound of the actual error. Of course, because the Gain 2 Gain Constant was used as the baseline, its error was not derived and is the original reported error.

Gain	+5° C					+25° C				
	Method 1 e <sup>-</sup> /DN	Method 2 ratio relative to Gain 2	Derived e <sup>-</sup> /DN	Error estimate in e <sup>-</sup> /DN	% change from Method 1	Method 1 e <sup>-</sup> /DN	Method 2 ratio relative to Gain 2	Derived e <sup>-</sup> /DN	Error estimate in e <sup>-</sup> /DN	% change from Method 1
0	207.21	7.70	233.04	28.75	+12.4	205.80	7.54	219.80	15.20	+14.1
1	100.02	3.27	98.88	12.55	-2.0	94.47	3.41	99.32	7.24	+5.2
2	30.27	1.	30.27	3.11	-	29.15	1.	29.15	1.40	-
3	12.65	0.425	12.85	1.82	+1.6	12.88	0.478	13.93	1.22	+8.2

Notes:

The Gain 0 data at +5° C had only 2 points on the linear portion of the light transfer curve. These were the only points used in this analysis. At +25° C, however, there were 6 useable points.

### 5.1.4.1.3 CONCLUSIONS

1. Method 2 has established the gain ratios for the two temperatures tested. These are listed in the above table.
2. The set of derived e<sup>-</sup>/DN values in the above table are the best estimate for these two temperatures. They agree very well for the Gain 1 and 2 cases but diverge significantly for the Gain 3 and 0 cases.

sclk	day	time	observation	gain	mode	expos
+25°C						
134579	213	0: 48: 4. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	0
134581	213	0: 51: 3. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	0
134621	213	2: 14: 23. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	0
134582	213	0: 52: 32. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	5
134583	213	0: 54: 1. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	5
134584	213	0: 55: 30. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	5
134585	213	0: 57: 11. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	15
134586	213	0: 58: 40. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	15
134587	213	1: 0: 10. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	15
134588	213	1: 1: 39. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	30
134589	213	1: 3: 8. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	30
134591	213	1: 6: 12. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	40
134592	213	1: 7: 41. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	40
134622	213	2: 15: 59. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	40
134594	213	1: 10: 40. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	60
134595	213	1: 12: 9. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	60
134596	213	1: 13: 38. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	60
134597	213	1: 15: 13. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	120
134598	213	1: 16: 42. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	120
134599	213	1: 18: 12. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	120
134600	213	1: 19: 41. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	180
134601	213	1: 21: 10. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	180
134602	213	1: 22: 39. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	180
134603	213	1: 24: 14. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	220
134604	213	1: 25: 43. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	220
134605	213	1: 27: 13. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	220
134609	213	1: 33: 15. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	320
134611	213	1: 36: 14. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	320
134624	213	2: 44: 38. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	320
134612	213	1: 37: 43. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	380
134613	213	1: 39: 12. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	380
134614	213	1: 40: 41. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	380
134615	213	1: 42: 16. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	460
134616	213	1: 43: 45. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	460
134618	213	1: 46: 44. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	560
134619	213	1: 48: 13. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	560
134620	213	1: 49: 42. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	560
134606	213	1: 28: 42. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	1800
134607	213	1: 30: 11. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	1800
134608	213	1: 31: 40. 0	LTC_BLEM_GAIN_700	2 (100K)	FULL	1800
134625	213	3: 34: 21. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	0
134626	213	3: 41: 28. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	0
134627	213	3: 42: 58. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	0
134628	213	3: 44: 27. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	0
134629	213	3: 45: 56. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	5
134630	213	3: 47: 25. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	5
134631	213	3: 48: 54. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	5
134632	213	3: 50: 30. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	15
134633	213	3: 51: 59. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	15
134634	213	3: 53: 28. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	15
134635	213	3: 54: 57. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	30
134636	213	3: 56: 26. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	30
134637	213	3: 57: 55. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	30
134639	213	4: 1: 0. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	40
134640	213	4: 2: 29. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	40
134668	213	5: 2: 56. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	40
134641	213	4: 3: 58. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	60
134643	213	4: 6: 56. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	60
134669	213	5: 4: 25. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	60
134644	213	4: 8: 32. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	120
134645	213	4: 10: 1. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	120
134646	213	4: 11: 30. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	120
134647	213	4: 12: 59. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	180
134649	213	4: 15: 57. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	180
134670	213	5: 6: 1. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	180
134650	213	4: 17: 38. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	220
134651	213	4: 19: 7. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	220
134652	213	4: 20: 36. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	220
134653	213	4: 22: 5. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	260
134654	213	4: 23: 34. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	260
134655	213	4: 25: 3. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	260
134656	213	4: 26: 39. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	320
134657	213	4: 28: 8. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	320
134658	213	4: 29: 37. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	320
134659	213	4: 31: 6. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	380
134661	213	4: 34: 4. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	380
134671	213	5: 7: 37. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	380
134662	213	4: 35: 41. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	460
134663	213	4: 37: 10. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	460
134666	213	4: 41: 37. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	560
134667	213	4: 43: 6. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	560
134672	213	5: 9: 13. 0	LTC_BLEM_GAIN_701	2 (100K)	FULL	560
134678	213	5: 34: 27. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	0
134679	213	5: 35: 56. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	0
134680	213	5: 37: 25. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	0
134681	213	5: 38: 54. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	5
134682	213	5: 40: 23. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	5
134683	213	5: 41: 52. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	5
134684	213	5: 43: 28. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	15
134685	213	5: 44: 57. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	15
134686	213	5: 46: 26. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	15
134687	213	5: 47: 55. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	20
134688	213	5: 49: 24. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	20
134689	213	5: 50: 53. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	20
134690	213	5: 52: 29. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	25
134691	213	5: 53: 58. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	25
134692	213	5: 55: 27. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	25
134693	213	5: 56: 56. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	30
134695	213	5: 59: 54. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	30
134720	213	6: 52: 17. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	30
134696	213	6: 1: 30. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	60
134697	213	6: 2: 59. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	60
134698	213	6: 4: 28. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	60
134699	213	6: 5: 57. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	90
134700	213	6: 7: 26. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	90

sclk	day	time	observation	gain	mode	expos
134701	213	6: 8: 55. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	90
134702	213	6: 10: 31. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	100
134703	213	6: 12: 0. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	100
134704	213	6: 13: 29. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	100
134705	213	6: 14: 58. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	120
134707	213	6: 17: 56. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	120
134721	213	6: 53: 53. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	120
134708	213	6: 19: 32. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	150
134709	213	6: 21: 1. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	150
134710	213	6: 22: 30. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	150
134711	213	6: 23: 59. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	180
134712	213	6: 25: 28. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	180
134713	213	6: 26: 57. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	180
134714	213	6: 28: 33. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	220
134715	213	6: 30: 2. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	220
134716	213	6: 31: 31. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	220
134717	213	6: 33: 0. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	260
134718	213	6: 34: 29. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	260
134719	213	6: 35: 58. 0	LTC_BLEM_GAIN_702	3 (40K)	FULL	260
134725	213	7: 15: 57. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	0
134726	213	7: 17: 1. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	0
134727	213	7: 18: 5. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	0
134728	213	7: 19: 9. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	15
134729	213	7: 20: 13. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	15
134730	213	7: 21: 17. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	15
134731	213	7: 22: 26. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	25
134732	213	7: 23: 30. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	25
134733	213	7: 24: 34. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	25
134734	213	7: 25: 38. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	35
134735	213	7: 26: 42. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	35
134736	213	7: 27: 46. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	35
134737	213	7: 28: 59. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	50
134738	213	7: 30: 3. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	50
134739	213	7: 31: 7. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	50
134740	213	7: 32: 11. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	100
134741	213	7: 33: 15. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	100
134742	213	7: 34: 19. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	100
134743	213	7: 35: 28. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	150
134744	213	7: 36: 32. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	150
134745	213	7: 37: 36. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	150
134746	213	7: 38: 40. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	180
134747	213	7: 39: 44. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	180
134748	213	7: 40: 48. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	180
134749	213	7: 42: 1. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	220
134750	213	7: 43: 5. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	220
134751	213	7: 44: 9. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	220
134752	213	7: 45: 13. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	260
134753	213	7: 46: 17. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	260
134754	213	7: 47: 21. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	260
134755	213	7: 48: 34. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	320
134756	213	7: 49: 38. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	320
134757	213	7: 50: 42. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	320
134758	213	7: 51: 46. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	380
134759	213	7: 52: 50. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	380
134760	213	7: 53: 54. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	380
134761	213	7: 55: 5. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	460
134762	213	7: 56: 9. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	460
134763	213	7: 57: 13. 0	LTC_BLEM_GAIN_703	1 (400K)	SUM0	460
134771	213	10: 32: 20. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	0
134772	213	10: 33: 11. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	0
134790	213	12: 8: 41. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	0
134774	213	10: 34: 53. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	5
134775	213	10: 35: 44. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	5
134776	213	10: 36: 35. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	5
134778	213	10: 38: 24. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	15
134779	213	10: 39: 15. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	15
134791	213	12: 9: 39. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	15
134780	213	10: 40: 6. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	20
134781	213	10: 40: 57. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	20
134782	213	10: 41: 48. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	20
134783	213	10: 42: 48. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	25
134784	213	10: 43: 39. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	25
134785	213	10: 44: 30. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	25
134786	213	10: 45: 21. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	30
134787	213	10: 46: 12. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	30
134788	213	10: 47: 3. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	30
134792	213	12: 10: 39. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	60
134793	213	12: 11: 30. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	60
134794	213	12: 12: 21. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	60
134795	213	12: 13: 12. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	90
134796	213	12: 14: 3. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	90
134797	213	12: 14: 54. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	90
134798	213	12: 15: 52. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	100
134799	213	12: 16: 43. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	100
134800	213	12: 17: 34. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	100
134801	213	12: 18: 25. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	120
134802	213	12: 19: 16. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	120
134803	213	12: 20: 7. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	120
134804	213	12: 21: 5. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	150
134805	213	12: 21: 56. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	150
134806	213	12: 22: 47. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	150
134807	213	12: 23: 38. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	180
134808	213	12: 24: 29. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	180
134809	213	12: 25: 20. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	180
134810	213	12: 26: 20. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	220
134811	213	12: 27: 11. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	220
134812	213	12: 28: 2. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	220
134813	213	12: 28: 53. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	260
134814	213	12: 29: 44. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	260
134815	213	12: 30: 35. 0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	260
+5°C						
120325	140	1: 59: 58. 0	BLEM_GAIN_200	3 (40K)	FULL	0
120326	140	2: 1: 27. 0	BLEM_GAIN_200	3 (40K)	FULL	0
120327	140	2: 2: 56. 0	BLEM_GAIN_200	3 (40K)	FULL	0
120328	140	2: 4: 25. 0	BLEM_GAIN_200	3 (40K)	FULL	40

sclk	day	time	observation	gain	mode	expos
120329	140	2: 5: 54. 0	BLEM_GAIN_200	3 (40K)	FULL	40
120330	140	2: 7: 23. 0	BLEM_GAIN_200	3 (40K)	FULL	40
120331	140	2: 8: 29. 0	BLEM_GAIN_200	3 (40K)	FULL	80
120333	140	2: 11: 27. 0	BLEM_GAIN_200	3 (40K)	FULL	80
120421	140	4: 16: 26. 0	BLEM_GAIN_200	3 (40K)	FULL	80
120334	140	2: 12: 56. 0	BLEM_GAIN_200	3 (40K)	FULL	100
120335	140	2: 14: 25. 0	BLEM_GAIN_200	3 (40K)	FULL	100
120336	140	2: 15: 54. 0	BLEM_GAIN_200	3 (40K)	FULL	100
120337	140	2: 17: 0. 0	BLEM_GAIN_200	3 (40K)	FULL	120
120338	140	2: 18: 29. 0	BLEM_GAIN_200	3 (40K)	FULL	120
120339	140	2: 19: 58. 0	BLEM_GAIN_200	3 (40K)	FULL	120
120340	140	2: 21: 27. 0	BLEM_GAIN_200	3 (40K)	FULL	150
120341	140	2: 22: 56. 0	BLEM_GAIN_200	3 (40K)	FULL	150
120342	140	2: 24: 25. 0	BLEM_GAIN_200	3 (40K)	FULL	150
120343	140	2: 25: 31. 0	BLEM_GAIN_200	3 (40K)	FULL	180
120344	140	2: 27: 0. 0	BLEM_GAIN_200	3 (40K)	FULL	180
120345	140	2: 28: 29. 0	BLEM_GAIN_200	3 (40K)	FULL	180
120346	140	2: 29: 58. 0	BLEM_GAIN_200	3 (40K)	FULL	220
120347	140	2: 31: 27. 0	BLEM_GAIN_200	3 (40K)	FULL	220
120348	140	2: 32: 56. 0	BLEM_GAIN_200	3 (40K)	FULL	220
120349	140	2: 34: 4. 0	BLEM_GAIN_201	2 (100K)	FULL	0
120350	140	2: 35: 33. 0	BLEM_GAIN_201	2 (100K)	FULL	0
120351	140	2: 37: 2. 0	BLEM_GAIN_201	2 (100K)	FULL	0
120352	140	2: 38: 31. 0	BLEM_GAIN_201	2 (100K)	FULL	100
120353	140	2: 40: 0. 0	BLEM_GAIN_201	2 (100K)	FULL	100
120354	140	2: 41: 29. 0	BLEM_GAIN_201	2 (100K)	FULL	100
120355	140	2: 42: 35. 0	BLEM_GAIN_201	2 (100K)	FULL	180
120356	140	2: 44: 4. 0	BLEM_GAIN_201	2 (100K)	FULL	180
120357	140	2: 45: 33. 0	BLEM_GAIN_201	2 (100K)	FULL	180
120358	140	2: 47: 2. 0	BLEM_GAIN_201	2 (100K)	FULL	220
120359	140	2: 48: 31. 0	BLEM_GAIN_201	2 (100K)	FULL	220
120422	140	4: 17: 32. 0	BLEM_GAIN_201	2 (100K)	FULL	220
120361	140	2: 51: 19. 0	BLEM_GAIN_201	2 (100K)	FULL	260
120362	140	2: 52: 48. 0	BLEM_GAIN_201	2 (100K)	FULL	260
120423	140	4: 18: 38. 0	BLEM_GAIN_201	2 (100K)	FULL	260
120364	140	2: 55: 46. 0	BLEM_GAIN_201	2 (100K)	FULL	320
120365	140	2: 57: 15. 0	BLEM_GAIN_201	2 (100K)	FULL	320
120366	140	2: 58: 44. 0	BLEM_GAIN_201	2 (100K)	FULL	320
120367	140	2: 59: 50. 0	BLEM_GAIN_201	2 (100K)	FULL	380
120368	140	3: 1: 19. 0	BLEM_GAIN_201	2 (100K)	FULL	380
120369	140	3: 2: 48. 0	BLEM_GAIN_201	2 (100K)	FULL	380
120371	140	3: 5: 46. 0	BLEM_GAIN_201	2 (100K)	FULL	460
120372	140	3: 7: 15. 0	BLEM_GAIN_201	2 (100K)	FULL	460
120424	140	4: 19: 44. 0	BLEM_GAIN_201	2 (100K)	FULL	460
120373	140	3: 8: 23. 0	BLEM_GAIN_202	1 (400K)	SUM2	0
120374	140	3: 9: 27. 0	BLEM_GAIN_202	1 (400K)	SUM2	0
120375	140	3: 10: 31. 0	BLEM_GAIN_202	1 (400K)	SUM2	0
120376	140	3: 11: 35. 0	BLEM_GAIN_202	1 (400K)	SUM2	80
120377	140	3: 12: 39. 0	BLEM_GAIN_202	1 (400K)	SUM2	80
120378	140	3: 13: 43. 0	BLEM_GAIN_202	1 (400K)	SUM2	80
120379	140	3: 14: 48. 0	BLEM_GAIN_202	1 (400K)	SUM2	150
120380	140	3: 15: 52. 0	BLEM_GAIN_202	1 (400K)	SUM2	150
120381	140	3: 16: 56. 0	BLEM_GAIN_202	1 (400K)	SUM2	150
120382	140	3: 18: 0. 0	BLEM_GAIN_202	1 (400K)	SUM2	180
120383	140	3: 19: 4. 0	BLEM_GAIN_202	1 (400K)	SUM2	180
120384	140	3: 20: 8. 0	BLEM_GAIN_202	1 (400K)	SUM2	180
120385	140	3: 20: 49. 0	BLEM_GAIN_202	1 (400K)	SUM2	220
120386	140	3: 21: 53. 0	BLEM_GAIN_202	1 (400K)	SUM2	220
120387	140	3: 22: 57. 0	BLEM_GAIN_202	1 (400K)	SUM2	220
120388	140	3: 24: 1. 0	BLEM_GAIN_202	1 (400K)	SUM2	260
120389	140	3: 25: 5. 0	BLEM_GAIN_202	1 (400K)	SUM2	260
120390	140	3: 26: 9. 0	BLEM_GAIN_202	1 (400K)	SUM2	260
120391	140	3: 27: 14. 0	BLEM_GAIN_202	1 (400K)	SUM2	320
120392	140	3: 28: 18. 0	BLEM_GAIN_202	1 (400K)	SUM2	320
120393	140	3: 29: 22. 0	BLEM_GAIN_202	1 (400K)	SUM2	320
120394	140	3: 30: 26. 0	BLEM_GAIN_202	1 (400K)	SUM2	380
120395	140	3: 31: 30. 0	BLEM_GAIN_202	1 (400K)	SUM2	380
120396	140	3: 32: 34. 0	BLEM_GAIN_202	1 (400K)	SUM2	380
120397	140	3: 33: 17. 0	BLEM_GAIN_203	0 (1400K)	SUM4	0
120398	140	3: 34: 8. 0	BLEM_GAIN_203	0 (1400K)	SUM4	0
120399	140	3: 34: 59. 0	BLEM_GAIN_203	0 (1400K)	SUM4	0
120400	140	3: 35: 50. 0	BLEM_GAIN_203	0 (1400K)	SUM4	40
120401	140	3: 36: 41. 0	BLEM_GAIN_203	0 (1400K)	SUM4	40
120402	140	3: 37: 32. 0	BLEM_GAIN_203	0 (1400K)	SUM4	40
120403	140	3: 38: 24. 0	BLEM_GAIN_203	0 (1400K)	SUM4	80
120404	140	3: 39: 15. 0	BLEM_GAIN_203	0 (1400K)	SUM4	80
120405	140	3: 40: 6. 0	BLEM_GAIN_203	0 (1400K)	SUM4	80
120406	140	3: 40: 57. 0	BLEM_GAIN_203	0 (1400K)	SUM4	100
120407	140	3: 41: 48. 0	BLEM_GAIN_203	0 (1400K)	SUM4	100
120408	140	3: 42: 39. 0	BLEM_GAIN_203	0 (1400K)	SUM4	100
120409	140	3: 43: 7. 0	BLEM_GAIN_203	0 (1400K)	SUM4	120
120410	140	3: 43: 58. 0	BLEM_GAIN_203	0 (1400K)	SUM4	120
120411	140	3: 44: 49. 0	BLEM_GAIN_203	0 (1400K)	SUM4	120
120412	140	3: 45: 40. 0	BLEM_GAIN_203	0 (1400K)	SUM4	150
120413	140	3: 46: 31. 0	BLEM_GAIN_203	0 (1400K)	SUM4	150
120414	140	3: 47: 22. 0	BLEM_GAIN_203	0 (1400K)	SUM4	150
120415	140	3: 48: 14. 0	BLEM_GAIN_203	0 (1400K)	SUM	180
120416	140	3: 49: 5. 0	BLEM_GAIN_203	0 (1400K)	SUM4	180
120417	140	3: 49: 56. 0	BLEM_GAIN_203	0 (1400K)	SUM4	180
120418	140	3: 50: 47. 0	BLEM_GAIN_203	0 (1400K)	SUM4	220
120419	140	3: 51: 38. 0	BLEM_GAIN_203	0 (1400K)	SUM4	220
120420	140	3: 52: 29. 0	BLEM_GAIN_203	0 (1400K)	SUM4	220