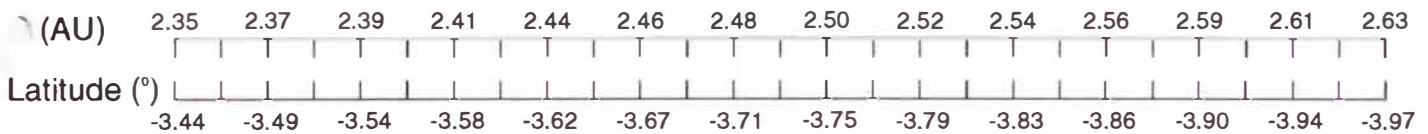
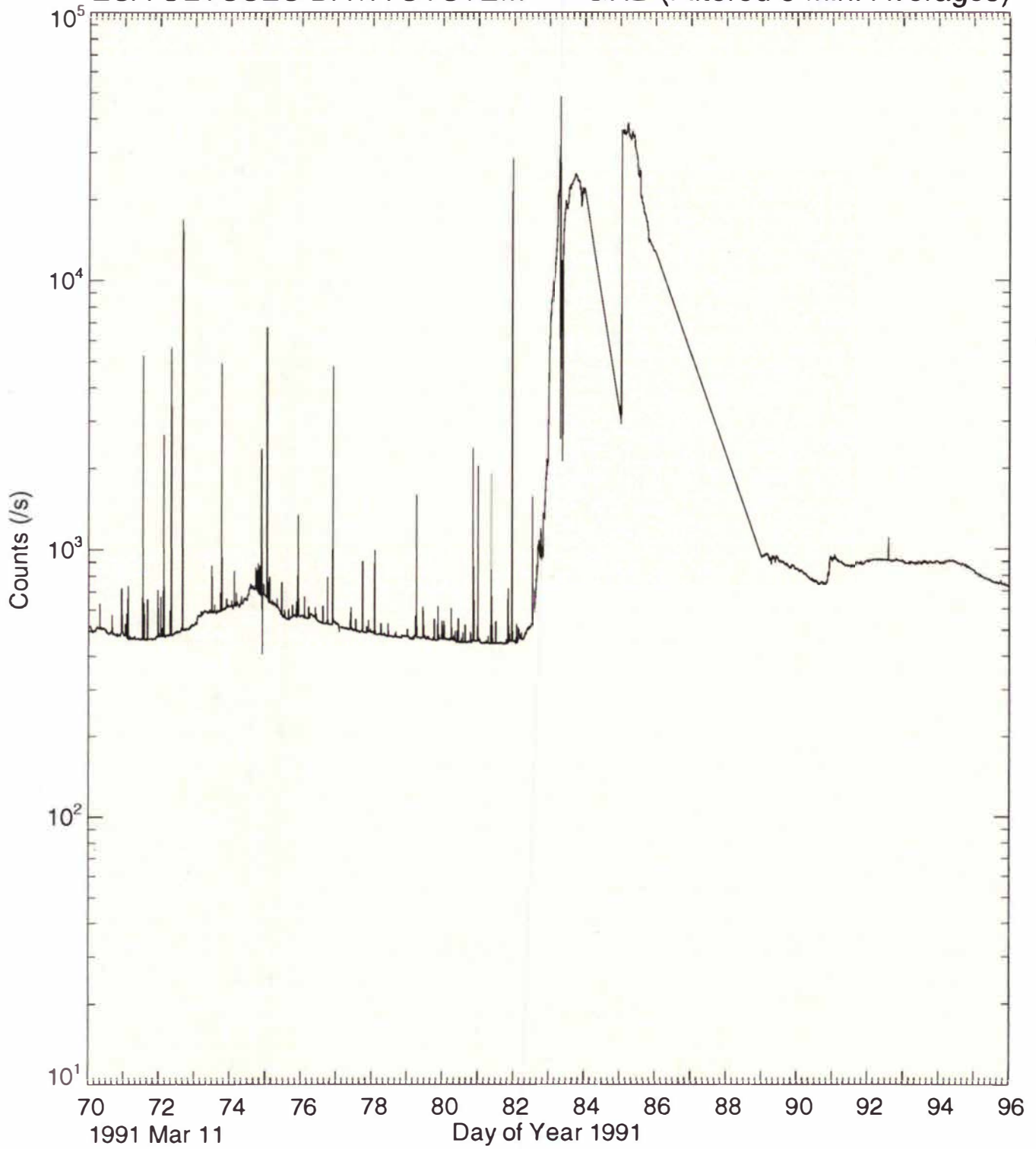


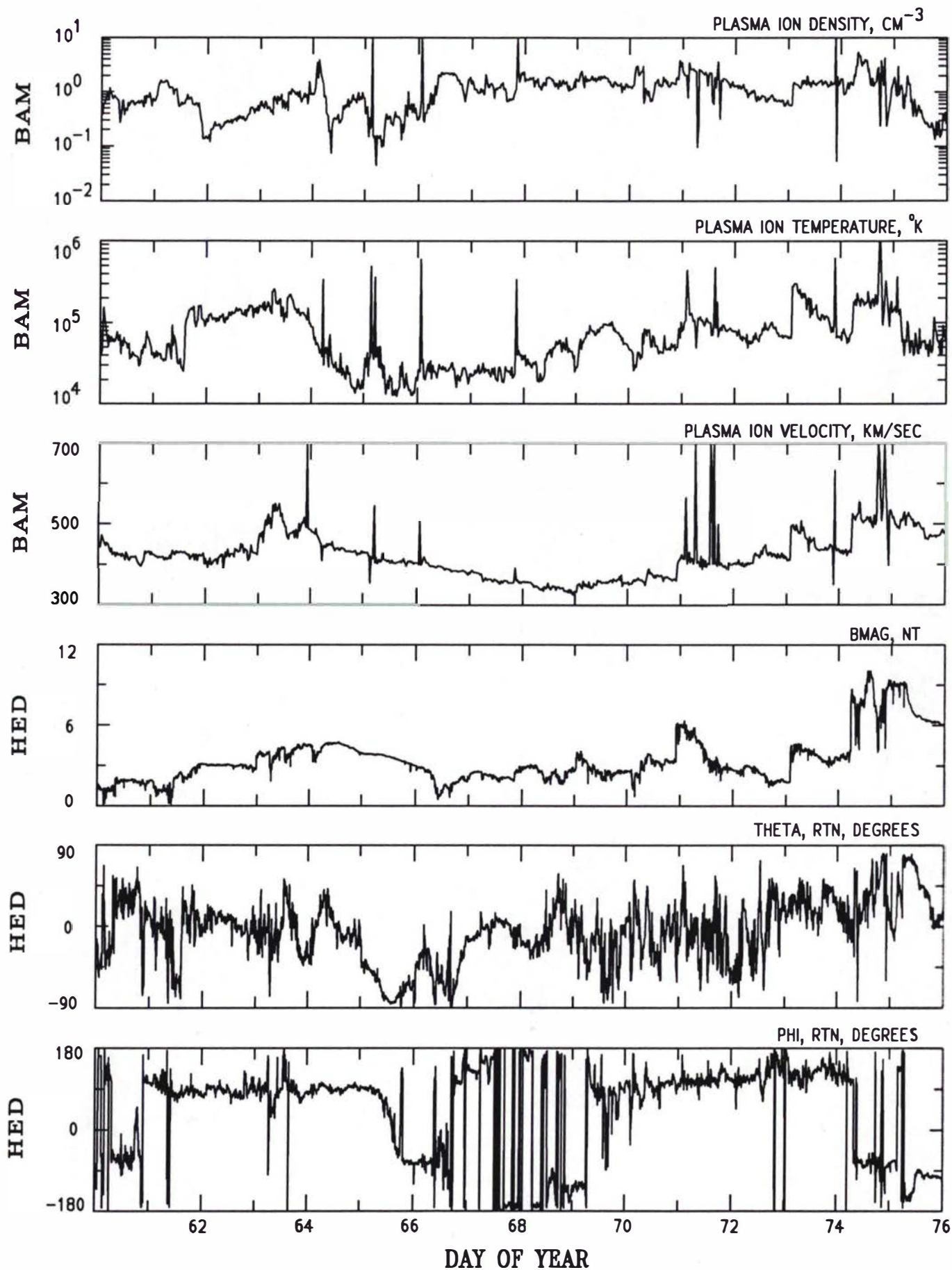
ESA ULYSSES DATA SYSTEM

GRB (Filtered 5 Min. Averages)



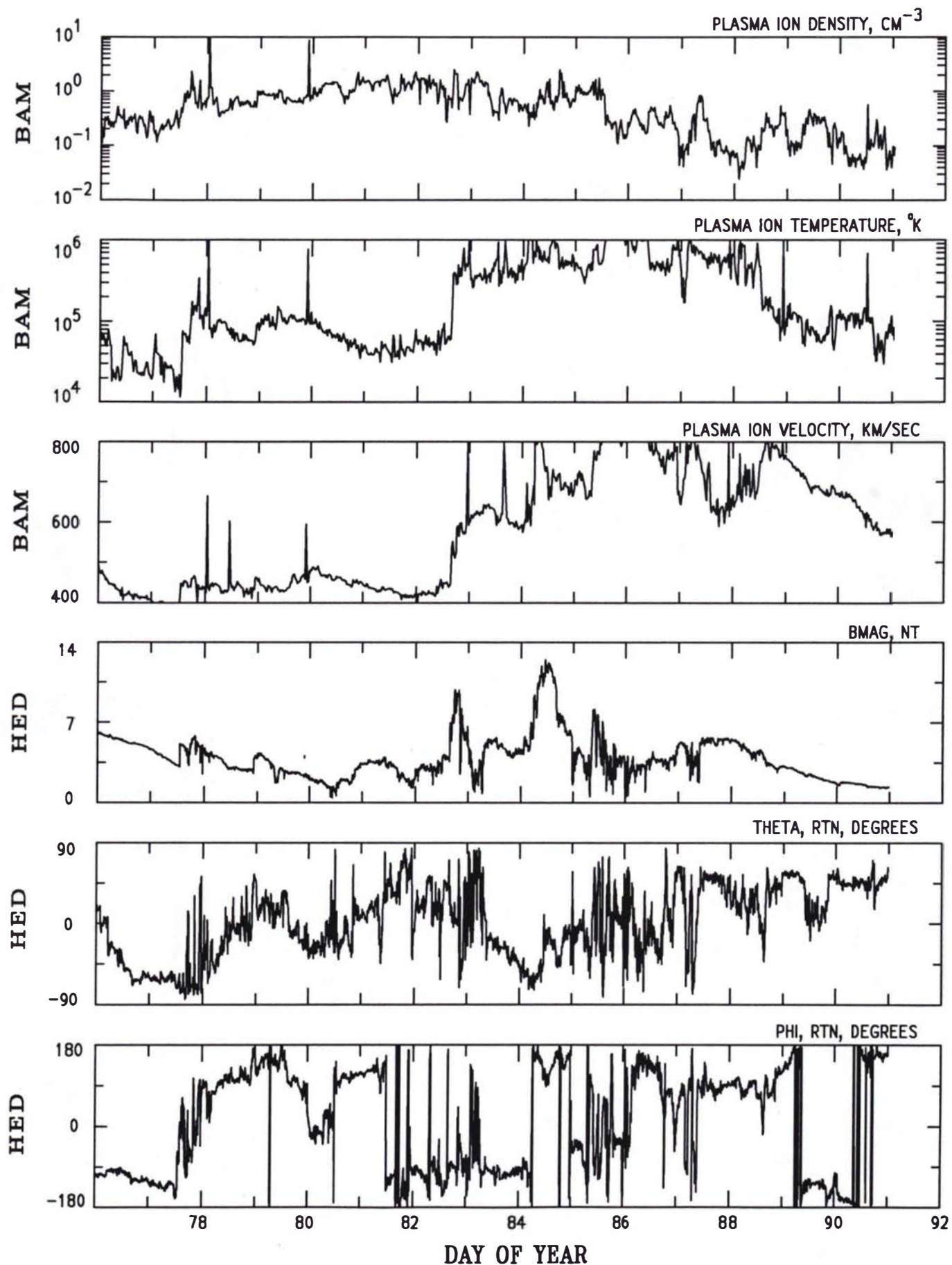
ULYSSES CDR - SOLAR WIND PLASMA AND MAGNETIC FIELD

91 060 MAR 1 00:00:00.000 - 91 076 MAR 17 00:00:00.000



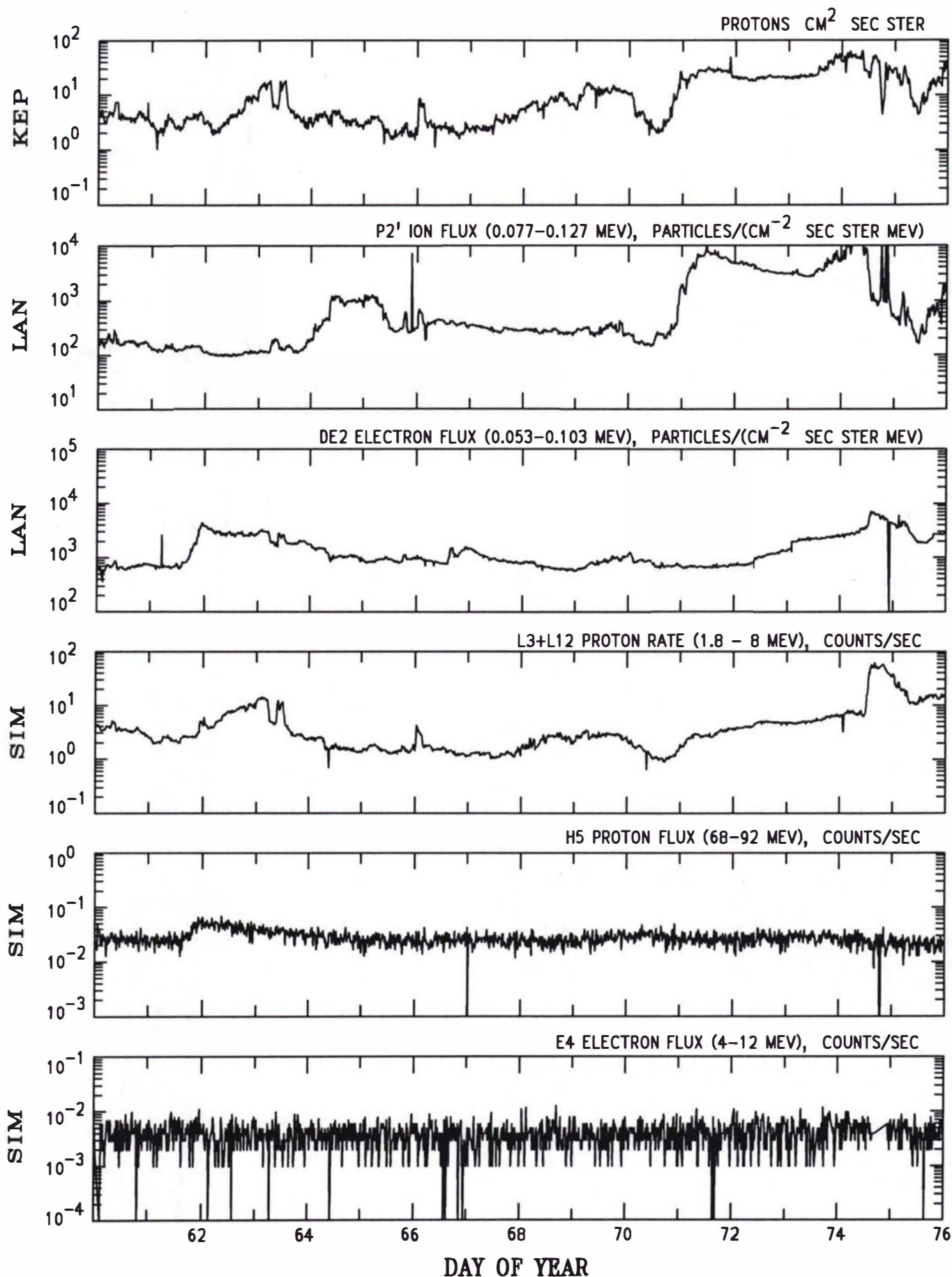
ULYSSES CDR - SOLAR WIND PLASMA AND MAGNETIC FIELD

91 076 MAR 17 00:00:00.000 - 91 092 APR 2 00:00:00.000



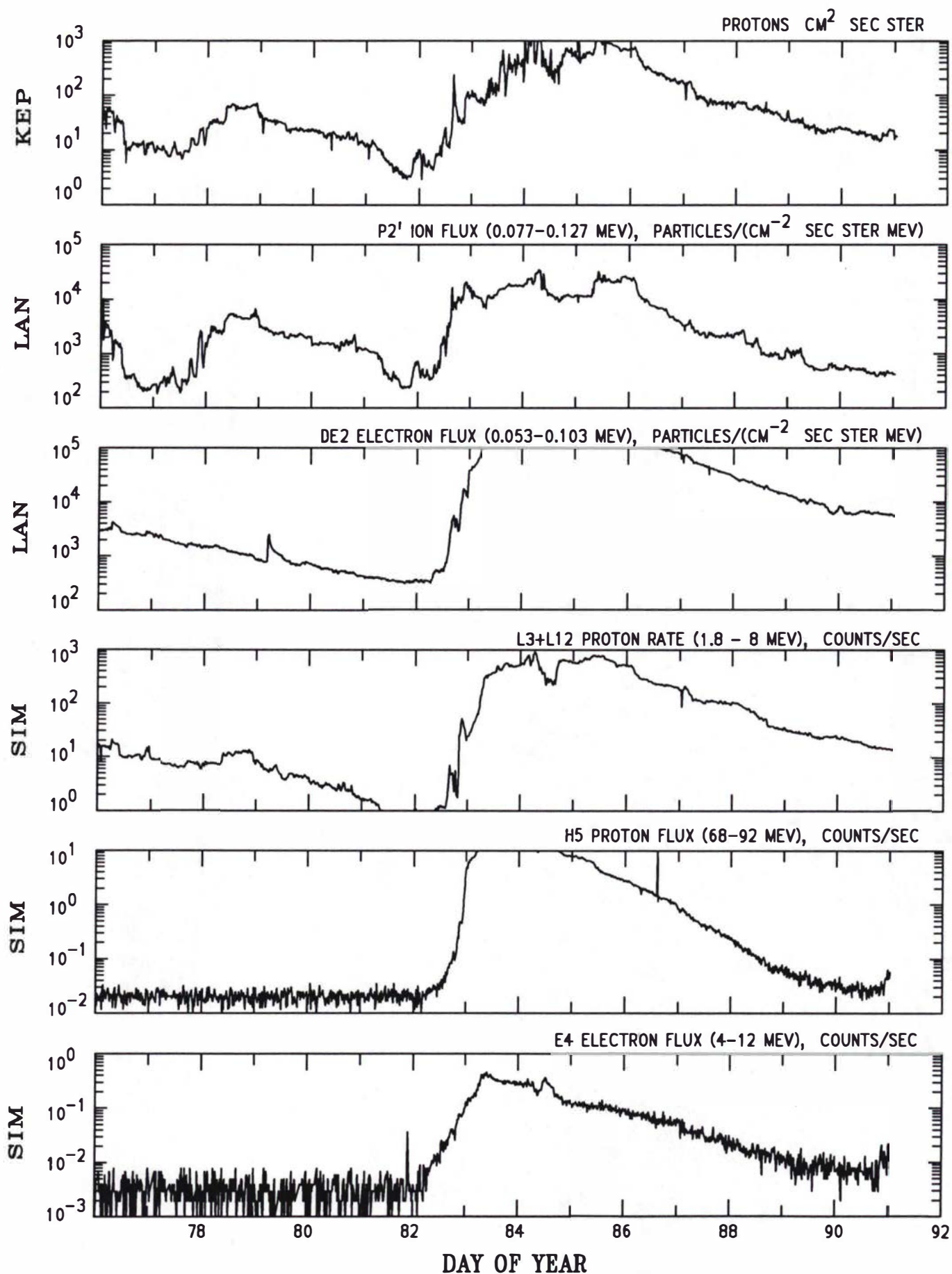
ULYSSES CDR - ENERGETIC PARTICLES, LOW ENERGY IONS AND COSMIC RAY

91 060 MAR 1 00:00:00.000 - 91 076 MAR 17 00:00:00.000



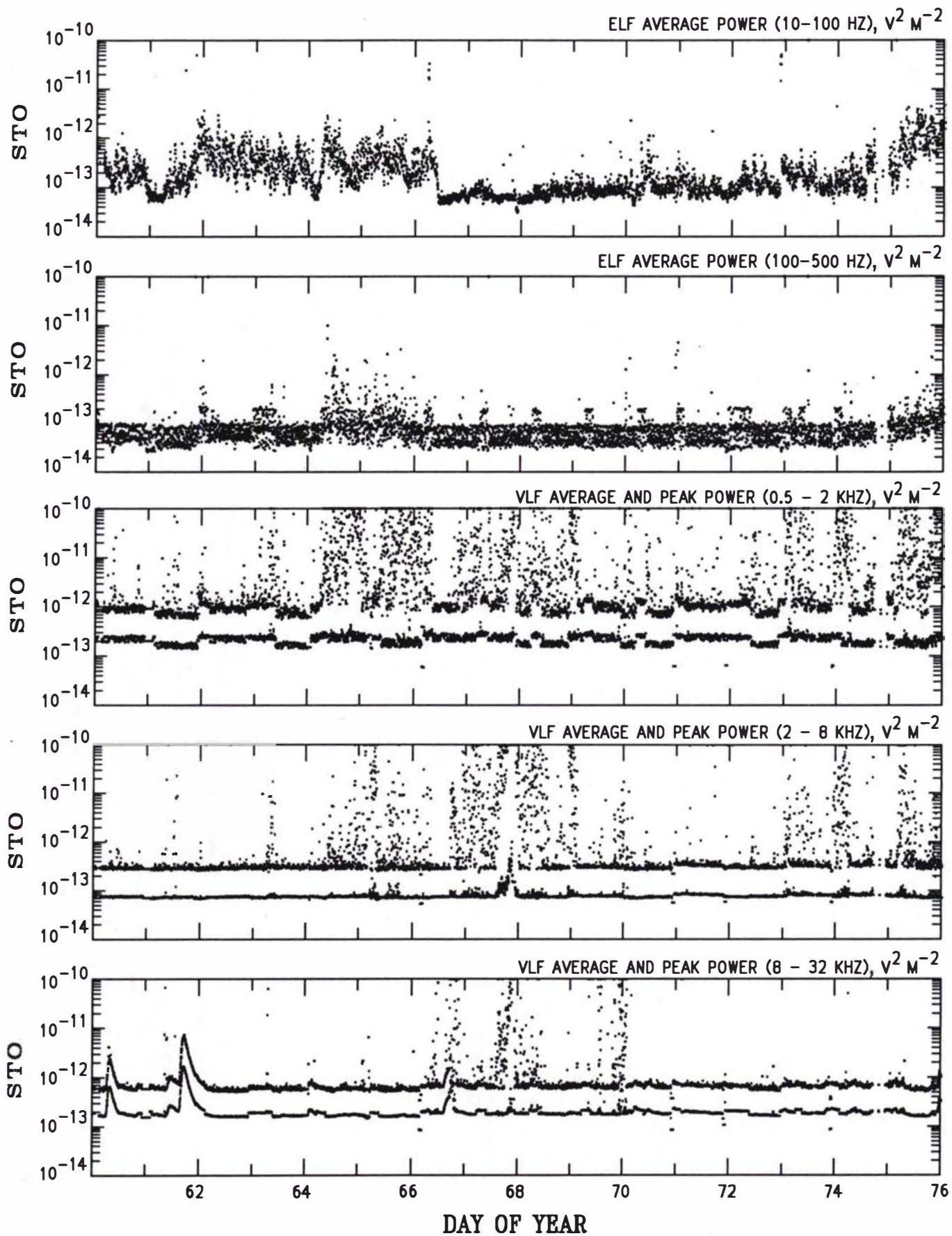
ULYSSES CDR - ENERGETIC PARTICLES, LOW ENERGY IONS AND COSMIC RAY

91 076 MAR 17 00:00:00.000 - 91 092 APR 2 00:00:00.000



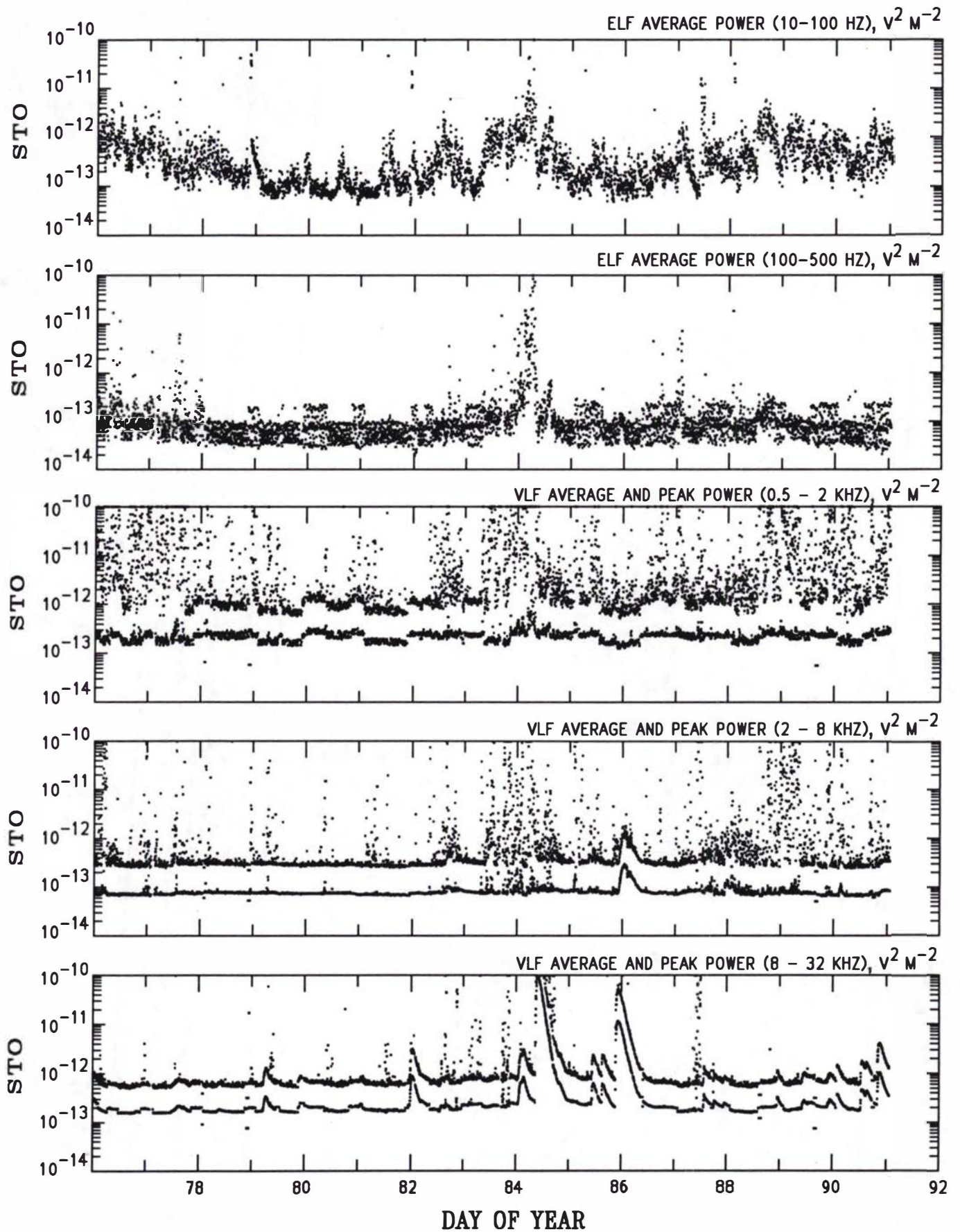
ULYSSES CDR - PLASMA WAVE

91 060 MAR 1 00:00:00.000 - 91 076 MAR 17 00:00:00.000



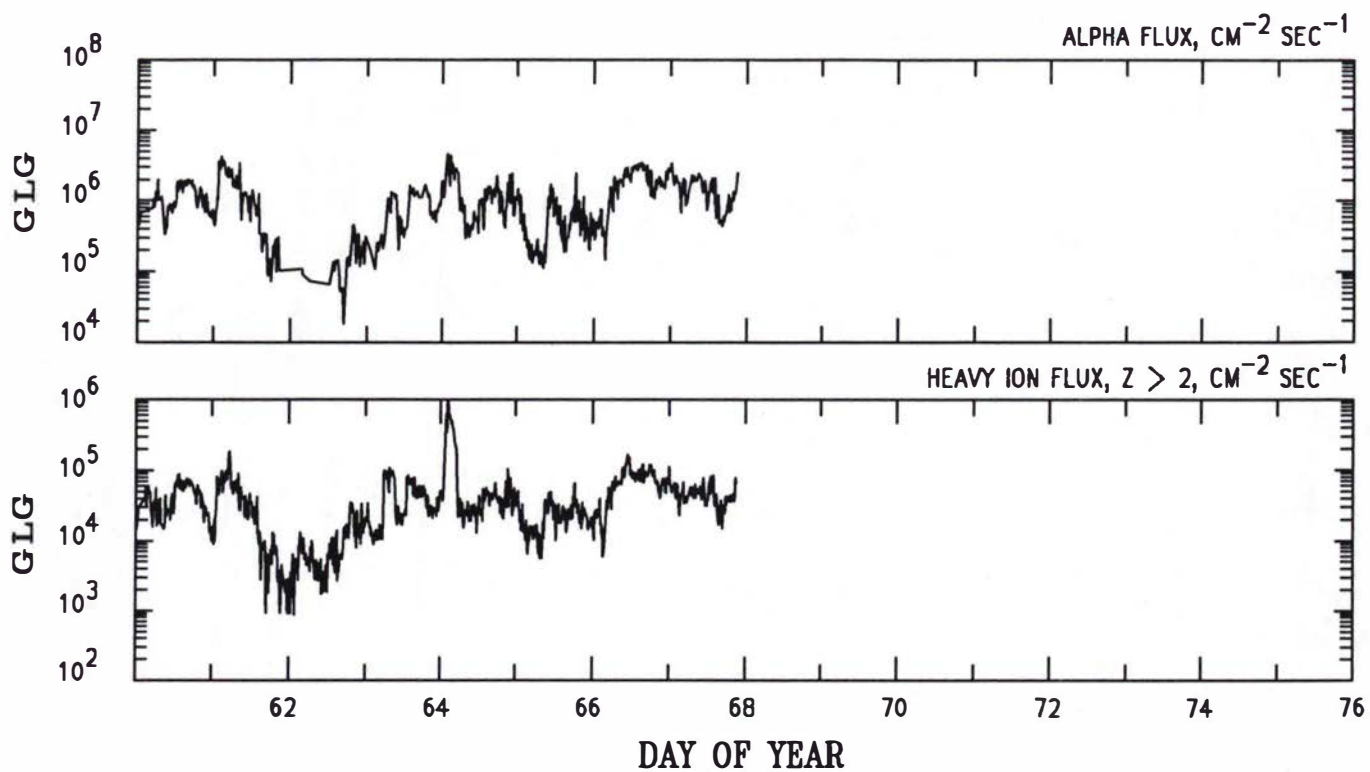
ULYSSES CDR - PLASMA WAVE

91 076 MAR 17 00:00:00.000 - 91 092 APR 2 00:00:00.000



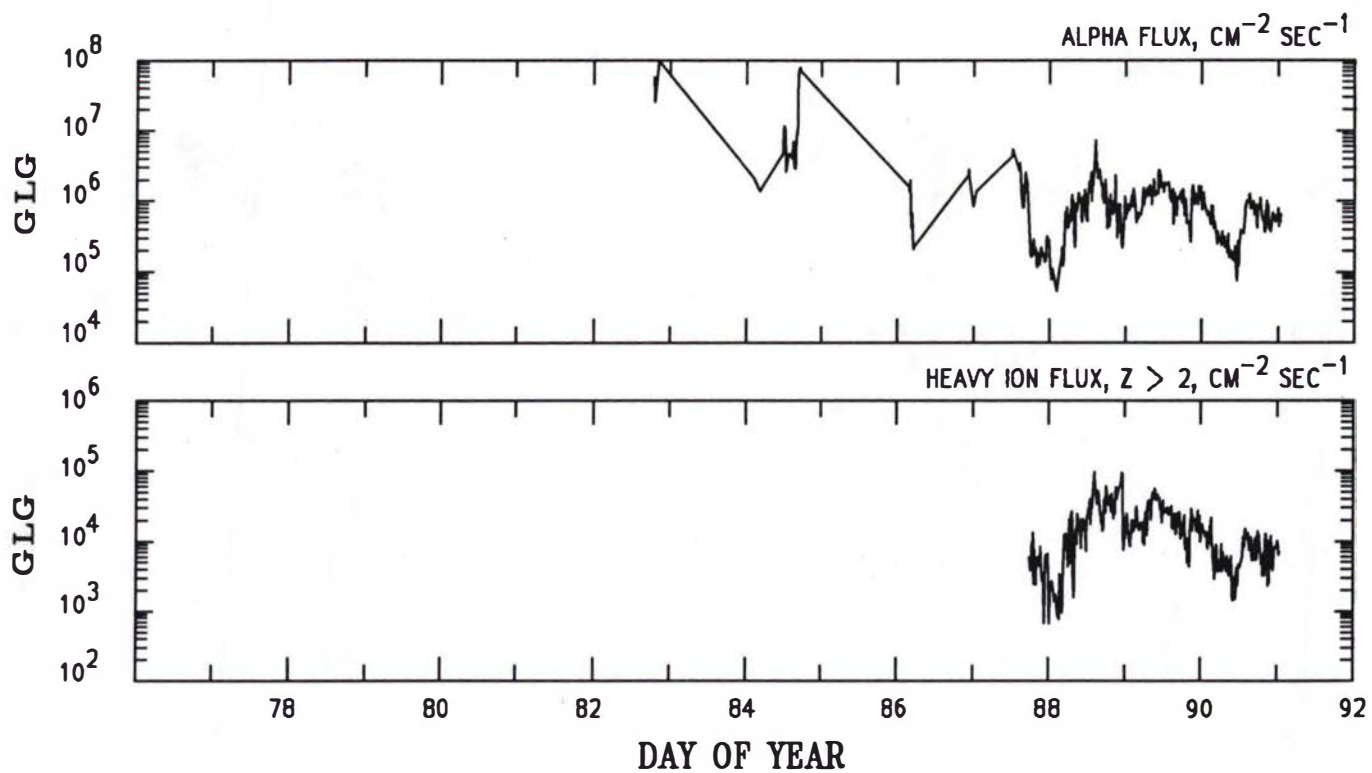
ULYSSES CDR - SOLAR WIND ION COMPOSITION

91 060 MAR 1 00:00:00.000 - 91 076 MAR 17 00:00:00.000

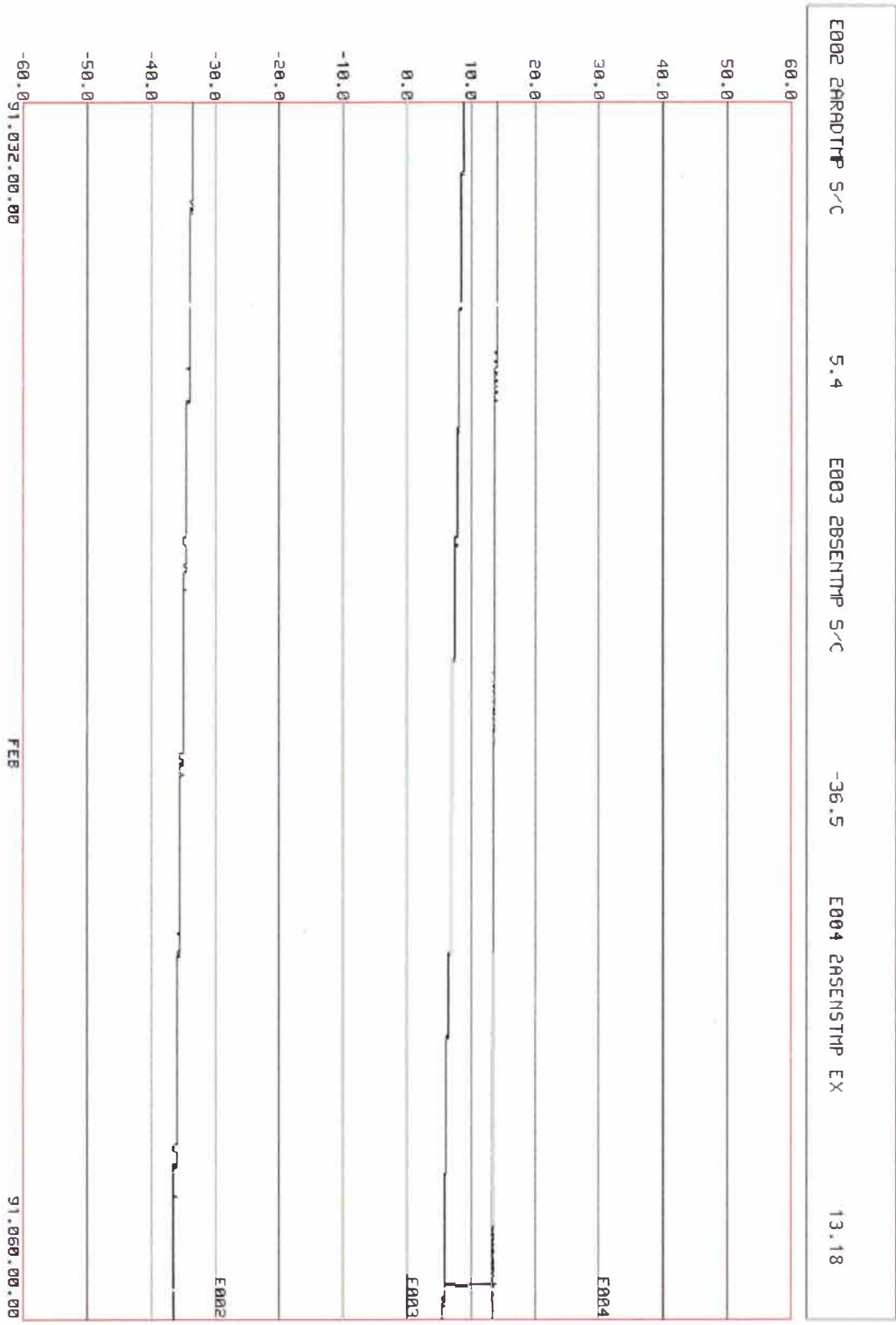


ULYSSES CDR - SOLAR WIND ION COMPOSITION

91 076 MAR 17 00:00:00.000 - 91 092 APR 2 00:00:00.000



.91.060.00.06.43.468 HUS monthly long term thermal data 818 RET



40
Mar 91

H α SOLAR FLARES

MARCH 1991

57 GOES events

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CND	NOAA/ USAF Region	CMP Mo Day	Dur (Min)	Imp Opt Xray	Obs See	Type	Area Measurement			Remarks
													Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
HOLL	16	1751	1753	1800	S20	W63	6538	03 11.9	9	SF C 4.8	3	E		19		F
HOLL		1755	1758	1804	S31	E90		03 23.8	9	SF	3	E		64		F
RAMY		1755	1802	1804	S30	E89		03 23.7	9	SF	3	E		12		
HOLL		1801	1806	1820	S10	W02	6545	03 16.6	19	1B M 1.1	3	E		128		UF
RAMY		1803	1806	1819	S09	W02	6545	03 16.6	16	SN	3	E		48		F
HOLL		1900E	1907U	1918	S10	W04	6545	03 16.5	180	SF	2	E		41		F
RAMY		1952	1955	2000	S29	E87		03 23.6	8	SF	3	E		57		
HOLL		1952	1955	2001	S31	E90		03 23.9	9	1M	3	E		146		
RAMY		2006	2007	2019	S16	W67	6538	03 11.7	13	SF C 8.0	3	E		51		F
HOLL		2010E	2012U	2019	S17	W69	6538	03 11.6	90	SN	2	E		87		U
RAMY		2021	2021	2029	S20	W64	6538	03 11.9	8	SF C 7.9	3	E		20		
HOLL		2021	2023	2028	S20	W65	6538	03 11.9	7	SF	2	E		59		F
HOLL		2045	2052	2111	S20	W65	6538	03 11.9	26	1M	2	E		154		
RAMY		2046	2046	2100	S19	W65	6538	03 11.9	14	SF M 1.9	3	E		24		F
RAMY		2144	2156	22200	S09	W04	6545	03 16.6	360	2B M 6.0	3	E		317		FH
HOLL		2219	2221	2225	S30	E94		03 24.3	6	SF	3	E		48		
LEAR	17	0016	0017	0022	S10	W05	6545	03 16.6	6	SF C 3.2	3	E		19		F
LEAR		0024	0027	0042	S22	W58	6538	03 12.5	18	SF C 4.3	3	E		26		F
LEAR		0028	0030	0034	S08	E00	6545	03 17.0	6	SF	3	E		25		F
LEAR		0142	0145	0220	S20	W67	6538	03 11.9	38	SN M 1.1	3	E		83		FE
LEAR		0142	0203	0220	S20	W67	6538		38	SN		E		55		K
GOES		0200	0209	0213					13	C 8.5						
LEAR		0215	0217	0306	S29	E90		03 24.1	51	1B M 1.2	3	E		240		
LEAR		0215	0250	0306	S29	E90			51	1B		E		98		K
GOES		0301E	0306	0311					100	C 7.3						
LEAR		0406	0409	0446	S10	W03	6545	03 16.9	40	1M C 4.4	3	E		103		FE
LEAR		0406	0416	0446	S10	W03	6545		40	1M		E		143		K
LEAR		0453	0455	0508	S25	E90		03 24.2	15	SN M 1.8	3	E		65		
LEAR		0453	0504	0508	S25	E90			15	SN		E		75		K
LEAR		0538	0545	0602	S18	W73	6538	03 11.7	24	SN M 1.4	3	E		91		FE
LEAR		0553	0556	0604	S07	W03	6545	03 17.0	11	SF	3	E		34		
LEAR		0601	0604	0616	S10	E16	6547	03 18.4	15	SN	3	E		47		F
LEAR		0824	0825	0834	S22	E12	6546	03 18.3	10	SF C 4.5	3	E		40		
LEAR		0832	0835	0844	S09	W04	6545	03 17.0	12	SF	3	E		22		F
LEAR		0926	0932	0953	S25	E83		03 23.8	27	2B M 2.1	3	E		547		
LEAR		0940	0943	0959	S10	W13	6545	03 16.4	19	SF	3	E		55		F
GOES		1013	1018	1023					10	C 6.3						
GOES		1105	1110	1113					8	C 4.8						
RAMY		1115	1123	1127	S24	E81		03 23.7	12	SF C 4.0	3	E		31		
RAMY		1134	1143	1204	S09	W14	6545	03 16.4	30	SF C 8.4	3	E		39		F
HOLL		1331E	1336U	1344	S28	E89		03 24.5	130	SF	1	E		42		
HOLL		1411	1413	1420	S09	W12	6545	03 16.7	9	SF	3	E		23		F
RAMY		1435	1440	1452	S26	E86		03 24.3	17	1B	3	E		187		
HOLL		1435	1440	1452	S26	E93		03 24.8	17	2B M 2.3	4	E		502		M
HOLL		1458	1500	1509	S21	W73	6538	03 12.0	11	SF	4	E		18		
RAMY		1600	1601	1611	S10	W13	6545	03 16.7	11	SF C 4.7	3	E		26		
HOLL		1600	1603	1612	S10	W13	6545	03 16.7	12	SF	3	E		15		
HOLL		1740	1750	1805	S10	W14	6545	03 16.7	25	SB M 2.4	3	E		99		F
RAMY		1741	1750	1805	S09	W15	6545	03 16.6	24	SN	3	E		75		
HOLL		1853	1855	1900	S10	W06	6545	03 17.3	7	SF	3	E		21		
HOLL		1854	1902	1923	S27	E90	6555	03 24.8	29	1M	3	E		146		F
RAMY		1859	1900	1905	S26	E84	6555	03 24.3	6	SF	3	E		30		
HOLL		1956	1958	2001	S20	W62	6538	03 13.1	5	SF	3	E		19		H
HOLL		2033	2040	2126	S22	E87	6555	03 24.5	53	1F C 6.5	3	E		123		H
HOLL		2040	2040	2053	S10	W16	6545	03 16.6	13	SF	3	E		26		F
HOLL		2040	2045	2053	S10	W16	6545		13	SF		E		31		K
HOLL		2054	2126	2305D	S10	W13	6545	03 16.9	131D	2B X 1.0	3	E		307		ZF
HOLL		2054	2143	2305D	S10	W13	6545		131D	2B		E		144		K
HOLL		2150	2153	2159	S25	E78	6555	03 23.9	9	SF	3	E		21		
HOLL		2230	2246	2312	S25	E78	6555	03 24.0	42	SF	3	E		40		
LEAR		2304	2312	2327	S17	E43	6550	03 21.2	23	SF	3	E		28		
HOLL		2312	2317	2355	S41	E05	6545	03 18.4	43	SN	3	E		71		F
LEAR		2312	2317	2359	S10	W14	6545	03 16.9	47	SN	3	E		71		FE
LEAR		2316	2317	2330	N23	E13	6551	03 19.0	14	SF	3	E		12		
LEAR		2322	2328	2343	S25	E77	6555	03 23.9	21	1M C 8.6	3	E		189		FE
HOLL		2359	2408	2449D	S25	W59	6538	03 13.4	500	SF	3	E		40		
LEAR	18	0004E	0004	0031	S25	W61	6538	03 13.3	27D	SF	3	E		23		

H α SOLAR FLARES

MARCH 1991

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CND	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks
															Time (UT)	Apparent (10 ⁻⁶ Disk)	Corr (Sq Deg)	
LEAR	18	0111	0112	0122	S17	E42	6550	03	21.2	11	SF		3	E		26		
LEAR		0133	0138	0146	S25	E76	6555	03	23.9	13	SF		3	E		43		
LEAR		0151	0155	0215	S23	E77	6555	03	24.0	24	1N	C 5.6	3	E		188		F
LEAR		0218	0232	0245	W22	E12	6551	03	19.0	27	SN		3	E		76		FE
LEAR		0419	0420U	0434	S10	W24	6545	03	16.4	15	SF		3	E		14		
LEAR		0419	0433	0439	S25	E80	6555	03	24.4	20	1F		3	E		100		F
LEAR		0443	0503	0520	S23	E78	6555	03	24.2	37	1F		3	E		152		
LEAR		0550	0552	0559	S09	W29	6545	03	16.1	9	SF		3	E		18		
LEAR		0550	0713	0803	S22	E75	6555			133	SF			E		62		K
LEAR		0550	0732	0803	S22	E75	6555	03	24.0	133	1F		3	E		114		F
LEAR		0620	0627	0635	S17	E42	6550	03	21.4	15	SF		3	E		25		
SVTO		0722	0731	0746	S18	E78	6555	03	24.2	24	SF		2	E		40		
LEAR		0751	0753	0758	S17	E41	6550	03	21.4	7	SF		3	E		19		
LEAR		0752	0816	0838	S11	W27	6545	03	16.3	46	SN		3	E		57		F
LEAR		0849	0852	1023	S20	E79	6555			94	SN			E		48		K
LEAR		0849	0912	1023	S20	E79	6555	03	24.4	94	SN		3	E		95		
LEAR		0936	0943	1002	S10	W24	6545	03	16.6	26	SN	C 8.0	3	E		44		FE
GOES		1026	1042	1108						42		C 9.6						
SVTO		1114E	1127U	1233D	S25	E73	6555	03	24.1	79D	1F		2	E		118		
GOES		1245	1301	1544						179		M 1.6						
SVTO		1320	1321	1338	S10	W30	6545	03	16.3	18	SF		3	E		26		F
SVTO		1333	1339	1342	S26	W67	6538	03	13.3	9	SF		3	E		87		
HOLL		1418	1418	1426	W21	E06	6551	03	19.0	8	SF		2	E		13		F
HOLL		1427	1429	1445	S23	E70	6555	03	24.0	18	SF		3	E		47		
HOLL		1449	1506	1531	S14	W78	6538	03	12.7	42	1F		3	E		127		F
HOLL		1506	1509	1515	S25	E71	6555	03	24.1	9	SF		3	E		24		
HOLL		1620	1626	1639	S24	E71	6555	03	24.2	19	SF		3	E		28		
HOLL		1632	1634	1647	S10	W28	6545	03	16.6	15	SF		3	E		40		
HOLL		1652	1710	1735	S23	E71	6555	03	24.2	43	SN		3	E		58		F
GOES		1703	1708	1724						21		M 1.0						
HOLL		1713	1731	1809	S10	W24	6545	03	16.9	56	1B	M 5.3	4	E		187		ZF
HOLL		1713	1736	1809	S10	W24	6545			56	1F			E		119		K
HOLL		1723	1731	1741	W23	E06	6551	03	19.2	18	SF		3	E		23		F
HOLL		1802	1805	1844	S25	W71	6538			42	SN			E		80		K
HOLL		1802	1819	1844	S25	W71	6538			42	SN		3	E		89		
HOLL		1826	1836	1853	S25	E75	6555	03	24.6	27	SF		4	E		44		F
HOLL		1854	1902	1923	S27	E90	6555	03	25.8	29	1N		3	E		146		F
HOLL		1901	1902	1909	S26	E78	6555	03	24.8	8	SF		3	E		22		F
HOLL		1909	1915	1945	S23	W69	6538	03	13.5	36	SF		3	E		31		
HOLL		1915	1921	1944	S25	E77	6555	03	24.8	29	SN		3	E		43		
HOLL		1952	1954	2033	S25	E74	6555			41	SB			E		28		K
HOLL		1952	2013	2033	S25	E74	6555	03	24.6	41	SF		3	E		48		F
GOES		2035	2040	2045						10		C 9.8						
HOLL		2051	2102	2118	S21	W77	6538	03	13.0	27	SF		3	E		87		
HOLL		2118	2119	2128	S24	E69	6555	03	24.2	10	SF		3	E		29		
HOLL		2138	2140	2158	S10	W31	6545	03	16.6	20	SB	M 1.4	3	E		82		FE
HOLL		2211	2219	2300D	S24	E68	6555	03	24.2	49D	SF	M 1.0	3	E		54		
LEAR		2303E	2307U	2417	S10	W34	6545	03	16.4	74D	2B	M 1.3	3	E		311		
HOLL		2313E	2313U	2420D	S10	W28	6545	03	16.9	67D	1N		3	E		105		F
GOES	19	0115	0122	0155						40		M 3.6						
LEAR		0147	0158	0240	S10	W33	6545	03	16.6	53	2B	M 6.7	3	E		501		
LEAR		0156	0204	0240	S23	E63	6555	03	23.9	44	1F		3	E		132		
LEAR		0612	0612	0623	S10	W35	6545	03	16.6	11	SF	M 1.2	3	E		46		
LEAR		0805	0805	0830	S10	W41	6545	03	16.2	25	SF		3	E		50		
LEAR		0829	0830	0838	S25	E63	6555	03	24.2	9	SF	C 9.4	3	E		37		
LEAR		0921	0923	0936	S16	E27	6550	03	21.4	15	SF		3	E		84		
GOES		1100	1106	1113						13		M 1.7						
GOES		1241	1304	1307						26		C 5.1						
GOES		1336	1406	1434						58		C 6.8						
GOES		1538	1542	1544						6		C 6.5						
GOES		1609	1618	1632						23		C 8.4						
LEAR		2351E	2356	2435D	S25	E54	6555			44D	SN			E		61		K
LEAR		2351E	2416U	2435D	S25	E54	6555	03	24.2	44D	2N		3	E		296		
GOES	20	0245	0251	0256						11		C 3.6						
GOES		0326	0333	0346						20		M 1.9						
GOES		0346	0350	0502						76		M 2.5						

42
Mar 91

H α SOLAR FLARES

MARCH 1991

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Time (UT)	Area Apparent (10 ⁻⁶ Disk)	Corr (Sq Deg)	Remarks
LEAR	20	0414E		0502D	S09	W41	6545	03	17.1	480	1W		3	E		216		
[SVTO		0535E	0614U	0635	S25	E52	6555	03	24.3	600	1W	M 7.0	2	E		105		
SVTO		0604	0622	0627D	S19	E59	6555	03	24.7	230	SF		3	E		72		
SVTO		0629	0630	0633	S09	W43	6545	03	17.0	4	SF		3	E		11		
GOES		0829E	0834	0848D						190		C 2.8						
GOES		0915	0934	0936						21		C 3.7						
GOES		1035	1043	1049						14		M 1.7						
GOES		1052	1102	1108						16		M 1.1						
GOES		1300	1316	1338						38		C 5.8						
SVTO		1417E	1417U	1515D	S20	E57	6555	03	24.9	580	SF	C 6.1	2	E		54		F
HOLL		1607E	1611U	1708	S27	E52	6555	03	24.7	610	SF		2	E		82		F
HOLL		1710	1740	1811	S21	E53	6555	03	24.8	61	1W	C 6.2	3	E		143		FE
[HOLL		1710	1752	1811	S21	E53	6555			61	SF			E		48		K
HOLL		1724	1724	1753	S11	W52	6545	03	16.8	29	SF	C 4.5	3	E		78		F
HOLL		1809	1811	1821	S22	E82	6557	03	27.0	12	SF		3	E		43		F
HOLL		1812	1821	1836	S21	E53	6555	03	24.8	24	SW	M 1.1	3	E		76		FE
GOES		1845	1857	1902						17		C 9.7						
HOLL		1904	1908	1918	S10	W53	6545	03	16.8	14	SF		3	E		20		
HOLL		1907	1907	1910	S25	E45	6555	03	24.3	3	SF		3	E		17		F
HOLL		1914	1956	2035	S28	E47	6555	03	24.5	81	1W	C 6.0	3	E		101		FE
GOES		2023	2029	2035						12		C 4.3						
[HOLL		2100	2111	2350D	S23	E52	6555	03	24.9	1700	1W	C 8.3	2	E		185		FE
HOLL		2100	2113	2350D	S23	E52	6555			1700	1W			E		190		K
GOES		2301	2307	2311						10		C 5.9						
GOES		2333E	2333	2350						170		C 9.5						
GOES	21	0036E	0050	0110D						340		M 1.5						
LEAR		0038E	0040	0138	S25	E41	6555	03	24.2	600	1B		3	E		100		
GOES		0106	0113	0116						10		C 6.5						
GOES		0218	0229	0231						13		C 6.7						
LEAR		0254E	0257	0301	S25	E39	6555	03	24.1	70	SF		3	E		35		F
LEAR		0425	0429	0437	S25	E51	6555	03	25.1	12	SF	C 4.7	3	E		30		
SVTO		0545	0547	0630	S25	E45	6555	03	24.7	45	SW		1	E		79		FH
GOES		0558	0559	0606D						80		M 1.6						
GOES		0651	0656	0701						10		C 5.5						
GOES		0723E	0737U	0809						460		C 5.8						
[LEAR		0803E	0818	0825D	S12	W61	6545	03	16.7	220	1B	M 2.7	3	E		233		
SVTO		0810E	0811U	0843D	S13	W60	6545	03	16.8	330	1W		1	E		101		F
LEAR		0811	0825	0825D	S23	E39	6555	03	24.3	140	2B		3	E		266		F
[SVTO		0823E	0824U	0943	S23	E39	6555	03	24.3	800	1W		2	E		239		UF
SVTO		0949	0954	1021	S24	E48	6555	03	25.1	32	SF	C 8.0	3	E		59		
SVTO		1029	1041	1051	S24	E48	6555	03	25.1	22	2B	M 2.6	4	E		353		FH
SVTO		1053	1054	1059	S22	E40	6555	03	24.5	6	SF		4	E		31		
SVTO		1102	1104	1110	S22	E39	6555	03	24.4	8	SF		4	E		28		F
SVTO		1118	1119	1126	S22	E43	6555	03	24.8	8	SF		4	E		36		
SVTO		1120	1127	1146	S09	W61	6545	03	16.9	26	SF		4	E		45		F
SVTO		1124	1124	1138	S11	E77		03	27.3	14	SF		3	E		23		
SVTO		1147	1154	1208	S25	E43	6555	03	24.8	21	SF		3	E		32		F
SVTO		1214	1248	1306	S19	E41	6555	03	24.6	52	SW	M 1.1	3	E		81		
SVTO		1333	1346	1410	S23	E38	6555	03	24.5	37	SW	C 9.4	3	E		81		FH
SVTO		1426	1426	1436	S26	E37	6555	03	24.5	10	SF		3	E		11		F
SVTO		1428	1429	1435	S16	E82		03	27.8	7	SF		3	E		11		
[SVTO		1503	1528	1550	S24	E44	6555	03	25.0	47	1W	M 1.7	3	E		237		FH
SVTO		1503	1544	1550	S24	E44	6555			47	SF			E		16		K
GOES		1622	1625	1627						5		C 3.6						
GOES		1706	1710	1714						8		C 5.4						
GOES		1829	1833	1838						9		C 4.5						
GOES		1849	1855	1902						13		C 9.1						
HOLL		2020E	2022U	2131D	S13	E29	6555	03	24.0	710	1W	X 1.0	1	E		163		FE
LEAR		2337	2343	2526	S25	E40	6555	03	25.1	109	2B	M 5.4	3	E		281		F
[LEAR		2337	2448	2526	S25	E40	6555			109	1B			E		115		K
GOES	22	0045	0049	0054						9		C 4.8						
GOES		0052E	0057	0115D						230		C 8.0						
LEAR		0330	0332	0354	S23	E23	6555	03	23.9	24	SF		3	E		37		F
GOES		0333E	0335	0407D						340		C 5.3						
LEAR		0411	0413	0416	W00	W10	6549	03	21.4	5	SF	C 3.0	3	E		15		
[LEAR		0504	0521	0549	S22	E29	6555	03	24.4	45	1W	C 3.5	3	E		108		FE

H α SOLAR FLARES

MARCH 1991

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CND	NOAA/ USAF	CMP Mo Day	Dur (Min)	Imp Opt Xray	Obs See Type	Area Measurement			Remarks	
							Region					Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)		
SVTO	22	0512E	0523	0545	S25	E34	6555	03 24.8	330	SN	1	E	81		FH	
SVTO		0558	0601	0742	S23	E36	6555		104	SF		E	67		K	
SVTO		0558	0648	0742	S23	E36	6555	03 25.0	104	SF	3	E	38		FH	
LEAR		0603	0604	0620	S09	W66	6545	03 17.3	17	SB	4	E	93			
SVTO		0604	0604	0613	S12	W73	6545	03 16.7	9	SF	2	E	75		F	
LEAR		0604	0606	0707	S26	E37	6555		63	SN		E	54		K	
LEAR		0604	0639	0707	S26	E37	6555	03 25.1	63	SN	3	E	55		FE	
LEAR		0629	0631	0657	S11	E74	6558	03 27.8	28	SF	3	E	22		F	
LEAR		0712	0720	0743	S22	E29	6555	03 24.5	31	SF	3	E	26		F	
LEAR		0810	0810	0844	S07	E21	6556	03 23.9	34	SF	3	E	26		F	
LEAR		0810	0812	0826	S17	E19	6555	03 23.8	16	SF	3	E	38			
GOES		0810	0814	0821					11		C 4.3					
LEAR		0830	0838	0924	S25	E35	6555	03 25.1	54	1B	M 6.3	3	E	125		FH
LEAR		0830	0914	0924	S25	E35	6555		54	SB		E	70		K	
SVTO		0839E	0839U	1002	S22	E34	6555	03 25.0	830	1B		2	E	115		UF
SVTO		0839E	0912	1002	S22	E34	6555		830	1B		E	119		K	
LEAR		0928	0939	1009	S23	E25	6555	03 24.3	41	1B	M 1.0	3	E	119		FH
LEAR		0931	0940	1008	S09	E16	6556	03 23.6	37	SF	3	E	63		F	
SVTO		1047	1051	1107	S03	W15	6549	03 21.3	20	SF	C 3.7	3	E	46		
SVTO		1101	1102	1106	S24	E28	6555	03 24.6	5	SF		3	E	12		
SVTO		1124	1127	1132	S12	E73	6558	03 28.0	8	SF		3	E	15		
SVTO		1144	1150	1219	S19	E29	6555	03 24.7	35	1B	M 1.3	3	E	156		ZF
SVTO		1313	1314	1321	S11	W81	6545	03 16.4	8	SF	C 4.8	3	E	18		
GOES		1346	1353	1358					12		C 2.9					
SVTO		1417	1430	1435	S21	E31	6555	03 25.0	18	SF		3	E	17		
HOLL		1428	1430	1440	S22	E31	6555	03 25.0	12	SF		2	E	36		
HOLL		1444	1503	1543	S20	E27	6555	03 24.7	59	SF		3	E	61		FH
SVTO		1500	1503	1525	S20	E26	6555	03 24.6	25	SF		3	E	53		
HOLL		1554	1555	1602	S23	E23	6555	03 24.4	8	SF		3	E	10		
HOLL		1555	1558	1606	S10	W78	6545	03 16.8	11	SF		3	E	35		F
HOLL		1707	1709	1738	S14	W09		03 22.0	31	SF		3	E	47		F
HOLL		1729	1730	1742	S13	E14	6556	03 23.8	13	SF		3	E	11		F
HOLL		1729	1739	1743	S25	E21	6555	03 24.3	14	SF		3	E	14		
HOLL		1746	1748	1806	S15	E14	6556	03 23.8	20	1N	C 5.3	3	E	148		FE
HOLL		1746	1812	1828	S25	E24	6555	03 24.6	42	SF		3	E	20		F
HOLL		1748	1752	1800	S16	E71	6558	03 28.1	12	SF		3	E	39		F
HOLL		1829	1836	1847	S21	E27	6555	03 24.8	18	SF		3	E	35		F
HOLL		1903	1914	2153	S27	E23	6555		170	1B		E	99		K	
HOLL		1903	2017	2153	S27	E23	6555	03 24.6	170	1B	M 2.5	3	E	243		FH
HOLL		2052	2056	2104	S14	W80	6545	03 16.8	12	SF		3	E	17		H
HOLL		2126	2130	2229	S13	W11			63	SN		E	81		K	
HOLL		2126	2144	2229	S13	W11		03 22.1	63	1N		3	E	114		F
HOLL		2243	2245	2317	S26	E28	6555	03 25.1	34	3B	X 9.4	3	E			MH
GOES	23	0149	0154	0205					16		M 3.3					
LEAR		0305E	0359	0623D	S10	E03	6556	03 23.3	1980	3M		3	E	823		FE
LEAR		0305E	0510U	0623D	S24	E11	6555	03 24.0	1980	2B	M 6.8	3	E	486		F
LEAR		0348E	0356U	0417	S02	W24	6549	03 21.4	290	SF		3	E	46		
LEAR		0414E	0422	0444	N14	E28	6559	03 25.3	300	1F		3	E	130		FE
LEAR		0726	0729U	0753	N13	W68	6553	03 18.2	27	SF		3	E	84		
LEAR		0738	0752U	0941	S23	E01	6555	03 23.4	123	1F		3	E	125		F
SVTO		1001	1010	1023	S02	W27	6549	03 21.4	22	SF		3	E	91		
GOES		1046E	1052	1148D					620		M 1.3					
SVTO		1113	1121	1201	N12	W68	6553	03 18.3	48	SF	M 1.3	3	E	34		H
SVTO		1229	1242	1305	S20	E14	6555	03 24.6	36	1B	M 6.8	3	E	239		FH
GOES		1327	1332	1340					13		C 8.2					
SVTO		1437	1442	1445	S25	E20	6555	03 25.1	8	SF	C 6.8	2	E	23		F
GOES		1536	1548	1606					30		C 6.5					
HOLL		1640	1645	1707	S28	E18	6555	03 25.1	27	SN	C 7.5	2	E	42		F
HOLL		1640	1652	1707	S28	E18	6555		27	SN		E	31		K	
HOLL		1726	1727	1743	S25	E11	6555	03 24.6	17	SF	C 5.8	3	E	32		FE
HOLL		1751	1753	1807	S15	E57	6558	03 28.0	16	SF		3	E	25		
HOLL		1758	1758	1807	S22	E06	6555	03 24.2	9	SF		3	E	24		F
HOLL		1814	1823U	1839	S27	E17	6555	03 25.1	25	SB		2	E	53		F
RAMY		1816	1816	1850	S26	E17	6555	03 25.1	34	SN	C 8.8	3	E	33		F
RAMY		1853E	1908U	1953D	S26	E17	6555	03 25.1	600	SN	M 1.5	3	E	42		FE
HOLL		1917E	1918U	2200D	S28	E17	6555	03 25.1	1630	SN	M 1.6	2	E	86		F
HOLL		1958E	2000U	2100D	S16	E56	6558	03 28.1	620	SF		2	E	52		

44
Mar 91

H α SOLAR FLARES

MARCH 1991

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CND	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Time (UT)	Area Measurement		Remarks
																Apparent (10-6 Disk)	Corr (Sq Deg)	
RAMY	23	2015	2016	2018	S22	E05	6555	03	24.2	3	SF		3	E		26		
RAMY		2044	2104	2118	S27	E15	6555	03	25.0	34	SF		3	E		41		
HOLL		2218E	2218U	2300D	S22	E04	6555	03	24.2	42D	1F	M 5.6	2	E		48		FE
HOLL		2230	2233U	2308	S16	E53	6558	03	27.9	38	SF		3	E		19		
HOLL		2305	2306	2421D	S22	E03	6555	03	24.2	76D	1B		2	E		151		UF
LEAR		2310E	2313	2430	S27	E07	6555	03	24.5	80D	2B		3	E		357		F
LEAR		2334	2336	2441	S14	W05	6556	03	23.6	67	SF		3	E		72		F
LEAR		2359	2408	2417	S16	E62	6558	03	28.7	18	1F		3	E		106		F
LEAR	24	0004	0015	0045	S06	W35	6549	03	21.4	41	SF		3	E		47		
LEAR		0010	0014	0215	S17	W30	6550			125	2M			E		201		K
LEAR		0010	0033	0215	S17	W30	6550	03	21.7	125	3M		3	E		748		FE
LEAR		0054	0054	0058	S16	E52	6558	03	28.0	4	SF		3	E		21		
HOLL		0055E	0055U	0111D	S17	W29	6550	03	21.8	16D	2F	M 2.1	2	E		438		UF
PALE		0238	0244	0417	S13	E50	6558	03	27.9	99	2M		3	E		297		FE
PALE		0238	0333	0417	S13	E50	6558			99	SM			E		68		K
LEAR		0239	0244	0421	S15	E51	6558	03	28.0	102	2B	M 3.2	3	E		365		
LEAR		0239	0254	0421	S15	E51	6558			102	2B			E		230		K
LEAR		0239	0344	0421	S15	E51	6558			102	2B			E		156		K
PALE		0305	0305	0309	S27	E09	6555	03	24.8	4	SF		3	E		37		H
LEAR		0313	0340	0434	M13	E13	6559	03	25.1	81	SF		3	E		42		
LEAR		0402	0411	0429	S29	E04	6555	03	24.5	27	SF		3	E		38		
PALE		0404	0408	0427	S27	E05	6555	03	24.5	23	SF		3	E		15		F
LEAR		0409	0420	0439	S14	W28	6550	03	22.0	30	SF		3	E		20		
LEAR		0501	0509	0550	S26	W02	6555	03	24.0	49	SF	C 6.1	3	E		56		
LEAR		0507	0509	0531	S13	W30	6550	03	21.9	24	SF		3	E		88		F
GOES		0838	0841	0847						9		C 2.7						
SVTO		0925	1023	1118	S26	E02	6555	03	24.5	113	1M		4	E		227		FH
GOES		1008	1021	1056						48		M 3.0						
SVTO		1228	1238	1253	S26	E02	6555	03	24.7	25	SF		4	E		24		F
SVTO		1234	1246	1318	S13	E48	6558	03	28.1	44	SF		4	E		62		F
SVTO		1354	1418	1502	S26	E00	6555	03	24.6	68	2B	M 3.7	4	E		280		FE
RAMY		1357	1412	1442	S26	W01	6555			45	1M			E		124		K
RAMY		1357	1416	1442	S26	W01	6555	03	24.5	45	1M	M 3.7	3	E		220		F
HOLL		1403E	1418	1430D	S27	W01	6555	03	24.5	27D	2B		2	E		262		F
SVTO		1412	1419	1504	S15	W13	6556	03	23.6	52	SF		3	E		34		
HOLL		1413	1418	1430D	S12	W12	6556	03	23.7	17D	SF		3	E		27		F
RAMY		1414	1419	1422	S19	W13	6556	03	23.6	8	SF		3	E		14		
SVTO		1417	1426	1447	S12	E45	6558	03	28.0	30	SF		4	E		60		F
HOLL		1420	1422	1430D	S15	E46	6558	03	28.1	10D	SF		3	E		60		F
RAMY		1421	1426	1436	S13	E46	6558	03	28.1	15	SF		3	E		20		
RAMY		1459	1507	1512	S20	E02	6555	03	24.8	13	SF		3	E		33		
HOLL		1536	1540	1558	S20	E49	6558			22	SF			E		14		K
HOLL		1536	1552	1558	S20	E49	6558	03	28.4	22	SF		3	E		27		F
HOLL		1610E	1614U	1619D	M15	W83	6553	03	18.4	9D	SF		2	E		44		
HOLL		1624E	1633U	1653D	S11	E19		03	26.1	29D	SF		1	E		22		
HOLL		1717	1721	1747	S23	W06	6555	03	24.2	30	SM		2	E		89		FE
HOLL		1717	1725	1747	S23	W06	6555			30	SF			E		96		K
RAMY		1718	1718	1730	S22	W06	6555	03	24.2	12	SF	C 5.0	3	E		48		F
HOLL		1817	1841	1857	S25	W10	6555	03	24.0	40	SM		3	E		81		FE
RAMY		1819	1826	1858	S26	W03	6555	03	24.5	39	SF		3	E		46		F
GOES		1841	1845	1852						11		C 5.2						
HOLL		1859	1904	1915	S11	E20	6560	03	26.3	16	SF		3	E		53		
RAMY		1901	1904	1910	S09	E19	6560	03	26.2	9	SF		3	E		28		
RAMY		1904	1904	1909	S27	W04	6555	03	24.5	5	SF		3	E		22		
RAMY		1918	1923	1926	S22	E02	6555	03	24.9	8	SM		3	E		39		
HOLL		1920	1921	1930	S27	E08	6555	03	25.4	10	SF		3	E		15		
HOLL		1937	1944	2039	S15	E45	6558	03	28.2	62	2B	M 1.4	3	E		337		F
HOLL		1937	1948	2039	S15	E45	6558			62	2B			E		267		K
RAMY		1938	1942	2019	S14	E42	6558	03	28.0	41	SM		3	E		96		F
HOLL		2051	2057	2111	S10	E18	6560	03	26.2	20	SF		3	E		20		
HOLL		2233E	2233U	2307D	S25	W06	6555	03	24.5	34D	SF	C 2.9	2	E		37		
HOLL		2305	2306	2421D	S22	E03	6555	03	25.2	76D	1B		2	E		151		UF
GOES		2308	2311	2313						5		C 3.8						
LEAR		2311	2318	2347	M14	W81	6553	03	18.8	36	SF		3	E		52		
LEAR	25	0007	0019	0103	S26	E01	6555	03	25.1	56	1B	X 1.1	3	E		202		F
PALE		0030E	0032U	0034D	M25	E02	6555	03	25.2	4D	1B		3	E		157		

H α SOLAR FLARES

MARCH 1991

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF		Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks
							Region	Mo Day						Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
GOES	25	0327E	0332	0342D					15D								
GOES		0410E	0413	0418D					8D								
LEAR		0440	0441	0447	S28	W06	6555	03 24.7	7	SF	C 2.9	3	E		26		
LEAR		0527	0535	0610	S27	W10	6555	03 24.4	43	18	M 1.5	3	E		174		
SVTO		0801E	0811	0839	S25	W03	6555	03 25.1	38D	18	X 5.3	2	E		224		FH
LEAR		0935	0938	1015D	S25	W12	6555	03 24.5	40D	SF	C 4.6	3	E		43		
SVTO		0936	0938	0959	S25	W11	6555	03 24.5	23	SF		2	E		30		F
RAMY		1124	1125	1218	S24	W13	6555		54	SW			E		19		K
RAMY		1124	1142	1218	S24	W13	6555	03 24.5	54	SW	C 8.3	3	E		54		
SVTO		1156E	1156U	1243D	S23	W13	6555	03 24.5	47D	SF		2	E		87		F
SVTO		1156E	1203U	1241D	S16	W20	6556	03 24.0	45D	SF		2	E		44		
RAMY		1248	1250	1254	S20	W10	6555	03 24.8	6	SW		3	E		30		
SVTO		1337	1339	1355	S15	E36	6558	03 28.3	18	SF	C 1.8	3	E		41		F
RAMY		1337	1340	1345	S16	E36	6558	03 28.3	8	SF		3	E		15		
SVTO		1426	1432	1457	S11	E10	6560	03 26.3	31	SF		3	E		25		F
RAMY		1428	1433	1447	S24	W06	6555	03 25.1	19	SF		3	E		71		F
SVTO		1431	1436	1452	S27	W10	6555	03 24.8	21	1F	C 7.9	3	E		133		F
HOLL		1432E	1433U	1452D	S24	W13	6555	03 24.6	20D	SF		2	E		63		F
GOES		1520	1525	1530					10		C 3.0						
HOLL		1544	1545	1609D	N13	W05	6559	03 25.3	25D	SF		2	E		28		F
RAMY		1545	1546	1602	N14	W06	6559	03 25.2	17	SF		3	E		41		F
SVTO		1546	1548	1601	S27	W12	6555	03 24.7	15	SF		3	E		77		F
RAMY		1546	1548	1602	S27	W11	6555	03 24.8	16	1W	C 9.0	3	E		122		F
HOLL		1551E	1552U	1609D	S28	W11	6555	03 24.8	18D	SF		2	E		70		FE
GOES		1920	2033	2042					82		C 8.6						
HOLL		2051E	2051U	2105	S18	E32	6558	03 28.3	14D	SF		2	E		68		F
HOLL		2150E	2211	2253D	S01	W62	6549	03 21.3	63D	1W	C 6.3	3	E		158		F
HOLL		2216	2219	2227	S24	W10	6555	03 25.1	11	SF		3	E		20		
GOES	26	0133E	0144	0152D					19D		C 2.4						
GOES		0315E	0320	0335D					20D		C 2.0						
GOES		0355E	0404	0418D					23D		C 2.2						
GOES		0520	0523	0526					6		C 2.1						
SVTO		0819	0824	0830	S27	W26	6555	03 24.3	11	SF	C 2.4	3	E		23		
LEAR		0924	0929	0947	S24	W27	6555	03 24.3	23	SW	C 2.8	3	E		76		F
SVTO		0926	0933	0941	S29	W17	6555	03 25.1	15	SF		3	E		52		
GOES		1019	1022	1025					6		C 2.2						
RAMY		1235	1236	1241	S24	W26	6555	03 24.5	6	SF	C 2.0	3	E		17		
RAMY		1350	1404	1435	S24	W20	6555	03 25.0	45	SW		3	E		41		FH
RAMY		1350	1422	1435	S24	W20	6555		45	SW			E		88		K
RAMY		1409	1416	1418	S11	E20	6558	03 28.1	9	SF	C 3.2	3	E		20		
RAMY		1614	1627	1656	S22	W30	6555	03 24.4	42	SF	M 1.0	4	E		41		F
HOLL		2011	2015	2024	S22	W34	6555	03 24.2	13	SF	C 3.3	3	E		28		F
HOLL		2026	2034	2137D	S28	W23	6555	03 25.0	71D	48	X 4.7	3	E				MU
PALE		2041E	2042	2102D	S28	W23	6555	03 25.1	21D	2W		3	E		557		EH
RAMY		2045E	2045U	2049D	S22	W33	6555	03 24.3	4D	3F		3	E				FH
HOLL		2202	2209	2223	S14	E14	6558	03 28.0	21	SF	C 2.3	3	E		24		F
GOES	27	0446	0449	0452					6		C 2.0						
SVTO		0743	0744	0749	S24	W03	6557	03 27.1	6	SF		3	E		14		F
SVTO		0915	0931	1013	S29	W33	6555	03 24.8	58	SF		3	E		39		F
RAMY		1241	1241	1248	S24	W39	6555	03 24.5	7	SF	C 2.3	3	E		22		F
HOLL		1451	1456	1528	S12	E08	6558	03 28.2	37	SF	C 2.0	4	E		54		UF
RAMY		1456	1457	1514	S12	E08	6558	03 28.2	18	SF		3	E		15		F
HOLL		1559	1605	1615	S19	W50	6555	03 23.8	16	SF	C 2.6	4	E		25		F
HOLL		1752	1757	1824	S26	W37	6555	03 24.9	32	1W	C 3.1	3	E		142		FE
HOLL		1752	1809	1824	S26	W37	6555		32	1W			E		117		K
RAMY		1754	1757	1819	S27	W39	6555	03 24.7	25	SF		4	E		74		FH
PALE		1755	1808U	1826	S28	W38	6555	03 24.8	31	SF		3	E		37		F
GOES		1831	1835	1837					6		C 2.4						
HOLL		1952	1954	1958	S22	W45	6555	03 24.4	6	SF		3	E		30		
HOLL		2007	2008	2013	S22	W56	6555	03 23.5	6	SF		3	E		34		
HOLL		2100	2122	2327D	S16	W09	6558	03 27.2	147D	1W		3	E		183		F
PALE		2117	2120	2259	S17	W07	6558	03 27.3	102	SF		3	E		38		
RAMY		2118	2125	2209D	S17	W08	6558	03 27.3	51D	SF		4	E		47		F
HOLL		2138	2151	2155	N17	W30		03 25.6	17	SF		3	E		19		F
HOLL		2202	2212	2327D	S24	W47	6555	03 24.3	85D	18	M 2.1	3	E		119		
HOLL		2202	2307	2327D	S24	W47	6555		85D	SB			E		68		K

46
Mar 91

H α SOLAR FLARES

MARCH 1991

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	See	Obs Type	Area Measurement			Remarks
															Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
PALE	27	2209E	2214	2254	S24	W46	6555	03	24.4	450	SF		3	E		63		
PALE		2316	2331	2339	S28	W41	6555	03	24.8	23	SF		3	E		24		
GOES	28	0153	0156	0159						6		C 2.3						
GOES		0321	0331	0341						20		C 2.4						
RAMY		1601	1602	1605	S27	W52	6555	03	24.6	4	SF		3	E		15		F
PALE		1916	1916	1923	N16	W42	6559	03	25.6	7	SF	C 3.3	3	E		14		F
RAMY		1917	1917	1920	N17	W43	6559	03	25.5	3	SF		3	E		10		
PALE		2047	2059U	2115	N16	W43	6559	03	25.6	28	SF	C 4.7	3	E		40		F
RAMY		2056	2058	2106	N16	W44	6559	03	25.5	10	SF		3	E		14		F
PALE		2109	2140	2204	S28	W49	6555	03	25.0	55	SF	C 3.5	3	E		95		
RAMY		2111	2111	2147D	S28	W50	6555	03	25.0	360	SF		3	E		26		F
HOLL		2219	2224	2237	S25	W58	6555	03	24.4	18	SF		3	E		48		F
LEAR	29	0004	0014	0037	S09	W37	6560	03	26.2	33	SF		3	E		45		
LEAR		0203	0212	0240	N15	W48	6559	03	25.4	37	SN	C 6.0	3	E		67		
PALE		0205	0209	0230	N16	W47	6559	03	25.5	25	SF		3	E		75		
GOES		0422	0516	0524						62		C 3.3						
LEAR		0526	0551	0630	S26	W62	6555	03	24.4	64	1F	C 4.8	3	E		103		
LEAR		0642	0648	0734	S28	W60	6555	03	24.6	52	3B	X 2.4	3	E		795		F
SVTO		0642	0653	0733	S27	W52	6555	03	25.2	51	2B		3	E		578		FH
SVTO		0915	0919	0944	N16	W51	6559	03	25.5	29	SF		3	E		38		
GOES		1037	1047	1106						29		M 1.1						
SVTO		1127	1131	1139	N15	W52	6559	03	25.5	12	SF		3	E		24		
SVTO		1217	1220	1227	N14	E58	6562	04	2.9	10	SF		3	E		38		
SVTO		1301	1307	1316	N16	E60	6562	04	3.1	15	SF		3	E		23		
GOES		1357	1400	1403						6		C 4.7						
HOLL		1453	1455	1457	S06	W63	6561	03	24.9	4	SF		3	E		38		
RAMY		1519	1519	1527	N13	E61	6562	04	3.2	8	SF		3	E		22		F
HOLL		1523	1526	1534	S19	W62	6555	03	24.9	11	SF		3	E		43		
RAMY		1525	1526	1528	S19	W62	6555	03	24.9	3	SF		3	E		18		H
HOLL		1917	1917	1947	S08	W47	6560	03	26.3	30	SF		3	E		69		F
HOLL		2111	2114	2117	S12	E60	6563	04	3.4	6	SF		3	E		14		F
PALE		2125	2128	2133	S10	E60	6563	04	3.4	8	SF		3	E		26		
HOLL		2125	2132	2214	S13	W23	6558	03	28.1	49	SF		3	E		33		F
PALE		2126	2129	2136	S15	W21	6558	03	28.3	10	SF		3	E		12		F
HOLL		2157	2200	2215	N13	E54	6562	04	3.0	18	SF		3	E		19		F
HOLL		2229	2232	2239	N13	E54	6562	04	3.0	10	SF		3	E		13		F
HOLL		2237	2238	2244	S25	W68	6555	03	24.7	7	SF		3	E		20		F
GOES		2250	2254	2256						6		C 4.6						
LEAR	30	0231	0250	0331	S10	E55	6563	04	3.2	60	SF		3	E		28		F
LEAR		0259	0321	0340	S26	W64	6555	03	25.1	41	1N	M 1.2	3	E		119		F
PALE		0309	0312	03350	S27	W71	6555	03	24.6	260	SF		3	E		92		F
LEAR		0419	0504	0558	S09	W62	6560	03	25.5	99	SF		3	E		31		
SVTO		0516E	0524U	0553D	S11	W59	6560	03	25.8	370	SF		2	E		81		
LEAR		0832	0834	0842	S10	E52	6563	04	3.3	10	SF		3	E		30		E
LEAR		0904	0908	0920	S22	W75	6555	03	24.6	16	1B	C 7.7	3	E		157		F
RAMY		1150E	1150U	1210	S27	W68	6555	03	25.2	200	SF		3	E		57		FH
HOLL		1925	2003	2010	S09	W74	6561	03	25.2	45	SF		3	E		38		
RAMY		1957	2003	2007	S06	W78	6561	03	25.0	10	SF		3	E		27		
HOLL		2014	2021	2031	S08	W78	6561	03	25.0	17	SF		3	E		44		F
GOES		2031	2036	2038						7		C 5.4						
GOES		2131	2138	2143						12		C 4.7						
GOES		2301	2306	2311						10		C 3.3						
PALE	31	0030	0032	0041	S22	W82	6555	03	24.7	11	SF	C 3.1	2	E		45		
HOLL		0031	0038	0045	S19	W80	6555	03	24.9	14	SF	C 7.6	3	E		26		
PALE		0115	0115	0126	S15	W37	6558	03	28.2	11	SF		3	E		28		F
LEAR		0249	0256	0312	S24	W77	6555	03	25.2	23	SF	C 4.2	3	E		59		
LEAR		0351	0356	0411	S10	E44	6563	04	3.5	20	SF		3	E		27		F
LEAR		0453	0500	0510	S10	E43	6563	04	3.4	17	SF		3	E		27		F
LEAR		0513	0517	0535	S29	W82	6555	03	24.8	22	SF		3	E		97		F
LEAR		0608	0610	0617	S10	E40	6563	04	3.3	9	SF		3	E		24		F
LEAR		0812	0819	0841	S24	W80	6555	03	25.2	29	2W	M 1.5	1	E		609		E
GOES		1125	1133	1137						12		C 8.7						
GOES		1345	1350	1355						10		C 5.2						
RAMY		1357	1359	1402	S13	E34	6563	04	3.1	5	SF		3	E		14		

From @UCBSP.SSL.BERKELEY.EDU:KHURLEY@JPLGP.SPAN Wed Apr 10 00:11:31 1991
Received: from UCBSP.SSL.BERKELEY.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA17546; Wed, 10 Apr 91 00:11:27 PDT
Message-Id: <9104100711.AA17546@sunspot.ssl.berkeley.edu>
Date: Tue 9 Apr 91 23:09:17-PST
From: \$C <KHURLEY@JPLGP.SPAN>
To: ANDERSON@sunspot.ssl.berkeley.edu
Subject: [Resent-MM Mail] [Resent-MM Mail]
Status: R

Date: Tue 9 Apr 91 23:07:38-PST
From: \$C <KHURLEY@JPLGP.SPAN>
To: MARSHA@UCBSP.SSL.BERKELEY.EDU
Subject: [Resent-MM Mail]

Received: from JPLGP by UCBSP.SSL.BERKELEY.EDU via MAIL-11 with DECnet;
Tue, 9 Apr 91 23:05:44-PST
Date: Tue 9 Apr 91 23:05:43-PST
From: KHURLEY@JPLGP.SPAN
Subject:
To: "UCBSP::KHURLEY"@JPLGP.SPAN

1st Mar. STO RAR seq. 11.

2nd Mar. Monitoring only.

3rd Mar. Monitoring only.
STO RAR seq. 12.
KEP GAS healthcheck.

4th Mar. KEP EPAC IFC.

5th Mar. STO RAR seq. 13.
GLG heater 3 on.

6th Mar. Earth pointing manoeuvre. Nutation damped after about 16
hours.
STO RAR seq. 14.
GLG FSR step reversal level 4.

7th Mar. STO RAR seq. 15.
No real-time commanding.

8th Mar. STO RAR seq. 16.
GLG heater 3 off and experiment reconfiguration.
HUS HV changes.

DSS 12 (Goldstone) ground transmitter tripped off during
playback. Loss of data due to downlink frequency change when
the spacecraft switched from coherent to non-coherent mode.
3 minute real-time & 15 minutes playback data lost.

Router problem caused 13 minute real-time data loss. Data
recovered during playback. Note that when we switch back to
1024 bps during passes (rather than 512 bps) this type of
problem may result in irretrievable data loss.

9th Mar. Monitoring only.

DSS 42 (Canberra) Telemetry Processing Assembly problem caused
21 minute real-time data loss. Data recovered during
playback. Note that when we switch back to 1024 bps during
passes (rather than 512 bps), this type of problem will result
in irretrievable data loss.

10th Mar. Monitoring only.
STO RAR seq. 17.

***** Starting to replace 512 bps during passes with 1024 bps. *****

11th Mar. DACS 1 failure. DACS 2 hot back-up. No data loss.
KEP EPAC IFC.

12th Mar. STO RAR seq. 18.

13th Mar. Earth pointing manoeuvre. Small amount of nutation after
manoeuvre which damped out after 24 hours.

14th Mar. Routine operations.

15th Mar. Routine operations.

16th Mar. Monitoring only.
No space in time-tag buffer for STO FES & PFR Commands.

17th Mar. Monitoring only.

18th Mar. DSS 61 unable to track because of power supply failure.
DSS 65 used for downlink (no uplink capability).
Power supply borrowed from DSS 63. Commanding commenced 2
hours before end of pass. All planned commanding completed
but switch to coherent downlink during playback caused some
data loss.

KEP EPAC IFC performed at end of pass - bit rate change from
1024 bps to 512 bps in middle.

19th Mar. Earth pointing manoeuvre.

DSS 42 Telemetry Processing Assembly problem at beginning of
pass. No data loss. Some bad data at 1024 bps.

20th Mar. Routine operations.
Sun sensor set to high gain.

DSS 12 bad tracking prediction download. 11 minutes of
data lost during playback due to antenna offpointing.
11 minutes real-time and 66 minutes of playback data lost.
Data not recoverable.

21st Mar. Routine operations.

22nd Mar. Earth pointing manoeuvre.
SIM KET IFTG on/off.

23rd Mar. Monitoring only.

DSS 12 decoder failure. 12 minutes real-time and 72 minutes
of playback data lost. Data not recoverable.

24th Mar. Monitoring only.

25th Mar. KEP EPAC IFC.
SIM KET A1 threshold check.

Router failure. 5 minutes real-time data lost. Data
recoverable.
DSS 42 : did not change subcarrier frequency at bit rate

change 1024 to 4096 bps. Station acquired 8 minutes late but MCCC did not lock up until 11 minutes later. All data recoverable.

26th Mar.

Routine operations

27th Mar.

Subcarrier frequency test.
SIM HET calibration.

28th Mar.

Earth pointing manoeuvre.
Subcarrier frequency test.
GLG deflection voltage mode change.

29th Mar.

Routine operations.

30th Mar.

Routine operations.
Start of weekend commanding.

31st Mar.

Routine operations.
DSS 61 late acquisition because wrong data used in auto-acquisition sequence. All data recoverable because it was recorded onboard spacecraft.

From @UCBSP.SSL.BERKELEY.EDU:KHURLEY@JPLGP.SPAN Fri Apr 12 12:58:08 1991
Received: from UCBSP.SSL.BERKELEY.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA25564; Fri, 12 Apr 91 12:58:03 PDT
Message-Id: <9104121958.AA25564@sunspot.ssl.berkeley.edu>
Date: Fri 12 Apr 91 11:55:54-PST
From: \$C <KHURLEY@JPLGP.SPAN>
To: ANDERSON@sunspot.ssl.berkeley.edu
Subject: [Resent-MM Mail] [Resent-MM Mail]
Status: RO

Date: Fri 12 Apr 91 11:44:27-PST
From: \$C <KHURLEY@JPLGP.SPAN>
To: MARSHA@UCBSP.SSL.BERKELEY.EDU
Subject: [Resent-MM Mail]

Received: from JPLGP by UCBSP.SSL.BERKELEY.EDU via MAIL-11 with DECnet;
Thu, 11 Apr 91 23:07:17-PST
Date: Thu 11 Apr 91 23:07:16-PST
From: KHURLEY@JPLGP.SPAN
Subject:
To: "UCBSP::KHURLEY"@JPLGP.SPAN

18th Mar. DSS 61 unable to track because of power supply failure.
DSS 65 used for downlink (no uplink capability).
Power supply borrowed from DSS 63. Commanding commenced 2
hours before end of pass. All planned commanding completed
but switch to coherent downlink during playback caused some
data loss.

KEP EPAC IFC performed at end of pass - bit rate change from
1024 bps to 512 bps in middle.

19th Mar. Earth pointing manoeuvre.

DSS 42 Telemetry Processing Assembly problem at beginning of
pass. No data loss. Some bad data at 1024 bps.

20th Mar. Routine operations.
Sun sensor set to high gain.

DSS 12 bad tracking prediction download. 11 minutes of
data lost during playback due to antenna offpointing.
11 minutes real-time and 66 minutes of playback data lost.
Data not recoverable.

21st Mar. Routine operations.

22nd Mar. Earth pointing manoeuvre.
SIM KET IFTG on/off.

23rd Mar. Monitoring only.

DSS 12 decoder failure. 12 minutes real-time and 72 minutes
of playback data lost. Data not recoverable.

24th Mar. Monitoring only.

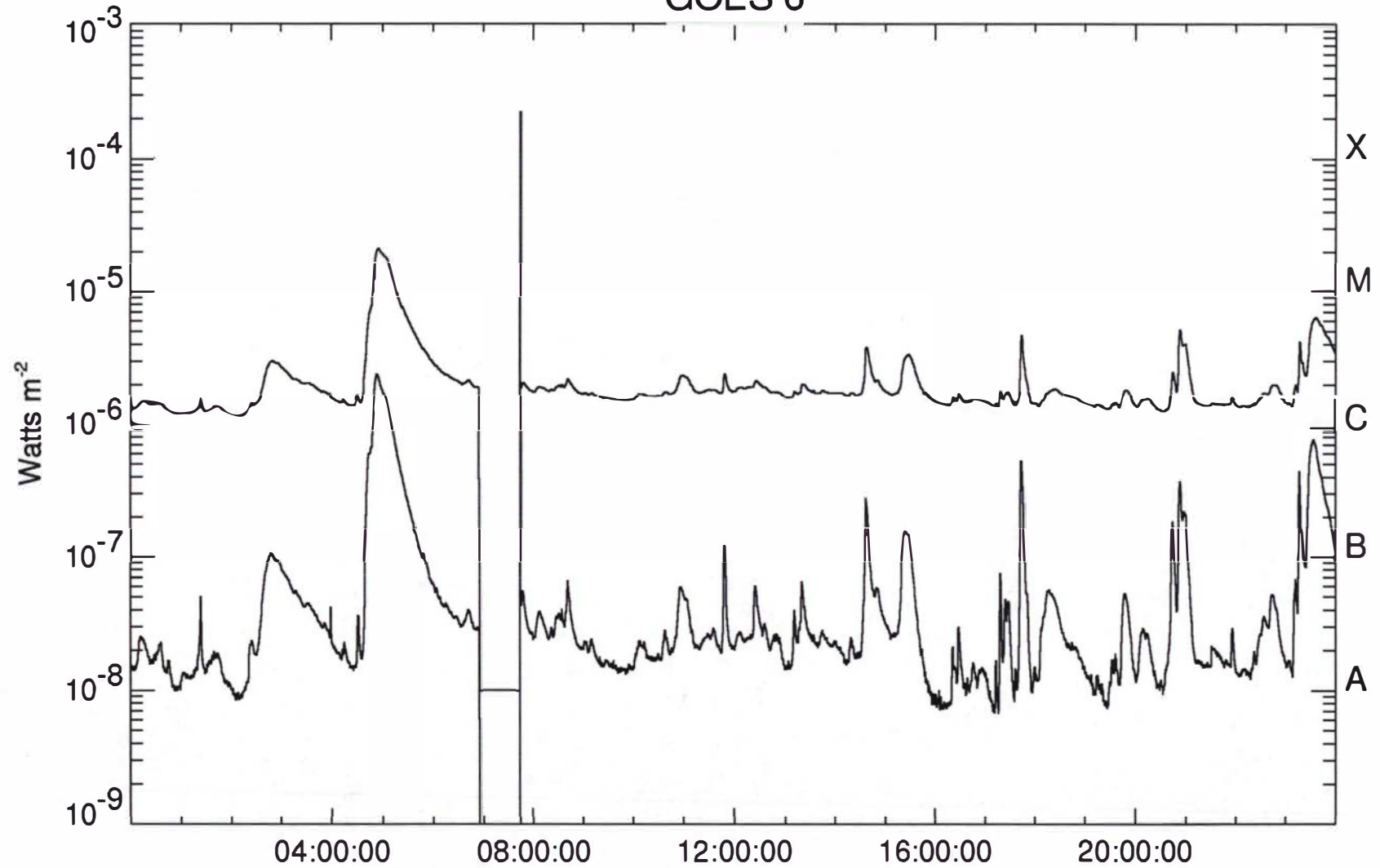
25th Mar. KEP EPAC IFC.
SIM KET A1 threshold check.

Router failure. 5 minutes real-time data lost. Data
recoverable.
DSS 42 : did not change subcarrier frequency at bit rate
change 1024 to 4096 bps. Station acquired 8 minutes late but

MCCC did not lock up until 11 minutes later. All data recoverable.

26th Mar.	Routine operations	
27th Mar.	Subcarrier frequency test. SIM HET calibration.	
28th Mar.	Earth pointing manoeuvre. Subcarrier frequency test. GLG deflection voltage mode change.	
29th Mar.	Routine operations.	
30th Mar.	Routine operations. Start of weekend commanding.	
31st Mar.	Routine operations. DSS 61 late acquisition because wrong data used in auto-acquisition sequence. All data recoverable because it was recorded onboard spacecraft.	
1st Apr.	KEP EPAC IFC.	
2nd Apr.	Earth pointing manoeuvre. KEP GAS health check.	
3rd Apr.	BAM-I matrix 3.	
4th Apr.	SIM KET A1 off.	
5th Apr.	Earth pointing manoeuvre.	
6th Apr.	STO DPU reset.	
7th Apr.	Clock change : PST -> PDT. HUS off/on.	
8th Apr.	KEP EPAC IFC.	
9th Apr.	Routine operations.	
10th Apr.	Earth pointing manoeuvre. HUS lower threshold reset.	
11th Apr.	Routine operations.	
12th Apr.	Routine operations.	
13th Apr.	Routine operations.	
14th Apr.	Routine operations.	
*****	Start of 2048 bps (1:3) playback. Only 2 hours of 1024 bps	*****
*****	real-time data per day.	*****
*****	Note that there will be times in the mission when only	*****
*****	1024 bps can be supported with 34 m antennae. During this	*****
*****	time, data will be recorded at 256 bps and played back at	*****
*****	1024 bps (1:1) ie. 512 bps realtime, 512 bps playback.	*****
15th Apr.	KEP EPAC IFC. Earth pointing manoeuvre.	
16th Apr.	Routine operations.	

GOES 6



Data Start: 91/03/01, 0000:02

Channel

1 (1.0 - 8.0 Angstroms)

2 (0.5 - 4.0 Angstroms)

Plot created: 96/11/26, 1800

Background not subtracted

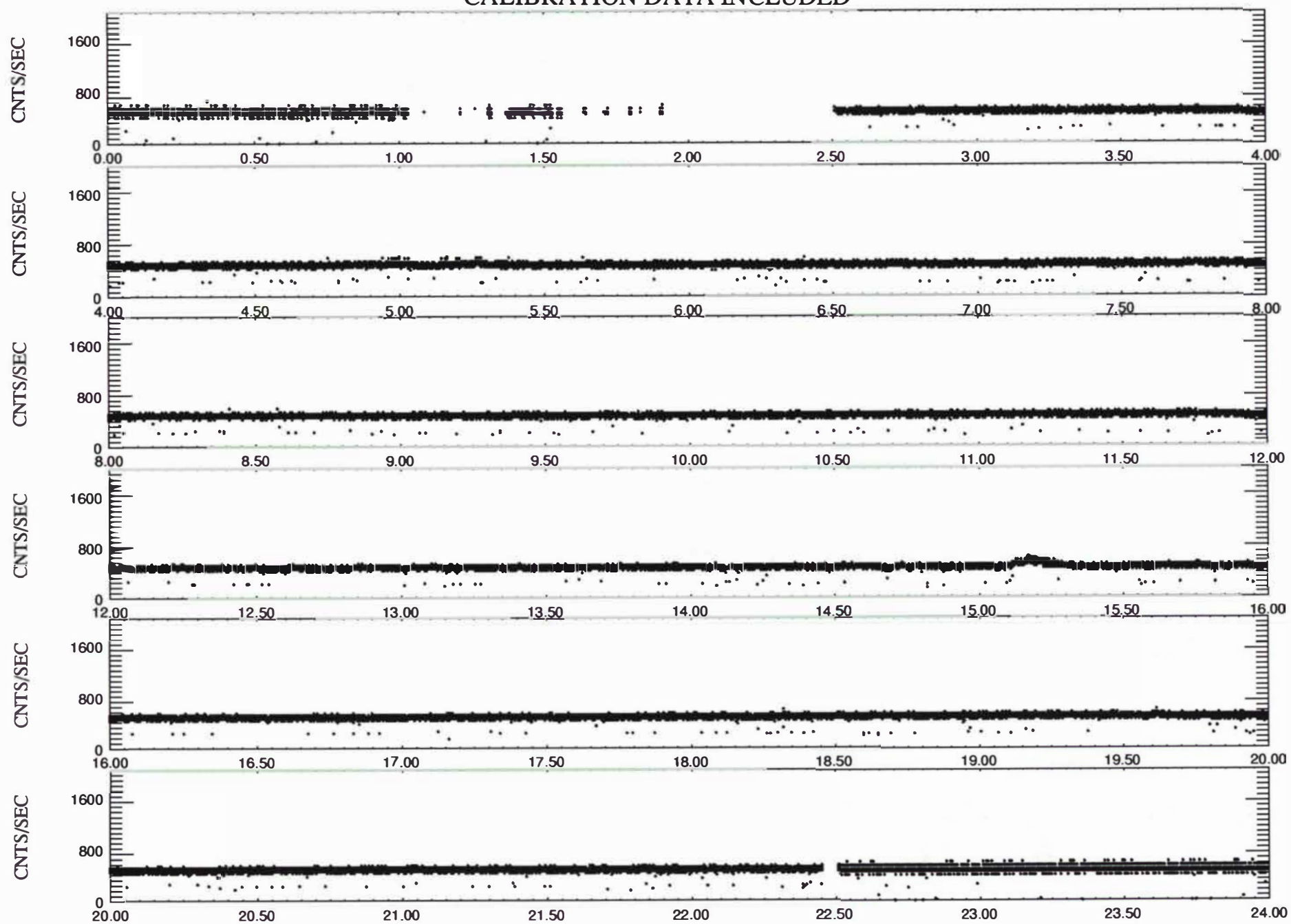
Background not subtracted

Sample average = 10

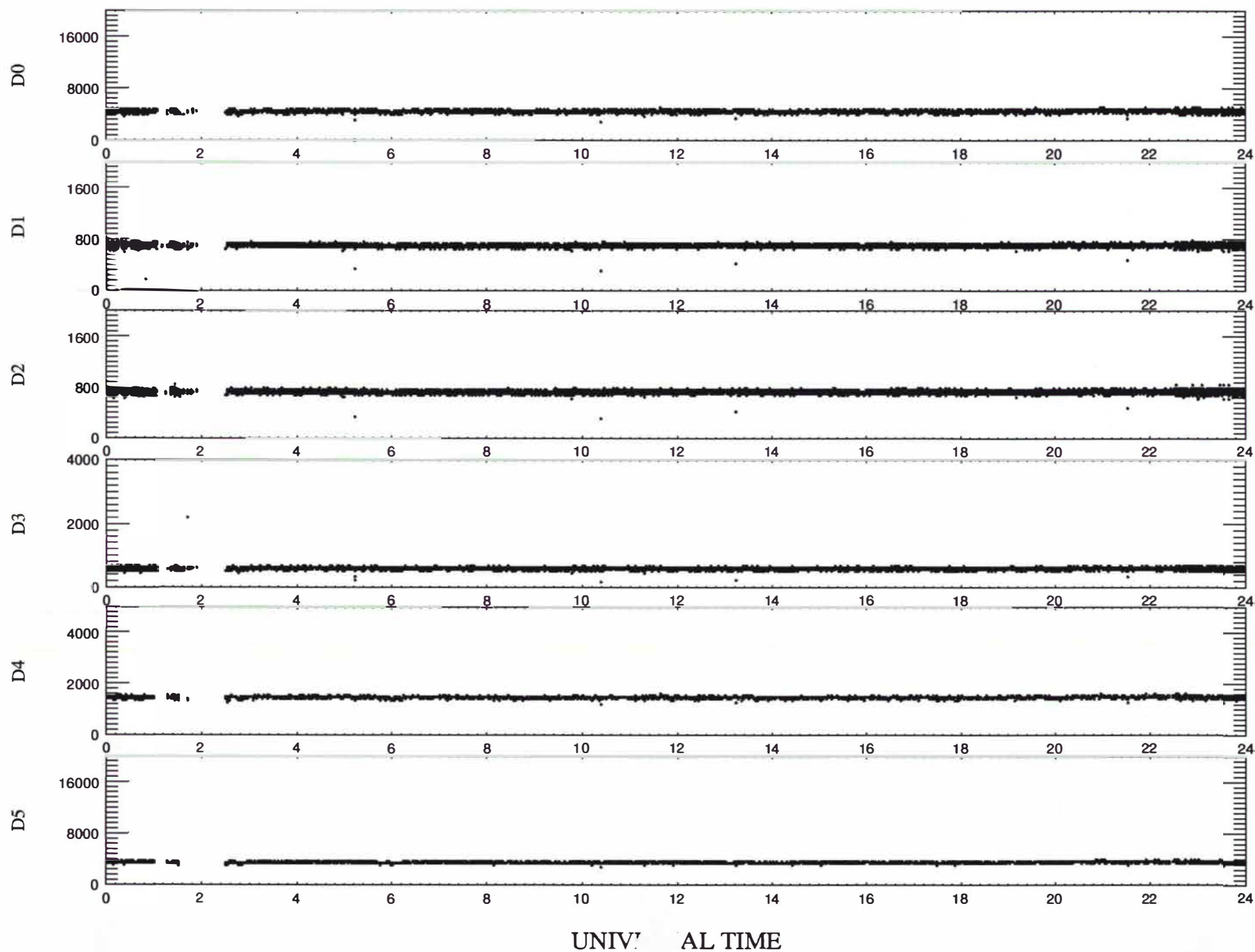
CBU	CCL	DMP	ROM	DMA	OSC	MP.	ICR	SPE	OPM	RSC	CAL	WCH	MEM	BRS	HUS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



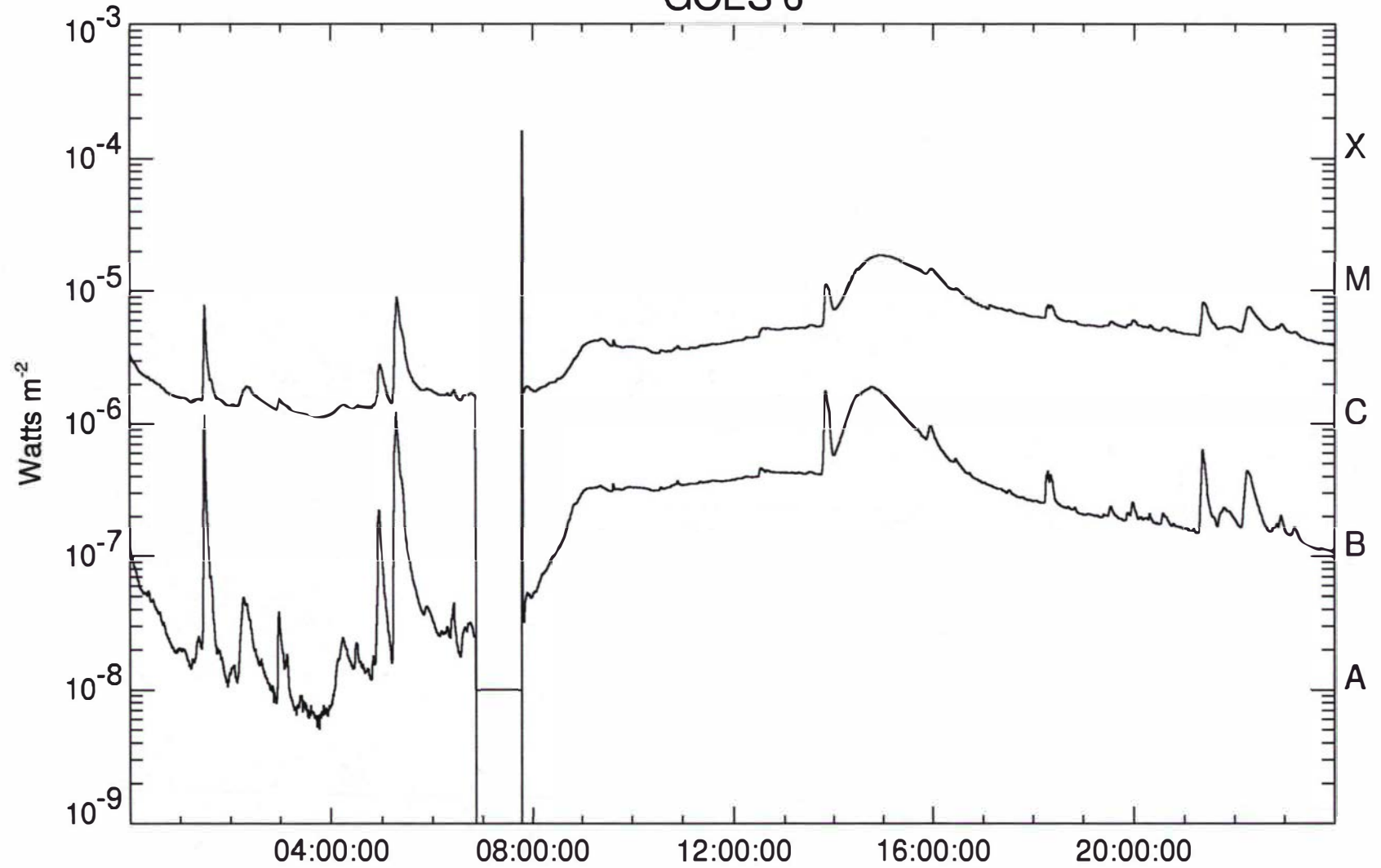
CALIBRATION DATA INCLUDED



UNIV! AL TIME



GOES 6



Data Start: 91/03/02, 0000:00

Channel

1 (1.0 - 8.0 Angstroms)

2 (0.5 - 4.0 Angstroms)

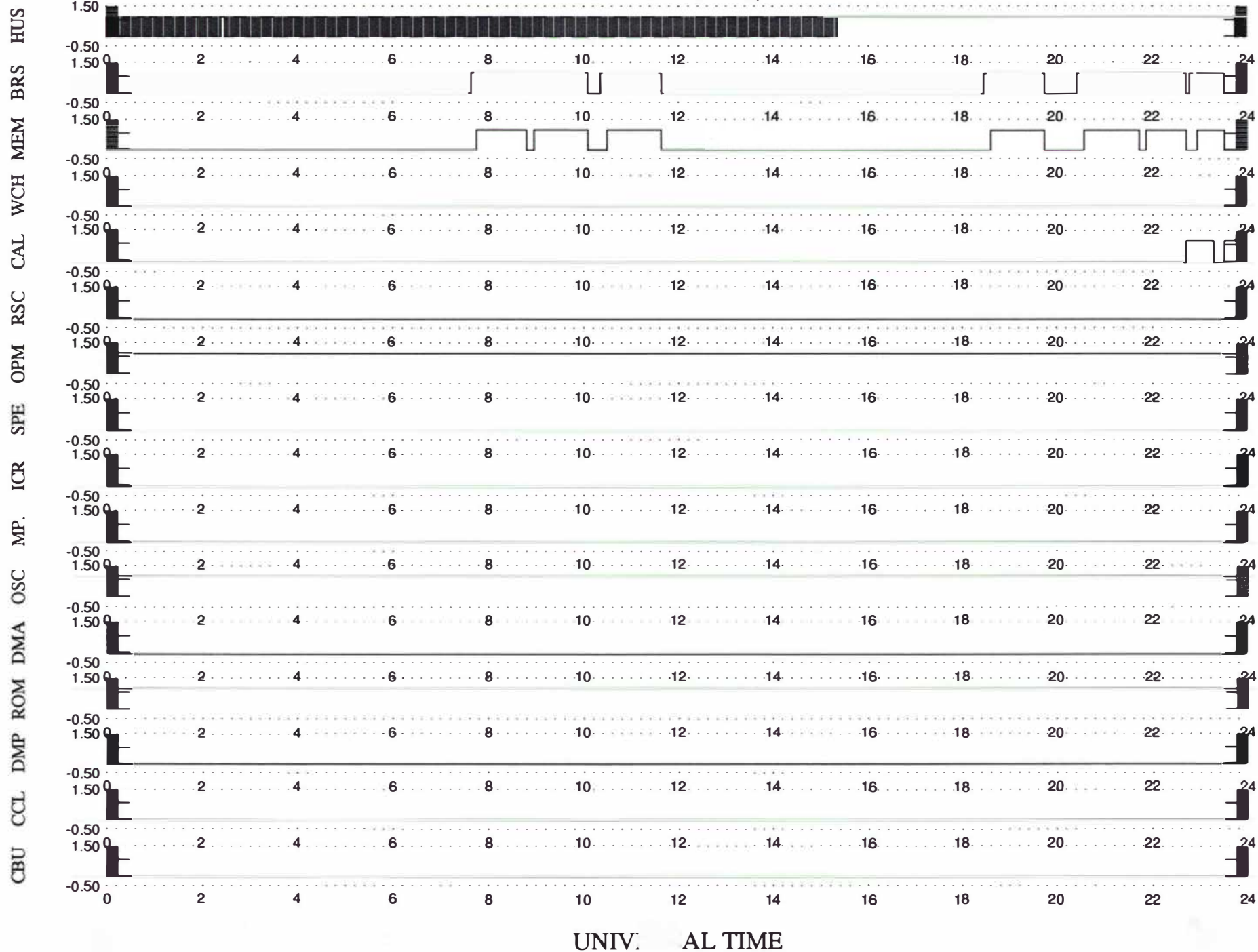
Plot created: 96/11/26, 1803

Background not subtracted

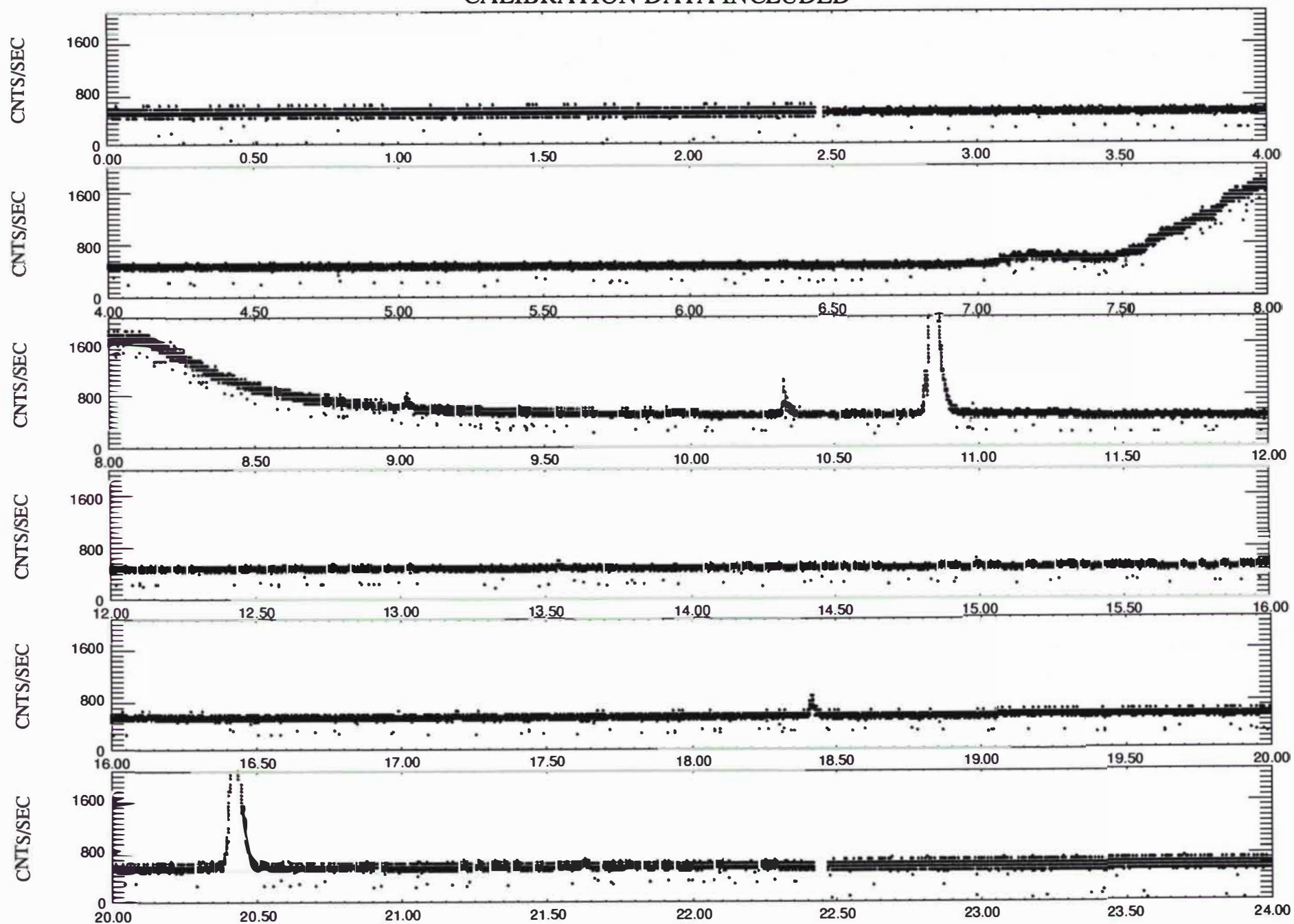
Background not subtracted

Sample average = 10

BURST NUMBER 13 - 15, 0 - 3

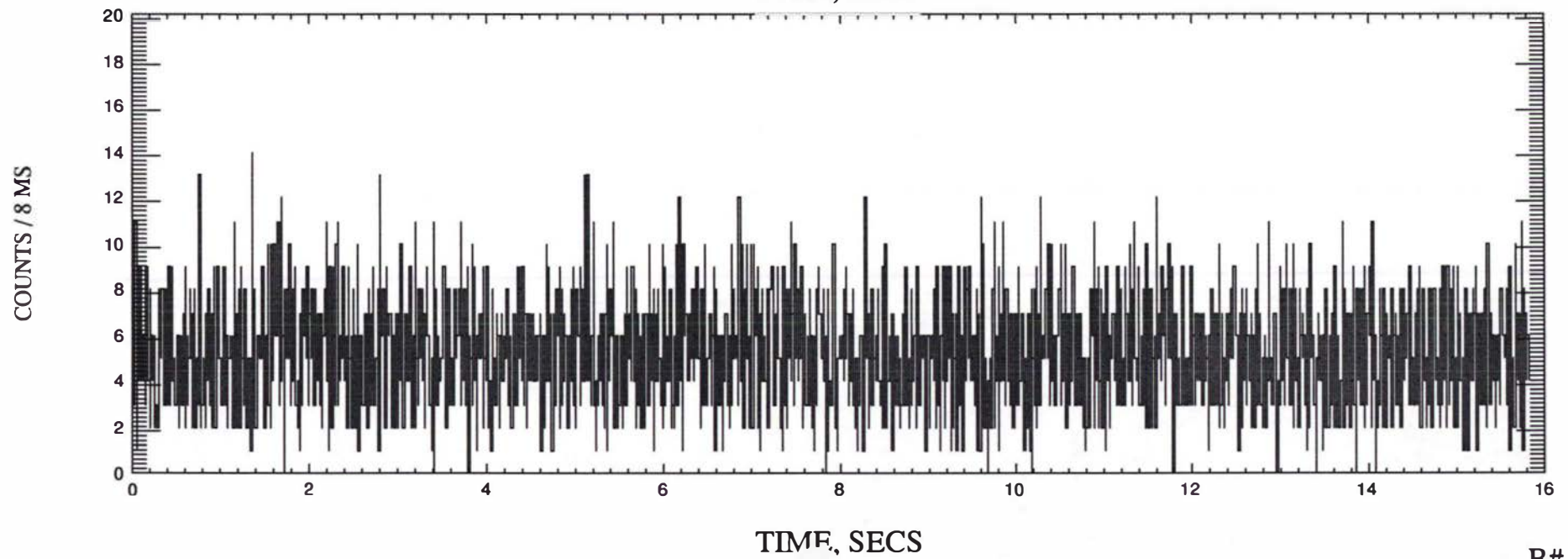
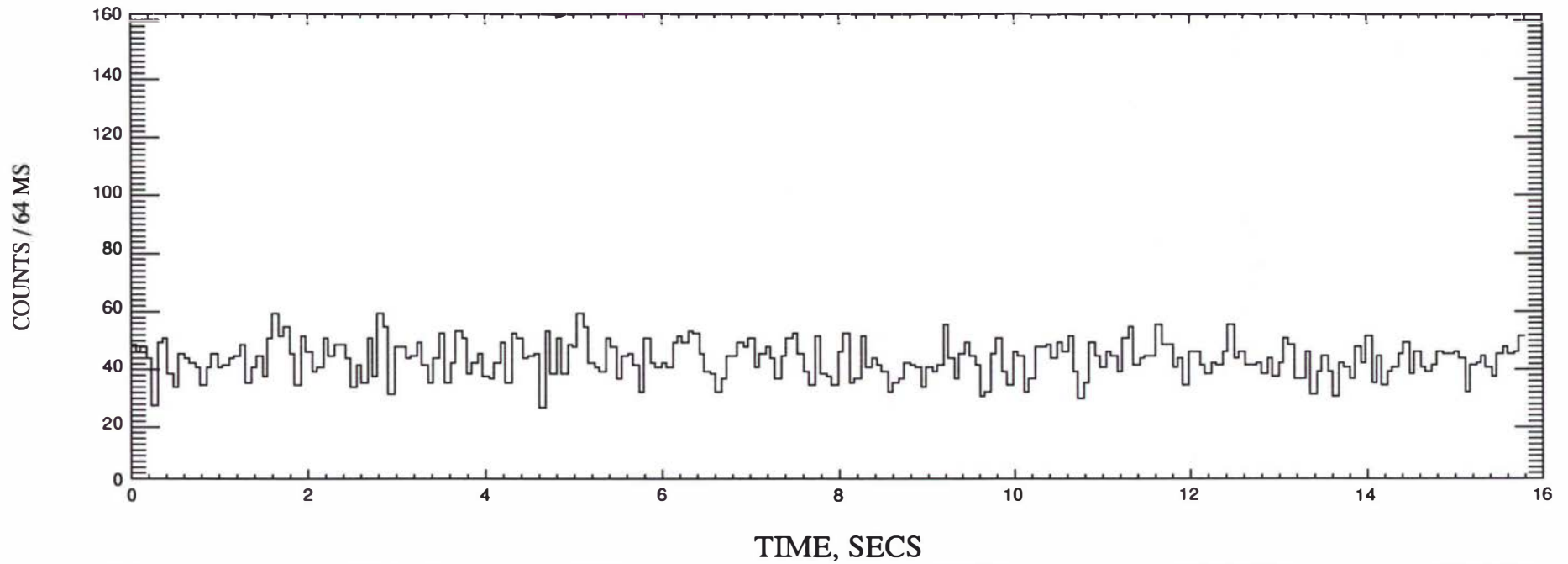


CALIBRATION DATA INCLUDED

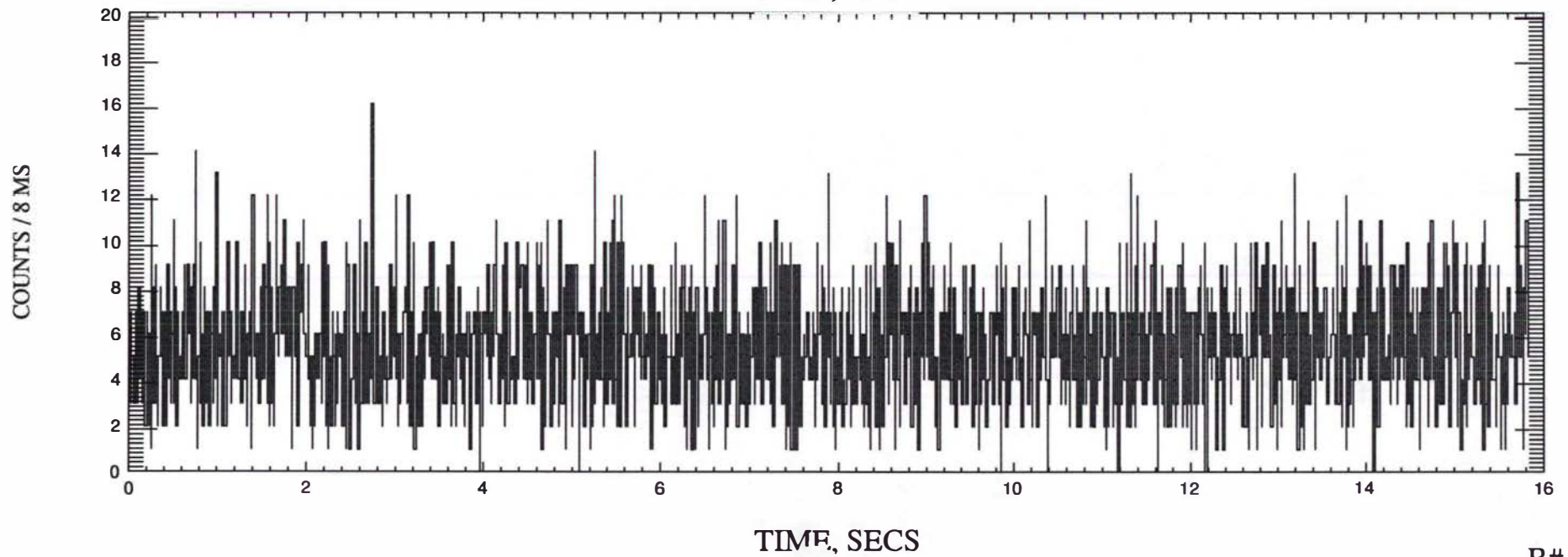
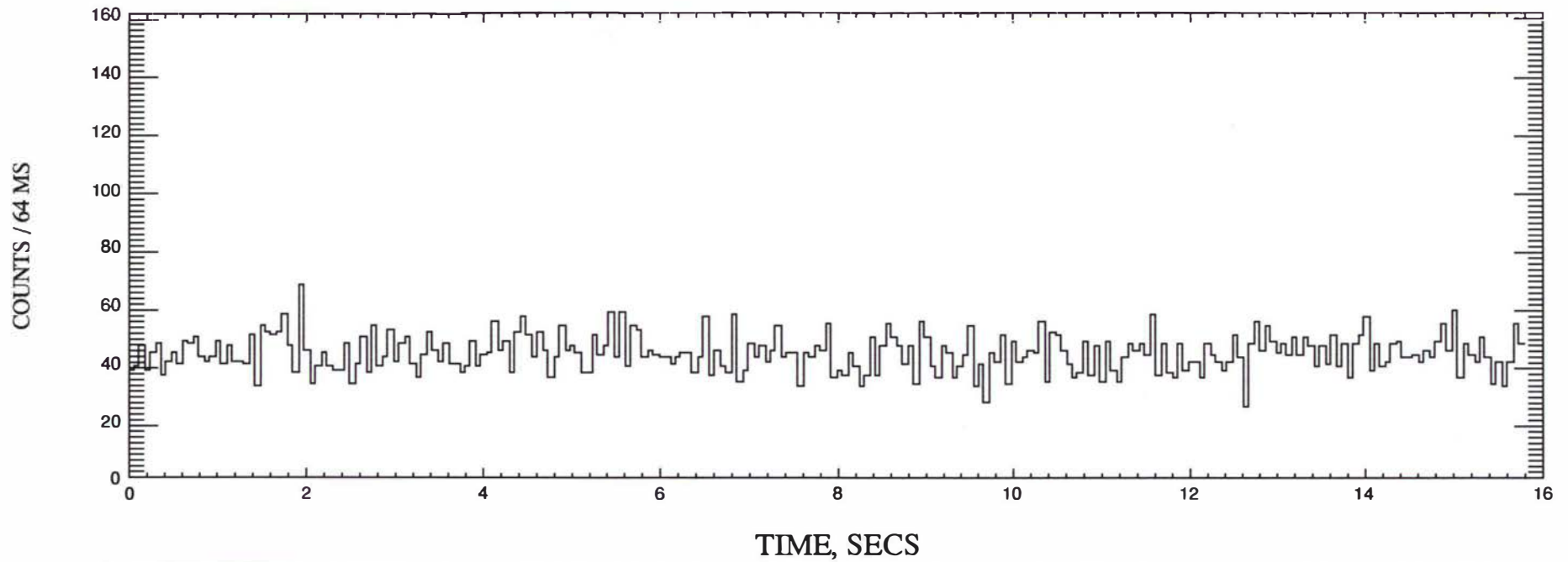


UNIV. TIME

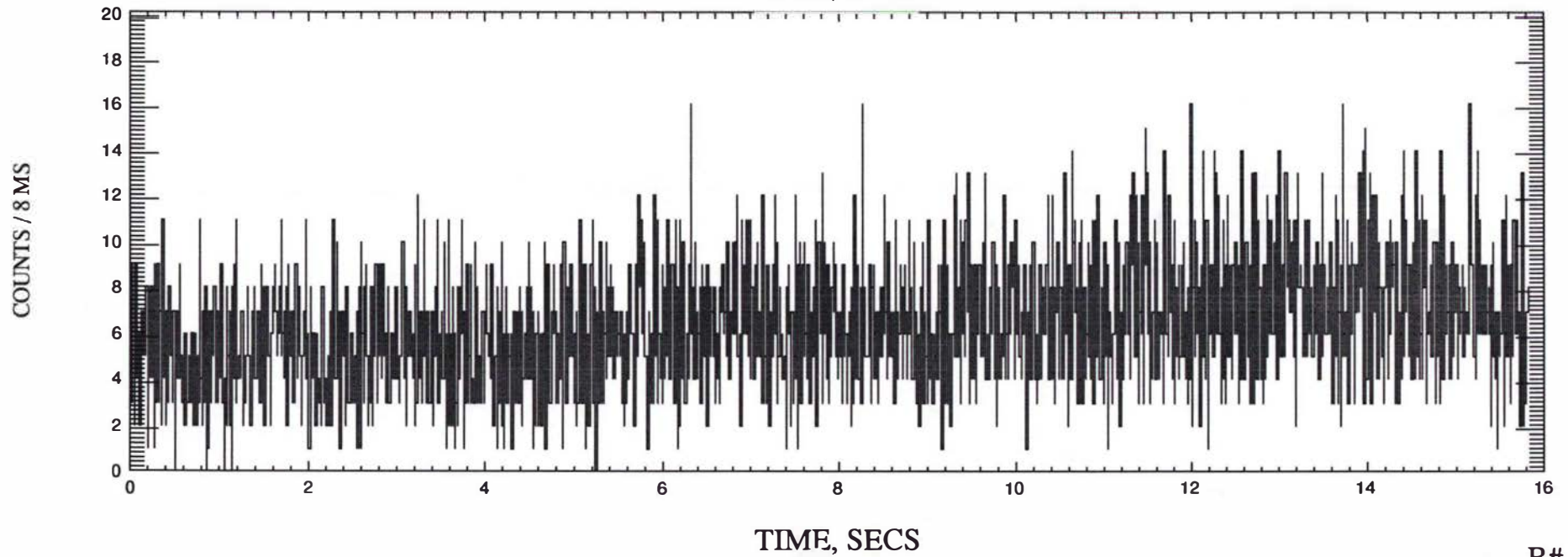
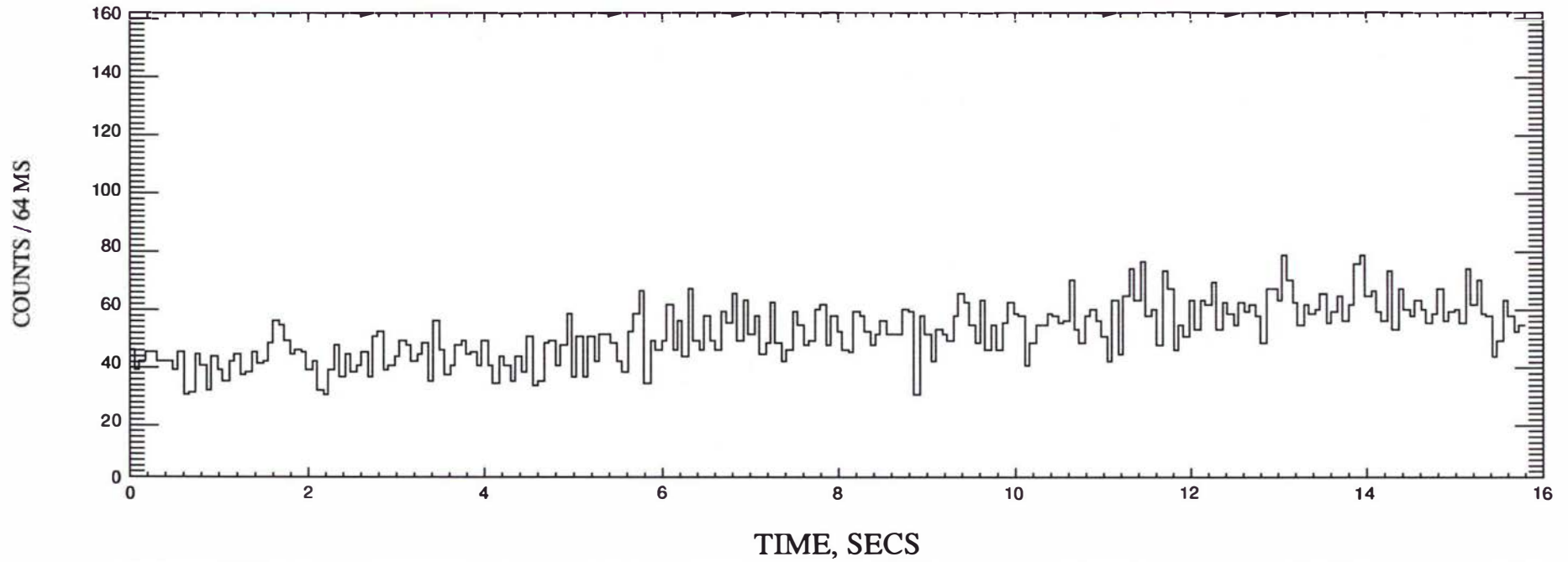
Burst Counter 13 at UT= 7.537517484029 h=27135.063 s 07:32:15.063



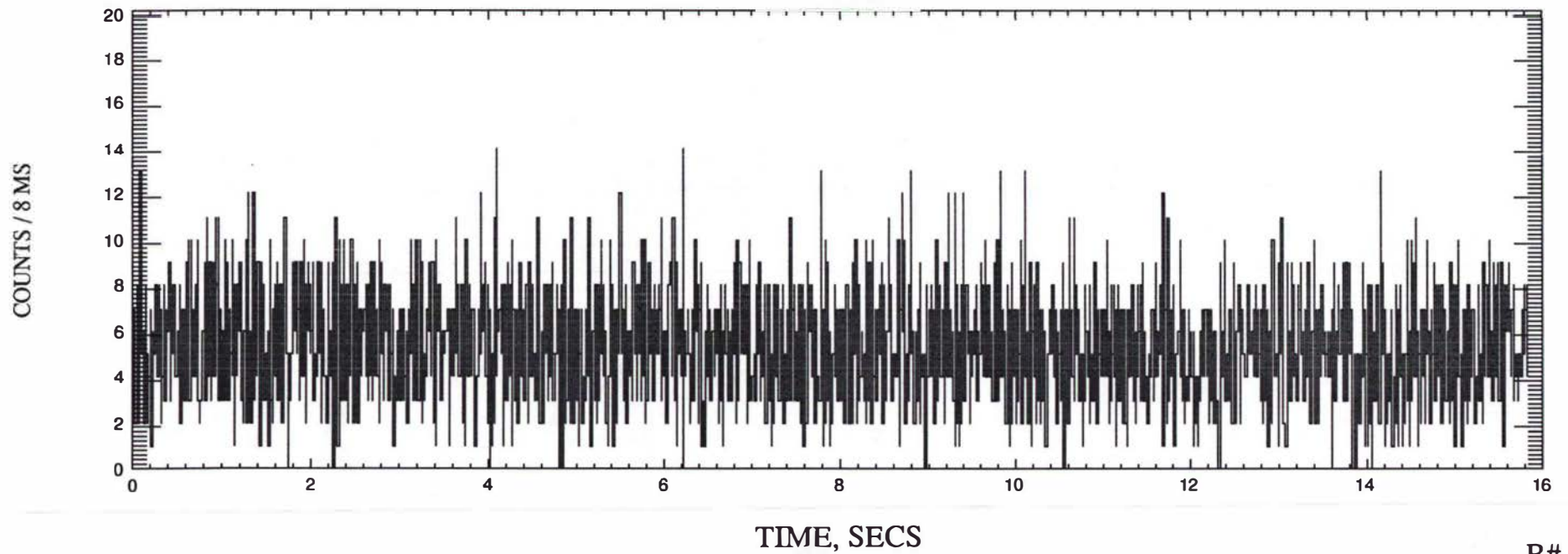
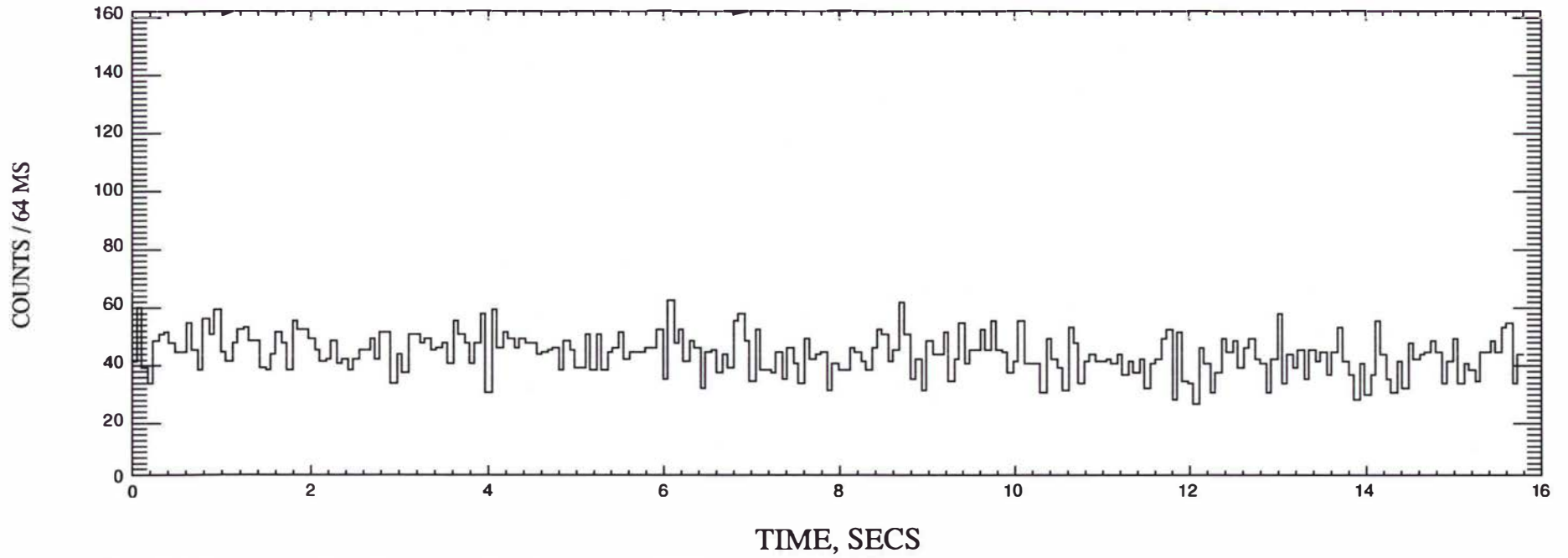
Burst Counter 14 at UT= 8.792676586575 h=31653.636 s 08:47:33.636



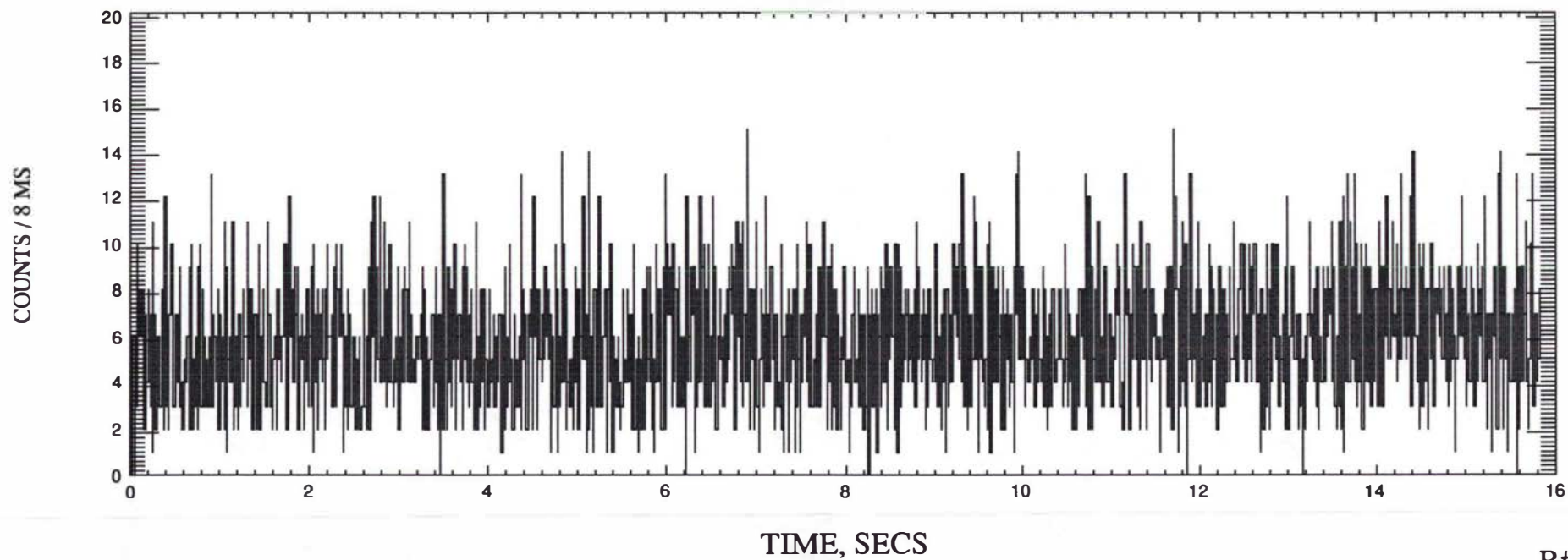
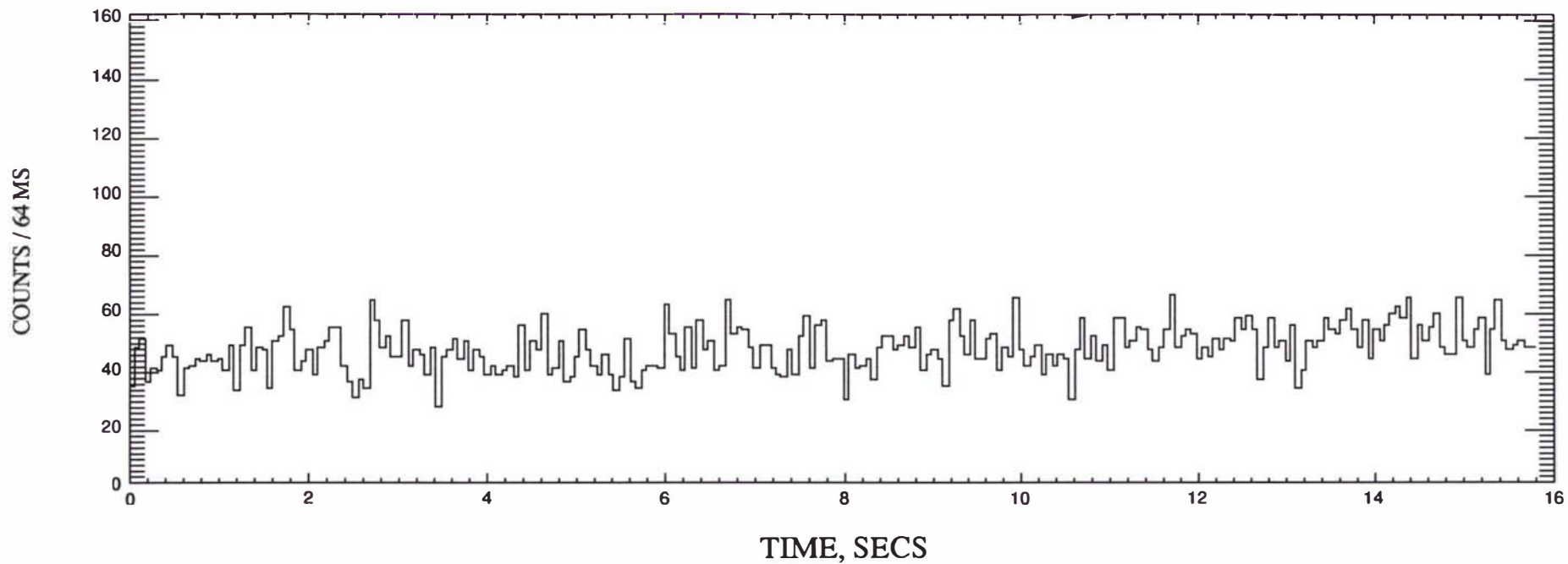
Burst Counter 15 at UT=10.315343267653 h=37135.236 s 10:18:55.236



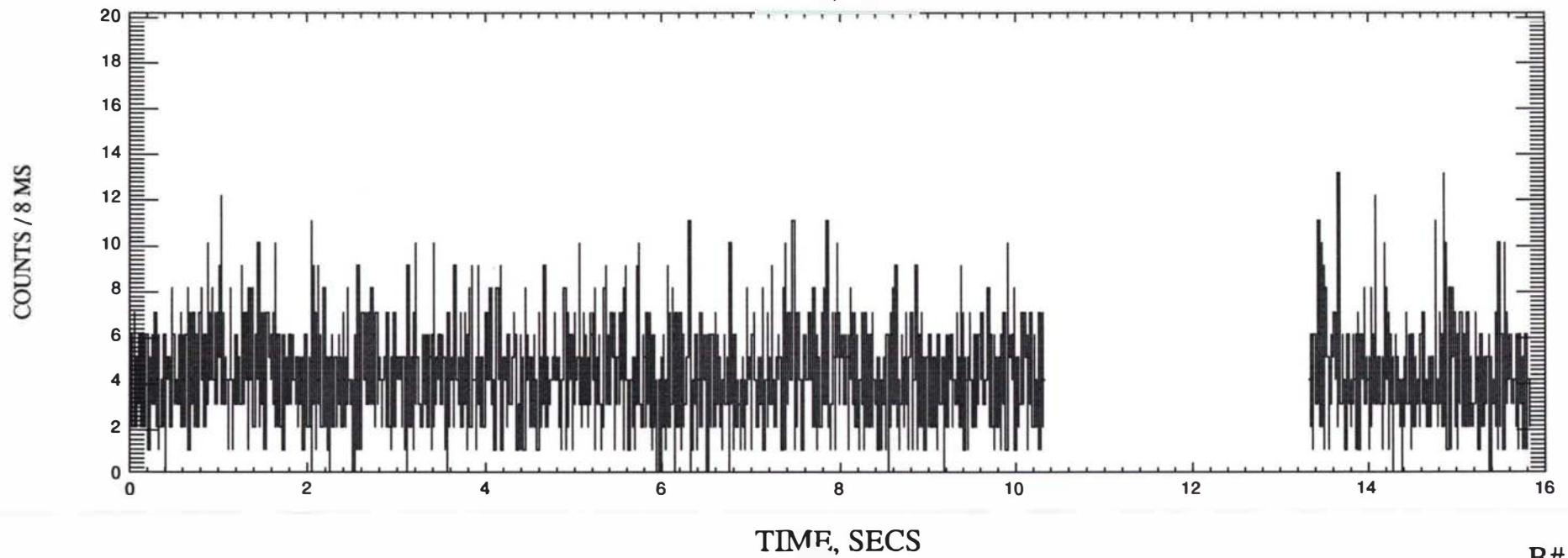
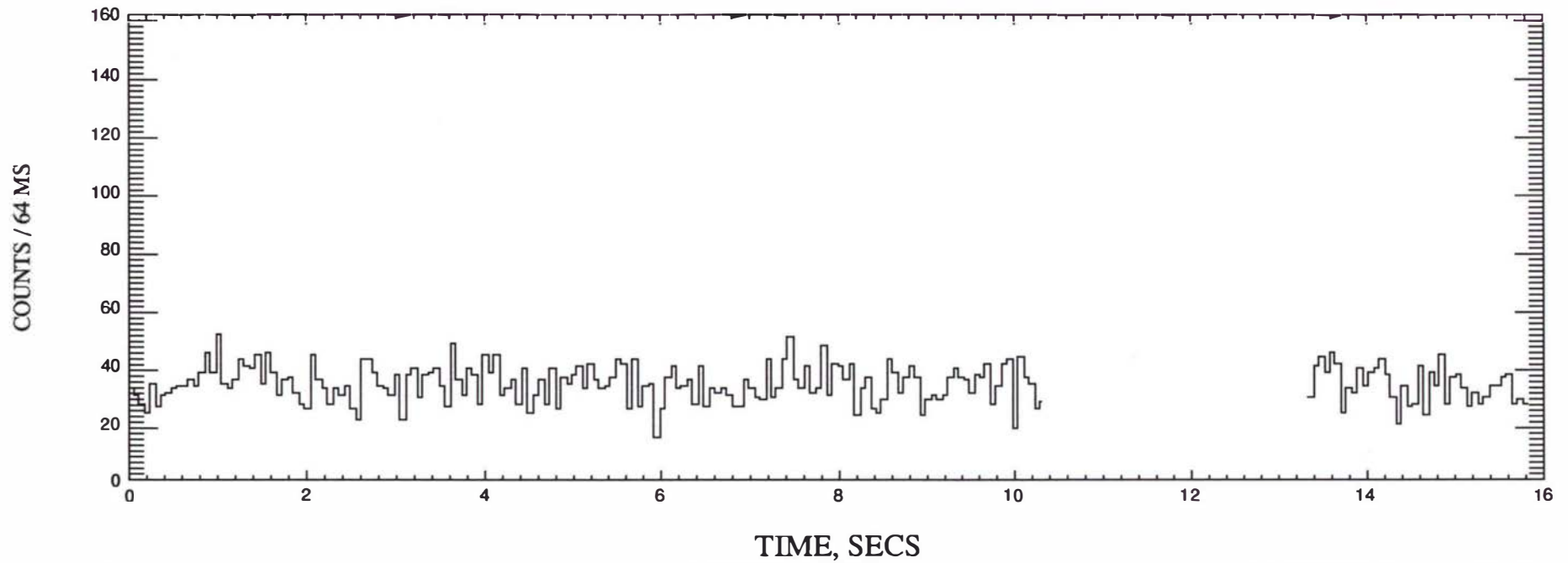
Burst Counter 0 at UT=18.407848400540 h=66268.254 s 18:24:28.254



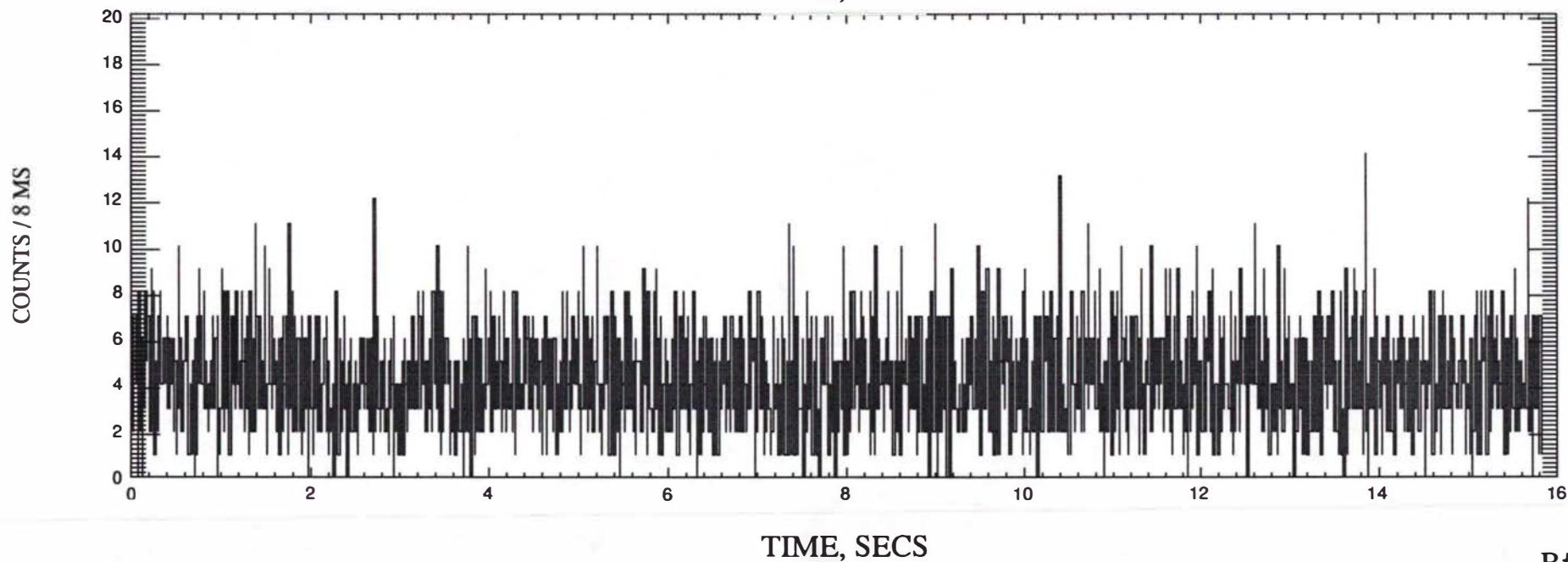
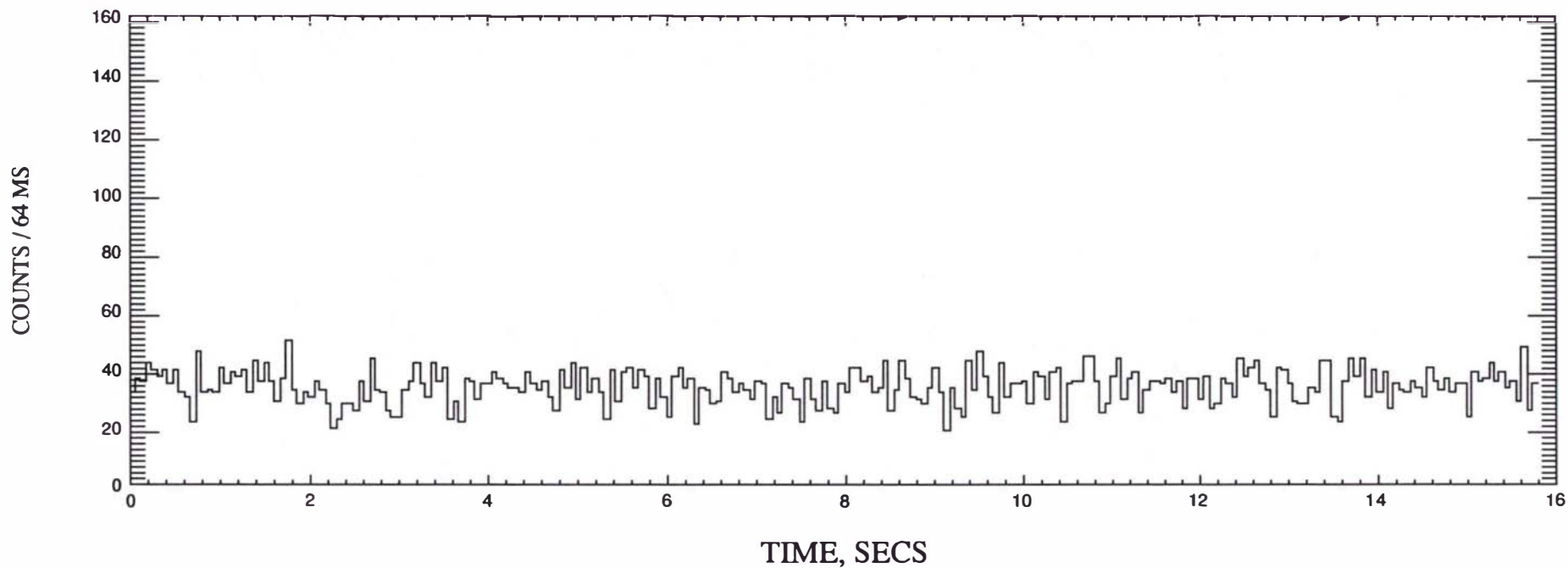
Burst Counter 1 at UT=20.384342104594 h=73383.632 s 20:23:03.632

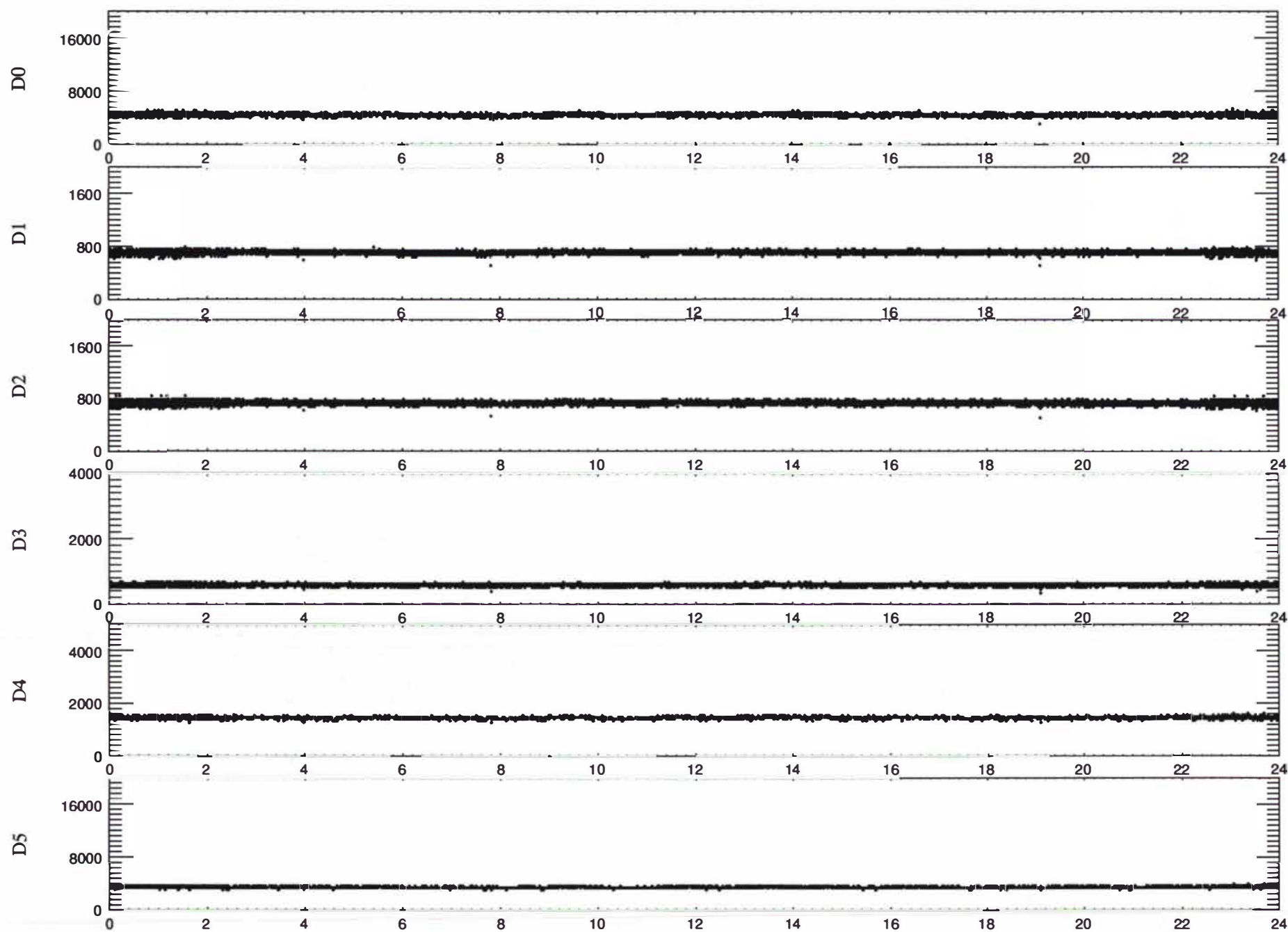


Burst Counter 2 at UT=21.715124393039 h=78174.448 s 21:42:54.448

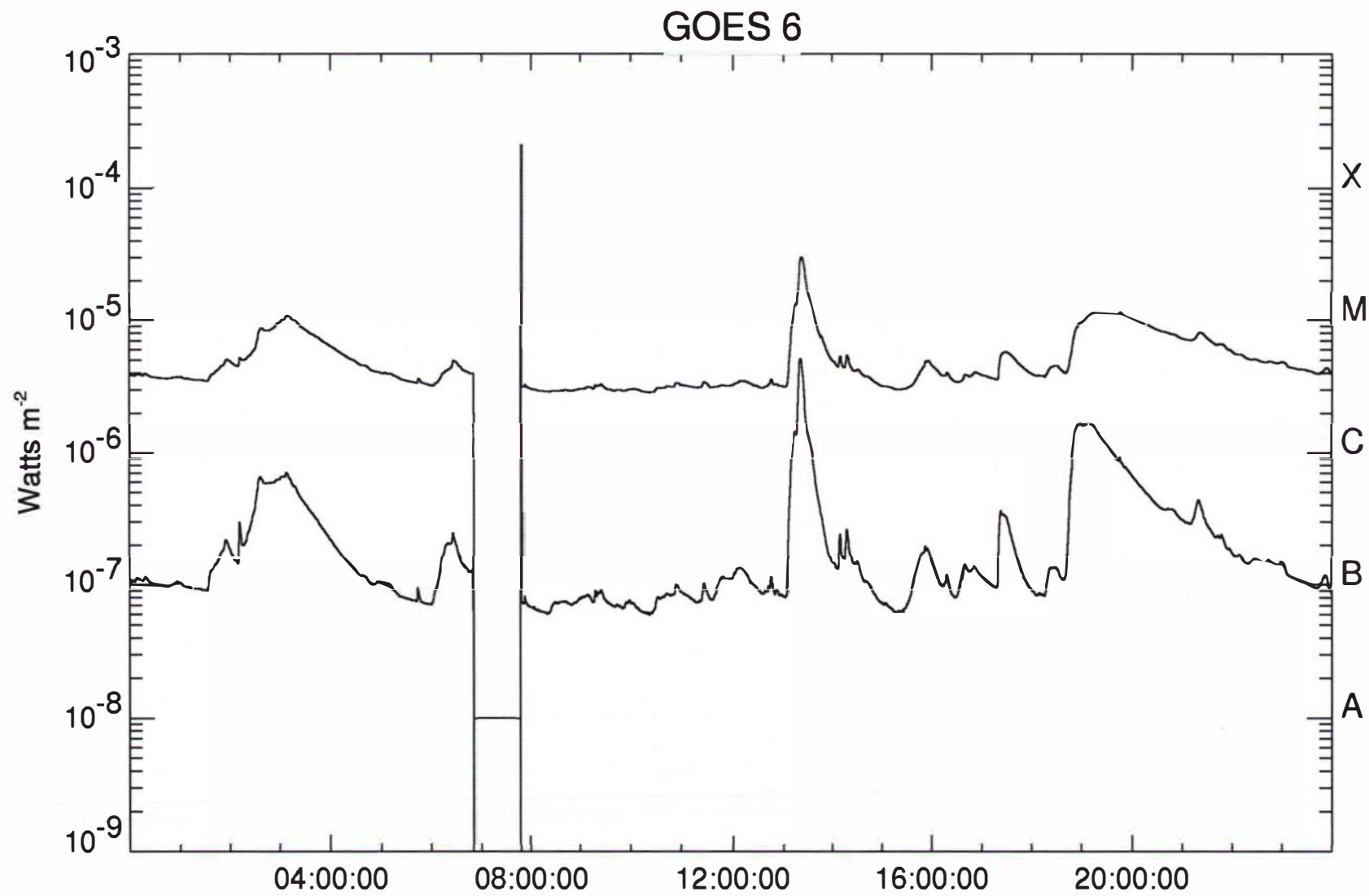


Burst Counter 3 at UT=22.790978571574 h=82047.523 s 22:47:27.523





UNIV AL TIME



Data Start: 91/03/03, 0000:01

Channel 1 (1.0 - 8.0 Angstroms)

2 (0.5 - 4.0 Angstroms)

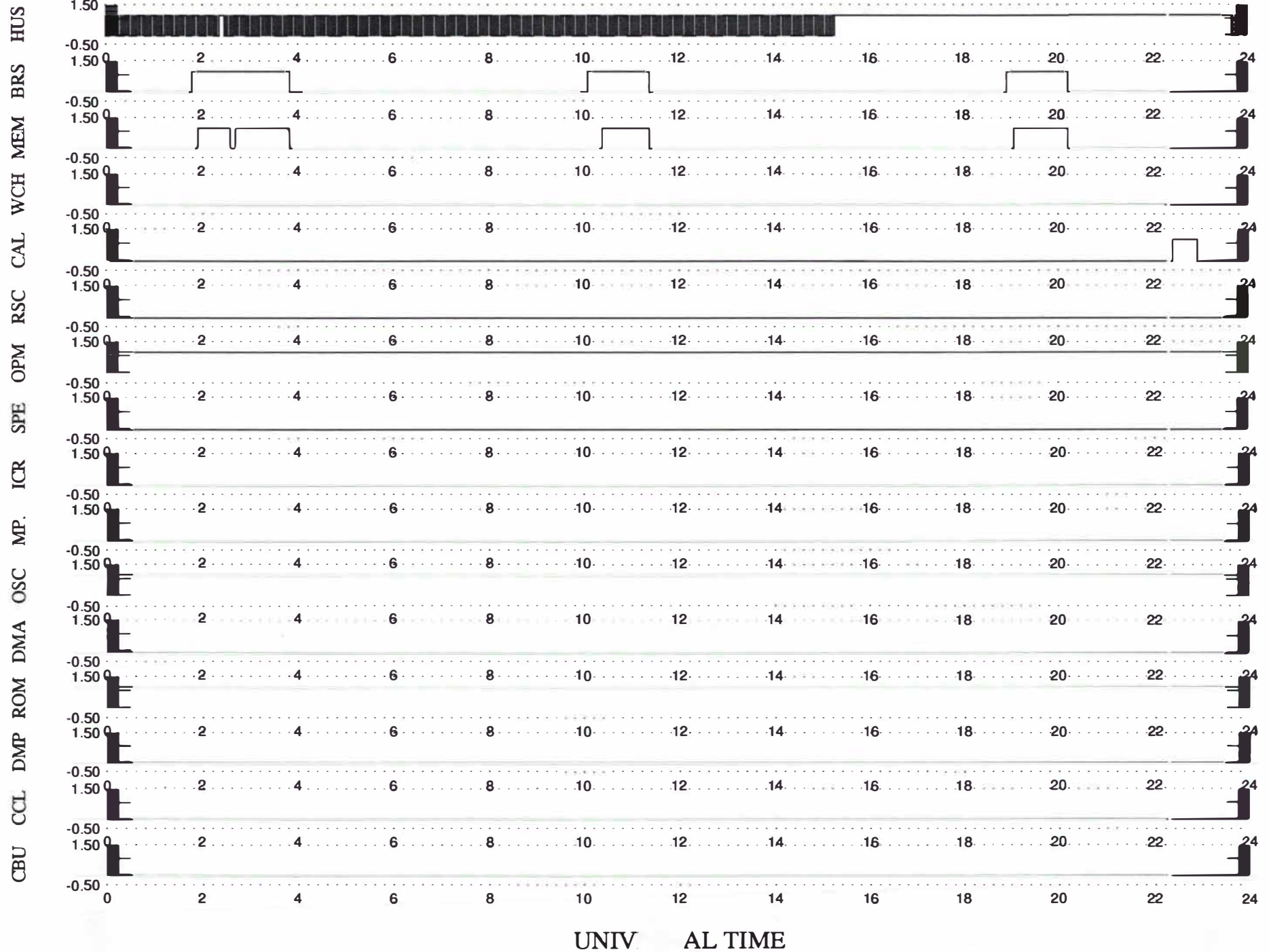
Plot created: 96/11/26, 1806

Background not subtracted

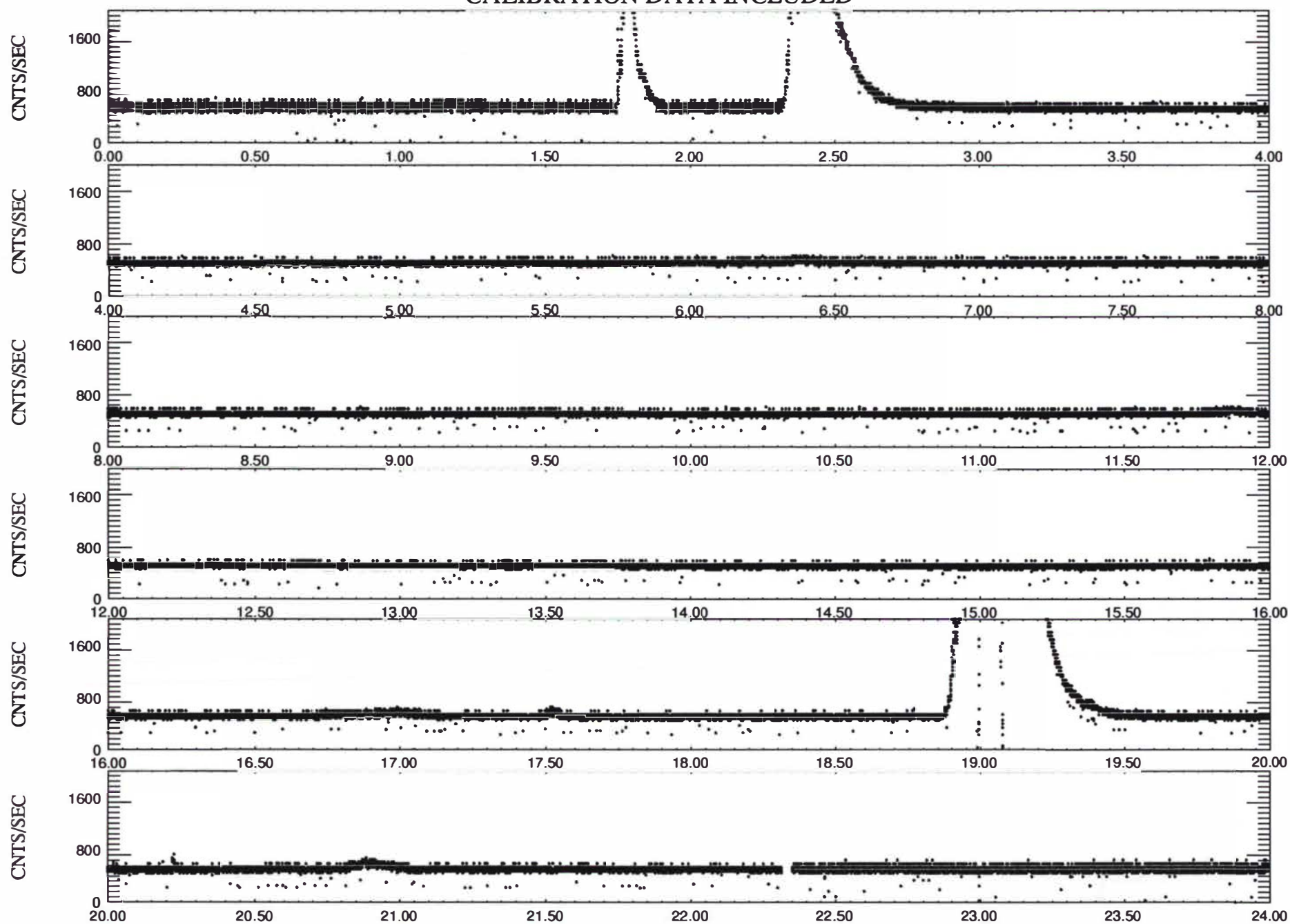
Background not subtracted

Sample average = 10

BURST NUMBER 4 - 7

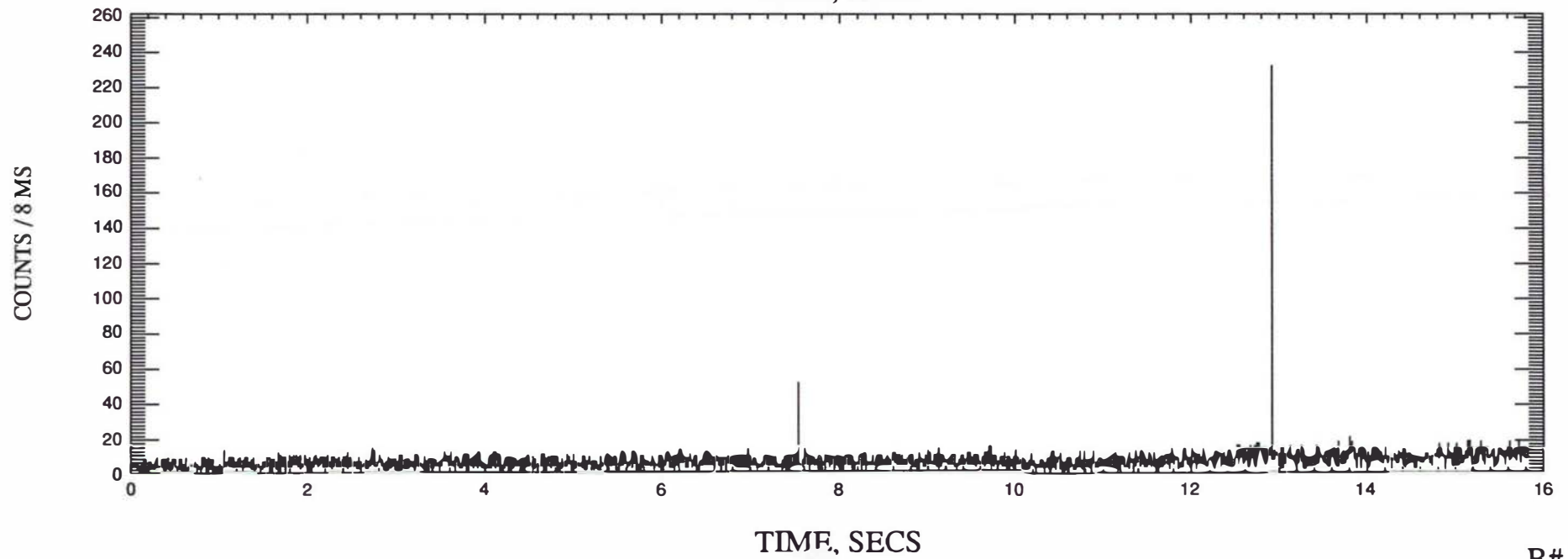
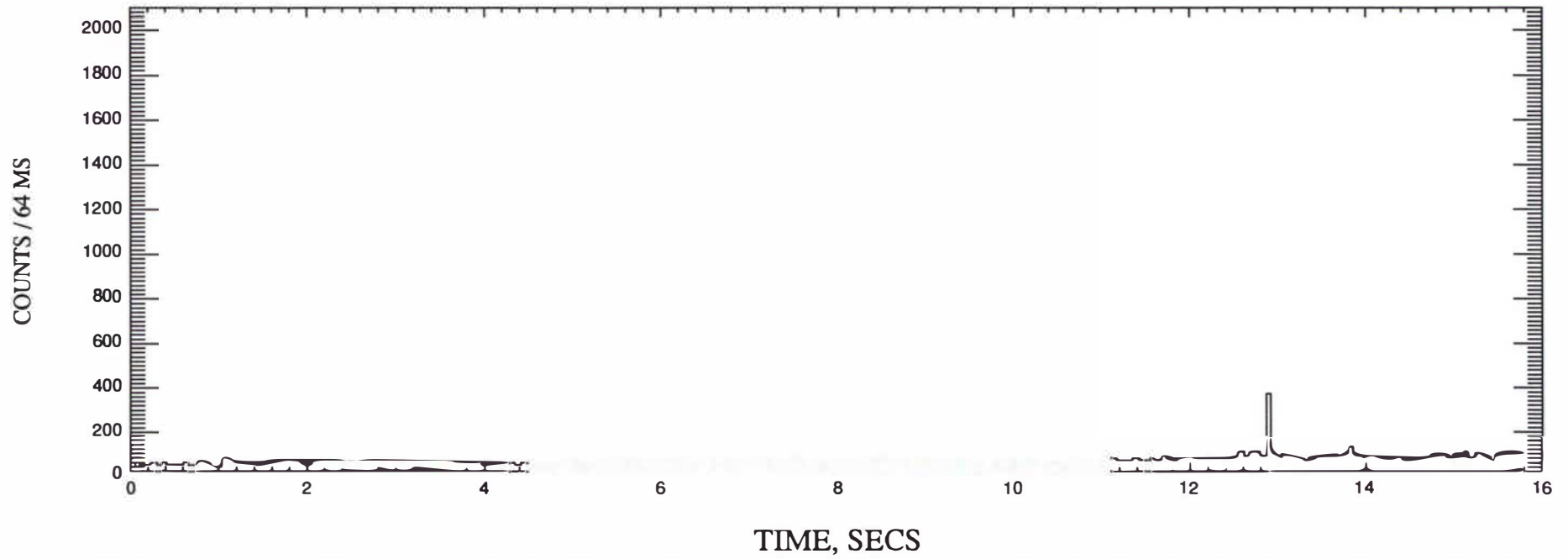


CALIBRATION DATA INCLUDED

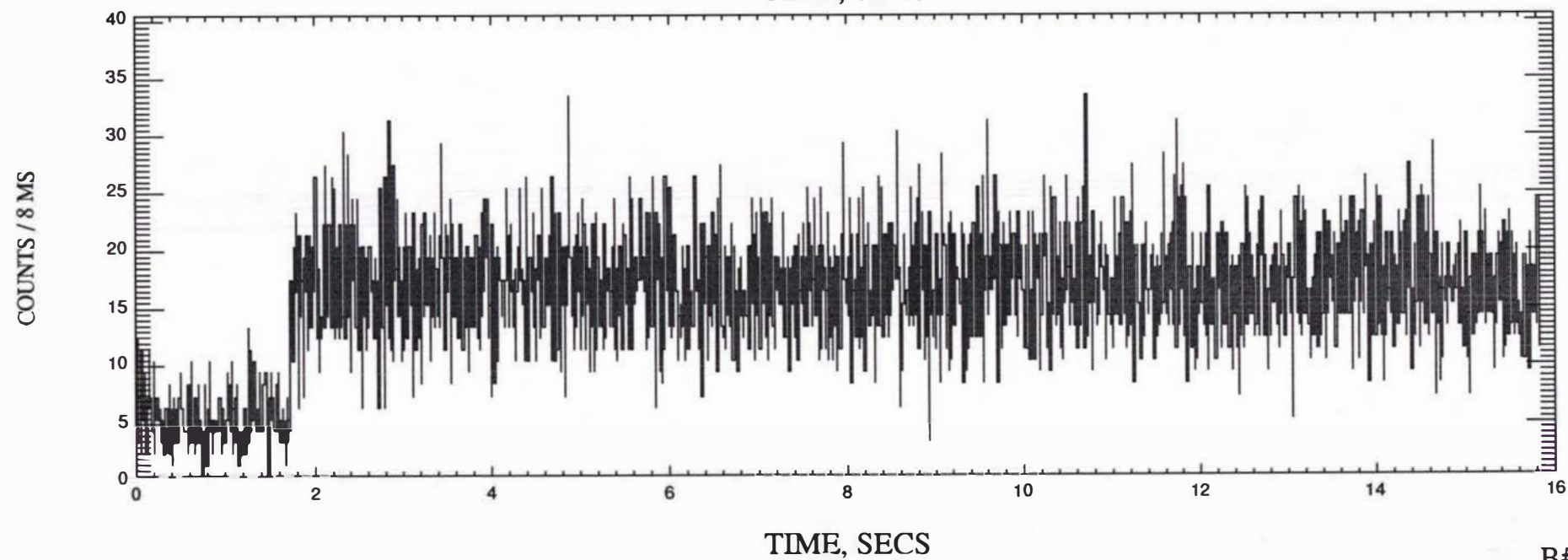
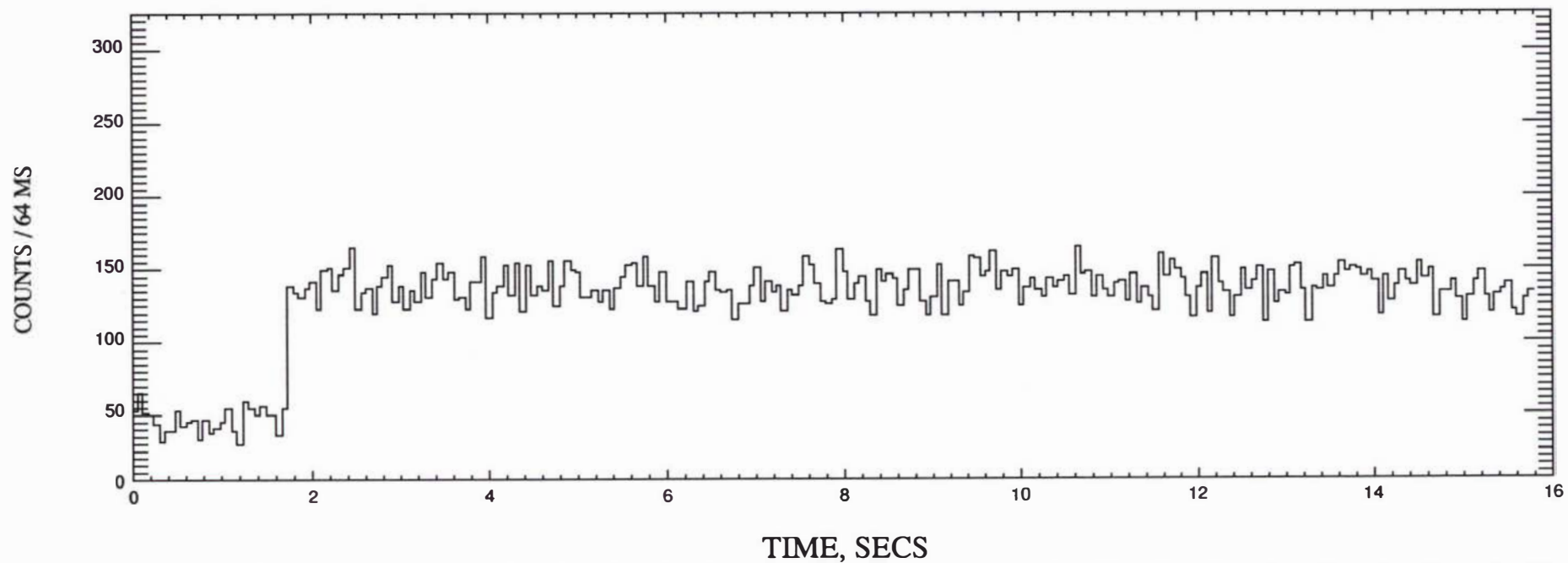


UNIV! AL TIME

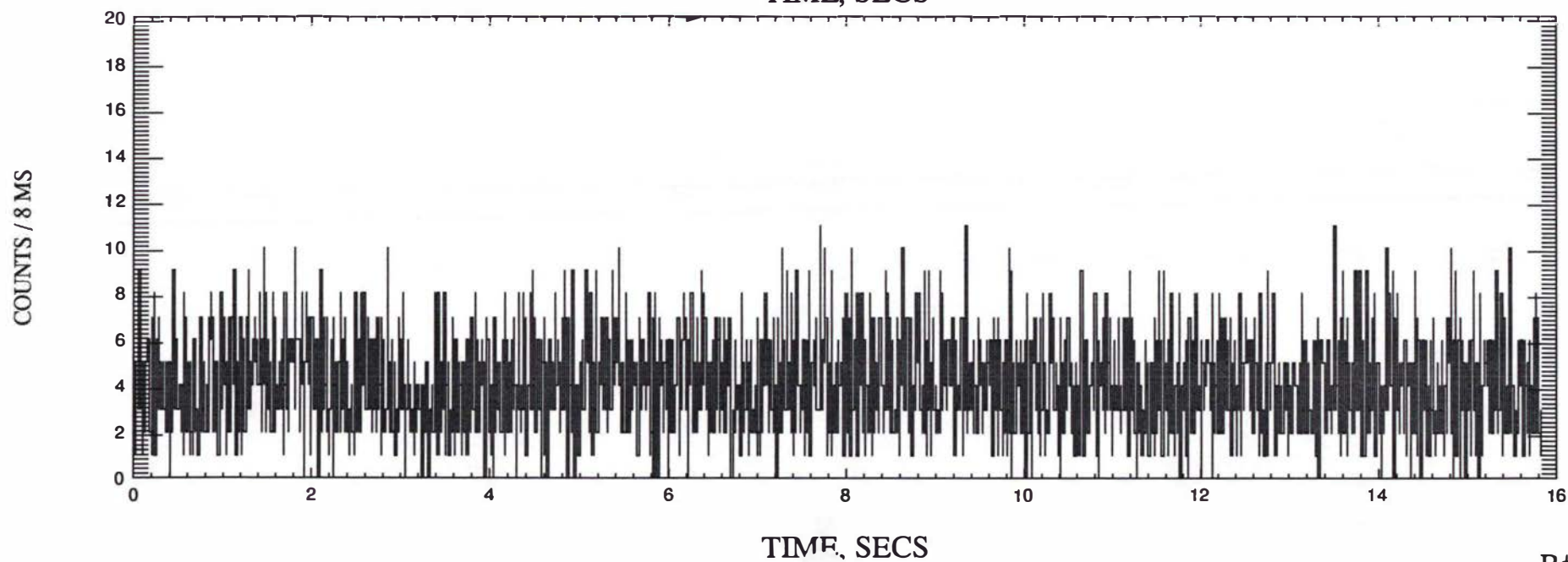
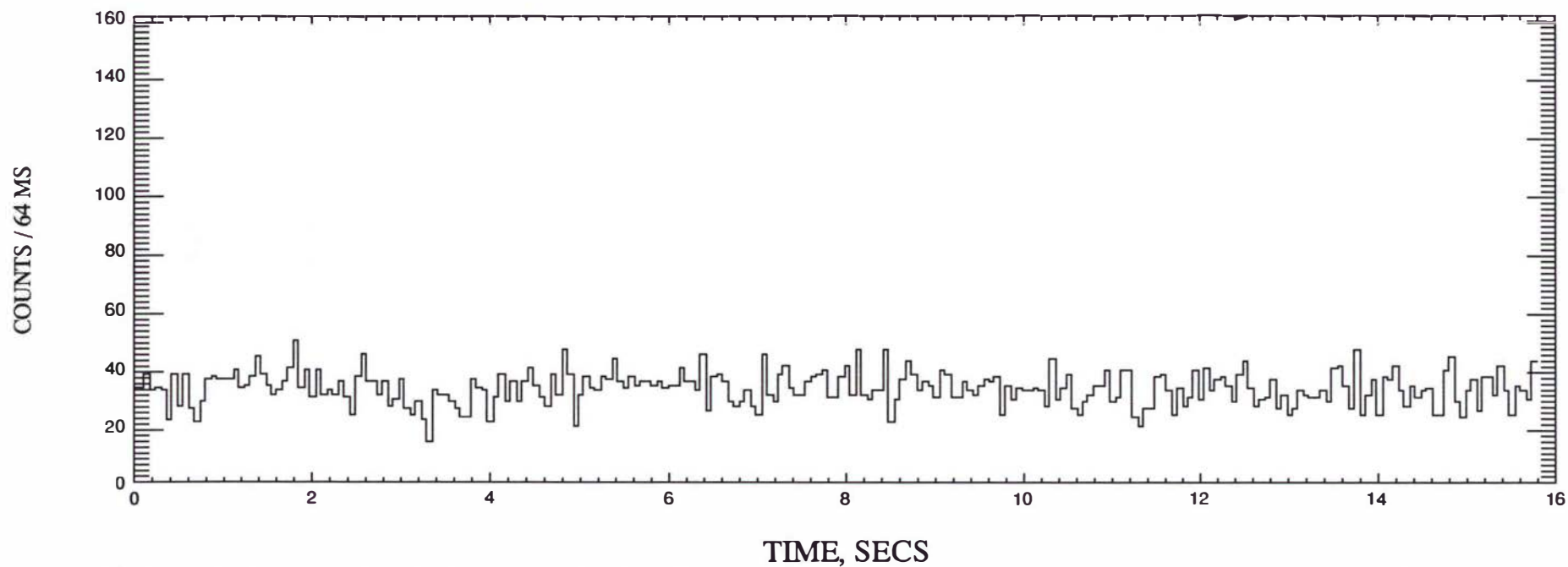
Burst Counter 4 at UT= 1.745063747830 h= 6282.229 s 01:44:42.229



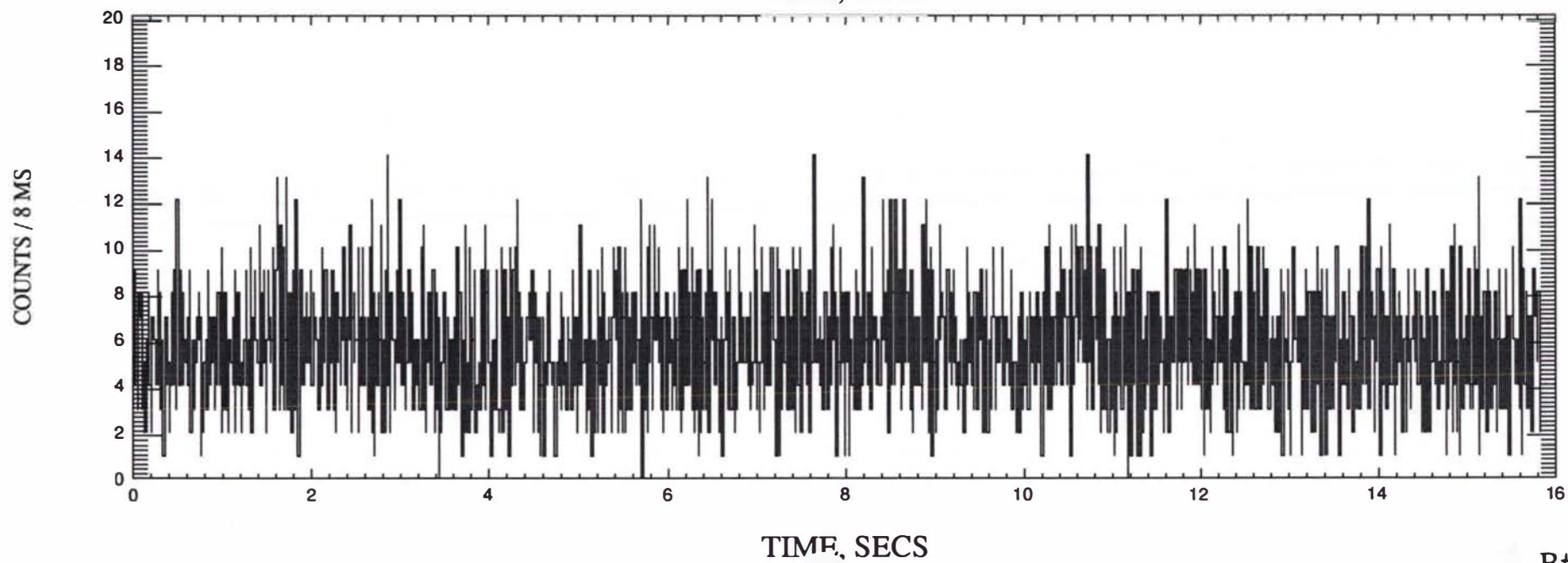
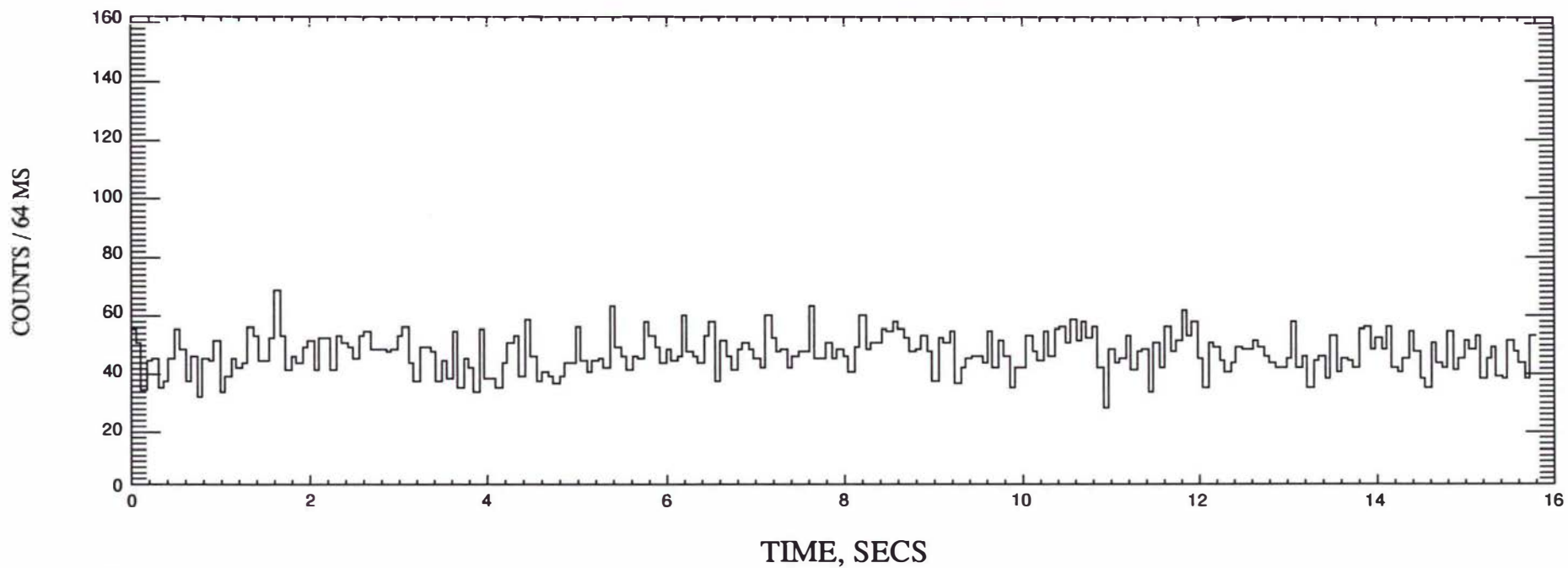
Burst Counter 5 at UT= 2.406075553894 h= 8661.872 s 02:24:21.872

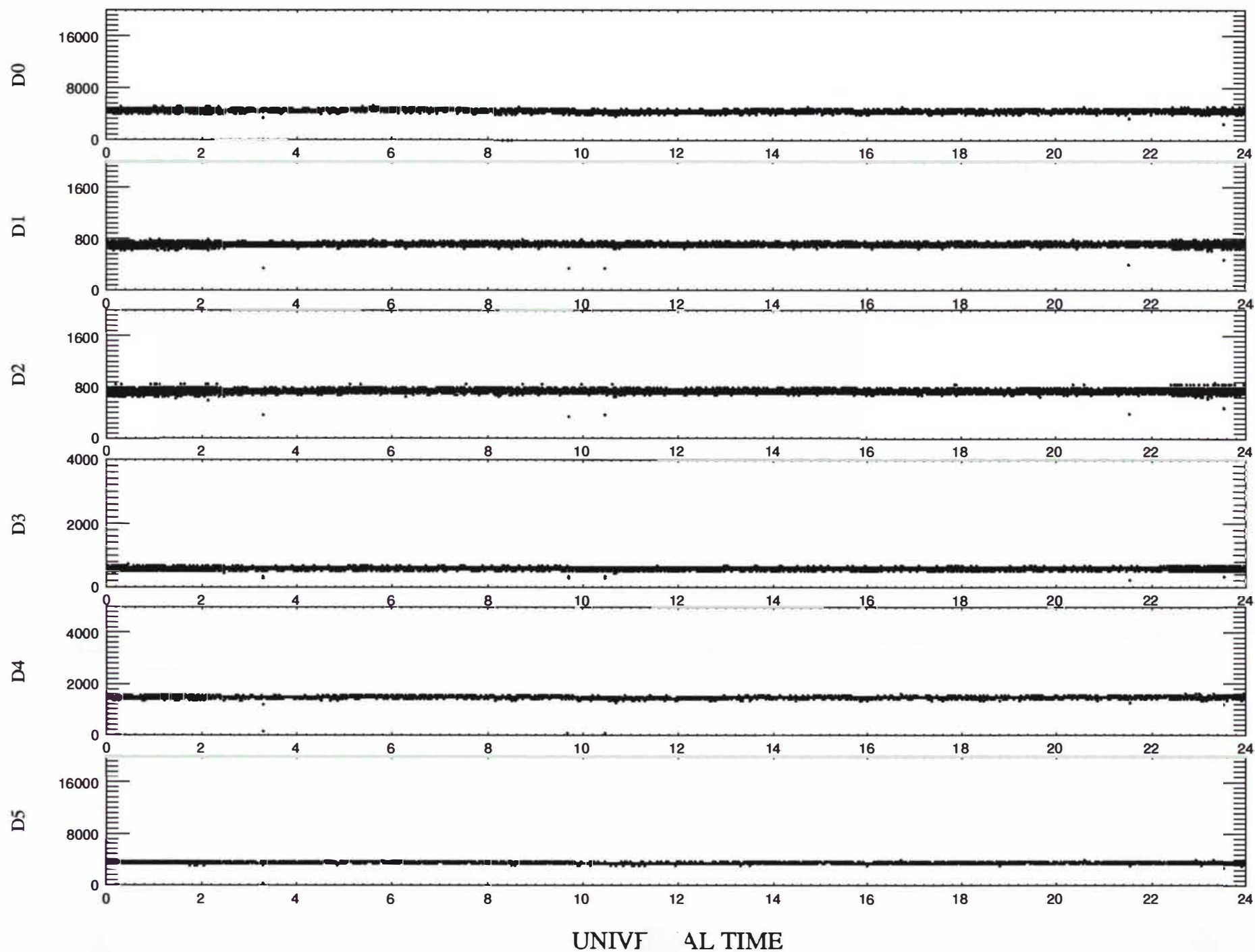


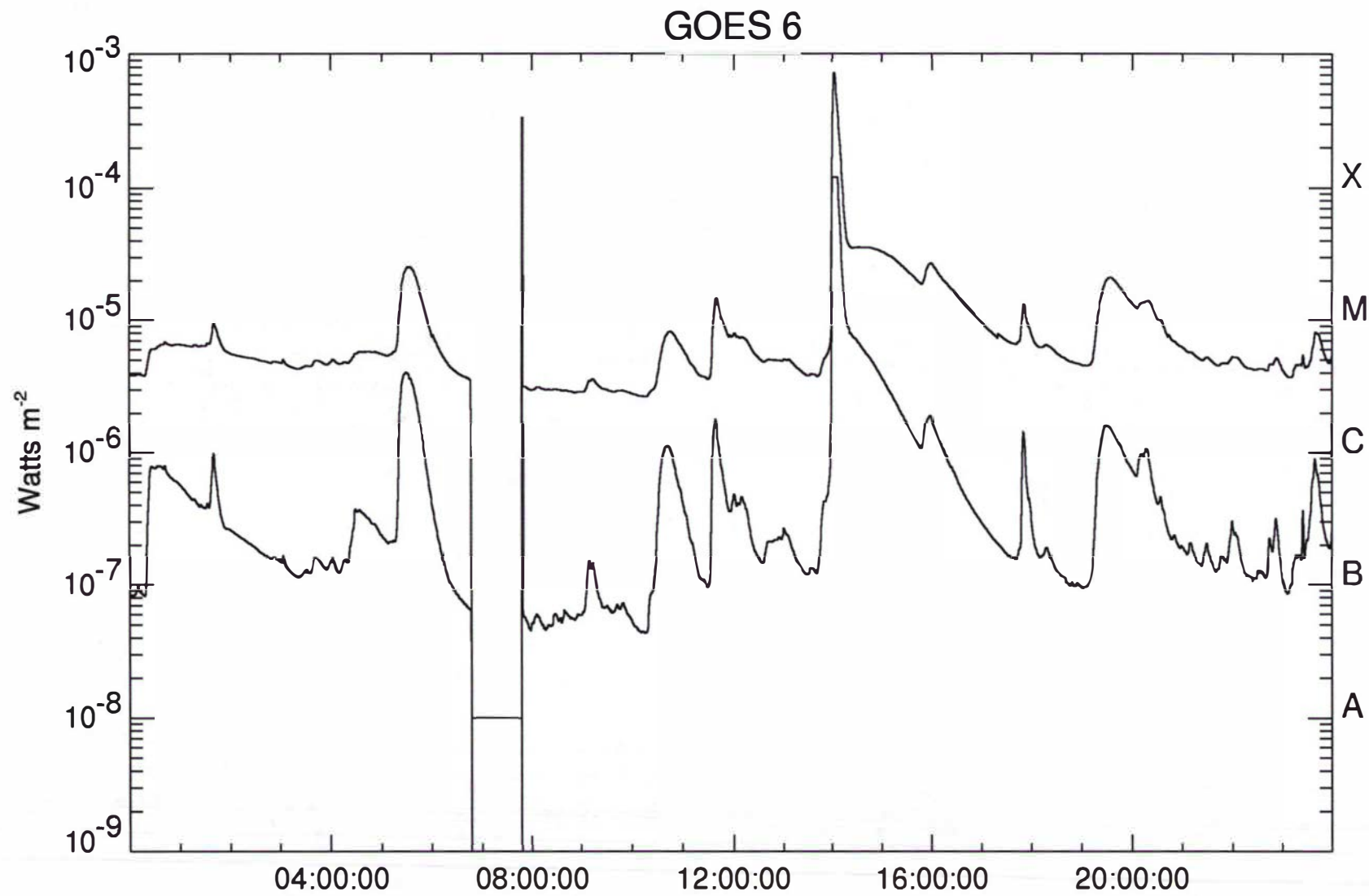
Burst Counter 6 at UT=10.118960295783 h=36428.257 s 10:07:08.257



Burst Counter 7 at UT=18.883283615112 h=67979.821 s 18:52:59.821





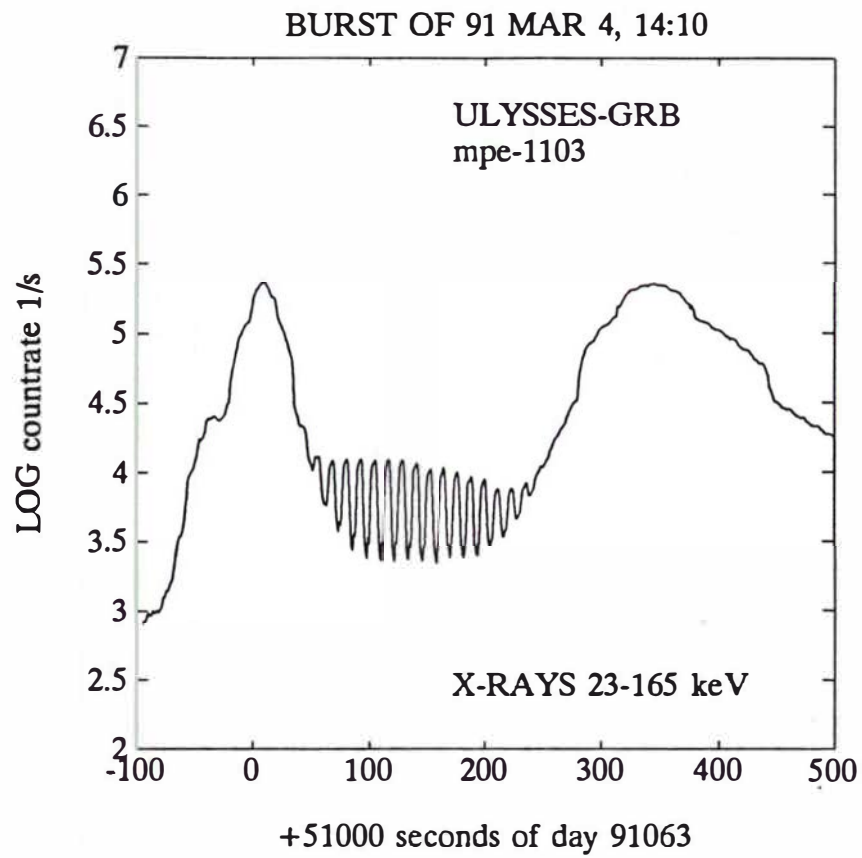


Data Start: 91/03/04, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

Plot created: 96/11/26, 1809

Background not subtracted
Background not subtracted
Sample average = 10



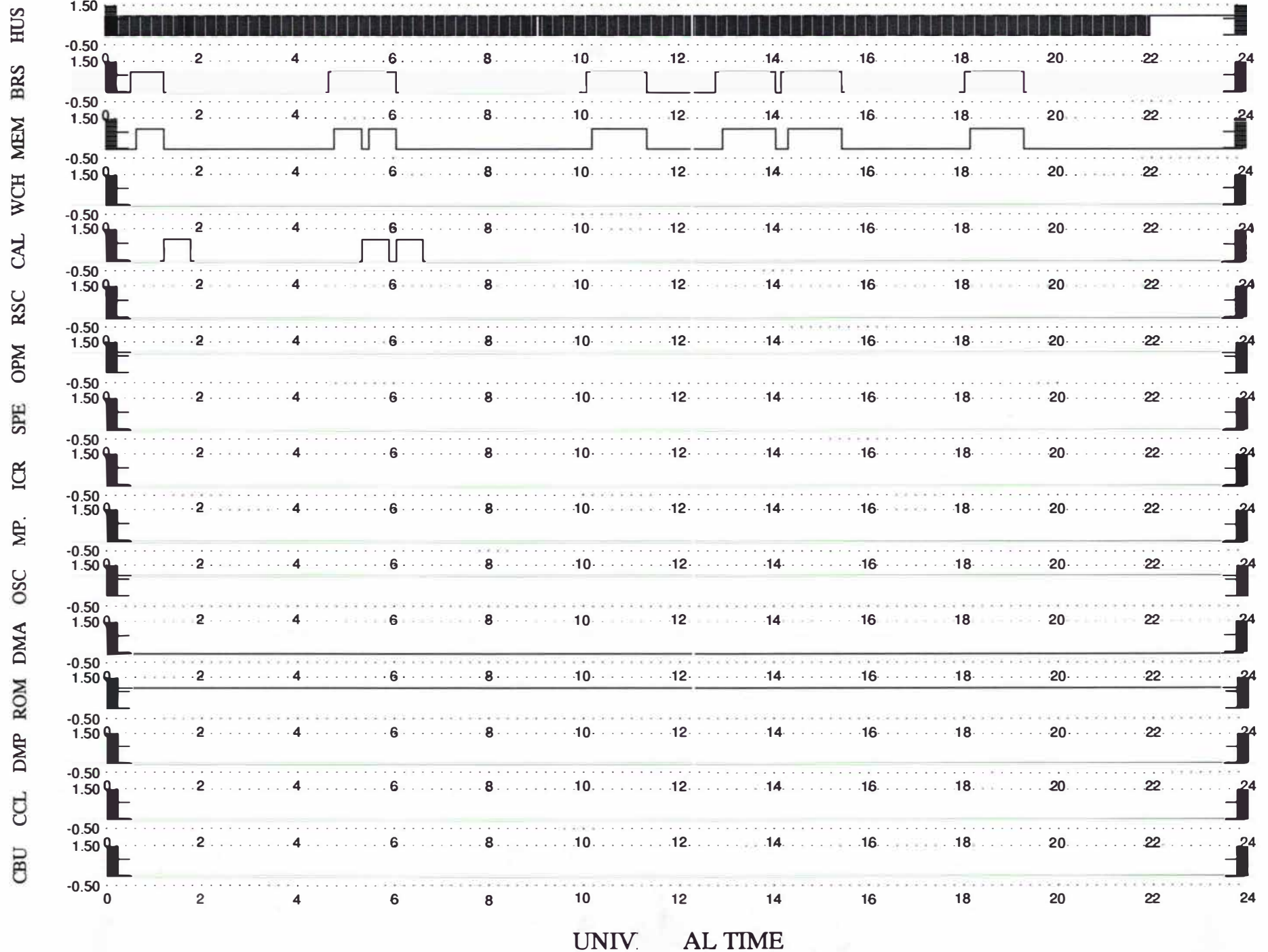
delta 77mm/500sec

period 11.988 sec

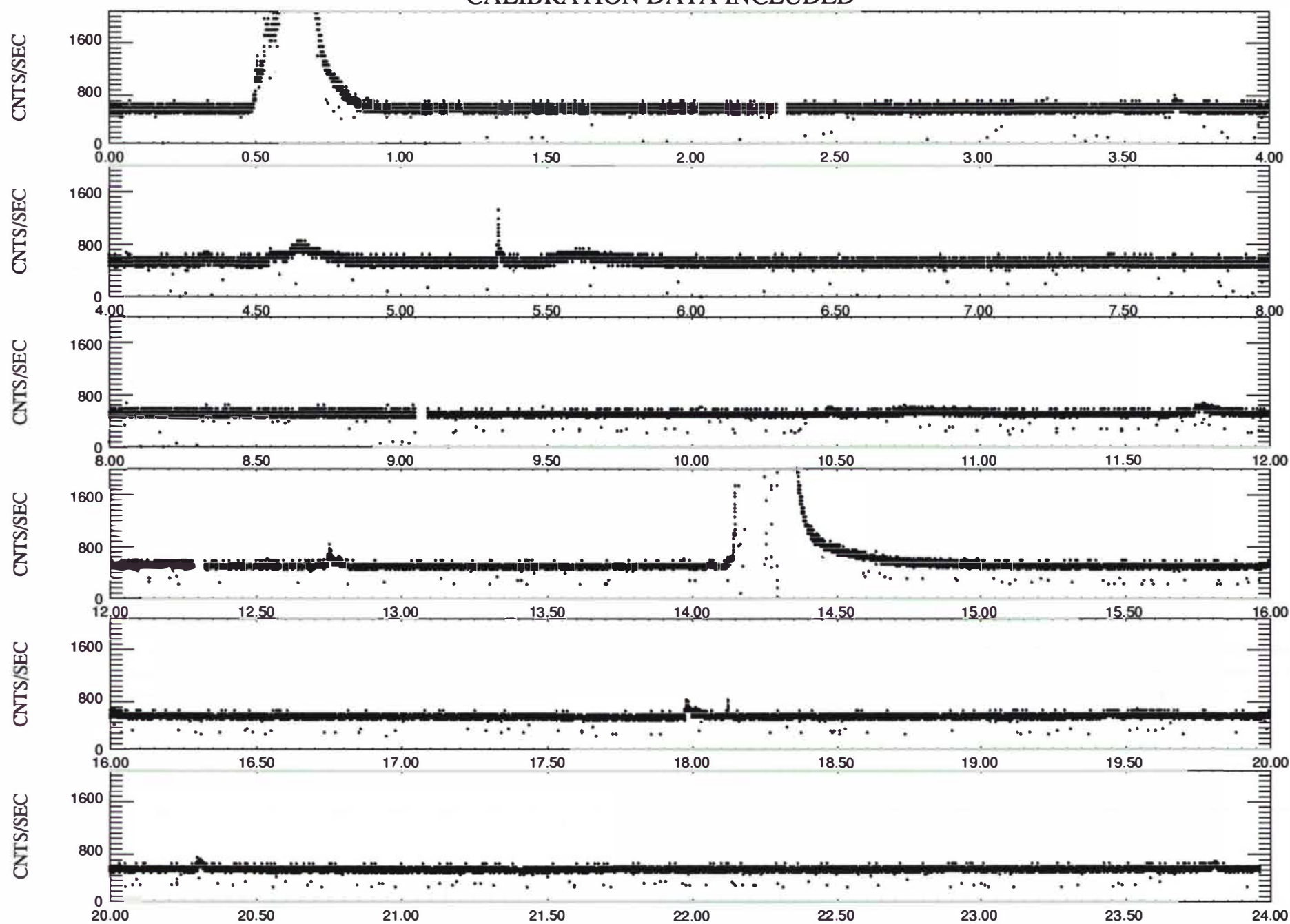
spin rate 5.005 rpm

star ang angle 23°

BURST NUMBER 8 - 14

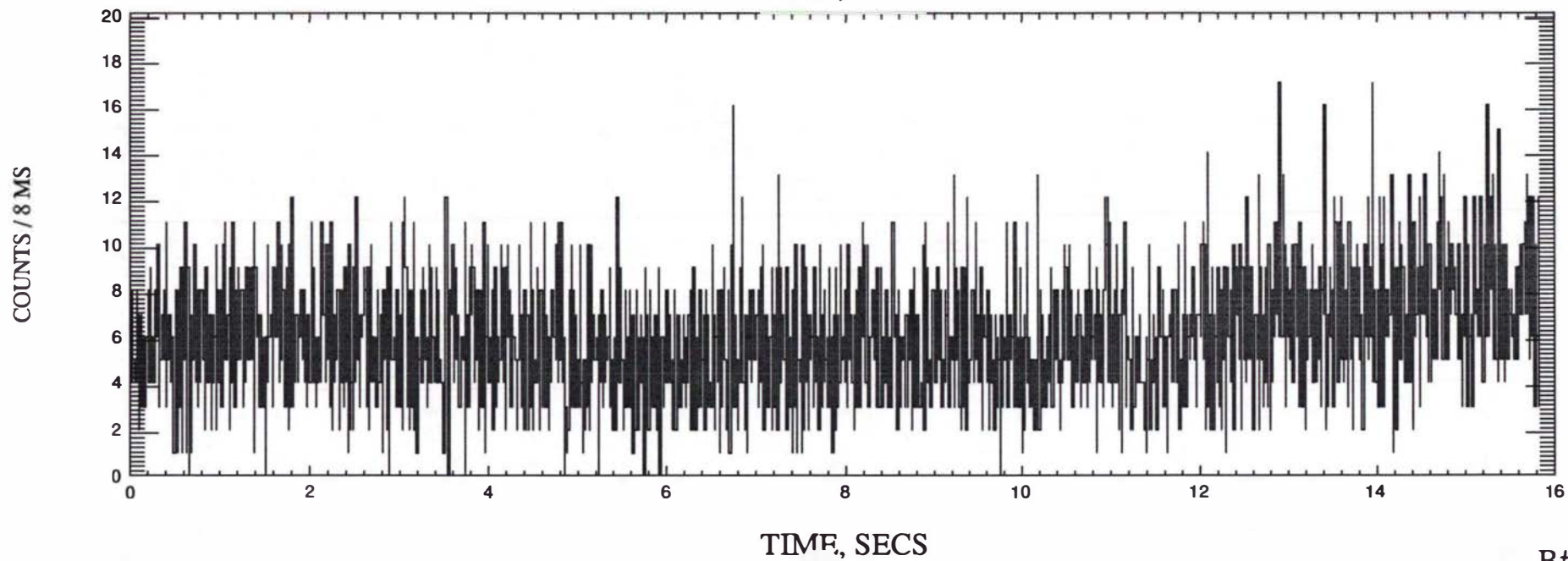
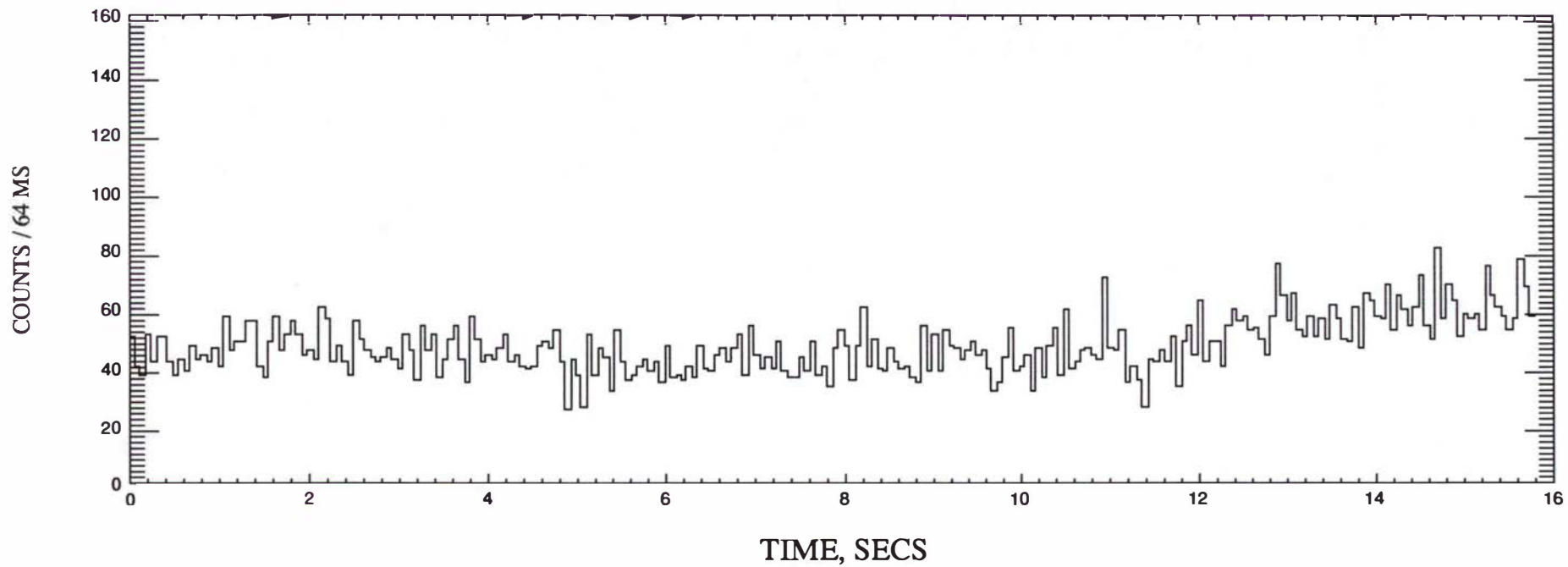


CALIBRATION DATA INCLUDED

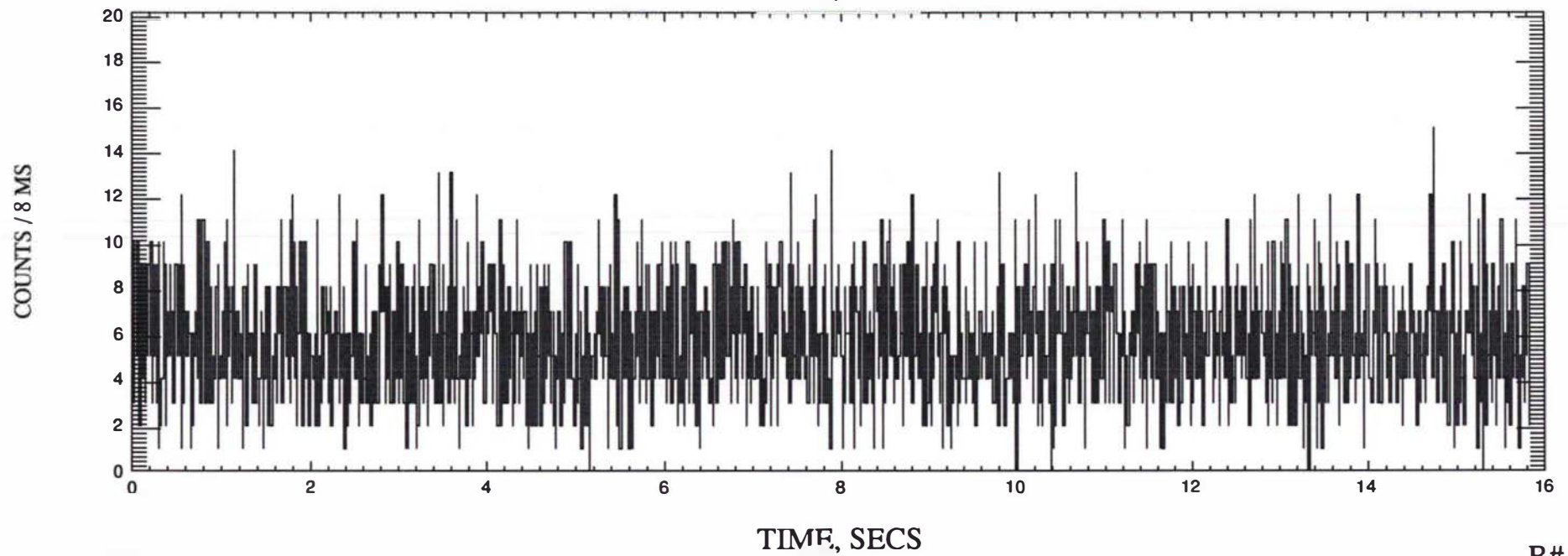
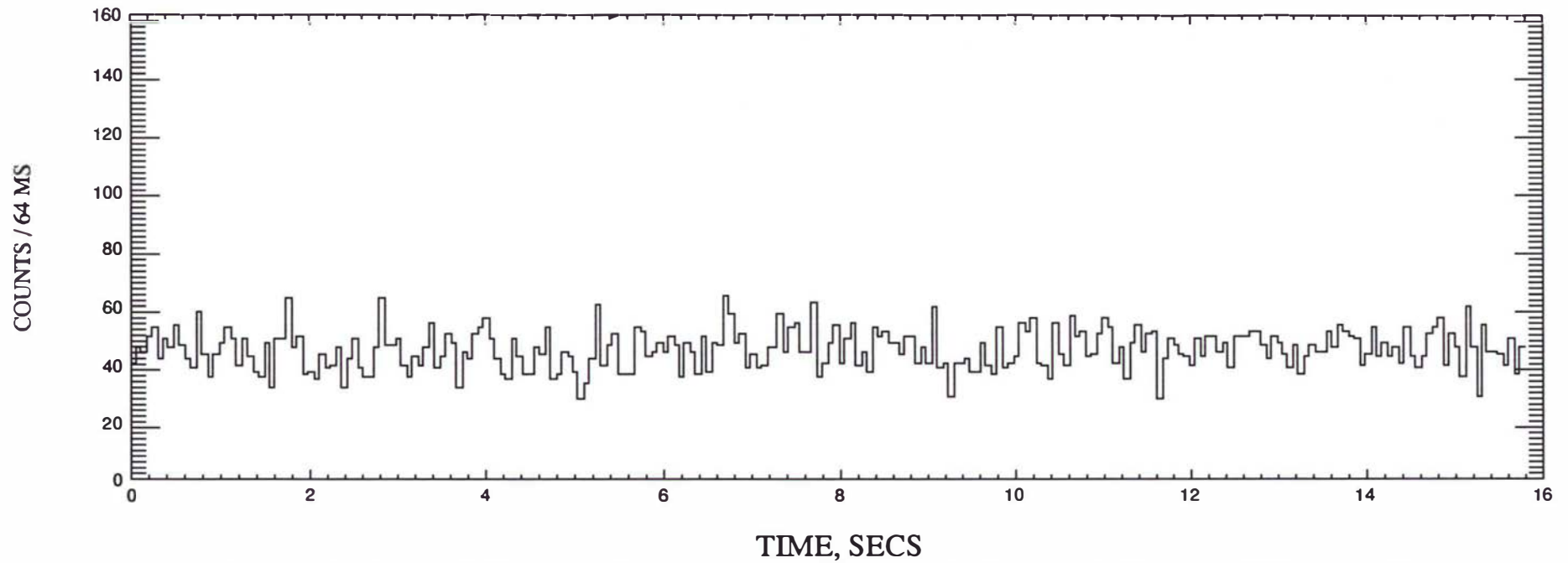


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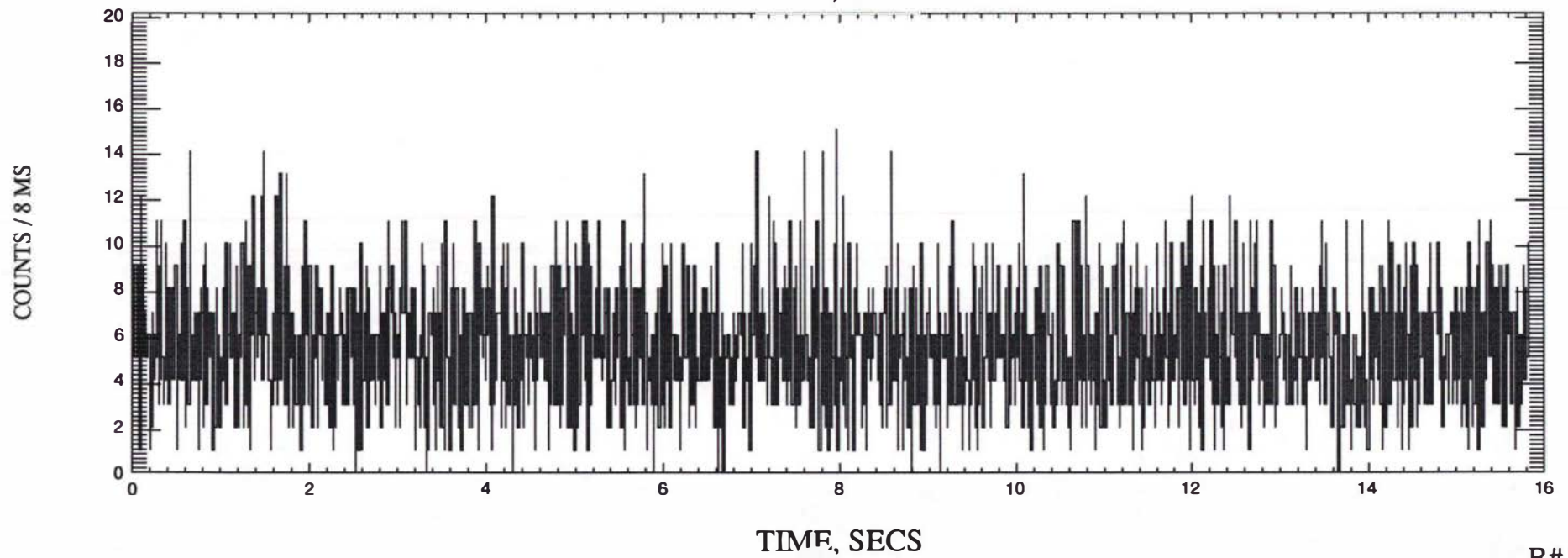
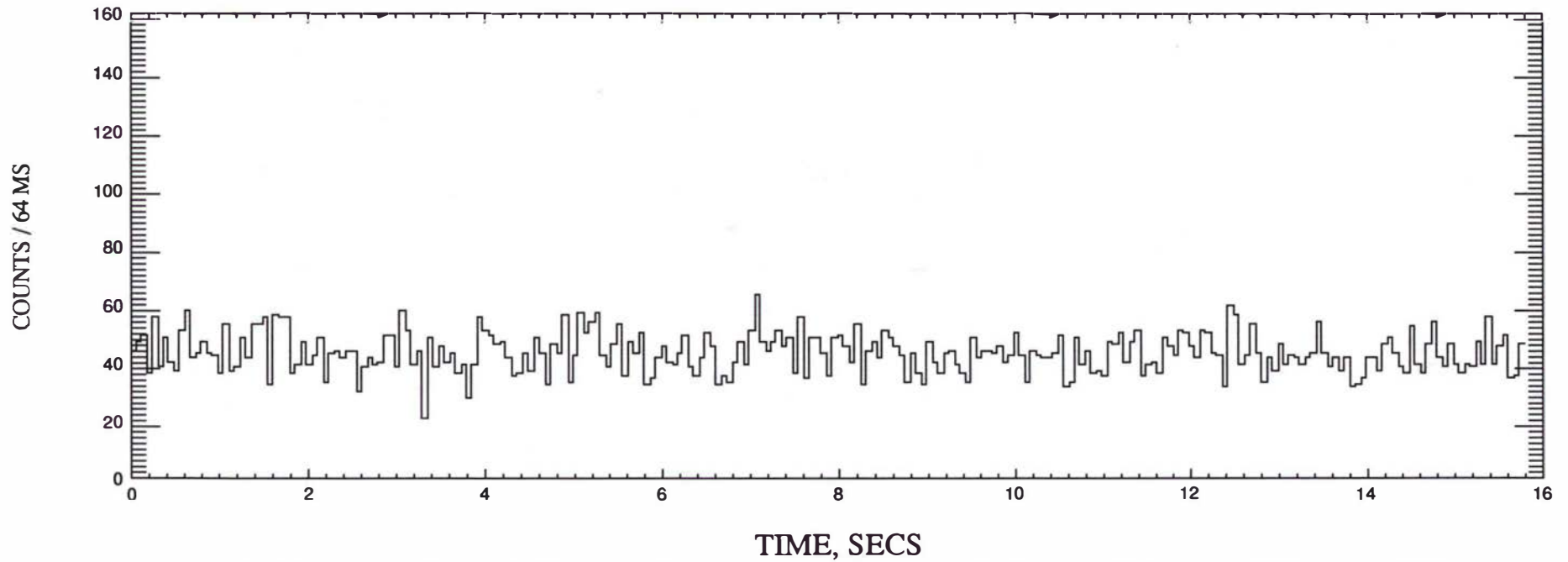
Burst Counter 8 at UT= 0.493730680678 h= 1777.430 s 00:29:37.430



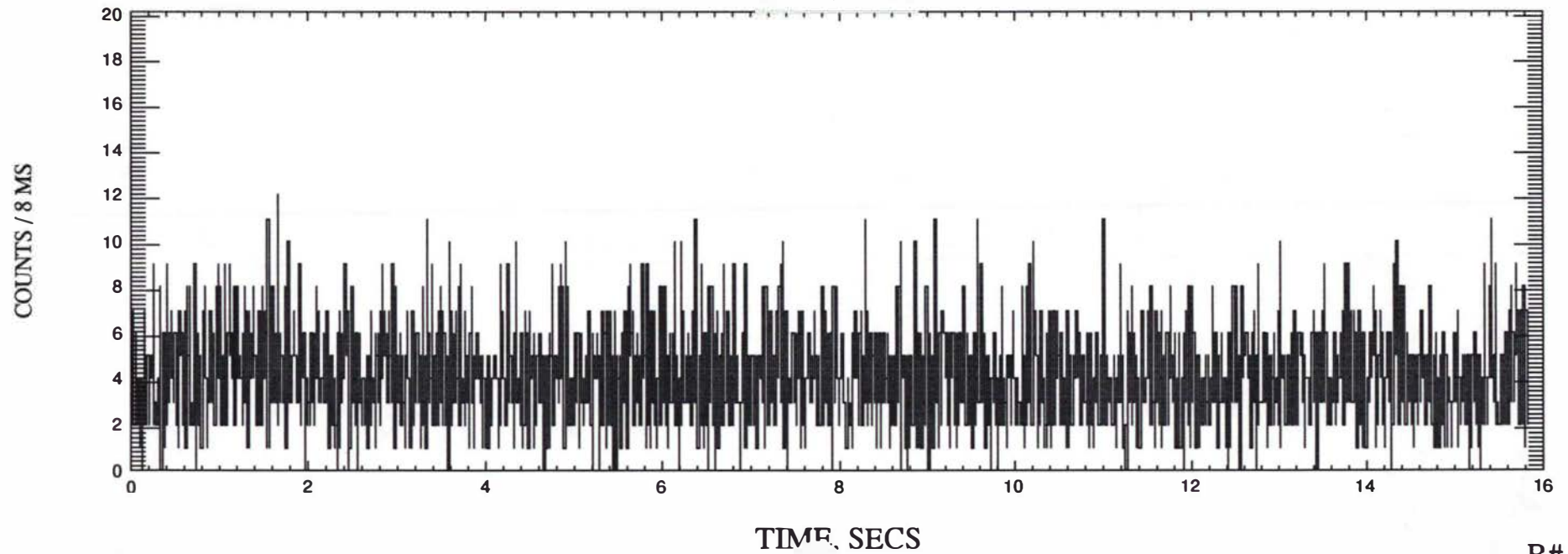
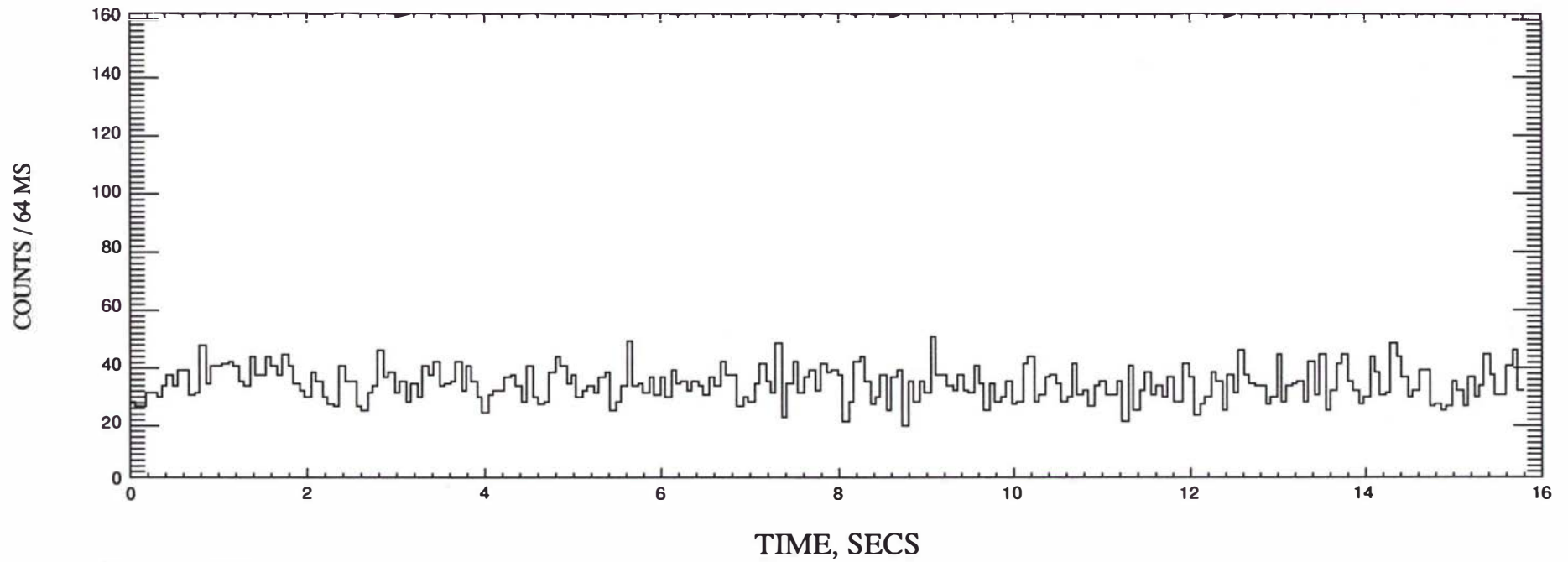
Burst Counter 9 at UT= 4.629707951016 h=16666.949 s 04:37:46.949



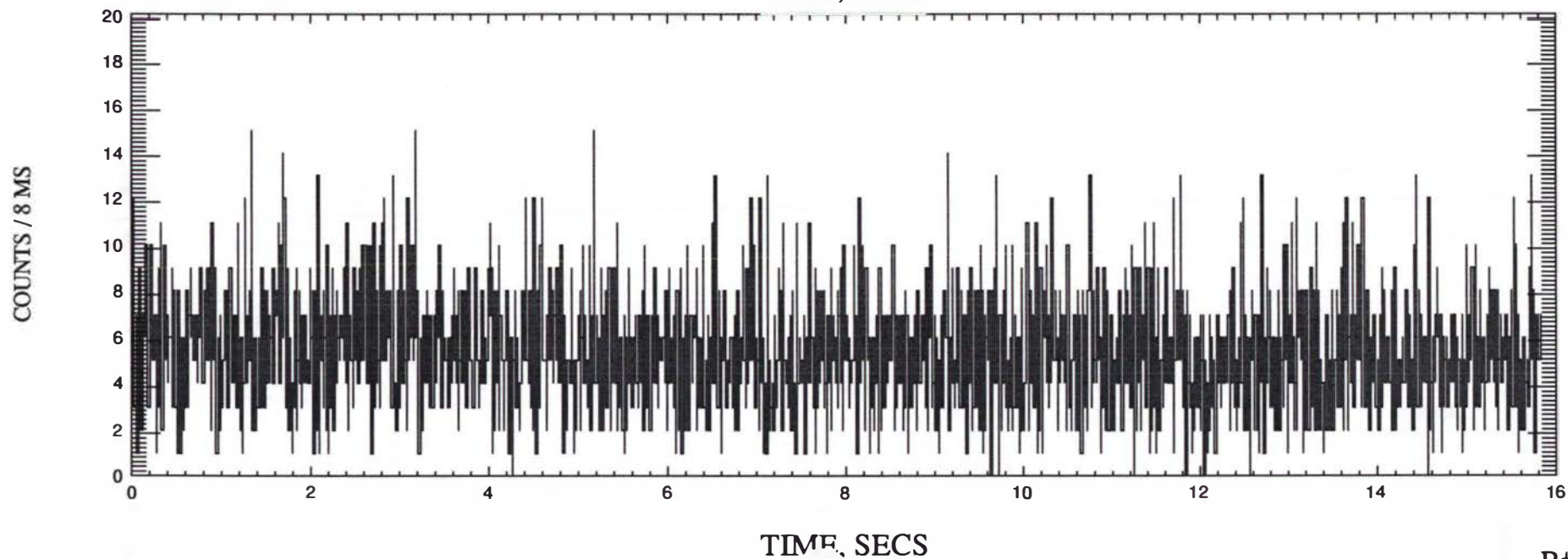
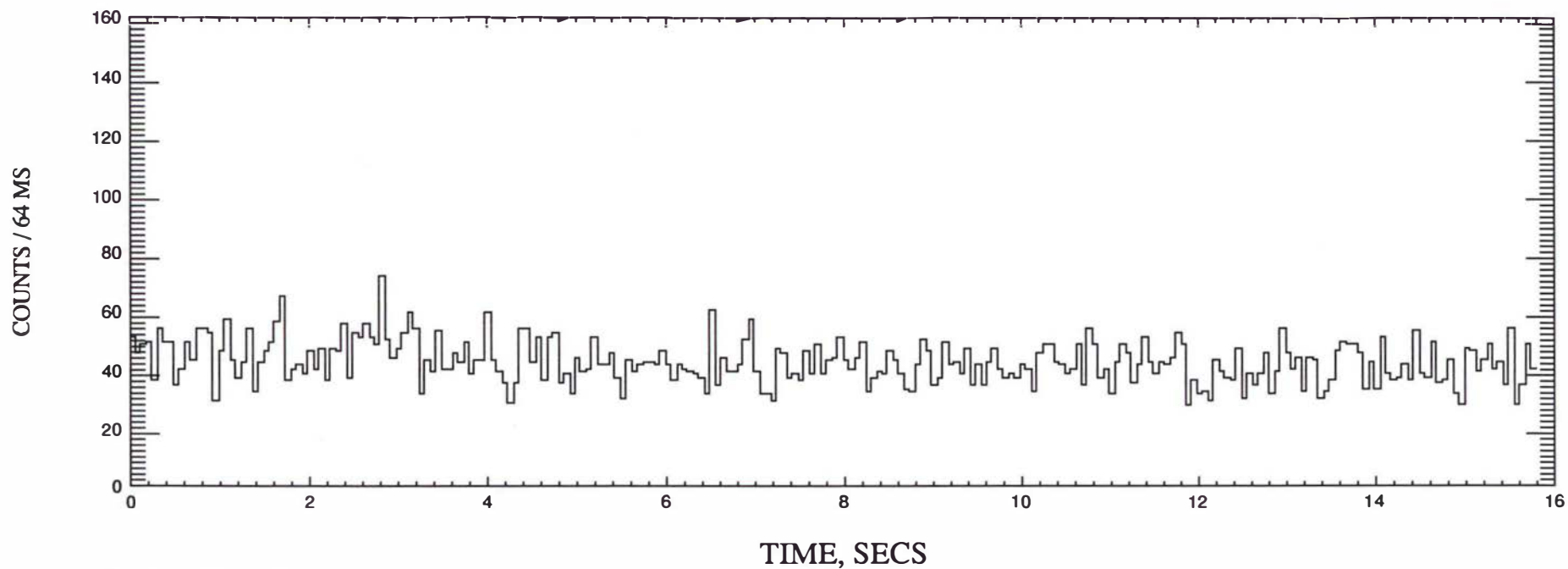
Burst Counter 10 at UT= 5.331248363919 h=19192.494 s 05:19:52.494



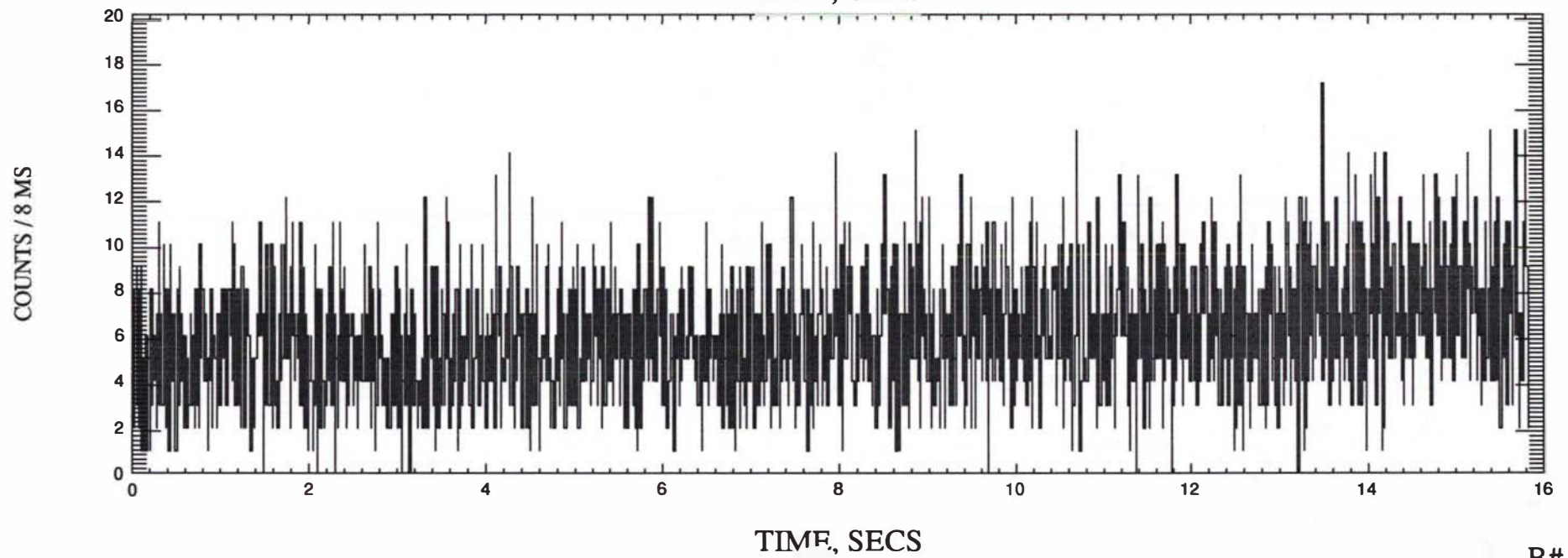
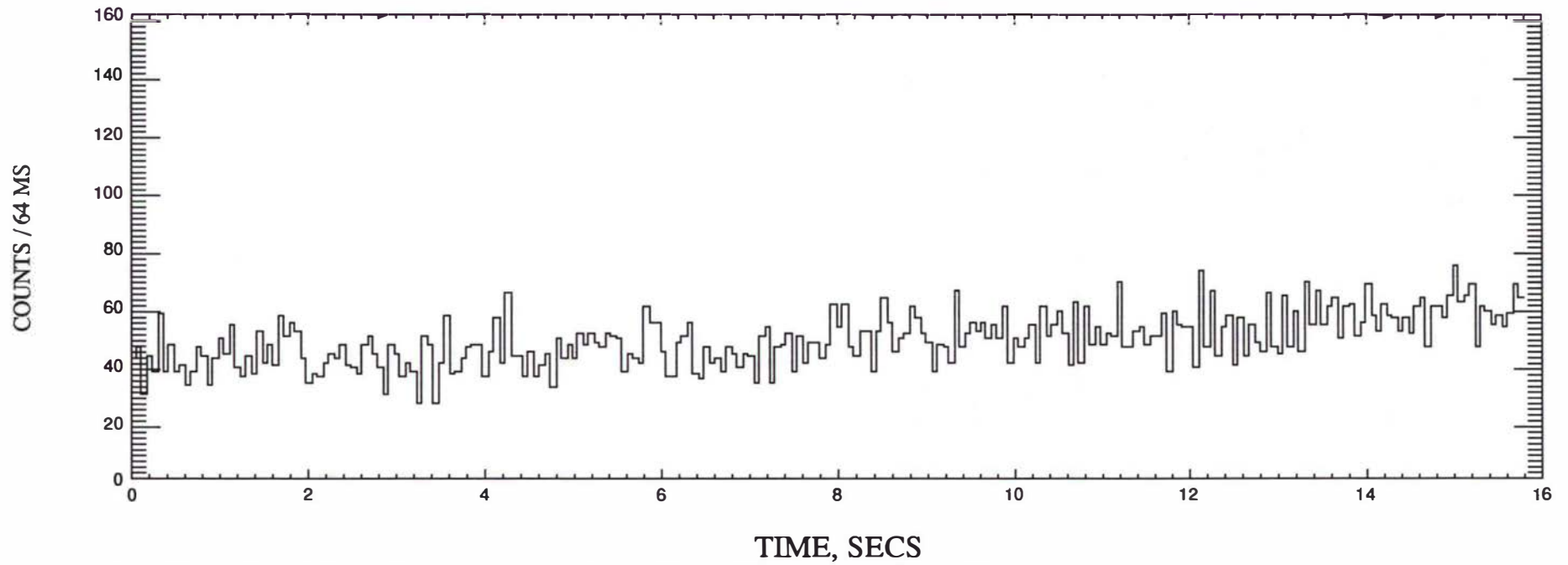
Burst Counter 11 at UT=10.031601748996 h=36113.766 s 10:01:53.766



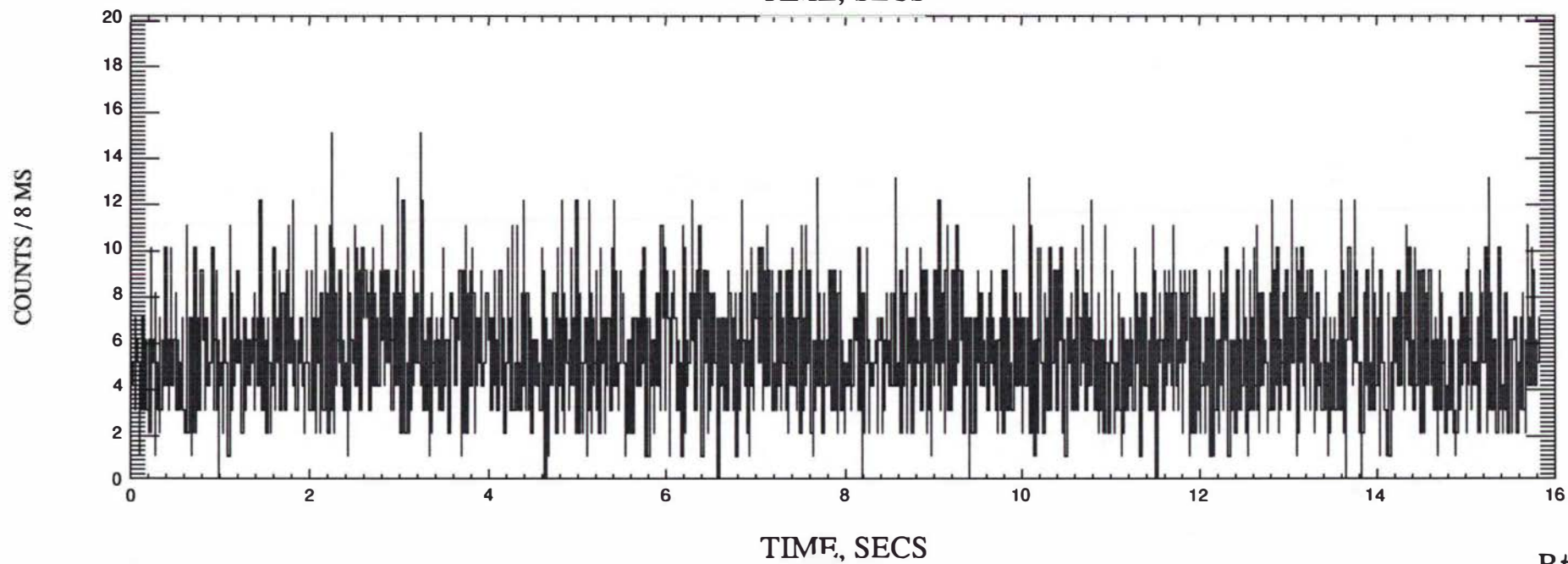
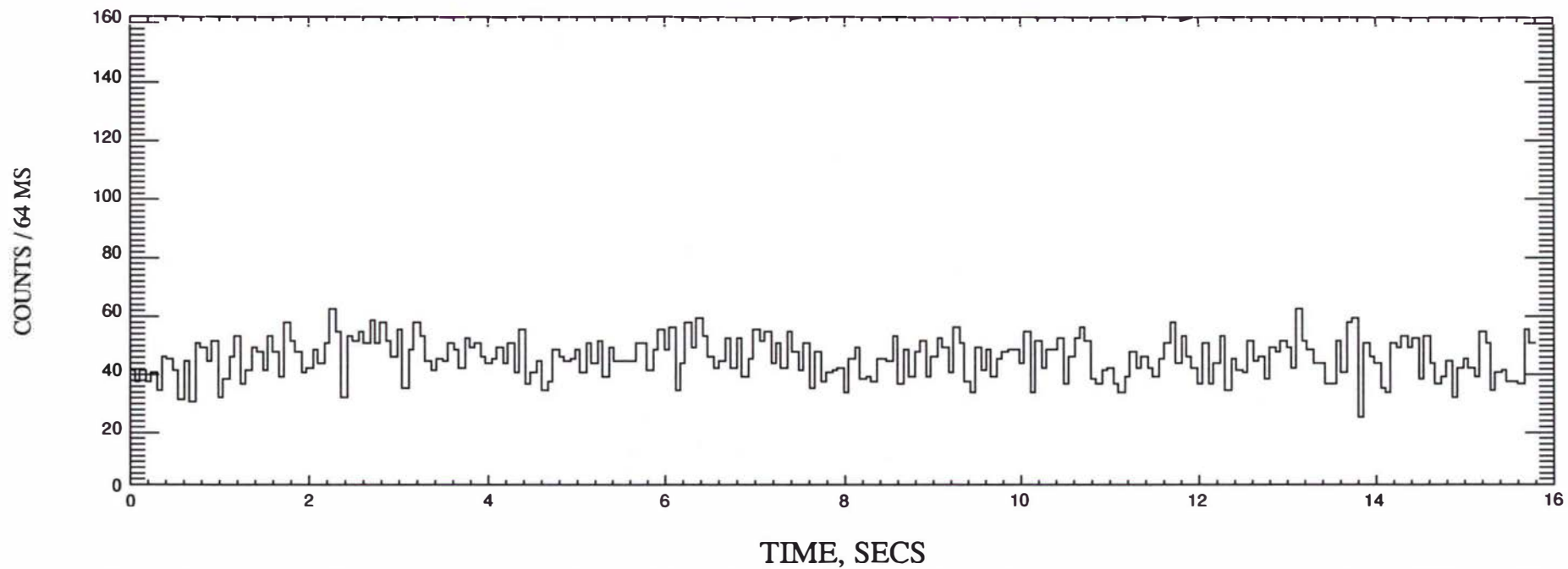
Burst Counter 12 at UT=12.751795785692 h=45906.465 s 12:45:06.465

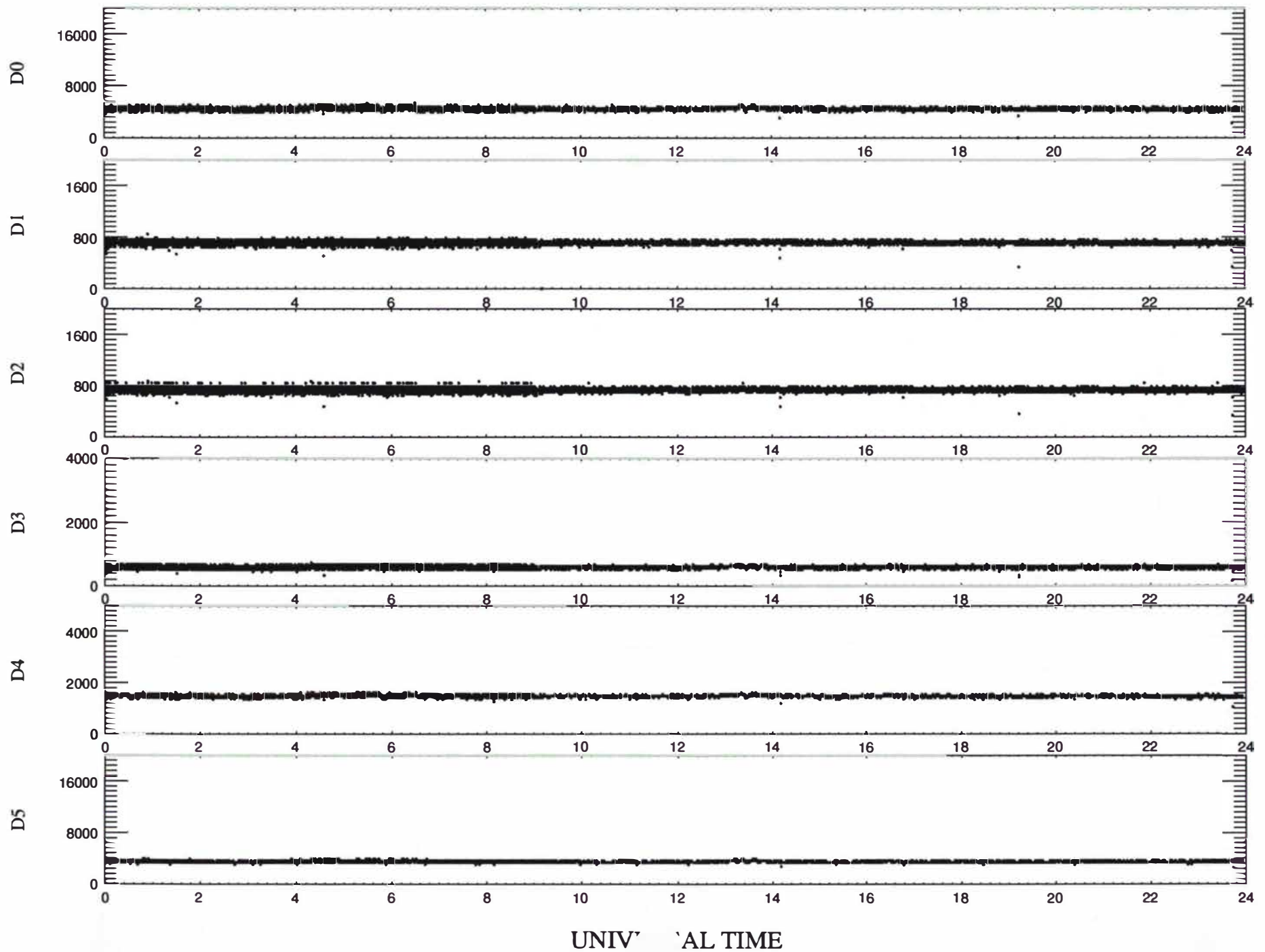


Burst Counter 13 at UT=14.137374437120 h=50894.548 s 14:08:14.548

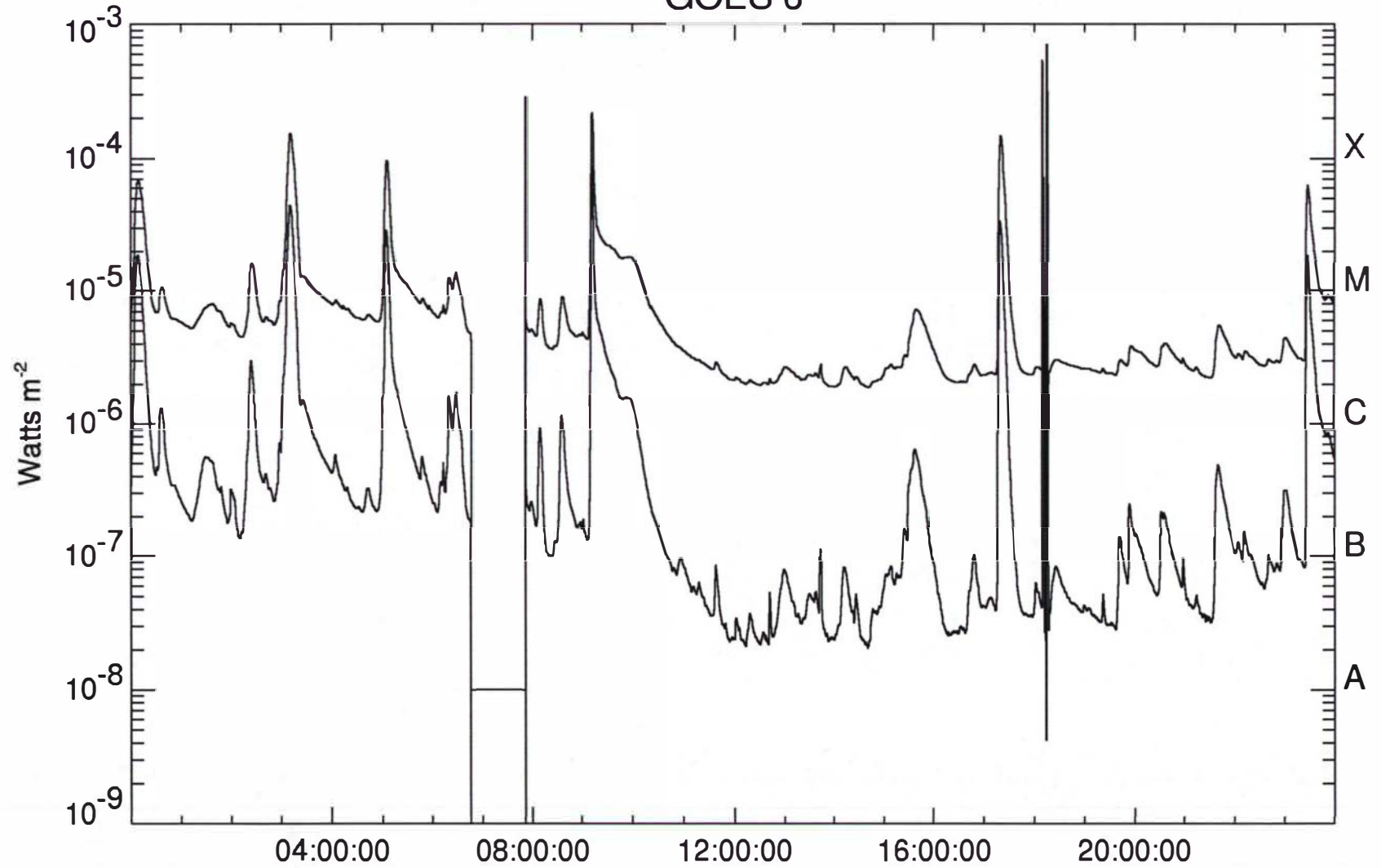


Burst Counter 14 at UT=17.975986493429 h=64713.551 s 17:58:33.551





GOES 6



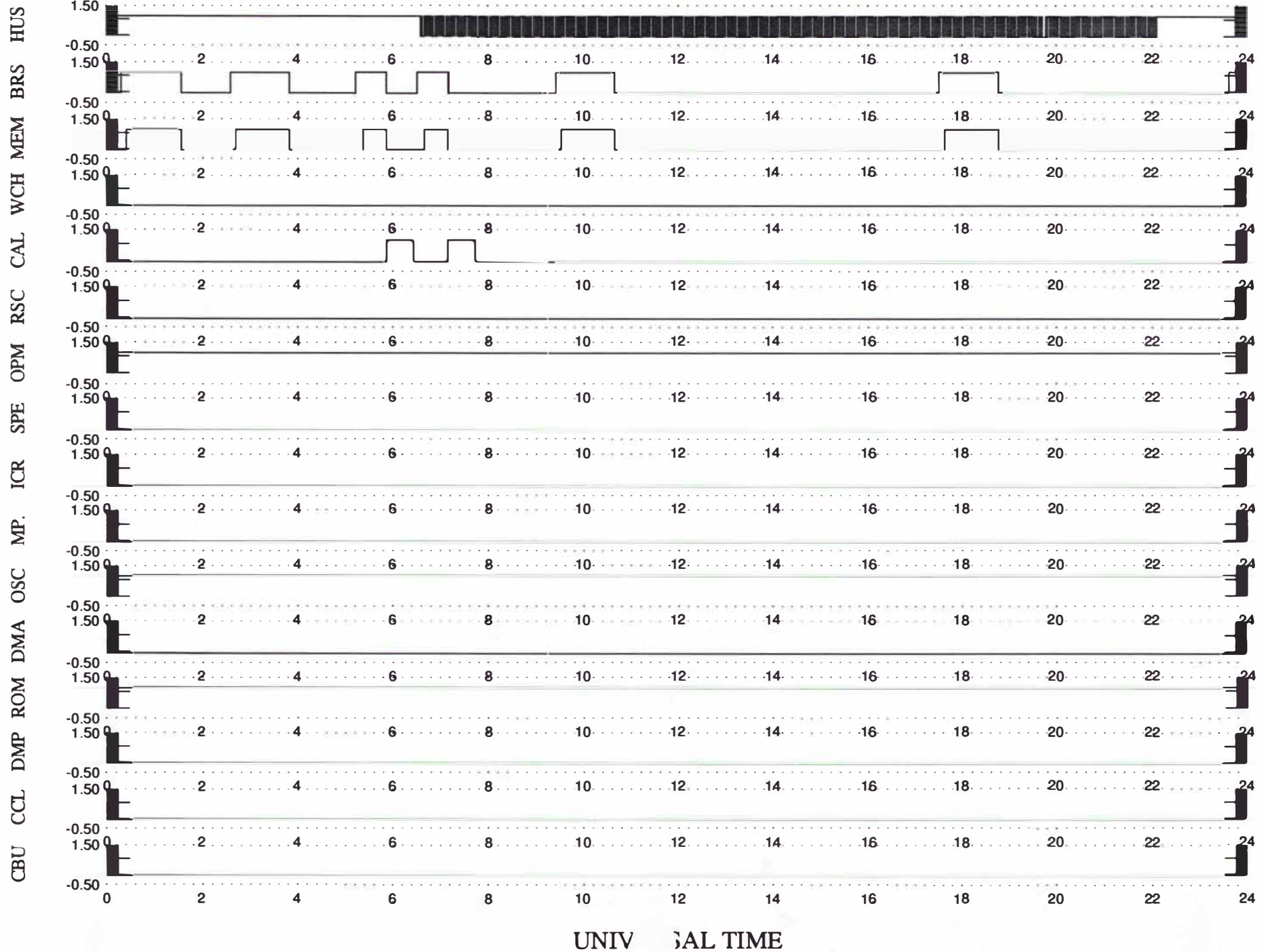
Data Start: 91/03/05, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

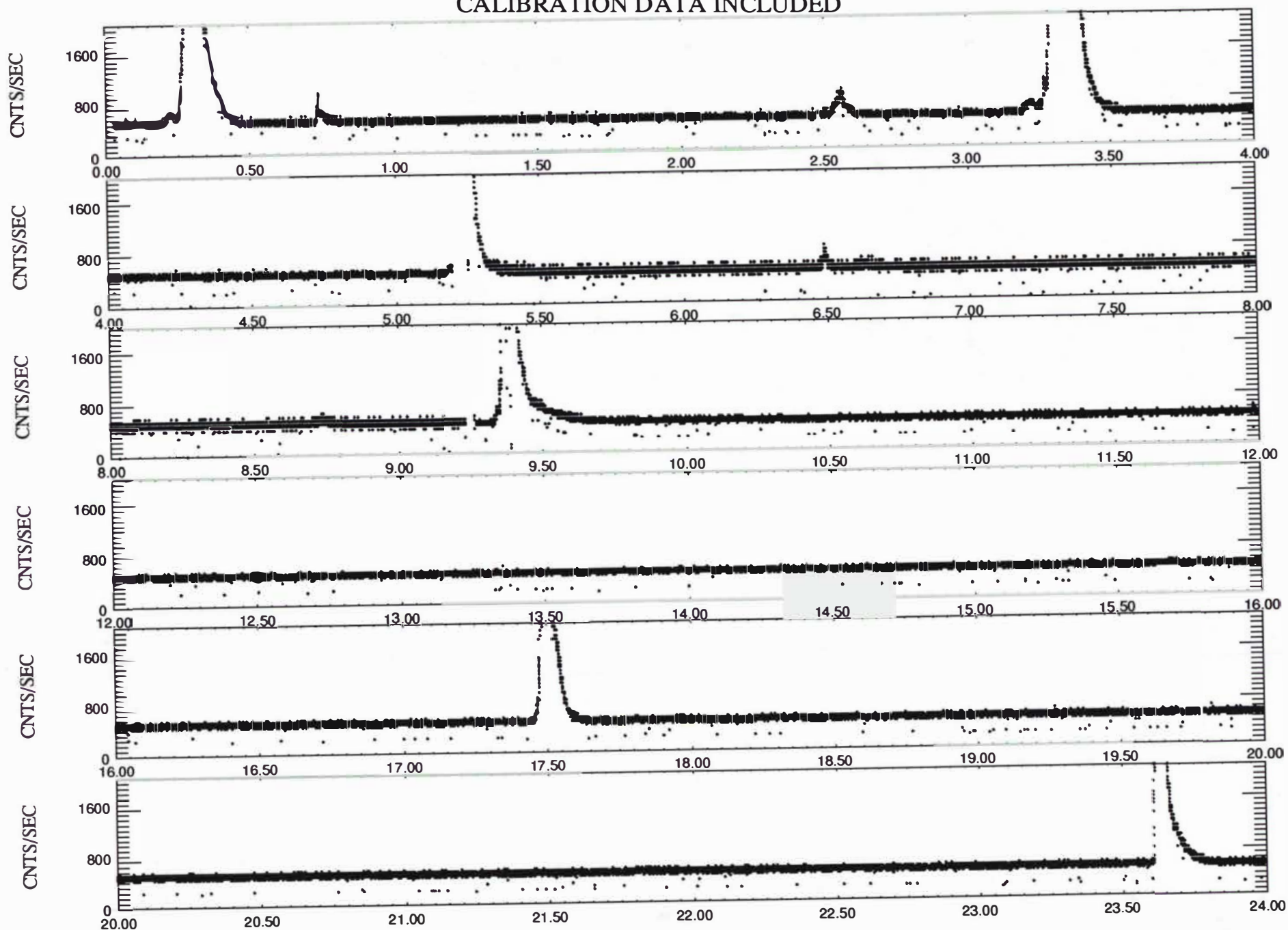
Plot created: 96/11/26, 1812

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 15, 0 - 5

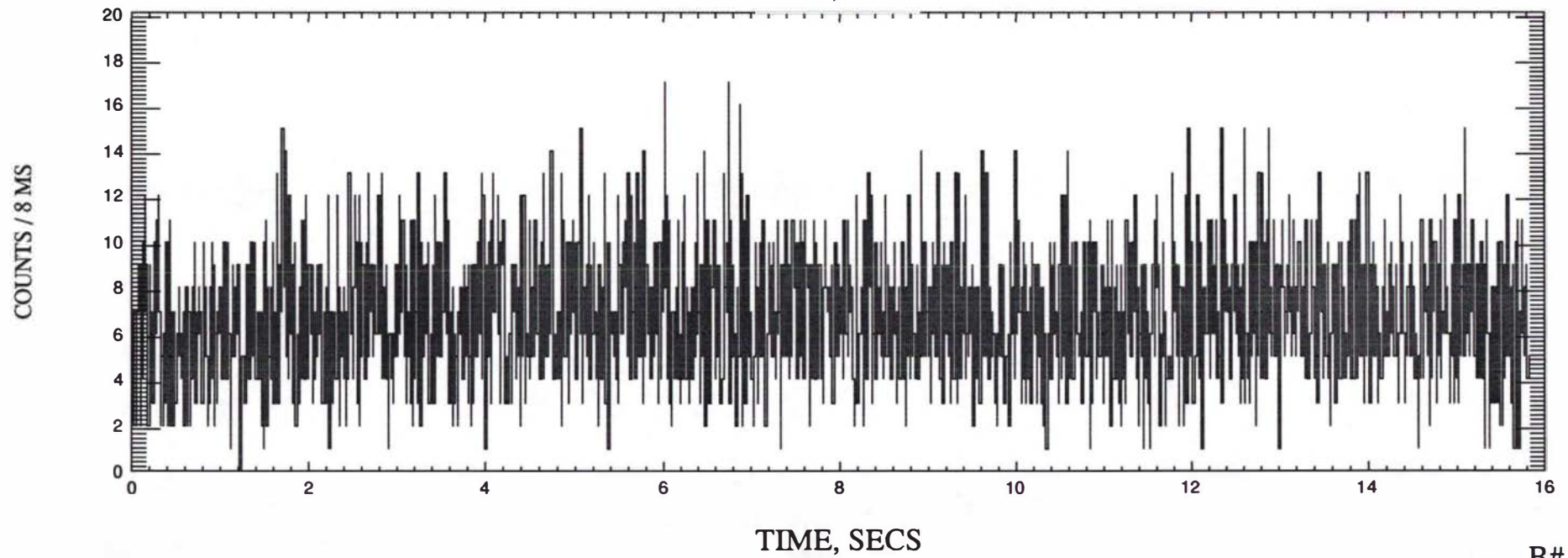
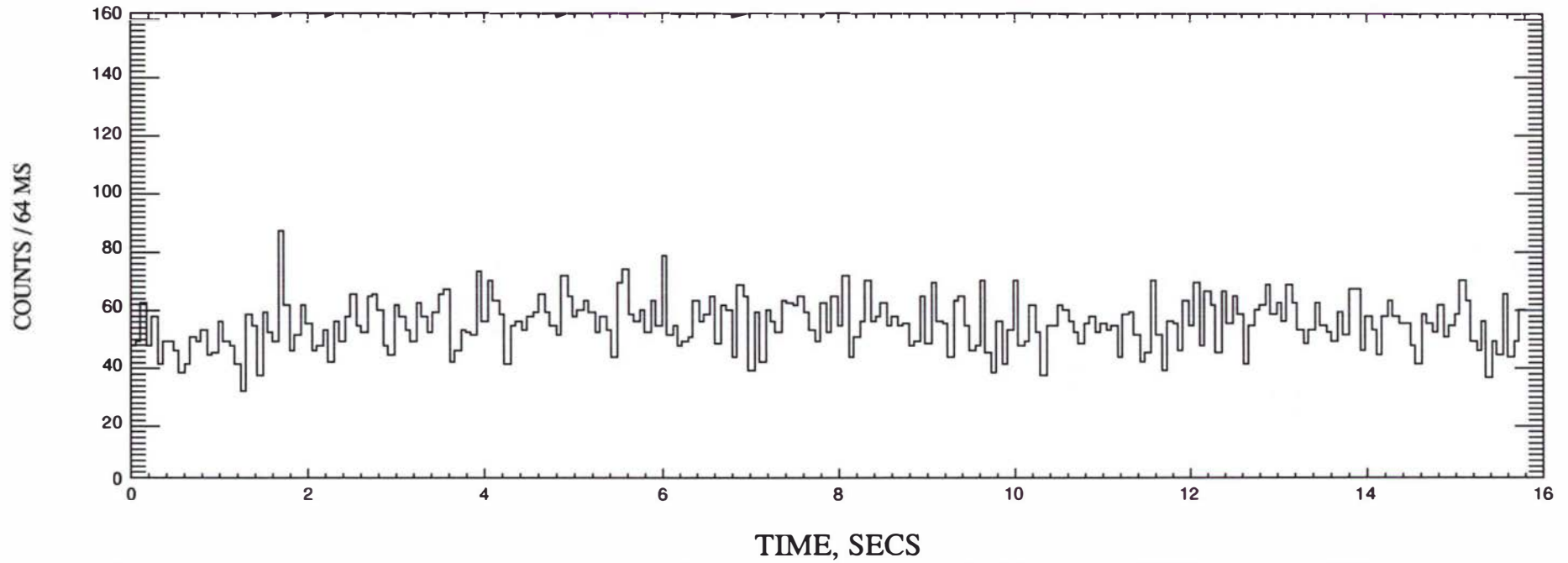


CALIBRATION DATA INCLUDED

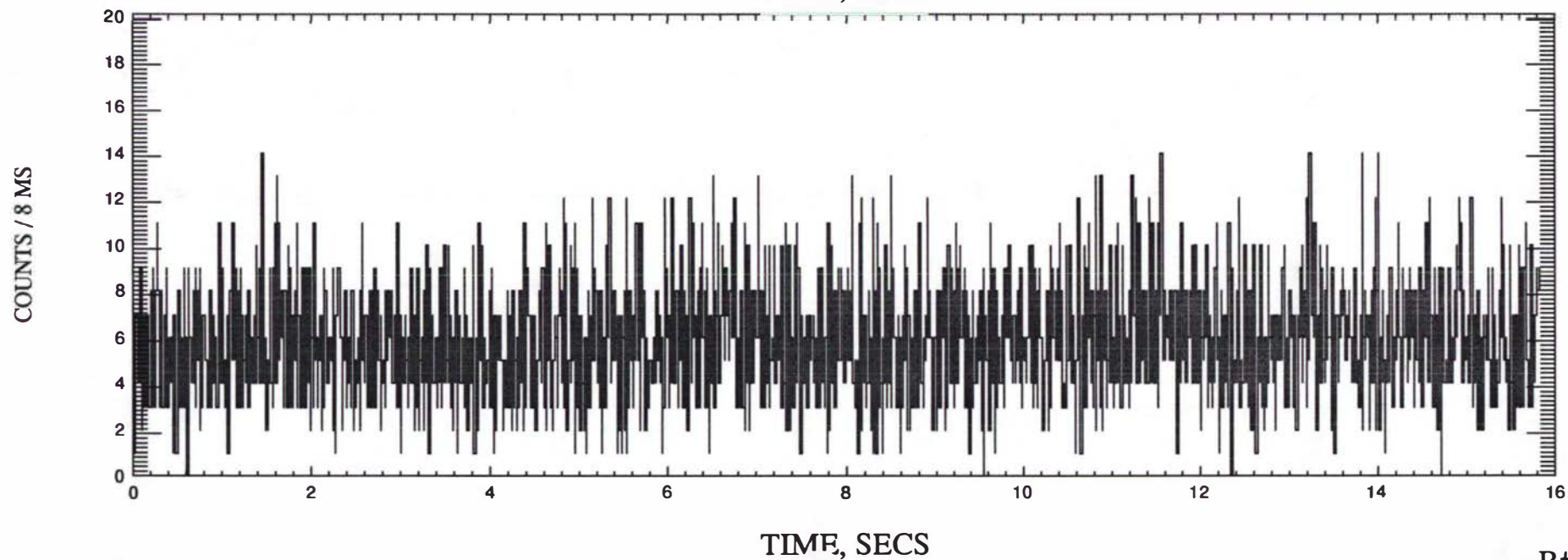
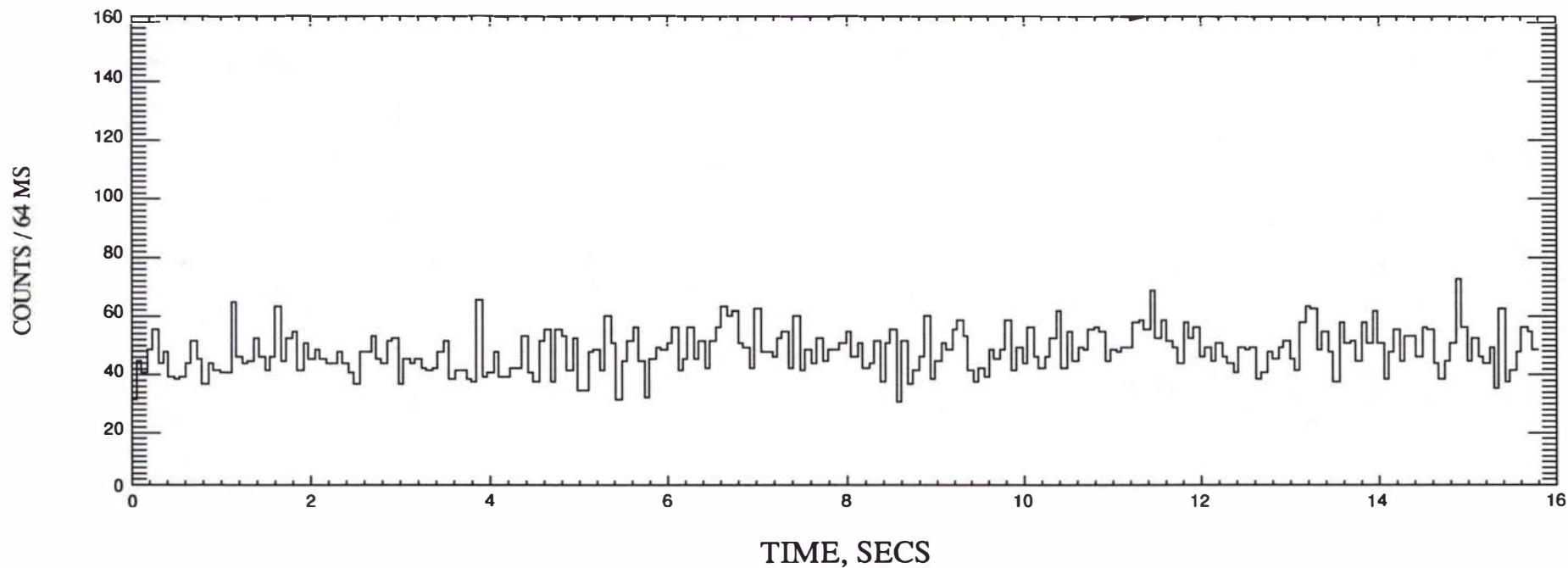


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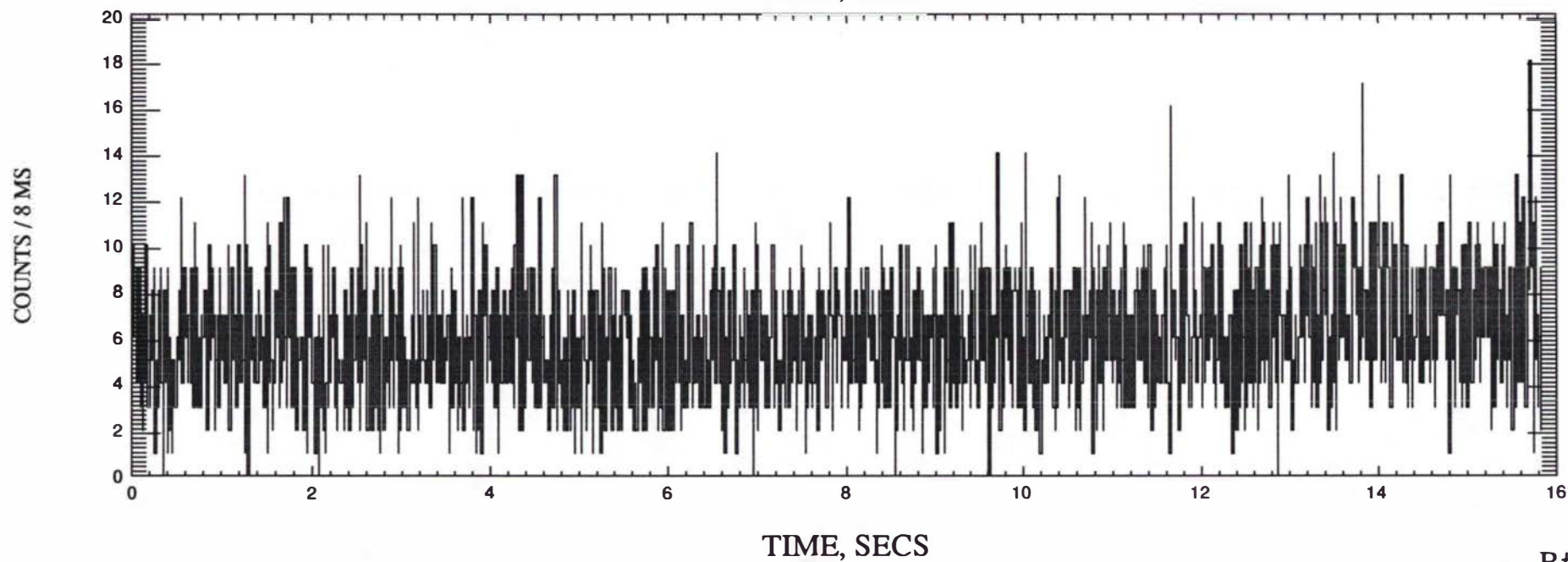
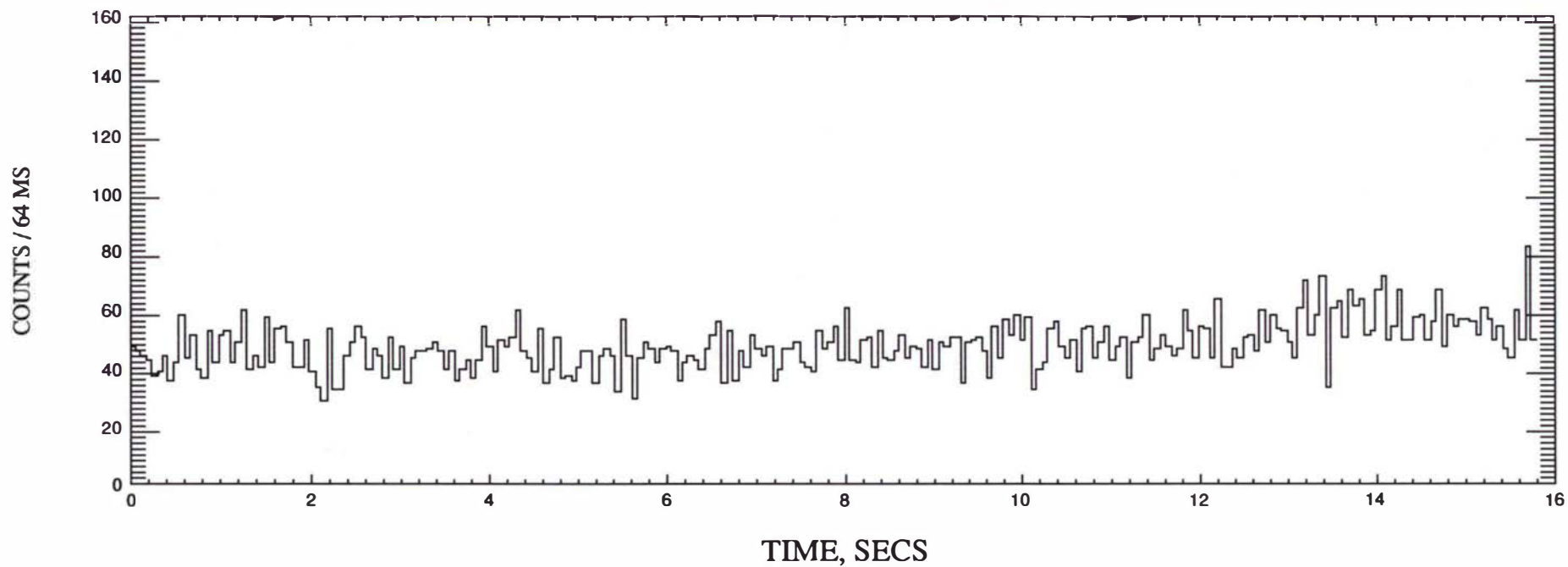
Burst Counter 15 at UT= 0.250879113939 h= 903.165 s 00:15:03.165



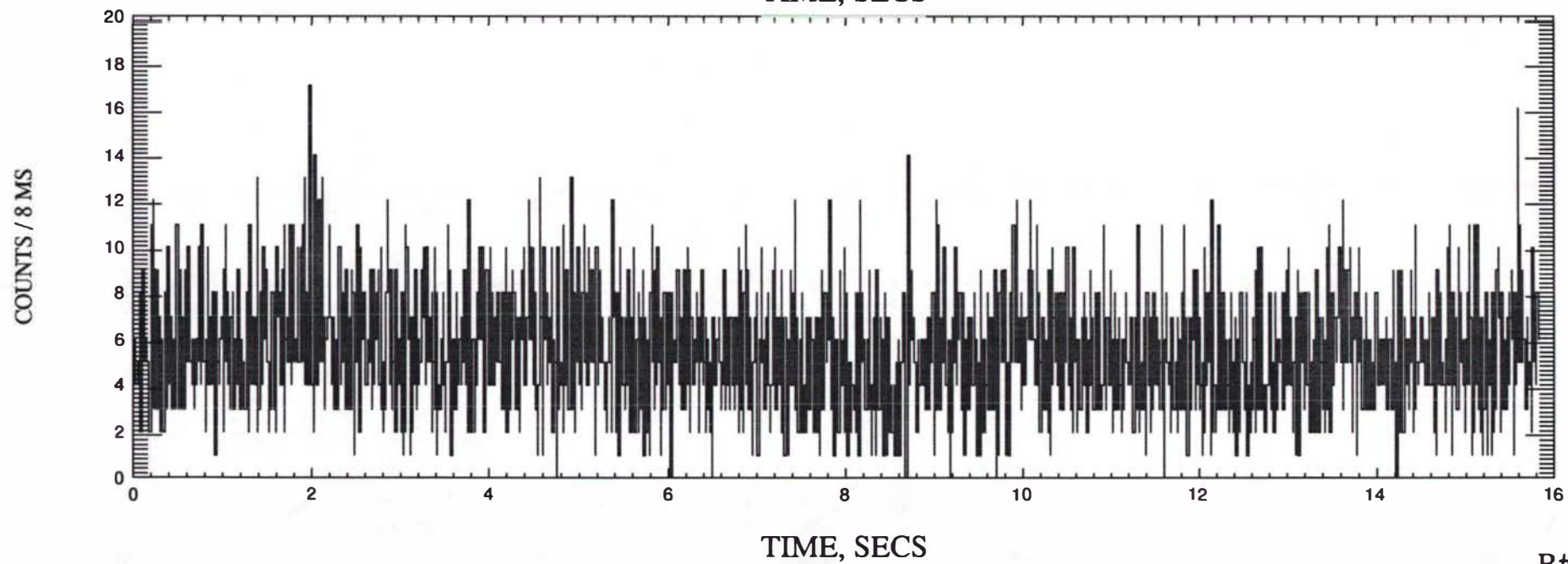
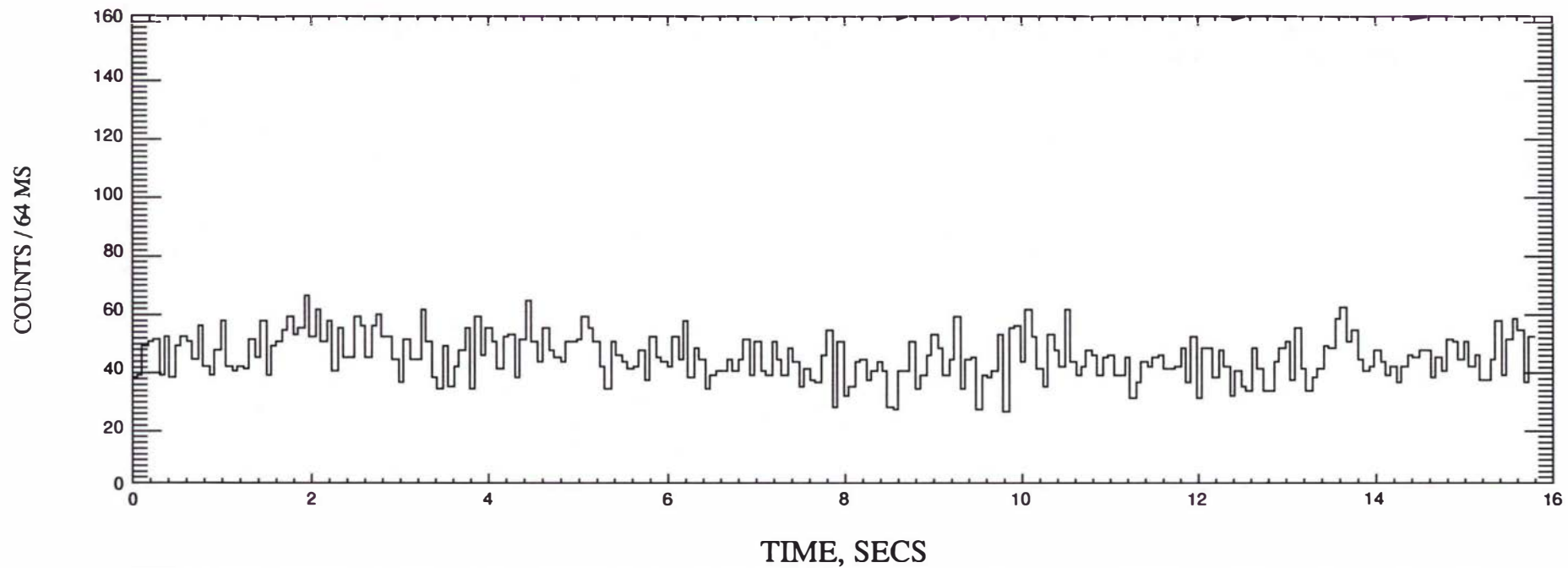
Burst Counter 0 at UT= 2.544541503059 h= 9160.349 s 02:32:40.349



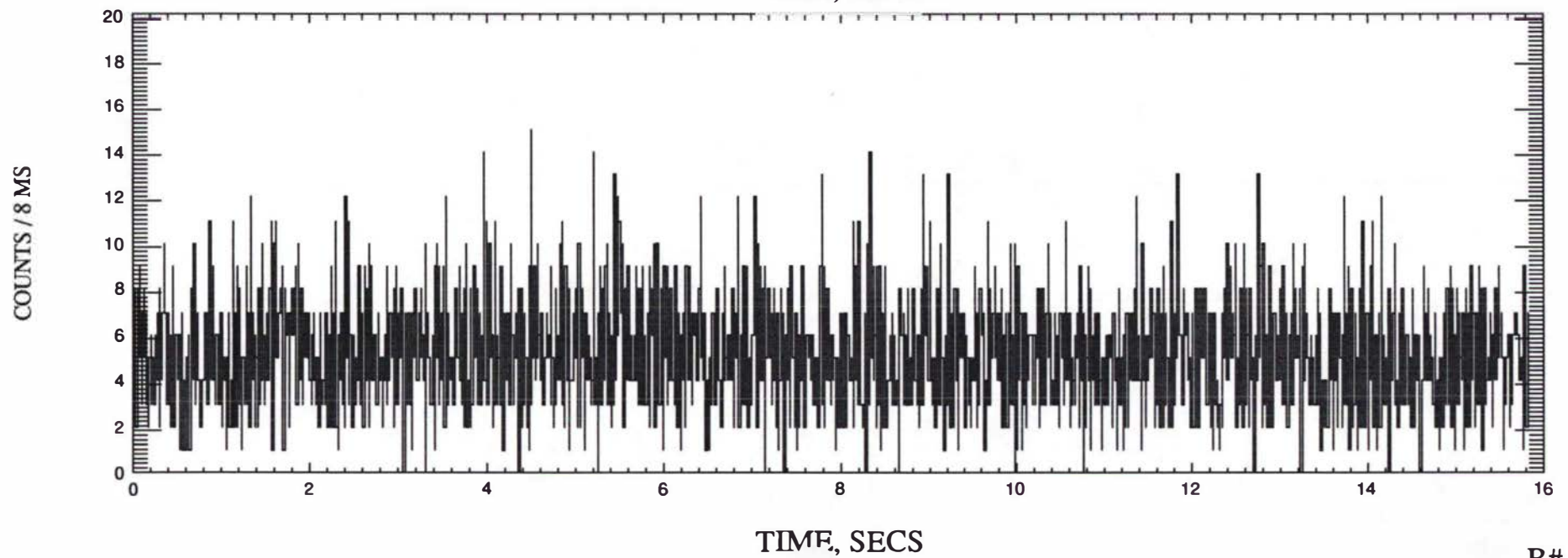
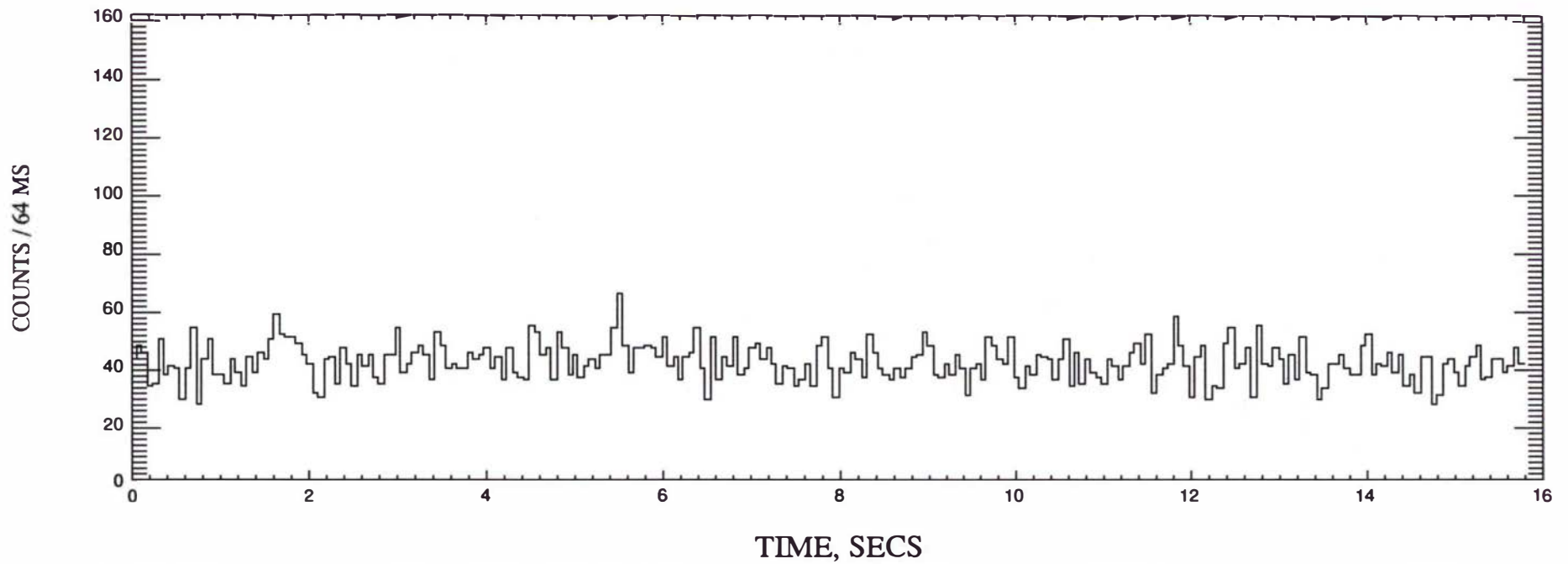
Burst Counter 1 at UT= 5.200977766249 h=18723.520 s 05:12:03.520



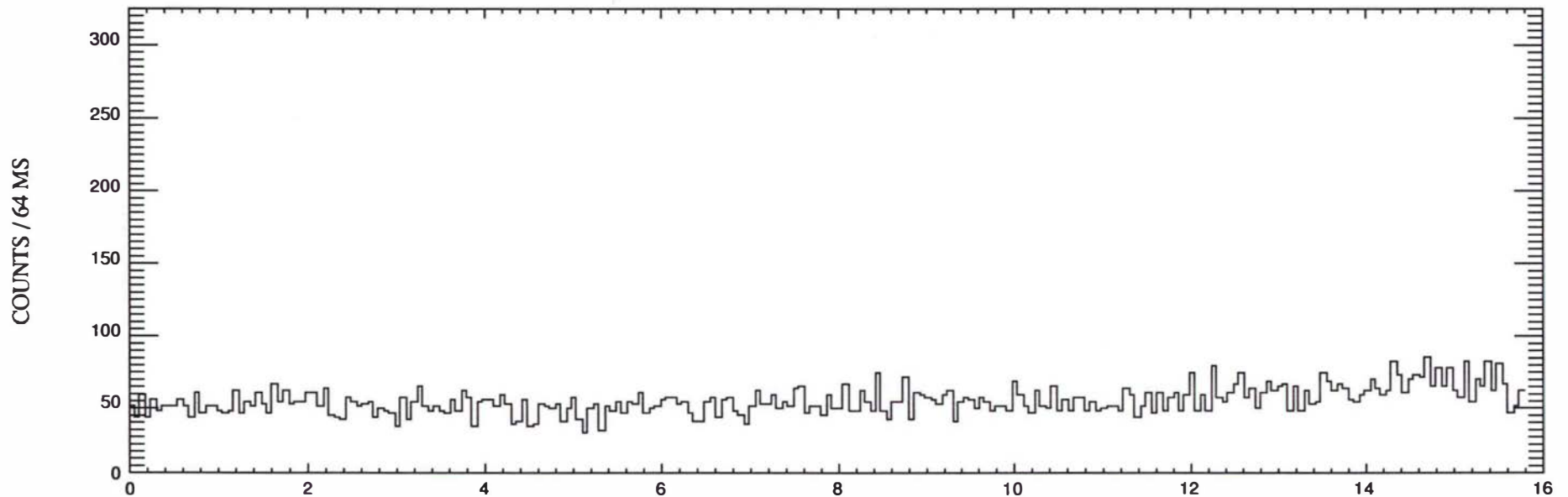
Burst Counter 2 at UT= 6.487807324727 h=23356.106 s 06:29:16.106



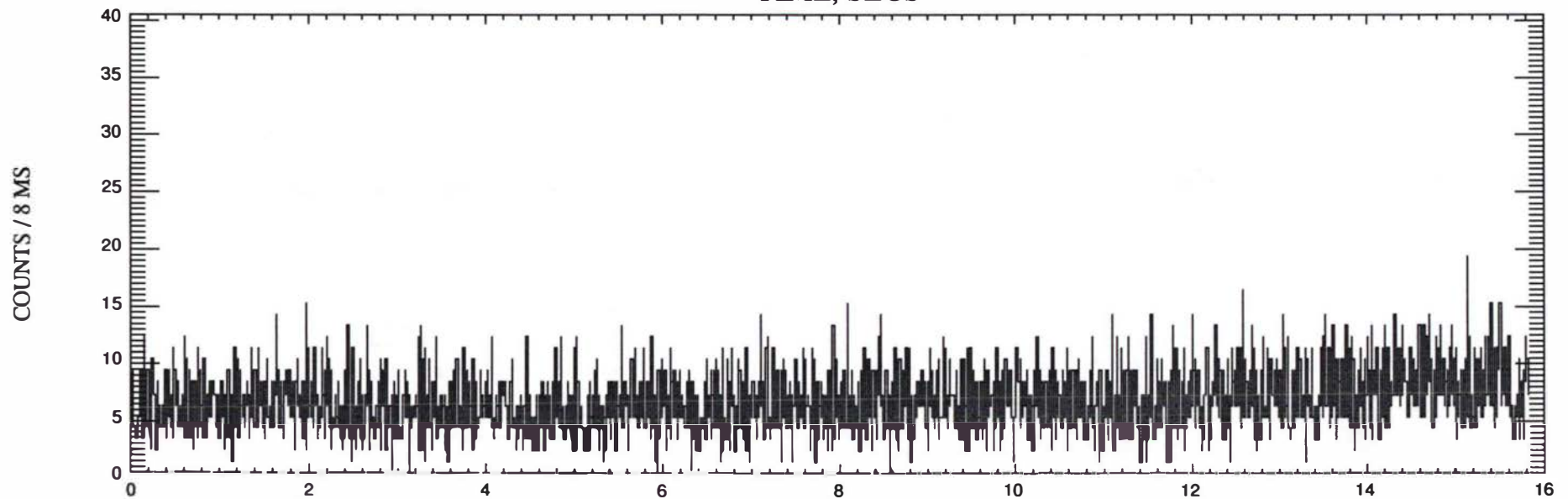
Burst Counter 3 at UT= 9.338269551595 h=33617.770 s 09:20:17.770



Burst Counter 4 at UT=17.463483556112 h=62868.541 s 17:27:48.541

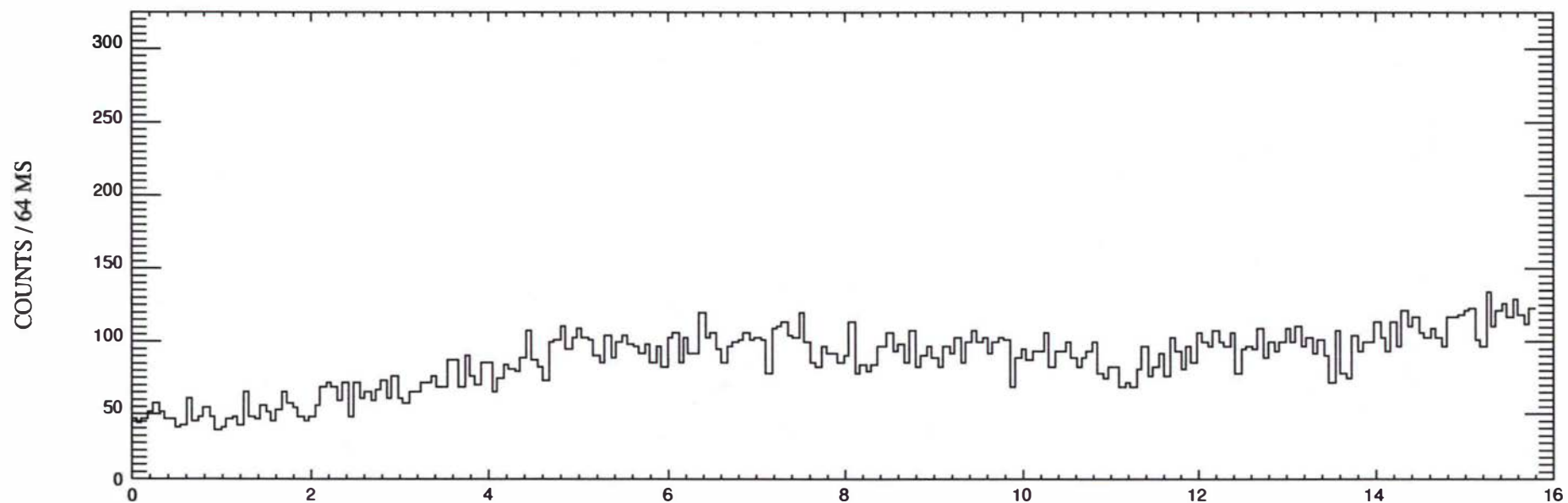


TIME, SECS

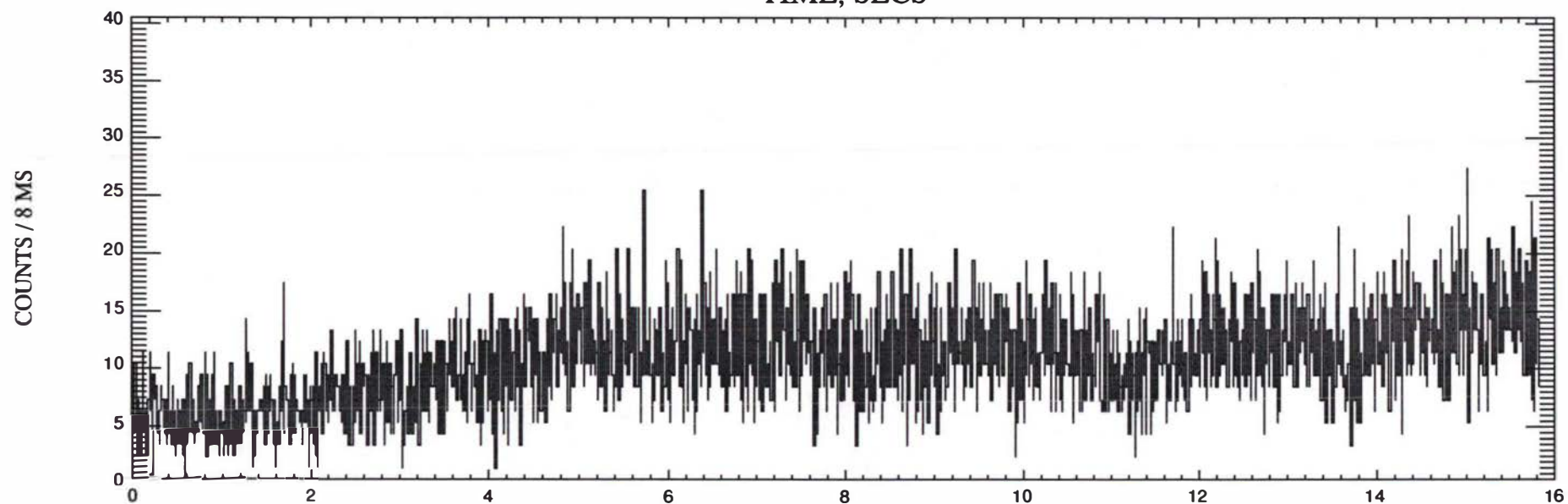


TIME, SECS

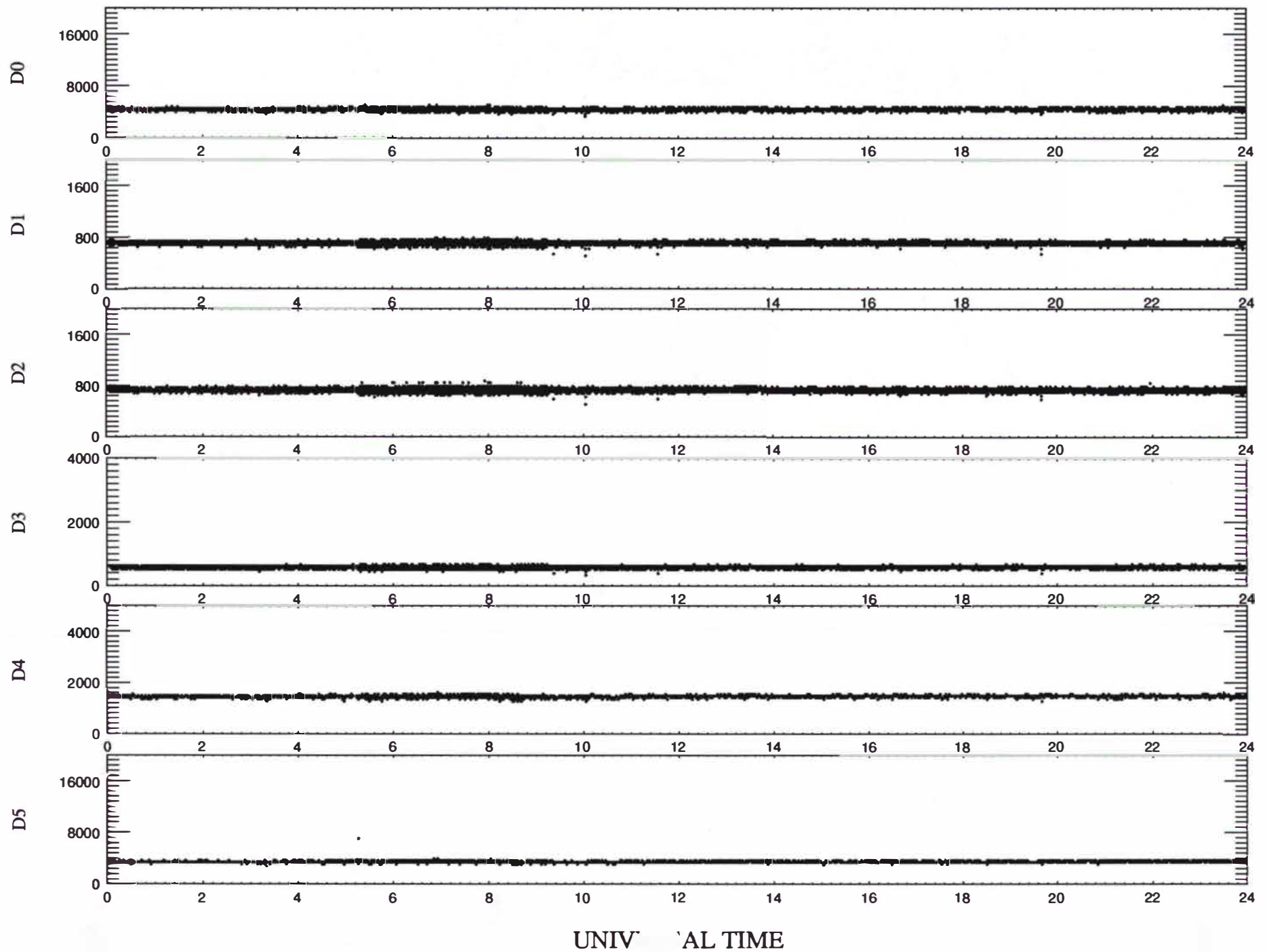
Burst Counter 5 at UT=23.604295175340 h=84975.463 s 23:36:15.463

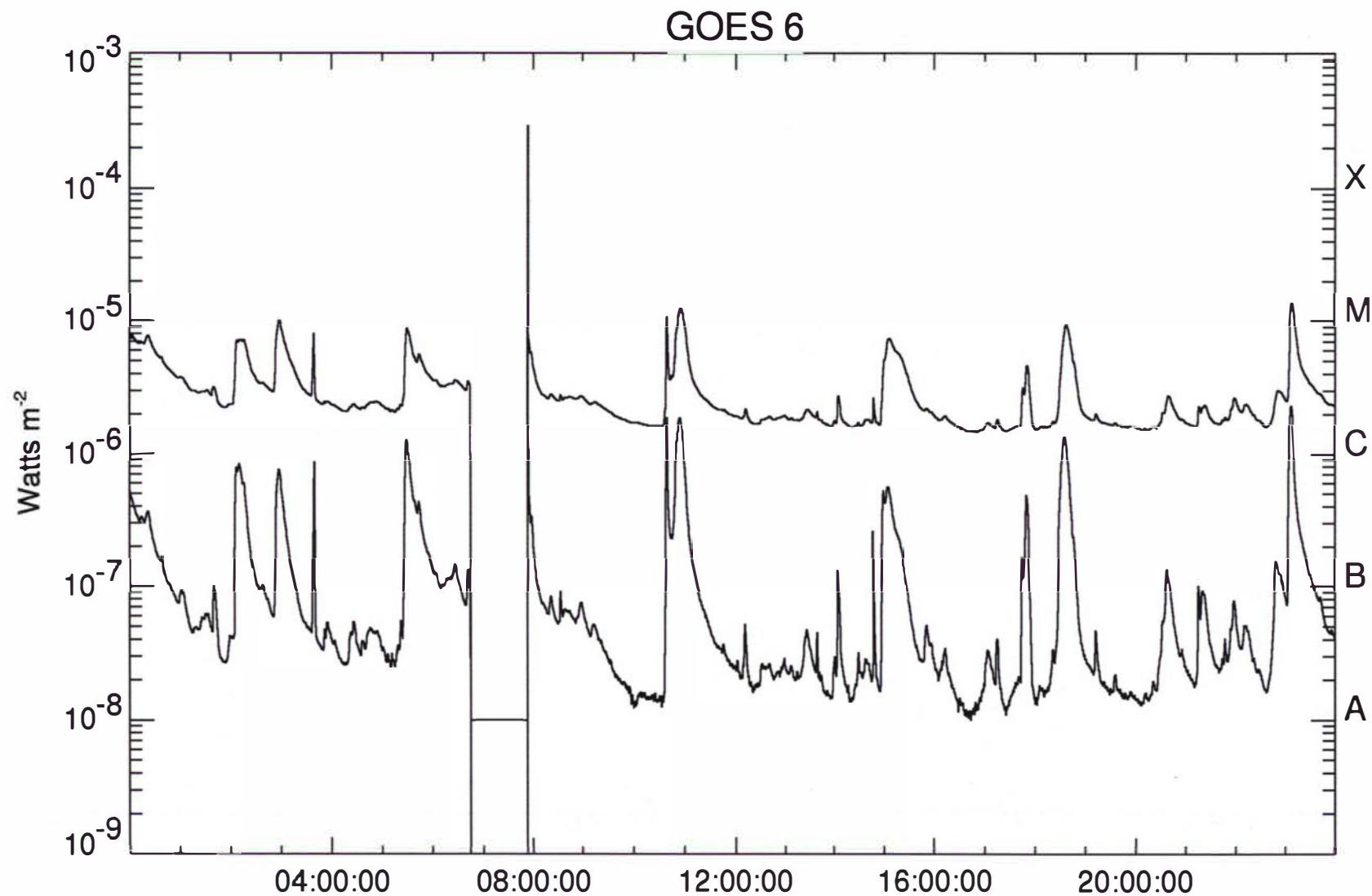


TIME, SECS



TIME, SECS





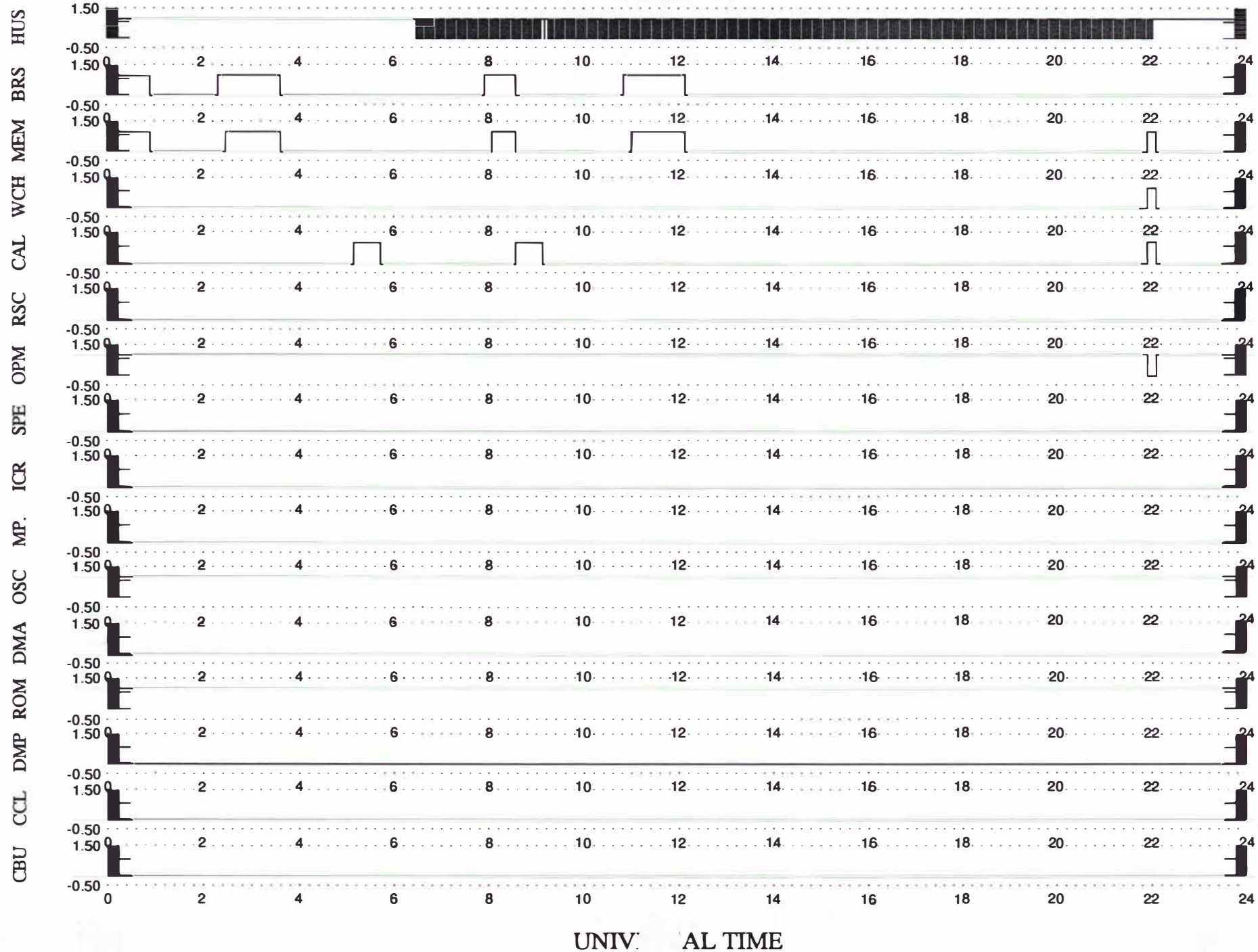
Data Start: 91/03/06, 0000:00

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

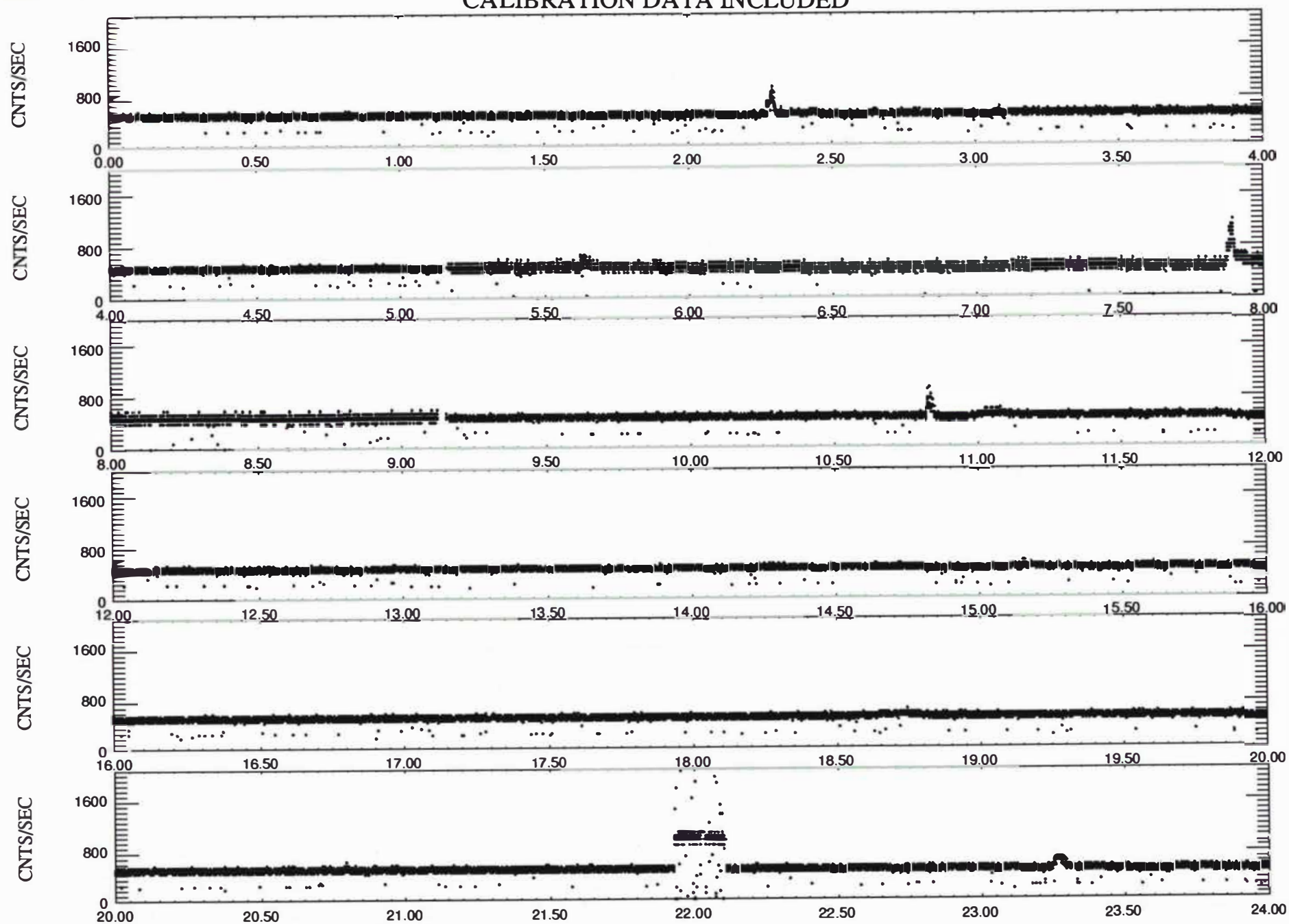
Plot created: 96/11/26, 1815

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 6 - 8

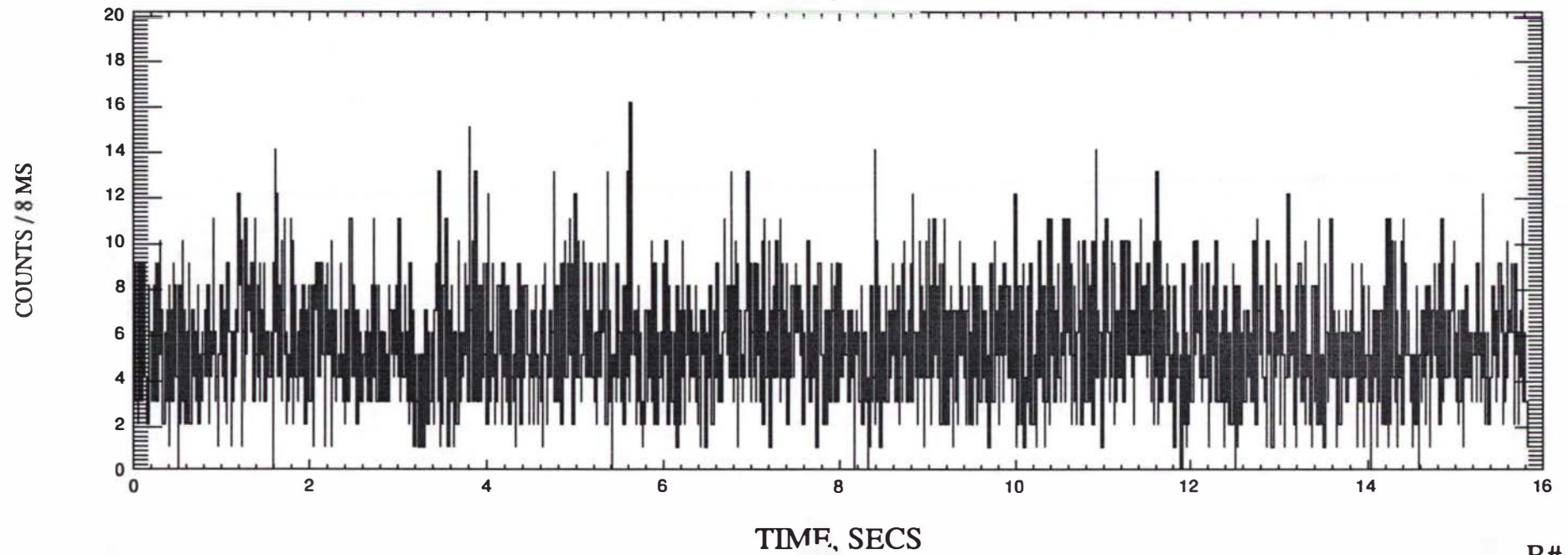
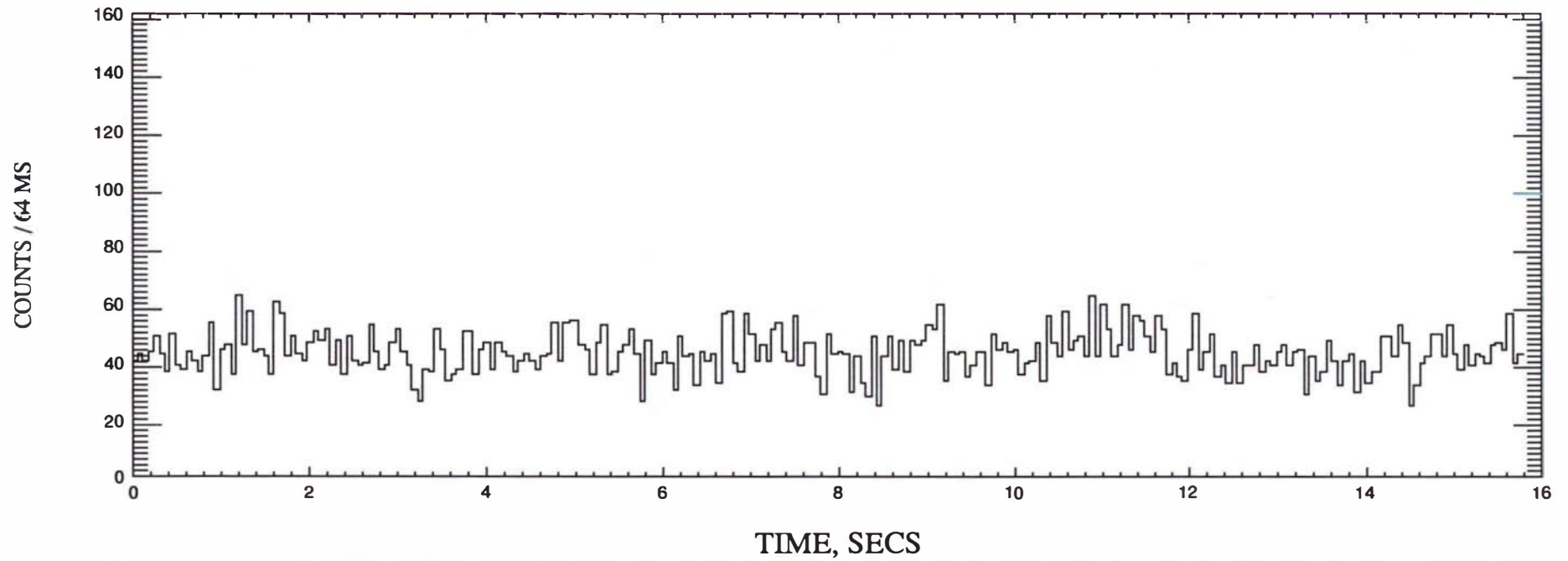


CALIBRATION DATA INCLUDED

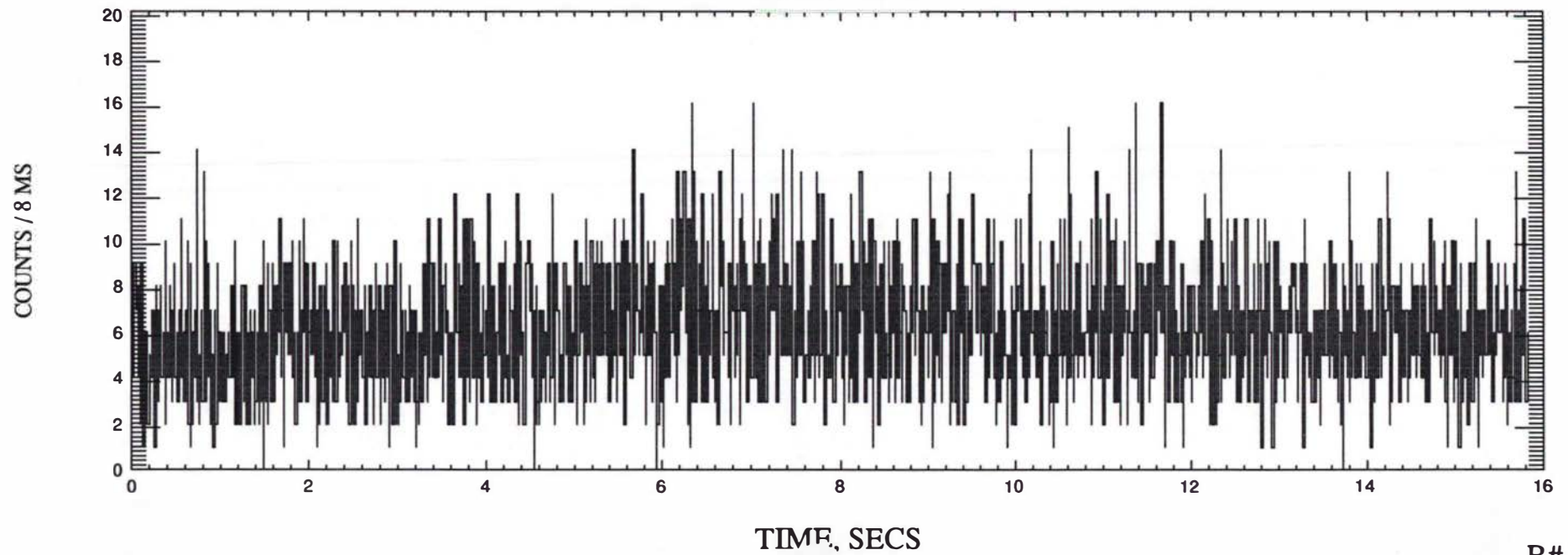
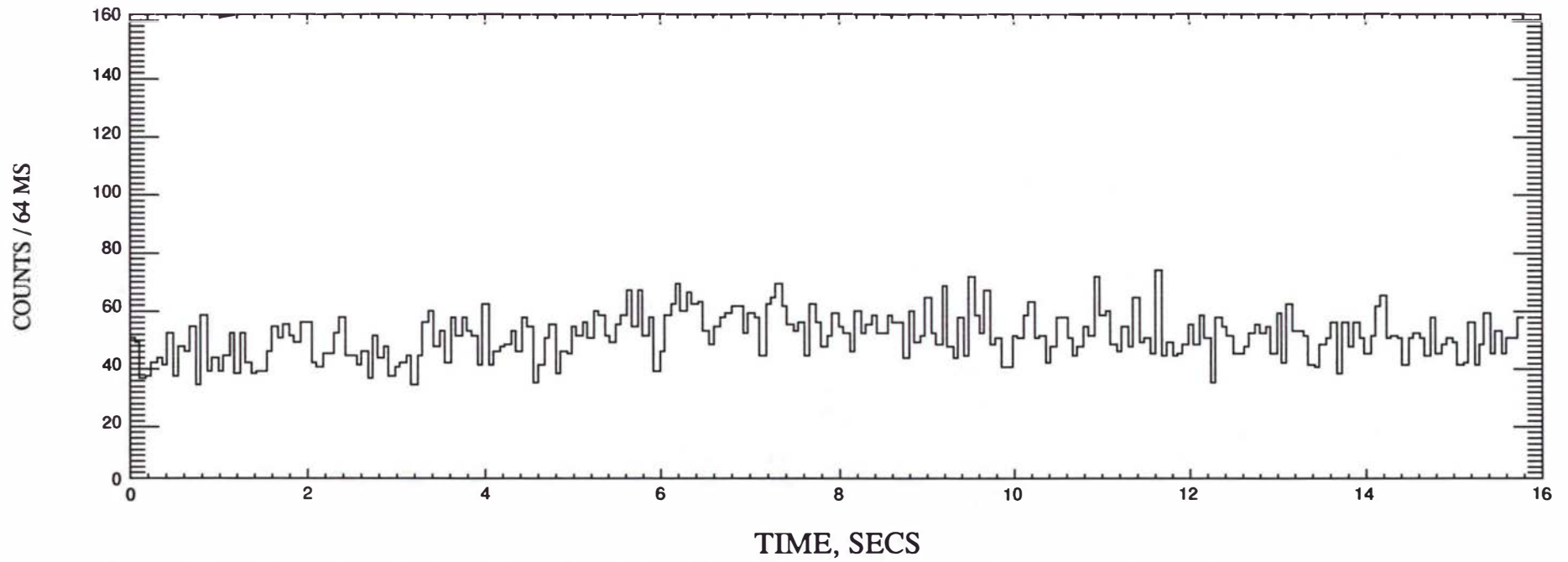


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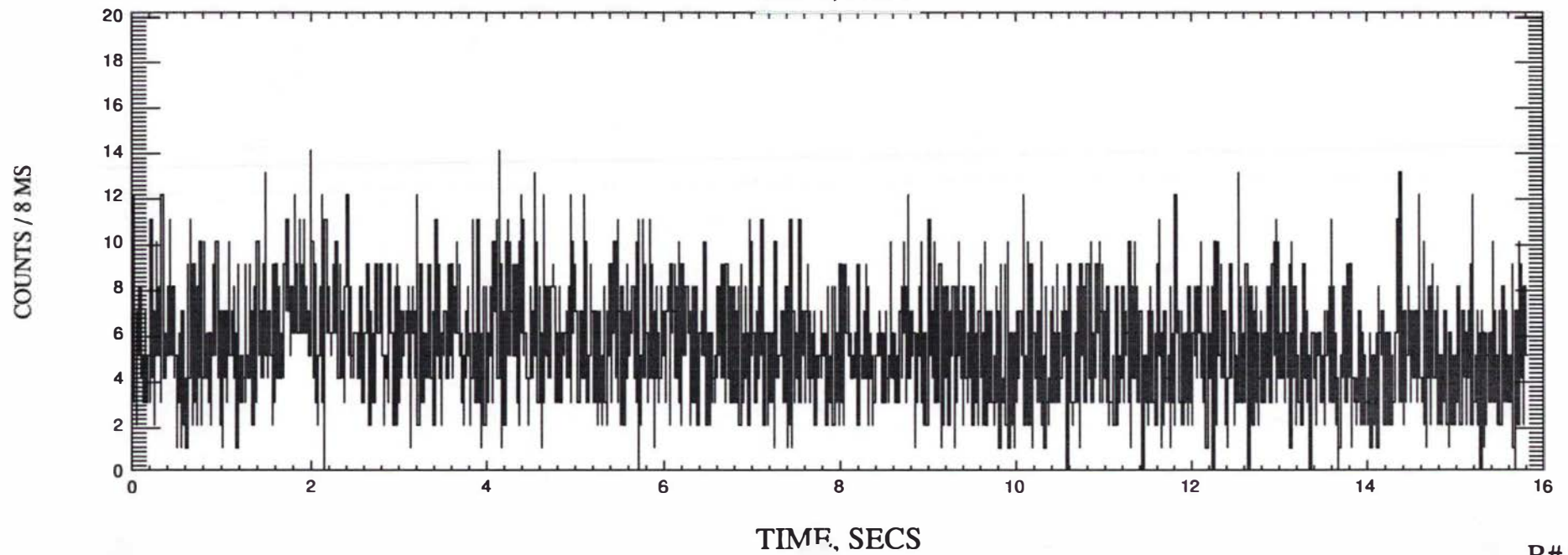
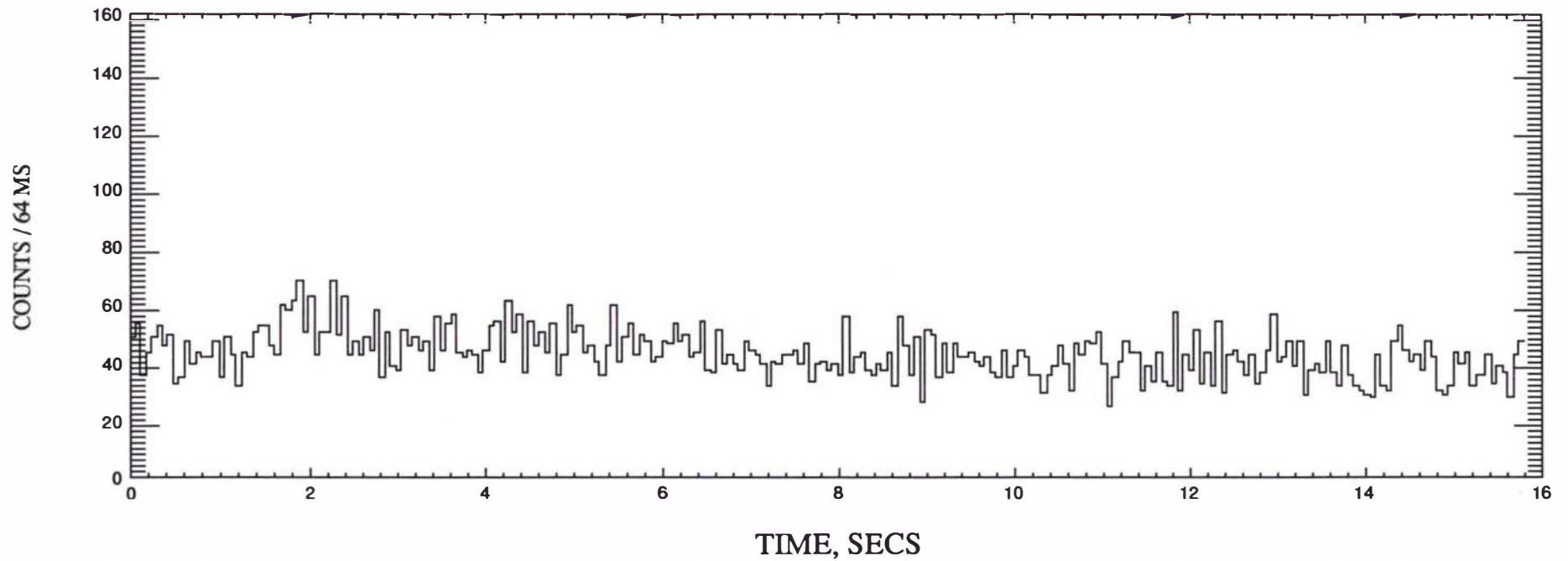
Burst Counter 6 at UT= 2.282190085517 h= 8215.884 s 02:16:55.884

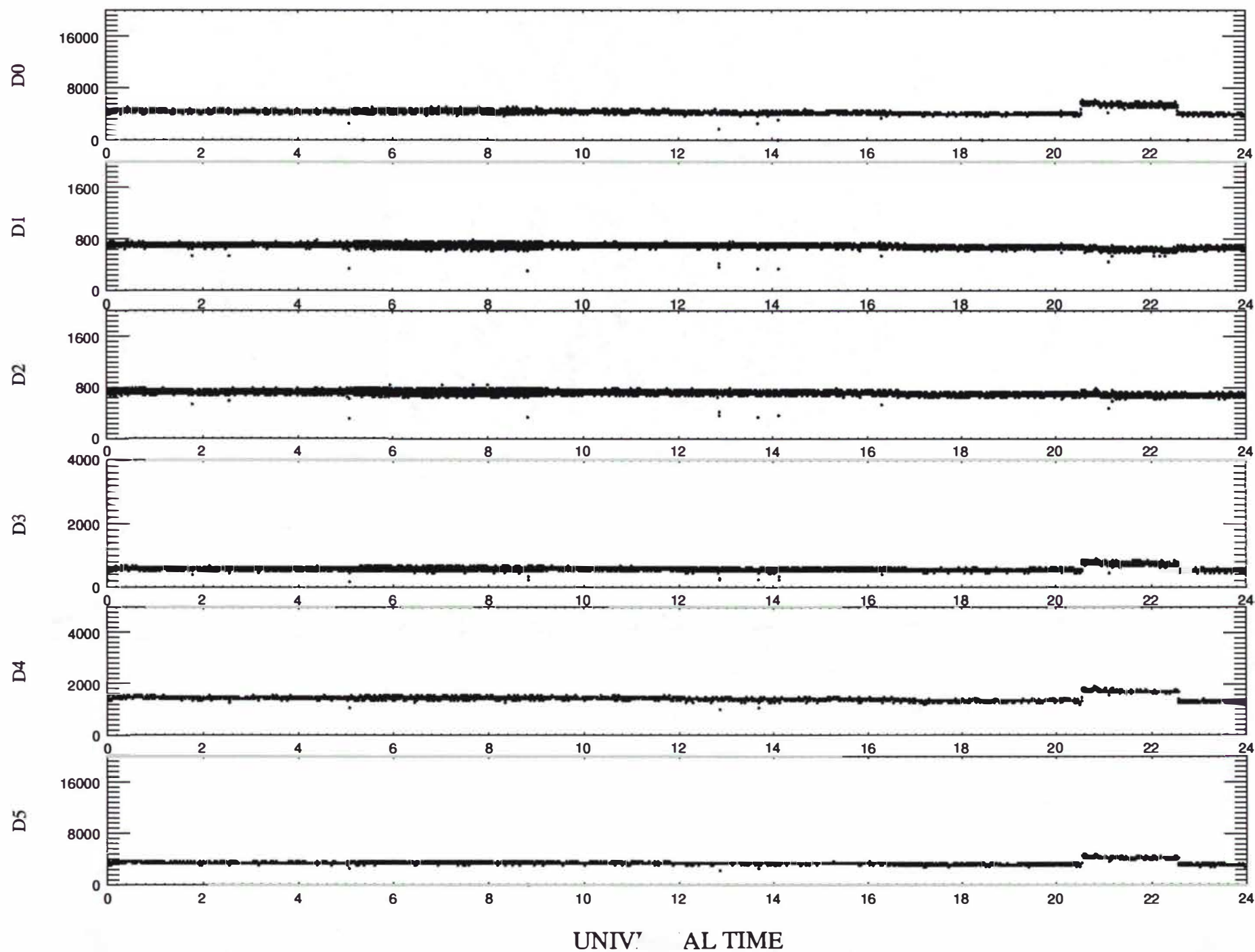


Burst Counter 7 at UT= 7.873058607313 h=28343.011 s 07:52:23.011

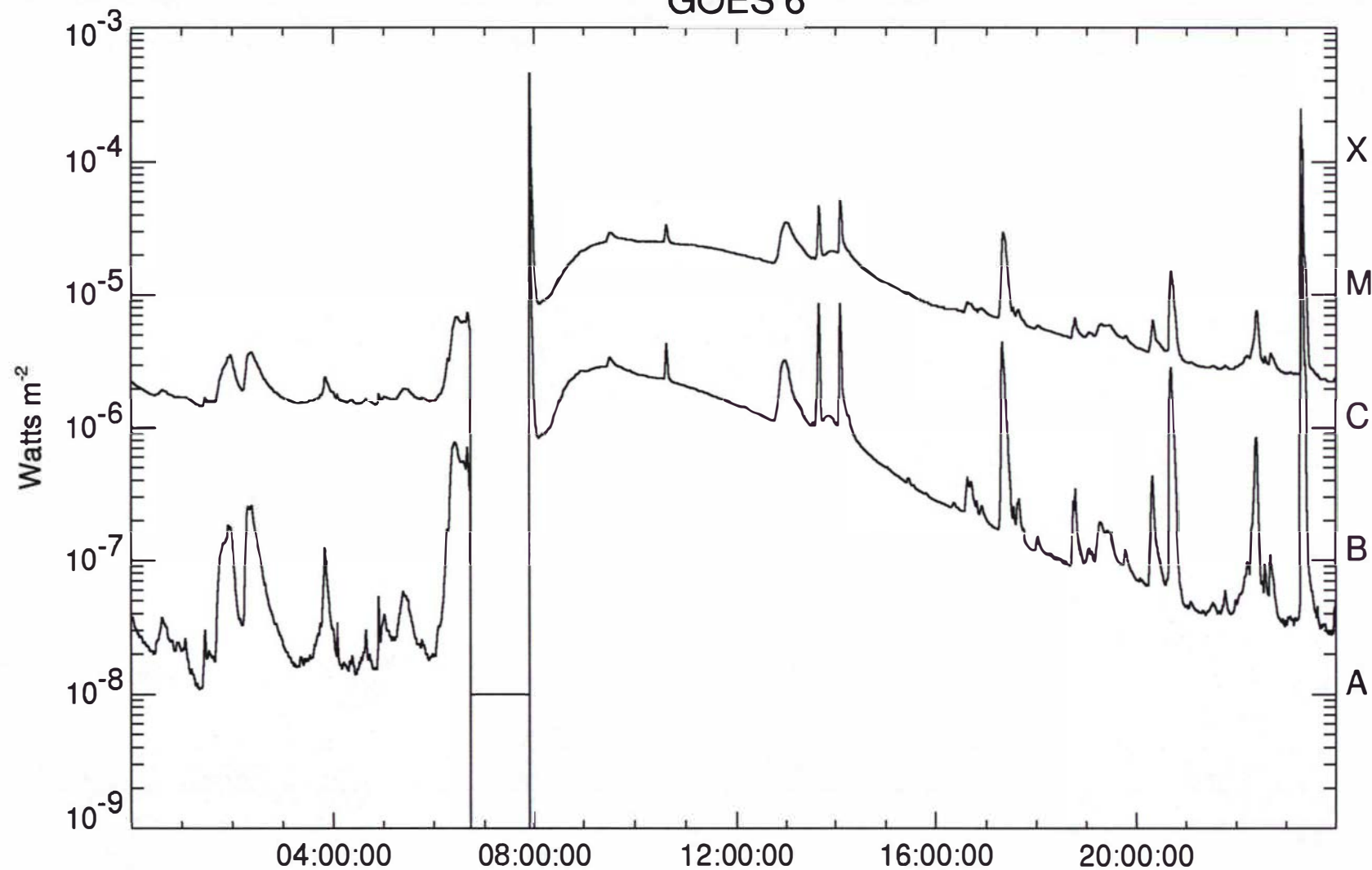


Burst Counter 8 at UT=10.821786321004 h=38958.431 s 10:49:18.431





GOES 6



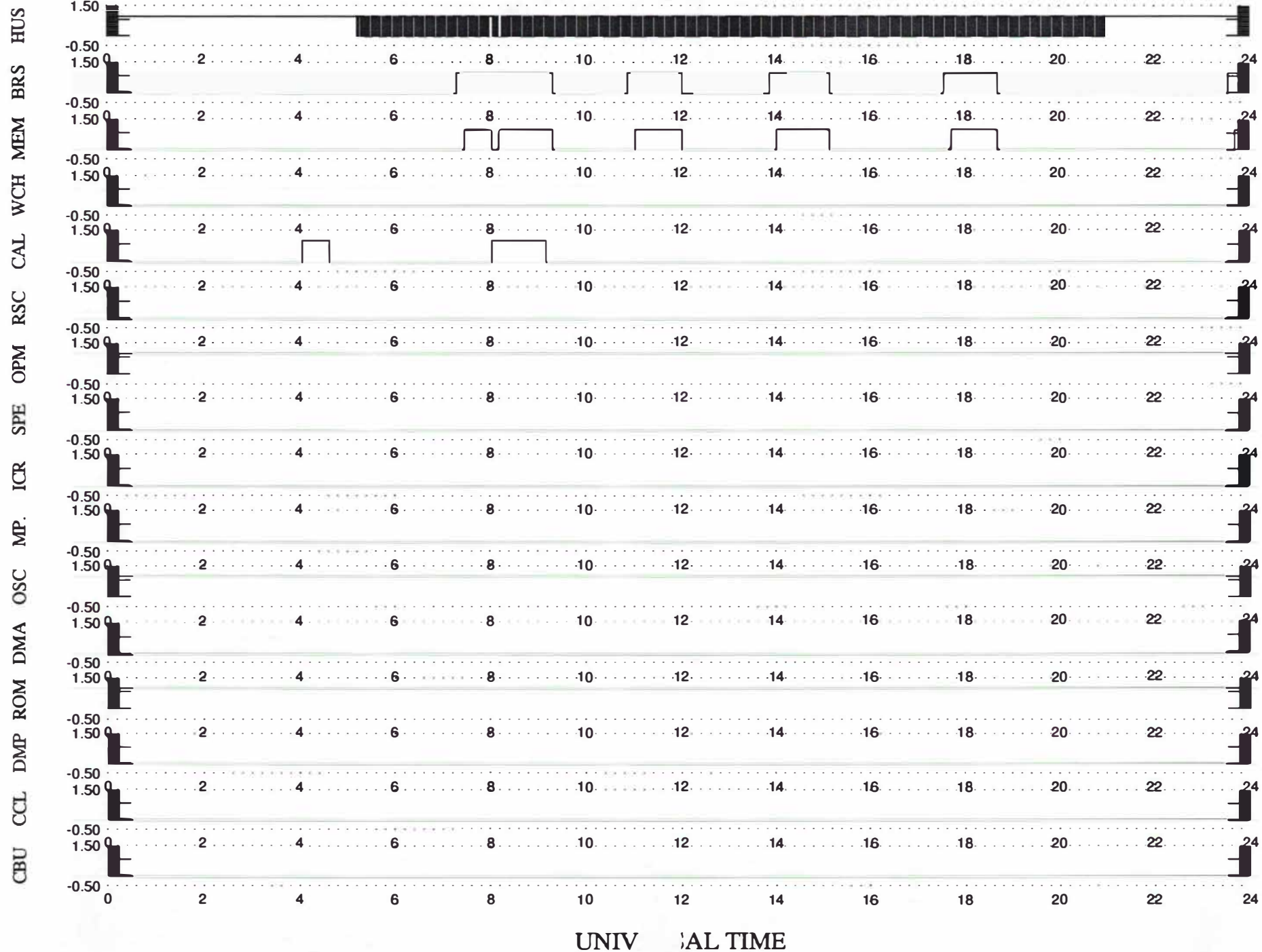
Data Start: 91/03/07, 0000:01

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

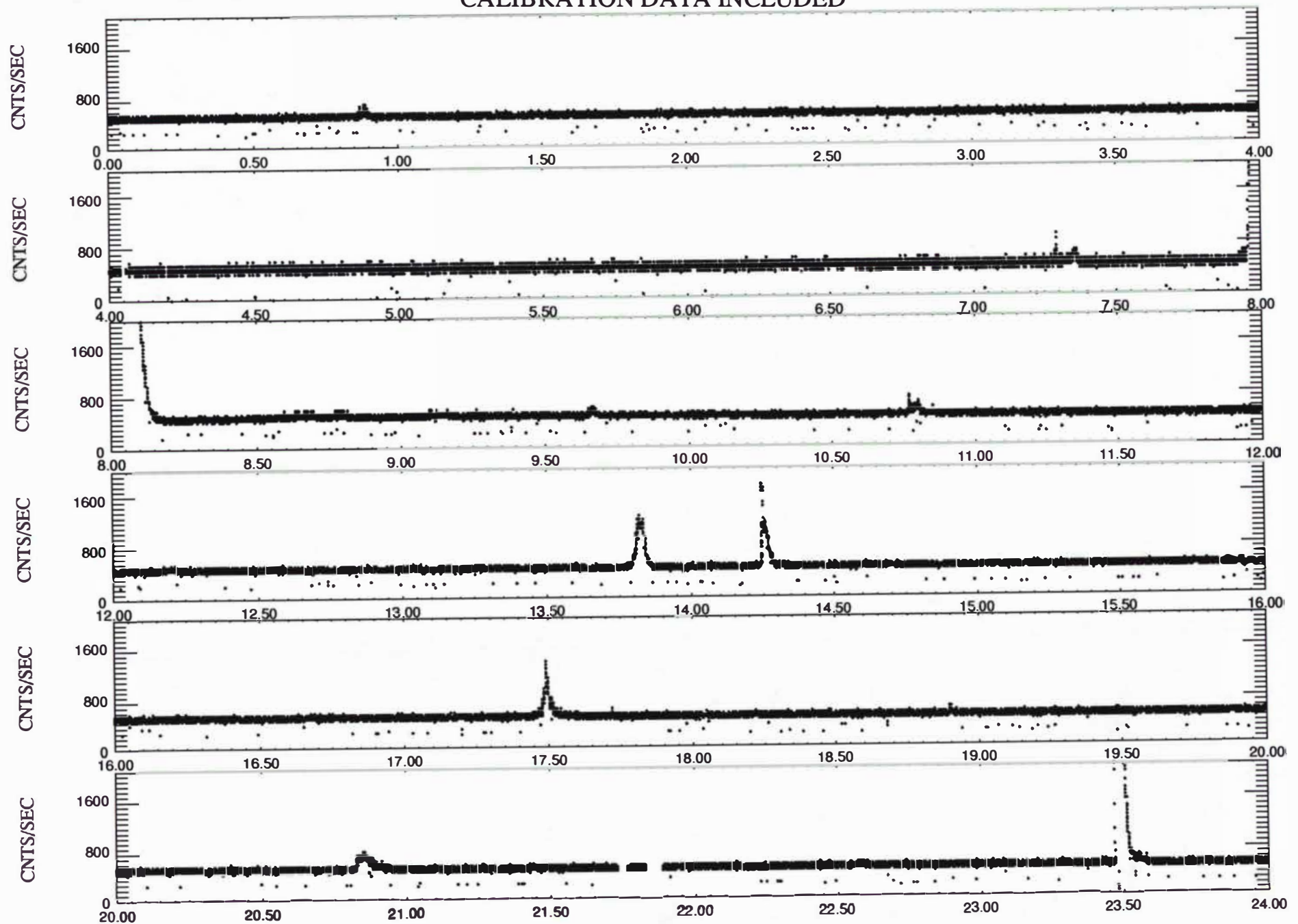
Plot created: 96/11/26, 1817

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 9 - 14

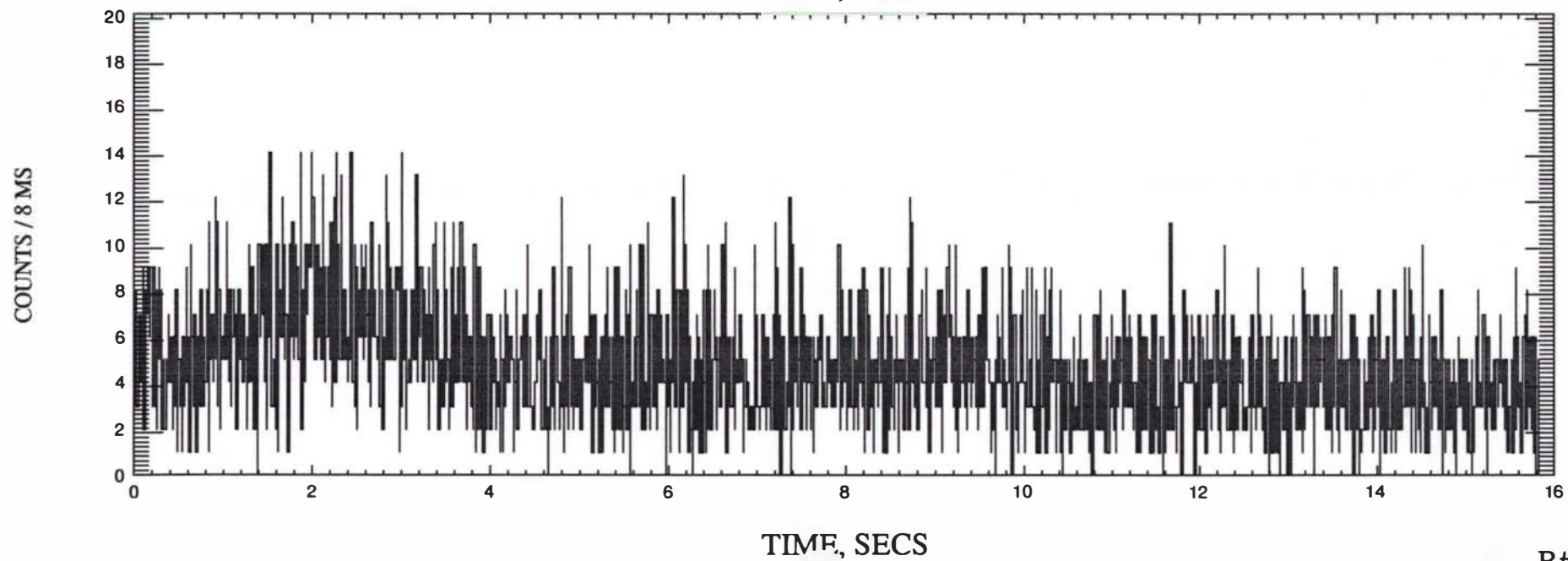
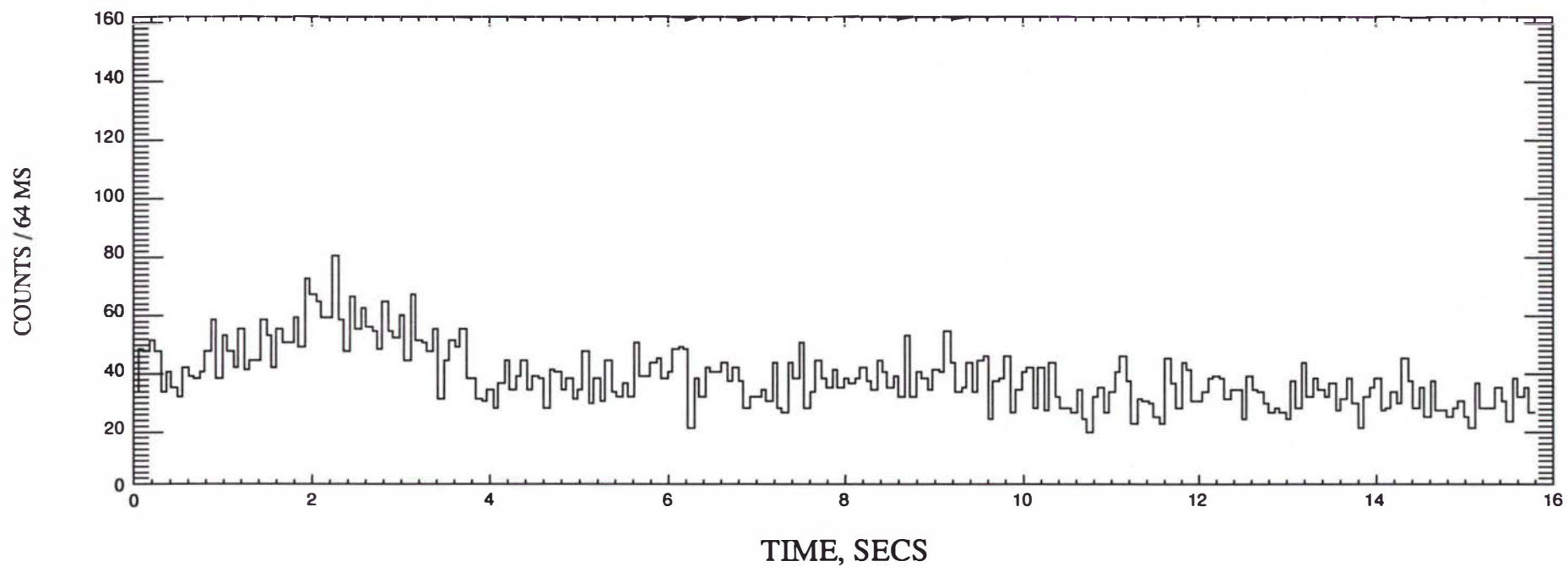


CALIBRATION DATA INCLUDED

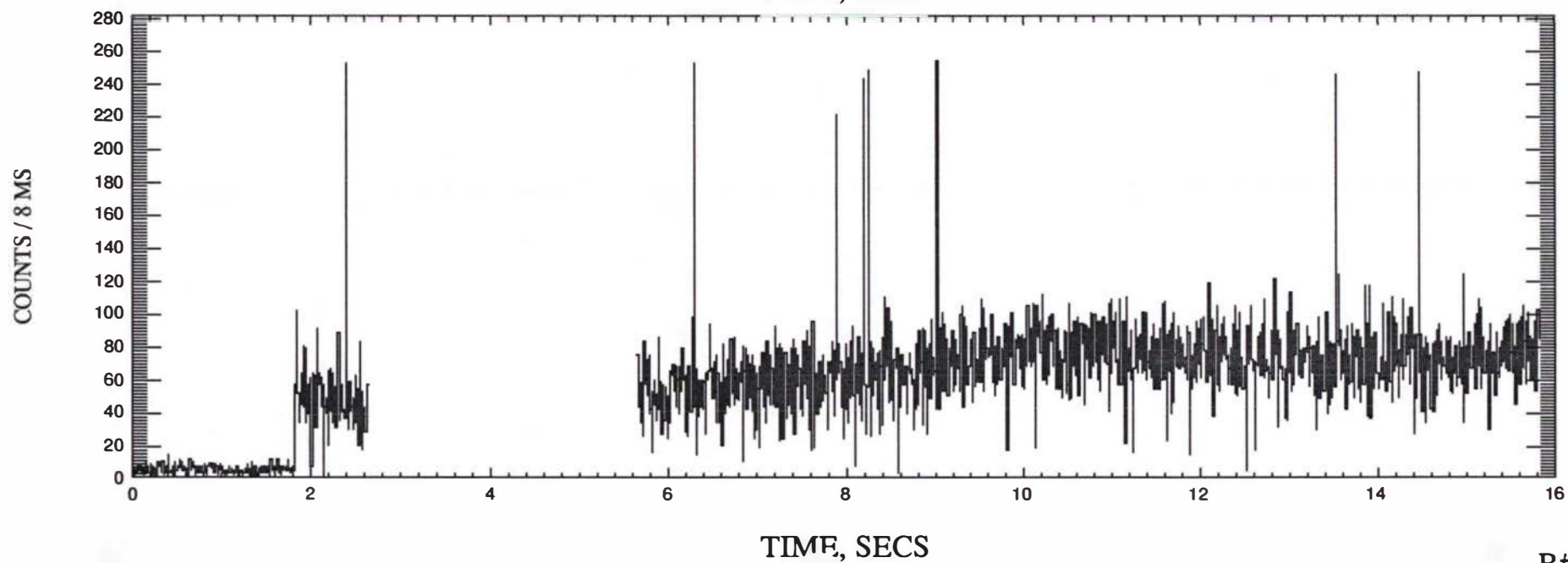
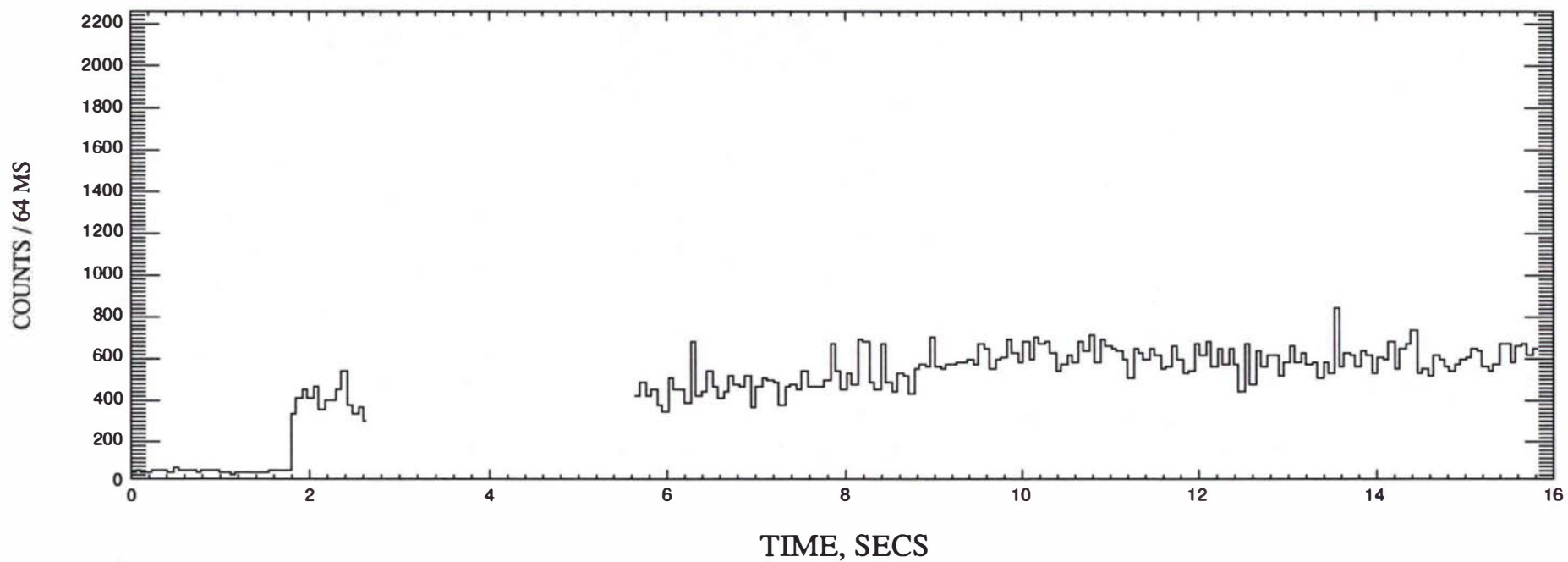


UNIV 'AL TIME

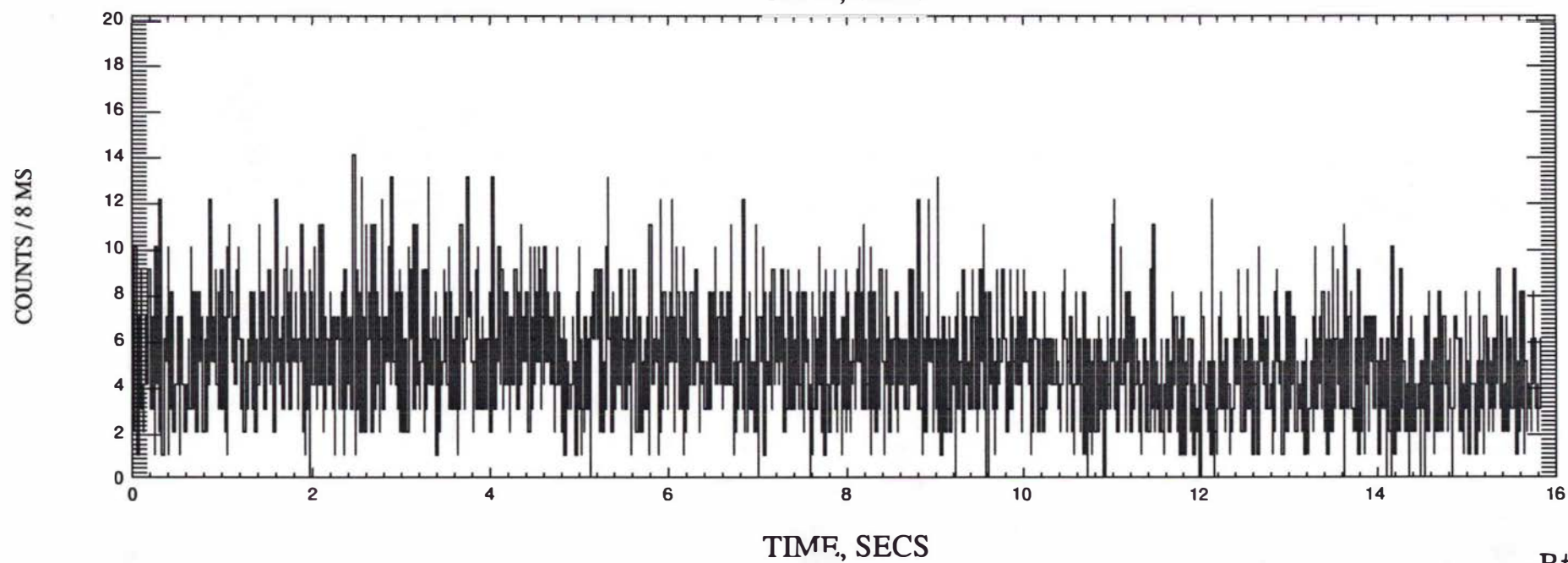
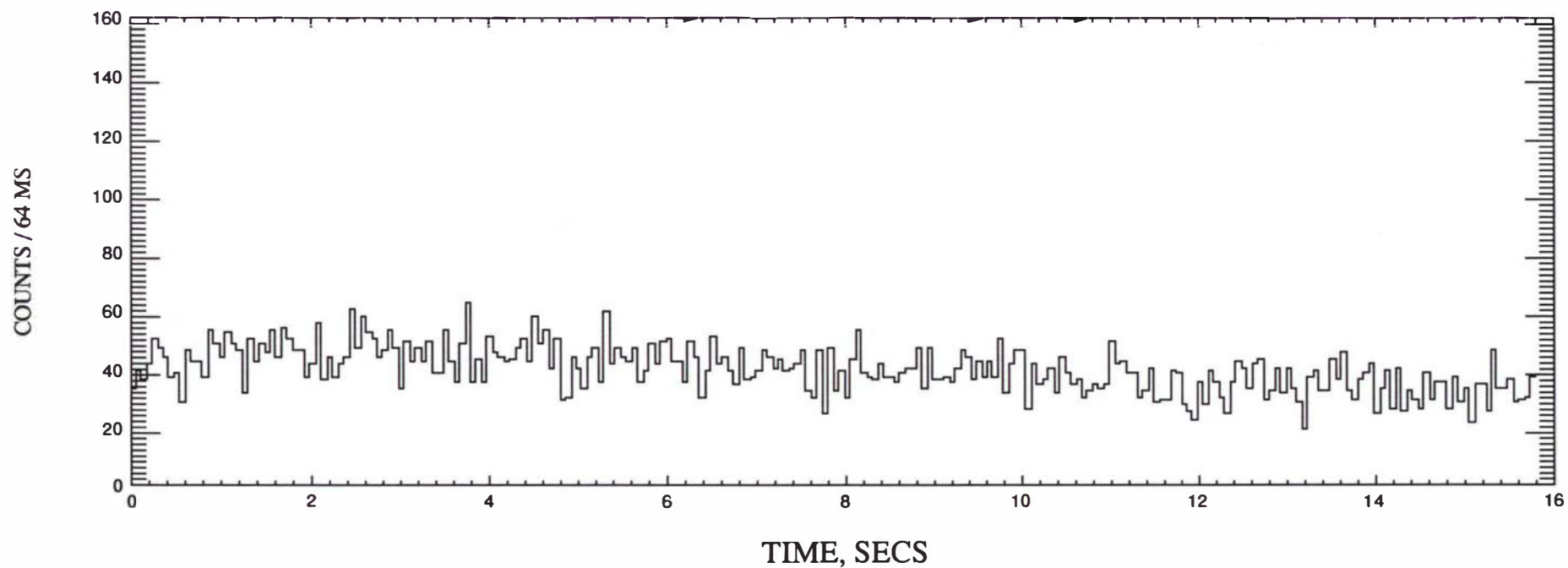
Burst Counter 9 at UT= 7.288492440118 h=26238.573 s 07:17:18.573



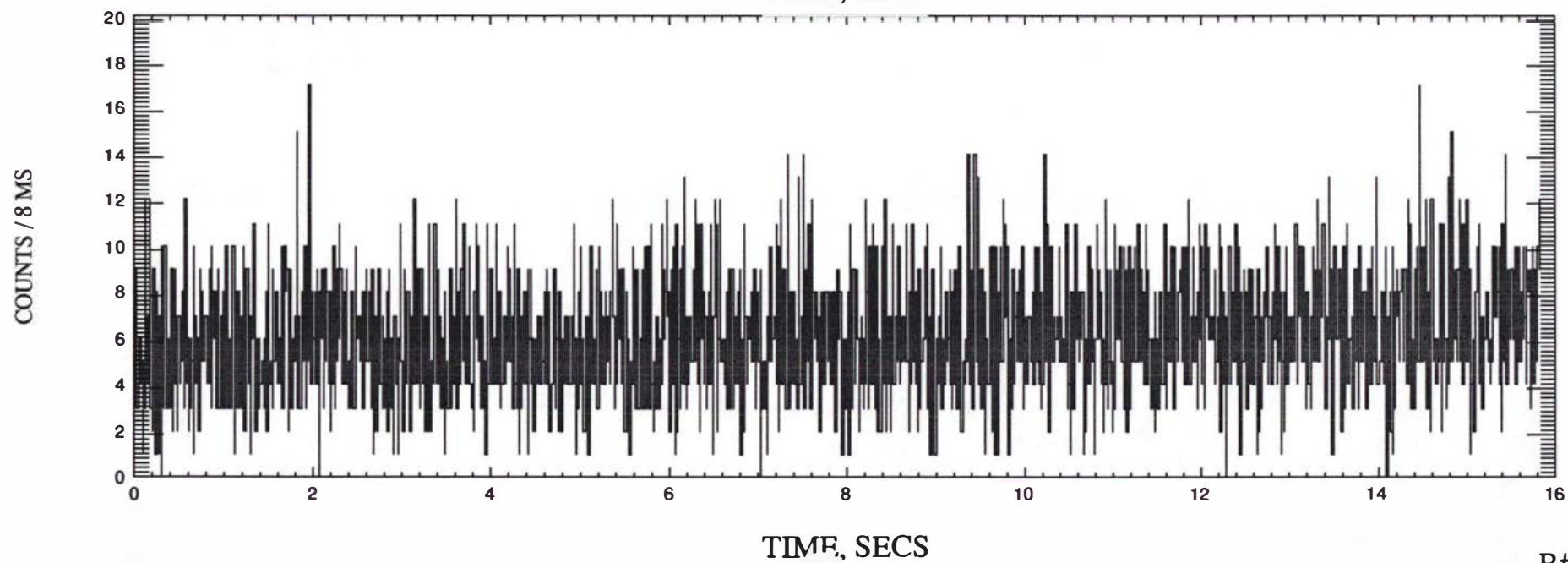
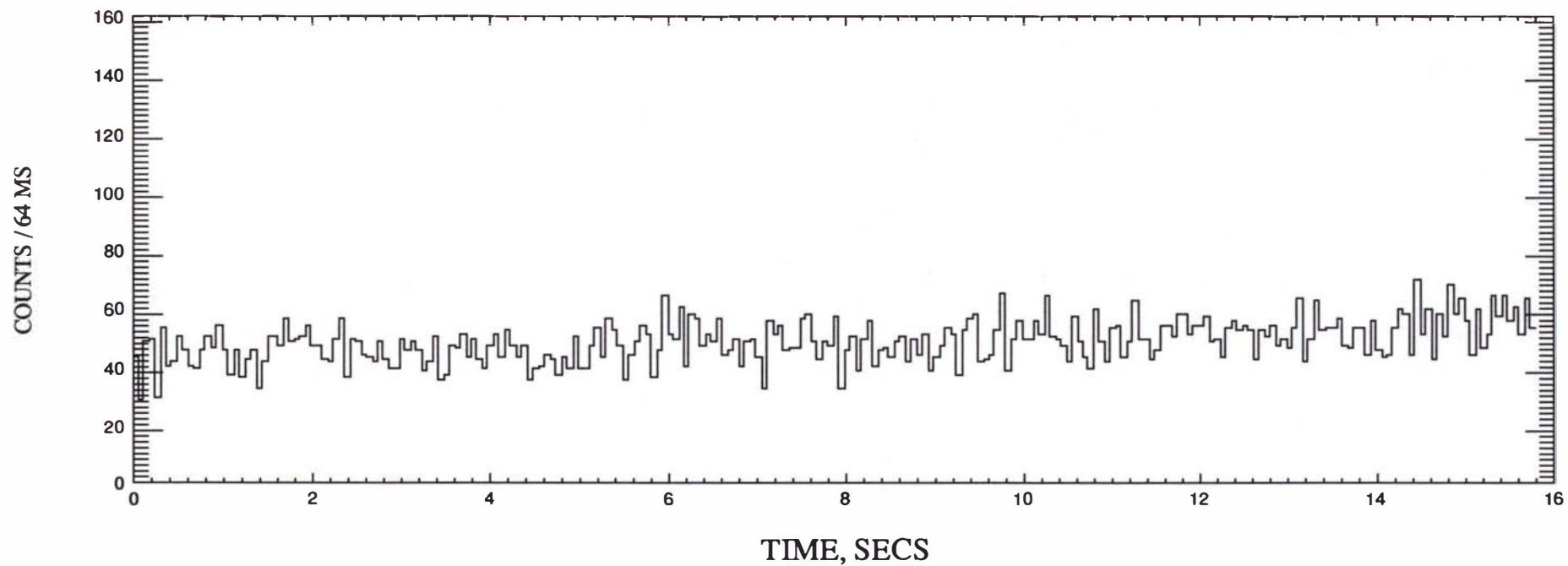
Burst Counter 10 at UT= 7.990104950799 h=28764.378 s 07:59:24.378



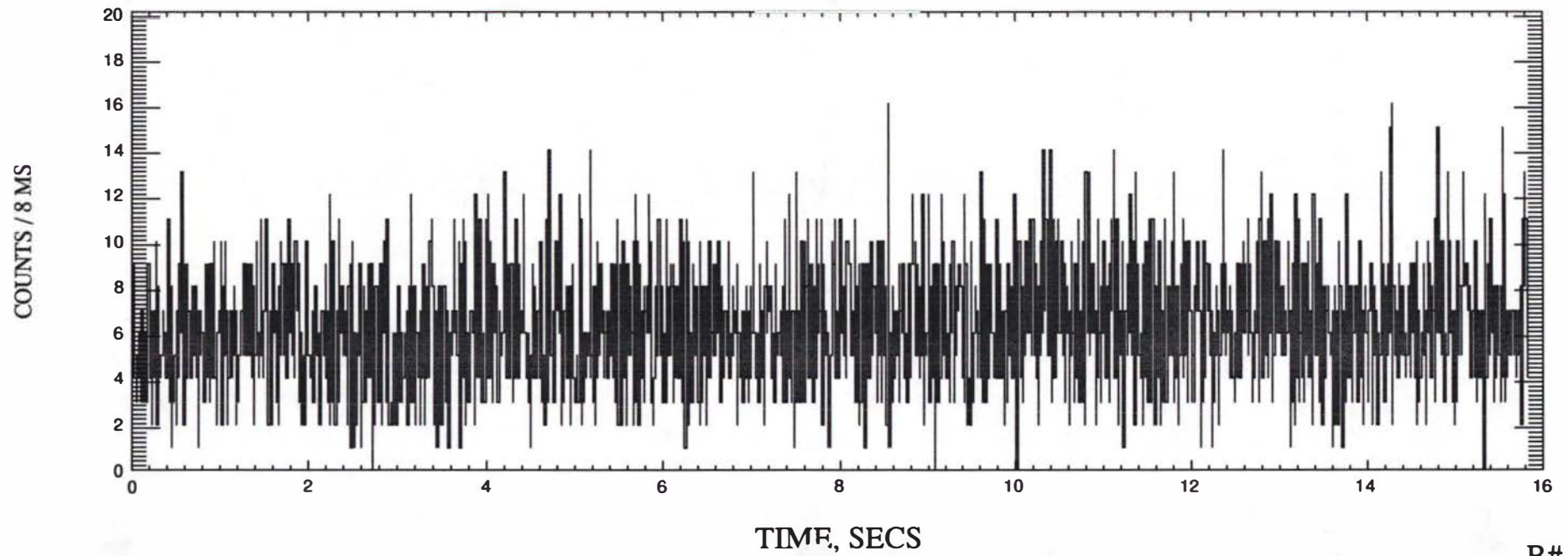
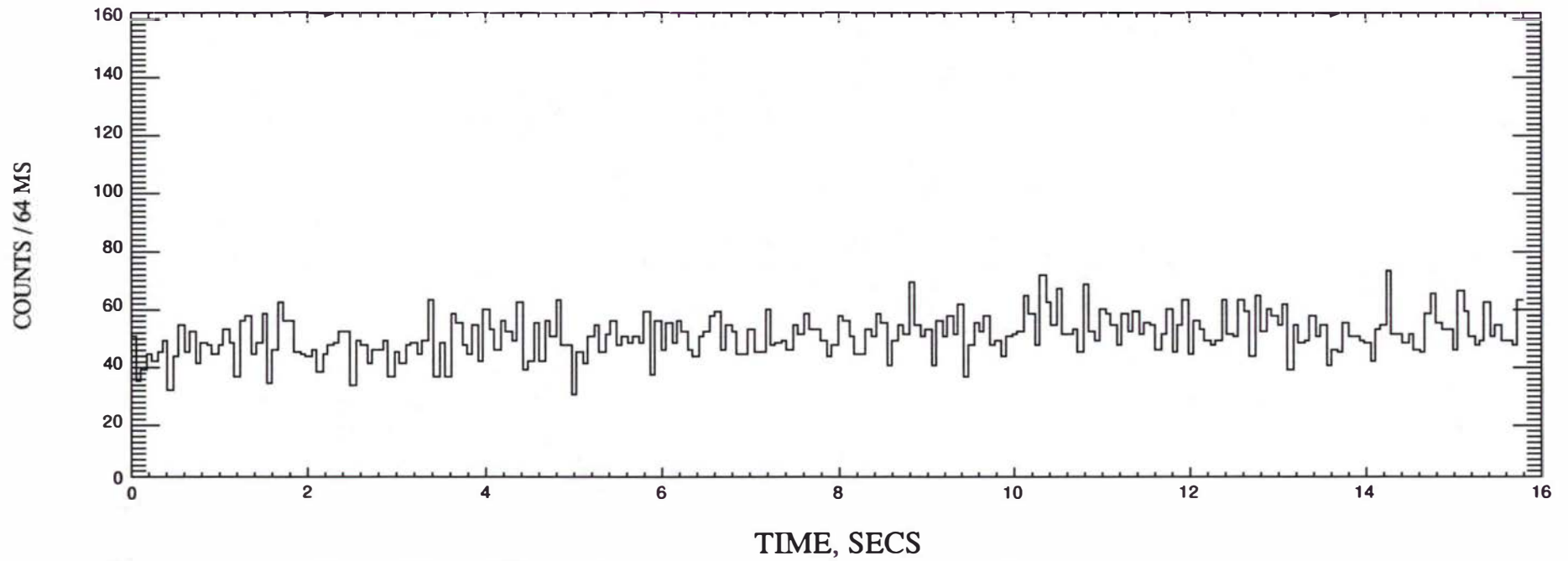
Burst Counter 11 at UT=10.764316808912 h=38751.541 s 10:45:51.541



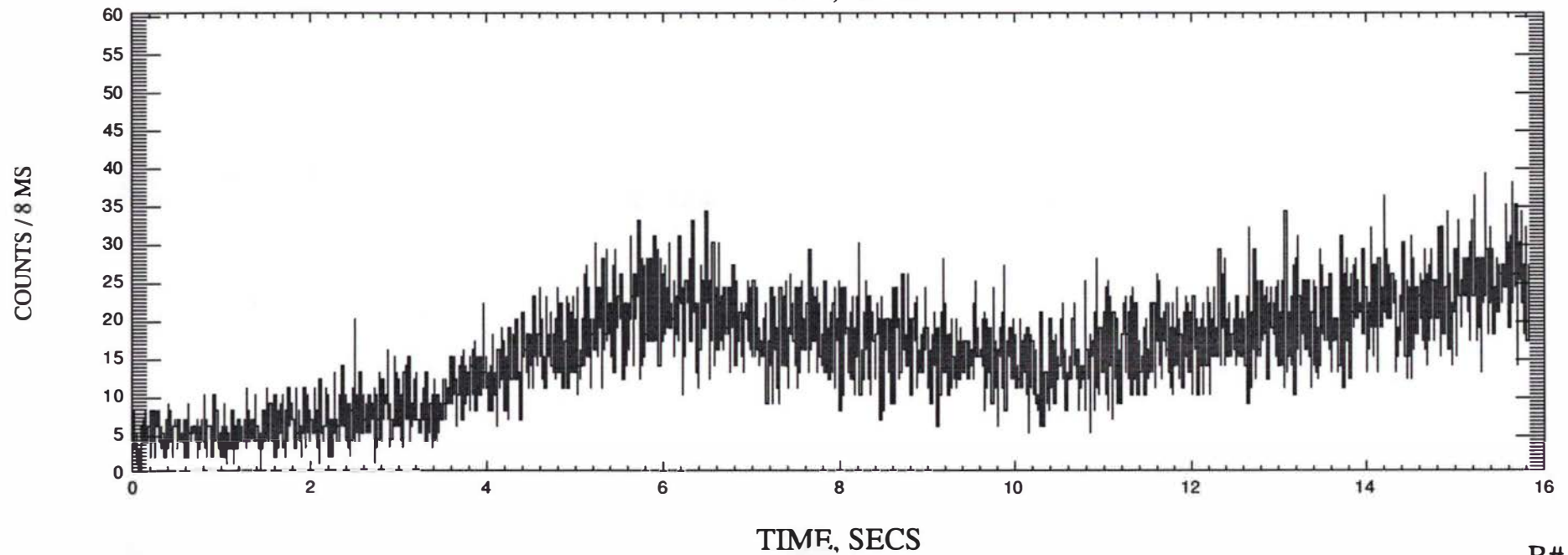
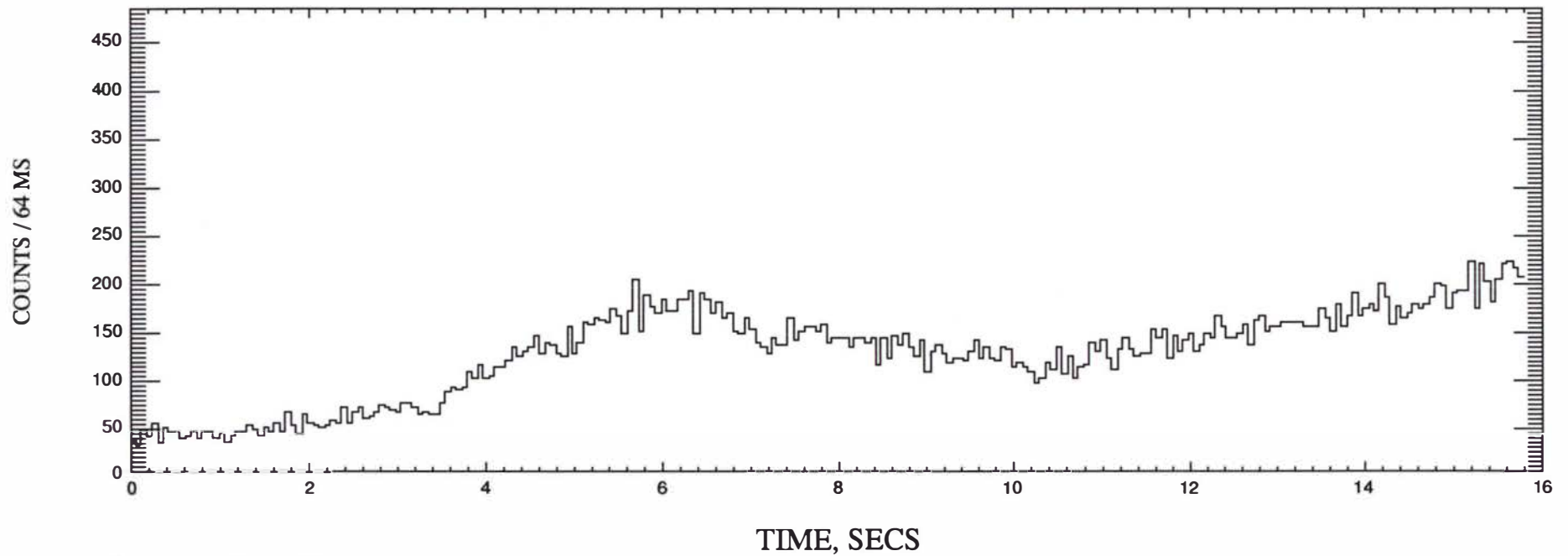
Burst Counter 12 at UT=13.801455247667 h=49685.239 s 13:48:05.239

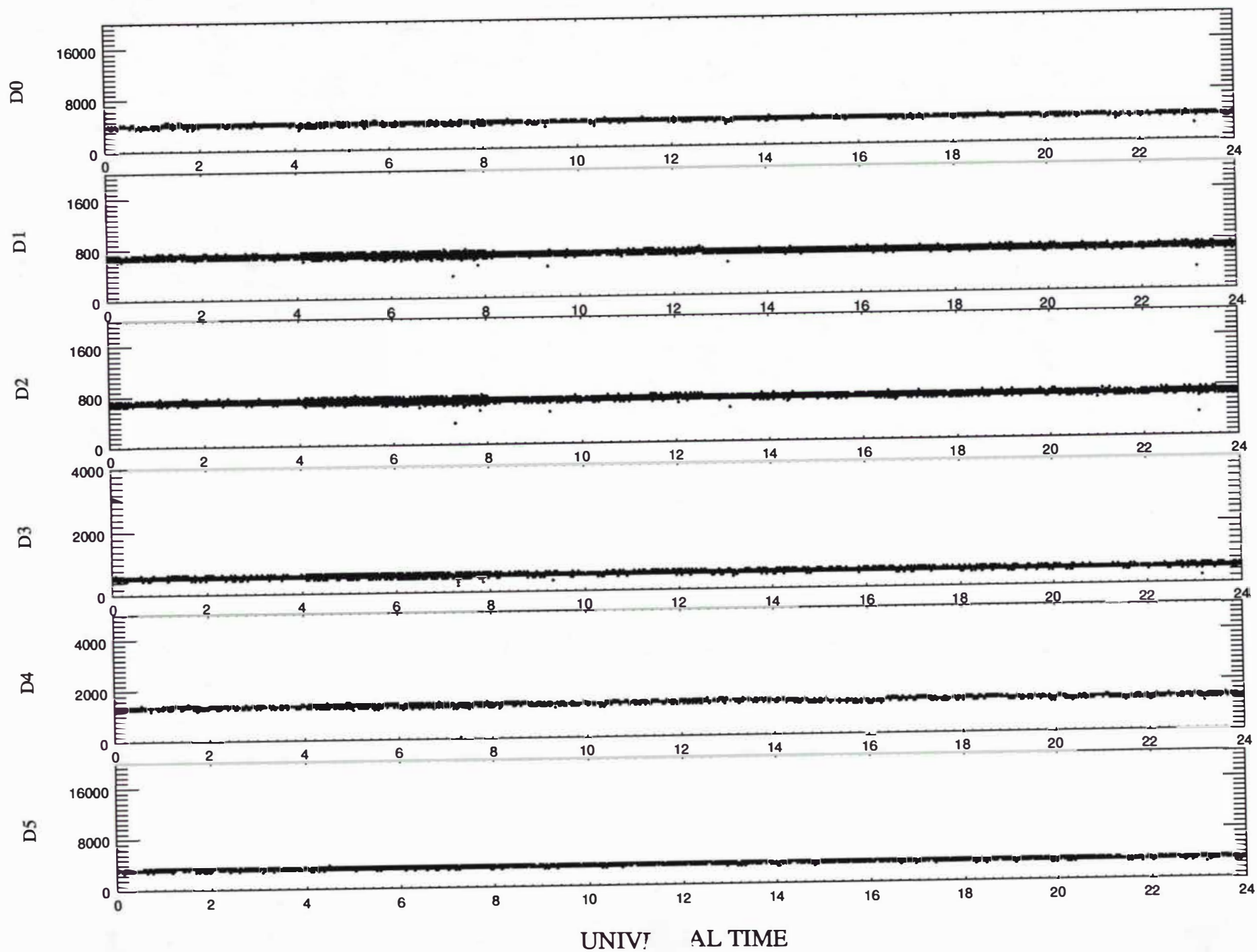


Burst Counter 13 at UT=17.479229634603 h=62925.227 s 17:28:45.227

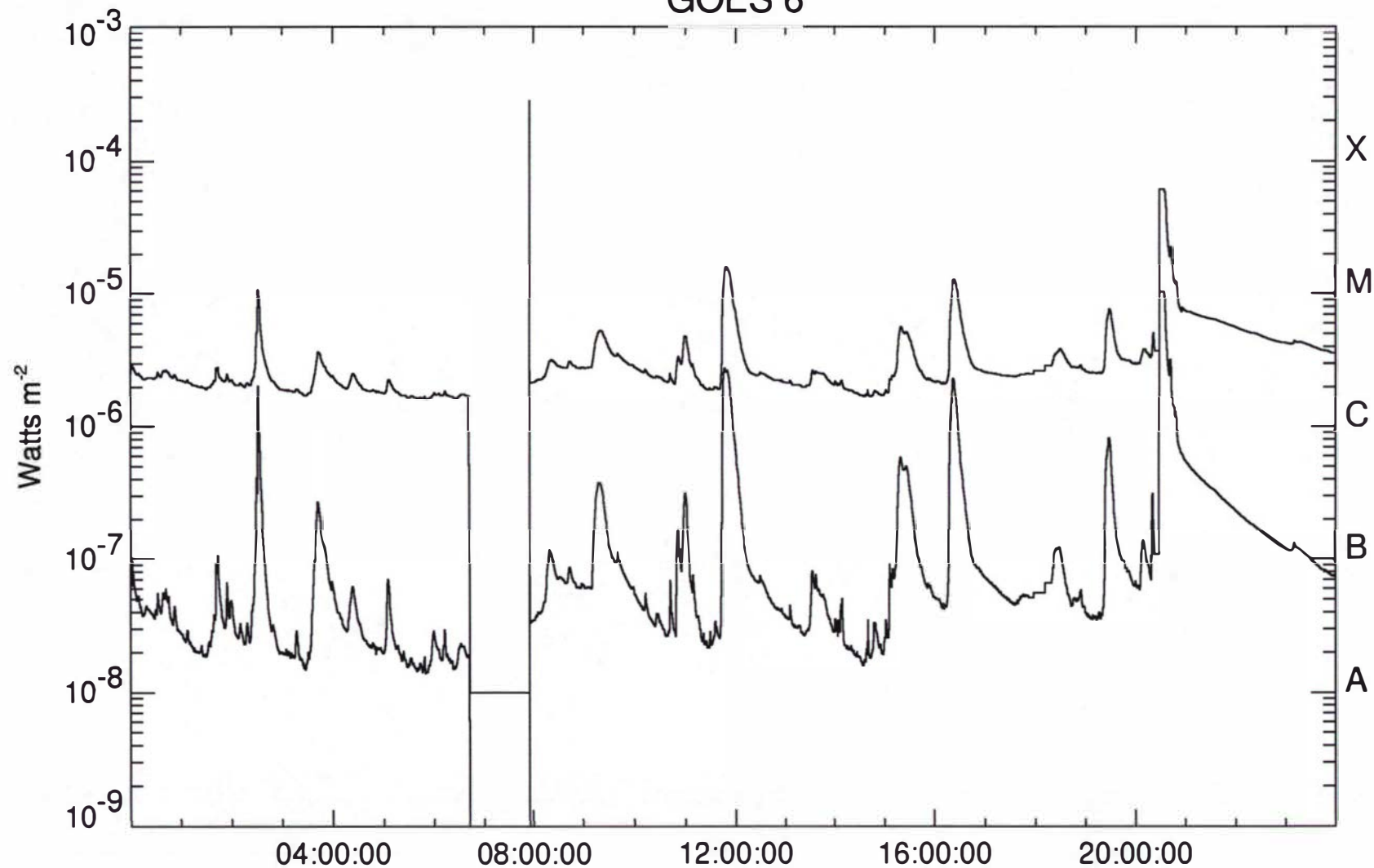


Burst Counter 14 at UT=23.465594185723 h=84476.139 s 23:27:56.139





GOES 6



Data Start: 91/03/08, 0000:02

Channel

1 (1.0 - 8.0 Angstroms)

2 (0.5 - 4.0 Angstroms)

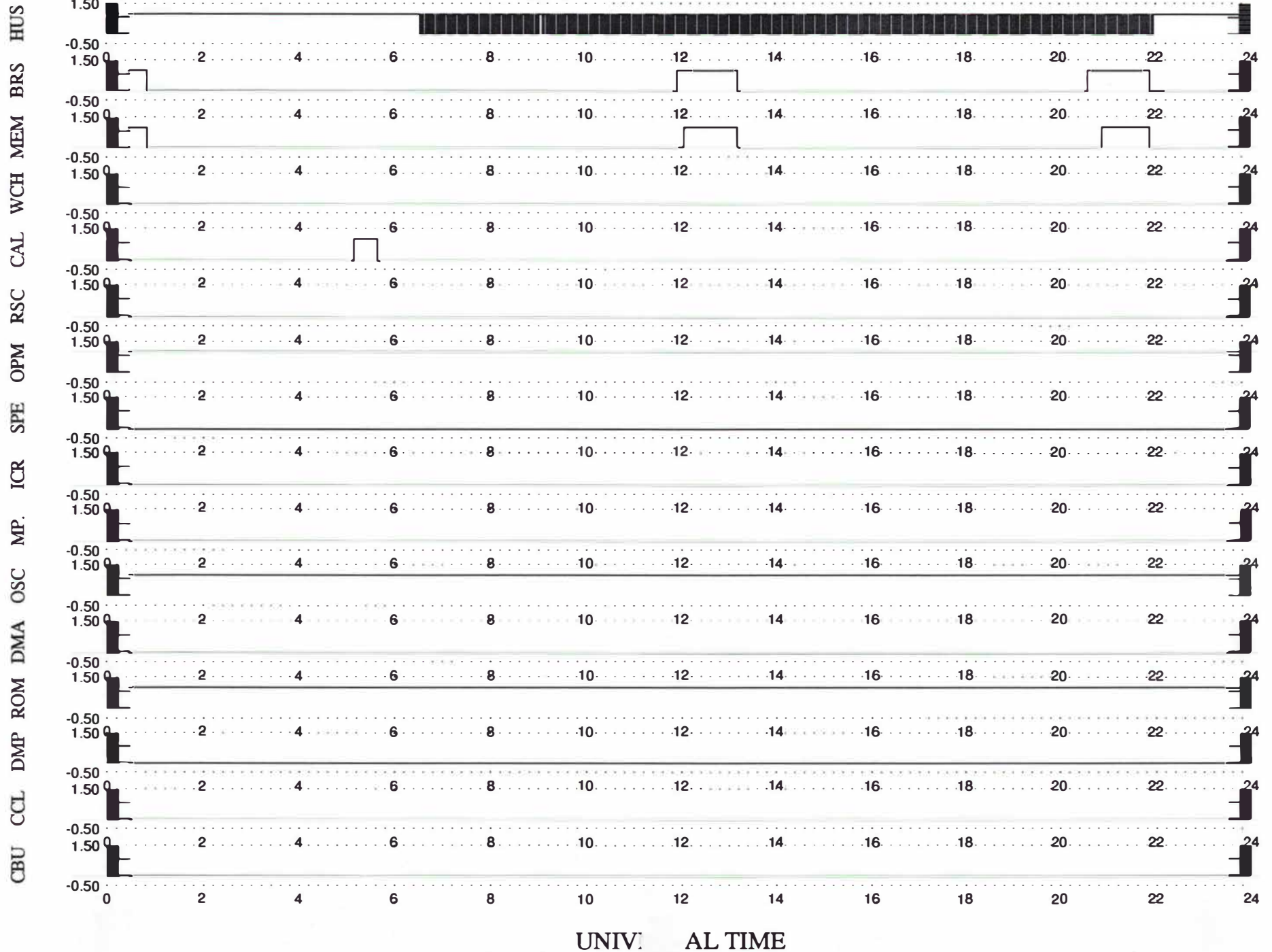
Plot created: 96/11/26, 1820

Background not subtracted

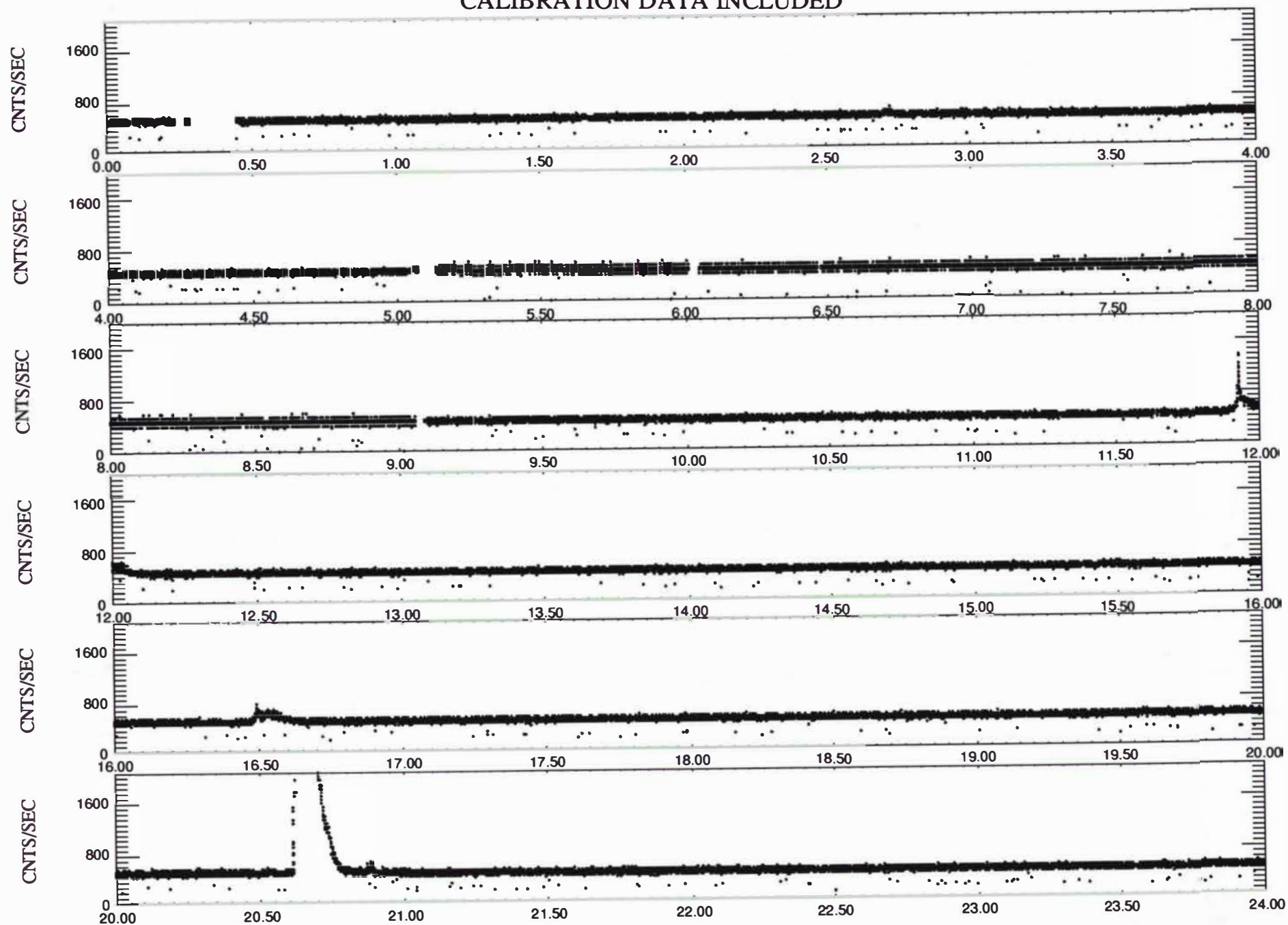
Background not subtracted

Sample average = 10

BURST NUMBER 15,0

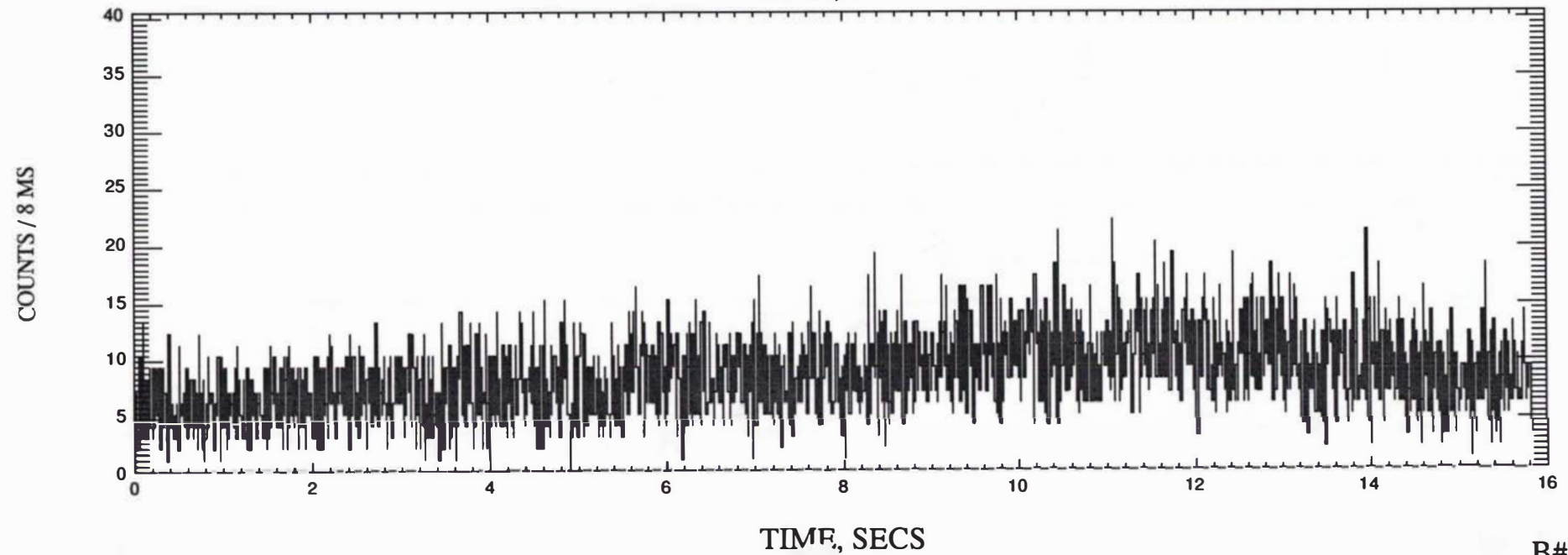
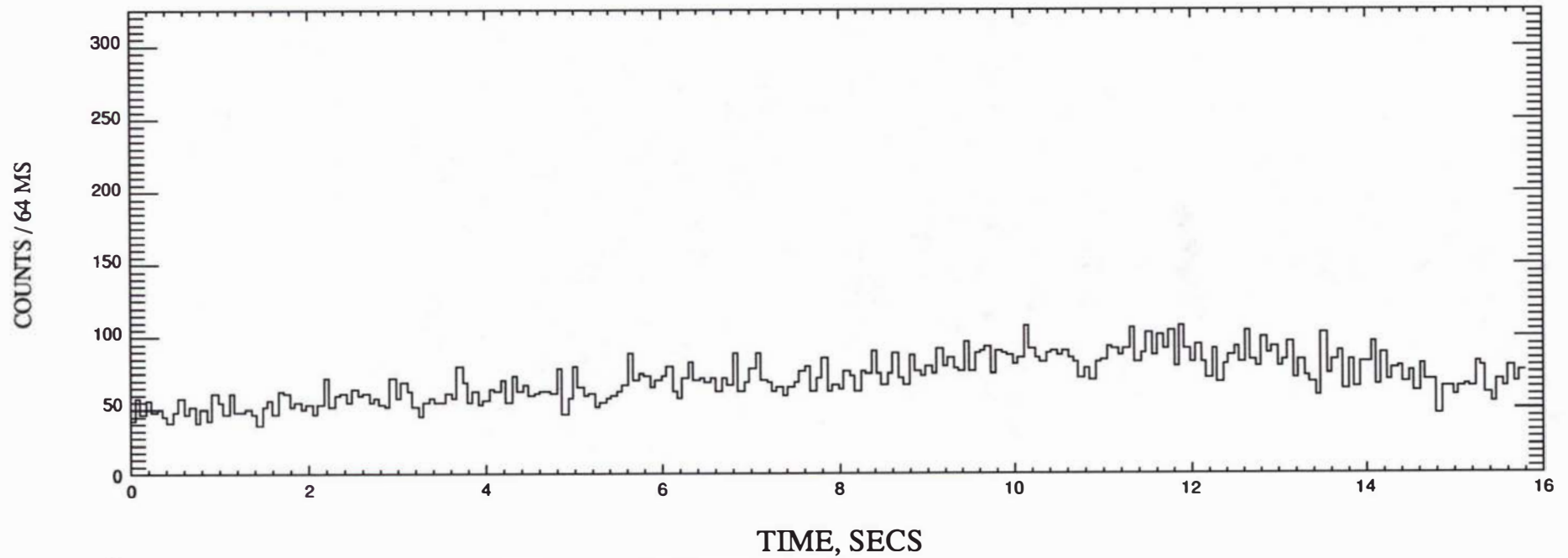


CALIBRATION DATA INCLUDED

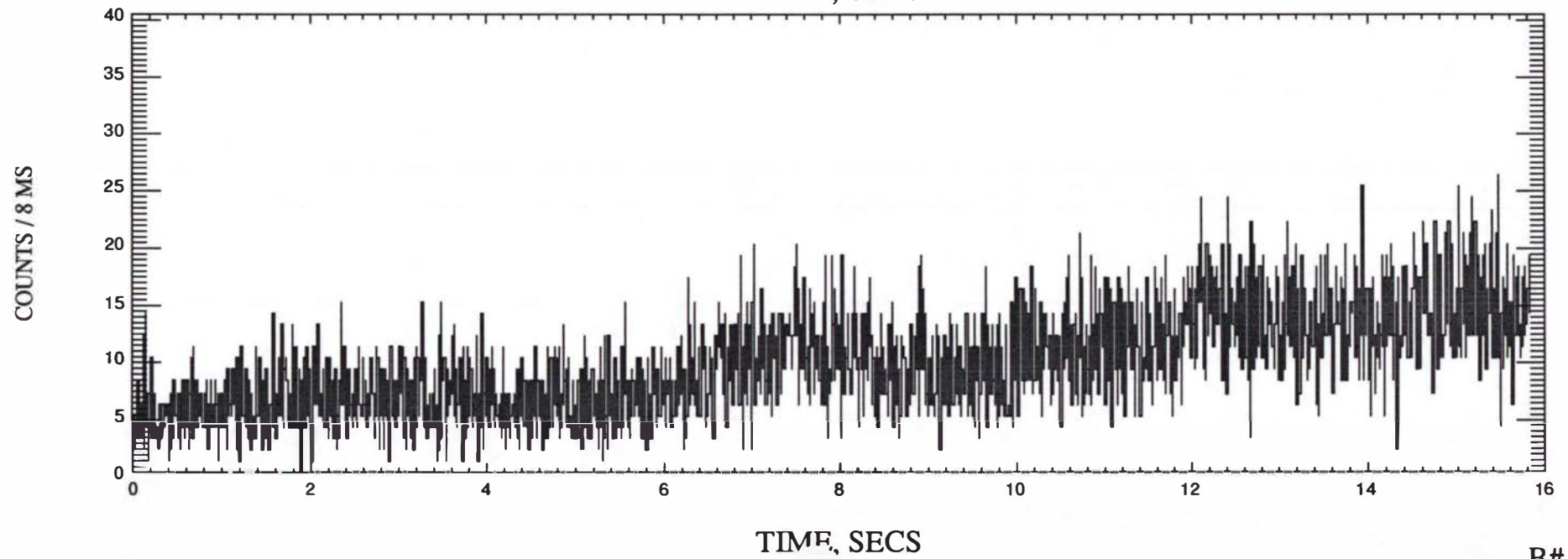
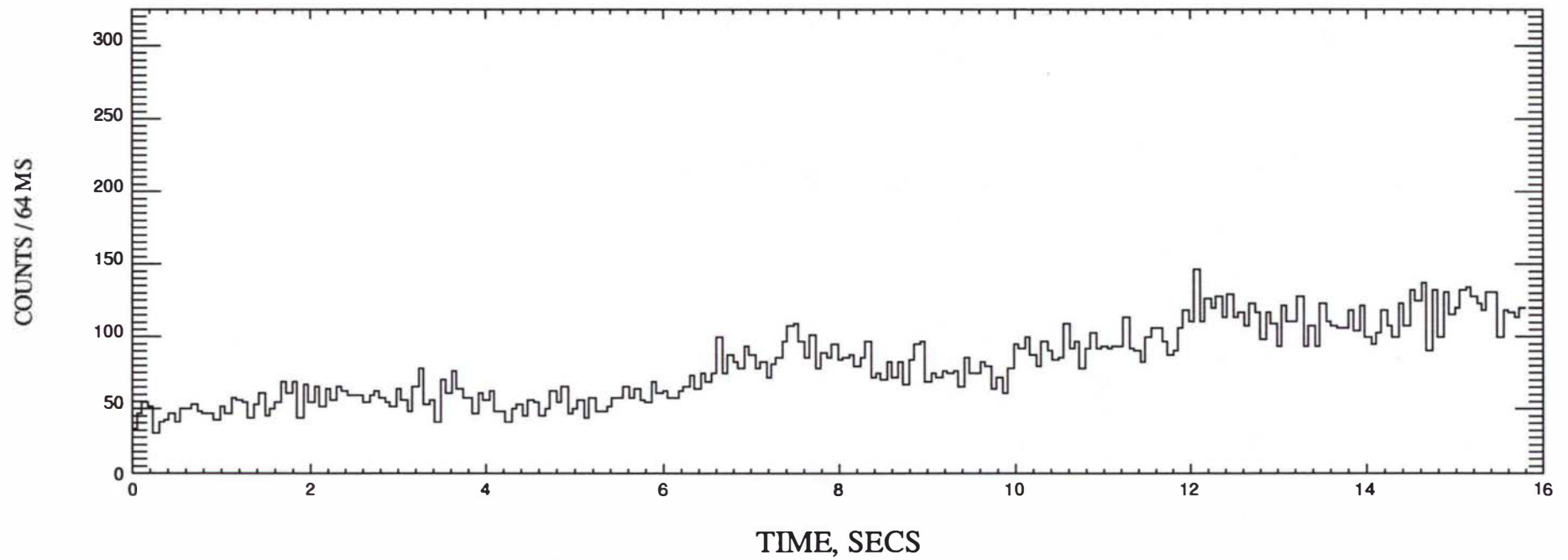


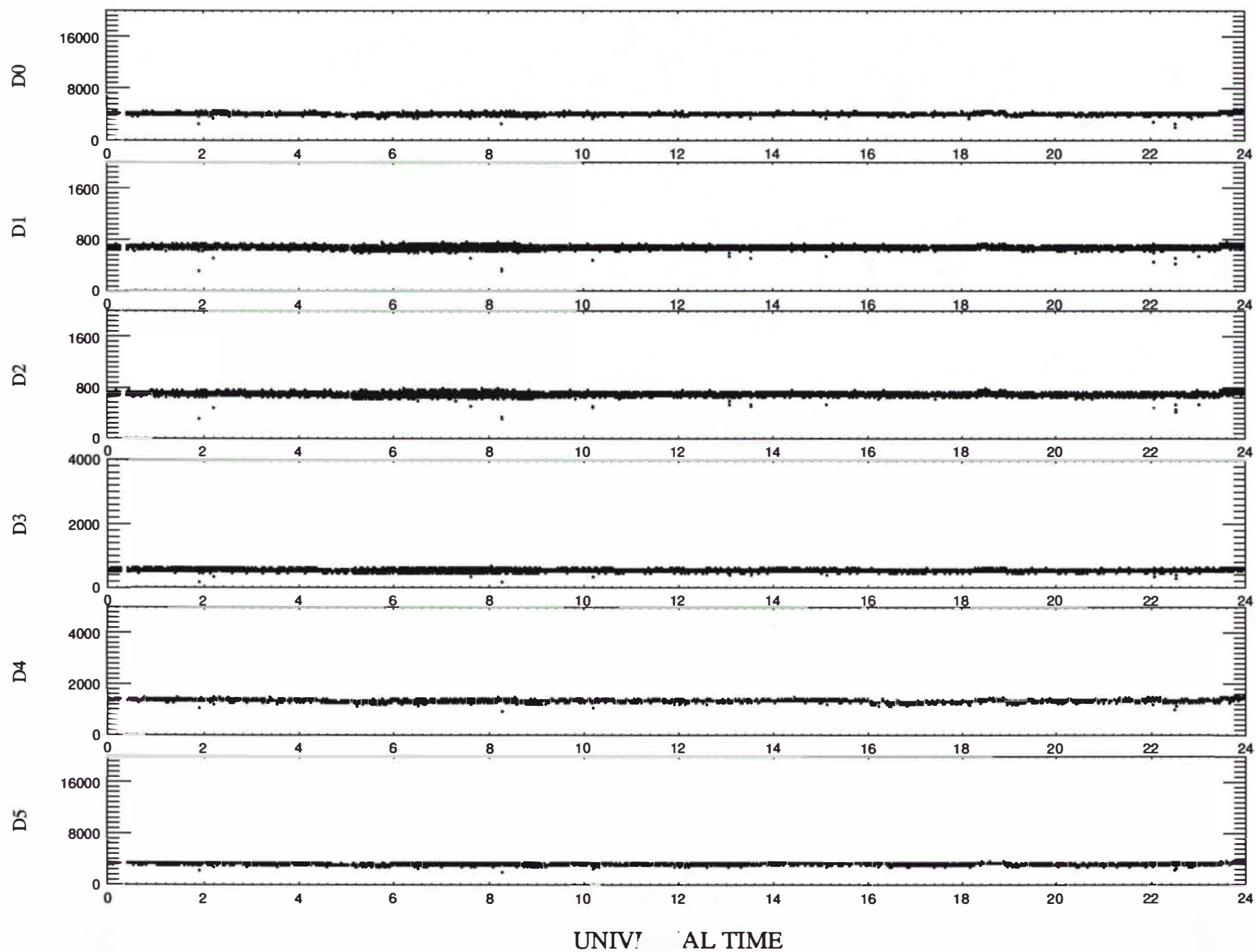
UNIV 'AL TIME

Burst Counter 15 at UT=11.923741094801 h=42925.468 s 11:55:25.468



Burst Counter 0 at UT=20.609795299106 h=74195.263 s 20:36:35.263





PV0

09/03/91

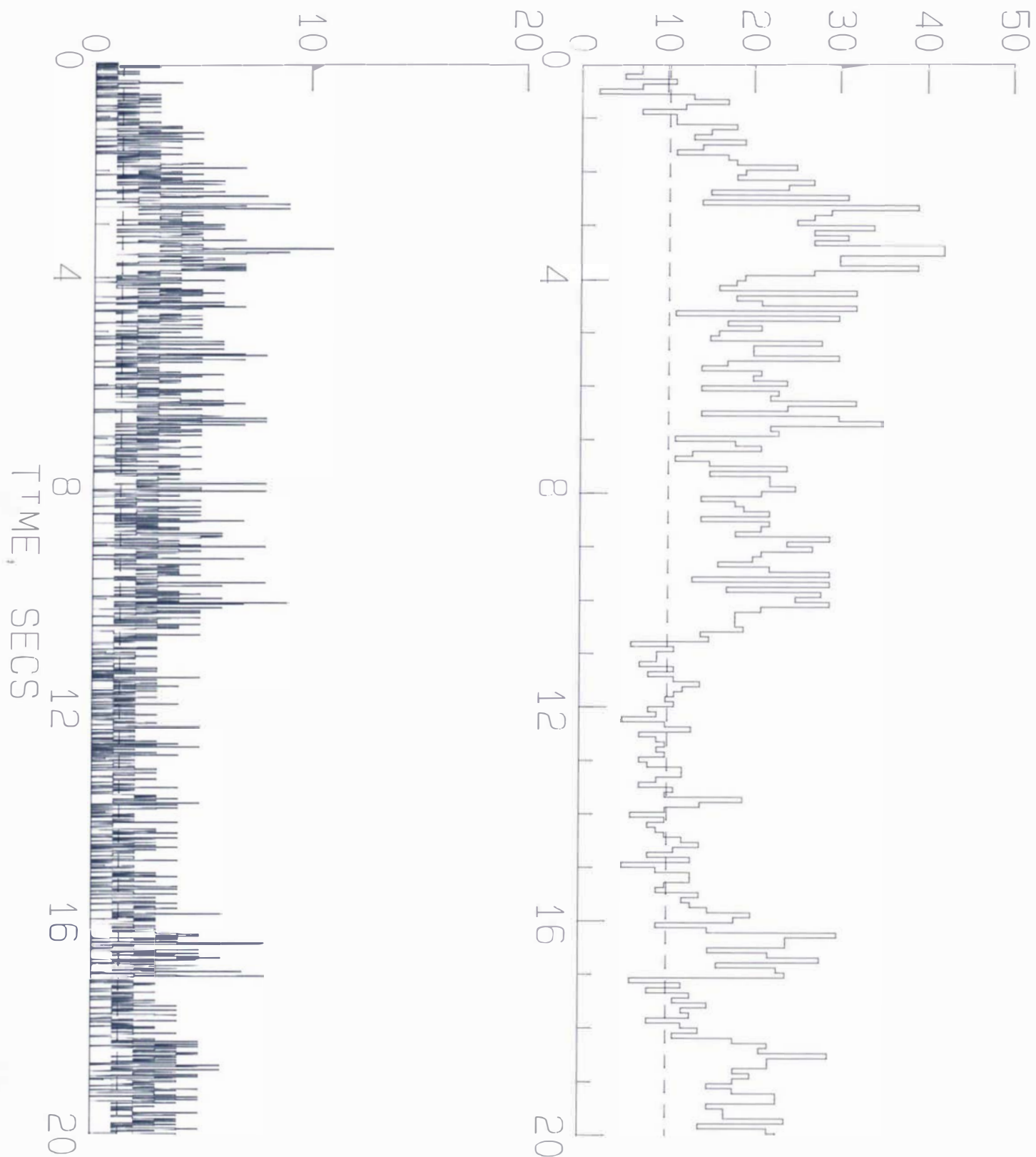
22182.294

100-2000 keV

6.09

COUNTS/ .012 S

COUNTS/ .094 S

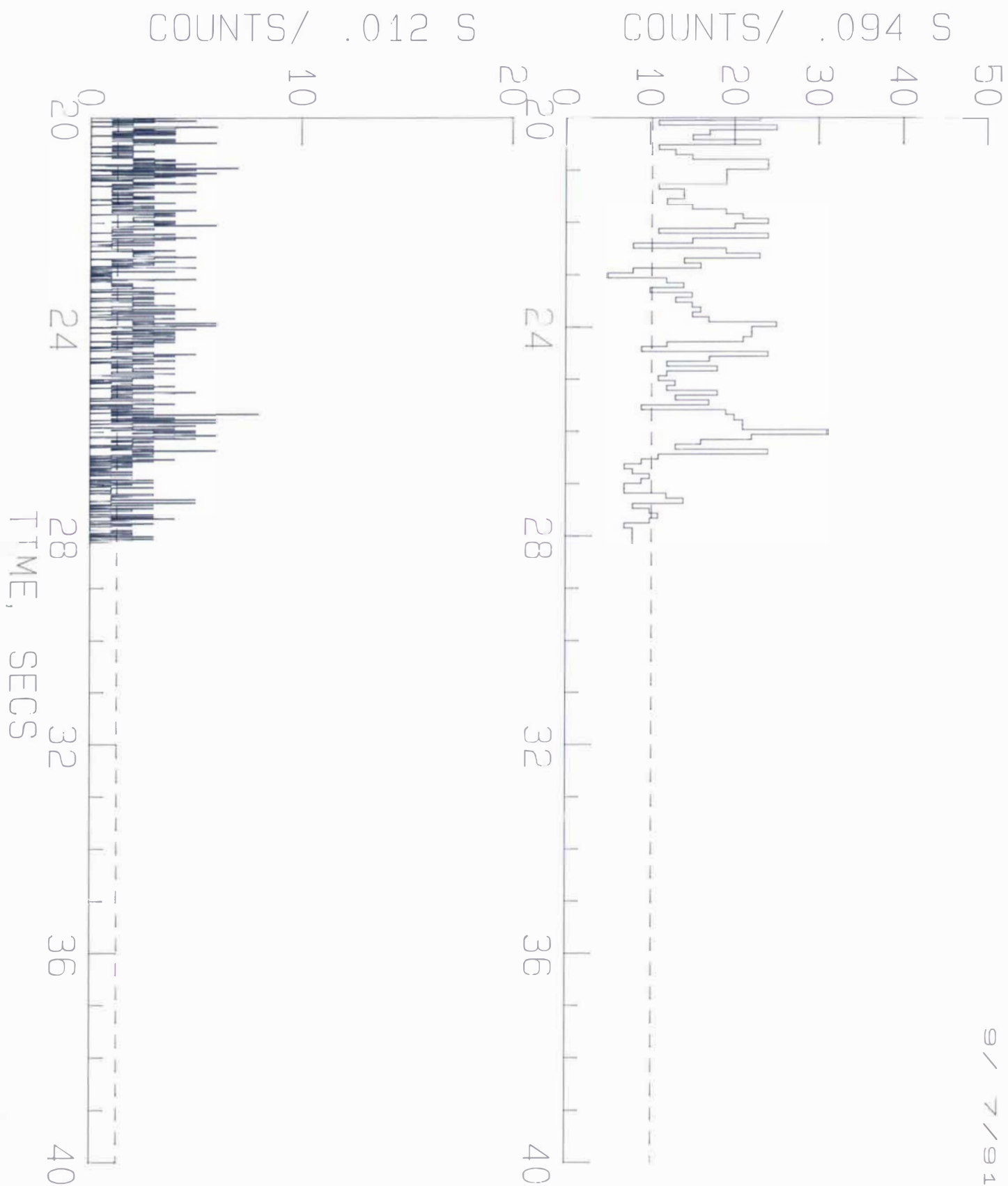


PVO

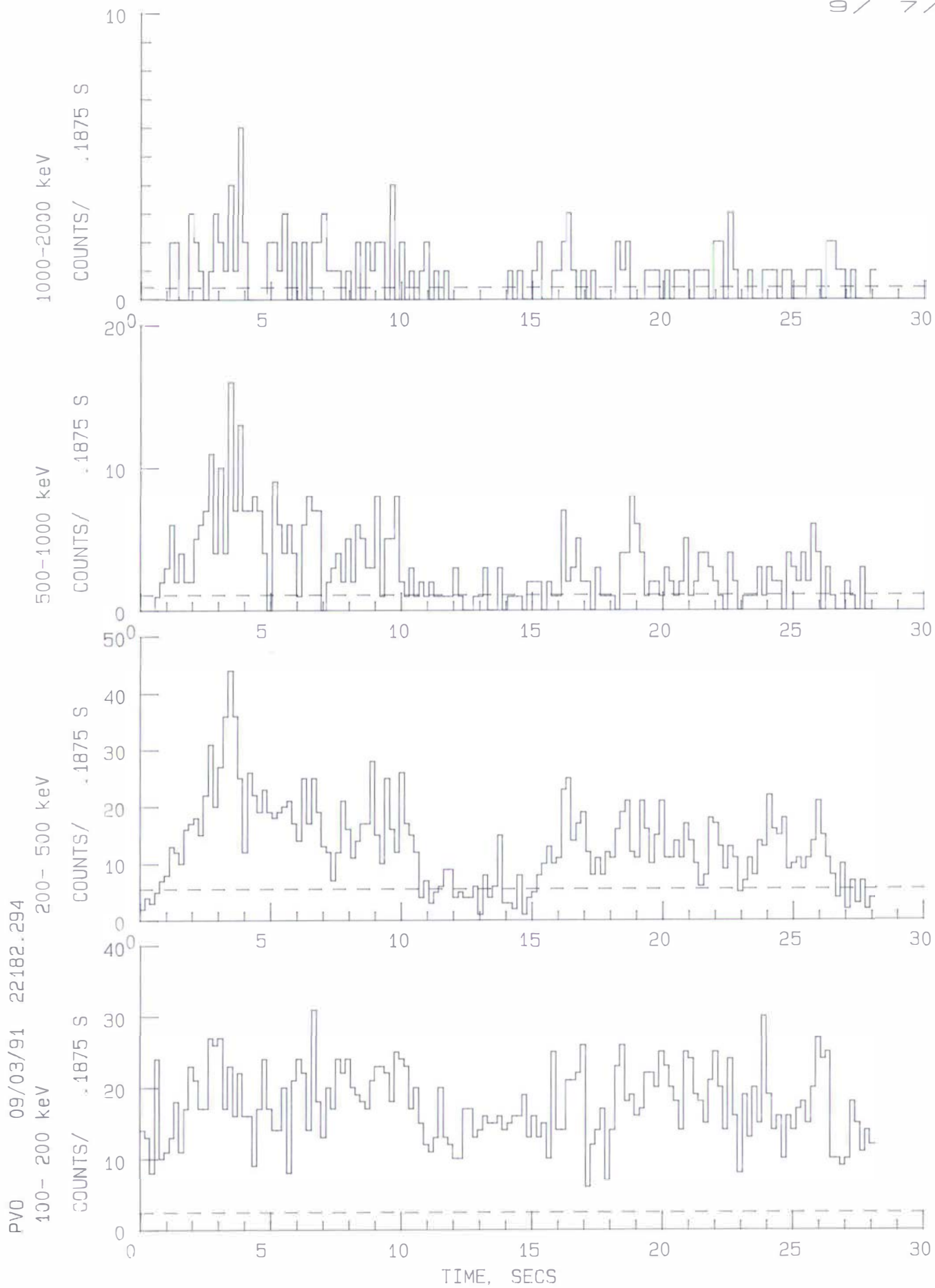
09/03/91

22182.294

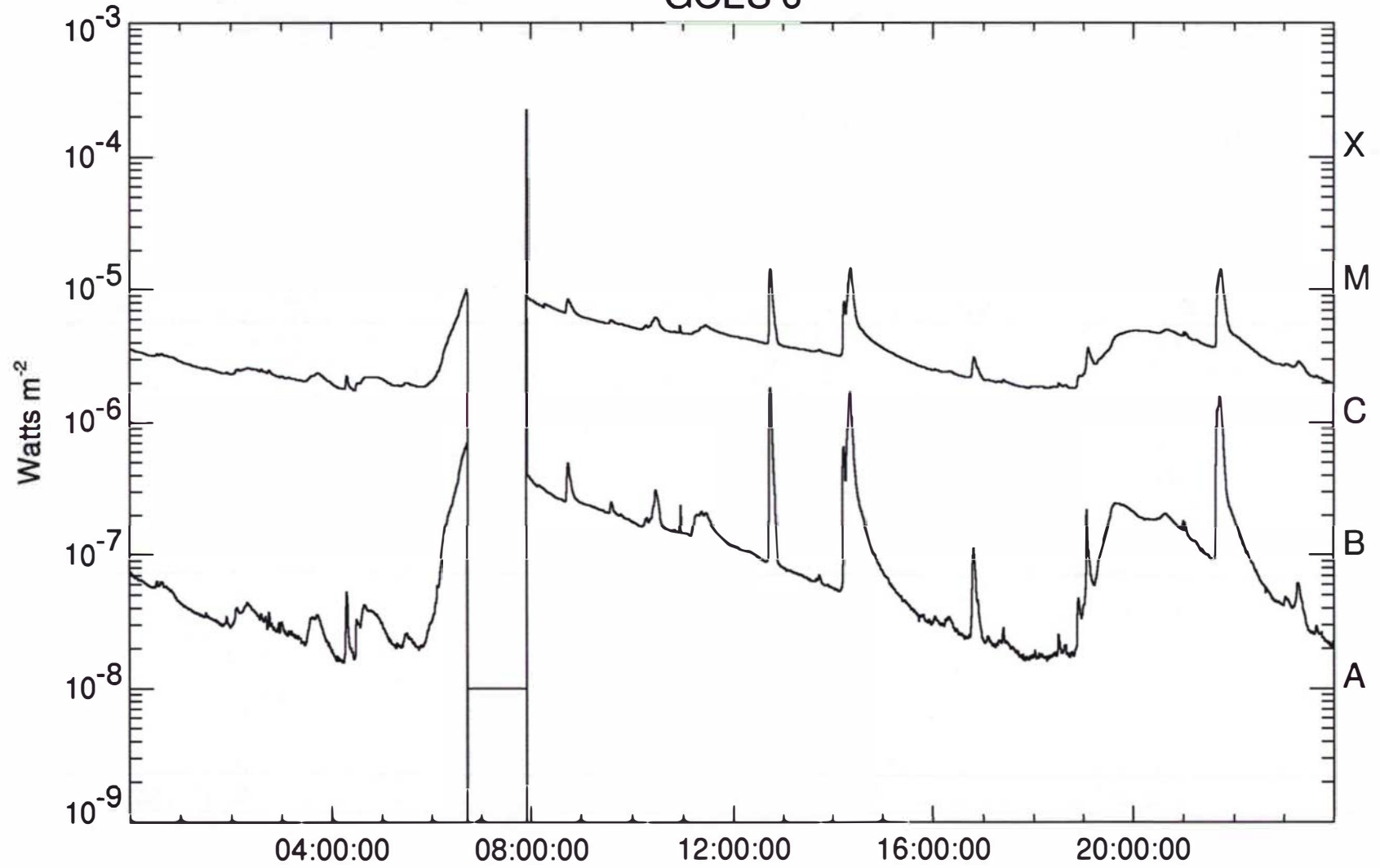
100-2000 keV



9 / 7 / 91



GOES 6



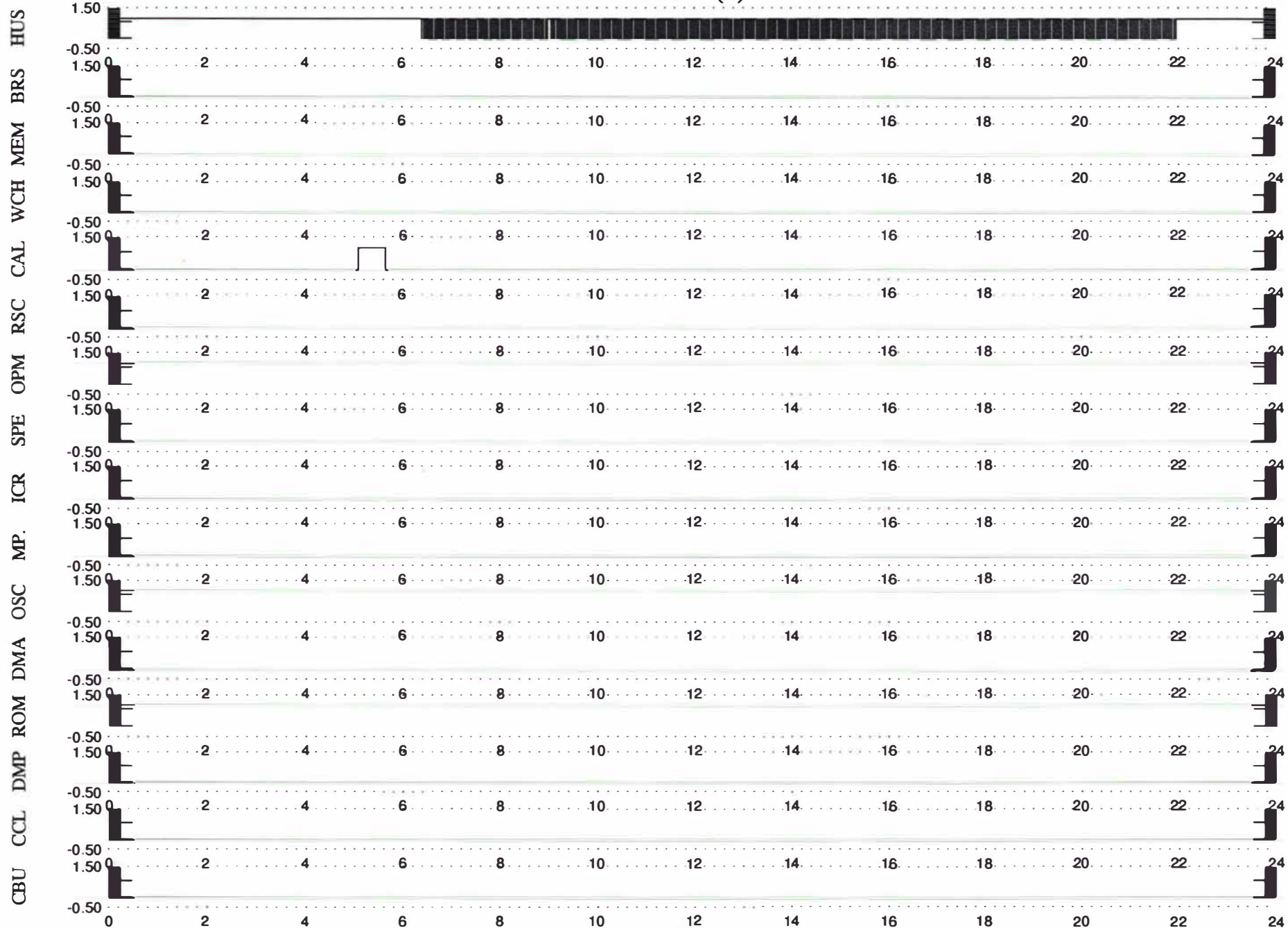
Data Start: 91/03/09, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

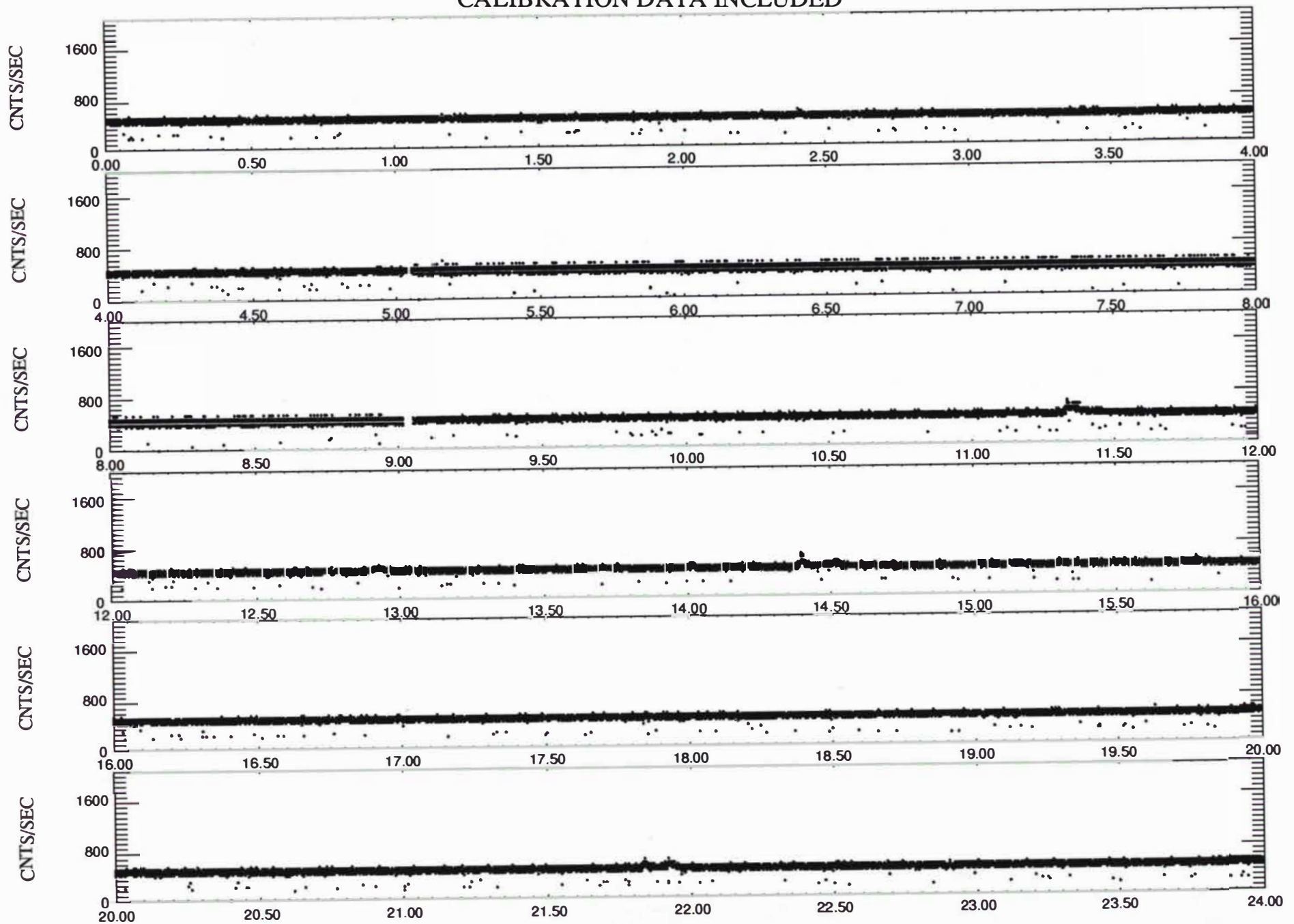
Plot created: 96/11/26, 1823

Background not subtracted
Background not subtracted
Sample average = 10

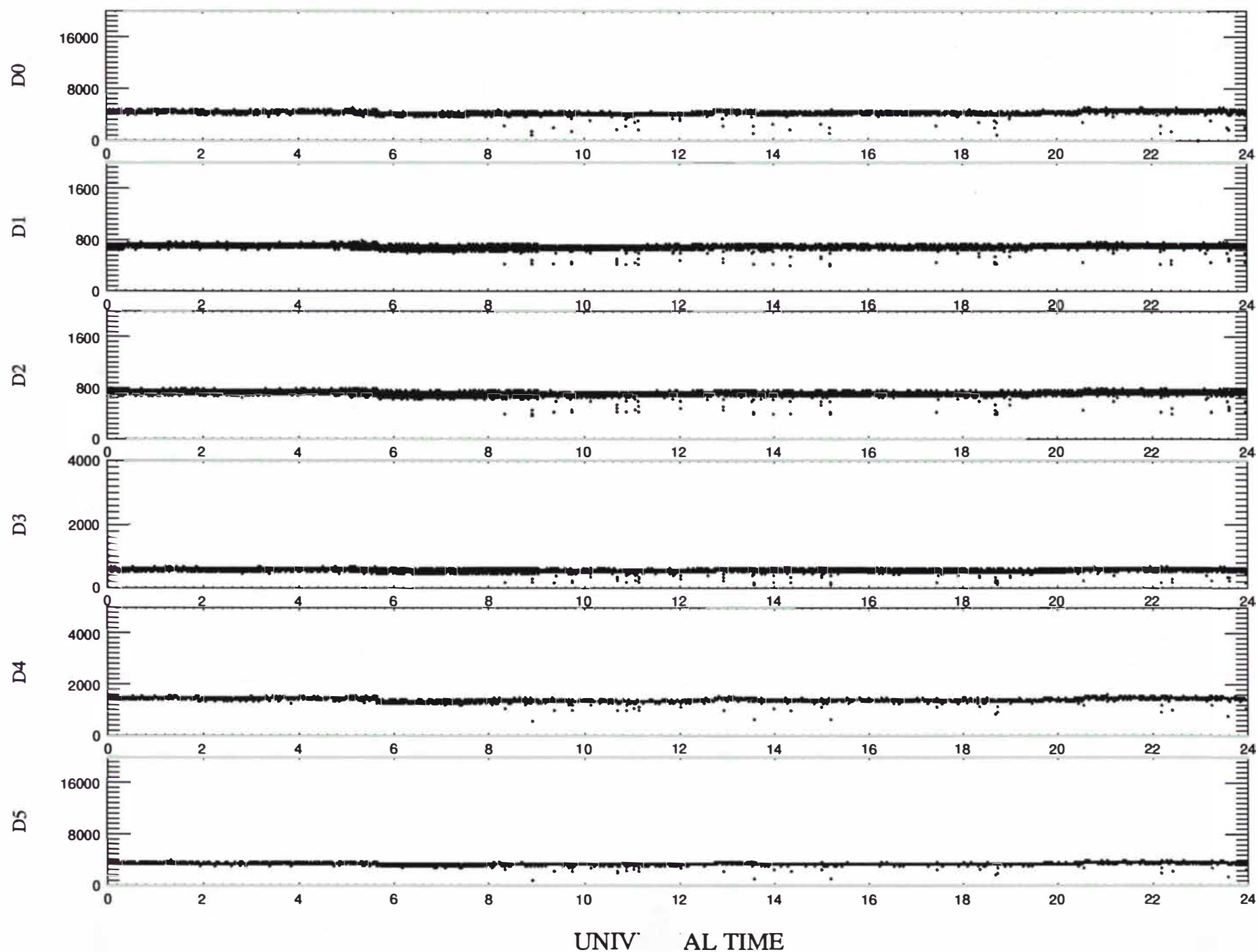
UNIV. AL TIME



CALIBRATION DATA INCLUDED



UNIV AL TIME



Helio corr removed
Date: Dec 2 '98

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

- ☐ Jim Schmidling's stat file correction applied?
- ☐ Final ephemeris used?
- ☐ Final, CDROM data used?
- ☐ Were data checked by Joe Springer for 0.5 s errors?
- ☐ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?
- ☐ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

- ☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)?
- ☐ BATSE ephemeris for T_0 ?
- ☐ Error circle position and radius from public catalog used?
- ☐ If MER data were used, is a 30 ms systematic error included?

3. PVO Data

- ☐ Ephemeris of PVO used (not Venus)?
- ☐ 2000 coordinates used?
- ☐ Geocentric time used?
- ☐ ACCESS database updated?

$$\sum 3 \Delta t_s = \overset{U/P}{799.536} - \overset{U/W}{156.324} - \overset{P/W}{642.819} = .393$$

$$3\sigma \text{ stat errors: } (150^2 + 300^2 + 300^2)^{1/2} = 450 \text{ ms}$$

U/W comparison is prob. most accurate. So decrease U/P by $\sim 200 \text{ ms}$

PVU time $\rightarrow 680000 \text{ s}$

Increase uncertainties associated with PVO by 200 ms

$$\sum 3 \Delta t_s = \overset{U/P}{799.336} - 156.324 - 642.819 = .193$$

$$3\sigma \text{ error: } (350^2 + 300^2 + 500^2)^{1/2} = 680 \text{ ms, so } 193 \text{ ms is } \sim 1\sigma$$

EVENT OF MAR 10, 1991 12:59

13 / 5/98

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

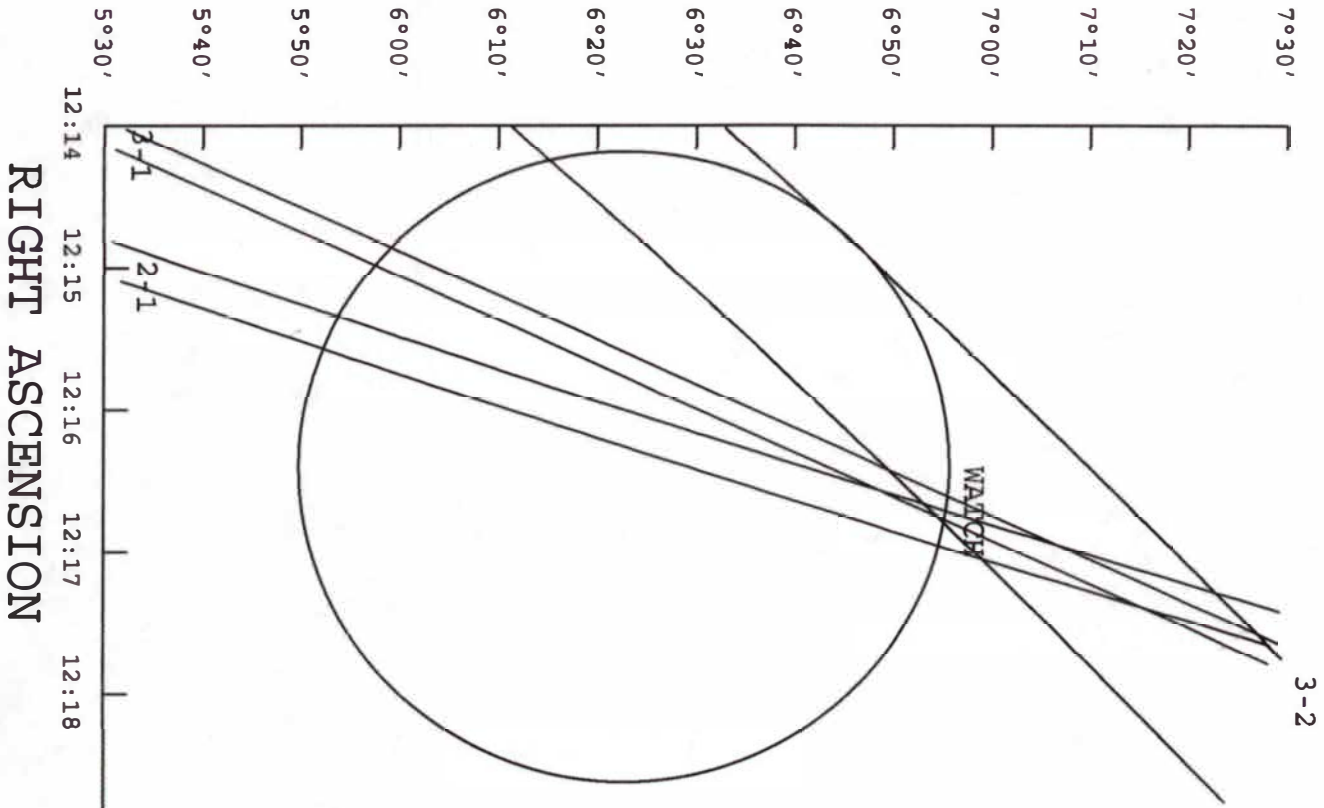
G=GALACTIC EQUATOR

1 ULYSSES

2 PVO

3 WATCH

DECLINATION



RIGHT ASCENSION

WATCH

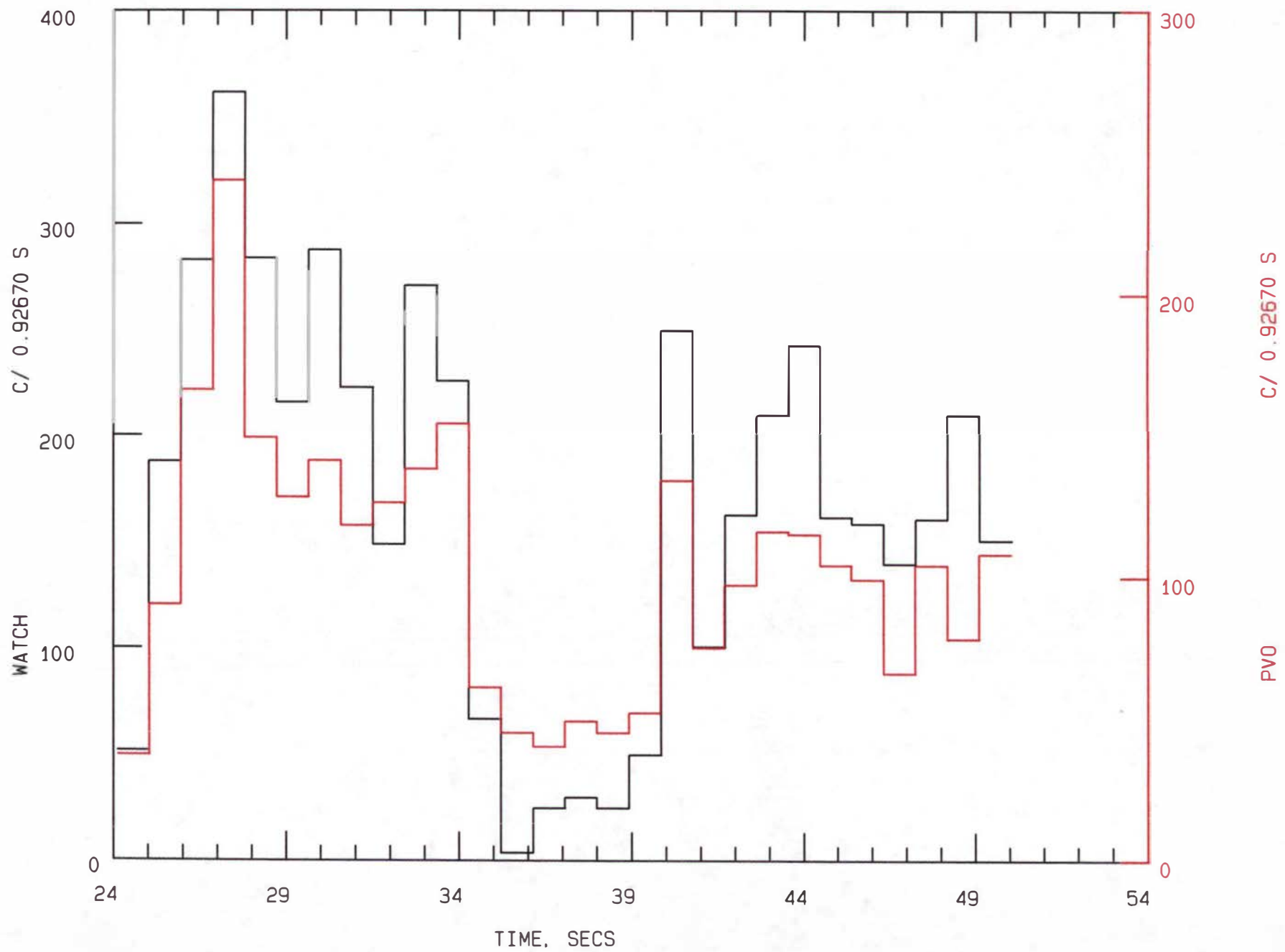
-PVO

CORRELATION

10/03/91

46898.300

13/ 5/98



WATCH

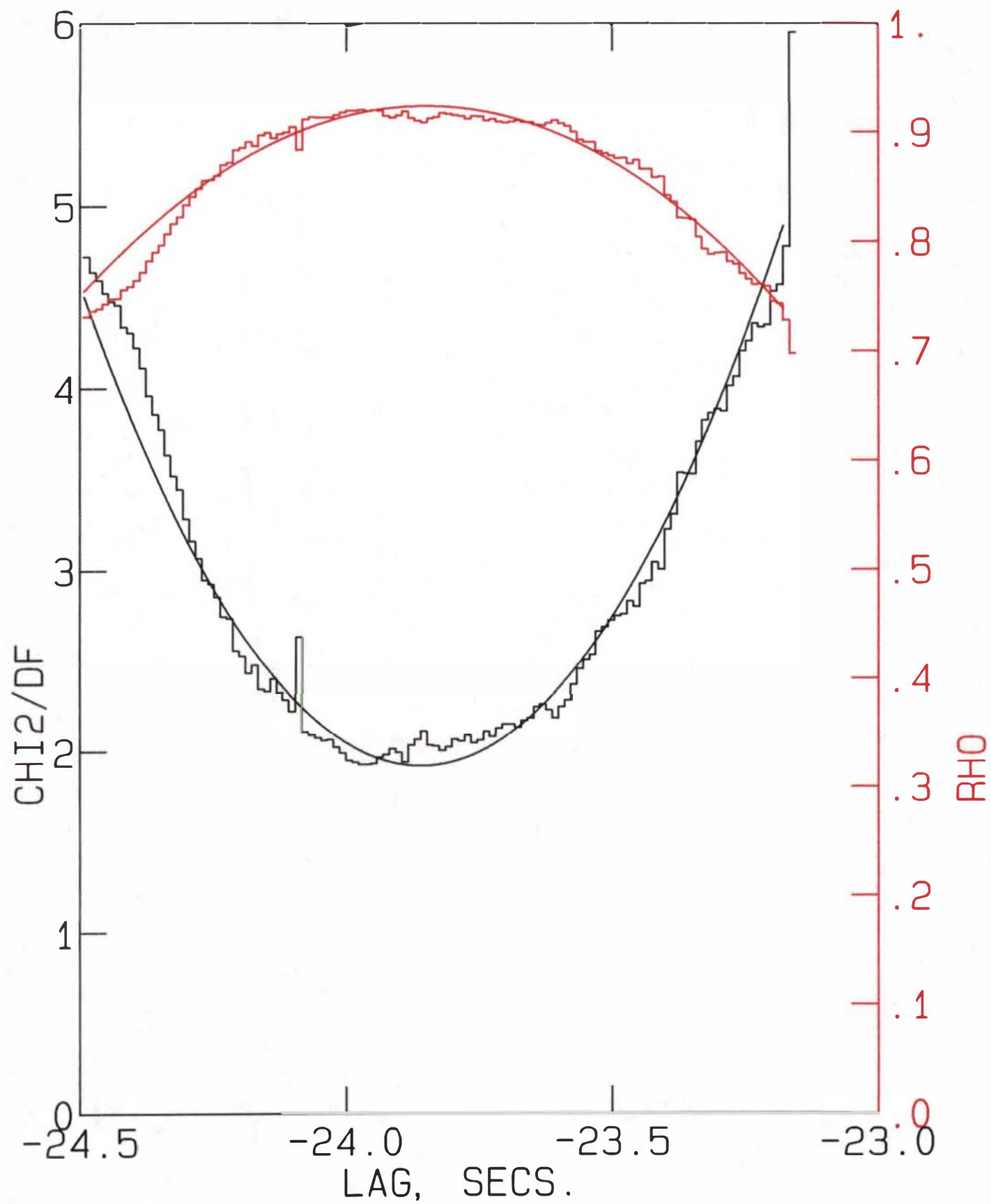
-PVO

CORRELATION

10/03/91

46898.300

13/ 5/98



WATCH

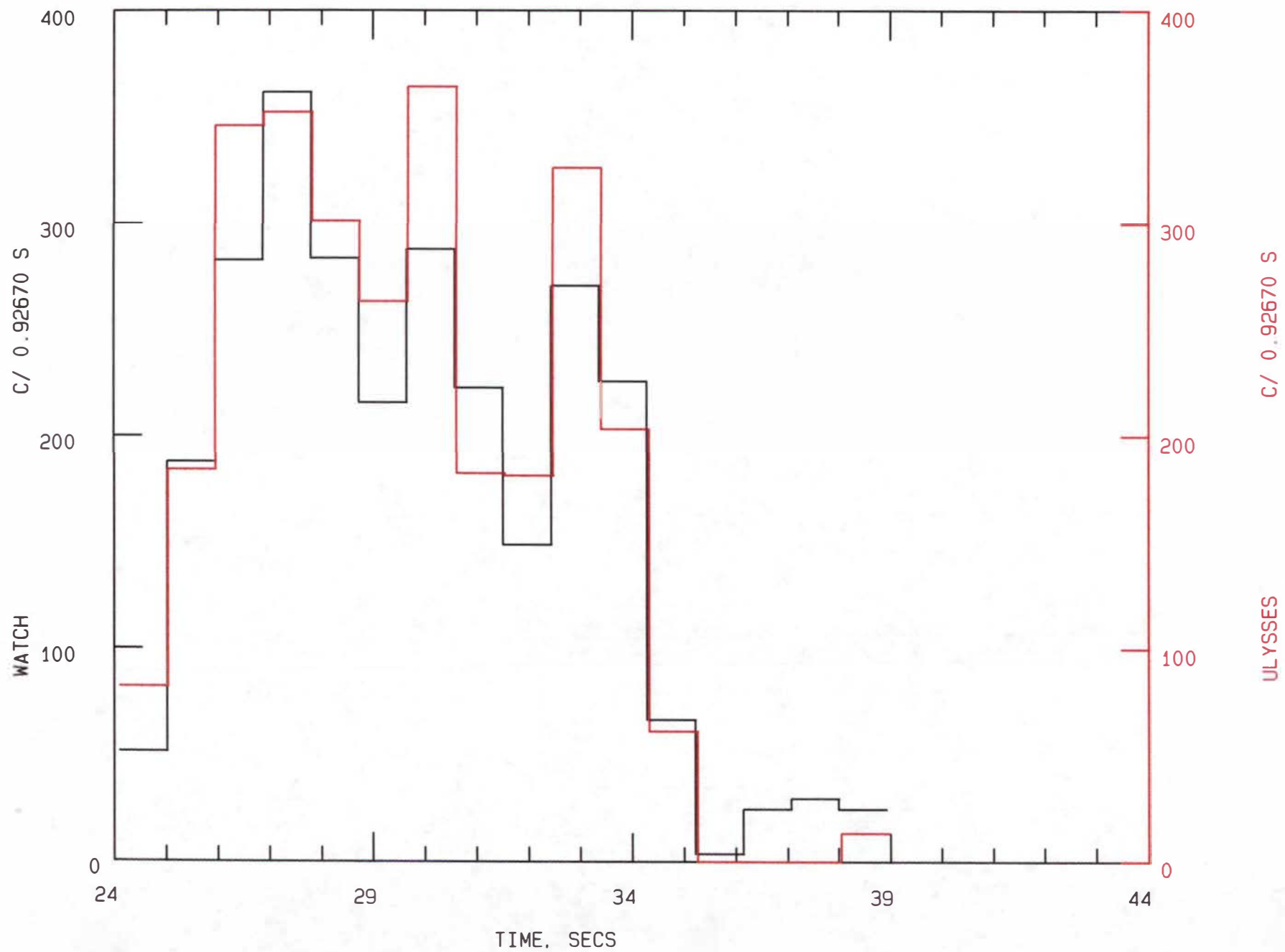
-ULYSSES

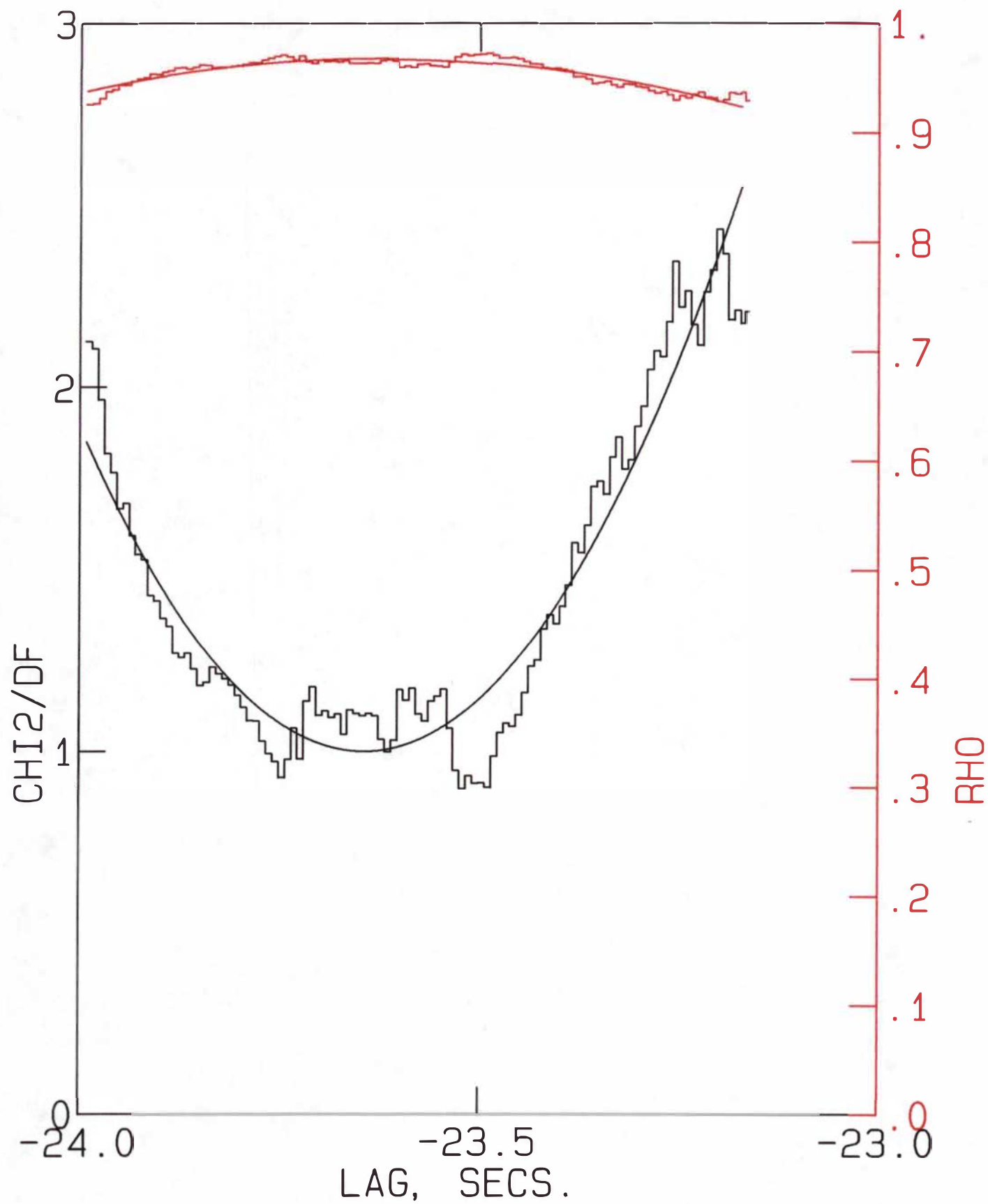
CORRELATION

10/03/91

46898.300

13/ 5/98





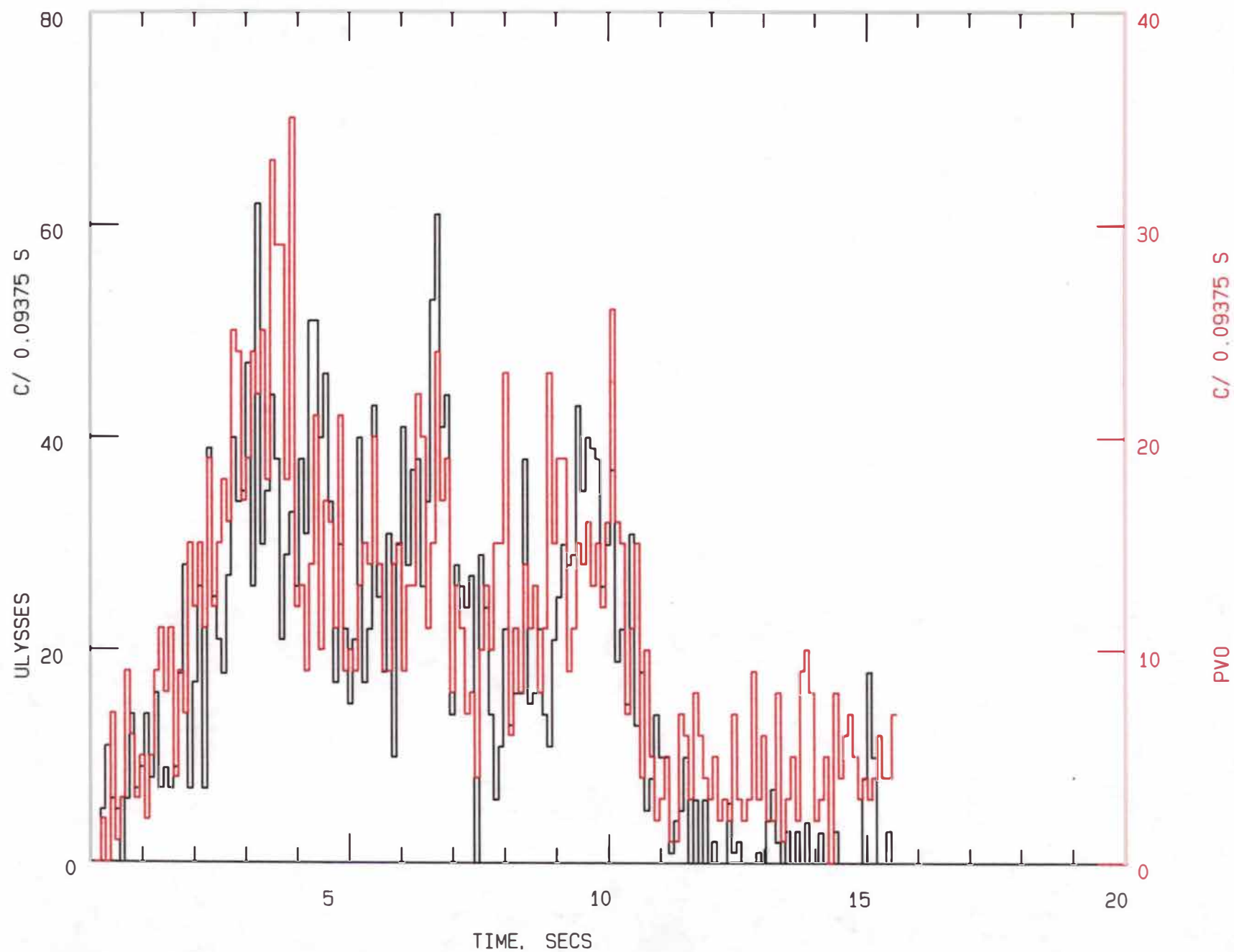
ULYSSES -PV0

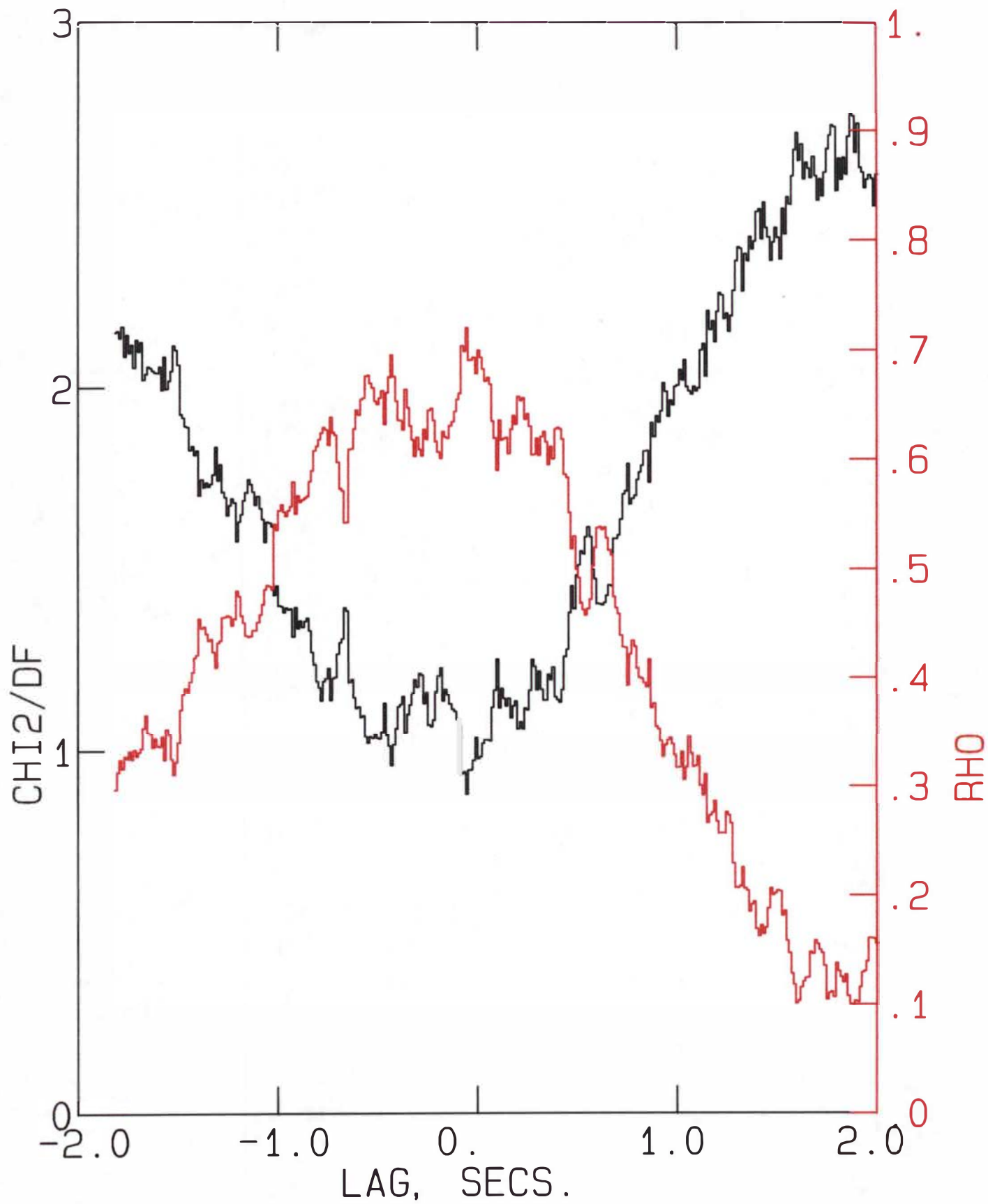
CORRELATION

10/03/91

46767.344

13/ 5/98





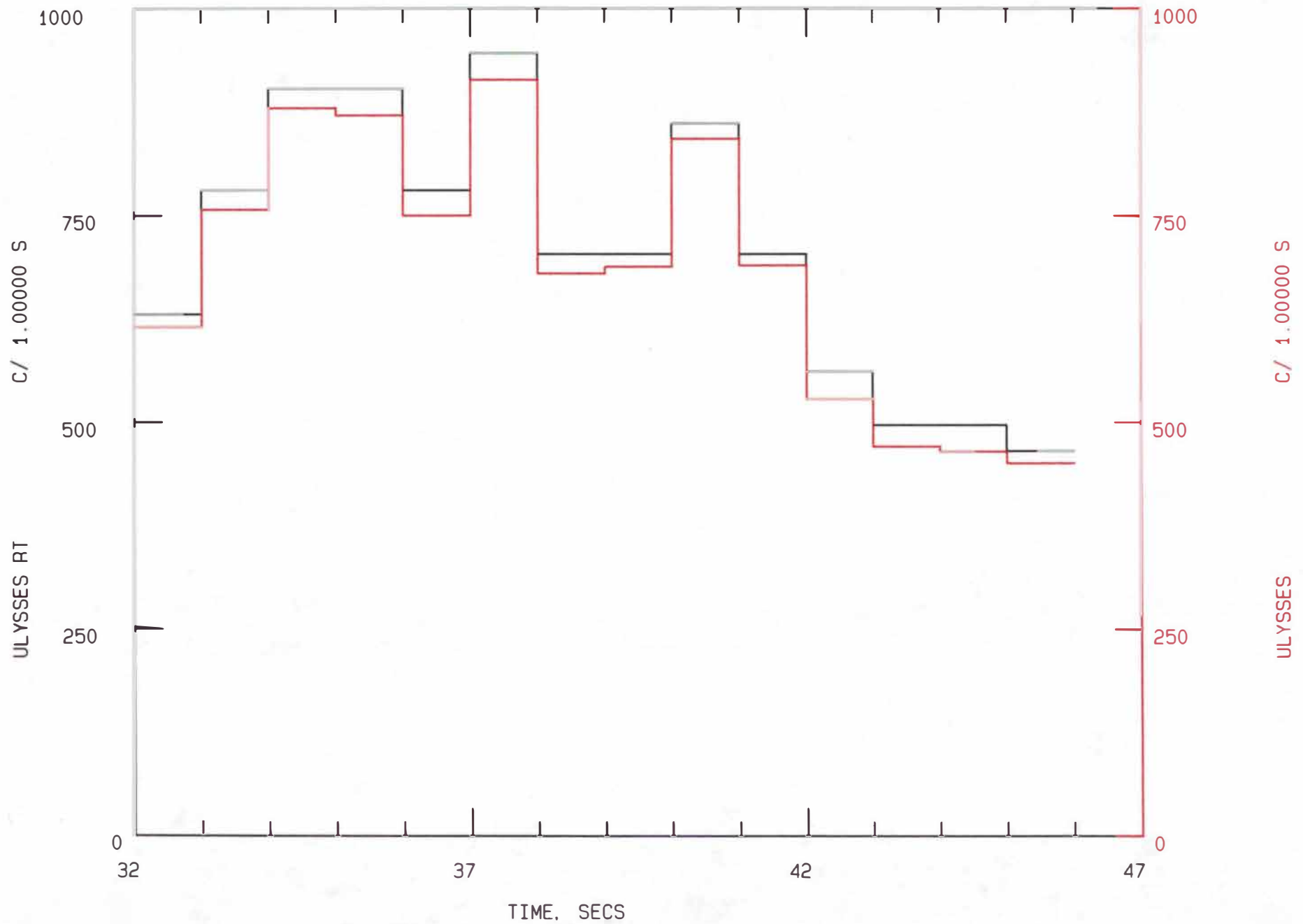
ULYSSES RT-ULYSSES

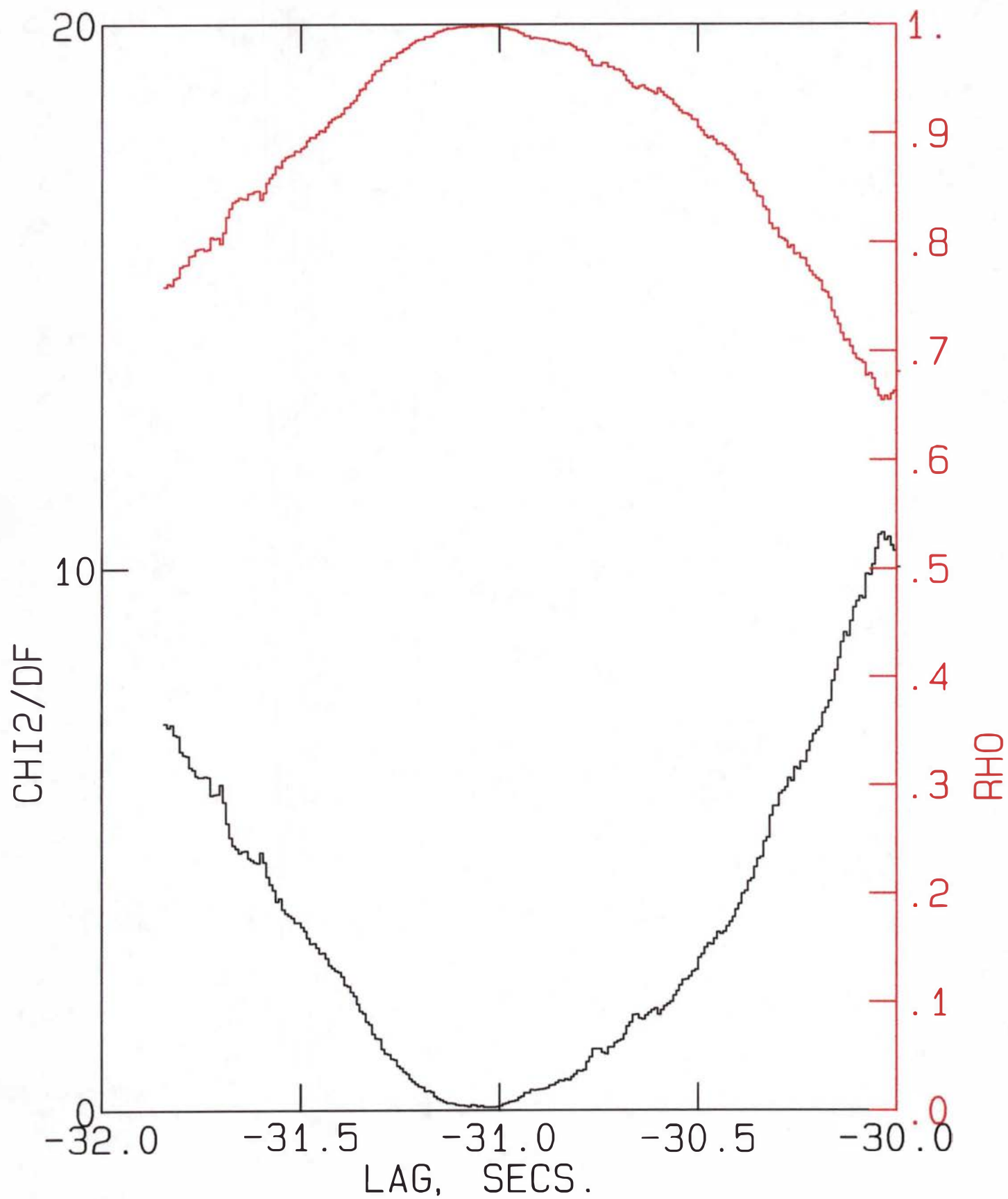
CORRELATION

10/ 3/91

46734.408

13/ 5/98

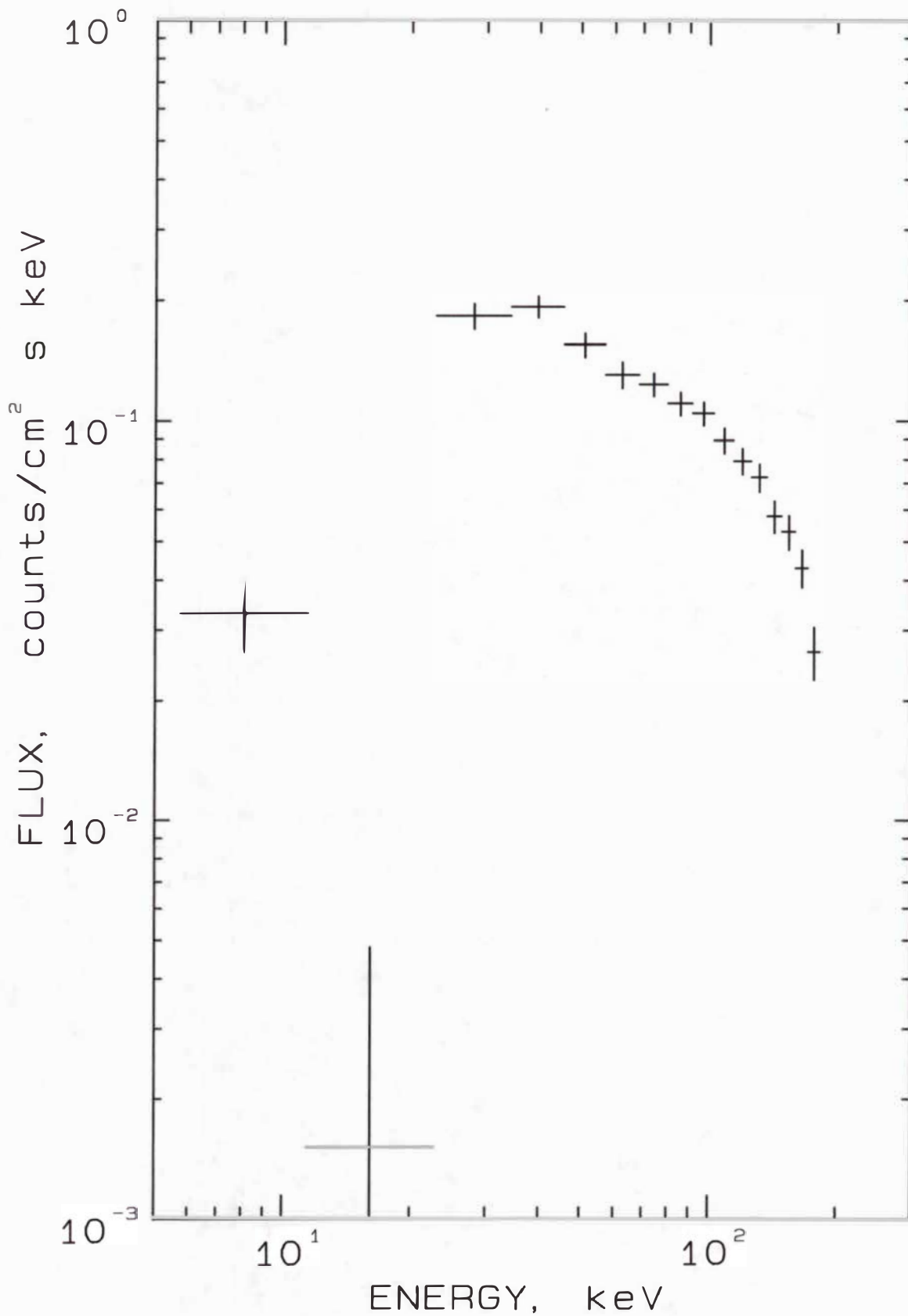




ULYSSES 10/03/91 46767.418

13/ 5/98

SPECTRUM INTEGRATED OVER 21.1 SECONDS, INTERVALS 2 TO 20



ULYSSES 10/03/91 46767.418 BURST SPECTRAL COUNT RATES

5- 22 keV

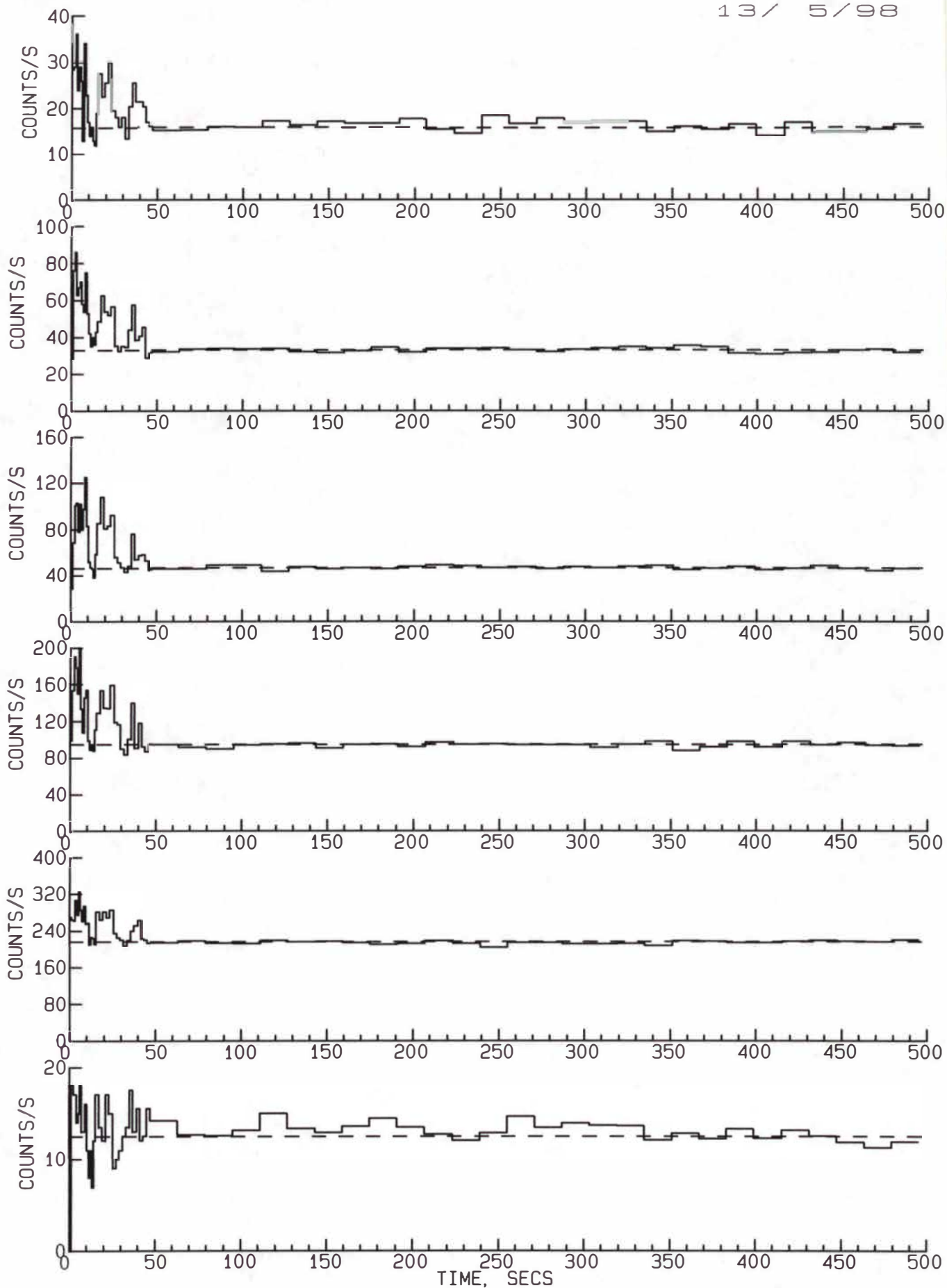
22- 57 keV

57- 91 keV

91-125 keV

125-159 keV

159-182 keV



13 / 5 / 98

ULYSSES

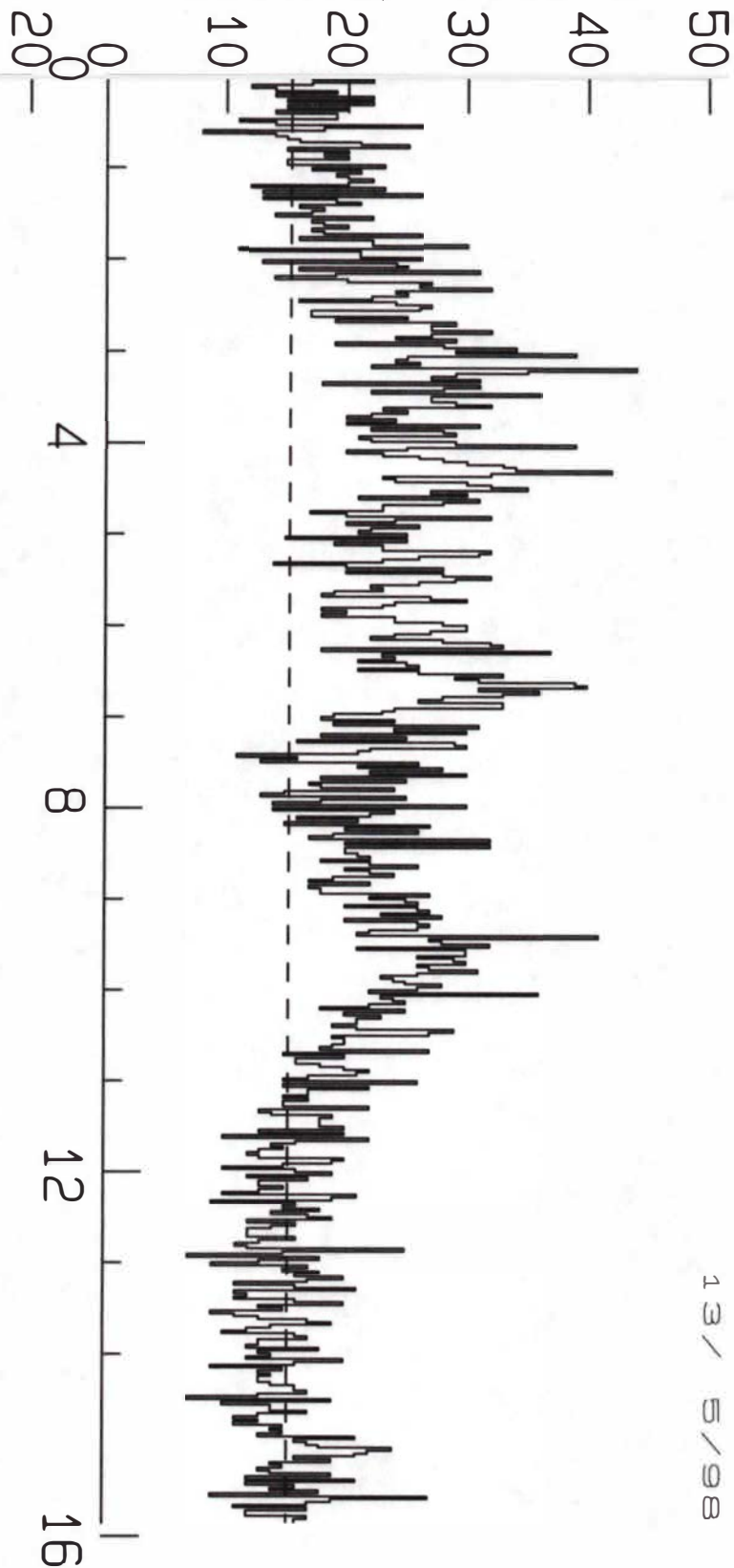
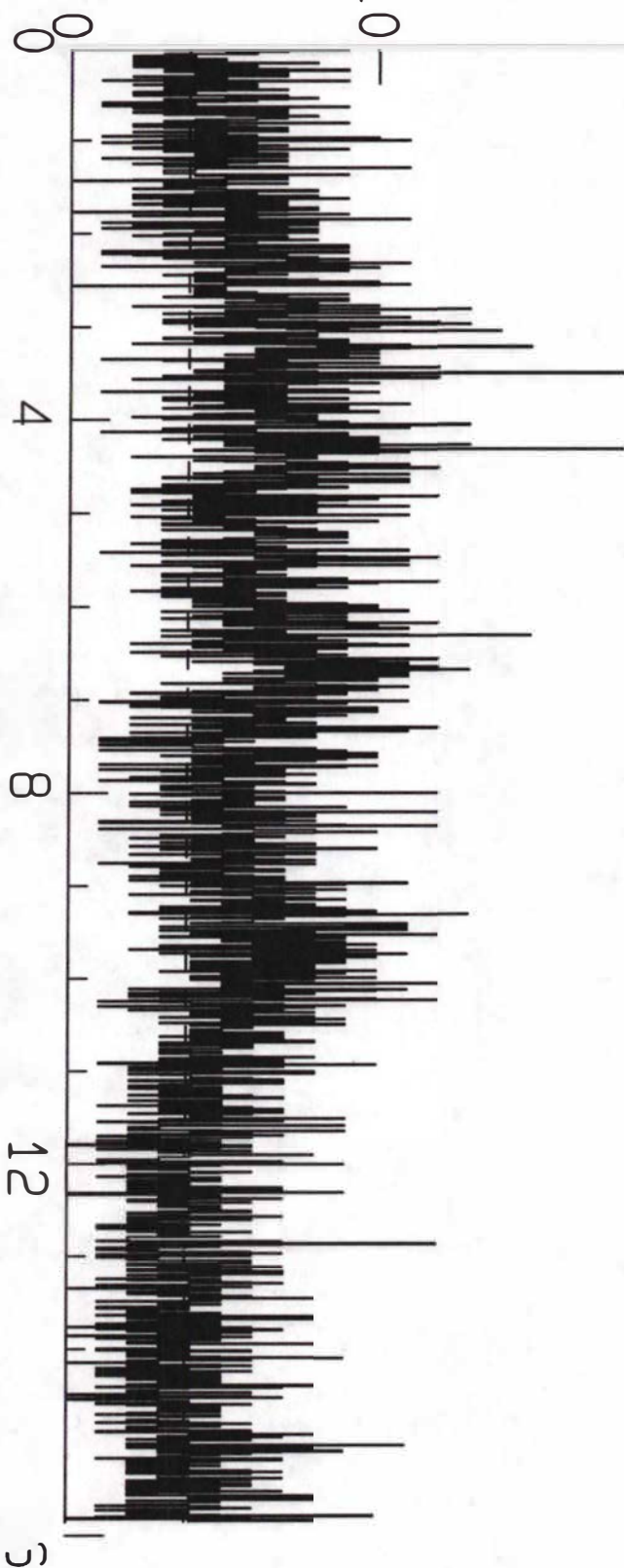
10/03/91

Ttrig=46767.344

26- 182 keV

COUNTS/0.008 S

COUNTS/0.031 S



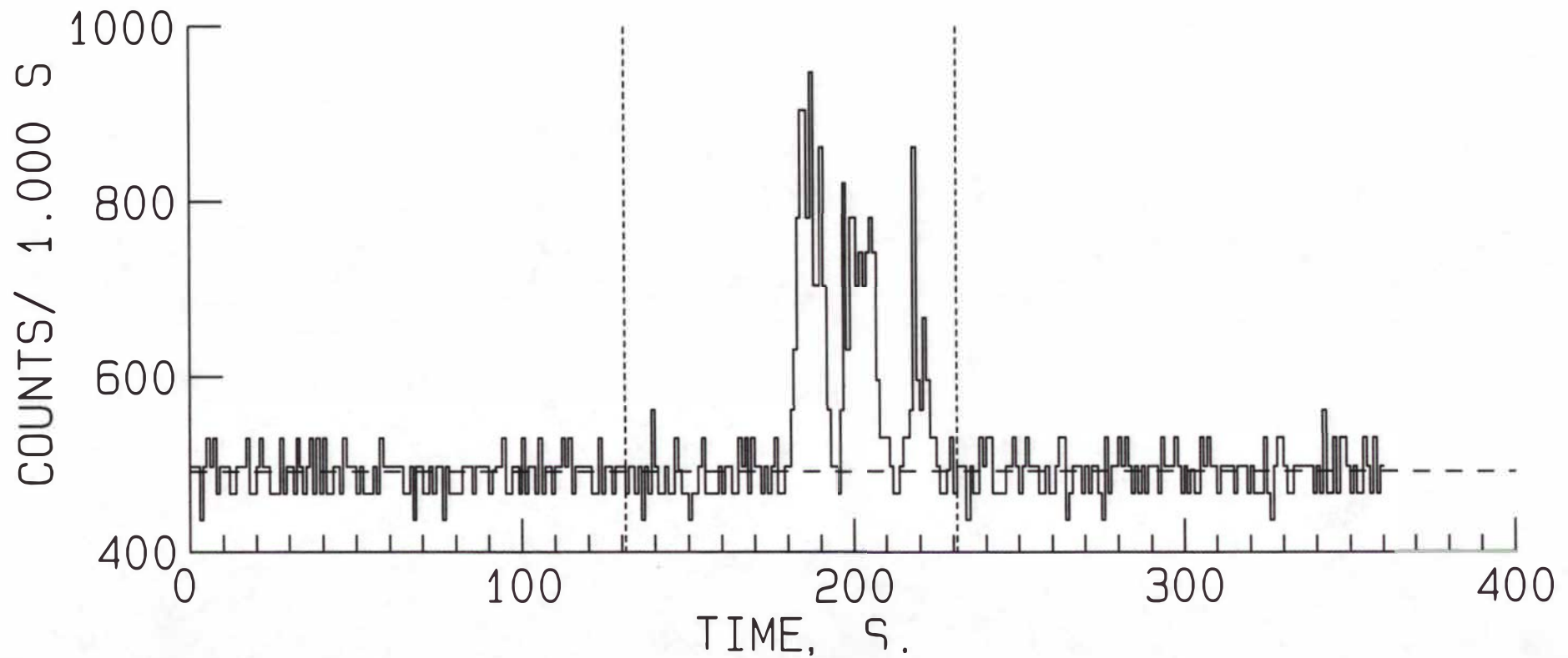
ULYSSES RT

13 / 5 / 98

10 / 3 / 91 46584.488 s

26- 182 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From root Mon Aug 23 10:30 1993
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA19302; Mon, 23 Aug 93 10:29:49
Received: from east.gsfc.nasa.gov by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA23093; Mon, 23 Aug 93 10:33:20 PDT
Received: from ESSDP2.DECnet MAIL11D_V3 by east.gsfc.nasa.gov (5.57/Ultrix3.0-C)
id AA16832; Mon, 23 Aug 93 13:33:34 -0400
Date: Mon, 23 Aug 93 13:33:34 -0400
Message-Id: <9308231733.AA16832@east.gsfc.nasa.gov>
From: 046369@essdp2.dnet.nasa.gov
To: "khurley@space6.ssl.berkeley.edu"@east.dnet.nasa.gov
Subject: DMSP GAMMA-RAY BURST DATA
Status: R

FROM: ESSDP2::TERRELL (JAMES TERRELL, LOS ALAMOS NATL LAB) MAILOUT.0823
TO: UCBSB::KHURLEY (KEVIN HURLEY) (EAST::"KHURLEY@SPACE6.SSL.BERKELEY.EDU")
CC: BATSE::KOUVELIOTOU
SUBJ: DMSP GAMMA-RAY BURST DATA, AS OF 16 JULY 1993 (EXTENDED, 8/23/93)

HERE ARE SOME NOTES RE DMSP PEAKTIMES FOR YOUR MASTER BURST LIST:

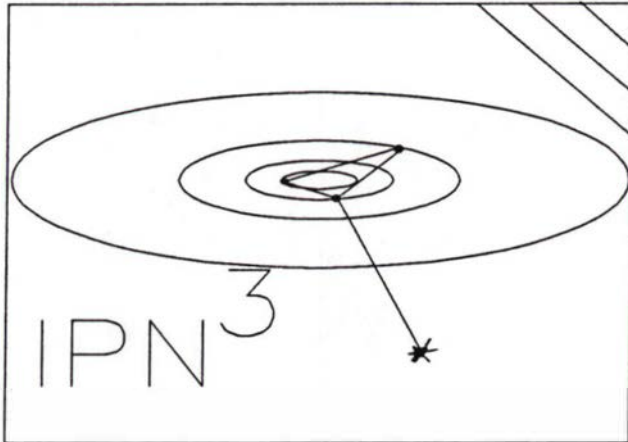
+ 8FEB91 32416 YES (8YES,9YES,10SAA)
+ 19FEB91 42325 YES (8YES,9YES,10SAA)
+ 10MAR91 46923 YES (8YES,9YES,10YES)
+ 1JUN91 69757 YES (8SR,9YES,10YES) NO AT 69736!
+ 14AUG91 40232 YES (8NR,9YES,10YES) NO AT 40182!
27SEP91 84415 YES (8SAA,9YES,10SAA)
16OCT91 36696 YES (8SAA,9YES,10NR)
4NOV91 54286 YES (8SR,9YES,10YES)
27NOV91 15739 YES (8NO,9NO,10YES)
2DEC91 73733 YES (8YES,9NO@144DEG,10NR)
9DEC91 66959 N/O (8SR,9SR,10NR,11ND)
21DEC91 22686 YES (8ND,9NO,10NO,11YES)
10JAN92 33478 NA (BLANK) (8ND,9NA,10SAA,11NA)
10FEB92 35633 YES (8NO,9WEAK,10SAA,11SAA)
6APR92 9855 N/O (OBSCURED) (8NO@141,10SR,11NO@137DEG)
1MAY92 76696 N/O (OBSCURED) (8NO@127,10NO@157,11NO@147DEG)
*+ 19MAY92 59406 YES (8SR,10YES,11NO)
22JUN92 25506 N/O (8SAA,10NR,11SA)
* 28JUN92 76452 YES (8ND,10YES,11NO)
29JUN92 75897 YES (ALL YES, SOFT)
14JUL92 47069 NA (BLANK) (8NA,10SAA,11SR)
* 16JUL92 60933 YES (9NO,10YES,11YES)
20JUL92 11524 N/O (OBSCURED) (8NA@130,10NA@145,11SR)
23JUL92 72188 N/O (OBSCURED) (8ND,10NA@148,11NR)
+ 26JUL92 165 YES (8NO,10YES,11YES,BOTH SOFT AND WEAK)
*+ 31JUL92 61660 YES (8SA,10YES,11NO) NO AT 61620!
10AUG92 79599 YES?(8YES?,10NA,11NA) (LONG SOFT PEAK) (SEE NOTE BELOW)
*+ 22AUG92 81542 YES (8YES,10YES,11YES)
* 4OCT92 50421 YES (8YES,10YES,11SR)
23NOV92 22727 YES (8YES,10YES,1SR) (NOT AT 22712)
23NOV92 46542 YES (8NR,10SR,11YES) (NOT AT 46584, BATSE GRB)
7DEC92 57649 YES (8YES,10YES,11YES)
6JAN93 55260 YES (8SAA,10YES,11SR)
12JAN93 55082 YES (8YES,10NO@138,11VERYWEAK) (8:BIG PEAK AT 55202)
20JAN93 84779 YES (8YES,10,YES,11YES) (NO, AT 84700!)

* I WILL BE SENDING YOU BY FAX DMSP LOCATION PLOTS FOR THE EVENTS MARKED
ABOVE WITH AN ASTERISK, PLUS A DATA PLOT FOR DMSP8, 10AUG92.
I WOULD APPRECIATE KNOWING WHETHER THESE HELP IN LOCATING EVENTS.
IF YOU WANT MORE COMPLETE INFORMATION PLEASE TELL ME. I HAVE RECEIVED
NO SOURCE LIST FROM YOU SINCE 920626. DID YOU RECEIVE MY LIST SENT 920716?

+ LISTINGS ADDED 930823 TO 930716 LIST.

--JIM TERRELL

FAXED



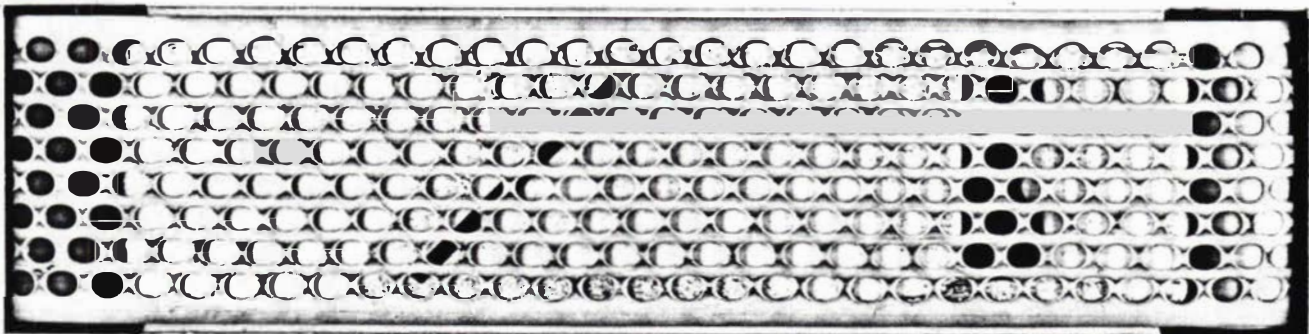
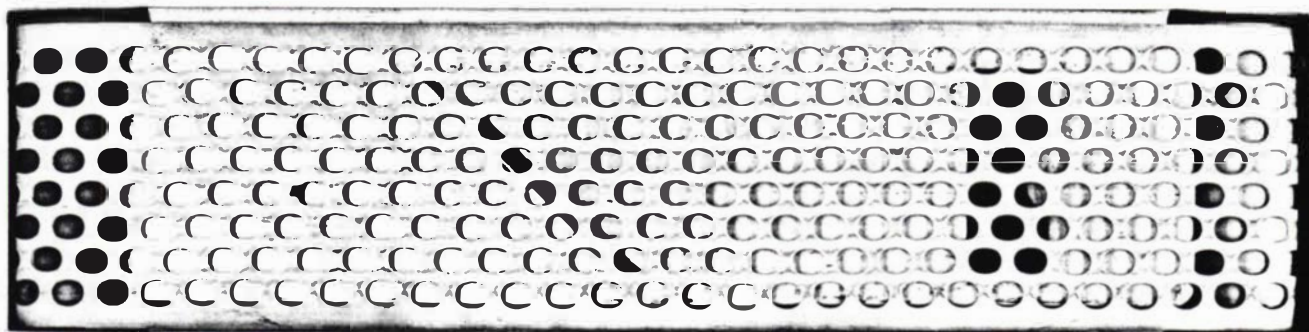
FAX FROM K. HURLEY
UNIVERSITY OF CALIFORNIA
SPACE SCIENCES LABORATORY
BERKELEY, CA. 94720
PHONE: (510) 643-9173
FAX: (510) 643-8640 (OFFICE), -8302 (SECT'Y)
E-MAIL: khurley@sunspot.ssl.berkeley.edu

TO: NIELS LUND, DSRI
FAX #:
DATE: August 19, 1993
TOTAL NUMBER OF PAGES: 4

Here are three triangulations.

1. March 10, 1991. I put the GRANAT coordinates in, and this has reduced the WATCH/Ulysses annulus width. It can be reduced further with a bit more work on the correlation between the time histories.
2. September 25 1992. Here again, the GRANAT ephemeris will reduce the annulus width, but we already have consistency. Ulysses observed both peaks in the time history, but there was a BATSE data gap for the entire period.
3. July 18 1992. I need the GRANAT ephemeris, and I have to do a little more work on the cross-correlation, but we are not entirely inconsistent. The changing WATCH background makes this one a bit tricky.

I got the five time histories you sent this morning, and I'll work on them in a week or so, after I get back from vacation.



From nl@dsri.dk Tue Aug 17 05:57:23 1993
Date: Tue, 17 Aug 93 14:58:46 +0200
From: Niels Lund <nl@dsri.dk>
To: khurley@sunspot.ssl.berkeley.edu
Content-Length: 38290

nk / iund.data

Dear Kevin:

Thanks for your fax. The data for GRB 910310 looks very nice now.
The time resolution of the WATCH data I cannot improve, but for this
burst I have the GRANAT position (provided by CESR Toulouse):

GRANAT relative to Earth at 910310 1300 UT:
X: -16255 km, Y: 44002 km, Z: 128448 km (Epoch 1950)

Attached find three more WATCH time histories and an update of the
burst list. The list has been updated for the three bursts attached
here; due to telemetry problems the data were incomplete, and the
assignment of UT-time was more complicated than usual.

niels

GRB 920902 WATCH data. (W6163)

Low energy count rate (6-15 keV)

UT start time: ' 1992 09 02 00:28:58.117
UT end time: ' 1992 09 02 00:30:55.047
Channel width: 0.91352 s

^

268	309	334	322	354	345	403	407	364	379
385	351	311	314	285	293	296	299	284	305
282	298	276	277	280	300	288	306	289	295
303	302	286	303	319	284	284	276	269	299
263	300	318	298	293	288	278	317	313	287
299	292	296	307	297	303	325	284	279	296
271	297	280	283	255	283	320	288	293	261
289	305	296	313	286	293	296	320	311	259
284	280	282	286	298	297	293	266	287	312
284	266	297	266	290	300	284	256	305	283
284	299	266	301	292	306	332	284	269	294
288	272	294	324	319	298	266	296	309	312
286	285	272	277	309	281	291	304		

Medium energy count rate (15-180 keV)

UT start time: ' 1992 09 02 00:28:58.117
UT end time: ' 1992 09 02 00:30:55.047
Channel width: 0.91352 s

^

130	145	159	177	240	356	388	409	396	285
260	191	160	146	154	114	128	137	134	130
118	139	123	135	151	116	152	131	118	120
127	137	134	116	127	154	128	143	136	140
127	138	119	107	139	132	123	111	119	113
125	133	154	121	114	128	131	116	142	128
127	121	133	132	119	135	156	125	147	115
128	124	115	122	137	130	129	122	113	139
146	119	134	122	116	123	143	155	110	105
107	121	135	138	129	137	123	134	138	124
125	154	150	122	126	122	138	120	128	132
143	117	137	124	136	121	124	137	136	128
144	122	128	128	137	124	128	129		

Low energy count rate (6-15 keV)

From root Thu Aug 5 05:22 1993
 Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
 id AA13940; Thu, 5 Aug 93 05:22:42
 Received: from danpost.uni-c.dk by sunspot.ssl.berkeley.edu (4.1/1.30.1)
 id AA01678; Thu, 5 Aug 93 05:22:43 PDT
 Received: from uhuru.dsri.dk by danpost.uni-c.dk (5.65c+/1.34)
 id AA08631; Thu, 5 Aug 1993 14:26:14 +0200
 Received: by uhuru.dsri.dk (4.1/SMI-4.1)
 id AA15442; Thu, 5 Aug 93 14:24:35 +0200
 Date: Thu, 5 Aug 93 14:24:35 +0200
 From: Niels Lund <nl@dsri.dk>
 Message-Id: <9308051224.AA15442@uhuru.dsri.dk>
 To: khurley@ssl.Berkeley.EDU
 Status: R

Dear Kevin:

Attached find time histories for two events: GRB 911209 and GRB 910310. You have already received GRB 911209 once before (one month ago), but I have detected an error in the on board software providing the time stamp on our count rate data, this error resulting in time stamps delayed by slightly over one rotation time of our modulators - approximately 0.9 s. This error does not affect the timing of our high resolution data, so I don't think it will move the time for GRB 910219.

Please delete the old data for GRB911209 from your files!

I have also received updated pointing information for GRB 911209. The pointing information I used previously was the "expected" pointing. What I have now should be the "actual" pointing at the beginning of the SIGMA observation. This is still not the true pointing at the time of the burst! But there is in this case an unusually large deviation between the expected and the actual pointing - about 5 degrees - so there is hope that the inconsistency you mentioned in your fax will go away. I must stop now, but expect to have the updated sky position for this event for tomorrow.

niels

GRB 911209 WATCH data. (W4680)
 WATCH LOCALIZATION
 (Matching BATSE event)
 (WATCH times have been updated 930805. nl)

Low Energy NaI (6- 15 keV)
 UT start time: ' 1991 12 9 18 35 43.702
 UT end time: ' 1991 12 9 18 39 12.931
 Channel width: 0.8173 s

145	169	185	160	155	161	136	161	153	159
175	169	175	164	197	164	160	157	177	177
224	177	154	189	231	212	247	195	178	192
157	175	197	350	366	311	288	230	212	202
207	170	151	162	314	299	200	176	161	164
197	185	190	161	235	172	157	182	166	172
153	173	162	147	169	140	156	161	186	146
178	155	146	199	164	178	164	163	175	160
144	199	161	180	203	177	147	152	187	166
164	179	196	152	165	173	184	183	165	179
181	184	191	191	185	165	161	162	159	180
181	177	193	161	185	156	183	183	193	163
161	185	183	195	158	148	168	188	190	142
165	160	174	158	173	167	154	202	157	145

```

Low Energy NaI (6- 15 keV)
UT start time: ' 1991  3 10  13  1 38.300
UT end time:   ' 1991  3 10  13  4 36.233
Channel width: 0.9267 s

```


^

188	215	197	206	217	198	190	195	190	207
175	197	193	207	226	211	199	198	180	201
234	196	190	205	201	198	202	251	288	366
337	314	351	384	278	313	331	219	229	204
225	222	247	322	268	288	335	325	308	295
288	336	307	333	259	251	209	241	199	195
176	193	195	225	227	245	340	253	247	280
270	229	221	213	224	222	212	213	204	213
203	190	193	191	218	190	207	208	206	222
212	198	213	197	214	210	183	207	171	207
202	204	197	215	201	191	201	201	204	220
232	205	203	203	202	220	185	172	190	191
223	179	194	210	174	217	211	197	213	191
209	203	199	202	213	177	173	203	232	223
208	210	196	176	191	188	219	208	196	201
160	200	178	198	187	191	218	203	207	208
209	195	206	204	186	180	210	184	186	205
228	172	201	206	190	192	204	206	202	213
194	209	182	216	193	230	230	195	202	216
225	181								

Sum of Medium Energy NaI and CsI (15 - 180 keV)

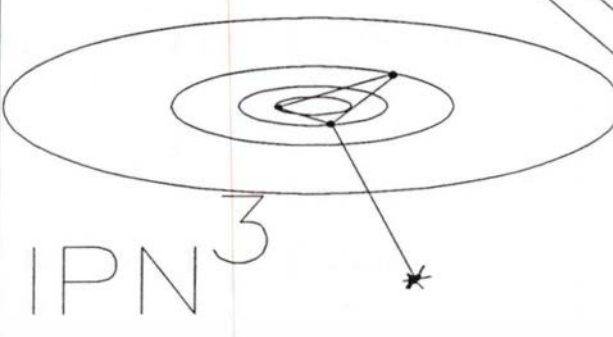
UT start time: ' 1991 3 10 13 1 38.300

UT end time: ' 1991 3 10 13 4 36.233

Channel width: 0.9267 s

^

208	218	188	172	175	181	197	209	203	193
192	199	195	174	189	186	206	165	164	190
203	174	181	166	223	208	232	368	463	542
464	396	468	403	329	451	406	247	184	205
210	205	230	430	281	343	390	423	342	339
320	341	390	331	278	184	214	202	167	205
168	169	208	213	210	320	399	187	262	258
208	208	181	205	225	210	188	186	169	193
192	214	172	200	202	194	196	193	192	202
178	195	195	179	219	181	174	193	206	206
192	196	180	186	197	197	213	206	186	200
191	200	200	190	171	207	179	186	184	180
171	187	192	177	196	191	183	201	198	172
202	192	176	192	204	162	214	191	216	198
205	175	169	179	194	173	186	232	204	215
207	225	192	175	185	203	182	172	191	196
205	185	176	165	176	179	205	163	190	215
199	183	196	182	181	214	174	177	181	179
201	193	205	182	197	205	188	183	178	180
209	225								

 IPN3	FAX FROM K. HURLEY UNIVERSITY OF CALIFORNIA SPACE SCIENCES LABORATORY BERKELEY, CA. 94720 PHONE: (510) 643-9173 FAX: (510) 643-8640 (OFFICE), -8302 (SECT'Y) E-MAIL: khurley@sunspot.ssl.berkeley.edu
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TO: Niels Lund, DSRI

FAX #:

DATE: July 23, 1993

TOTAL NUMBER OF PAGES: 6

As we discussed, I am sending you my notes on those Watch/Ulysses events which seem to have some potential for making small error boxes. Note that there are some Watch events for which we have no data, and cannot proceed. I would like to get the data as soon as possible. I think that this will make a nice Huntsville paper, provided we can remove the inconsistencies.

WATCH/ULYSSES EVENTS

1. 19 Feb 91. Done. Watch/Ulysses/PVO triangulation agrees with Watch error box. Optical transient inside Watch error box, but not inside IPN location.
2. 10 March 91. Watch/Ulysses/PVO event. I need the Watch digital data to triangulate this.
3. 17 Jul 91. Watch/BATSE/Ulysses/PVO event. BATSE and triangulation positions are around RA=241, dec=-63; Watch position given as 234, +29. Inconsistent.
4. 16 Oct 91. Watch/BATSE/Ulysses/PVO event. Earth/Venus/Ulysses were aligned, making the triangulation uncertain, but the Watch error box is consistent with Ulysses/BATSE annulus, and marginally consistent with BATSE error box. Needs more work.
5. 9 Dec 91. Watch/Ulysses/BATSE event. Watch error box is several degrees from Ulysses/BATSE annulus, but inside BATSE error box. This one needs more work.
6. 14 Jul 92. Watch/Sigma/BATSE/PVO event. The Sigma camera localized this event. Everyone is in agreement!
7. 18 Jul 92, 14:41. Watch/Ulysses event. I need the Watch digital data to do the triangulation.
8. 18 Jul 92, 21:32. Watch/Ulysses/BATSE event. I haven't triangulated it yet, but have all the data I need to do it.
9. 23 Jul 92. Watch/Ulysses/Sigma/PVO event. Localized by Sigma gamma camera. Previous Watch position (with 0.5° radius error box) was inconsistent with triangulated position, but in Sigma error box. New Watch position (with 1° radius error box) is consistent with everybody, although the IPN location is at the edge of the Watch box. PVO ephemeris needs to be updated - still using Venus.
10. 3 Sep 92 1:36. Ulysses/Watch/BATSE event. I need the BATSE data to triangulate this one.
11. 3 Sep 92 23:11. Ulysses/Watch event. I need the Watch data to triangulate it.
12. 25 Sep 92 19:30. This one is new (at least, to me). I'm looking for it in the Ulysses real-time data (I know we didn't trigger on it). However, there is also a Phebus event on this day, with time given as 20:30. I wonder if there is a mistake here somewhere?
13. 25 Sep 92 22:49. Ulysses/Watch event. I need the Watch data to triangulate it.

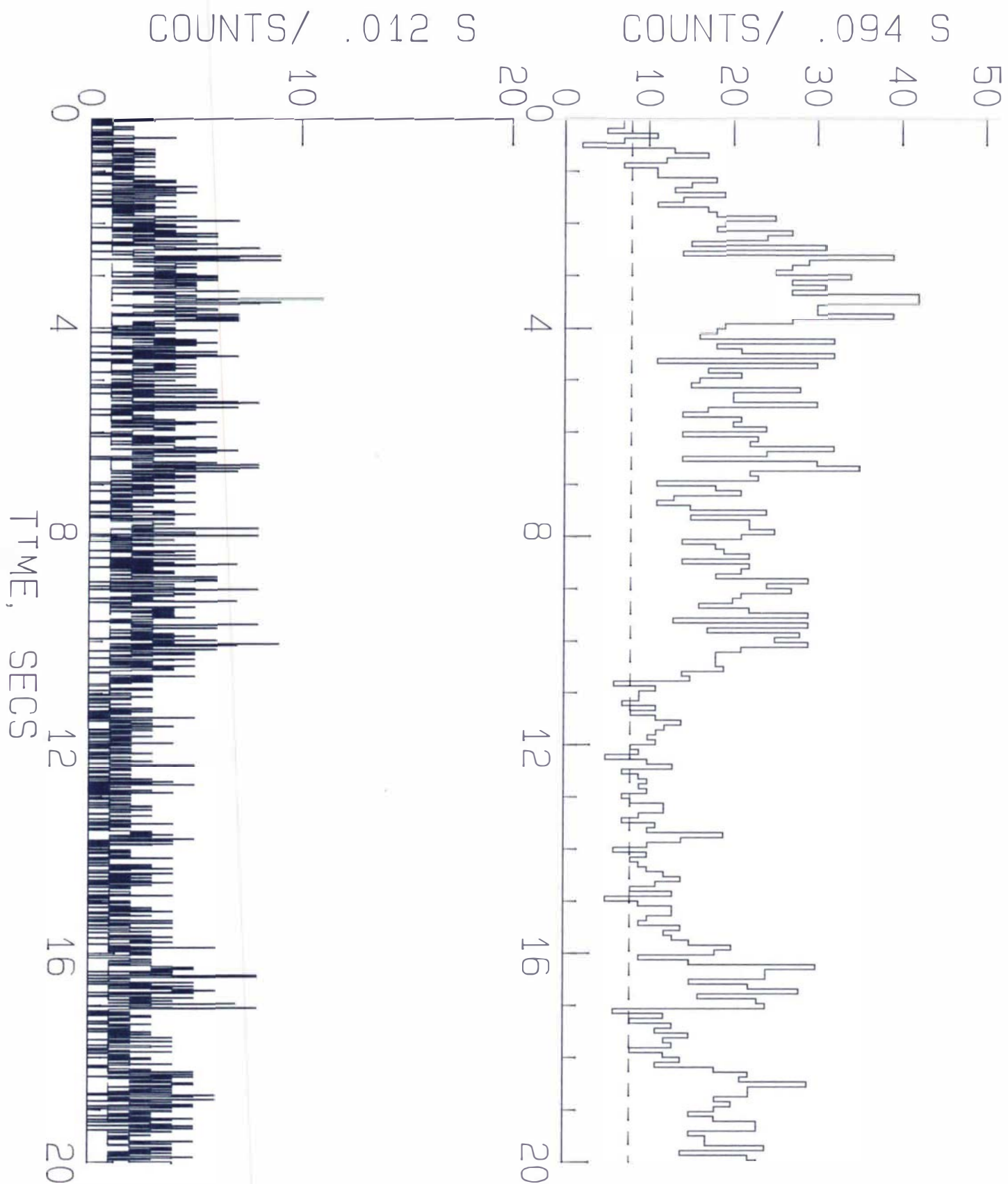
Possible
Watch RT 25
Need more
data to confirm

PV0

10/03/91

47568.096

100-2000 keV



PV0

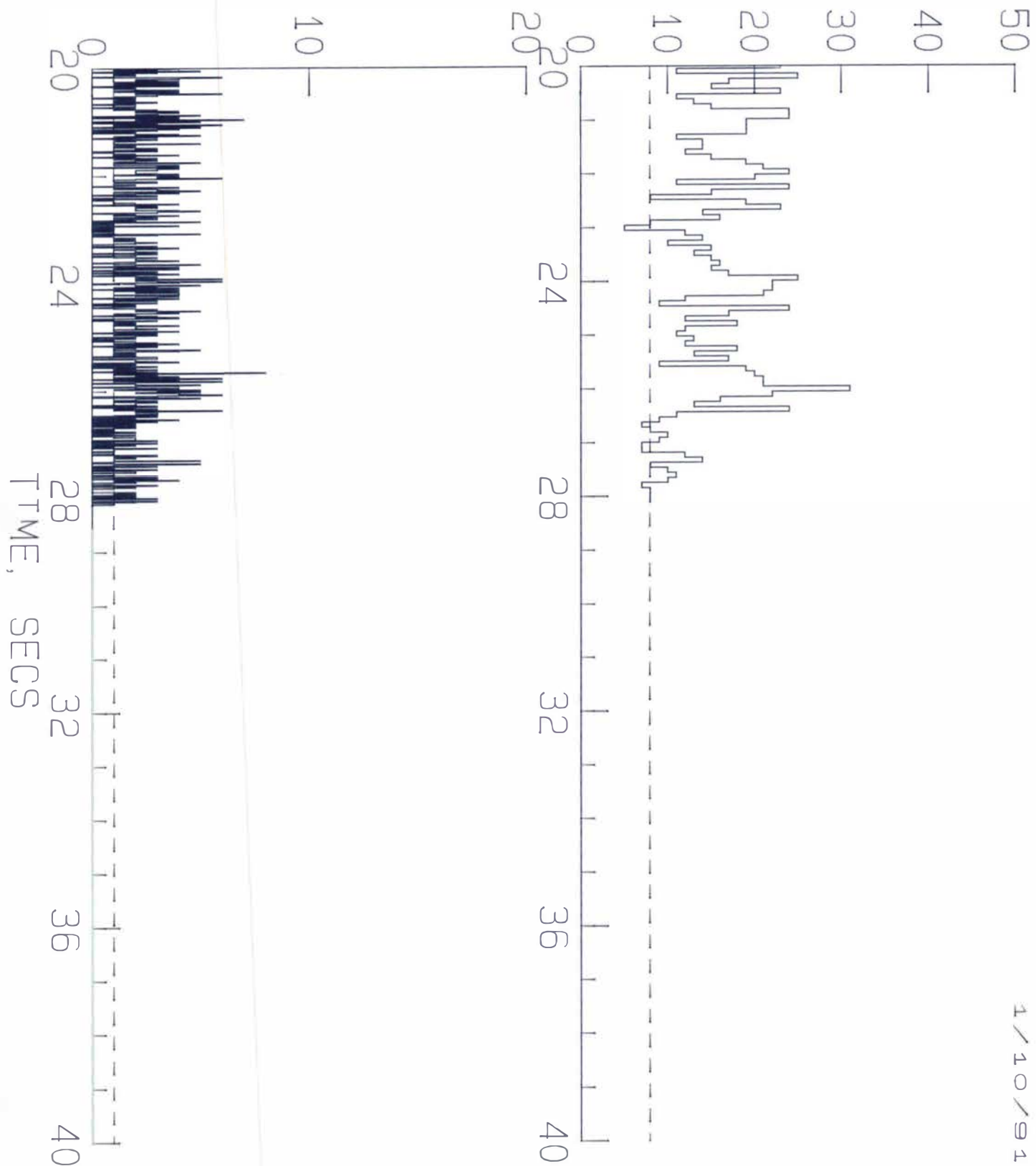
10/03/91

47568.096

100-2000 keV

COUNTS/ .012 S

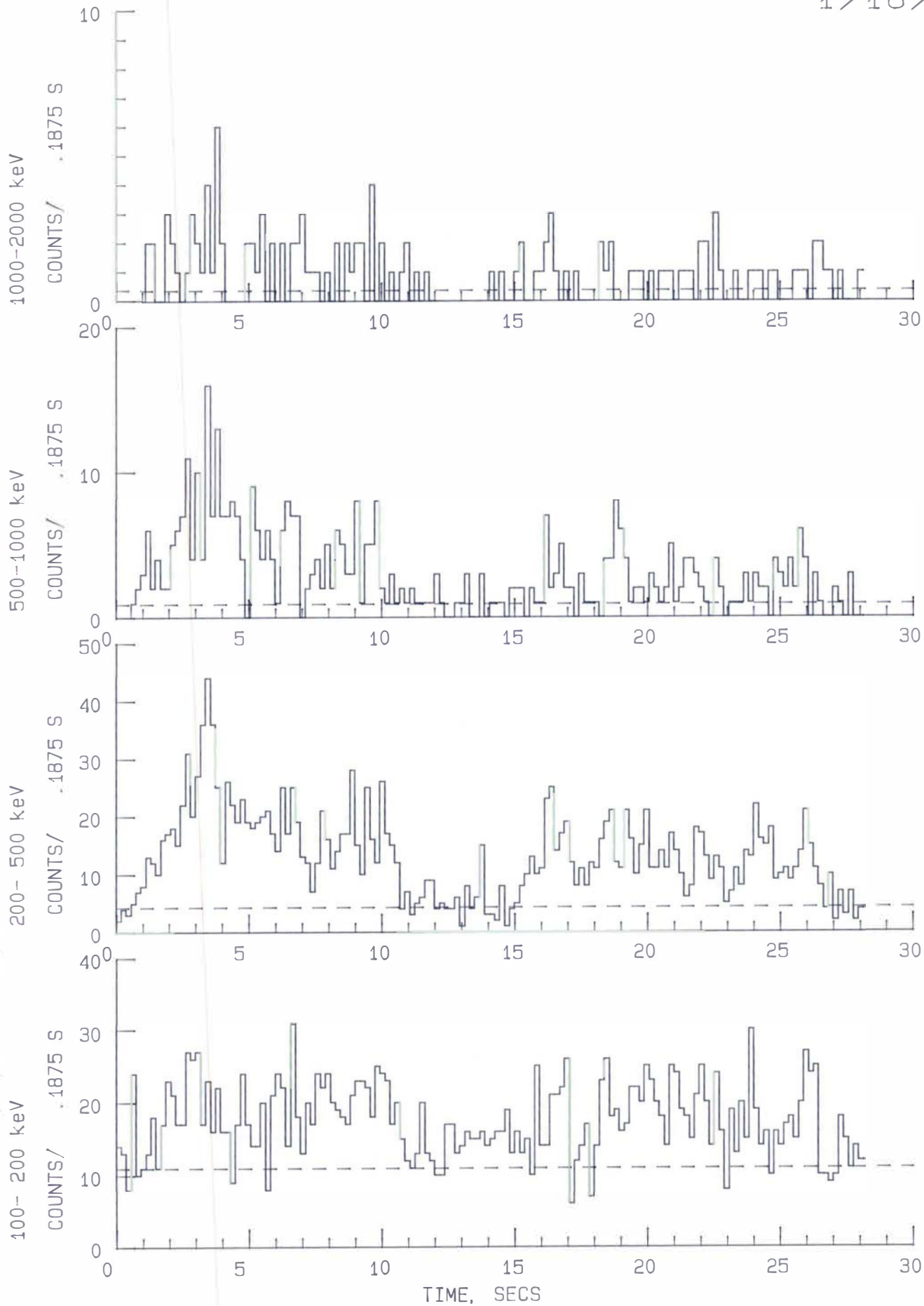
COUNTS/ .094 S



1/10/91

1 / 10 / 91

PV0 10/03/91 47568.096



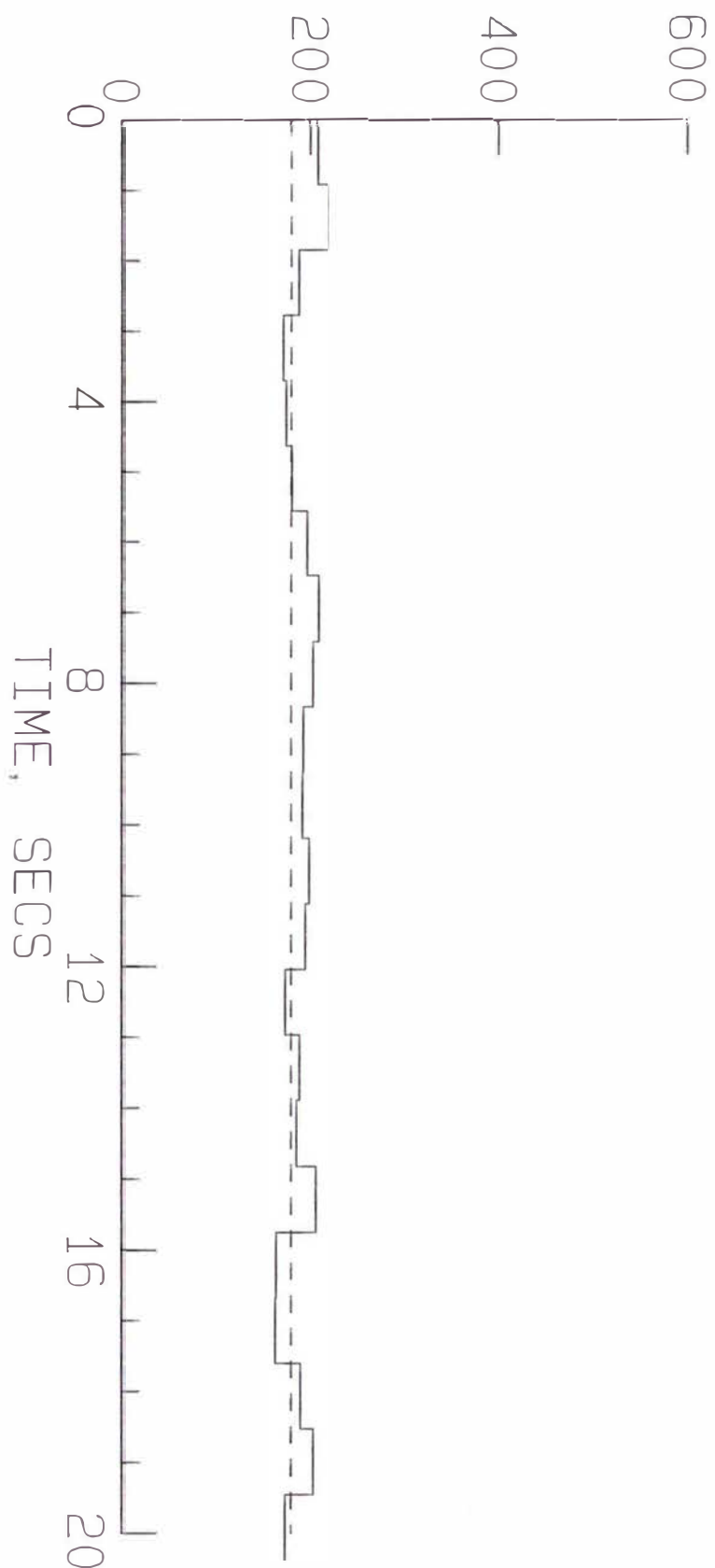
WATCH

10/03/91

46898.300

15- 180 keV

COUNTS/ .927 S



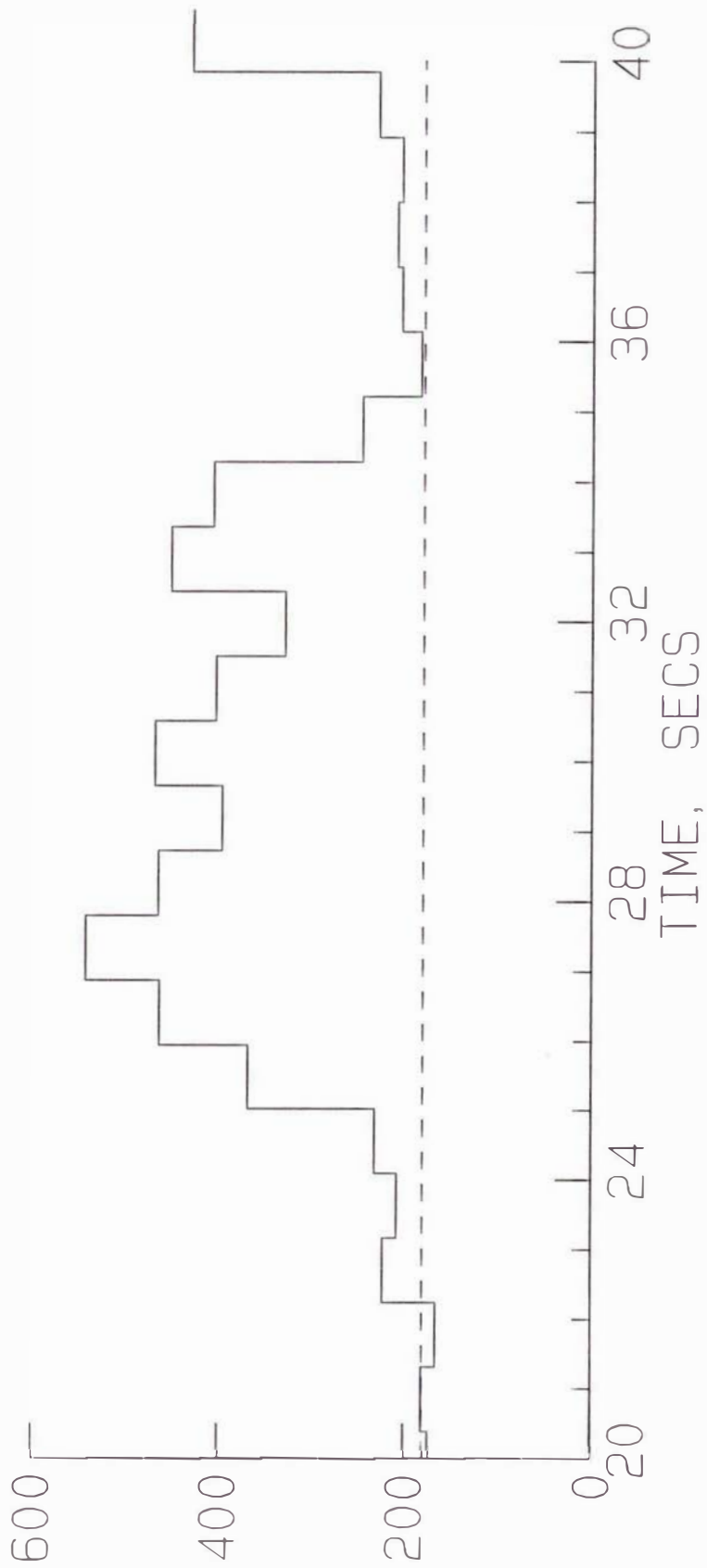
46898.300

10/03/91

WATCH

15 - 180 keV

COUNTS/ .927 S



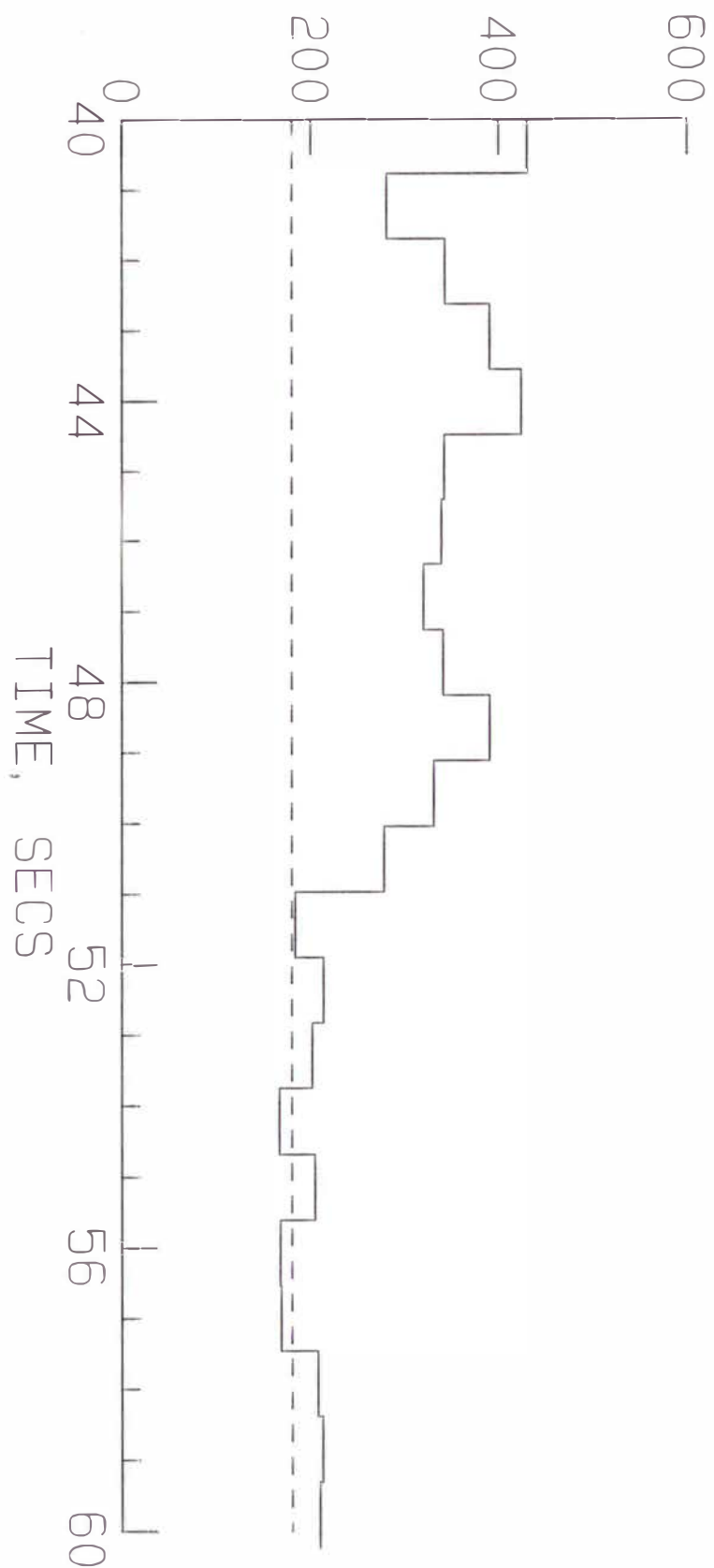
WATCH

10/03/91

46898.300

15- 180 keV

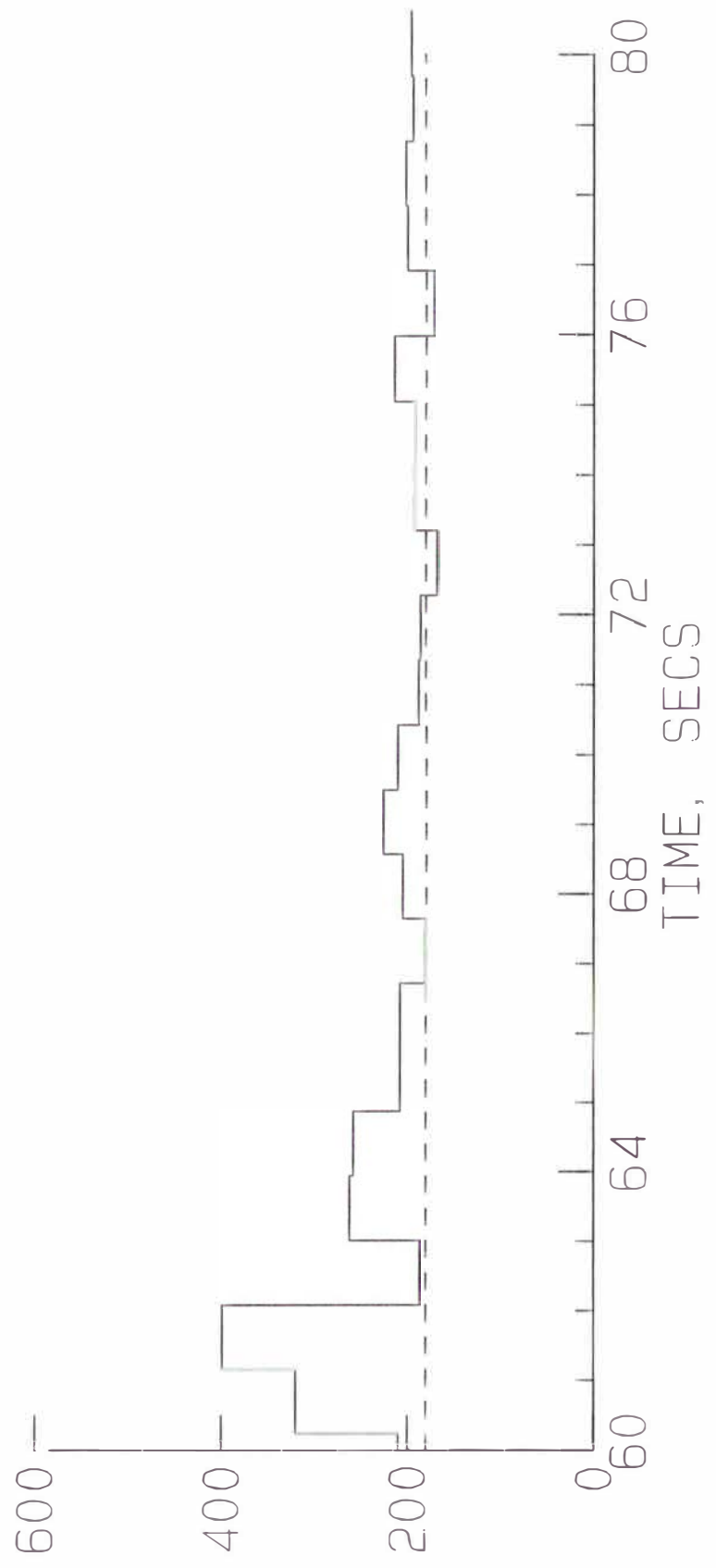
COUNTS/ .927 S



WATCH 10/03/91 46898.300

15 - 180 keV

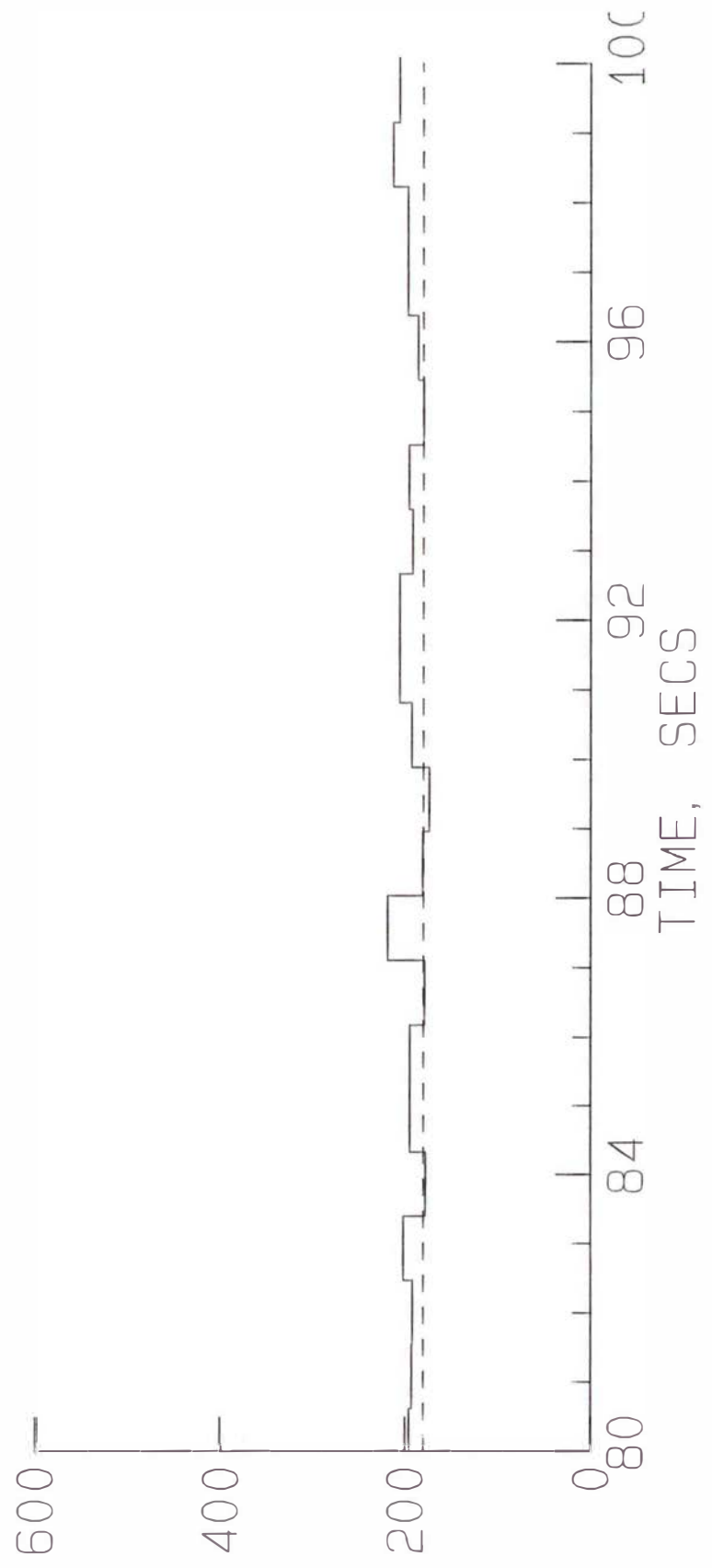
COUNTS/ .927 S



WATCH 10/03/91 46898.300

15 - 180 keV

COUNTS/ .927 S

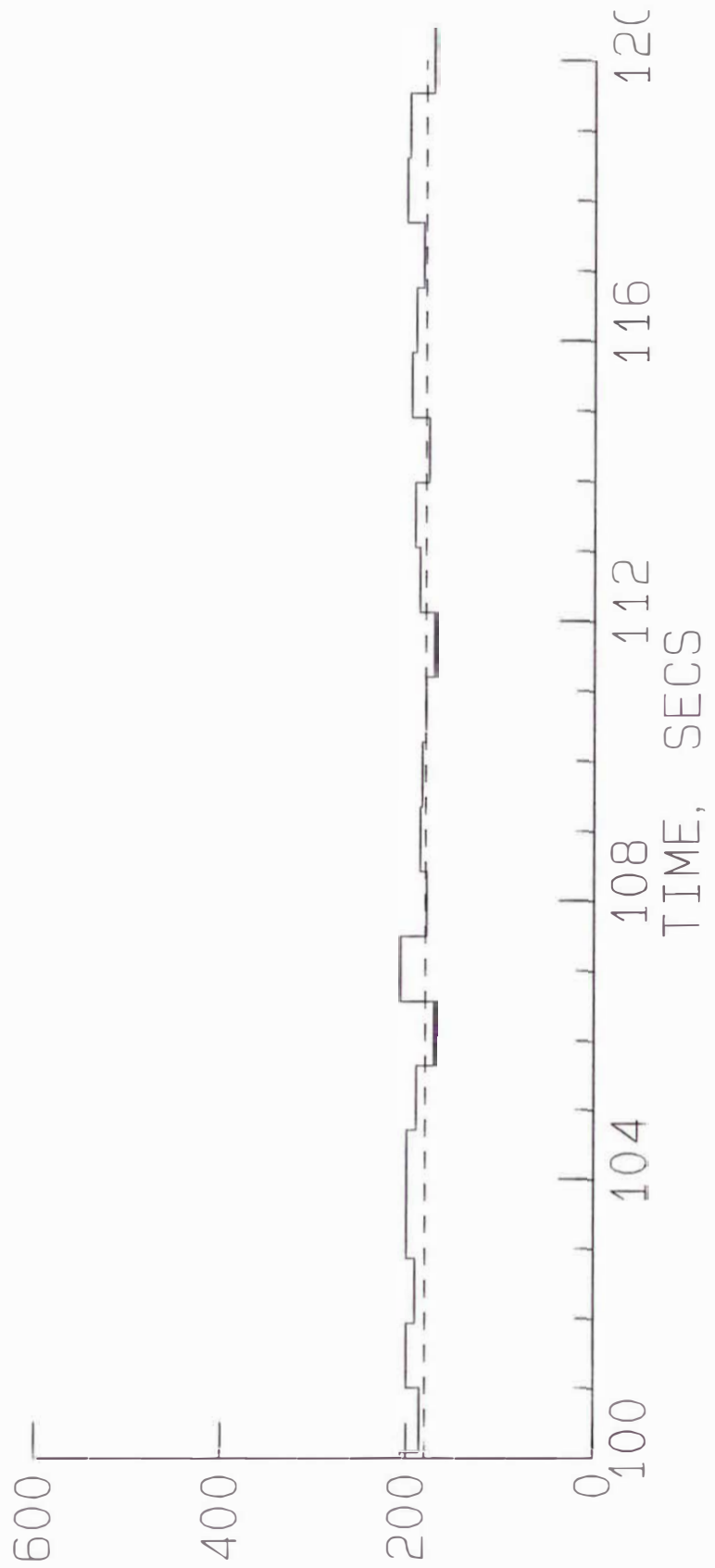


46898.300

10/03/91

15 - 180 keV

COUNTS/ .927 S

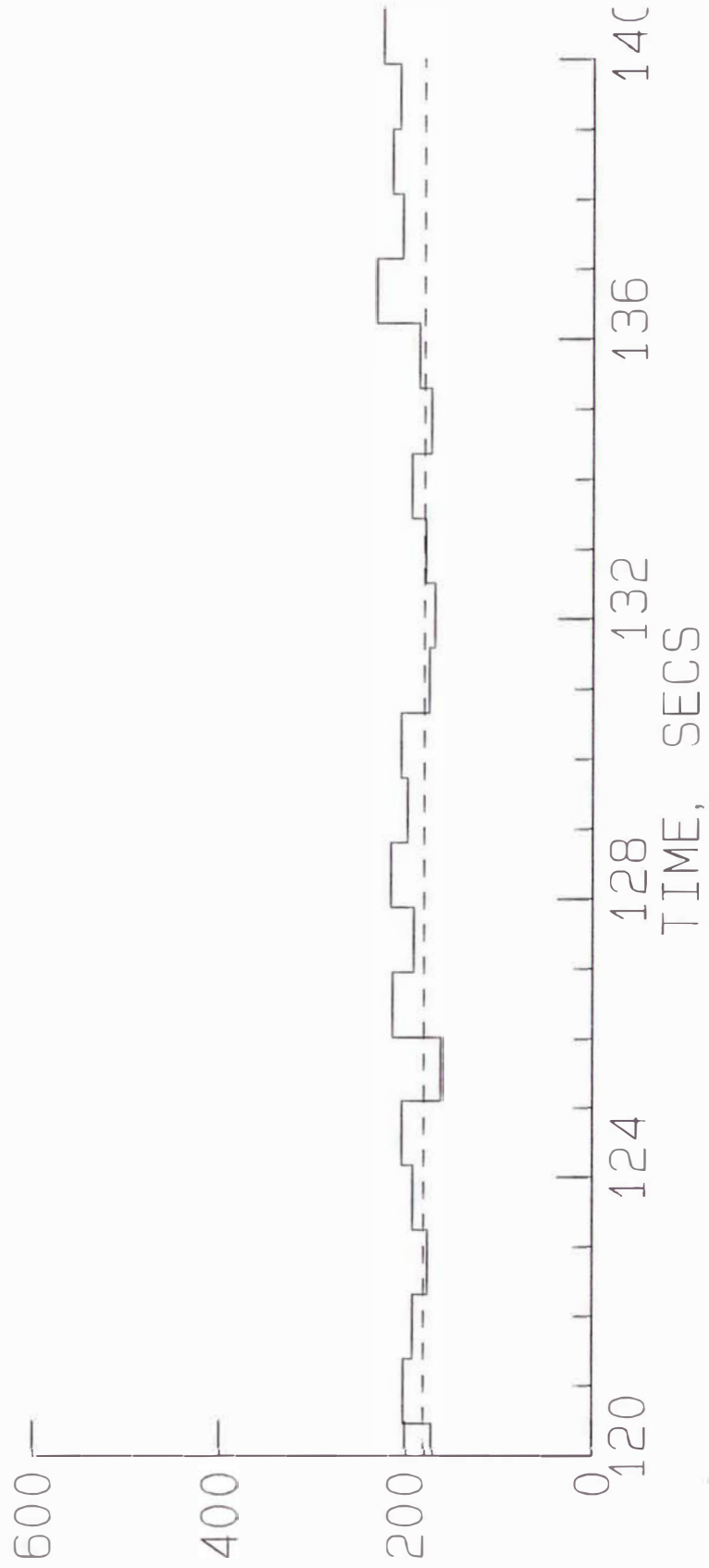


46898.300

10/03/91

15 - 180 keV

COUNTS/ .927 S

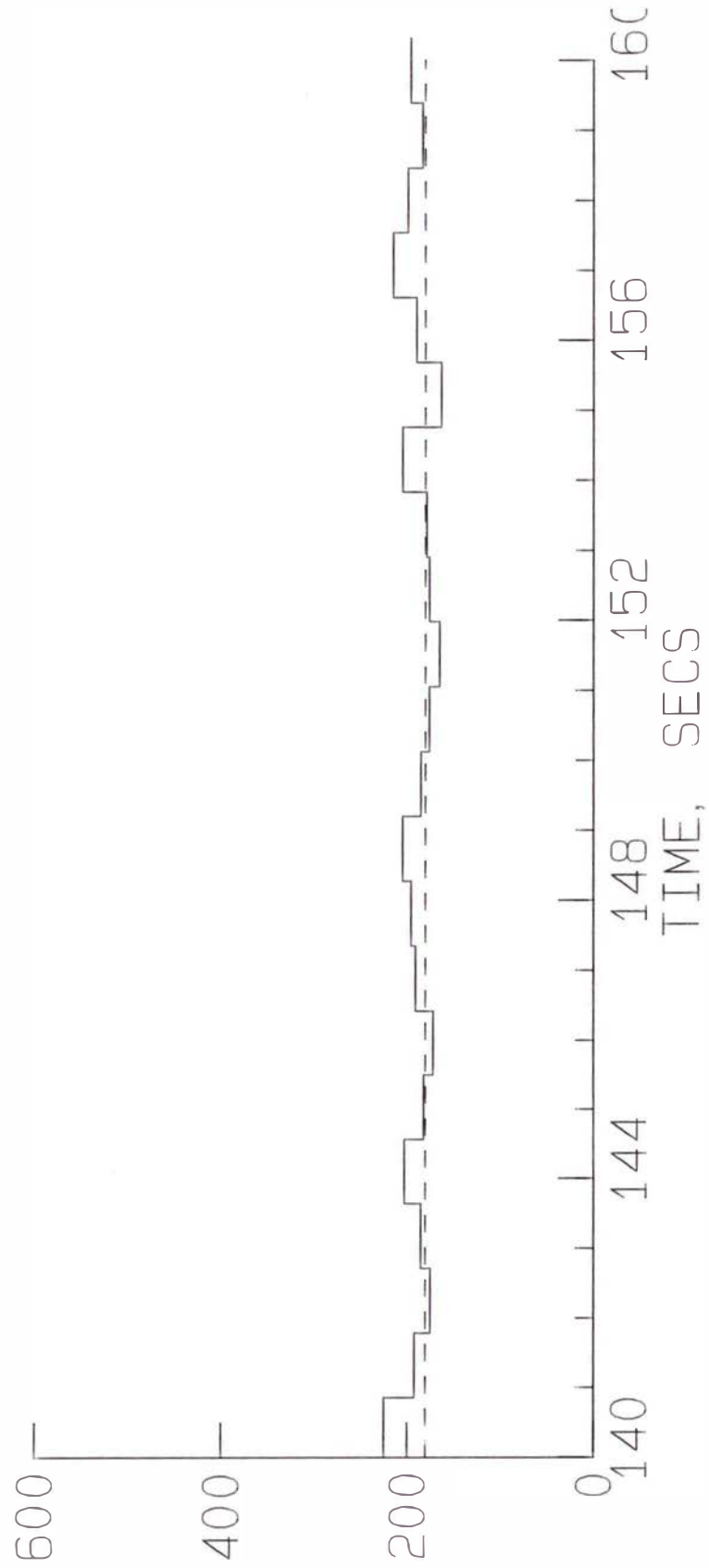


46898.300

10/03/91

15 - 180 keV

COUNTS/ .927 S

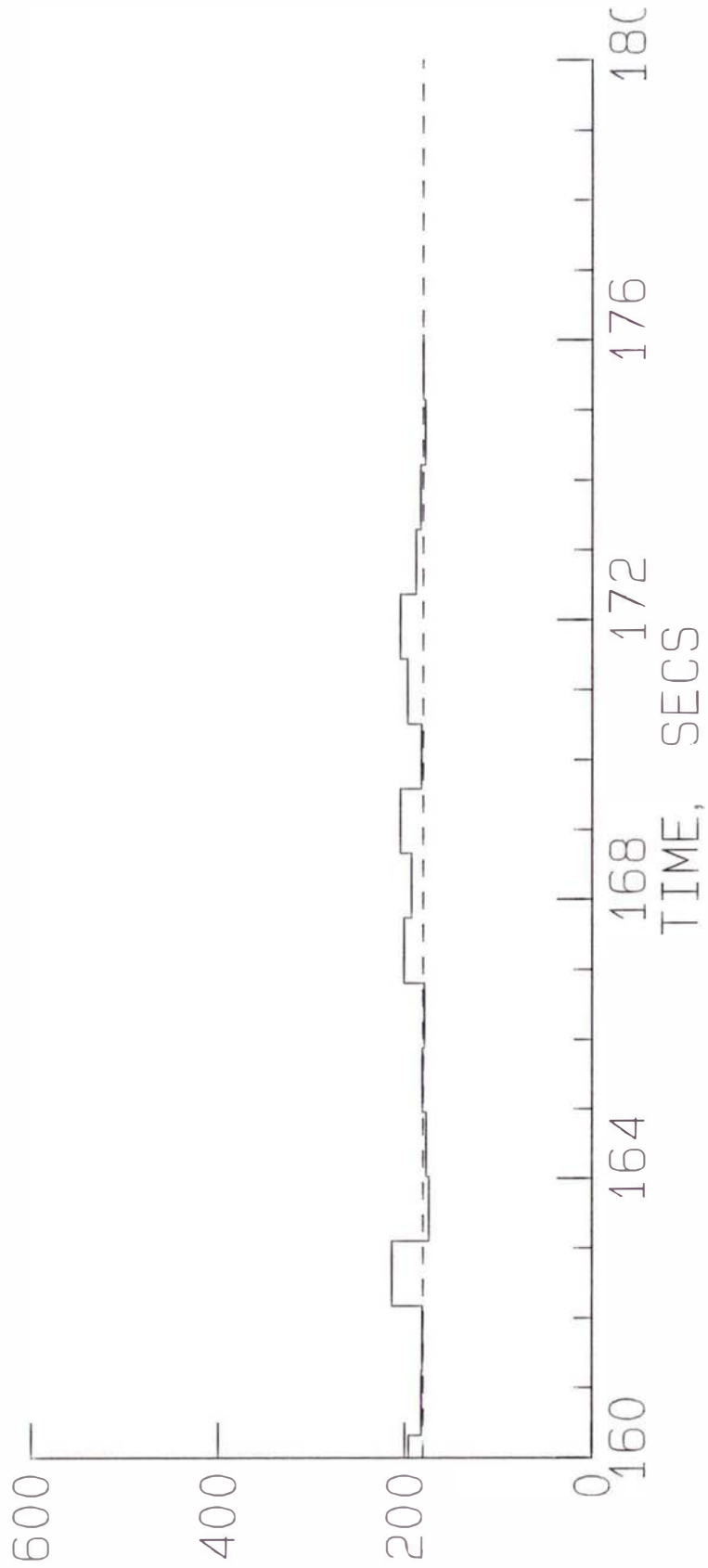


46898.300

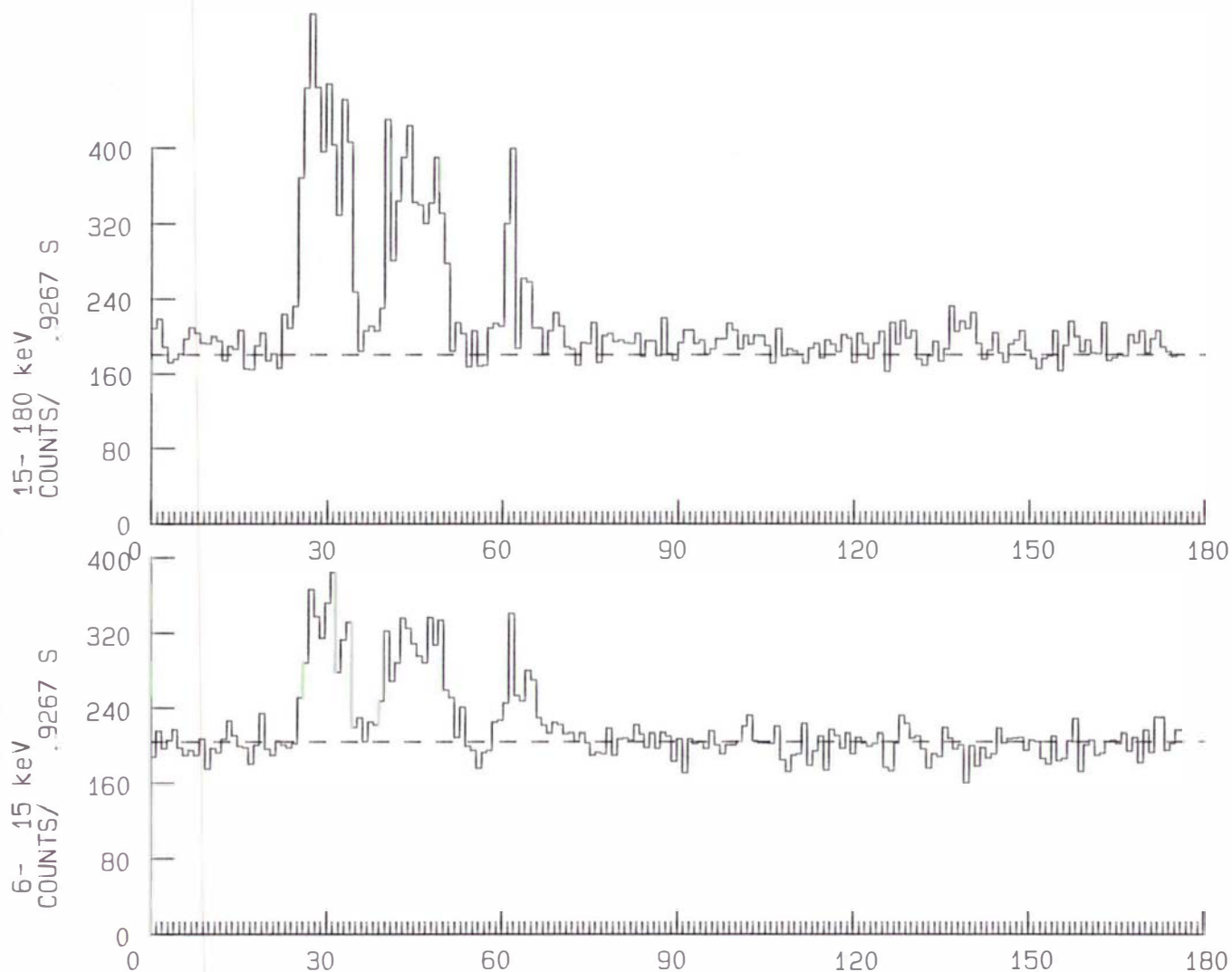
10/03/91

15 - 180 keV

COUNTS/ .927 S



WATCH 10/03/91 46898.300



DANISH SPACE RESEARCH INSTITUTE

Gl. Lundtoftevej 7
DK-2800 Lyngby
Denmark

Your ref.:

Our ref.: NL/agj

Lyngby, 10 June 1991

Dr. Kevin Hurley
Space Sciences Laboratory
University of California
Berkeley, CA 94720
U.S.A.

Dear Kevin,

Enclosed find a packet of material I am sending to you and to the other members of our "circle" (Tom Cline, John Laros, Michel Boer).

First, there is the positions of GRANAT at the times of the detections of the February 19 and March 10 bursts. I hope that the coordinate systems are well enough specified.

Second, I enclose time histories of several bursts, now with time calibration marks. There are three bursts for which an accurate position would be very valuable because follow-up data exists. For the February 19 burst, we have an ESO Schmidt plate taken on February 22. For the March 10 event, there is a Schmidt plate taken at Cala Alto and a radio survey from the VLA about a week after the burst. Finally, for the January 26 burst from last year, René Hudec has found an optical transient from 1964 about 0.5 degrees from the position determined by WATCH. It would, therefore, be very interesting if we could tighten the constraints on the gamma-burst location by a cooperative effort between PVO and WATCH.

You propose to establish a specific format of data exchange - I completely agree and suggest that we work on this using e-mail. You can find me on *INTERNET* using the address *nl@danru.dk* or on *SPAN* as 22207::nl .

GB910219

I have been spending some time trying to understand the time history of GB910219 in the different energy bands. For this event I have about 20 seconds of "raw" data, including the first major peak. The raw data gives a 7 bit pulseheight and time in 3.6 ms bins for each photon, so I can display the time history as function of pulseheight as I like. Unfortunately, the energy calibrations of the WATCH instruments are quite uncertain. The spectrum of this event in the WATCH range is rather soft and I am actually surprised that PVO saw it so well.

When comparing the time histories of PVO, ULYSSES and WATCH you note that WATCH detects three subpeaks within the first major peak, whereas PVO only sees two and ULYSSES only one - but the background in the ULYSSES data I have seen is quite high - maybe a better data selection in the ULYSSES data could bring out more detailed structure. I have tried to see if the third peak seen by WATCH is only present at the lower energies (to which PVO must be blind) but this is not the case.

I also enclose three plots showing the strong spectral evolution in the time histories in the WATCH energy range. Actually, to me this burst looks very similar to GB900126 from which the GINGA team saw the soft X-ray precursor.

GRB 910310

Here I have not much news. We only have data with 0.9 s time resolution and only in two fixed energy bands. I indicate the UT time for the first channel showing a strong excess.

GRB 910408

This is the short event I mentioned in my last FAX. It is too short for us to locate using the RMC. However, when I plot our time history with 8 ms resolution I see a very clear pulsating structure. This may be intrinsic to the source or it may be the modulation due to our rotating grid. In the latter case we can get some constraints on the position from the RMC. I would therefore like to see the ULYSSES data from this event plotted on a corresponding time scale. Did PVO see this burst or was it too soft ?

GRB 900126

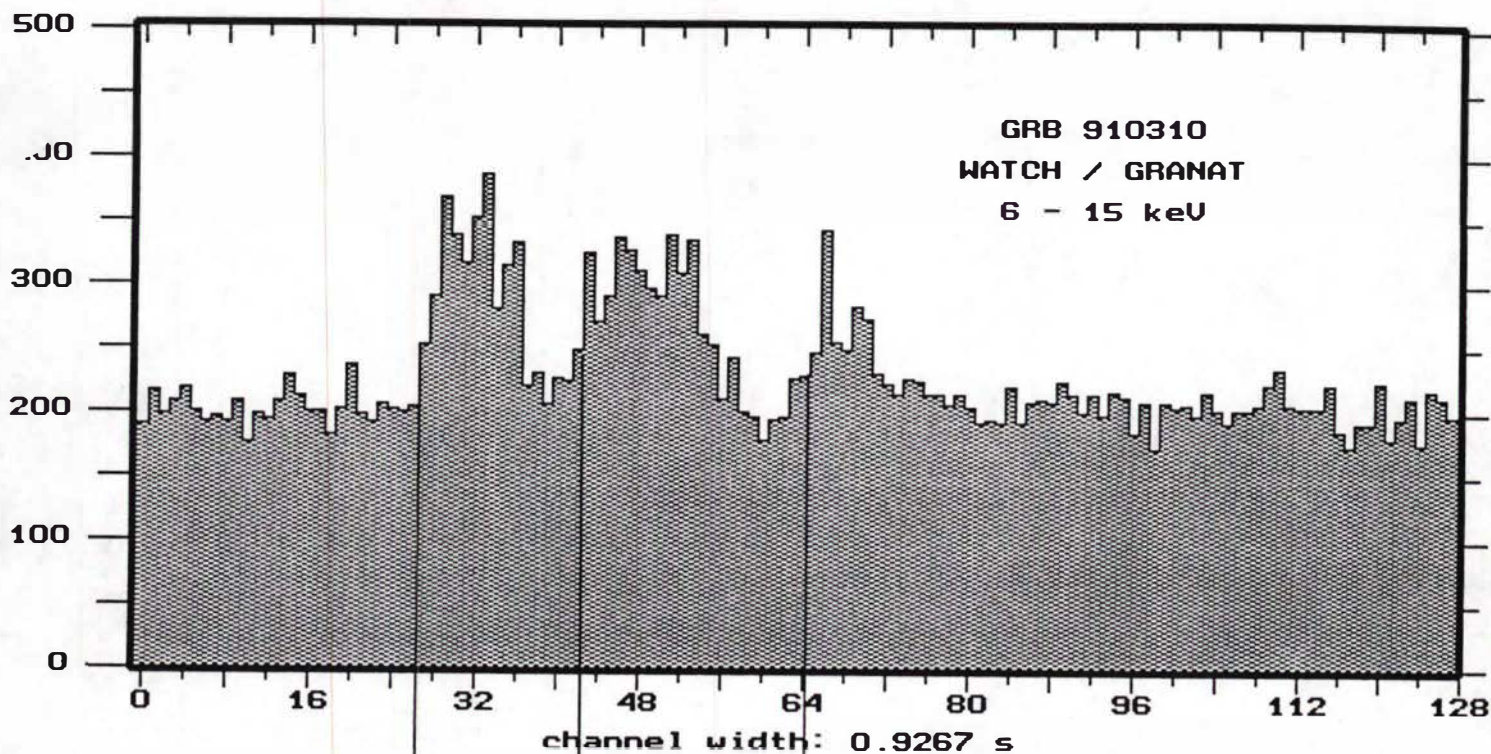
This burst was before the ULYSSES time, it was seen by GINGA and WATCH and it is the peculiar burst where the soft X-ray emission precedes the harder X-rays (Murakami et al., Nature 350, 592, 1991). WATCH determined the position as RA 8h46.2m dec -38.1 (1950). Error radius 0.3 degrees. My interest now is due to a letter I received from René Hudec who tells me that he has found on a Schmidt plate from 1963 an optical outburst of a star just outside of our error box. Did PVO see this burst ? If yes, we may be able to improve on the WATCH position and comment on the likelihood of the association of the optical transient and the gamma burst.

GRB 900118

This was a slow, hard burst we detected last year. We have a position for it which possibly could be improved if PVO also saw it. It may have to be found in the untriggered count rates as the rise time may be several seconds. Our position is RA = 11h 29m, dec = -44.5° (1950). From that you should be able to calculate the PVO time.

With best regards,

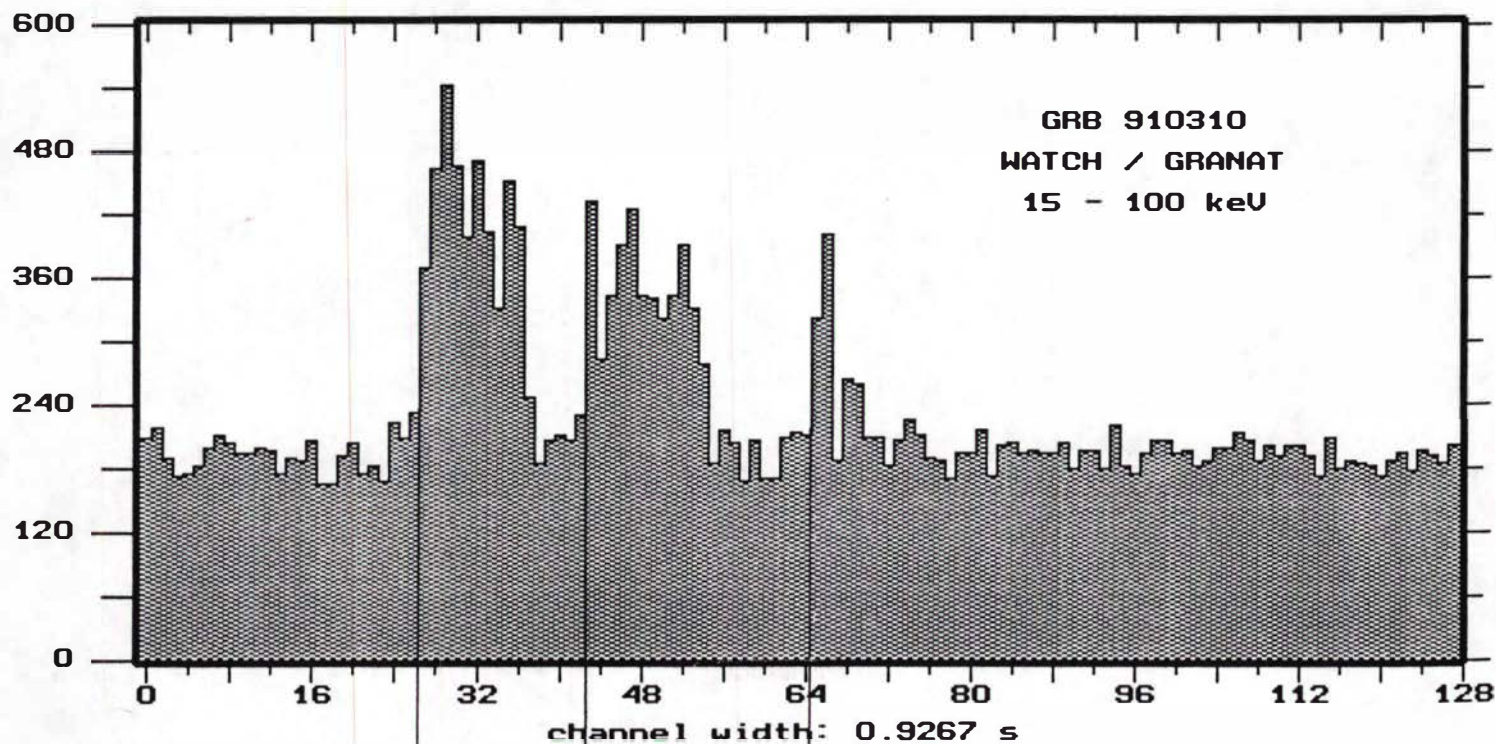
Niels
Niels Lund



ch 27
13^h 0^m 3^s.253
46803s

ch 43
... 18^s.080

ch 65
... 38^s.468



ch 27 start: 13^h 0^m 3^s.253

ch. 43 start: 13^h 0^m 18^s.080

ch 65 start: 13^h 0^m 38^s.468

From @STAR.STANFORD.EDU:081877@ESSDP2.SPAN Wed Oct 9 14:19:16 1991
 Received: from STAR.STANFORD.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
 id AA13515; Wed, 9 Oct 91 14:19:13 PDT
 Message-Id: <9110092119.AA13515@sunspot.ssl.berkeley.edu>
 Received: from ESSDP2 by STAR.STANFORD.EDU via MAIL-11 with DECnet;
 Wed, 9 Oct 91 14:20:27-PST
 Date: Wed 9 Oct 91 14:20:26-PST
 From: 081877%ESSDP2.SPAN@STAR.STANFORD.EDU
 Subject: More PVO ephemerides
 To: khurley@sunspot.ssl.berkeley.edu
 Status: R

PVO 3. EPH

Y	D	T	R (km)	ra	dec	
90	338	34687.	252680317.	258.57381	-23.39342	
90	353	78321.	248677456.	279.85427	-24.06424	
90	359	03515.	247046400.	286.878	-23.635	interpolated
91	22	54418.	235291563.	324.15655	-15.89856	
91	39	32380.	226250855.	344.05029	-8.33670	
91	50	42658.	219342141.	356.67619	-2.68948	
91	69	47568.	205682631.	17.93532	7.18626	
91	104	26605.	174752730.	58.48658	21.75443	
91	107	72130.	171182172.	62.82395	22.74430	
91	118	20865.	160264715.	75.80118	24.88636	
91	142	43979.	132772367.	105.72326	25.32471	
91	149	45872.	124406157.	113.85479	24.29285	
91	198	16419.	66888778.	154.15816	9.19120	

DMSP - 2 s time res data only (RT data only)

Time at peak of event: May 2 81443 s DMSP 9

Feb 19 1st: DMSP 8 42323 } 1st peak
2nd: DMSP 9 42326 }

↑
Discrepancy - take DMSP 9,
better S/N

Mar 10 DMSP 8 1st peak 46923 } Higher
3rd peak 46958 } S/N

DMSP 9 1st 46925
3rd 46959

DMSP 10 1st 46925.5 } Good
2nd 46941.5 } S/N
3rd 46959.5 }
like Di. - 8

May 3 DMSP 8 1st 25456
2nd 25500

DMSP 9 1st 25454
2nd 25500

June 1 DMSP 9 1st 69756
10 69757.5

Files are corrupted - need to be sanitized before we can get them

On FAKES ① raw time is given. Subtract 1.9 s DMSP 8, 9;

S.S for DMSP 10 - #s above have already been corrected

② $G = \gamma$ $P =$ particles - 2 detectors on each DMSP, several
size ranges

From @STAR.STANFORD.EDU:081877@ESSDP1.SPAN Thu Oct 3 07:11:38 1991
 Received: from STAR.STANFORD.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
 id AA07316; Thu, 3 Oct 91 07:11:35 PDT
 Message-Id: <9110031411.AA07316@sunspot.ssl.berkeley.edu>
 Received: from ESSDP1 by STAR.STANFORD.EDU via MAIL-11 with DECnet;
 Thu, 3 Oct 91 07:12:35-PST
 Date: Thu 3 Oct 91 07:12:35-PST
 From: 081877%ESSDP1.SPAN@STAR.STANFORD.EDU
 Subject: more pvo ephemerides
 To: khurley@sunspot.ssl.berkeley.edu
 Status: R

WDZ.EPH

	Y	D	T	R(km)	ra	dec
	90	338	34687.	252680317.	258.57381	-23.39342
	90	353	78321.	248677456.	279.85427	-24.06424
	91	22	54418.	235291563.	324.15655	-15.89856
	91	39	32380.	226250855.	344.05029	-8.33670
	91	50	42658.	219342141.	356.67619	-2.68948
Mar 10	91	69	47568.	205682631.	17.93532	7.18626
	91	104	26605.	174752730.	58.48658	21.75443
	91	107	72130.	171182172.	62.82395	22.74430
	91	118	20865.	160264715.	75.80118	24.88636
	91	149	45872.	124406157.	113.85479	24.29285

JL $\rightarrow$ KH Sep 30 '91

June 1 - no data on PVO, but DMSP has this event. Terrell
will do this one

April 21 - Low bit rate mode

Aug 14 - ephemeris (extrapolated back from Aug 15)
Approximately R 44491021 km
 α 152.5959
 δ +3.6114

Mar 10, Feb 19 times JL gave me were T_{00} , not T_0 -
(but on data which was e-mailed, we have T_{00})

Feb 19 - PVO fig on 1st peak - check whether we all are
dealing with this peak + not 2nd one, 50 s later

From @STAR.STANFORD.EDU:081877@ESSDP1.SPAN Thu Sep 12 13:39:43 1991
Received: from STAR.STANFORD.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA16784; Thu, 12 Sep 91 13:39:39 PDT
Message-Id: <9109122039.AA16784@sunspot.ssl.berkeley.edu>
Received: from ESSDP1 by STAR.STANFORD.EDU via MAIL-11 with DECnet;
Thu, 12 Sep 91 13:40:55-PST
Date: Thu 12 Sep 91 13:40:55-PST
From: 081877@ESSDP1.SPAN@STAR.STANFORD.EDU
Subject: Accurate PVO ephemerides
To: khurley@sunspot.ssl.berkeley.edu
Status: RO

Kevin, below are accurate ephemerides for 90/12/4, 91/2/19, and 91/3/10.

90	338	34687.	252680317.	258.57381	-23.39342
91	50	42658.	219342141.	356.67619	-2.68948
91	69	47568.	205682631.	17.93532	7.18626

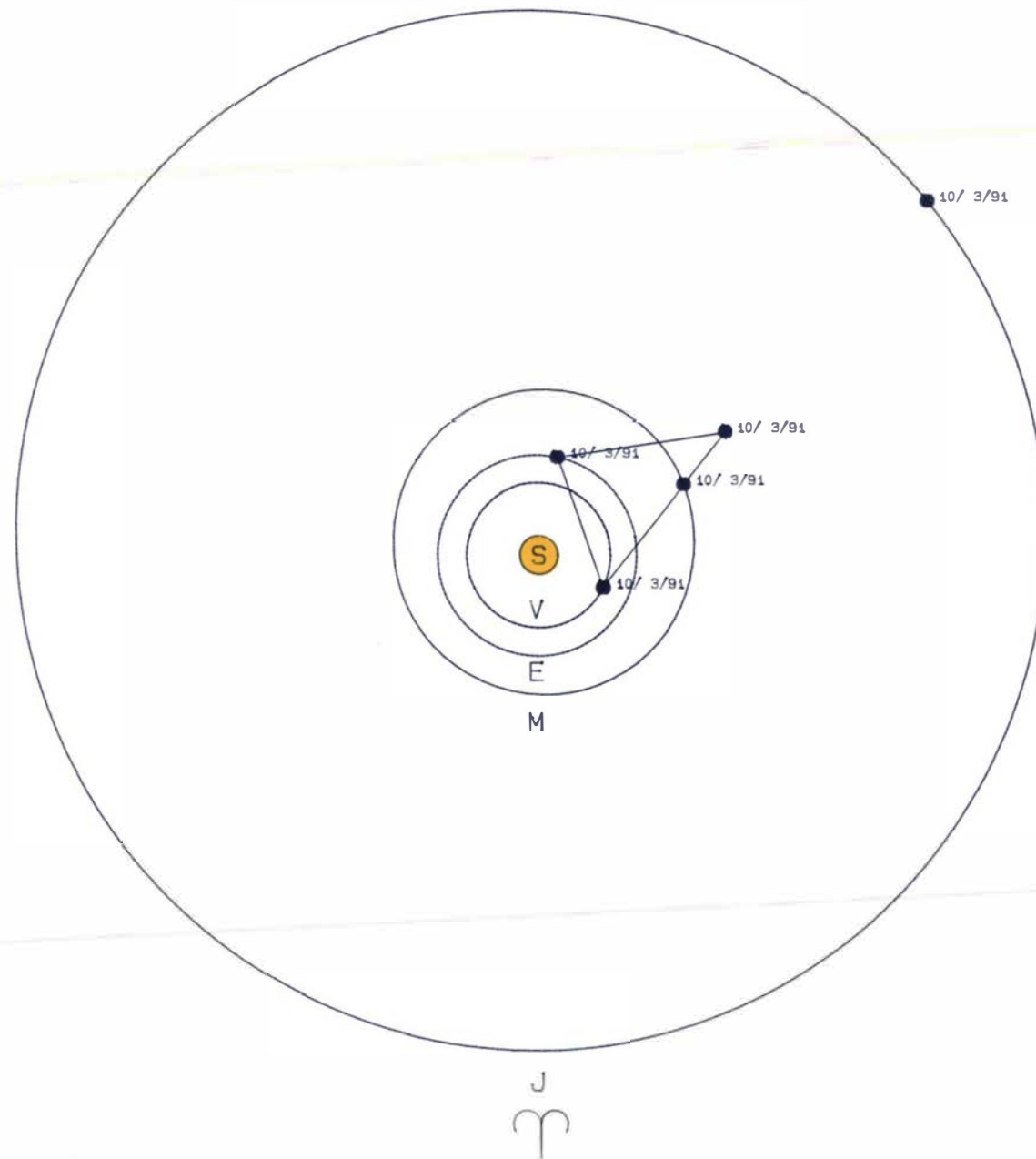
From @STAR.STANFORD.EDU:081877@ESSDP1.SPAN Wed Sep 11 13:50:14 1991
Received: from STAR.STANFORD.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA07299; Wed, 11 Sep 91 13:50:10 PDT
Message-Id: <9109112050.AA07299@sunspot.ssl.berkeley.edu>
Received: from ESSDP1 by STAR.STANFORD.EDU via MAIL-11 with DECnet;
Wed, 11 Sep 91 13:51:26-PST
Date: Wed 11 Sep 91 13:51:26-PST
From: 081877@ESSDP1.SPAN@STAR.STANFORD.EDU
Subject: ephemerides
To: khurley@sunspot.ssl.berkeley.edu
Status: R

Kevin, below are ephemerides for 90/12/4, 91/2/19, and 91/3/10. The first one could be off by as much as 0.1 lt-sec; the others are more accurate, but I wouldn't trust them beyond about .03 sec. I will try to improve upon this later.

90	338	34687.	251326108.	259.05349	-23.38336
91	50	42658.	219342157.	356.67621	-2.68951
91	69	47568.	205682619.	17.93533	7.18625



ULYSSES ORBIT - ECLIPTIC PLANE PROJECTION



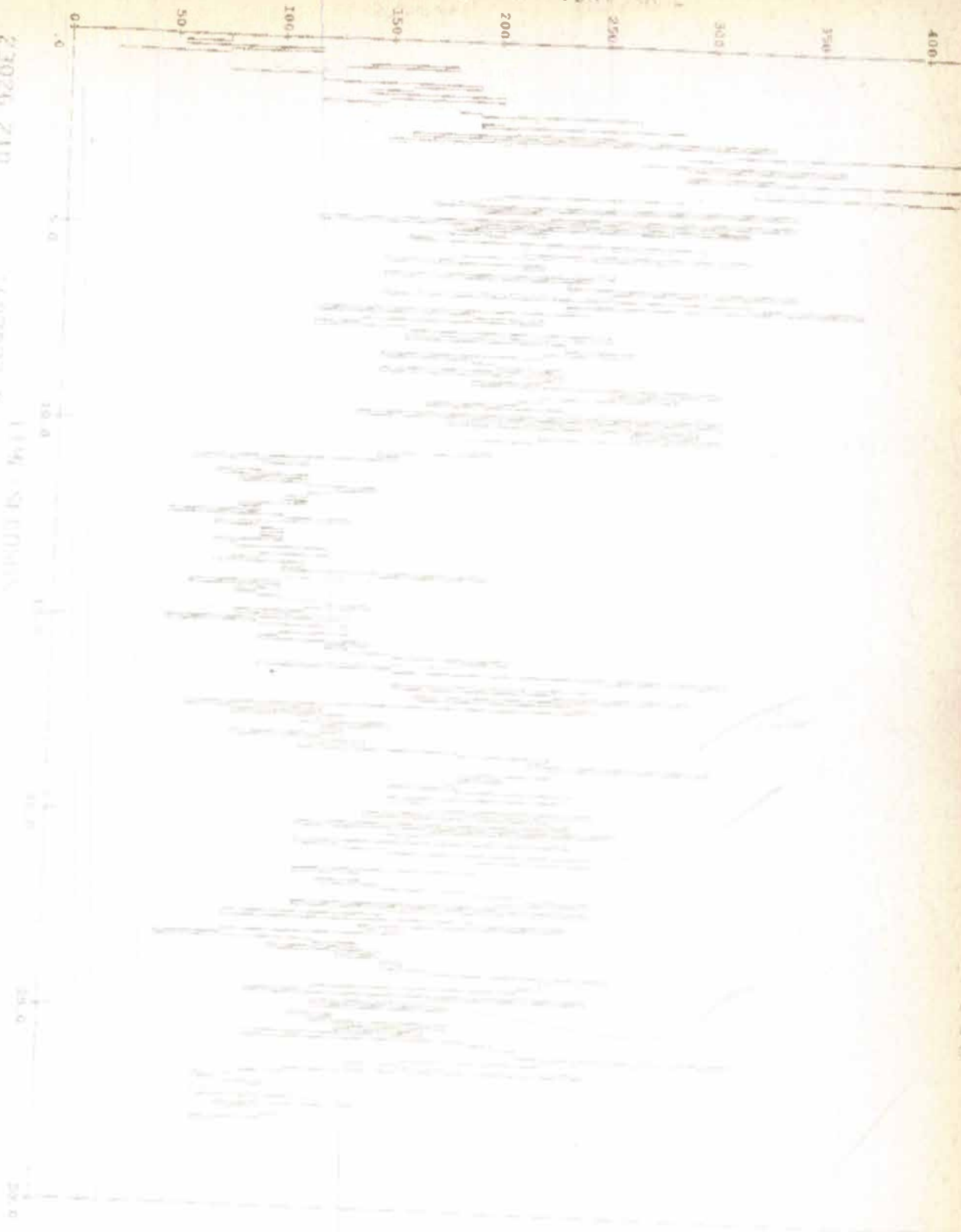
DETECTOR COUNT RATE

23026 210
21/ 1719

1607037 2
1601042 1 21533 007

1144 - 84 000000
240 0

WENT FOR START
7.7



→ MB June 10 '91

91-3/11
41665 096

DANISH SPACE RESEARCH INSTITUTE

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DK-2800 LYNGBY
DENMARK

PHONE: +45 42 88 22 77 TELEFAX: +45 45 93 02 83 TELEX: 37198 danru dk

DATE: 25/4 91

Page / of 8

From: NIELS LUND

TO : Dr Kevin Hurley

FAX 415 643 7629

Dear Kevin

Attached find the time histories of GRB 910219 (= GRS 1410+594) and GRB 910310 (= GRS 1217+066) as recorded by WATCH. I am very much interested in checking and improving the positions determined by the WATCH RMC-system by the long baseline timing technique. I have already for some time been communicating with Michel Boer at MPI Garching concerning a comparison of WATCH and ULYSSES data.

We have obtained Schmidt telescope exposures for both of the above fields within a few days of the bursts and improved positions would be very useful for the analysis of these plates.

The finest time resolution available in the WATCH data are 3.6 ms per channel for the february 19 burst and 927 ms per channel for the march 10 event. The latter event had a slower risetime and consequently no high speed data was recorded on board.

We are currently scanning our data for weak bursts using event lists provided by GINGA, and the other GRANAT experiments. We have found a few weak gamma burst candidates this way. Among the strong burst candidates given to us we have been able to classify one as due to particles (from the absence of the characteristic RMC modulation) and three as solar events.

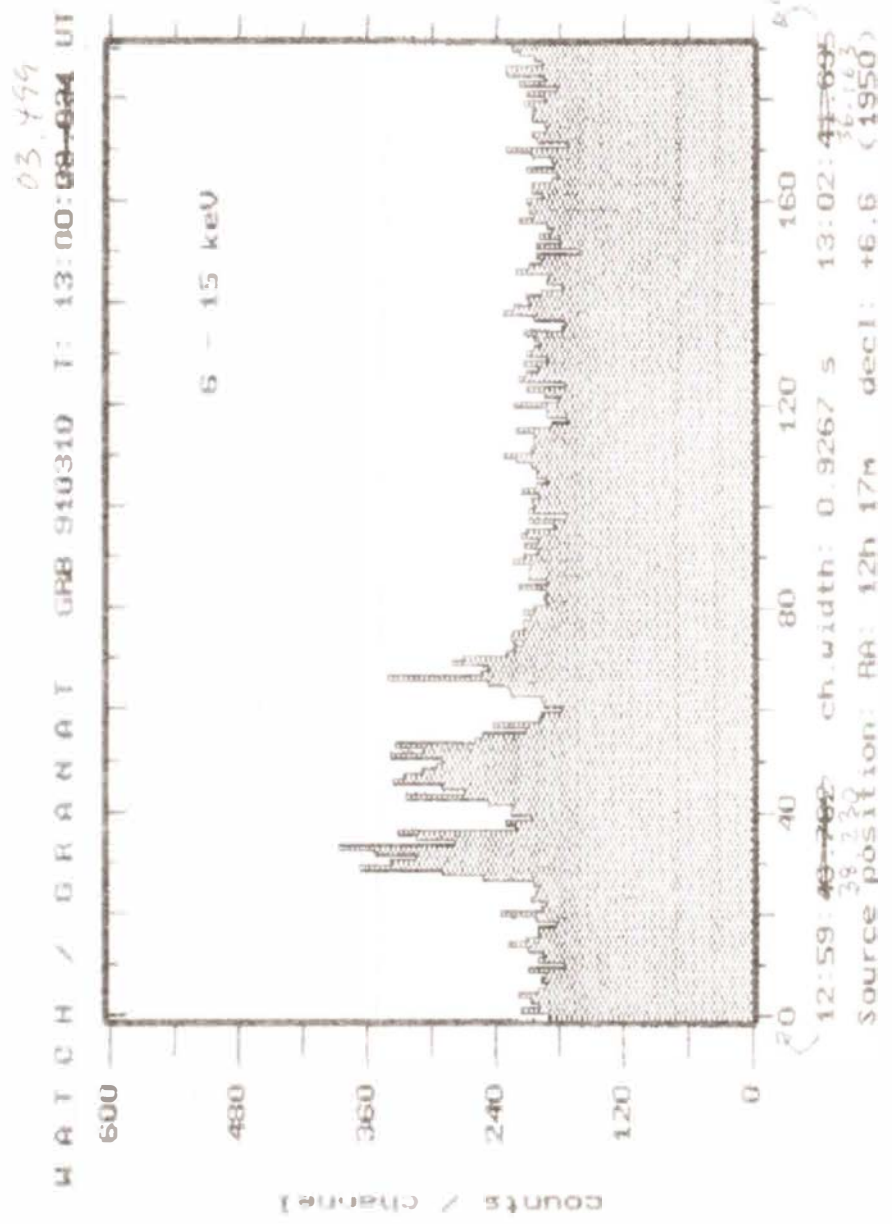
I attach also a gamma burst candidate seen by WATCH on april 8 1991. The event is so short that we cannot localize it based on our RMC-data. I would appreciate if you could confirm the reality of this event.

I will appreciate very much to receive from you similar information for these and future gamma ray bursts.

best regards

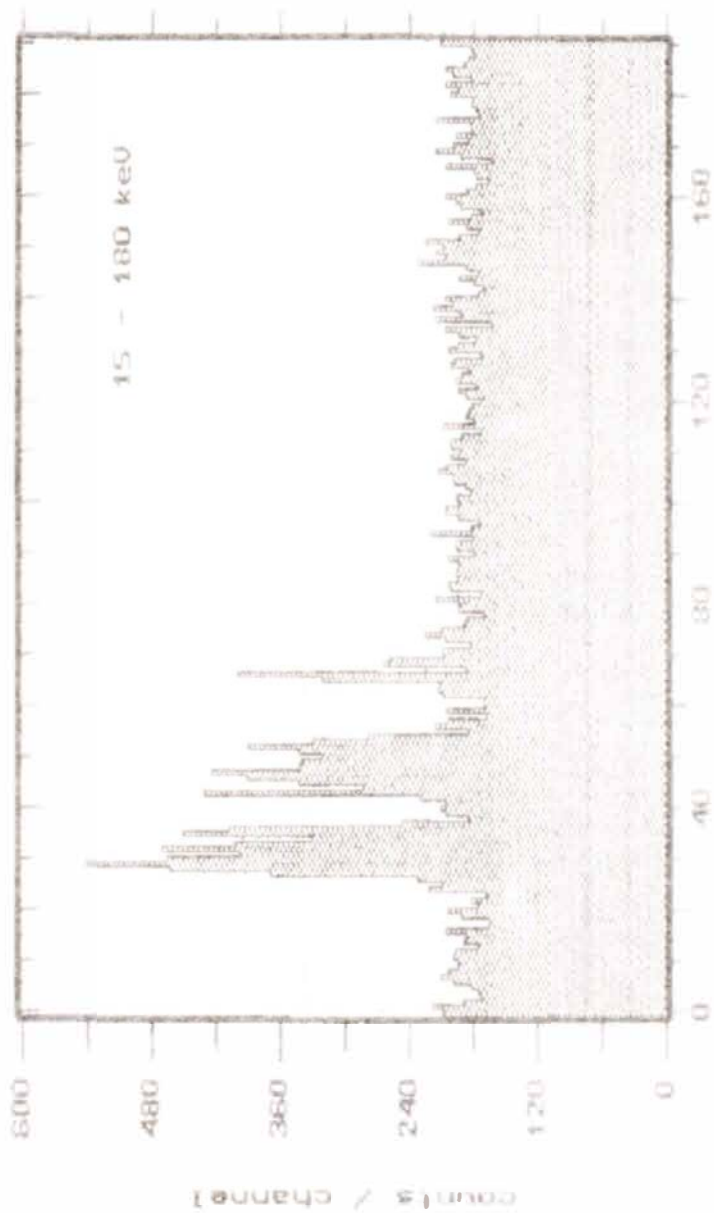
Niels *N. Lund*

cc John Laros, Tom Cline.



See page 5-6

W A T C H / G R A N A T G R B S10310 T: 13:00:09-094 UT



12.59:48-702 ch width: 0.3267 s 13:02 44-695
Source position RA: 12h 17m dec: +6.6 (1950)

From MEB%DGAIPPlS.BITNET@lilac.berkeley.edu Thu Apr 18 02:55:28 1991
Received: from lilac.berkeley.edu by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA12135; Thu, 18 Apr 91 02:55:22 PDT
Received: from DGAIPPlS.BITNET
by lilac.berkeley.edu (5.64/1.16.28)
id AA01755; Thu, 18 Apr 91 02:55:13 -0700
Message-Id: <9104180955.AA01755@lilac.berkeley.edu>
Received: by DGAIPPlS (Mailer R2.07) id 2524; Thu, 18 Apr 91 11:51:52 EST
Date: Thu, 18 Apr 91 11:49:48 EST
From: Michel BOER <MEB%DGAIPPlS.bitnet@lilac.berkeley.edu>
Subject: Watch data
To: Kevin HURLEY <khurley@sunspot.ssl.berkeley.edu>
Status: R

Attention!!!! le temps du 19 fevrier est 11:45:24.286 UT
10 Mars 13:00:03.499
Je ne suis pas sur de la fiabilite de ces temps sur Granat
Michel

Received: from vm.uni-c.dk by DGAIPPlS.BITNET (Mailer R2.07) with BSMTTP id
2086; Wed, 03 Apr 91 18:20:20 EST
Received: from NEUVML by vm.uni-c.dk (Mailer R2.07) with BSMTTP id 7969; Wed, 03
Apr 91 17:53:45 DNT
Received: from danpost.uni-c.dk by vm.uni-c.dk (IBM VM SMTP R1.2.2MX) with TCP;
Wed, 03 Apr 91 17:53:43 DNT
Received: from dkuug.dk by danpost.uni-c.dk (5.65/1.34)
id AA15709; Wed, 3 Apr 91 15:52:12 GMT
Received: from danru.dk by dkuug.dk via EUnet with UUCP (5.64+/8+bit/IDA-1.2.8)
id AA06223; Wed, 3 Apr 91 17:53:15 +0200
Received: by danru.dk (smail2.5)
id AA04748; 3 Apr 91 17:45:56 MET (Wed)
To: MEB%DGAIPPlS.bitnet
Message-Id: <9104031745.AA04743@danru.dk>
Date: 3 Apr 91 17:45:51 MET (Wed)
From: nl@danru.dk (Niels Lund)
X-Charset: ASCII
X-Char-Esc: 29

Apr 8 18.8

Fm. Niels Lund, DSRI
To Michel Boer, MPI, Garching, Extraterrestrische Physik.

hello Michel.

Thank you for the fax with the Ulysses data. Yes I believe it is the same event, but I would really like to see your data plotted on a more coarse time scale where the structure is not buried in statistics. I attach here the count rate data of WATCH for the events from feb. 19 and march 10. I have now gotten the correct time calibration and this has moved both events a few minutes from my first released values. For the february event we have "raw" data, i.e. data with fine time resolution, I include data accumulated in 57 ms bins but we can do finer bins if need be. Our raw data only cover the first of the two bursts associated with this event. It appears that it is the same peak for which you have fine resolution data. The raw data are not yet time calibrated, this will have to wait until I return from Japan. Unfortunately the march event had a rather long risetime, and therefore I do not have fine time resolution data. In fact what you see is what you get, about 0.9 seconds per channel. The event is rather strong though, and I think we should be able to adjust our count rate curves to achieve a timing accuracy of the order 100 ms. I will send you the data also by fax so you can see the curves. If you can replot your data easily I suggest you try to add 5 channels to achieve a time resolution comparable to my fine resolution data. I would really love to see that plot.

From MAILER%CFAPS2.BITNET@lilac.berkeley.edu Wed Mar 13 15:19:08 1991
Received: from lilac.berkeley.edu by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA05538; Wed, 13 Mar 91 15:19:05 PST
Received: from cfa.bitnet
by lilac.berkeley.edu (5.64/1.16.28)
id AA17187; Wed, 13 Mar 91 15:19:55 -0800
Received: from cfaps2.Span by cfaps2 with VMSmail ;
Wed, 13 Mar 91 17:50:33 EST
Date: Wed, 13 Mar 91 17:50:33 EST
From: green%cfaps2.span@cfa.bitnet@lilac.berkeley.edu
Message-Id: <910313175033.03b@cfaps2>
Subject: IAUC 5207
To: quai@cfa.BITNET
X-St-Vmsmail-To: ST%QUAI
Status: R

Circular No. 5207

Central Bureau for Astronomical Telegrams
INTERNATIONAL ASTRONOMICAL UNION

Postal Address: Central Bureau for Astronomical Telegrams
Smithsonian Astrophysical Observatory, Cambridge, MA 02138, U.S.A.
Telephone 617-495-7244/7440/7444 (for emergency use only)
TWX 710-320-6842 ASTROGRAM CAM EASYLINK 62794505
MARSDEN or GREEN@CFA.BITNET MARSDEN or GREEN@CFAPS2.SPAN

SUPERNOVA 1991M IN IC 1151

C. Pennypacker, S. Perlmutter, S. Carlson, N. Hamilton, H. Marvin, R. Muller, and C. Smith communicate: "The Berkeley Automated Supernova Search reports the discovery of a supernova located 60" north and 36" east of the core of galaxy IC 1151 (R.A. = 15h56m16s.5, Decl. = +17 35'03", equinox 1950.0) in two separate images observed Mar. 12 UT. There was no supernova visible on an image taken Feb. 24 to a limit (90-percent confidence level) of mag 17.5."

B. Schmidt and B. Leibundgut, Center for Astrophysics, report: "A spectrogram (range 400-900 nm) obtained on Mar. 13.35 UT with the Multiple Mirror Telescope shows the object to be a type-Ia supernova close to maximum light. SN 1991M was at mag about 15 and is located at R.A. = 15h56m20s.5, Decl. = +17 35'25" (equinox 1950.0)."

GRS 1217+066

N. Lund, S. Brandt, and A. Castro-Tirado, on behalf of the WATCH/GRANAT team (Danish Space Research Institute, Lyngby; and Space Research Institute, Moscow), report: "A peculiar cosmic gamma-ray burst, GRS 1217+066 (R.A. = 12h17m, Decl. = +6.6, equinox 1950.0, error radius 0.3 deg) was recorded by the WATCH all-sky x-ray monitor on Mar. 10.54 UT. The duration of the event was about 40 s. Optical and radio follow up are encouraged."

John Laros says they detected it on ESP exp + 1 MeV (3/20)

SUPERNOVA 1990N IN NGC 4639

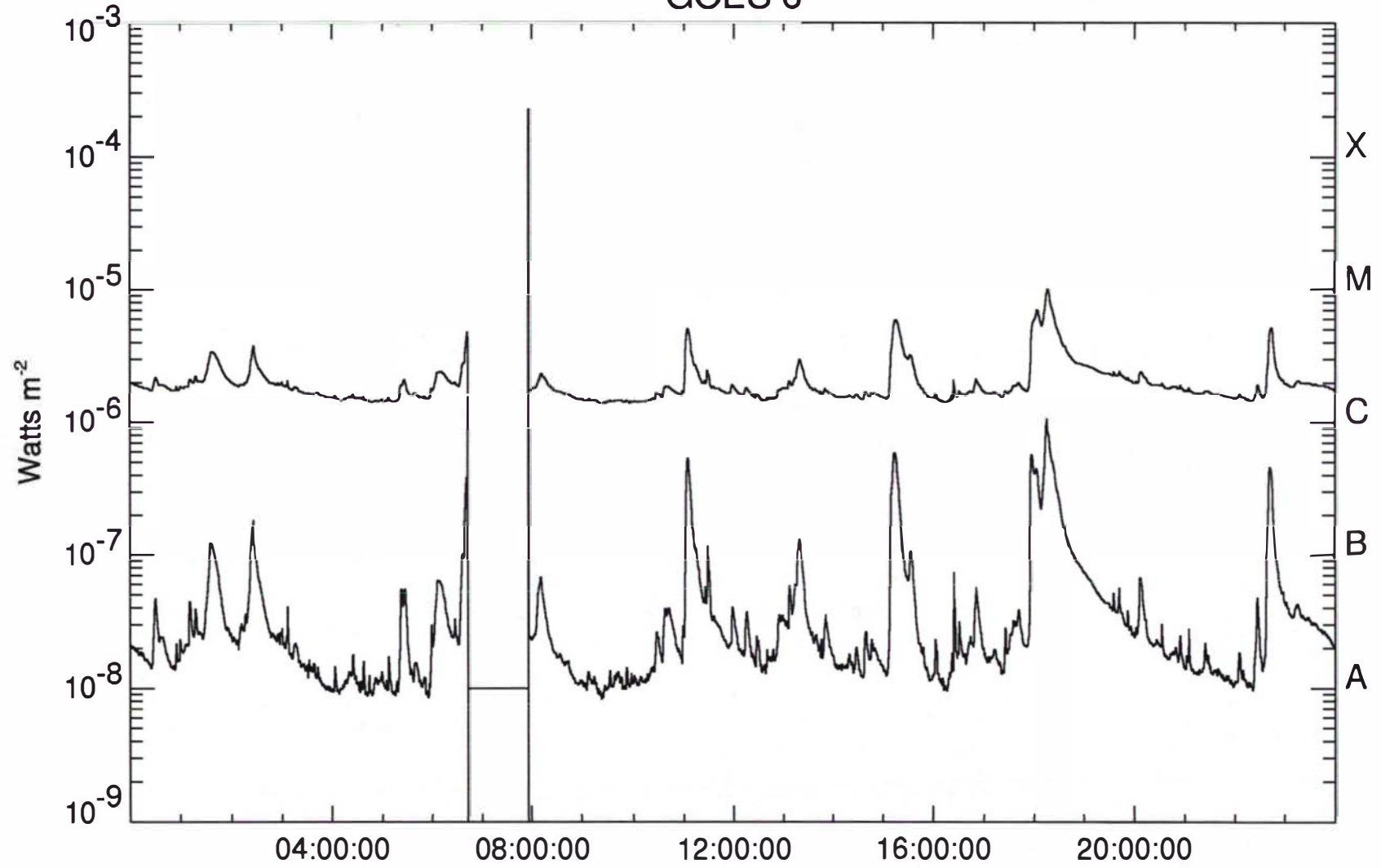
C. Pollas, Observatoire de la Cote d'Azur, reports detection of this object at V about 18.5 on a Tech Pan exposure taken Mar. 13.14 UT.

COMET LEVY (1990c)

Total visual magnitude estimates (cf. IAUC 5197): Feb. 21.05 UT, 8.4 (V. F. de Assis Neto, Sao Francisco de Oliveira, Brazil, 10x70 binoculars); Mar. 4.18, 8.0 (A. Hale, Las Cruces, NM, 10x50 binoculars); 9.23, 8.4 (C. S. Morris, Pine Mountain Club, CA, 20x80 binoculars); 13.08, 8.2 (J. E. Bortle, Stormville, NY, 10x50 binoculars). Corrigendum to IAUC 5172: last line, for (Morris); read (Morris).

*+ PVO 46500 s
4/16/91*

GOES 6



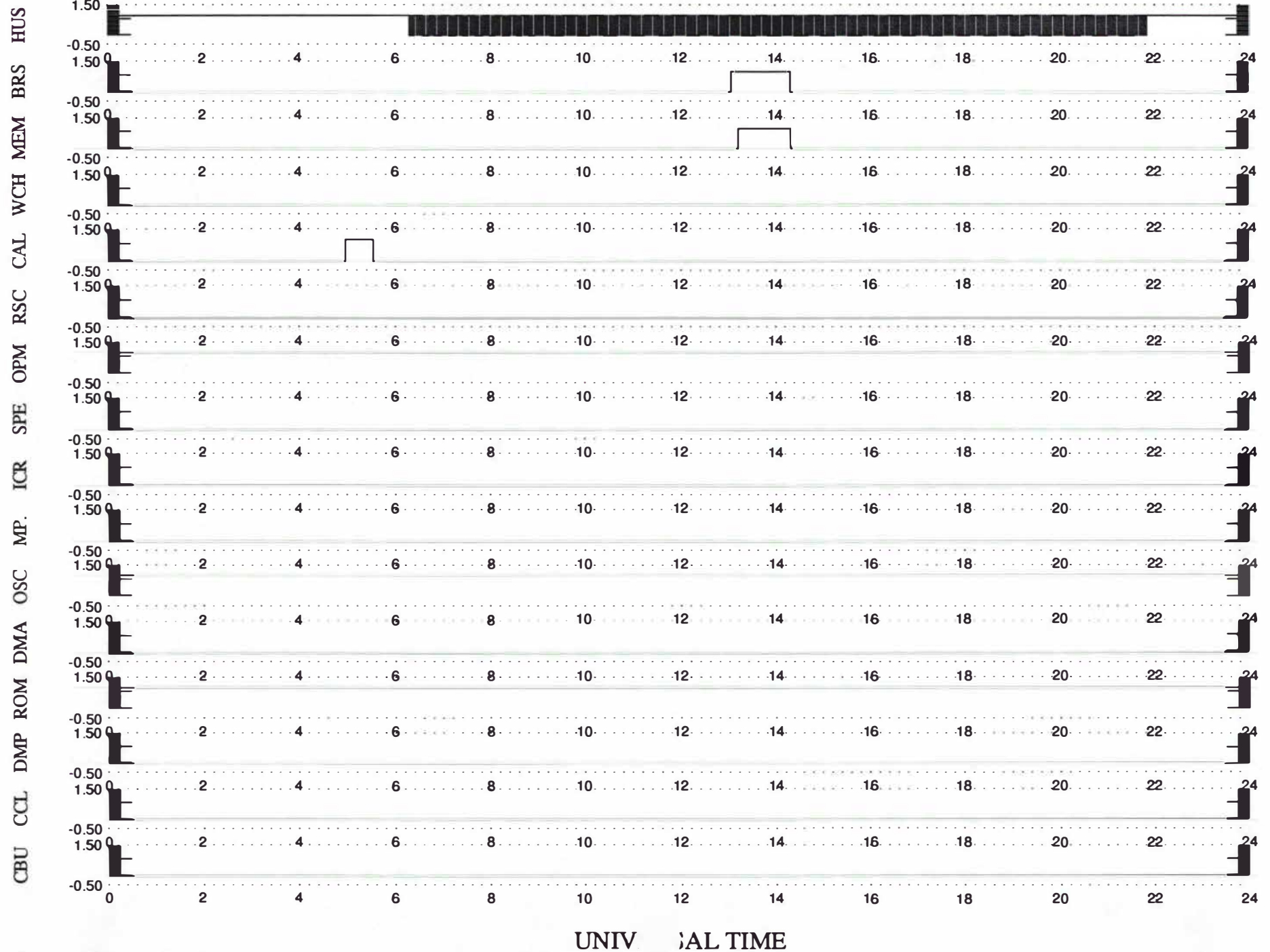
Data Start: 91/03/10, 0000:00

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

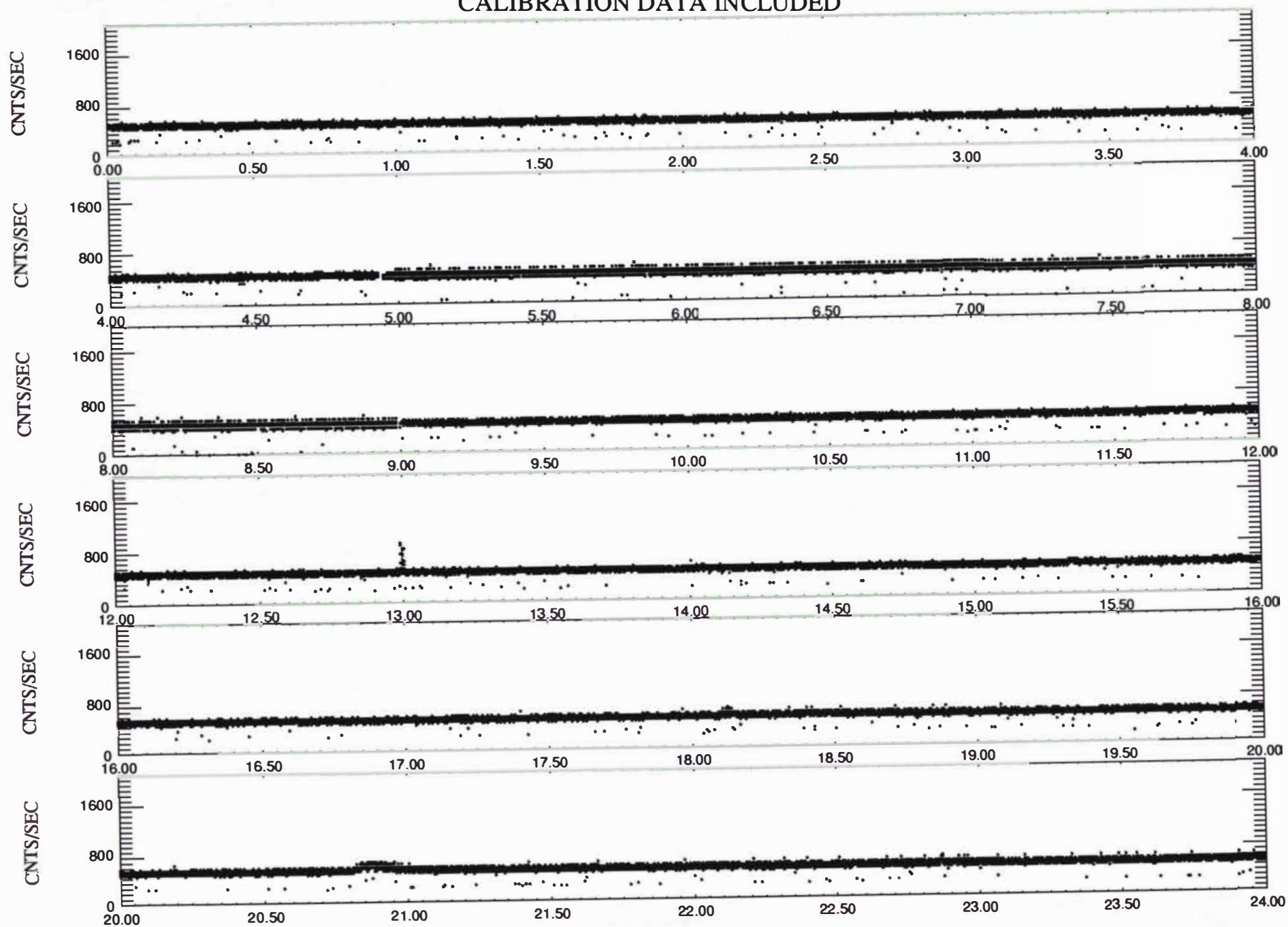
Plot created: 96/11/26, 1826

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 1

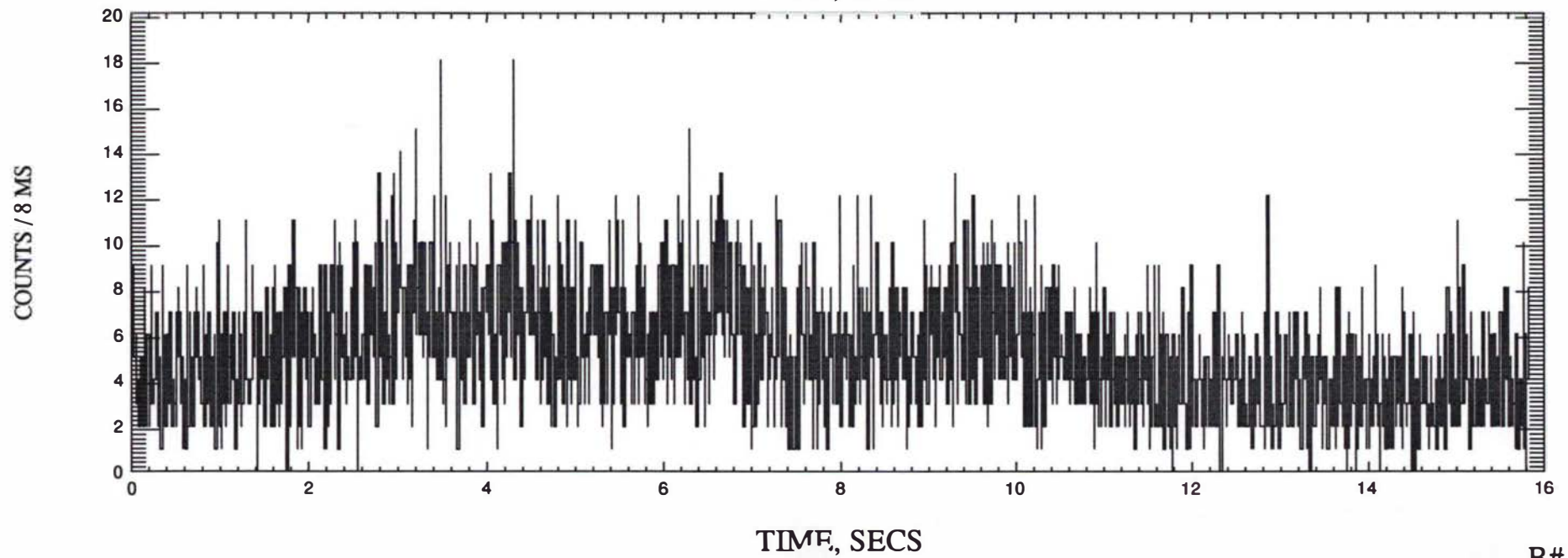
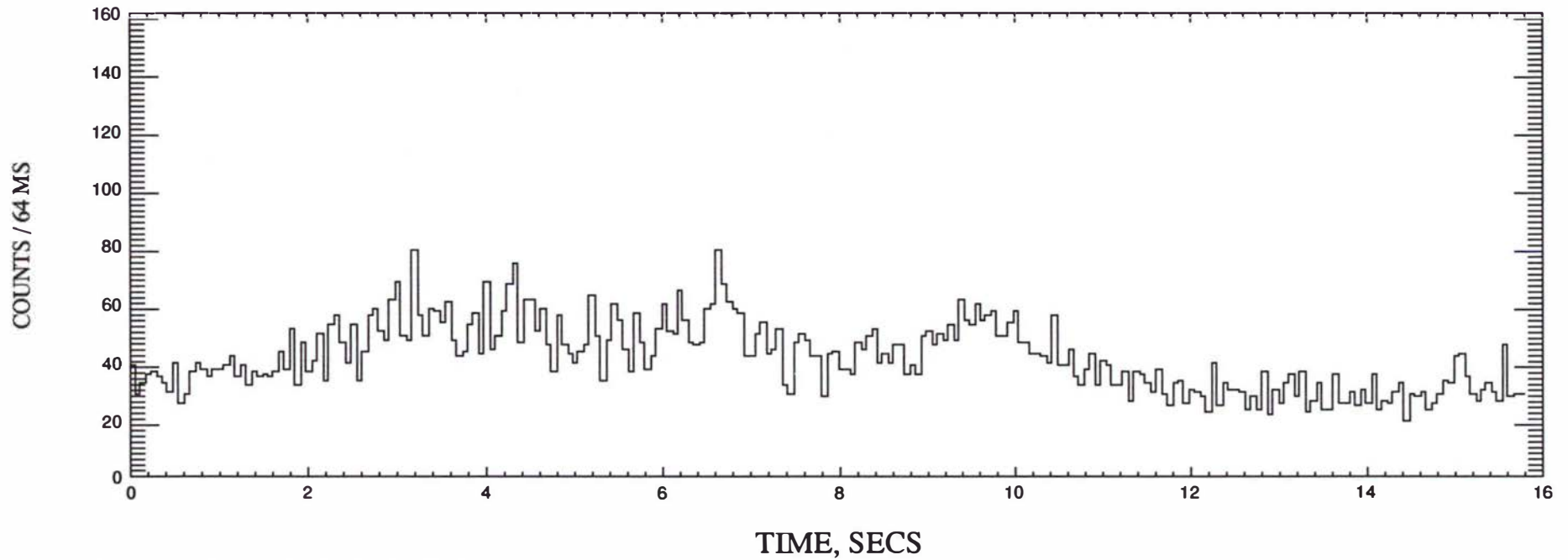


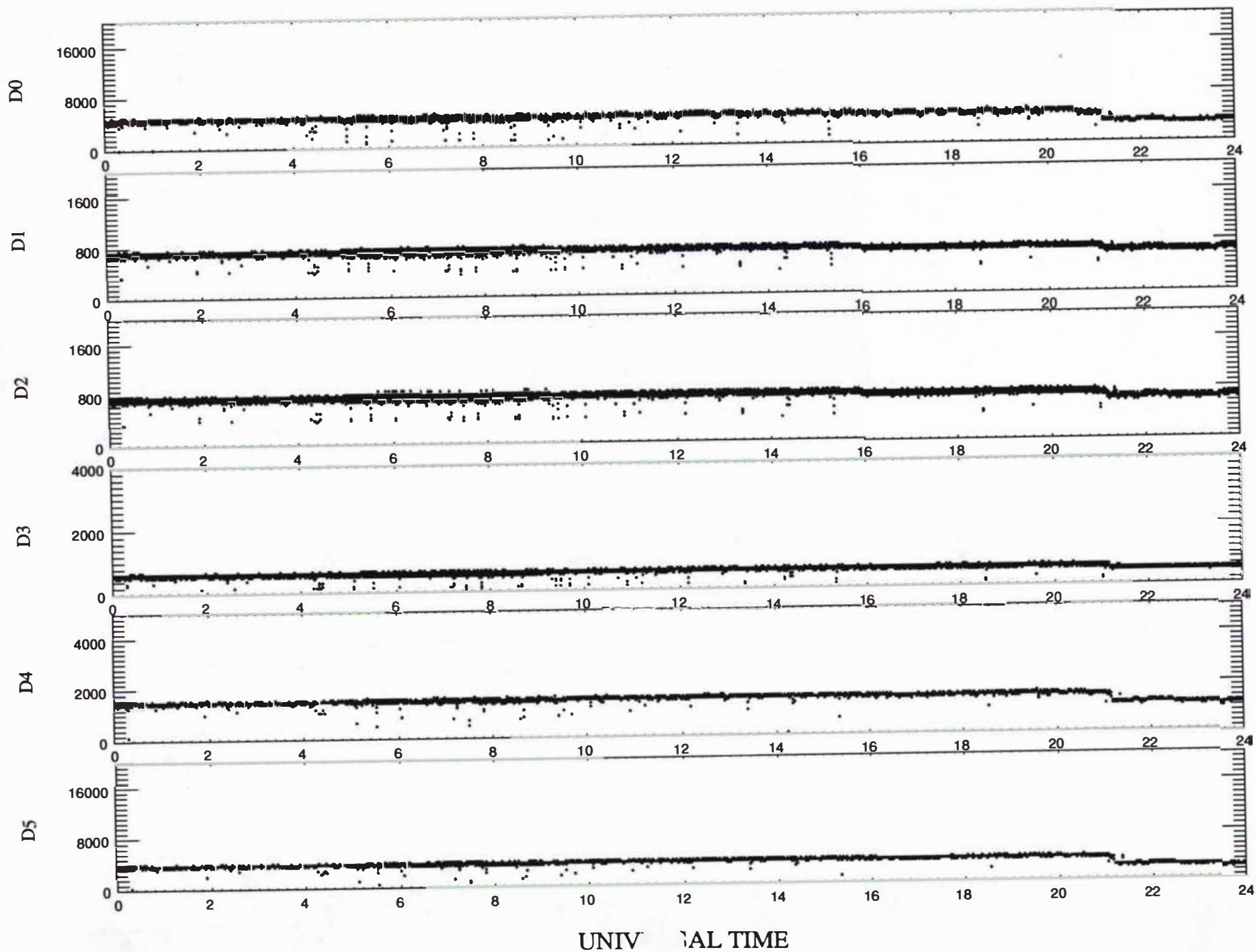
CALIBRATION DATA INCLUDED

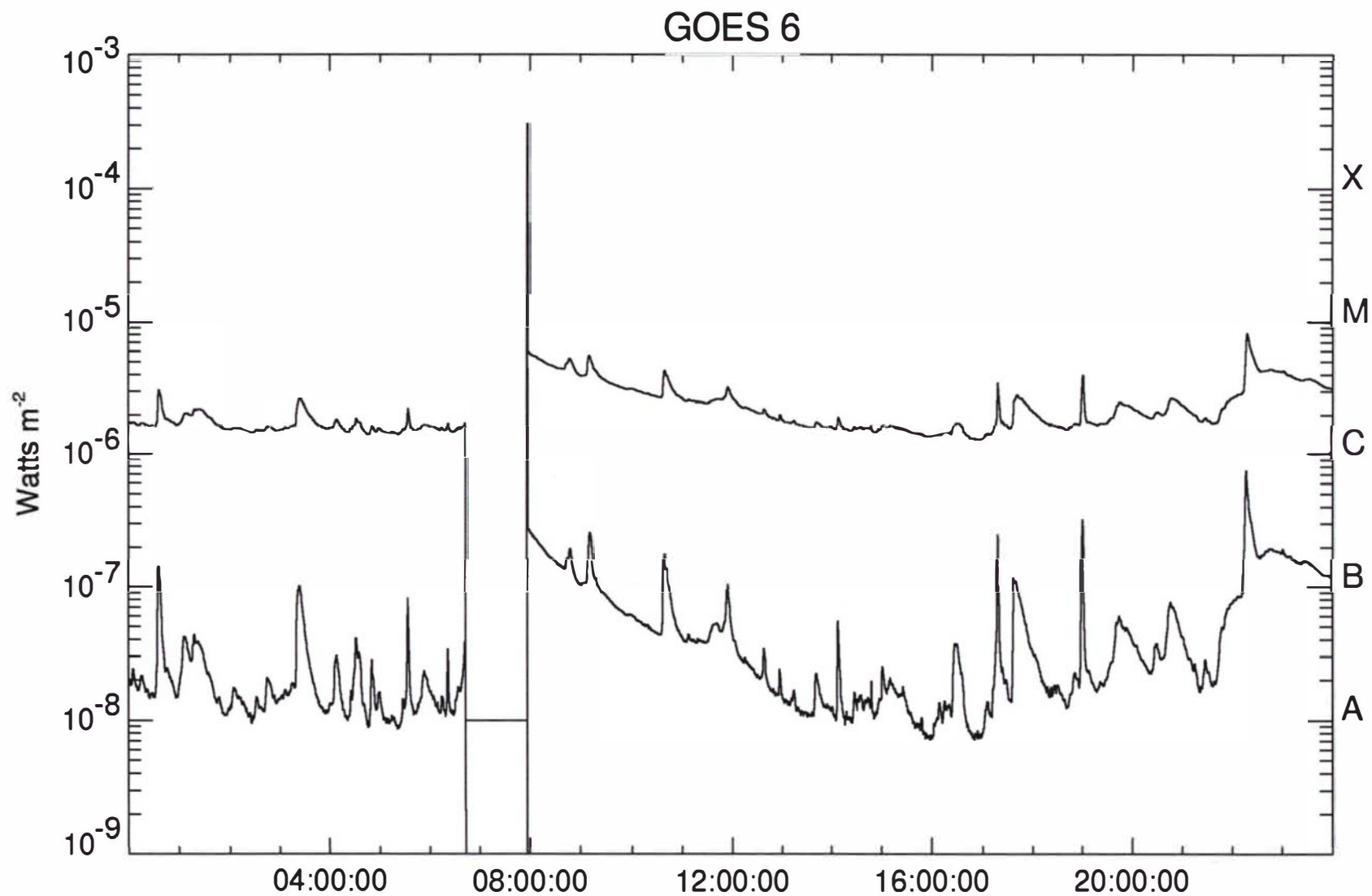


UNIV 'AL TIME

Burst Counter 1 at UT=12.990949359470 h=46767.418 s 12:59:27.418







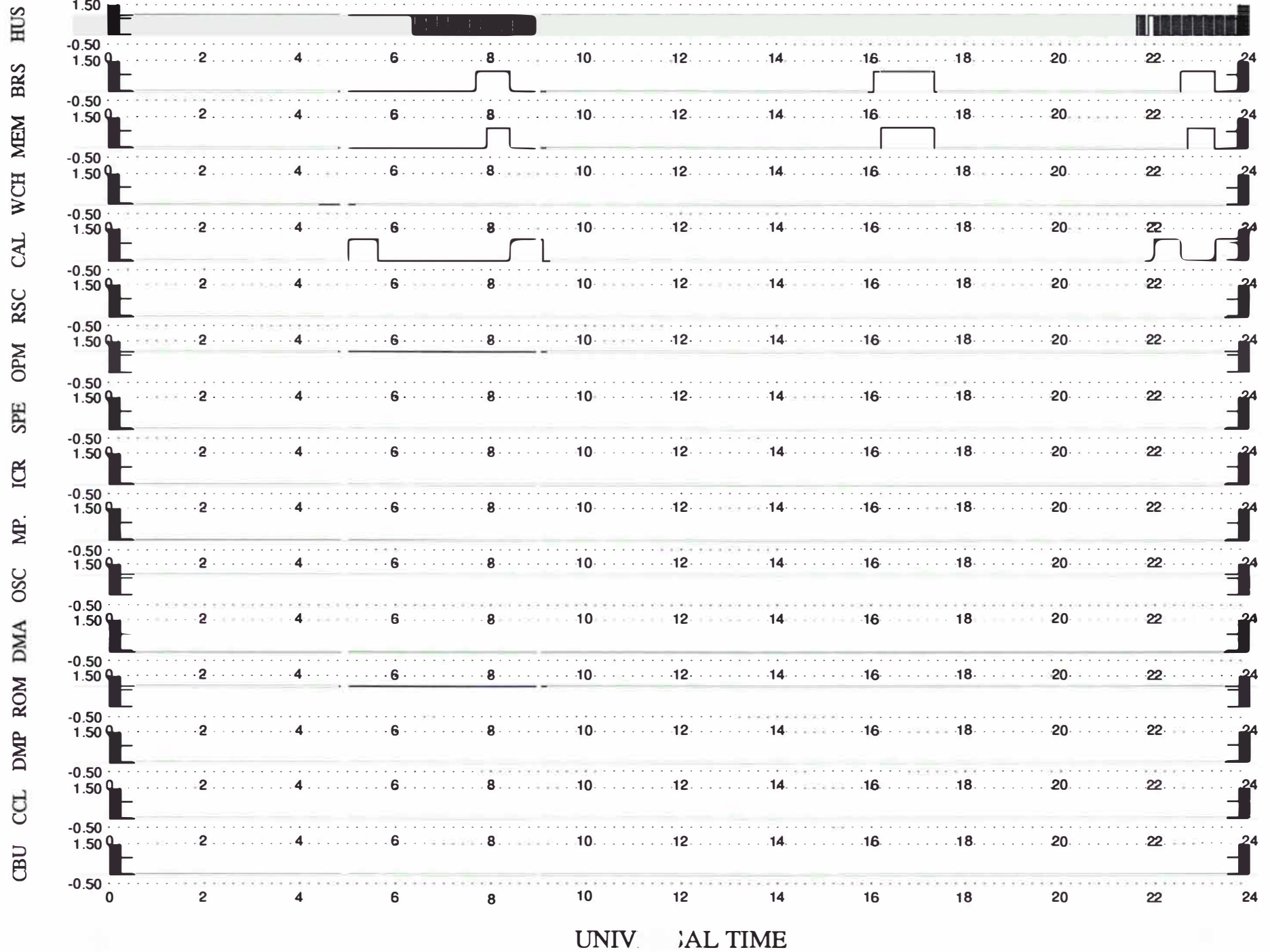
Data Start: 91/03/11, 0000:01

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

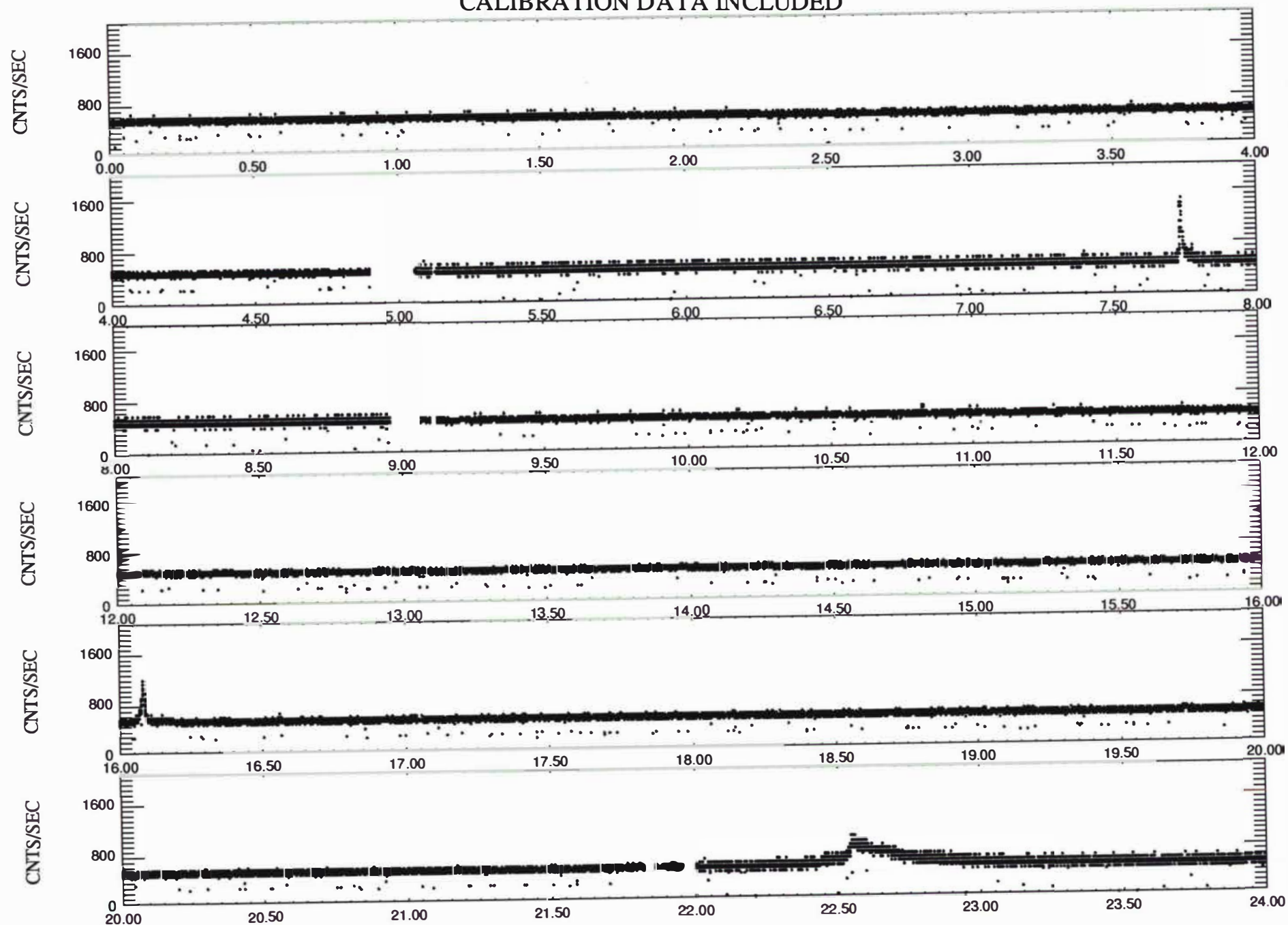
Plot created: 96/11/26, 1829

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 2 - 4

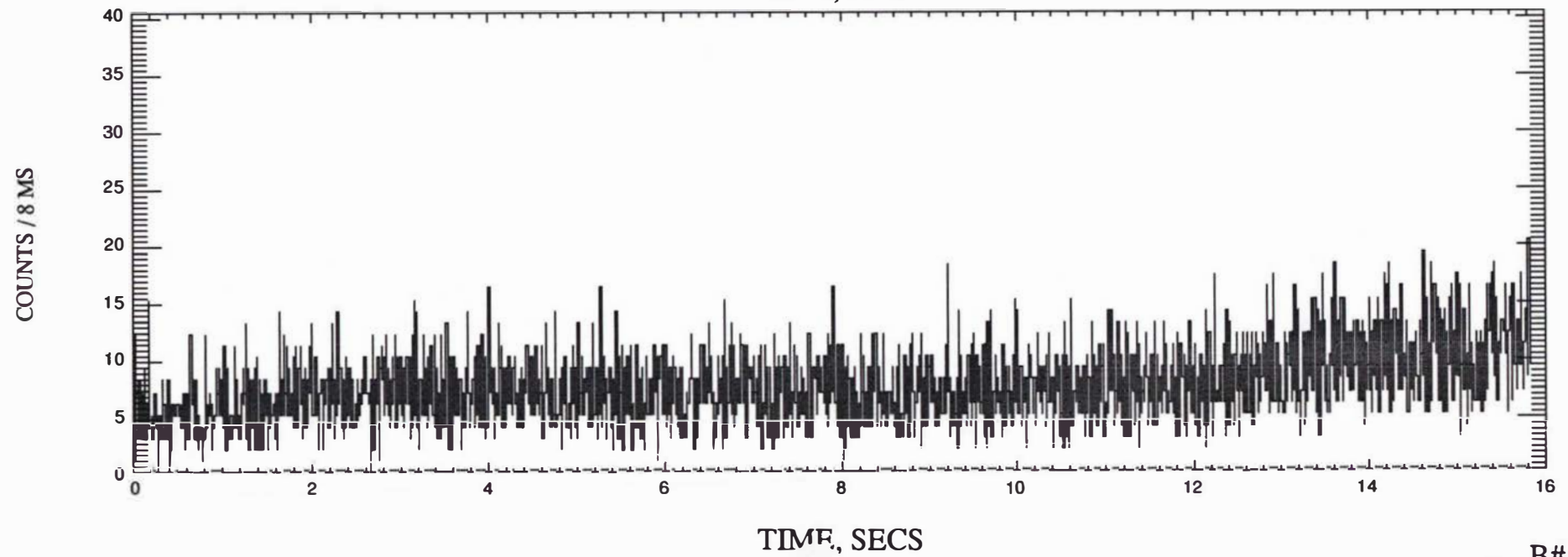
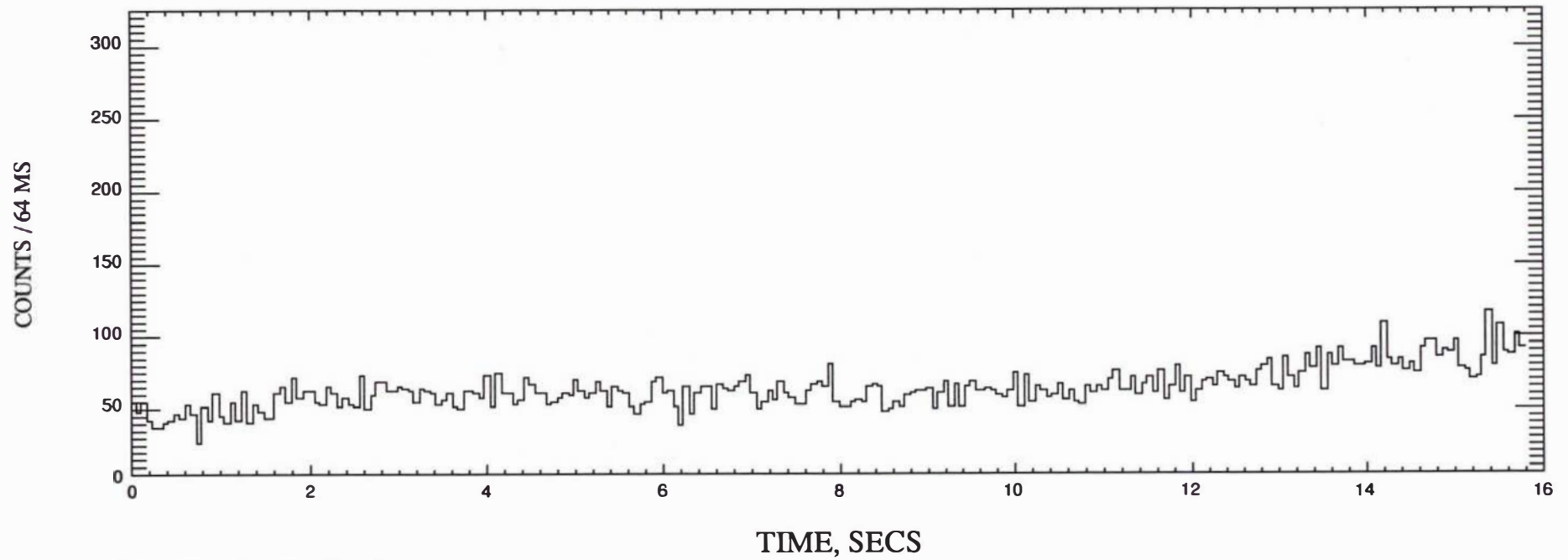


CALIBRATION DATA INCLUDED

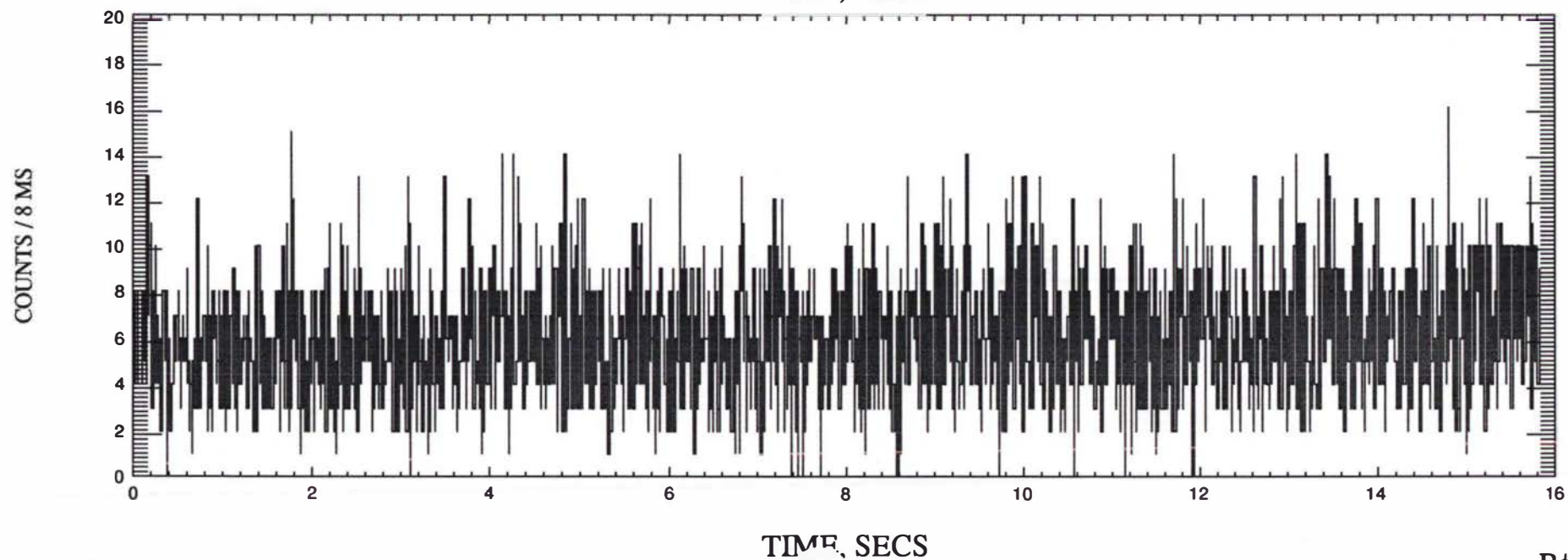
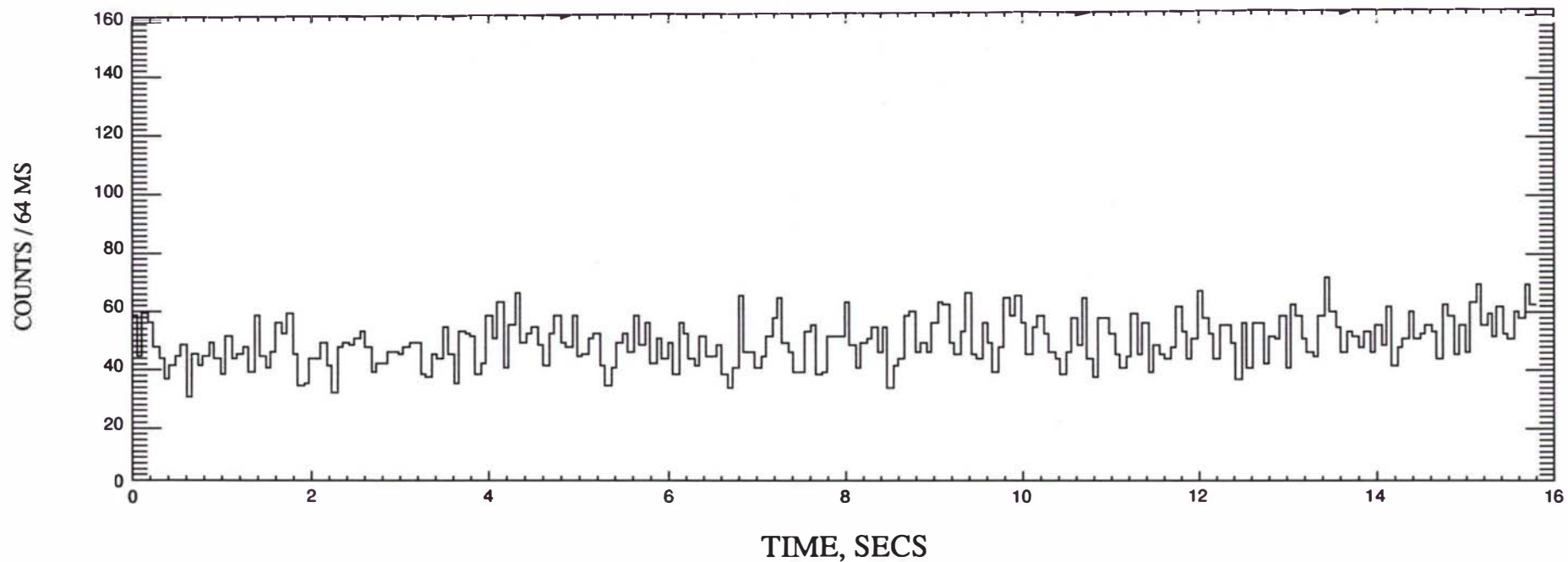


UNIV. TIME

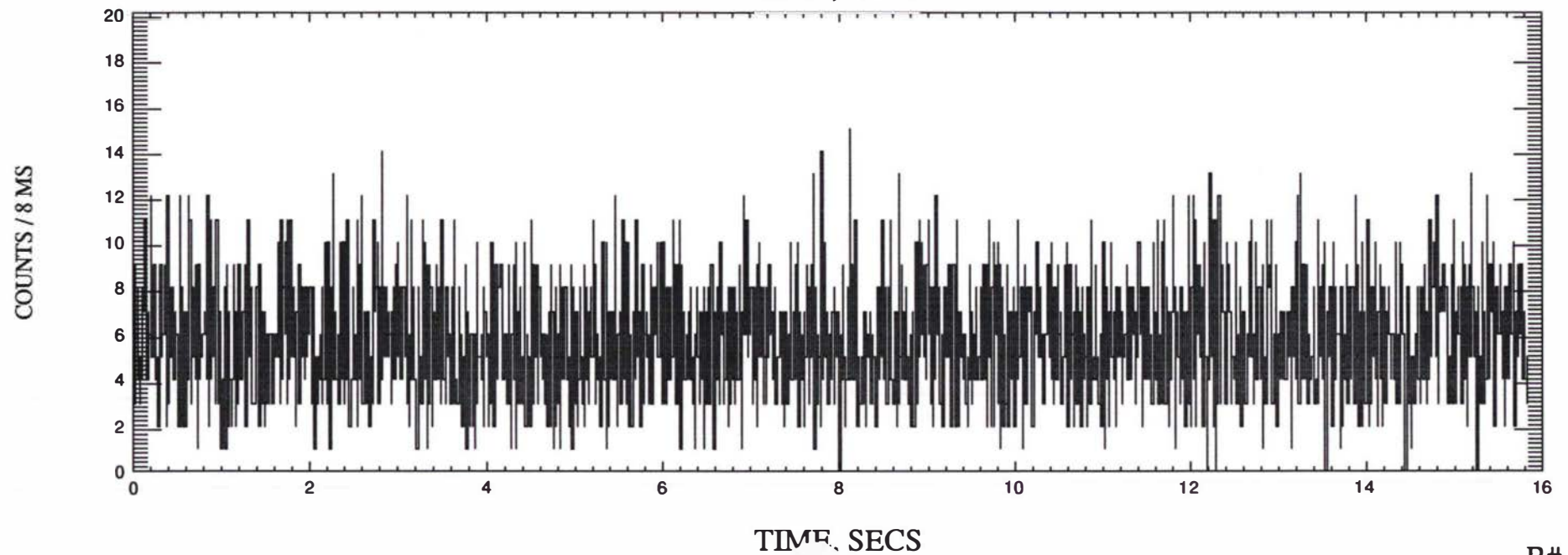
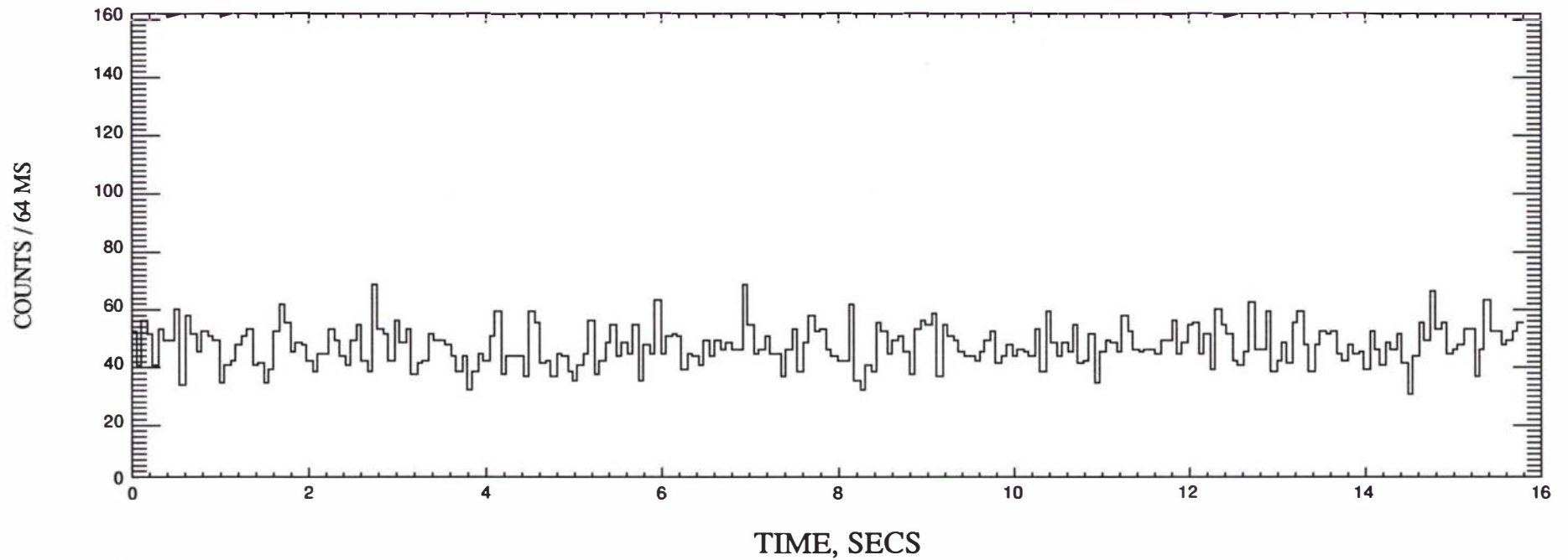
Burst Counter 2 at UT= 7.724567409092 h=27808.443 s 07:43:28.443

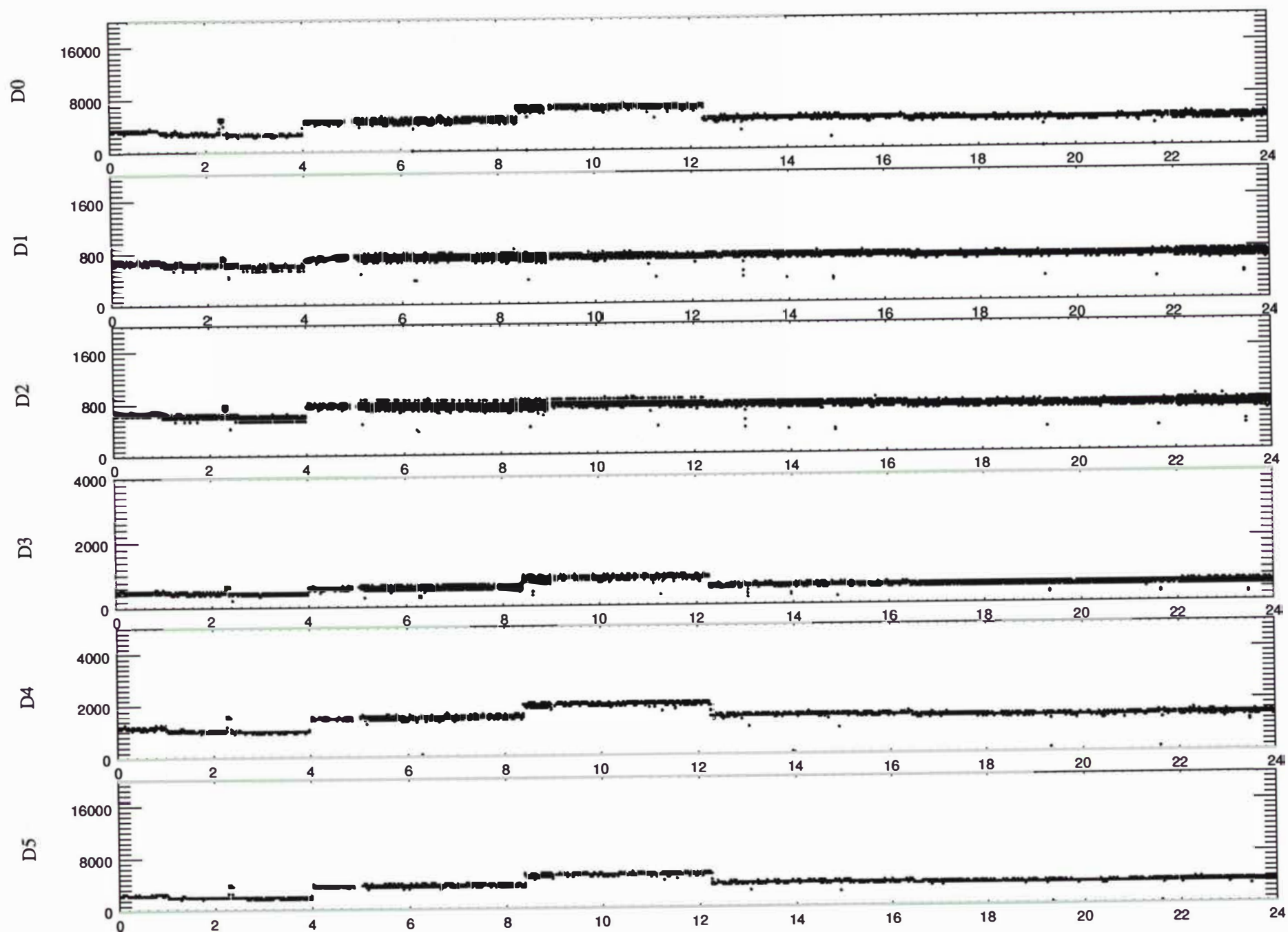


Burst Counter 3 at UT=16.072991680569 h=57862.770 s 16:04:22.770



Burst Counter 4 at UT=22.537973526849 h=81136.705 s 22:32:16.705





UNIVERSAL TIME

FAXCOVER

DANISH SPACE RESEARCH INSTITUTE

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DK-2800 LYNGBY
DENMARK

PHONE: +45 42 88 22 77 TELEFAX: +45 45 93 02 83 TELEX: 37198 dans dk

DATE: Nov 23, 1993

Page 1 of 2

From: Alberto J. CASTRO-TIRADO

TO : Kevin HURLEY

FAX no

Name : 510 643 8640

Dear Kevin.

Thank you for your answer. Enclosed I send you the list of CONFIRMED 69 GRBS plus 14 CANDIDATES. Now you may fill the WATCH response in the Master GRB list for WATCH-GRANAT in the period 1/1/90 - 25/9/92.

GRB 920321 (at 13:00:44) is a ≤ 1.5 burst in WATCH data, so I think it could be the same event seen by Ulysses. We do not have better time resolution.

The other repeater is 900126/920311. The two error boxes are separated by 1° , at $\sim \alpha = 08^h 46^m$ $\delta = -38^\circ$ (1450.0)

Kind regards,

Alberto

First GRANAT/WATCH
Gamma-Ray Burst
Catalogue

1W GRB (yy-mm-dd)	U.T. (hh:mm:ss)
900118	17:40:48
900120	20:37:33
900123a	01:42:13
900123b	18:44:17
900126	18:04:27
900222	11:56:35
900308	09:32:02
900327	10:24:28
900404	17:54:36
900413	10:11:21
900708a	11:30:21
900708b	18:44:53
900901	01:35:47
900925	20:25:22
900929	01:49:18
901009	00:15:46
901015b	08:44:48
901027	04:21:07
901112	14:57:37
901116	01:42:10
901119	18:08:32
901219	21:52:43
910117	00:57:51
910122	15:13:40
910202	20:57:35
910219	11:45:25
910310	13:02:06
910312	12:43:09
910425	00:37:52
910517	05:02:20
910627	04:29:24
910717a	04:11:07
910717b	13:07:25

910721	19:30:12
910723	14:06:20
910814	19:14:11
910815	14:24:32
910817	17:09:26
910818	13:44:46
910821	10:33:36
910901	05:24:14
910925	03:35:36
910927	23:26:53
911016	11:03:31
911018	05:32:00
911022	04:14:58
911202	20:28:51
911205	23:04:41
911209	18:36:00
920105	17:41:17
920116	18:30:35
920130	00:29:47
920302	06:16:54
920307	00:18:06
920311	02:20:20
920325	17:17:37
920615	14:24:56
920714	13:04:53
920718a	14:41:16
920718b	21:32:47
920720	05:53:04
920723a	01:00:34
920723b	20:03:11
920814	06:10:25
920902	00:29:04
920903a	01:36:15
920903b	23:28:52
920925a	19:30:43
920925b	20:45:14
920925c	22:46:14

CANDIDATES

900415	06:20:58
900603	06:20:50
900616	03:56:50
900618	23:12:22
900625	22:04:16
900628	11:17:53
900815	11:35:12
900914	04:46:40
901015a	02:42:16
910408	22:24:18
910414	07:38:27
910816	01:57:40
920314	05:48:12
920721	13:00:49
920721	06:17:25

DATE	U.T.	Nr UGB	Event Nature
1990-12-24	15:34:32.617	216-a	Solar Flare
1991-01-06	16:39:57.526	218-a	GRB
1991-01-17	00:57:12.234	223-a	GRB ?
1991-01-18	14:03:26.738	224-a	Solar Flare
1991-01-21	00:18:12.304	227-a	Solar Flare
1991-01-22	15:13:50.333	228-a	GRB
1991-01-25	06:29:38.745	231-a	Solar Flare
1991-02-01	11:44:54.779	233-a	Solar Flare
1991-02-01	18:46:17.191	233-b	Solar Particles
1991-02-02	20:57:39.170	234-a	GRB ?
1991-02-04	08:58:45.821	235-a	GRB
1991-02-04	10:48:08.317	235-b	Solar Flare
1991-02-04	14:50:33.480	235-c	Solar Flare
1991-02-06	06:10:53.398	236-a	Solar Flare
1991-02-06	06:45:52.285	236-b	Solar Flare
1991-02-06	08:45:28.852	236-c	GRB
1991-02-10	17:35:33.692	237-a	Solar Flare
1991-02-11	03:25:22.425	237-b	GRB
1991-02-19	09:23:07.760	239-a	Solar Flare
1991-03-12	12:43:02.596	252-a	Solar Flare
1991-03-13	02:59:14.539	254-a	Solar Flare
1991-03-13	08:01:48.347	254-b	Solar Flare
1991-03-14	13:31:08.601	255-a	Solar Flare
1991-03-14	18:11:50.507	255-b	Solar Flare
1991-03-14	22:56:15.309	255-c	GRB
1991-03-22	20:07:59.817	256-a	Solar Flare
1991-03-22	22:42:51.228	256-b	Solar Flare
1991-03-23	01:51:17.475	256-c	Solar Flare
1991-03-23	14:34:35.610	257-a	Solar Particles
1991-03-23	14:48:54.705	257-b	Solar Particles
1991-03-23	15:01:31.774	257-c	Solar Particles
1991-03-29	06:44:19.108	260-a	Solar Flare
1991-03-31	13:45:30.490	261-a	Solar Flare
1991-03-31	19:08:38.993	261-b	Solar Flare
1991-04-02	14:27:44.130	262-a	GRB

Table 1 GRBs List

Event ID	Time(U.T.) (hr:mn)	Peak Counts Cp (cnts/4sec)	Bit
901009	00:15:52		Hi
901021	00:09:07		Hi
901103	05:52:56		Hi
901112	19:20:38		Lo Uly
901219	21:52:50		Hi Uly
901022	15:14:08		Hi Uly
901030	11:56:08		Hi
9010204	08:58:47		Hi Uly
9010206	08:45:29		Med Uly
910312	12:43:34		Hi Uly
910314	22:56:12		Lo Uly
910315	22:55:48		Lo Uly
910322	12:41:48		Med
910402	14:28:13		Med Uly
910429	03:11:50		Med GRO
910522	12:14:08		Hi Uly
910527	23:45:36		Hi
910709	20:22:38		Med
910717	04:33:05		Hi GRO
910723	14:06:16		Lo
910725	13:12:06		Med GRO
910803	08:33:28		Med GRO
910814	19:14:34		Lo GRO
910815	12:34:32		Med
910821	10:33:39		Hi
910827	13:11:18		Hi
910905	23:48:55		Med GRO
910907	01:04:56		Lo GRO?
910926	18:25:56		Lo GRO
911008	17:56:04		Lo
911016	11:01:30		Lo GRO
911029	04:50:52		Lo
accuracy			Hi <+-0.1s Med +-0.5s Lo +-2.0s

Murakami's

Preliminary list

SOLAR

Requested Uly data Request for data of event N/O

Got Ganga data

Requested U. RT data

Got Ganga data

SOLAR

✓

Requested RT

Requested RT data

Uly RT

RT requested

RT requested

Uly

RT requested

RT requested

RT requested

RT

RT requested

No data

Requested RT

Requested RT

Requested RT

Requested RT

Requested RT

Requested RT

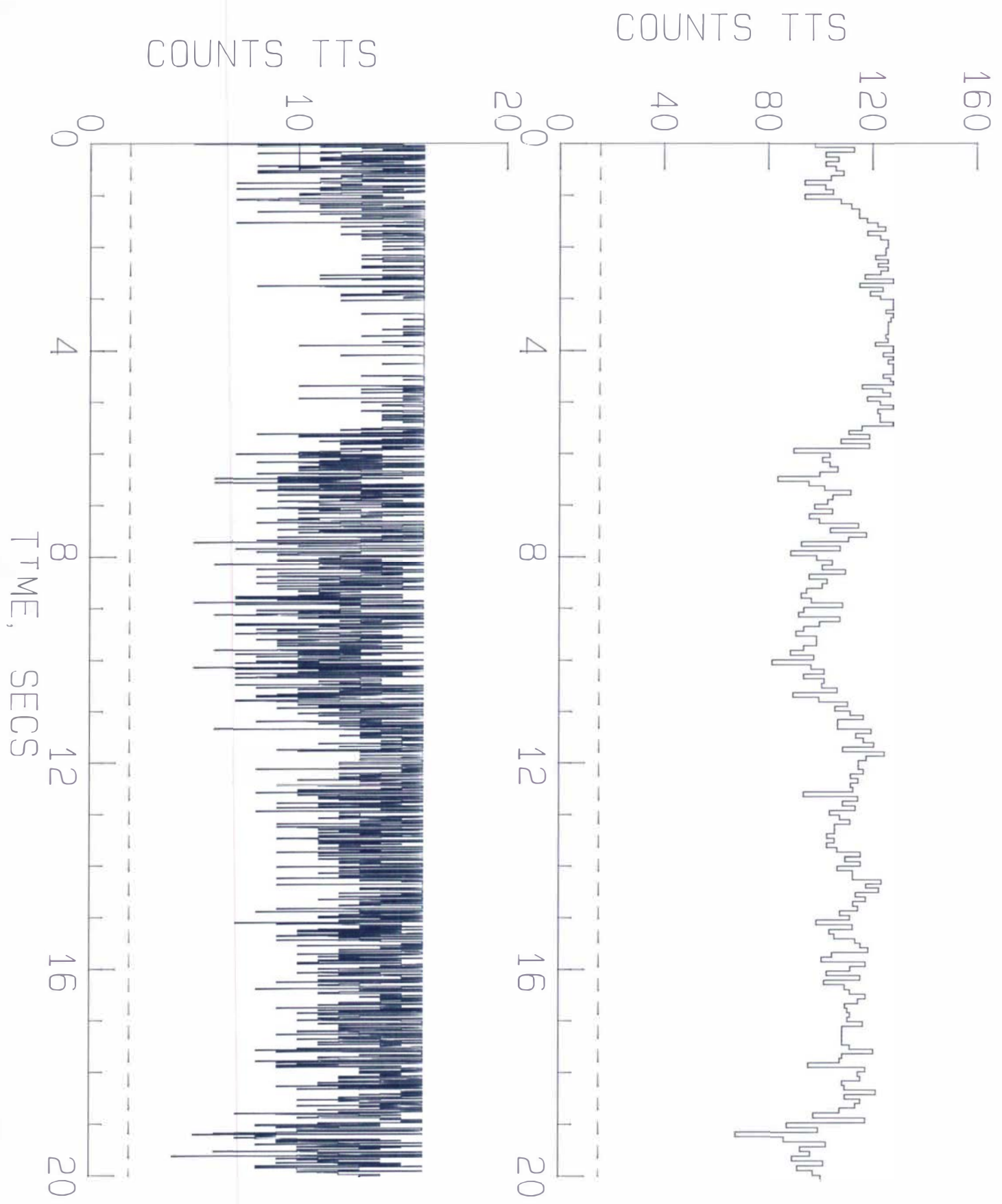
Requested RT

PV0

12/03/91

45654.835

100-2000 keV

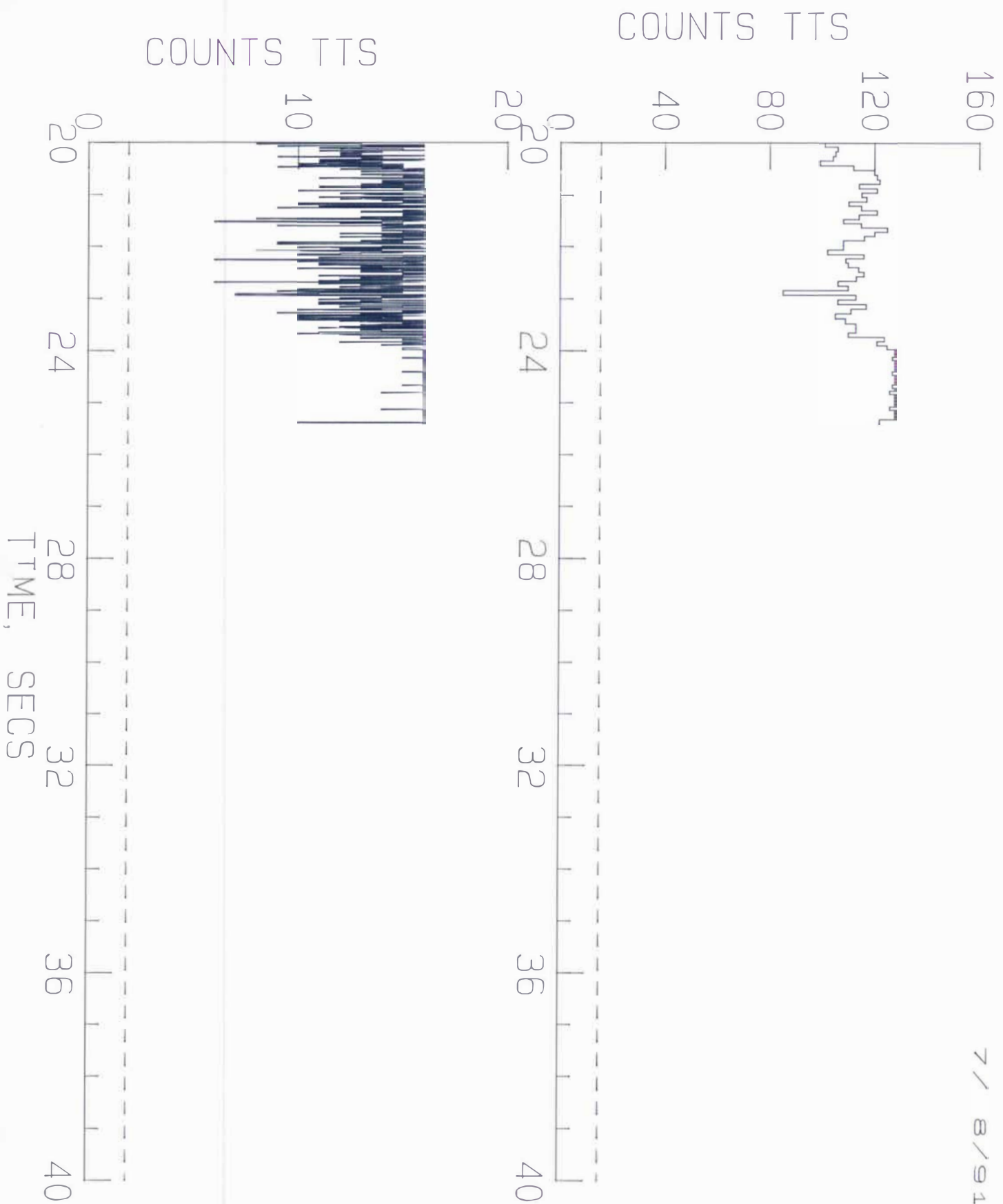


PV0

12/03/91

45654.835

100-2000 keV

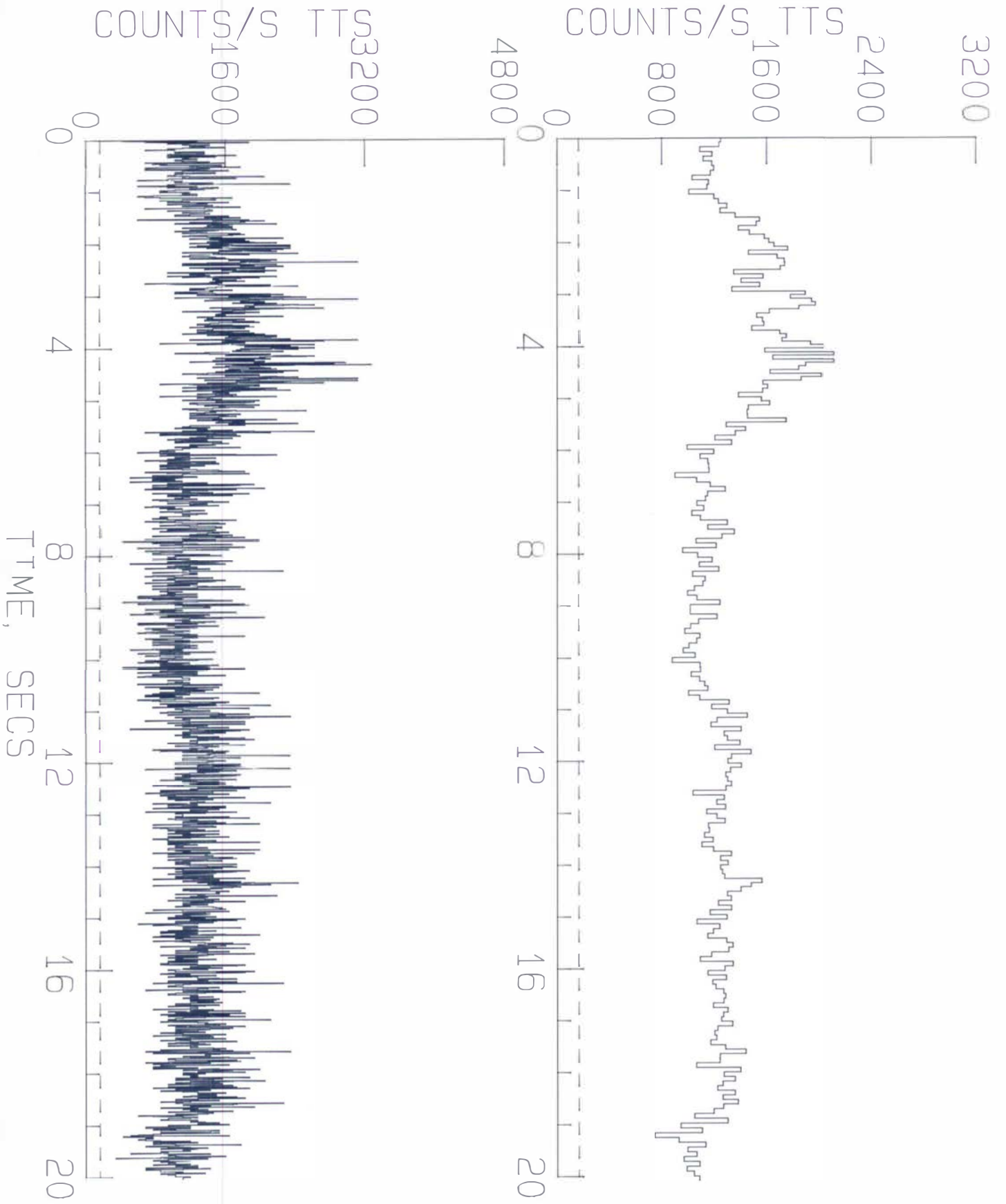


PV0

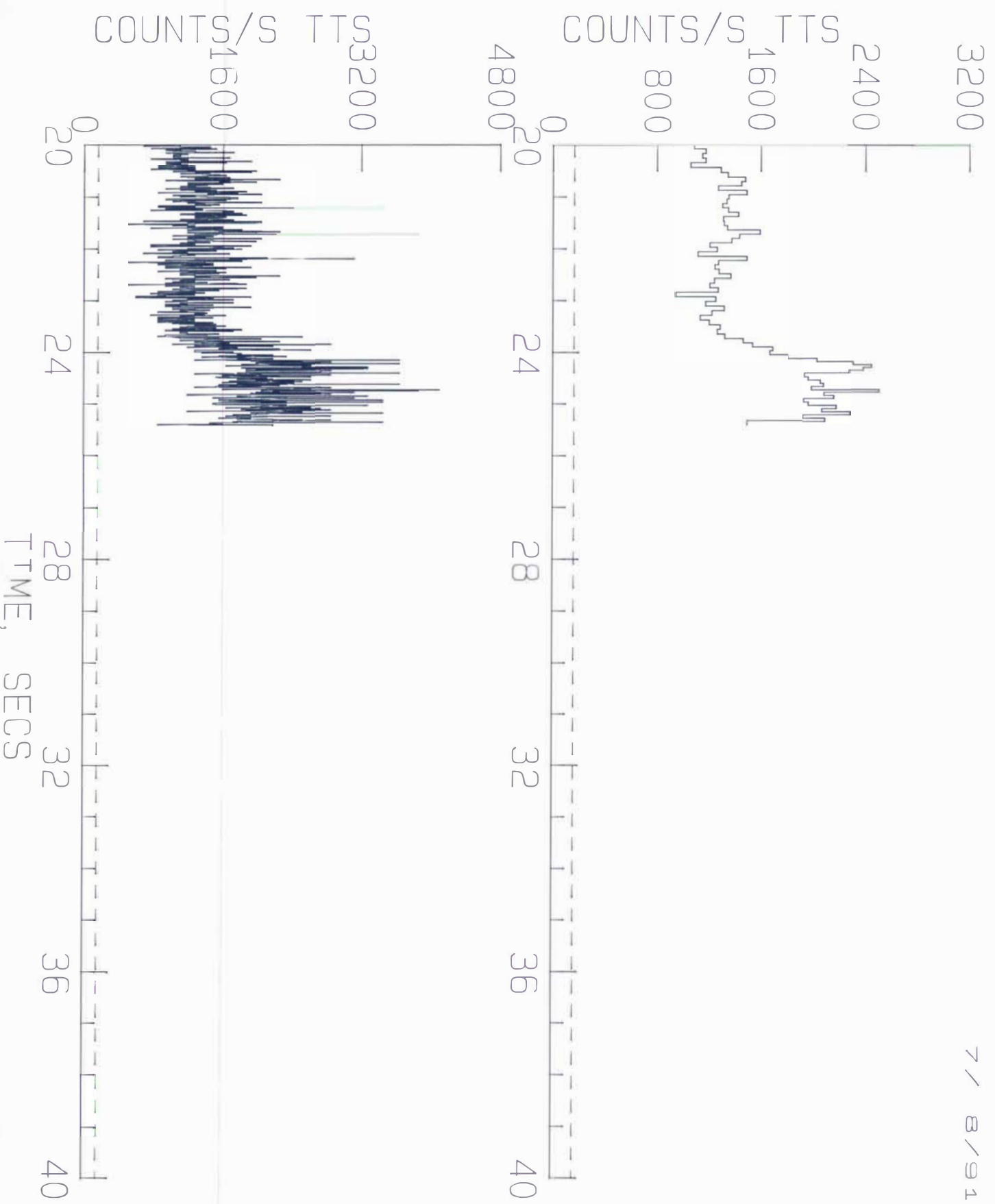
12/03/91

45654.835

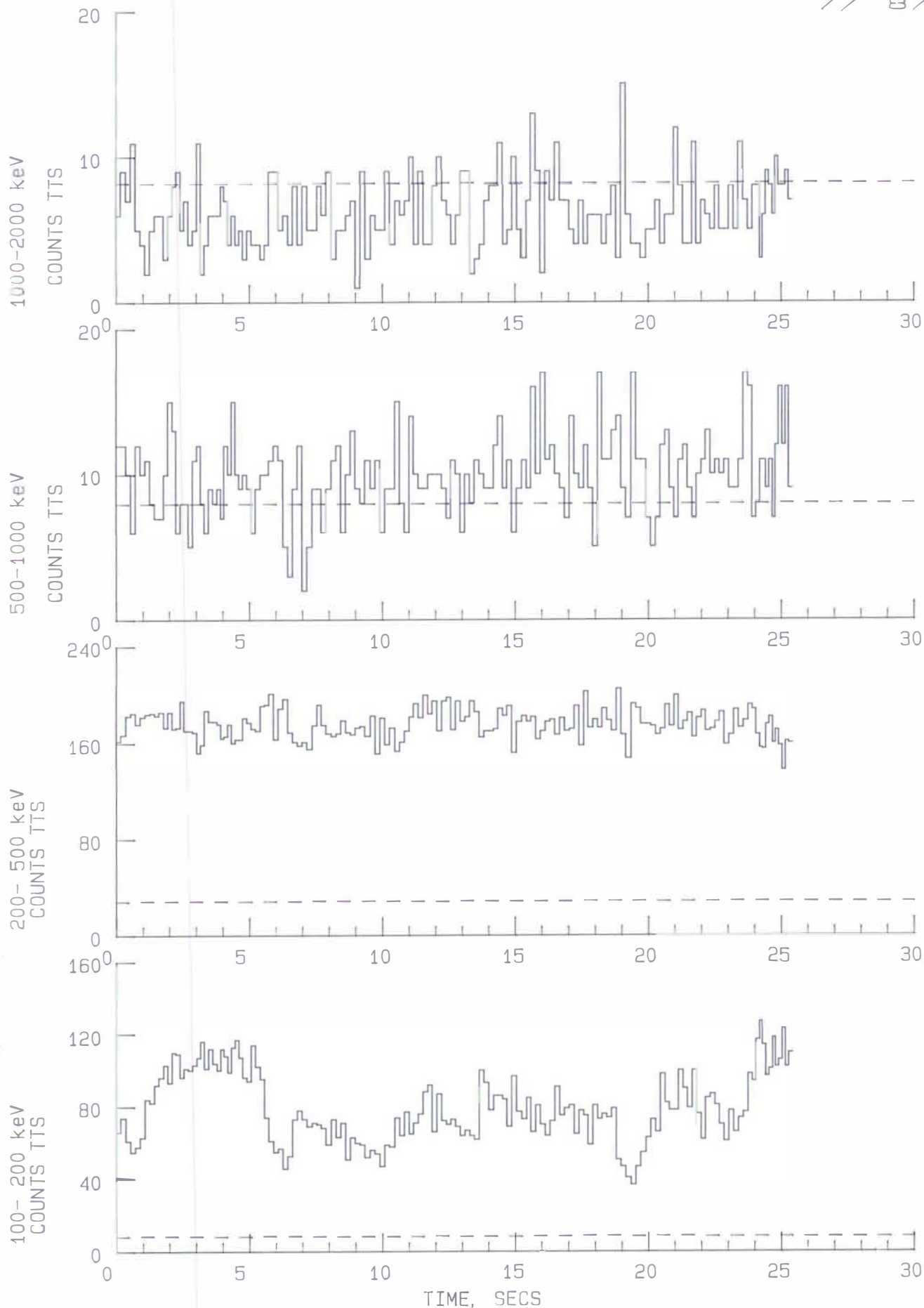
100-2000 keV

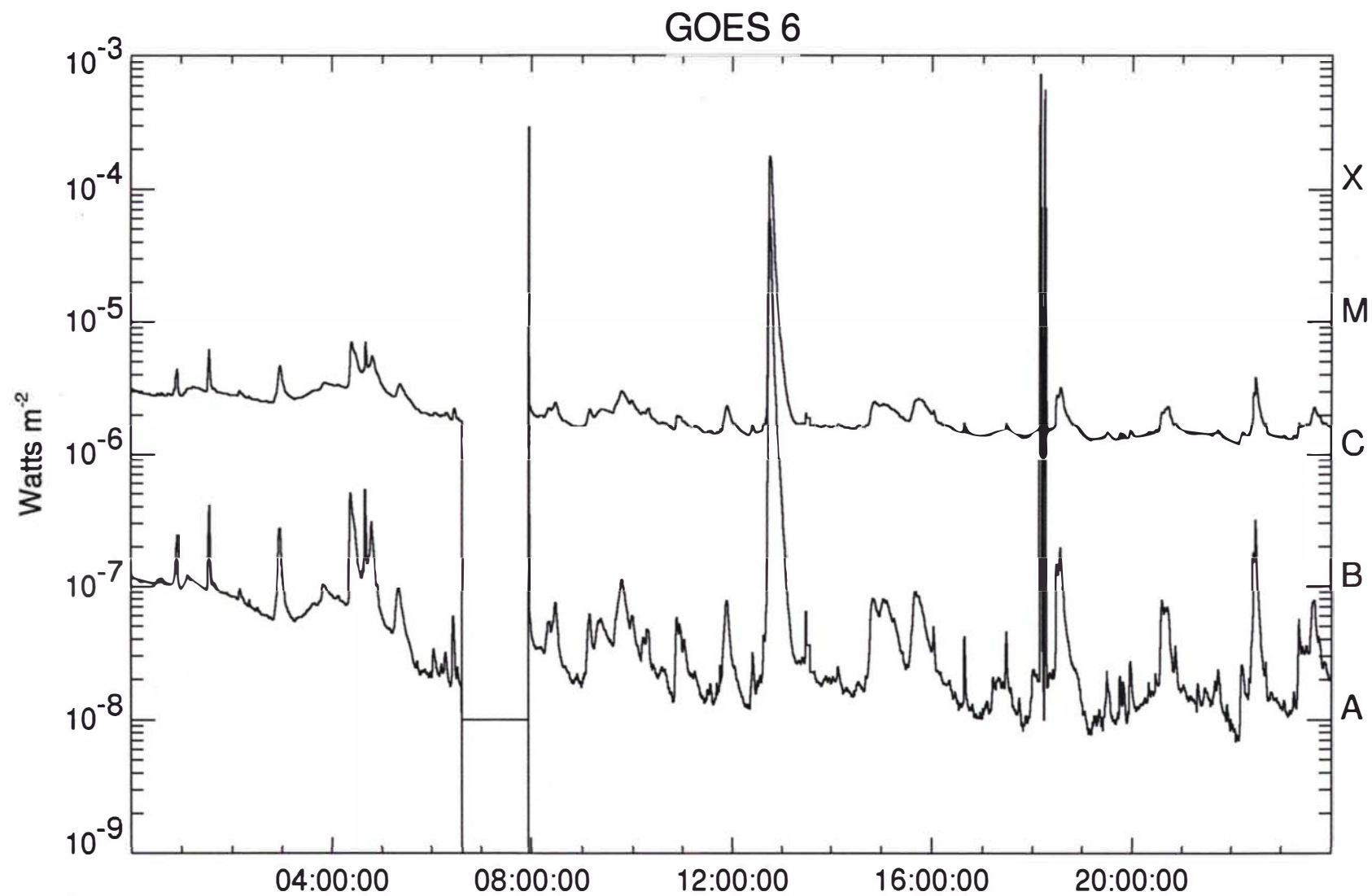


PV0 12/03/91 45654.835
100-2000 keV



PV0 12/03/91 45654.835





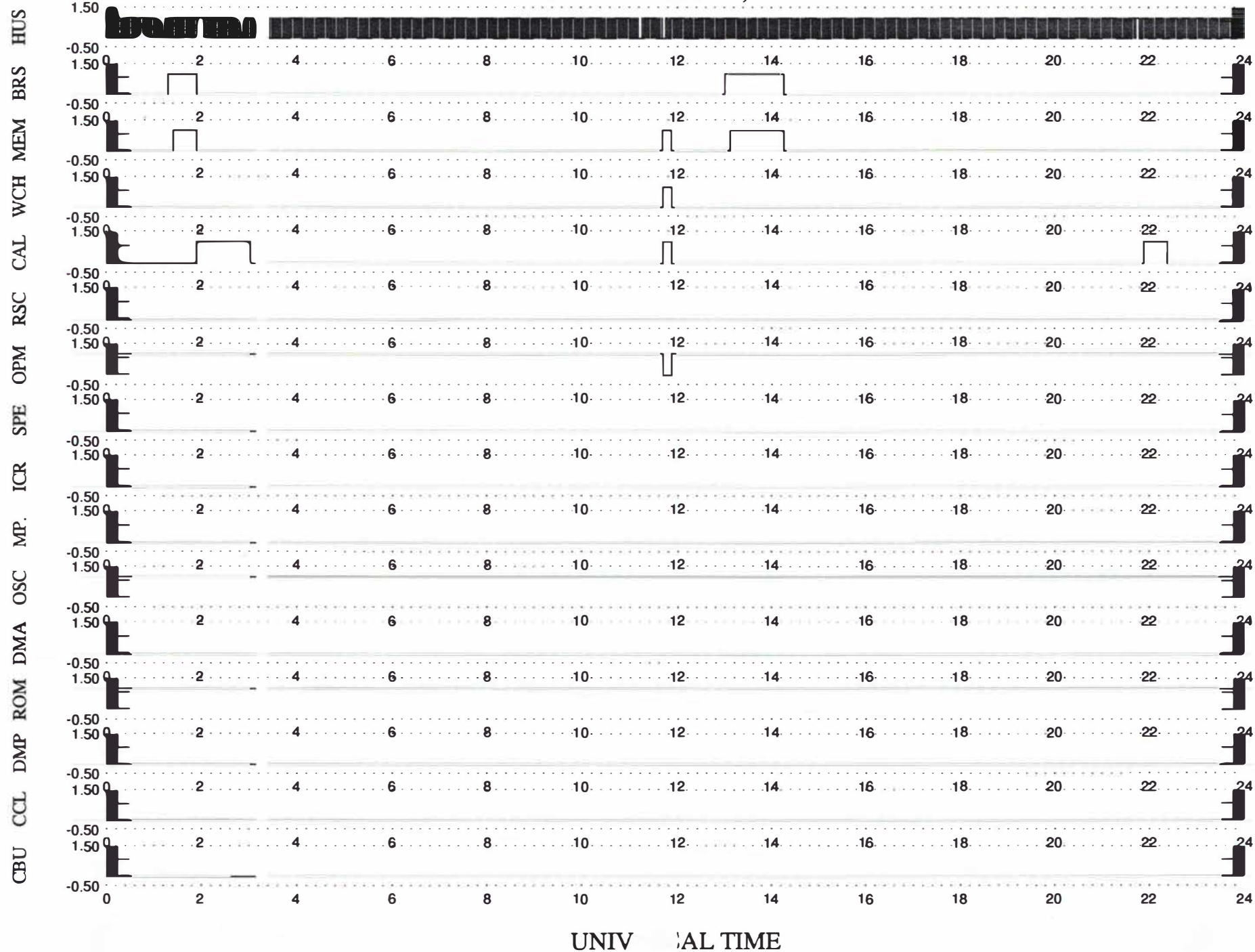
Data Start: 91/03/12, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

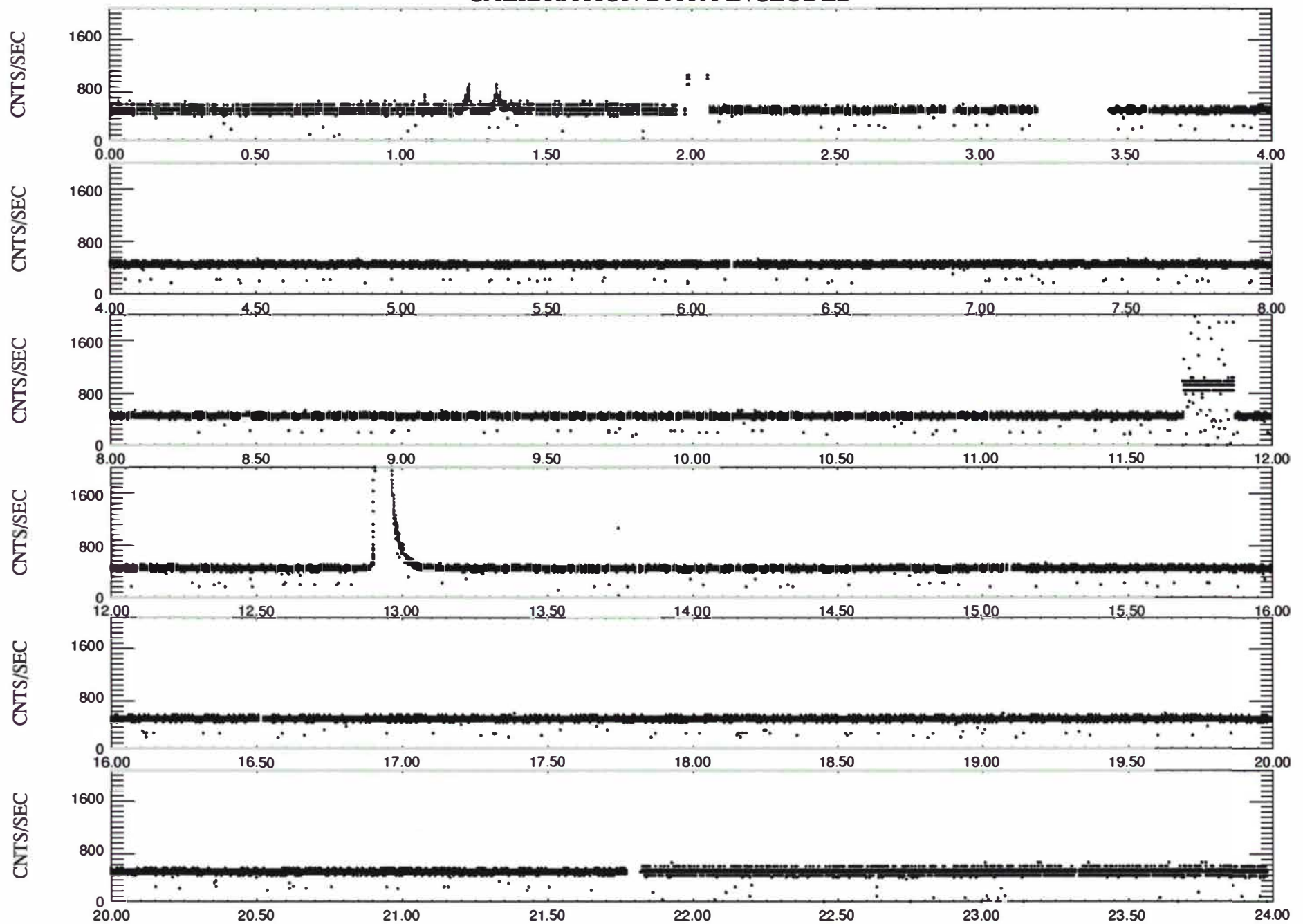
Plot created: 96/11/26, 1832

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 5, 6

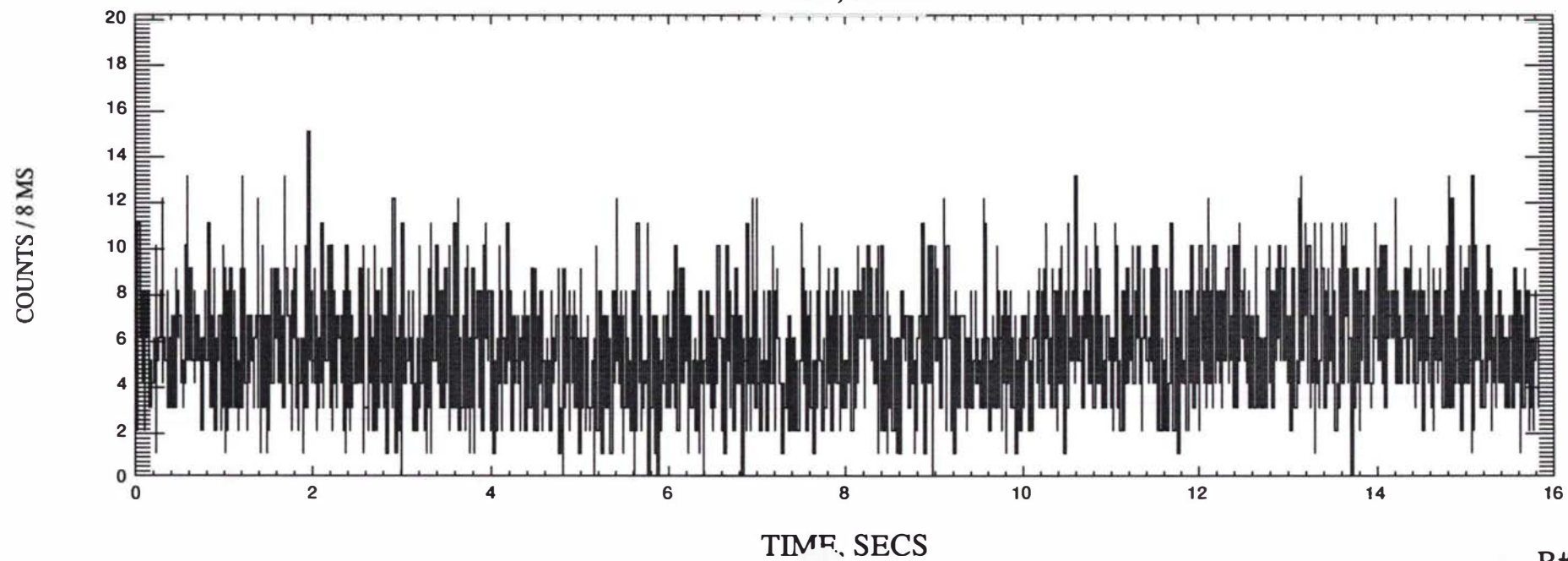
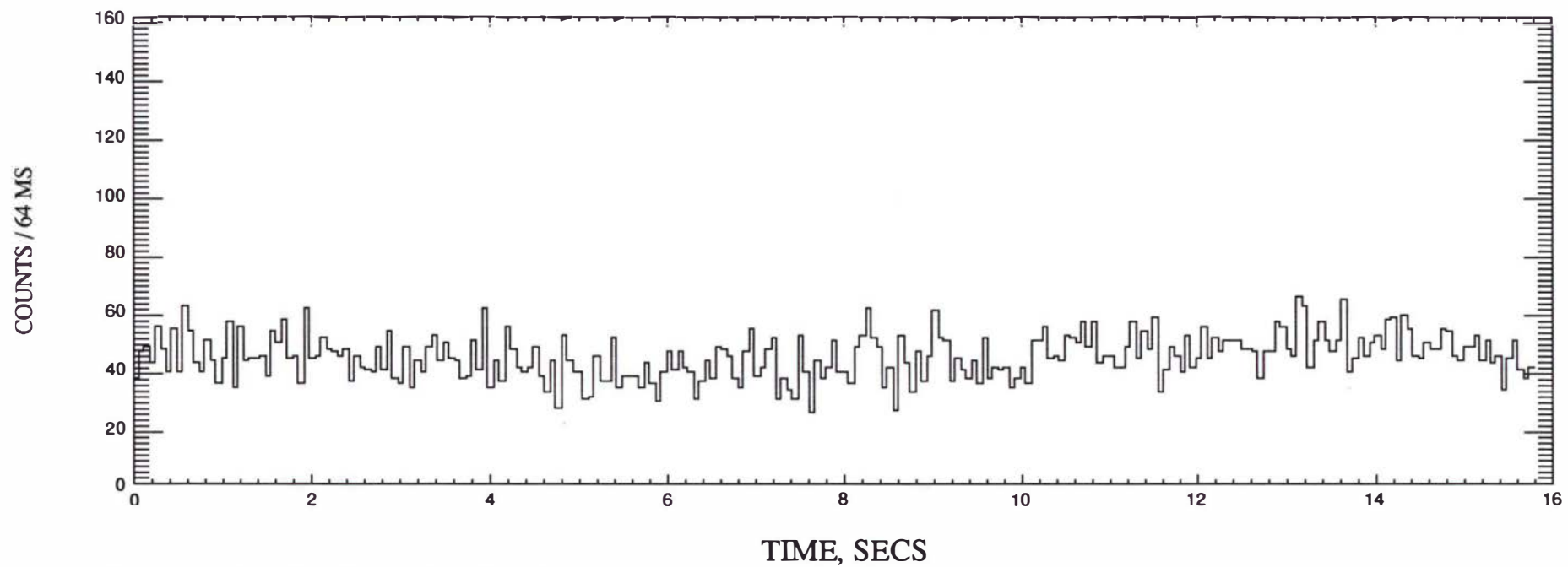


CALIBRATION DATA INCLUDED

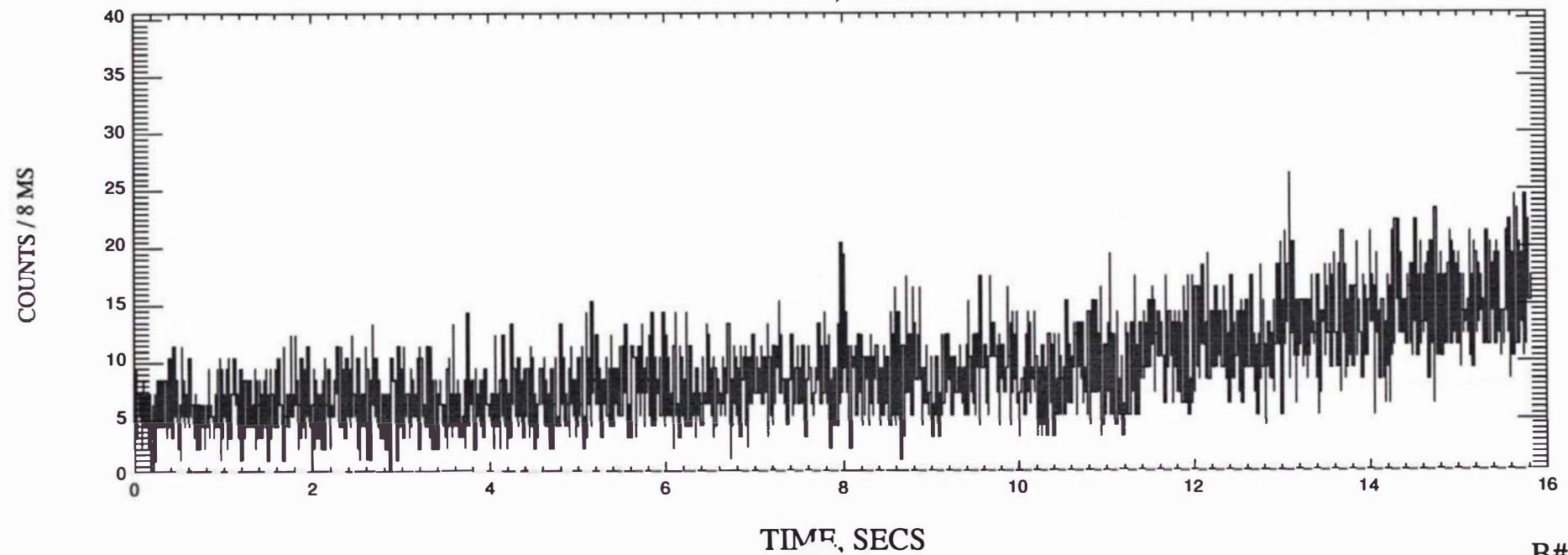
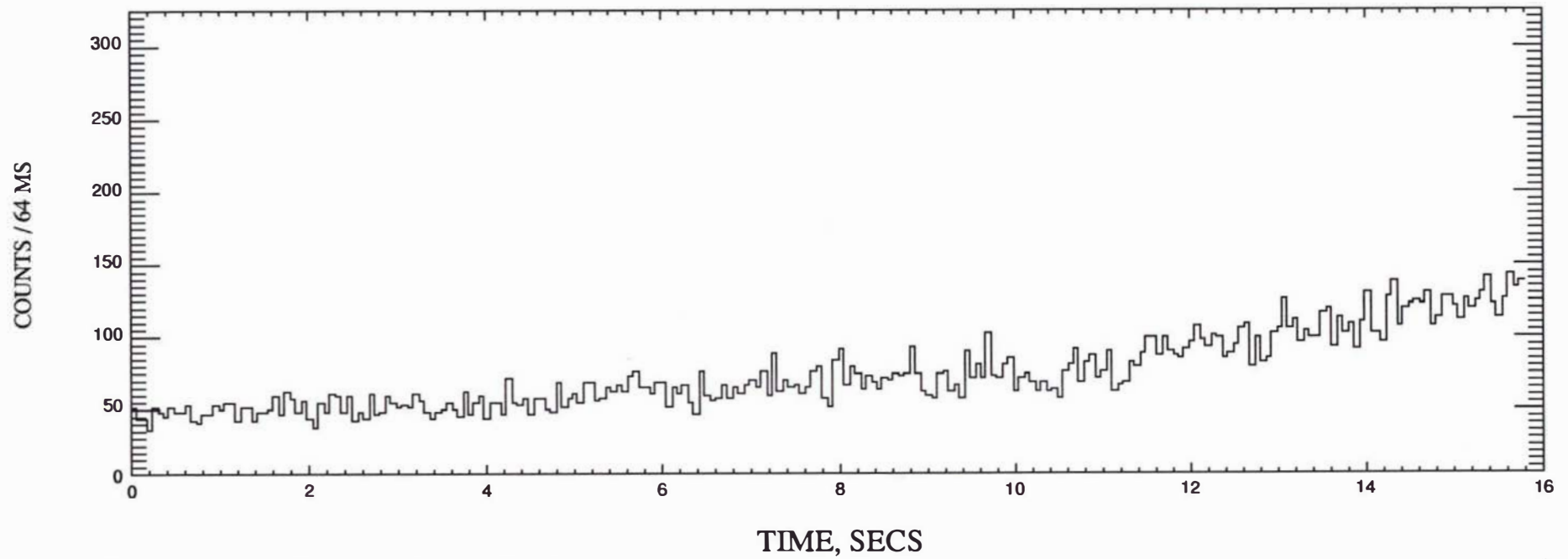


UNIV AL TIME

Burst Counter 5 at UT= 1.224761678908 h= 4409.142 s 01:13:29.142



Burst Counter 6 at UT=12.900182410346 h=46440.657 s 12:54:00.657



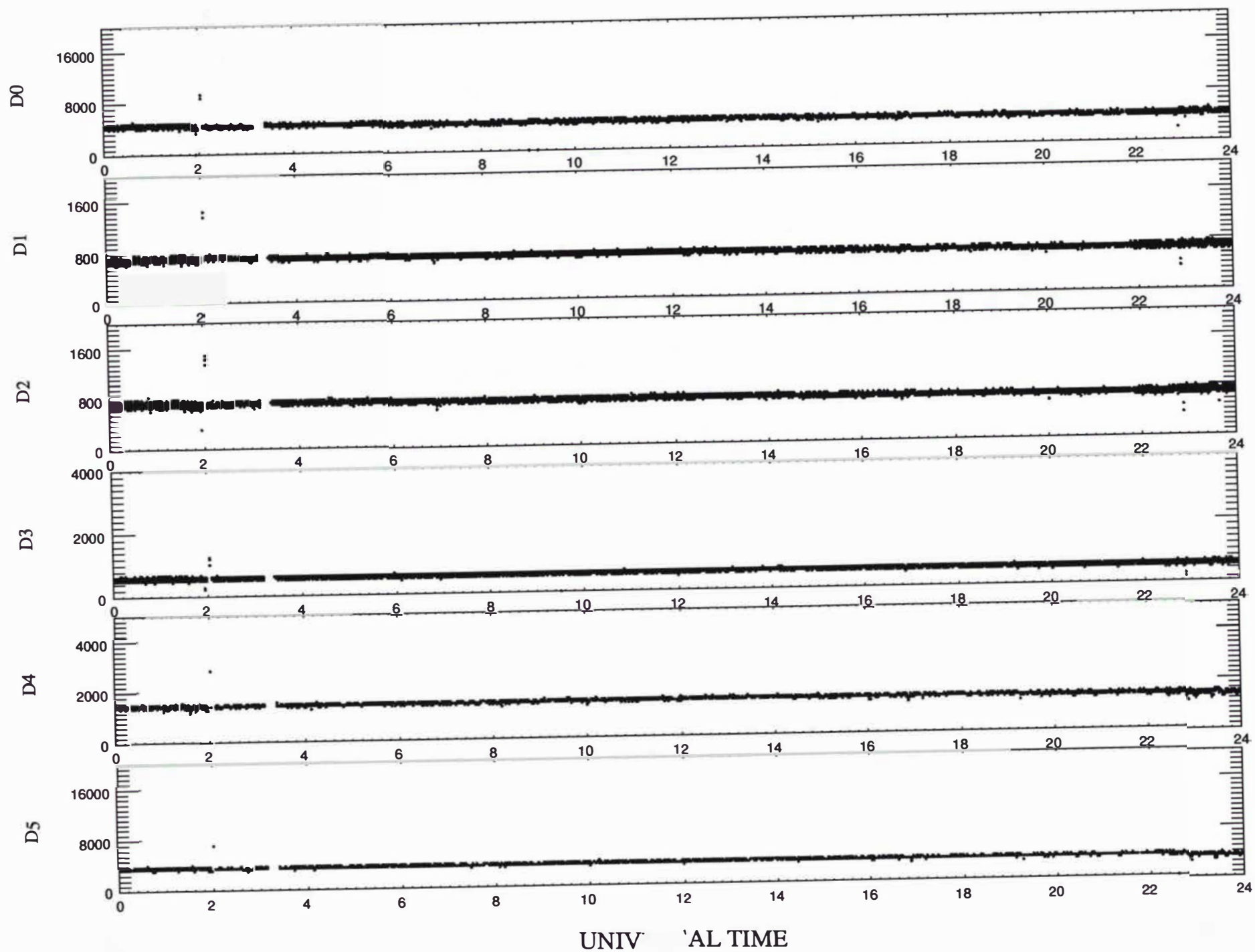


Table 1. (Contd.)

Burst	Number	Activation time	Duration T_{90} , s	$C_{\max}/C_{\min}$	Remarks
1	2	3	4	5	6
PB901121b	194.3	18 ^h 09 ^m 10 ^s .643	7.59 ± 0.51	1.33 ± 0.24	
PB901213	209.3	7 06 23.125	2.48 ± 0.19	1.93 ± 0.36	
PB901216	211.1	15 47 15.796	2.23 ± 0.54	2.05 ± 0.35	
PB901218	213.1	16 10 55.518	10.35 ± 0.68	2.87 ± 0.30	
PB901221	214.1	0 30 04.998	7.38 ± 0.29	1.05 ± 0.22	
PB910106	218.1	16 39 57.526	1.59 ± 0.19	1.81 ± 0.26	U
PB910117	223.1	0 57 12.234	11.53 ± 0.64	2.04 ± 0.27	
PB910122	228.1	15 13 50.333	13.89 ± 0.12	4.10 ± 0.37	SU
PB910202	234.2	20 57 39.164	4.77 ± 0.31	1.16 ± 0.23	
PB910203	234.3	9 19 06.273	4.55 ± 0.33	1.52 ± 0.29	
PB910204a	235.1	8 58 45.809	4.65 ± 0.15	1.33 ± 0.24	
PB910204b	235.2	10 48 08.317	24.52 ± 0.47	1.50 ± 0.24	
PB910204c	235.3	14 50 33.466	8.72 ± 0.38	1.98 ± 0.26	
PB910206	236.3	8 45 28.848	0.70 ± 0.09	3.17 ± 0.42	U
PB910210	237.1	17 35 33.690	2.64 ± 0.30	2.12 ± 0.33	
PB910211	237.2	3 25 22.422	4.77 ± 0.30	2.82 ± 0.28	U
PB910314	255.3	22 56 15.307	7.08 ± 0.38	9.62 ± 0.55	U
PB910402	262.1	14 27 44.130	35.88 ± 0.05	64.86 ± 1.85	U
PB910404a	263.1	14 19 50.241	13.78 ± 0.21	2.59 ± 0.25	
PB910404b	263.2	17 17 18.561	4.14 ± 0.18	1.55 ± 0.21	
PB910417	273.1	20 07 31.882	19.39 ± 0.21	5.71 ± 0.39	SU
PB910517	282.1	5 02 42.956	2.80 ± 0.11	3.56 ± 0.32	SU
PB910527	287.1	23 44 33.511	0.12 ± 0.01	2.13 ± 0.34	

Note: The burst was observed independently with other instruments: K – KONUS, W – WATCH, S – SIGMA, G – GINGA, U – ULYSSES.

signal, produced automatically when there is an excess rate of registered pulses in the range from 0.1 to 1.6 MeV by eight standard deviations over 0.25 or 1 s integration time, activates the instrument to study burst information in more detail.

THE CRITERION OF BURST DETECTION

Each of the six *PHEBUS* instrument detectors is equipped with a trigger cell to register bursts. A cell is activated if the count rate exceeds the background level, in at least two detectors simultaneously, by at least $C_{\min}$ for any of the two time intervals, 0.25 and 1 s. The $C_{\min}$ value is automatically determined for all detectors by a microprocessor, and it is equal to eight standard deviations for each of the above-mentioned time intervals. If the "burst" signal is produced, synchronized information on the light-curve of the burst is registered for each detector. Spectral information from all detectors is also registered.

A cosmic gamma-ray burst, a solar flare, or in some cases, high-energy charged particles of the magnetosphere may cause an event. Solar flares were identified

by comparing the list of events registered from the Sun in the H α line and solar radio observations data with the list of events registered by the *PHEBUS* instrument. Magnetospheric events were sorted out of the remaining list on the basis of their long histories, smooth light curves, and soft energy spectra. The rest of the events were considered cosmic gamma-ray bursts. Some of them were also registered by other burst instruments of the *GRANAT* observatory (KONUS, WATCH, SIGMA) [1 - 3] or by instruments of other satellites (GINGA, ULYSSES) [4, 5]. The column "Remarks" in Table 1 indicates which space instruments, besides *PHEBUS*, registered the given event.

During the first year and a half of the instrument's operation, it registered 147 detections, 66 of them being cosmic gamma-ray bursts.

This catalog contains only cosmic gamma-ray bursts. The first column of Table 1 gives the designation of the burst. The two first letters, PB (*PHEBUS* burst) mean that the *PHEBUS* instrument has registered the burst. Figures designate the year, month, and day of the registration of the burst. The second column contains the number of the *GRANAT* observatory observing run

(j)

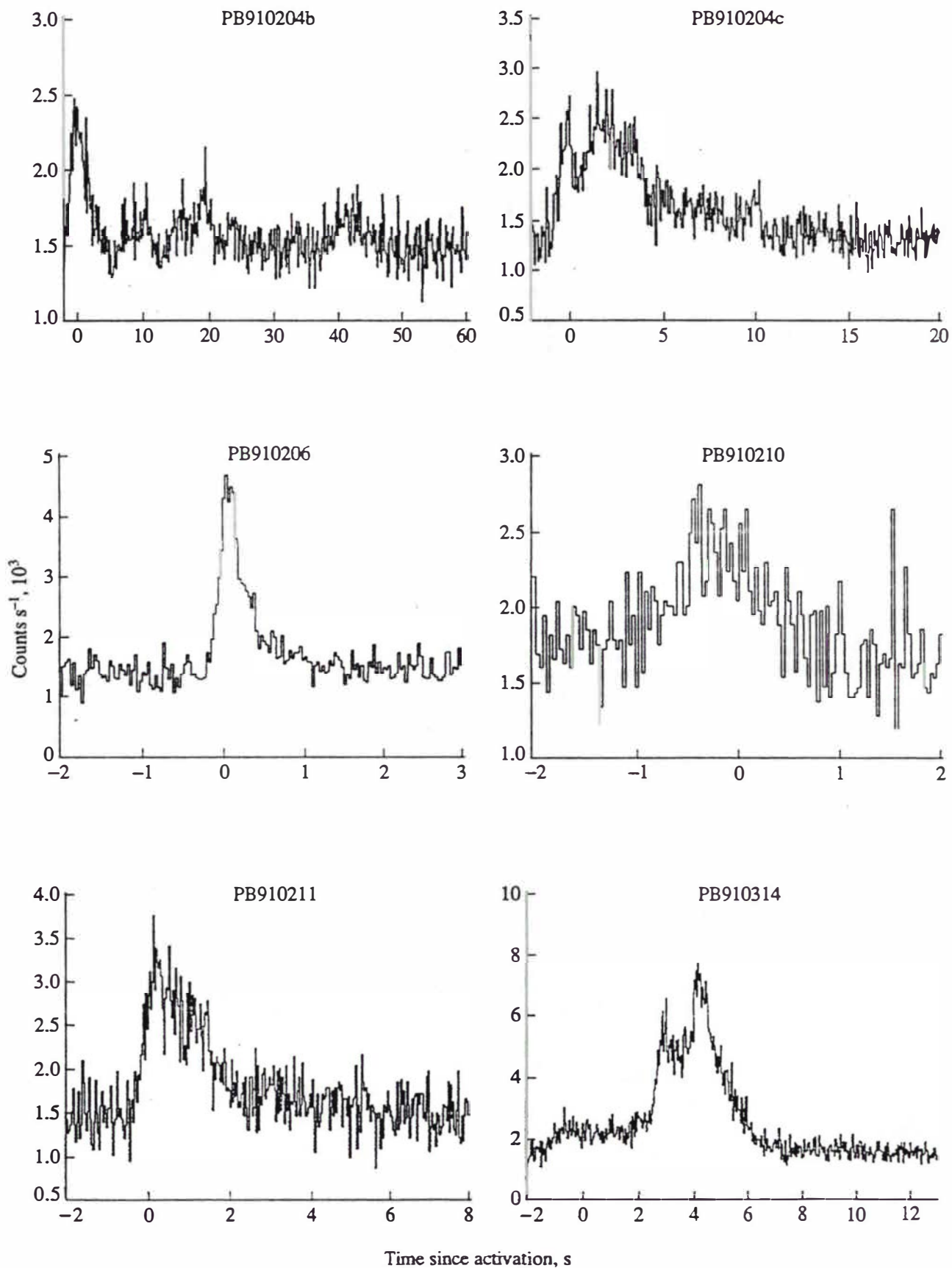


Fig. 1. (Contd.).

DATE	U.T.	Nr UGB	Event Nature
1990-12-24	15:34:32.617	216-a	Solar Flare
1991-01-06	16:39:57.526	218-a	GRB
1991-01-17	00:57:12.234	223-a	GRB ?
1991-01-18	14:03:26.738	224-a	Solar Flare
1991-01-21	00:18:12.304	227-a	Solar Flare
1991-01-22	15:13:50.333	228-a	GRB
1991-01-25	06:29:38.745	231-a	Solar Flare
1991-02-01	11:44:54.779	233-a	Solar Flare
1991-02-01	18:46:17.191	233-b	Solar Particles
1991-02-02	20:57:39.170	234-a	GRB ?
1991-02-04	08:58:45.821	235-a	GRB
1991-02-04	10:48:08.317	235-b	Solar Flare
1991-02-04	14:50:33.480	235-c	Solar Flare
1991-02-06	06:10:53.398	236-a	Solar Flare
1991-02-06	06:45:52.285	236-b	Solar Flare
1991-02-06	08:45:28.852	236-c	GRB
1991-02-10	17:35:33.692	237-a	Solar Flare
1991-02-11	03:25:22.425	237-b	GRB
1991-02-19	09:23:07.760	239-a	Solar Flare
1991-03-12	12:43:02.596	252-a	Solar Flare
1991-03-13	02:59:14.539	254-a	Solar Flare
1991-03-13	08:01:48.347	254-b	Solar Flare
1991-03-14	13:31:08.601	255-a	Solar Flare
1991-03-14	18:11:50.507	255-b	Solar Flare
1991-03-14	22:56:15.309	255-c	GRB
1991-03-22	20:07:59.817	256-a	Solar Flare
1991-03-22	22:42:51.228	256-b	Solar Flare
1991-03-23	01:51:17.475	256-c	Solar Flare
1991-03-23	14:34:35.610	257-a	Solar Particles
1991-03-23	14:48:54.705	257-b	Solar Particles
1991-03-23	15:01:31.774	257-c	Solar Particles
1991-03-29	06:44:19.108	260-a	Solar Flare
1991-03-31	13:45:30.490	261-a	Solar Flare
1991-03-31	19:08:38.993	261-b	Solar Flare
1991-04-02	14:27:44.130	262-a	GRB

SOLAR

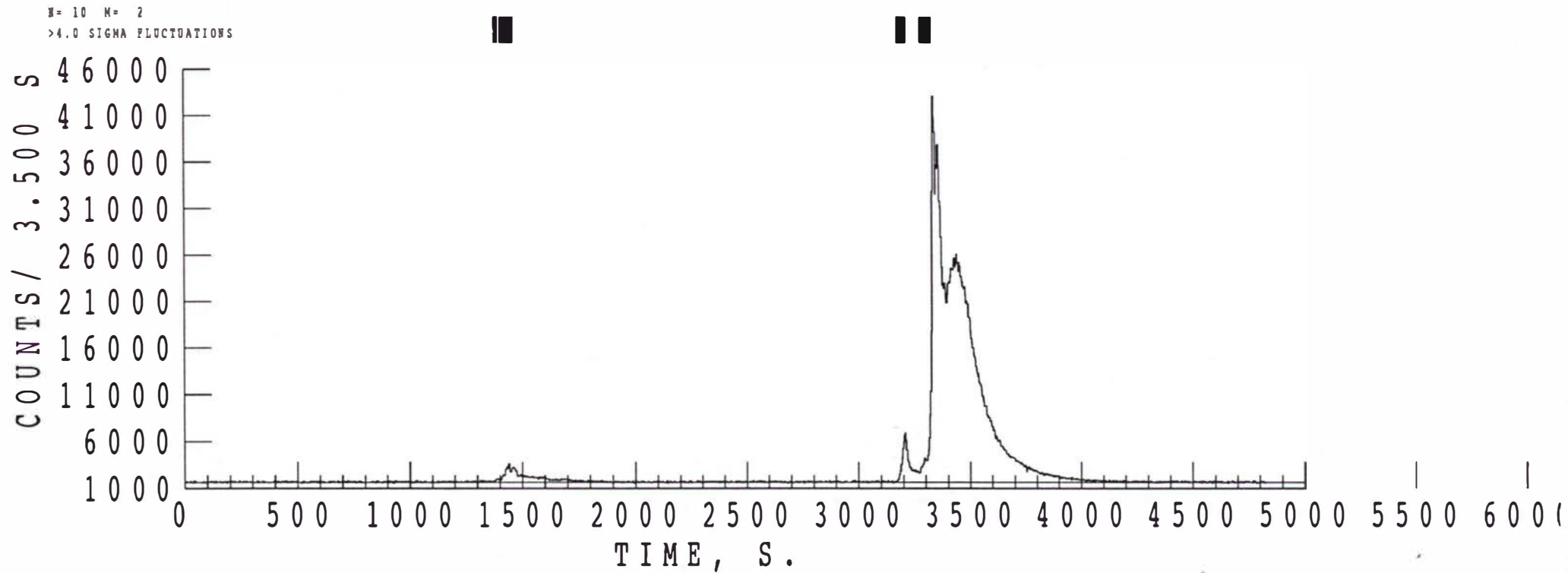
ULYSSES RT

11 / 12 / 98

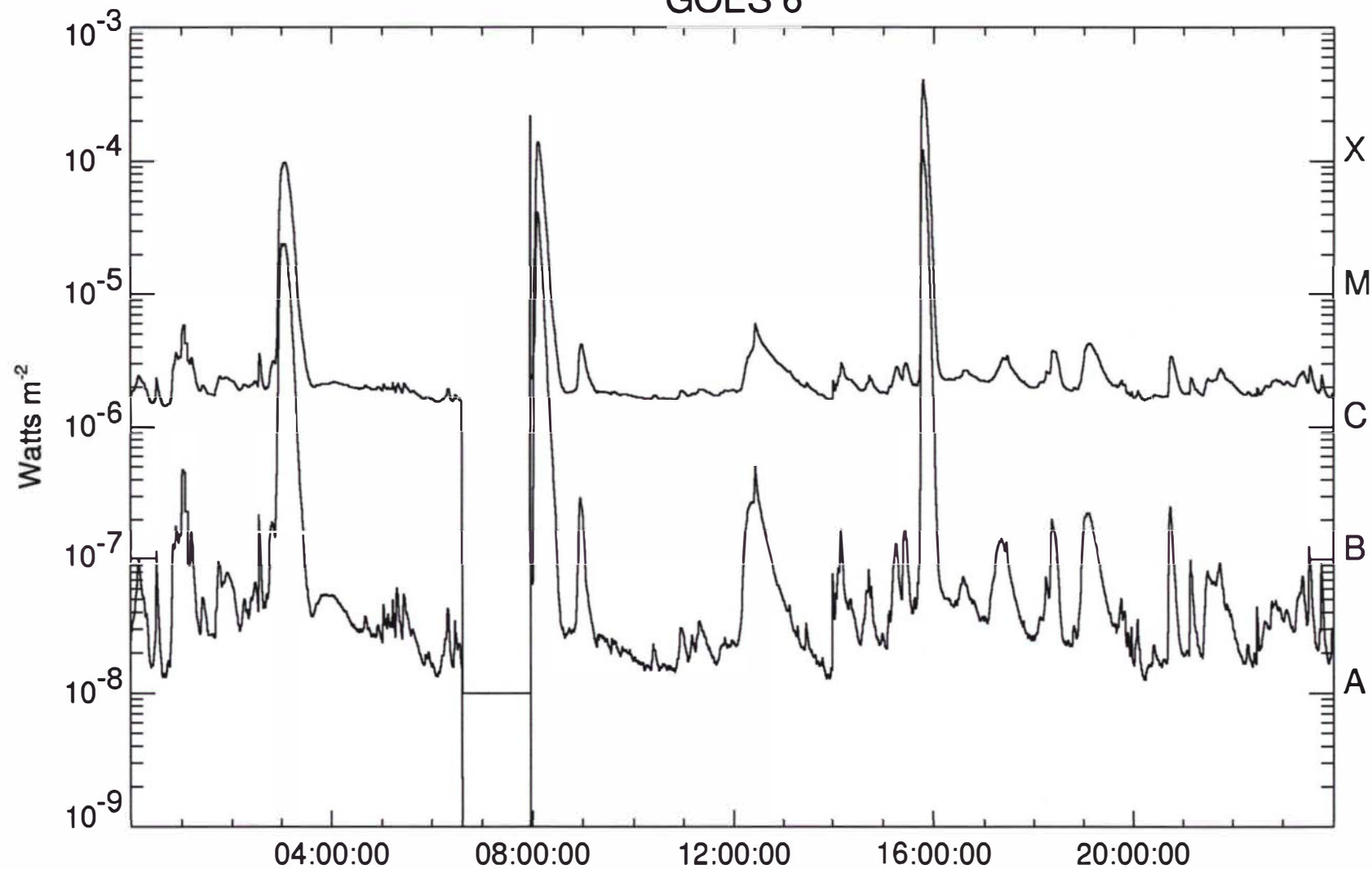
13 / 3 / 91 26388.398 s

0.500 S INTERVALS REGROUPED BY 7

0 - 0 keV



GOES 6



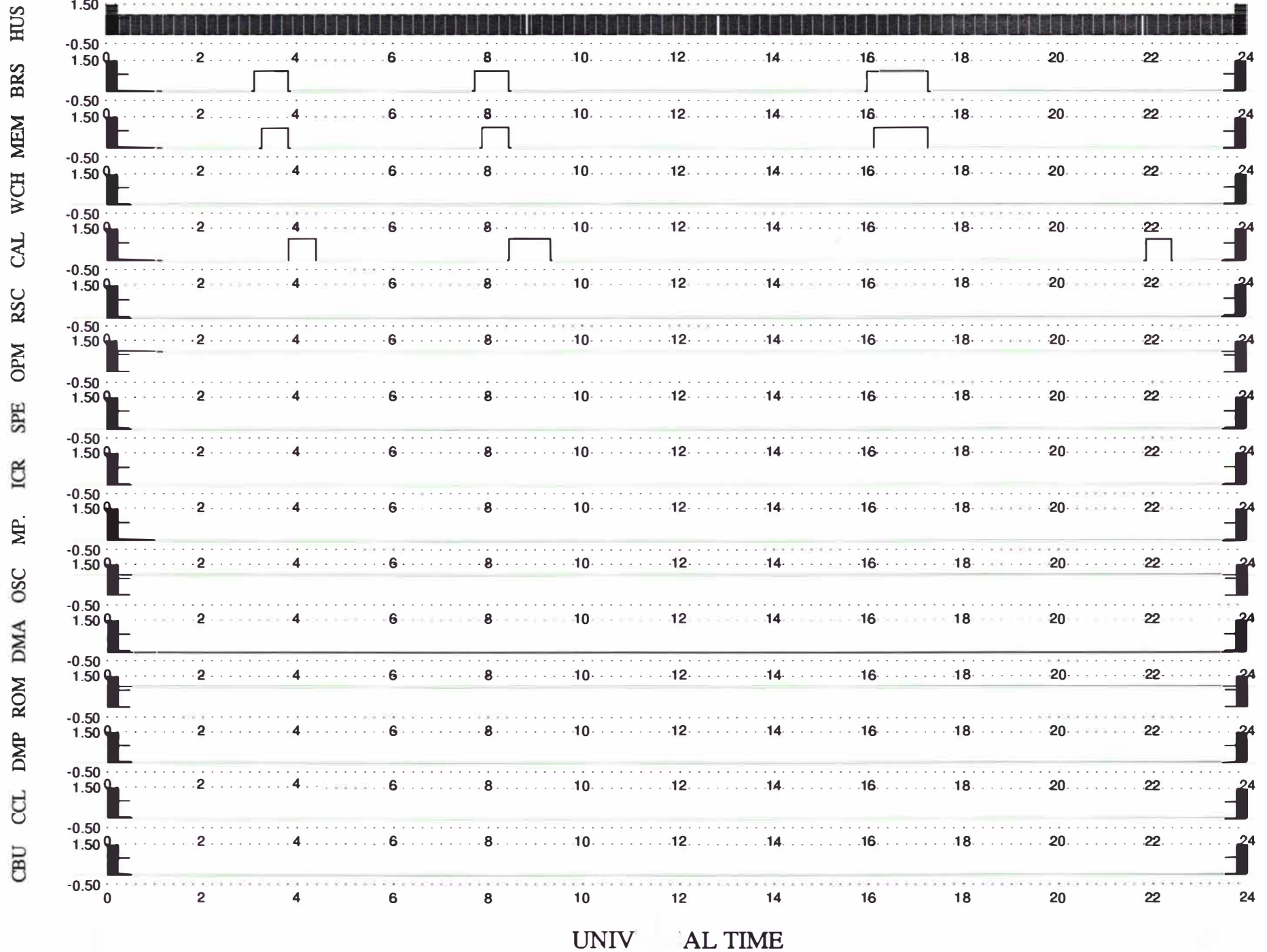
Data Start: 91/03/13, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
 Channel 2 (0.5 - 4.0 Angstroms)

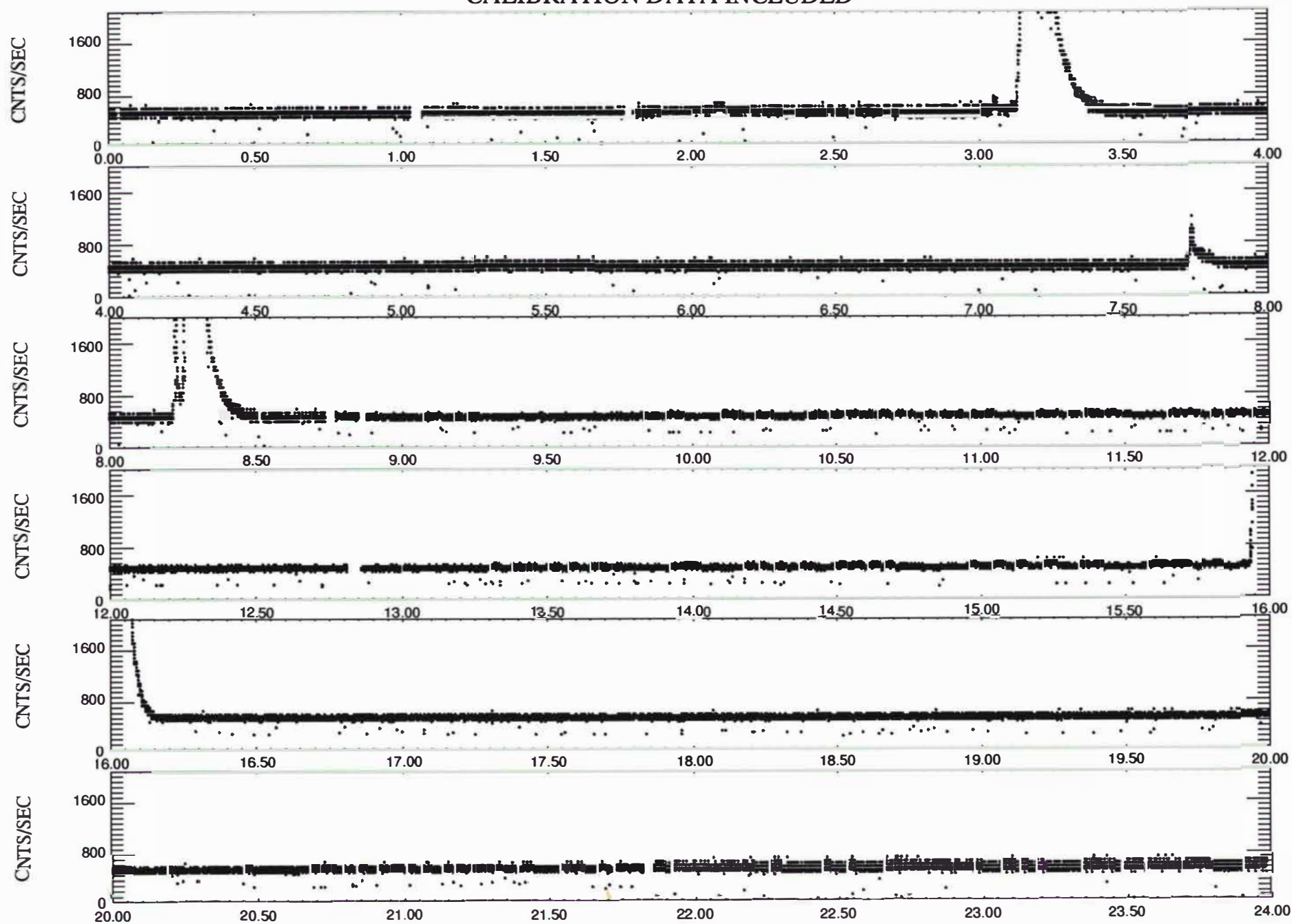
Plot created: 96/11/26, 1835

Background not subtracted
 Background not subtracted
 Sample average = 10

BURST NUMBER 7 - 9

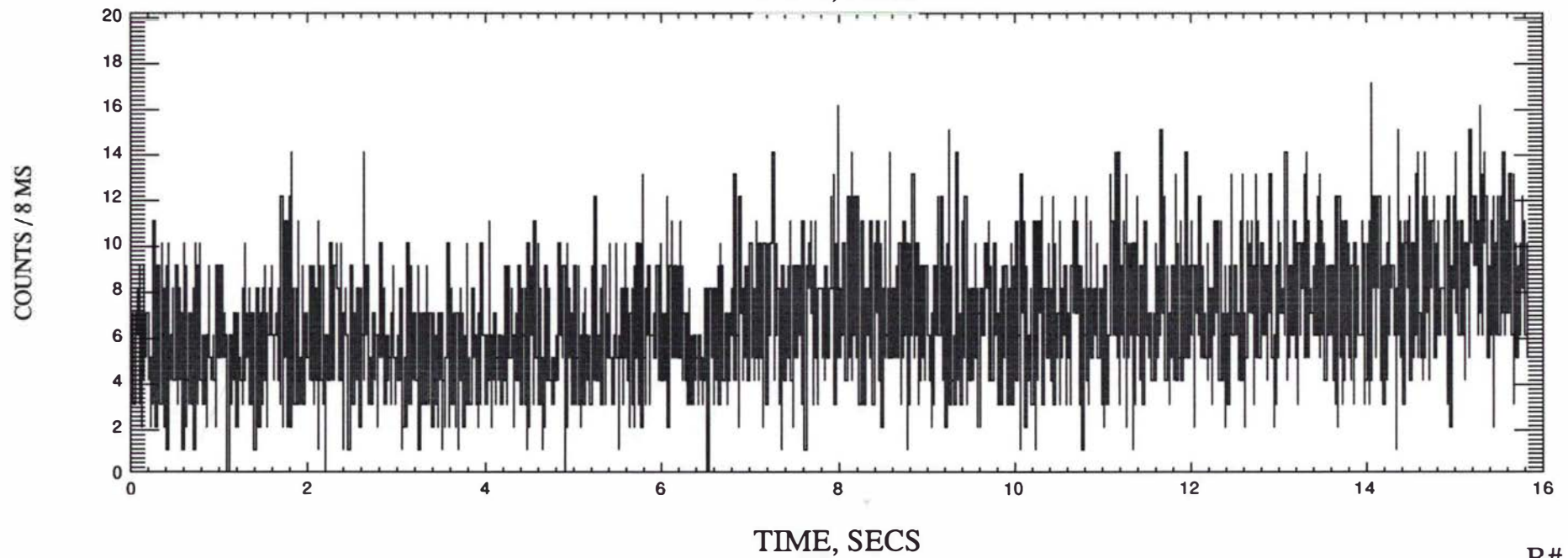
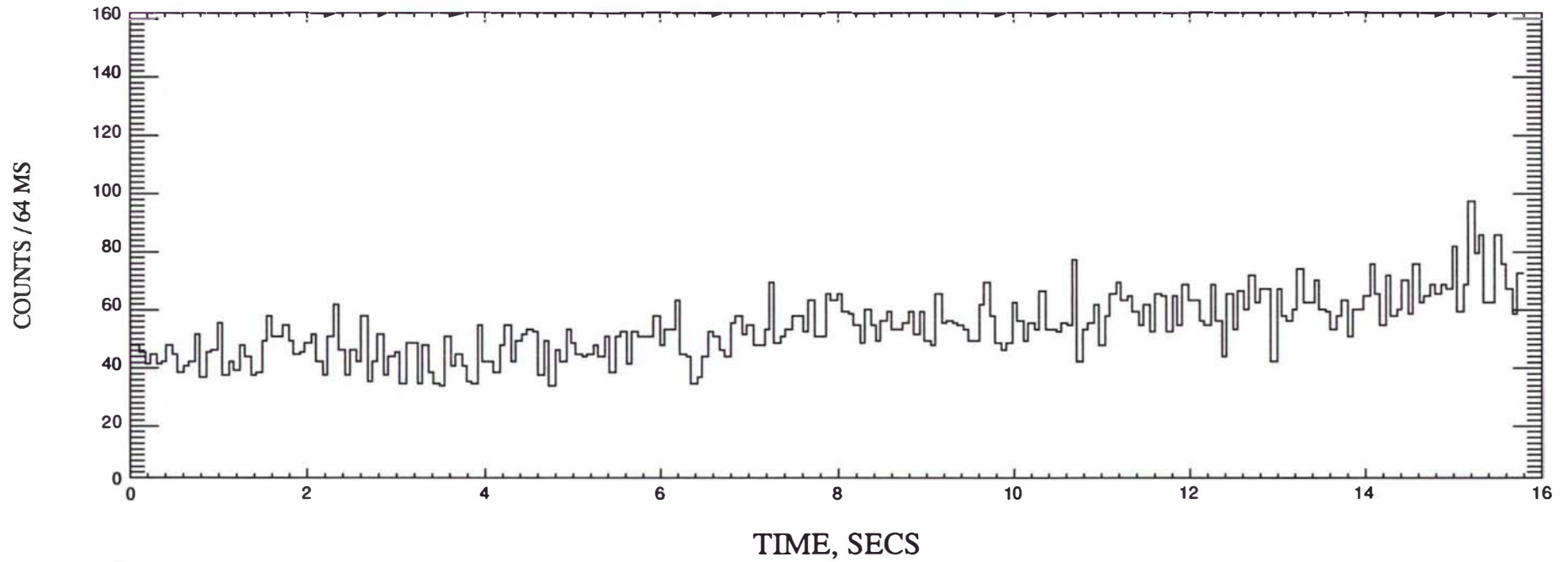


CALIBRATION DATA INCLUDED

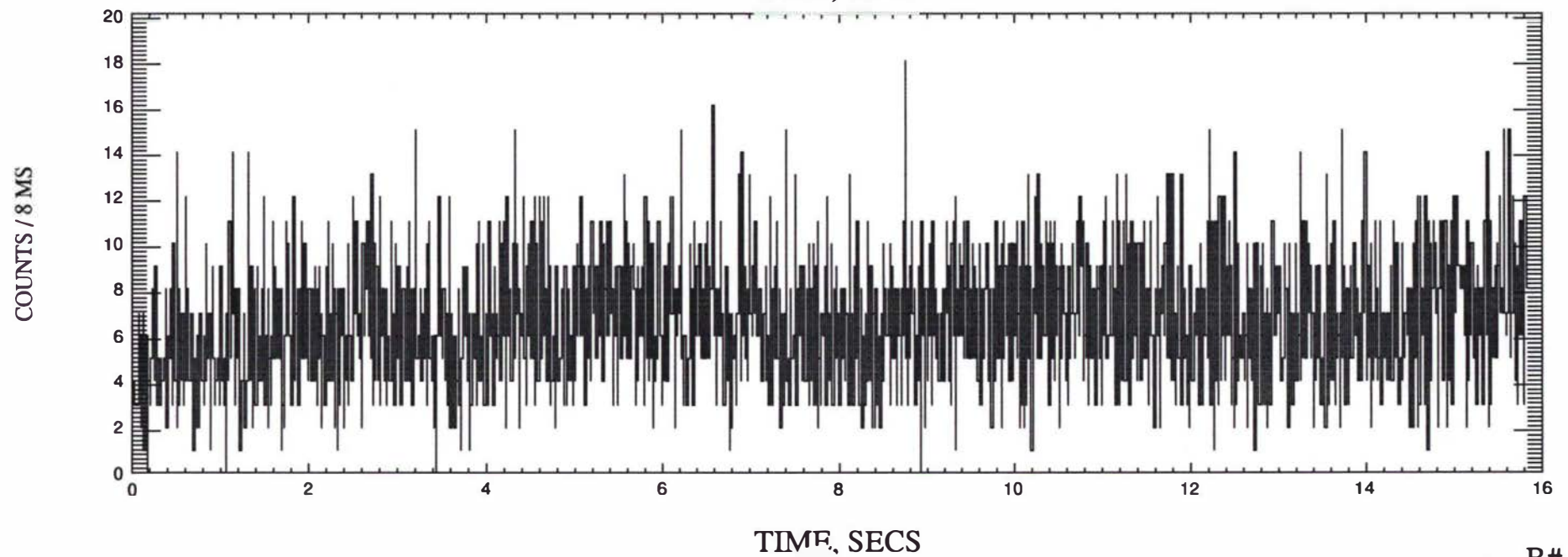
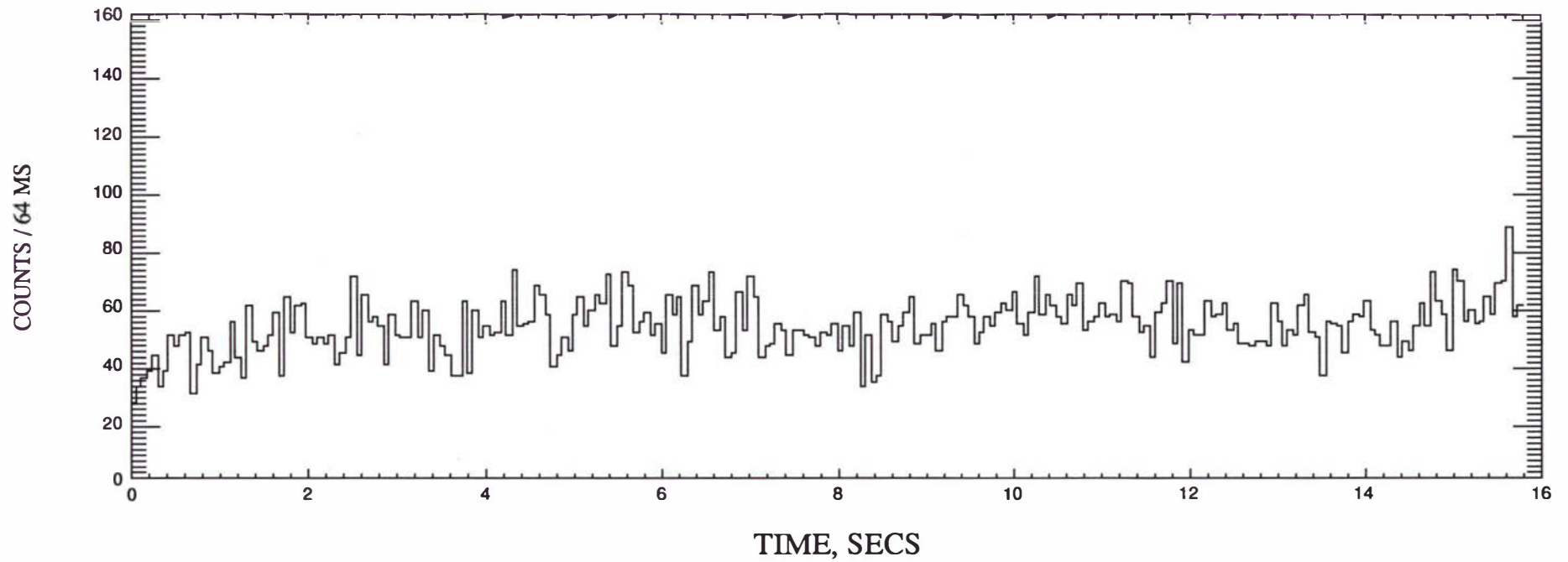


UNIV AL TIME

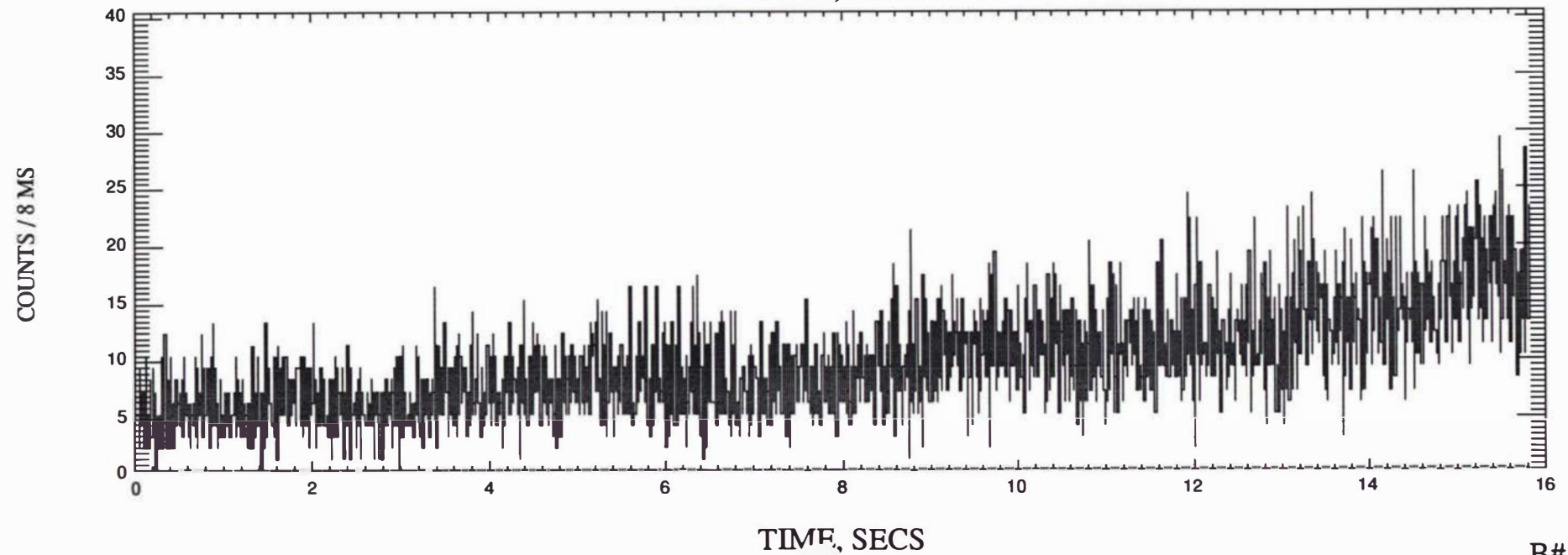
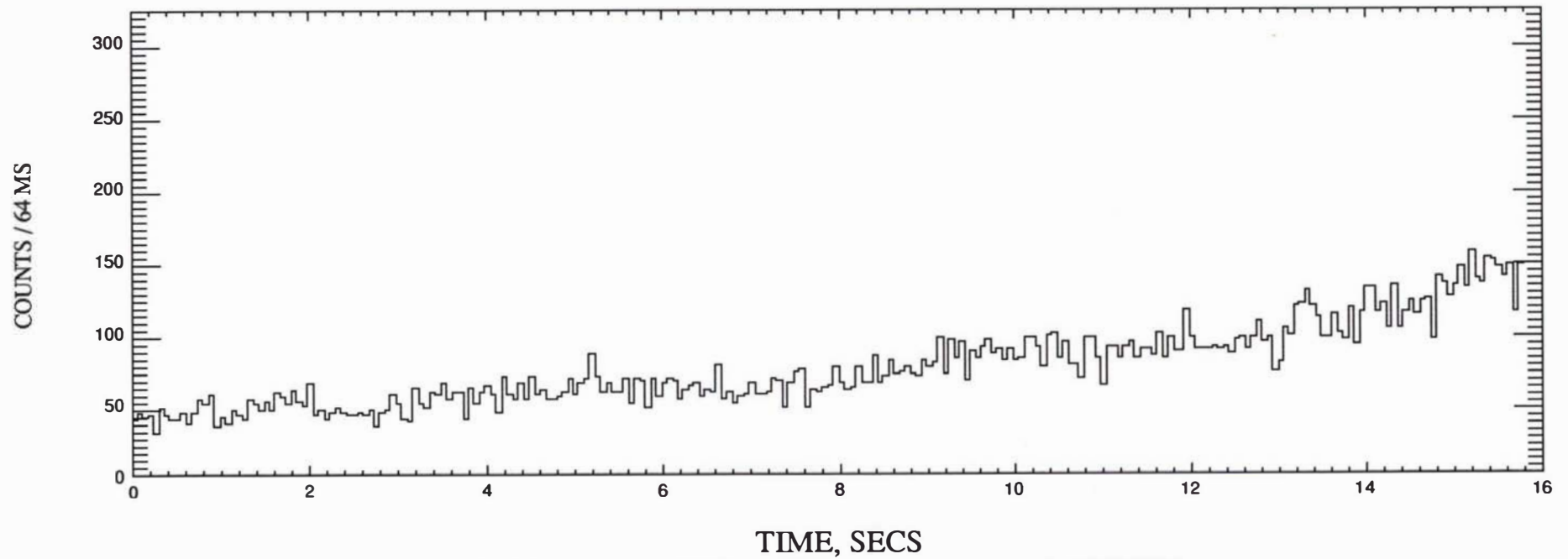
Burst Counter 7 at UT= 3.125515840318 h=11251.857 s 03:07:31.857

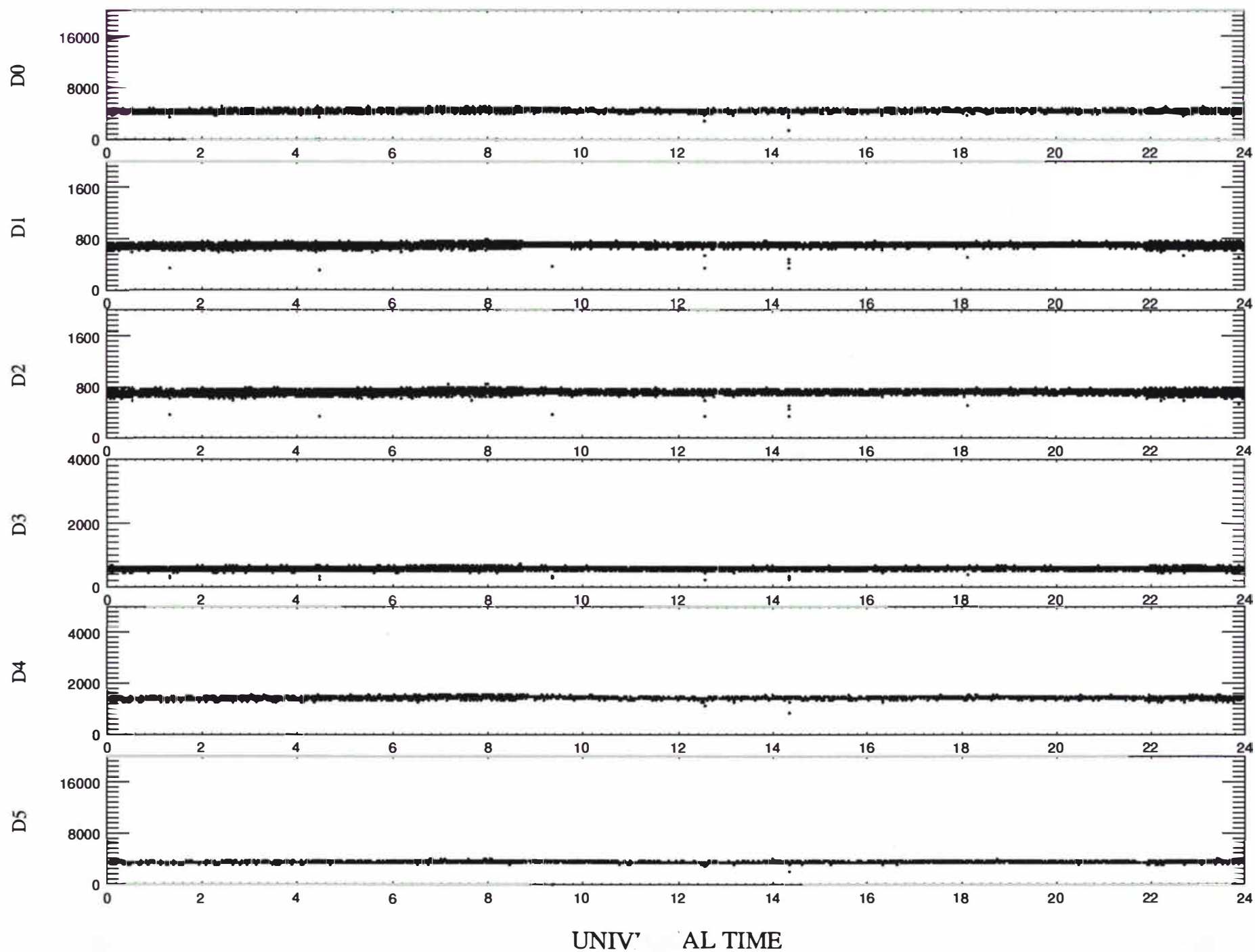


Burst Counter 8 at UT= 7.725948367649 h=27813.414 s 07:43:33.414



Burst Counter 9 at UT=15.935681105720 h=57368.452 s 15:56:08.452





PHEBUS

14/ 3/91 82573.309 s

100- 1600 keV

s

COUNTS/0.03125

150

100

50

0

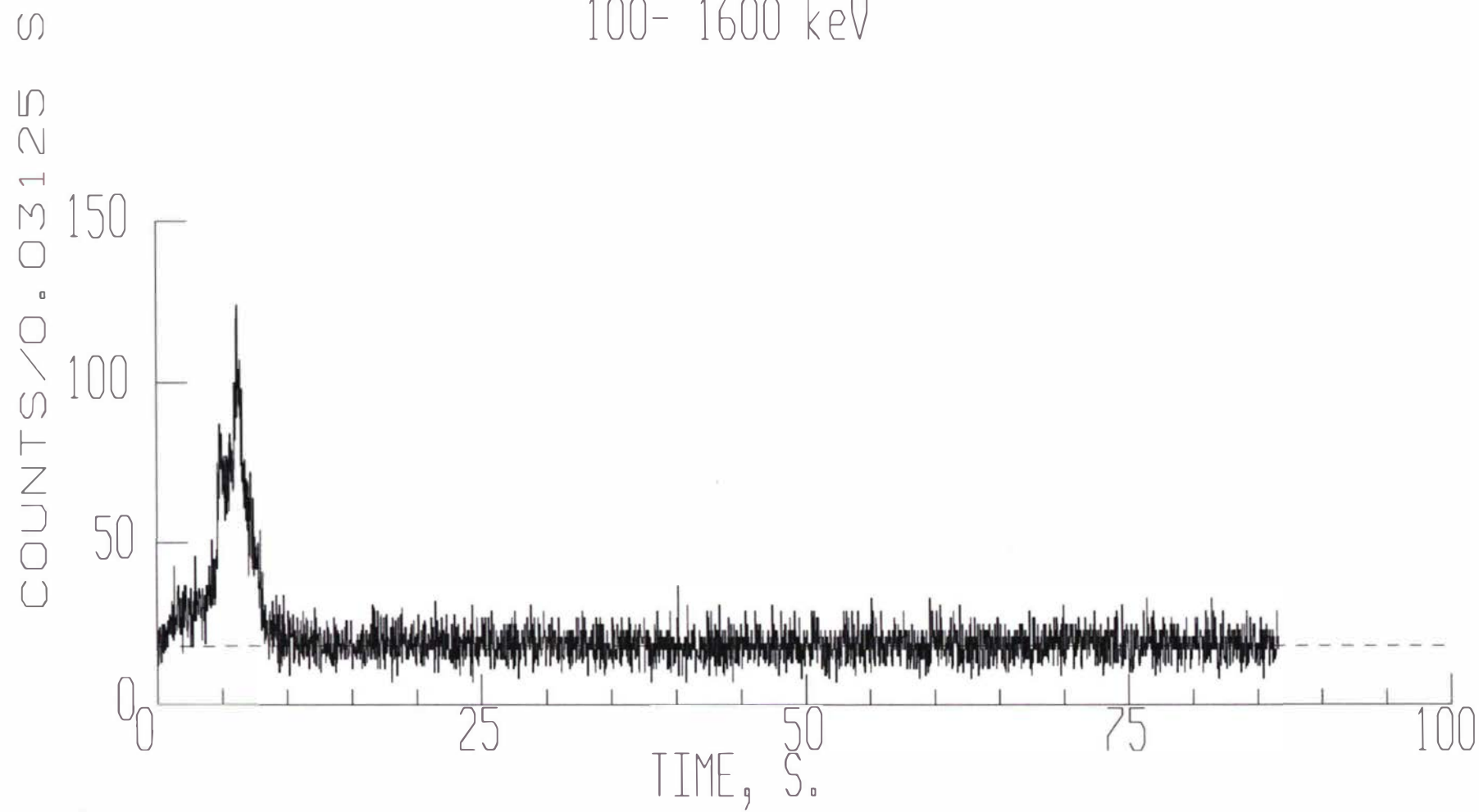
25

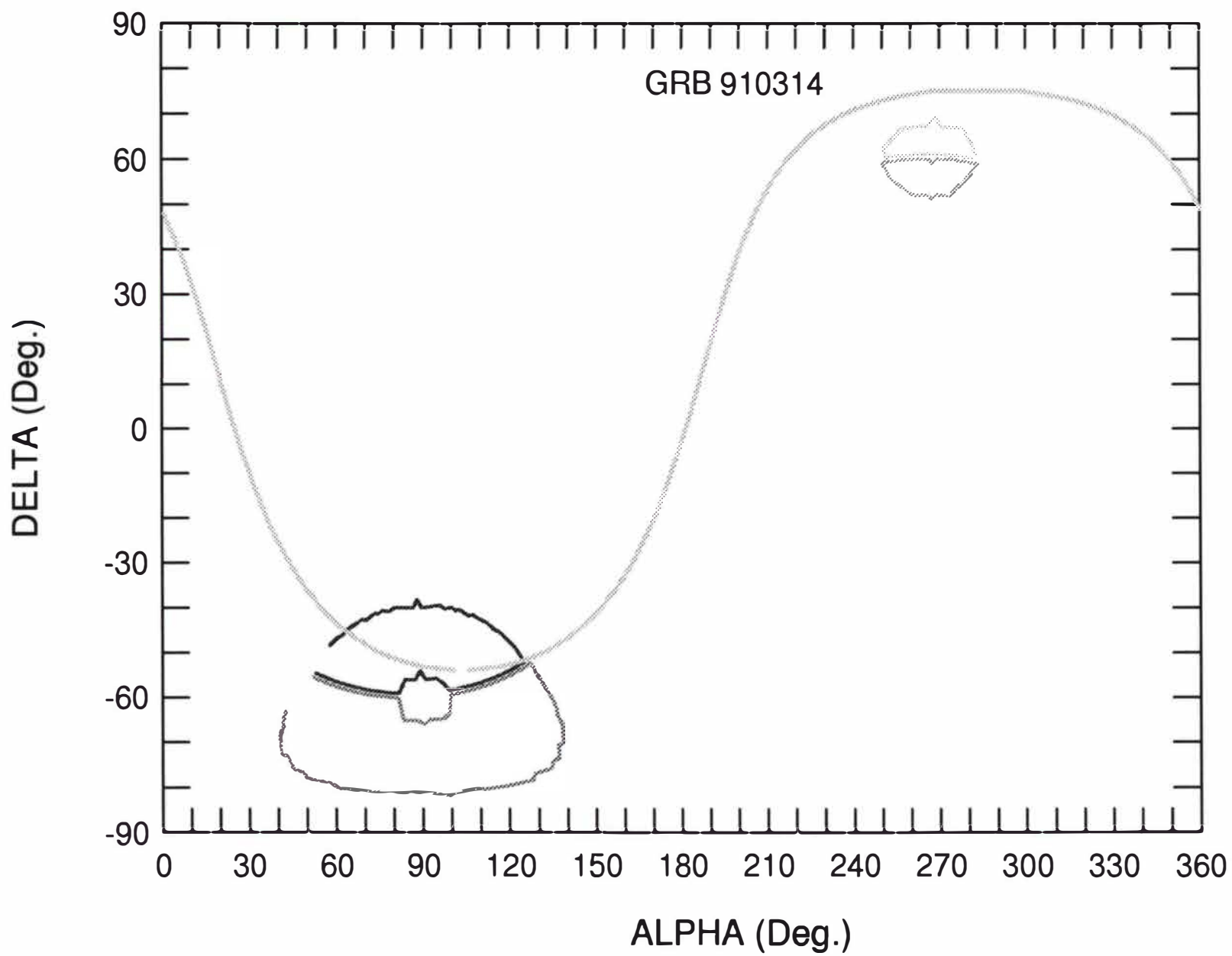
50

75

100

TIME, S.





N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

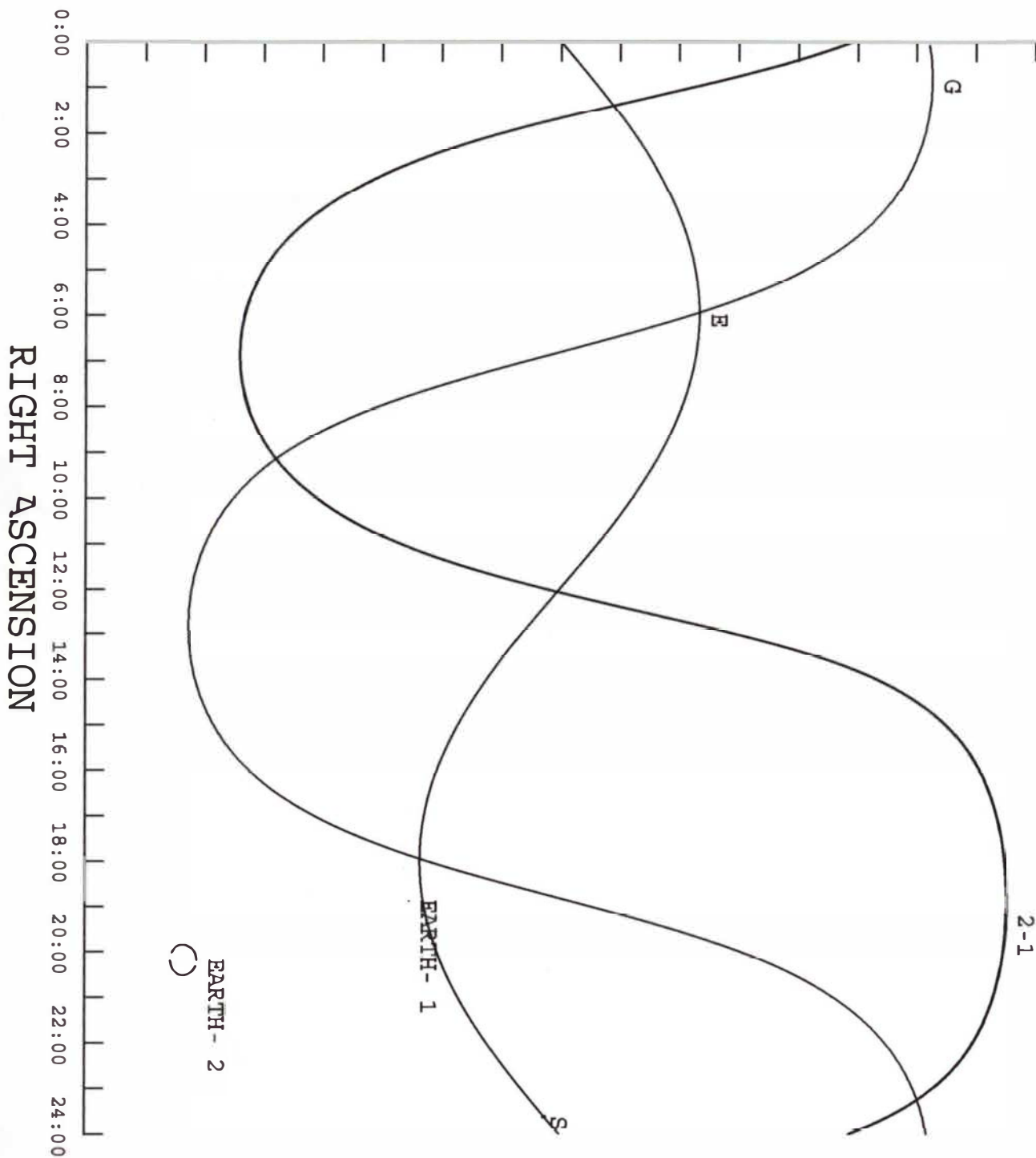
E=ECLIPTIC

G=GALACTIC EQUATOR

1 ULYSSES

2 PHEBUS

DECLINATION



EVENT OF MAR 14, 1991 22:52

13/10/97

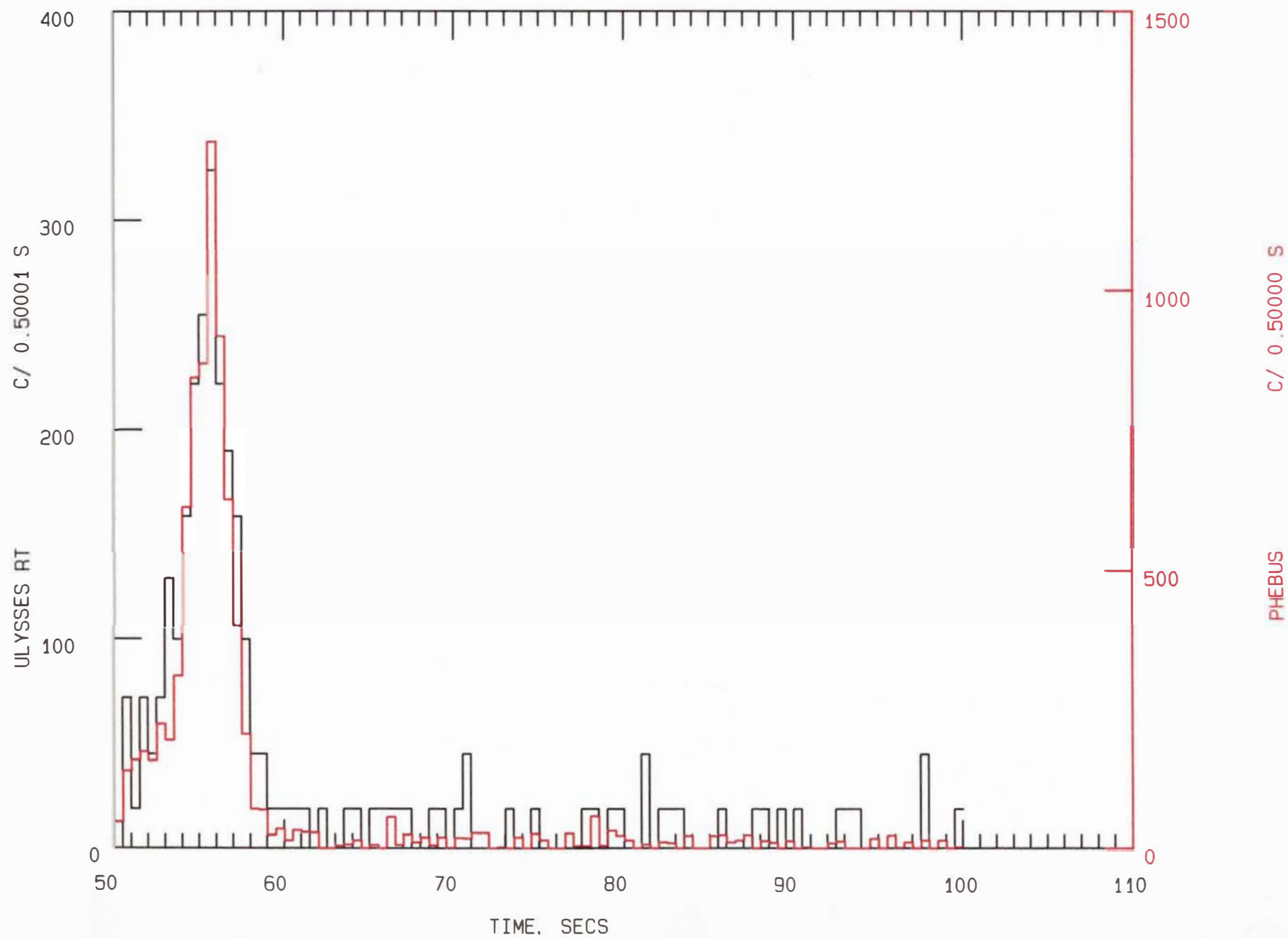
ULYSSES RT-

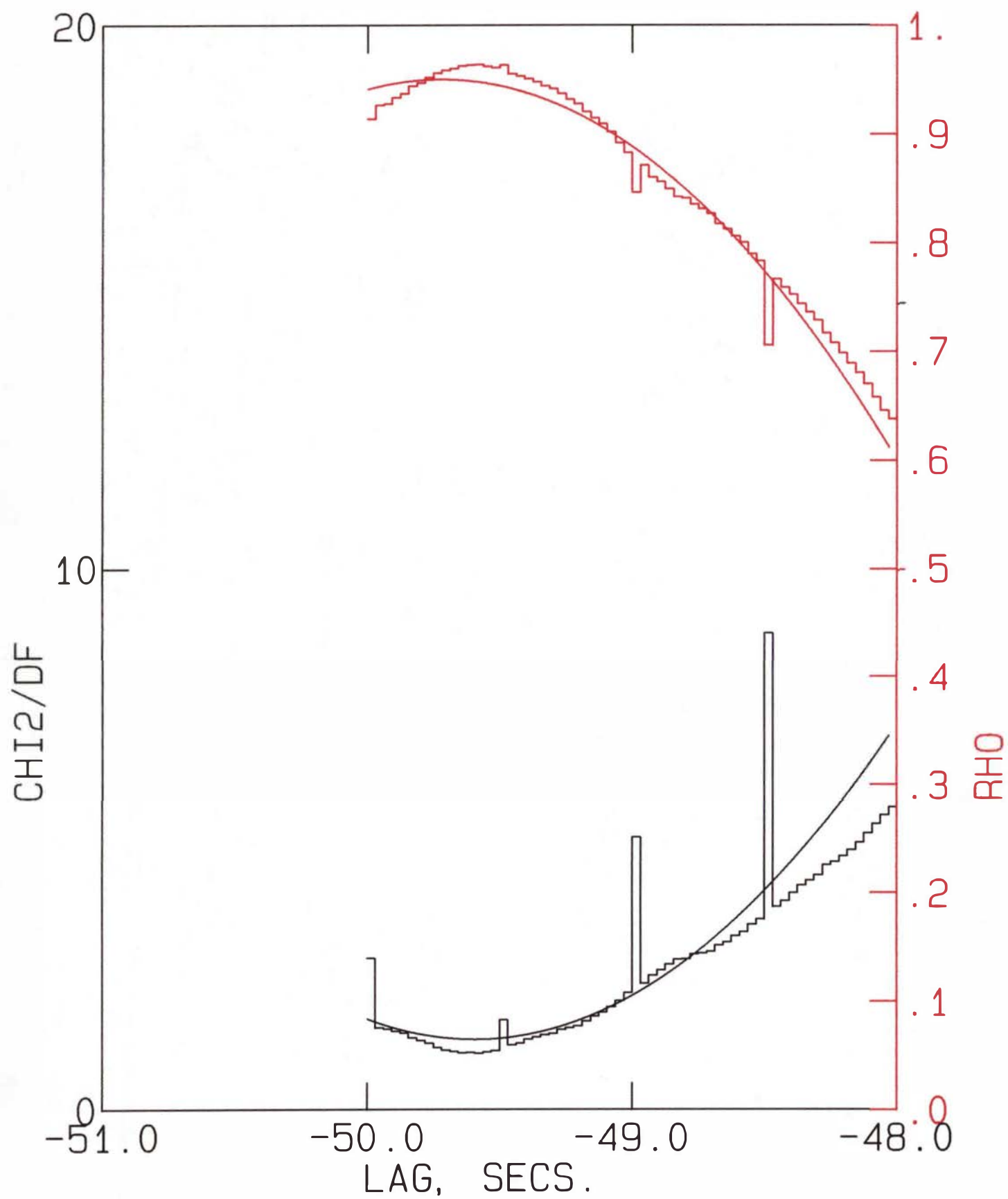
PHEBUS CORRELATION

14/ 3/91

82347.924

13/10/97





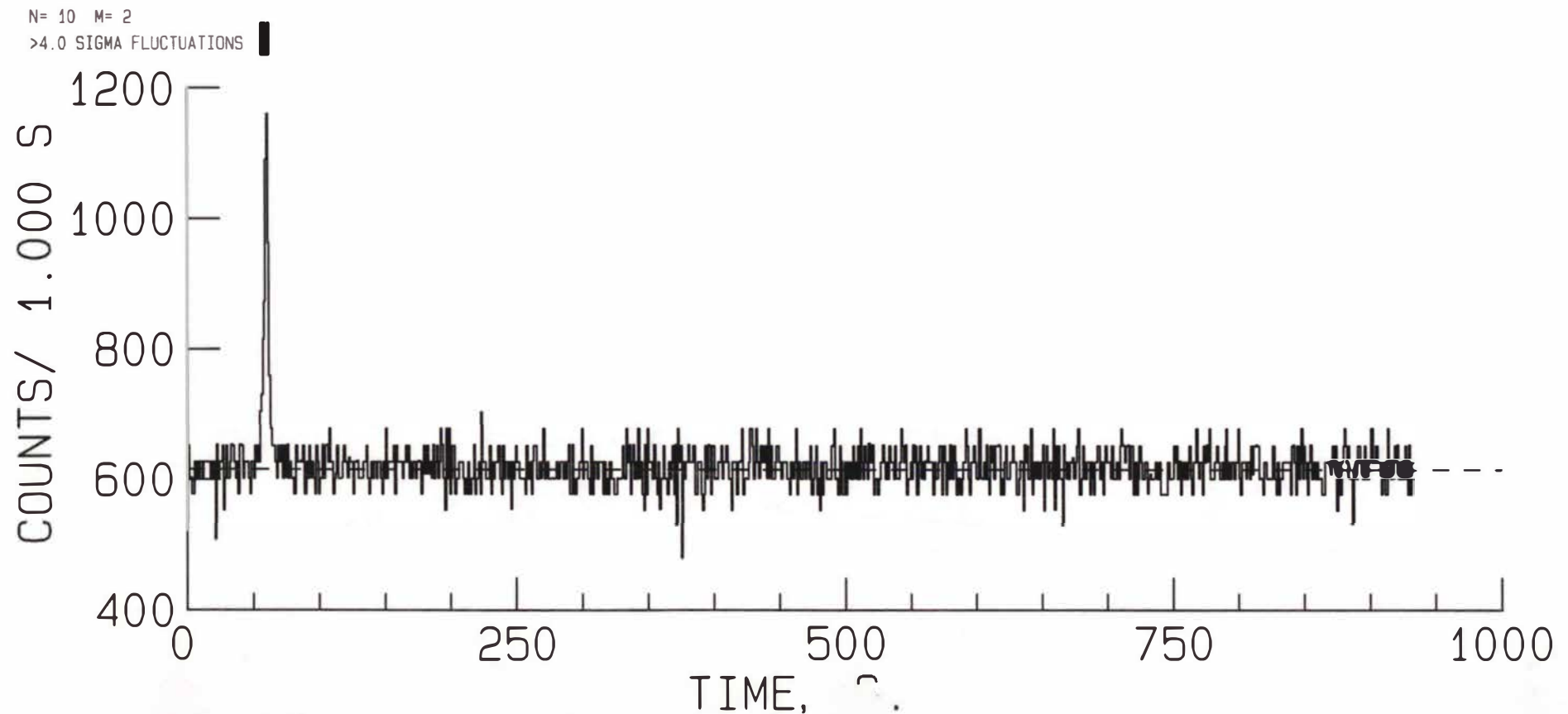
ULYSSES RT

13/10/97

14/ 3/91 82343.525 s

0.500 S INTERVALS REGROUPED BY 2

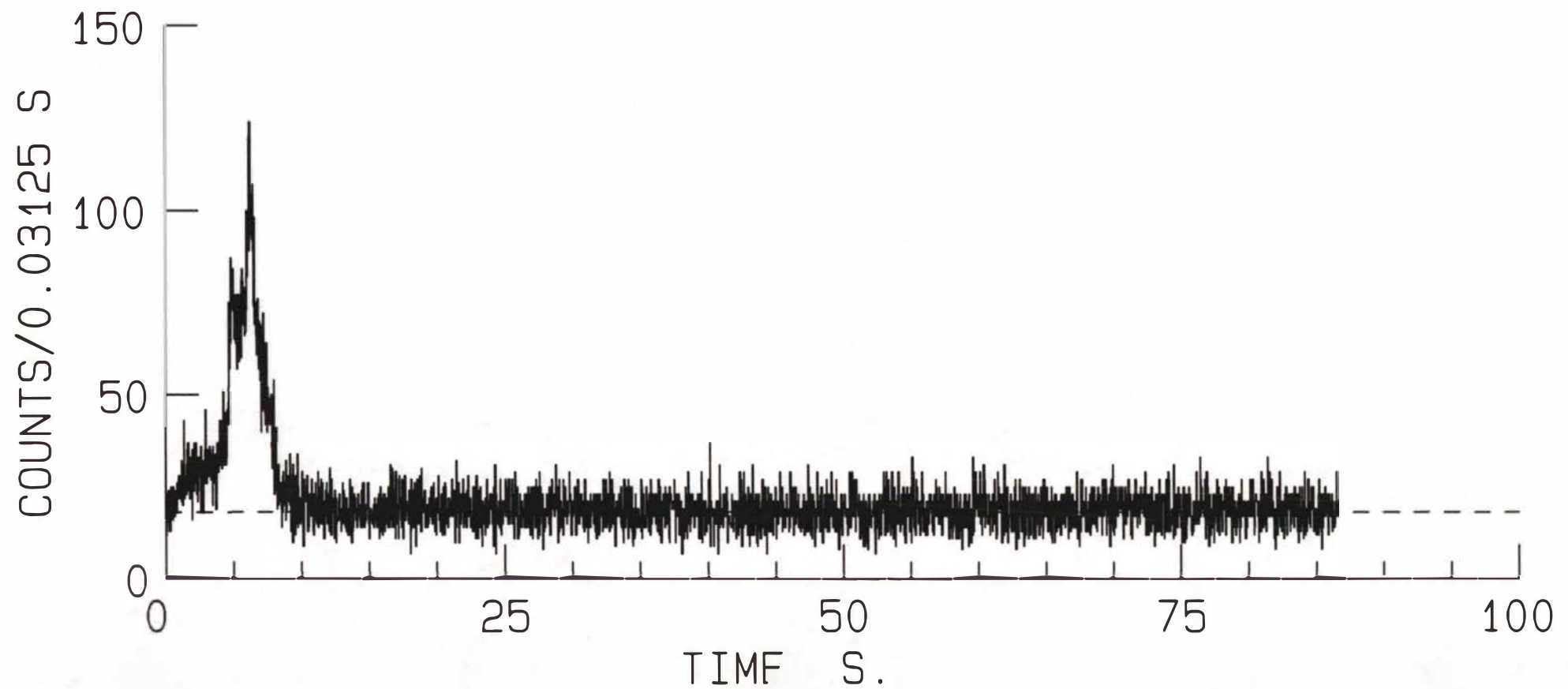
26- 183 keV



PHEBUS

14/ 3/91 82573.305 s

100- 1600 keV



From root Wed Dec 8 07:58 1993
 Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
 id AA08899; Wed, 8 Dec 93 07:57:44
 Received: from mx.nsi.nasa.gov by sunspot.ssl.berkeley.edu (4.1/1.30.1)
 id AA22497; Wed, 8 Dec 93 07:00:41 PST
 Received: Wed, 8 Dec 93 07:03:53 PST from ESSDP2.dnet by mx.nsi.nasa.gov (4.1/1.2)
 Message-Id: <9312081503.AA10272@mx.nsi.nasa.gov>
 Received: from ESSDP2.dnet by AMES.dnet with MAIL-11
 (utk-maill1d v1.7); Wed, 8 Dec 93 07:03:57 PST
 Date: Wed, 8 Dec 93 07:03:57 PST
 From: 068486@essdp2.span.nasa.gov
 X-To: AMES::"khurley@space6.ssl.berkeley.edu"
 Subject: RE:
 To: khurley@space6.ssl.berkeley.edu
 Status: R

KEVIN,
 HERE ARE THE RESULTS OF OUR SURVEY OF THE PVO REAL-TIME DATA FOR EVIDENCE OF
 RESPONSE TO EVENTS LISTED IN YOUR CATALOG.

DATE	TIME	PVO RESPONSE
90/11/11	21:49	N/O
90/11/12	14:57	N/O
90/11/16	01:42	N/O
90/11/19	18:08	N/O
90/11/21	00:04	N/O
90/11/21	18:09	N/O
90/12/02	13:45	N/O
90/12/21	00:30	N/O
90/12/25	05:50	N/O
91/01/17	00:57	N/O
91/01/24	11:50	N/O
91/02/04	08:58	N/O
91/02/04	14:19	N/O
91/02/04	14:58	N/O
91/02/17	02:59	N/O
91/03/14	22:56	N/O
91/03/15	22:55	N/O
91/04/04	17:17	(NO)
91/05/18	17:10	N/O
91/05/23	19:03	N/O
91/05/27	23:44	N/O
91/05/28	21:26	N/O
91/06/02	22:55	N/O
91/06/09	00:48	N/O
91/06/29	19:55	N/O
91/07/09	20:22	N/O
91/07/17	13:07	N/O
91/08/03	08:24	N/O
91/08/15	12:34	N/O
91/08/15	14:24	N/O
91/08/16	01:57	(NO)
91/09/05	23:48	N/O
91/09/16	21:58	N/O
91/09/25	03:35	N/O
91/09/26	18:25	N/O
91/09/30	11:55	N/O
91/10/03	00:39	N/O
91/10/04	01:27	N/O
91/10/06	09:01	(NO)
91/10/22	04:13	N/O
91/10/25	21:25	N/O
91/11/06	03:42	N/O
91/11/14	01:40	N/O
91/11/17	01:58	N/O
91/12/05	23:04	N/O

91/12/21	06:17	N/O	
91/12/21	22:03	N/O	
91/12/27	15:56	N/O	
92/01/05	17:41	N/O	
92/01/13	20:52	N/O	
92/01/25	08:57	N/O	
92/01/30	00:29	N/O	
92/01/30	22:50	N/O	
92/02/18	18:42	N/O	
92/02/21	06:14	N/O	
92/02/26	18:15	YES	TRIGGER AT 29336 S UT
92/02/27	06:00	N/O	
92/02/27	08:45	N/O	
92/03/02	06:16	N/O	
92/03/04	14:34	N/O	
92/03/07	00:18	N/O	
92/03/21	12:50	(NO)	
92/03/26	02:01	N/O	
92/03/27	09:38	N/O	
92/03/29	16:38	(NO)	
92/04/04	22:37	N/O	
92/04/08	12:05	N/O	
92/04/20	02:12	N/O	
92/04/29	18:59	N/O	
92/05/02	19:05	N/O	
92/06/01	THRU 92/06/29	TURNED OFF--	N/O
92/07/01	19:39	N/O	
92/07/07	06:33	N/O	
92/07/17	01:15	N/O	
92/07/23	00:59	N/O	
92/07/23	01:00	N/O	
92/07/23	21:48	N/O	
92/07/25	19:30	N/O	
92/07/25	22:49	N/O	
92/07/26	00:34	N/O	
92/07/31	17:07	N/O	
92/08/10	21:35	N/O	
92/08/14	06:10	N/O	
92/08/16	12:36	N/O	
92/08/22	22:39	N/O	
92/08/30	01:45	N/O	
92/09/04	04:41	N/O	

THIS LIST IS NOT COMPLETE. IT INCLUDES EVENTS FOR WHICH NO REAL-TIME DATA ARE AVAILABLE BECAUSE OF INAPPROPRIATE MODE, NO TRACKING, OR THE EXPERIMENT WAS TURNED OFF. WHERE DATA HAVE BEEN CHECKED, SENSITIVITY DEPENDS UPON THE TIME RESOLUTION AVAILABLE IN THE DATA. I'LL BE SENDING ADDITIONAL RESULTS AS THEY BECOME AVAILABLE.

REGARDS,

RAY

Table 1 GRBs List

Event ID	Time(U.T.) (hr:mn)	Peak Counts Cp (cnts/4sec)	Bit
901009	00:15:52		Hi
901021	00:09:07		Hi
901103	05:52:56		Hi
901112	19:20:38		Lo Uly
901219	21:52:50		Hi Uly
910122	15:14:08		Hi Uly
910130	11:56:08		Hi
910204	08:58:47		Hi Uly
910206	08:45:29		Med Uly
910312	12:43:34		Hi Uly
910314	22:56:12		Lo Uly
910315	22:55:48		Lo Uly
910322	12:41:48		Med
910402	14:28:13		Med Uly
910429	03:11:50		Med GRO
910522	12:14:08		Hi Uly
910527	23:45:36		Hi
910709	20:22:38		Med
910717	04:33:05		Hi GRO
910723	14:06:16		Lo
910725	13:12:06		Med GRO
910803	08:33:28		Med GRO
910814	19:14:34		Lo GRO
910815	12:34:32		Med
910821	10:33:39		Hi
910827	13:11:18		Hi
910905	23:48:55		Med GRO
910907	01:04:56		Lo GRO?
910926	18:25:56		Lo GRO
911008	17:56:04		Lo
911016	11:01:30		Lo GRO
911029	04:50:52		Lo
accuracy			Hi <+-0.1s
			Med +-0.5s
			Lo +-2.0s

Murakami's
 Preliminary list
 SOLAR
 Requested Ulysses data Request PRO data Request N/O
 Got Ganga data
 Requested U. RT data
 Got Ganga data
 SOLAR
 Requested RT
 Requested RT data
 Uly RT
 RT requested
 RT requested
 Uly
 RT requested
 RT requested
 RT requested
 RT
 RT requested
 No data
 Requested RT
 Requested RT
 Requested RT
 Requested RT
 Requested RT
 Requested RT

BATSEARCH PROGRAM

Hudec Transient

BATSE BURST #

EVENT OF 1991 MAR 14 DAY OF YEAR= 73

EVENT CROSSING TIME AT BATSE : 66840. S. OR 18:34:00.0

COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)

BURST ARRIVAL DIRECTION: 163.000 35.000

BATSE PEAK COUNTING RATE: 0 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND

POSITION OF ULYSSES ON 14/ 3/ 91 IS:

RA= 102.158 DEC= 25.343 DIST= 1.869 AU

BATSE-ULYSSES DISTANCE = 279669720. KM.

ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH ORB ARRIVAL DIRECTION=127.32 DEG.

LIGHT TRAVEL TIME ALONG PROJECTED PATH= -565.52 SECS.

CROSSING TIME AT ULYSSES IS 66274. S. OR 18:24:34 +/- 170.22 SECONDS

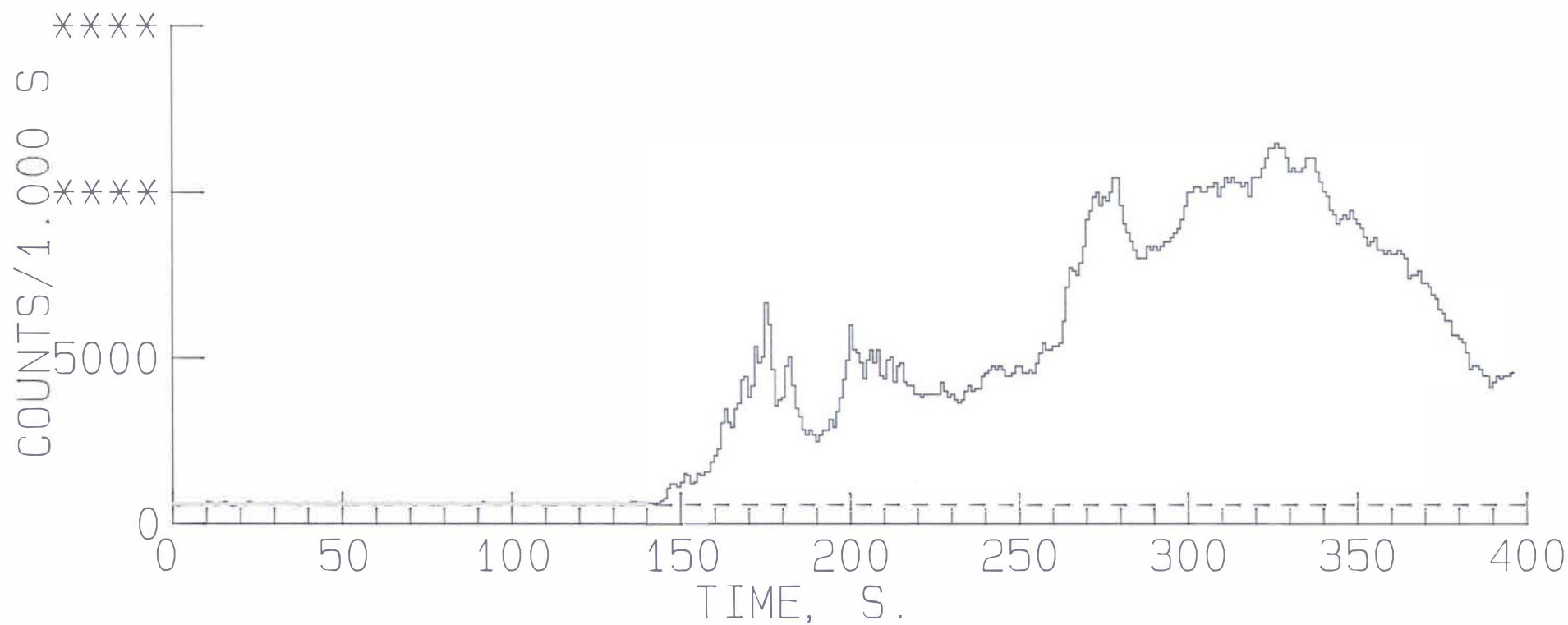
13 / 4 / 92

ULYSSES RT

14 / 3 / 91 66060.227 s

0 - 0 keV

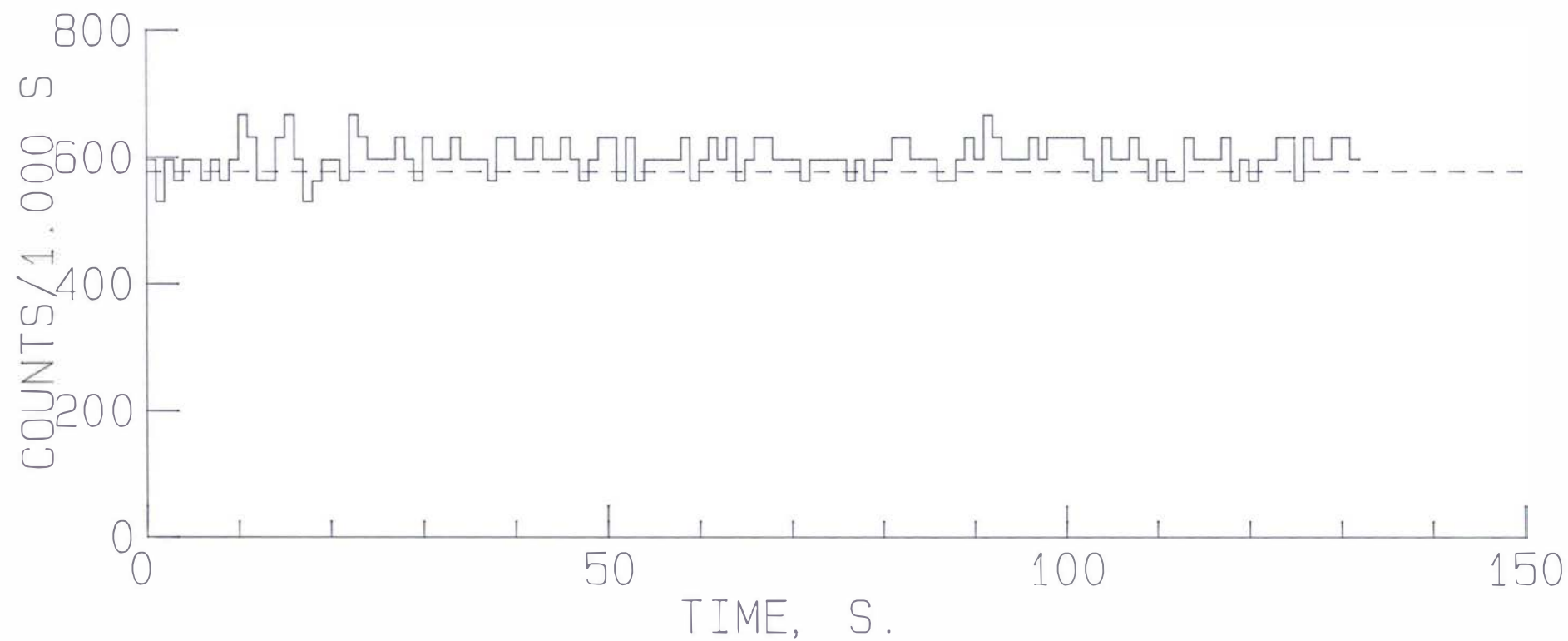
N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



13 / 4 / 92

ULYSSES RT
14 / 3 / 91 66060.227 s
0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



solar 19910314 66240

ULYSSES RT

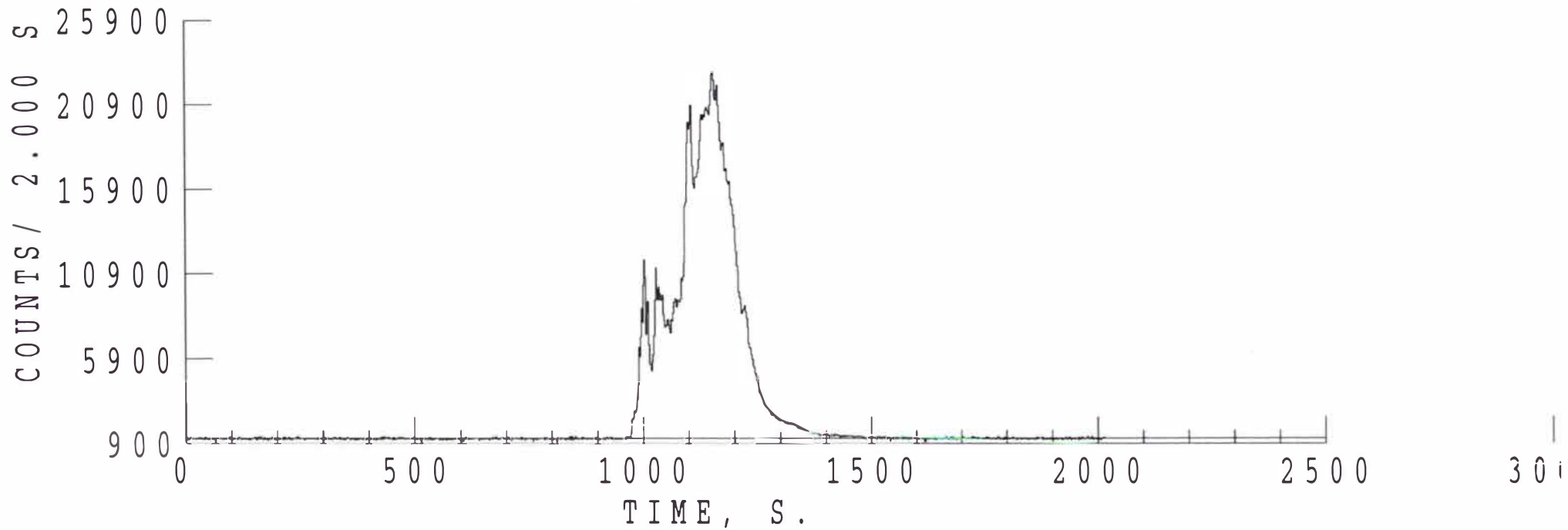
15/02/07

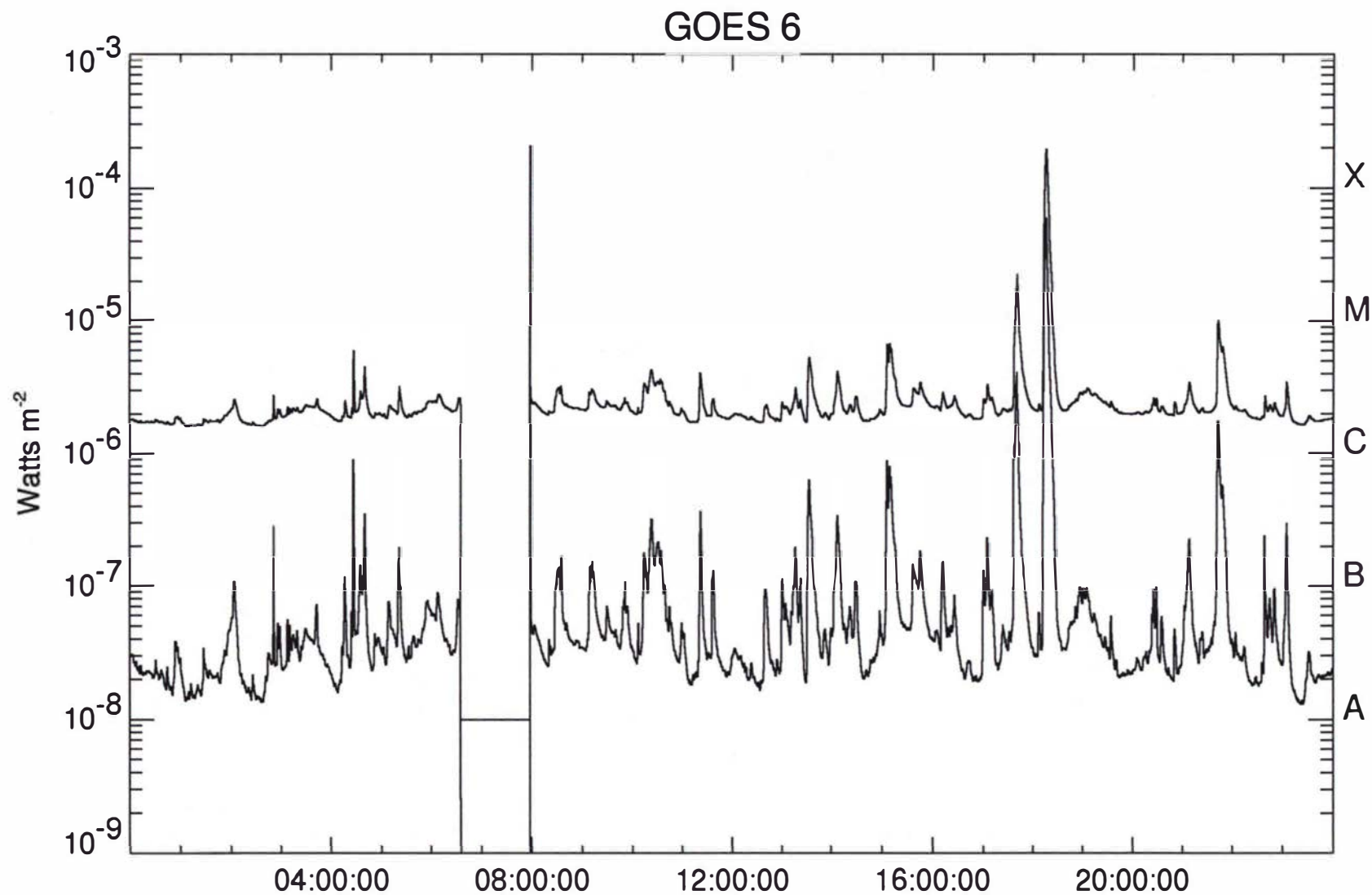
14/03/91 65232.203 s

1.000 S INTERVALS REGROUPED BY 2

0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS





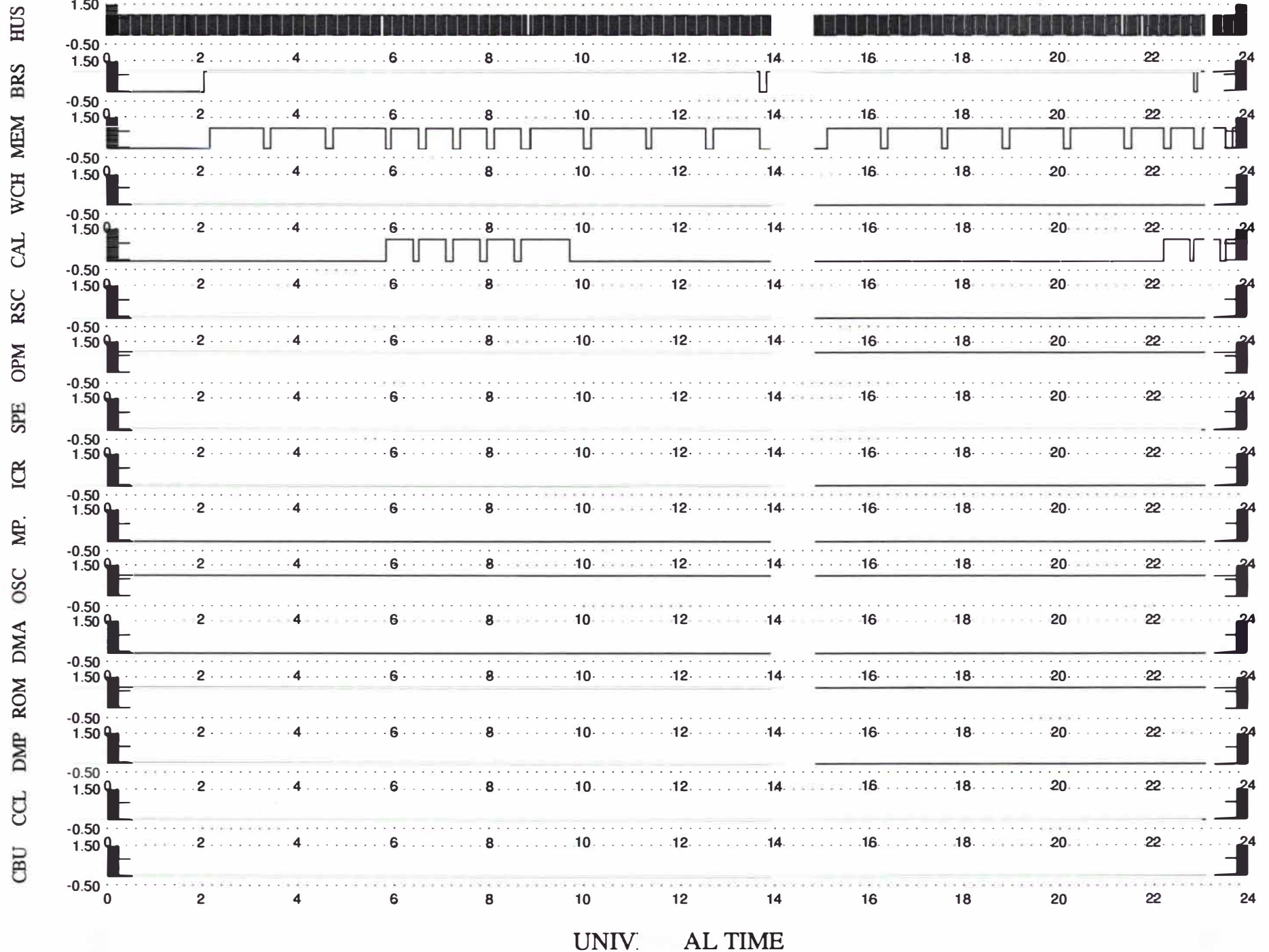
Data Start: 91/03/14, 0000:00

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

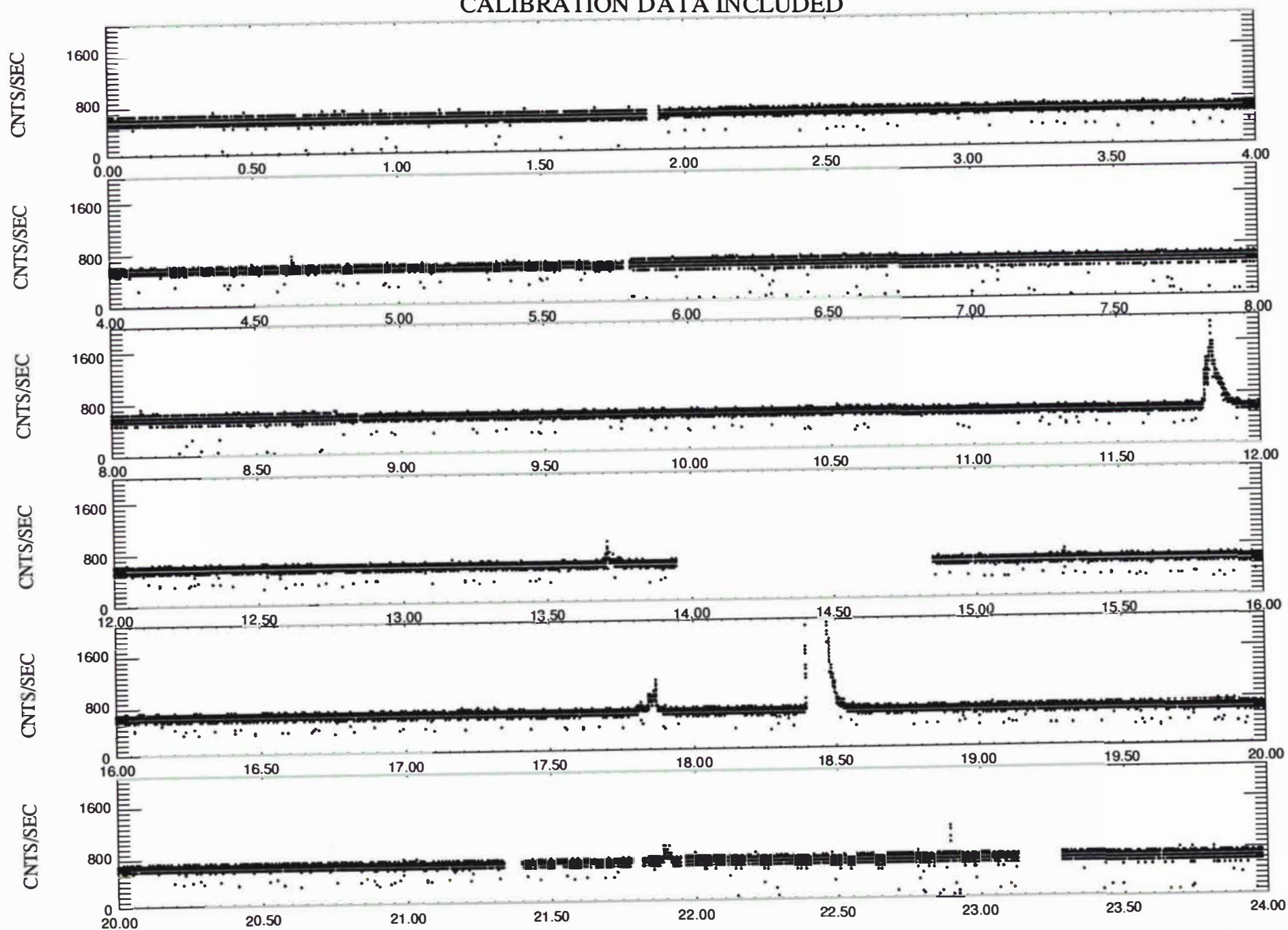
Plot created: 96/11/26, 1837

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 10 - 15, 0 - 14

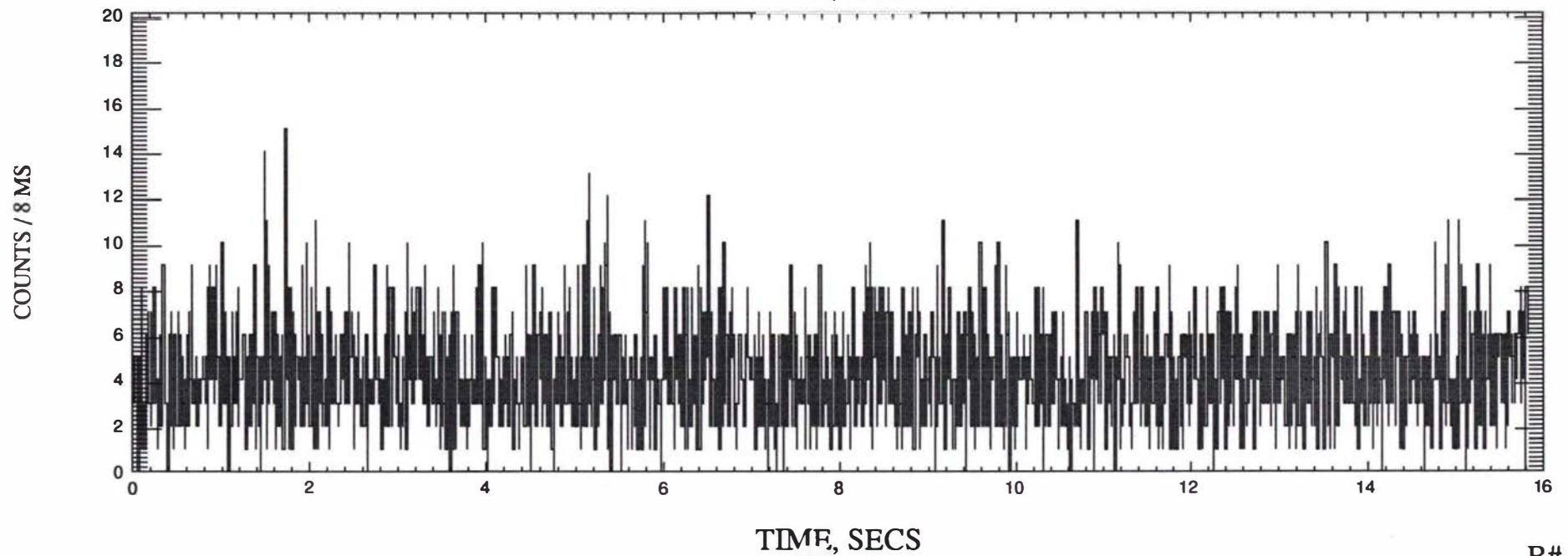
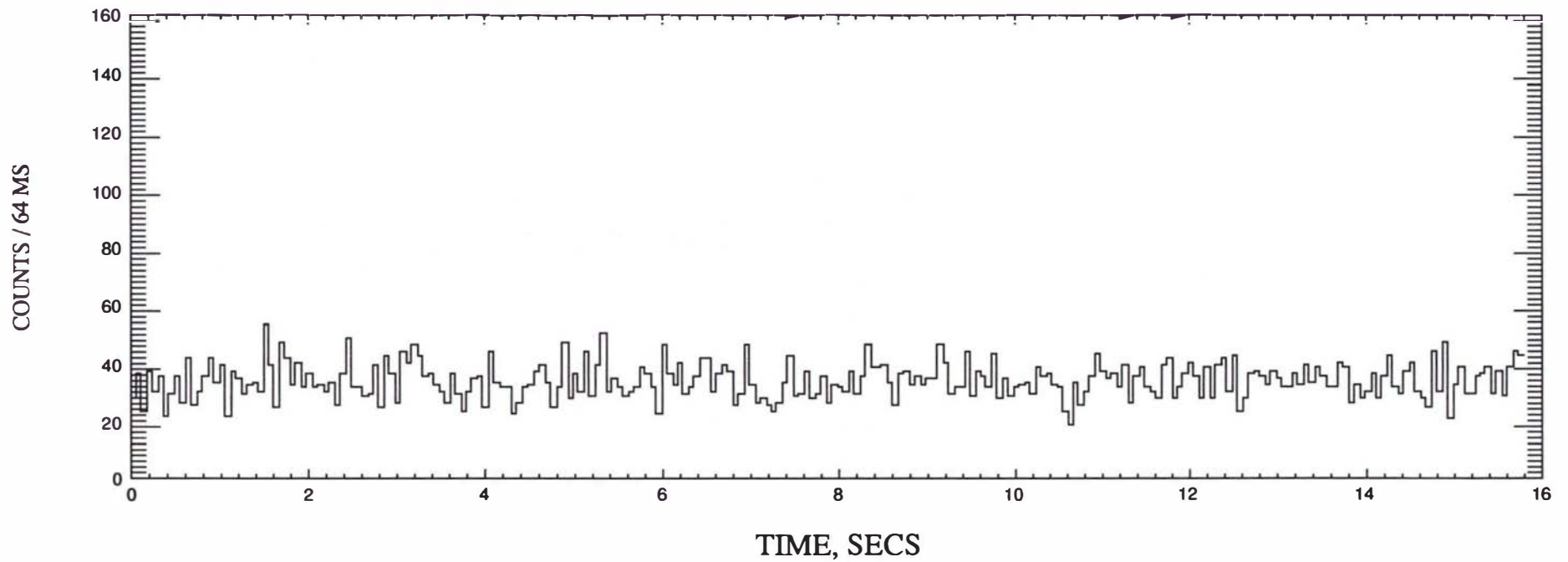


CALIBRATION DATA INCLUDED

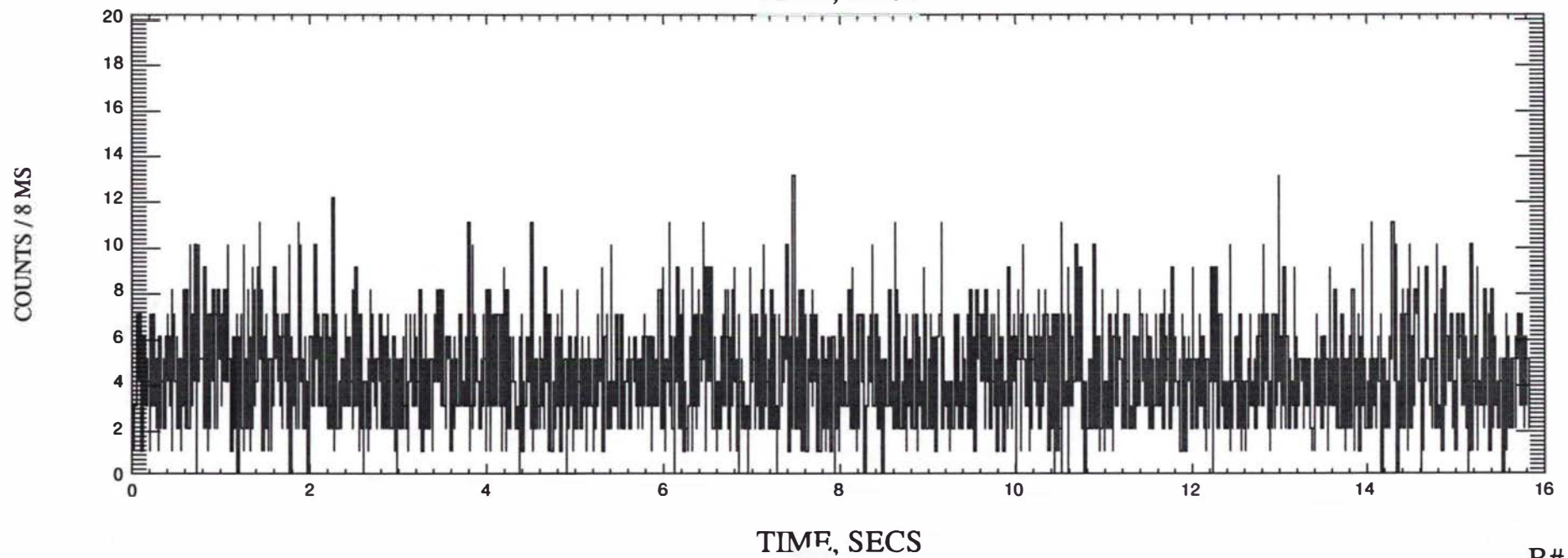
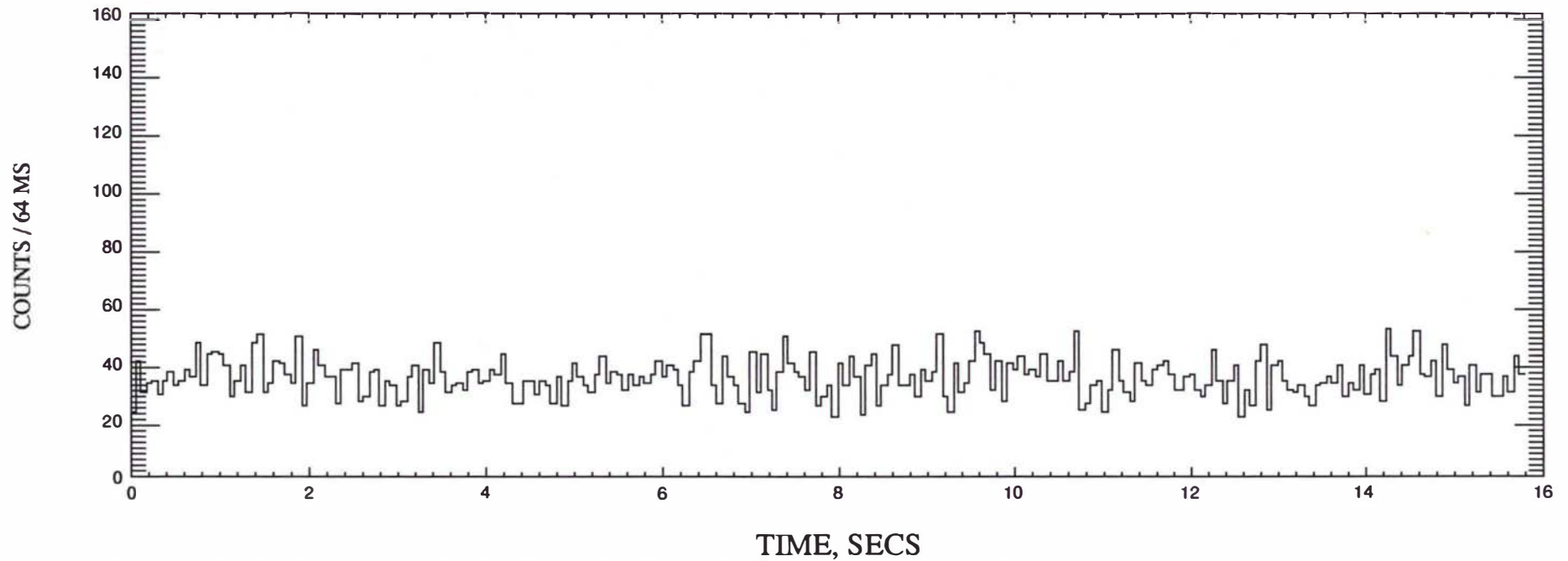


UNIV. TIME

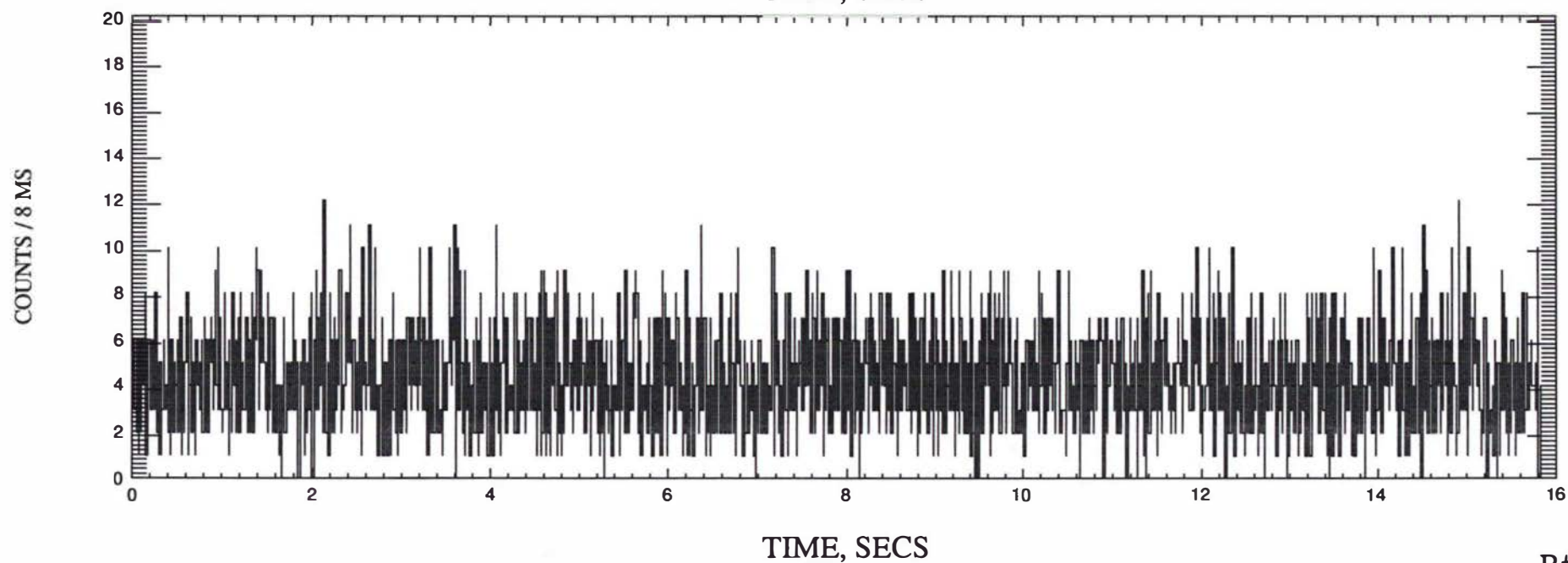
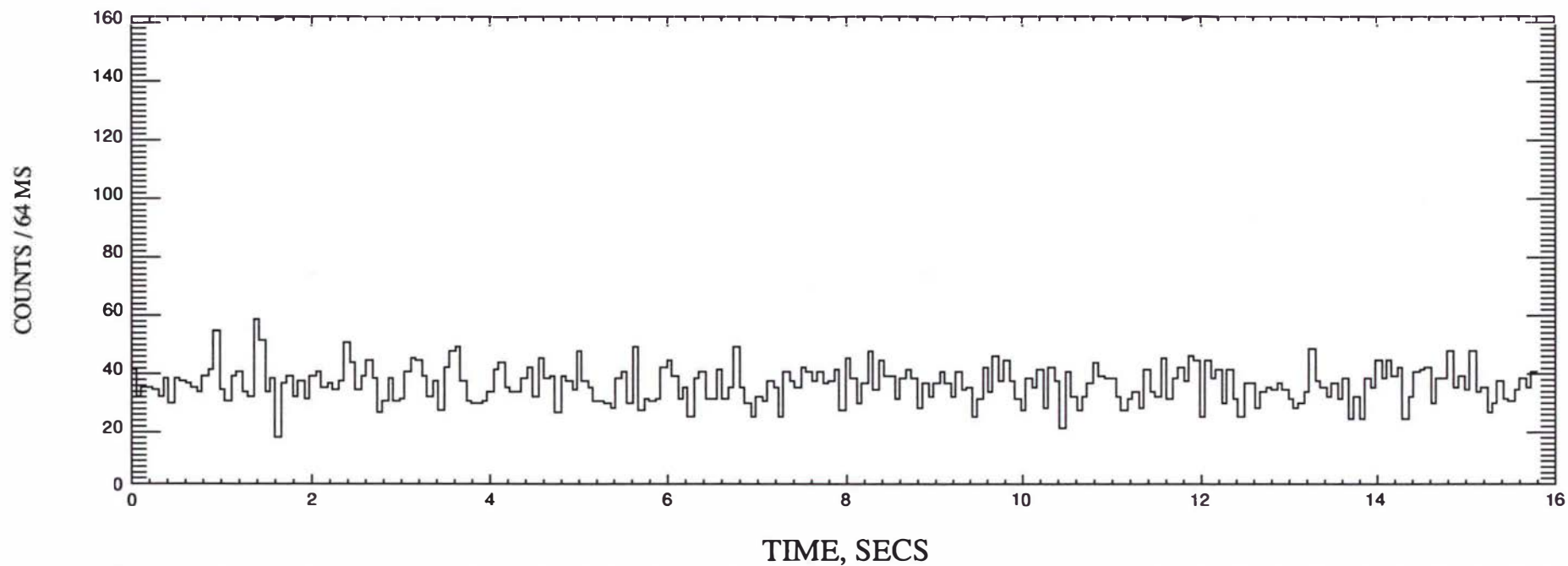
Burst Counter 10 at UT= 1.967257906596 h= 7082.128 s 01:58:02.128



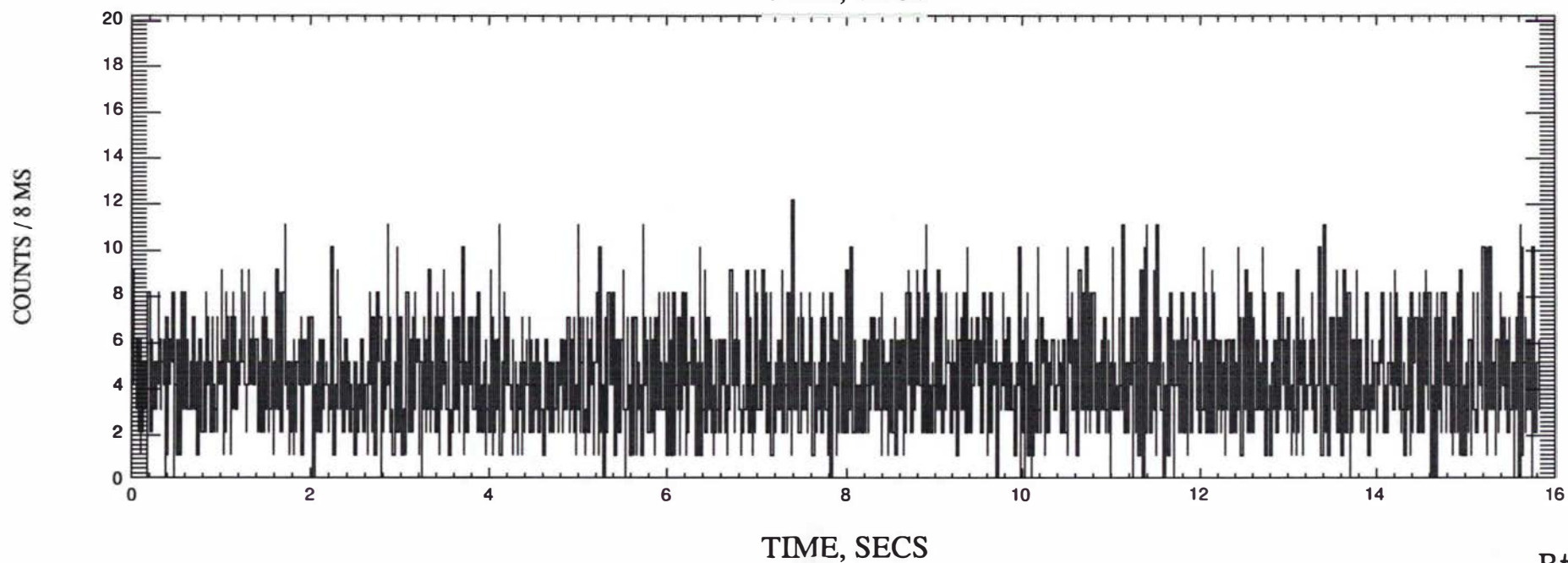
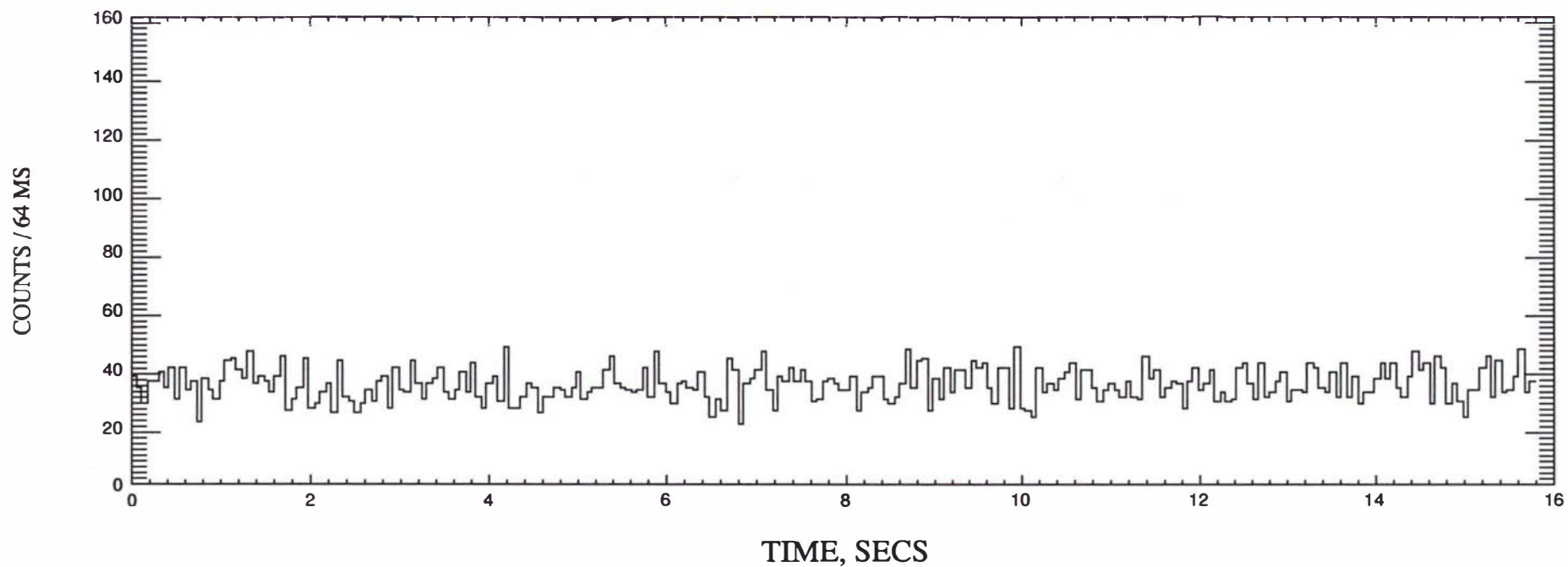
Burst Counter 11 at UT= 3.246169064840 h=11686.209 s 03:14:46.209



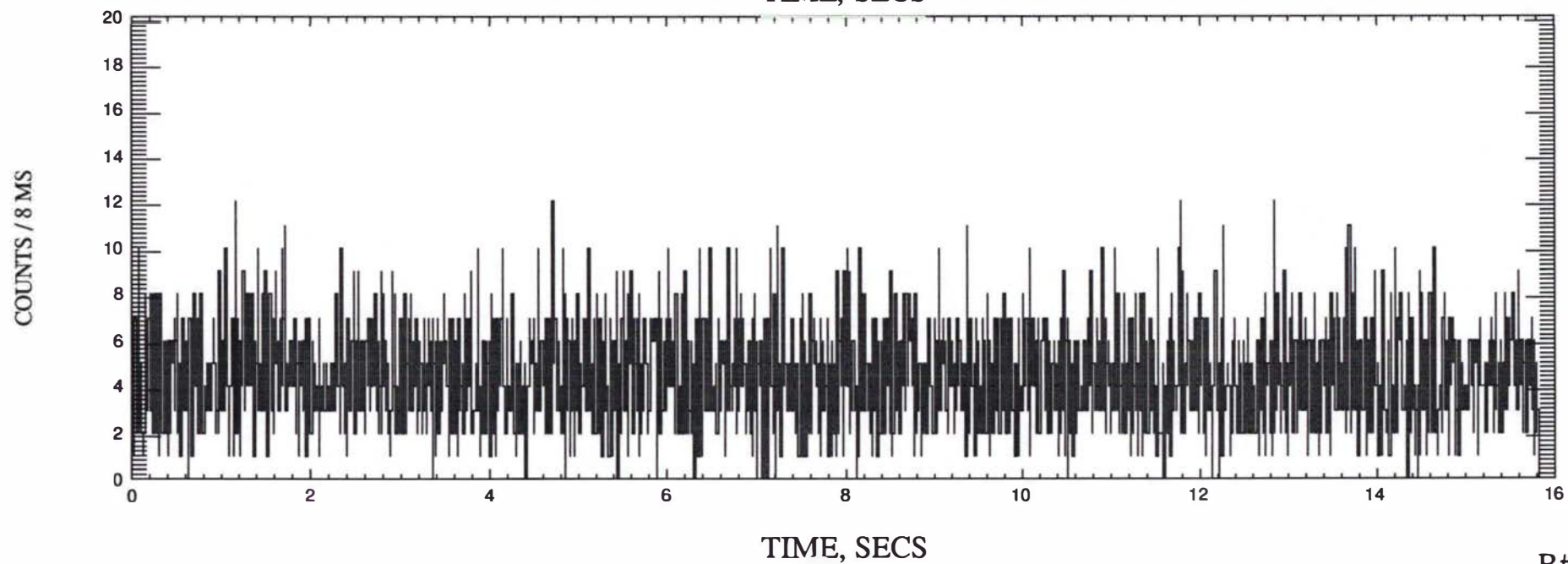
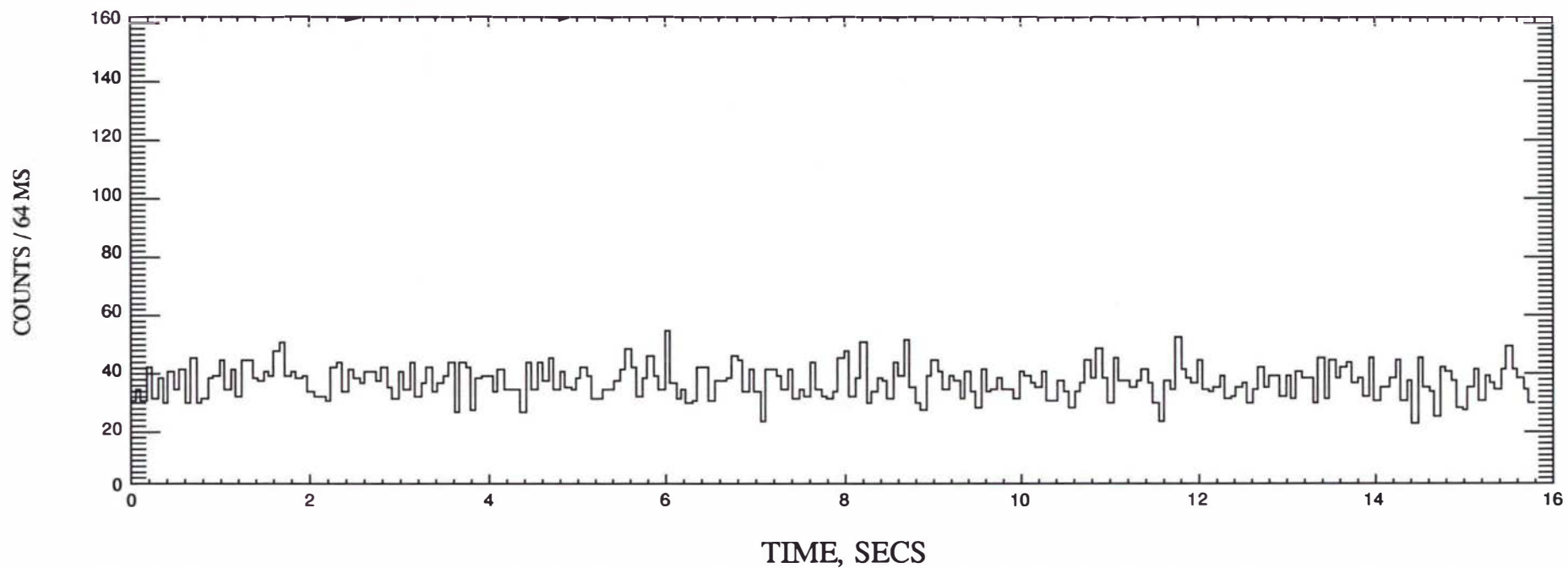
Burst Counter 12 at UT= 4.539248241848 h=16341.294 s 04:32:21.294



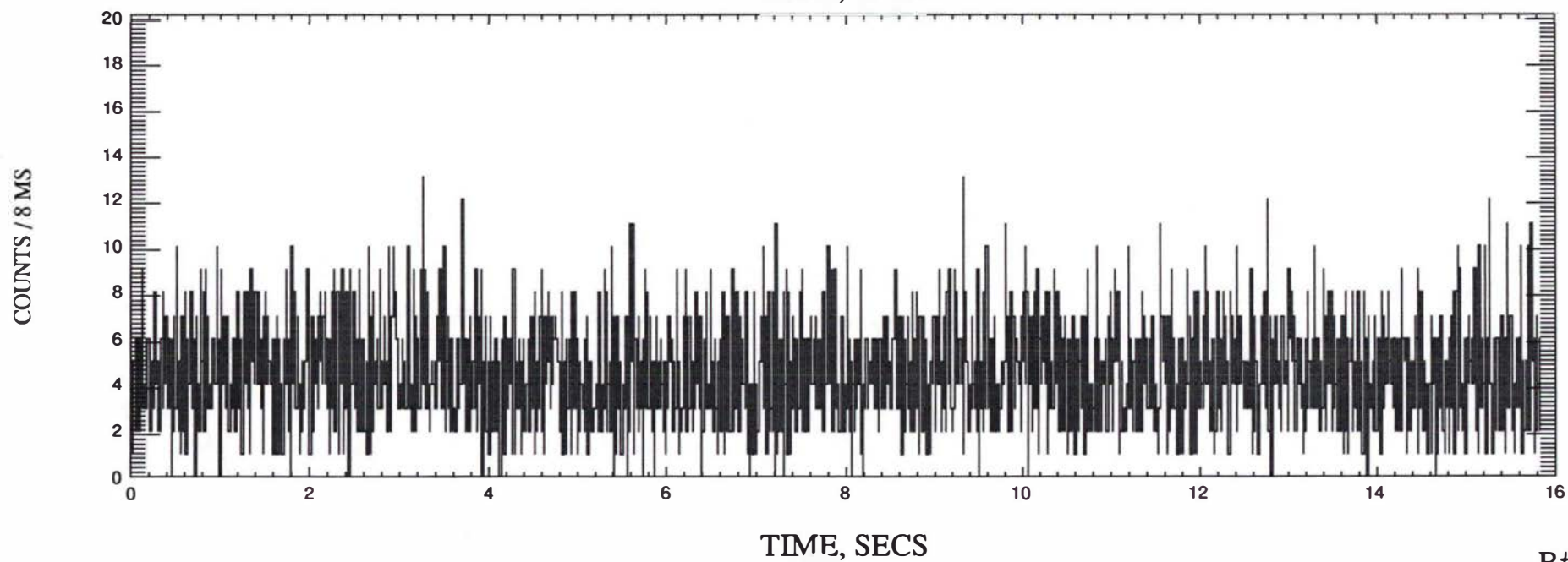
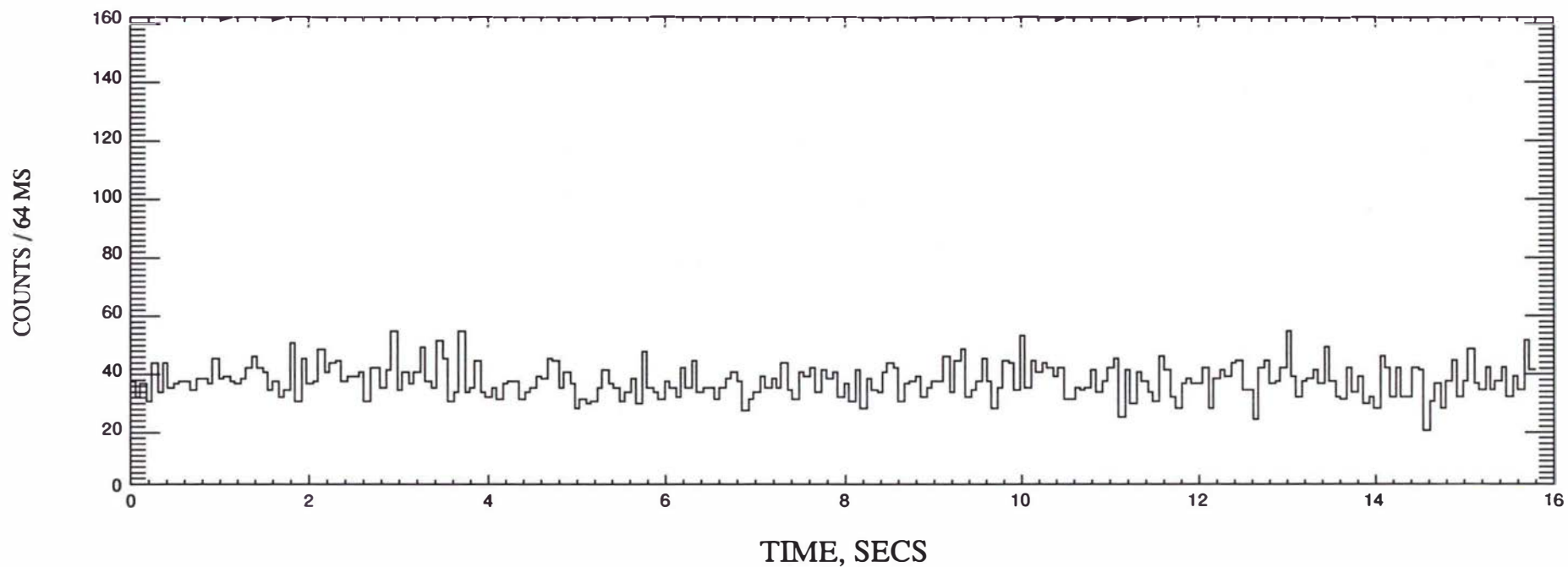
Burst Counter 13 at UT= 5.819549365573 h=20950.378 s 05:49:10.378



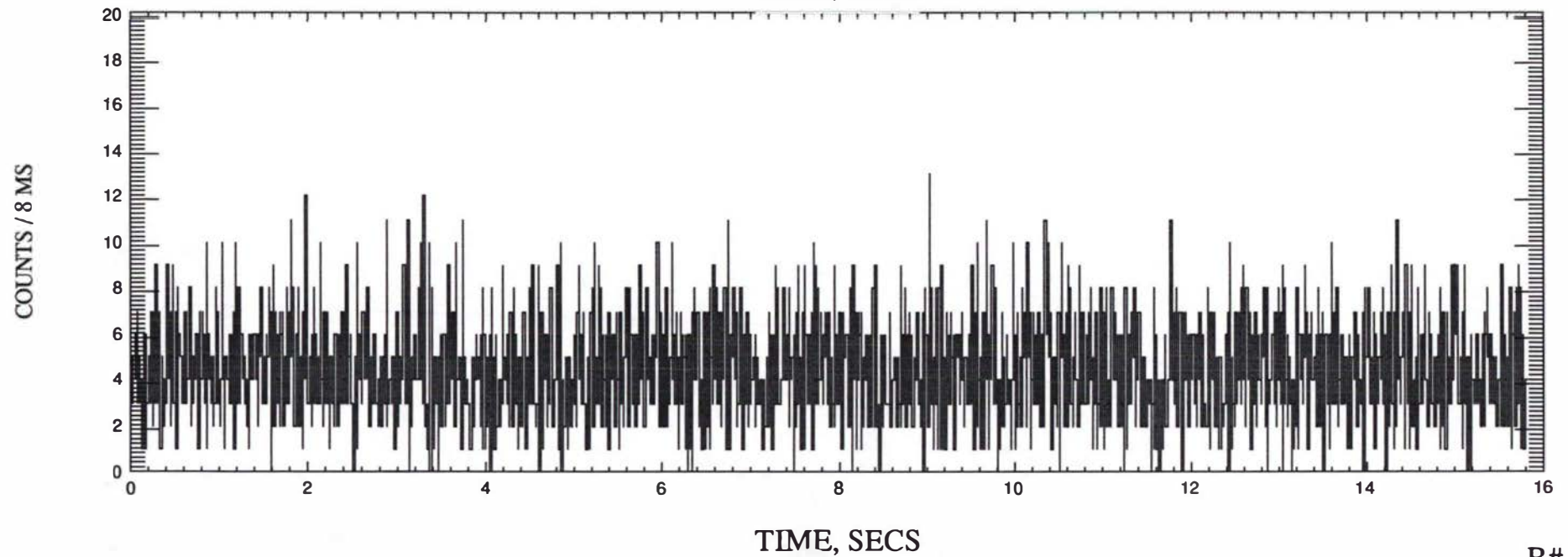
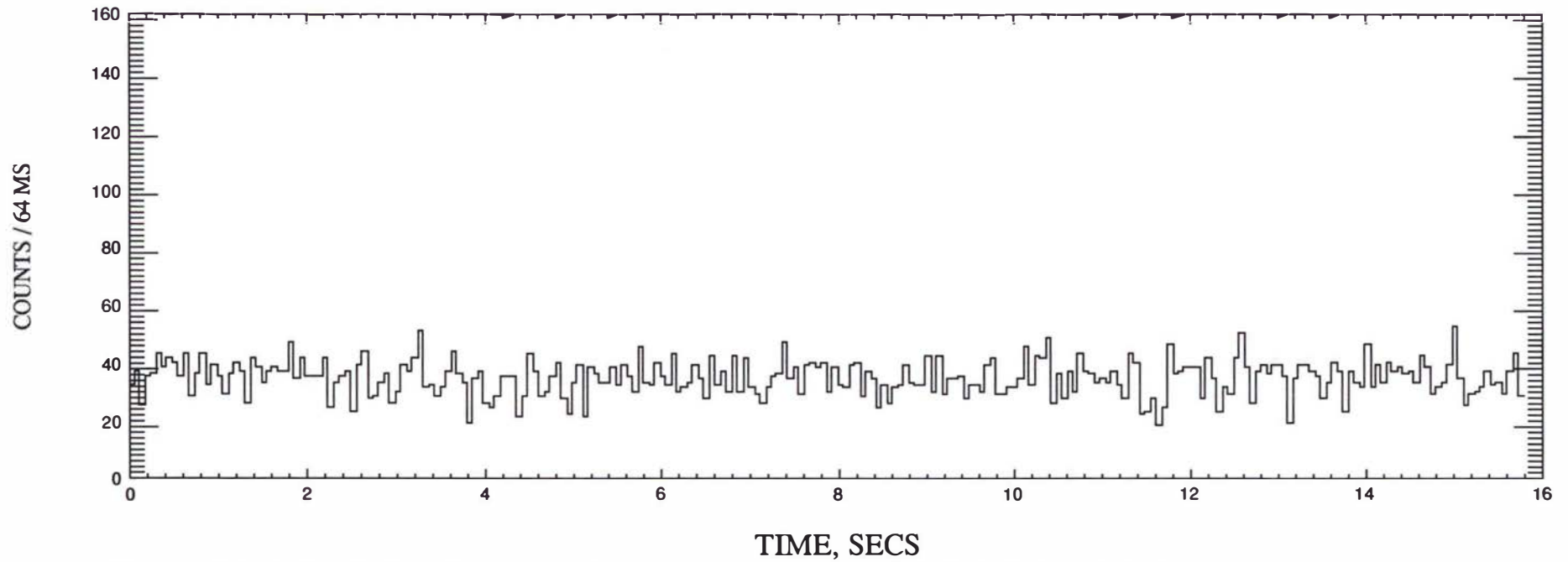
Burst Counter 14 at UT= 6.533157501221 h=23519.367 s 06:31:59.367



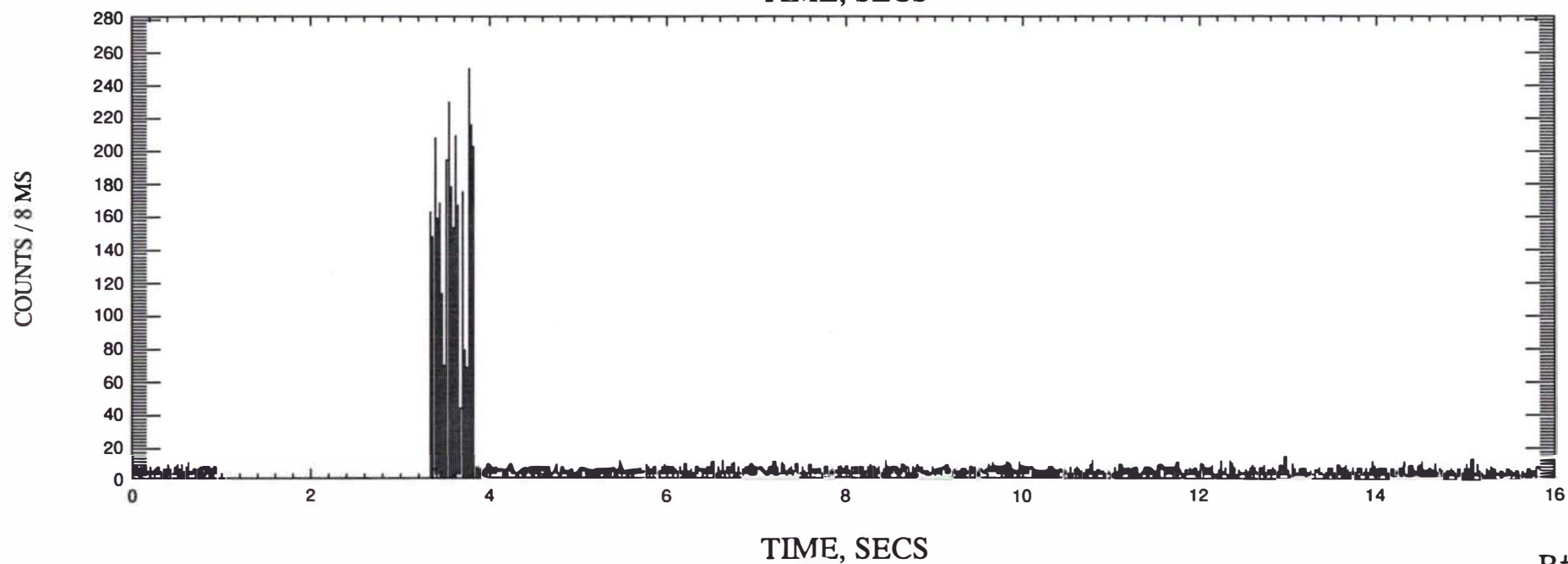
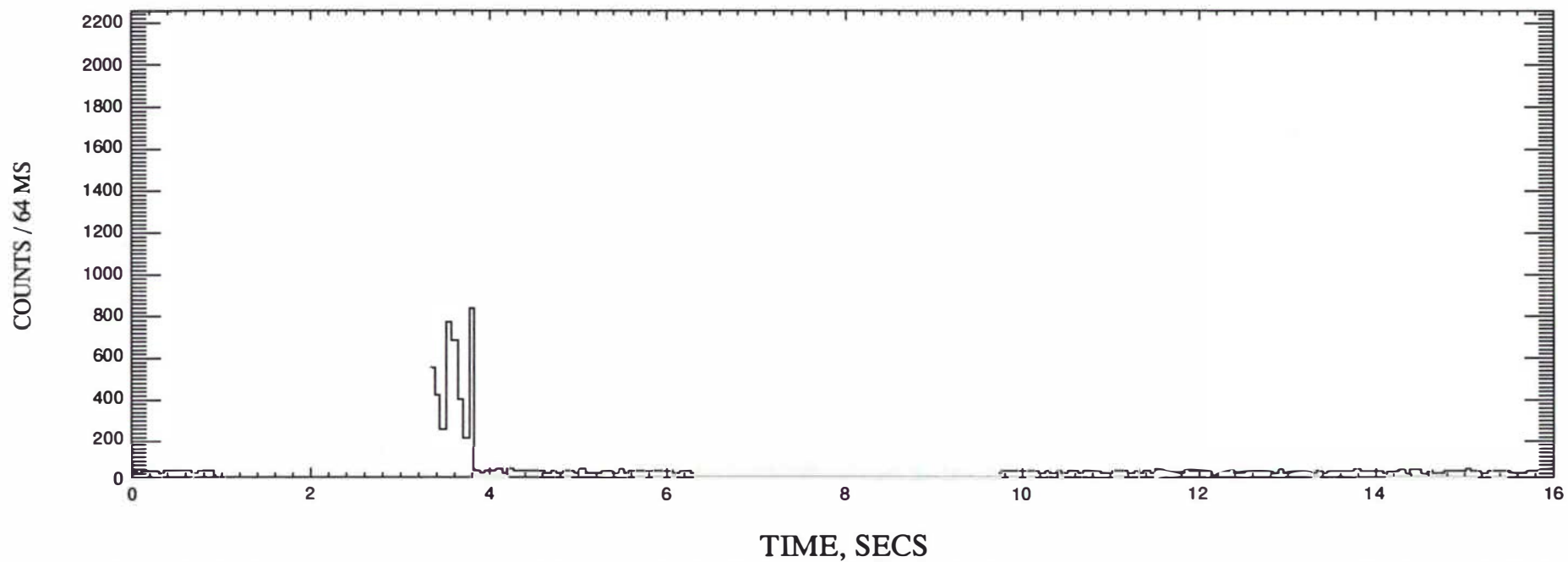
Burst Counter 15 at UT= 7.247632429335 h=26091.477 s 07:14:51.477



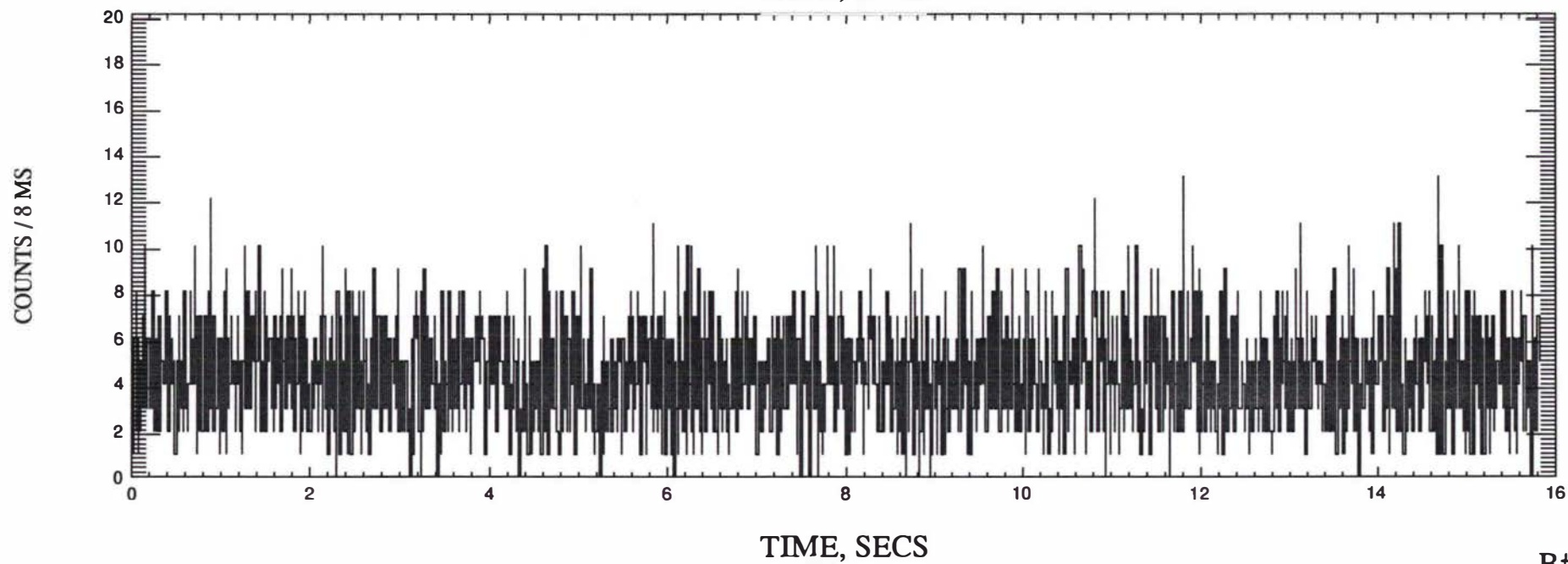
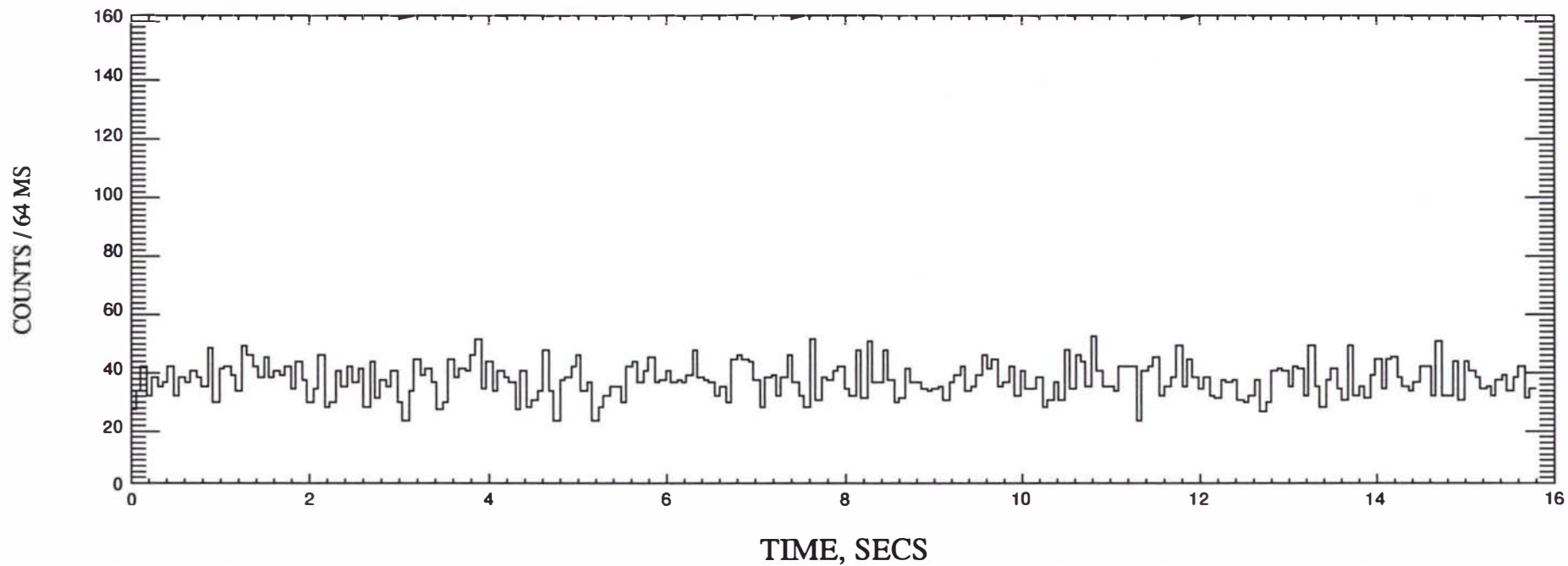
Burst Counter 0 at UT= 7.951807878282 h=28626.508 s 07:57:06.508



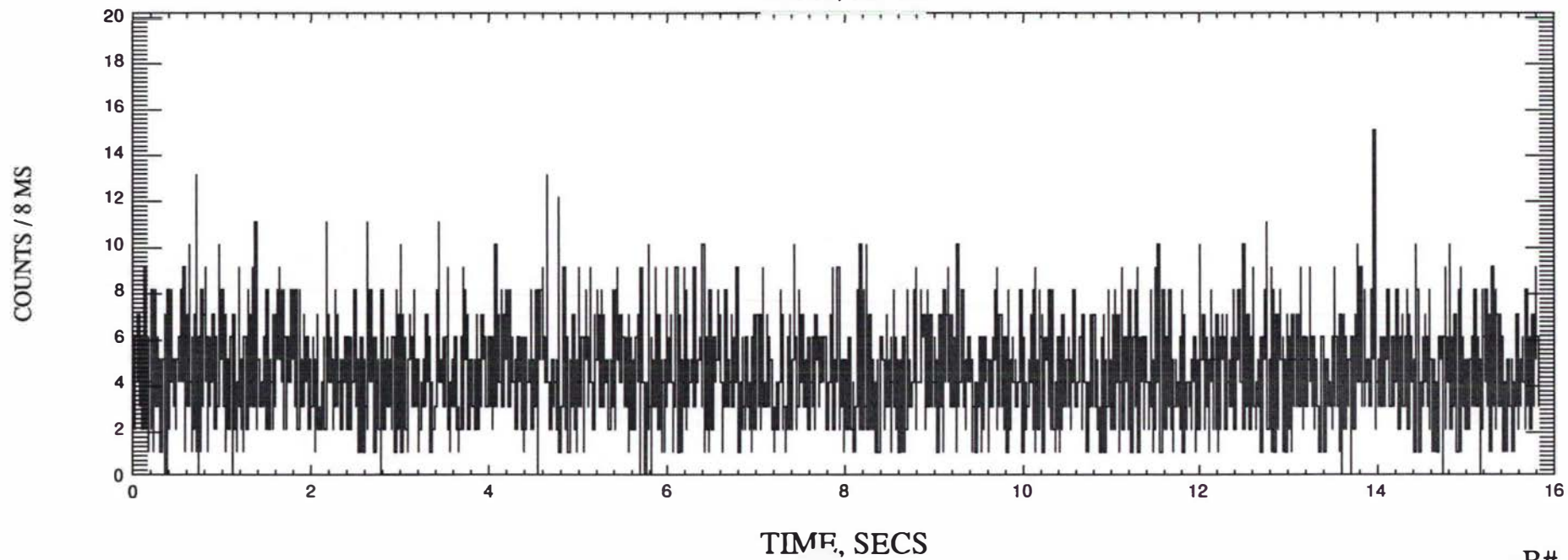
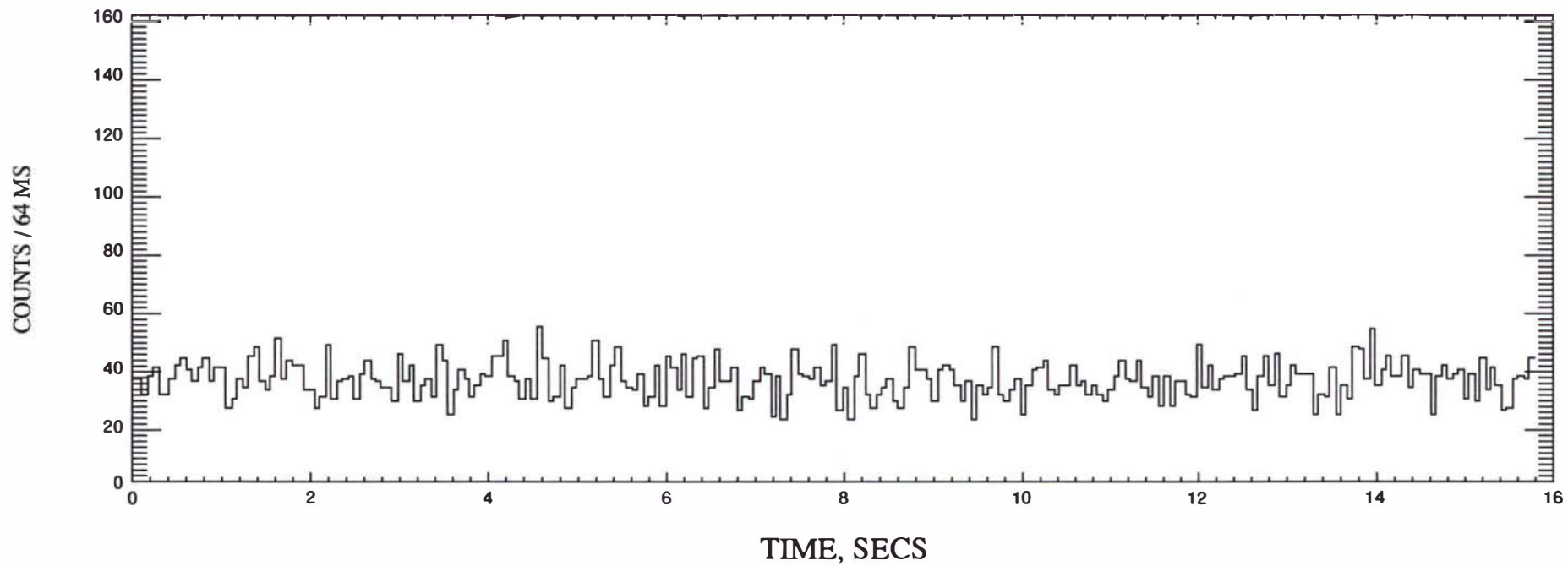
Burst Counter 1 at UT= 8.654312320285 h=31155.524 s 08:39:15.524



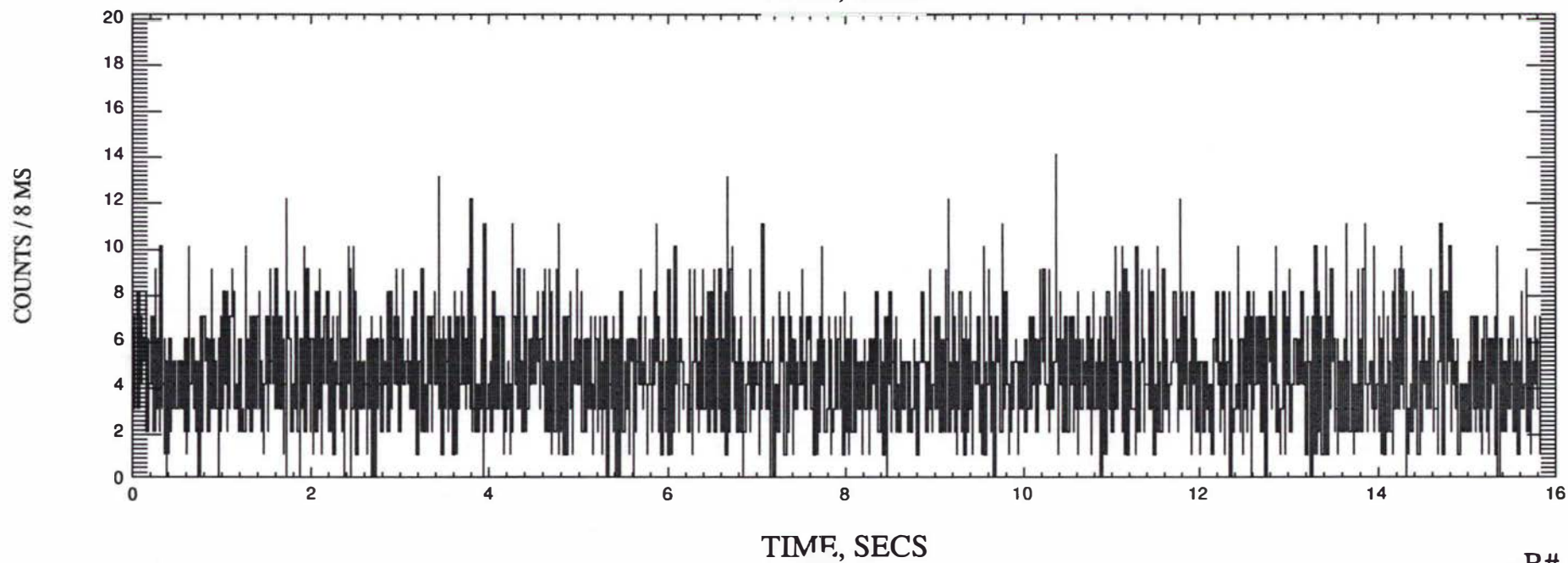
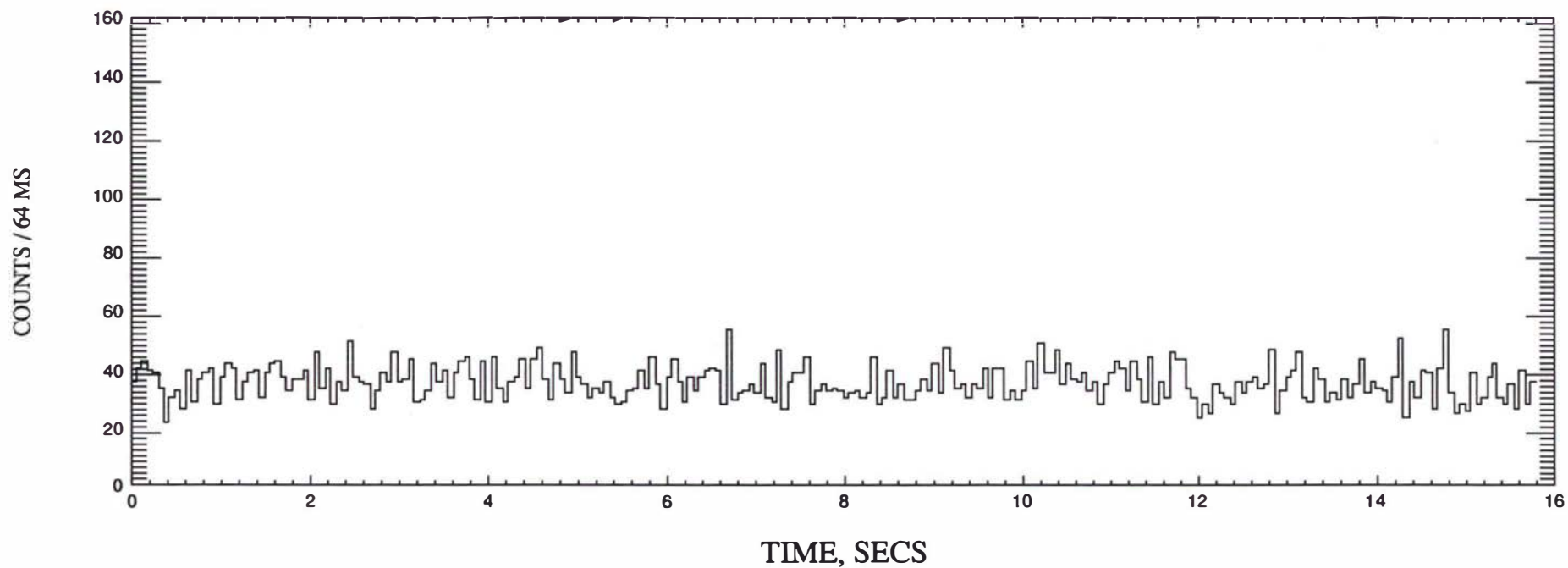
Burst Counter 2 at UT= 9.915166778564 h=35694.600 s 09:54:54.600



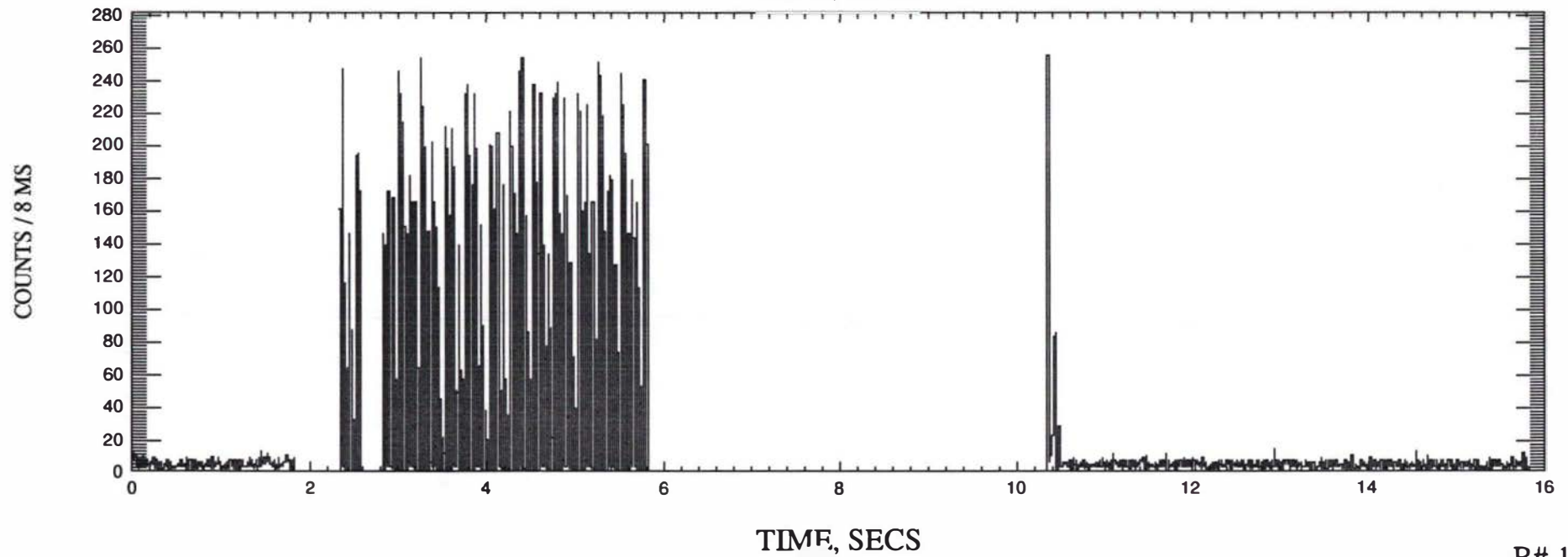
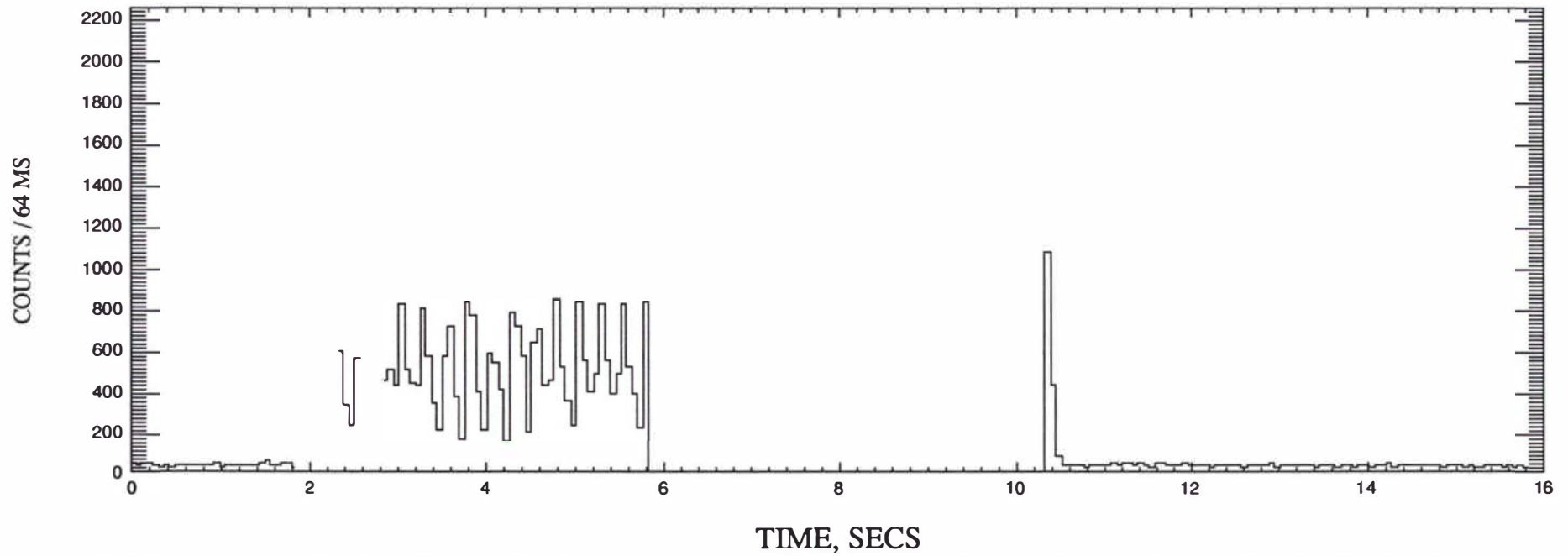
Burst Counter 3 at UT=11.191034584045 h=40287.725 s 11:11:27.725



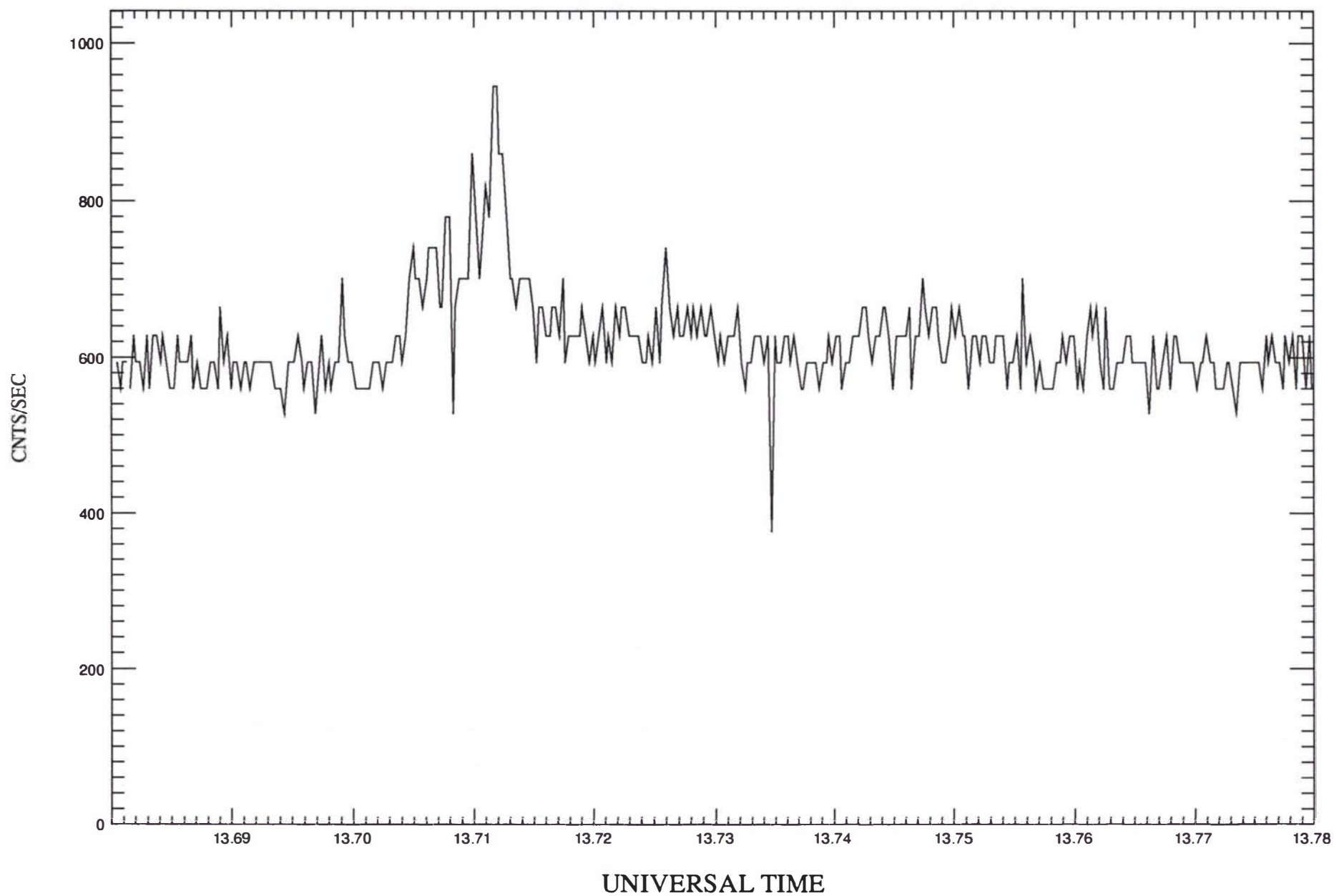
Burst Counter 4 at UT=12.458002654182 h=44848.810 s 12:27:28.810



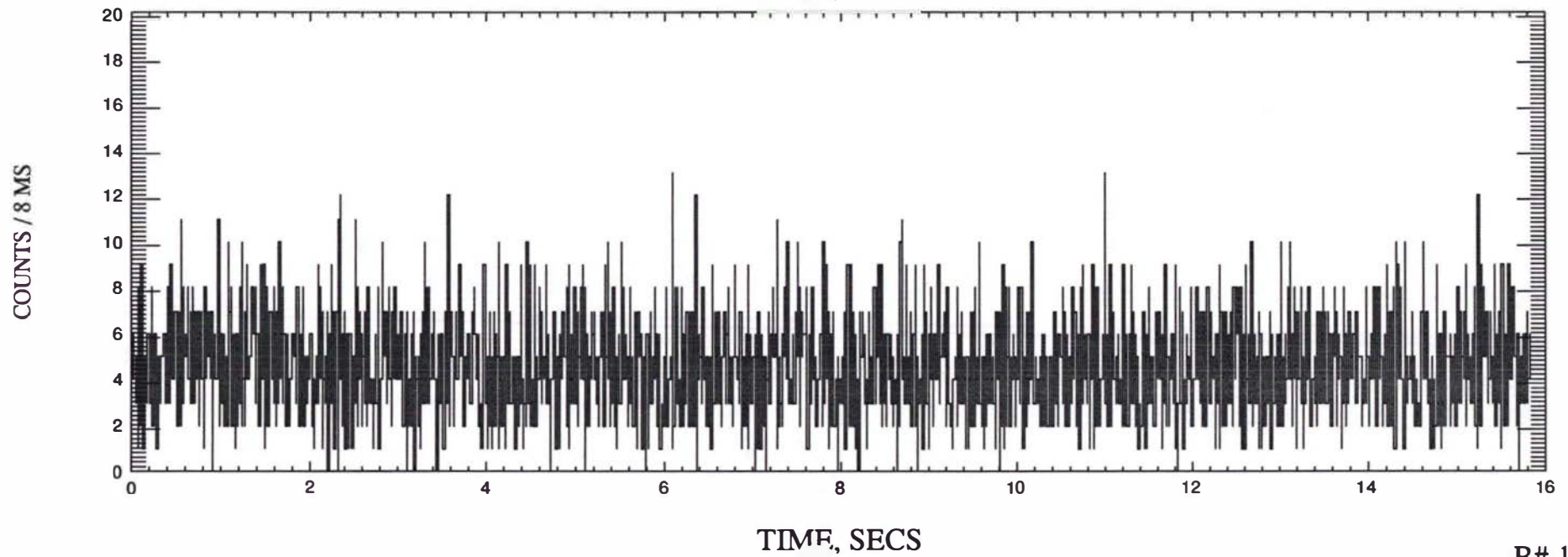
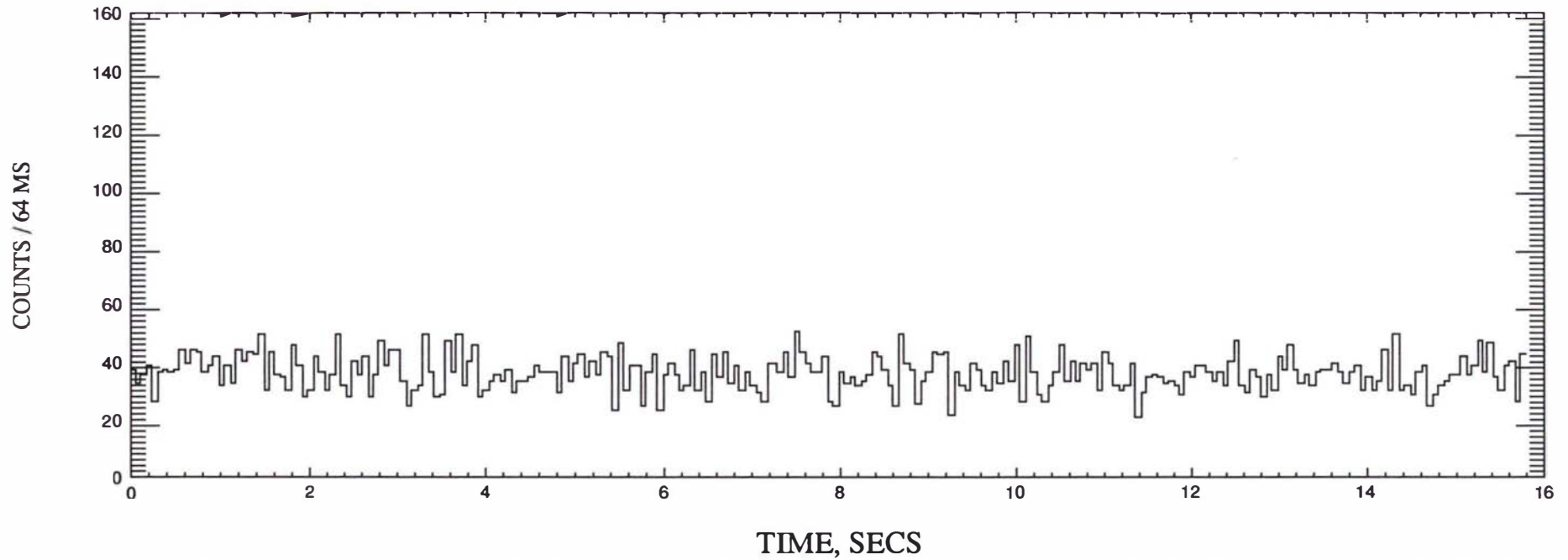
Burst Counter 6 at UT=13.726081831190 h=49413.895 s 13:43:33.895



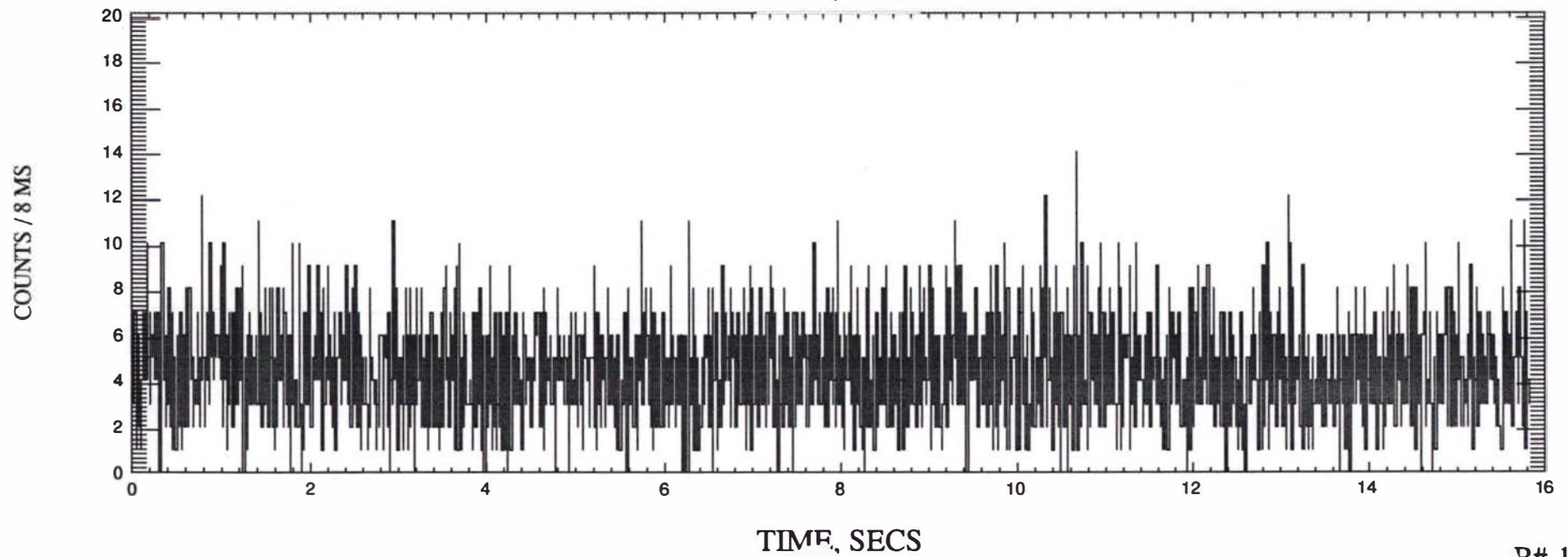
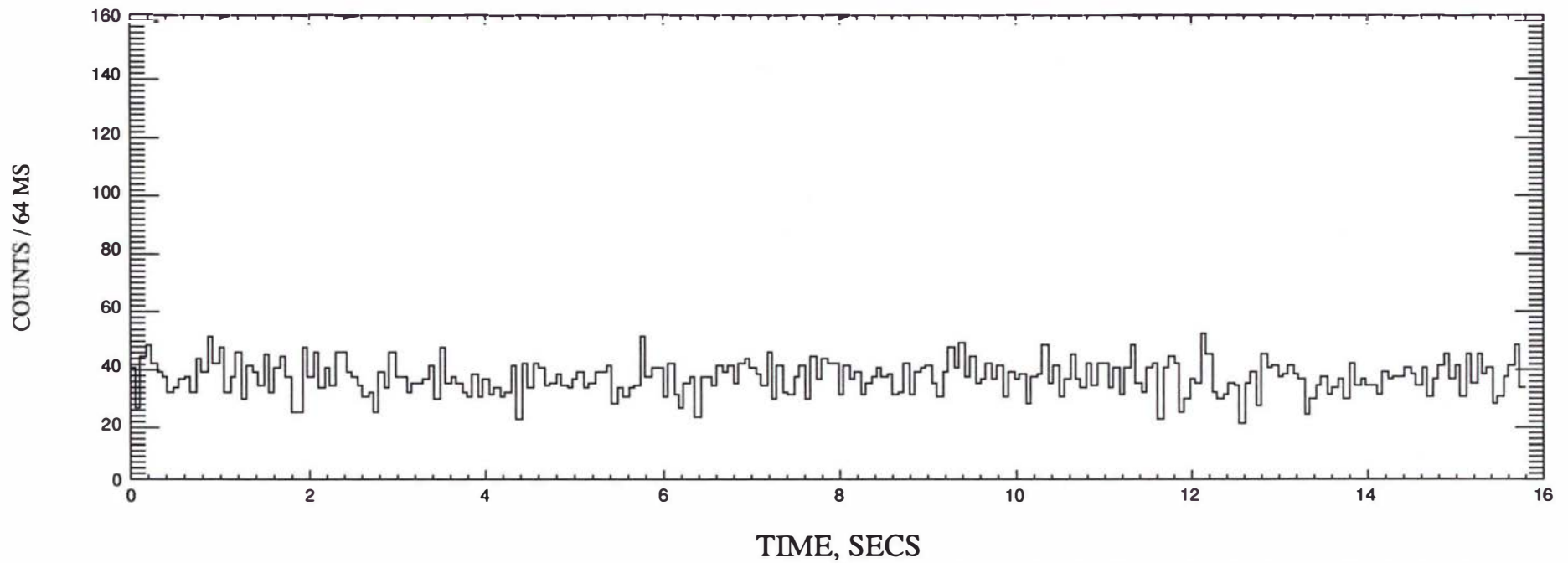
CALIBRATION DATA INCLUDED



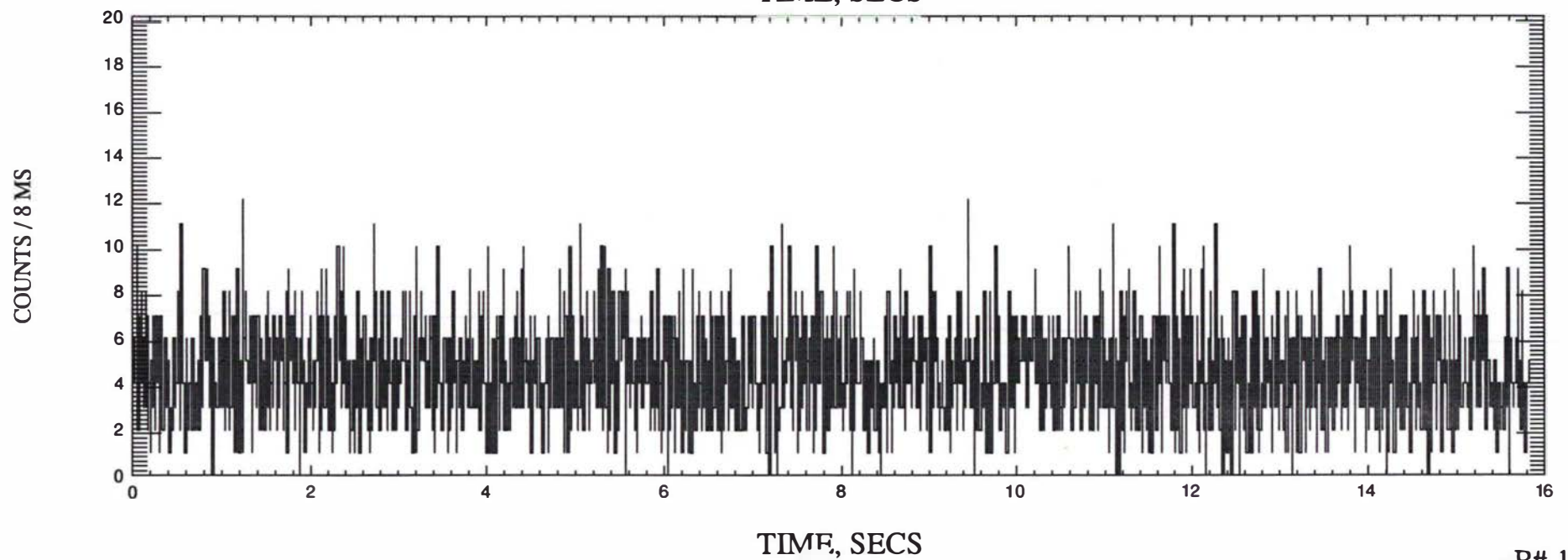
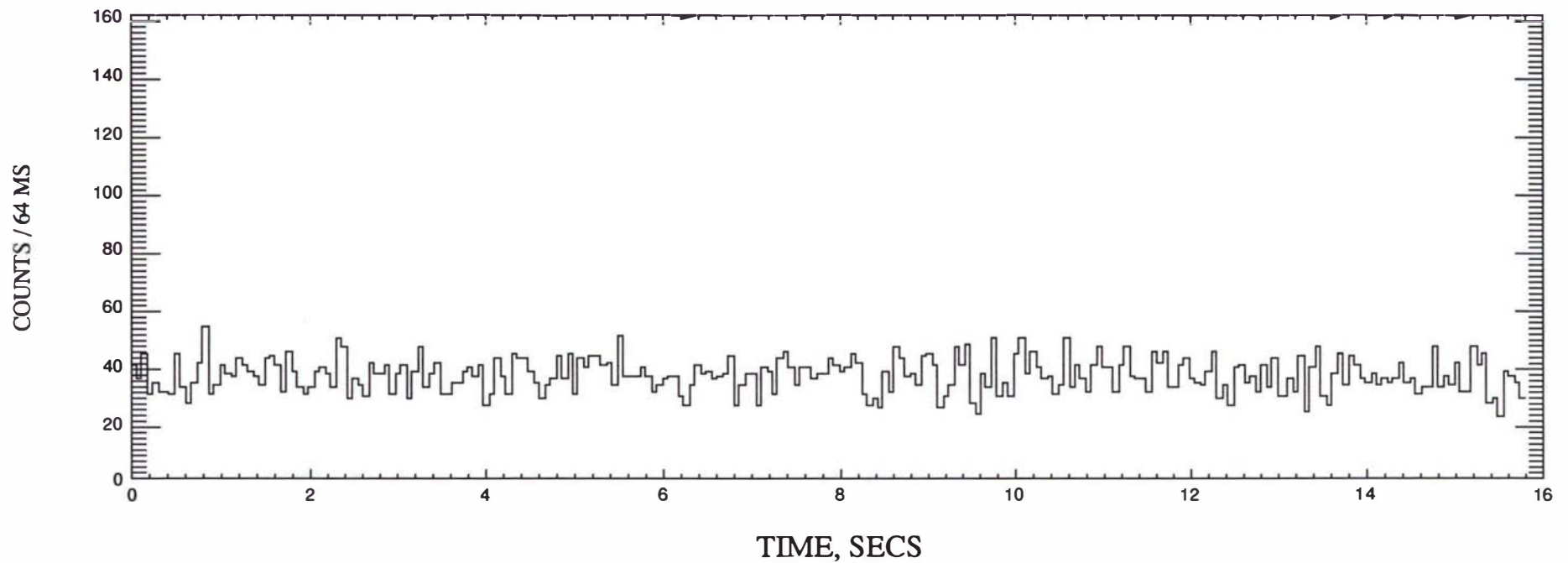
Burst Counter 7 at UT=16.242507315742 h=58473.026 s 16:14:33.026



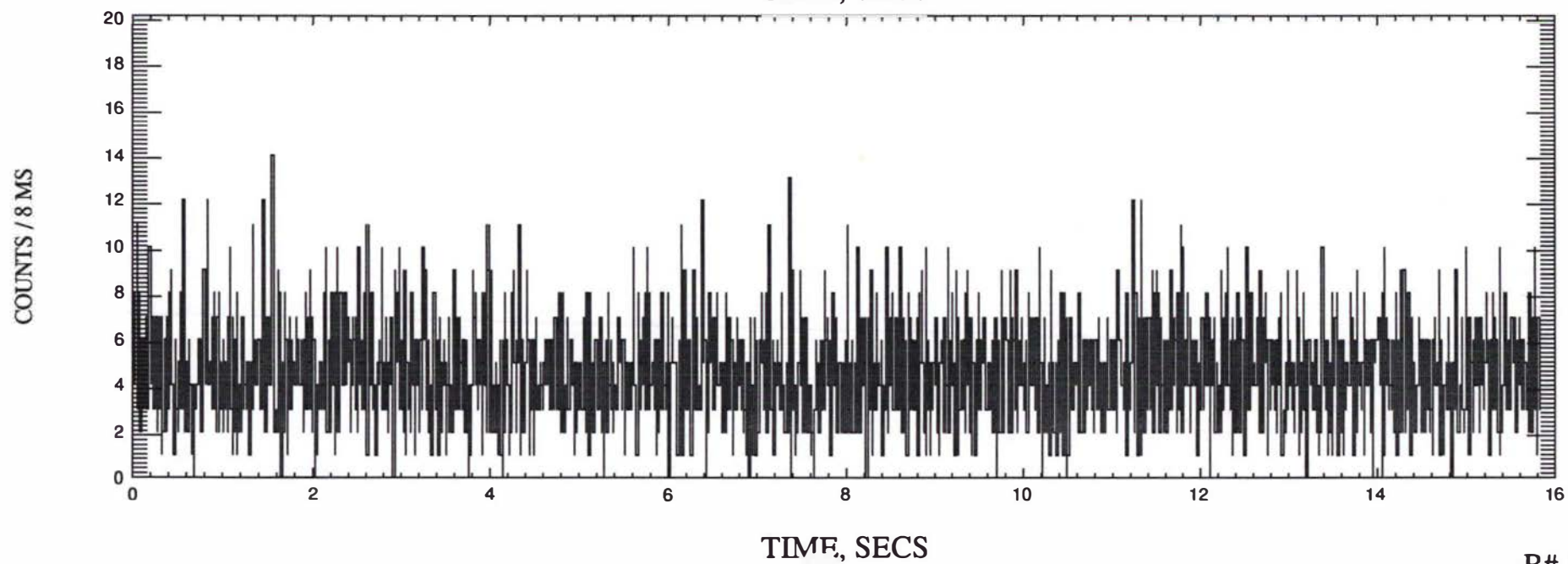
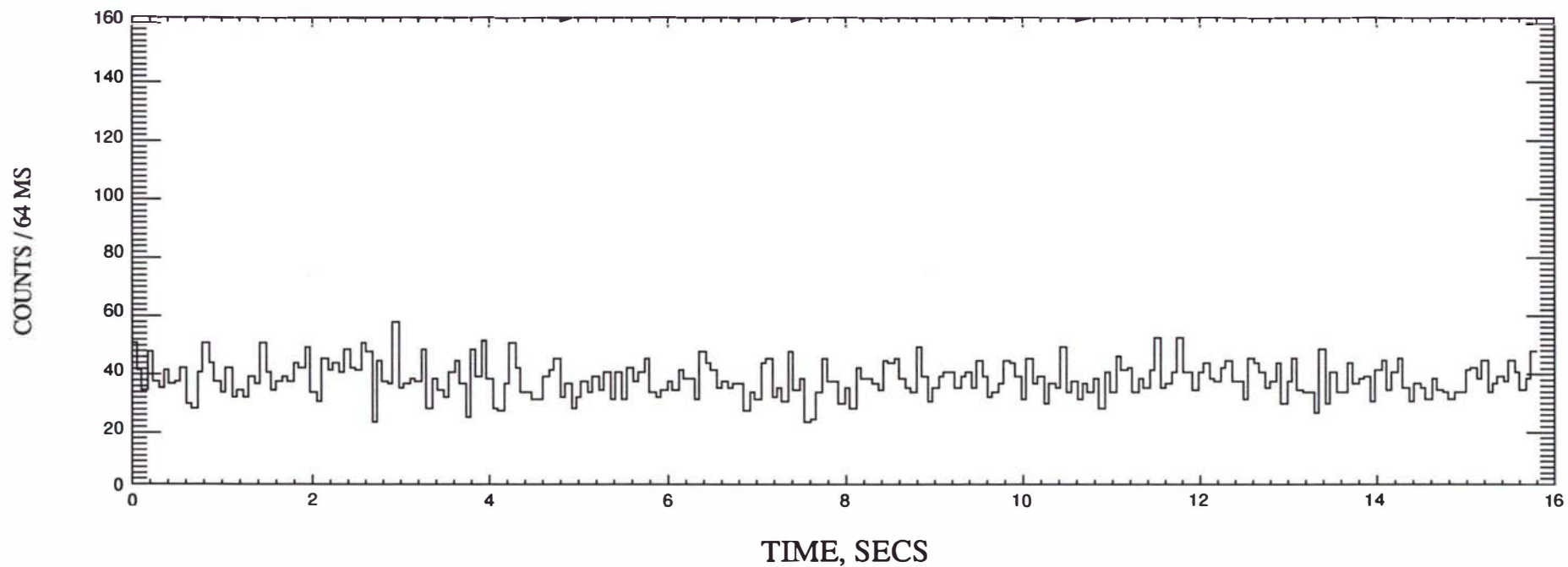
Burst Counter 8 at UT=17.509757499695 h=63035.127 s 17:30:35.127



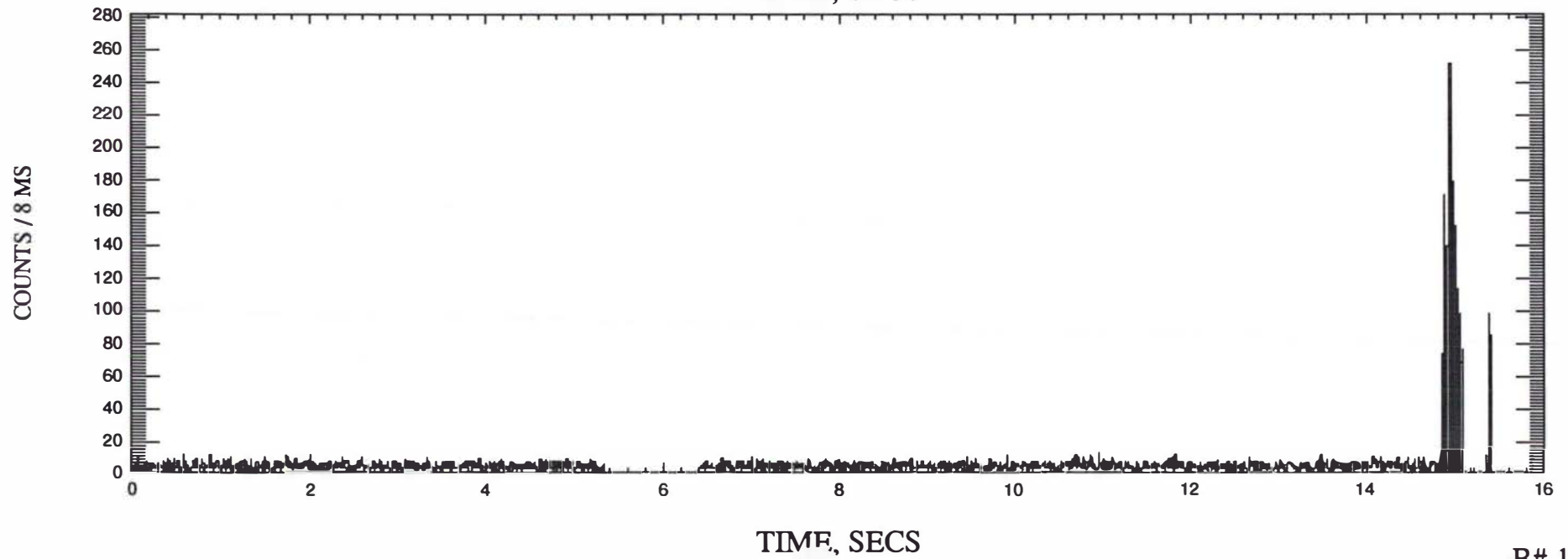
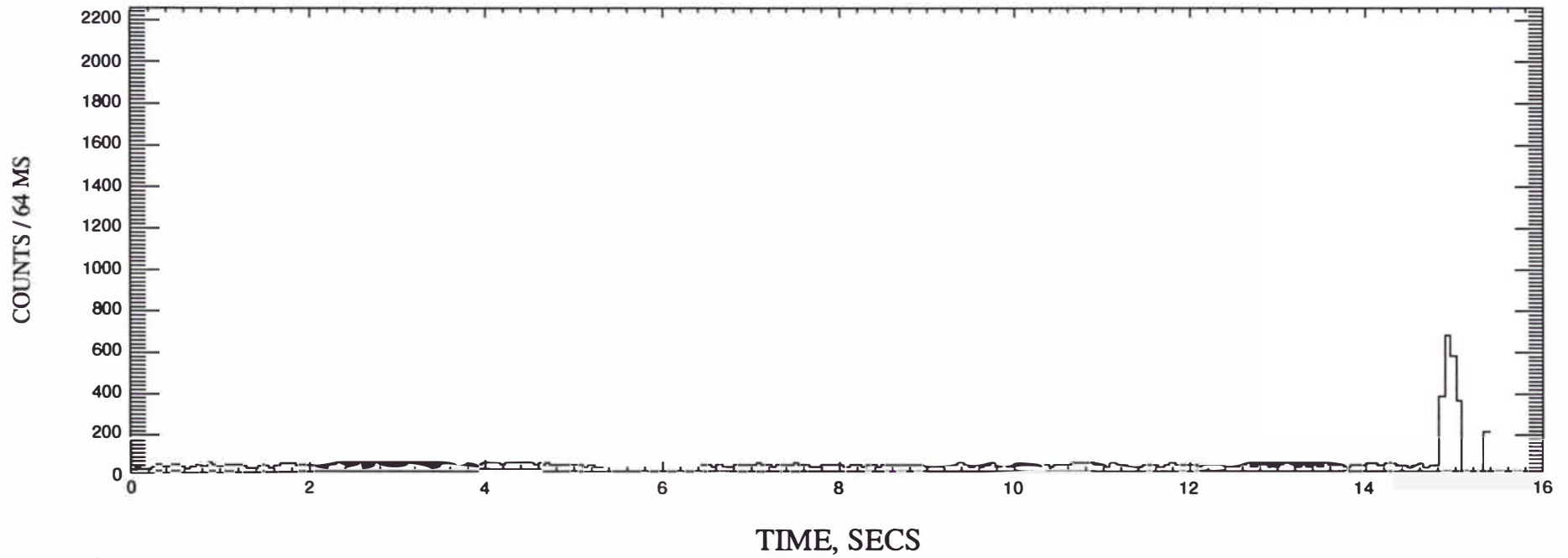
Burst Counter 9 at UT=18.767843187120 h=67564.235 s 18:46:04.235



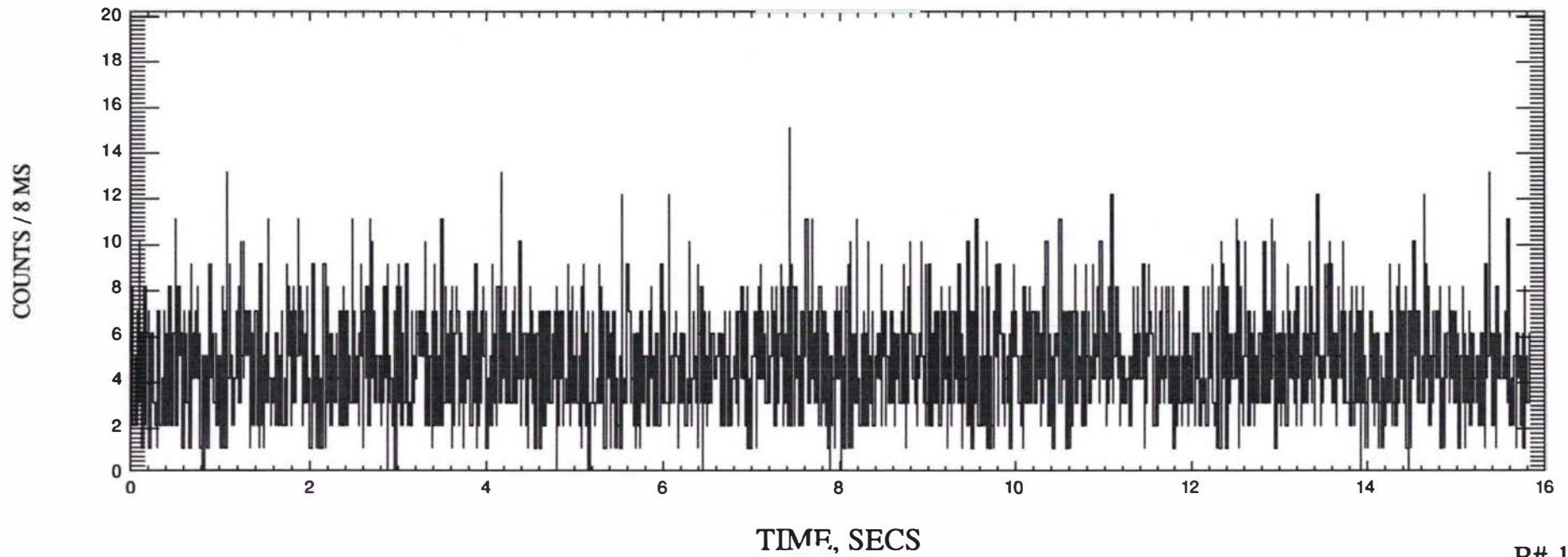
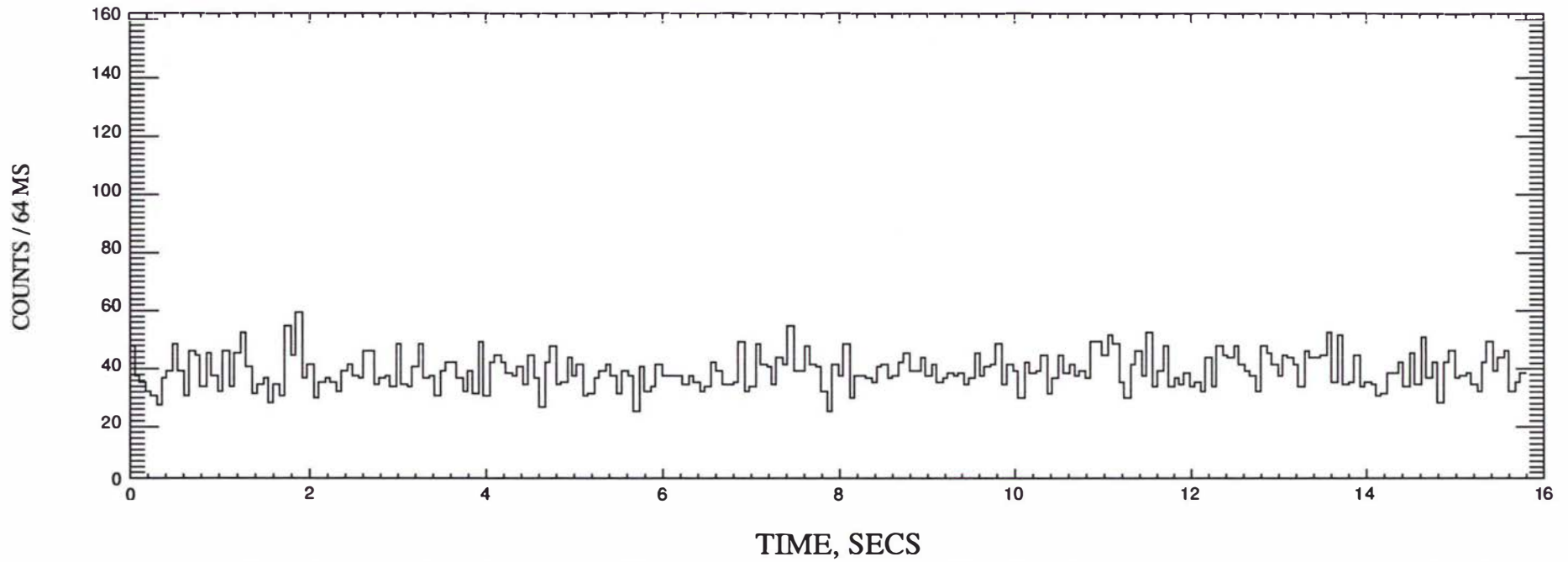
Burst Counter 10 at UT=20.029535645379 h=72106.328 s 20:01:46.328



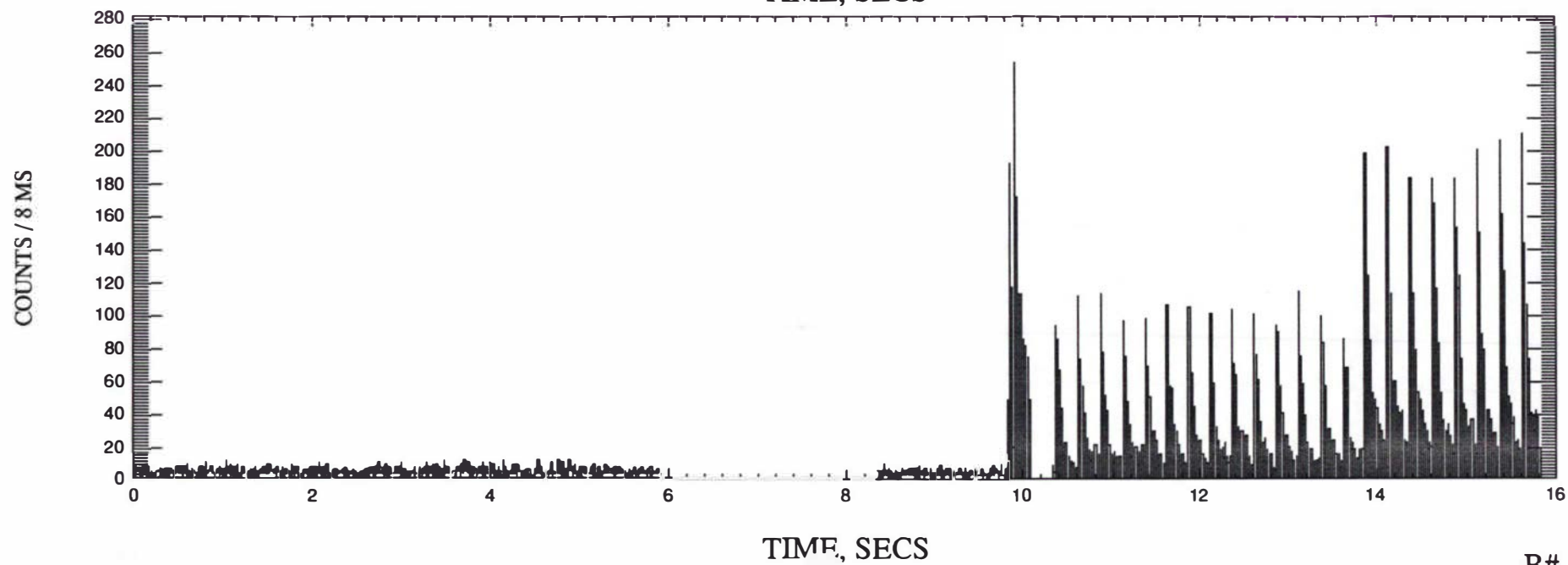
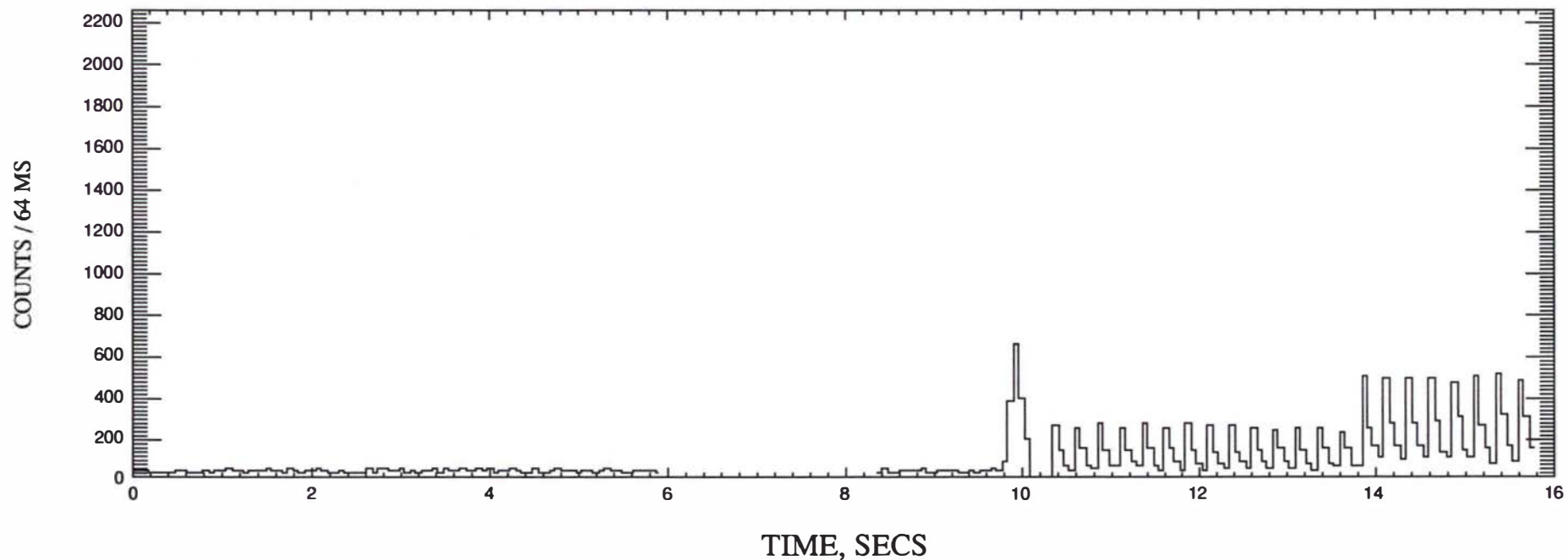
Burst Counter 11 at UT=21.293166041904 h=76655.398 s 21:17:35.398



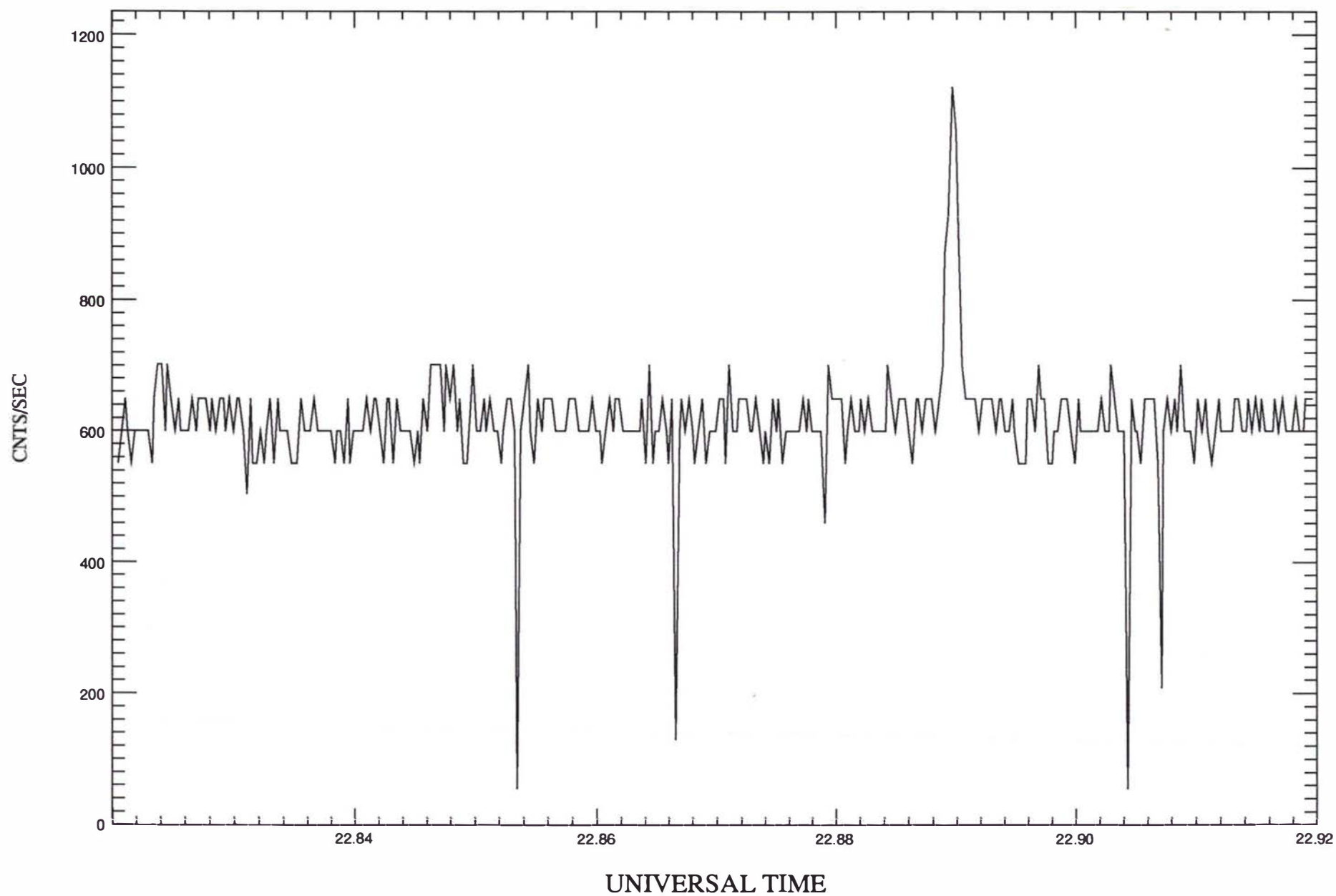
Burst Counter 12 at UT=22.171784218682 h=79818.423 s 22:10:18.423



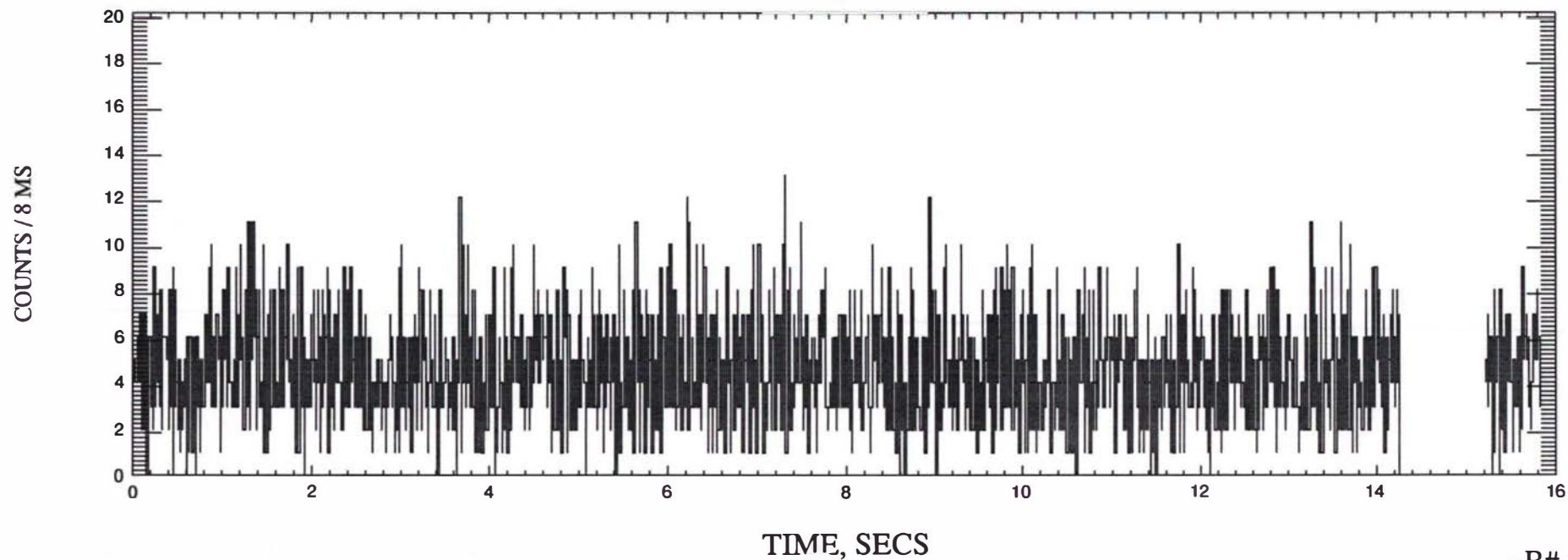
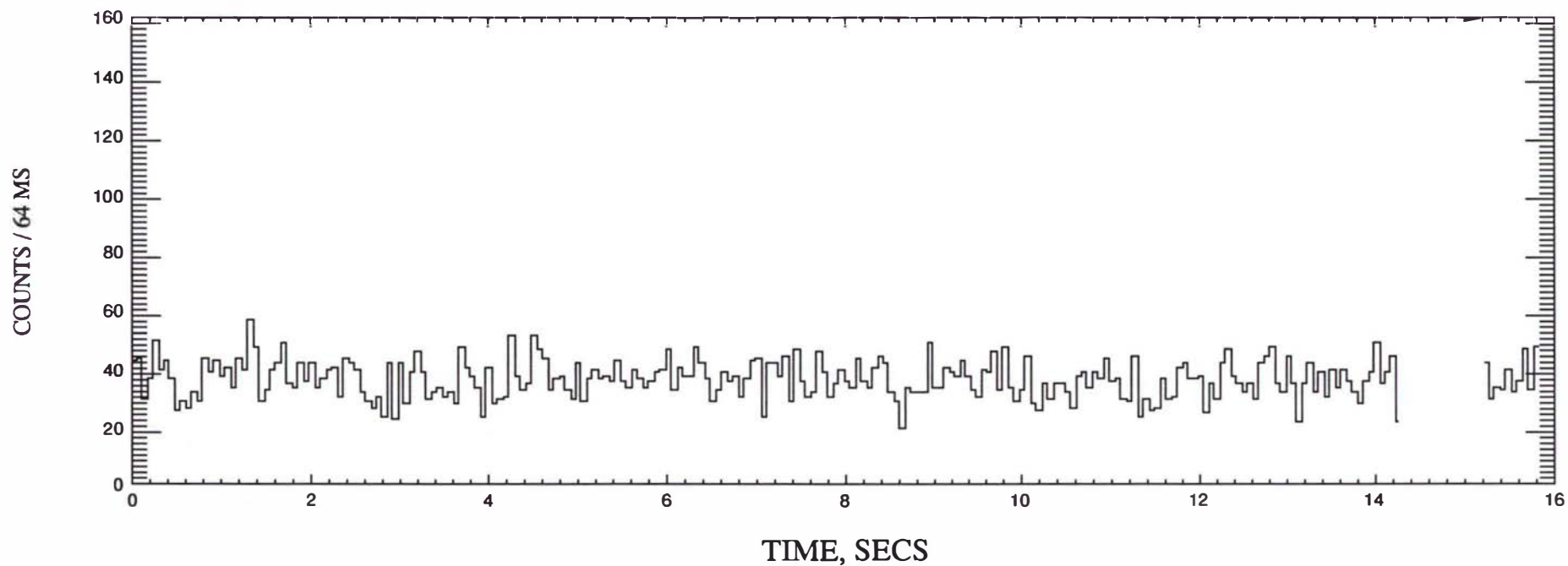
Burst Counter 13 at UT=22.874861577352 h=82349.502 s 22:52:29.502

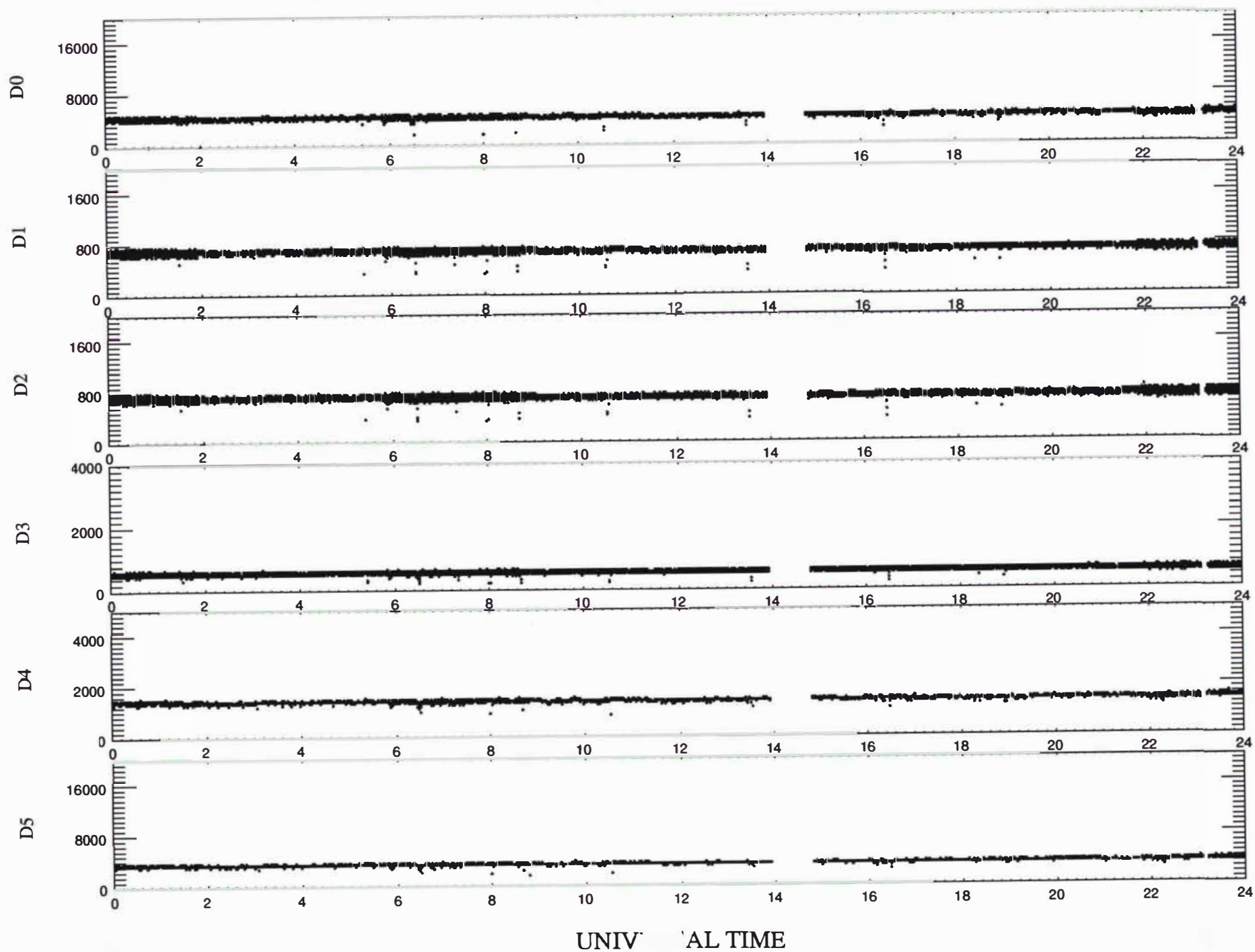


CALIBRATION DATA INCLUDED



Burst Counter 14 at UT=23.575982988146 h=84873.539 s 23:34:33.539





From root Wed Dec 8 07:58 1993
 Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
 id AA08899; Wed, 8 Dec 93 07:57:44
 Received: from mx.nsi.nasa.gov by sunspot.ssl.berkeley.edu (4.1/1.30.1)
 id AA22497; Wed, 8 Dec 93 07:00:41 PST
 Received: Wed, 8 Dec 93 07:03:53 PST from ESSDP2.dnet by mx.nsi.nasa.gov (4.1/1.2)
 Message-Id: <9312081503.AA10272@mx.nsi.nasa.gov>
 Received: from ESSDP2.dnet by AMES.dnet with MAIL-11
 (utk-maill1d v1.7); Wed, 8 Dec 93 07:03:57 PST
 Date: Wed, 8 Dec 93 07:03:57 PST
 From: 068486@essdp2.span.nasa.gov
 X-To: AMES::"khurley@space6.ssl.berkeley.edu"
 Subject: RE:
 To: khurley@space6.ssl.berkeley.edu
 Status: R

KEVIN,
 HERE ARE THE RESULTS OF OUR SURVEY OF THE PVO REAL-TIME DATA FOR EVIDENCE OF
 RESPONSE TO EVENTS LISTED IN YOUR CATALOG.

DATE	TIME	PVO RESPONSE
90/11/11	21:49	N/O
90/11/12	14:57	N/O
90/11/16	01:42	N/O
90/11/19	18:08	N/O
90/11/21	00:04	N/O
90/11/21	18:09	N/O
90/12/02	13:45	N/O
90/12/21	00:30	N/O
90/12/25	05:50	N/O
91/01/17	00:57	N/O
91/01/24	11:50	N/O
91/02/04	08:58	N/O
91/02/04	14:19	N/O
91/02/04	14:58	N/O
91/02/17	02:59	N/O
91/03/14	22:56	N/O
91/03/15	22:55	N/O
91/04/04	17:17	(NO)
91/05/18	17:10	N/O
91/05/23	19:03	N/O
91/05/27	23:44	N/O
91/05/28	21:26	N/O
91/06/02	22:55	N/O
91/06/09	00:48	N/O
91/06/29	19:55	N/O
91/07/09	20:22	N/O
91/07/17	13:07	N/O
91/08/03	08:24	N/O
91/08/15	12:34	N/O
91/08/15	14:24	N/O
91/08/16	01:57	(NO)
91/09/05	23:48	N/O
91/09/16	21:58	N/O
91/09/25	03:35	N/O
91/09/26	18:25	N/O
91/09/30	11:55	N/O
91/10/03	00:39	N/O
91/10/04	01:27	N/O
91/10/06	09:01	(NO)
91/10/22	04:13	N/O
91/10/25	21:25	N/O
91/11/06	03:42	N/O
91/11/14	01:40	N/O
91/11/17	01:58	N/O
91/12/05	23:04	N/O

91/12/21	06:17	N/O
91/12/21	22:03	N/O
91/12/27	15:56	N/O
92/01/05	17:41	N/O
92/01/13	20:52	N/O
92/01/25	08:57	N/O
92/01/30	00:29	N/O
92/01/30	22:50	N/O
92/02/18	18:42	N/O
92/02/21	06:14	N/O
92/02/26	18:15	YES TRIGGER AT 29336 S UT
92/02/27	06:00	N/O
92/02/27	08:45	N/O
92/03/02	06:16	N/O
92/03/04	14:34	N/O
92/03/07	00:18	N/O
92/03/21	12:50	(NO)
92/03/26	02:01	N/O
92/03/27	09:38	N/O
92/03/29	16:38	(NO)
92/04/04	22:37	N/O
92/04/08	12:05	N/O
92/04/20	02:12	N/O
92/04/29	18:59	N/O
92/05/02	19:05	N/O
92/06/01	THRU 92/06/29	TURNED OFF--N/O
92/07/01	19:39	N/O
92/07/07	06:33	N/O
92/07/17	01:15	N/O
92/07/23	00:59	N/O
92/07/23	01:00	N/O
92/07/23	21:48	N/O
92/07/25	19:30	N/O
92/07/25	22:49	N/O
92/07/26	00:34	N/O
92/07/31	17:07	N/O
92/08/10	21:35	N/O
92/08/14	06:10	N/O
92/08/16	12:36	N/O
92/08/22	22:39	N/O
92/08/30	01:45	N/O
92/09/04	04:41	N/O

THIS LIST IS NOT COMPLETE. IT INCLUDES EVENTS FOR WHICH NO REAL-TIME DATA ARE AVAILABLE BECAUSE OF INAPPROPRIATE MODE, NO TRACKING, OR THE EXPERIMENT WAS TURNED OFF. WHERE DATA HAVE BEEN CHECKED, SENSITIVITY DEPENDS UPON THE TIME RESOLUTION AVAILABLE IN THE DATA. I'LL BE SENDING ADDITIONAL RESULTS AS THEY BECOME AVAILABLE.

REGARDS,

RAY

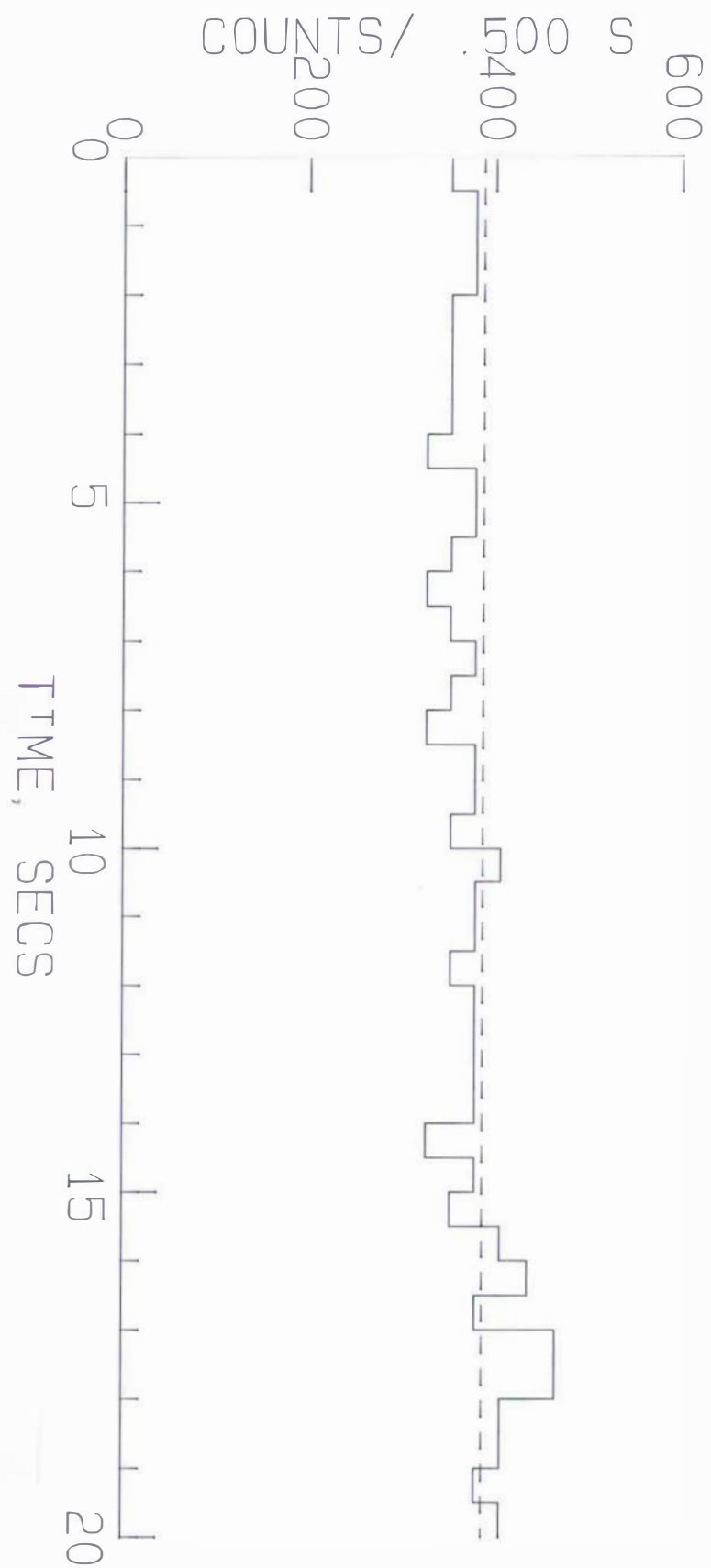
Table 1 GRBs List

Event ID	Time(U.T.) (hr:mn)	Peak Counts Cp (cnts/4sec)	Bit
901009	00:15:52		Hi
901021	00:09:07		Hi
901103	05:52:56		Hi
901112	19:20:38		Lo Uly
901219	21:52:50		Hi Uly
901222	15:14:08		Hi Uly
90130	11:56:08		Hi
90204	08:58:47		Hi Uly
90206	08:45:29		Med Uly
910312	12:43:34		Hi Uly
910314	22:56:12		Lo Uly
910315	22:55:48		Lo Uly
910322	12:41:48		Med
910402	14:28:13		Med Uly
910429	03:11:50		Med GRO
910522	12:14:08		Hi Uly
910527	23:45:36		Hi
910709	20:22:38		Med
910717	04:33:05		Hi GRO
910723	14:06:16		Lo
910725	13:12:06		Med GRO
910803	08:33:28		Med GRO
910814	19:14:34		Lo GRO
910815	12:34:32		Med
910821	10:33:39		Hi
910827	13:11:18		Hi
910905	23:48:55		Med GRO
910907	01:04:56		Lo GRO?
910926	18:25:56		Lo GRO
911008	17:56:04		Lo
911016	11:01:30		Lo GRO
911029	04:50:52		Lo
			Hi <+-0.1s
accuracy			Med +-0.5s
			Lo +-2.0s

Murakami's
 Preliminary list
 SOLAR
 Requested Uly data Requested RT data N/O
 Got Ganga data
 Requested U. RT data
 Got Ganga data
 SOLAR
 Requested RT
 Requested RT data
 Uly RT
 RT requested
 RT requested
 Uly
 RT requested
 RT requested
 RT requested
 RT
 RT requested
 No data
 Requested RT
 Requested RT
 Requested RT
 Requested RT
 Requested RT
 Requested RT

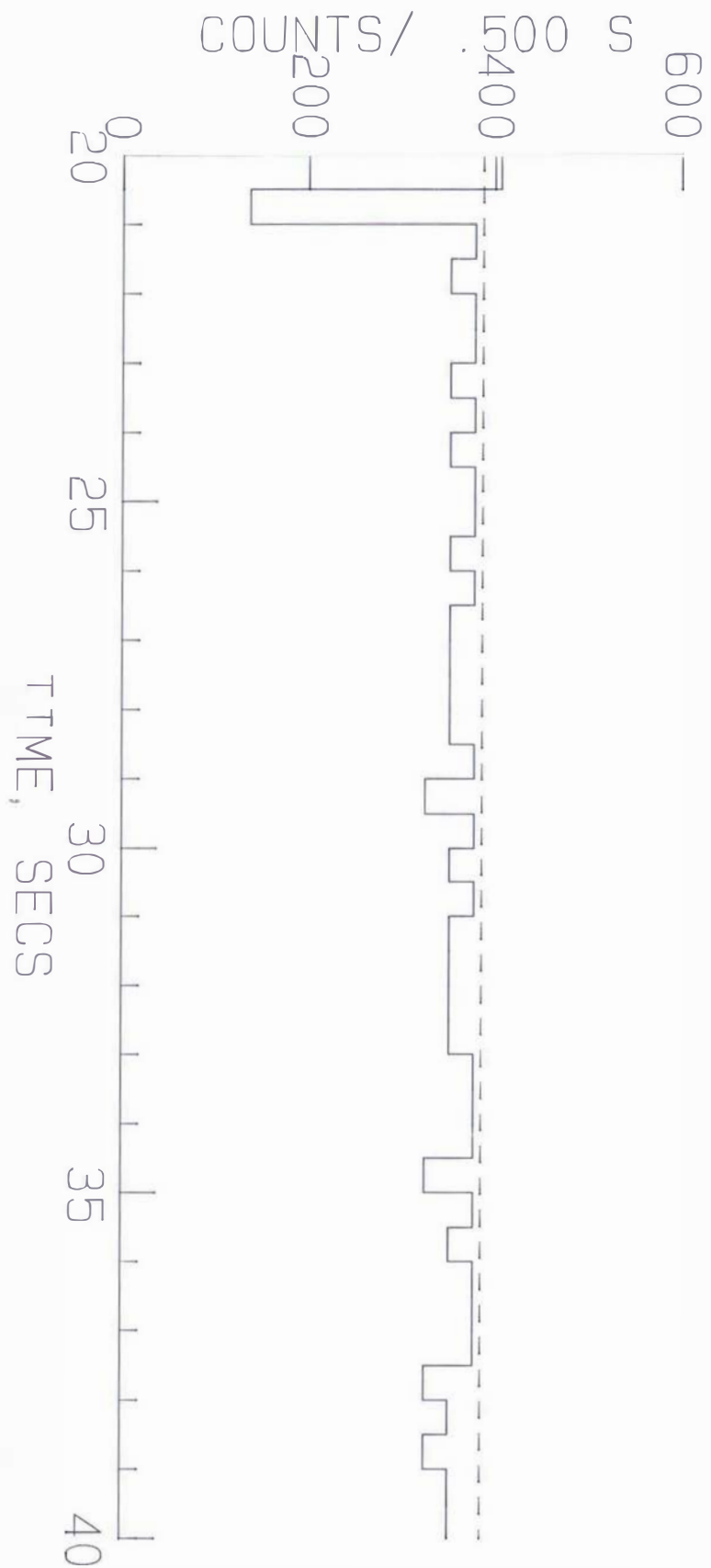
ULYSSES RT 15/ 3/91

0- 0 keV 81919.113 S



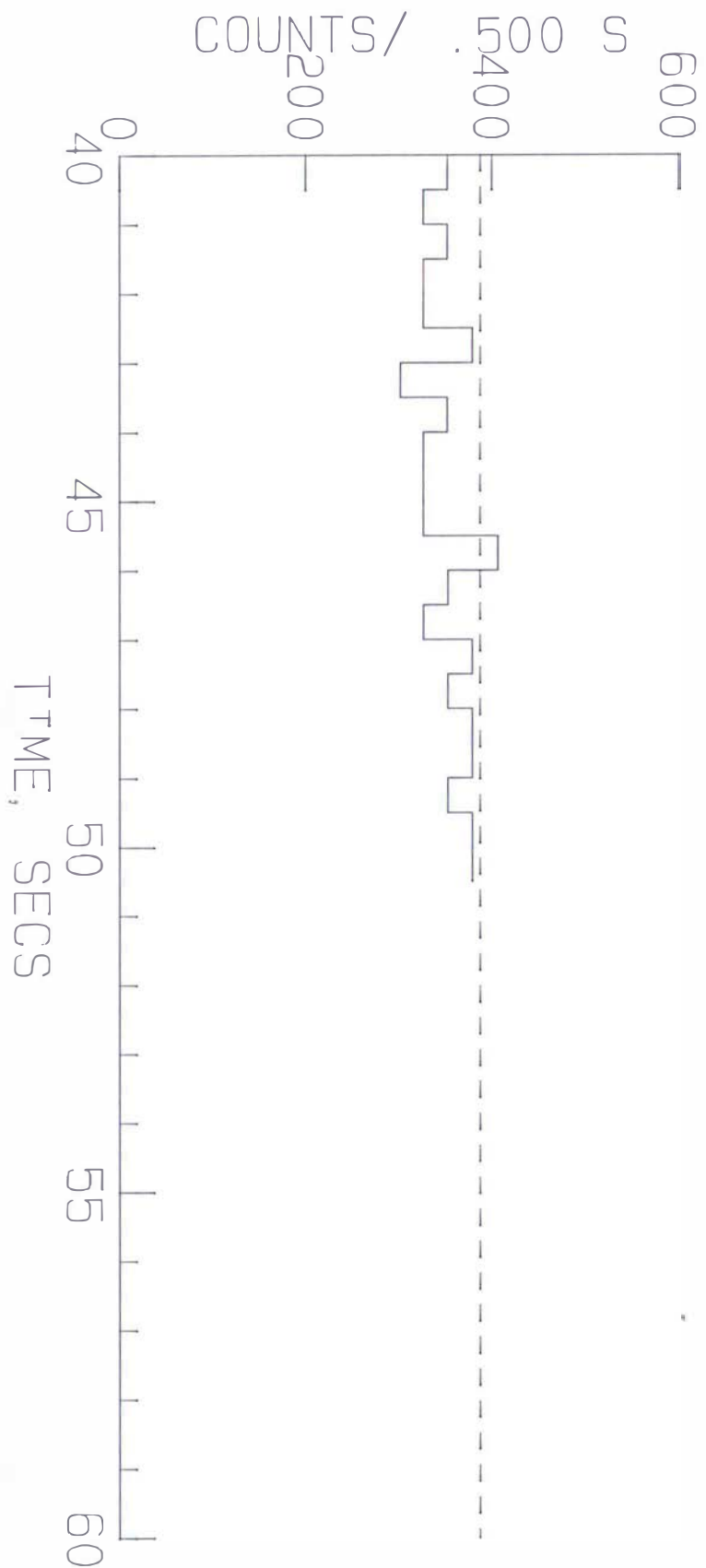
ULYSSES RT 15/ 3/91

0- 0 keV 81919.113 S



ULYSSES RT 15/ 3/91

0- 0 keV 81919.113 S



1 / 4 / 92

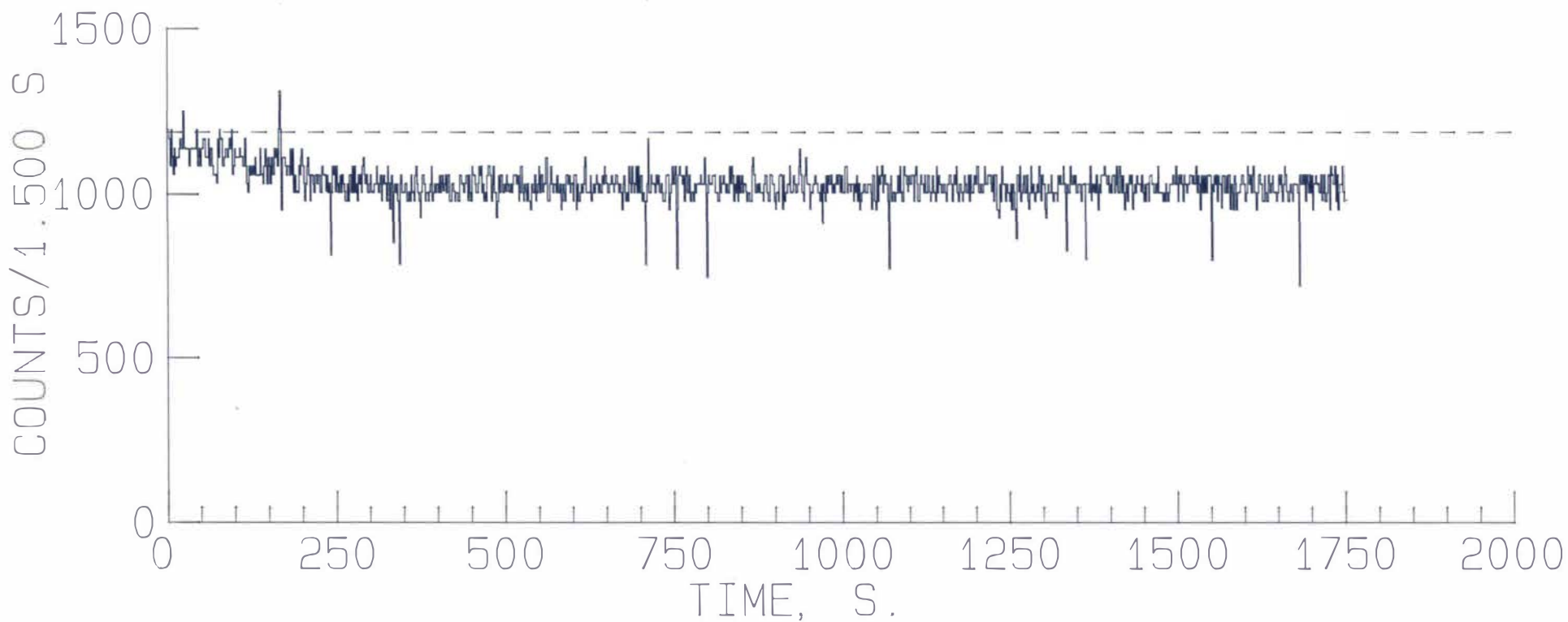
ULYSSES RT

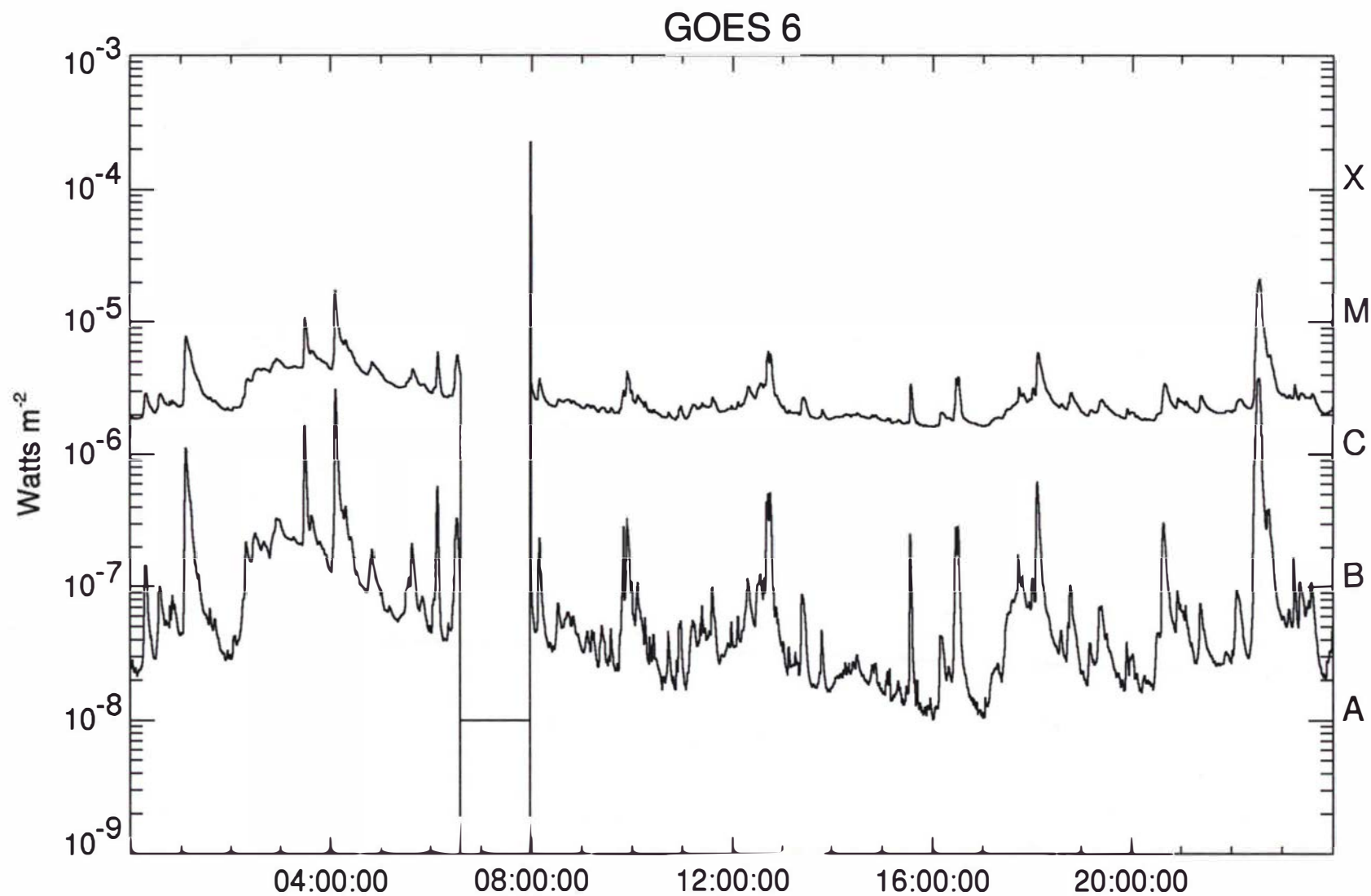
15/ 3/91 81769.109 s

.500 S INTERVALS REGROUPED BY 3

0- 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS





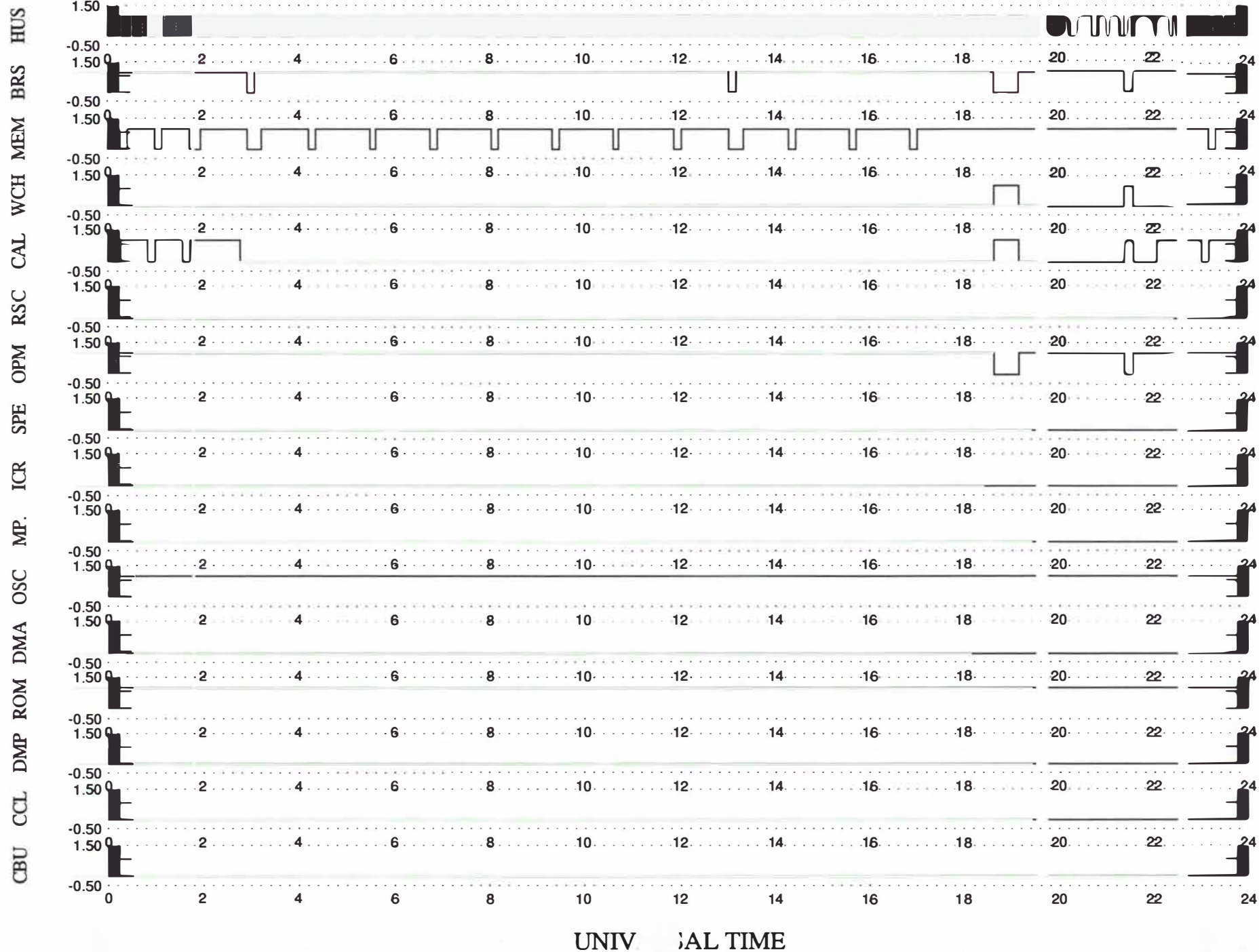
Data Start: 91/03/15, 0000:01

Channel 1 (1.0 - 8.0 Angstroms)
Channel 2 (0.5 - 4.0 Angstroms)

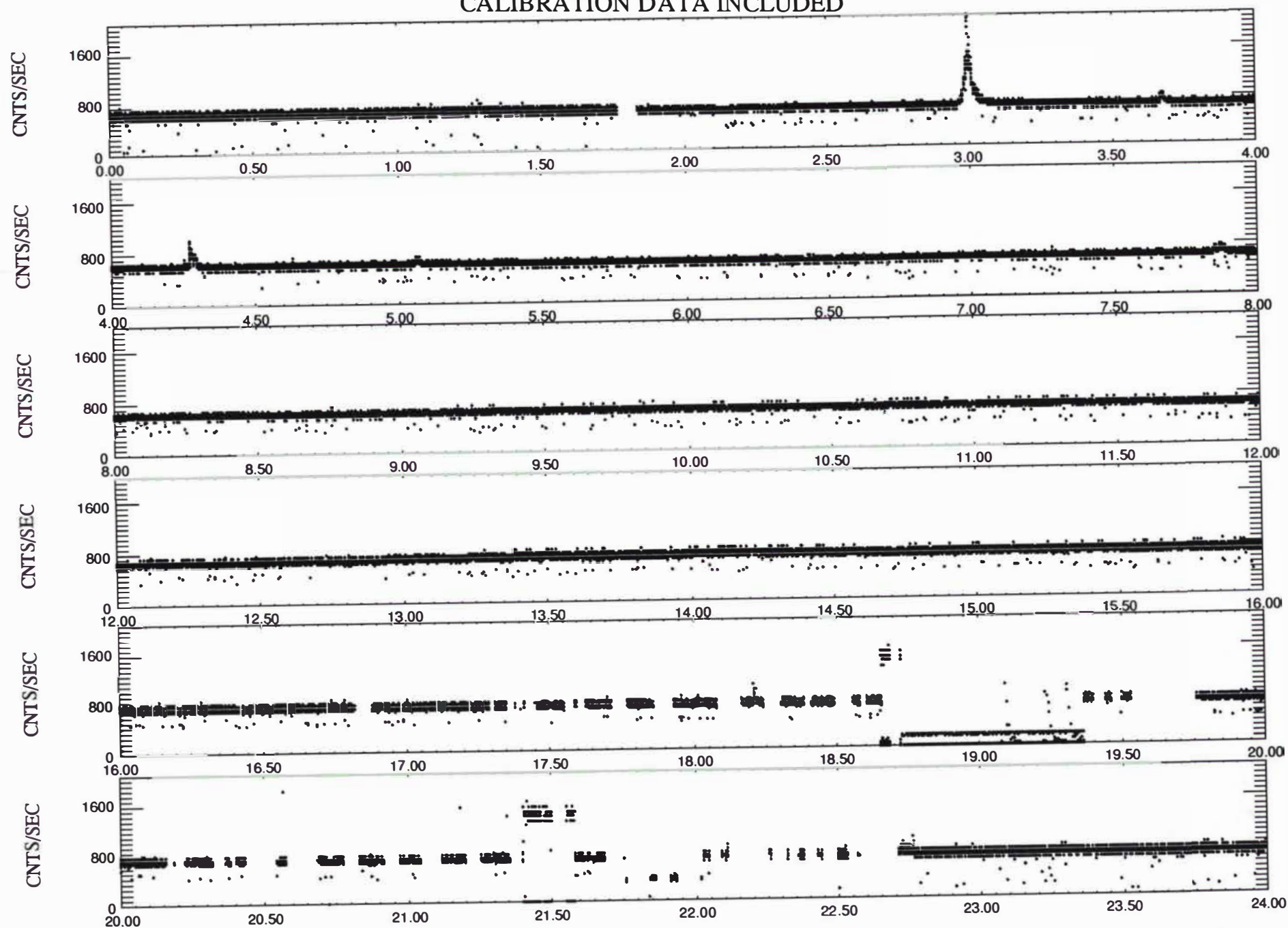
Plot created: 96/11/26, 1840

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 15, 0 - 14, 13 - 15, 4 - 4, 0 - 4

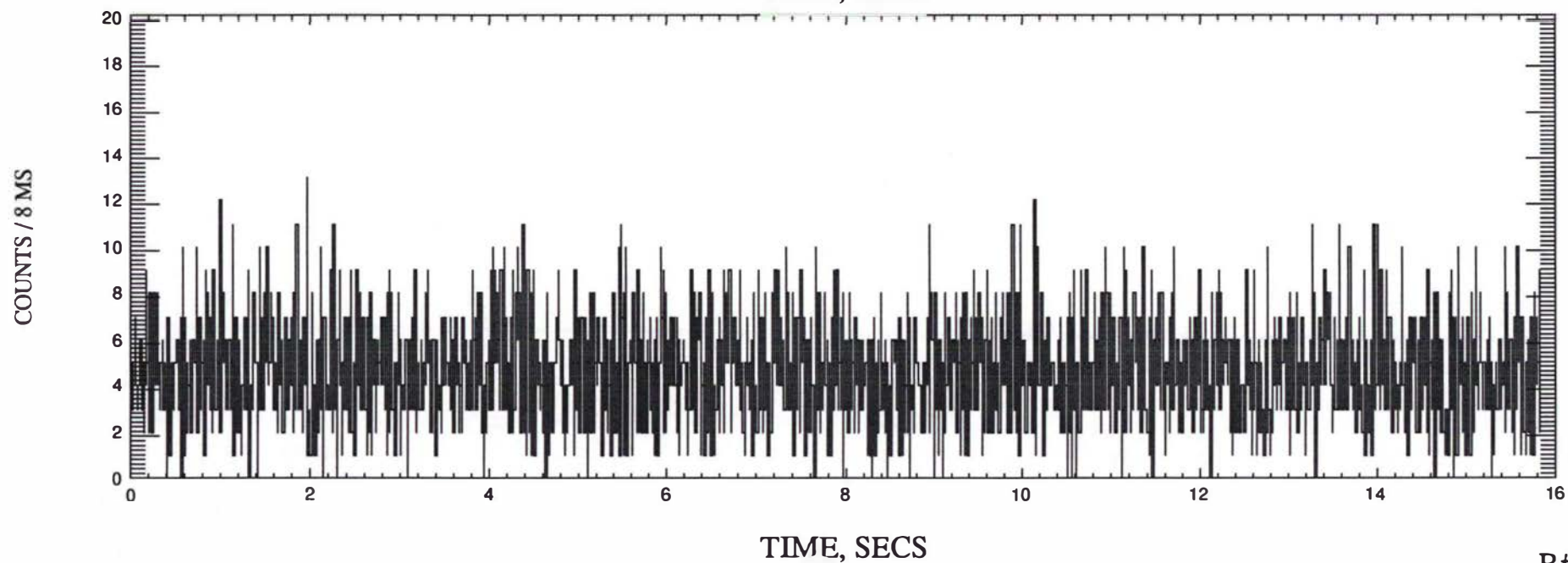
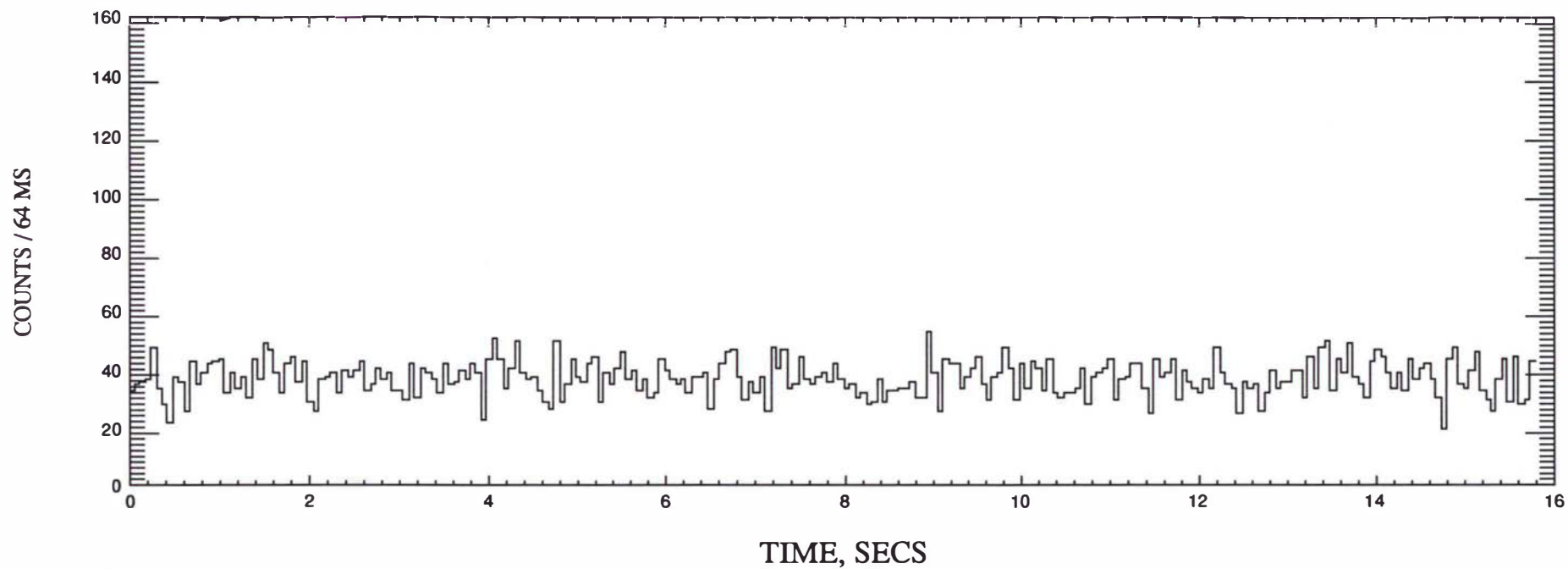


CALIBRATION DATA INCLUDED

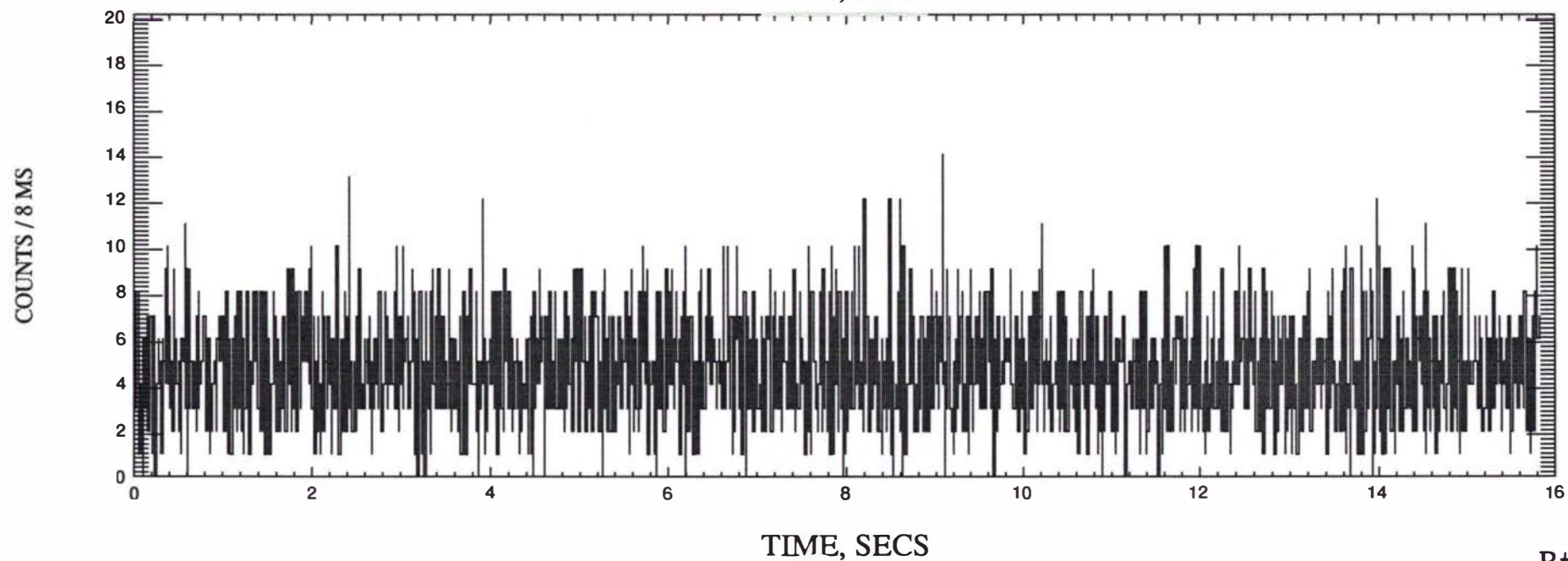
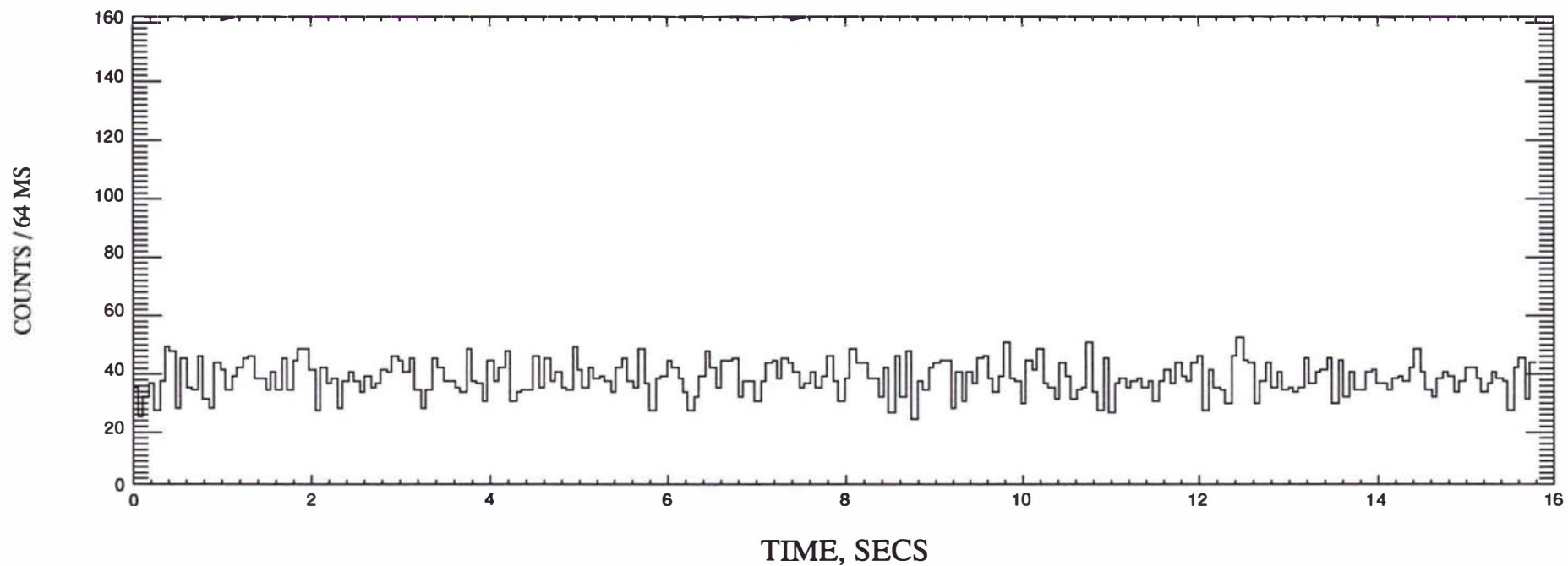


UNIV TIME

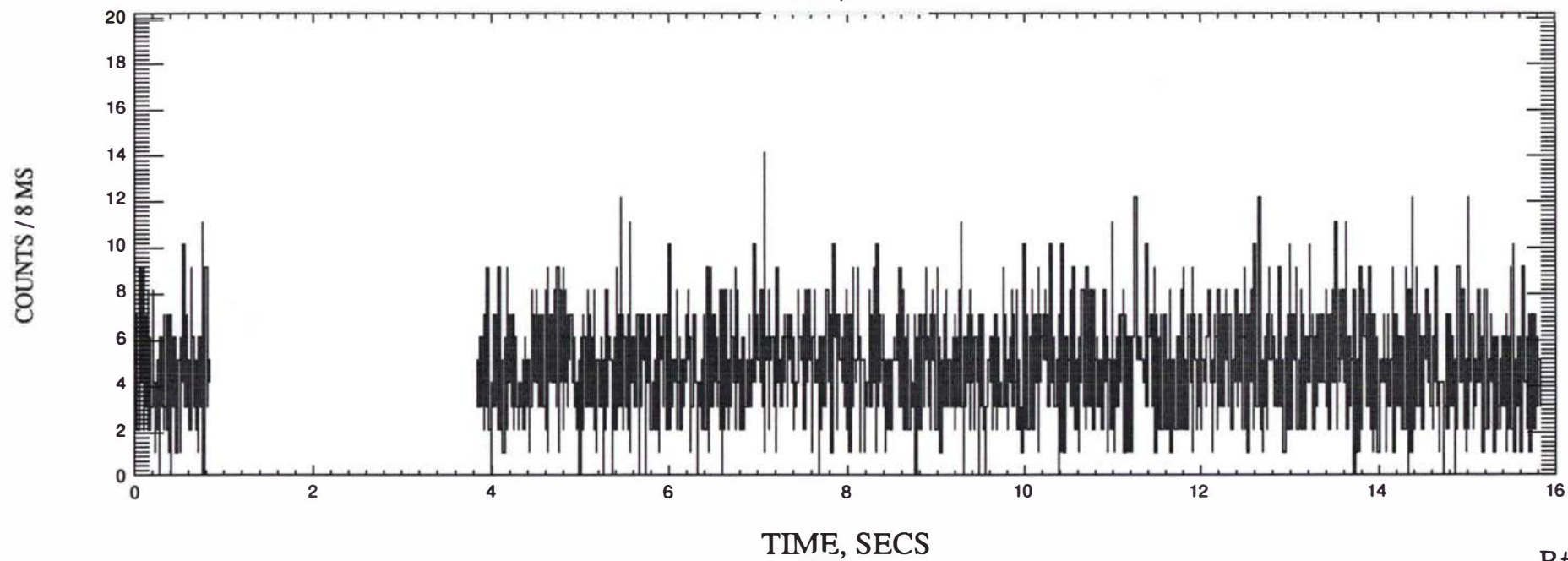
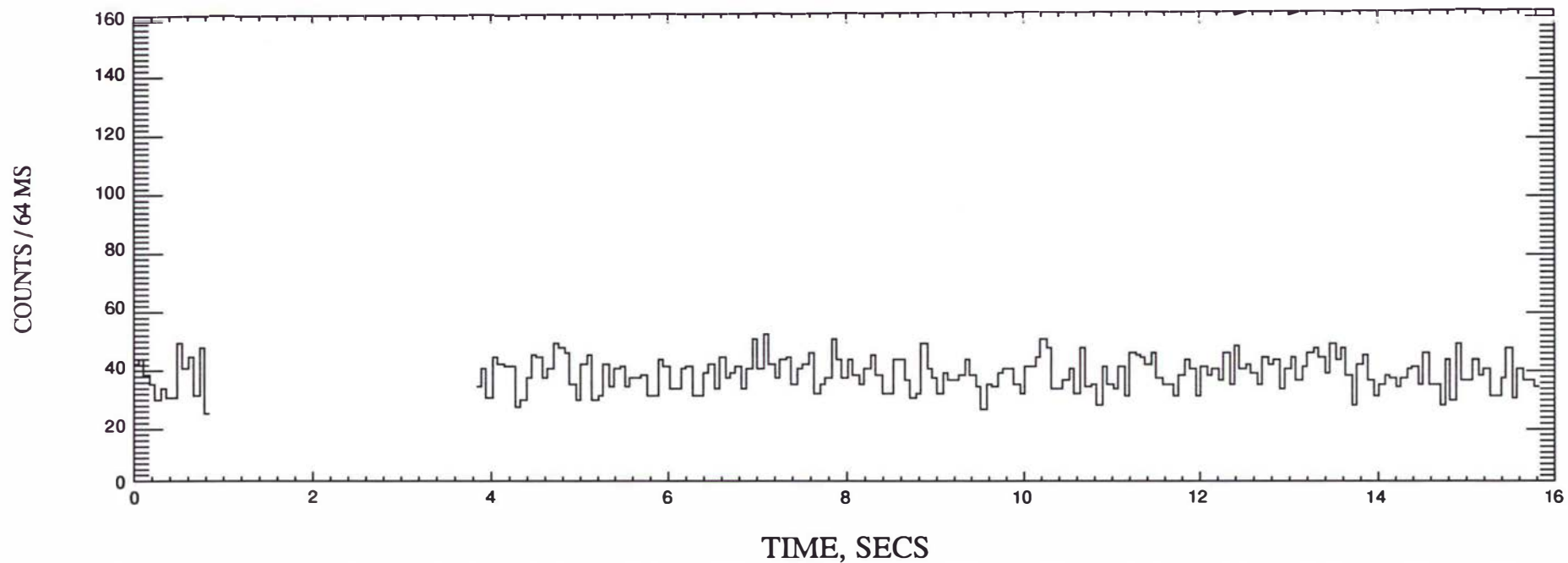
Burst Counter 15 at UT= 0.279042985704 h= 1004.555 s 00:16:44.555



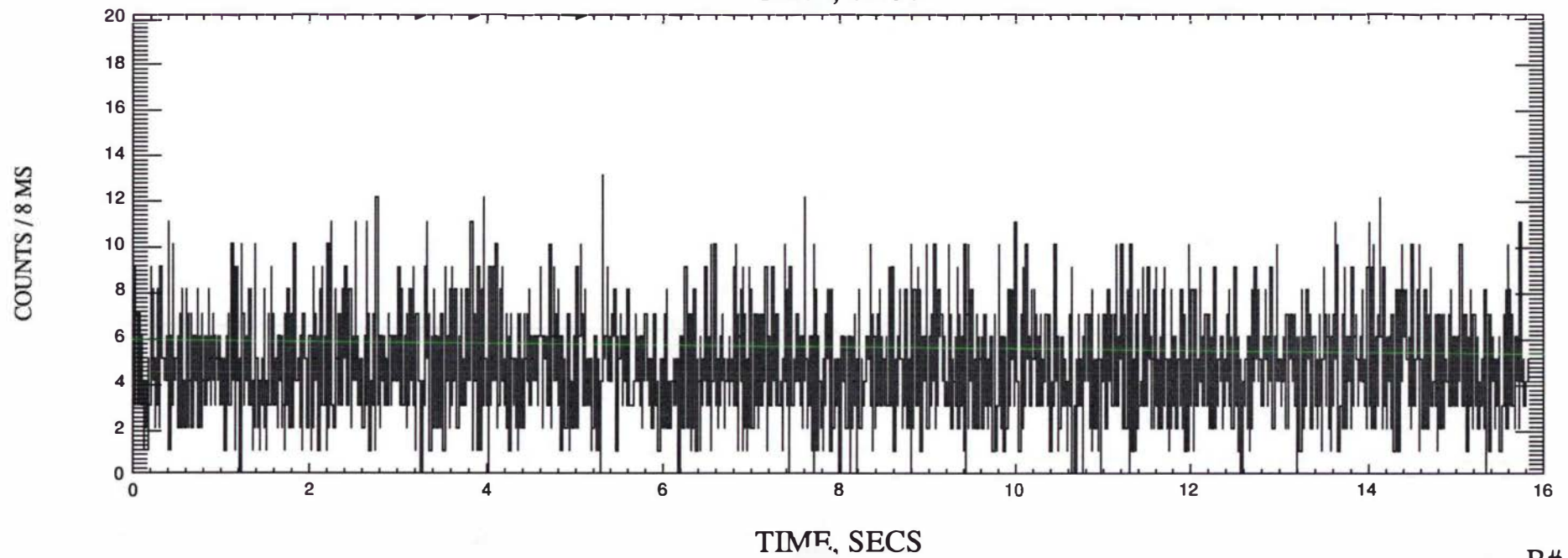
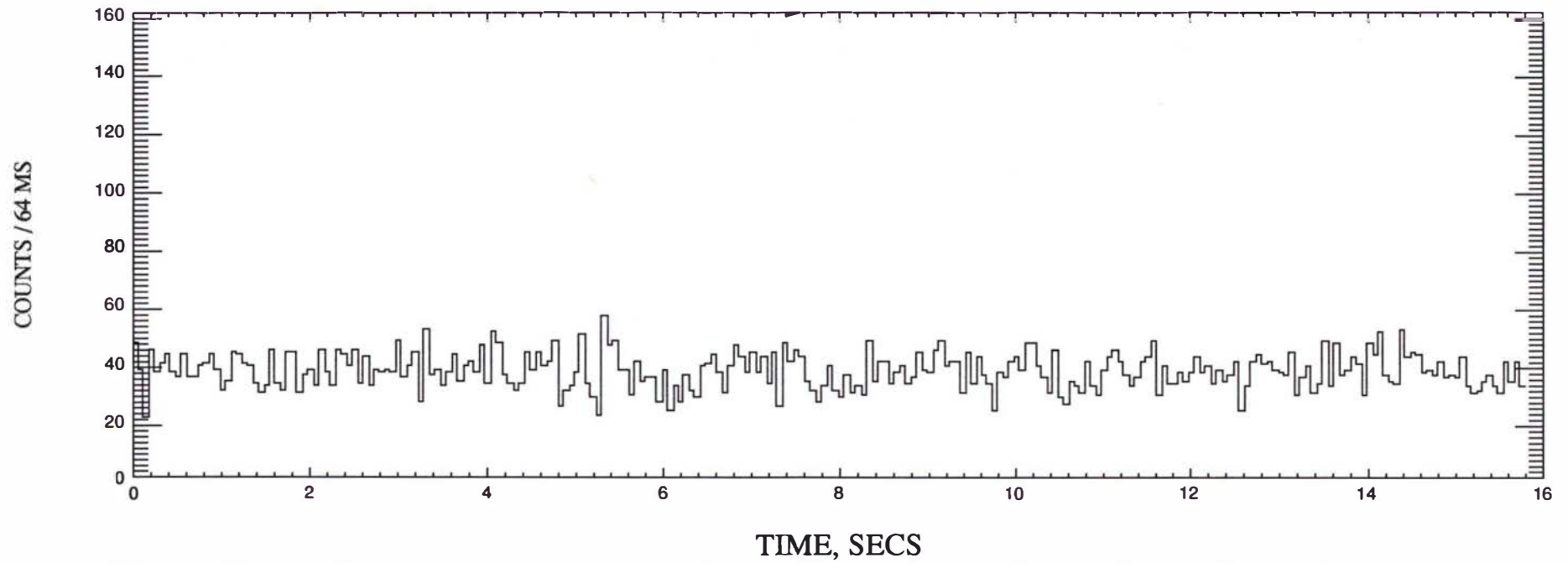
Burst Counter 0 at UT= 0.981015743679 h= 3531.657 s 00:58:51.657



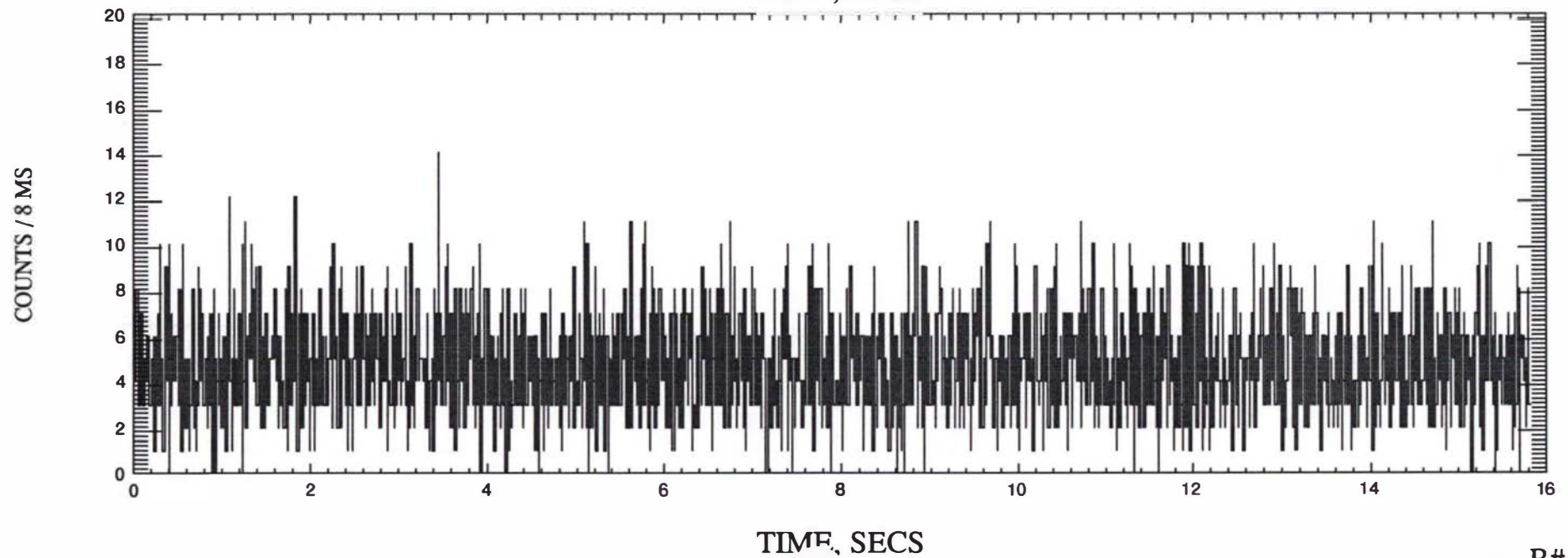
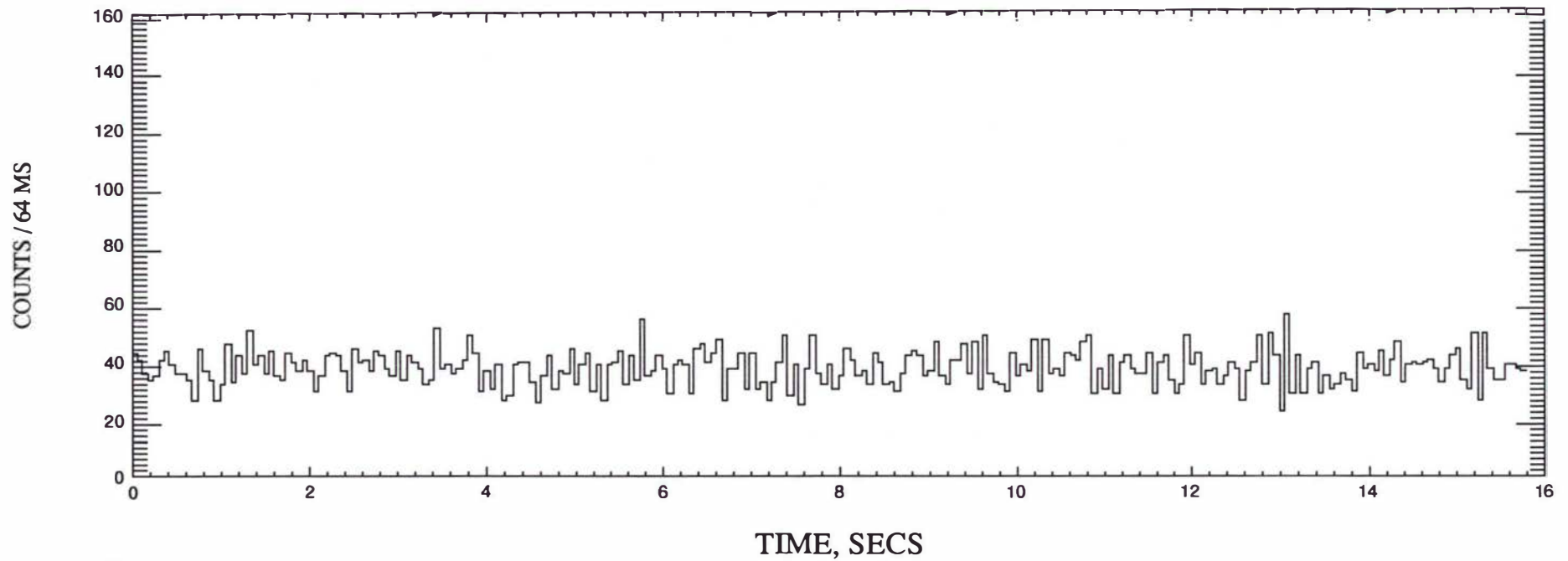
Burst Counter 1 at UT= 1.682691192627 h= 6057.688 s 01:40:57.688



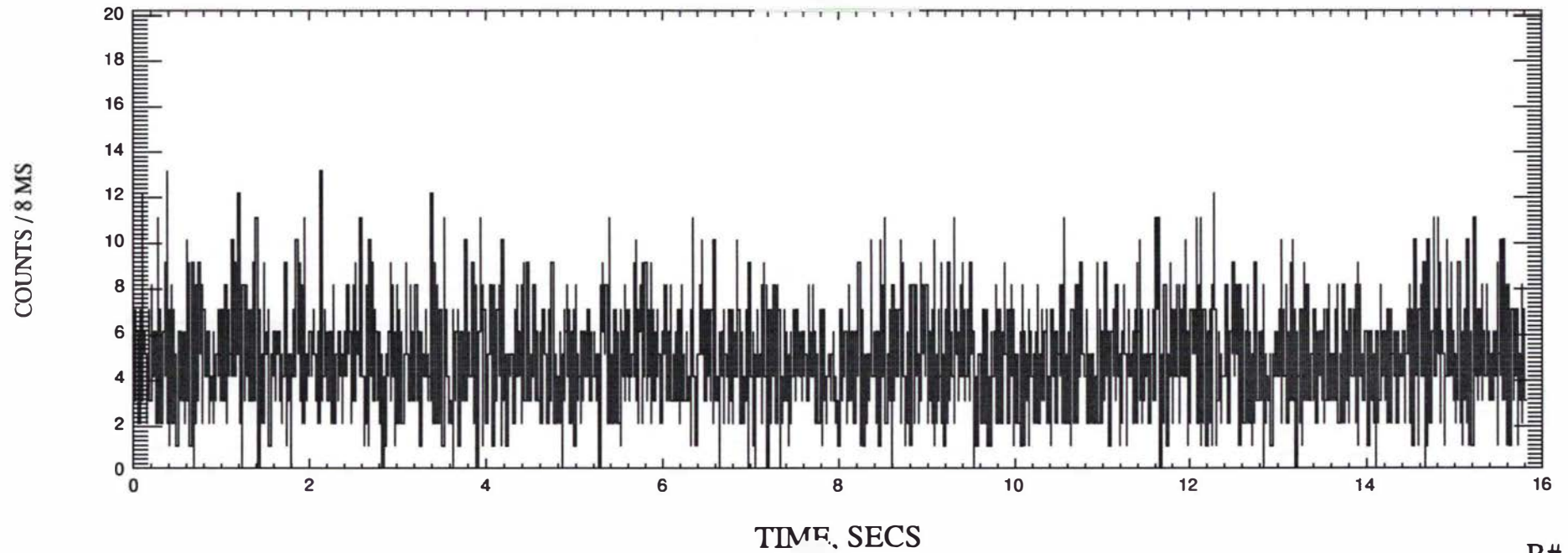
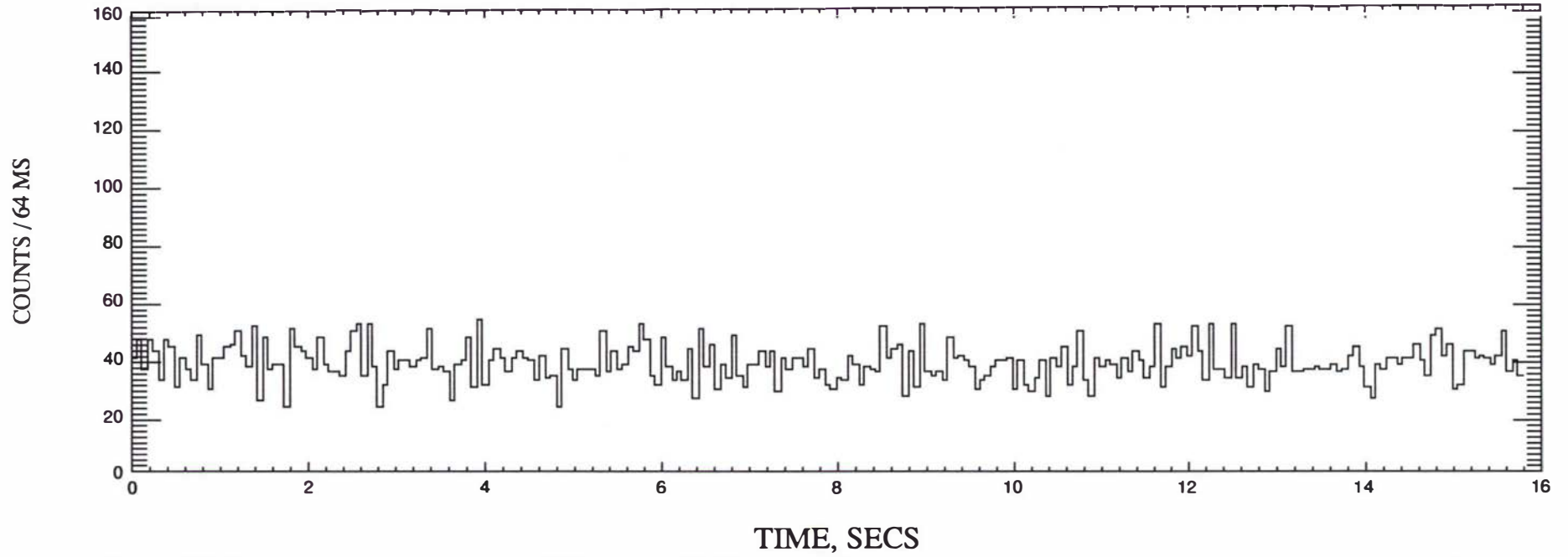
Burst Counter 2 at UT= 2.945218501621 h=10602.787 s 02:56:42.787



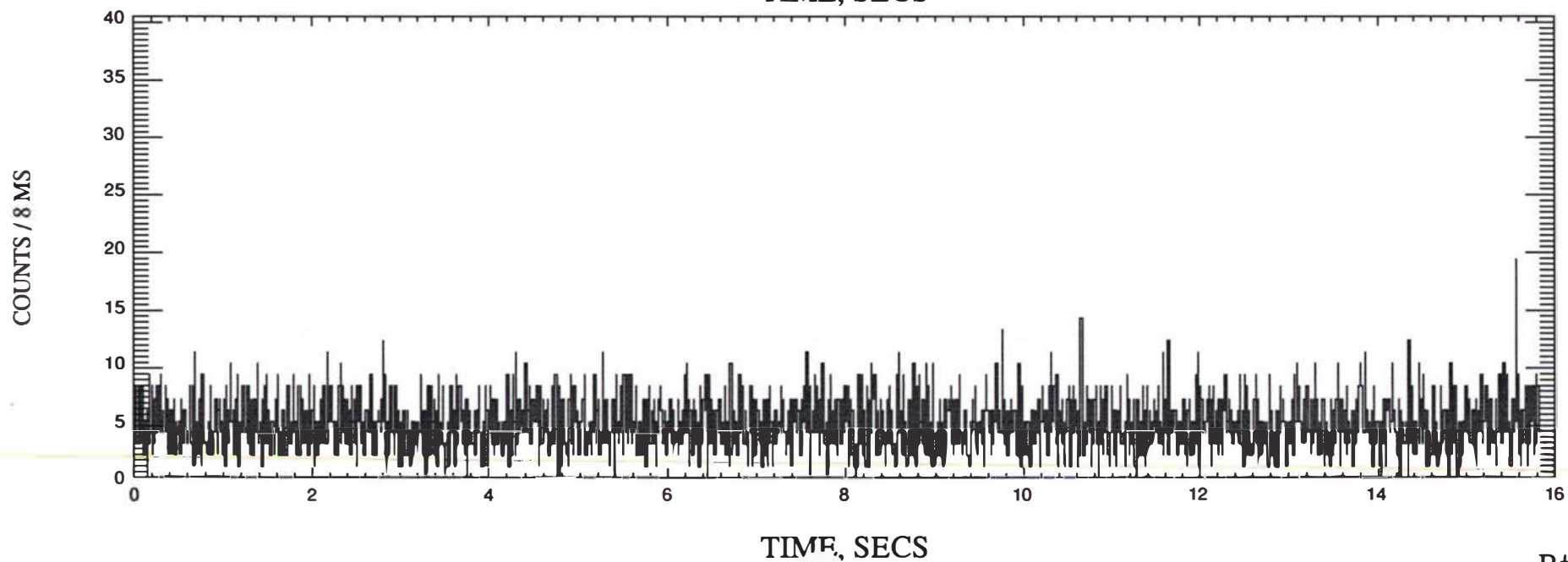
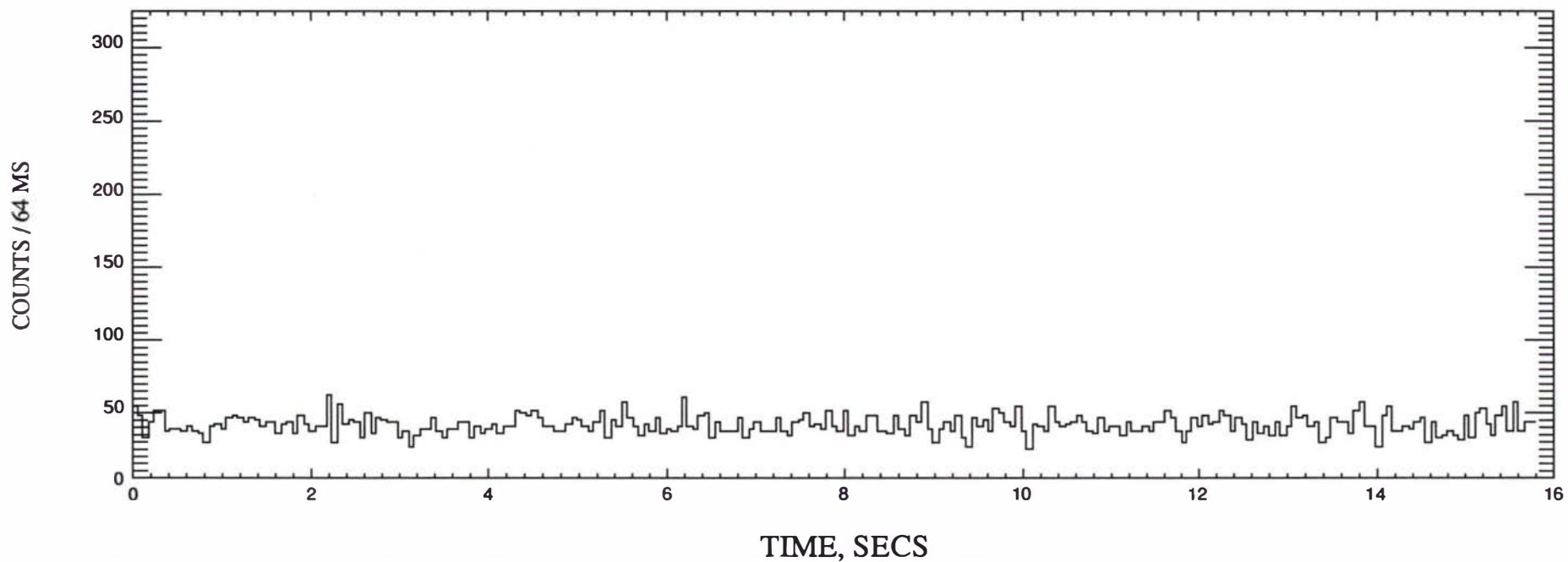
Burst Counter 3 at UT= 4.207177433438 h=15145.839 s 04:12:25.839



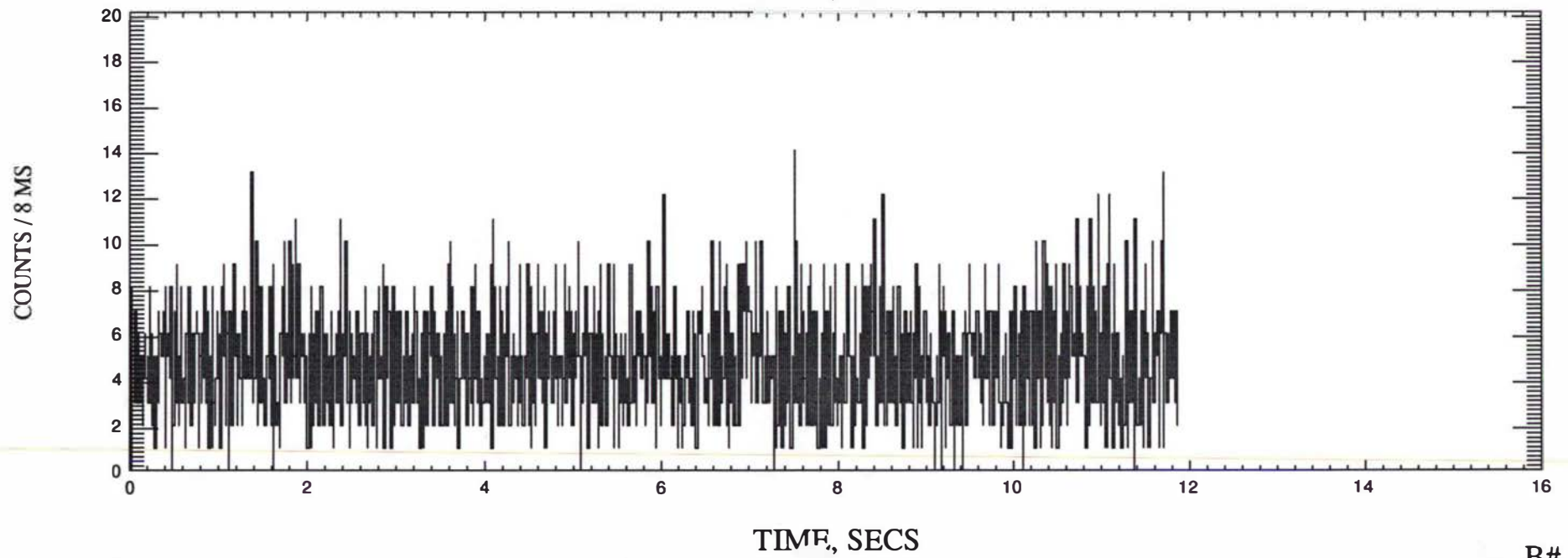
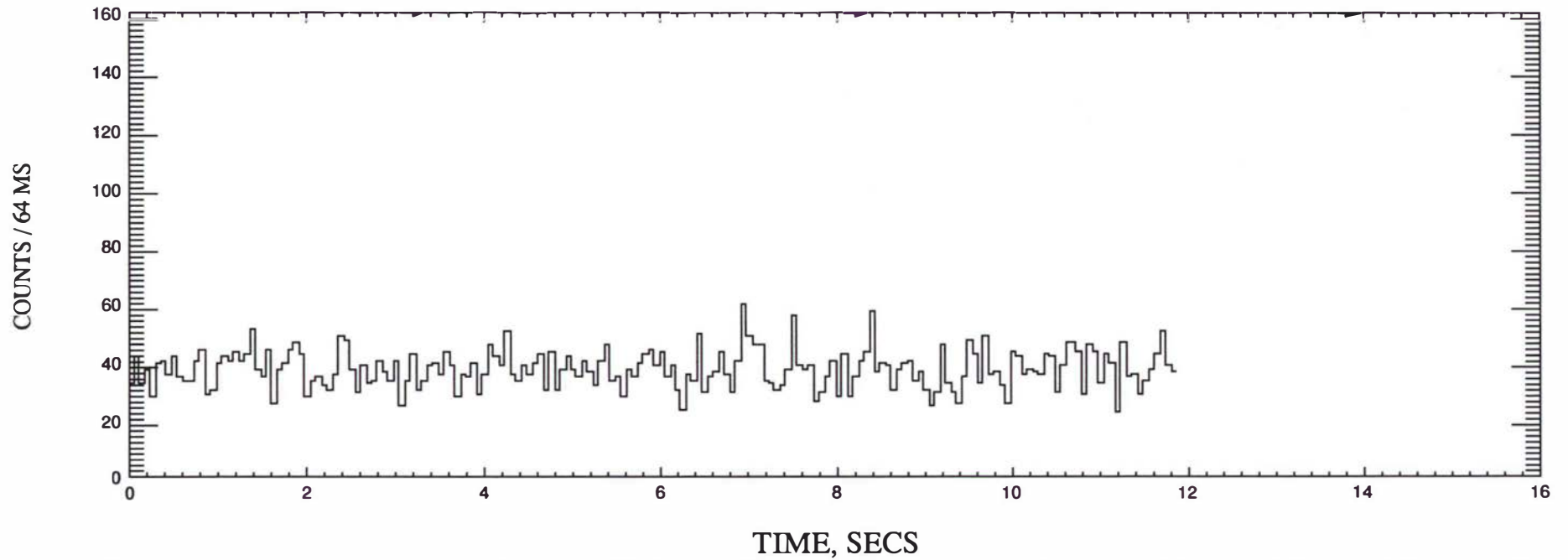
Burst Counter 4 at UT= 5.469694544474 h=19690.900 s 05:28:10.900



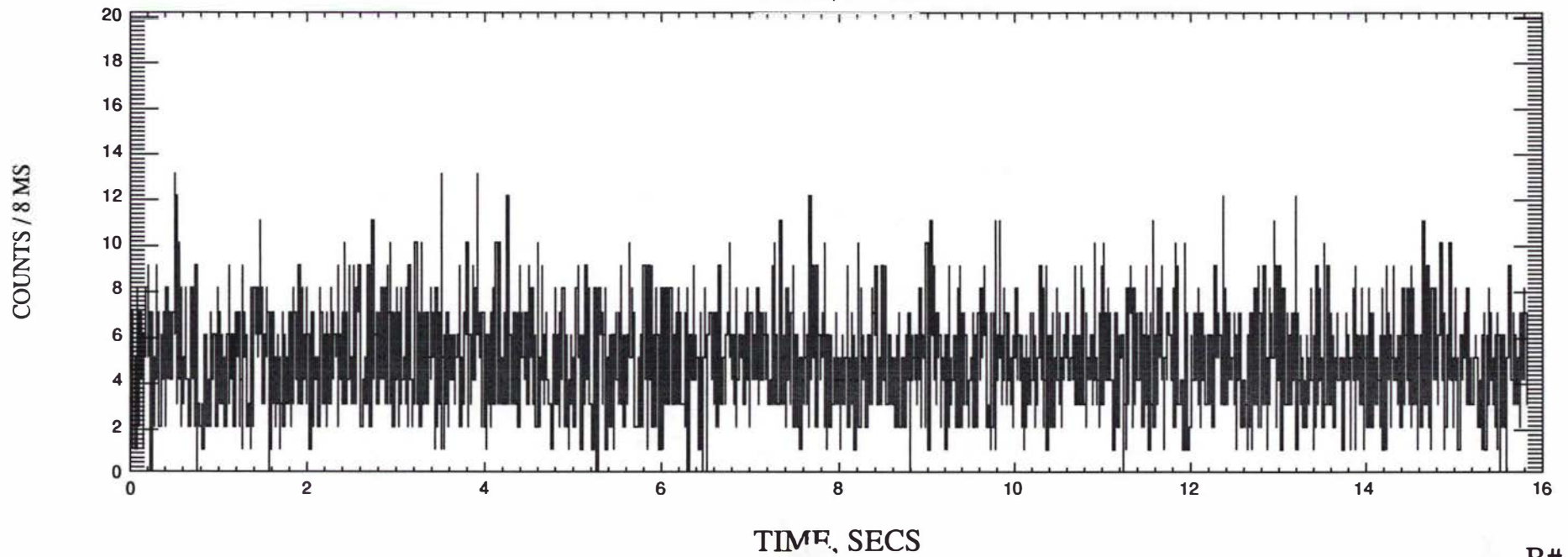
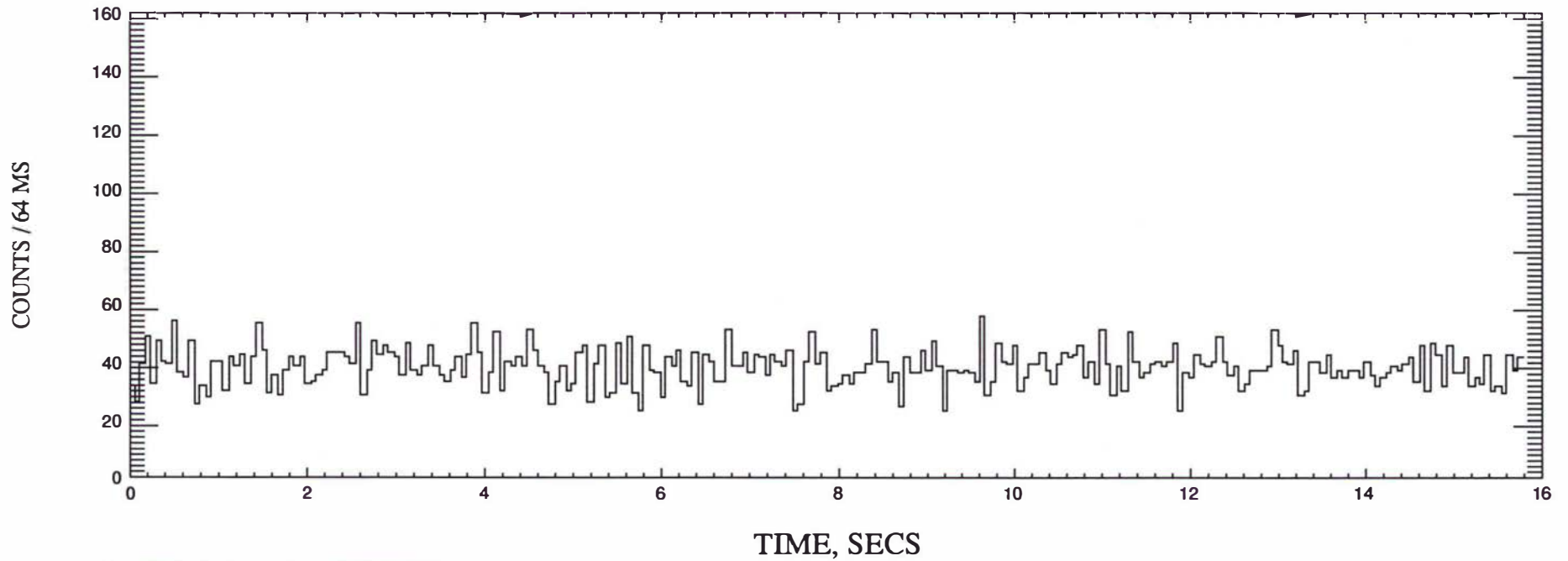
Burst Counter 5 at UT= 6.732218165927 h=24235.985 s 06:43:55.985



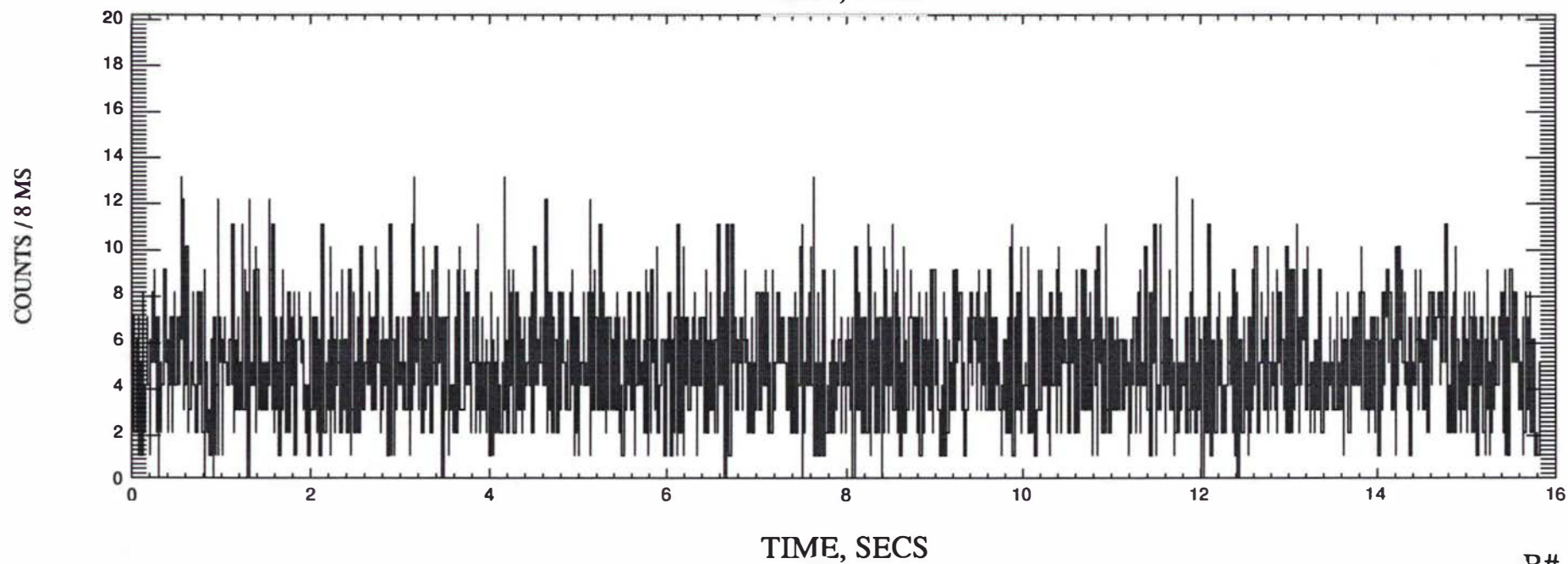
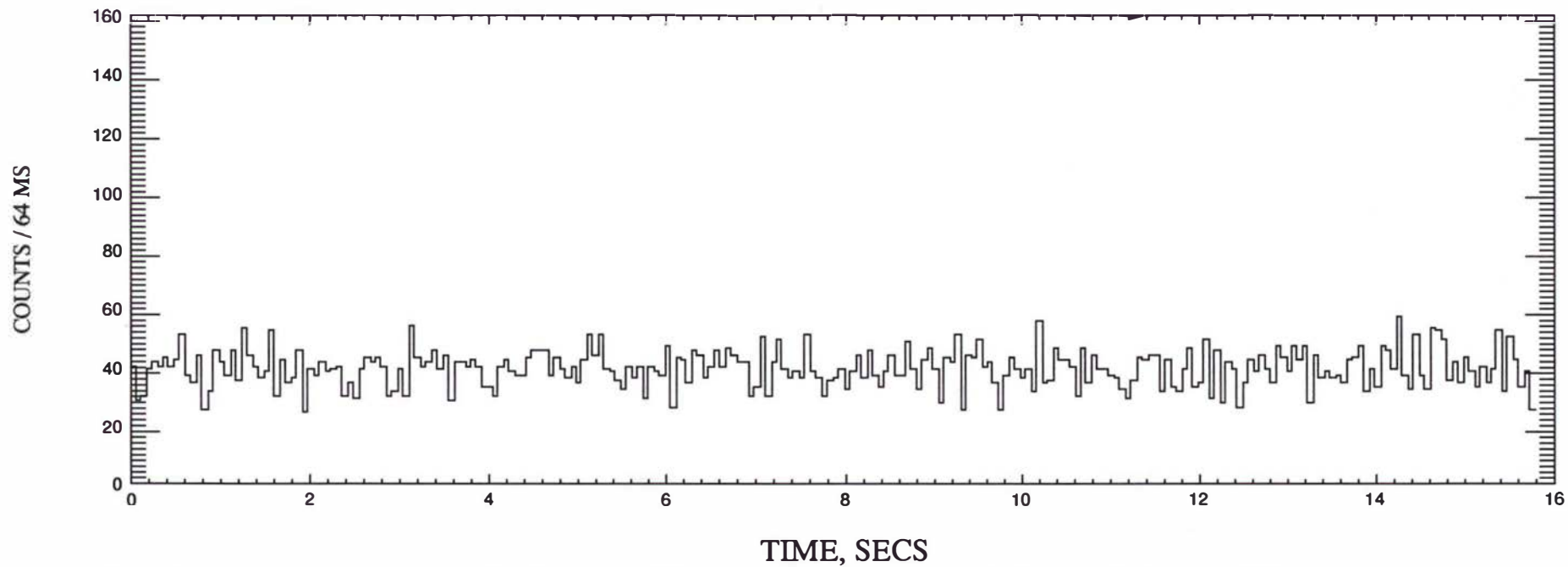
Burst Counter 6 at UT= 7.994188406203 h=28779.078 s 07:59:39.078



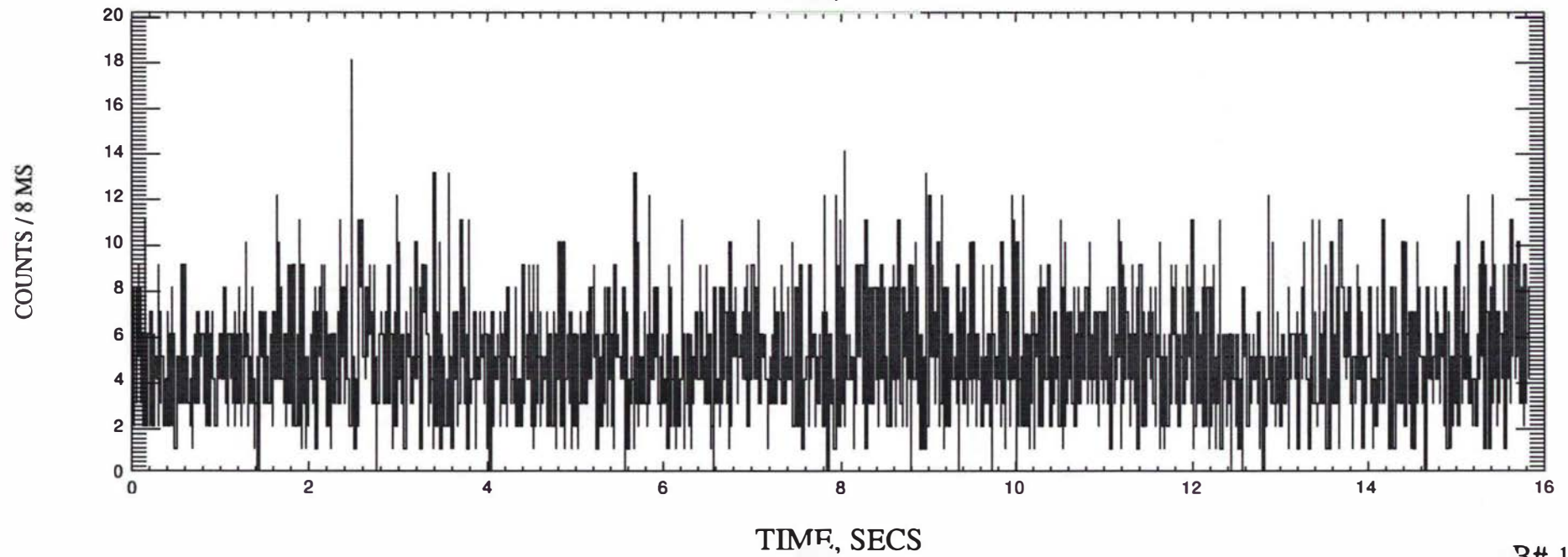
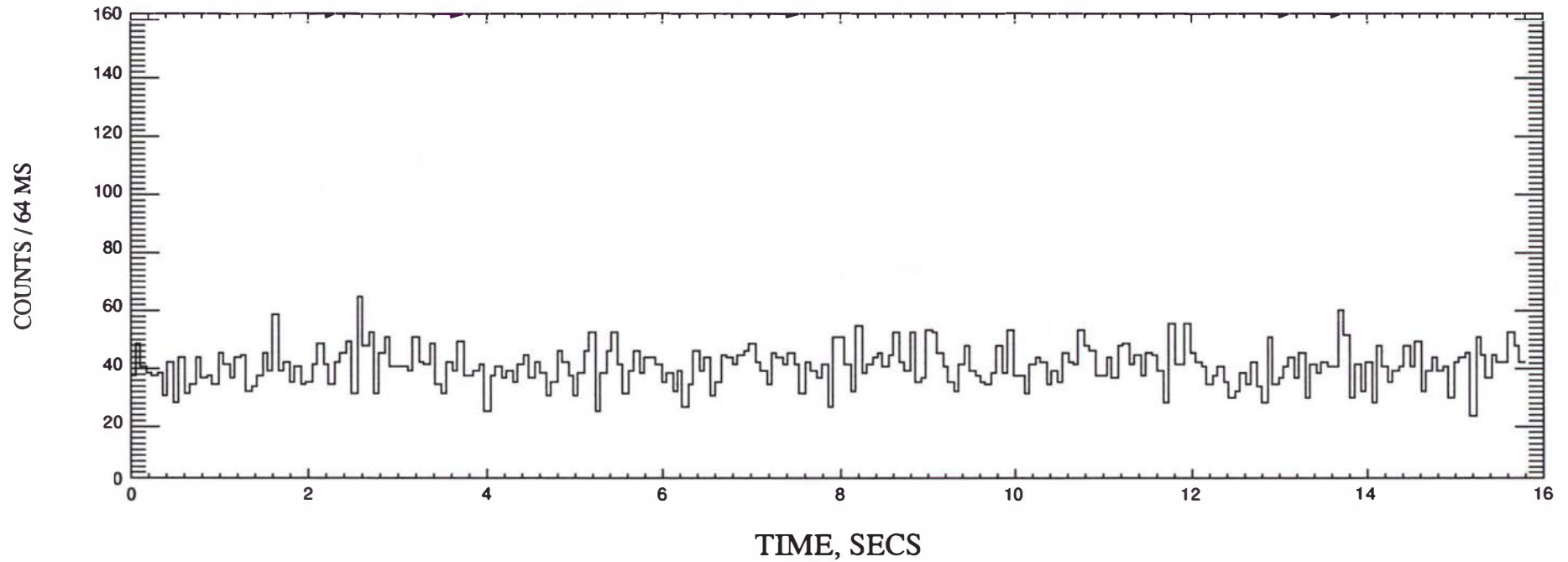
Burst Counter 7 at UT= 9.256162982517 h=33322.187 s 09:15:22.187



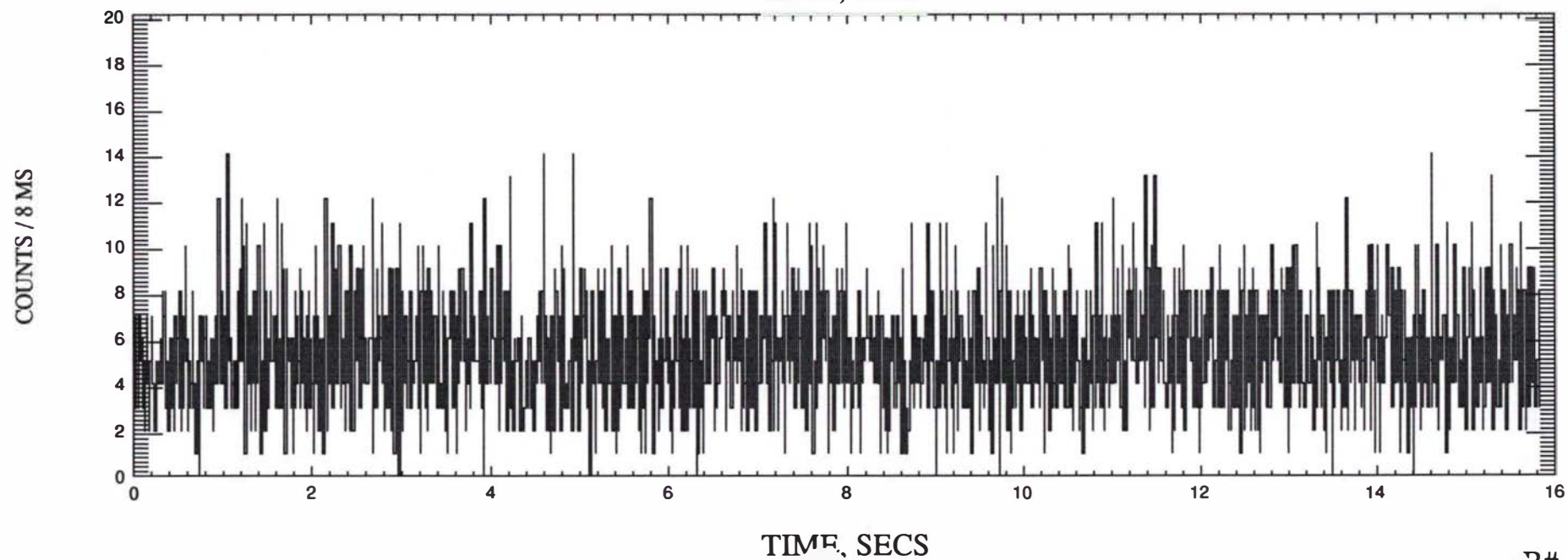
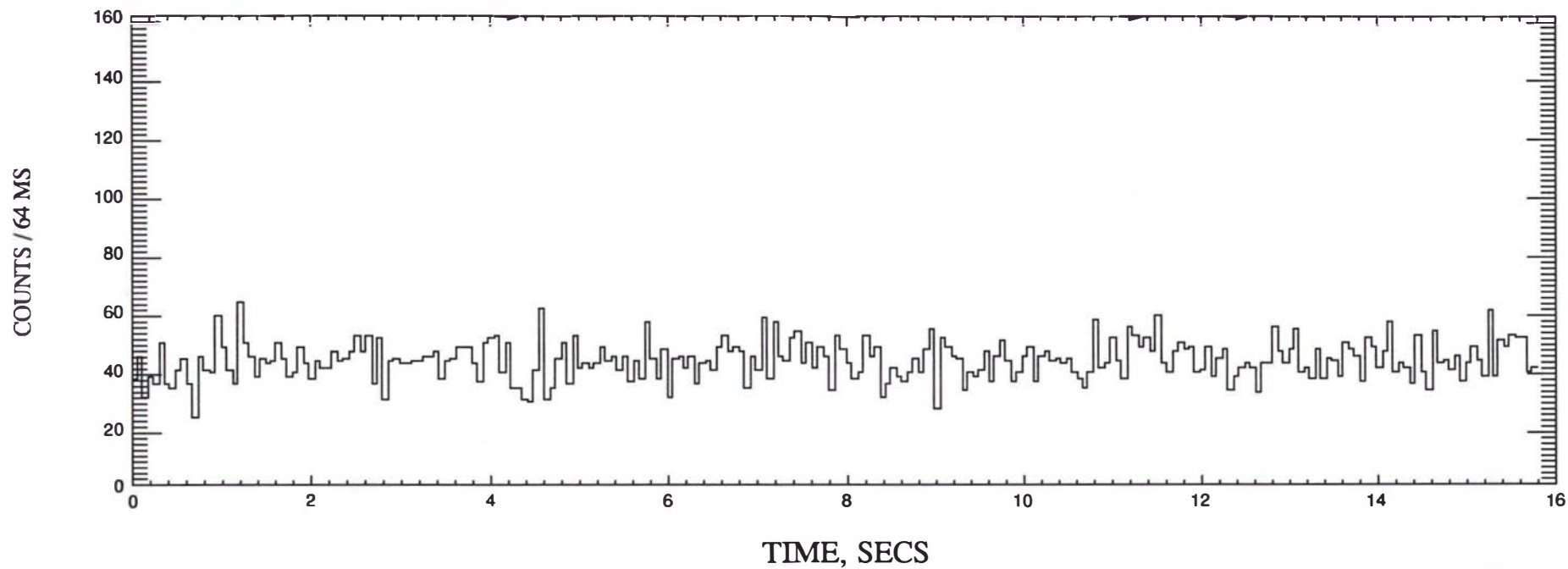
Burst Counter 8 at UT=10.518393635220 h=37866.217 s 10:31:06.217



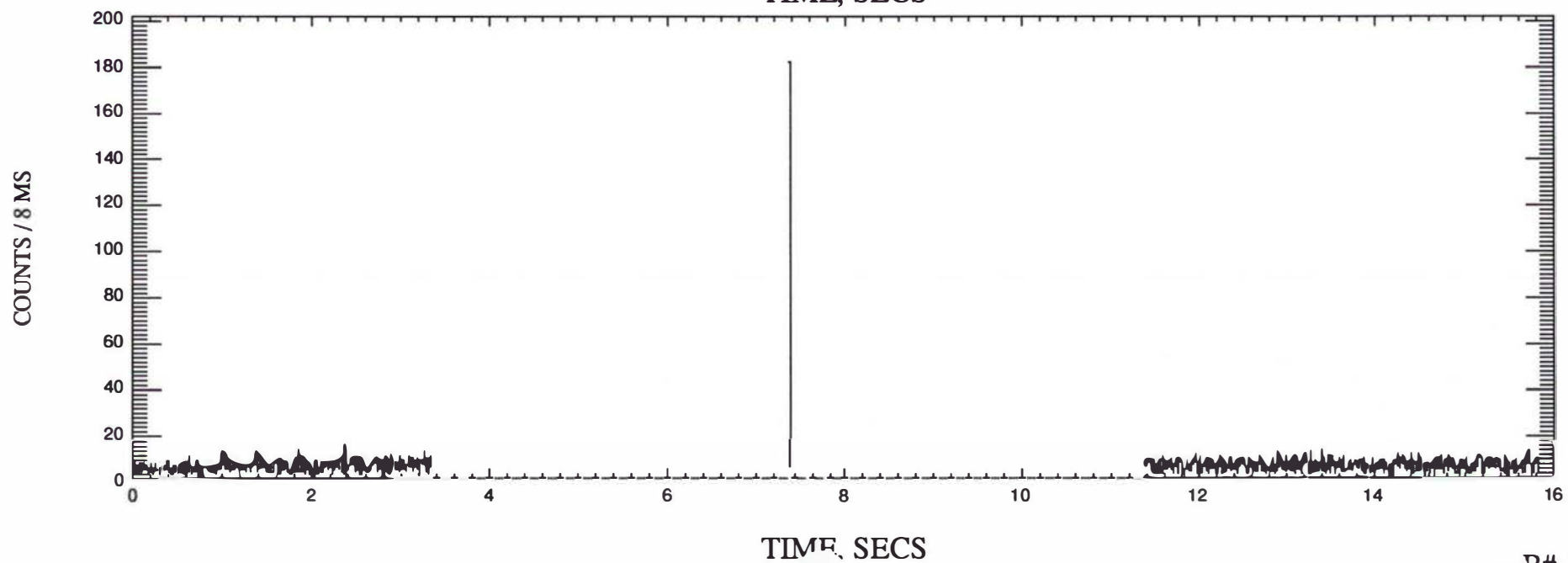
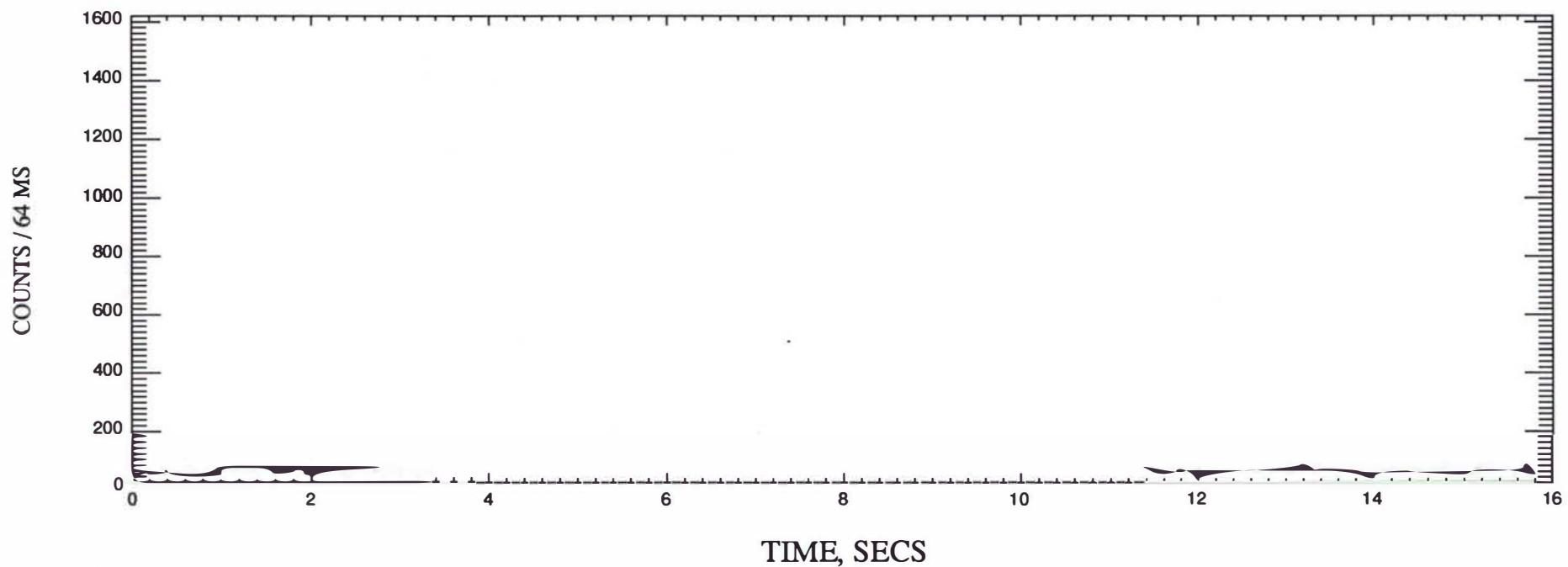
Burst Counter 9 at UT=11.780928764343 h=42411.344 s 11:46:51.344



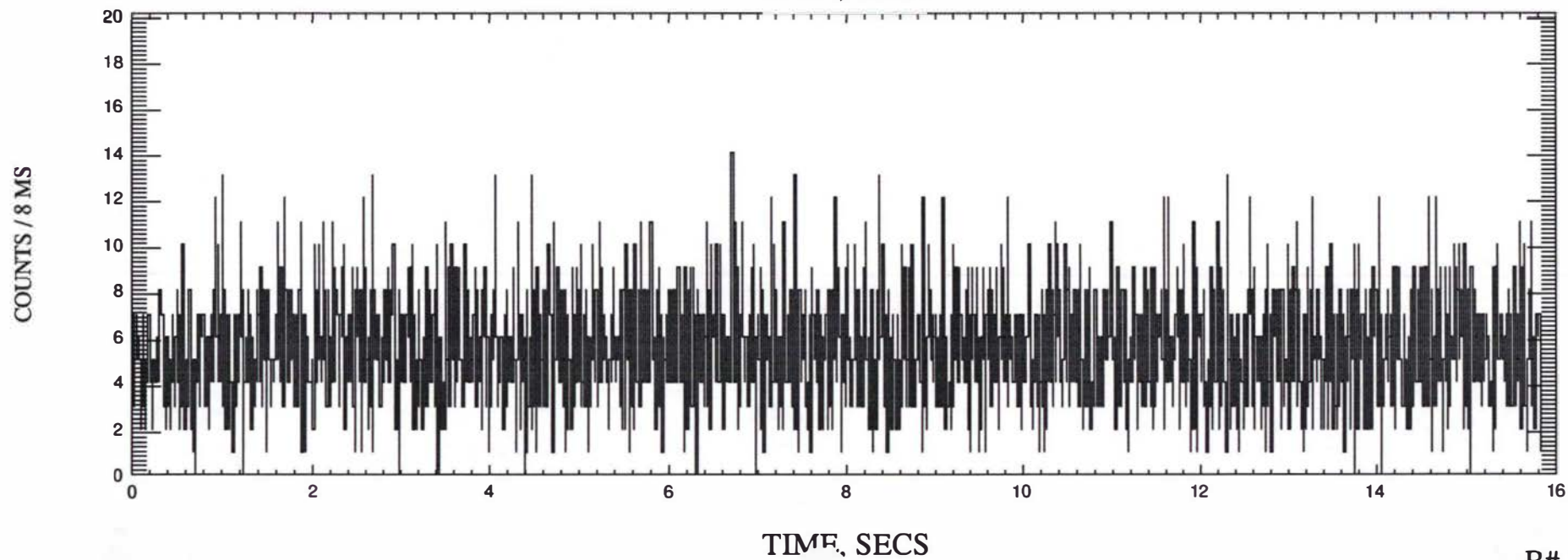
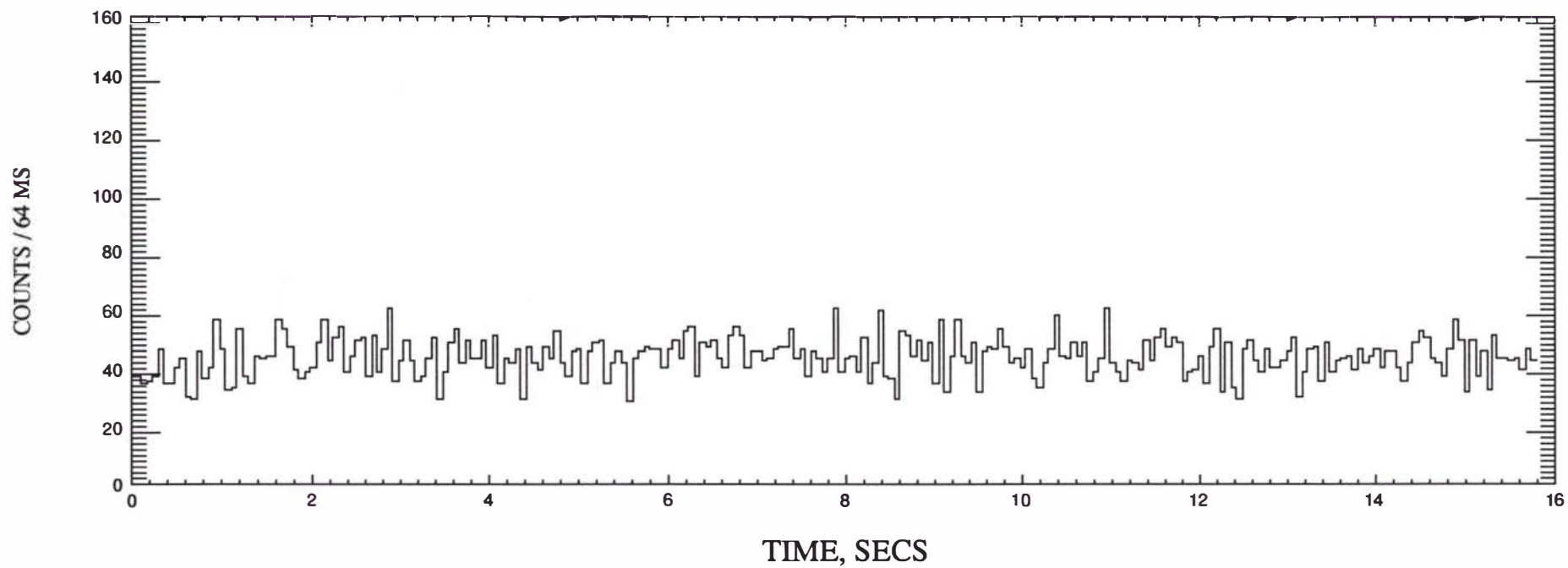
Burst Counter 10 at UT=13.042857767741 h=46954.288 s 13:02:34.288



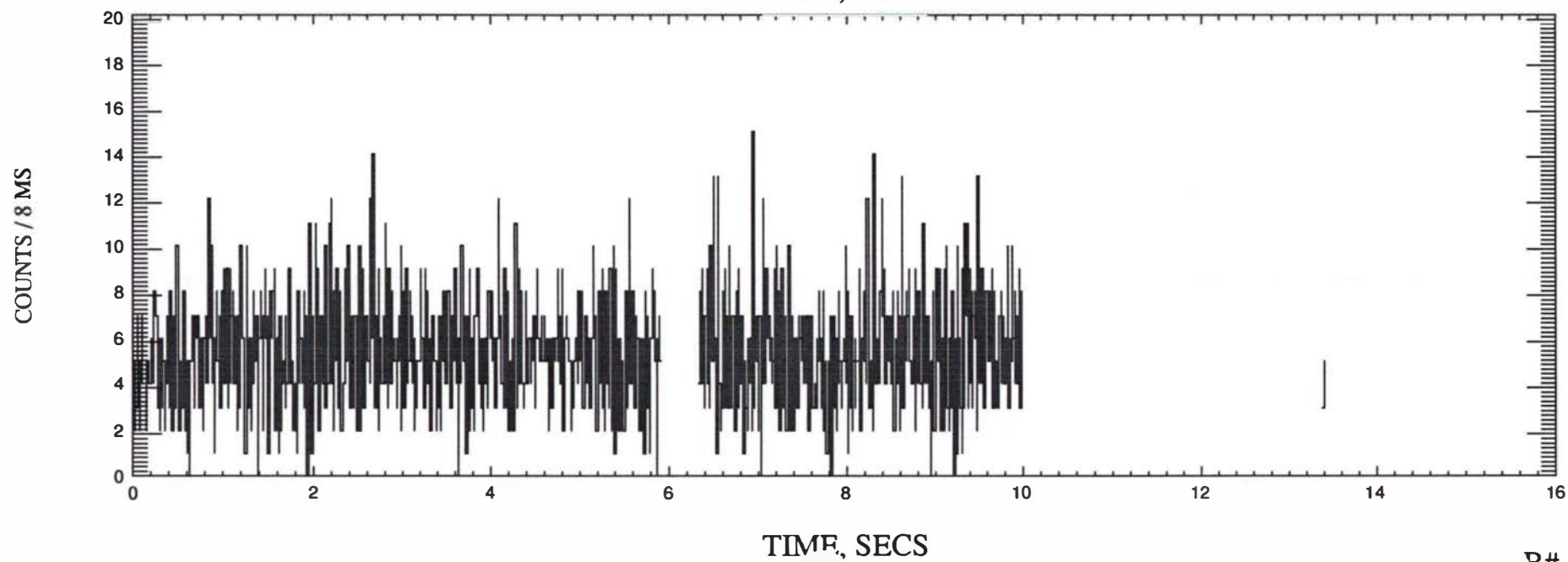
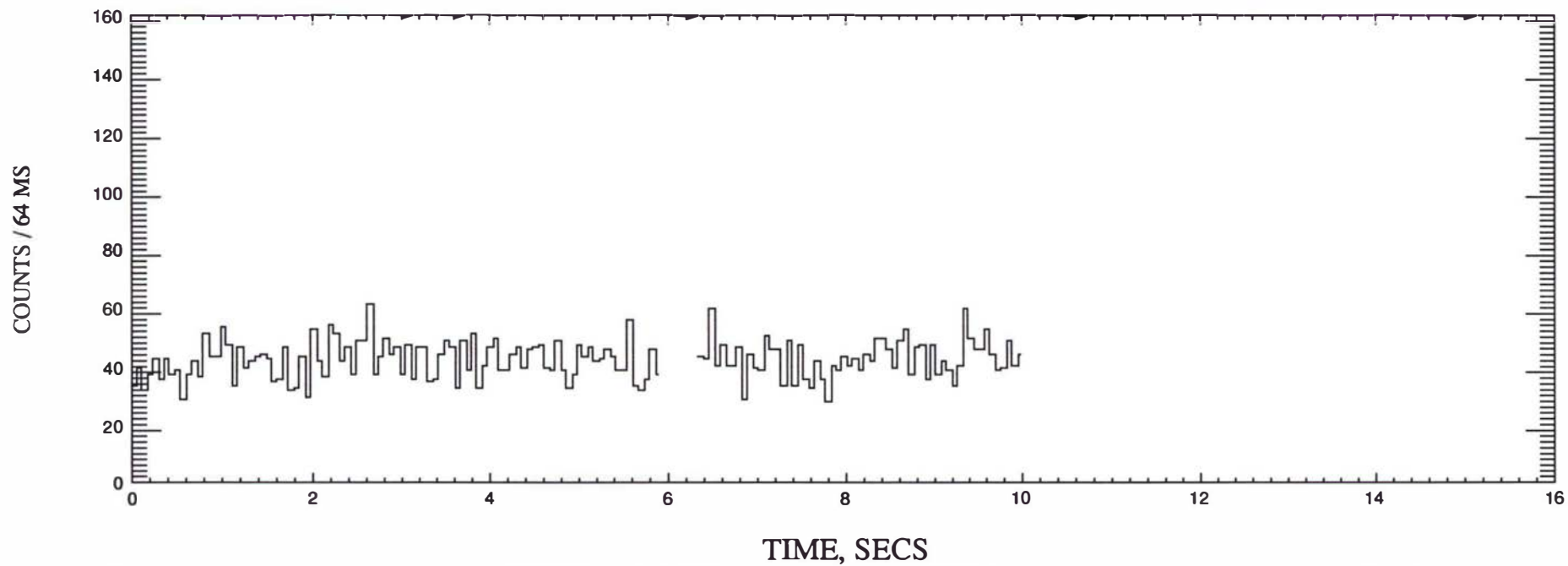
Burst Counter 11 at UT=14.305085796780 h=51498.309 s 14:18:18.309



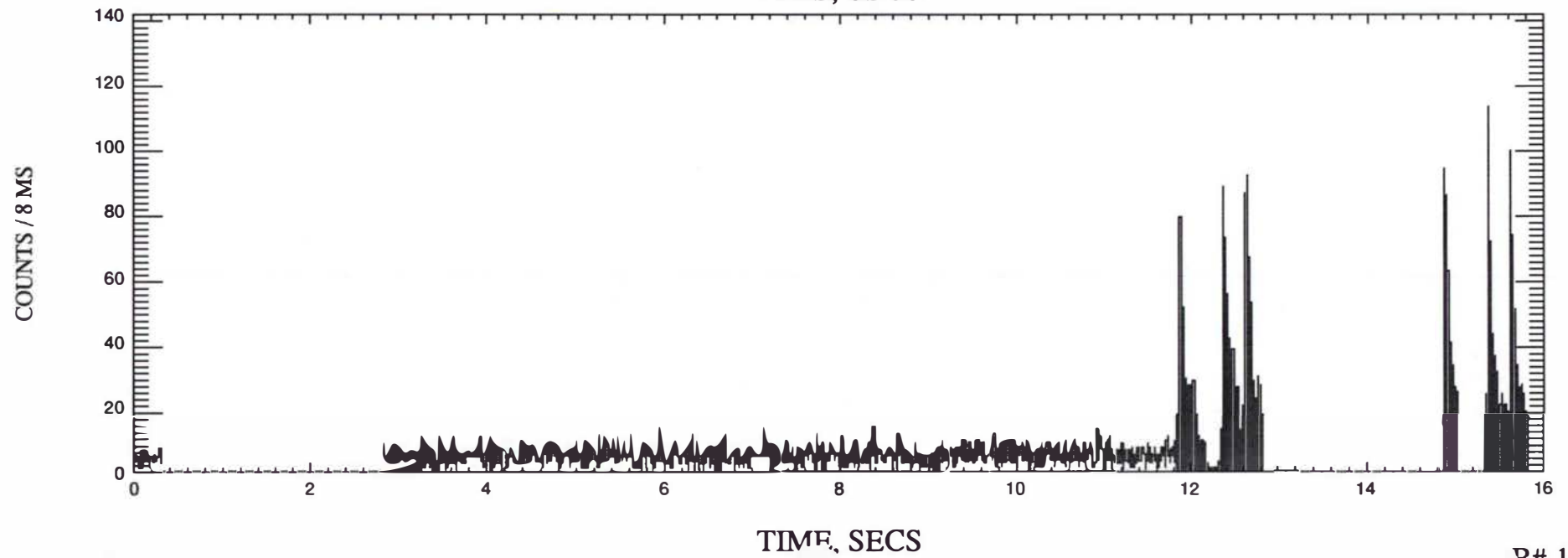
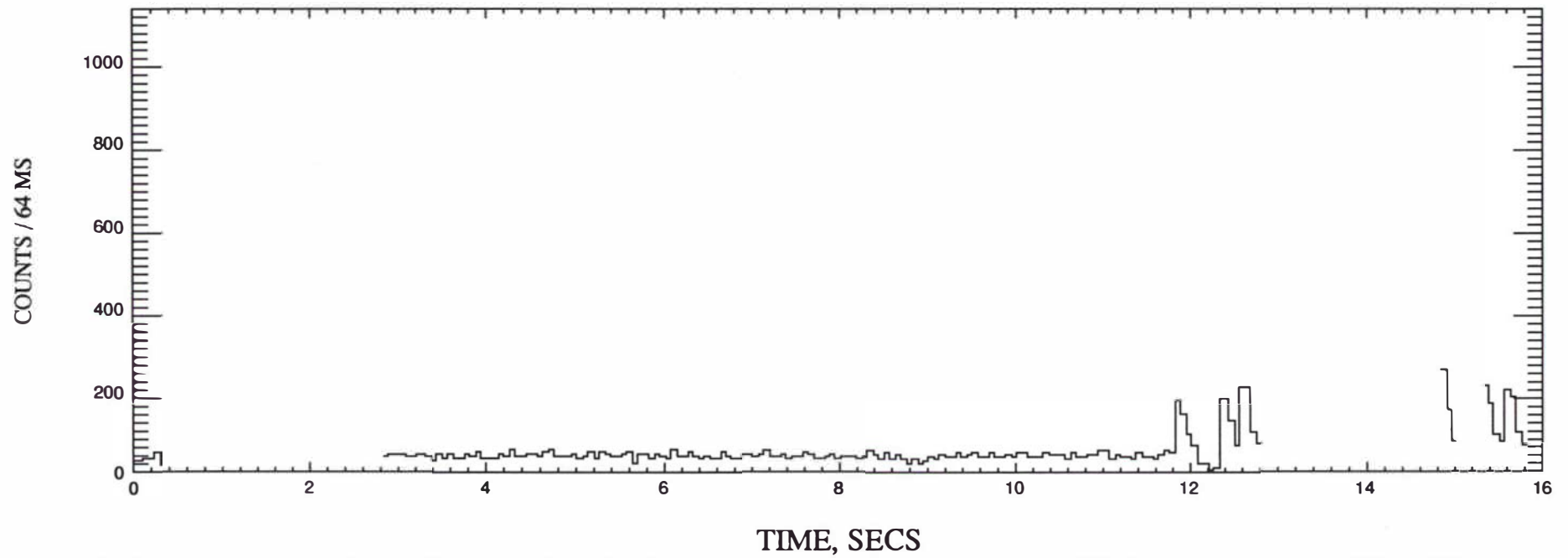
Burst Counter 12 at UT=15.567351171705 h=56042.464 s 15:34:02.464



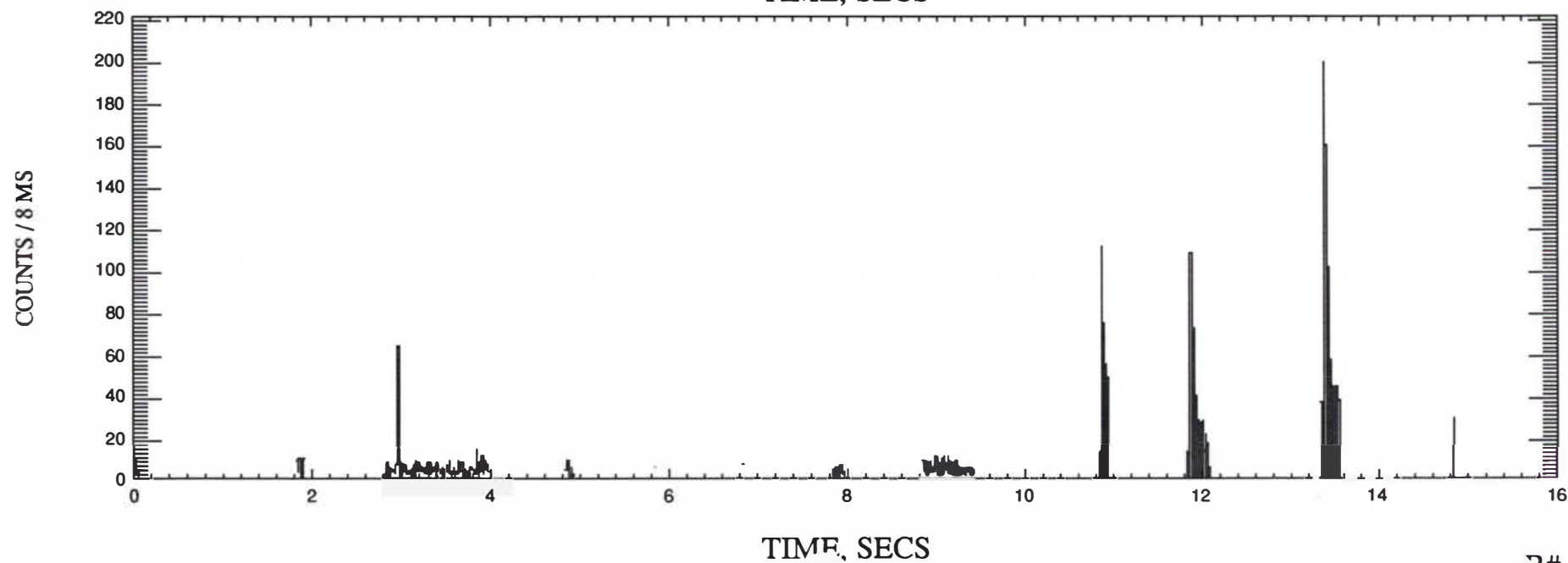
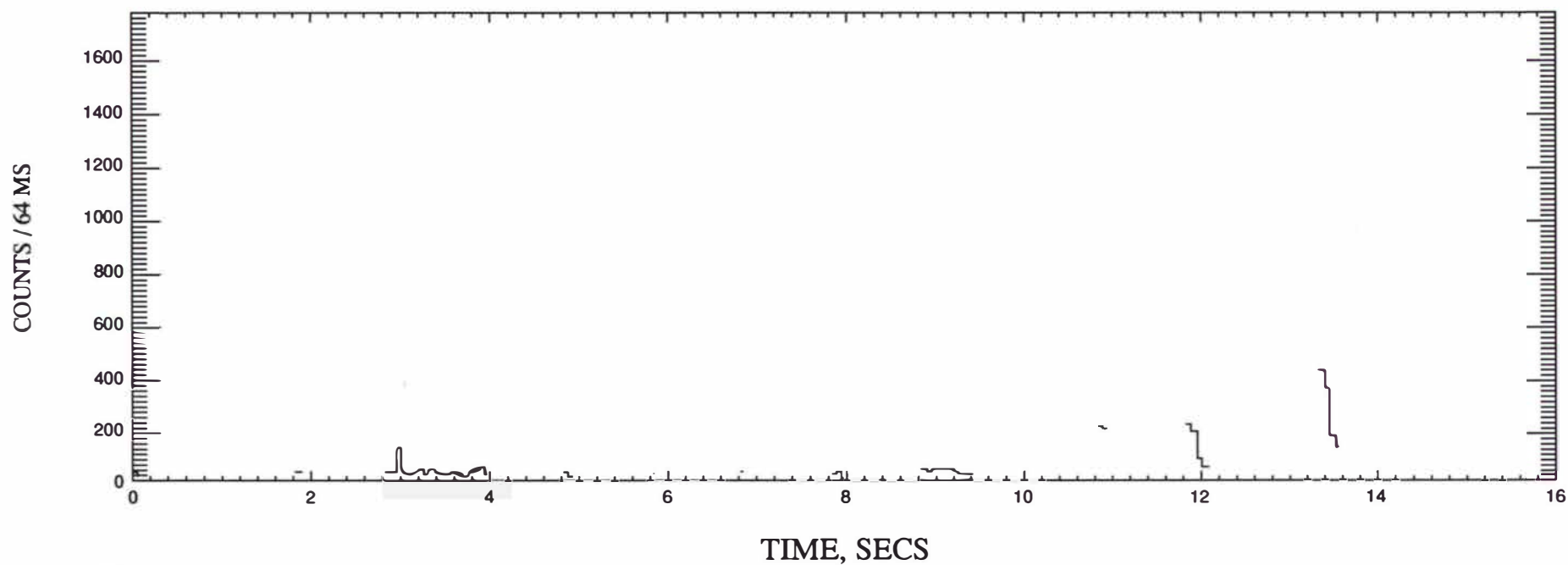
Burst Counter 13 at UT=16.829619373745 h=60586.630 s 16:49:46.630



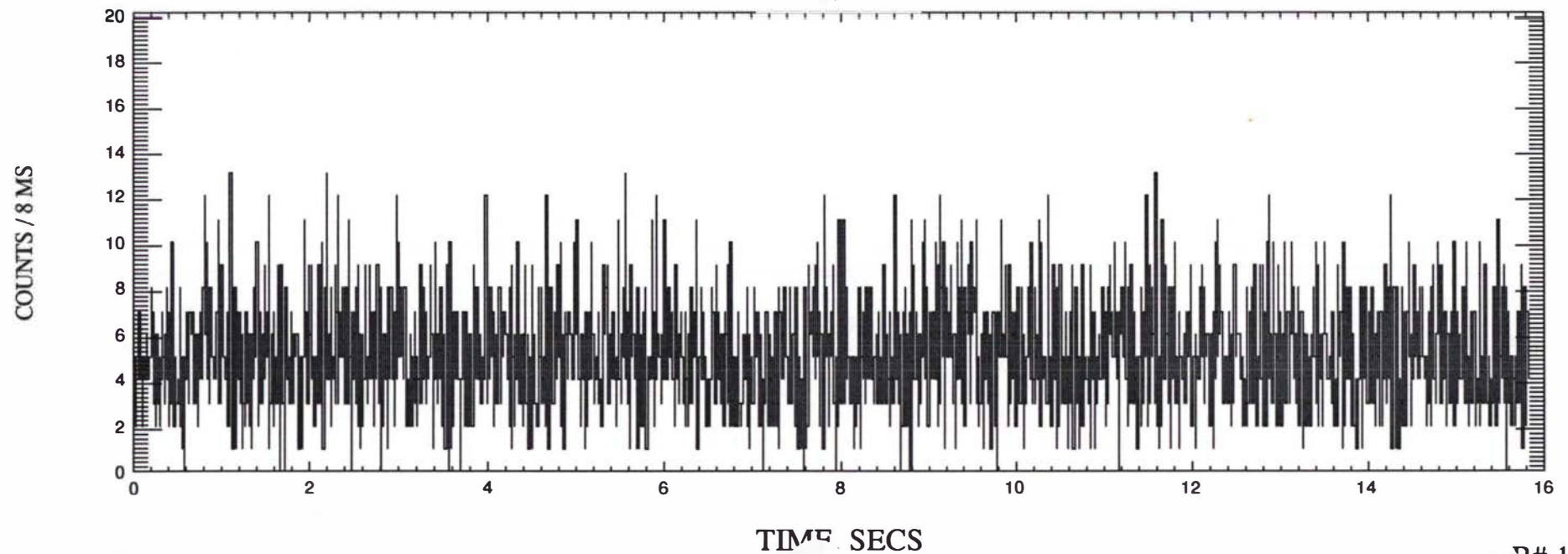
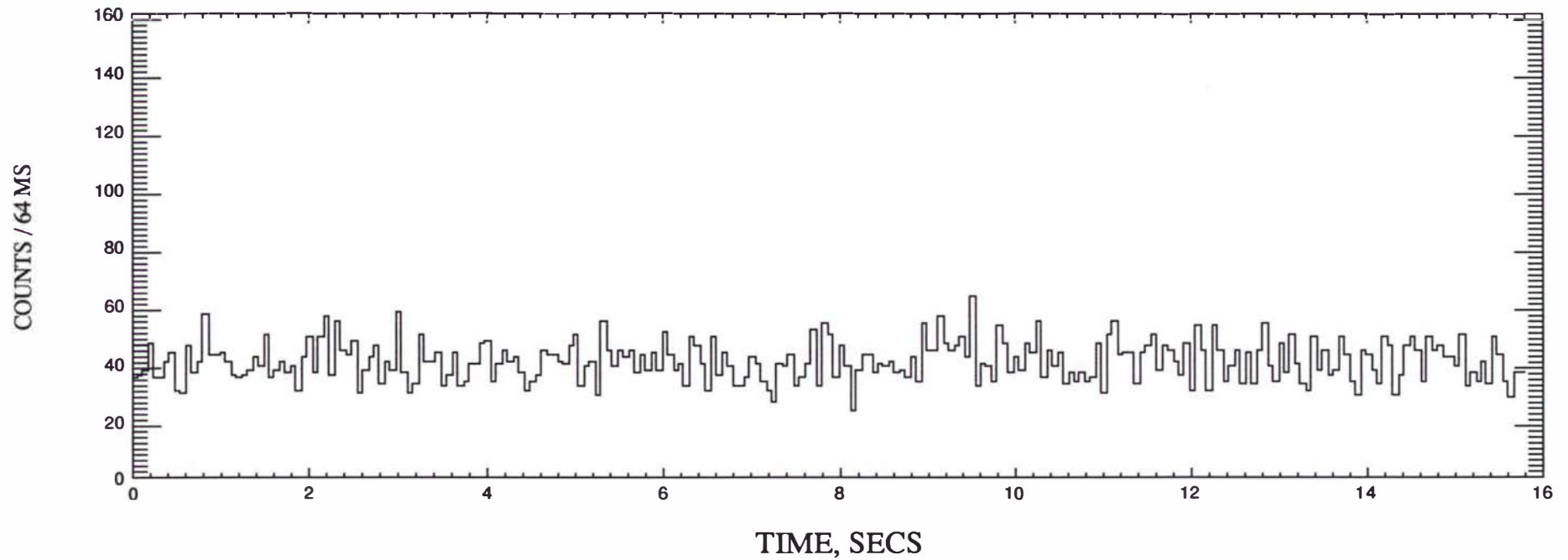
Burst Counter 15 at UT=18.705756276449 h=67340.723 s 18:42:20.723



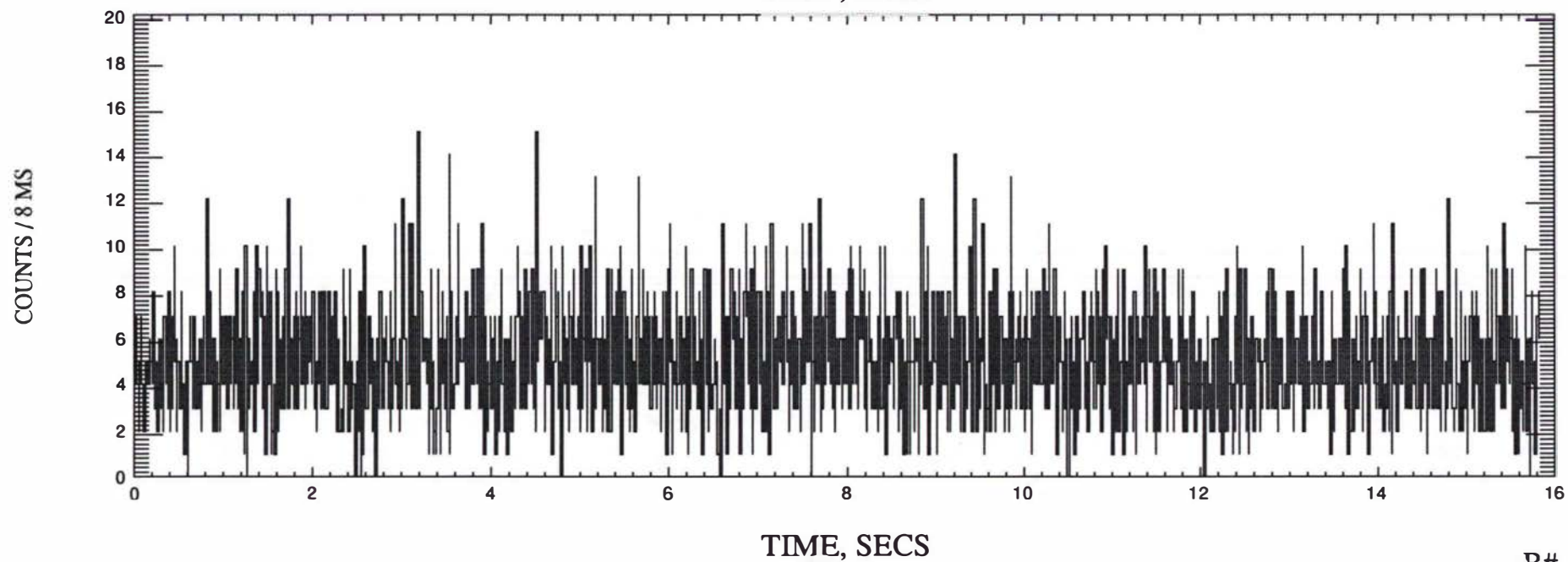
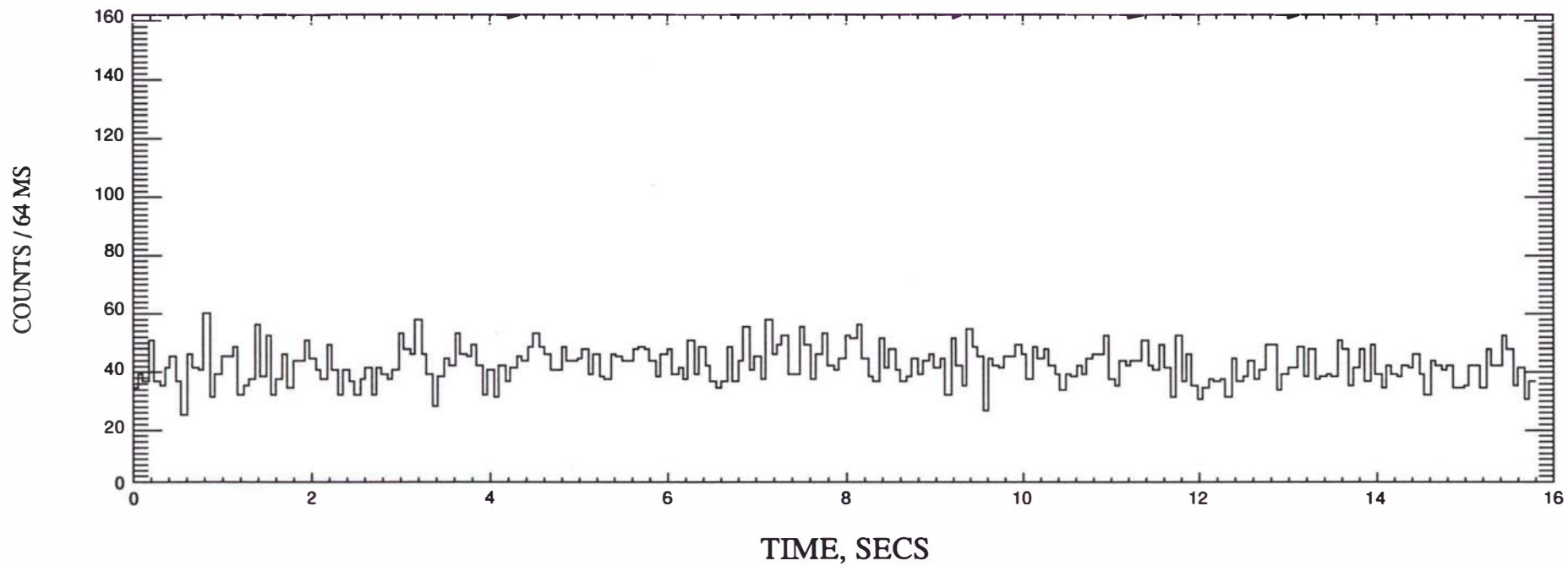
Burst Counter 1 at UT=21.398589884440 h=77034.924 s 21:23:54.924

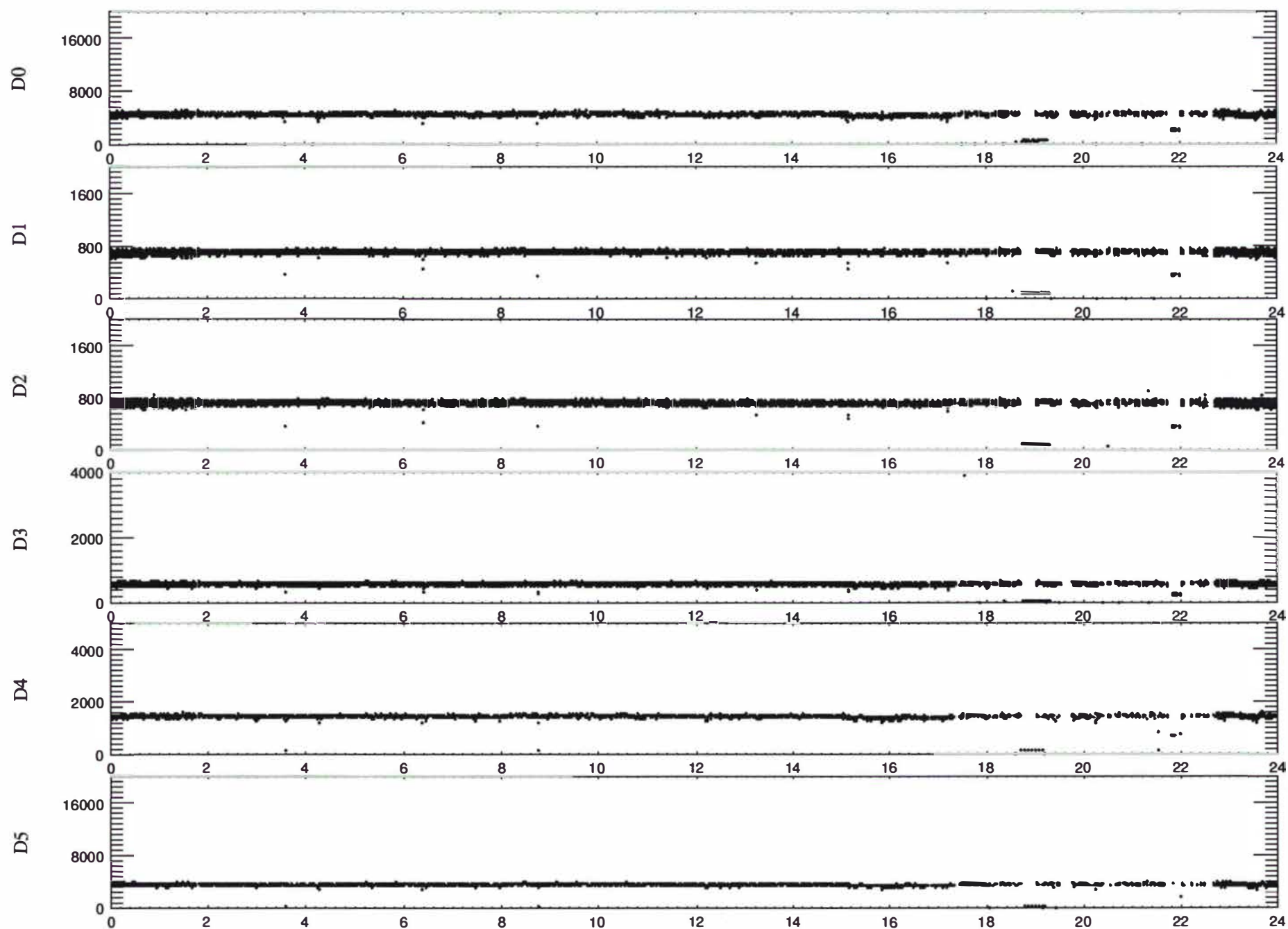


Burst Counter 3 at UT=23.185304751926 h=83467.097 s 23:11:07.097

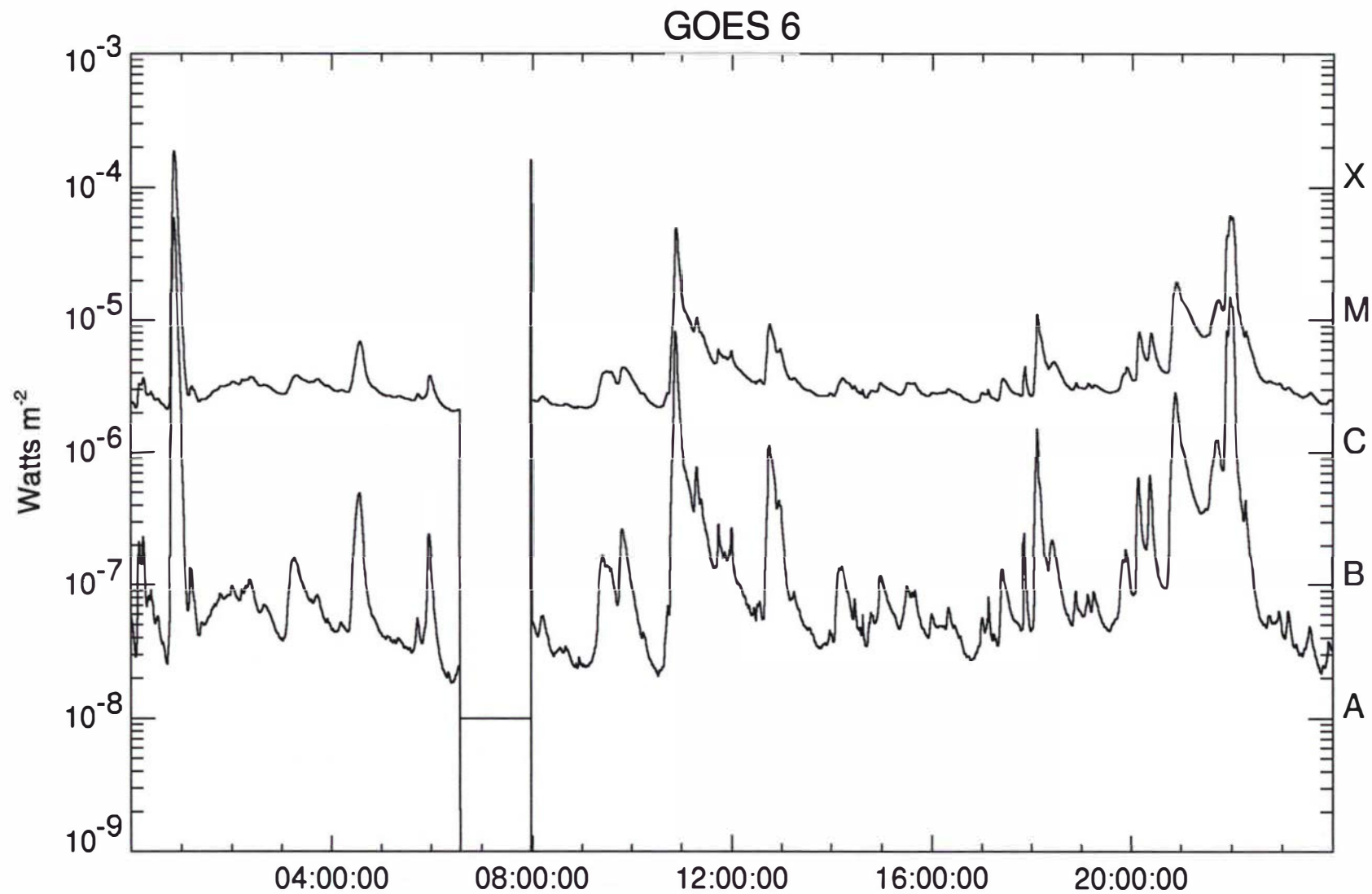


Burst Counter 4 at UT=23.887535756429 h=85995.129 s 23:53:15.129





UNIV' AL TIME



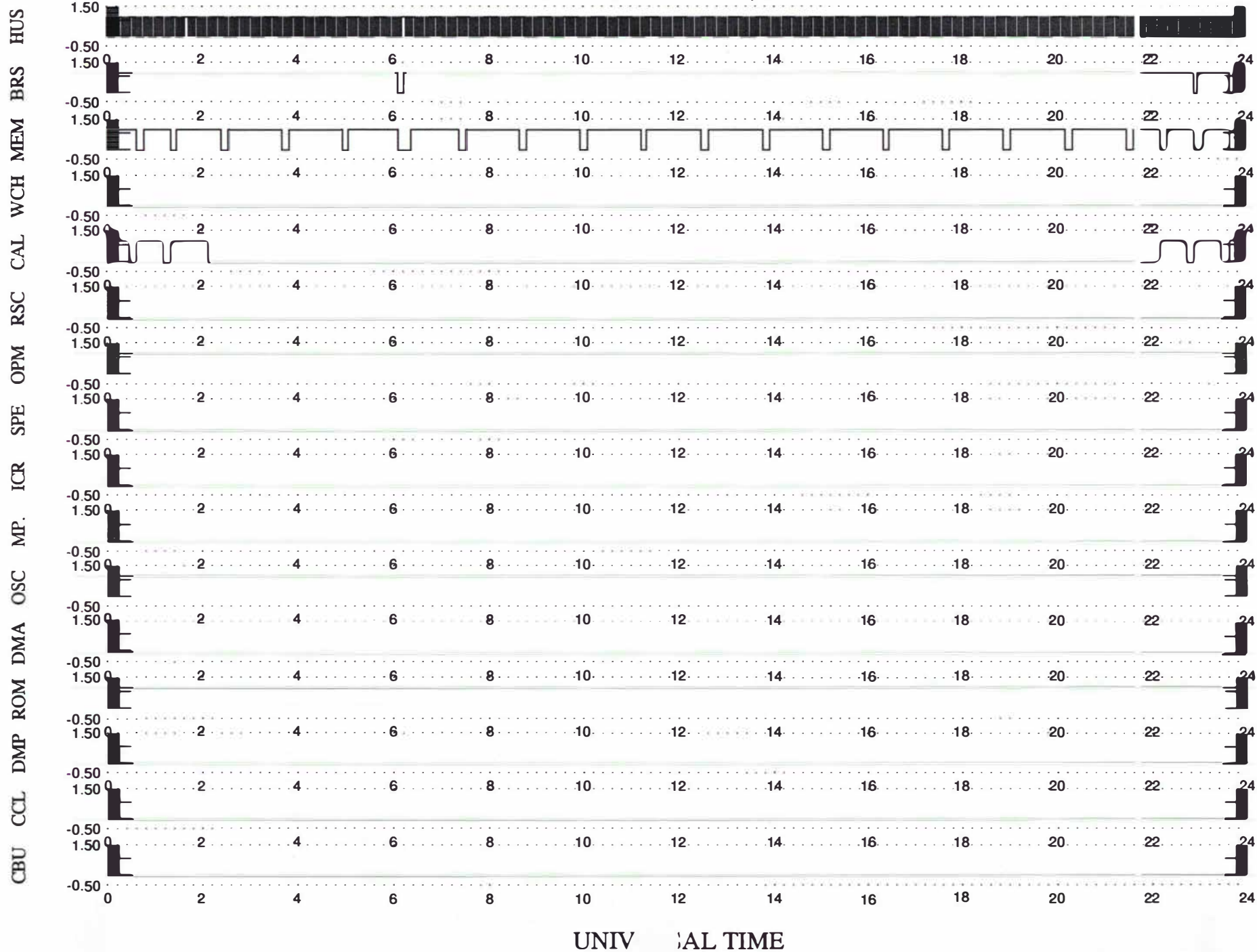
Data Start: 91/03/16, 0000:01

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

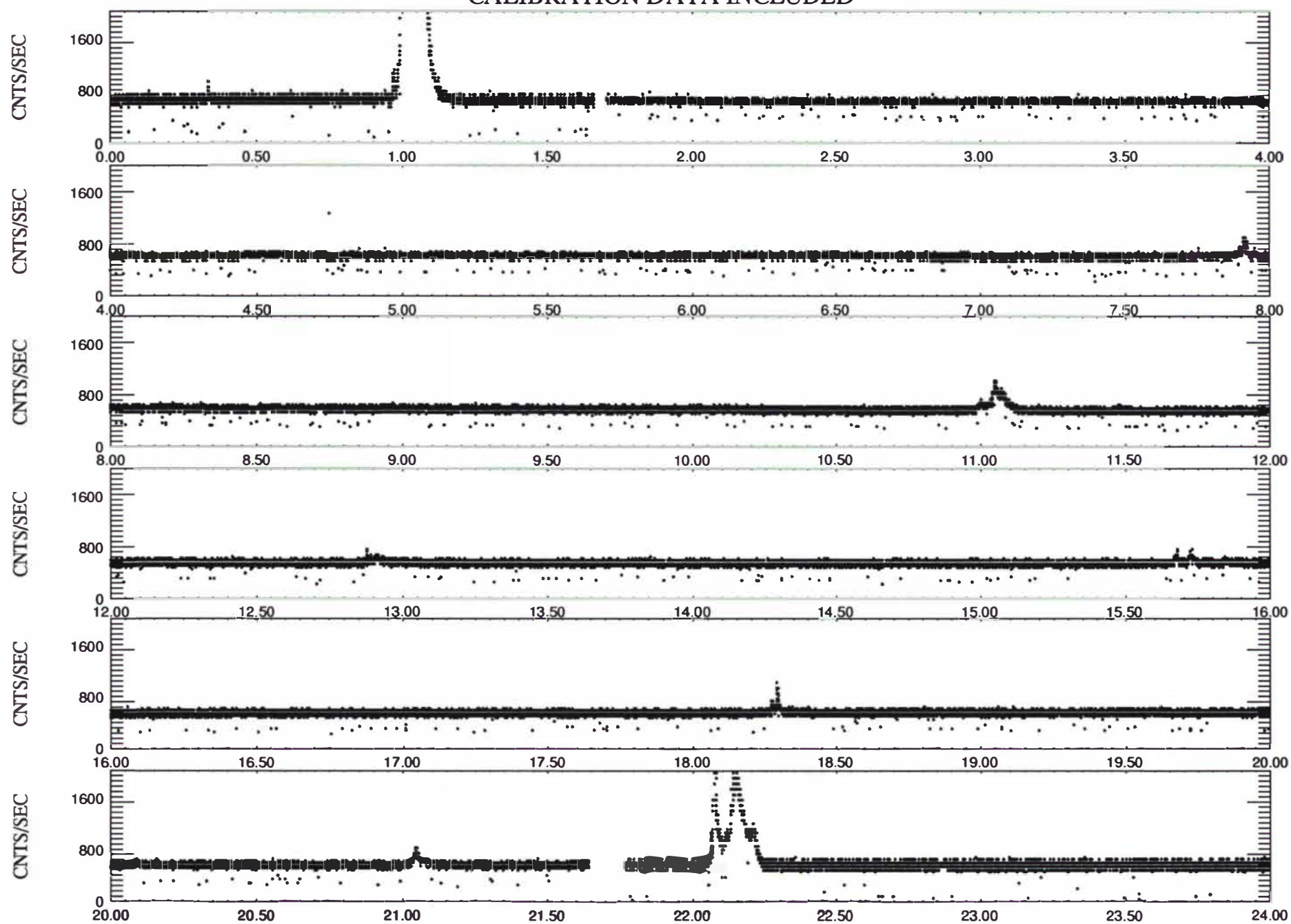
Plot created: 96/11/26, 1843

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 5 - 15, 0 - 9

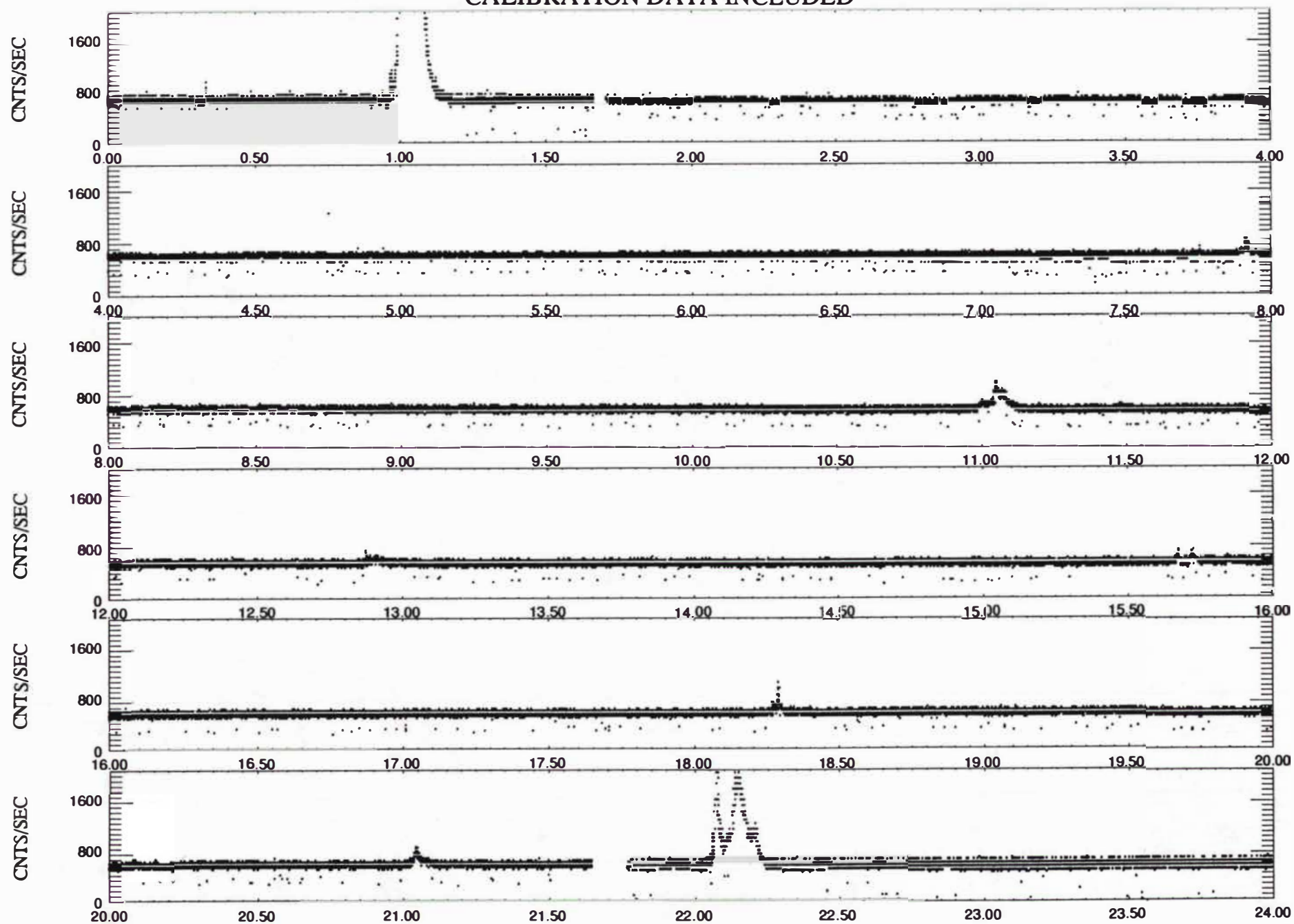


CALIBRATION DATA INCLUDED



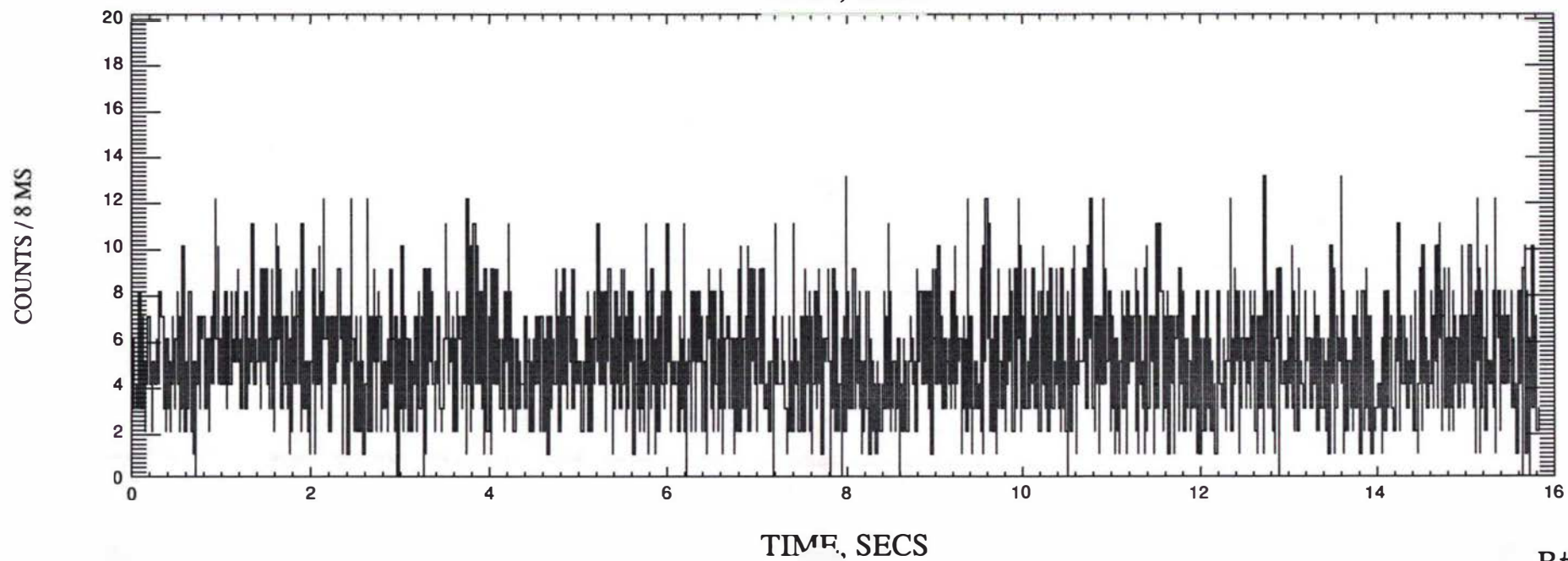
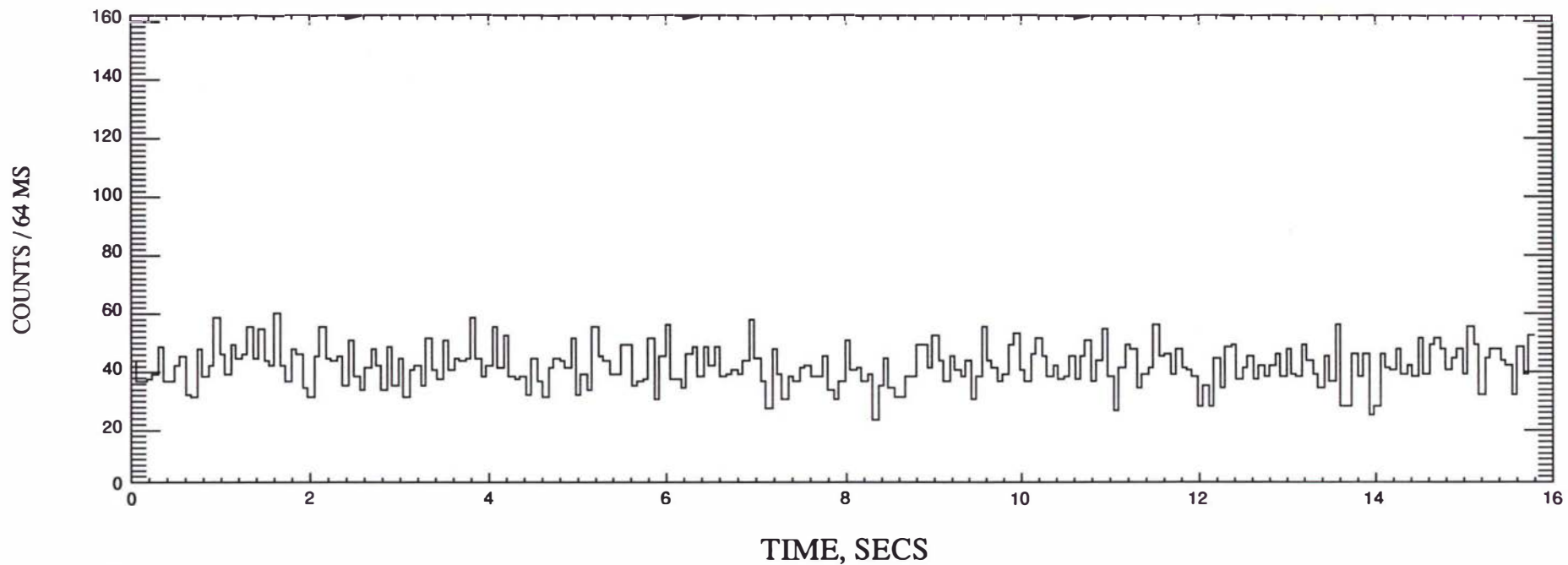
UNIV AL TIME

CALIBRATION DATA INCLUDED

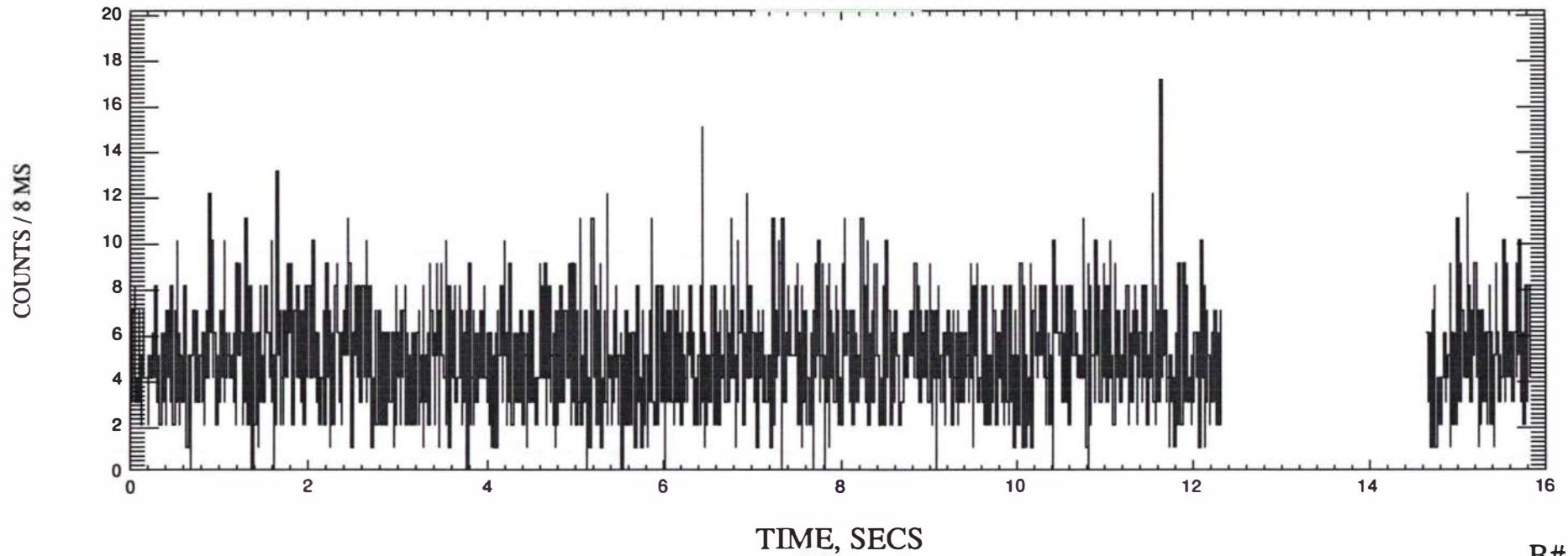
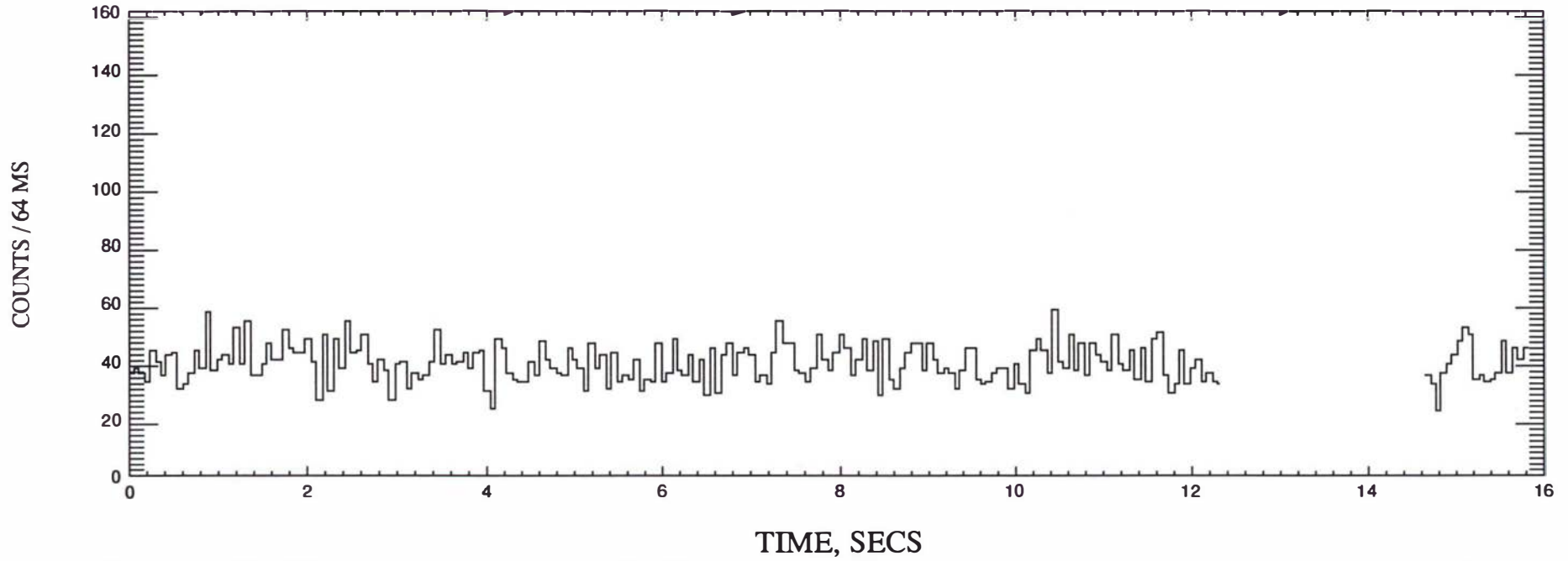


UNIV AL TIME

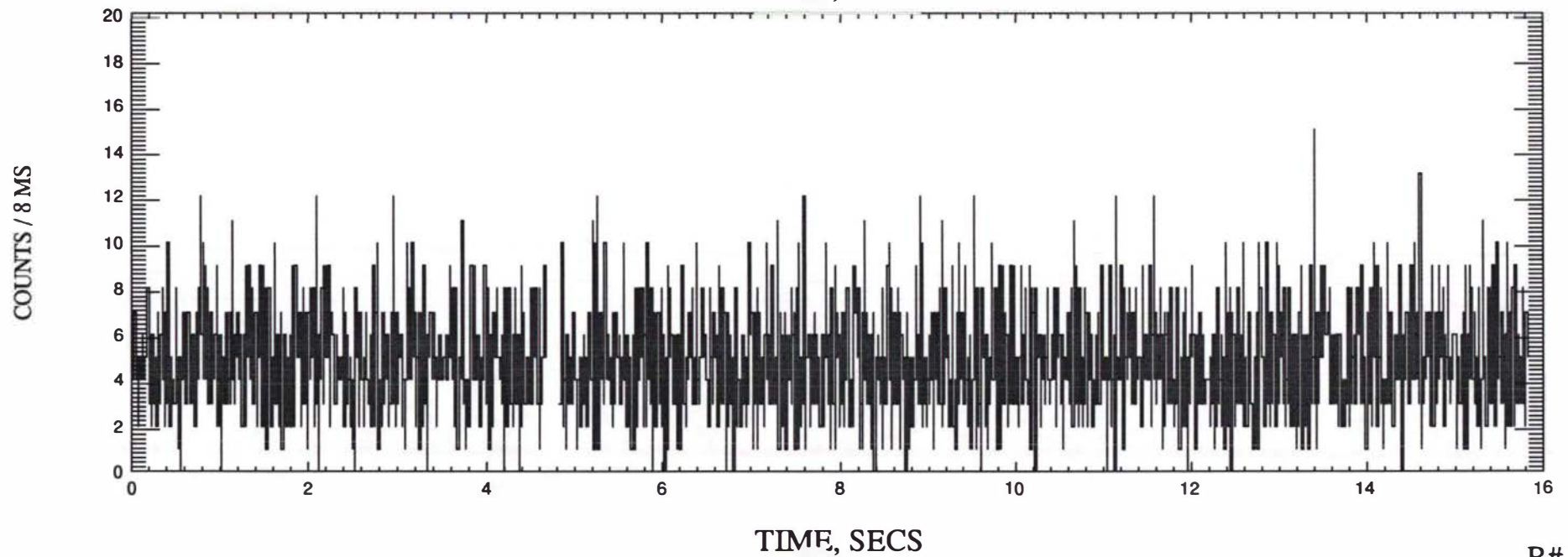
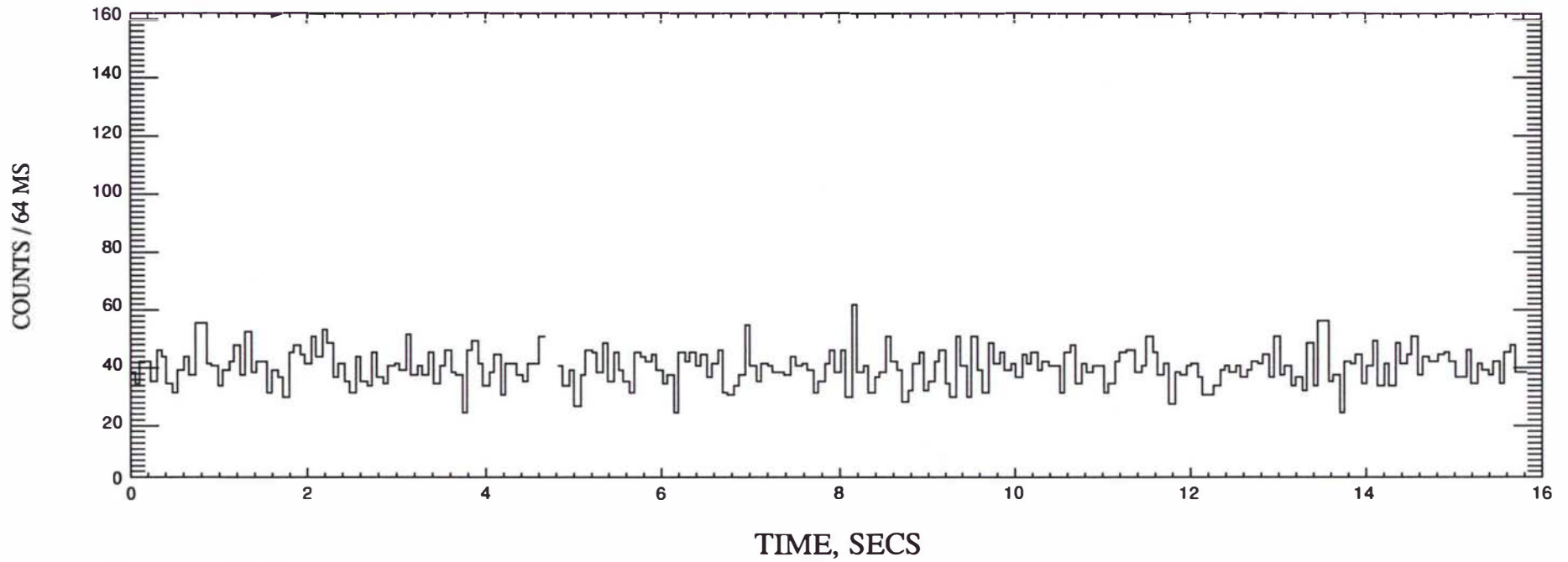
Burst Counter 5 at UT= 0.589740719265 h= 2123.067 s 00:35:23.067



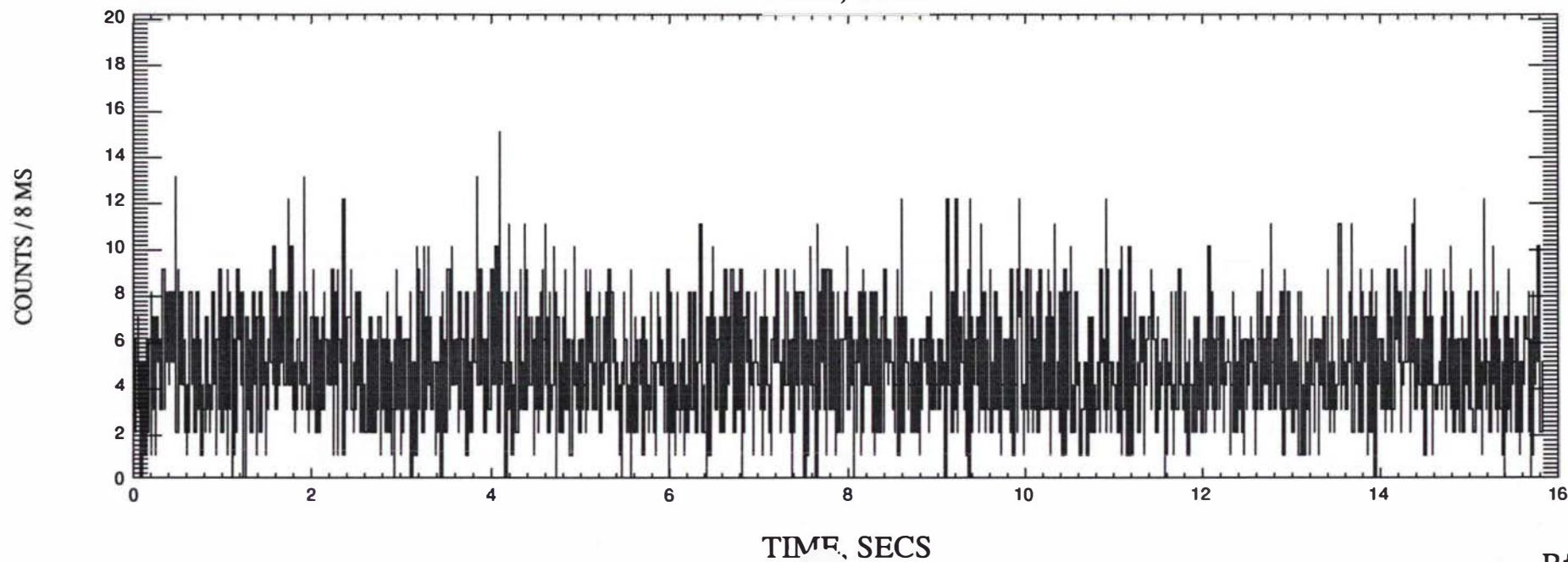
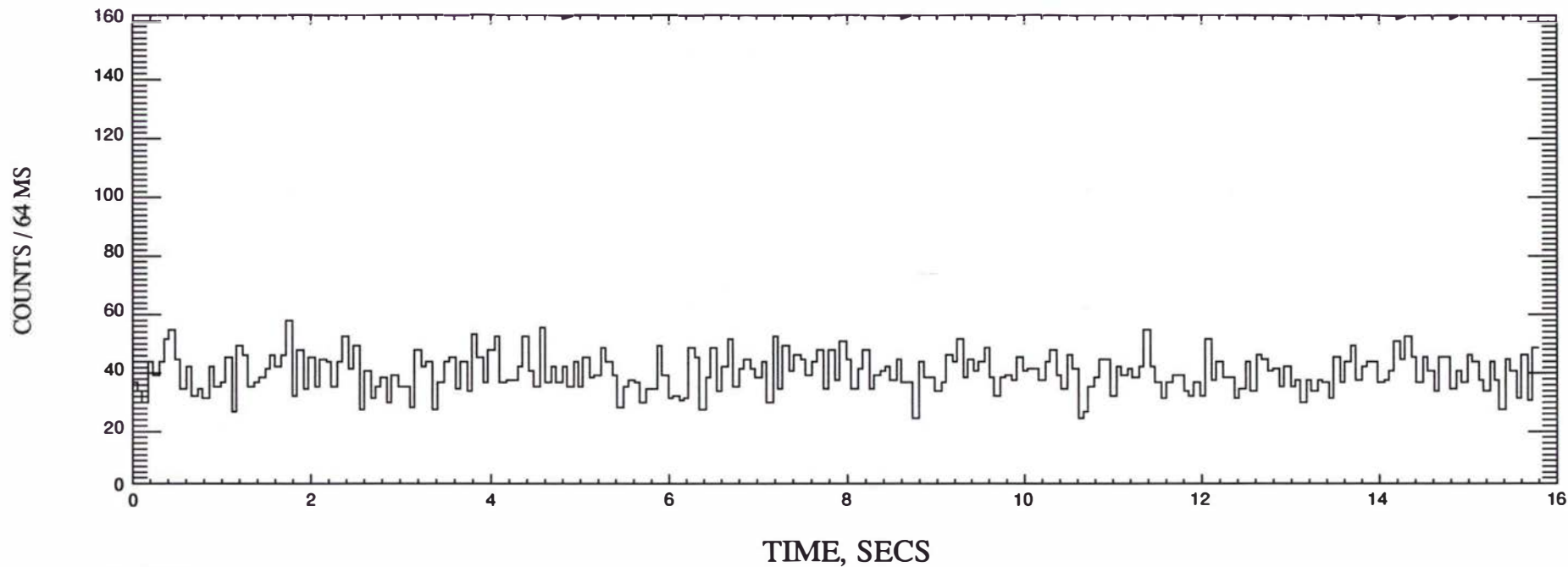
Burst Counter 6 at UT= 1.291984748840 h= 4651.145 s 01:17:31.145



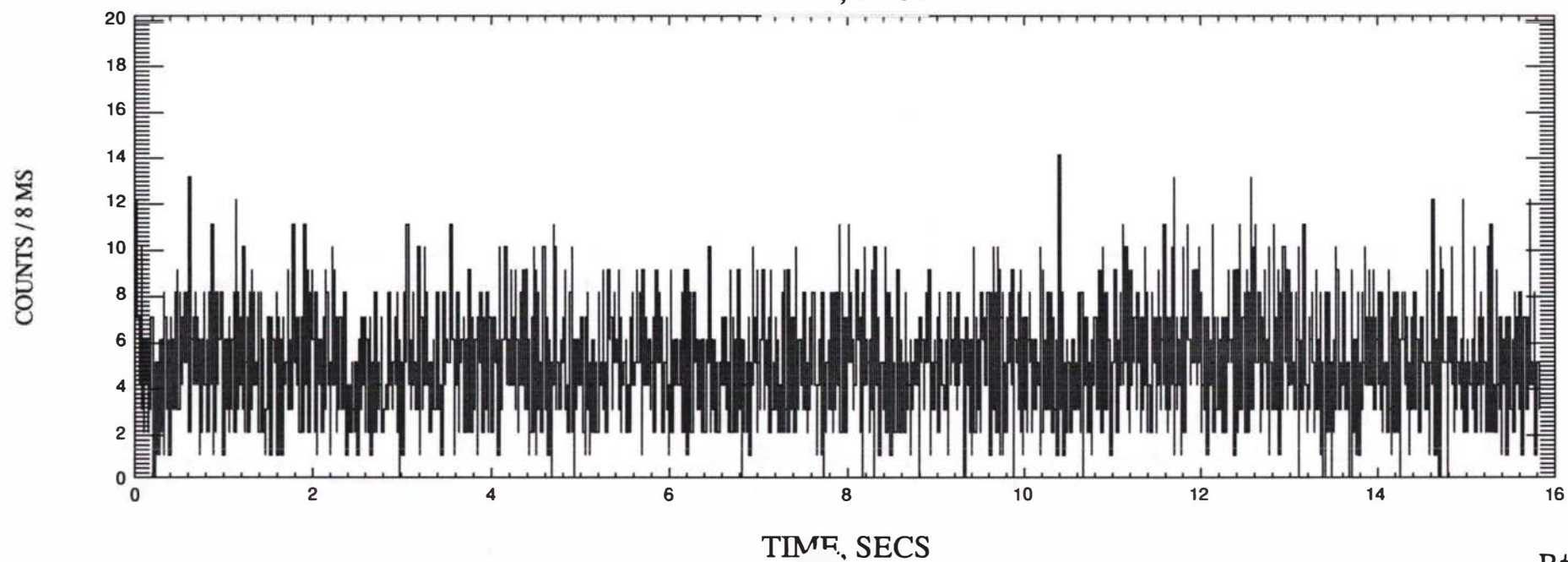
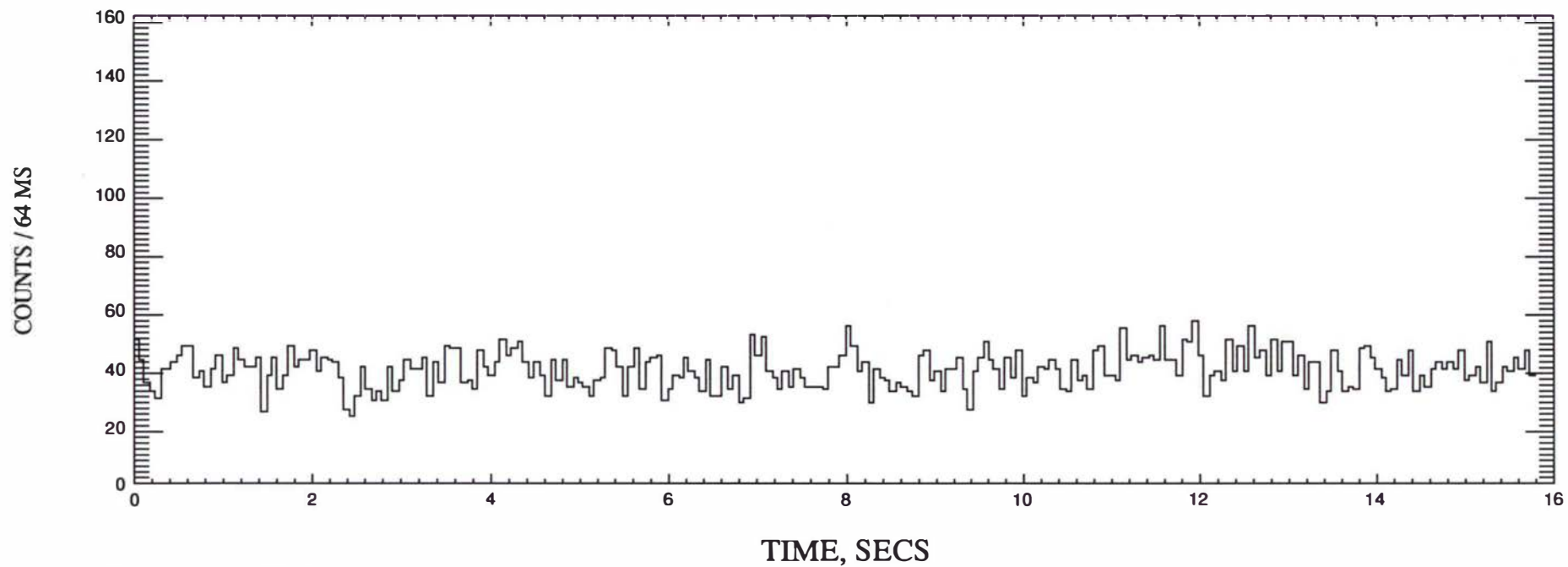
Burst Counter 7 at UT= 2.323147438897 h= 8363.331 s 02:19:23.331



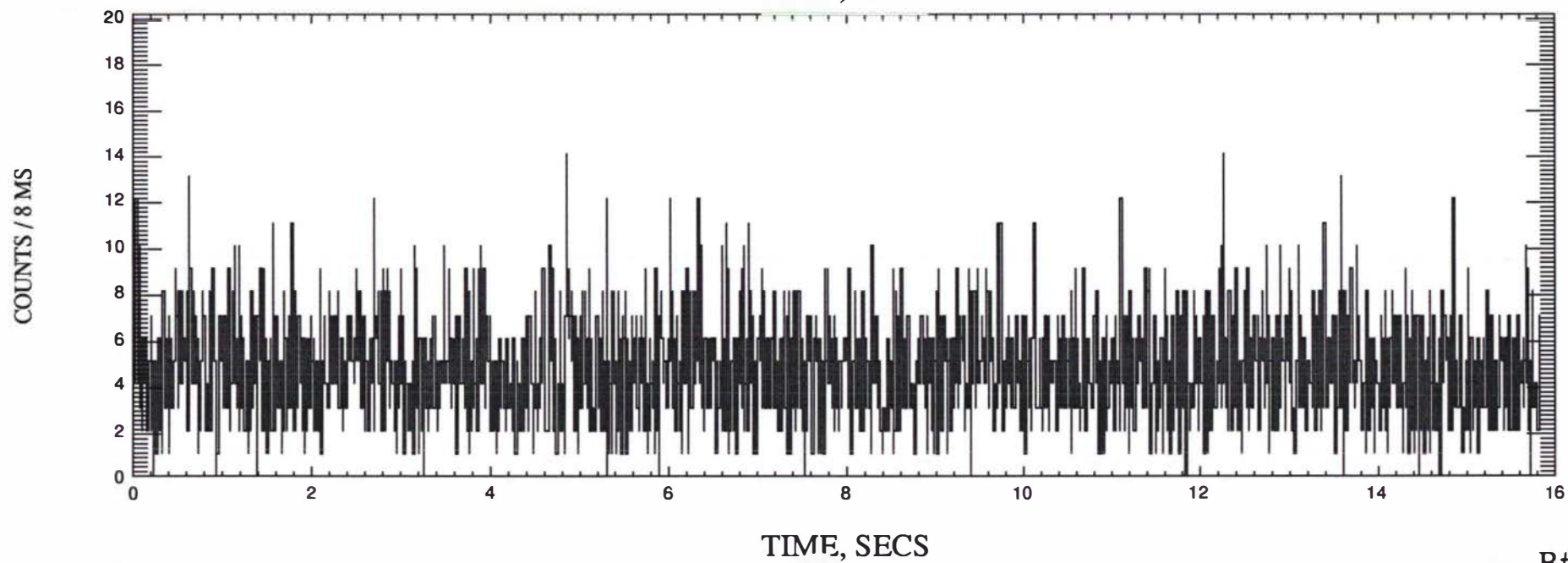
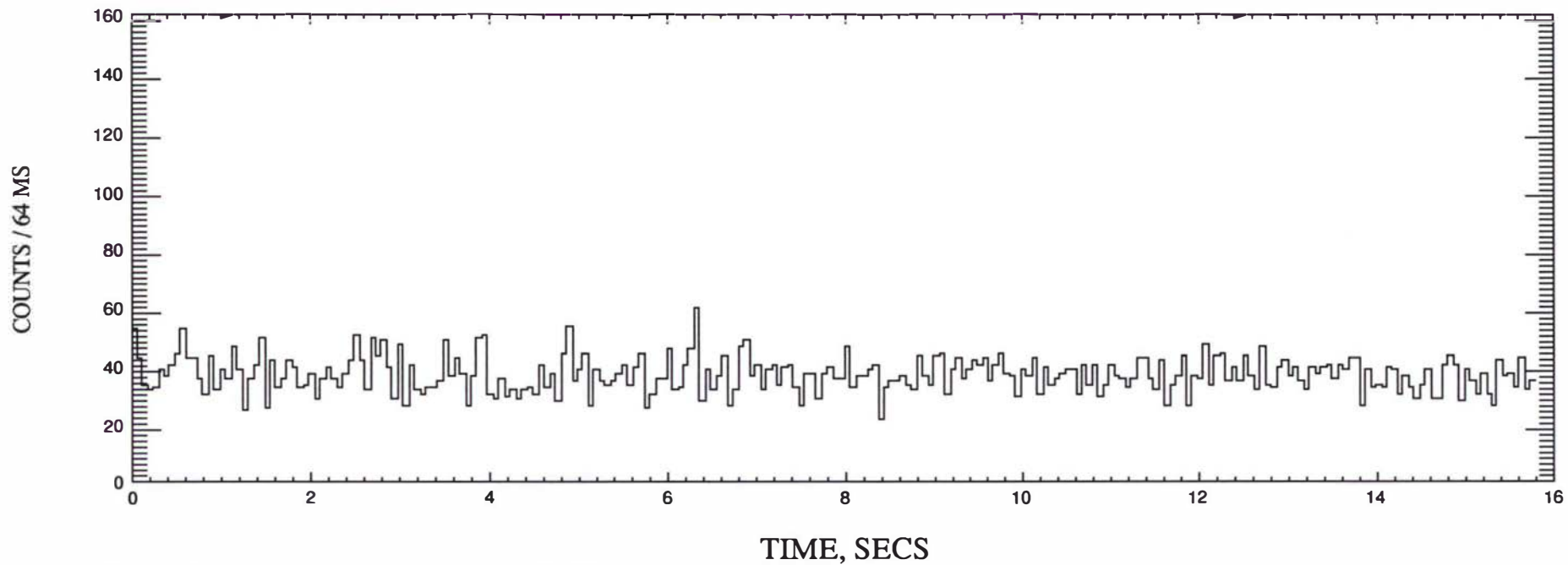
Burst Counter 8 at UT= 3.585935817295 h=12909.369 s 03:35:09.369



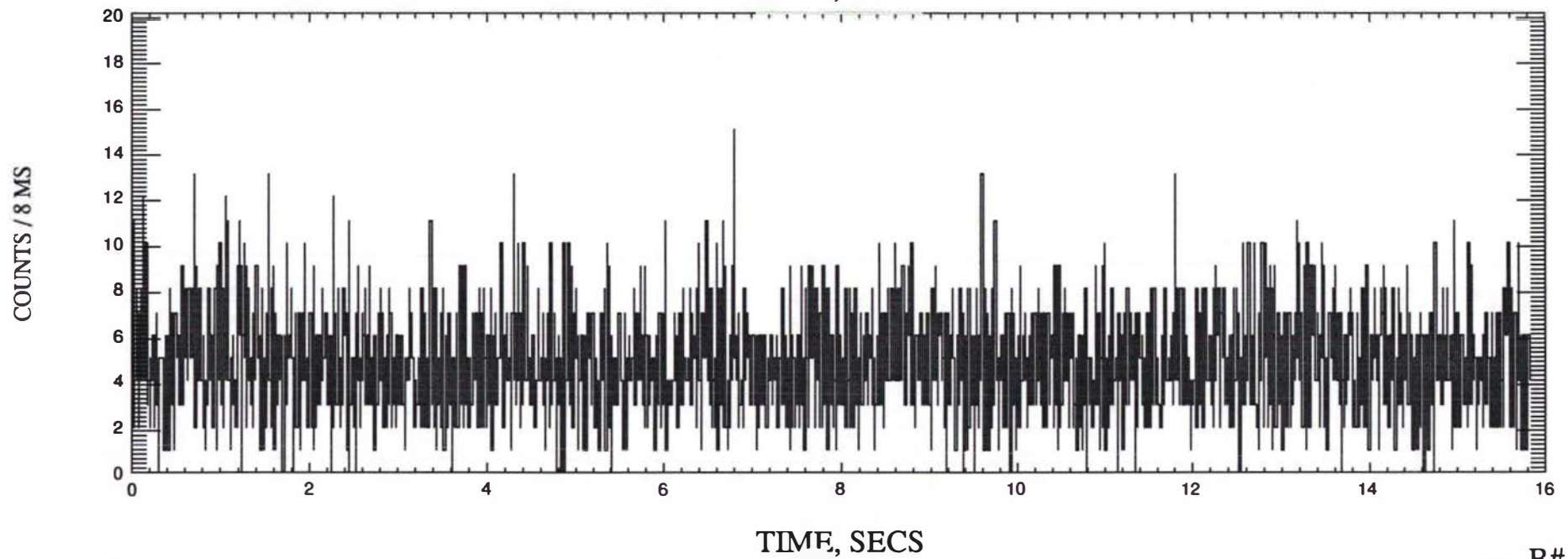
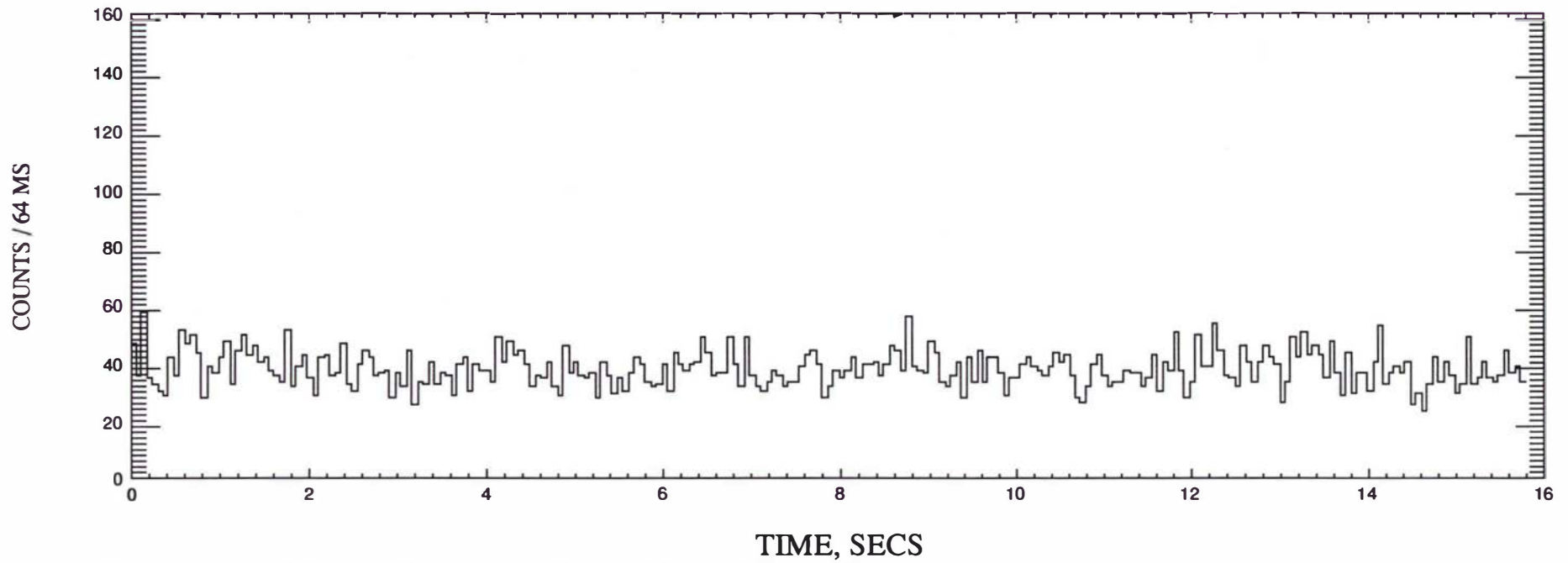
Burst Counter 9 at UT= 4.847632620070 h=17451.477 s 04:50:51.477



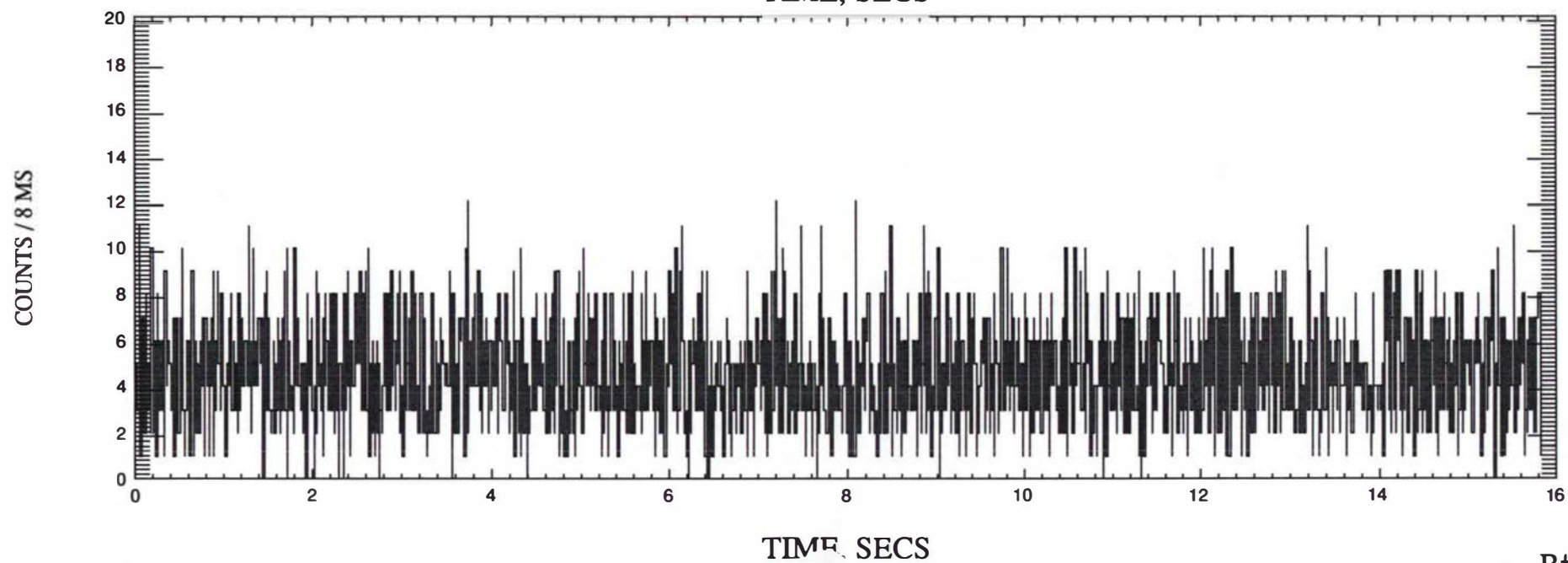
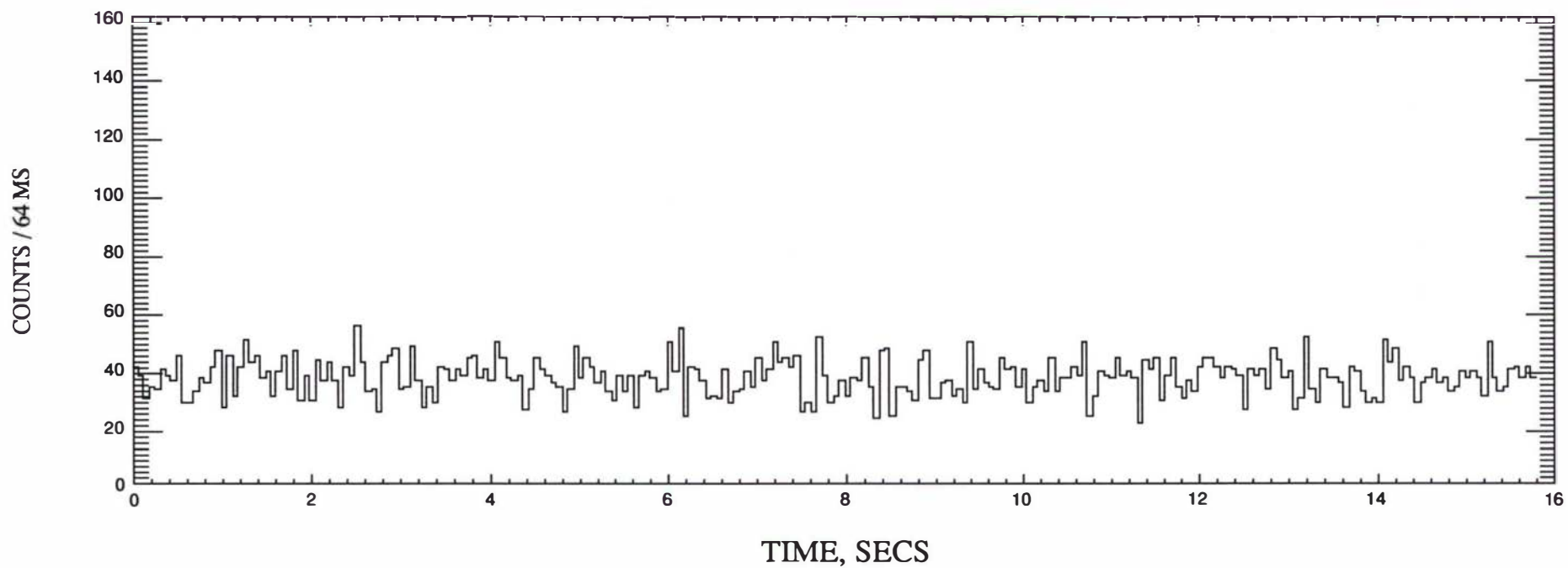
Burst Counter 10 at UT= 6.109876293606 h=21995.555 s 06:06:35.555



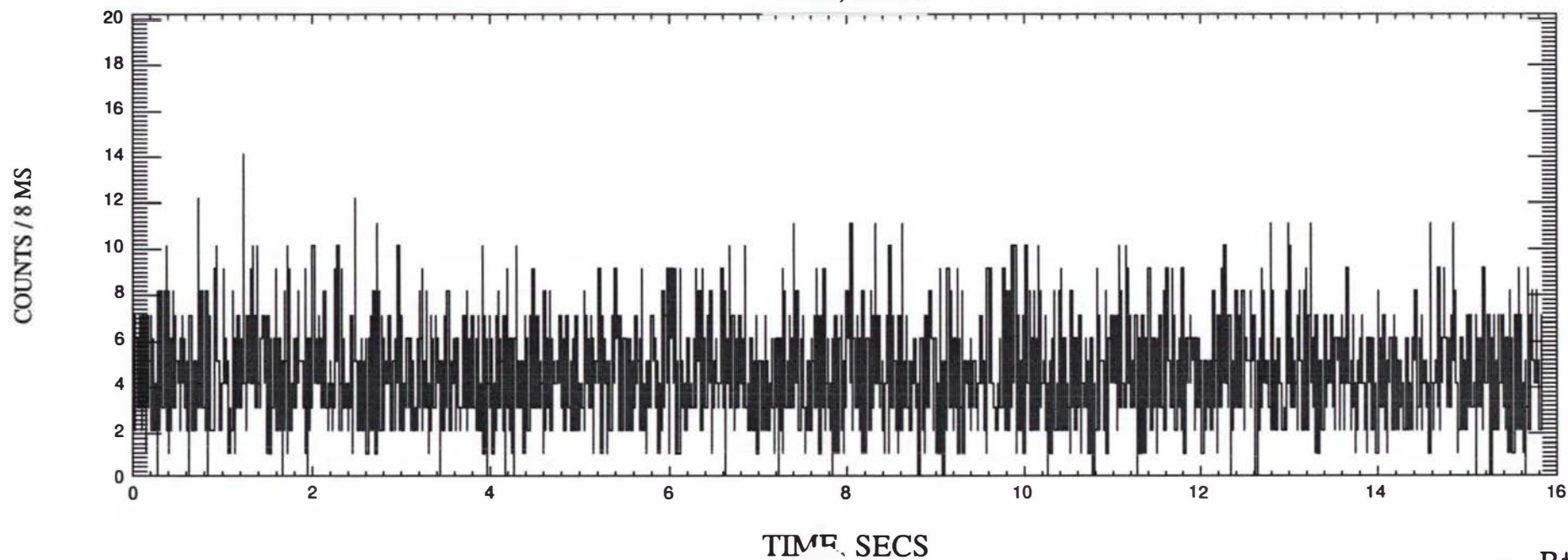
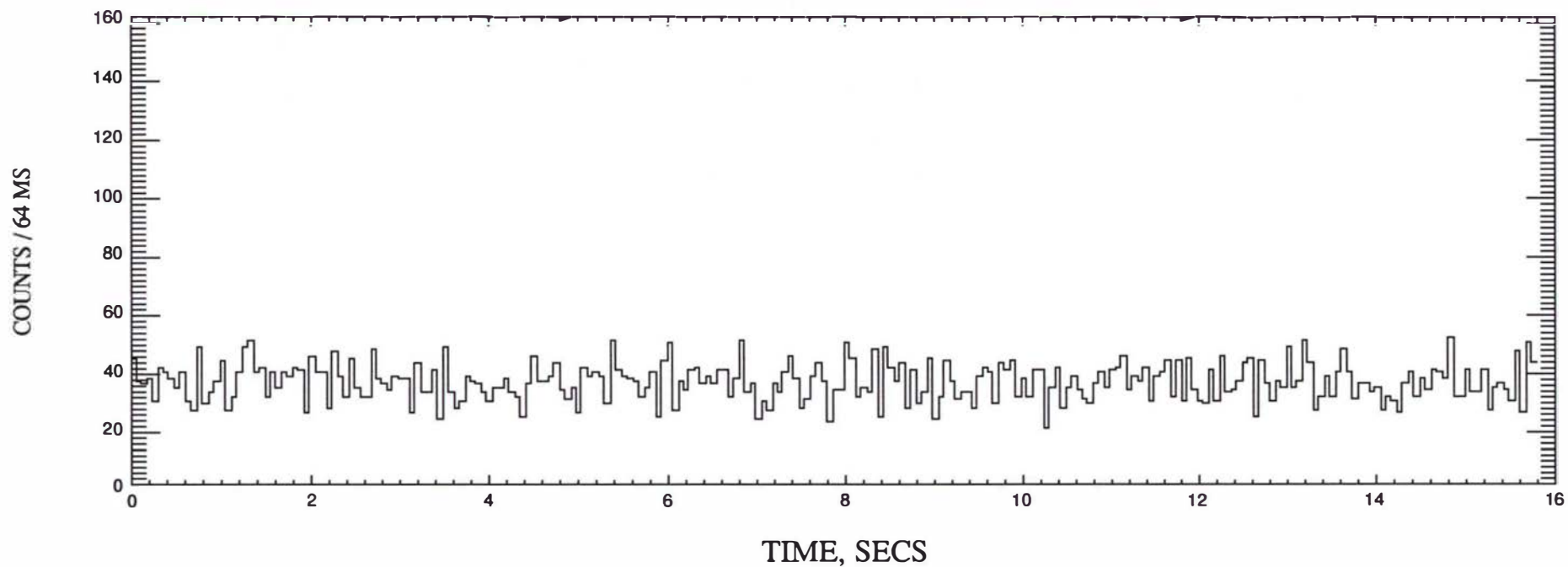
Burst Counter 11 at UT= 7.372095642090 h=26539.544 s 07:22:19.544



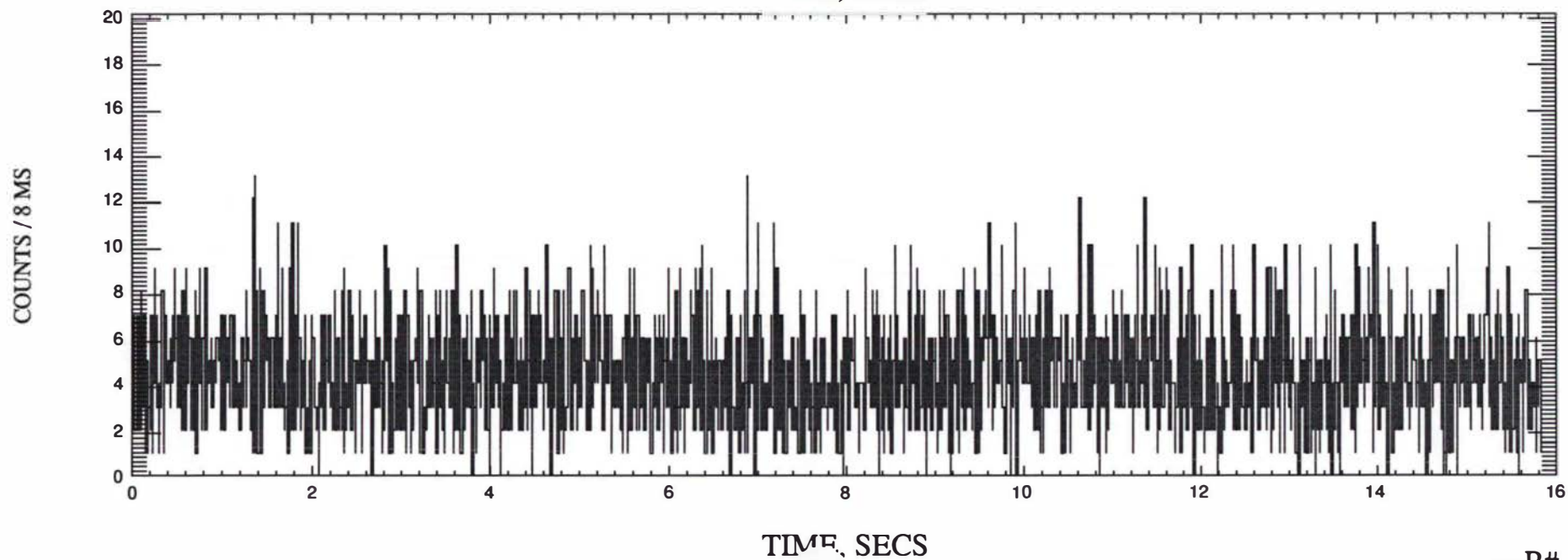
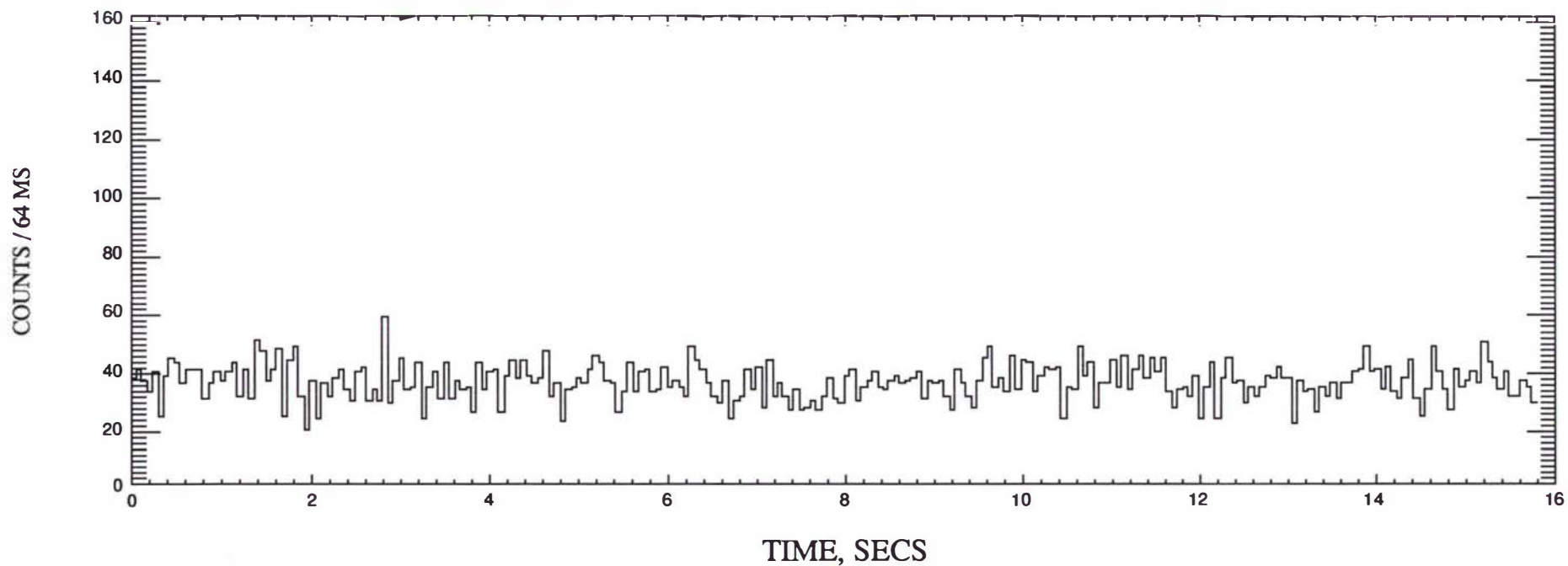
Burst Counter 12 at UT= 8.635200860765 h=31086.723 s 08:38:06.723



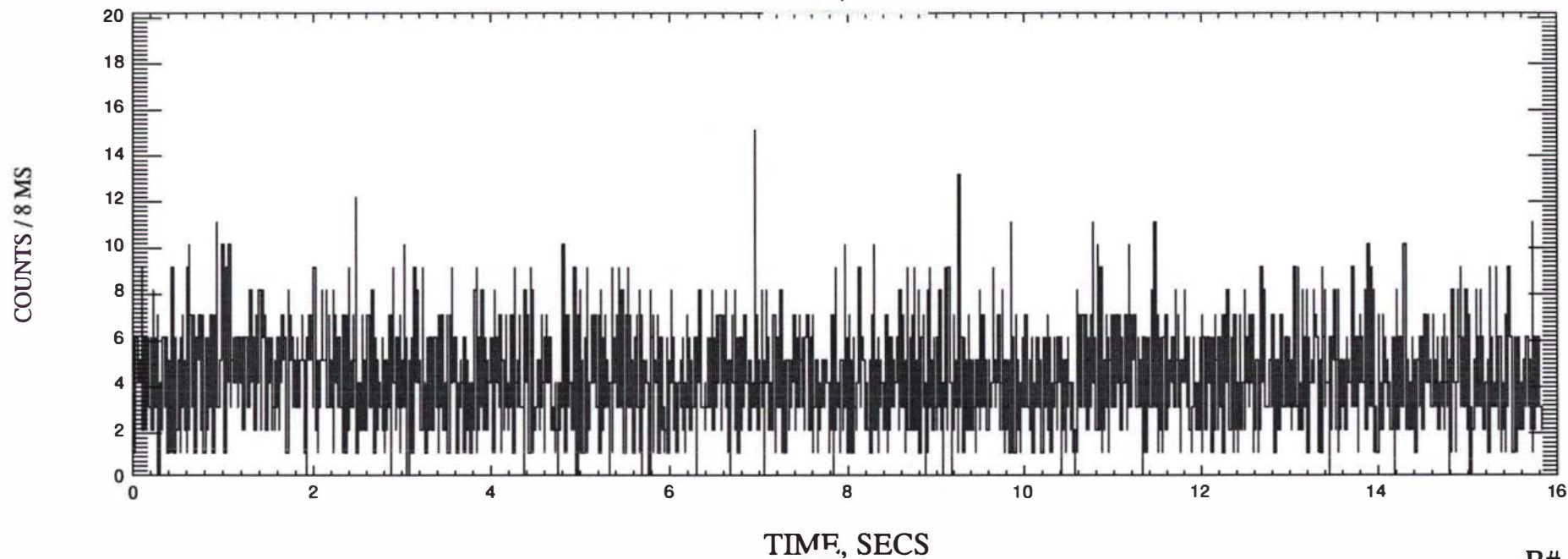
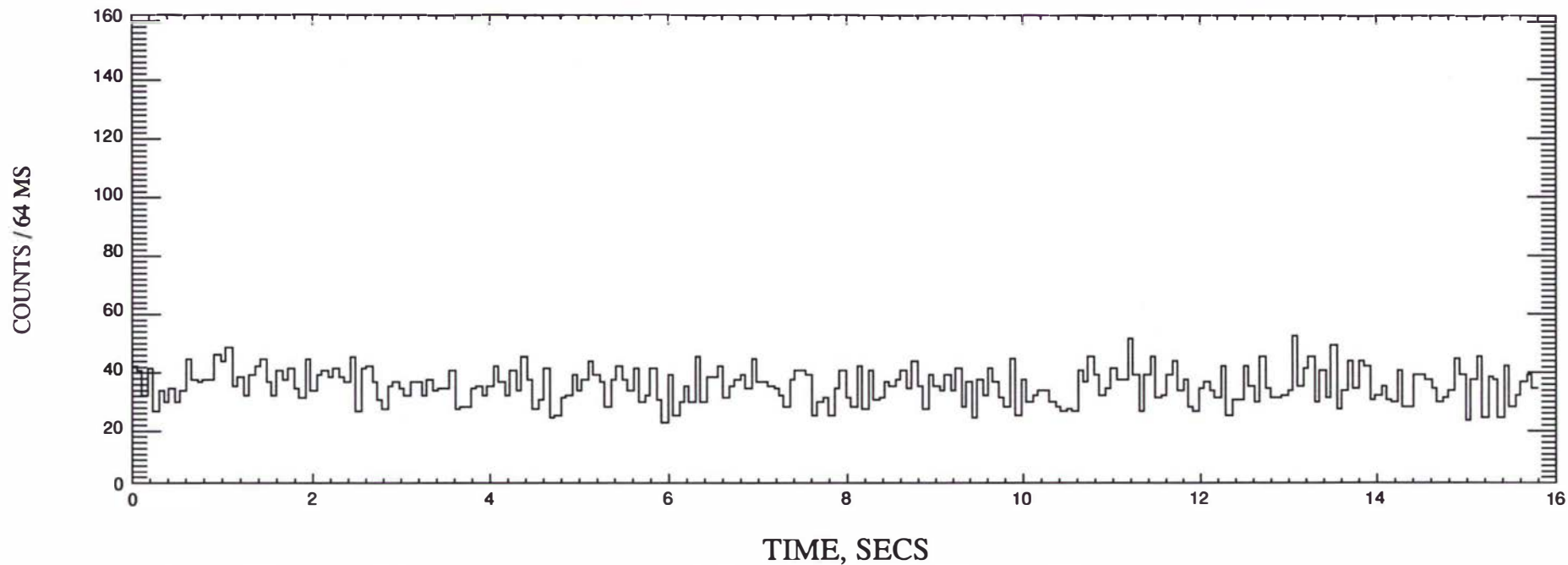
Burst Counter 13 at UT= 9.899673266941 h=35638.824 s 09:53:58.824



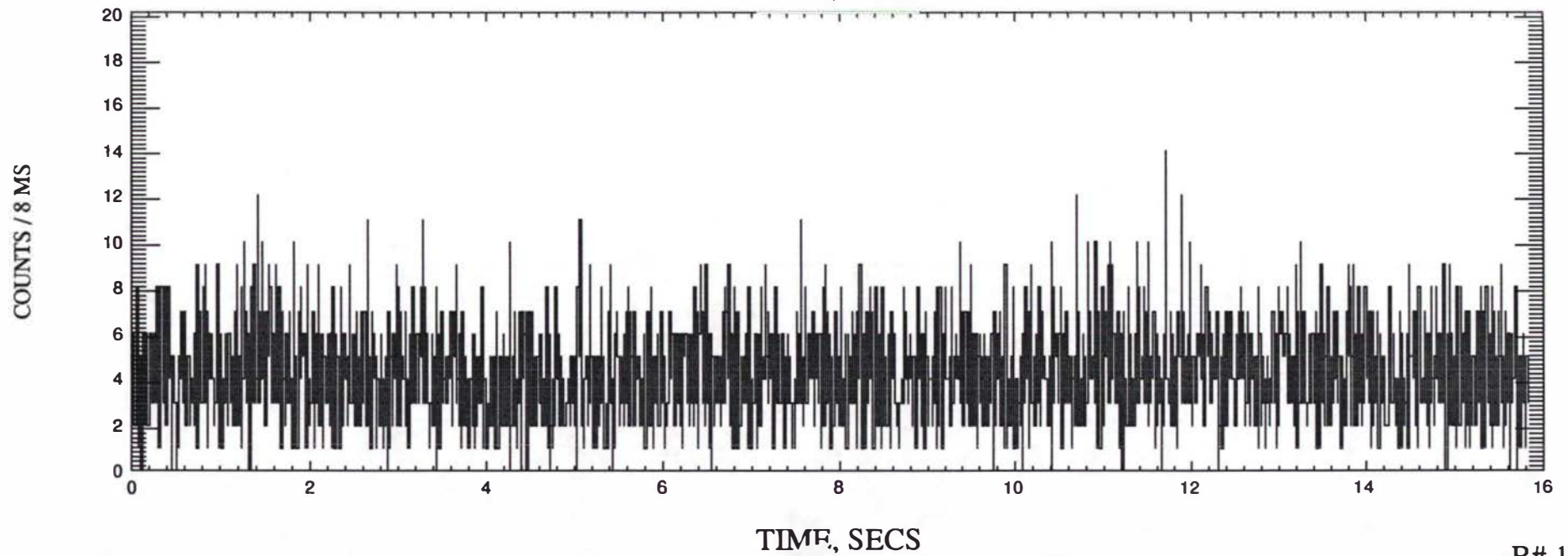
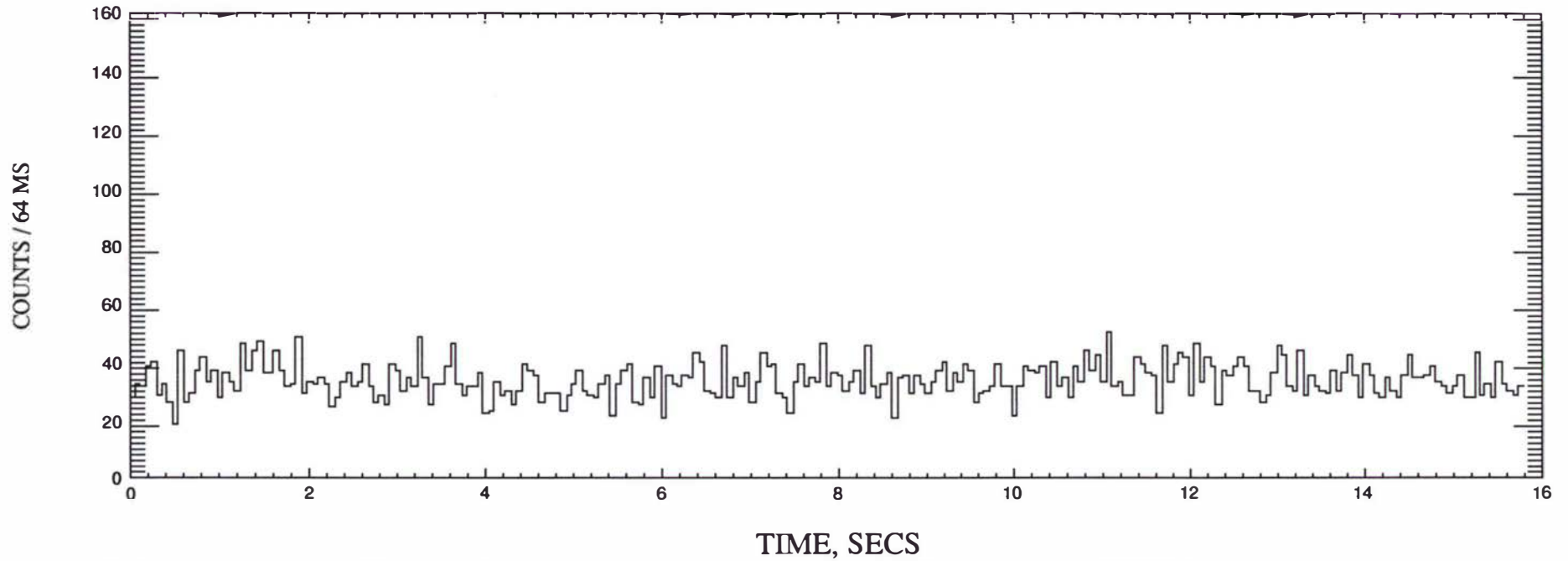
Burst Counter 14 at UT=11.174143507216 h=40226.917 s 11:10:26.917



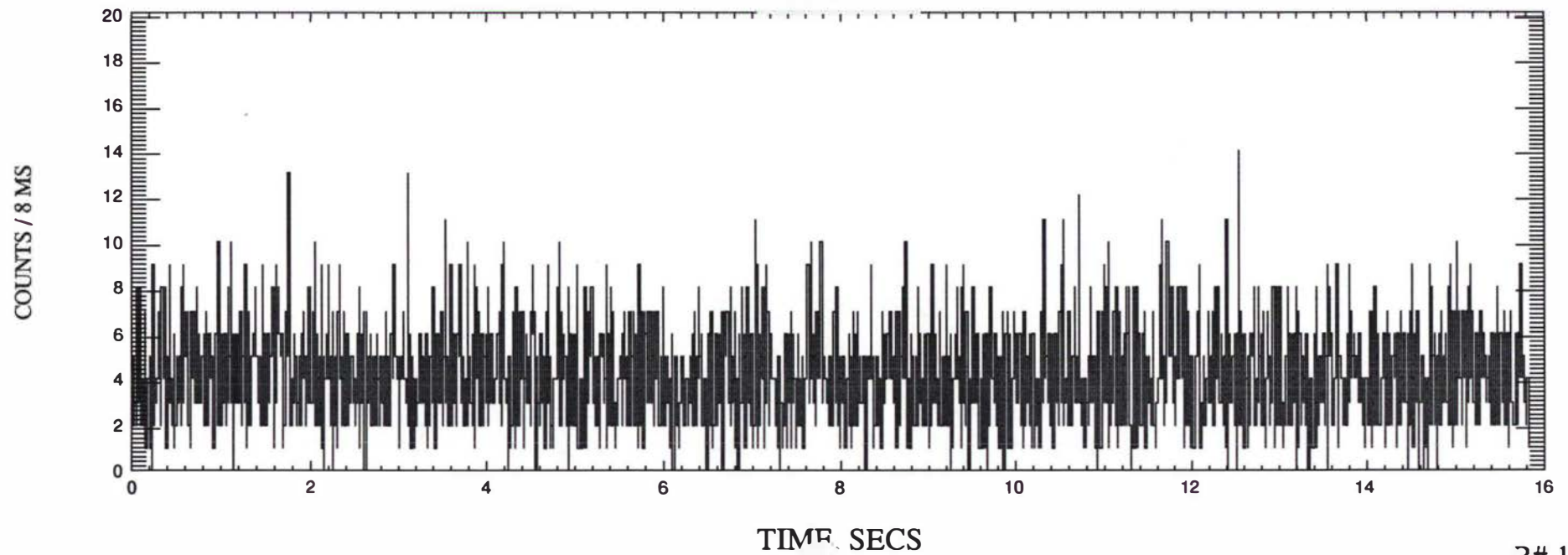
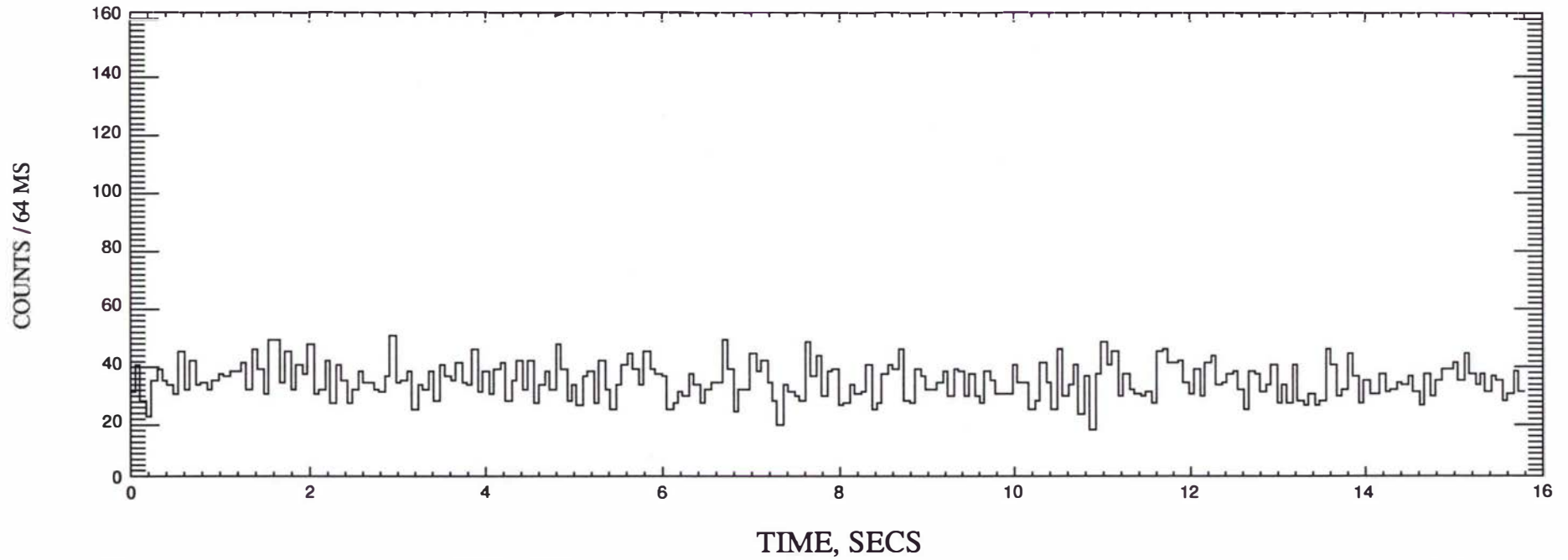
Burst Counter 15 at UT=12.439722684224 h=44783.002 s 12:26:23.002



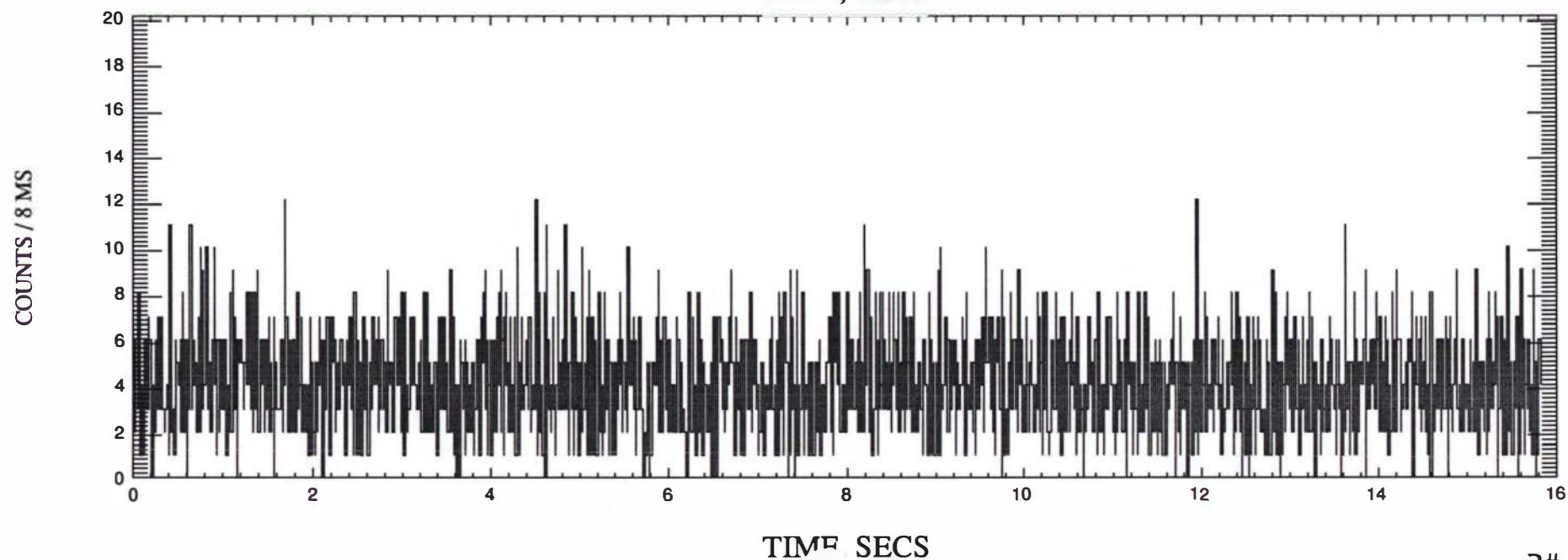
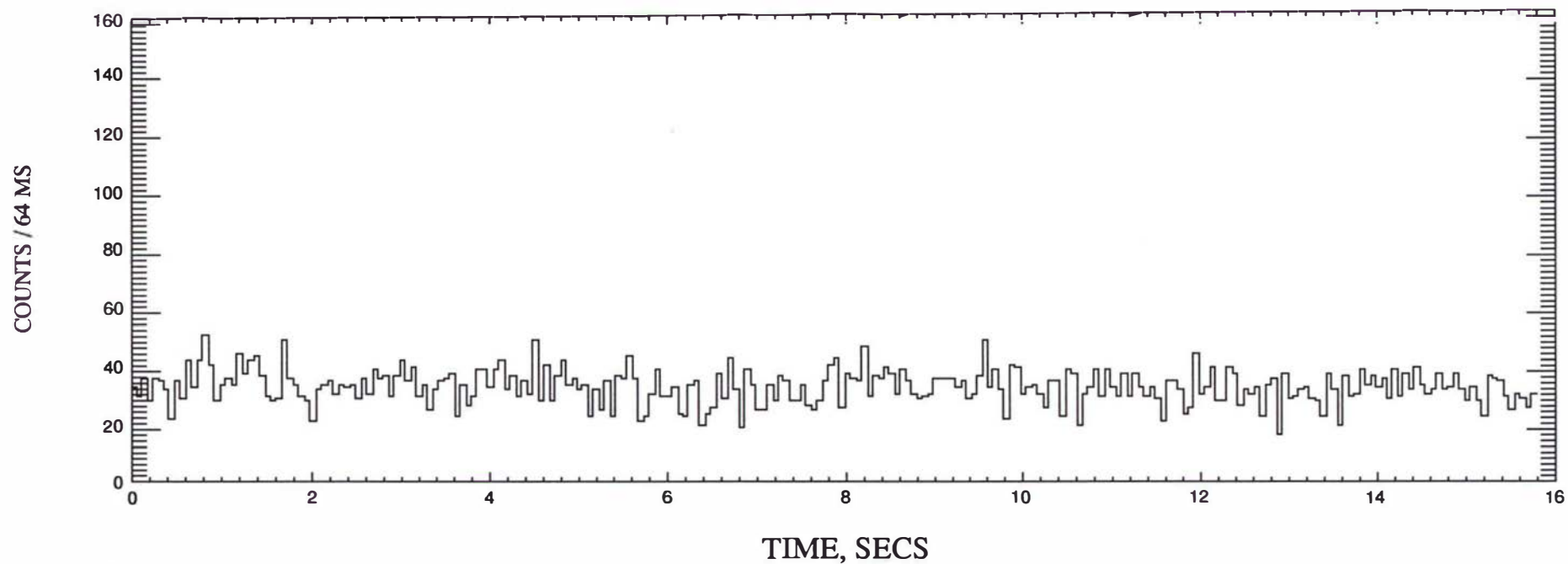
Burst Counter 0 at UT=13.706957677205 h=49345.048 s 13:42:25.048



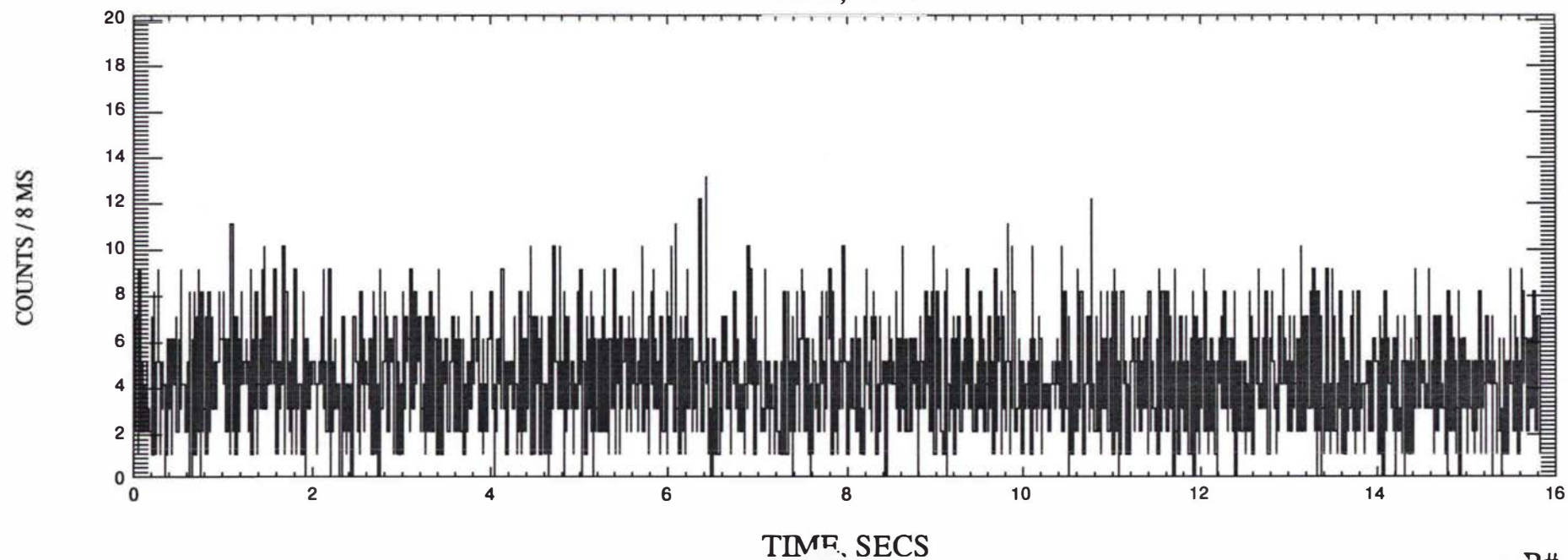
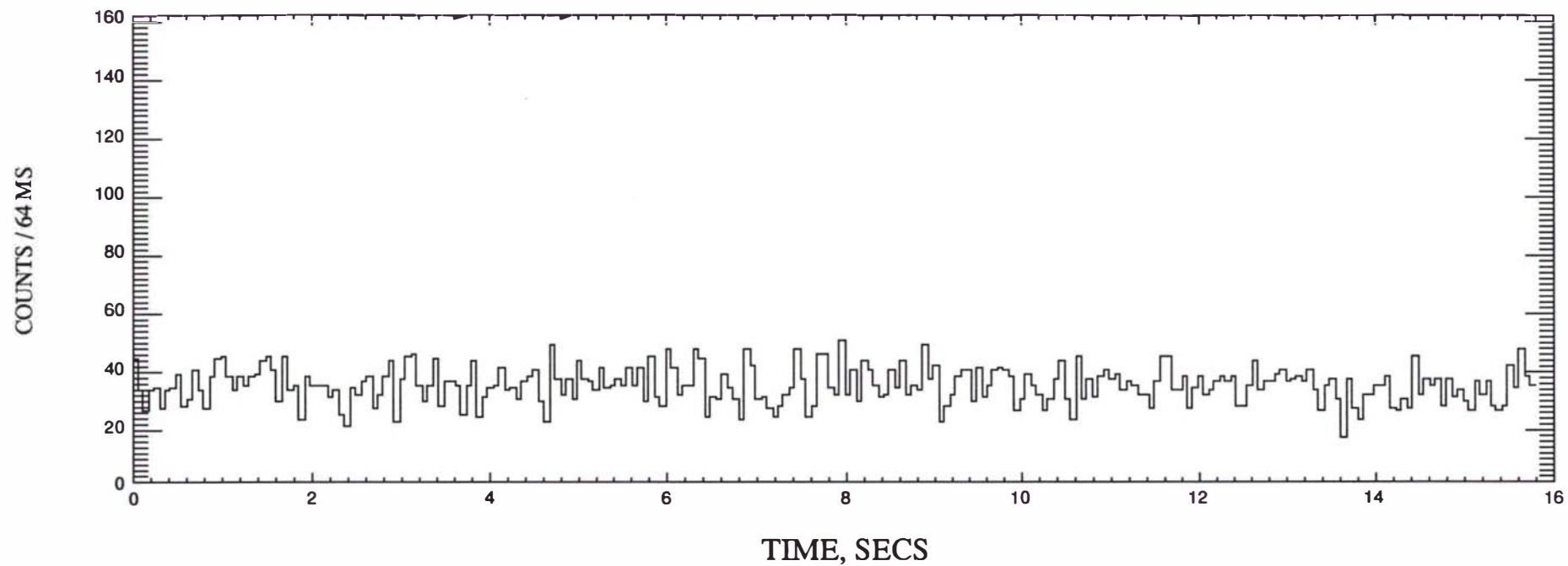
Burst Counter 1 at UT=14.983930083381 h=53942.148 s 14:59:02.148



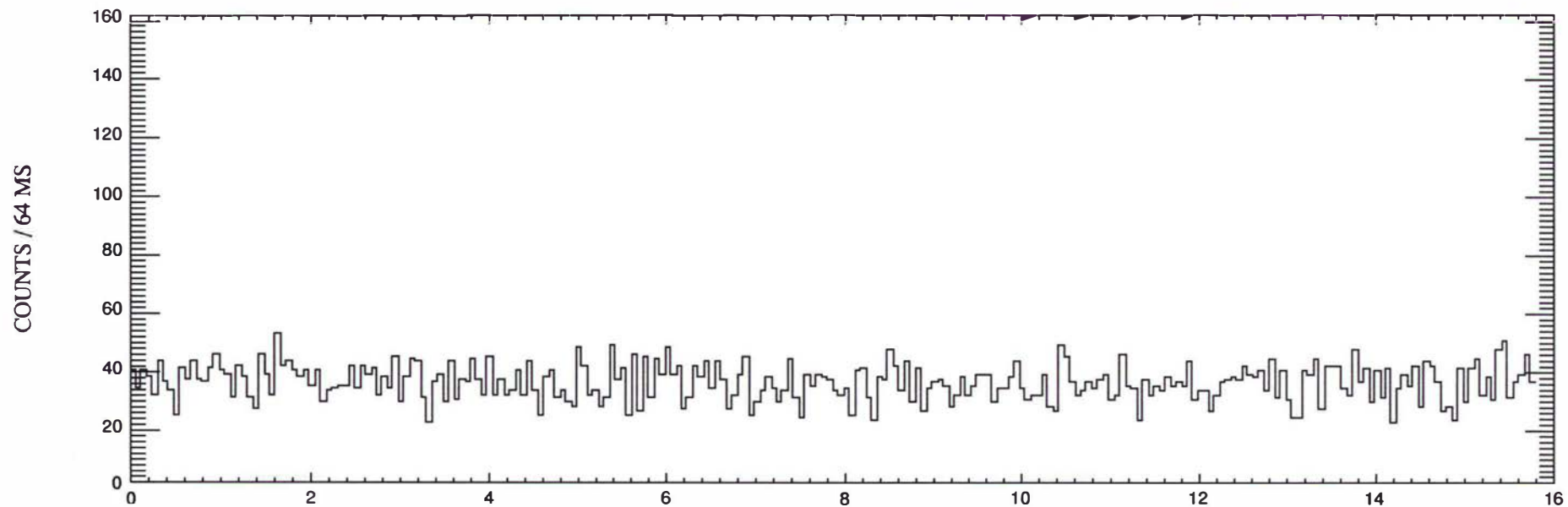
Burst Counter 2 at UT=16.319515770806 h=58750.257 s 16:19:10.257



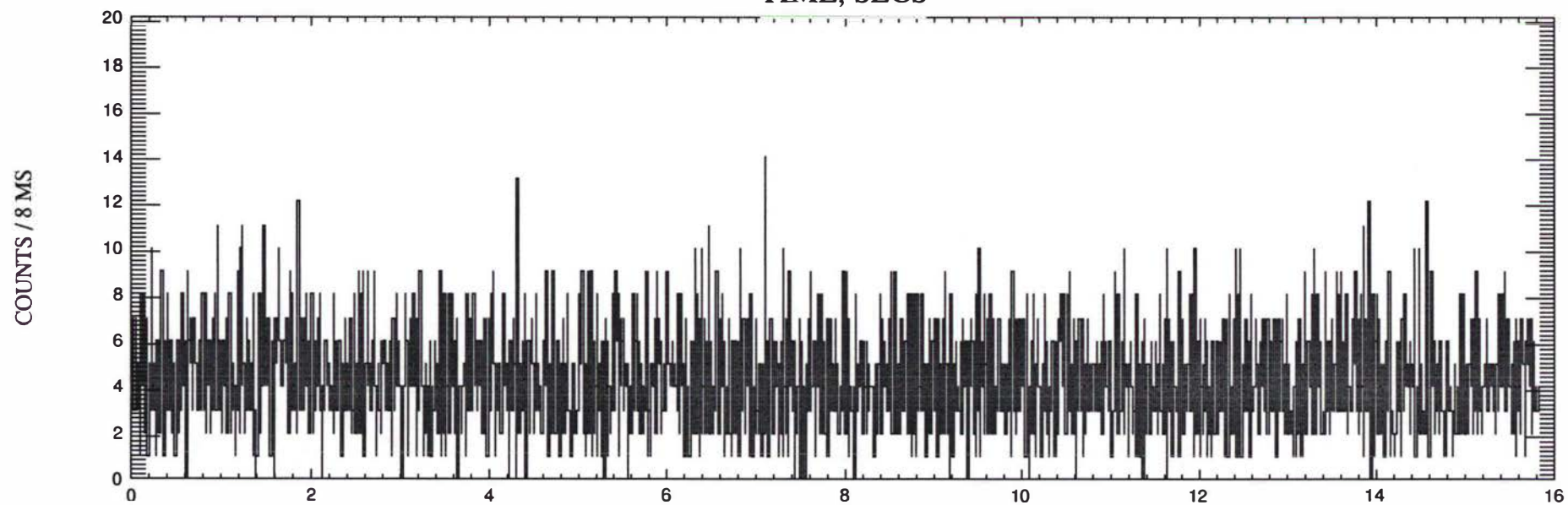
Burst Counter 3 at UT=17.581479500665 h=63293.326 s 17:34:53.326



Burst Counter 4 at UT=18.845120743646 h=67842.435 s 18:50:42.435

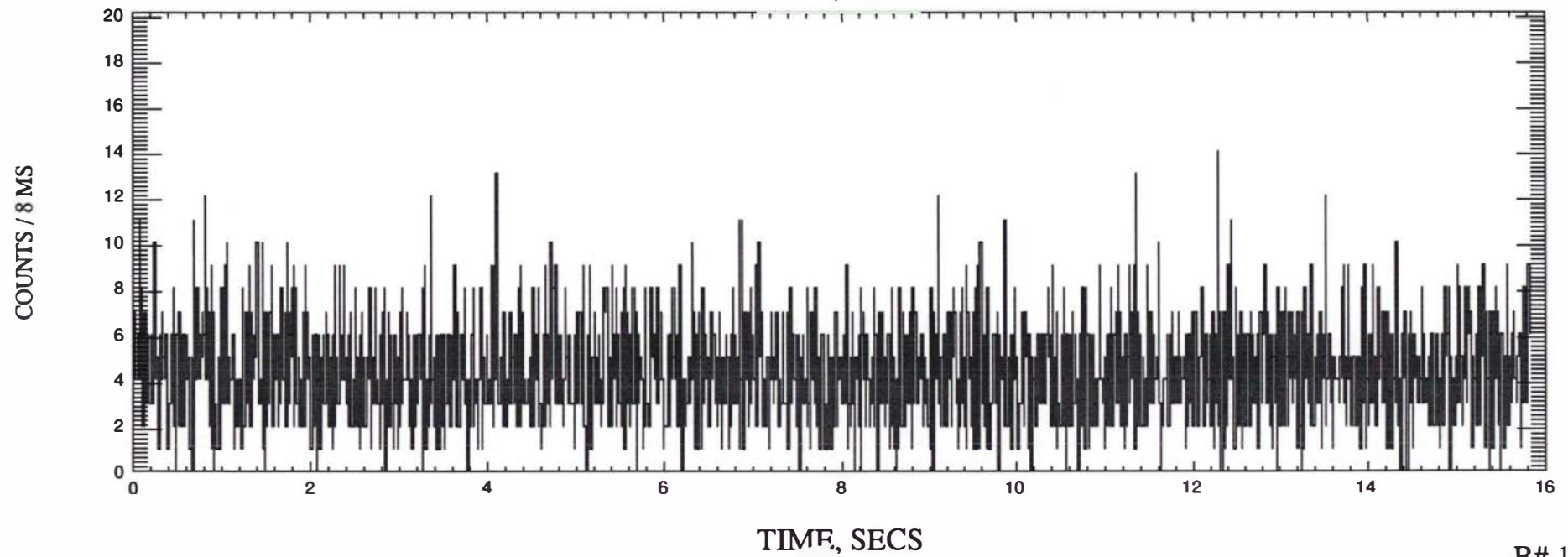
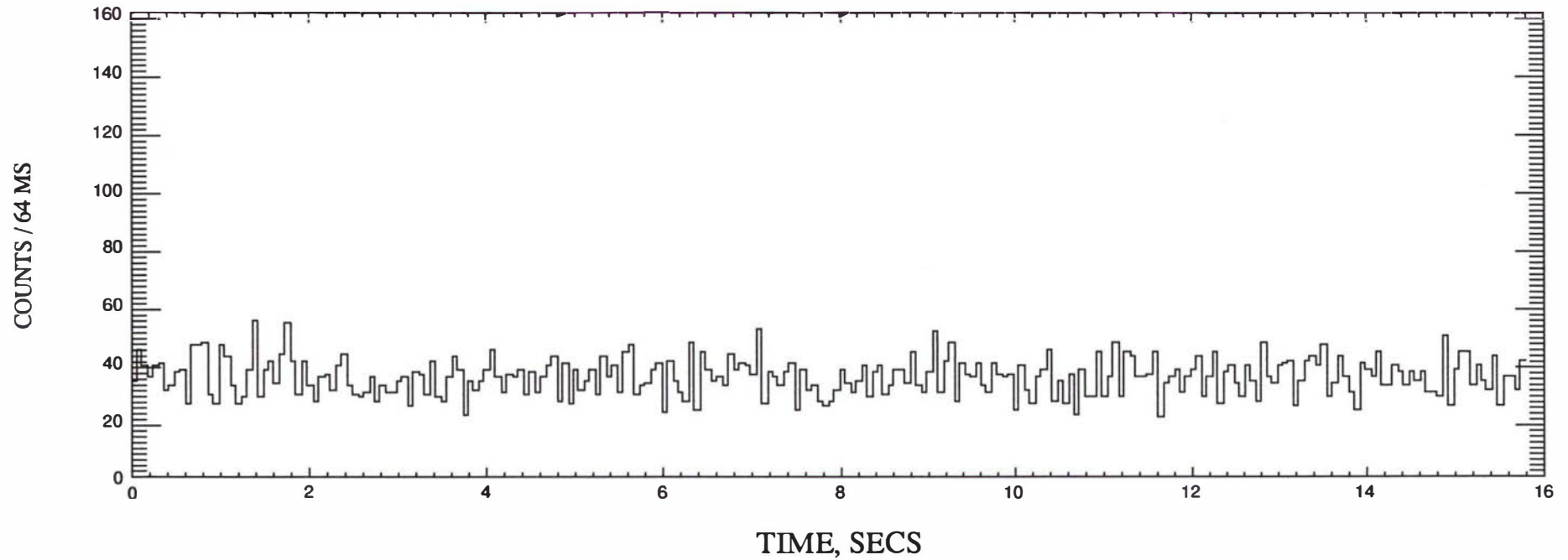


TIME, SECS

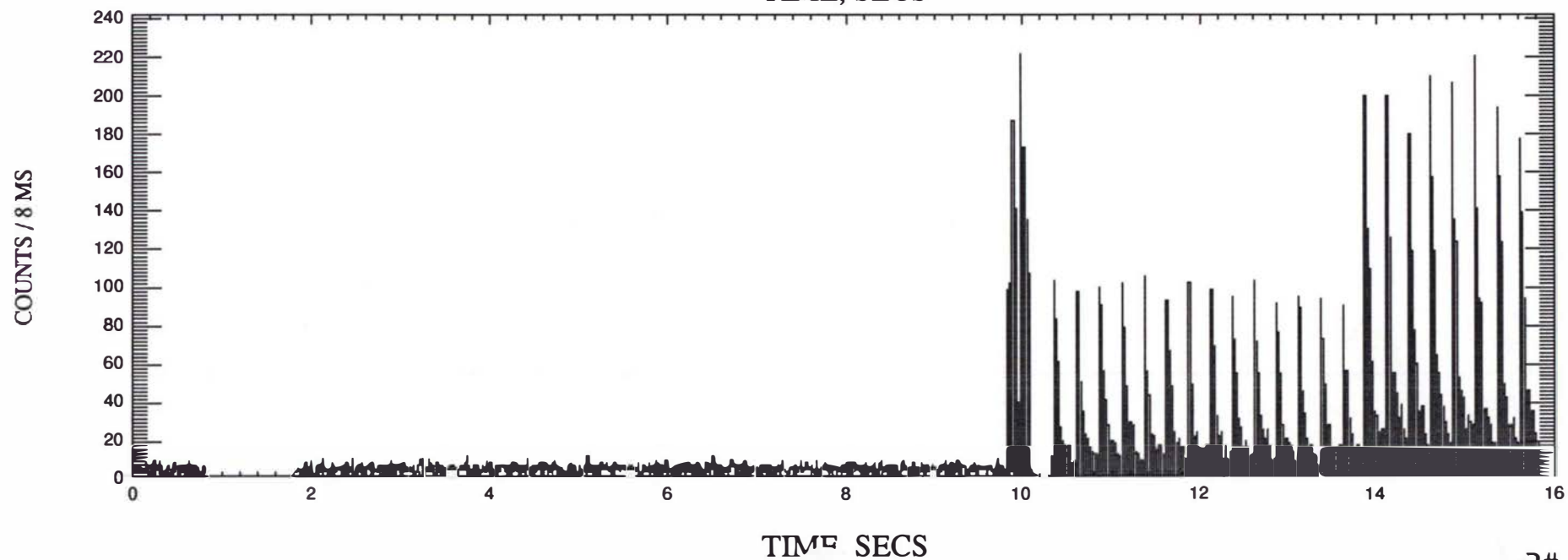
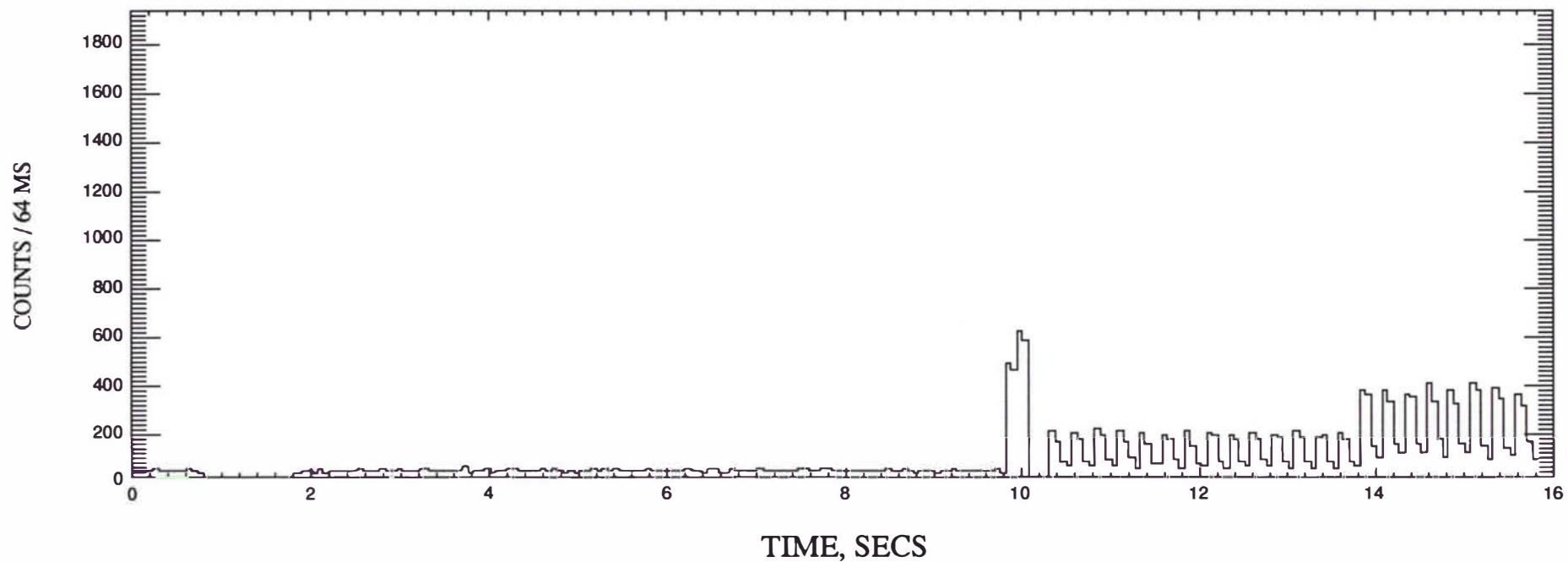


TIME, SECS

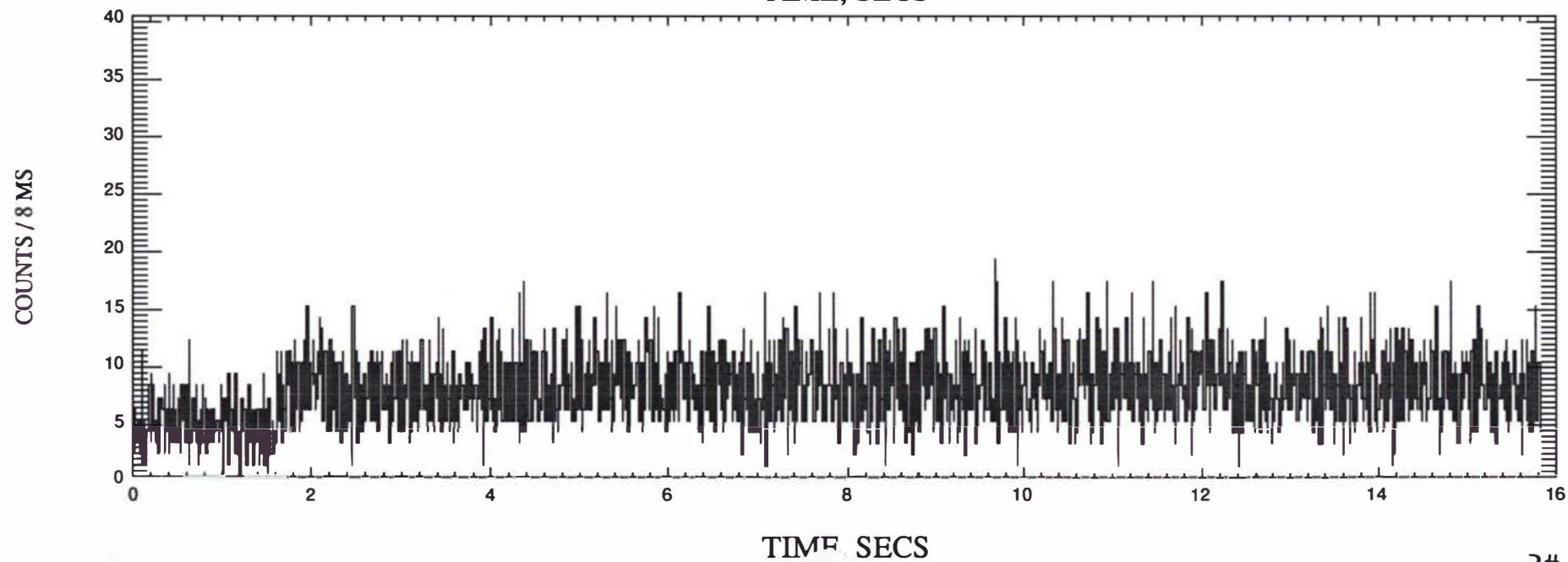
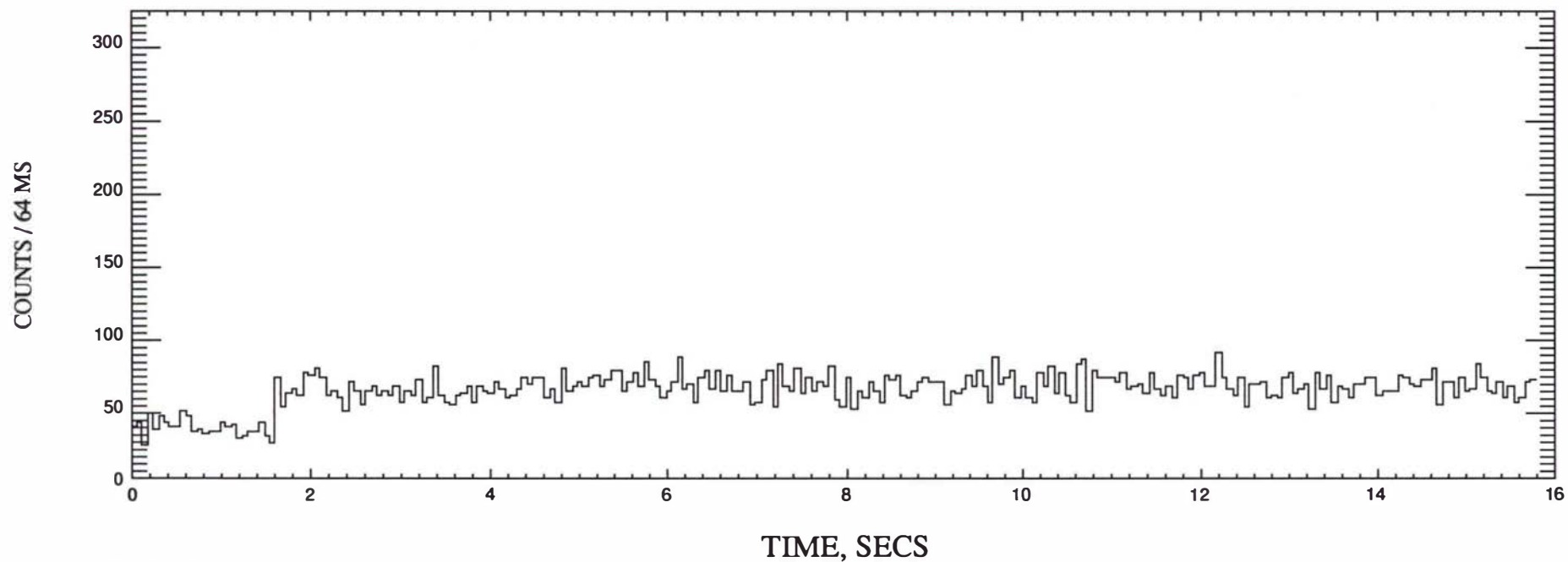
Burst Counter 5 at UT=20.115415632460 h=72415.496 s 20:06:55.496



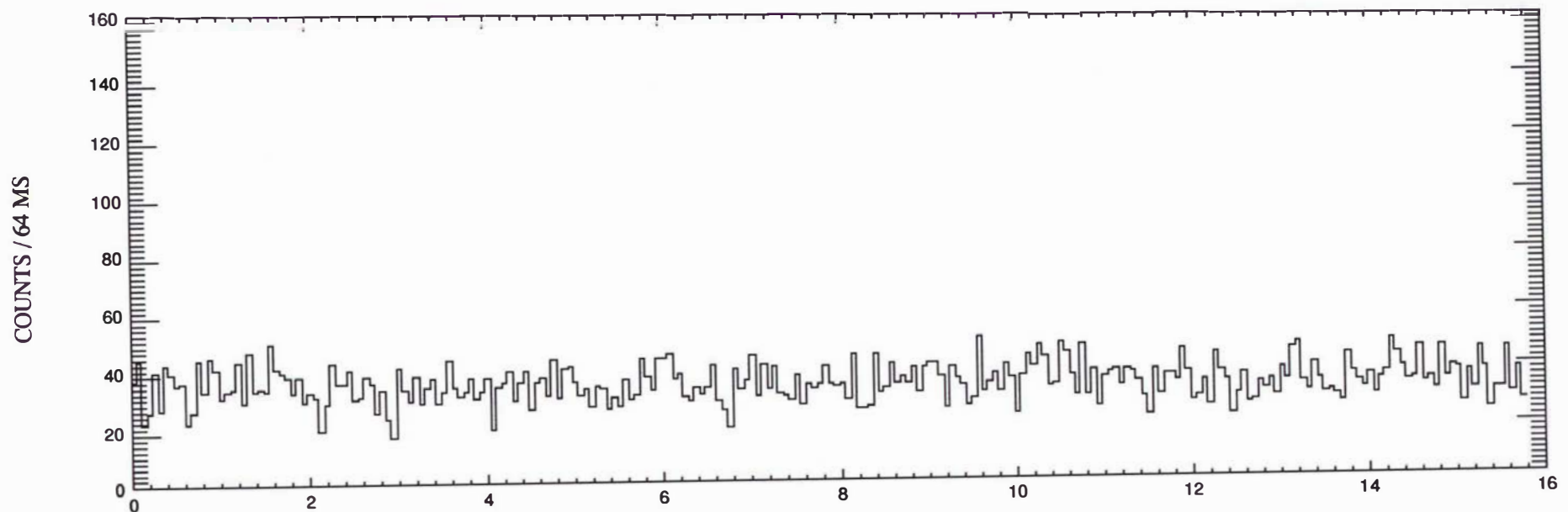
Burst Counter 6 at UT=21.450434913635 h=77221.566 s 21:27:01.566



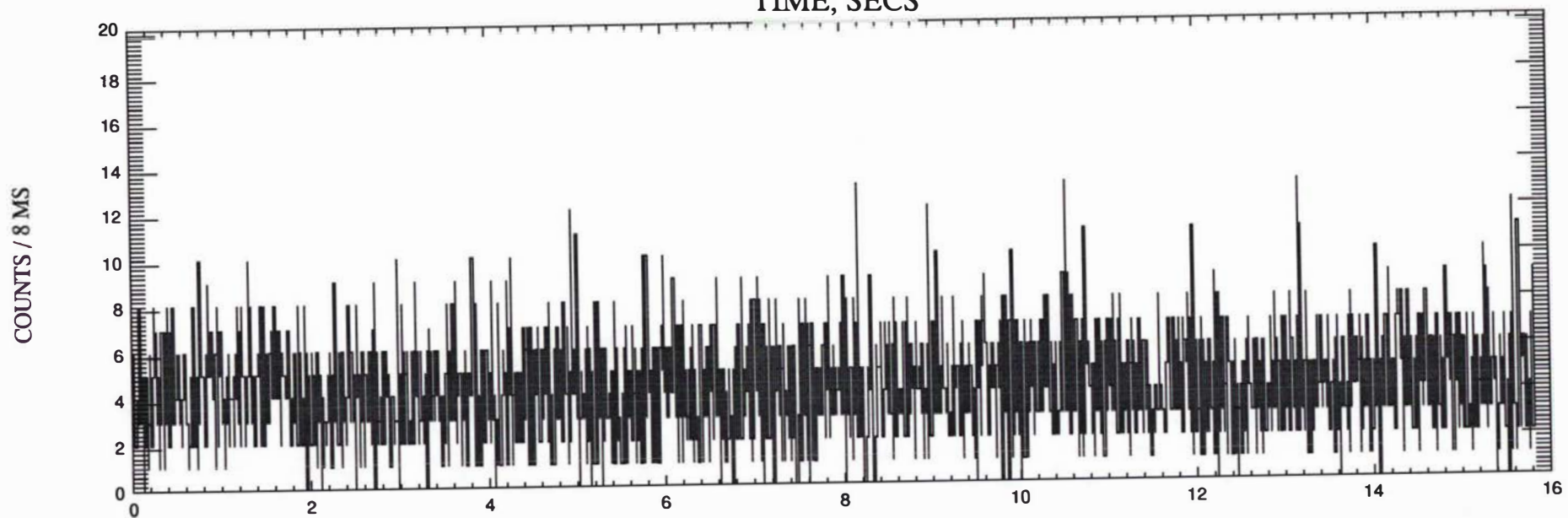
Burst Counter 7 at UT=22.181077503628 h=79851.879 s 22:10:51.879



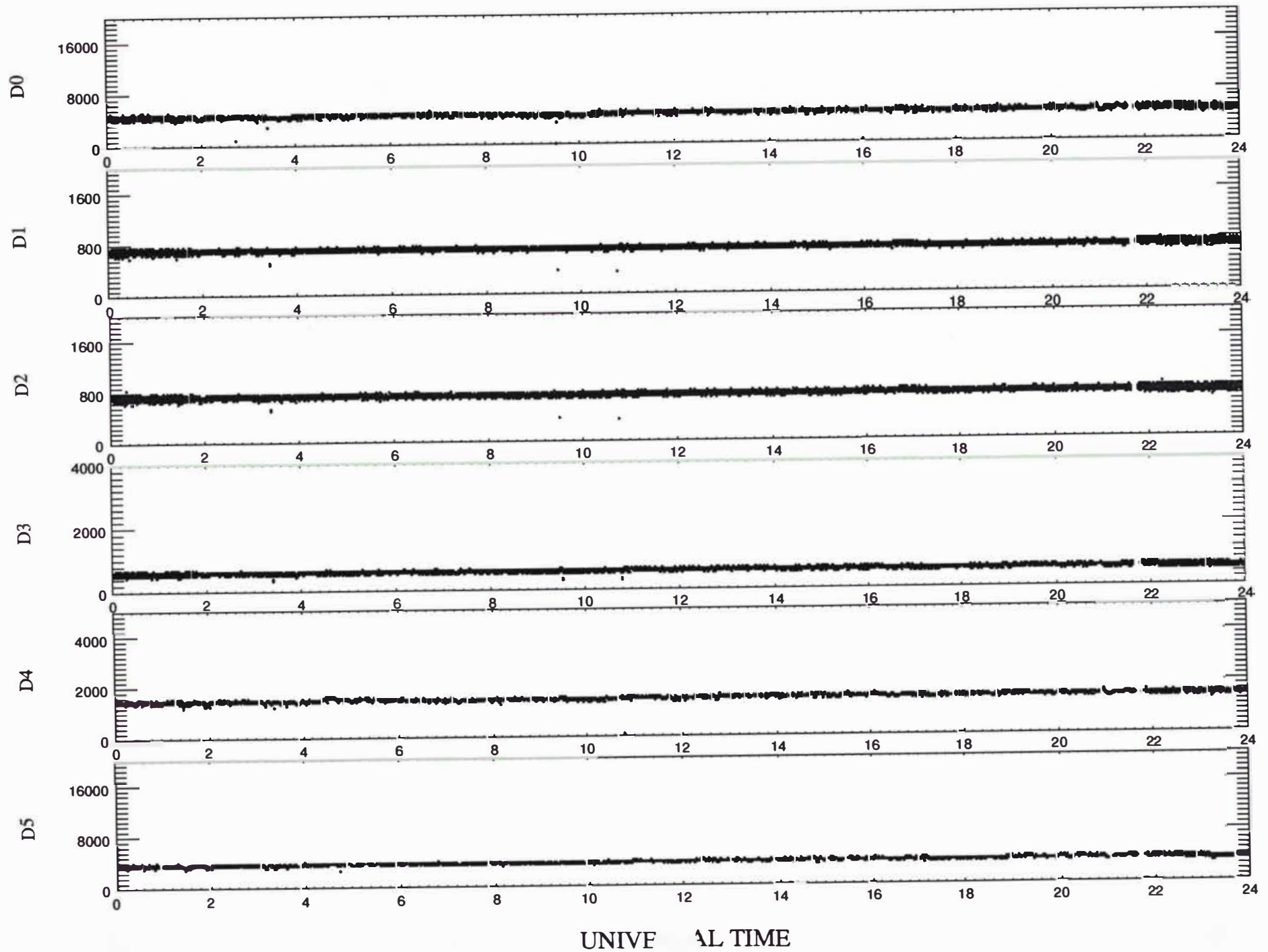
Burst Counter 8 at UT=22.944084561666 h=82598.704 s 22:56:38.704

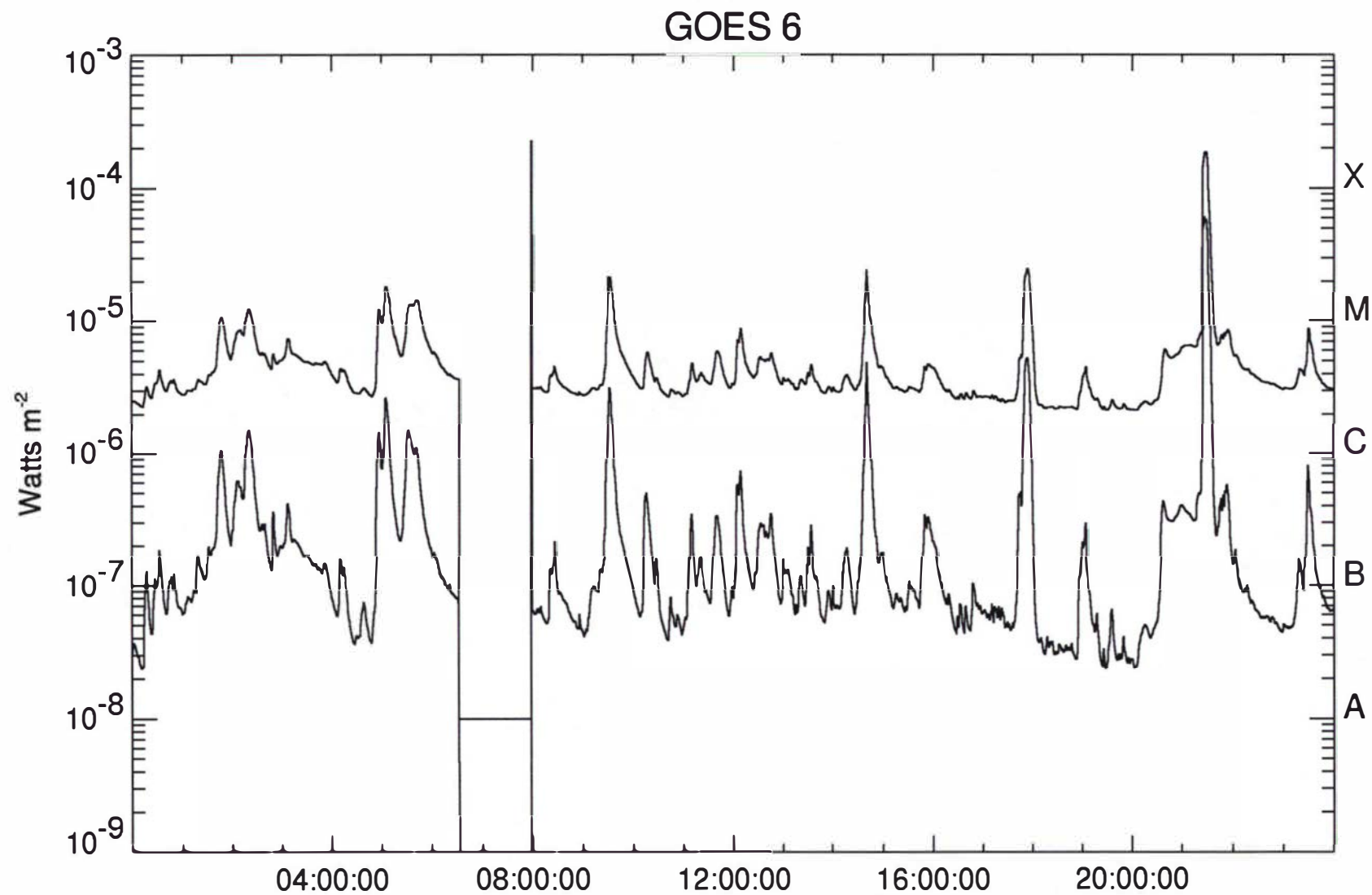


TIME, SECS



TIME, SECS





Data Start: 91/03/17, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

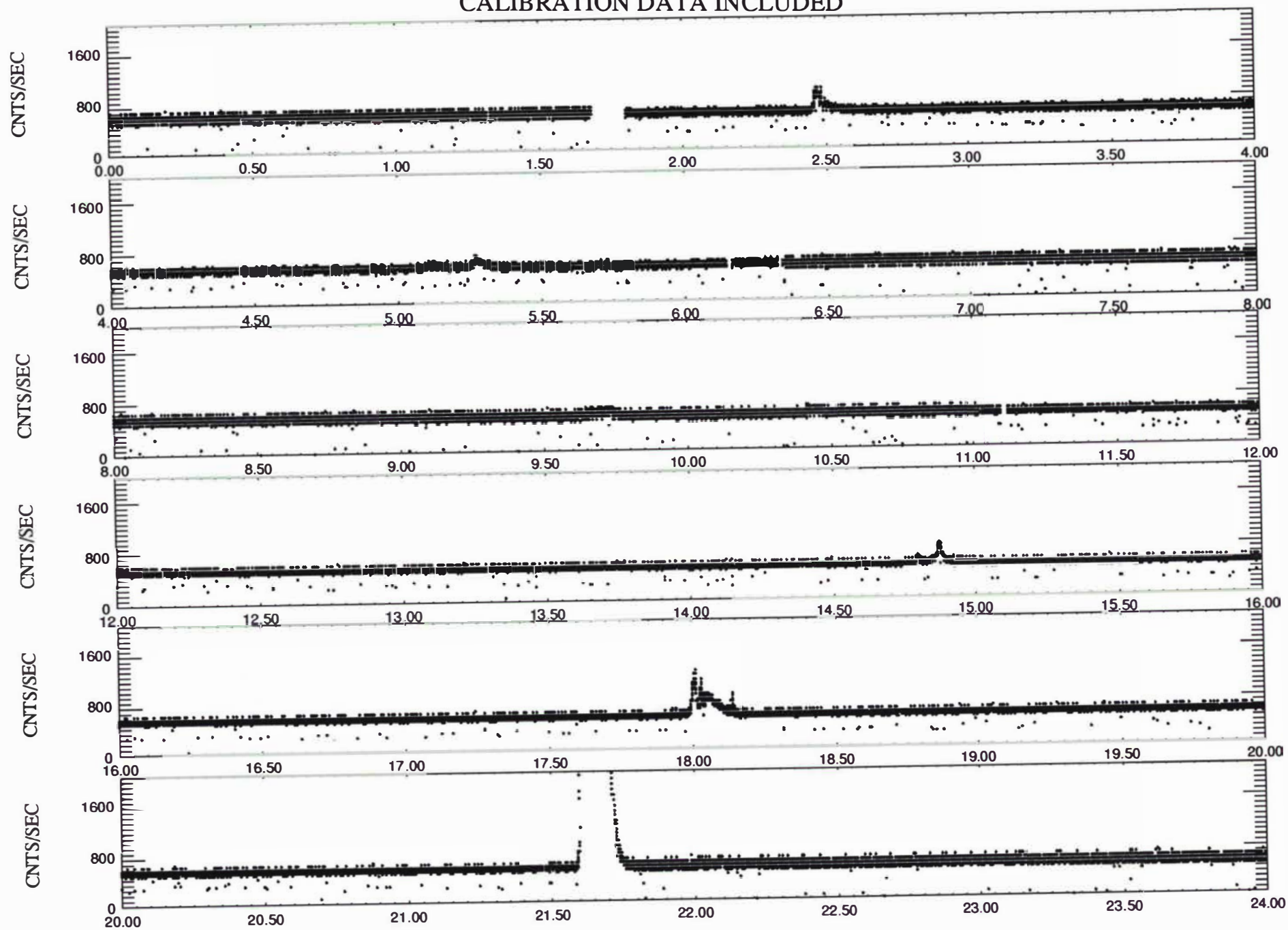
Plot created: 96/11/26, 1846

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 10 - 15, 0 - 8

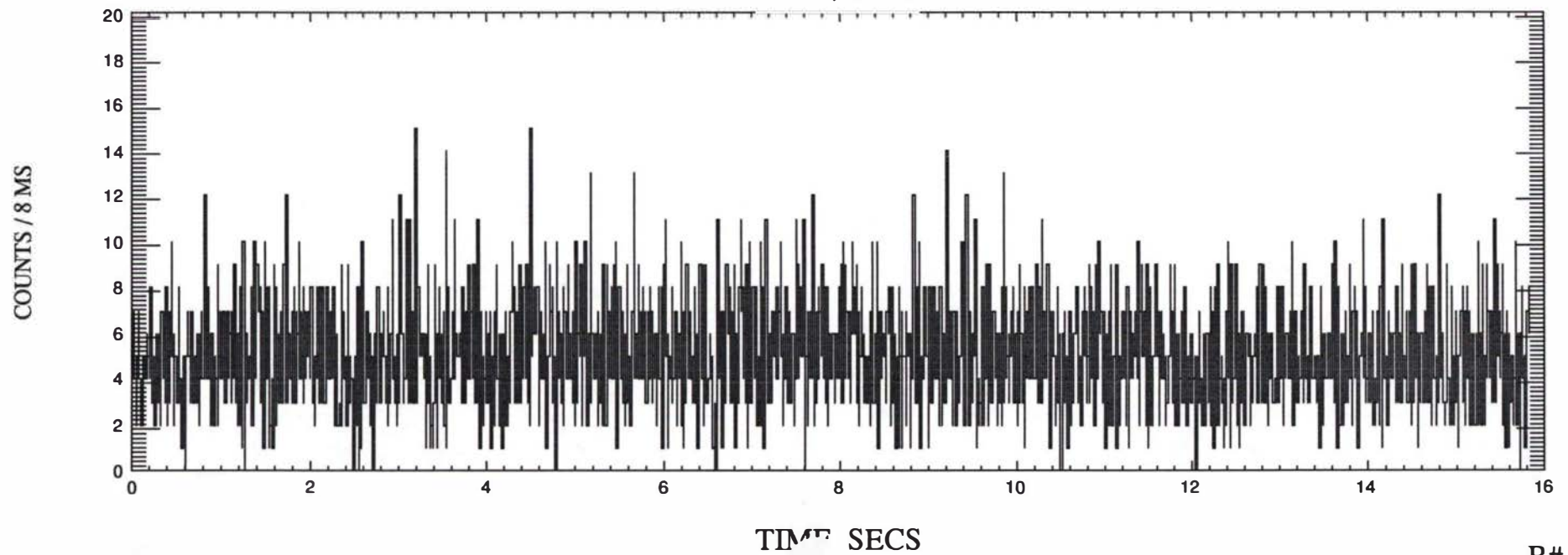
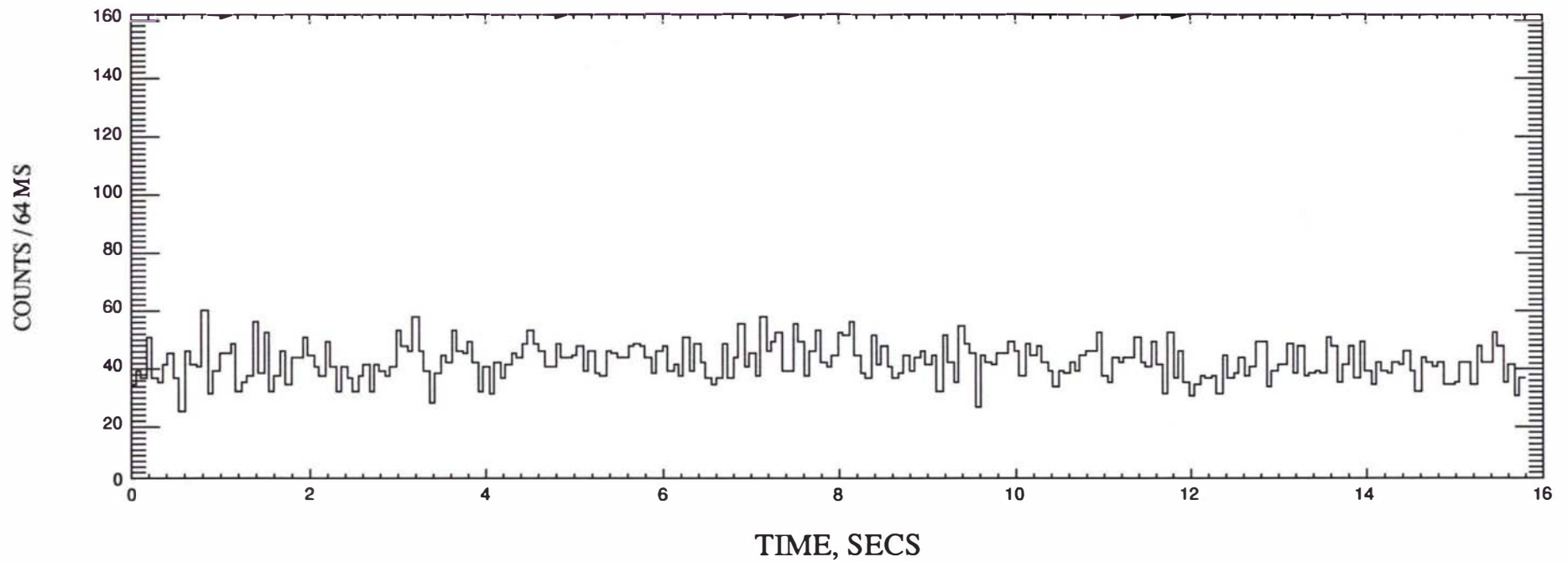


CALIBRATION DATA INCLUDED

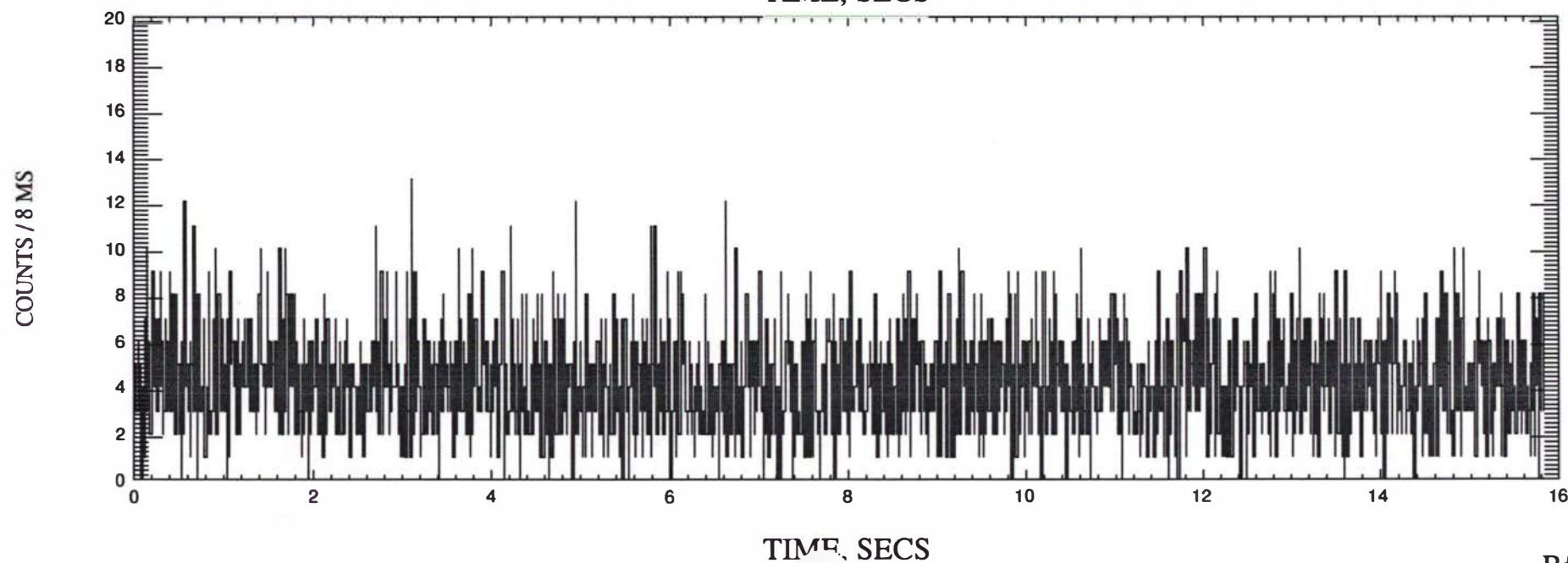
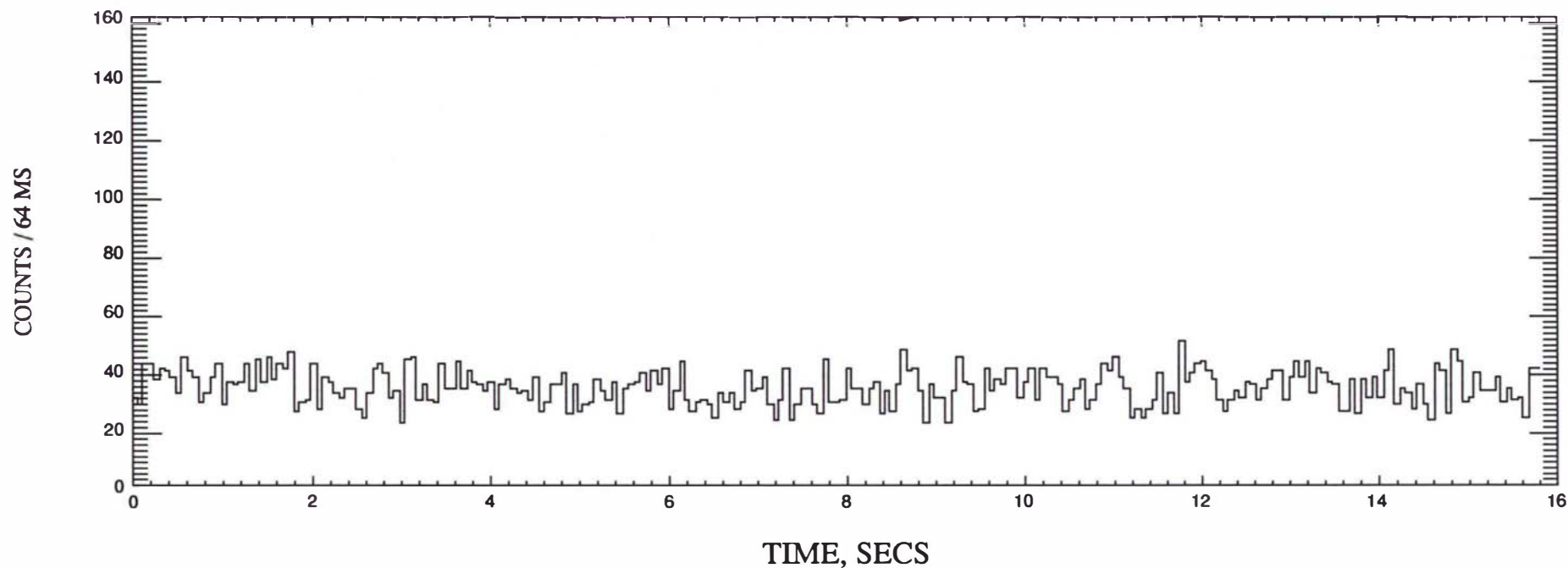


UNIV. TIME

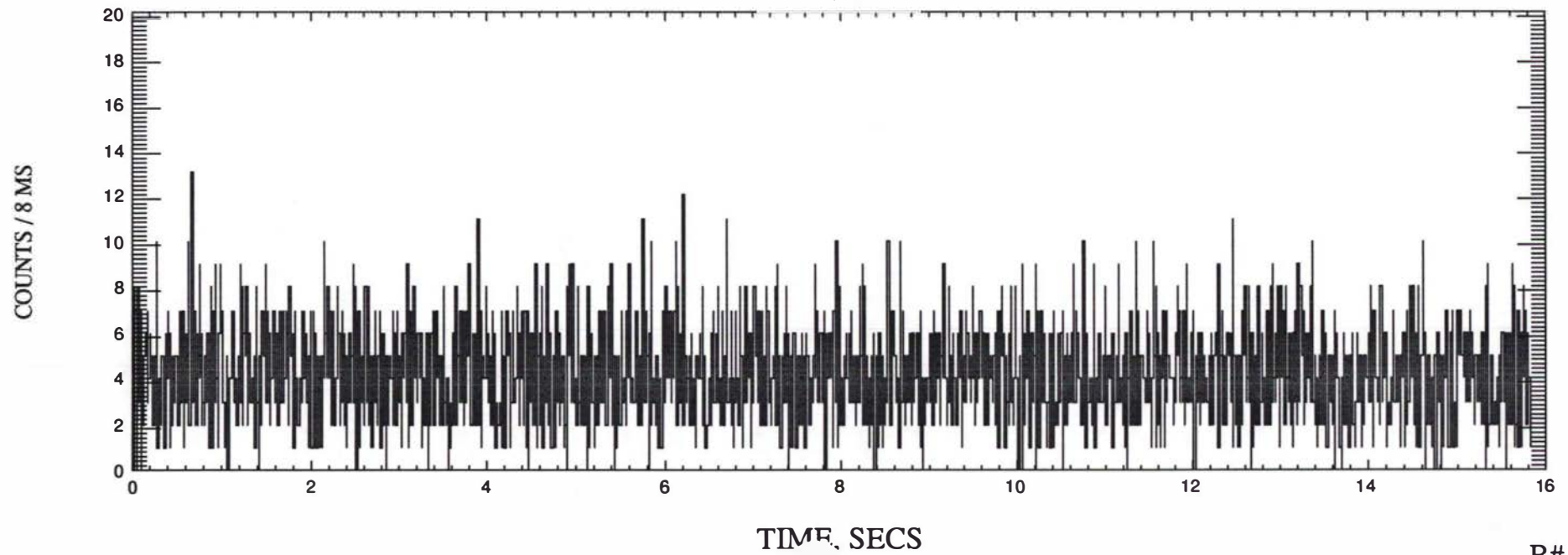
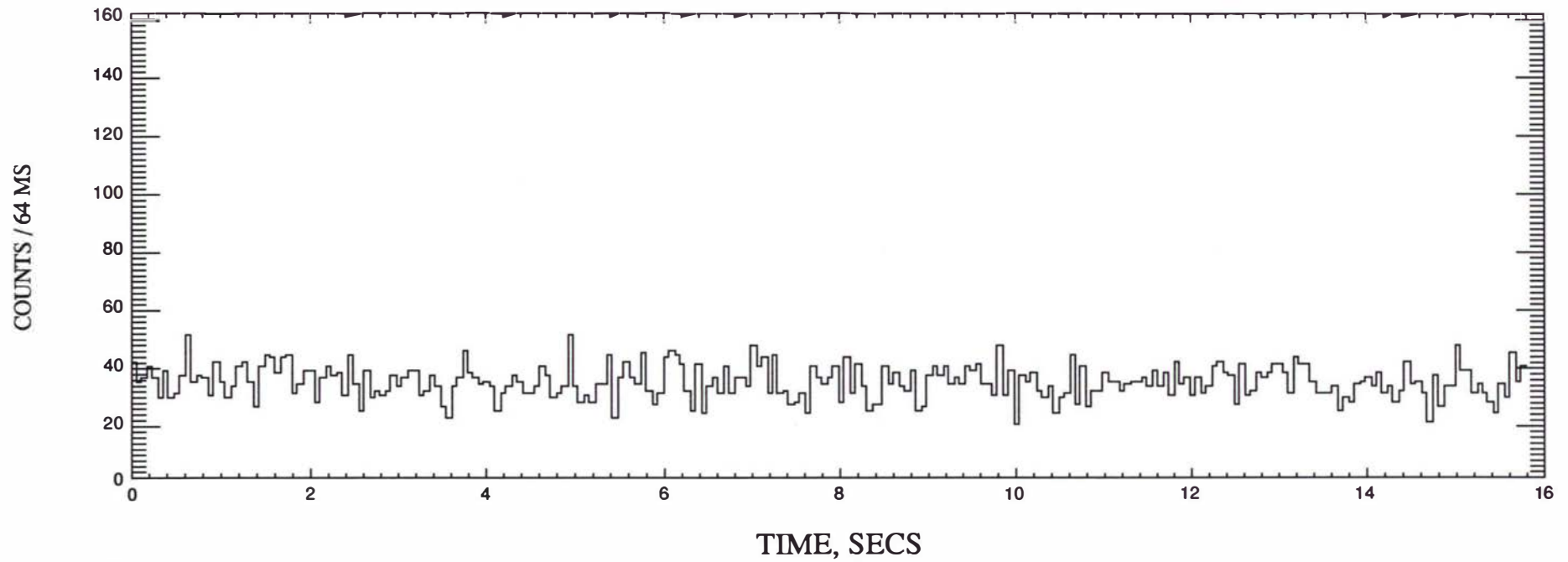
Burst Counter 4 at UT= 0.558536177741 h= 2010.730 s 00:33:30.730



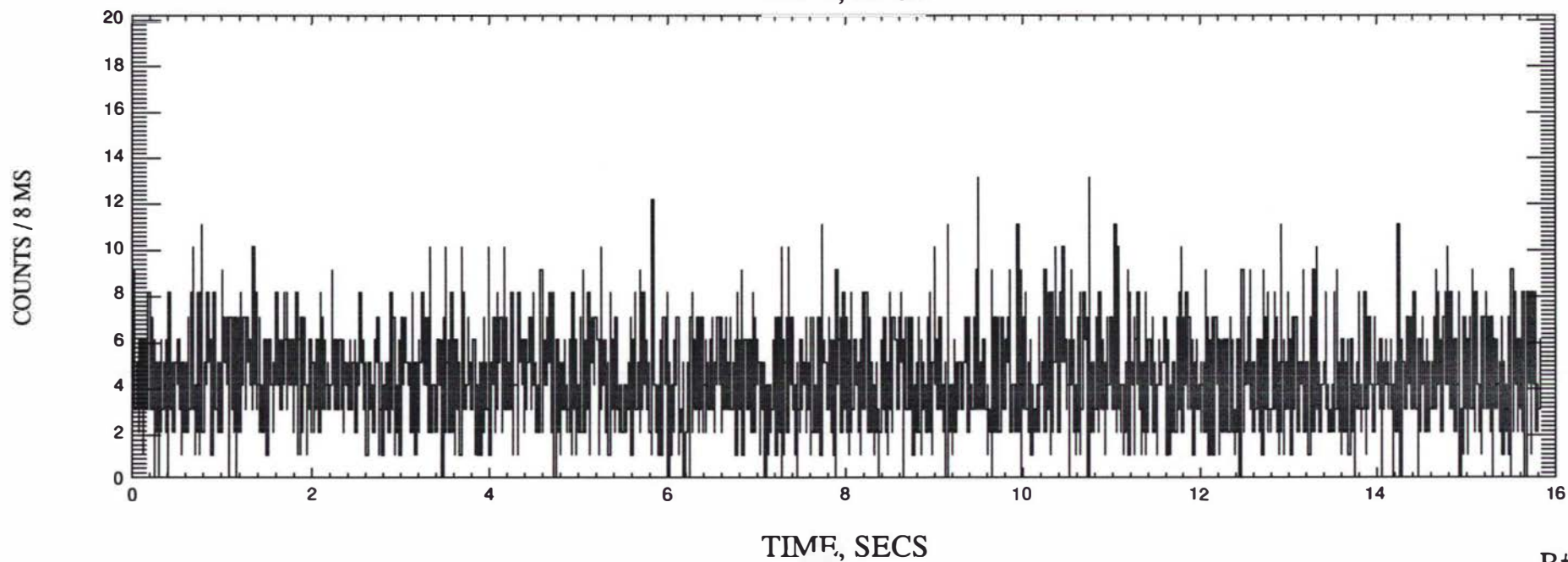
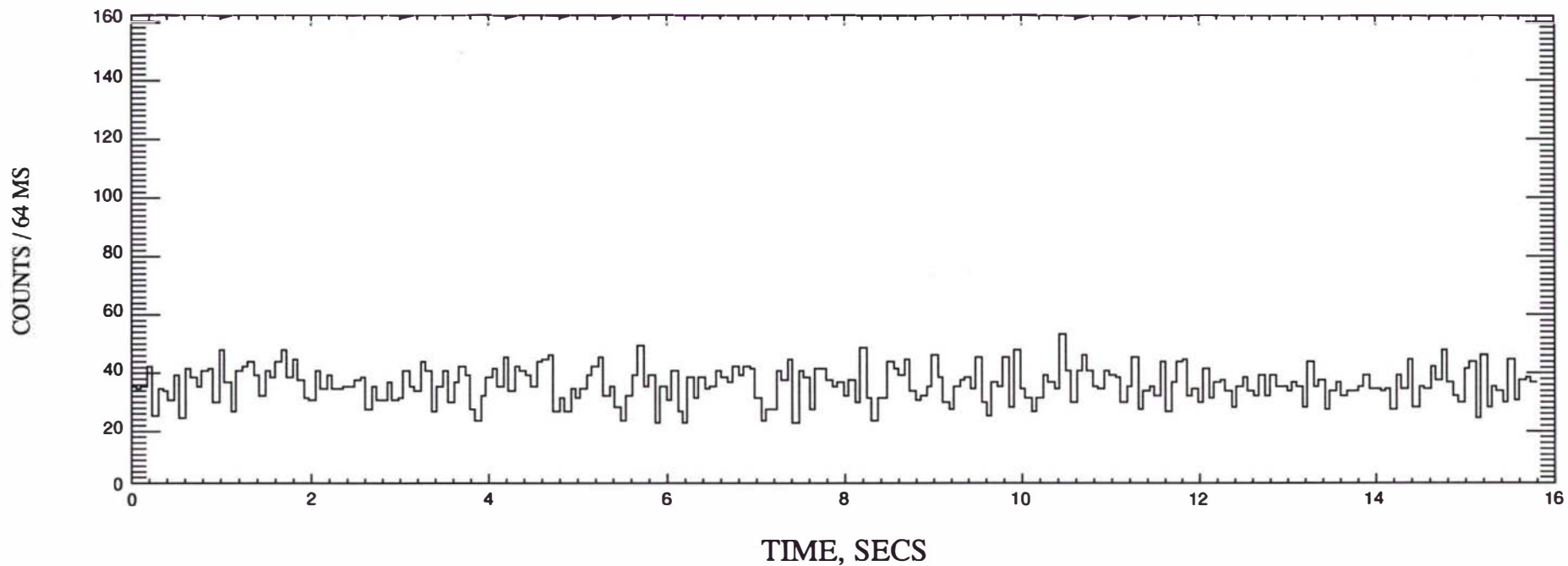
Burst Counter 11 at UT= 1.229406505161 h= 4425.863 s 01:13:45.863



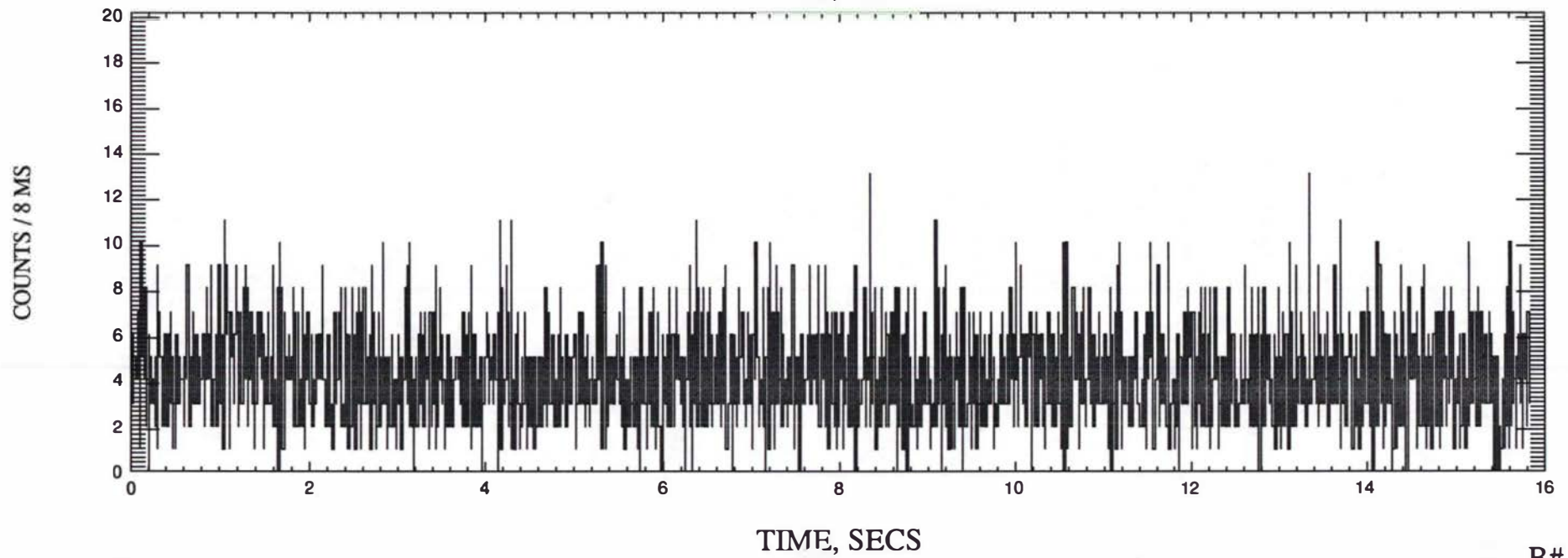
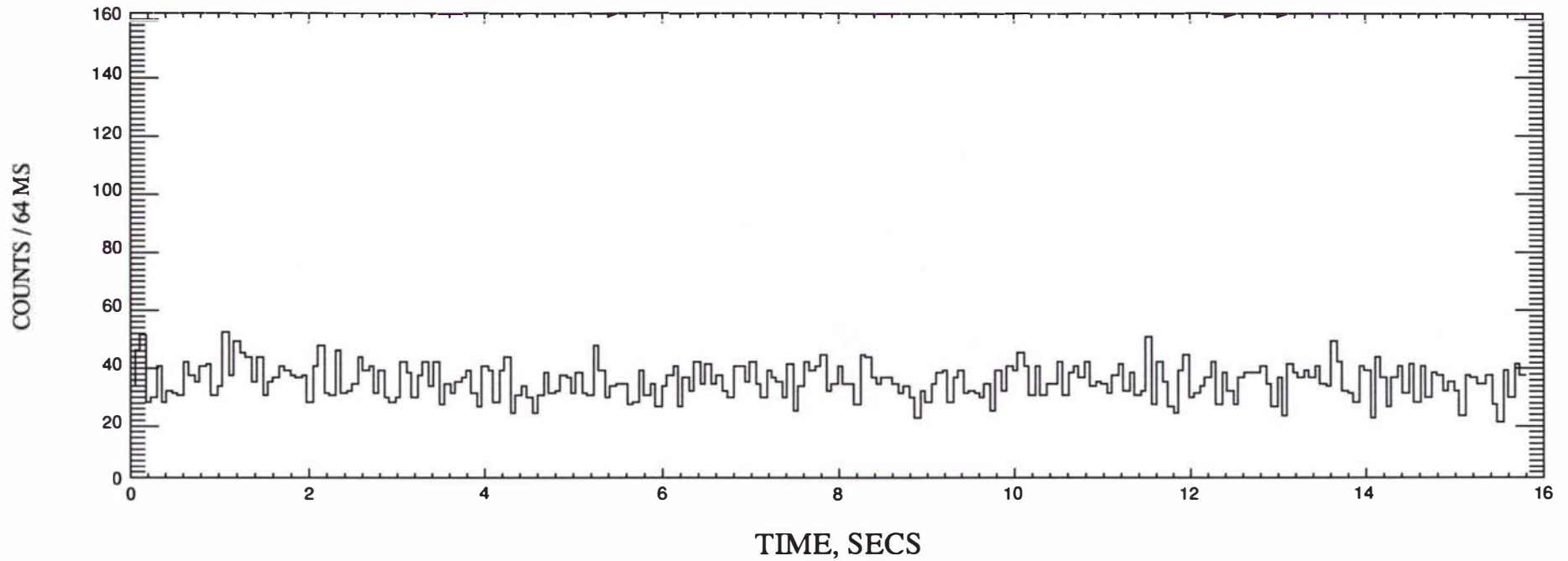
Burst Counter 12 at UT= 2.218033693102 h= 7984.921 s 02:13:04.921



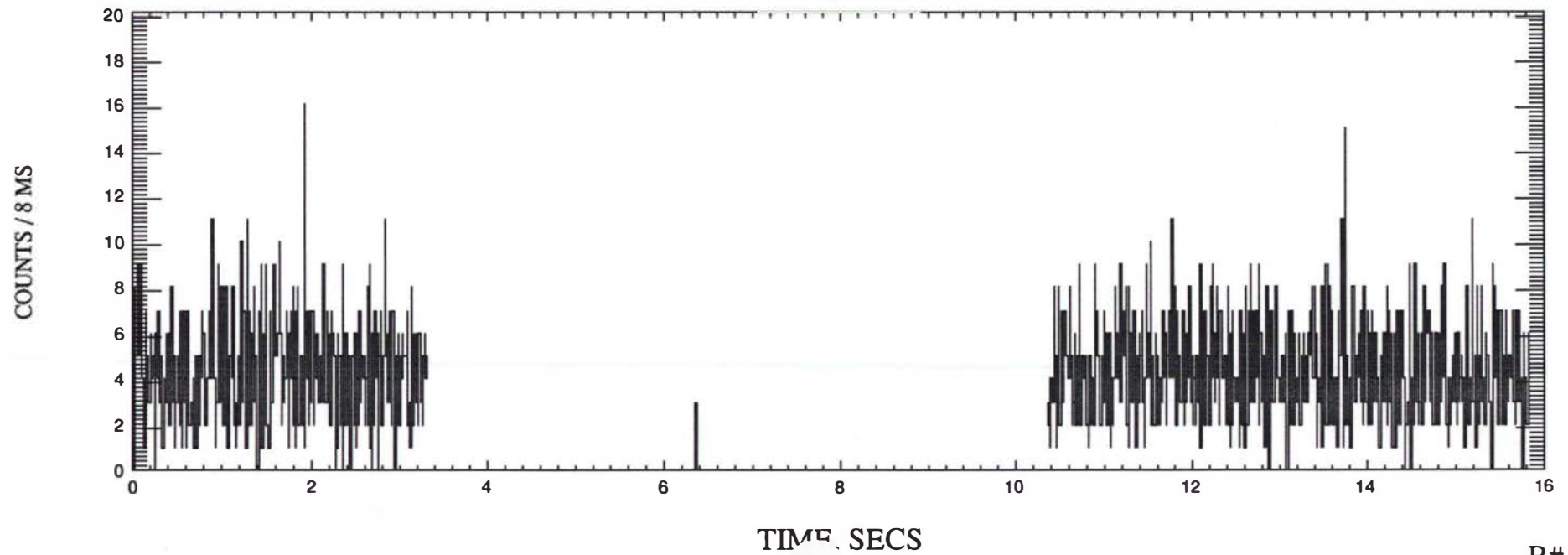
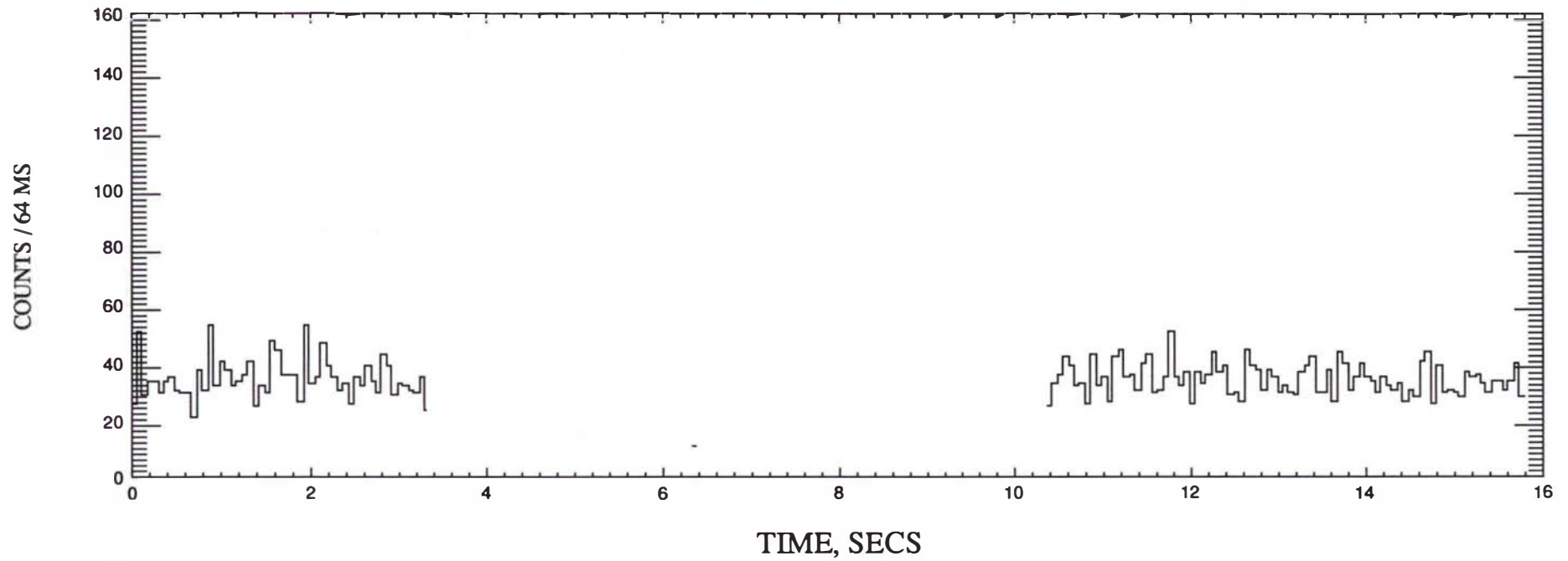
Burst Counter 13 at UT= 3.522504386902 h=12681.016 s 03:31:21.016



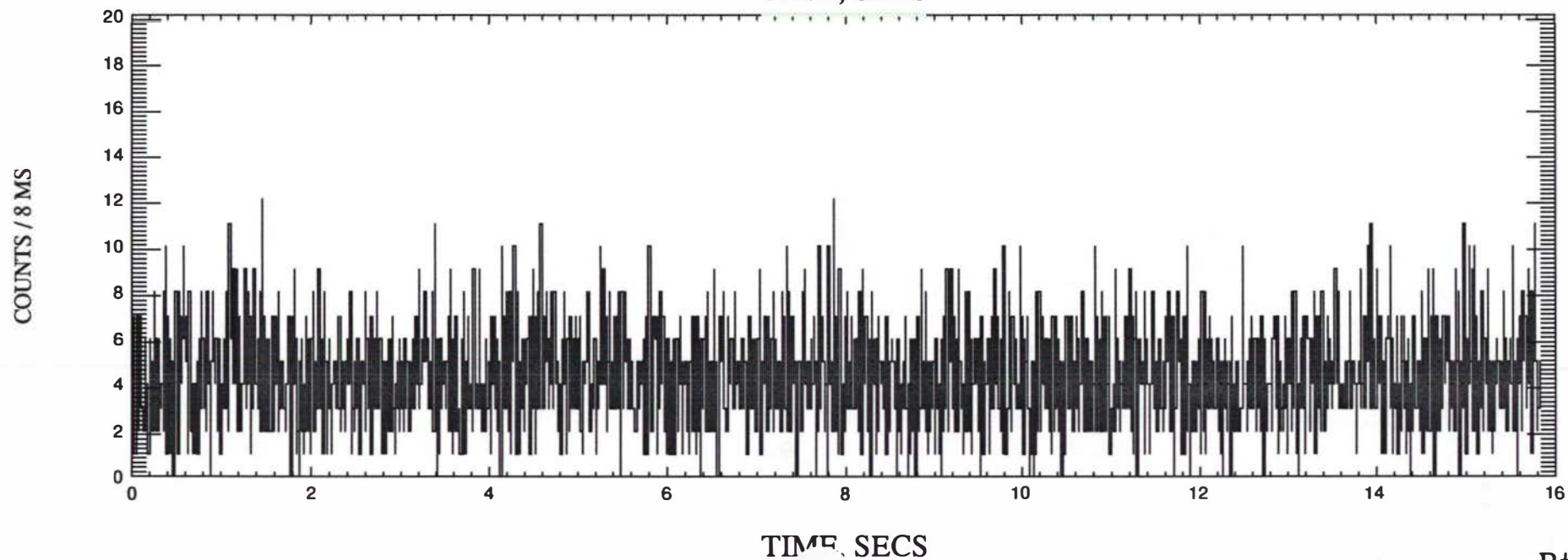
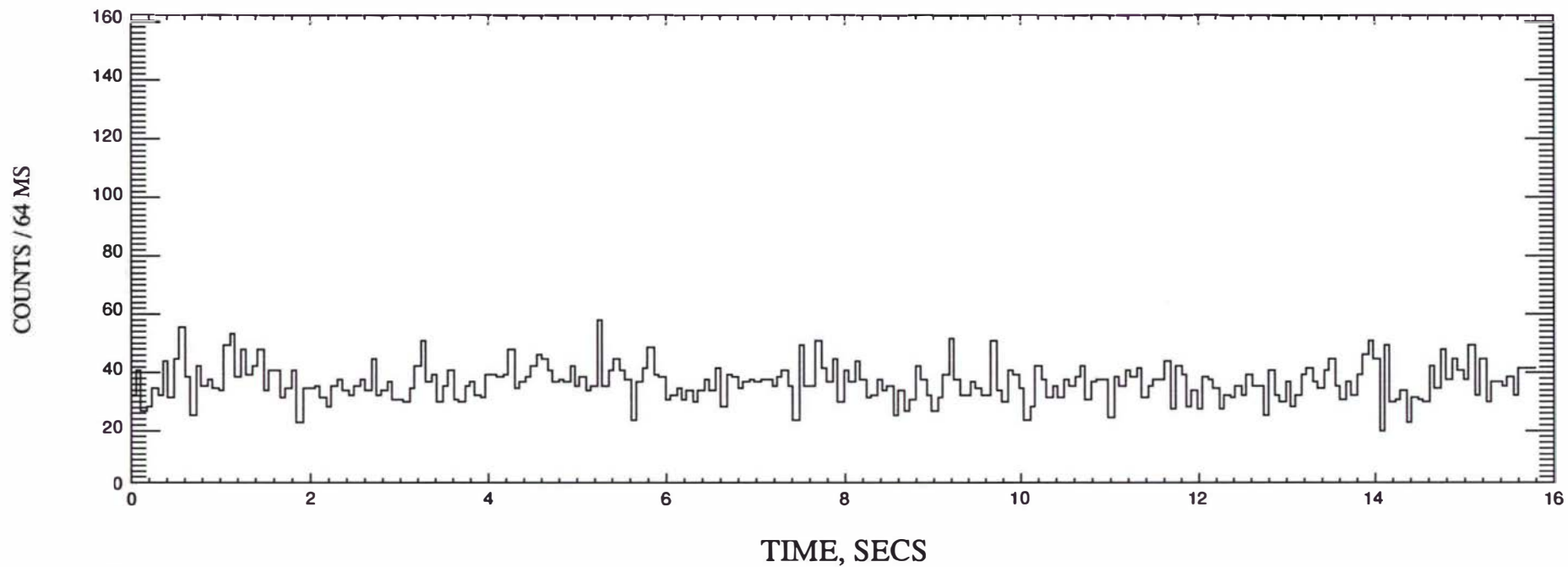
Burst Counter 14 at UT= 4.782525384691 h=17217.091 s 04:46:57.091



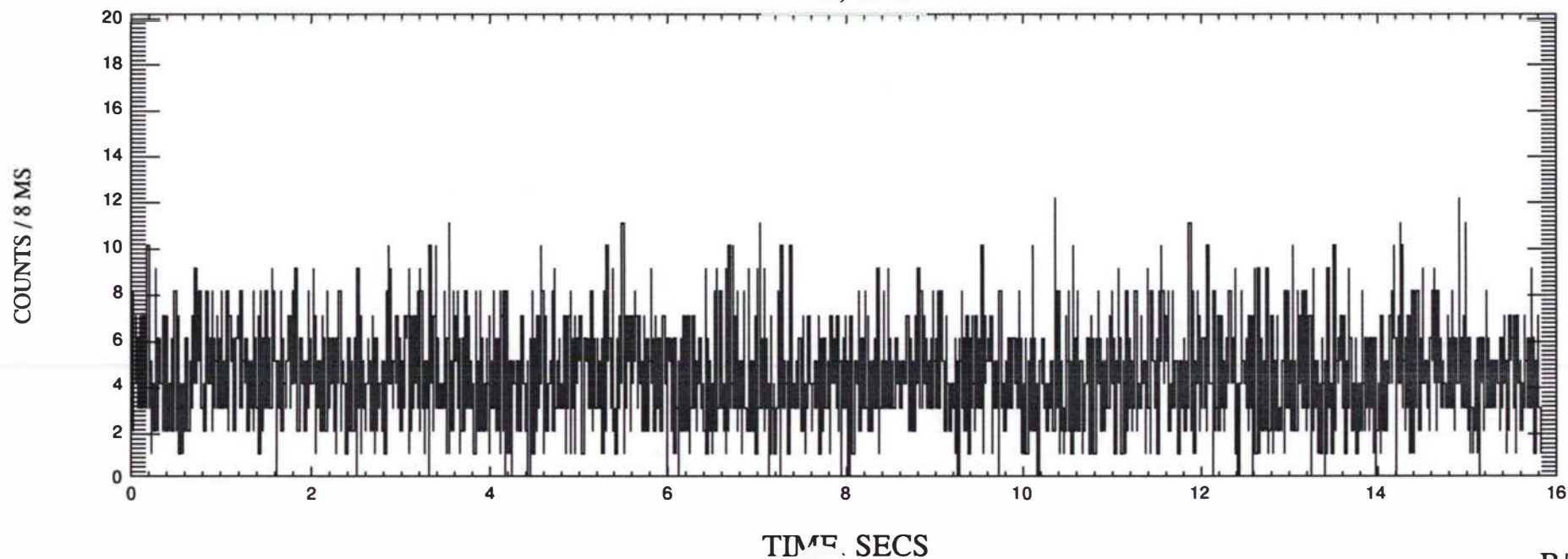
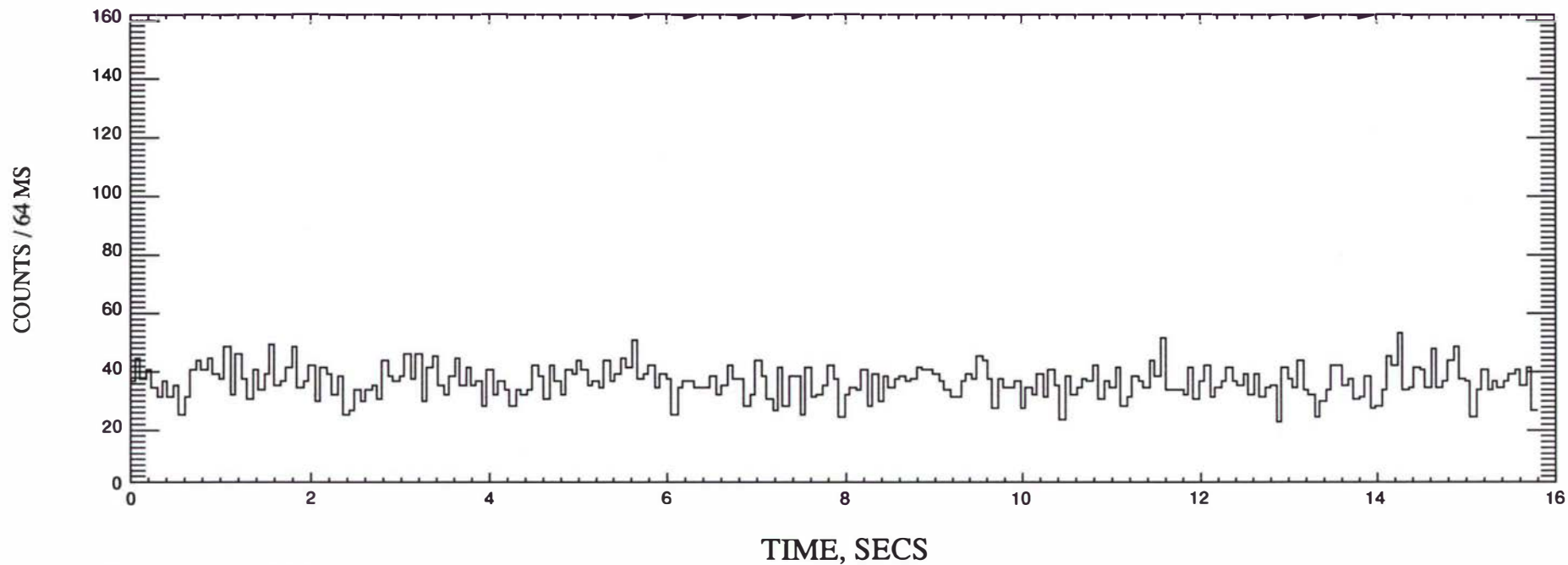
Burst Counter 15 at UT= 6.040324613783 h=21745.169 s 06:02:25.169



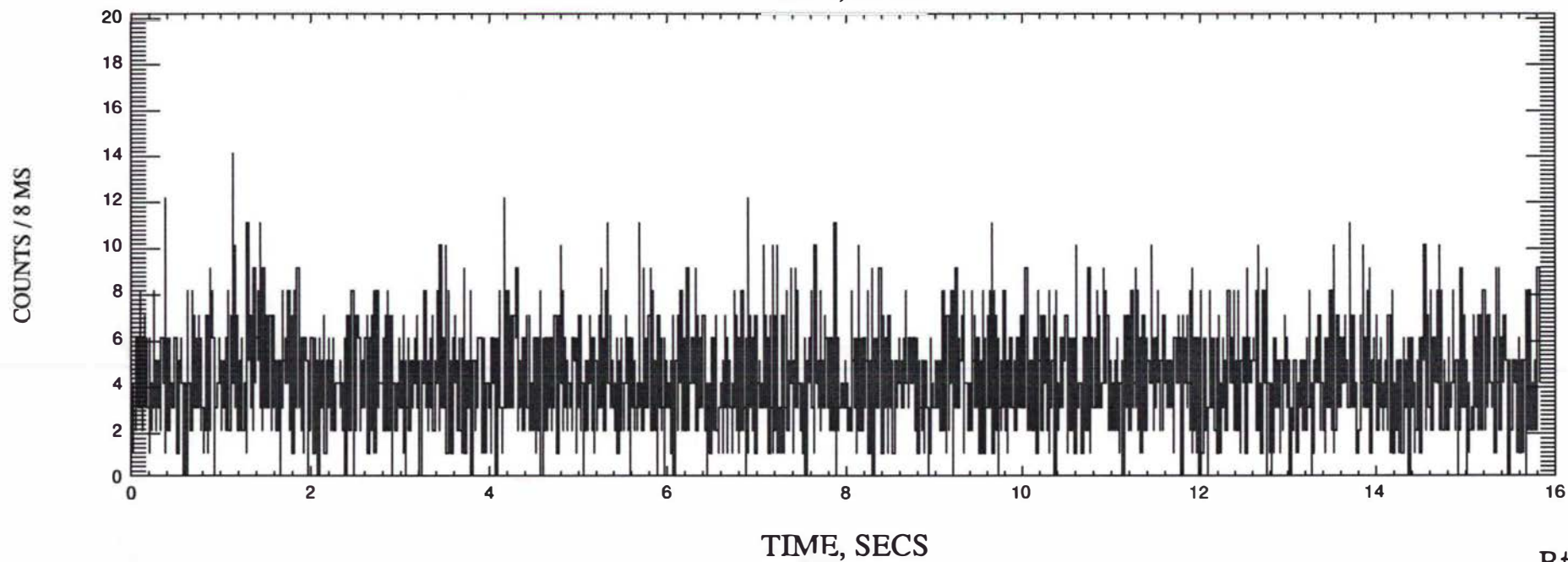
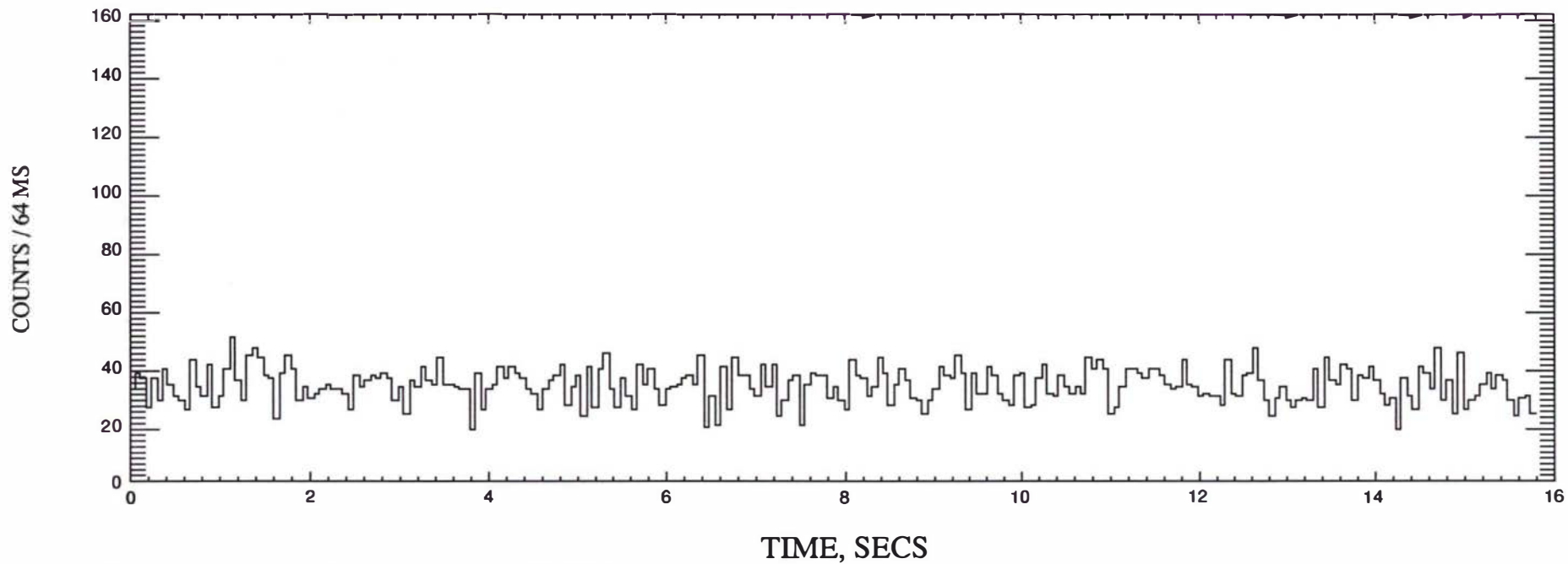
Burst Counter 0 at UT= 6.859779934353 h=24695.208 s 06:51:35.208



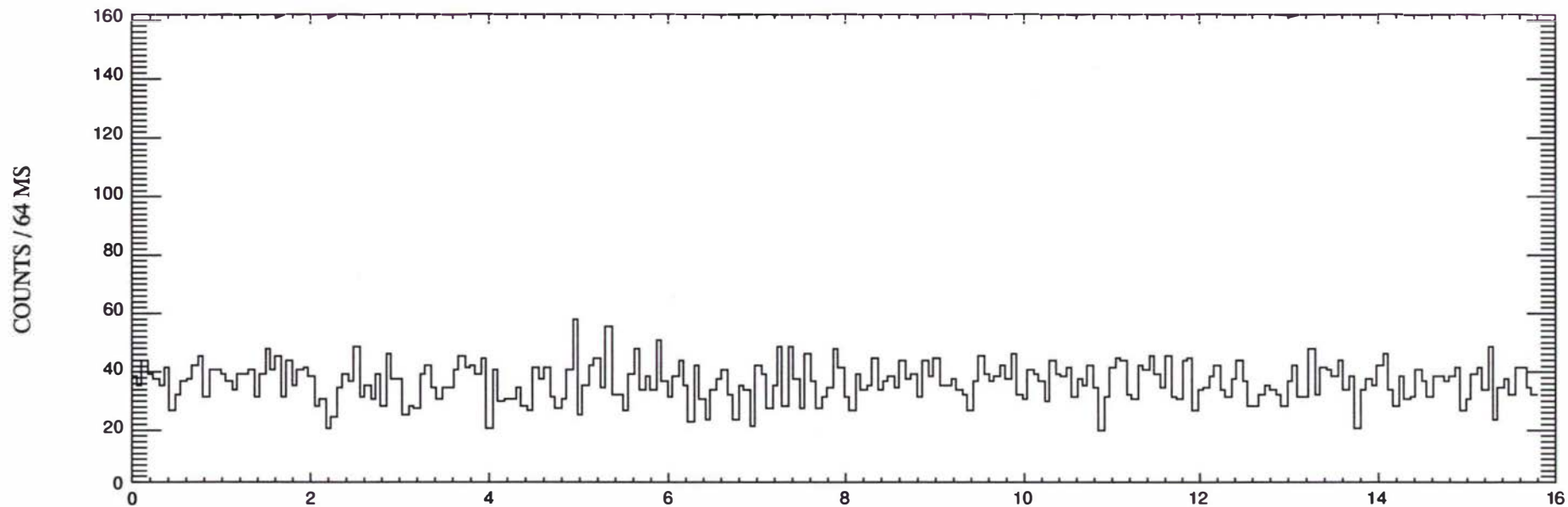
Burst Counter 1 at UT= 7.586459727817 h=27311.255 s 07:35:11.255



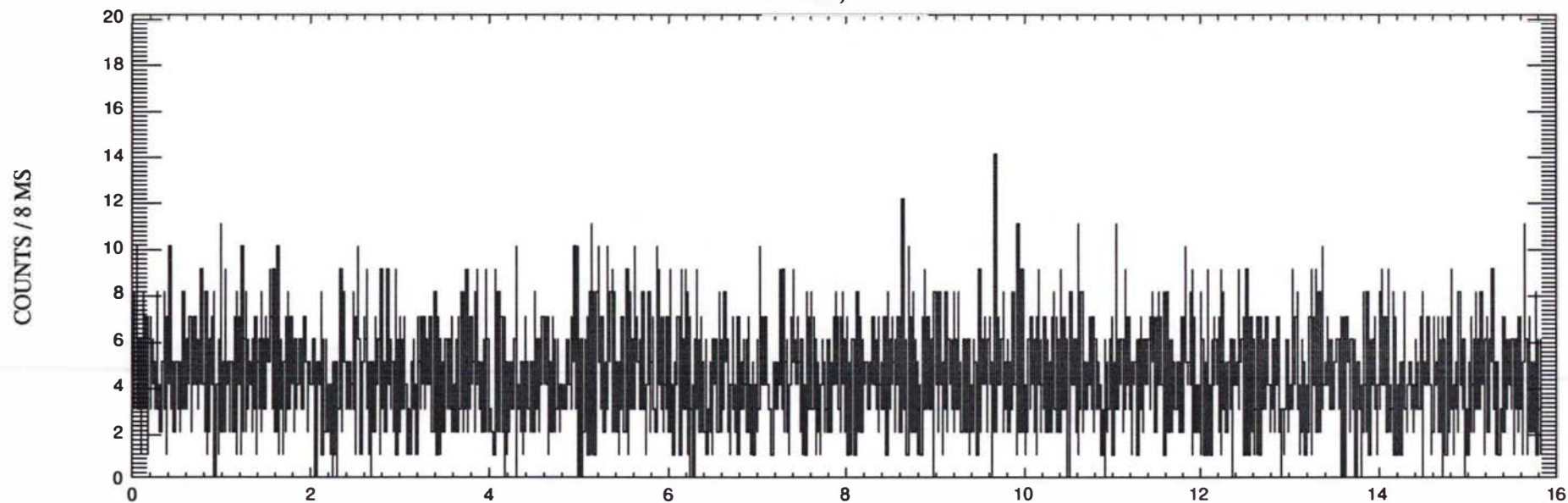
Burst Counter 2 at UT= 8.317037086487 h=29941.334 s 08:19:01.334



Burst Counter 10 at UT= 0.504940257602 h= 1817.785 s 00:30:17.785

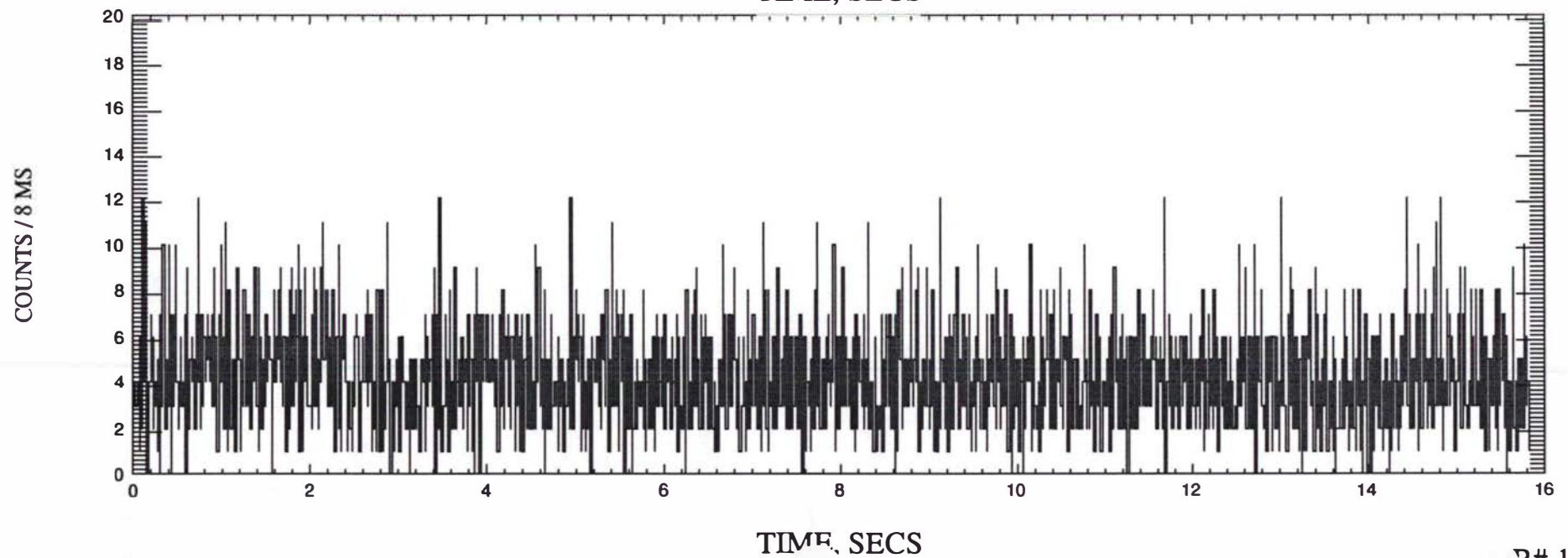
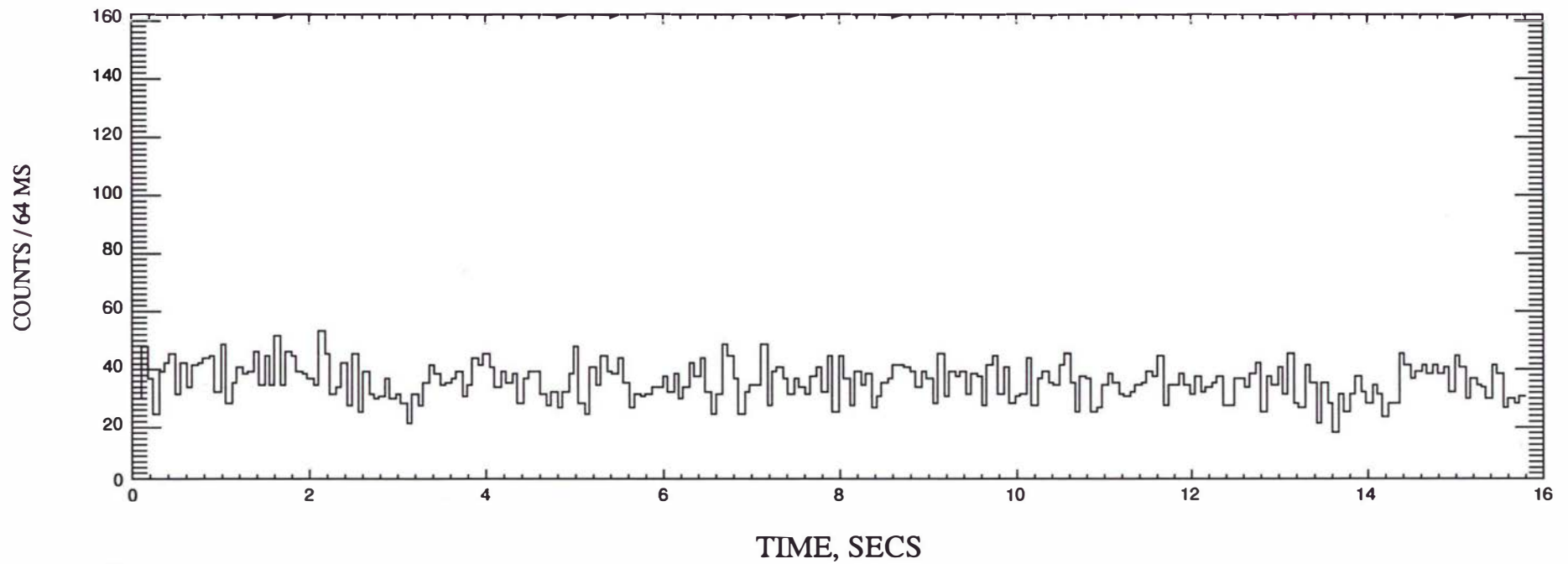


TIME, SECS

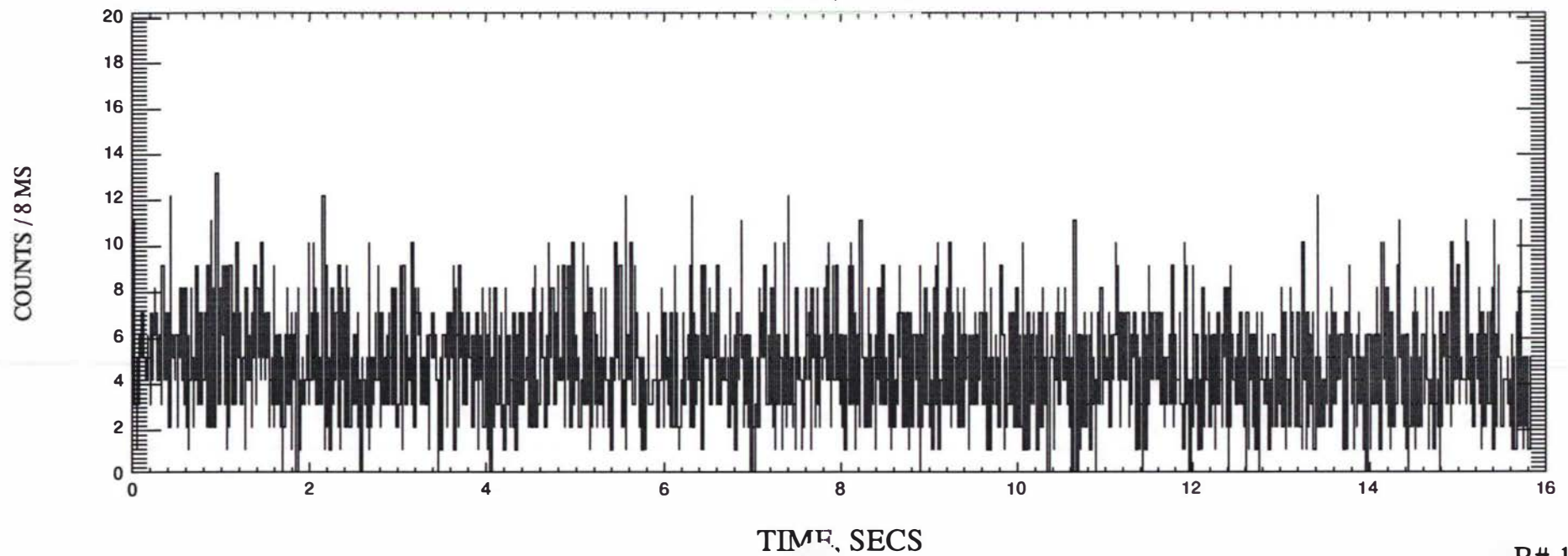
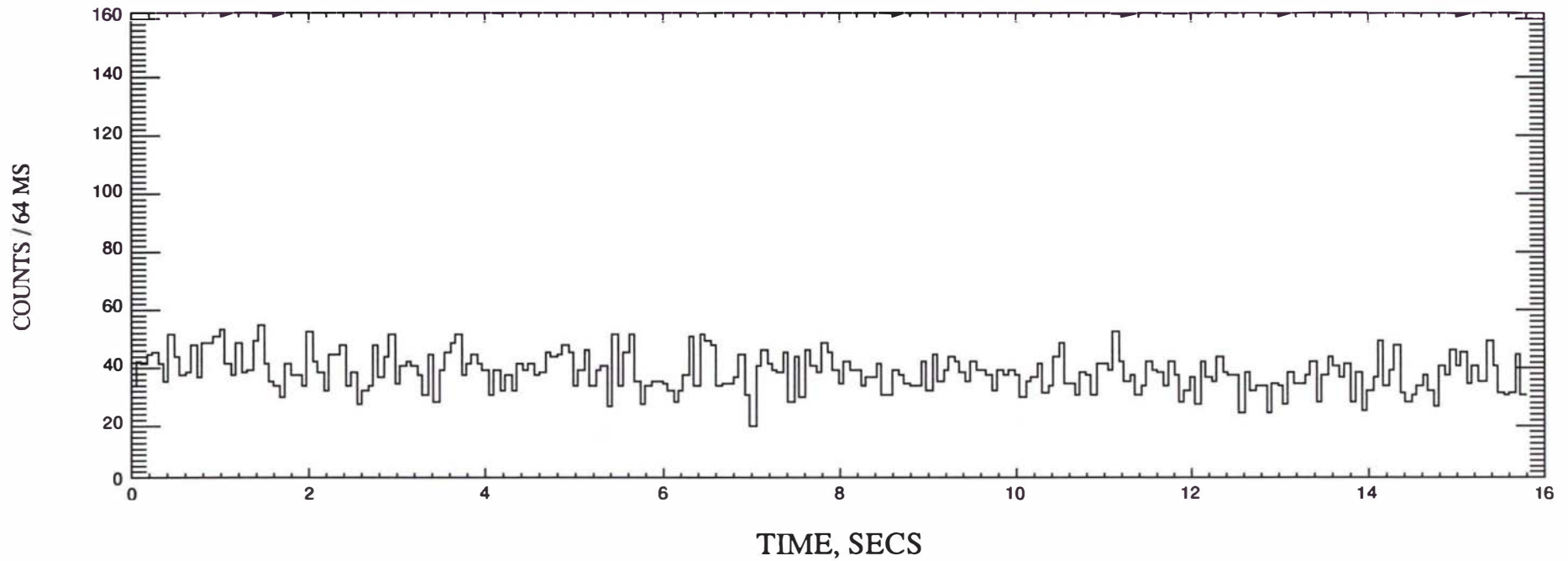


TIME, SECS

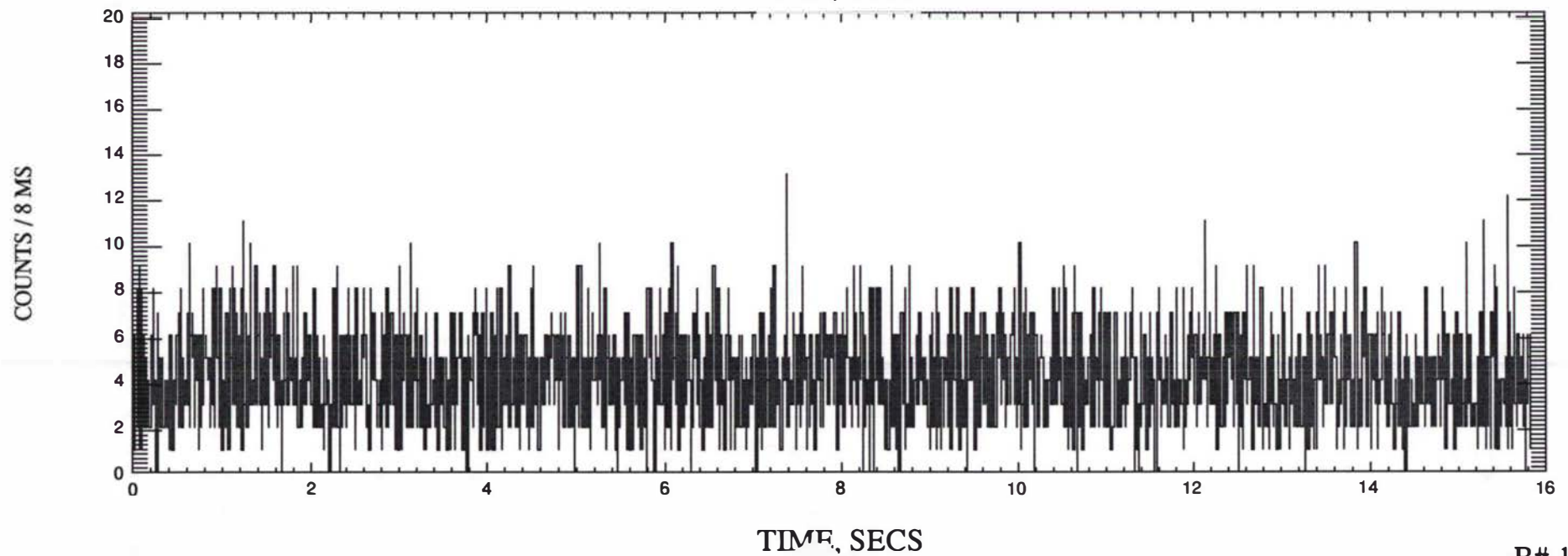
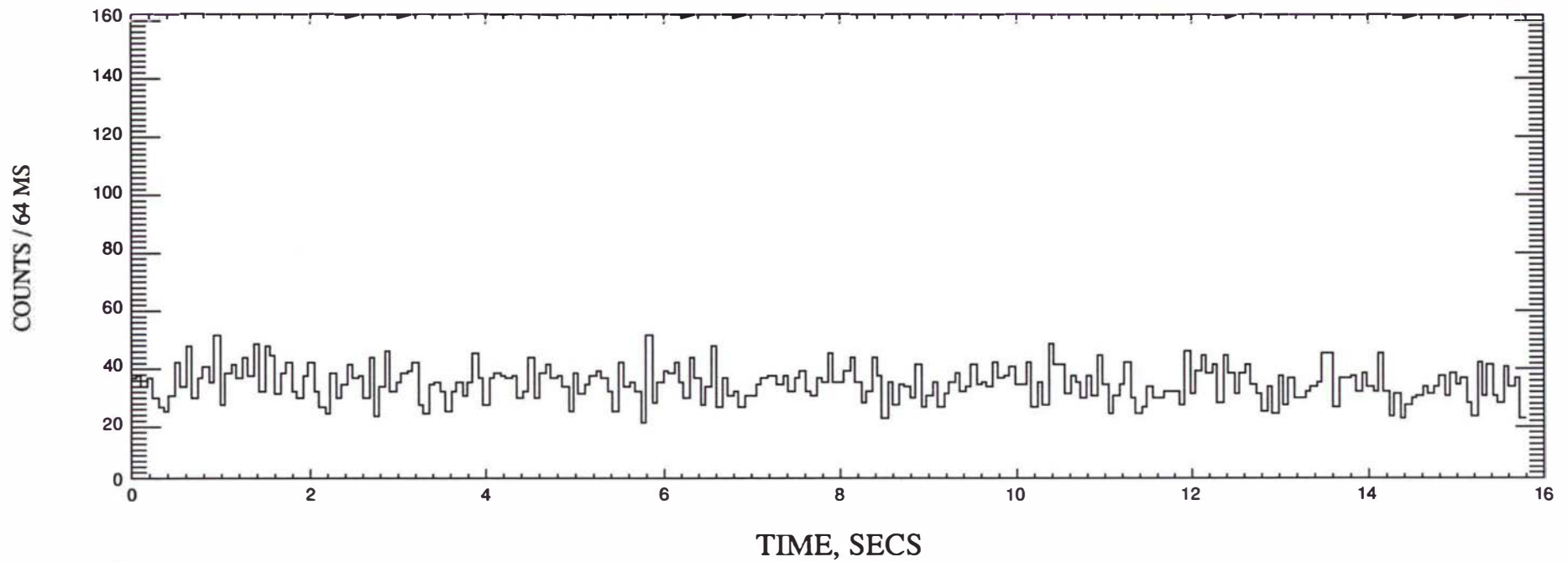
Burst Counter 3 at UT= 9.123997277154 h=32846.390 s 09:07:26.390



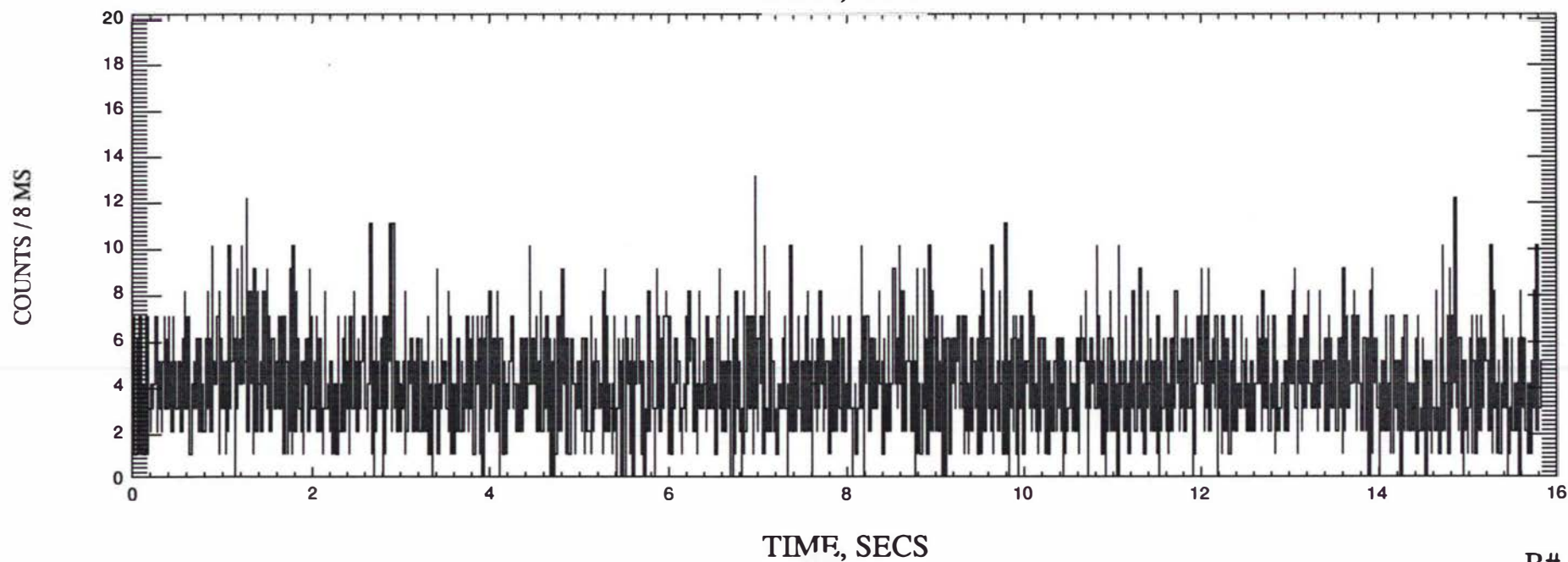
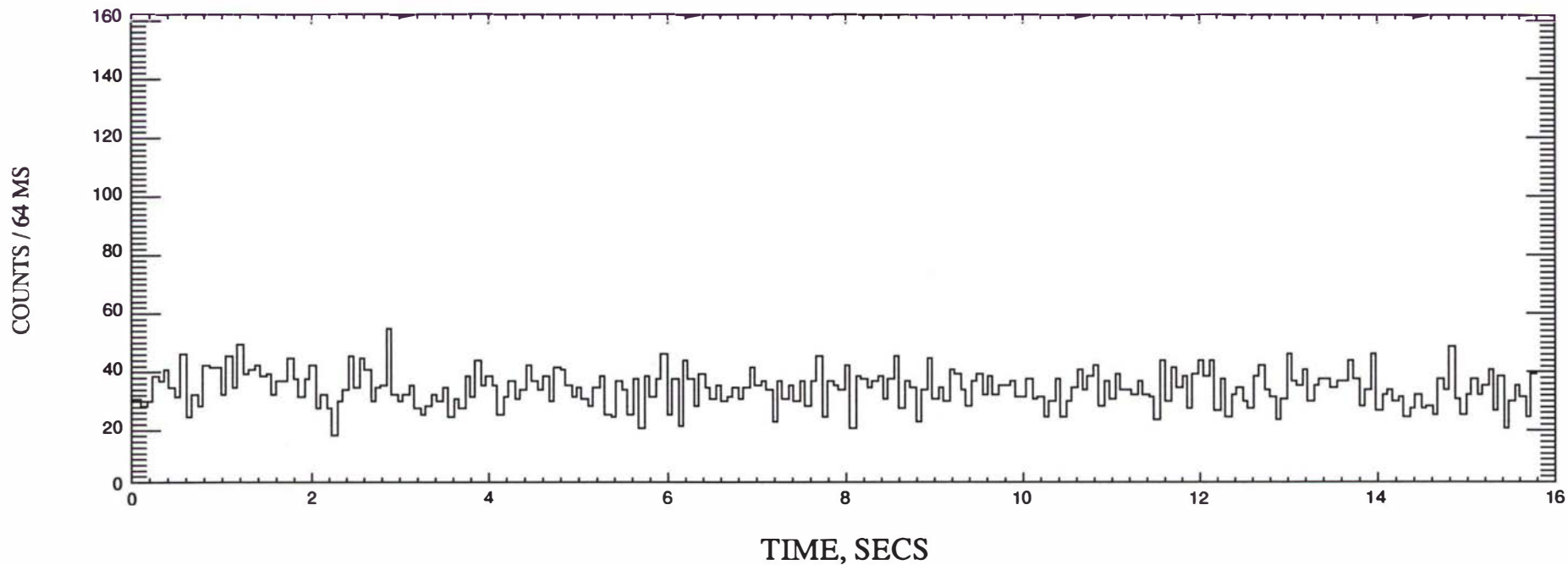
Burst Counter 4 at UT=10.414852061801 h=37493.467 s 10:24:53.467



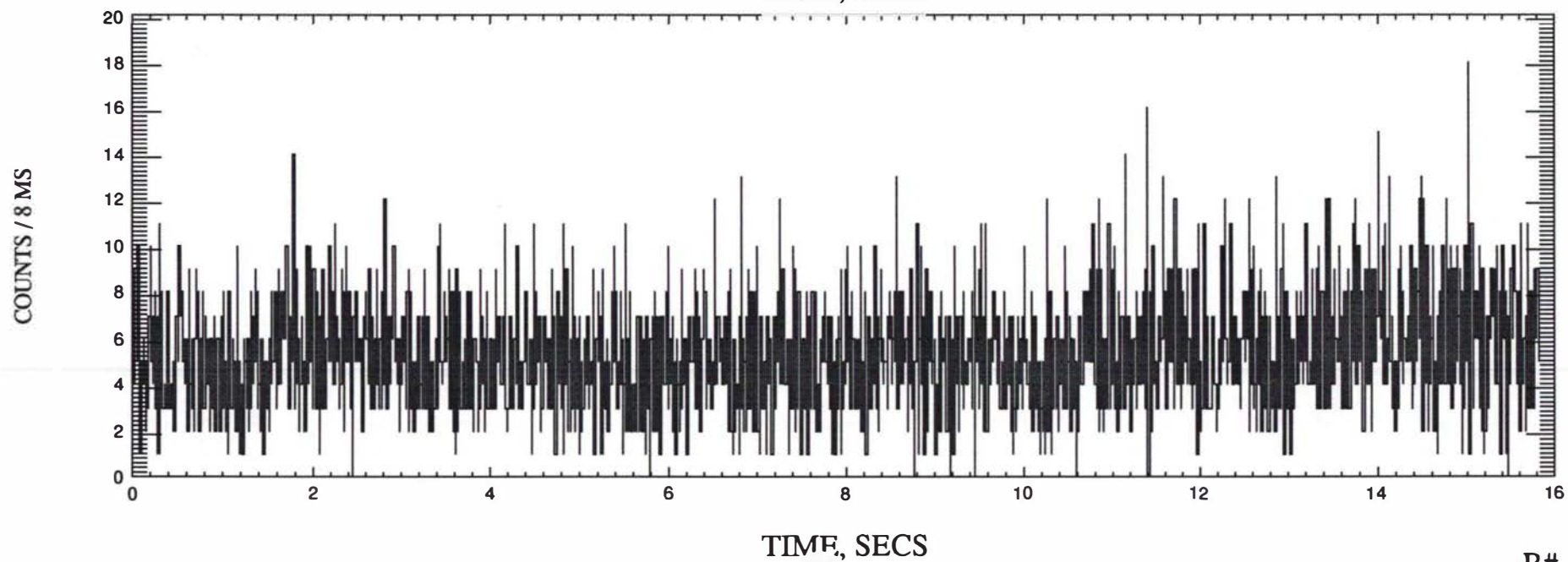
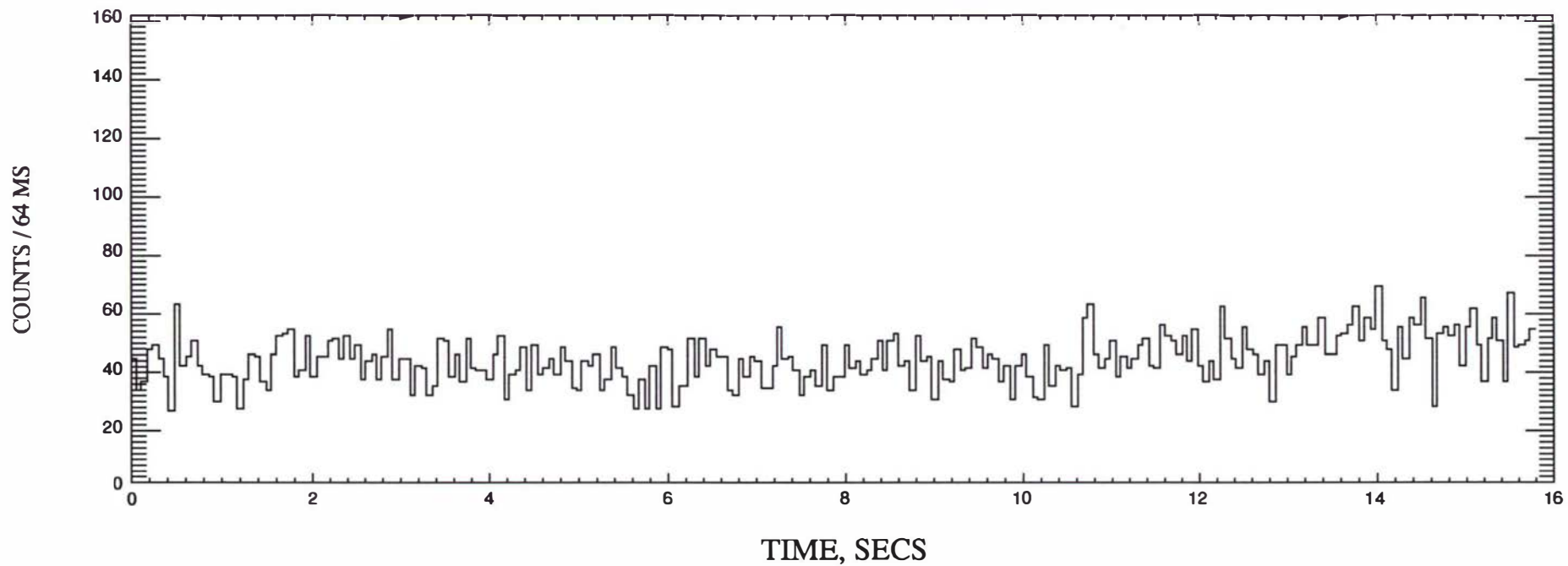
Burst Counter 5 at UT=11.542925232781 h=41554.531 s 11:32:34.531



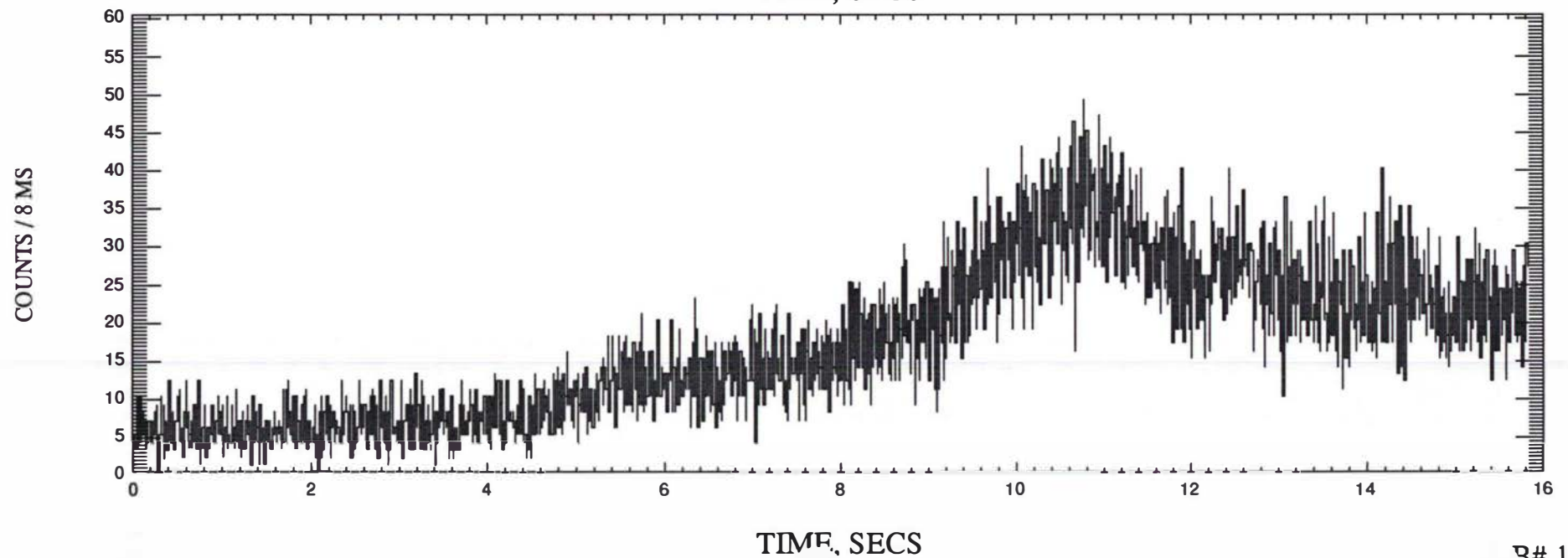
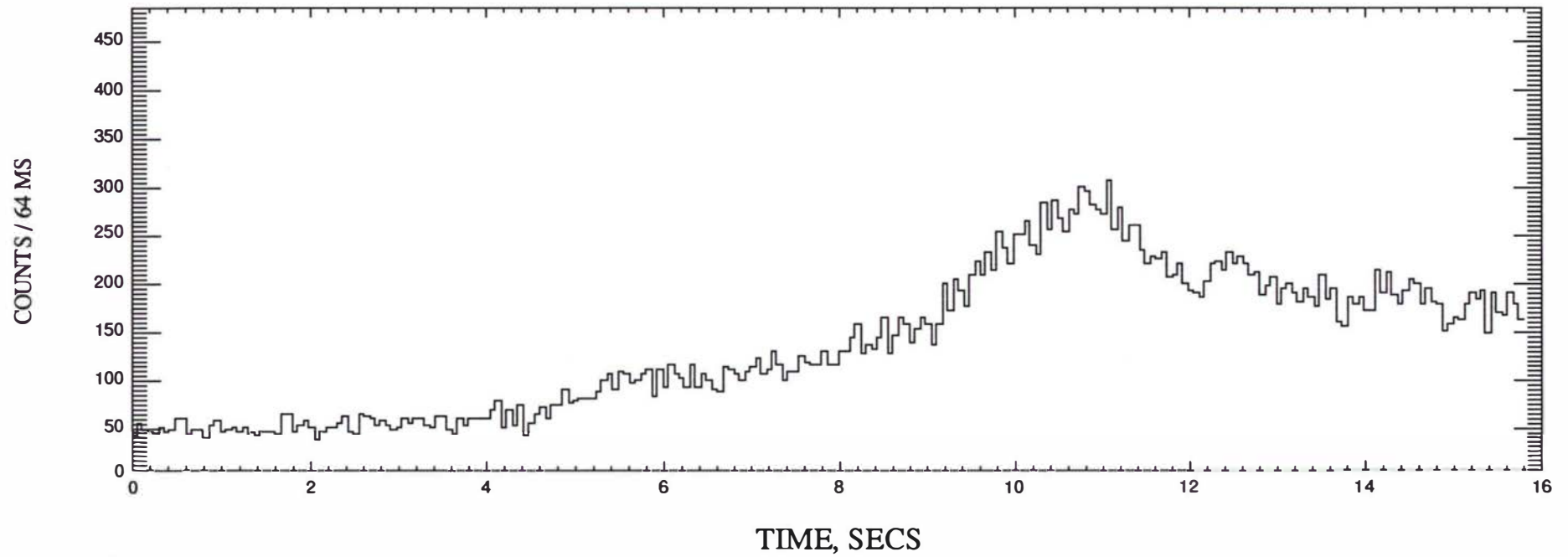
Burst Counter 6 at UT=14.487692684597 h=52155.694 s 14:29:15.694

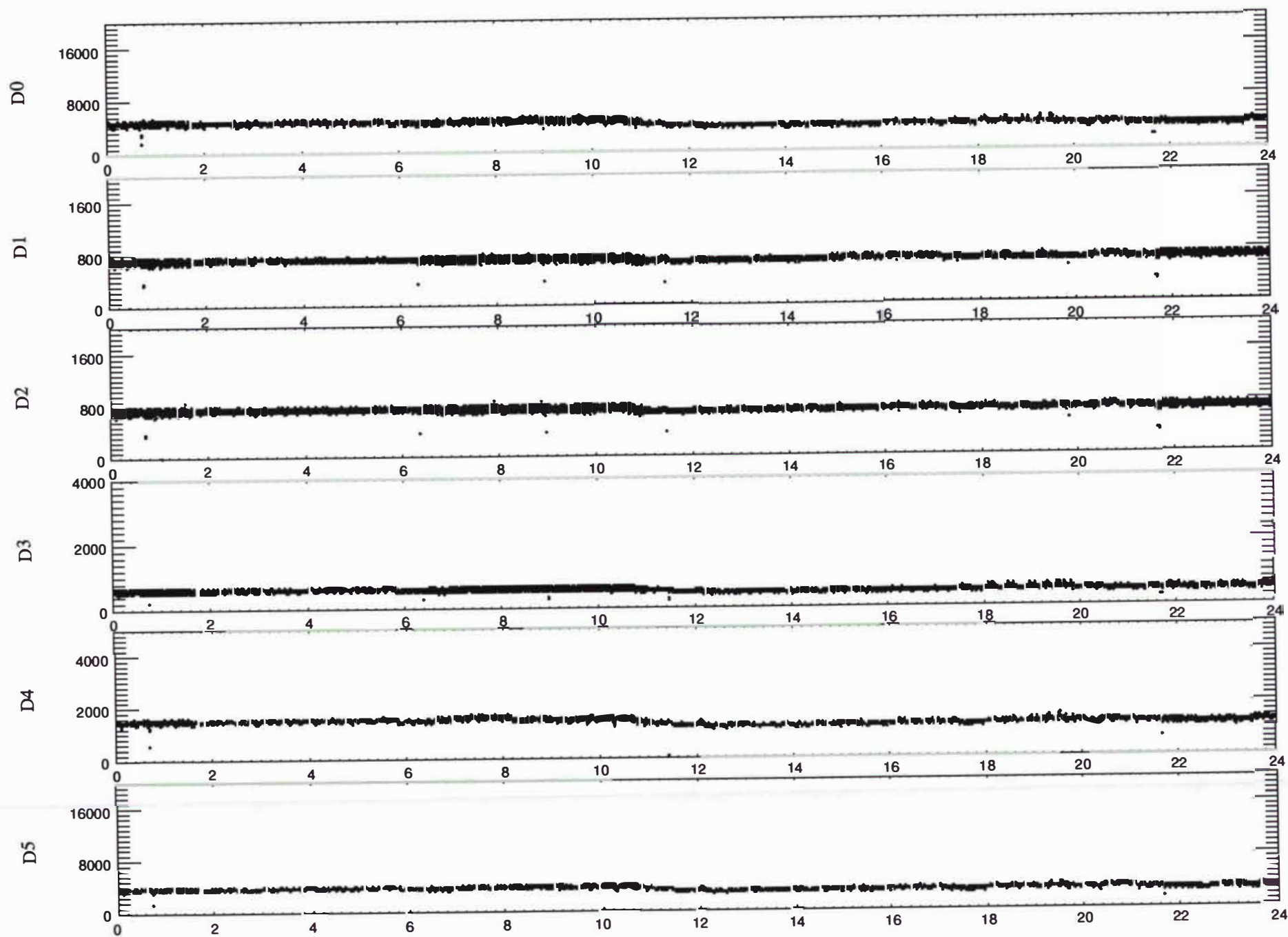


Burst Counter 7 at UT=17.987616127862 h=64755.418 s 17:59:15.418



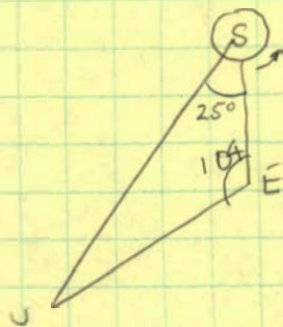
Burst Counter 8 at UT=21.592683245341 h=77733.660 s 21:35:33.660





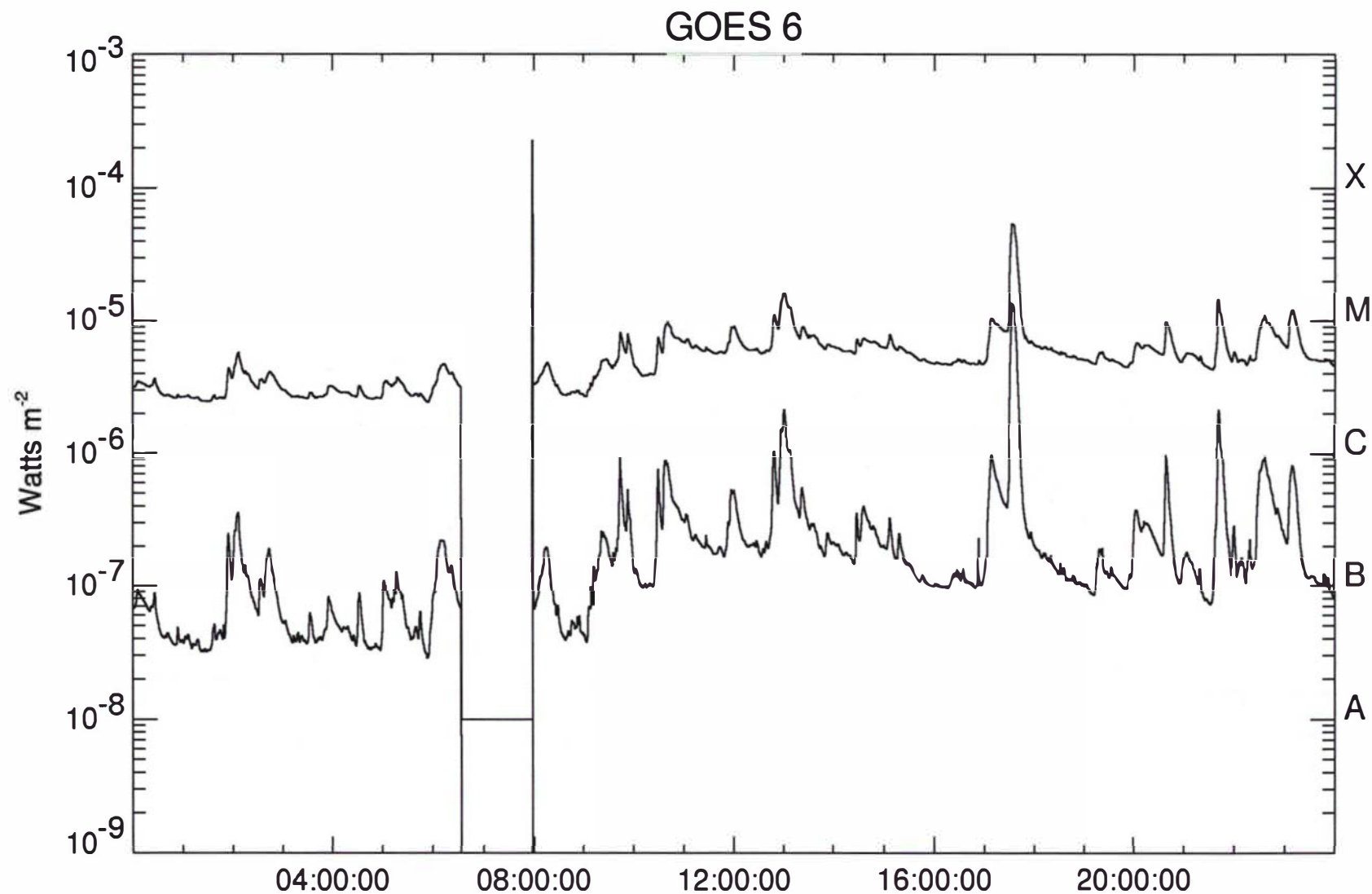
UNIV 'AL TIME

Flare went from E90 to W80 between Mar 17 19:02 and
 Mar 31 8:19 : $170^\circ / (31.3 - 17.8 \text{ d})$ or $12.6^\circ/\text{d}$ (360° in 28.5 d)



Active region visible to Ulysses 2d earlier (Mar 15), to Mar 29

3/22 22:42 - n arrive at Haleakala
 IMP 8 γ ~ 500 keV - same time
 Protons delayed 2-3 hrs $p > 1100$ MeV present at flare site
 At U1, protons peak ~ 6:00 23rd Day 24
 e- peak day 83.5, then 84.5 again
 $10^1 - 10^2$ part/cm²s MeV
 Shock 15:30 23rd 5:51 25th



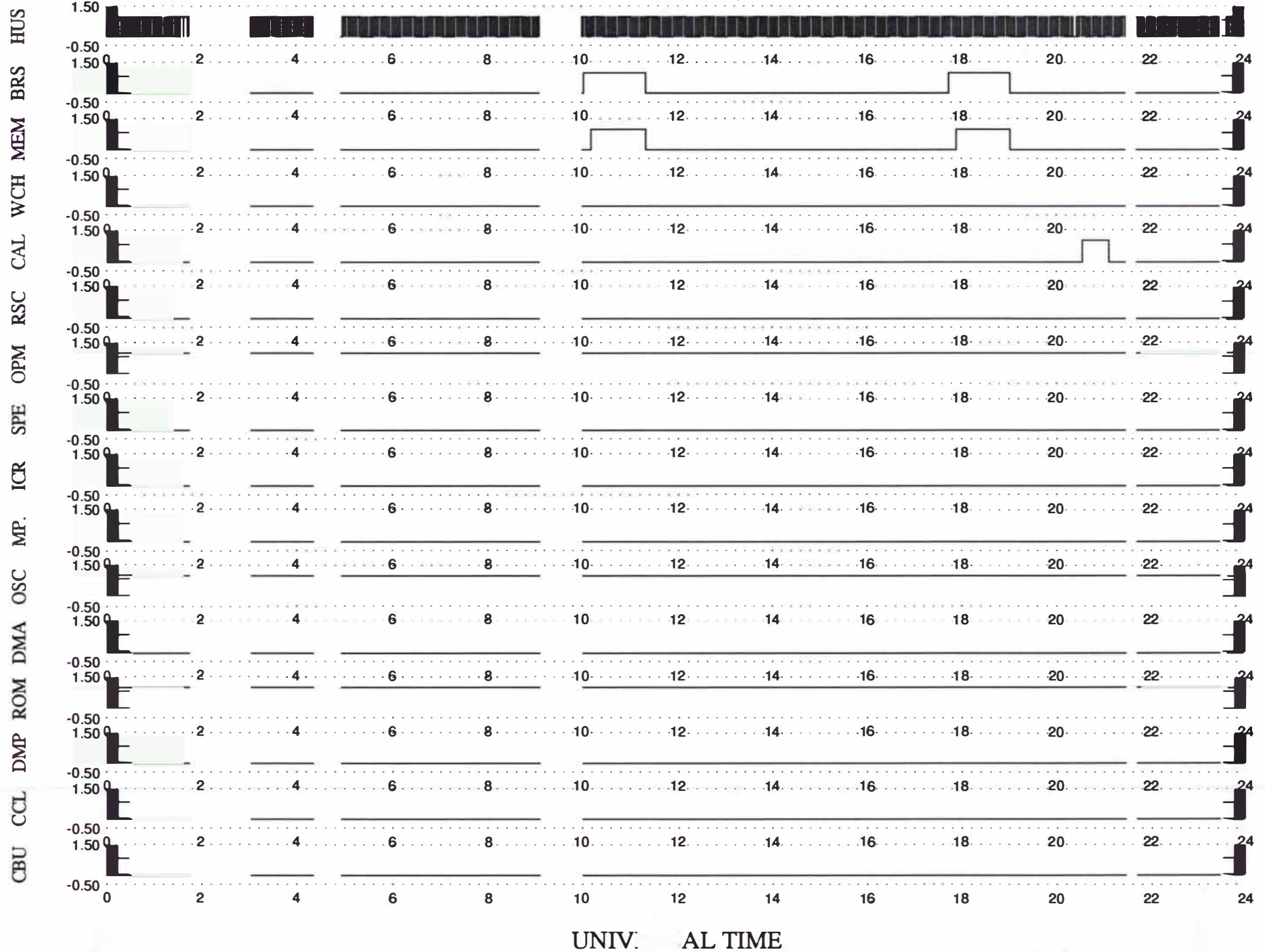
Data Start: 91/03/18, 0000:00

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

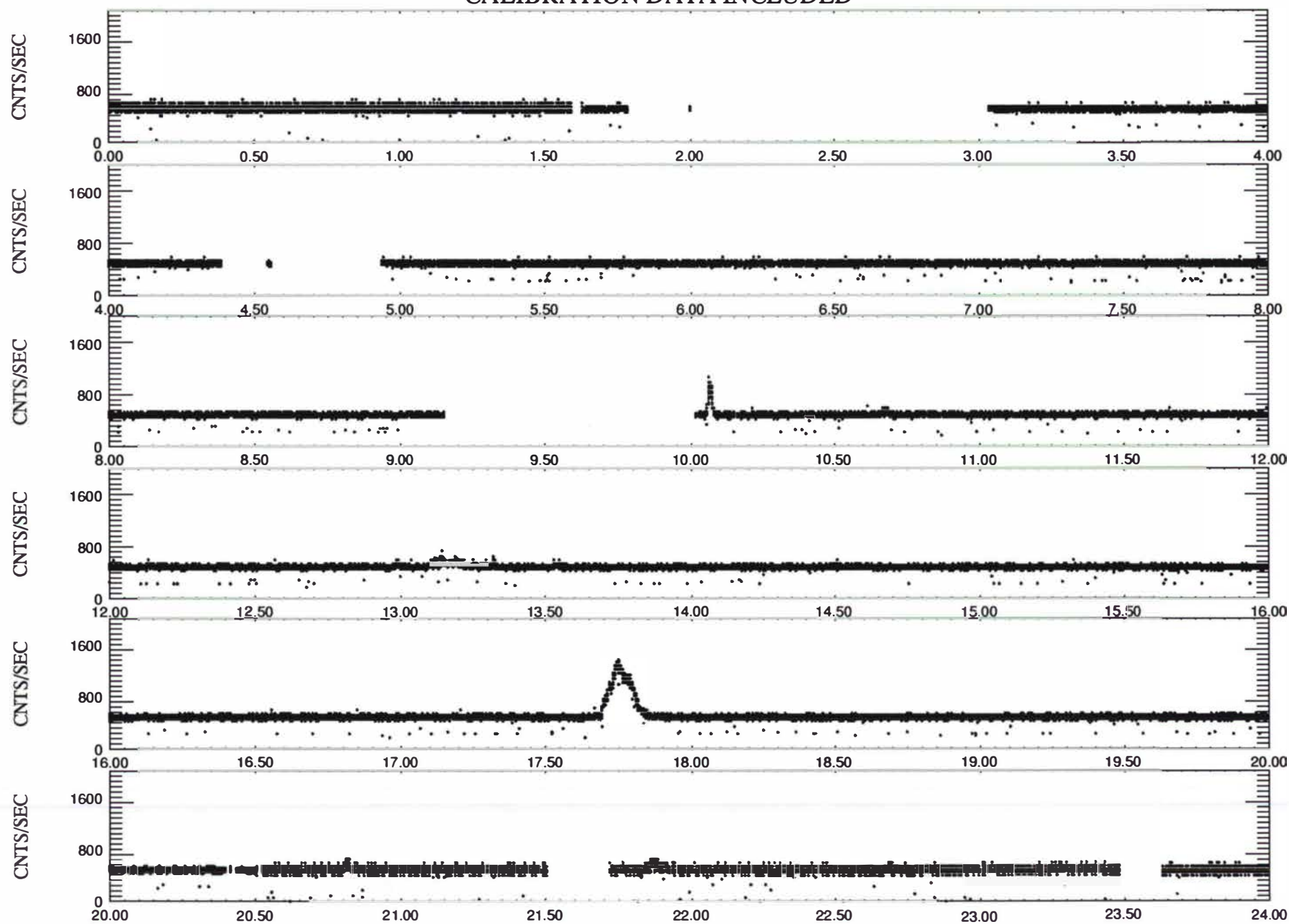
Plot created: 96/11/26, 1849

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 9, 10

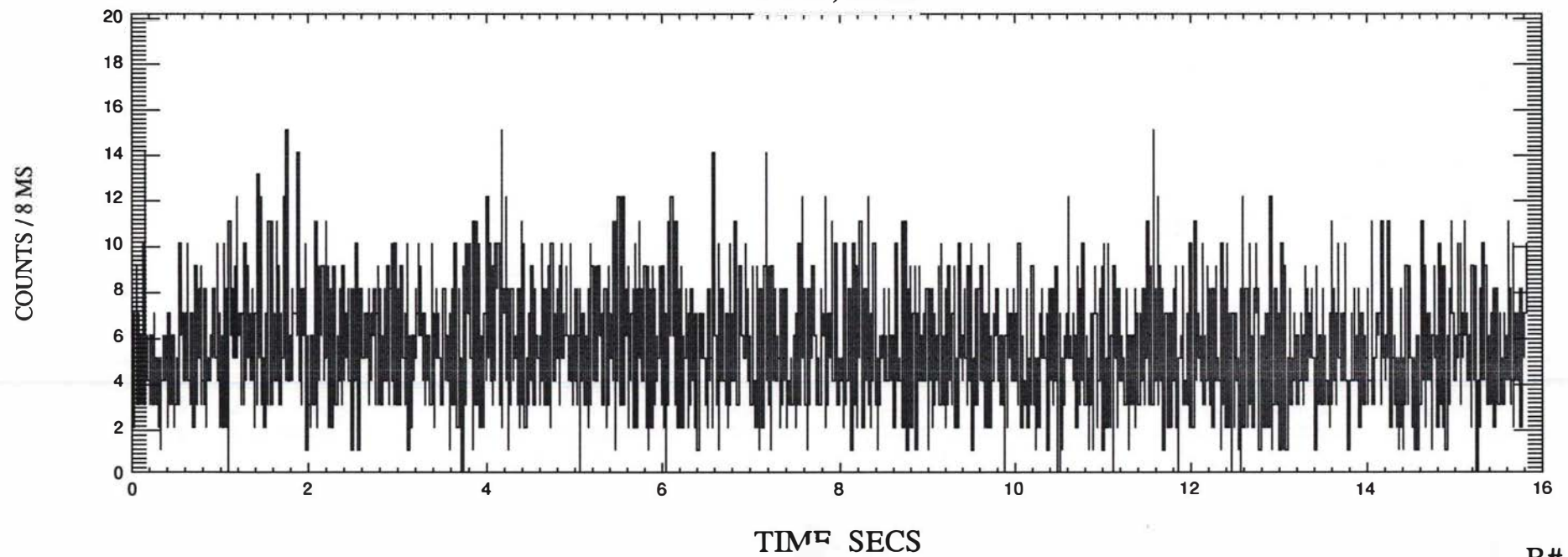
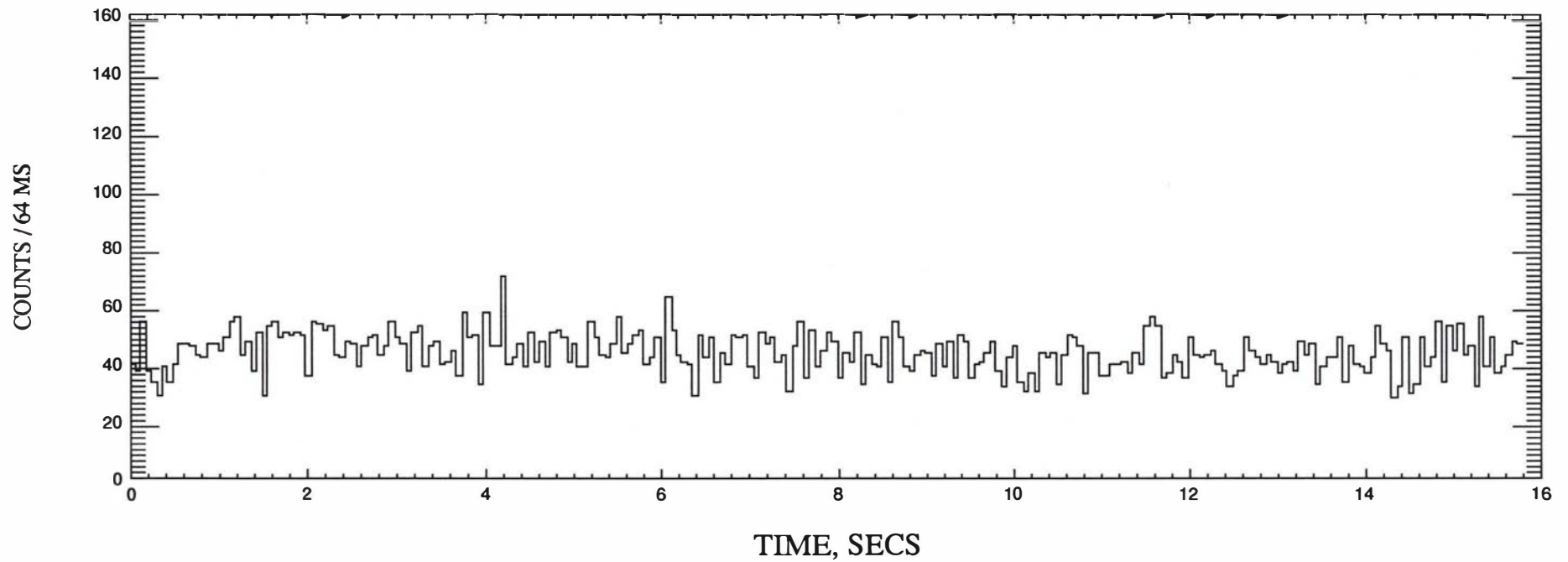


CALIBRATION DATA INCLUDED

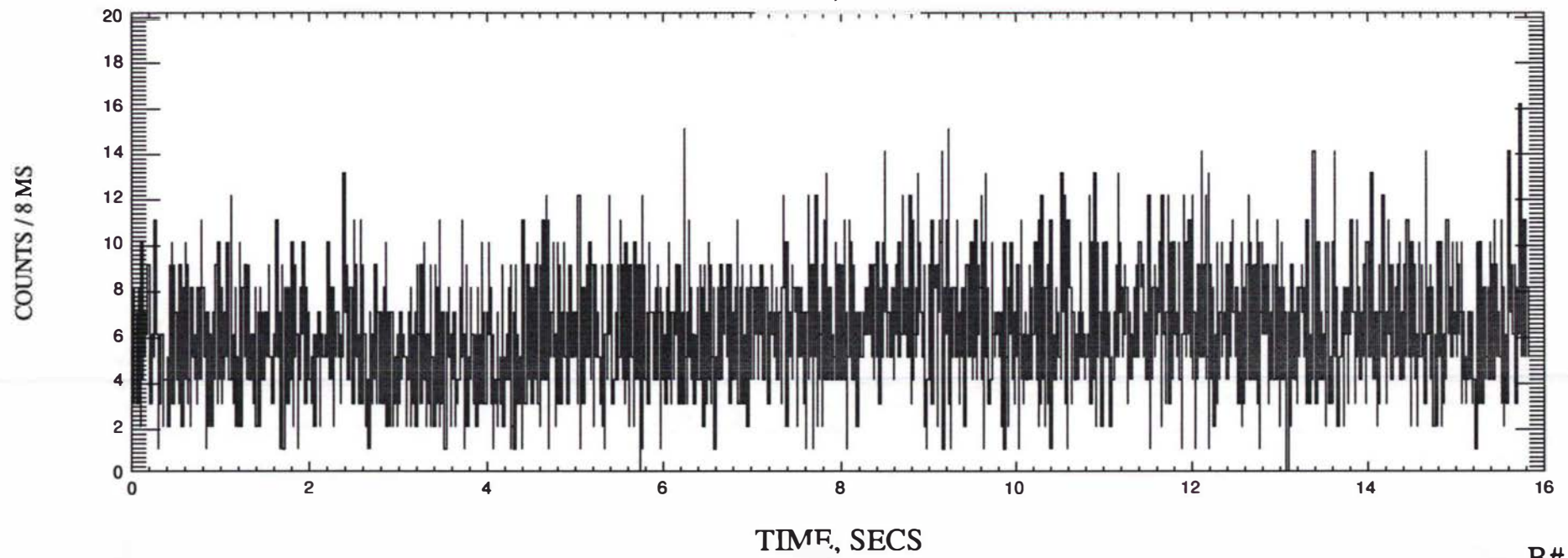
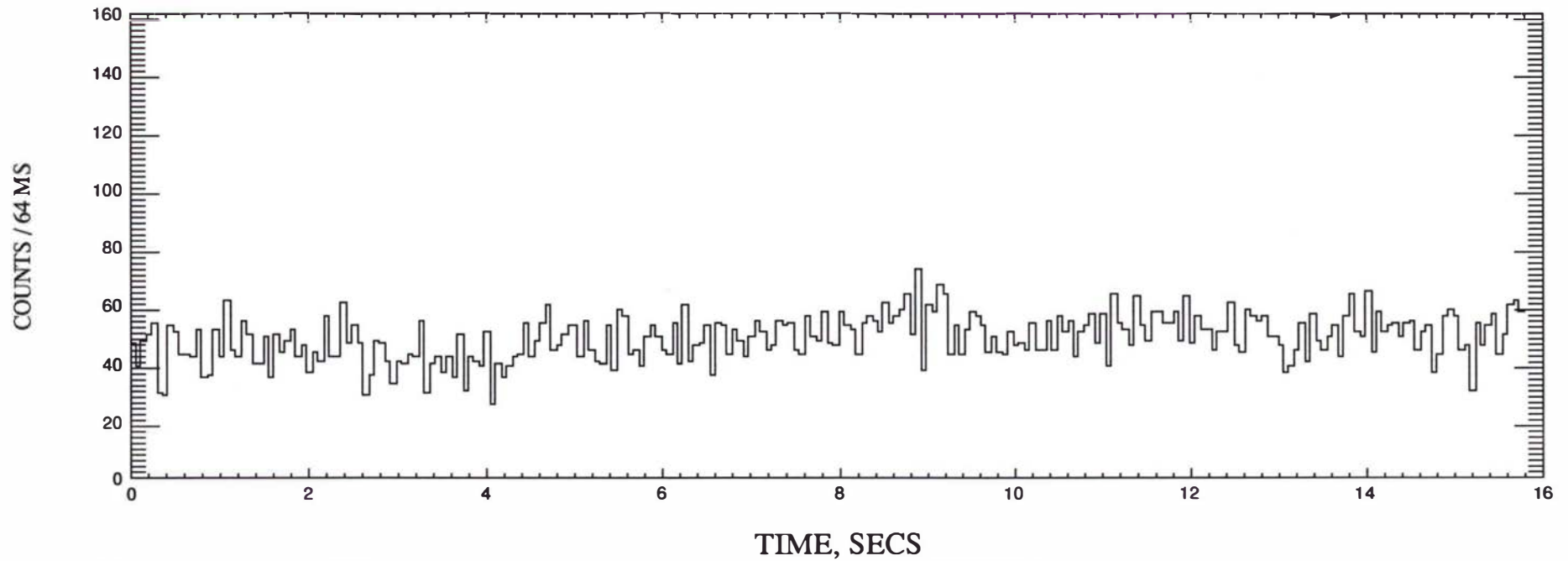


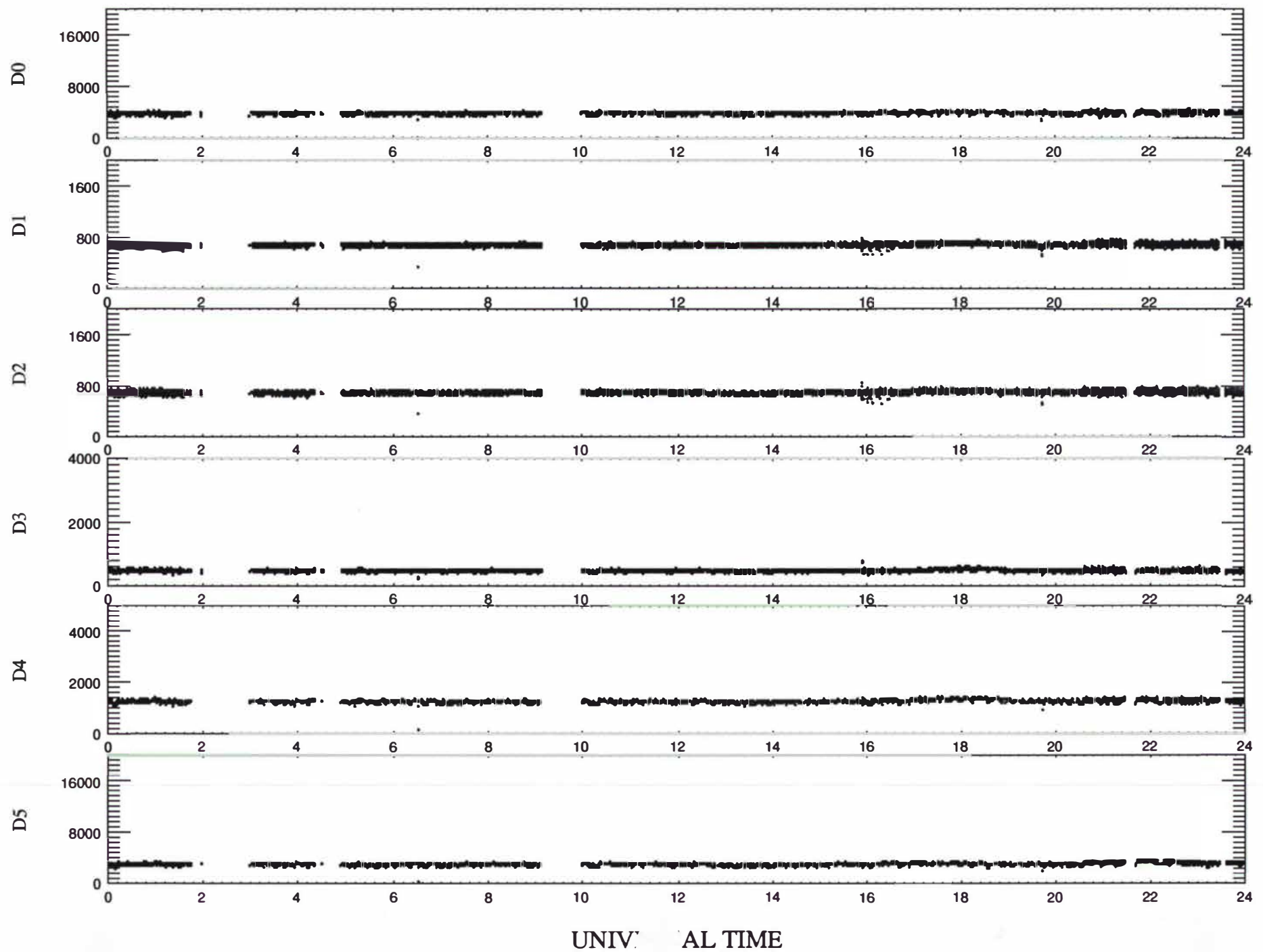
UNIV AL TIME

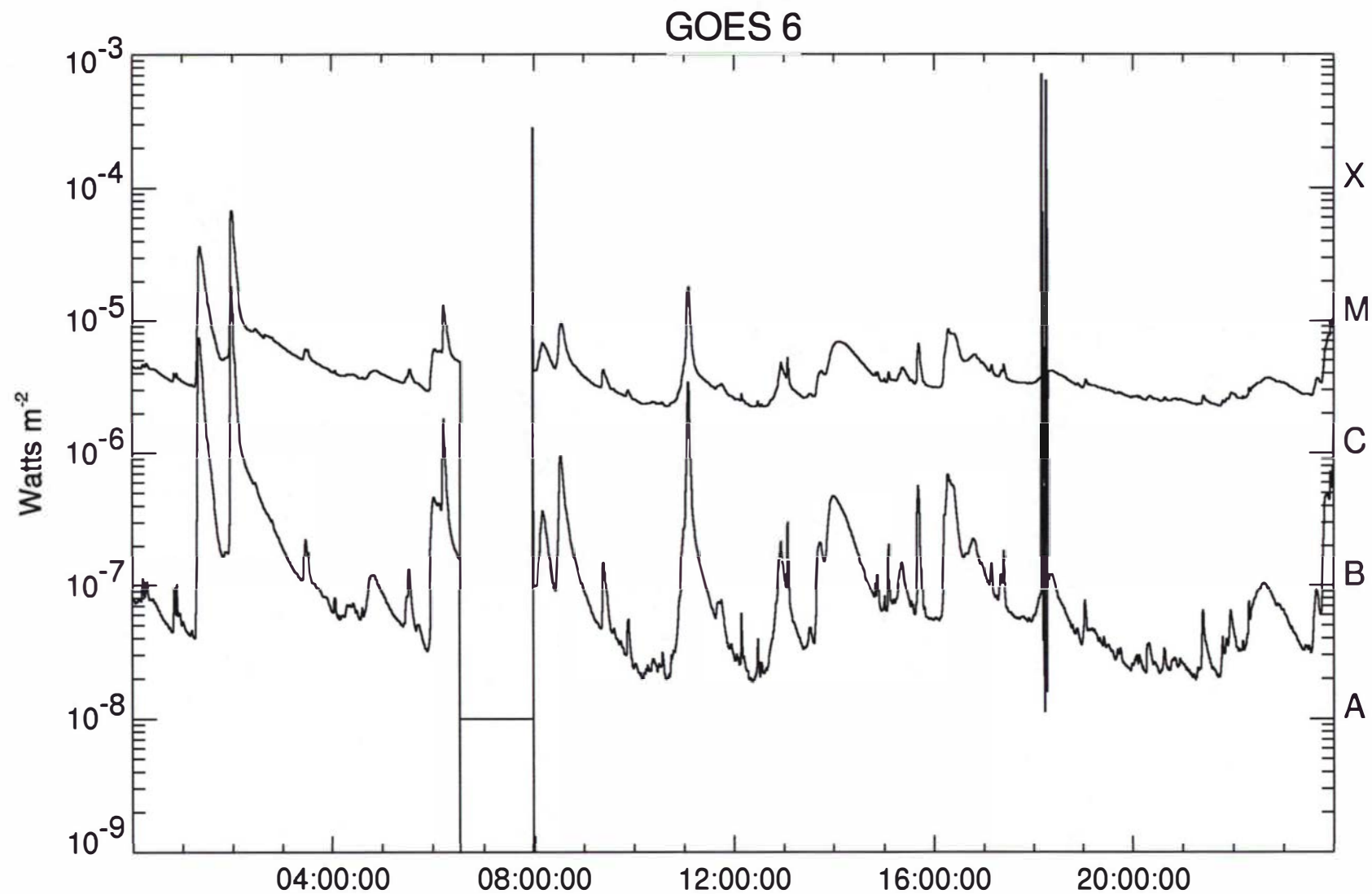
Burst Counter 10 at UT=17.695688722399 h=63704.479 s 17:41:44.479



Burst Counter 9 at UT= 9.214415927463 h=33171.897 s 09:12:51.897







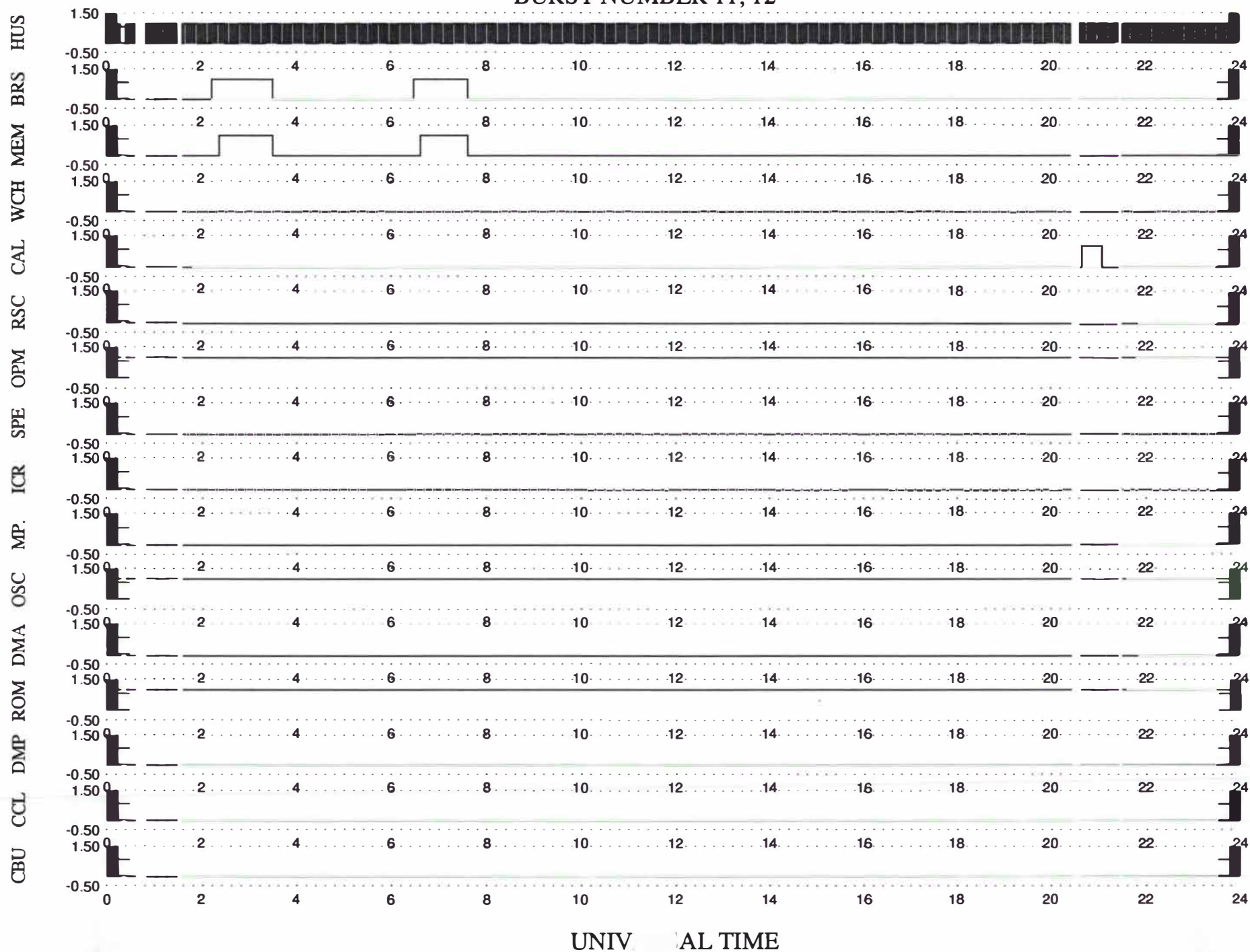
Data Start: 91/03/19, 0000:00

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

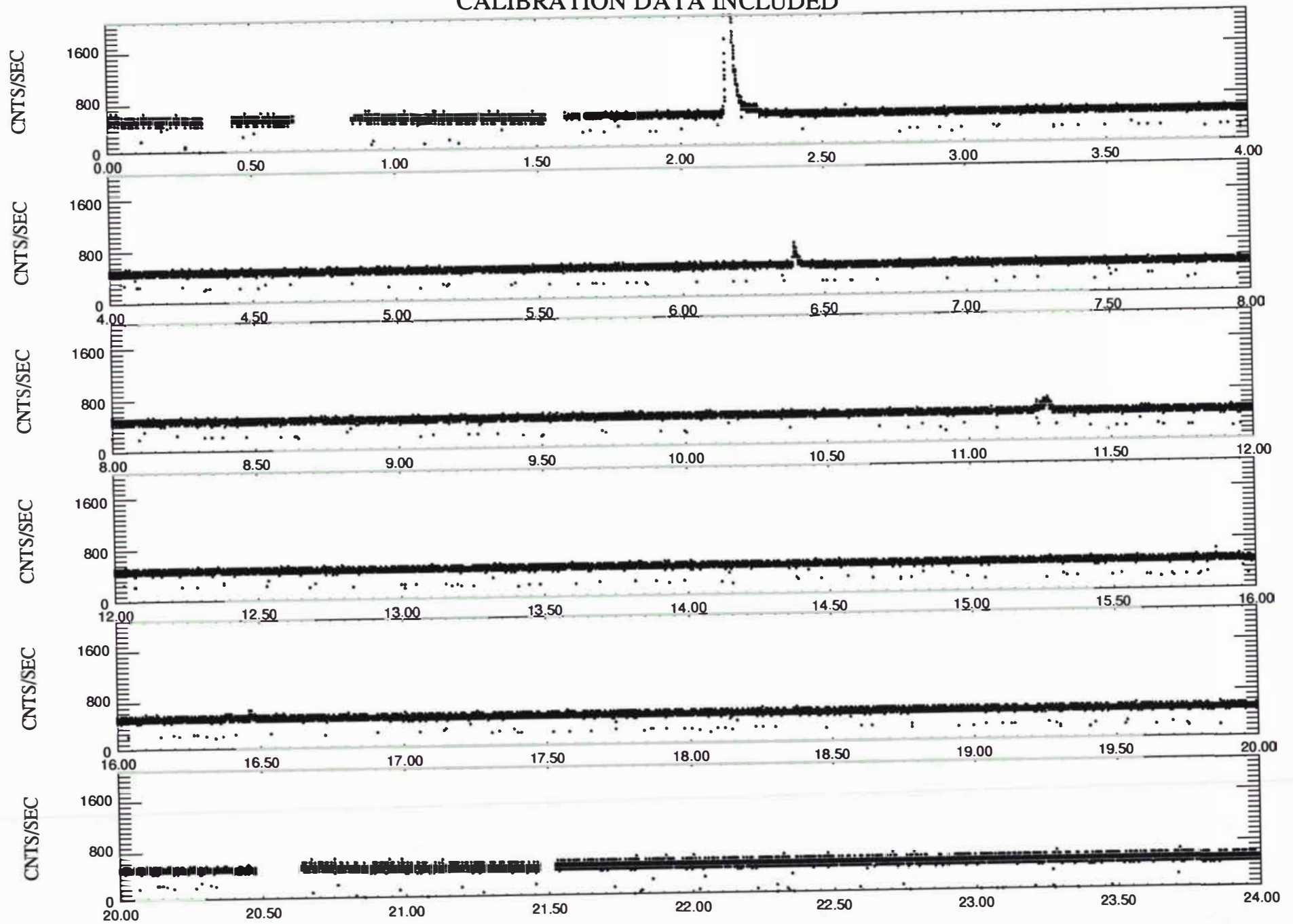
Plot created: 96/11/26, 1852

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 11, 12

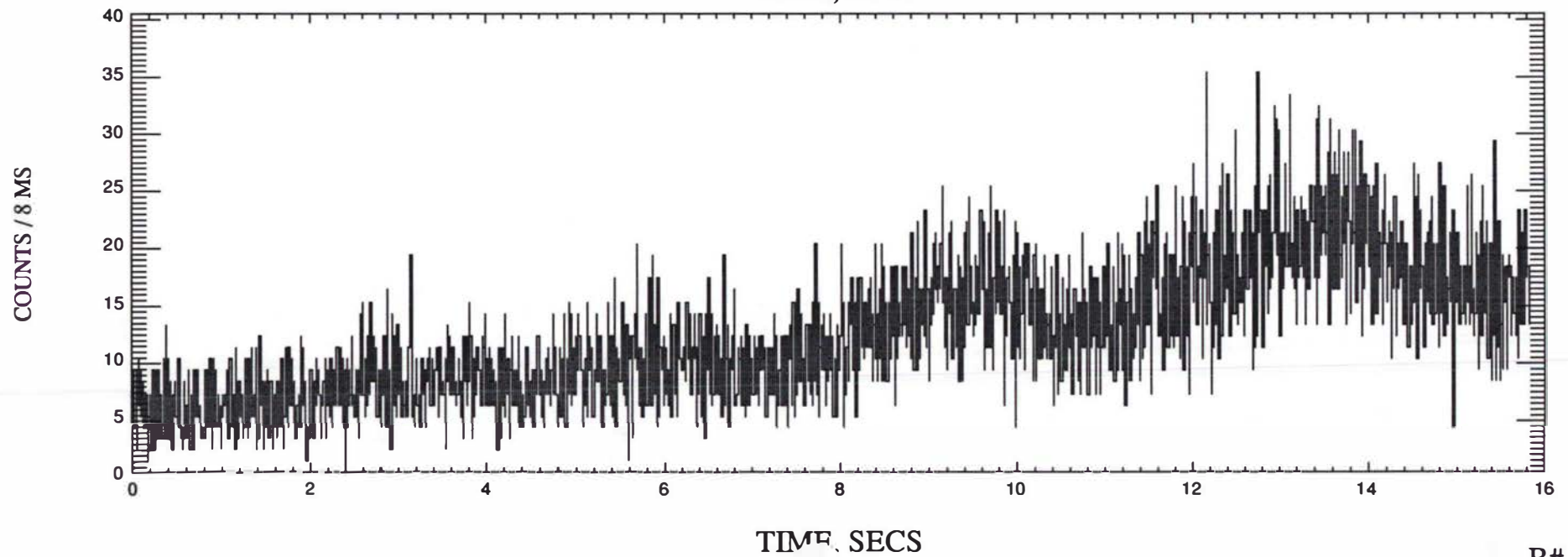
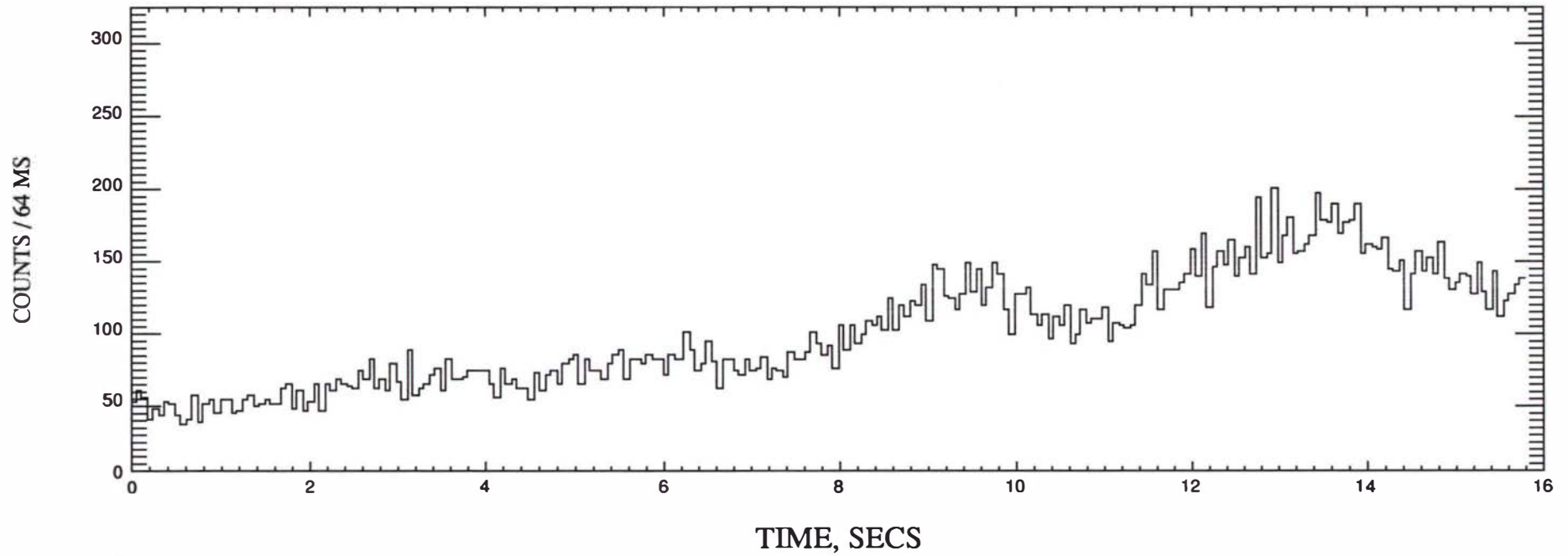


CALIBRATION DATA INCLUDED

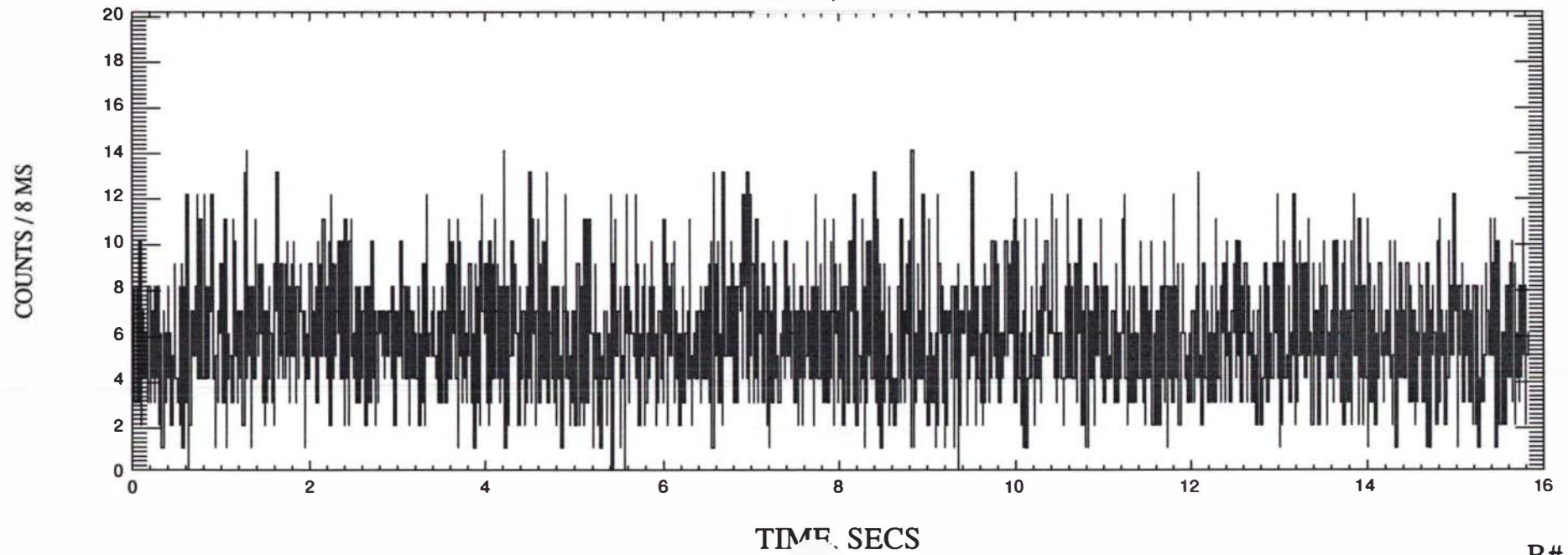
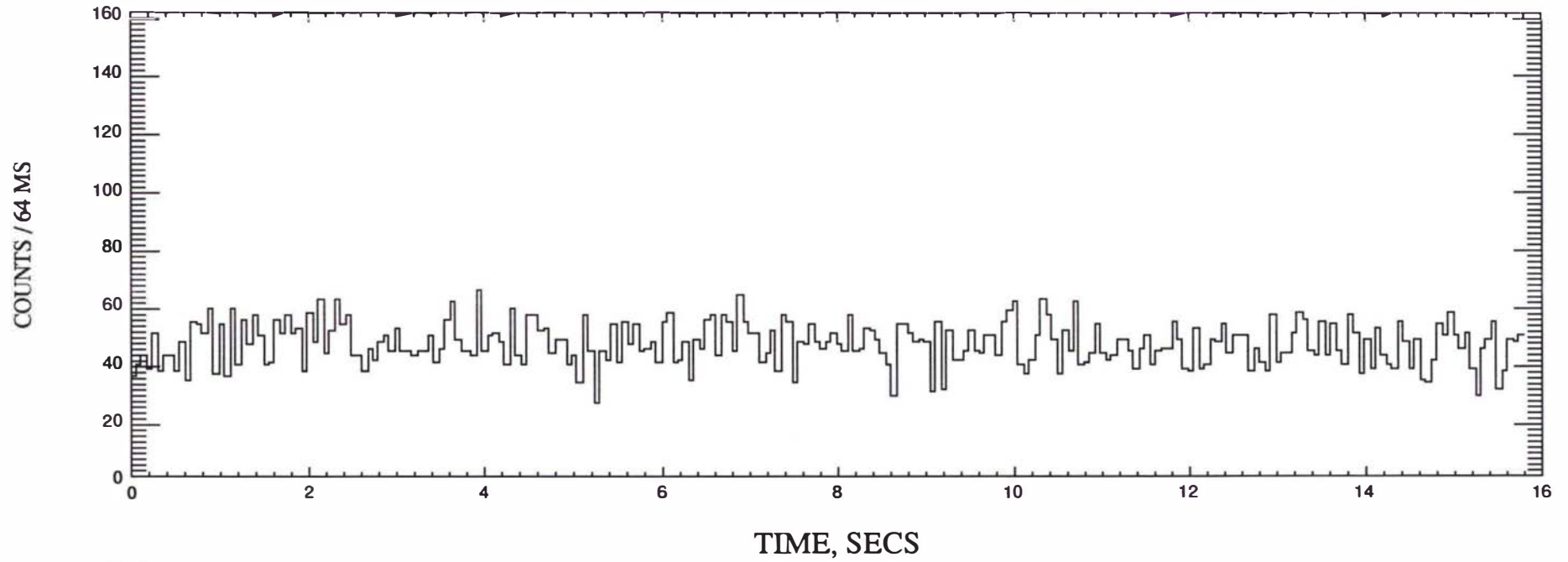


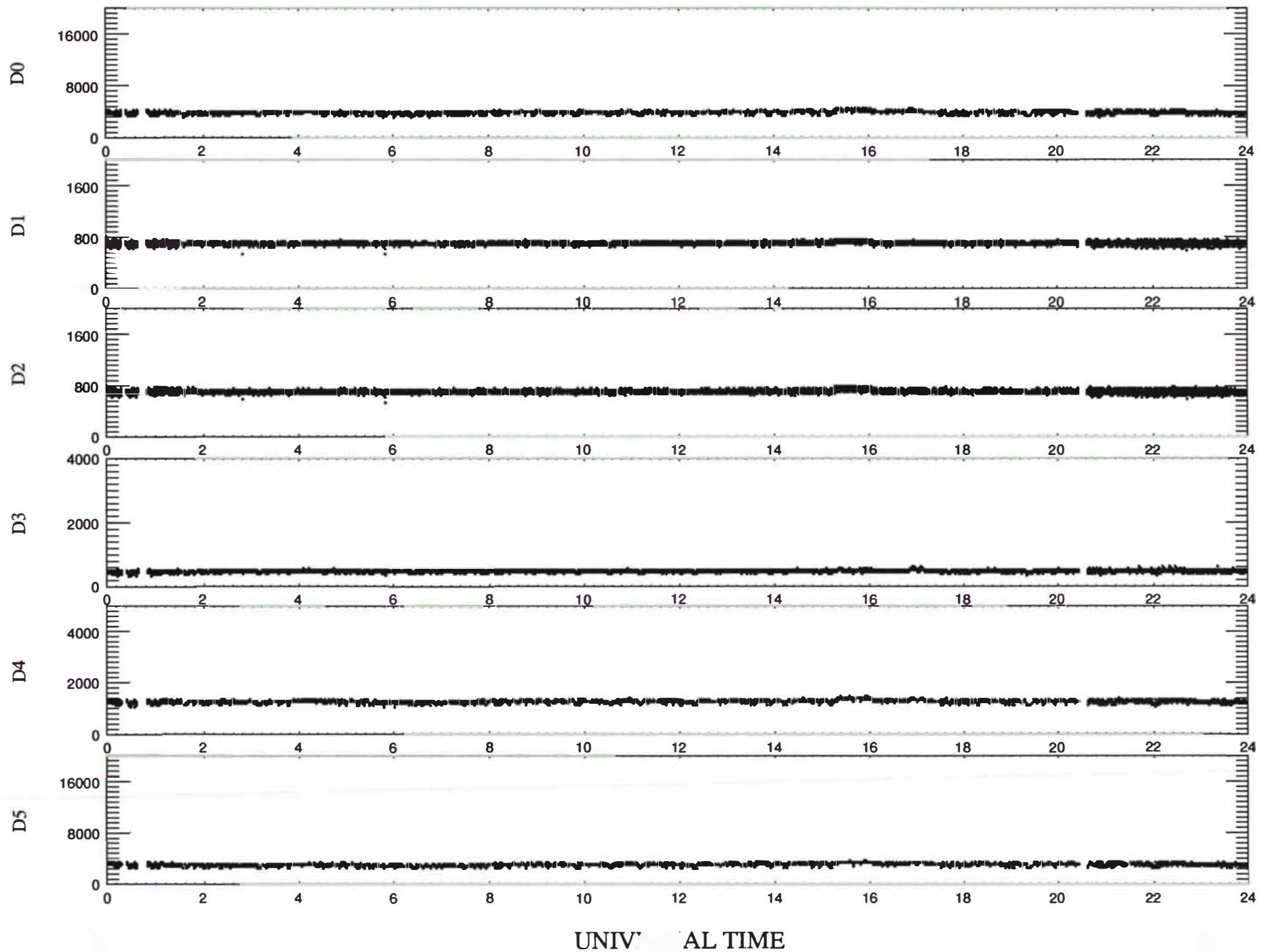
UNIV 'AL TIME

Burst Counter 11 at UT= 2.149870151944 h= 7739.533 s 02:08:59.533

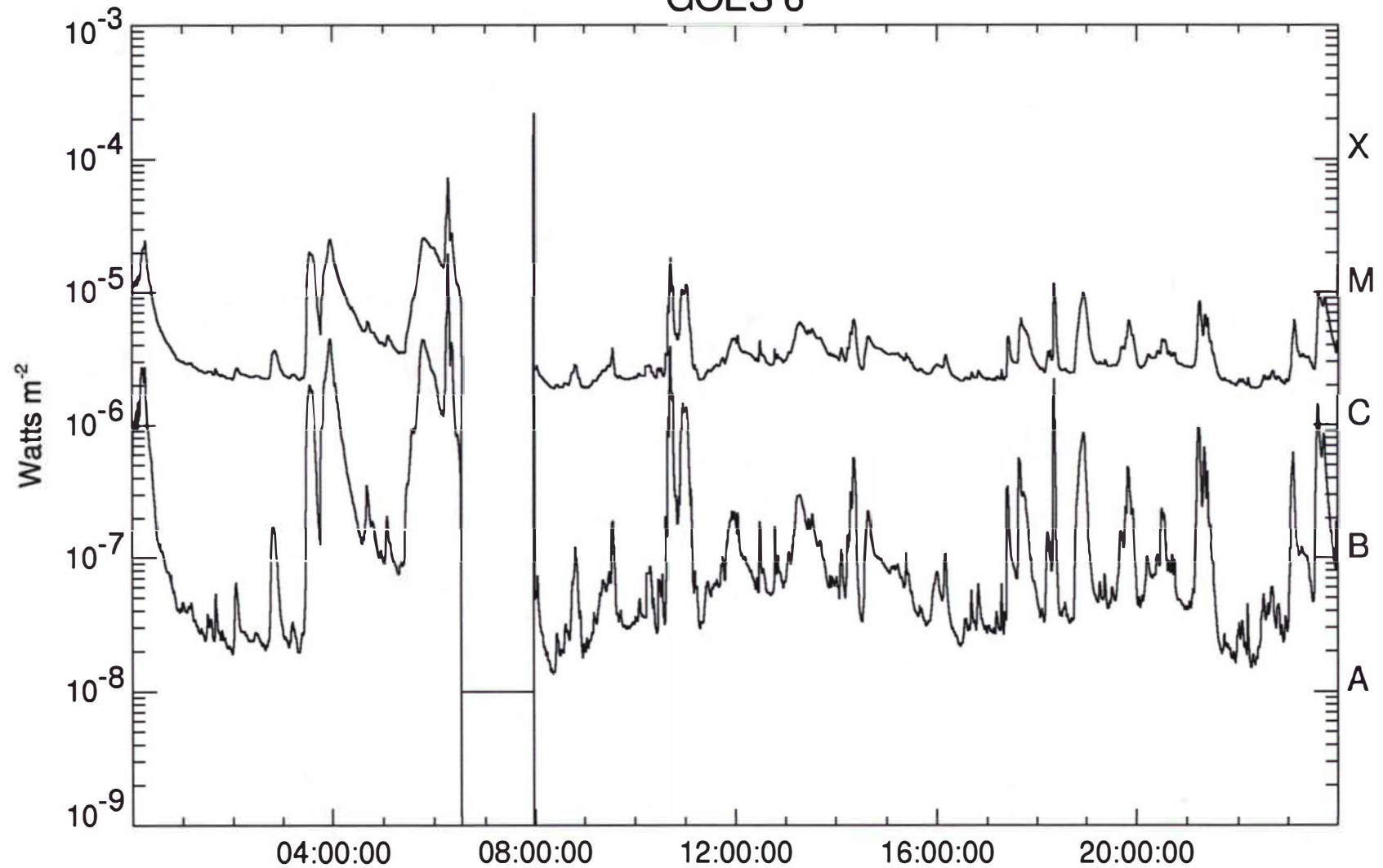


Burst Counter 12 at UT= 6.389741901822 h=23003.071 s 06:23:23.071





GOES 6



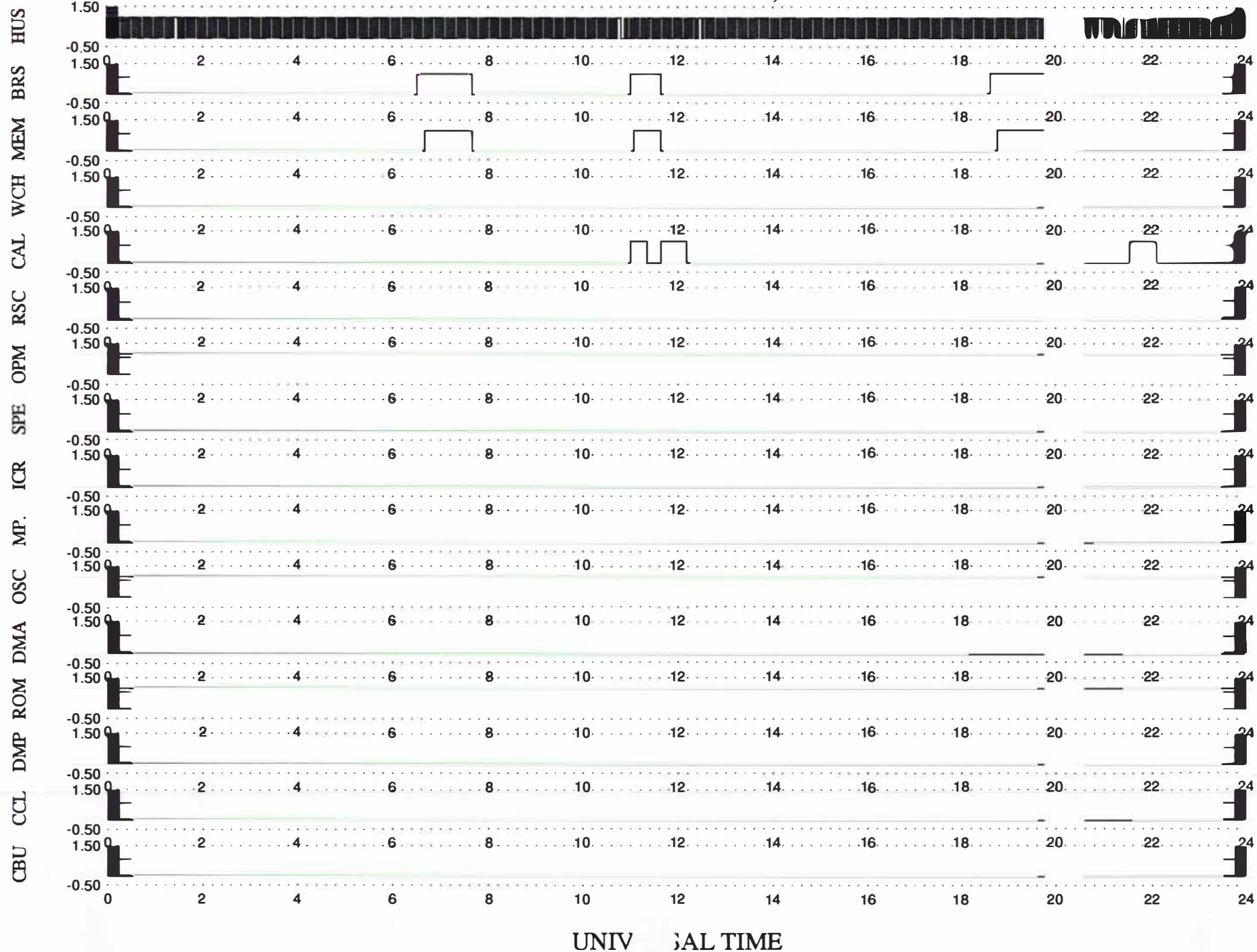
Data Start: 91/03/20, 0000:01

Channel 1 (1.0 - 8.0 Angstroms)
 Channel 2 (0.5 - 4.0 Angstroms)

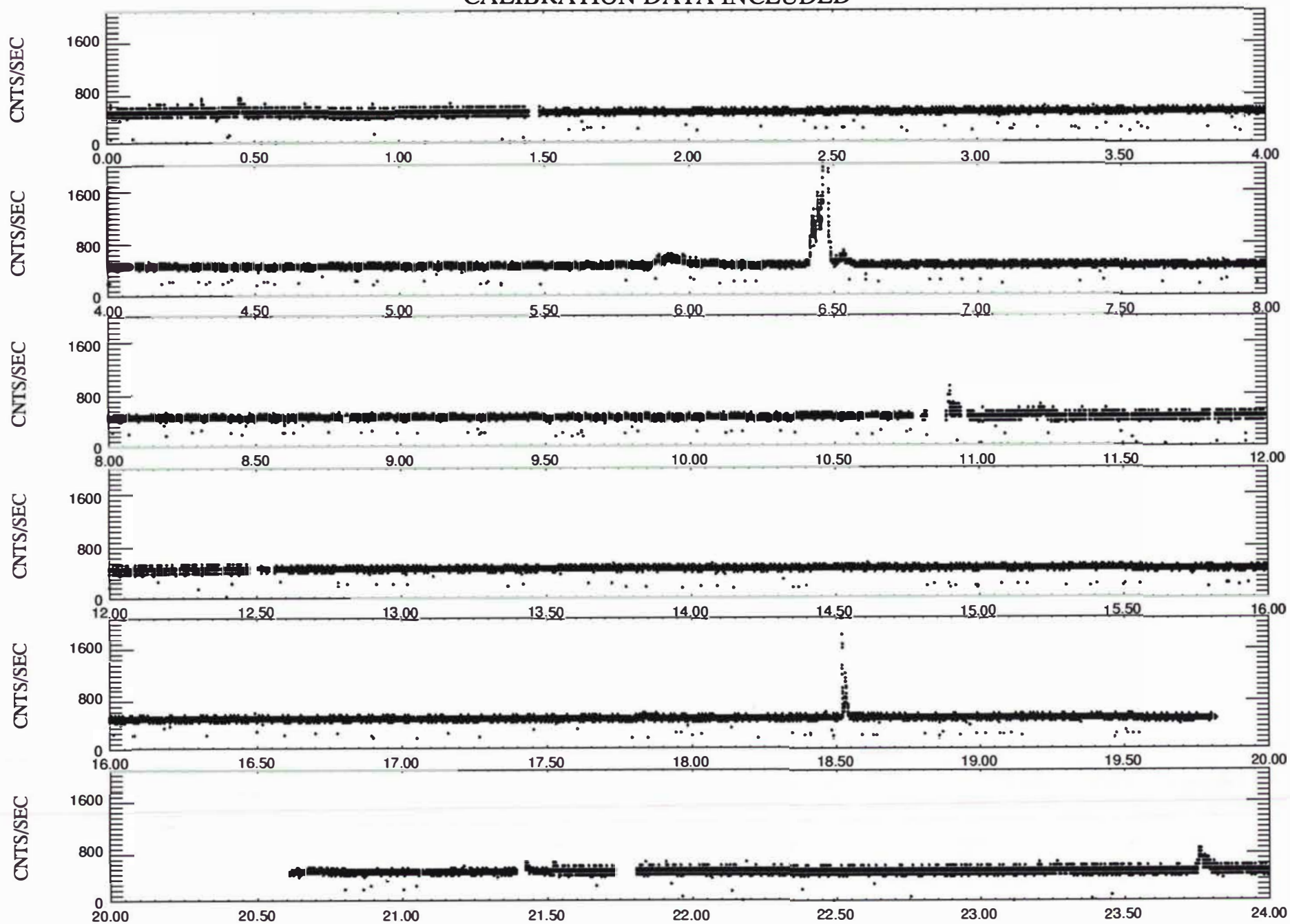
Plot created: 96/11/26, 1855

Background not subtracted
 Background not subtracted
 Sample average = 10

BURST NUMBER 13 - 15, 0

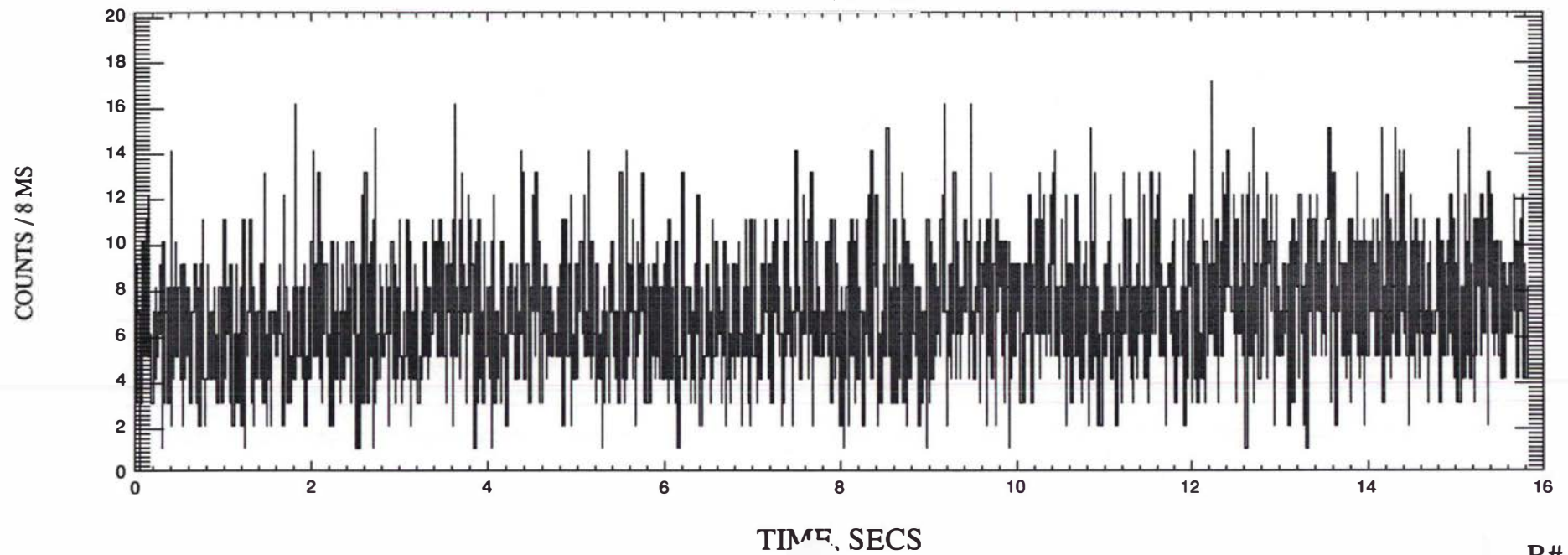
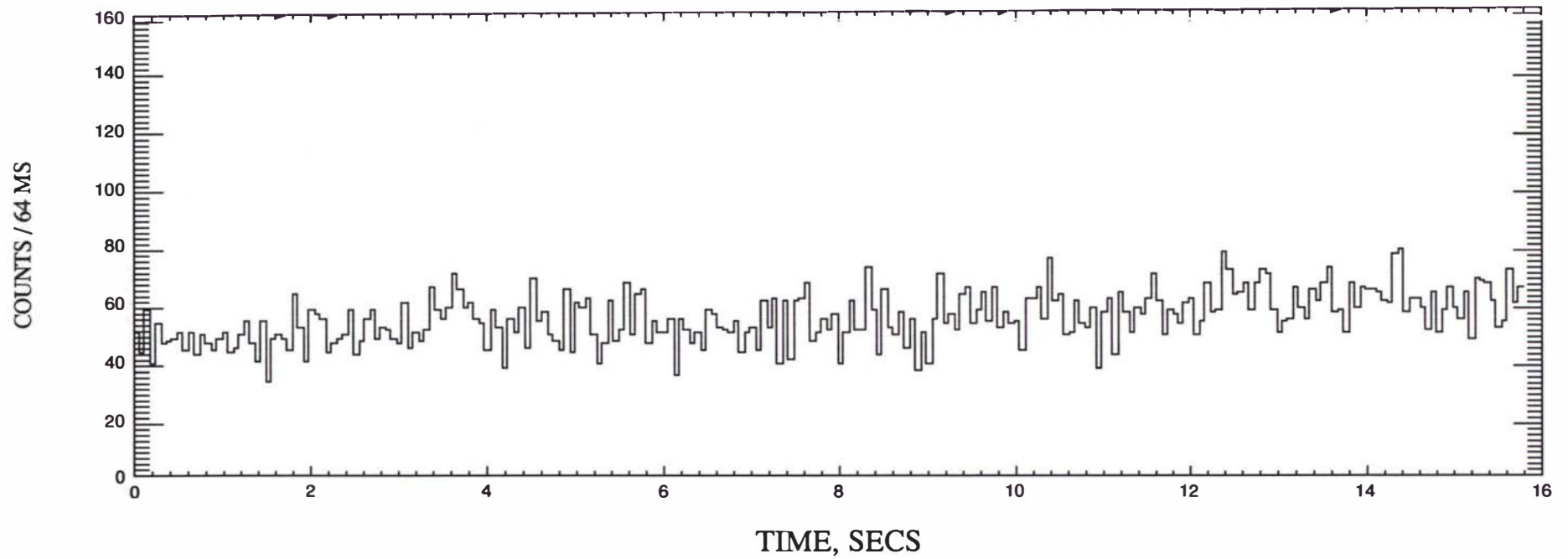


CALIBRATION DATA INCLUDED

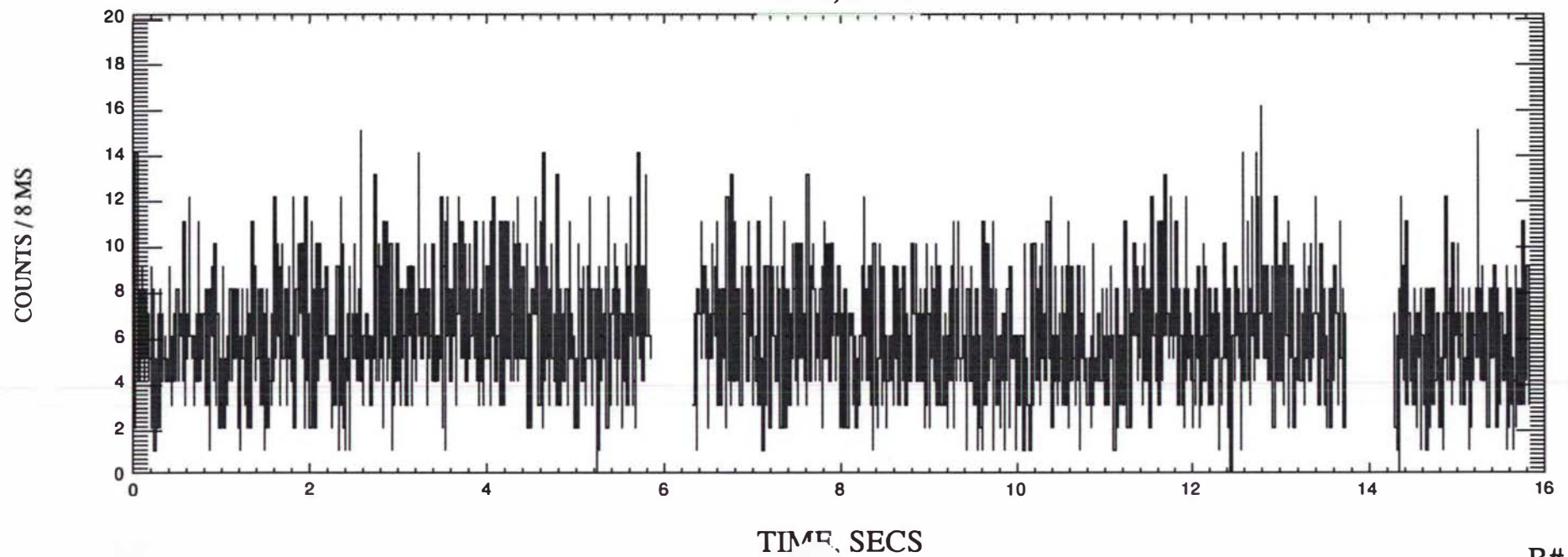
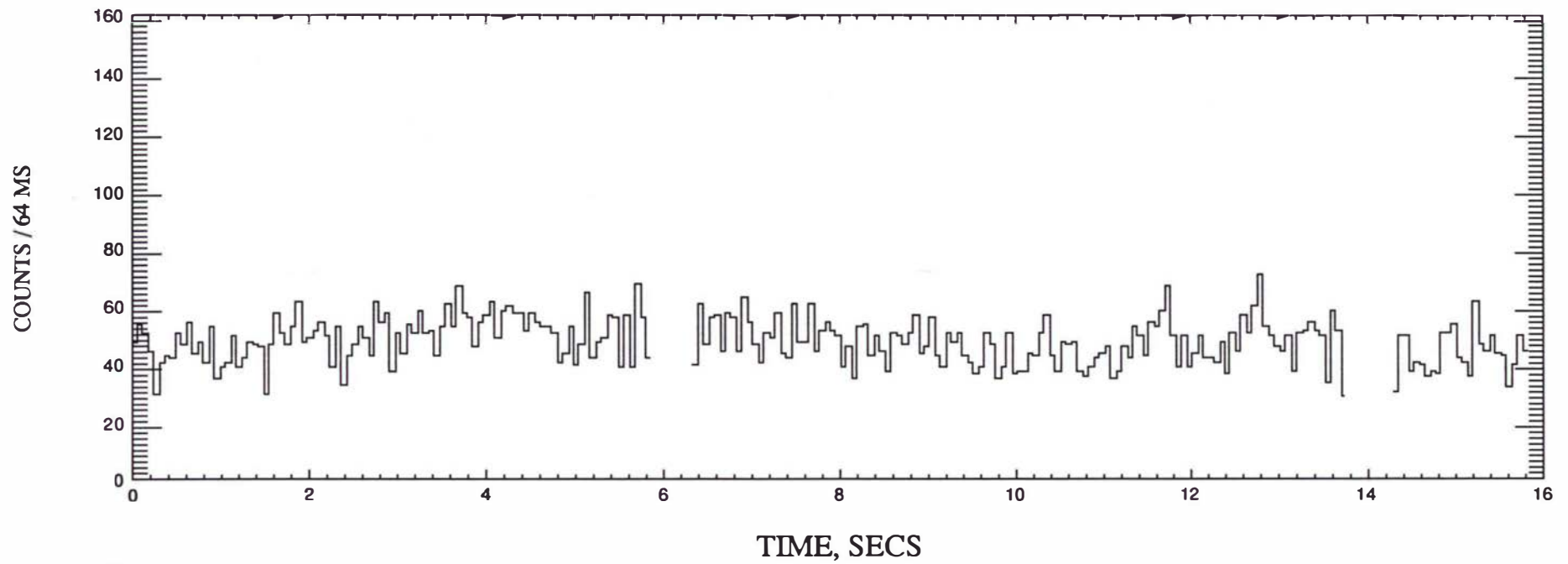


UNIV AL TIME

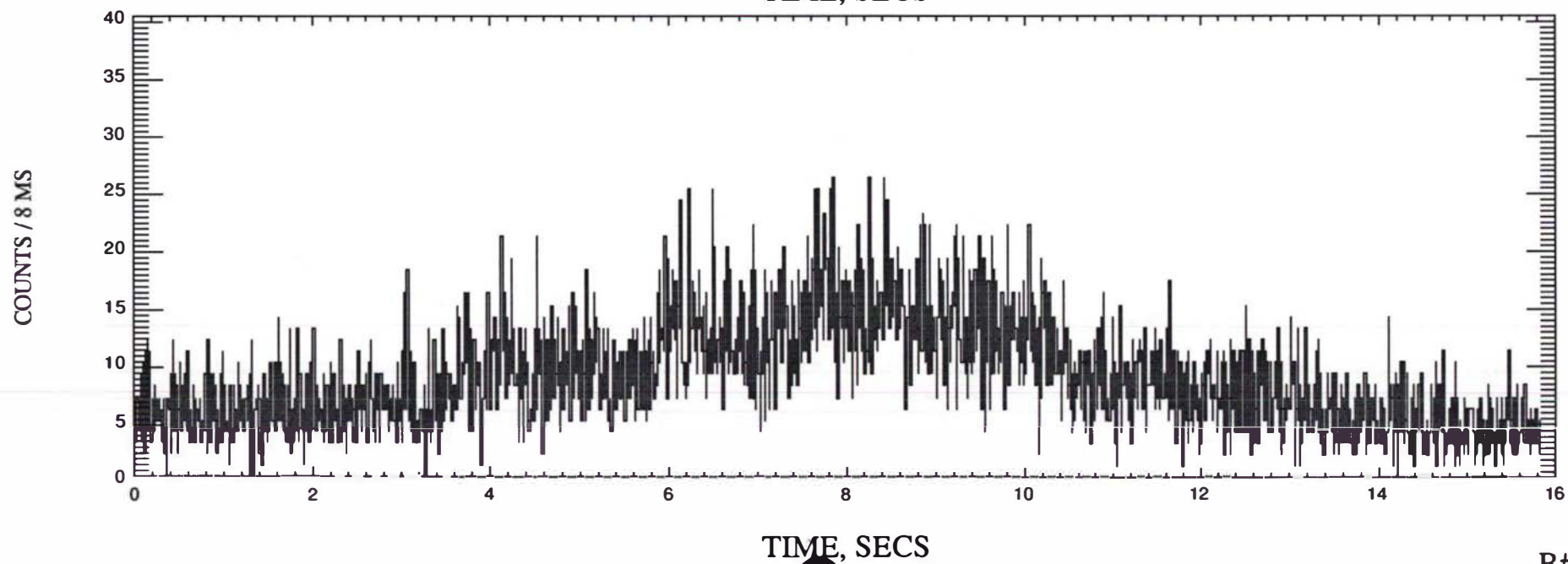
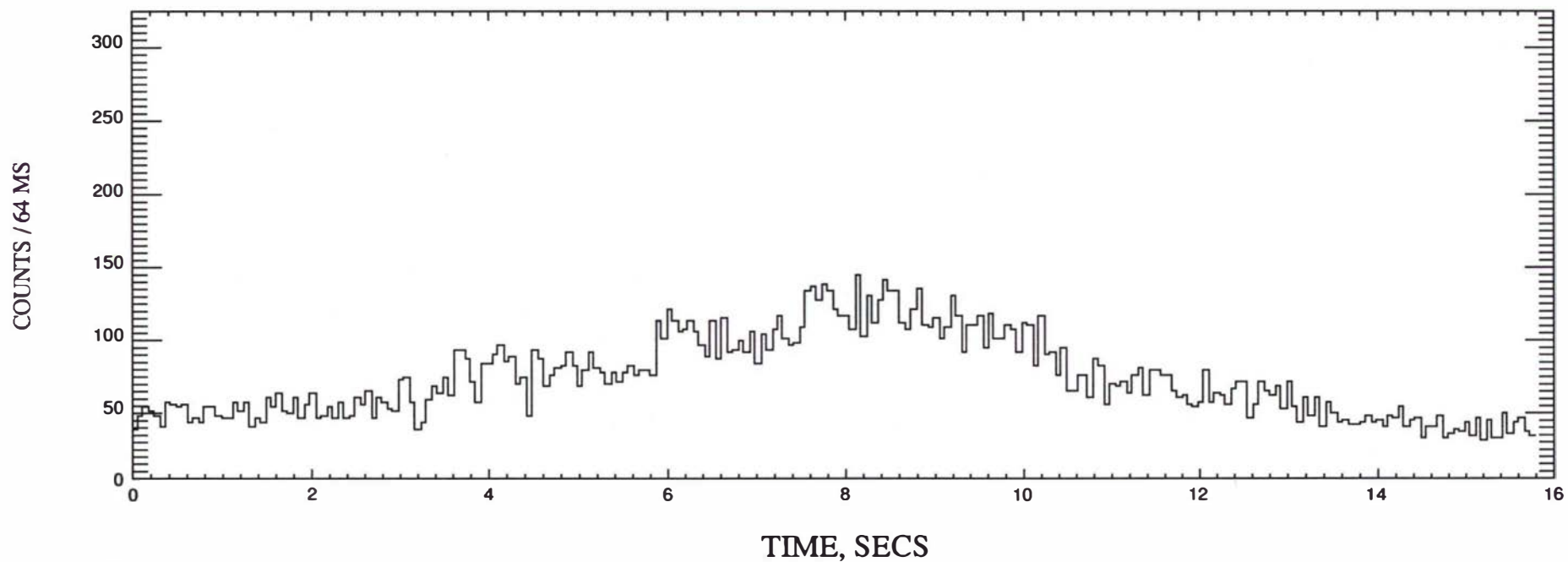
Burst Counter 13 at UT= 6.418097470601 h=23105.151 s 06:25:05.151



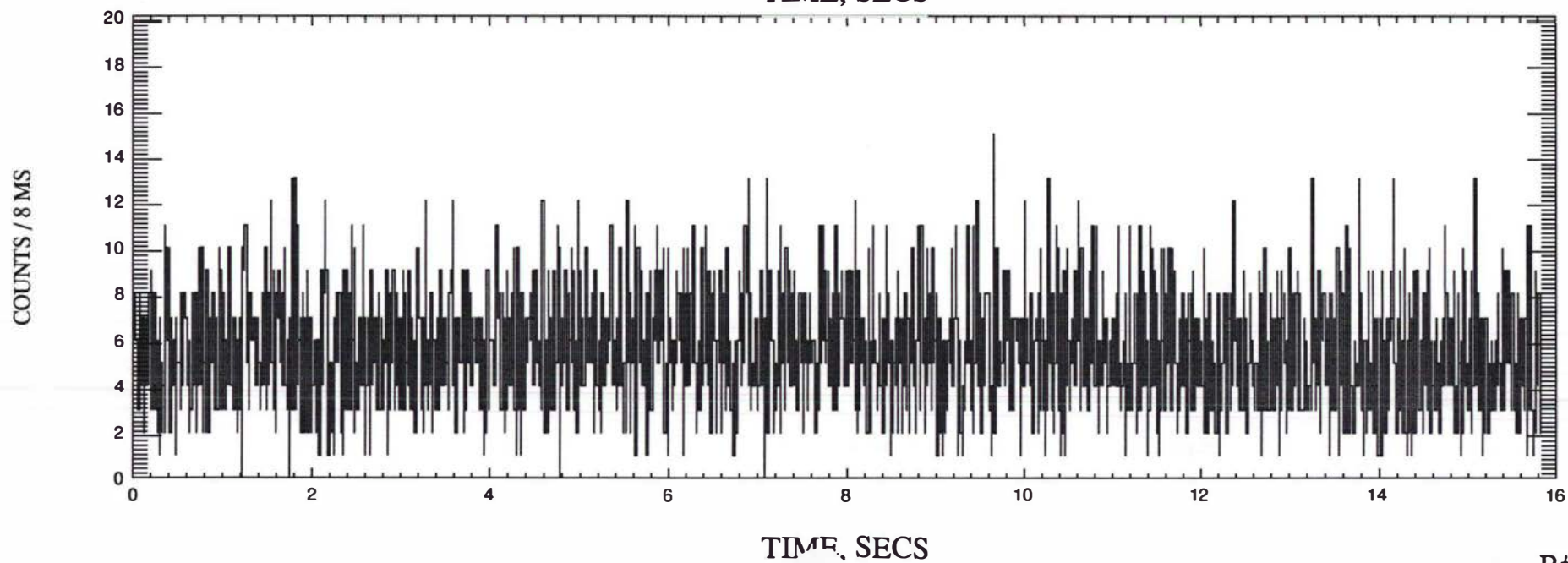
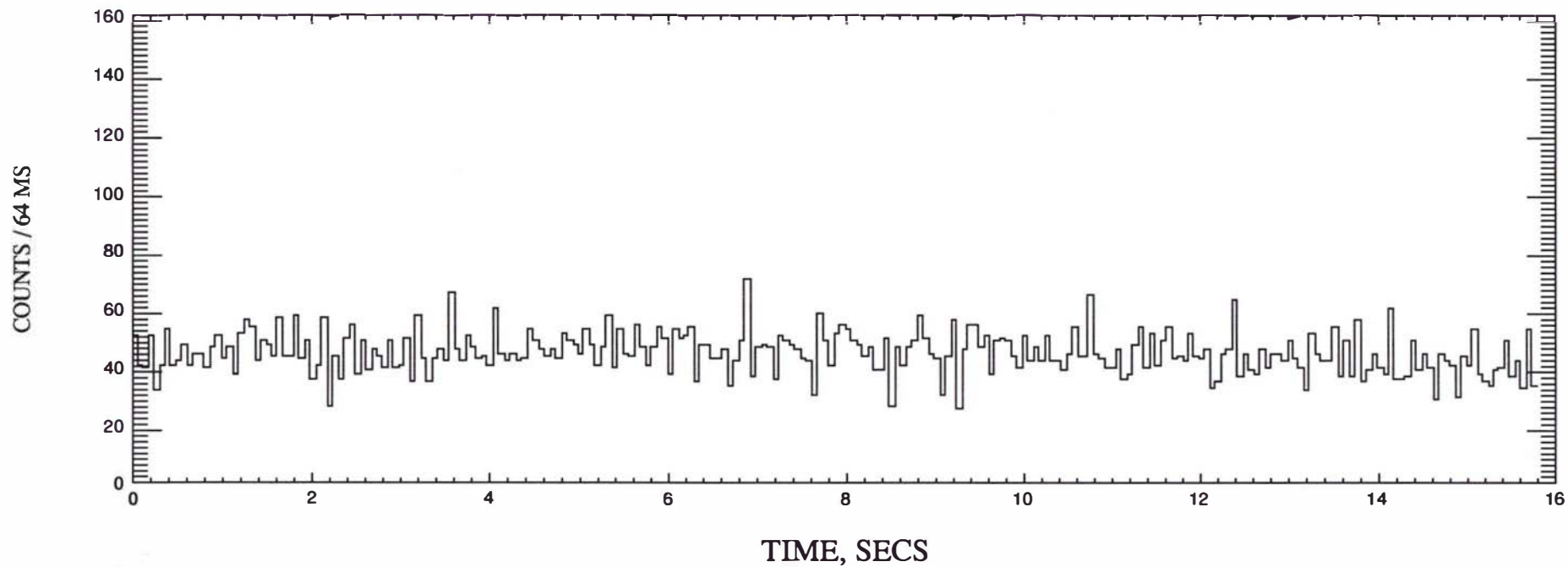
Burst Counter 14 at UT=10.696018040975 h=38505.665 s 10:41:45.665

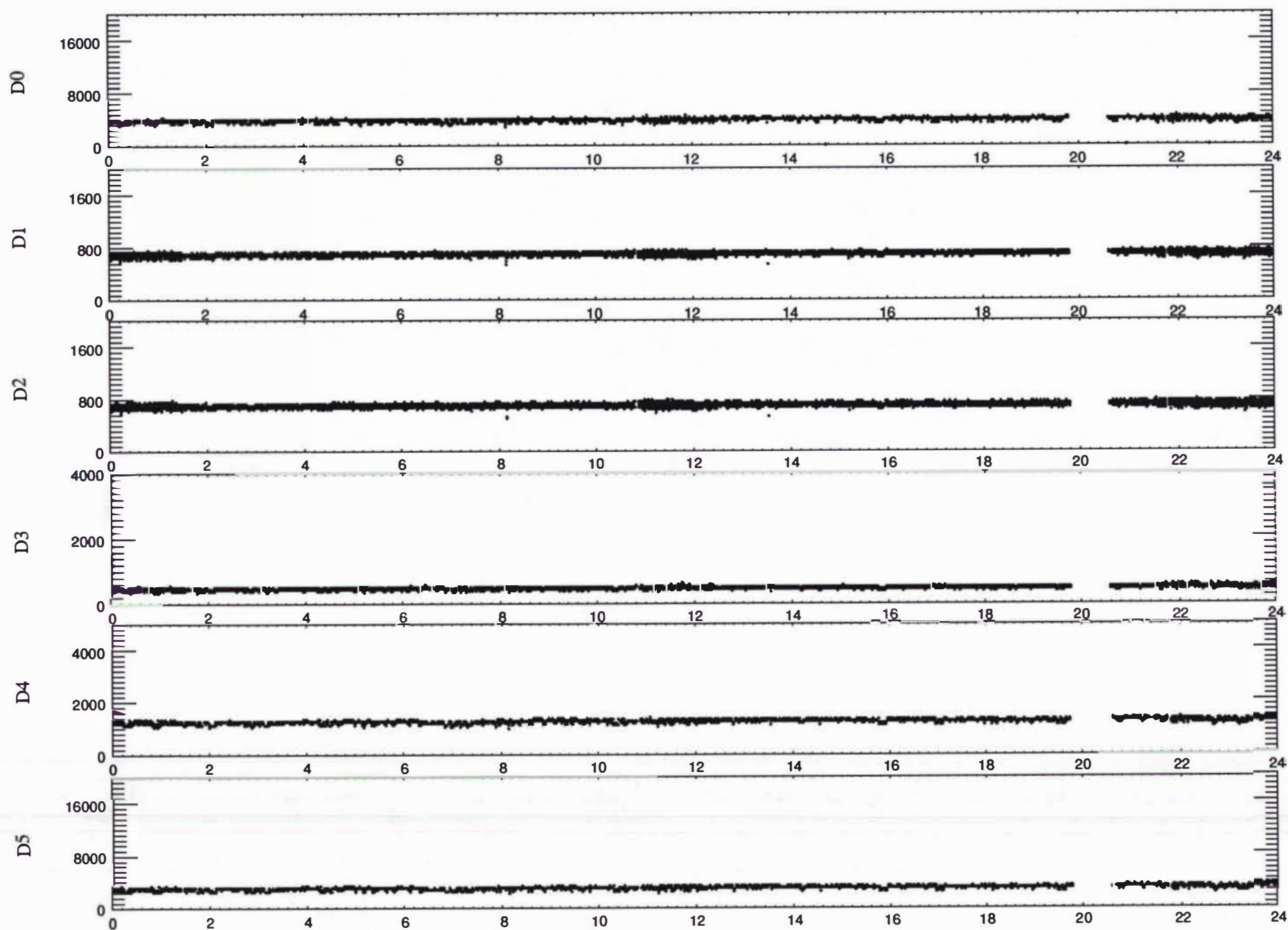


Burst Counter 15 at UT=18.517760713365 h=66663.939 s 18:31:03.939



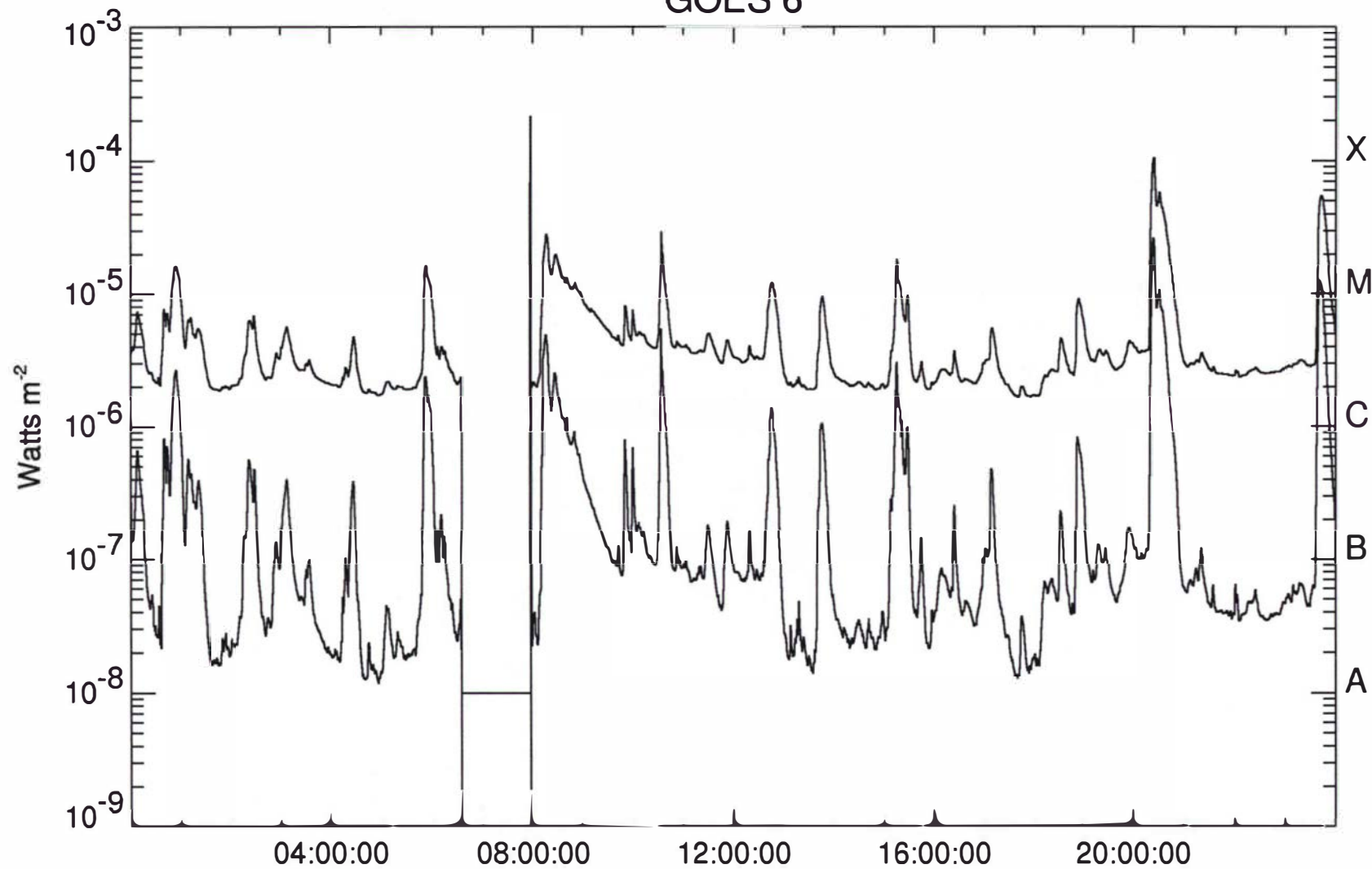
Burst Counter 0 at UT=23.752579354180 h=85509.286 s 23:45:09.286





UNIV AL TIME

GOES 6



Data Start: 91/03/21, 0000:02

Channel

1 (1.0 - 8.0 Angstroms)

2 (0.5 - 4.0 Angstroms)

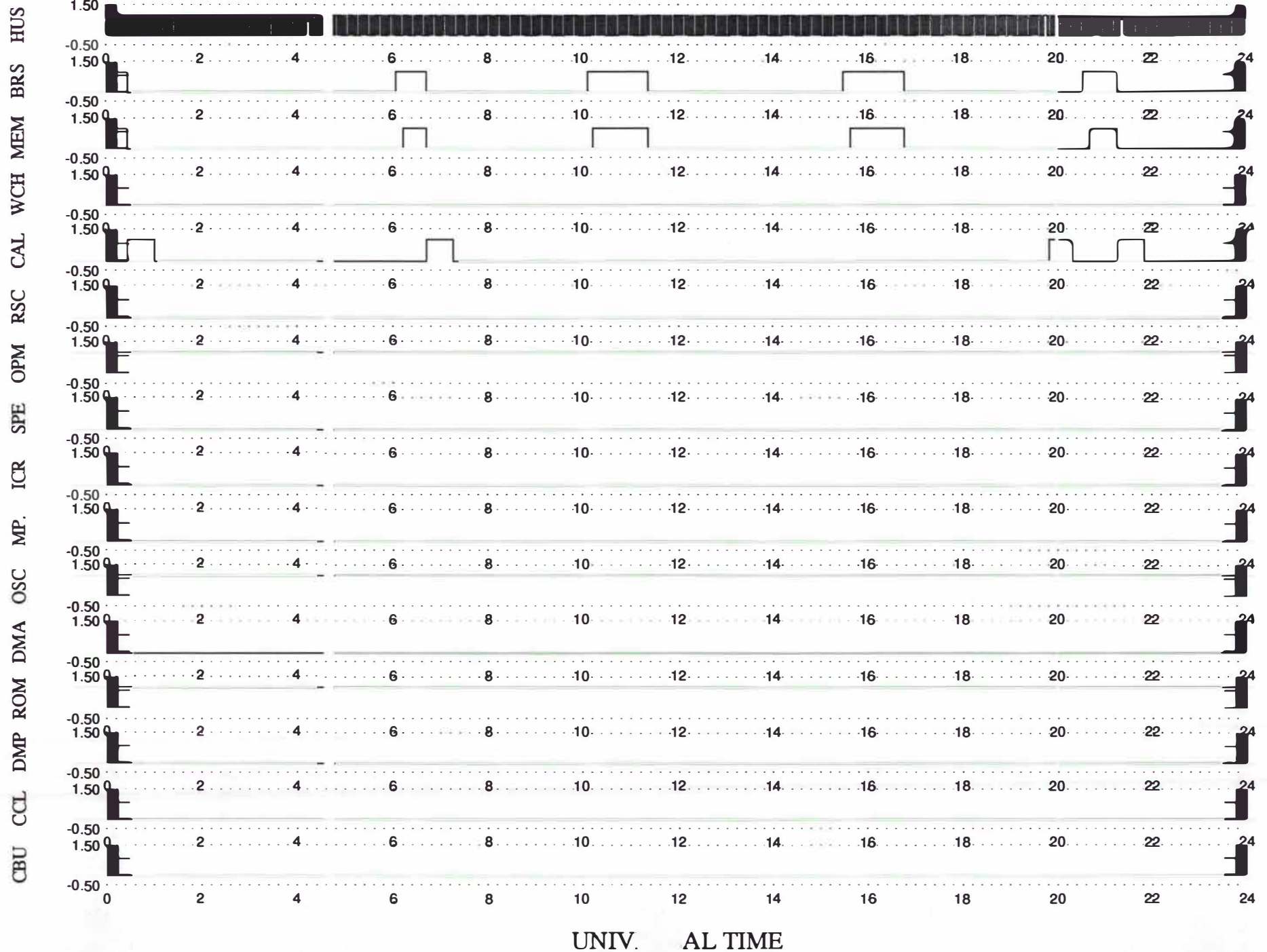
Plot created: 96/11/26, 1858

Background not subtracted

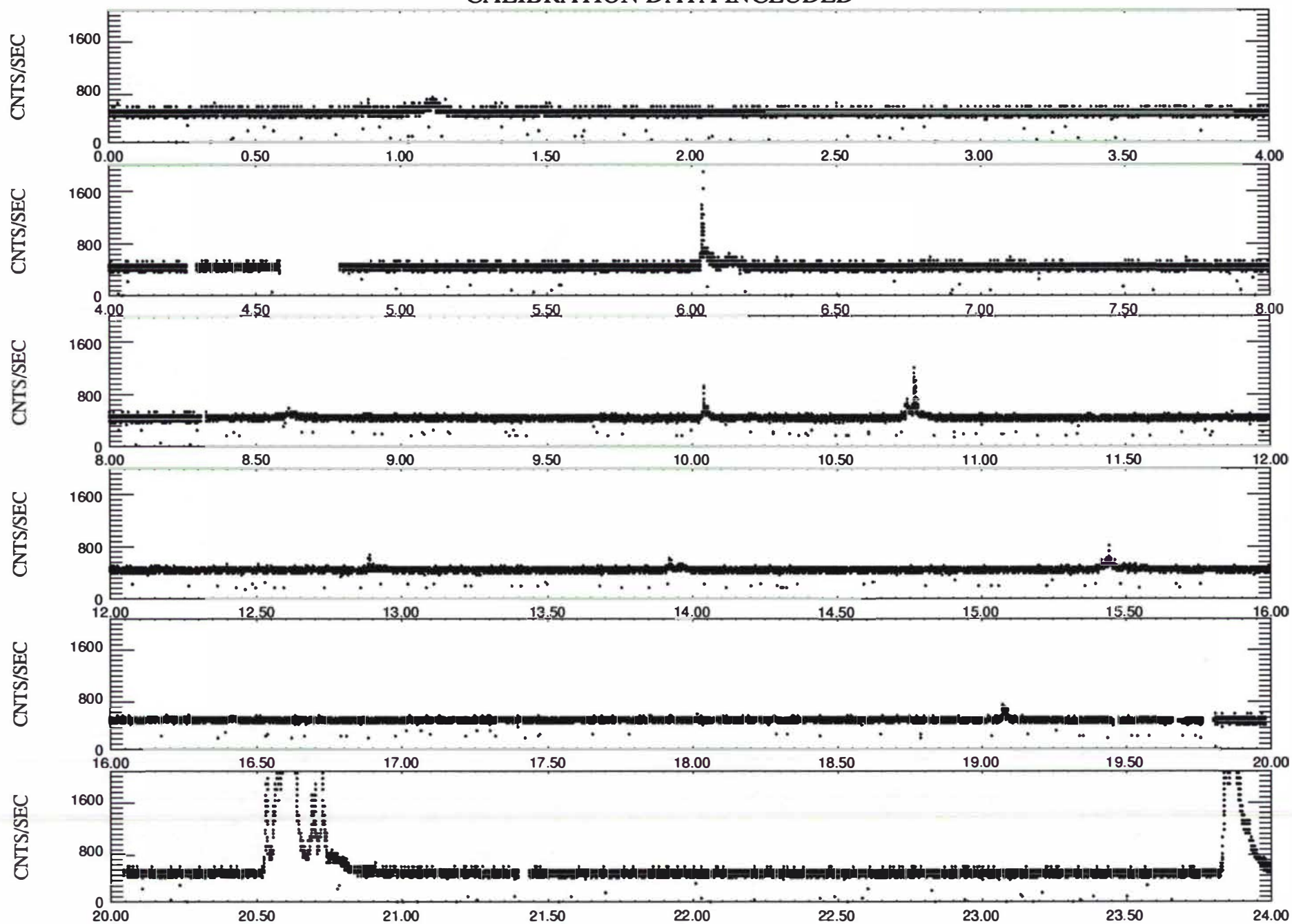
Background not subtracted

Sample average = 10

BURST NUMBER 1 - 5

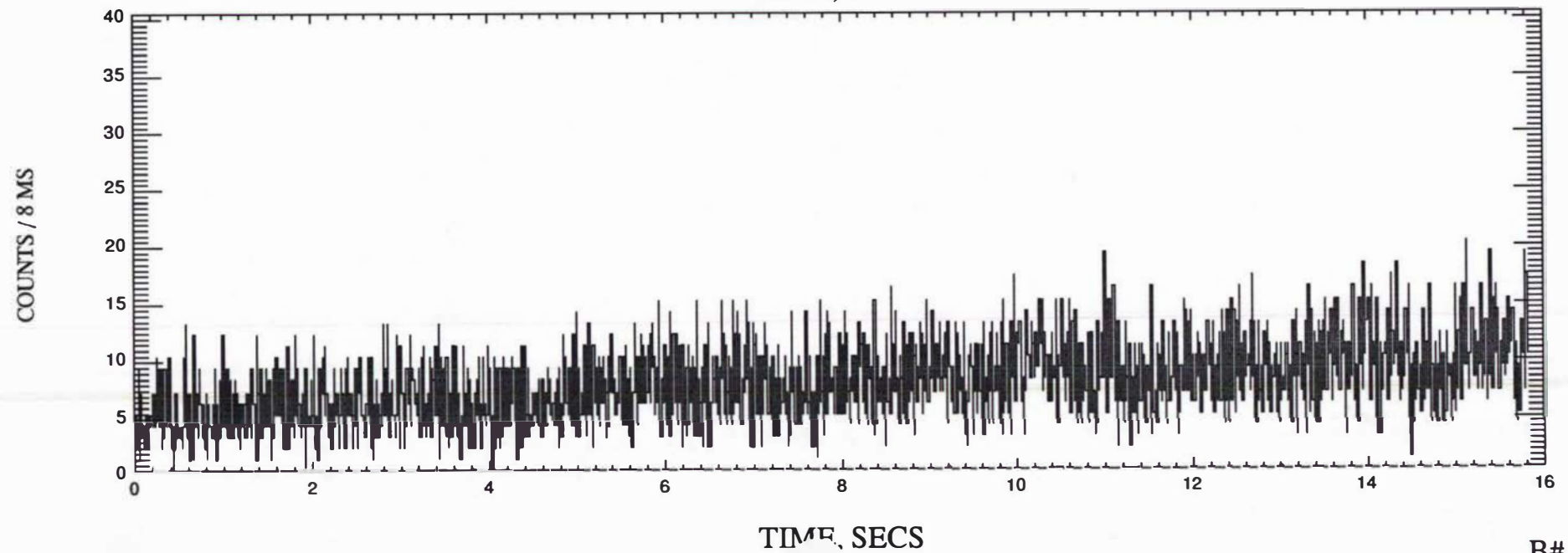
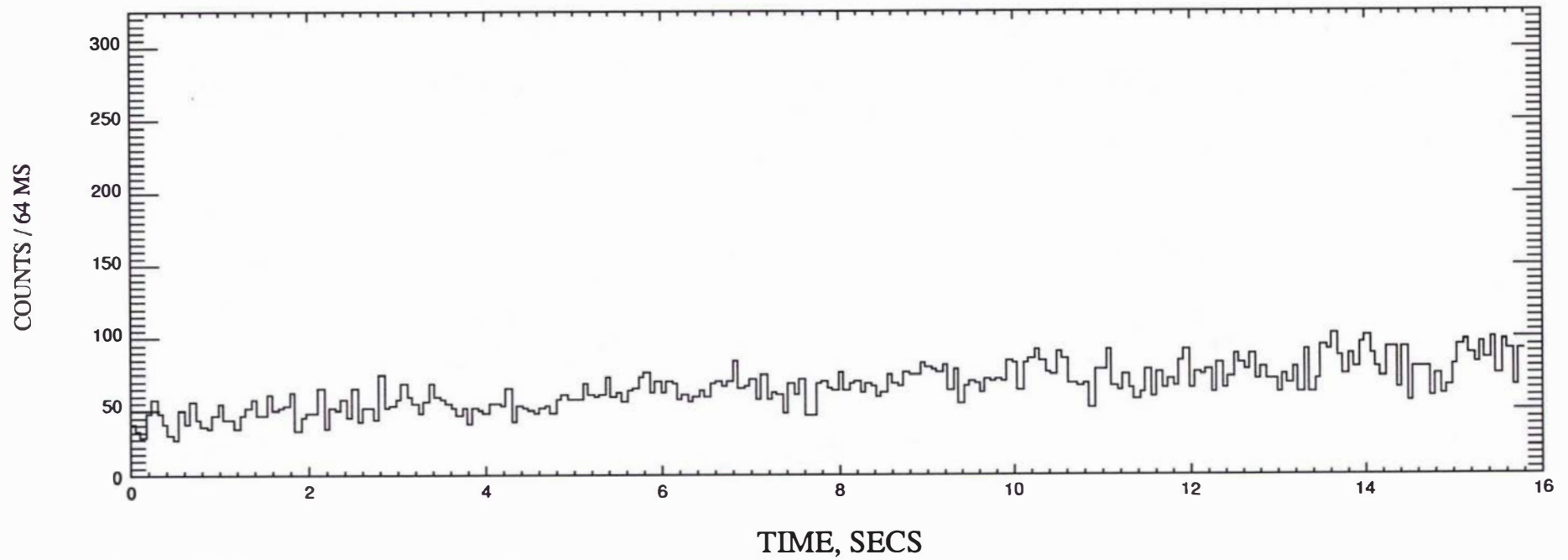


CALIBRATION DATA INCLUDED

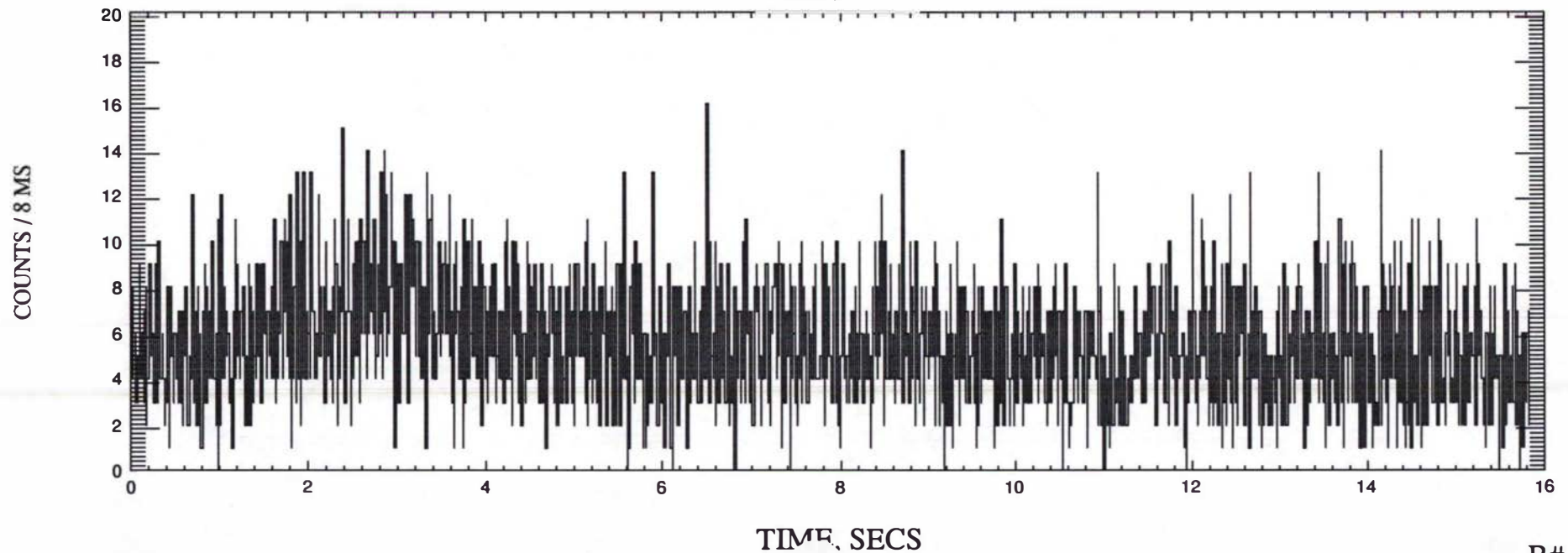
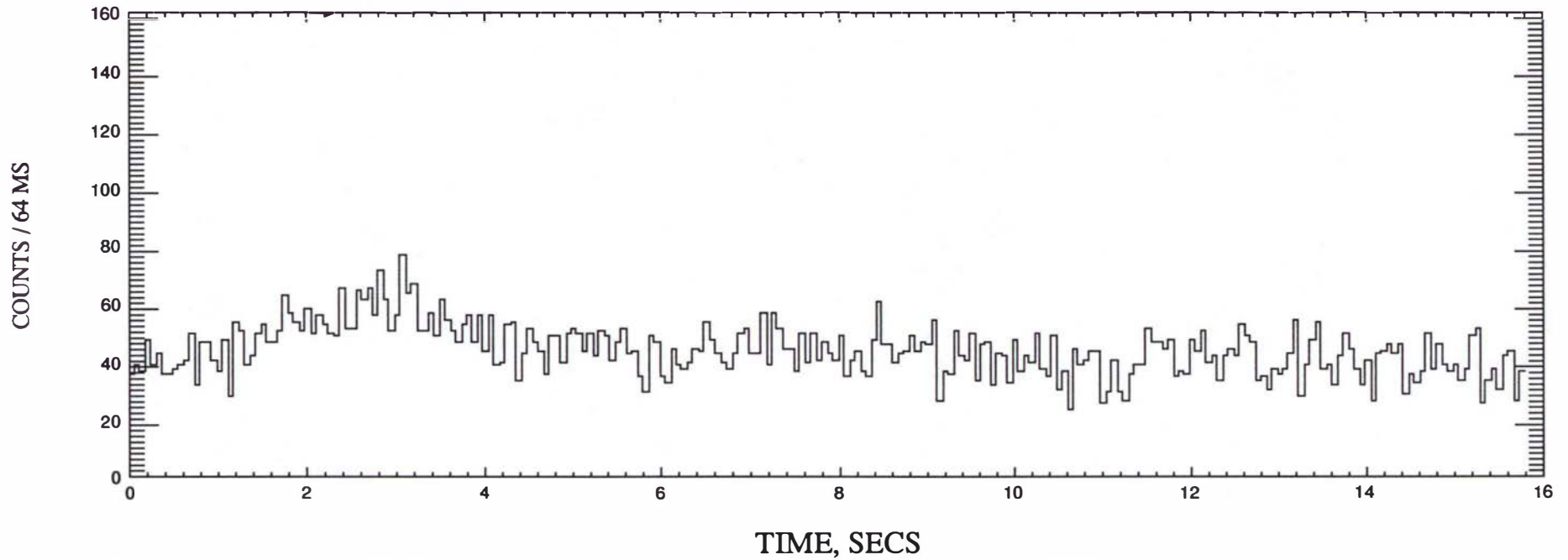


UNIV AL TIME

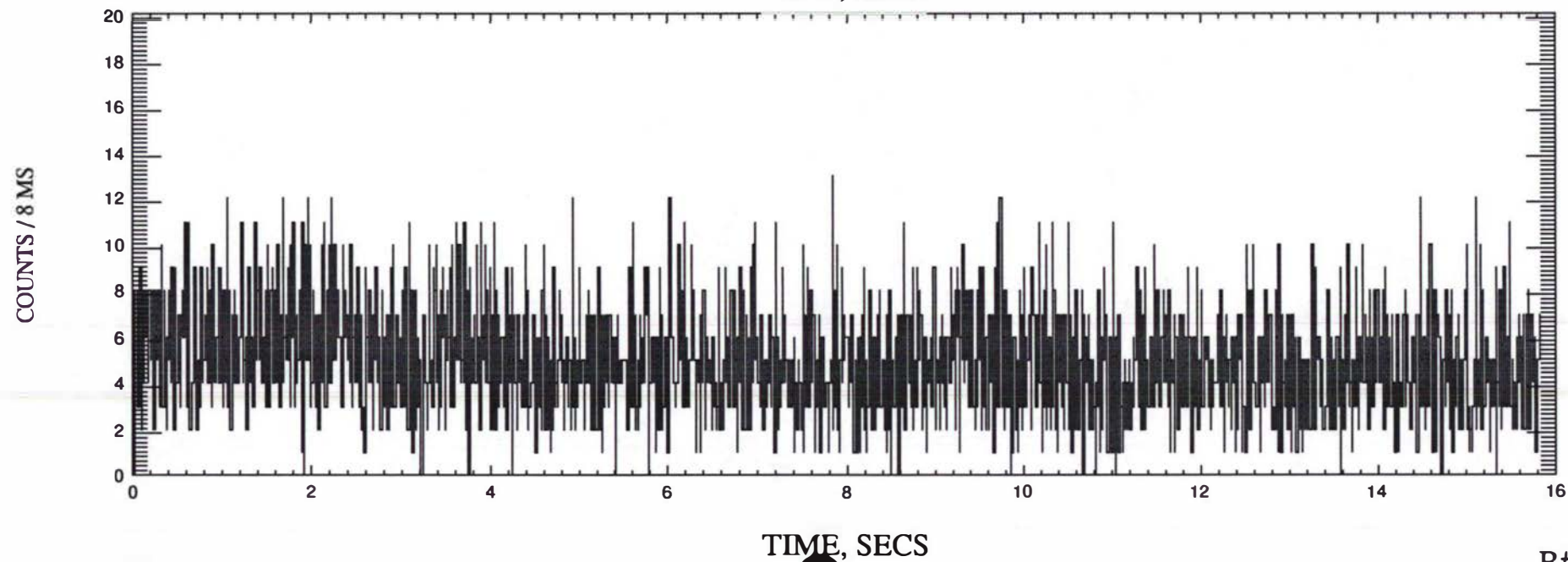
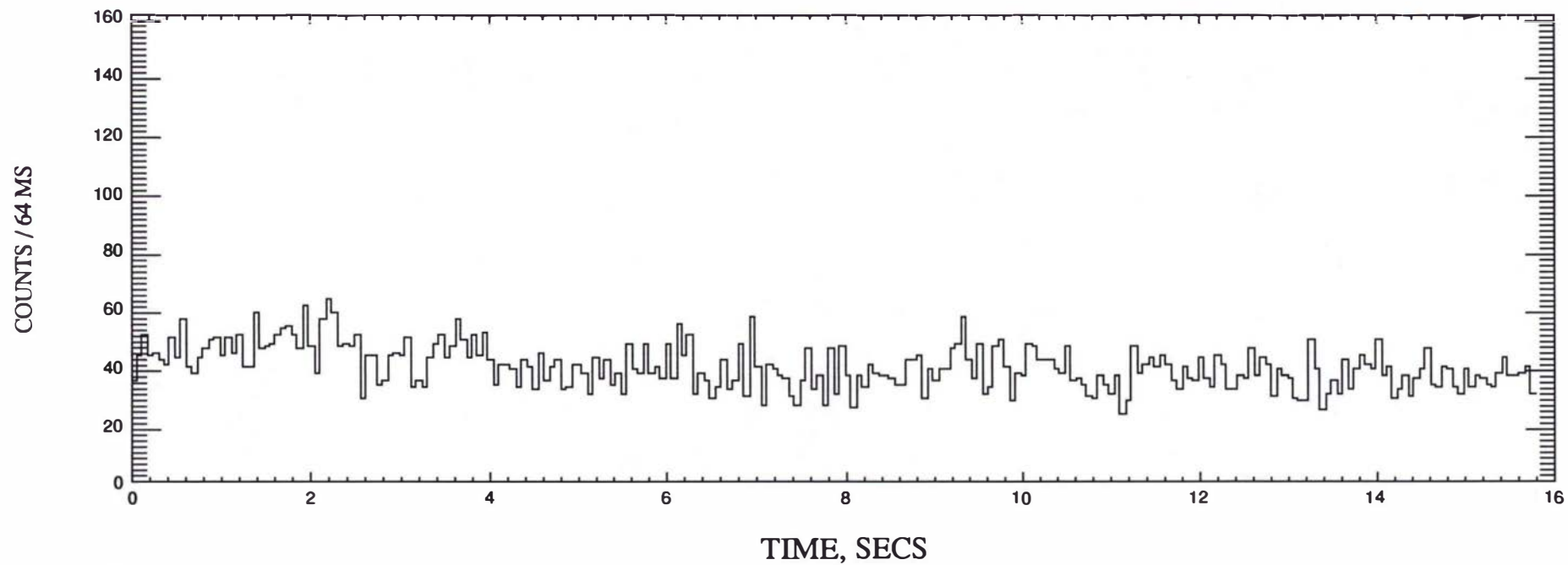
Burst Counter 1 at UT= 6.030403255887 h=21709.452 s 06:01:49.452



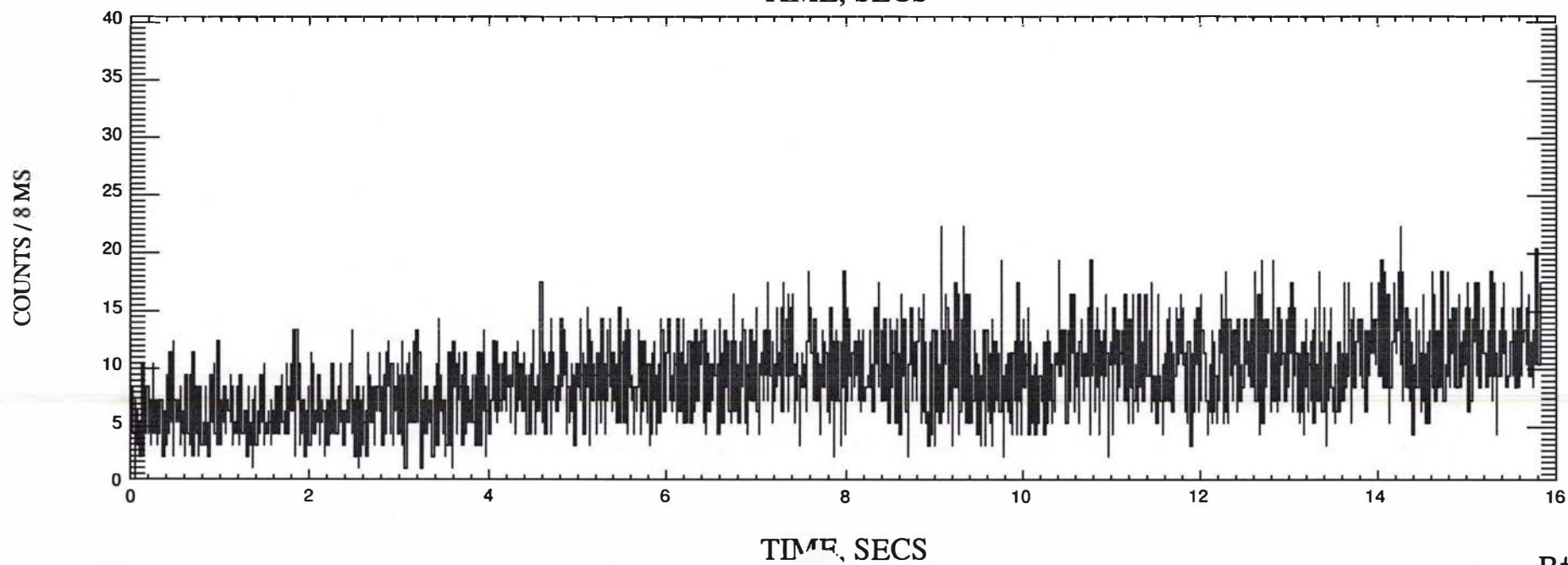
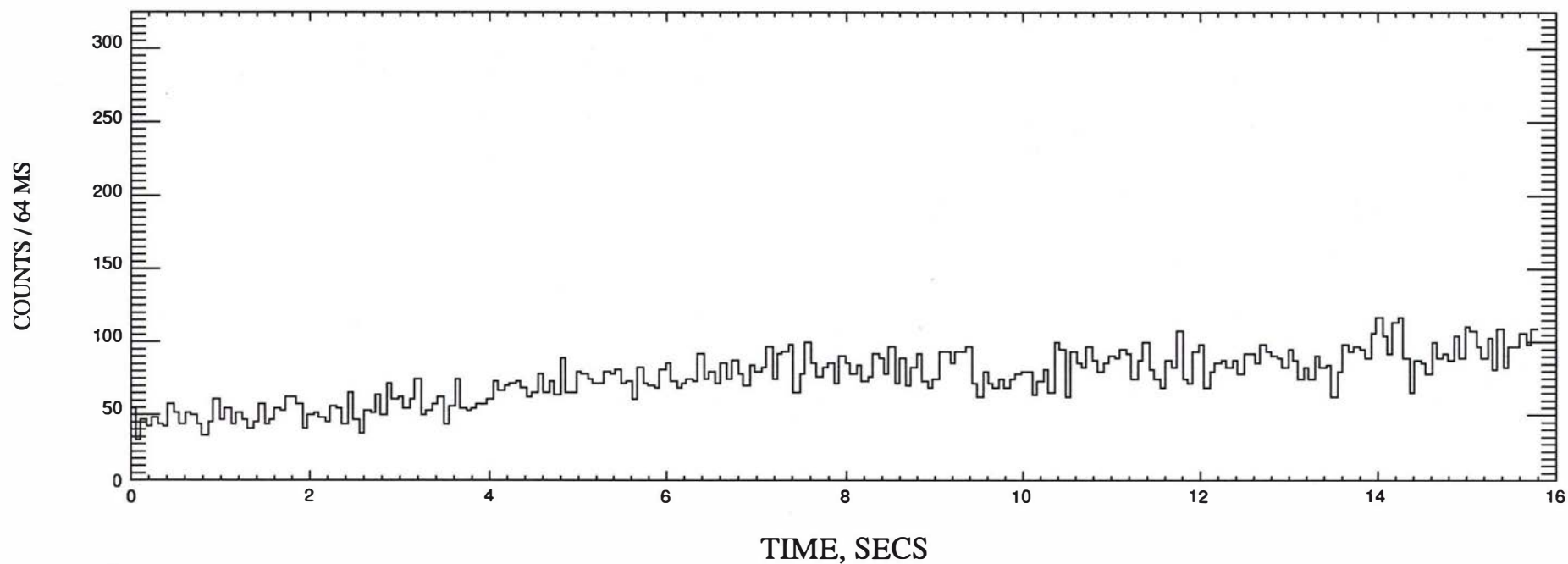
Burst Counter 2 at UT=10.036235194736 h=36130.447 s 10:02:10.447



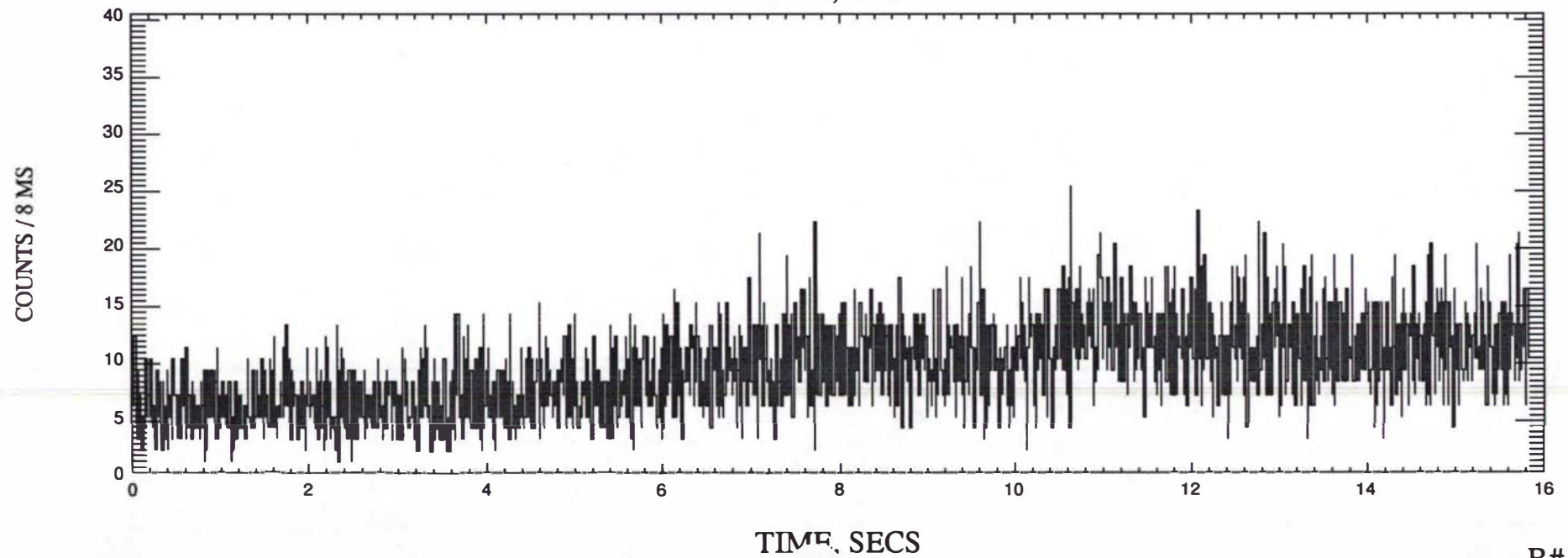
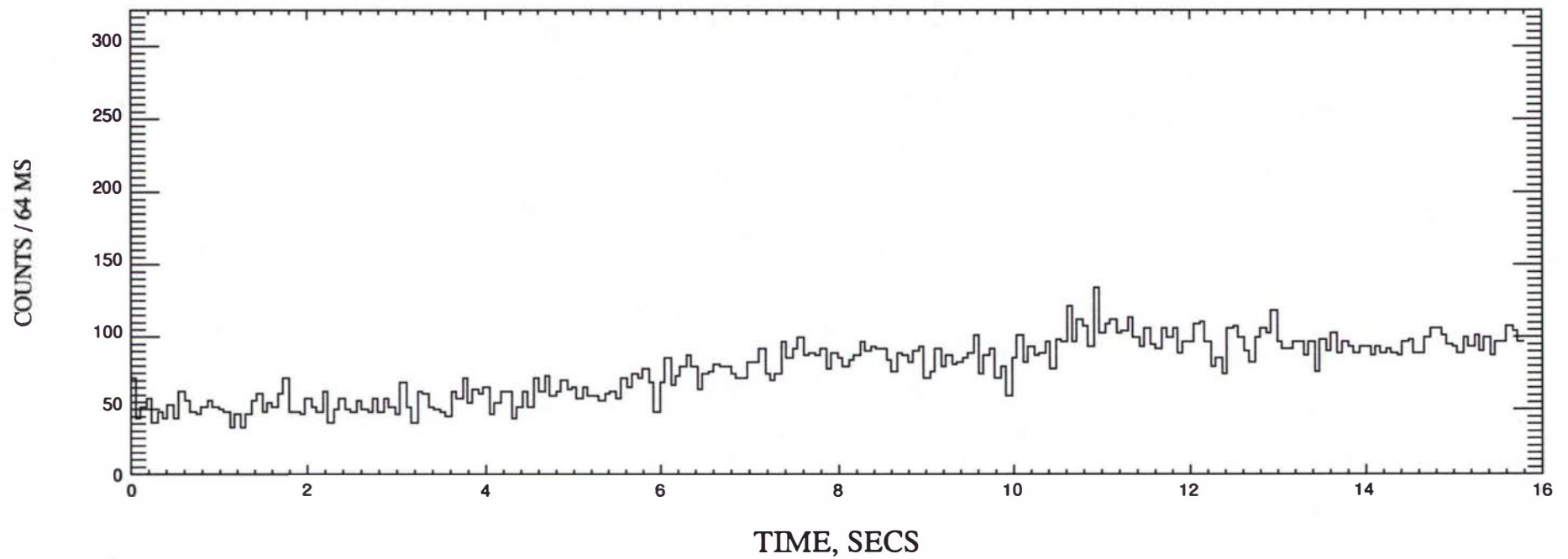
Burst Counter 3 at UT=15.441060447693 h=55587.818 s 15:26:27.818

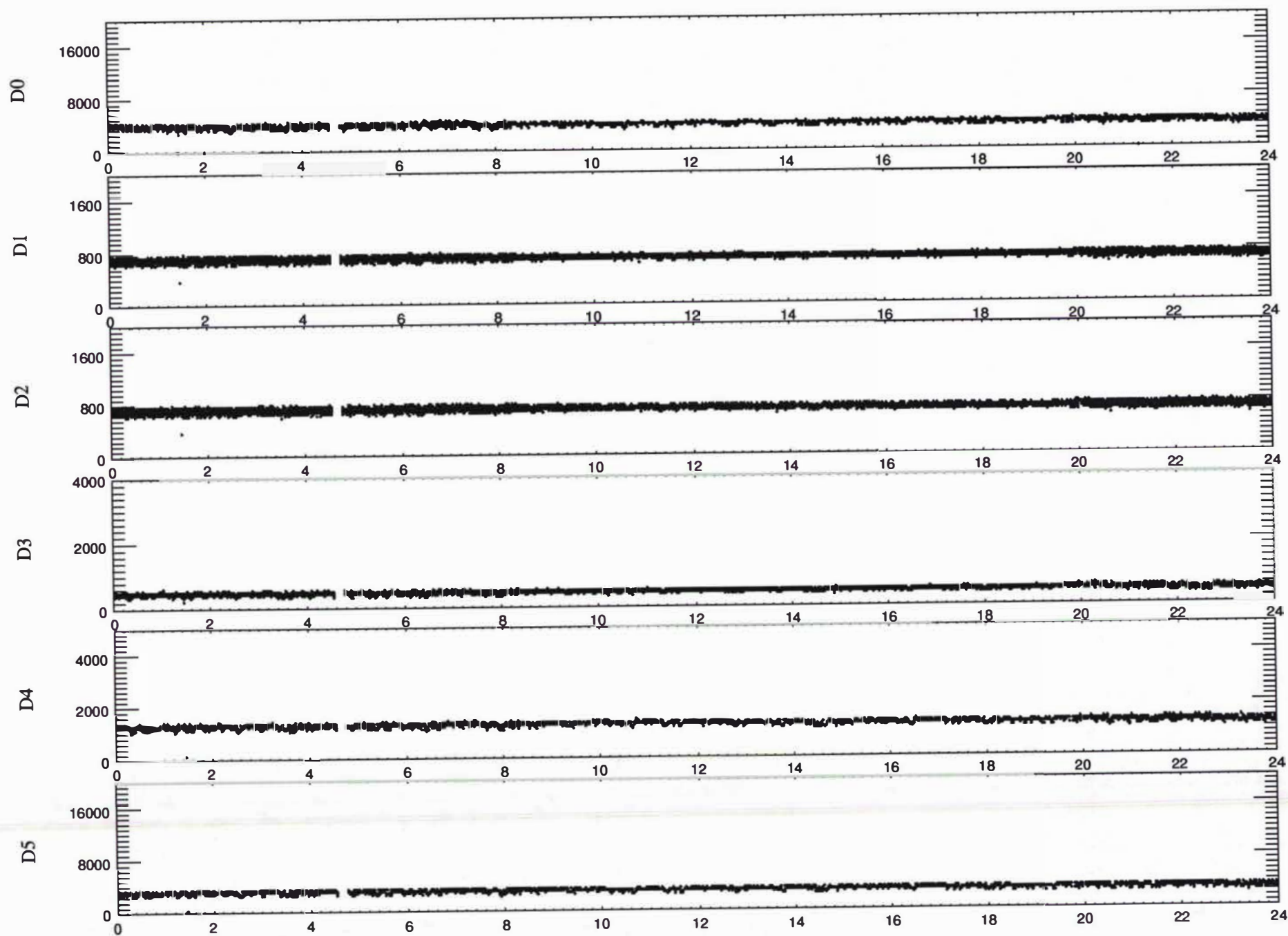


Burst Counter 4 at UT=20.524695281982 h=73888.903 s 20:31:28.903



Burst Counter 5 at UT=23.828364605374 h=85782.113 s 23:49:42.113





UNIV AL TIME

DATE	U.T.	Nr UGB	Event Nature
1990-12-24	15:34:32.617	216-a	Solar Flare
1991-01-06	16:39:57.526	218-a	GRB
1991-01-17	00:57:12.234	223-a	GRB ?
1991-01-18	14:03:26.738	224-a	Solar Flare
1991-01-21	00:18:12.304	227-a	Solar Flare
1991-01-22	15:13:50.333	228-a	GRB
1991-01-25	06:29:38.745	231-a	Solar Flare
1991-02-01	11:44:54.779	233-a	Solar Flare
1991-02-01	18:46:17.191	233-b	Solar Particles
1991-02-02	20:57:39.170	234-a	GRB ?
1991-02-04	08:58:45.821	235-a	GRB
1991-02-04	10:48:08.317	235-b	Solar Flare
1991-02-04	14:50:33.480	235-c	Solar Flare
1991-02-06	06:10:53.398	236-a	Solar Flare
1991-02-06	06:45:52.285	236-b	Solar Flare
1991-02-06	08:45:28.852	236-c	GRB
1991-02-10	17:35:33.692	237-a	Solar Flare
1991-02-11	03:25:22.425	237-b	GRB
1991-02-19	09:23:07.760	239-a	Solar Flare
1991-03-12	12:43:02.596	252-a	Solar Flare
1991-03-13	02:59:14.539	254-a	Solar Flare
1991-03-13	08:01:48.347	254-b	Solar Flare
1991-03-14	13:31:08.601	255-a	Solar Flare
1991-03-14	18:11:50.507	255-b	Solar Flare
1991-03-14	22:56:15.309	255-c	GRB
1991-03-22	20:07:59.817	256-a	Solar Flare
1991-03-22	22:42:51.228	256-b	Solar Flare
1991-03-23	01:51:17.475	256-c	Solar Flare
1991-03-23	14:34:35.610	257-a	Solar Particles
1991-03-23	14:48:54.705	257-b	Solar Particles
1991-03-23	15:01:31.774	257-c	Solar Particles
1991-03-29	06:44:19.108	260-a	Solar Flare
1991-03-31	13:45:30.490	261-a	Solar Flare
1991-03-31	19:08:38.993	261-b	Solar Flare
1991-04-02	14:27:44.130	262-a	GRB

From root Thu Dec 9 11:14 1993
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA09450; Thu, 9 Dec 93 11:14:17
Received: from mx.nsi.nasa.gov by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA01091; Thu, 9 Dec 93 10:17:05 PST
Received: Thu, 9 Dec 93 10:20:23 PST from ESSDP2.dnet by mx.nsi.nasa.gov (4.1/1.2)
Message-Id: <9312091820.AA06809@mx.nsi.nasa.gov>
Received: from ESSDP2.dnet by AMES.dnet with MAIL-11
(utk-maill1d v1.7); Thu, 9 Dec 93 10:20:24 PST
Date: Thu, 9 Dec 93 10:20:24 PST
From: 068486@essdp2.span.nasa.gov
X-To: AMES: "khurley@space6.ssl.berkeley.edu"
Subject: RE:
To: khurley@space6.ssl.berkeley.edu
Status: R

KEVIN,

HERE ARE MORE RESULTS. I WILL BE SENDING YOU THE DATA FILES.

DATE	TIME	PVO RESPONSE
90/12/13	07:06	MAYBE-NEAR 3 SIGMA RESPONSE AT 25847 UT
90/12/16	15:47	MAYBE-3.4 SIGMA RESPONSE AT 57130 UT
90/12/18	13:54	N/O
91/01/06	16:39	RI 6 SIGMA 59443-59459 UT
91/02/02	20:57	RI-4 SIGMA AT 75598 UT C3, 5.8 SIGMA SUMMED 75438-75758 UT IS THIS AN EXTREMELY LONG EVENT?
91/02/06	16:39	RI- 6 SIGMA
91/02/11	03:25	RI
91/03/22	12:41	(NO)
91/04/04	14:19	(NO)
91/05/29	17:36	N/O
91/11/19	17:12	(NO)
91/12/22	15:00	RI WEAK
92/01/16	18:30	RI
92/02/24	09:53	N/O
92/02/29	19:21	(NO)
92/07/14	13:04	RI
92/07/20	05:52	RI
92/07/25	01:41	(NO)

THIS LIST IS STILL NOT COMPLETE. THE REMAINING EVENTS ON MY LIST WERE RECORDED
WITH 64 S TIME RESOLUTION. THESE DATA MAY NOT BE USEFUL.

REGARDS,

RAY

Table 1 GRBs List

Event ID	Time(U.T.) (hr:mn)	Peak Counts Cp (cnts/4sec)	Bit
901009	00:15:52		Hi
901021	00:09:07		Hi
901103	05:52:56		Hi
901112	19:20:38		Lo Uly
901219	21:52:50		Hi Uly
901022	15:14:08		Hi Uly
901030	11:56:08		Hi
90204	08:58:47		Hi Uly
90206	08:45:29		Med Uly
90312	12:43:34		Hi Uly
90314	22:56:12		Lo Uly
90315	22:55:48		Lo Uly
910322	12:41:48		Med
910402	14:28:13		Med Uly
910429	03:11:50		Med GRO
910522	12:14:08		Hi Uly
910527	23:45:36		Hi
910709	20:22:38		Med
910717	04:33:05		Hi GRO
910723	14:06:16		Lo
910725	13:12:06		Med GRO
910803	08:33:28		Med GRO
910814	19:14:34		Lo GRO
910815	12:34:32		Med
910821	10:33:39		Hi
910827	13:11:18		Hi
910905	23:48:55		Med GRO
910907	01:04:56		Lo GRO?
910926	18:25:56		Lo GRO
911008	17:56:04		Lo
911016	11:01:30		Lo GRO
911029	04:50:52		Lo
accuracy			Hi <+-0.1s Med +-0.5s Lo +-2.0s

Munakami's

Preliminary list

SOLAR

Requested Uly data Requested RT data N/O

Got Gunga data

Requested U. RT data

Got Gunga data

SOLAR

Requested RT

Requested RT data

Uly RT

RT requested
RT requestedUly
RT requested

RT requested

RT requested

RT

RT requested

No data

Requested RT

Requested RT

Requested RT

Requested RT

Requested RT

Requested RT

Requested RT

16 / 5 / 92

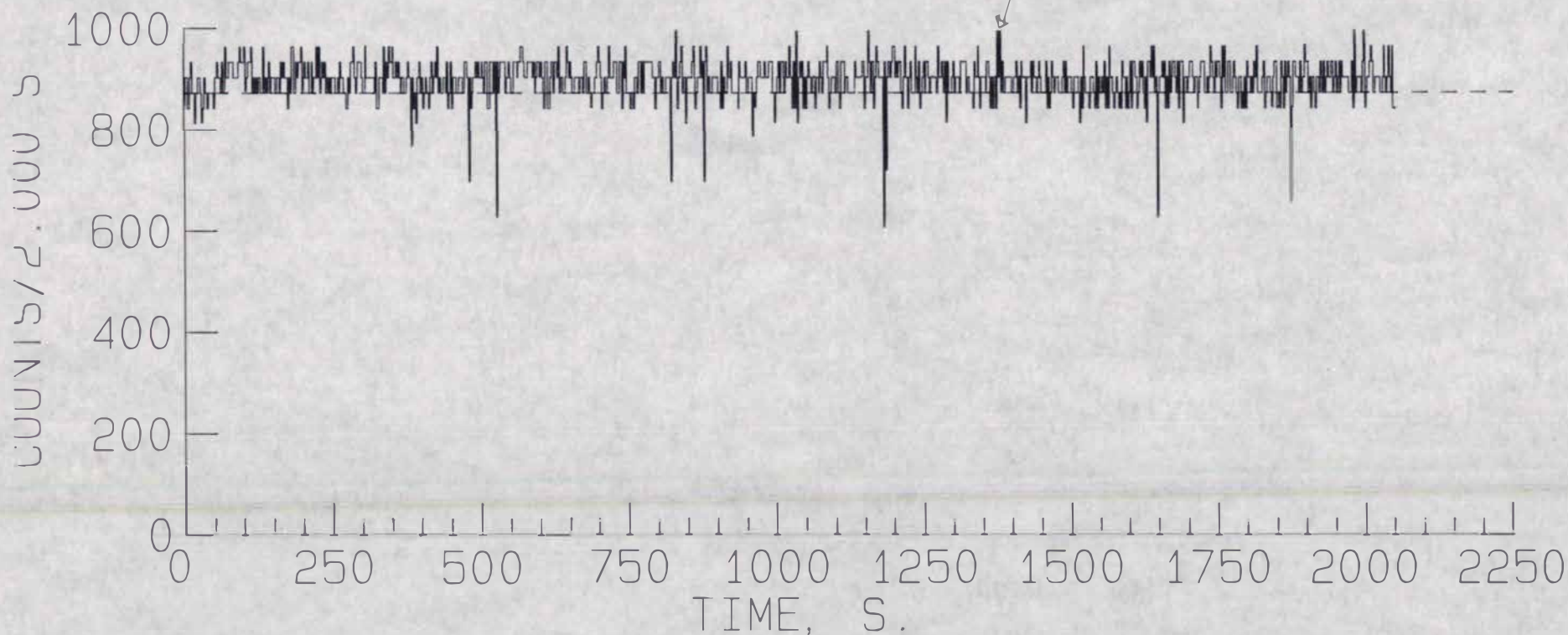
ULYSSES RT

22 / 3 / 91 44676.461 s

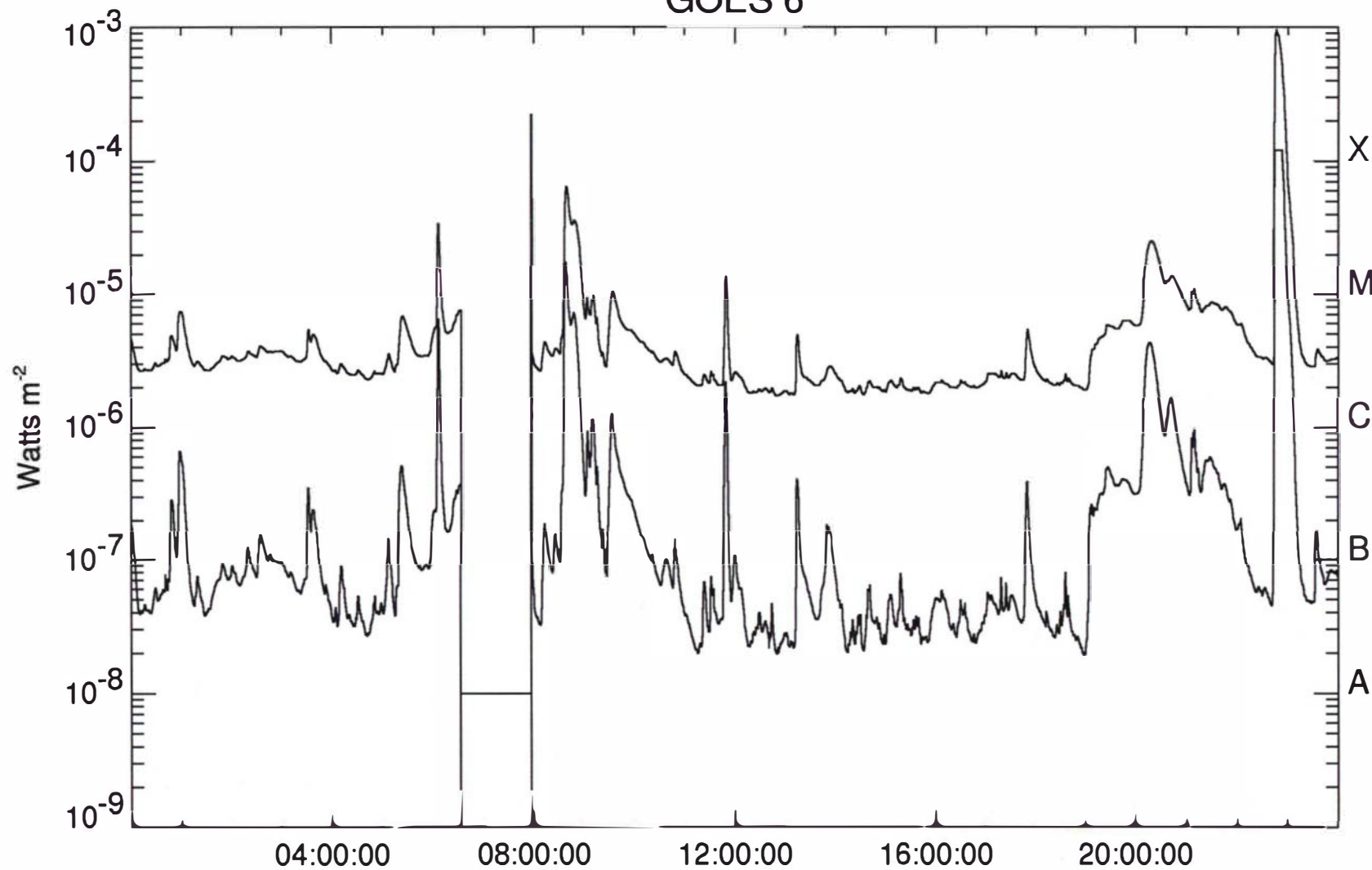
1.000 S INTERVALS REGROUPED BY 2

26 - 185 keV

N= 10 M= 6
>4.0 SIGMA FLUCTUATIONS



GOES 6



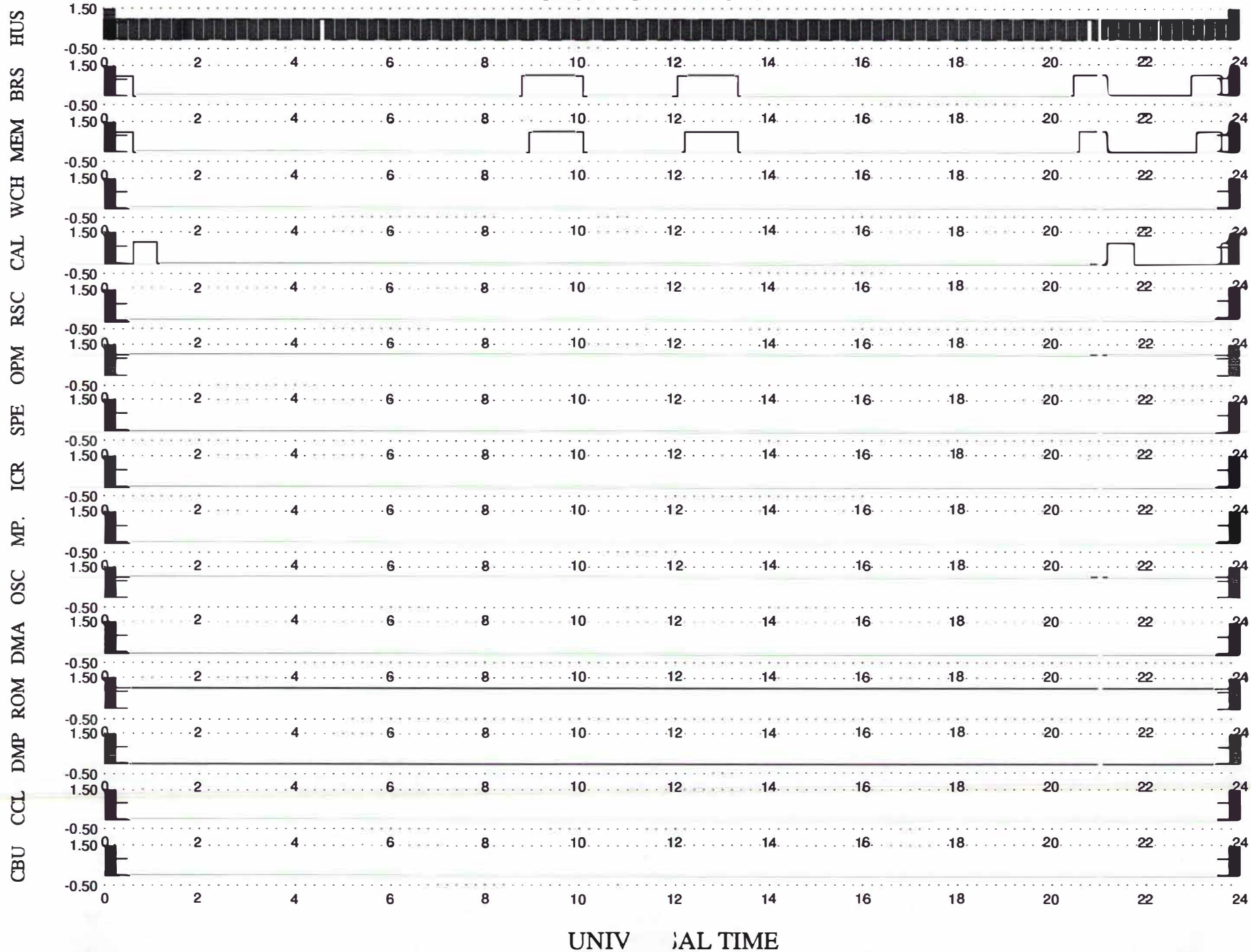
Data Start: 91/03/22, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
Channel 2 (0.5 - 4.0 Angstroms)

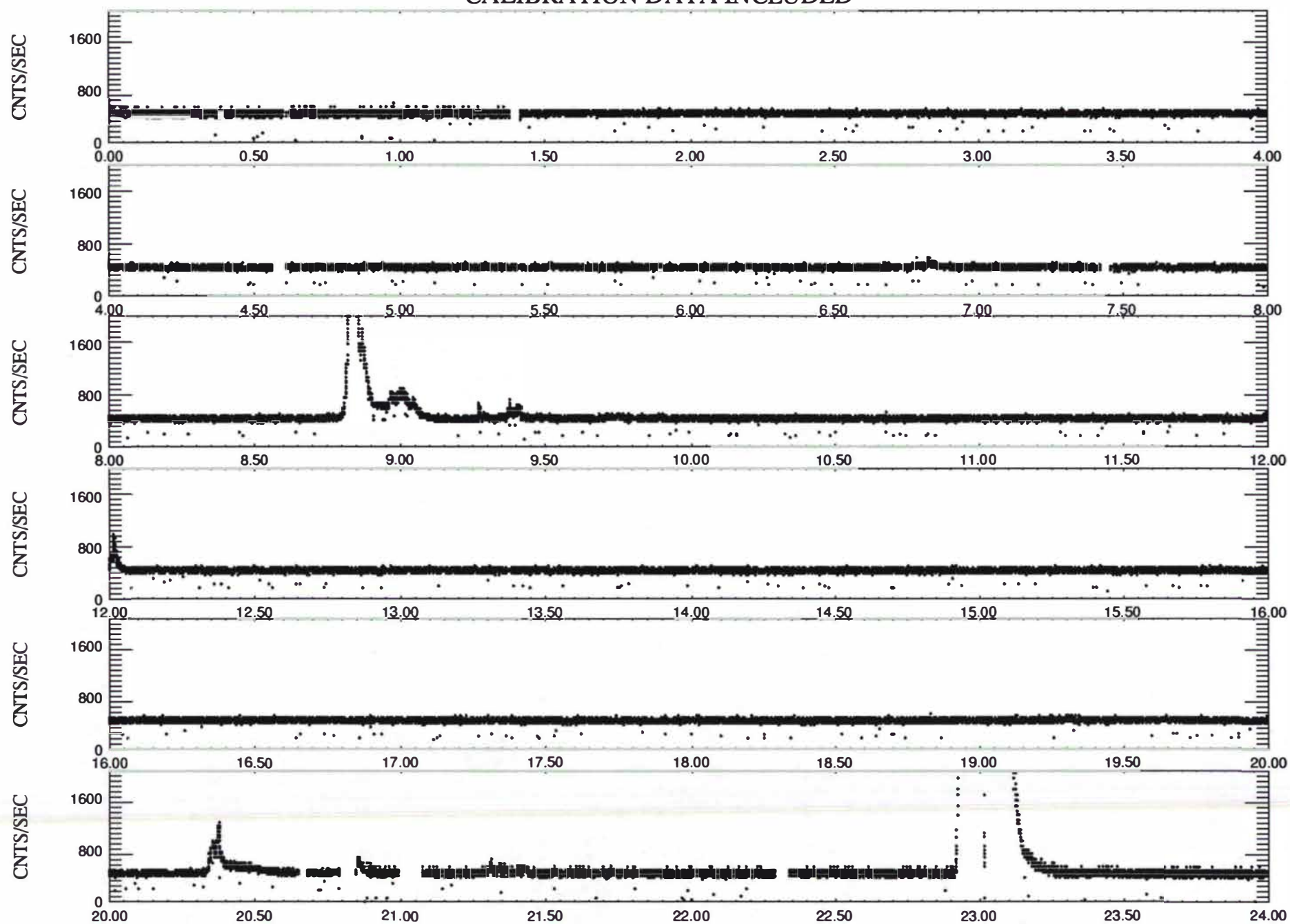
Plot created: 96/11/26, 1900

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 6 - 9

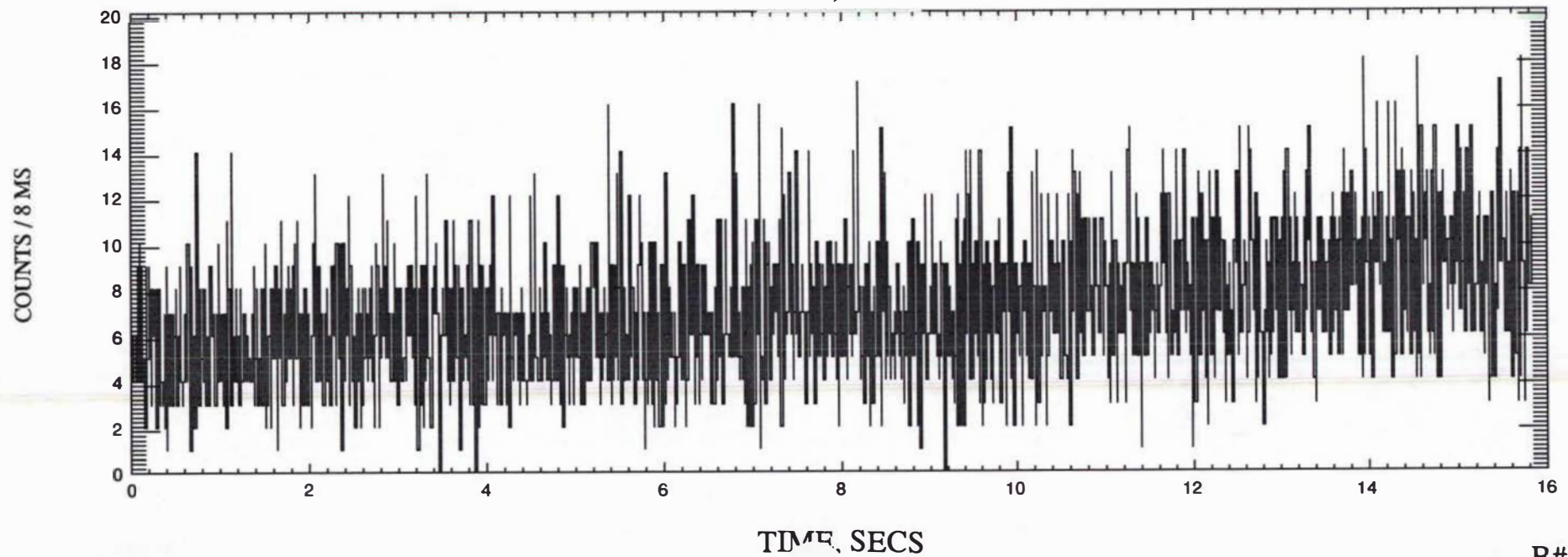
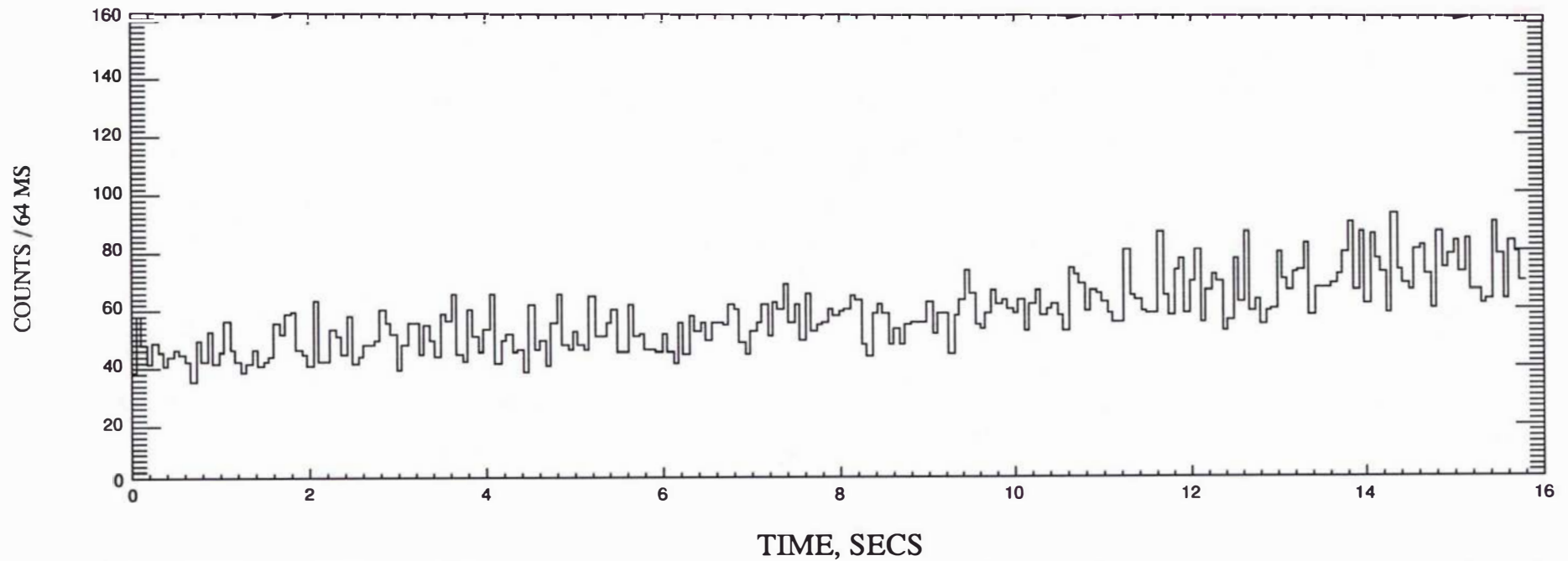


CALIBRATION DATA INCLUDED

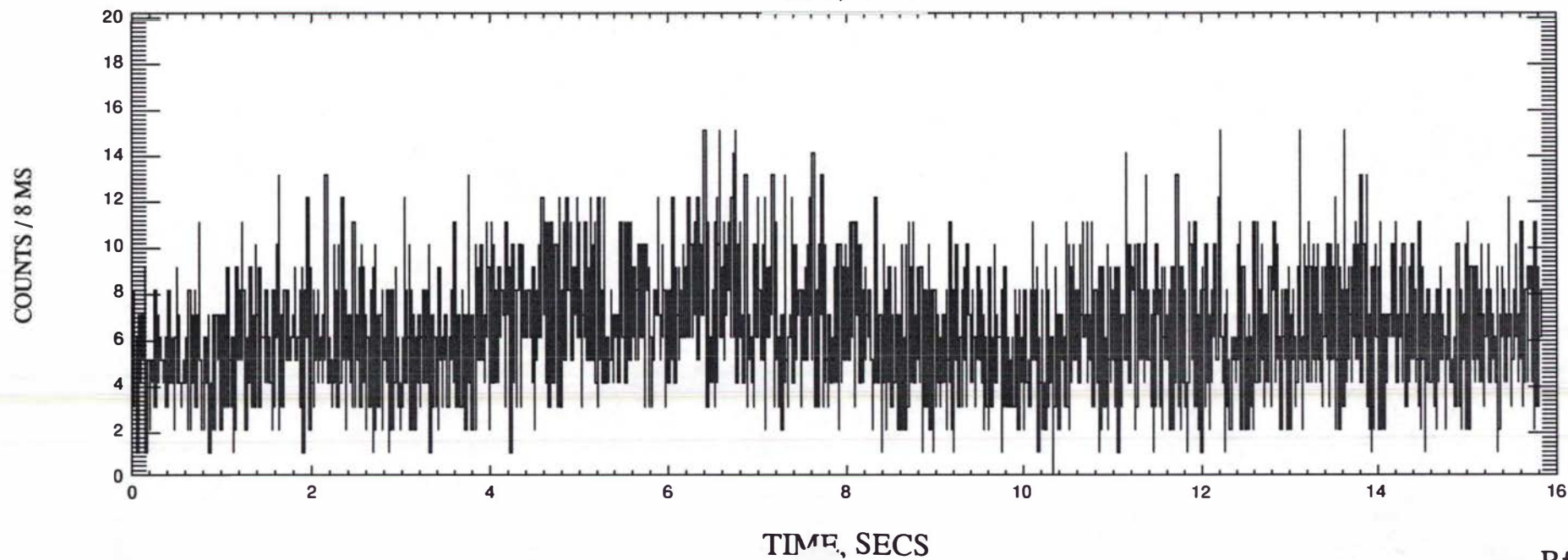
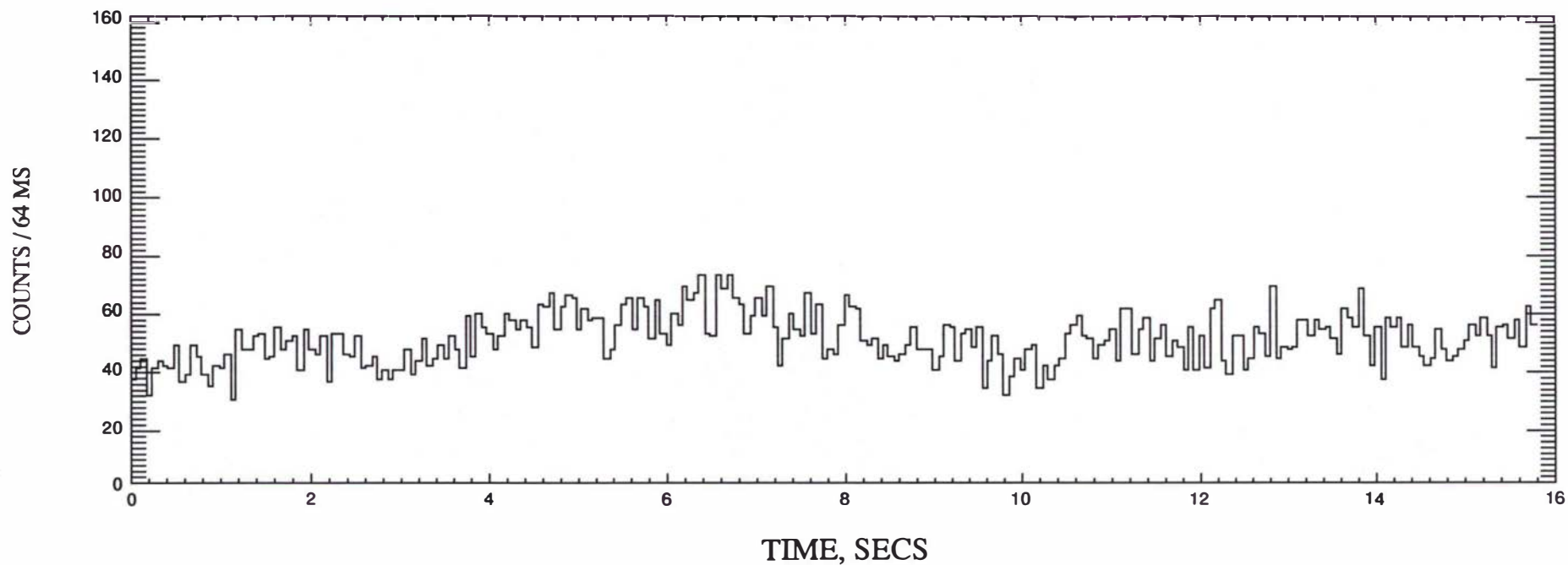


UNIV CAL TIME

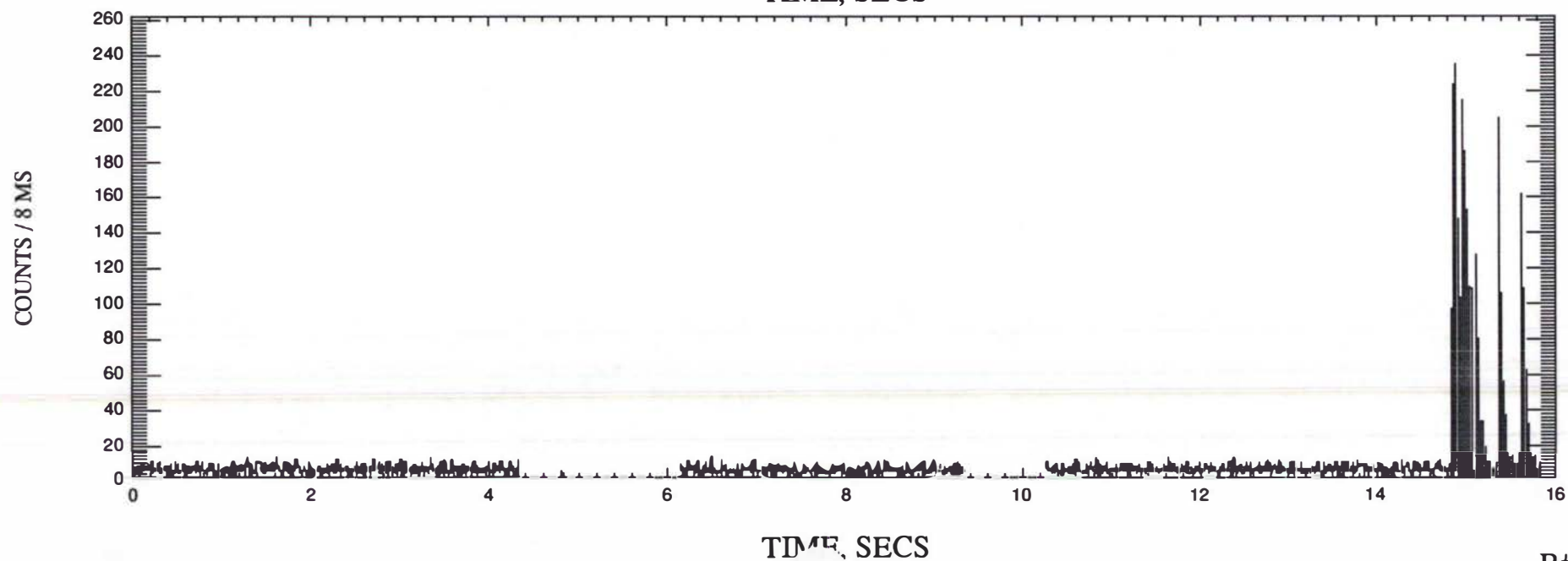
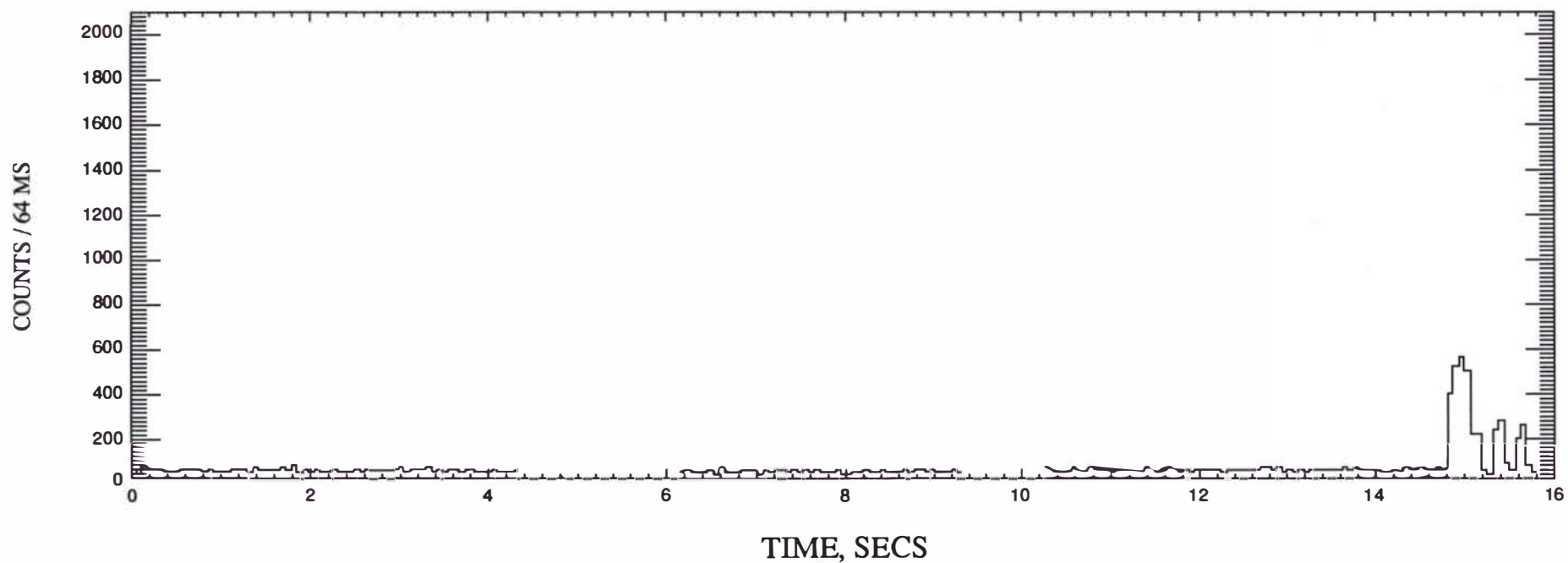
Burst Counter 6 at UT= 8.808597560459 h=31710.951 s 08:48:30.951



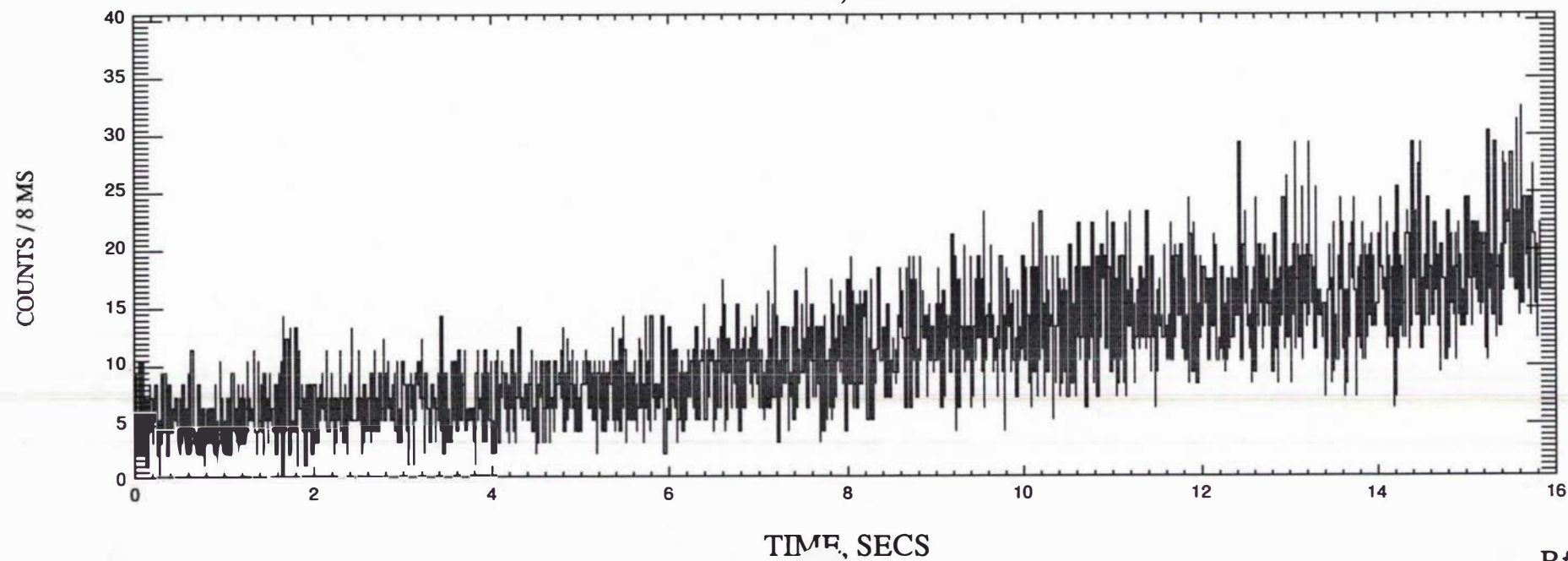
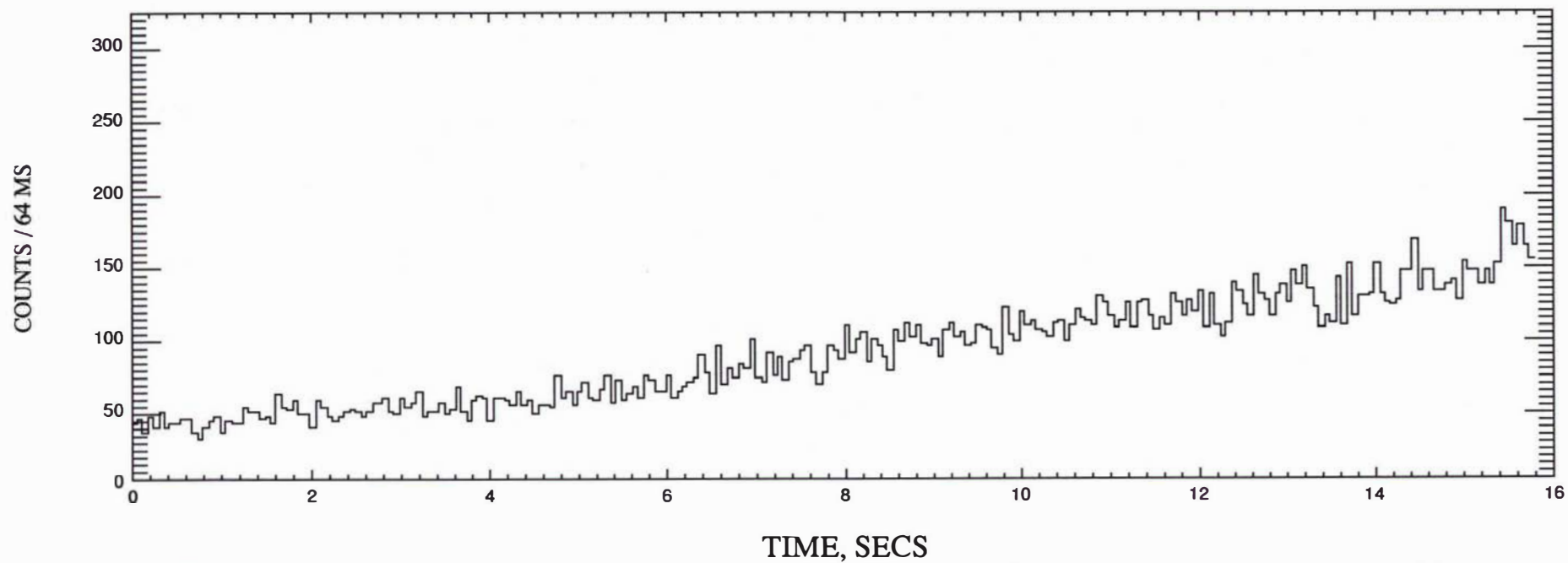
Burst Counter 7 at UT=12.008726738824 h=43231.416 s 12:00:31.416

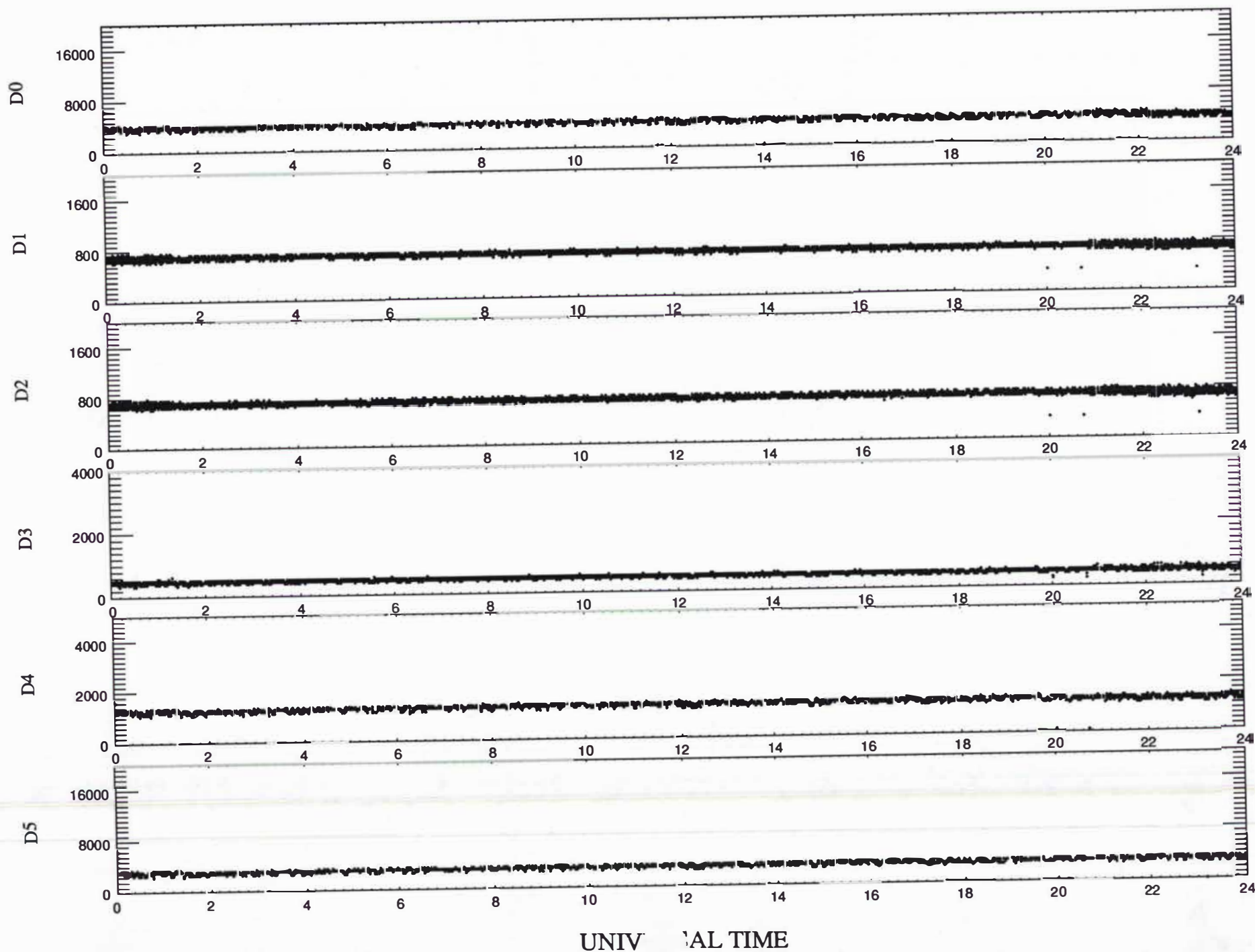


Burst Counter 8 at UT=20.342004962497 h=73231.218 s 20:20:31.218

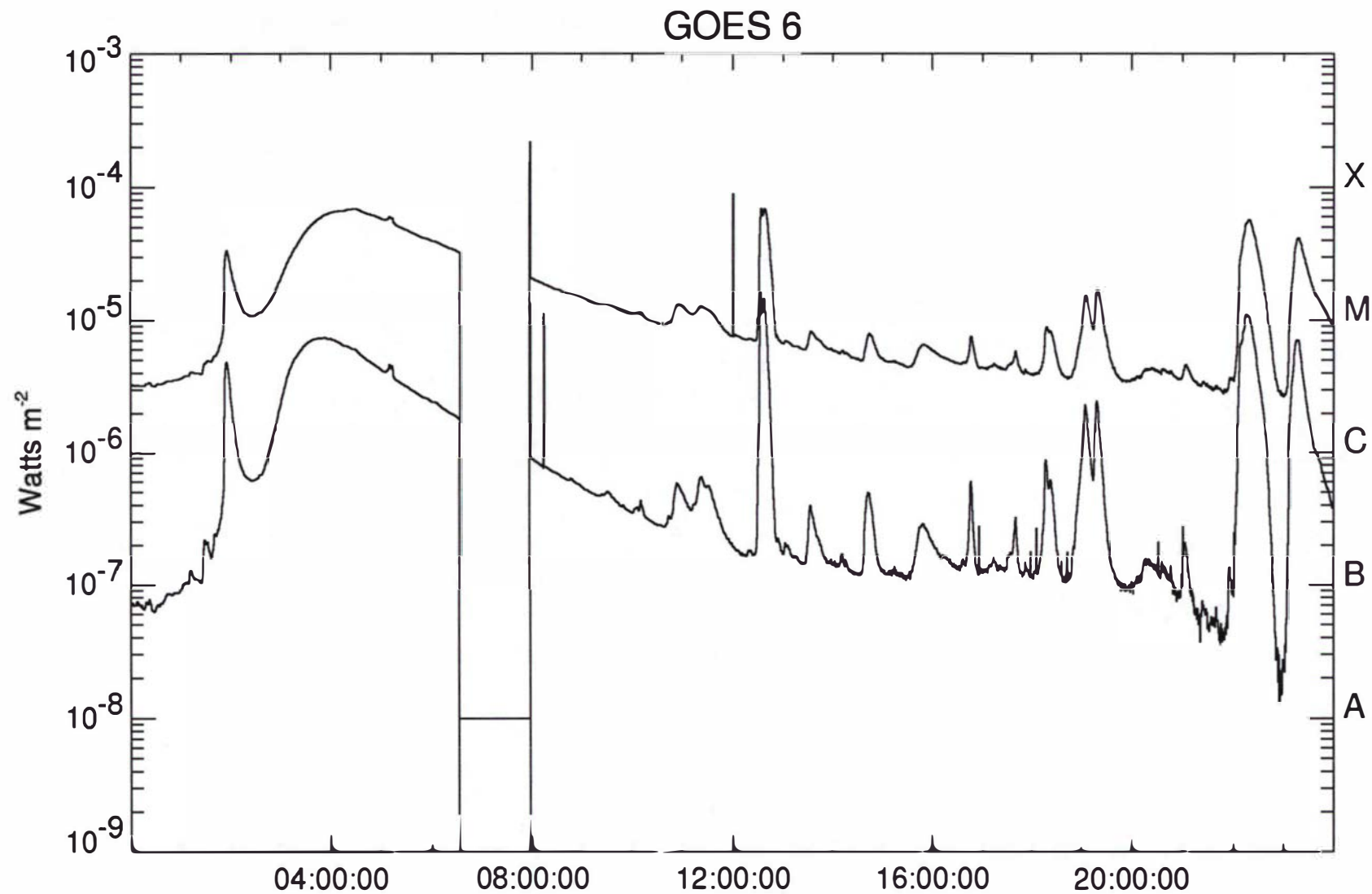


Burst Counter 9 at UT=22.918025232951 h=82504.891 s 22:55:04.891





DATE	U.T.	Nr UGB	Event Nature
1990-12-24	15:34:32.617	216-a	Solar Flare
1991-01-06	16:39:57.526	218-a	GRB
1991-01-17	00:57:12.234	223-a	GRB ?
1991-01-18	14:03:26.738	224-a	Solar Flare
1991-01-21	00:18:12.304	227-a	Solar Flare
1991-01-22	15:13:50.333	228-a	GRB
1991-01-25	06:29:38.745	231-a	Solar Flare
1991-02-01	11:44:54.779	233-a	Solar Flare
1991-02-01	18:46:17.191	233-b	Solar Particles
1991-02-02	20:57:39.170	234-a	GRB ?
1991-02-04	08:58:45.821	235-a	GRB
1991-02-04	10:48:08.317	235-b	Solar Flare
1991-02-04	14:50:33.480	235-c	Solar Flare
1991-02-06	06:10:53.398	236-a	Solar Flare
1991-02-06	06:45:52.285	236-b	Solar Flare
1991-02-06	08:45:28.852	236-c	GRB
1991-02-10	17:35:33.692	237-a	Solar Flare
1991-02-11	03:25:22.425	237-b	GRB
1991-02-19	09:23:07.760	239-a	Solar Flare
1991-03-12	12:43:02.596	252-a	Solar Flare
1991-03-13	02:59:14.539	254-a	Solar Flare
1991-03-13	08:01:48.347	254-b	Solar Flare
1991-03-14	13:31:08.601	255-a	Solar Flare
1991-03-14	18:11:50.507	255-b	Solar Flare
1991-03-14	22:56:15.309	255-c	GRB
1991-03-22	20:07:59.817	256-a	Solar Flare
1991-03-22	22:42:51.228	256-b	Solar Flare
1991-03-23	01:51:17.475	256-c	Solar Flare
1991-03-23	14:34:35.610	257-a	Solar Particles
1991-03-23	14:48:54.705	257-b	Solar Particles
1991-03-23	15:01:31.774	257-c	Solar Particles
1991-03-29	06:44:19.108	260-a	Solar Flare
1991-03-31	13:45:30.490	261-a	Solar Flare
1991-03-31	19:08:38.993	261-b	Solar Flare
1991-04-02	14:27:44.130	262-a	GRB



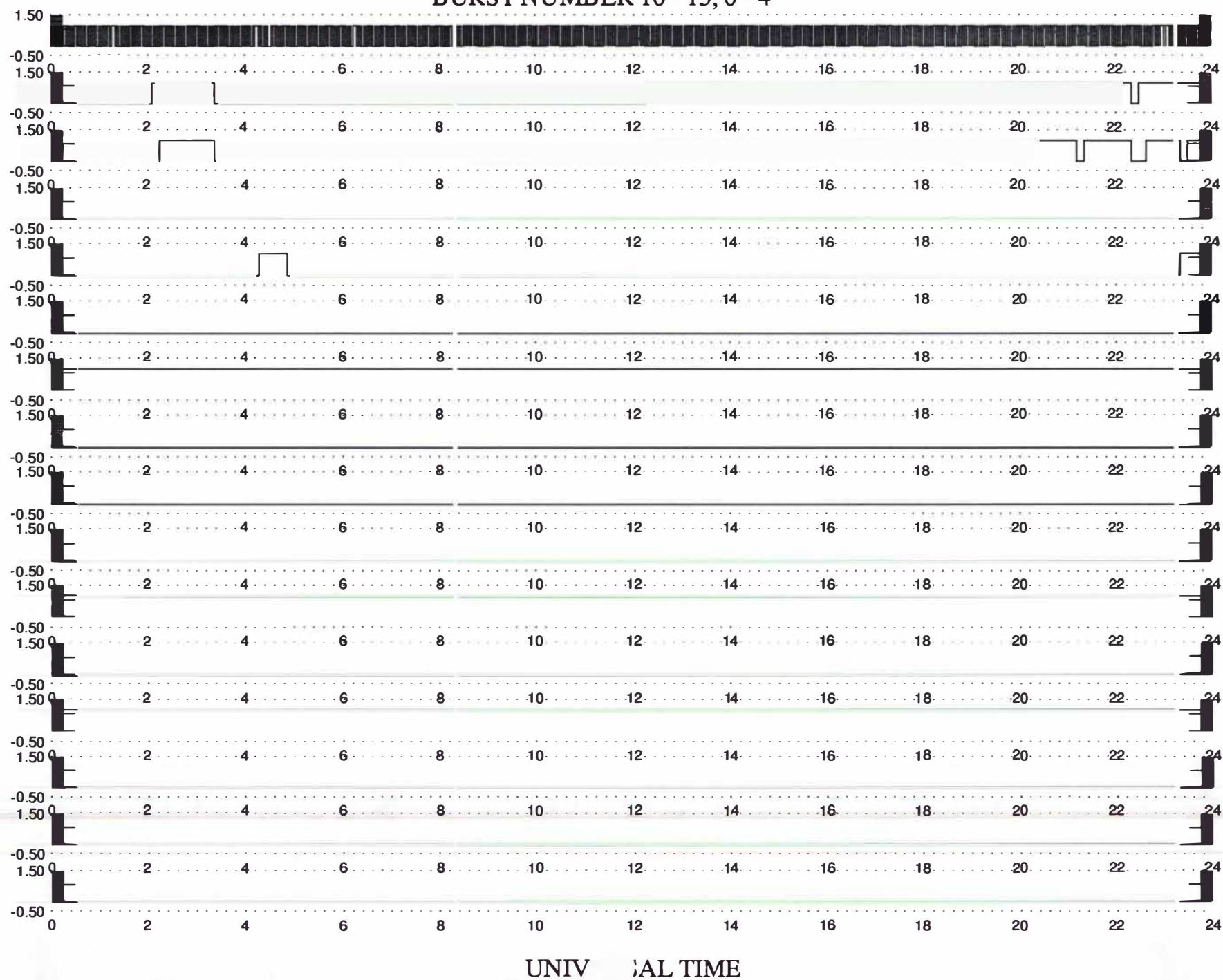
Data Start: 91/03/23, 0000:00

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

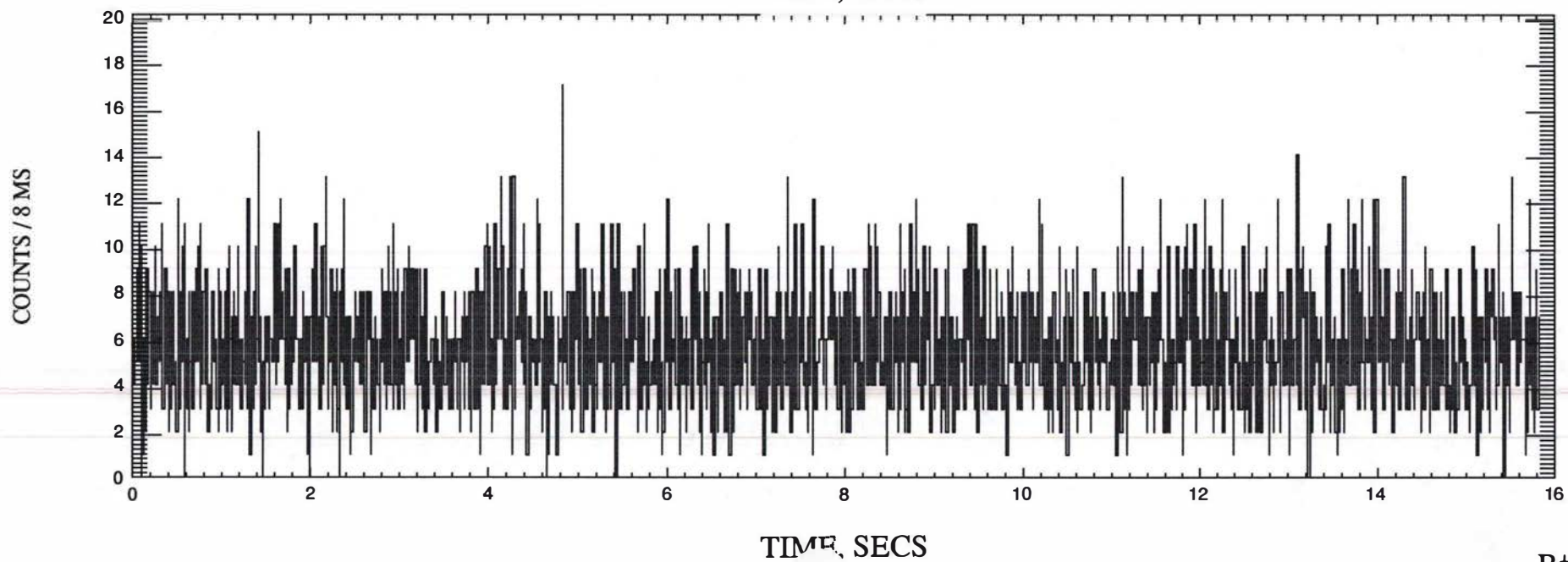
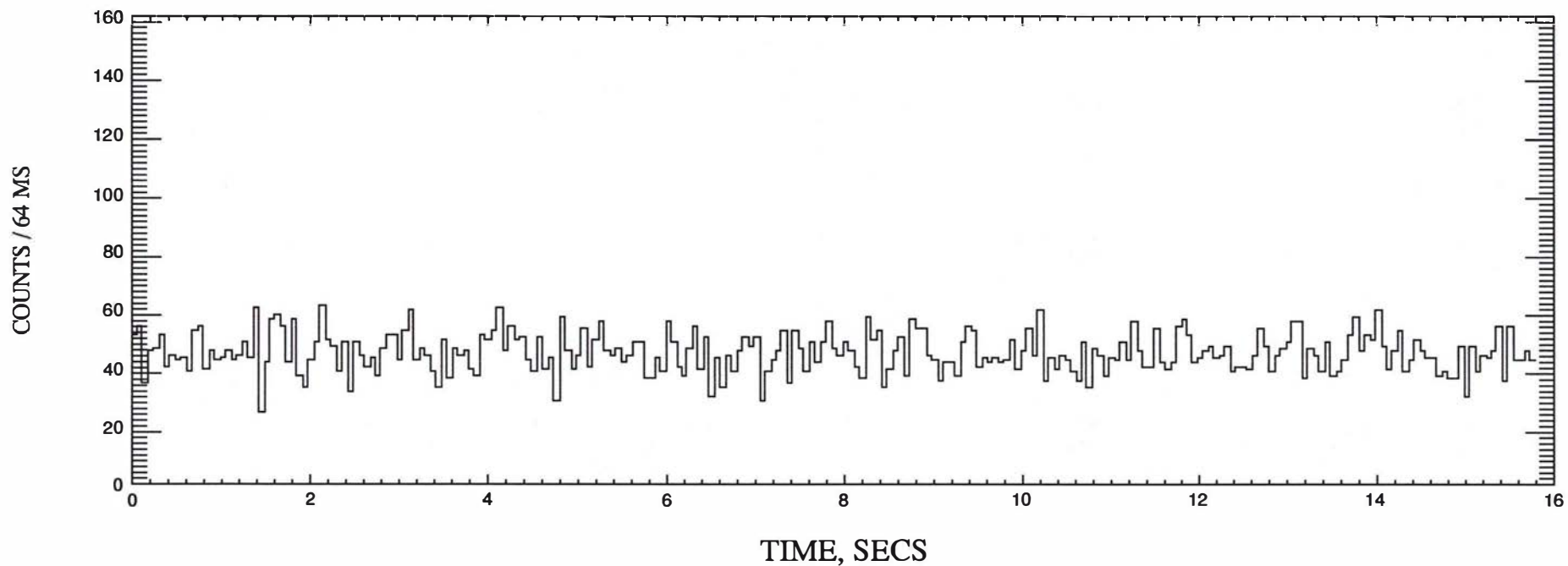
Plot created: 96/11/26, 1903

Background not subtracted
Background not subtracted
Sample average = 10

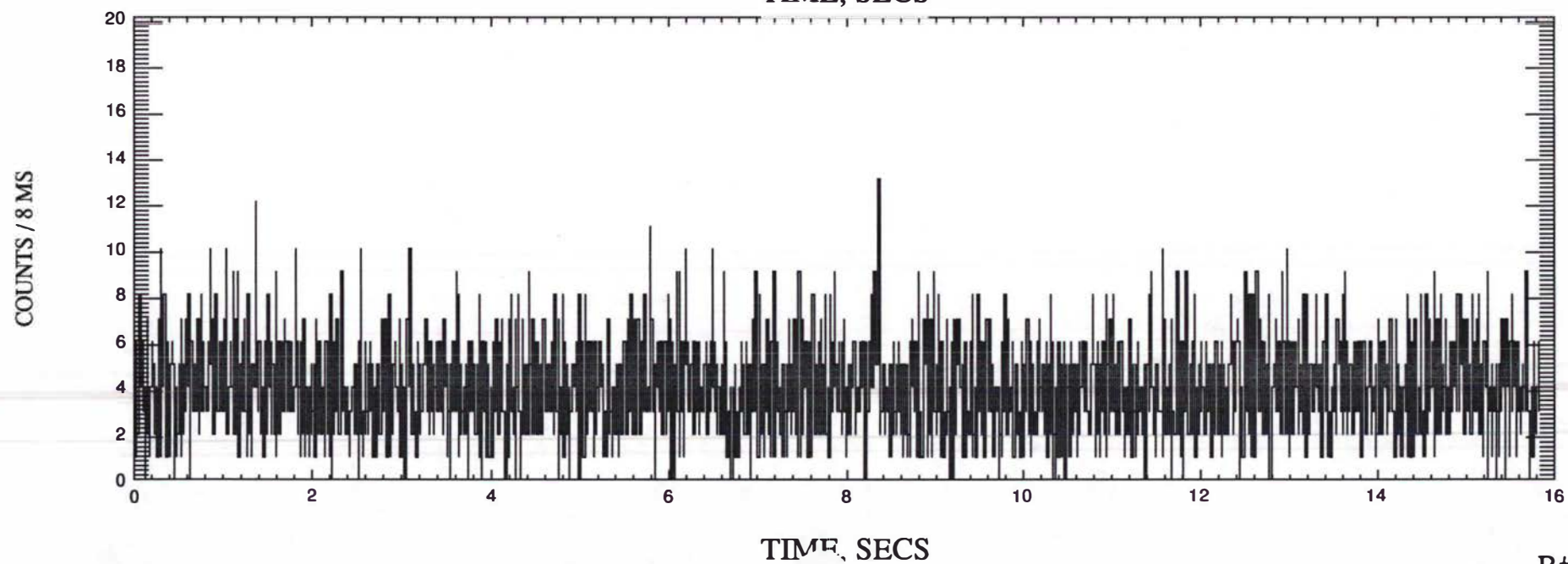
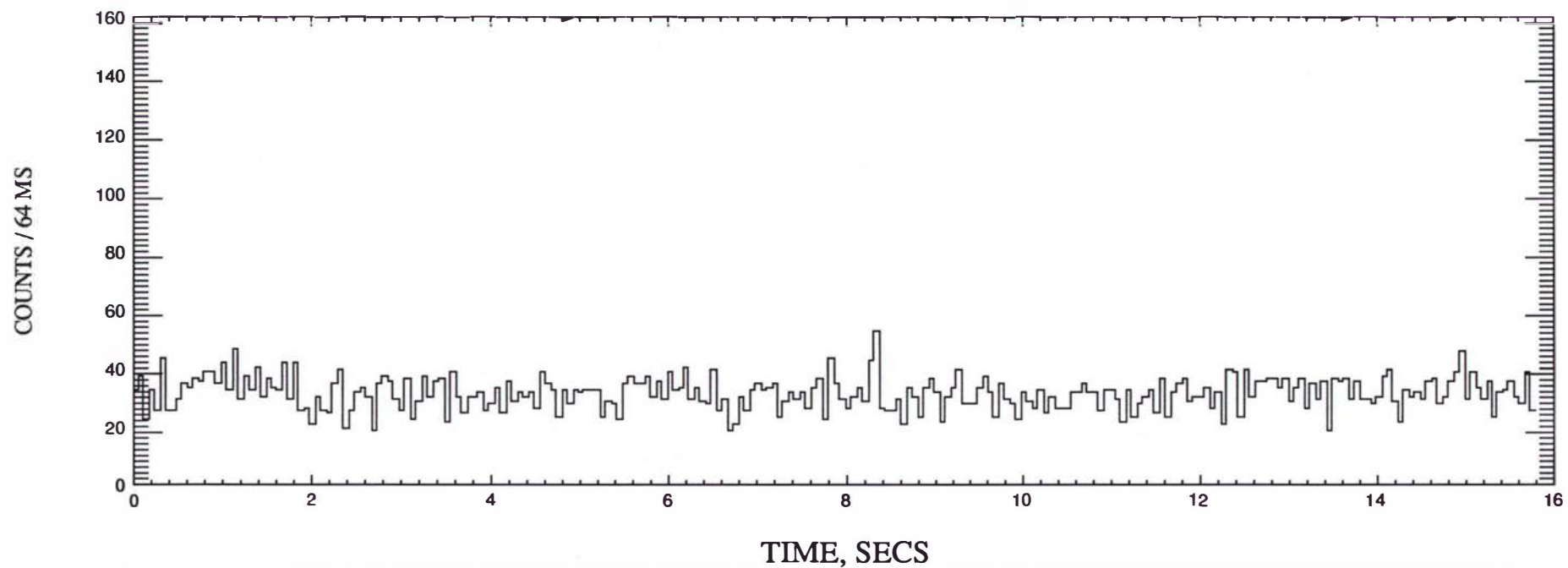
CBU	CCL	DMP	ROM	DMA	OSC	MP.	ICR	SPE	OPM	RSC	CAL	WCH	MEM	BRS	HUS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



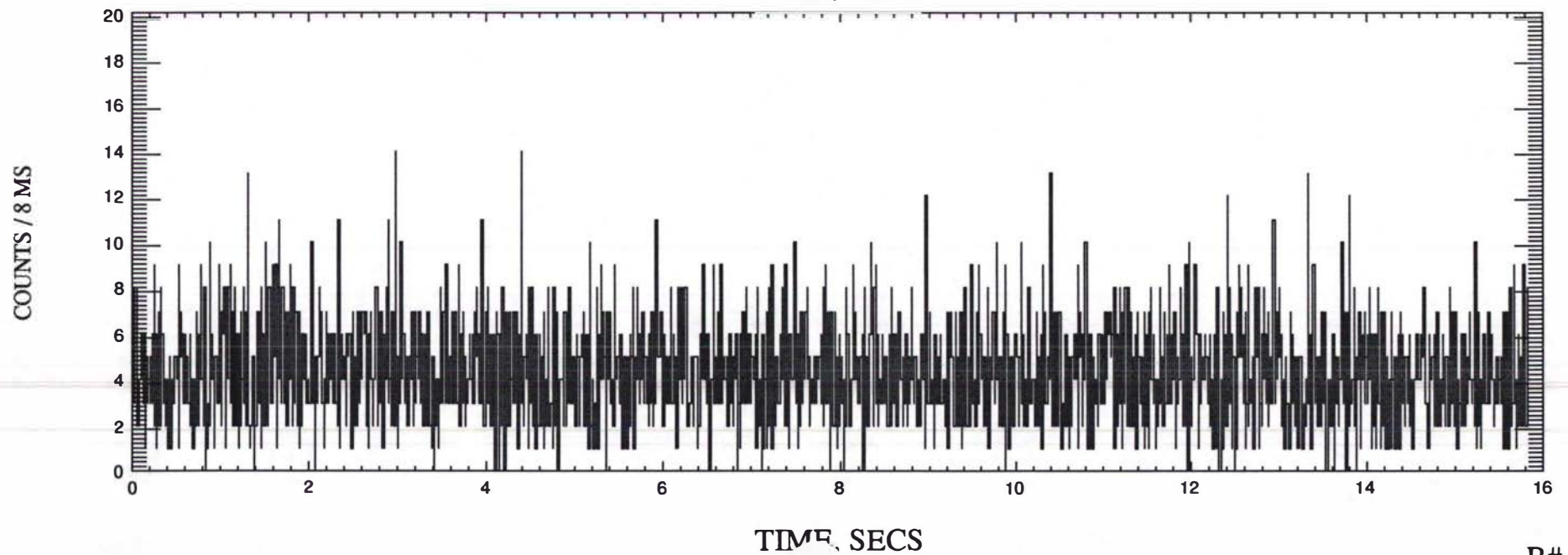
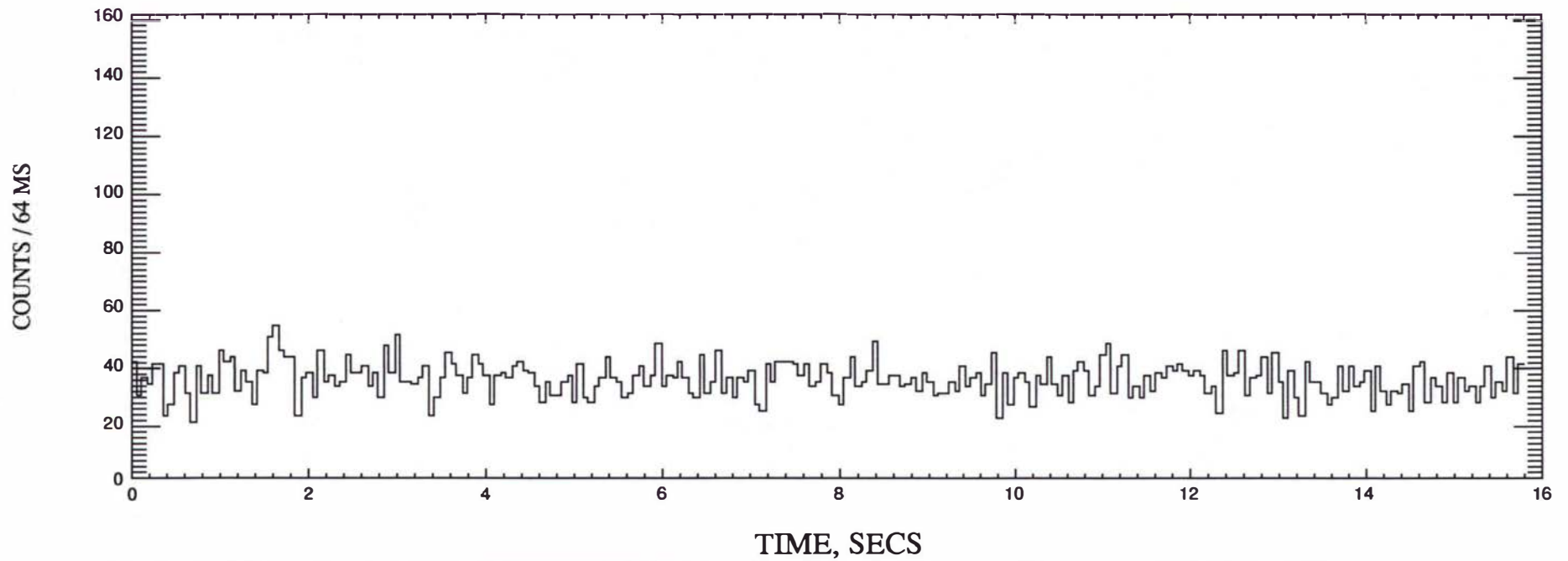
Burst Counter 10 at UT= 2.061551119486 h= 7421.584 s 02:03:41.584



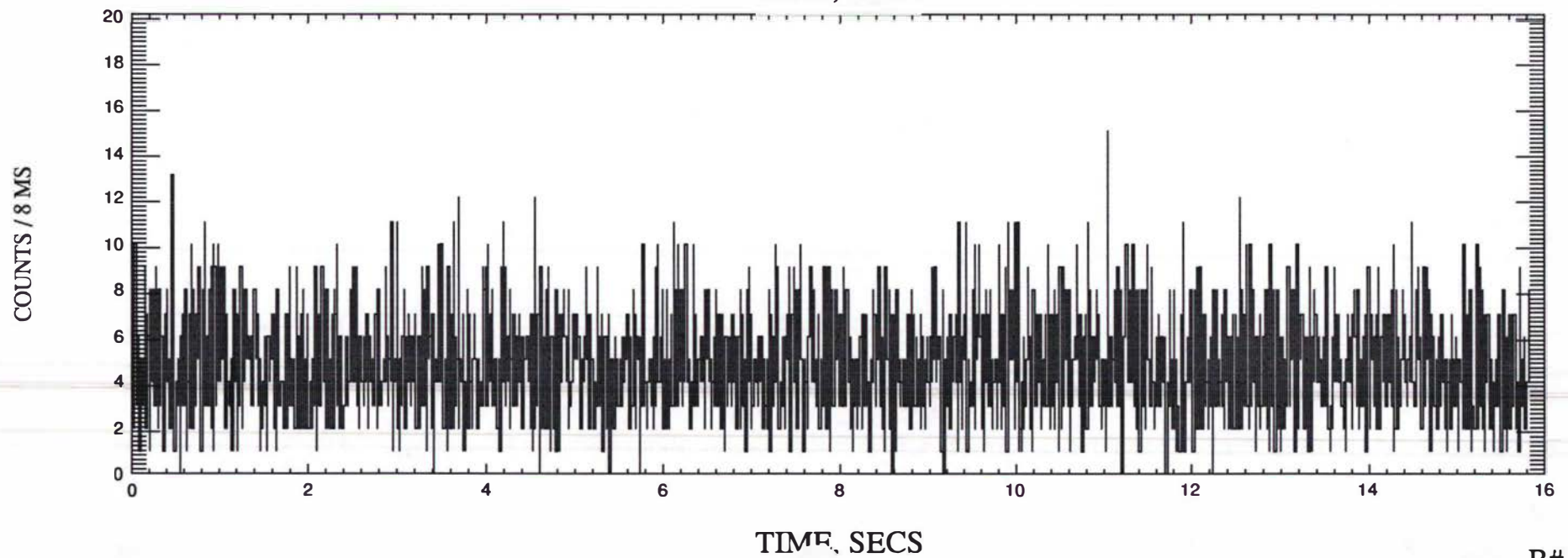
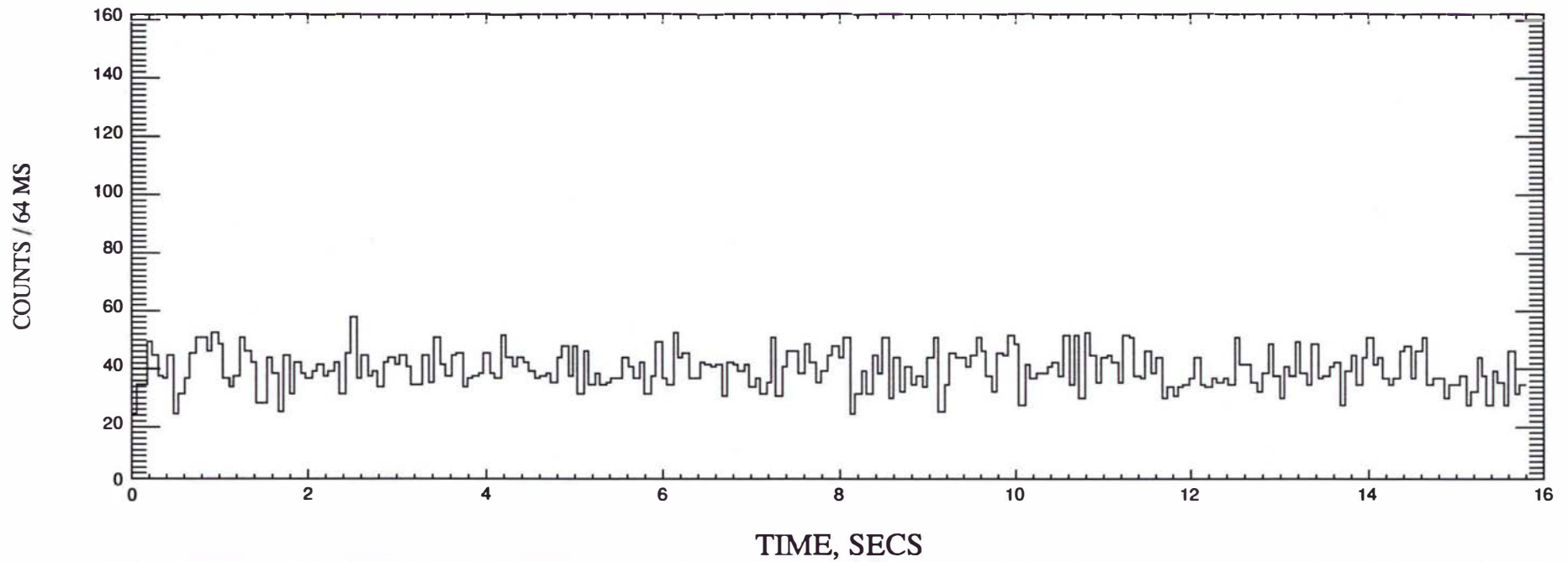
Burst Counter 11 at UT=12.260544306437 h=44137.960 s 12:15:37.960



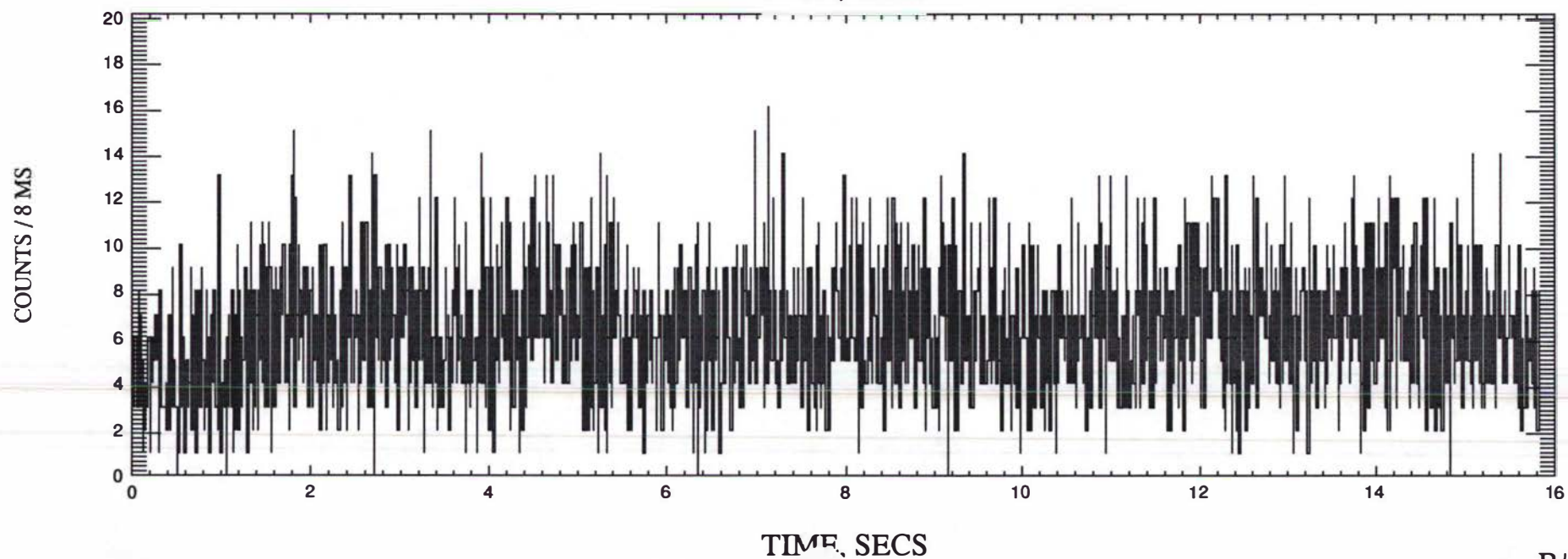
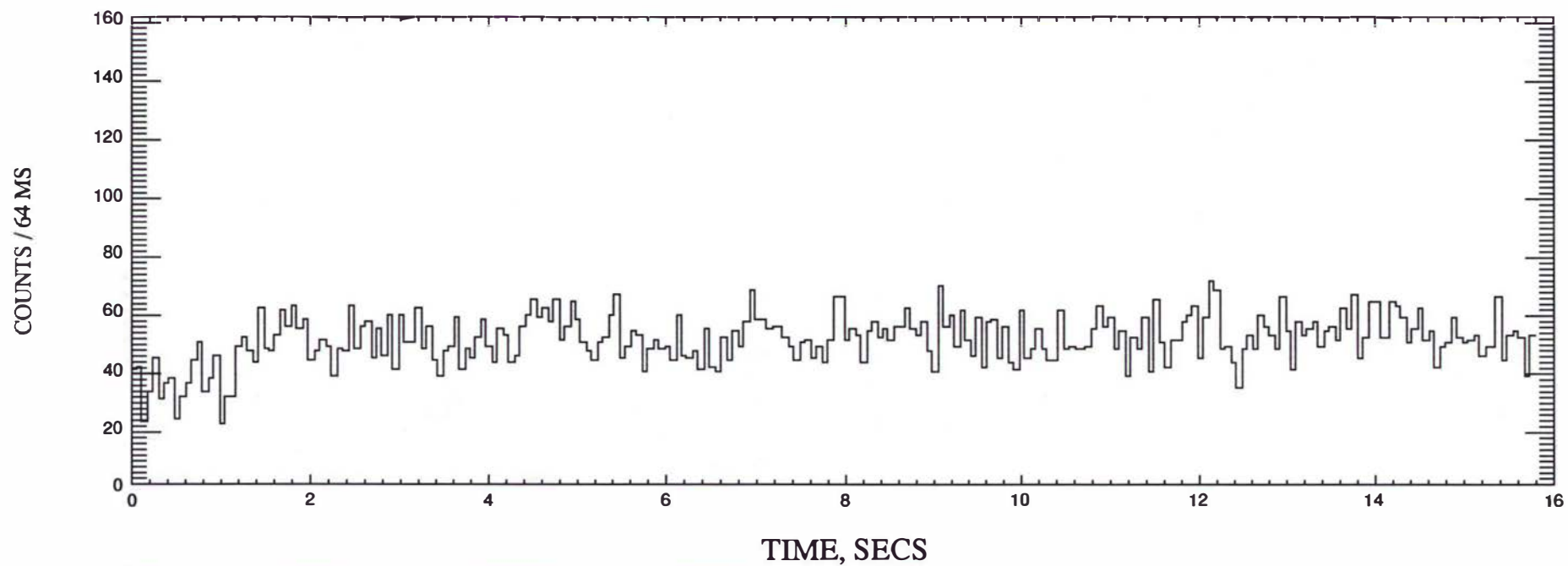
Burst Counter 12 at UT=13.526674181620 h=48696.027 s 13:31:36.027



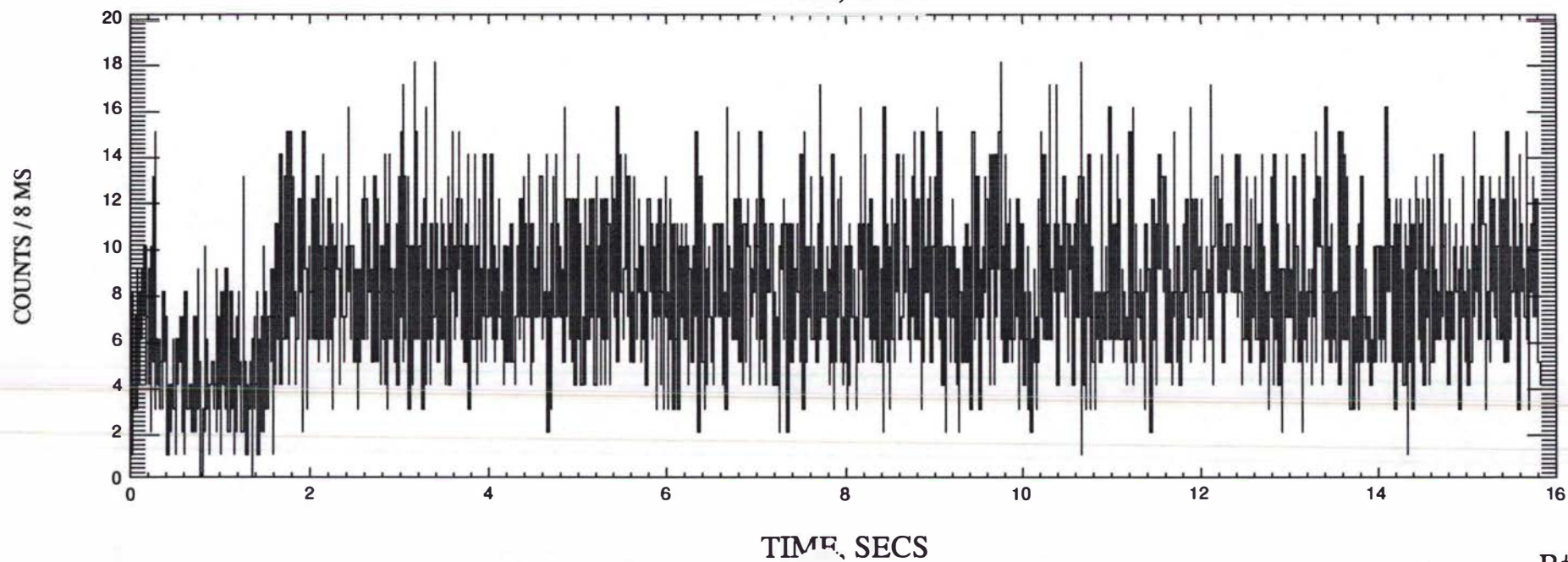
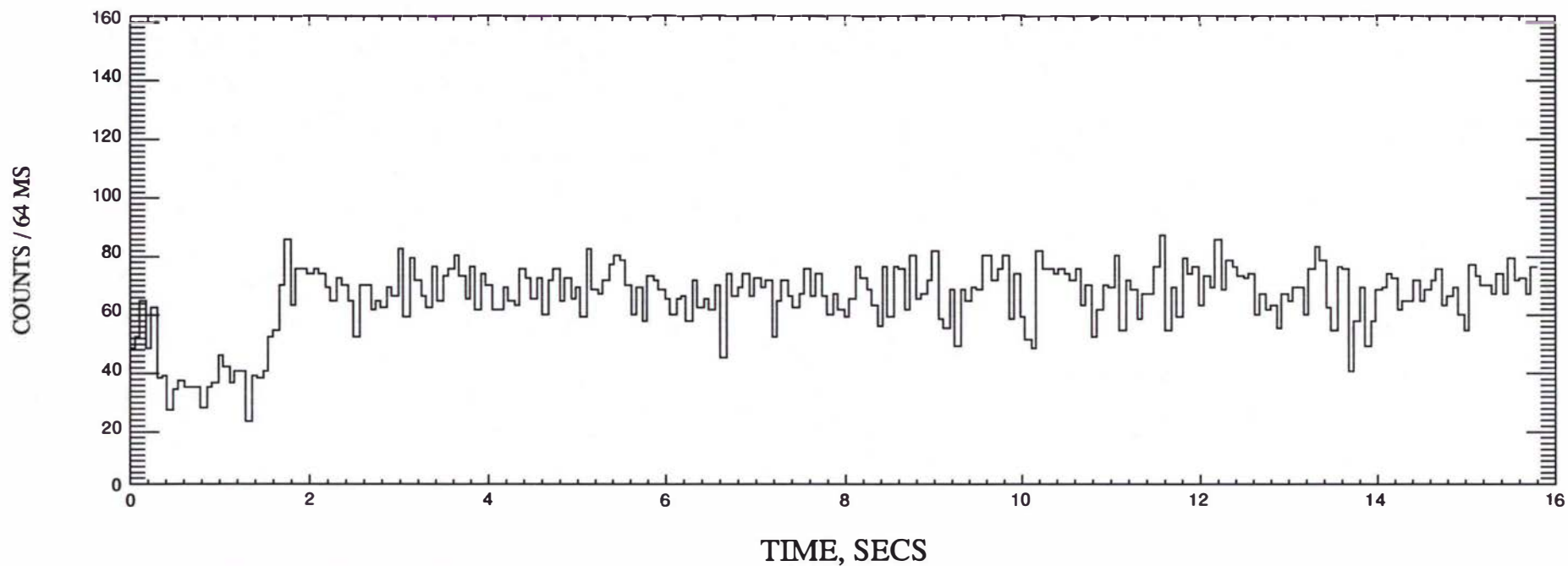
Burst Counter 13 at UT=14.788641730414 h=53239.110 s 14:47:19.110



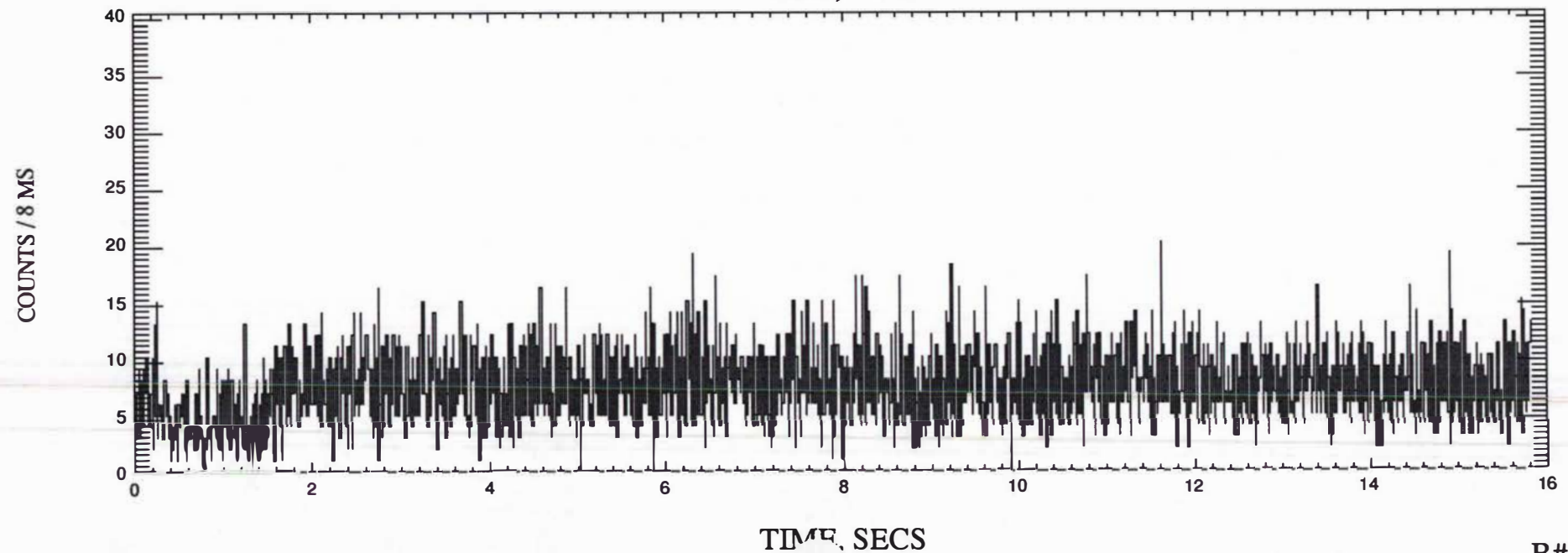
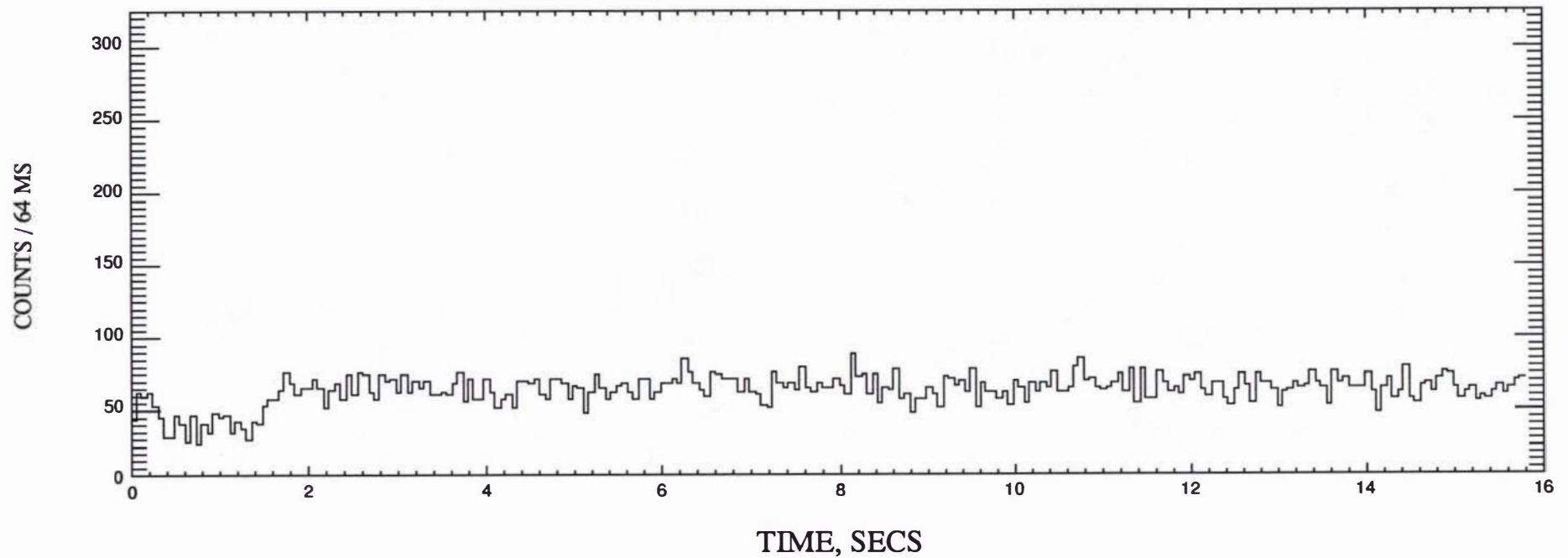
Burst Counter 14 at UT=16.050745997959 h=57782.686 s 16:03:02.686



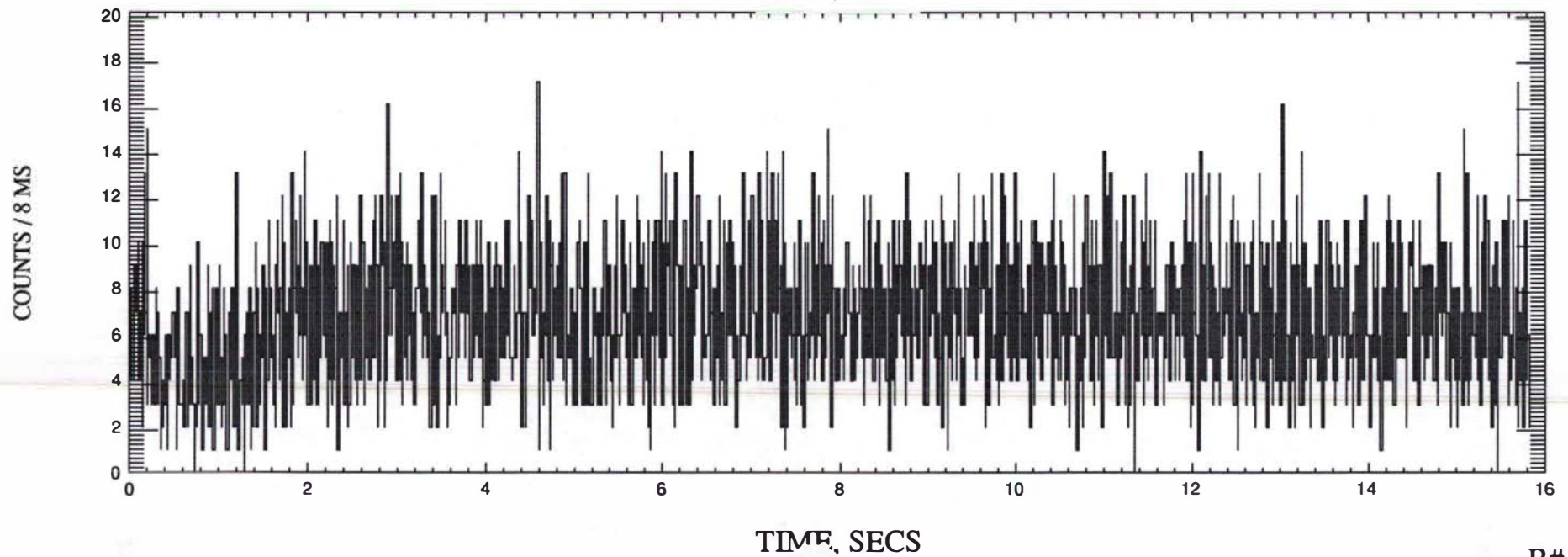
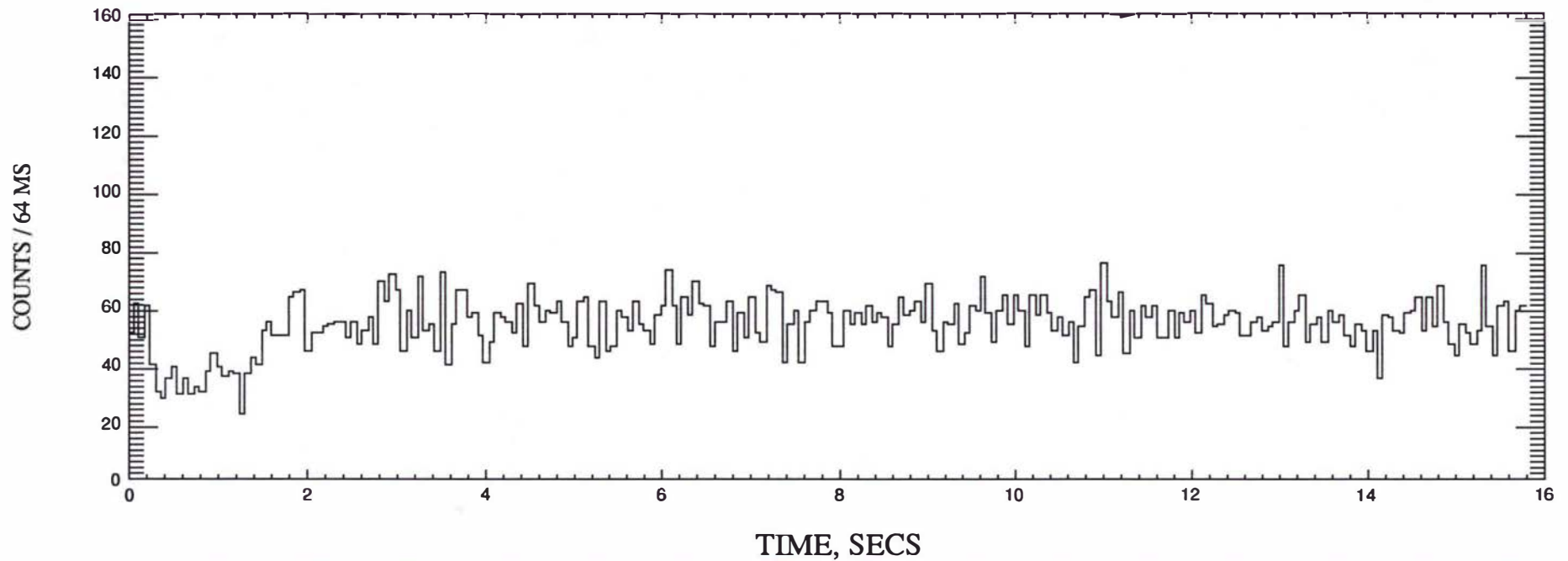
Burst Counter 15 at UT=17.312908859253 h=62326.472 s 17:18:46.472



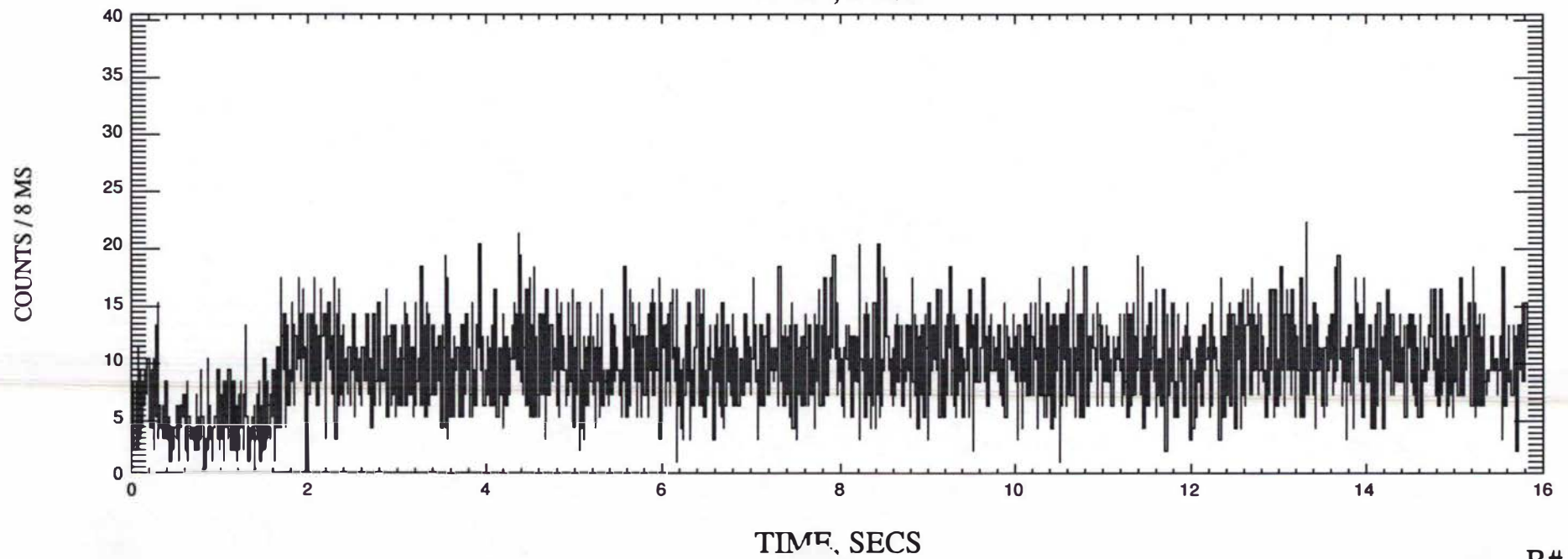
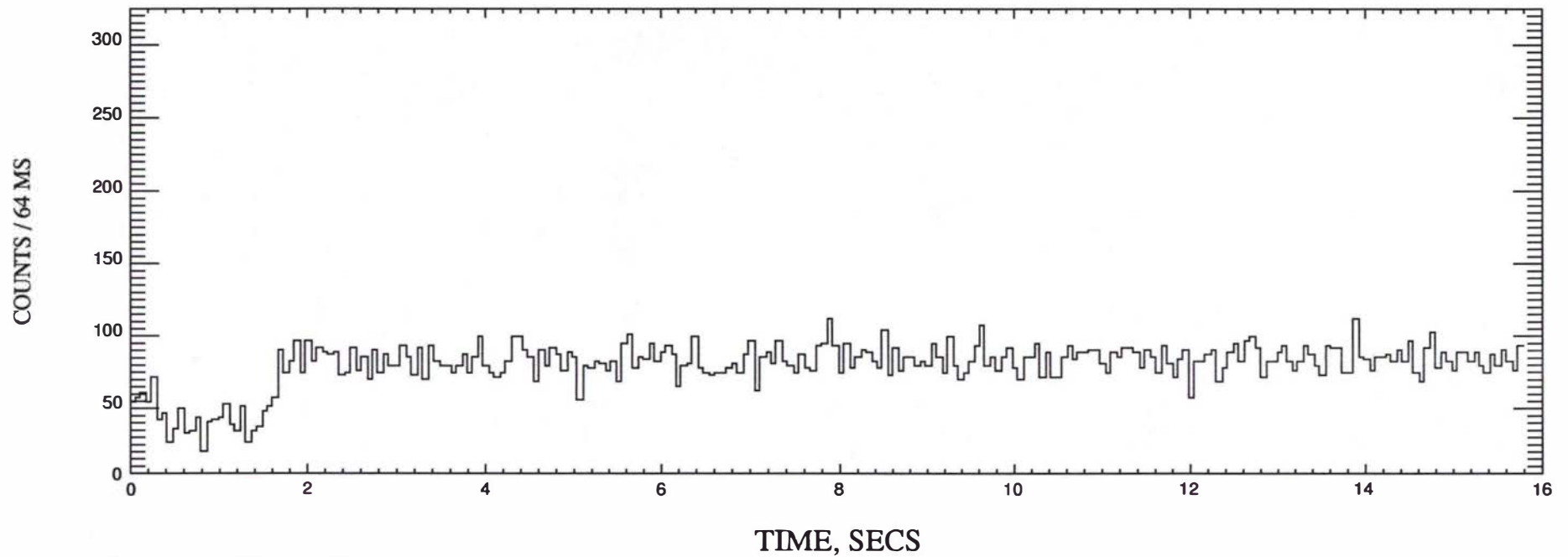
Burst Counter 0 at UT=18.575160696242 h=66870.579 s 18:34:30.579



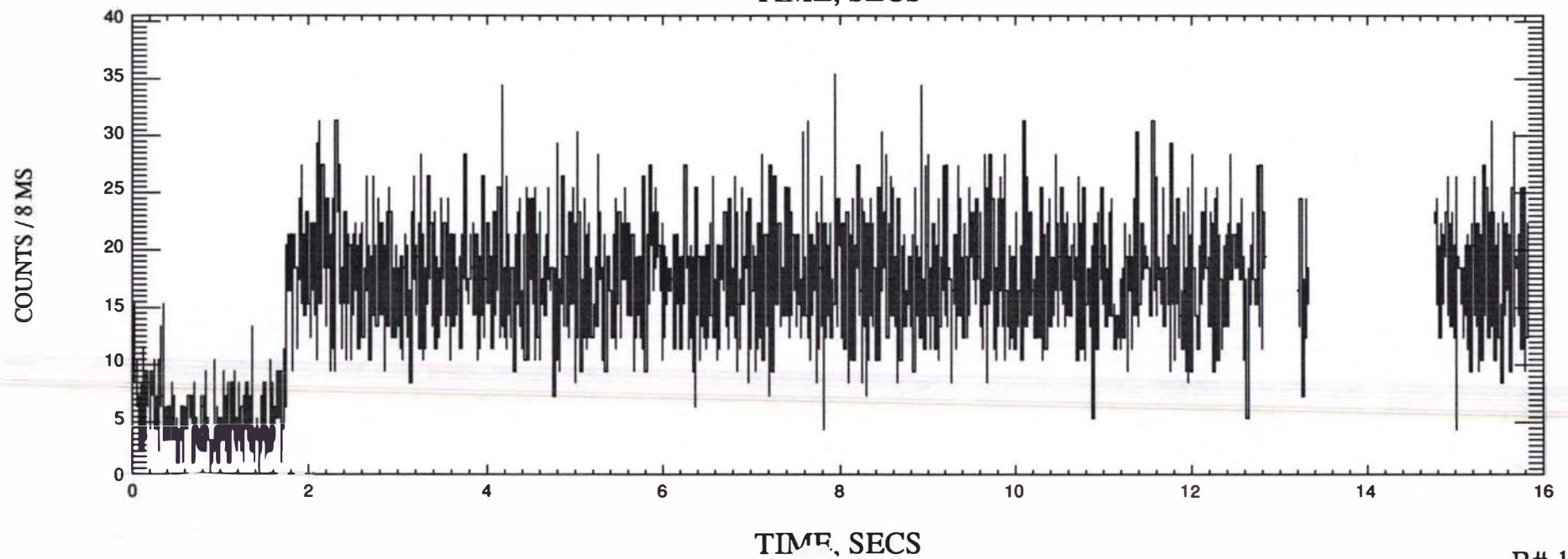
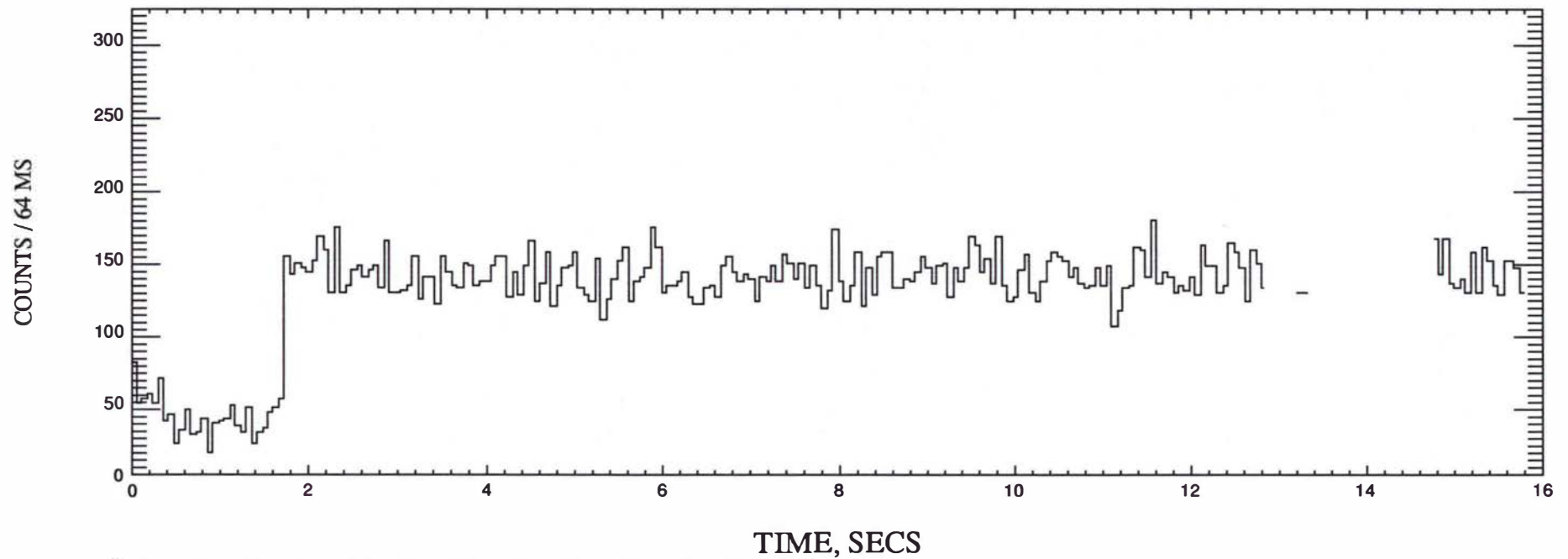
Burst Counter 1 at UT=19.837419043647 h=71414.709 s 19:50:14.709



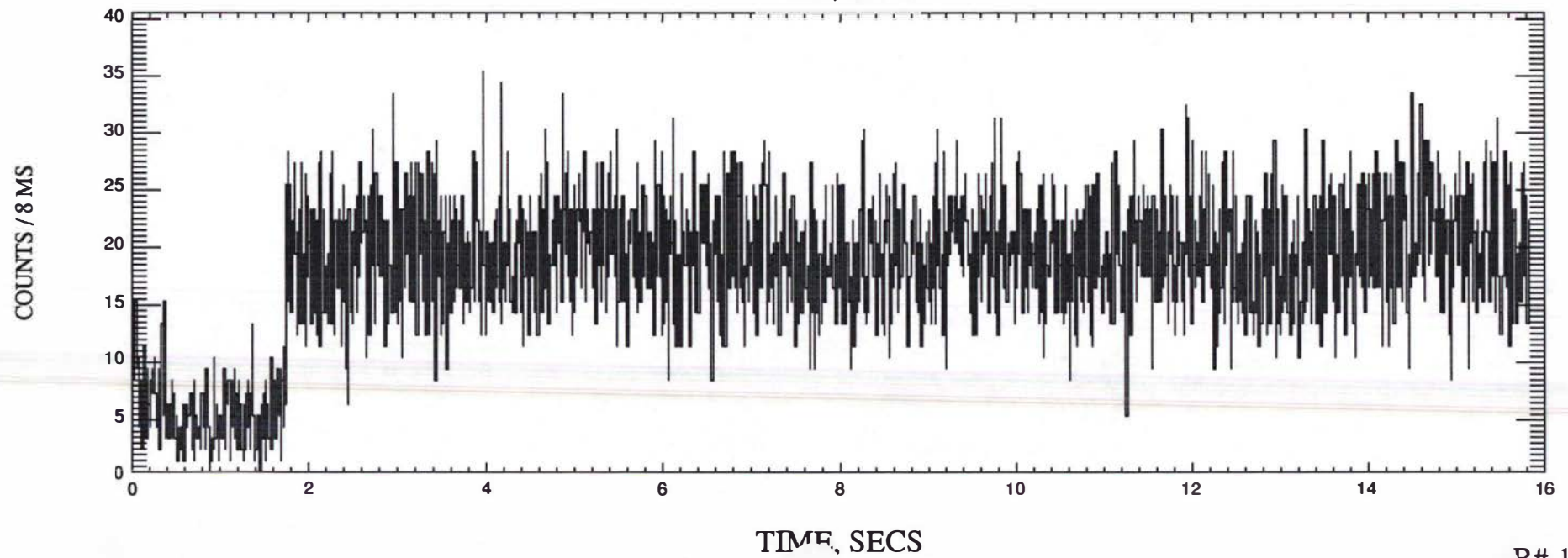
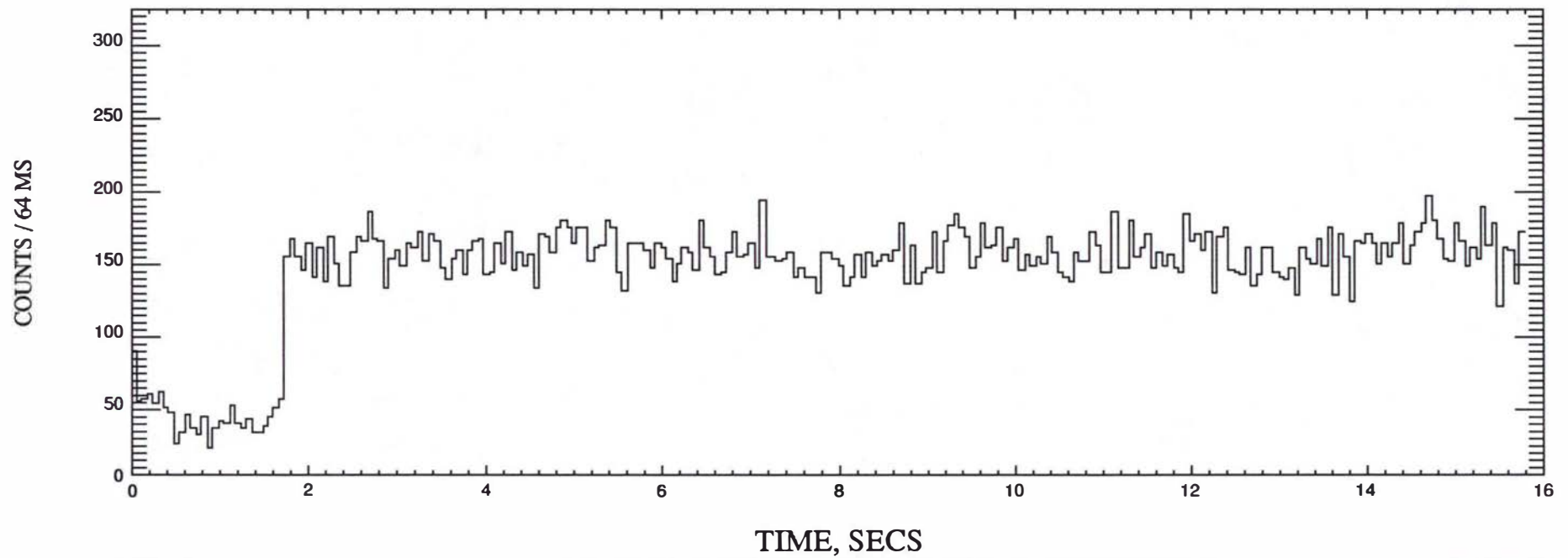
Burst Counter 2 at UT=21.099638328552 h=75958.698 s 21:05:58.698

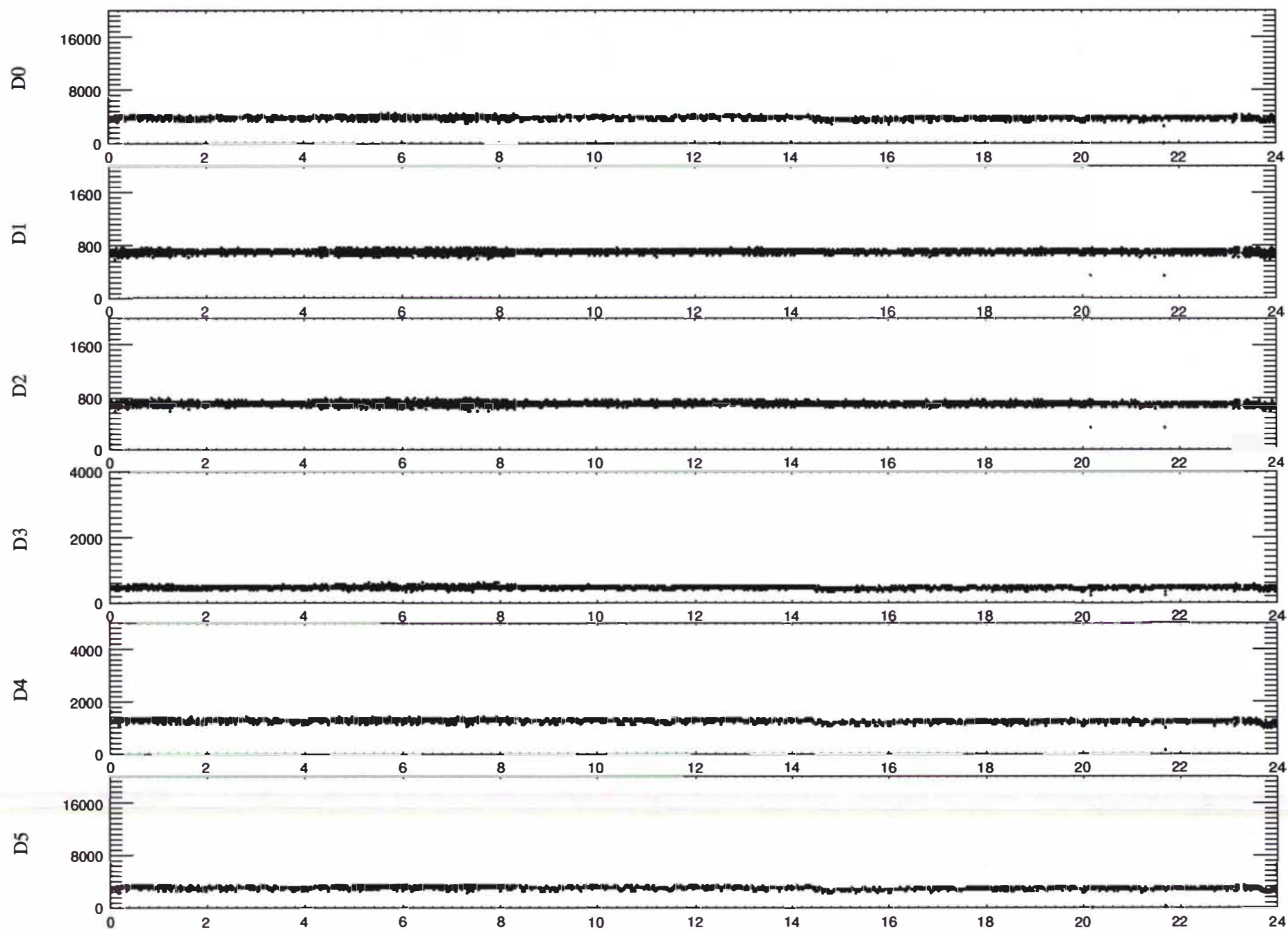


Burst Counter 3 at UT=22.361866294013 h=80502.719 s 22:21:42.719

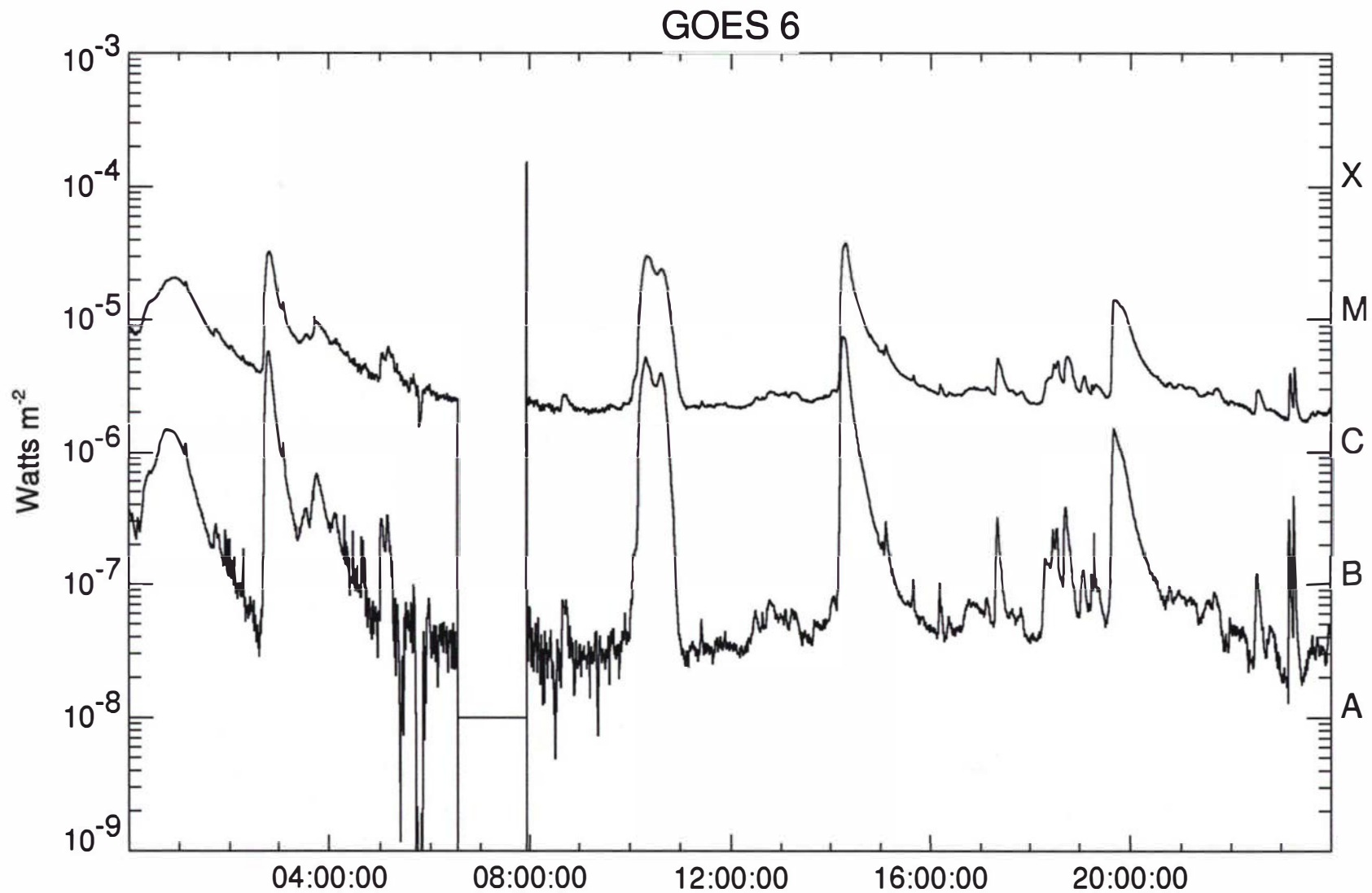


Burst Counter 4 at UT=23.295212855869 h=83862.766 s 23:17:42.766





UNIVEI L TIME



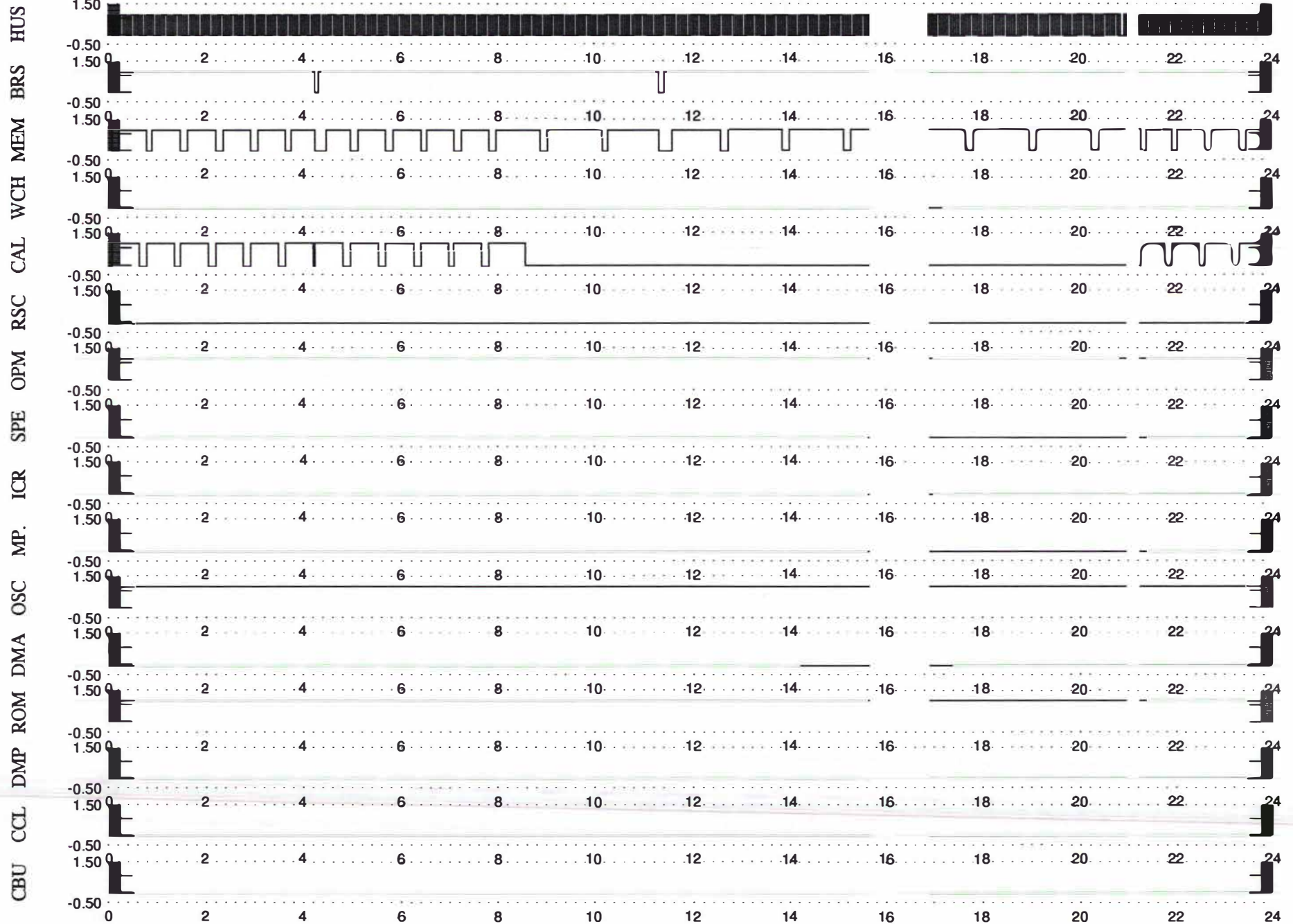
Data Start: 91/03/24, 0000:00

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

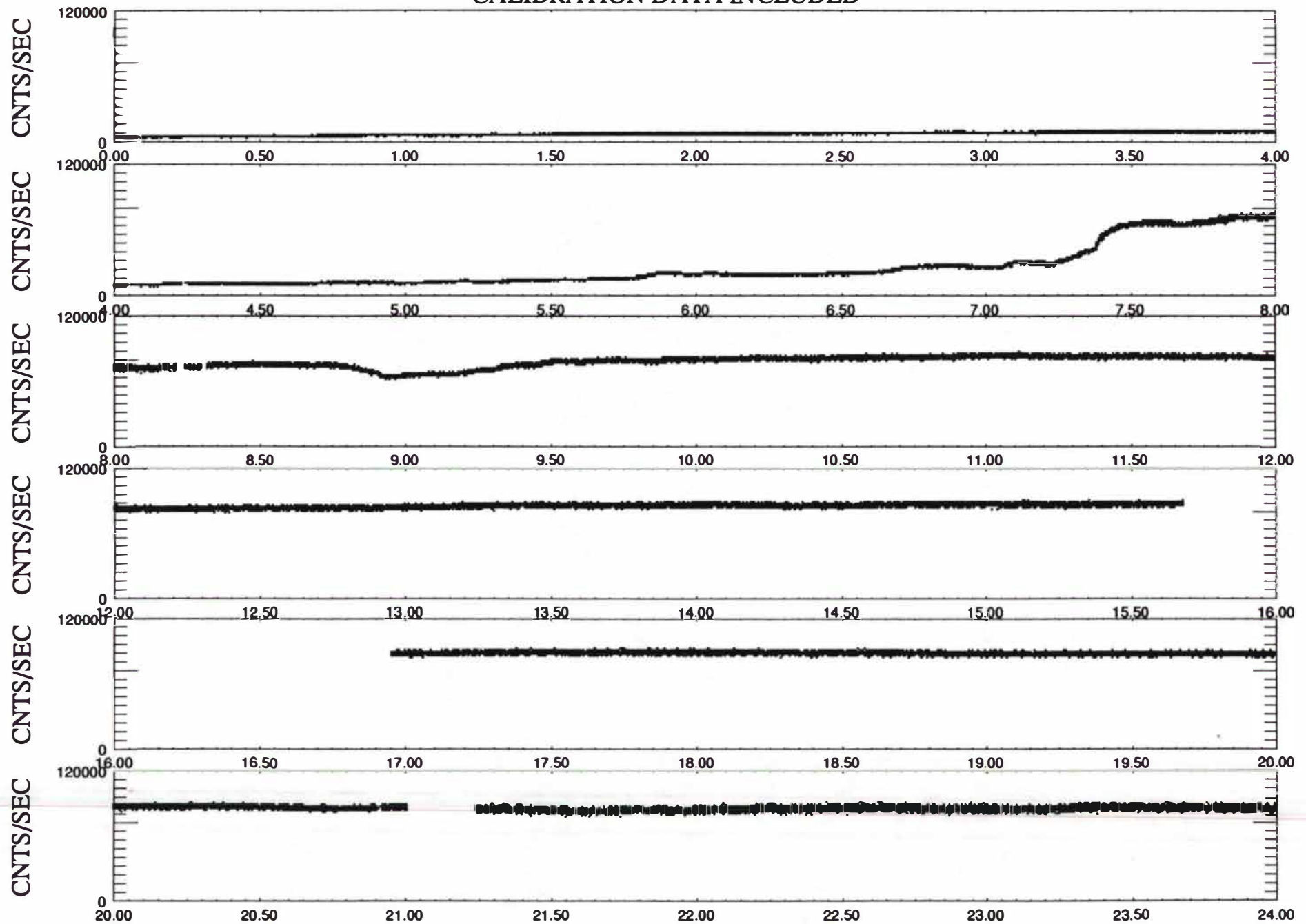
Plot created: 96/11/26, 1906

Background not subtracted
Background not subtracted
Sample average = 10

BURST NUMBER 5 - 15, 0 - 14

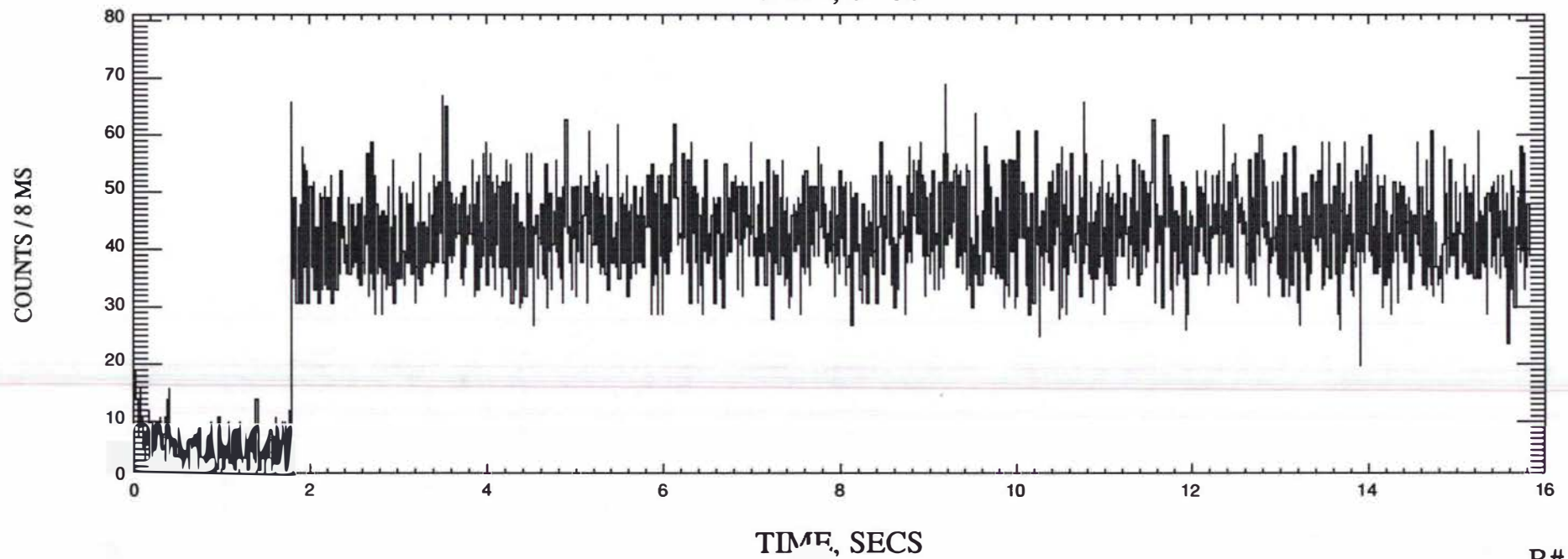
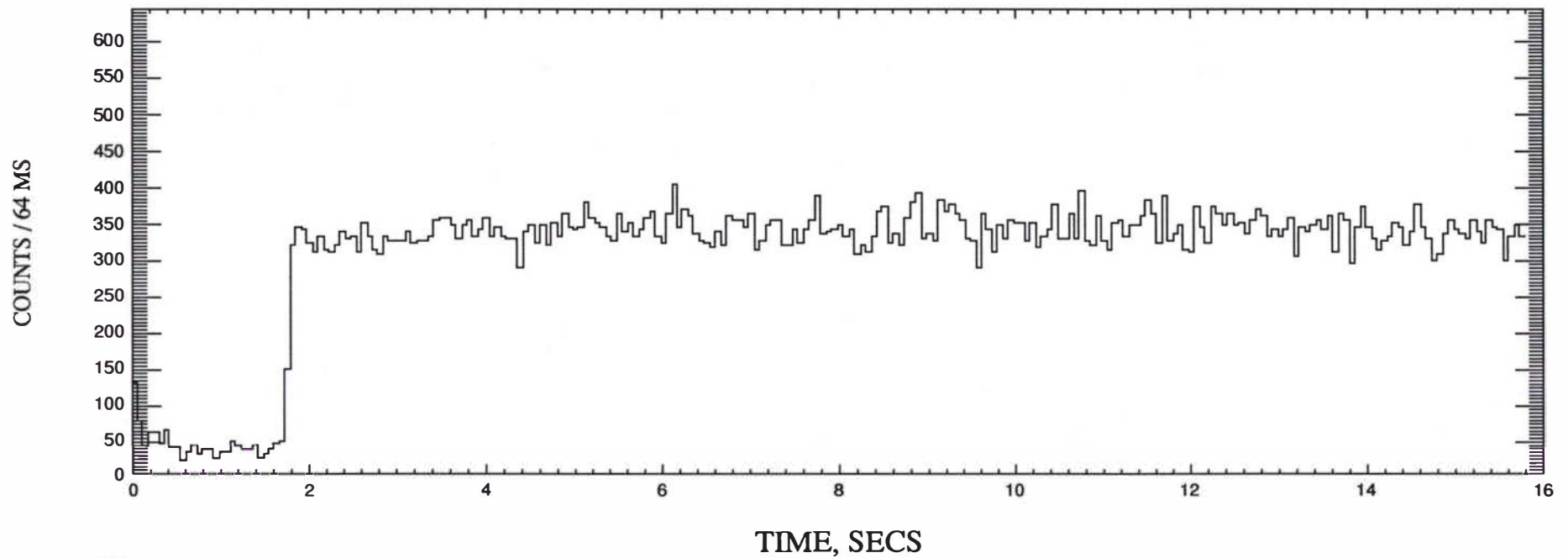


CALIBRATION DATA INCLUDED

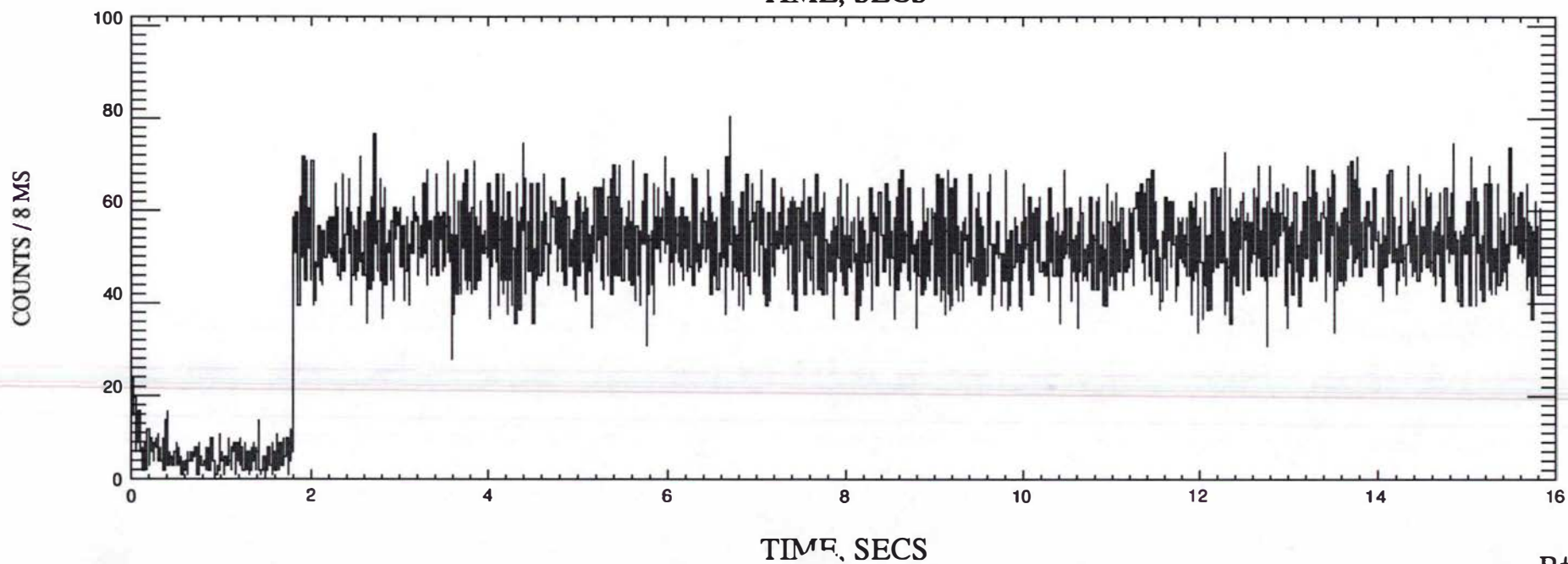
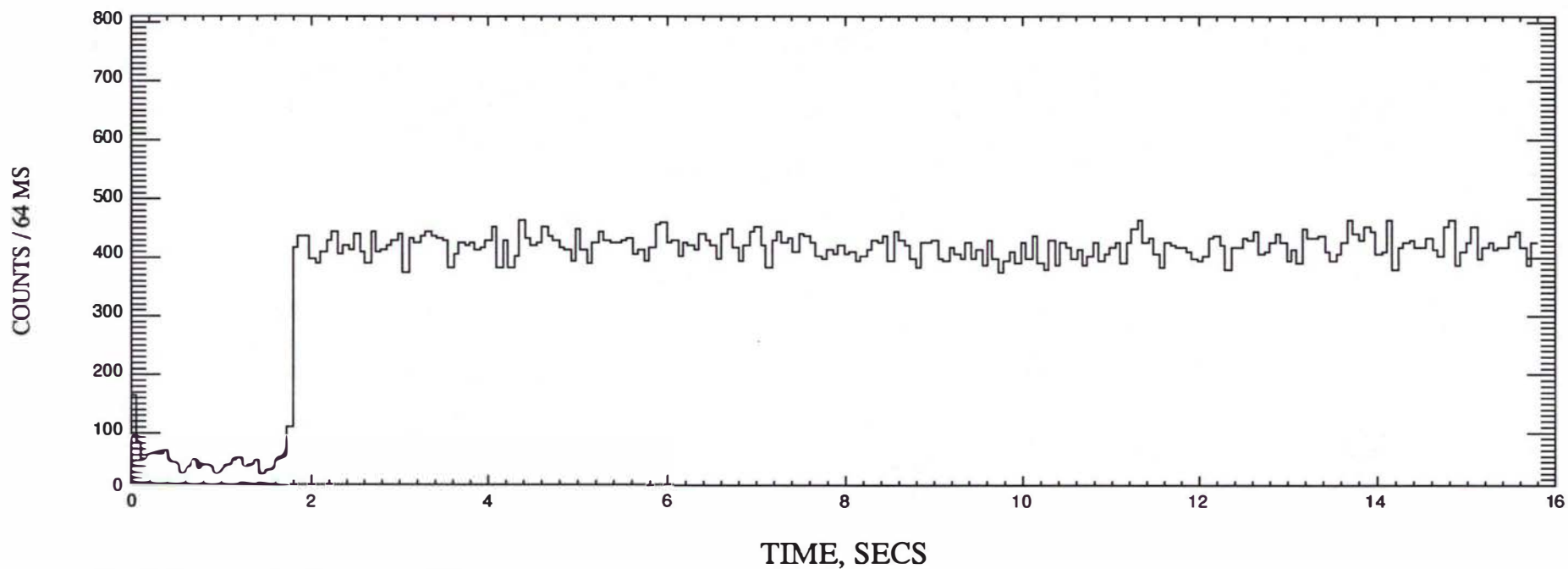


UNIV L TIME

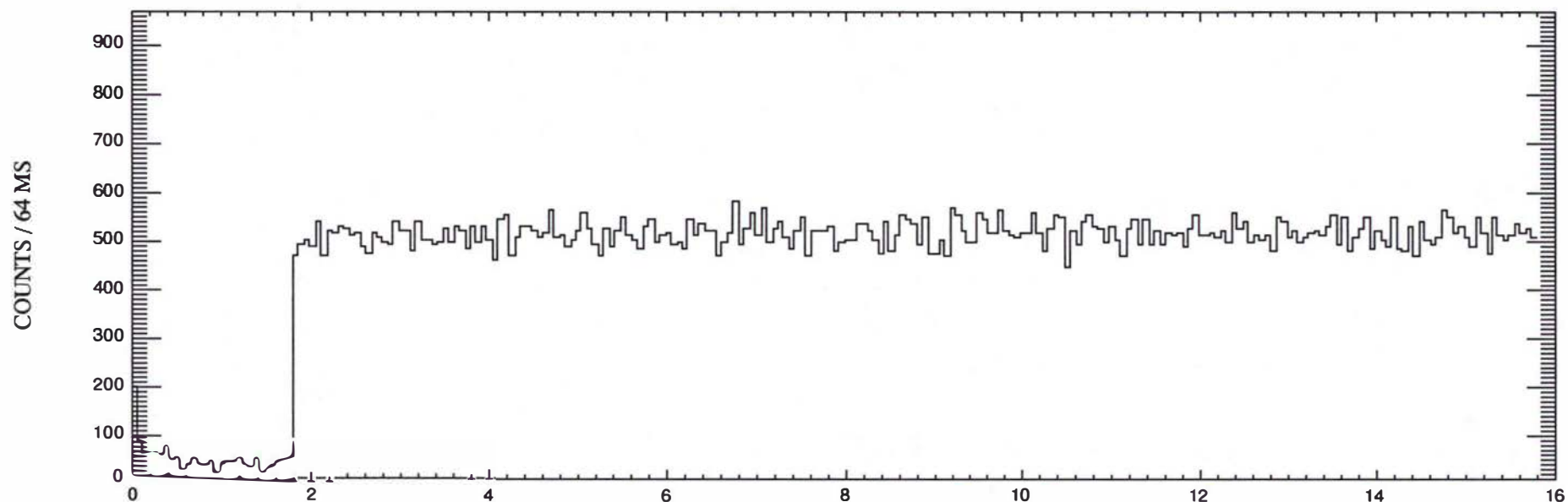
Burst Counter 5 at UT= 0.068549461365 h= 246.778 s 00:04:06.778



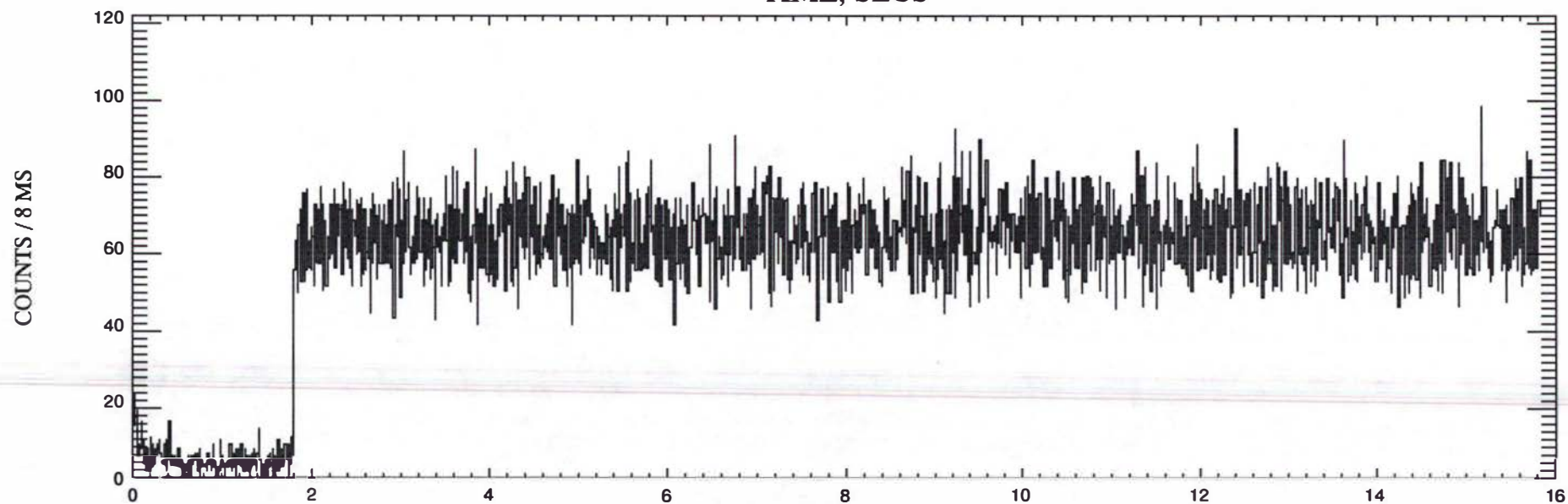
Burst Counter 6 at UT= 0.770782347785 h= 2774.816 s 00:46:14.816



Burst Counter 7 at UT= 1.473015234205 h= 5302.855 s 01:28:22.855

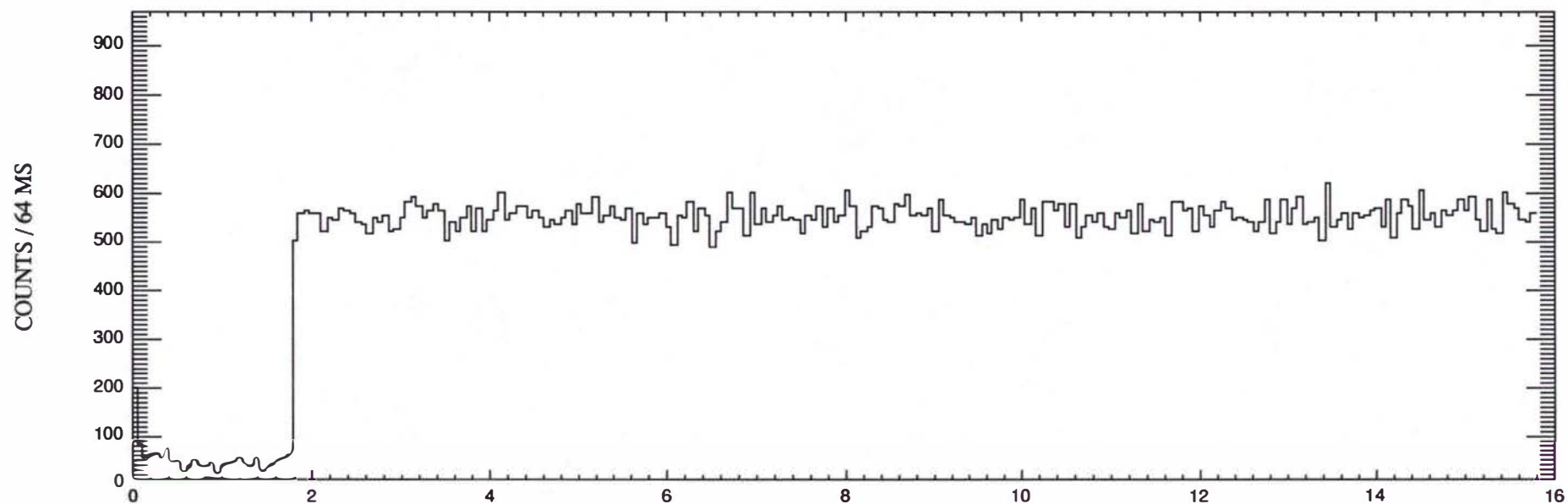


TIME, SECS

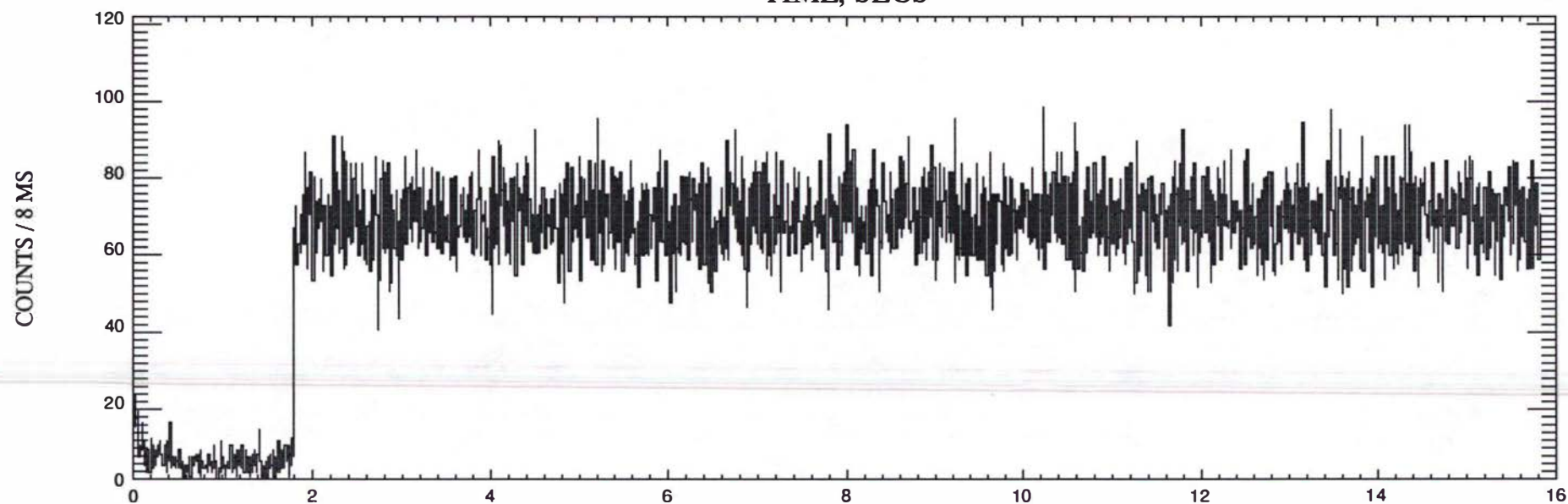


TIME, SECS

Burst Counter 8 at UT= 2.175250290765 h= 7830.901 s 02:10:30.901

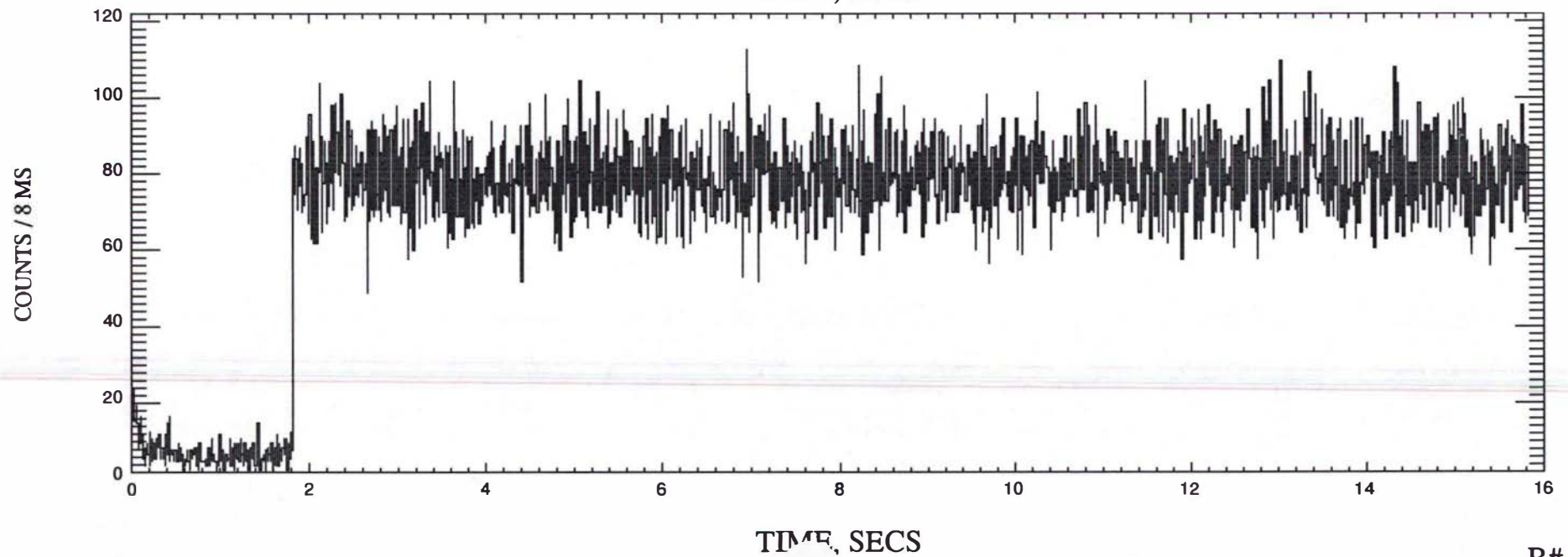
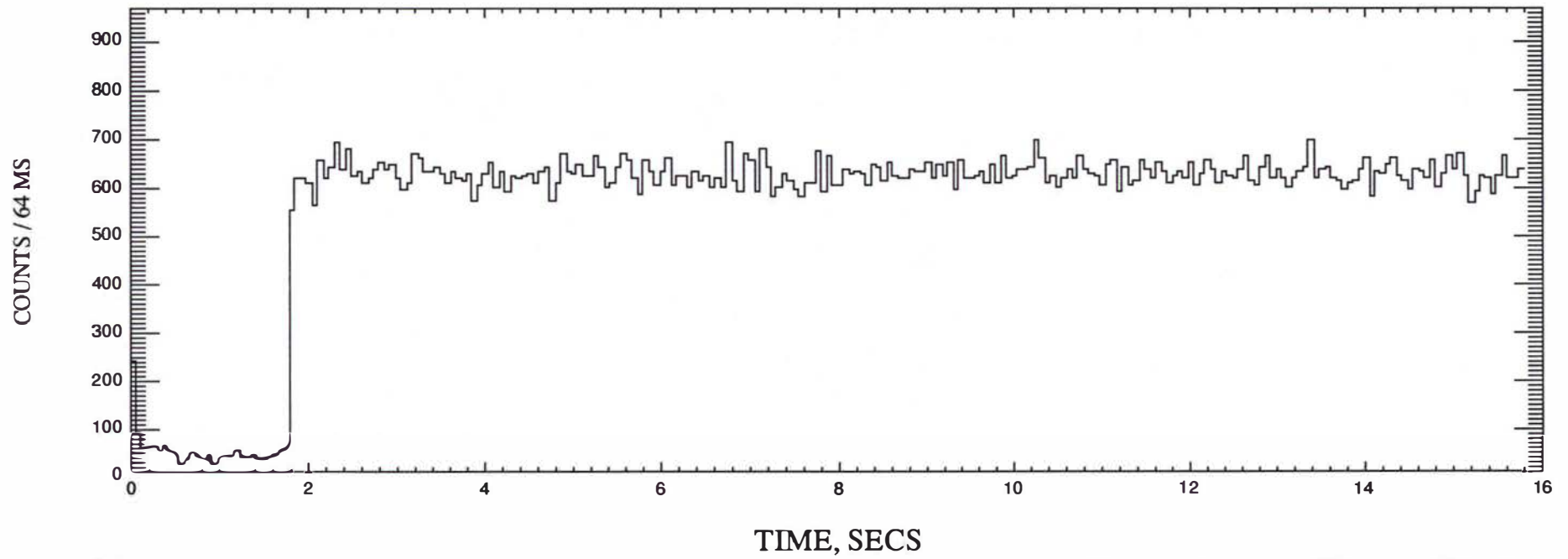


TIME, SECS

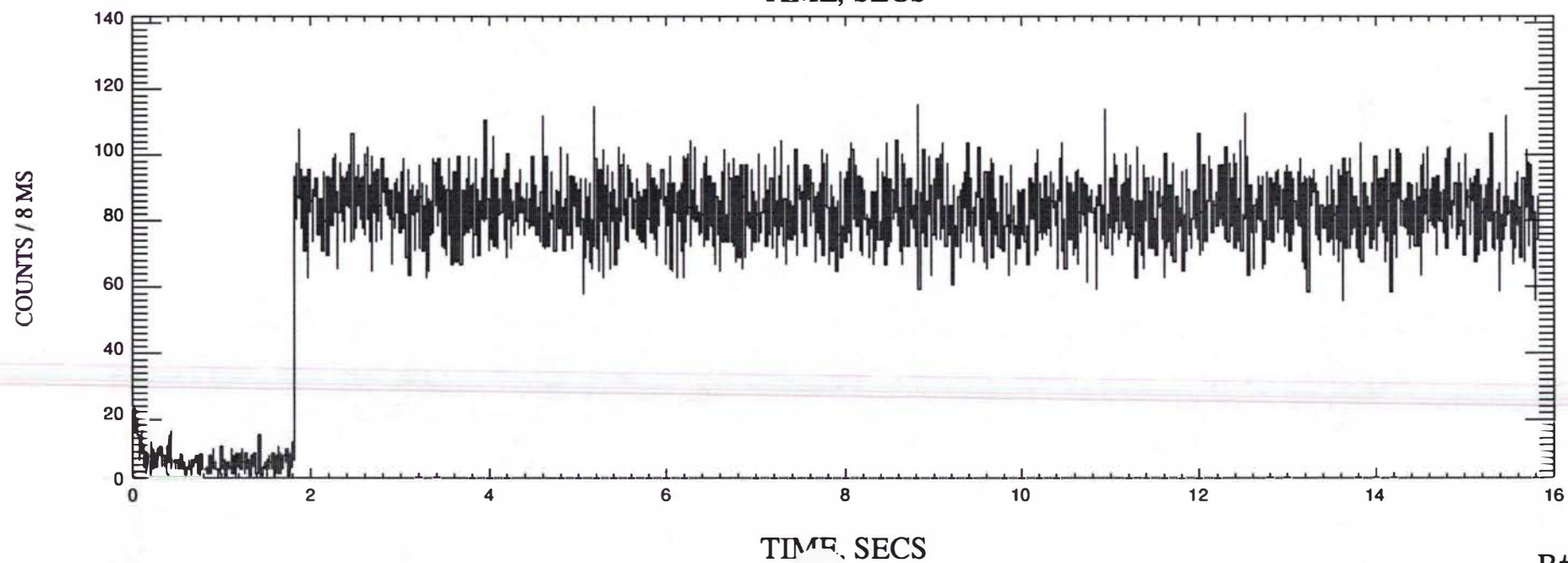
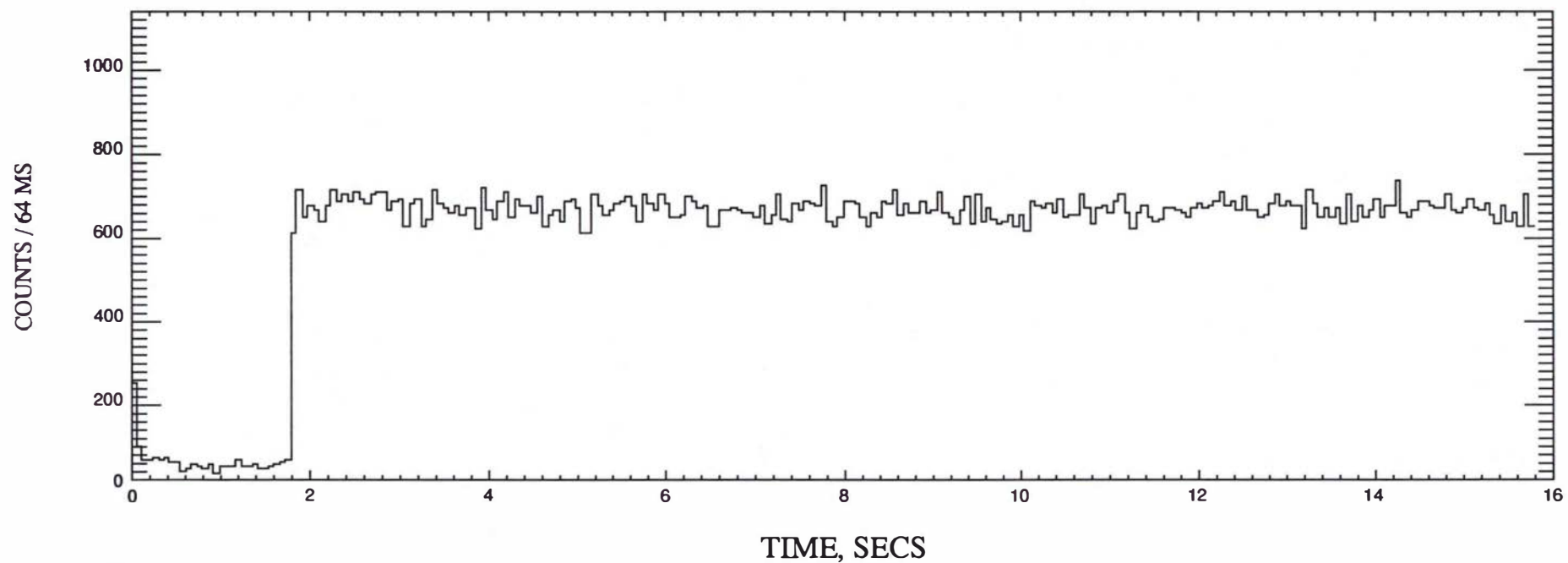


TIME, SECS

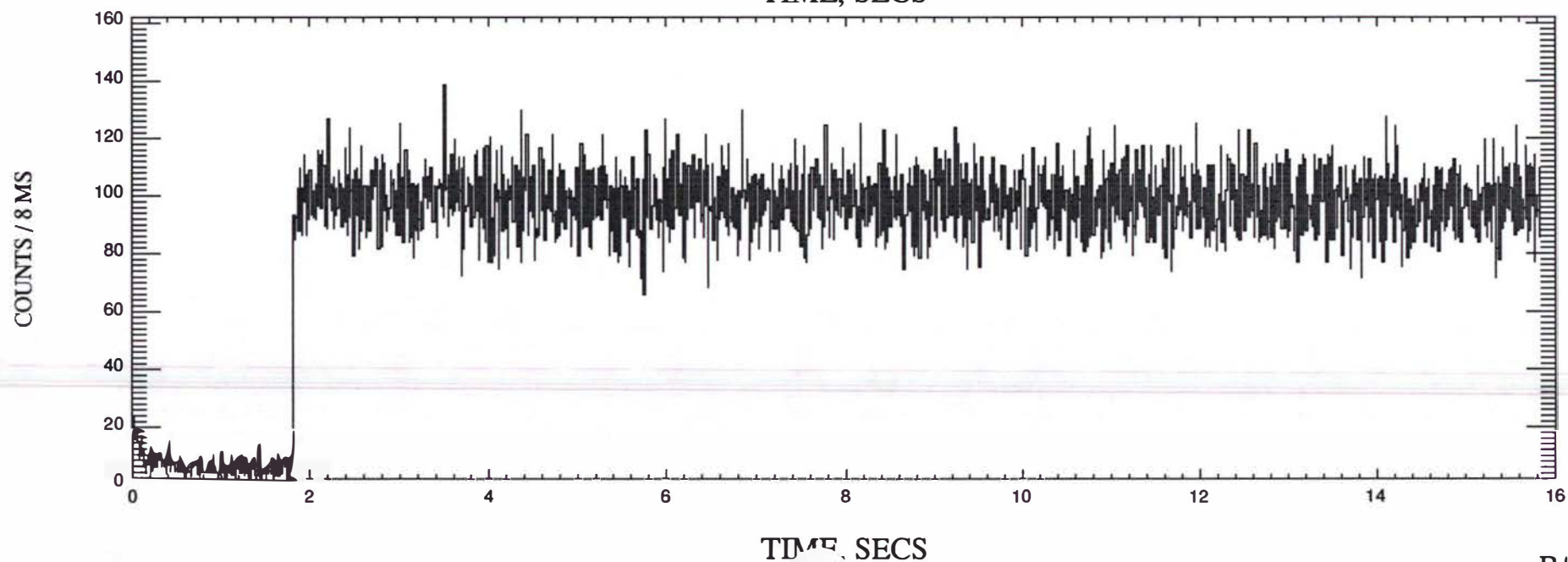
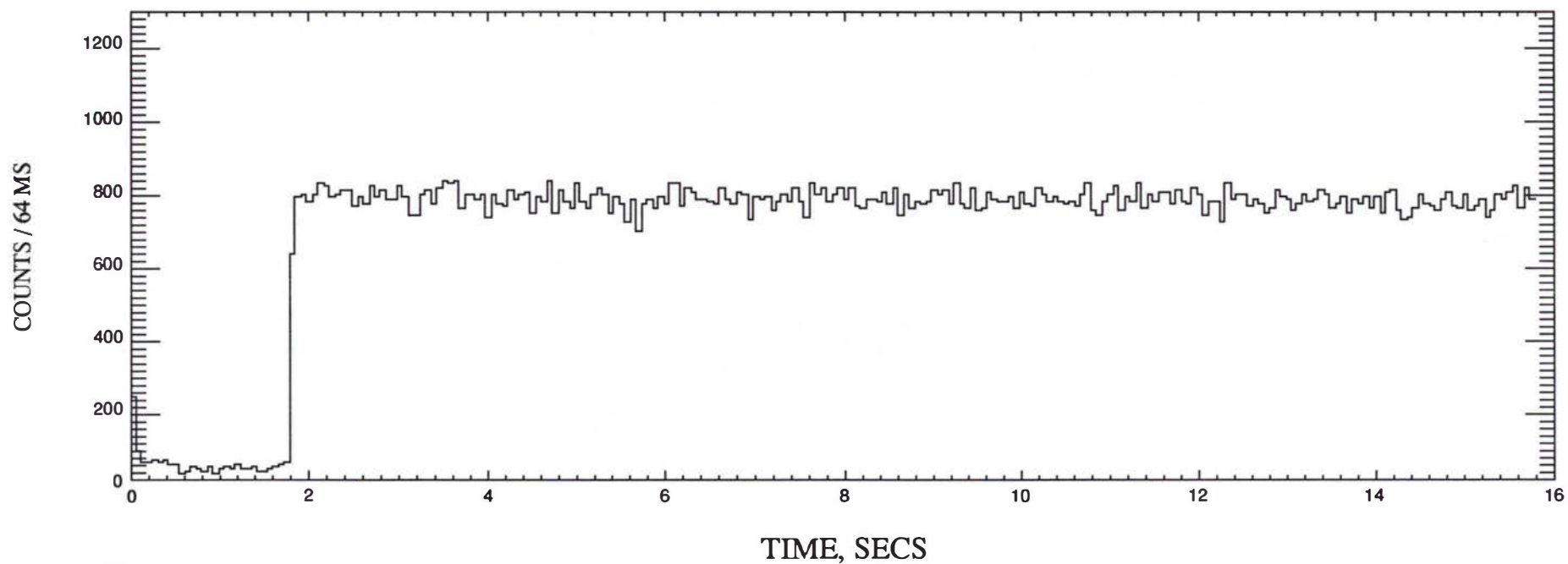
Burst Counter 9 at UT= 2.877483181424 h=10358.939 s 02:52:38.939



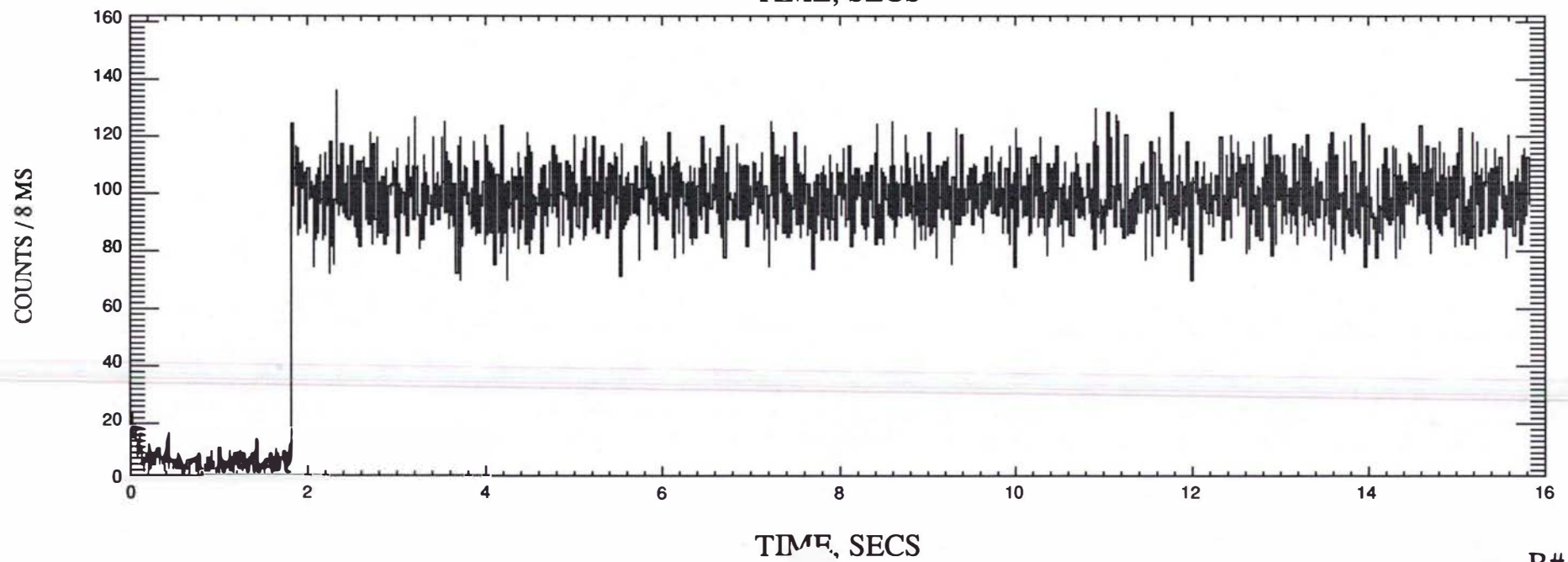
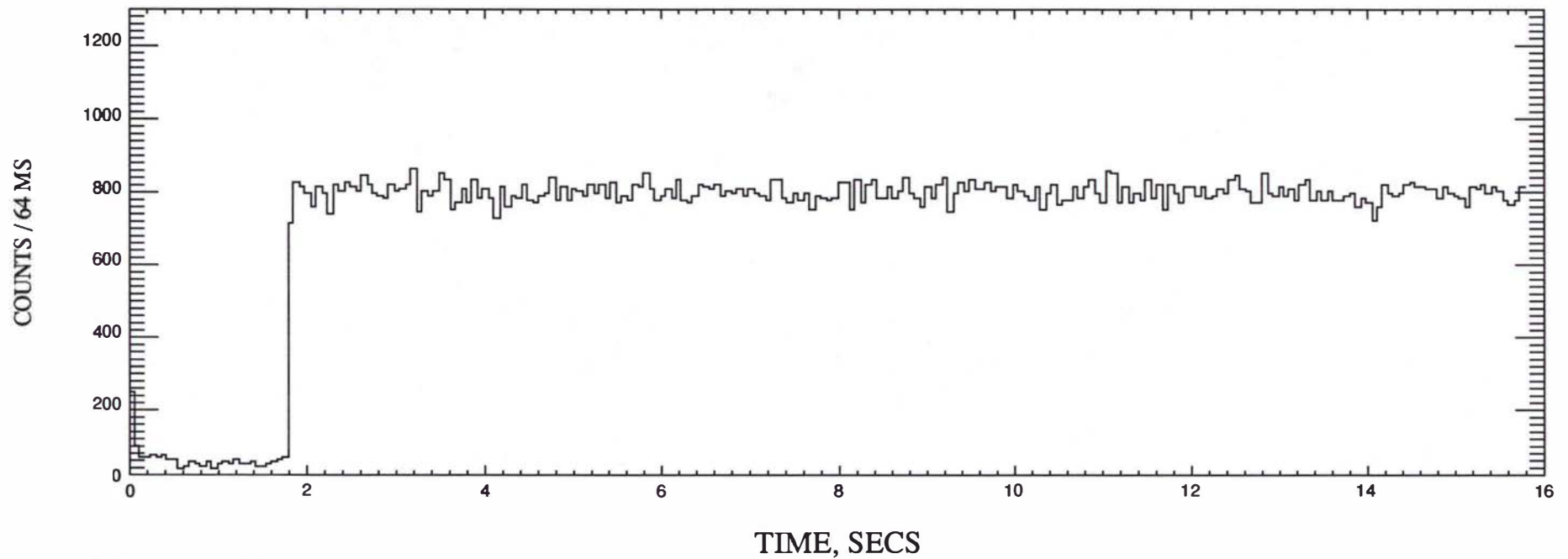
Burst Counter 10 at UT= 3.579718237983 h=12886.986 s 03:34:46.986



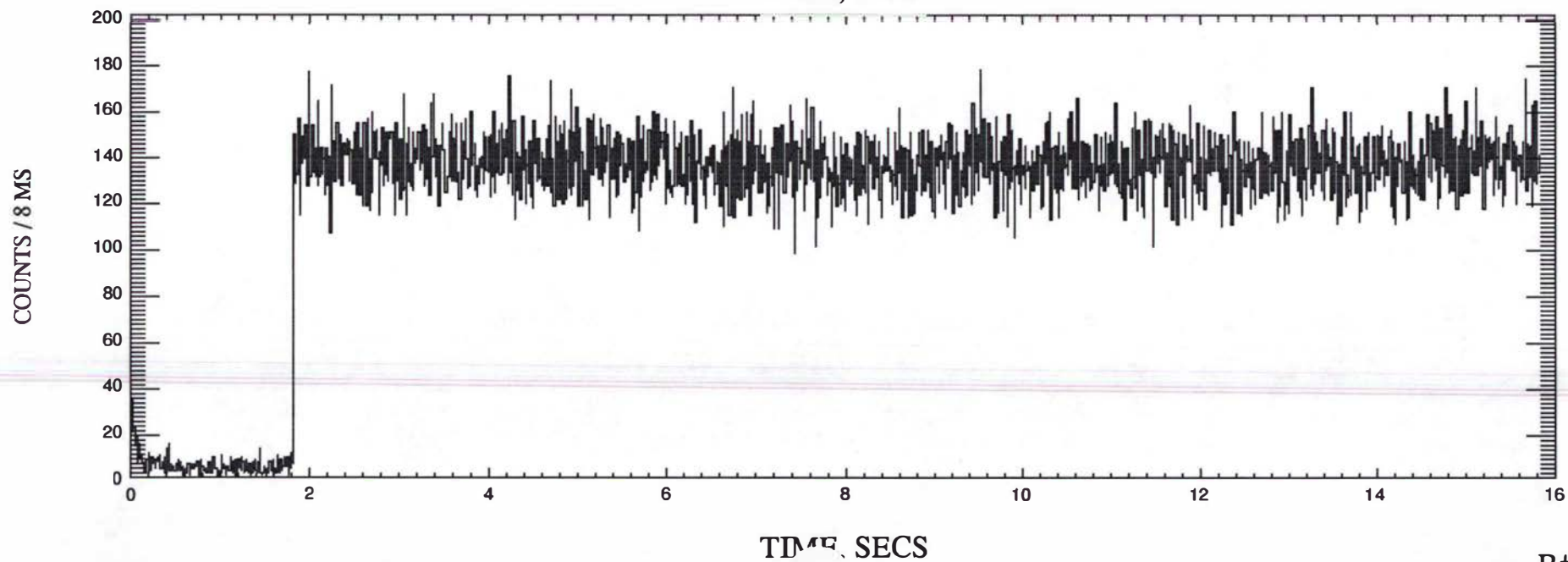
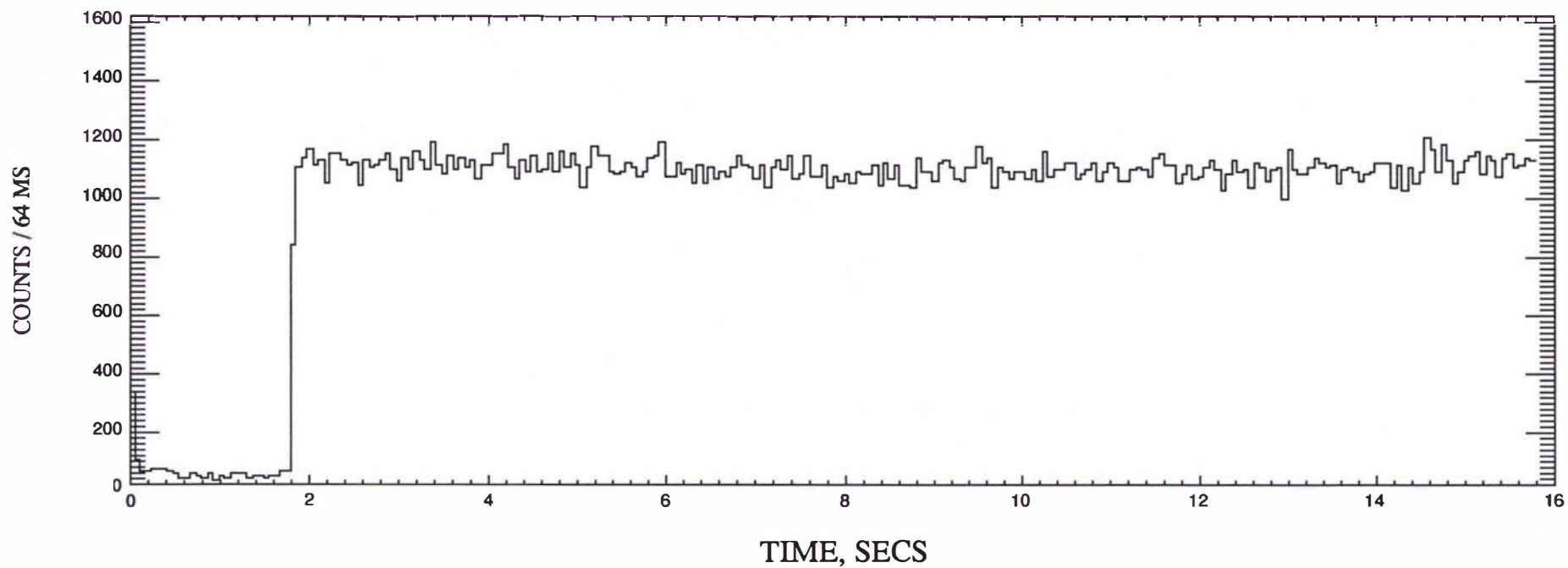
Burst Counter 11 at UT= 4.281953616672 h=15415.033 s 04:16:55.033



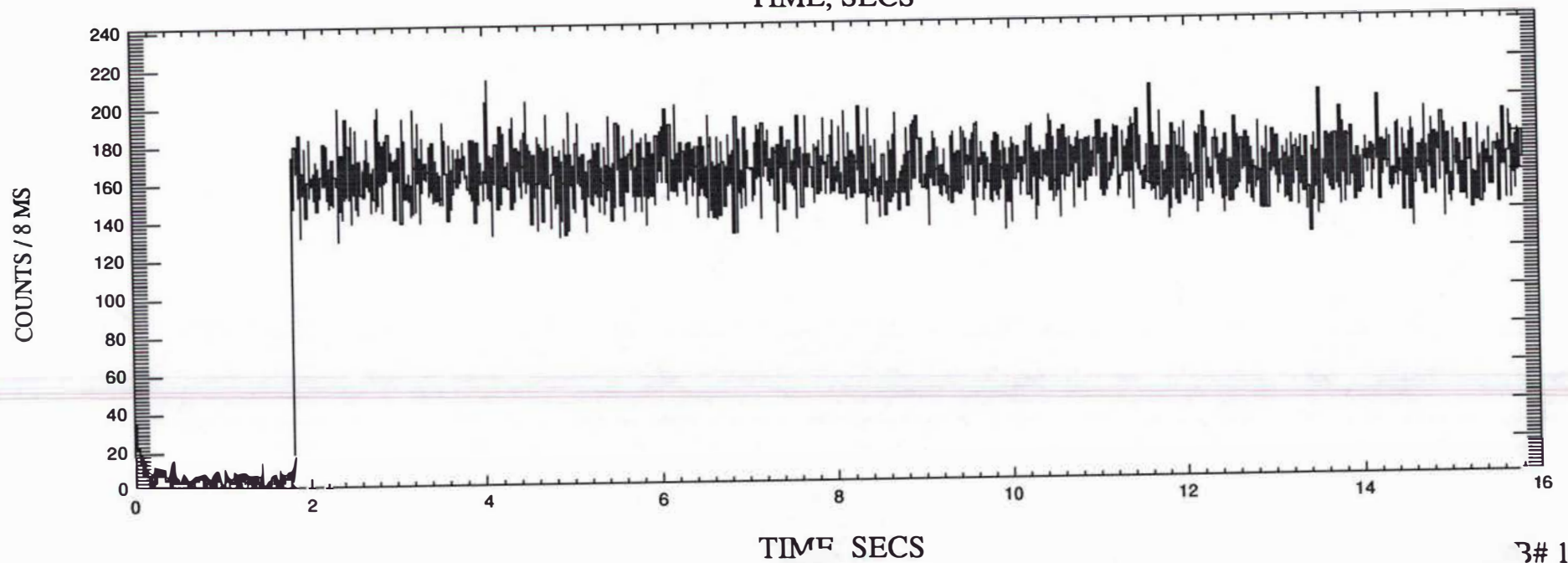
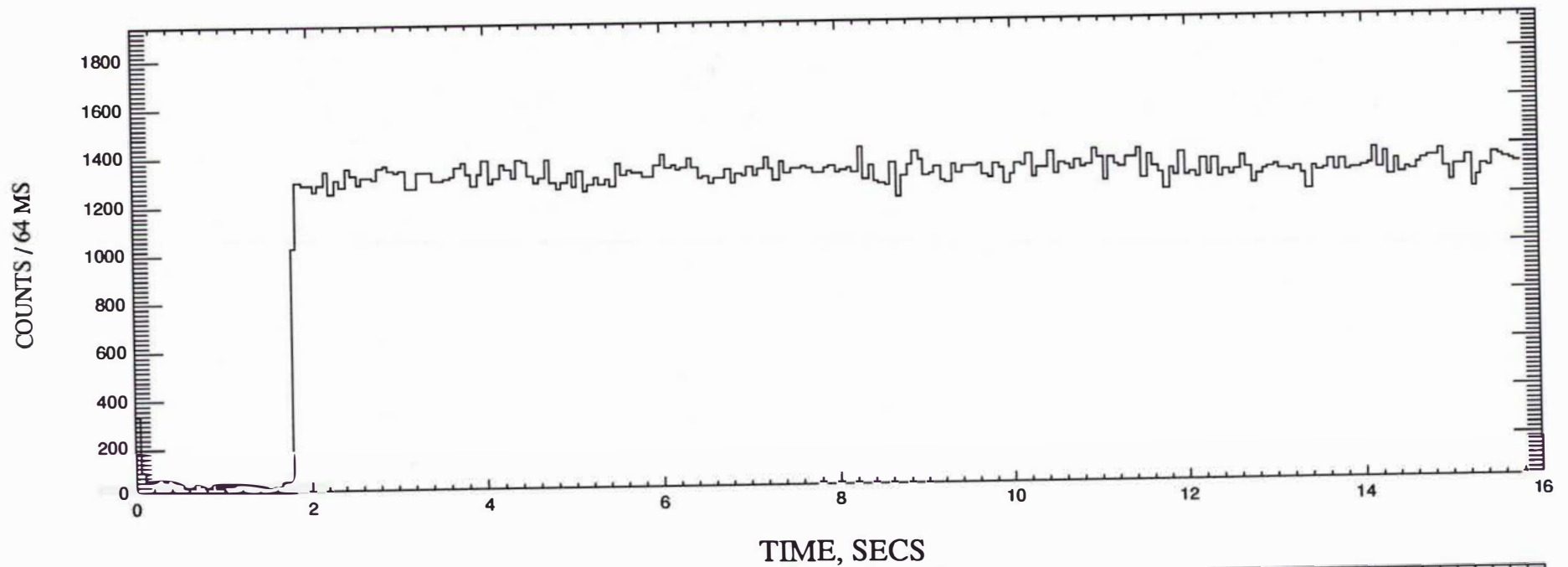
Burst Counter 12 at UT= 4.984187393188 h=17943.075 s 04:59:03.075



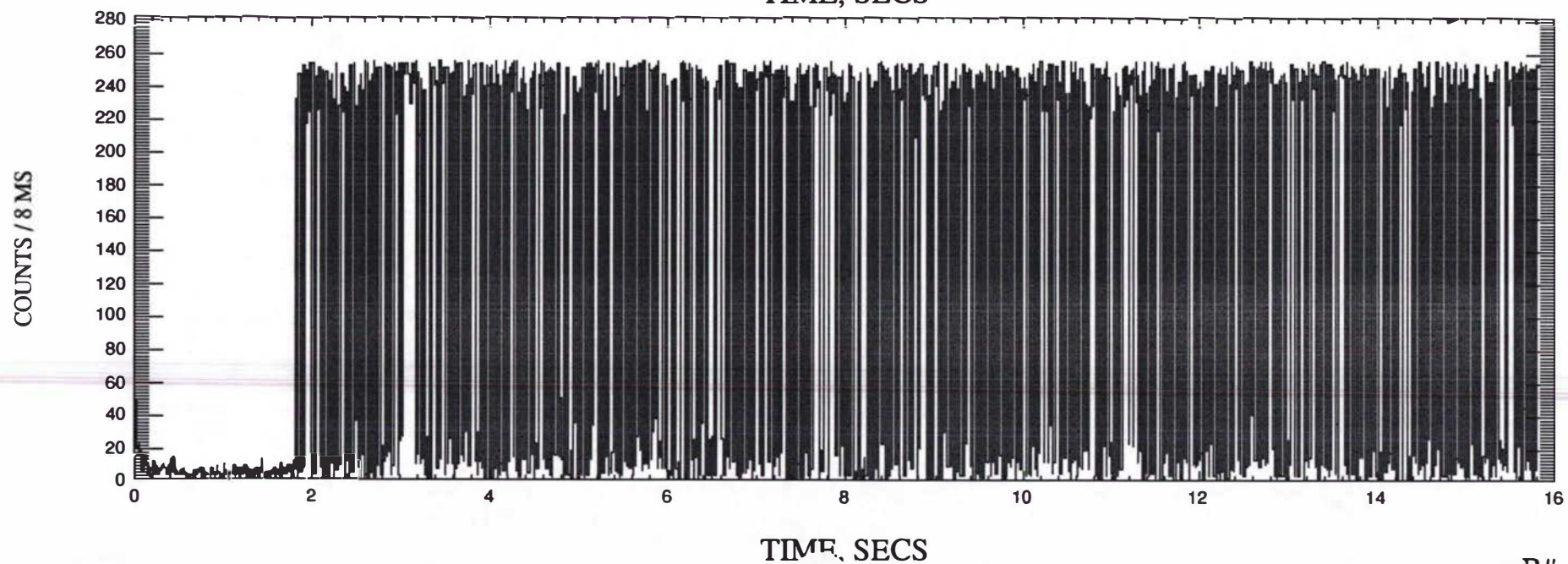
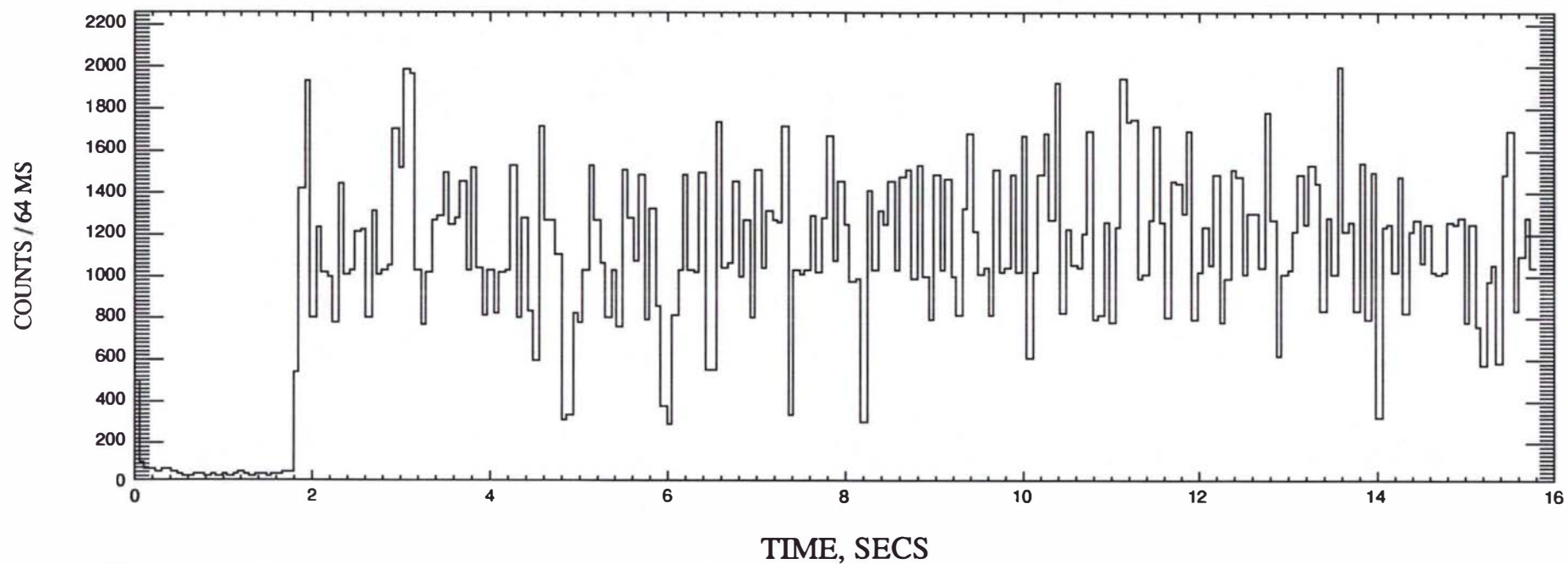
Burst Counter 13 at UT= 5.686420279609 h=20471.113 s 05:41:11.113



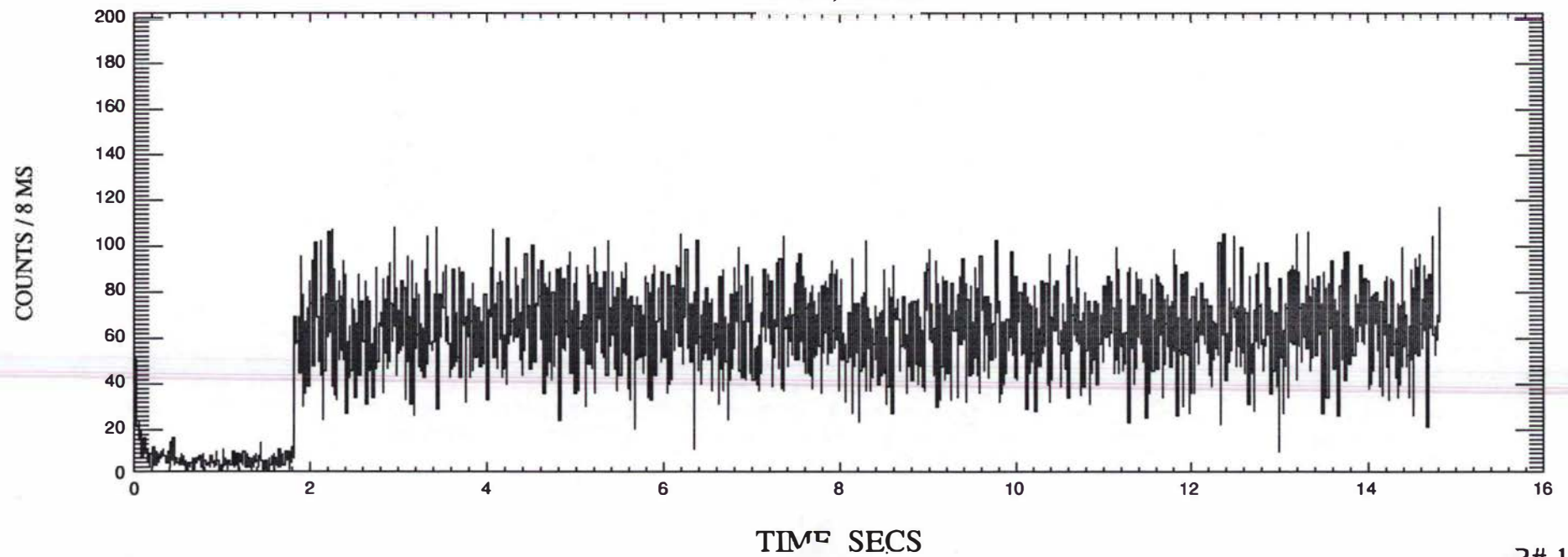
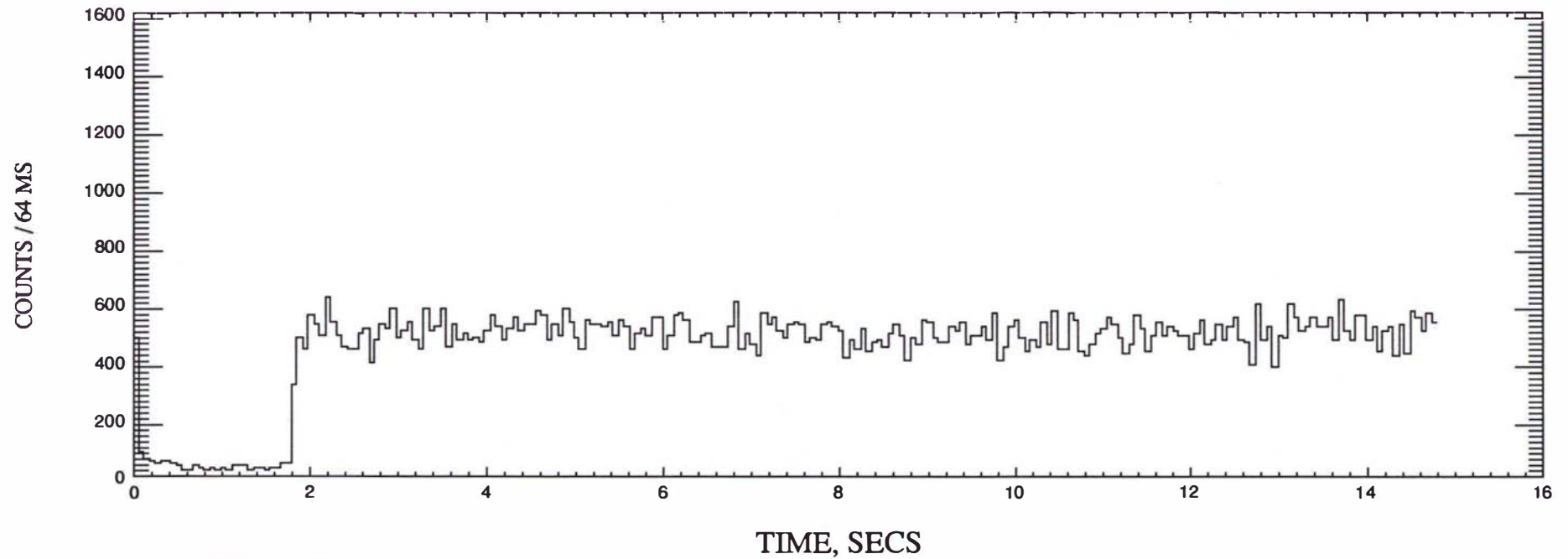
Burst Counter 14 at UT= 6.388655336168 h=22999.159 s 06:23:19.159



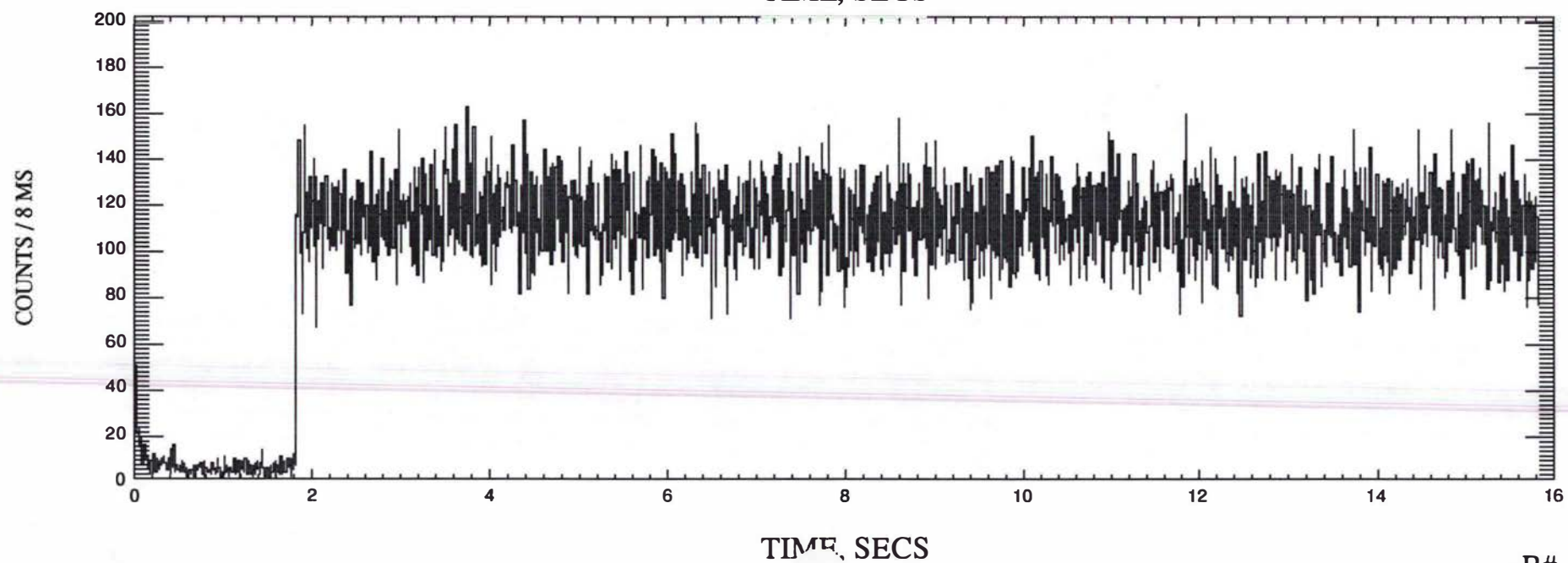
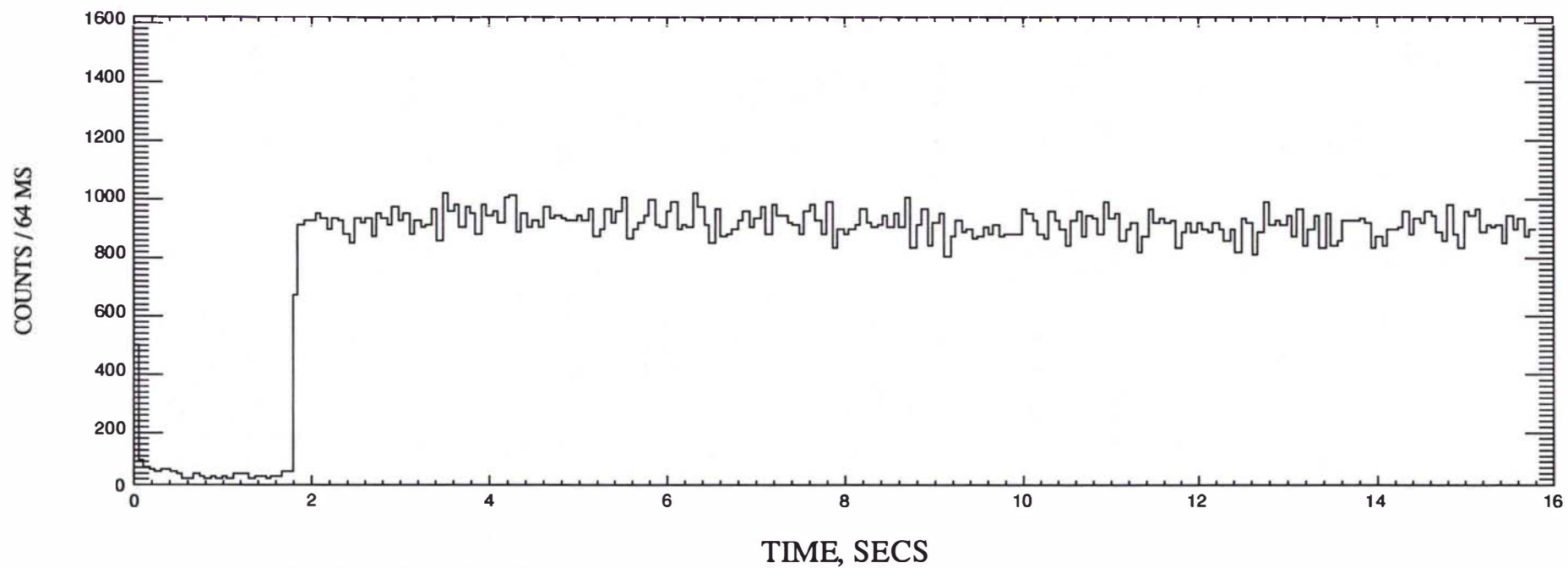
Burst Counter 15 at UT= 7.090888222588 h=25527.198 s 07:05:27.198



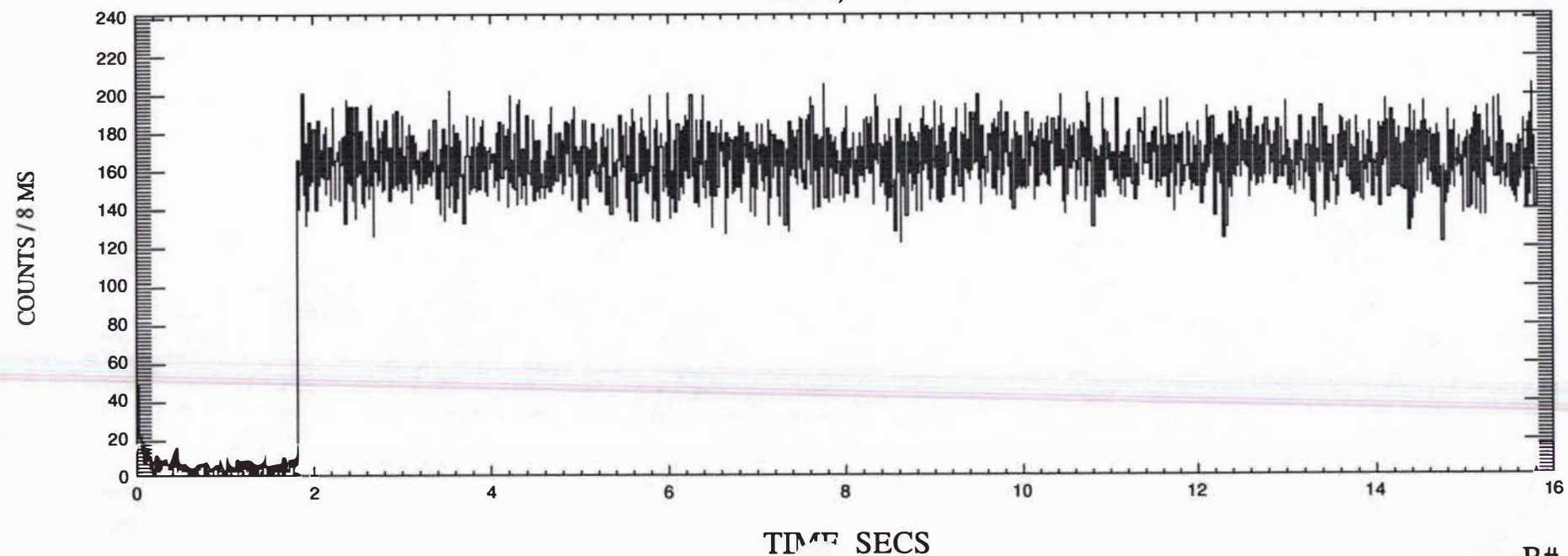
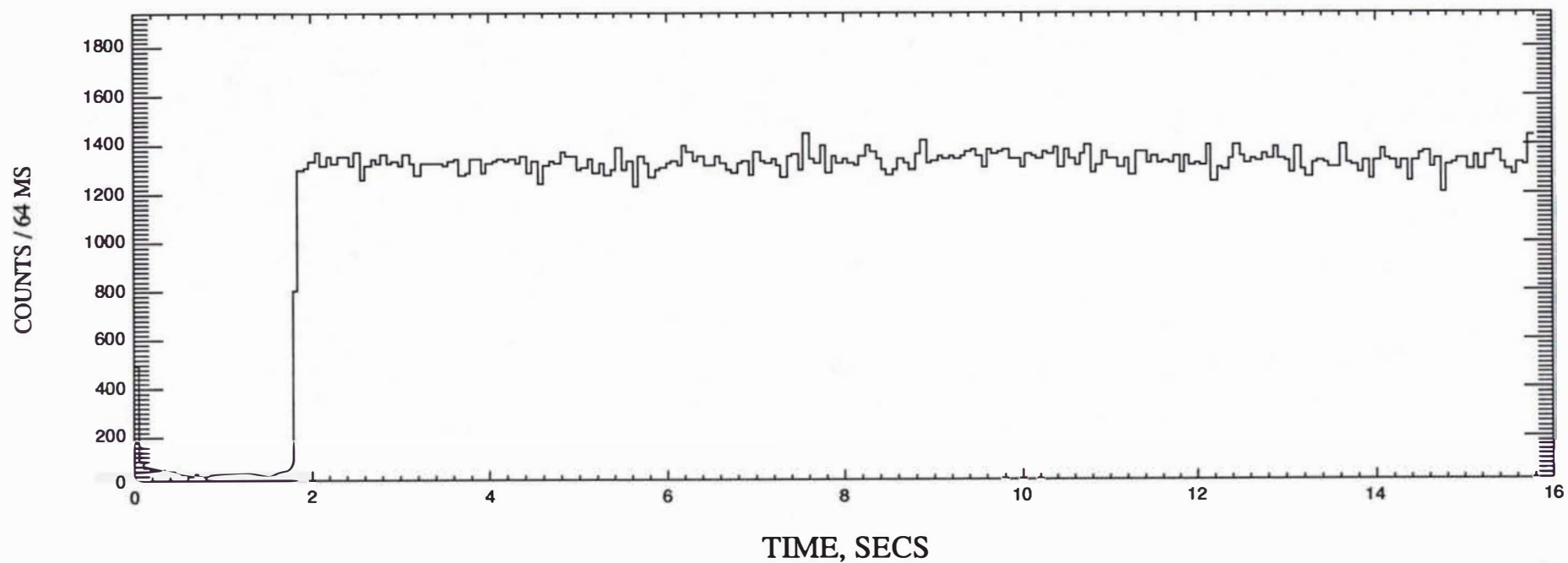
Burst Counter 0 at UT= 7.793123283386 h=28055.244 s 07:47:35.244



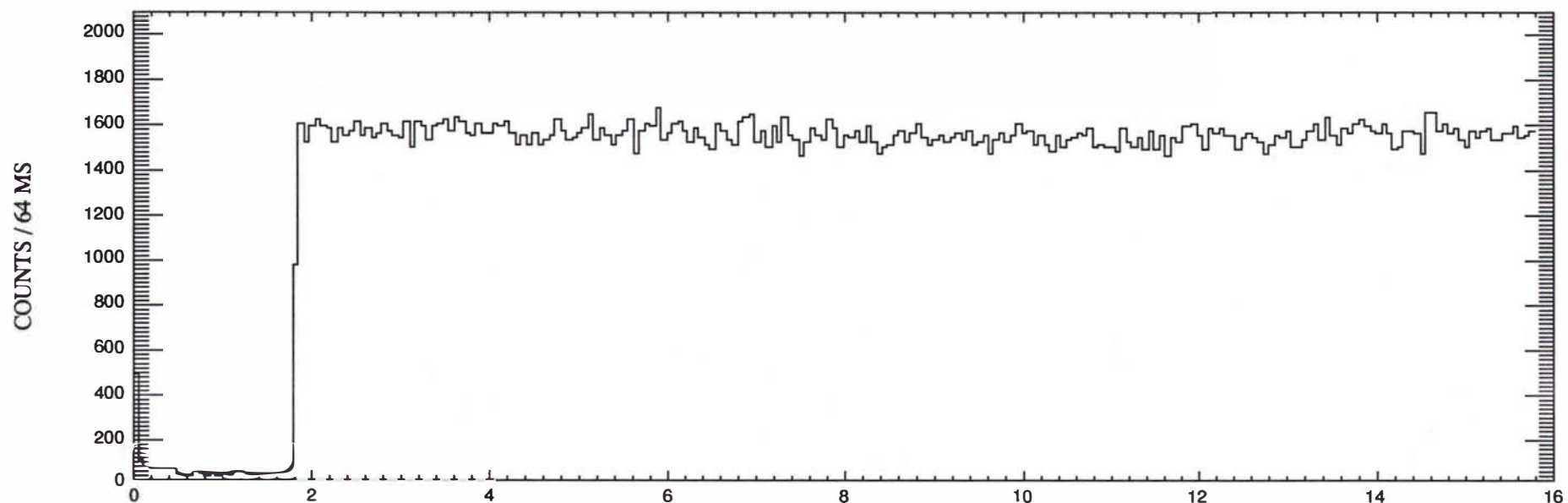
Burst Counter 1 at UT= 8.779808239407 h=31607.310 s 08:46:47.310



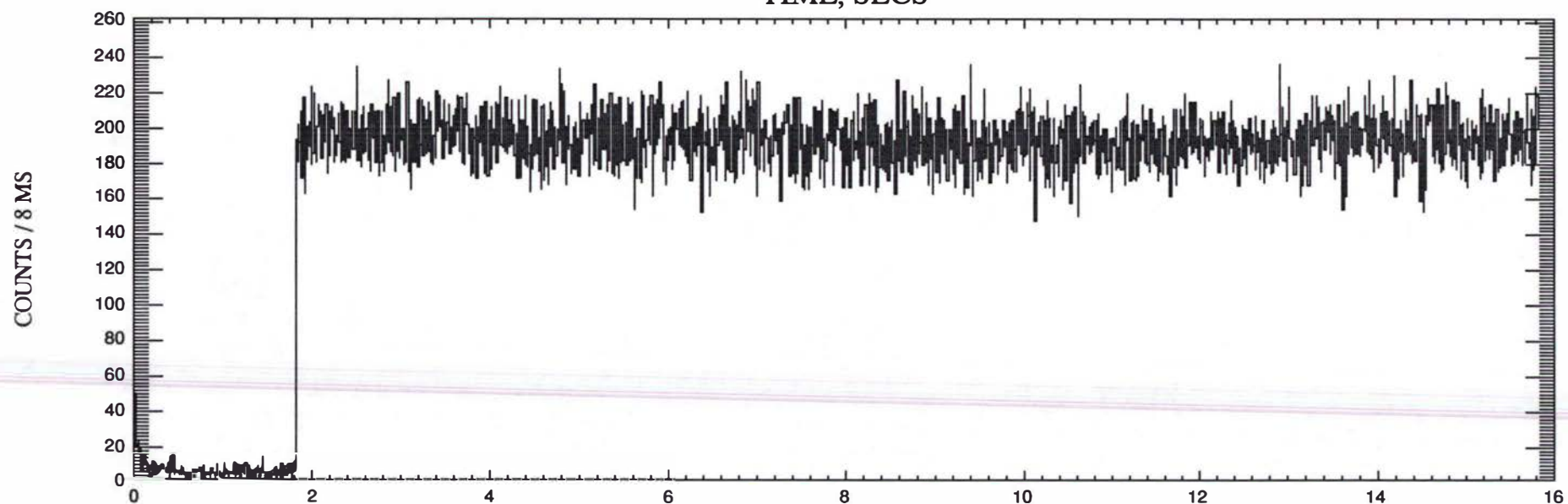
Burst Counter 2 at UT=10.042053565979 h=36151.393 s 10:02:31.393



Burst Counter 3 at UT=11.304298892551 h=40695.476 s 11:18:15.476

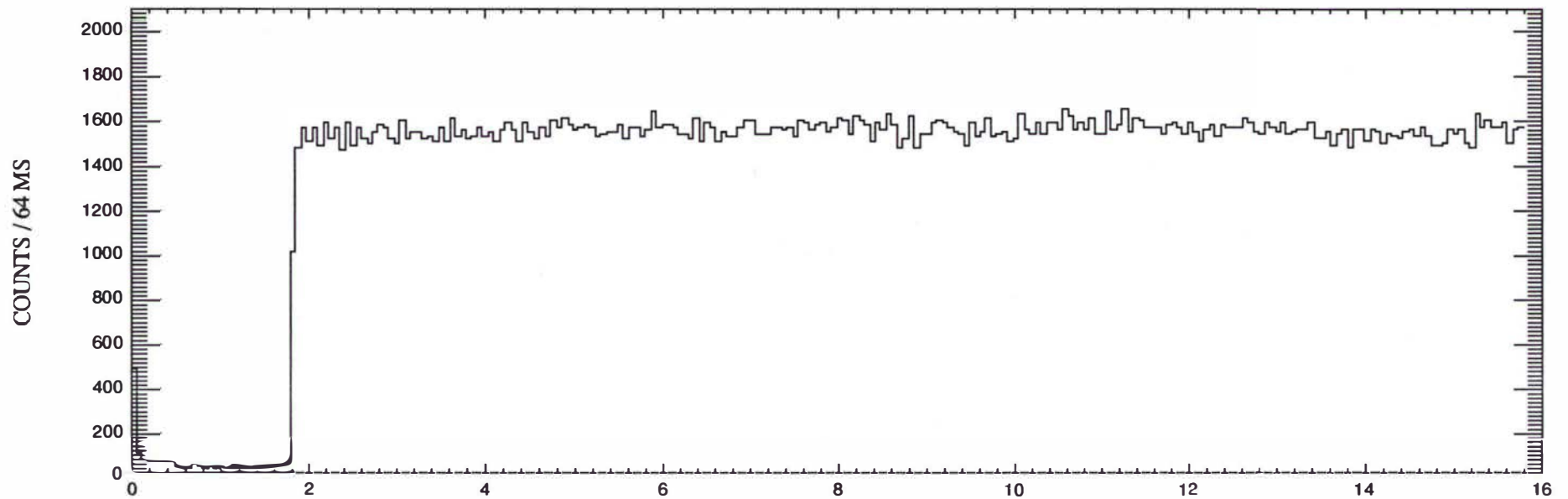


TIME, SECS

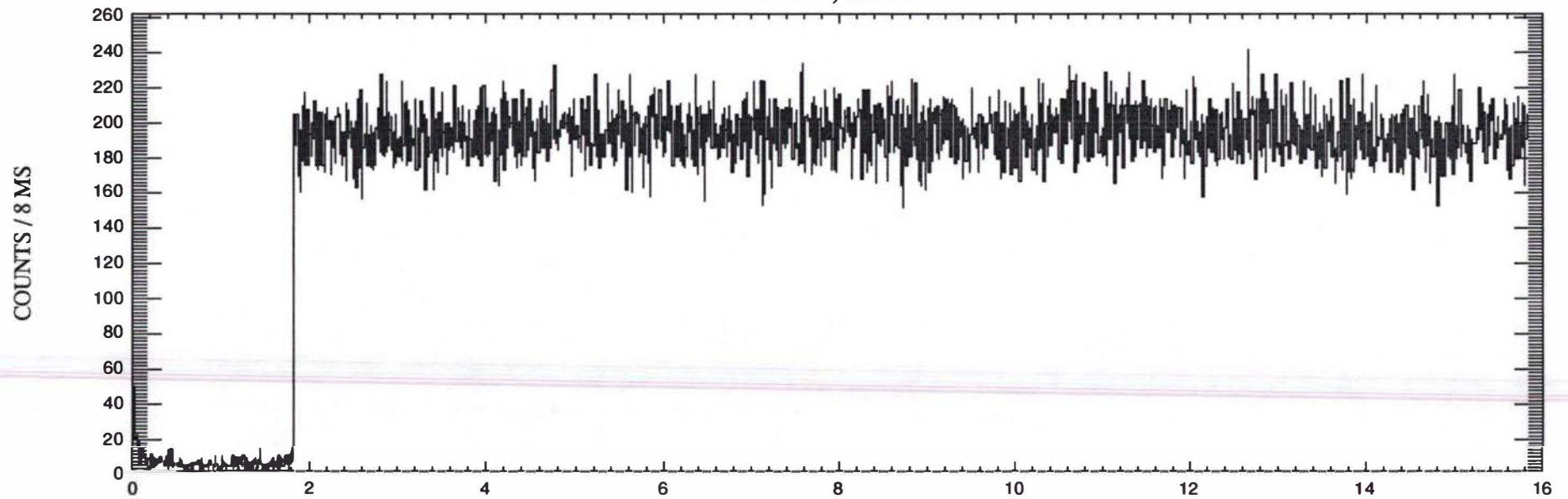


TIME, SECS

Burst Counter 4 at UT=12.566541650560 h=45239.550 s 12:33:59.550

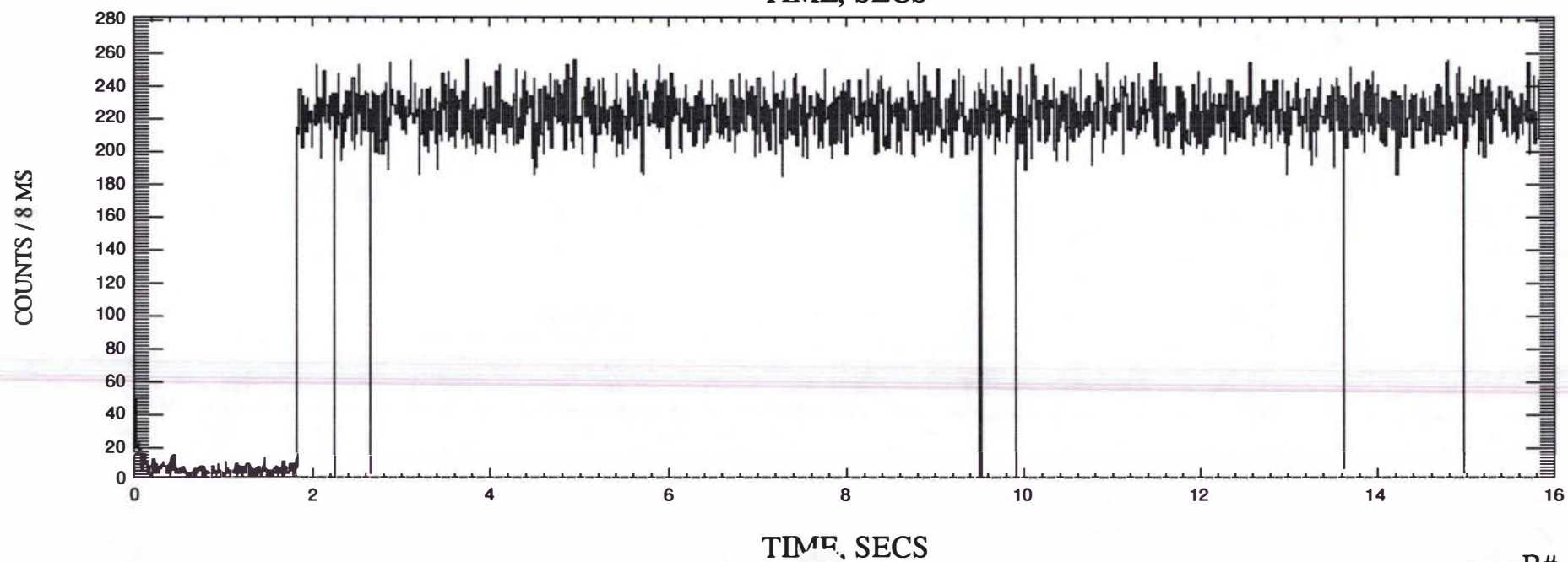
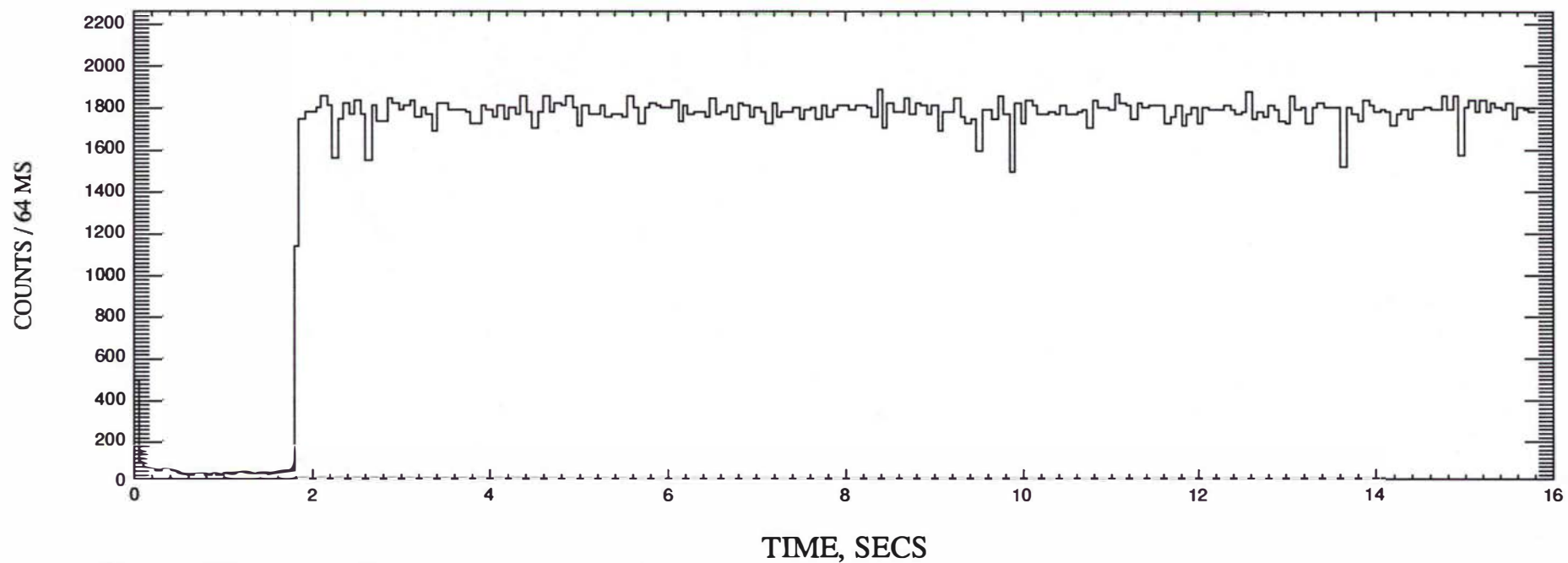


TIME, SECS

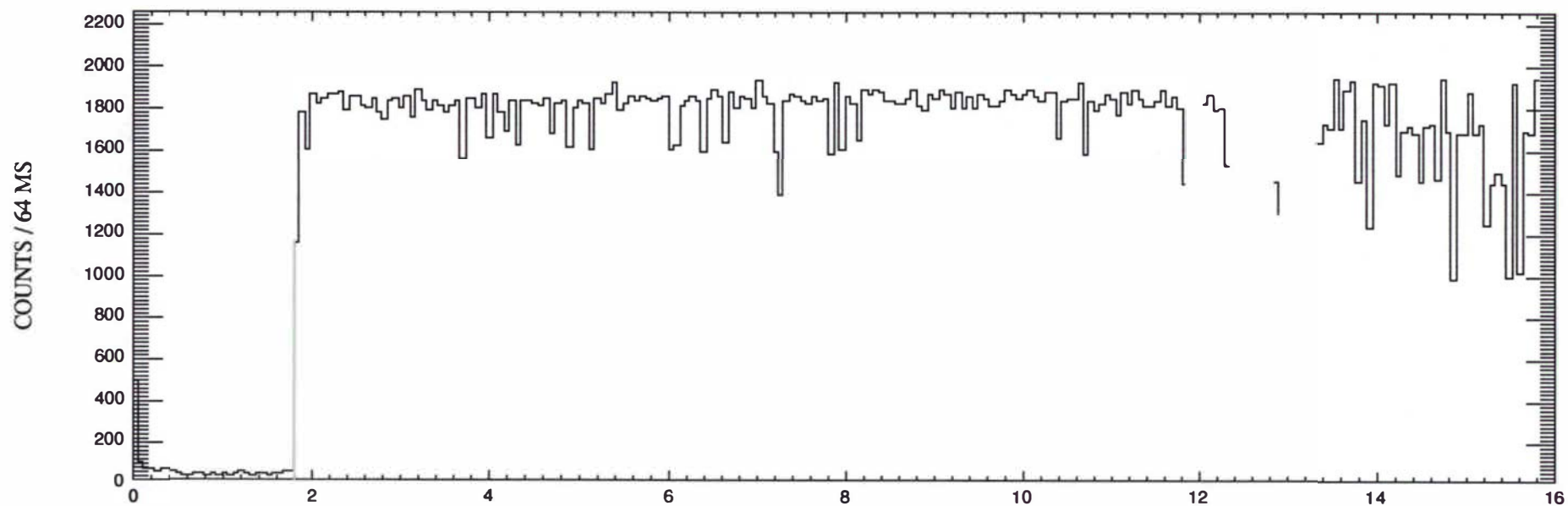


TIME, SECS

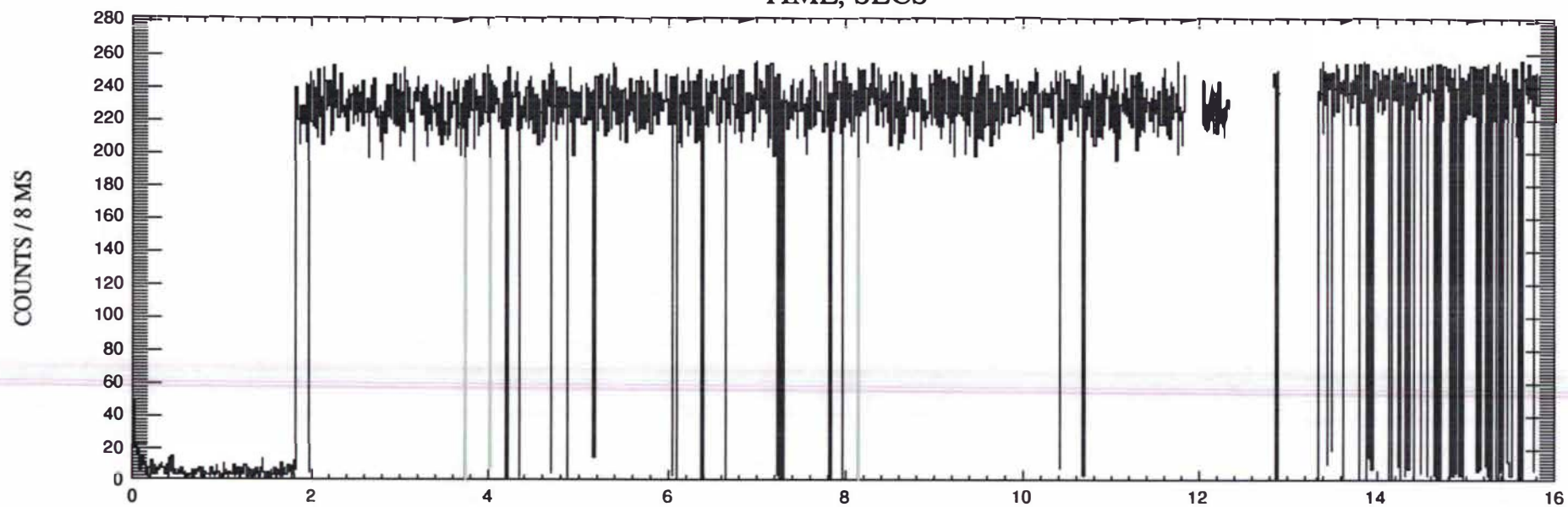
Burst Counter 5 at UT=13.828786977132 h=49783.633 s 13:49:43.633



Burst Counter 7 at UT=15.091032303704 h=54327.716 s 15:05:27.716

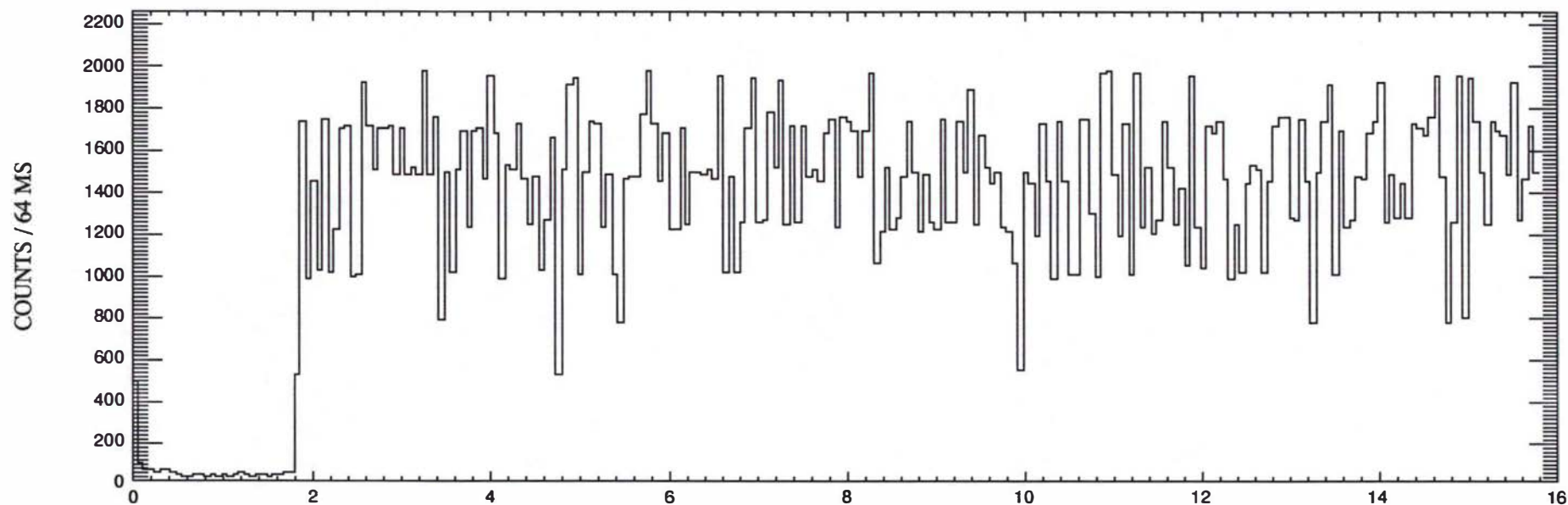


TIME, SECS

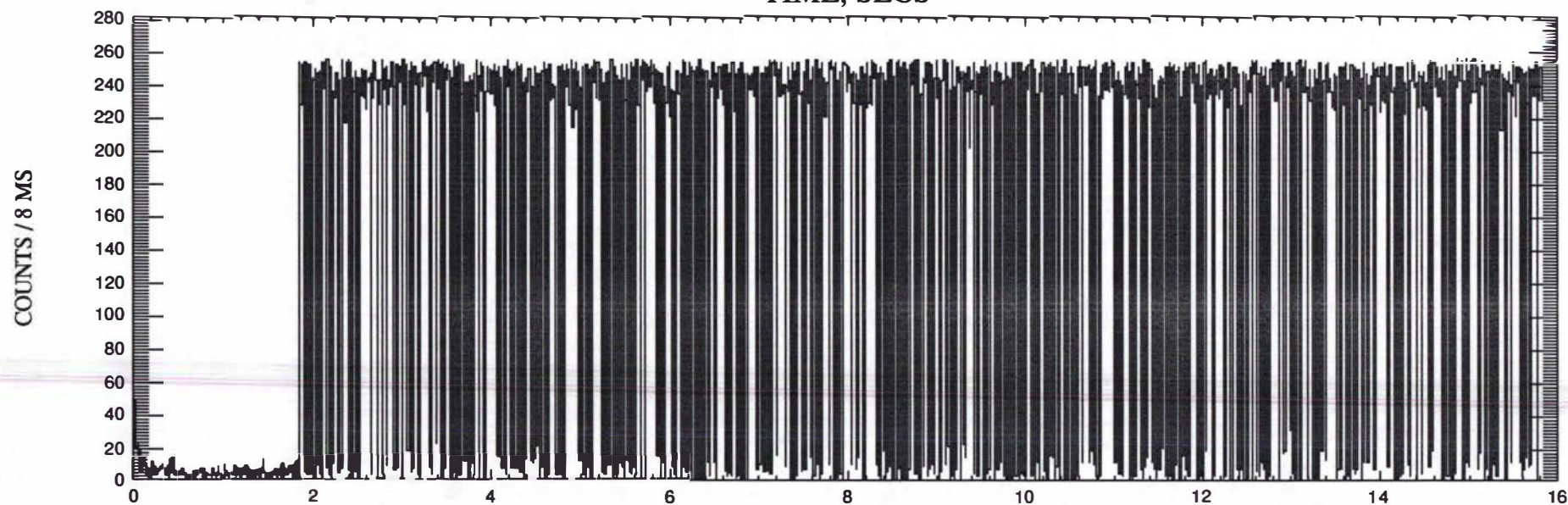


TIME, SECS

Burst Counter 8 at UT=17.615521672567 h=63415.878 s 17:36:55.878

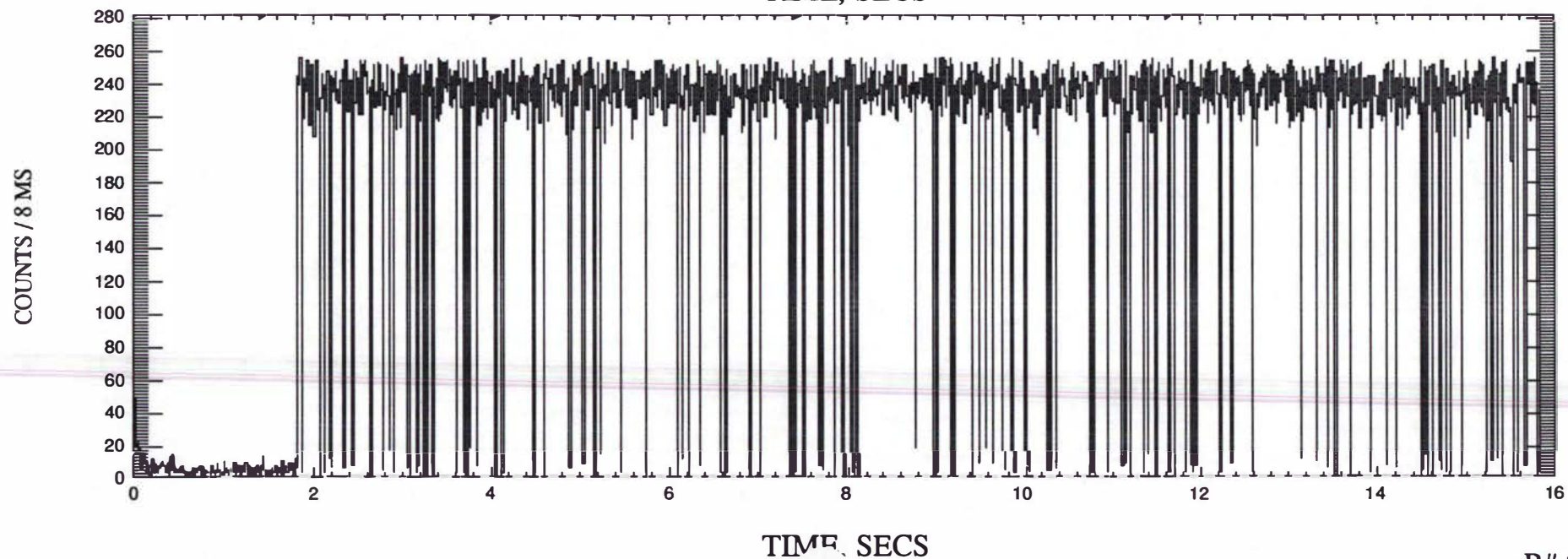
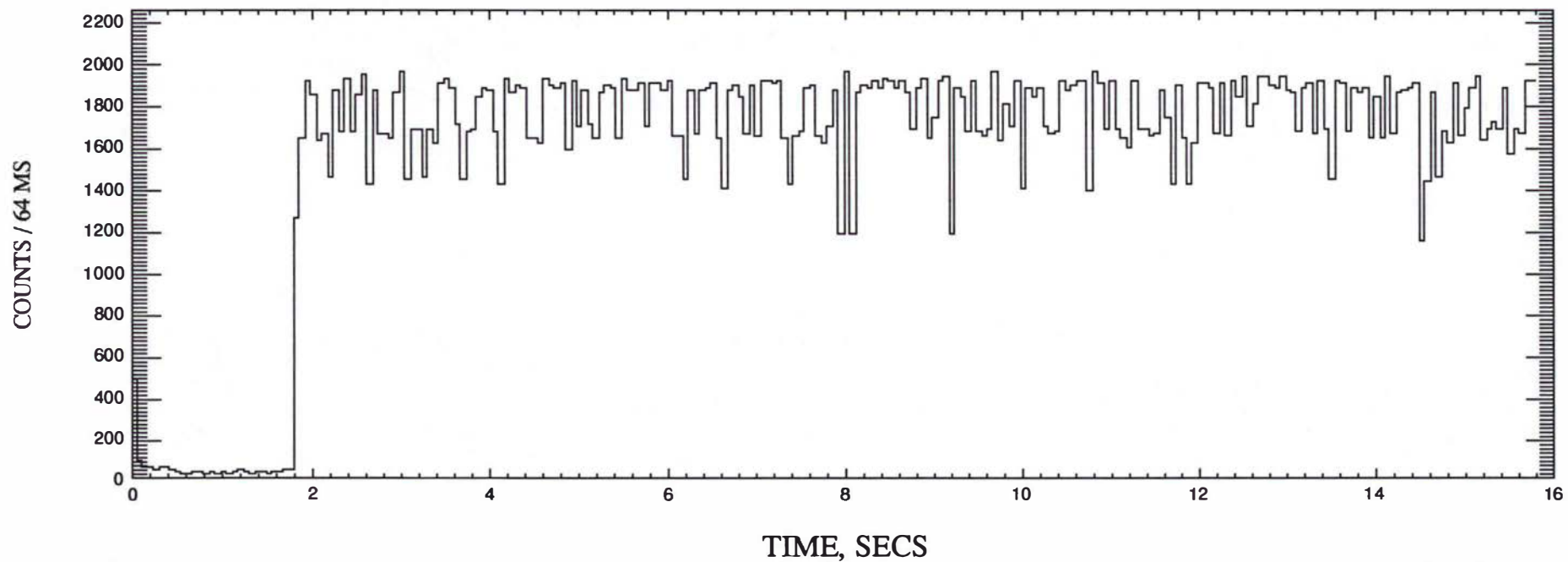


TIME, SECS

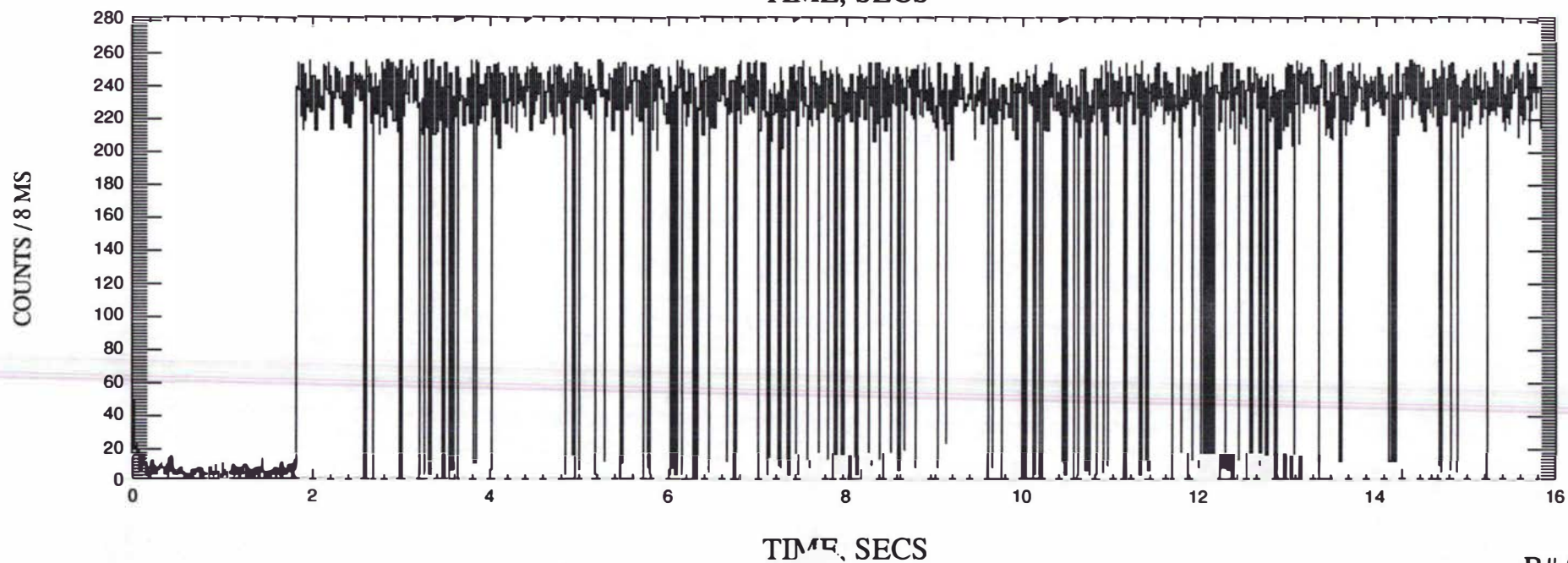
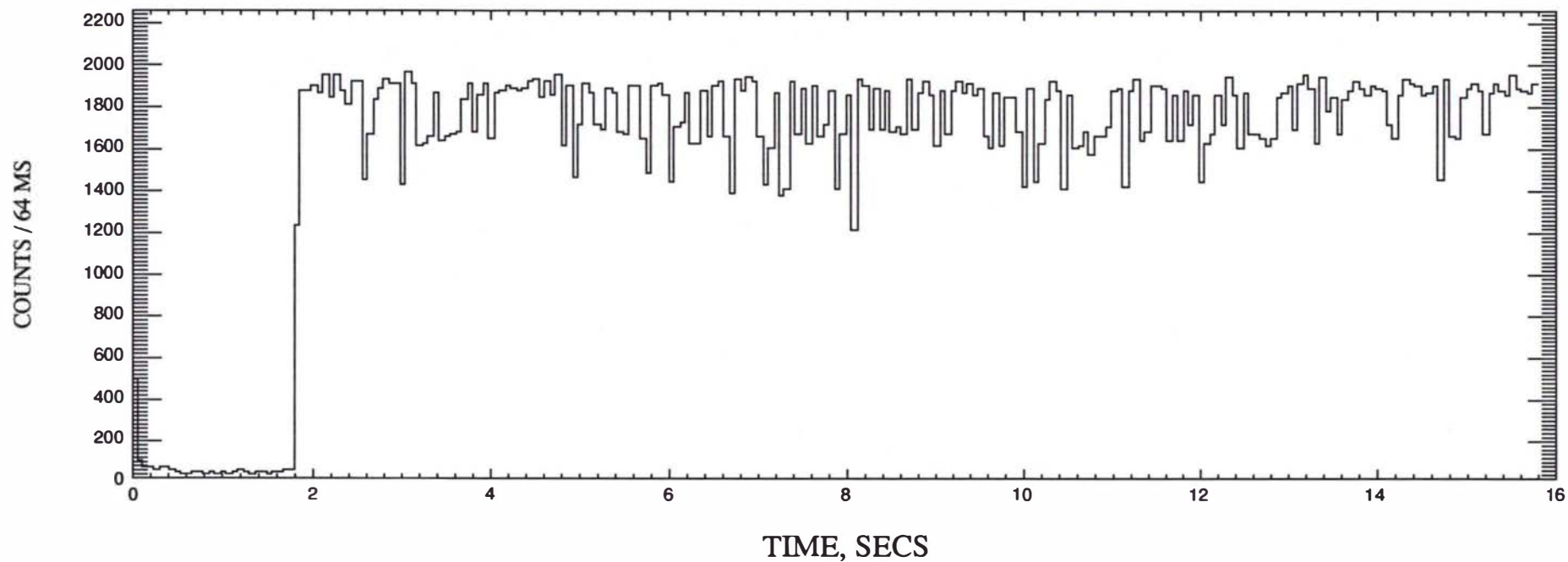


TIME, SECS

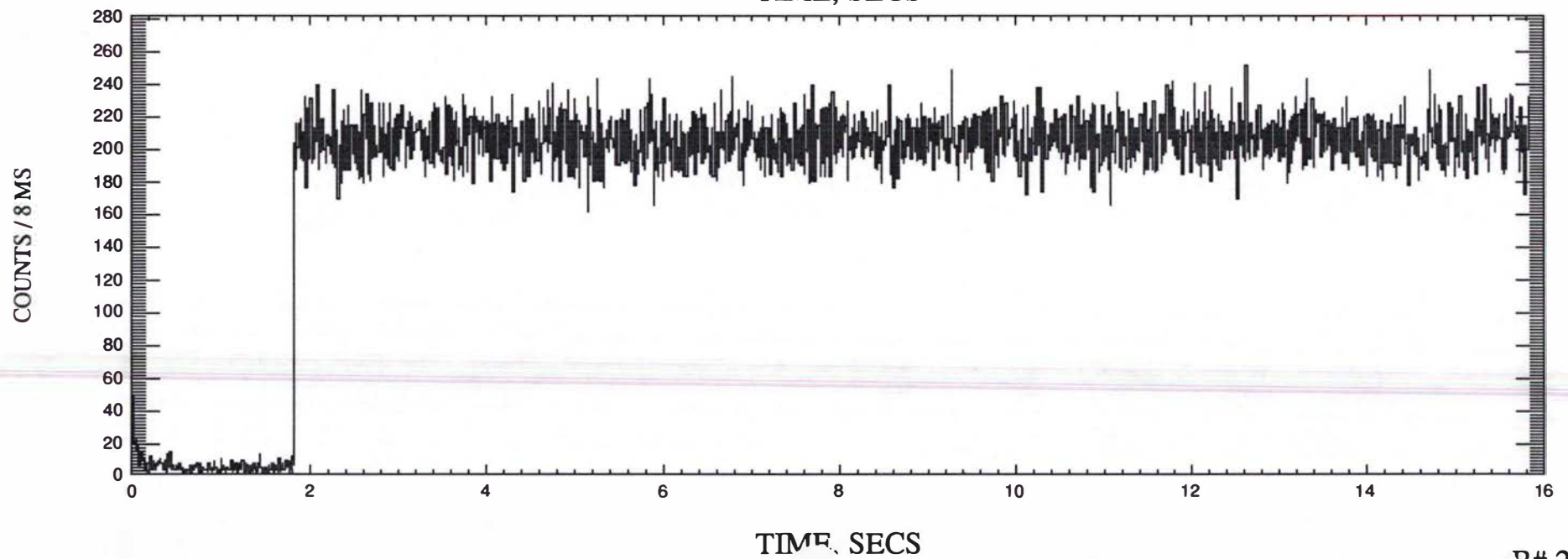
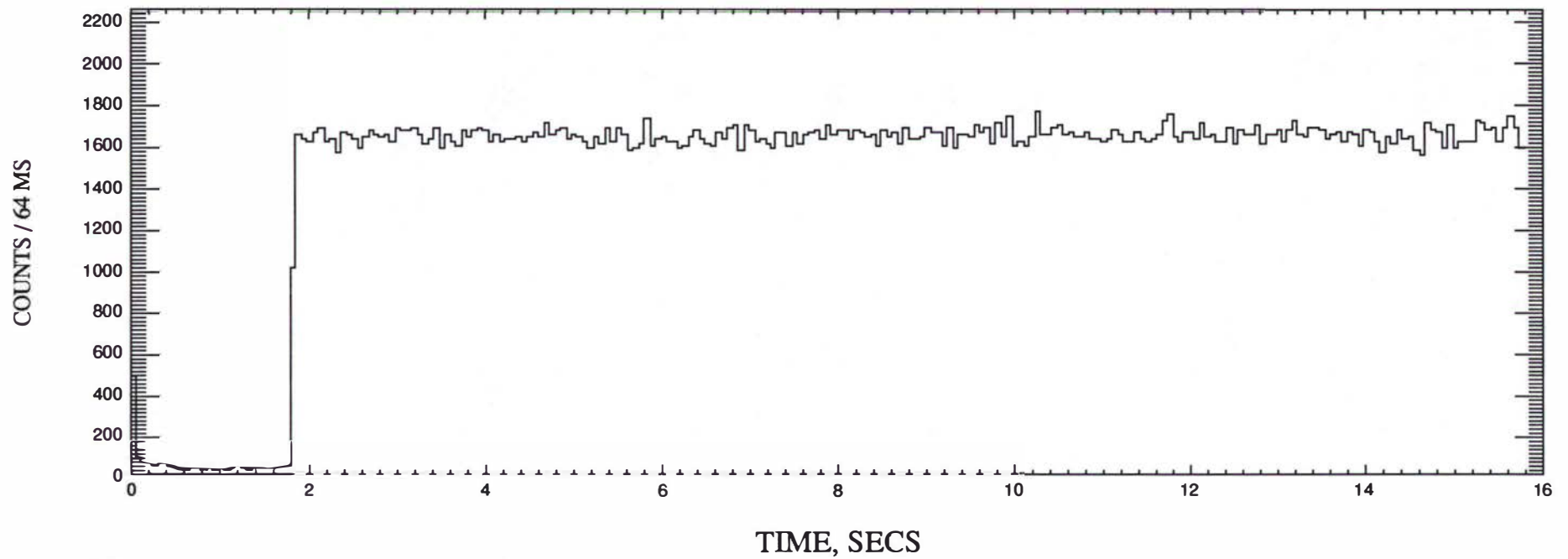
Burst Counter 9 at UT=18.877766999139 h=67959.961 s 18:52:39.961



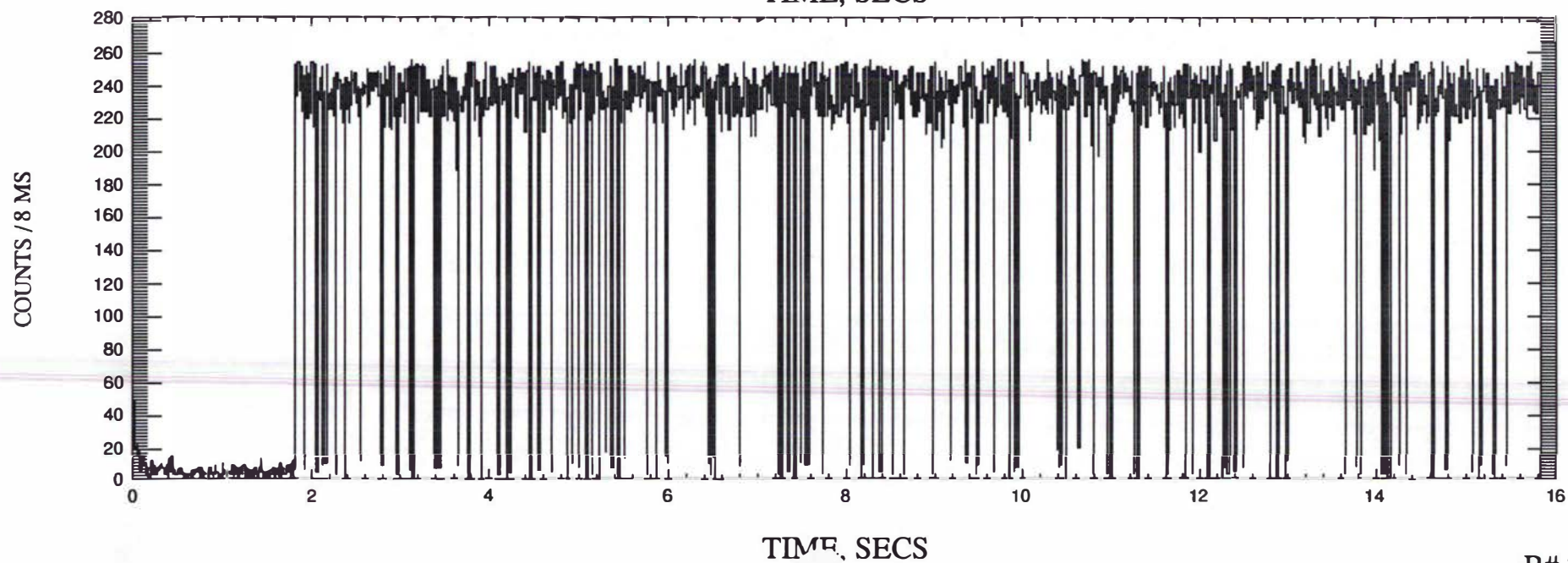
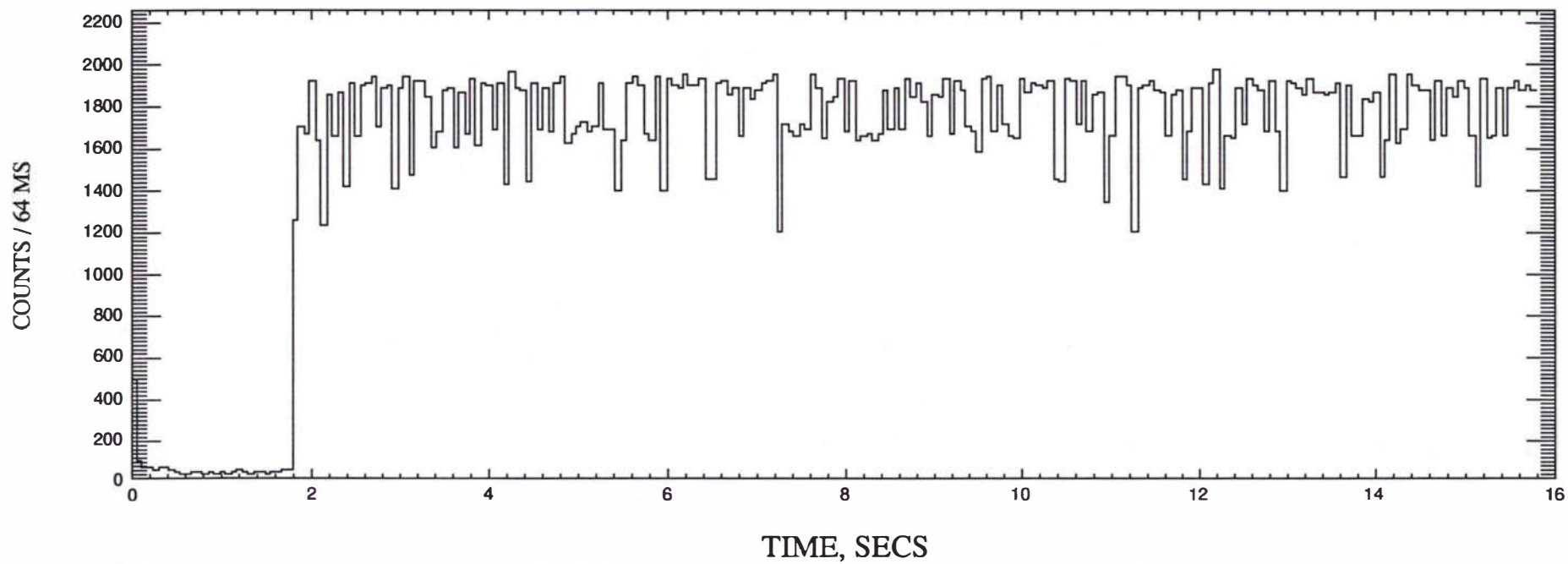
Burst Counter 10 at UT=20.140012325711 h=72504.044 s 20:08:24.044



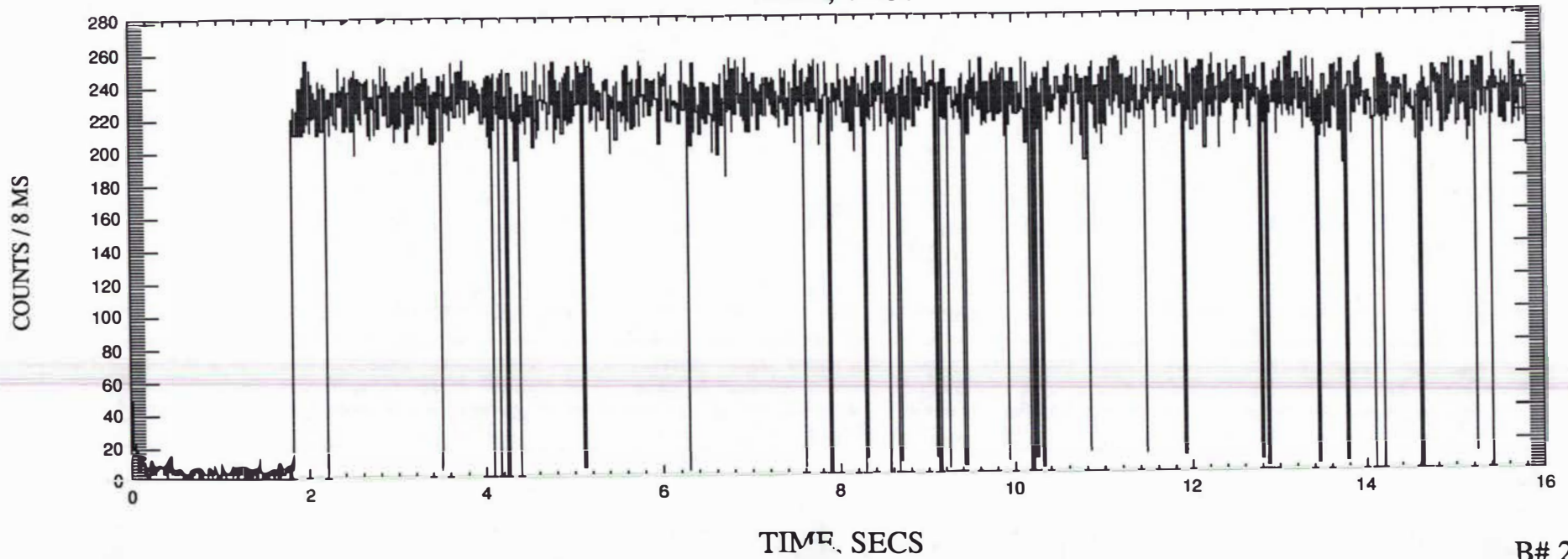
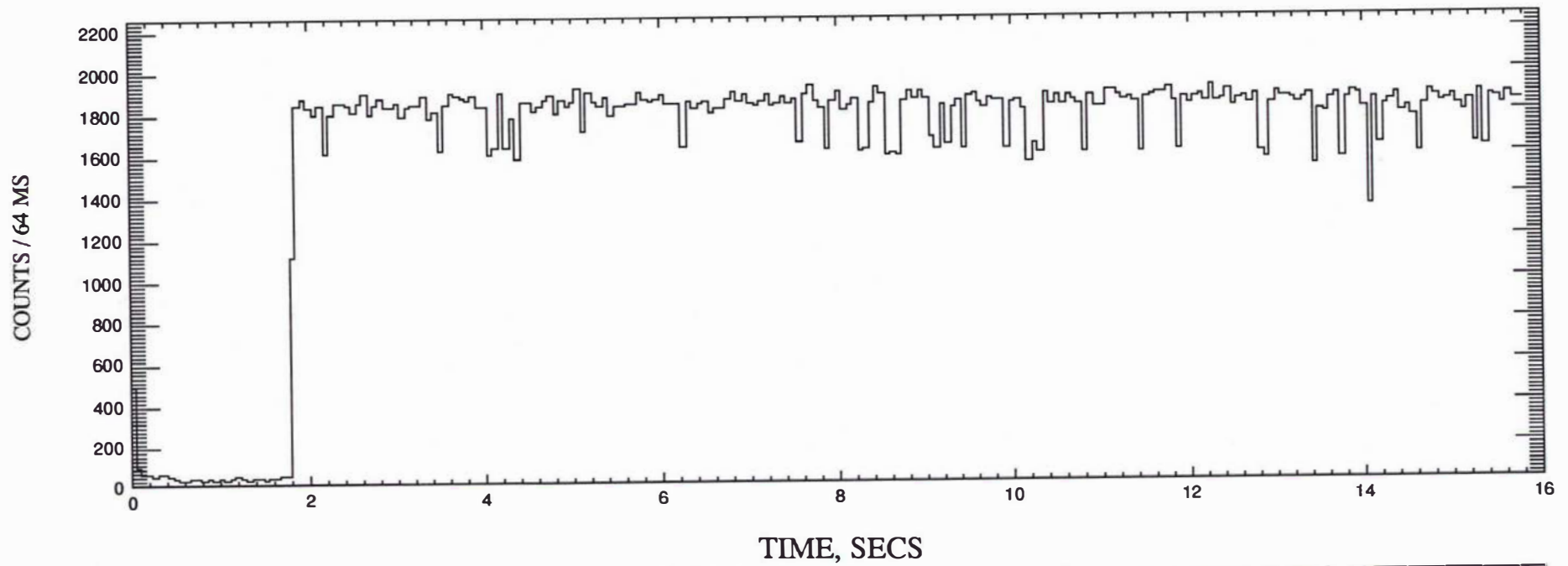
Burst Counter 12 at UT=21.908932982551 h=78872.159 s 21:54:32.159

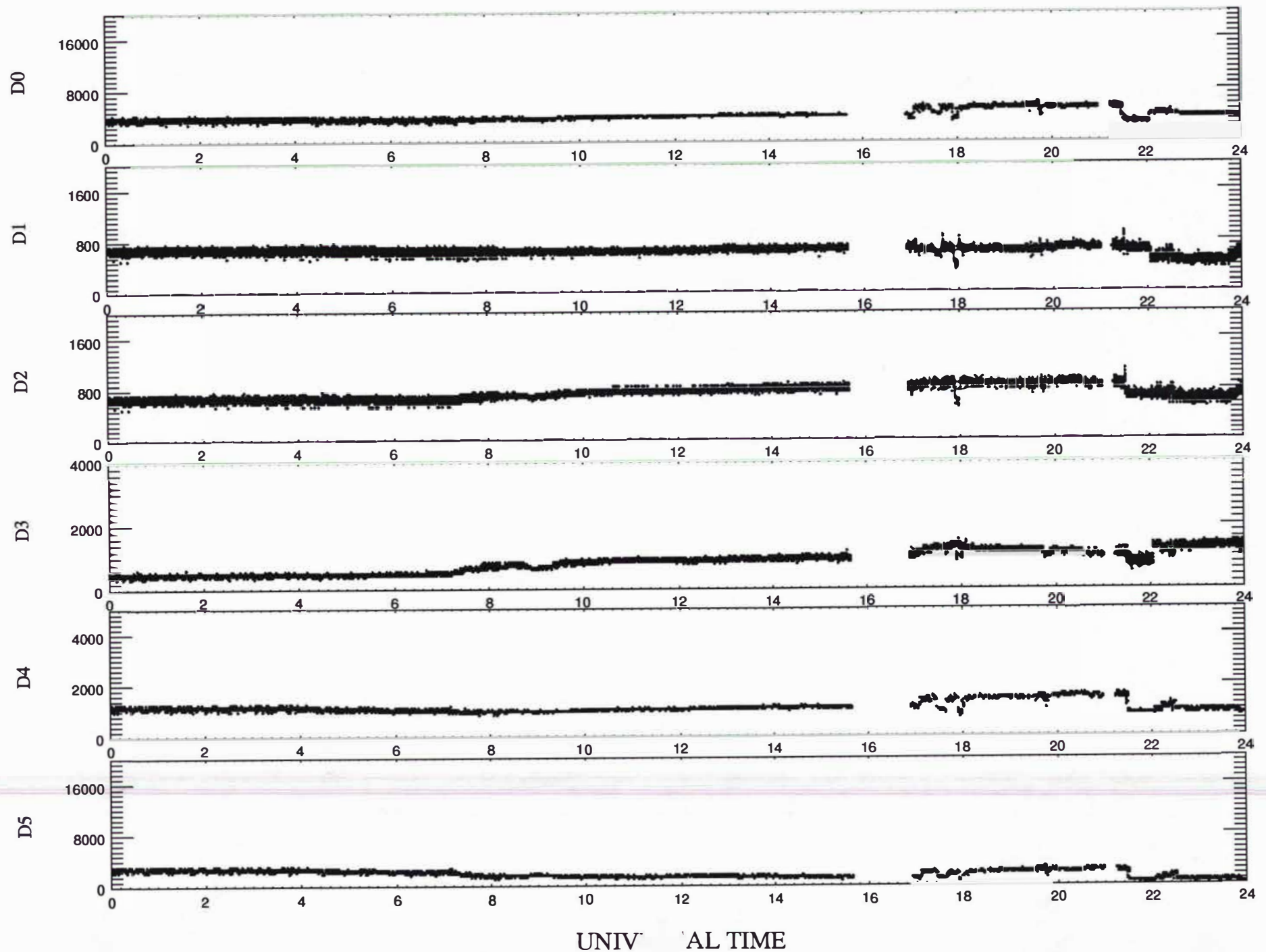


Burst Counter 13 at UT=22.611168039110 h=81400.205 s 22:36:40.205



Burst Counter 14 at UT=23.313403095669 h=83928.251 s 23:18:48.251





Ron Zurek

4/11/91

GOES 7 sat sync orbit

Strong shock seen at earth - caution - this increased fluxes, fluences by $\times 10$ - if shock not seen at Ulysses could be $10\times$ less
As seen from earth: peak fluxes from 5 min augs

> 10 MeV - enormous event	40,000 *	part./cm ² s sr
> 30 MeV	6×10^3	
> 100 MeV - big	8.0×10^1	
1 GeV - average - small		

Conversion to fluence
by $\times 4\pi \times \text{time}$

part/cm²

> 10 MeV	9.5×10^9 c/cm ²
> 100 MeV	1.4×10^6 c/cm ²
> 1 GeV	

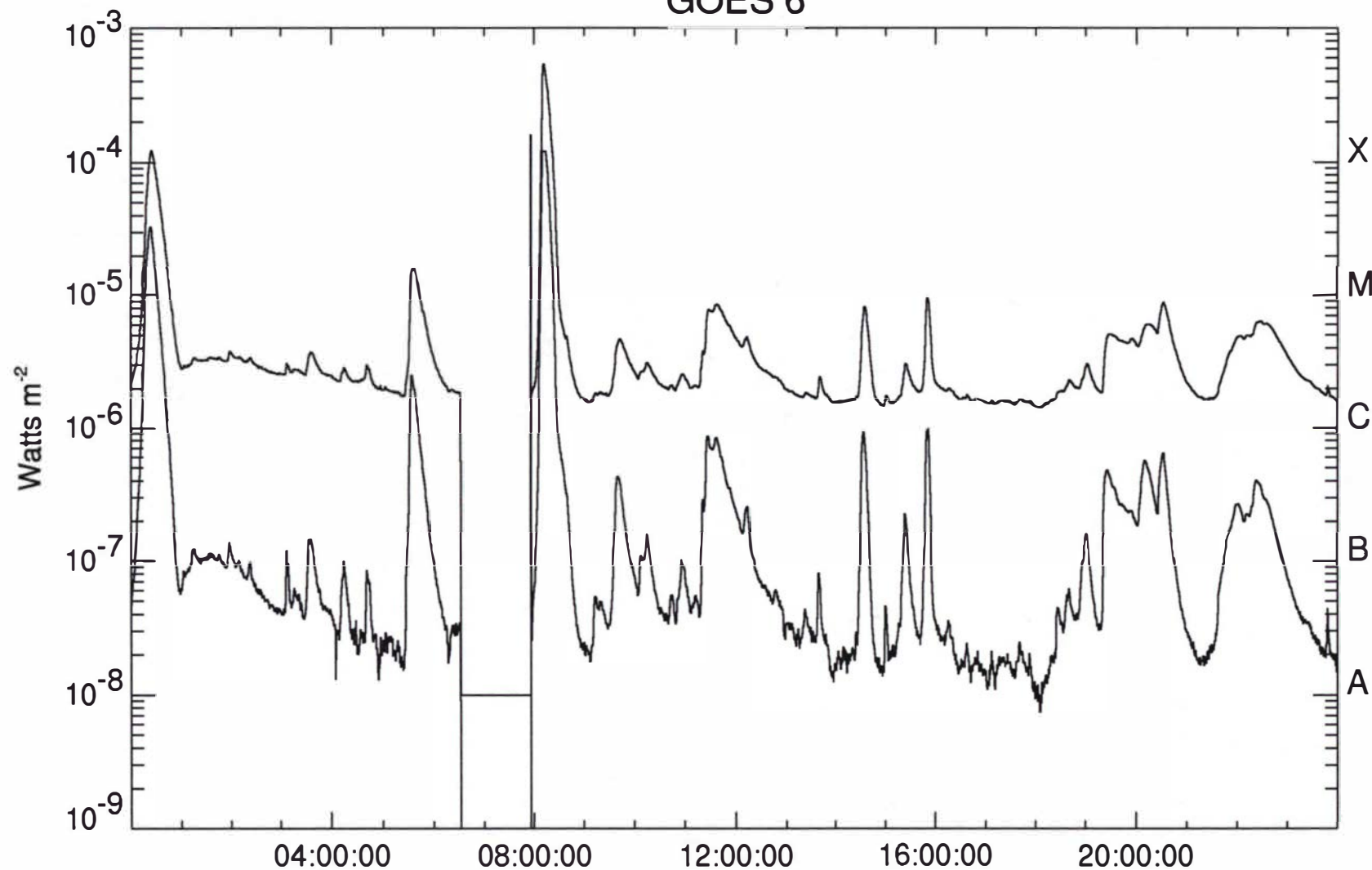
Cf Oct 19, 89 event > 10 1.2×10^{10} c/cm²
 $\approx$ Aug 72 and Mar 91 was close to them

* w/o shock could have been $\sim 7-8000$ only! it peaked at only $\sim 2-3000$ prior to shock!

They see particles up to ~ 300 MeV - lots of structure in IPM

26 Mar Sun Earth S/C L 100° ; range wrt Sun 2.5 AU
Ask Rob - when did event peak on Ulysses

GOES 6



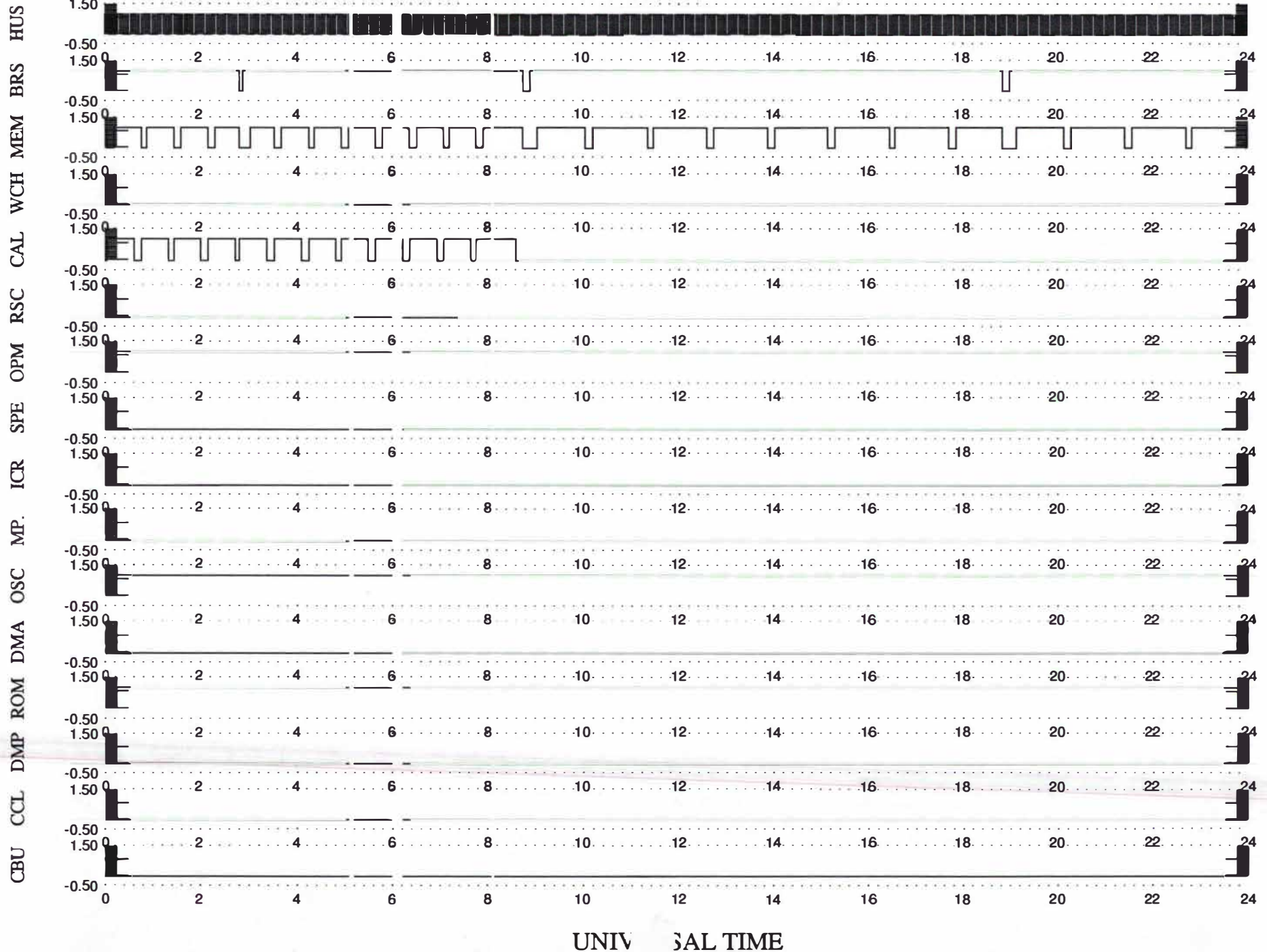
Data Start: 91/03/25, 0000:01

Channel 1 (1.0 - 8.0 Angstroms)
Channel 2 (0.5 - 4.0 Angstroms)

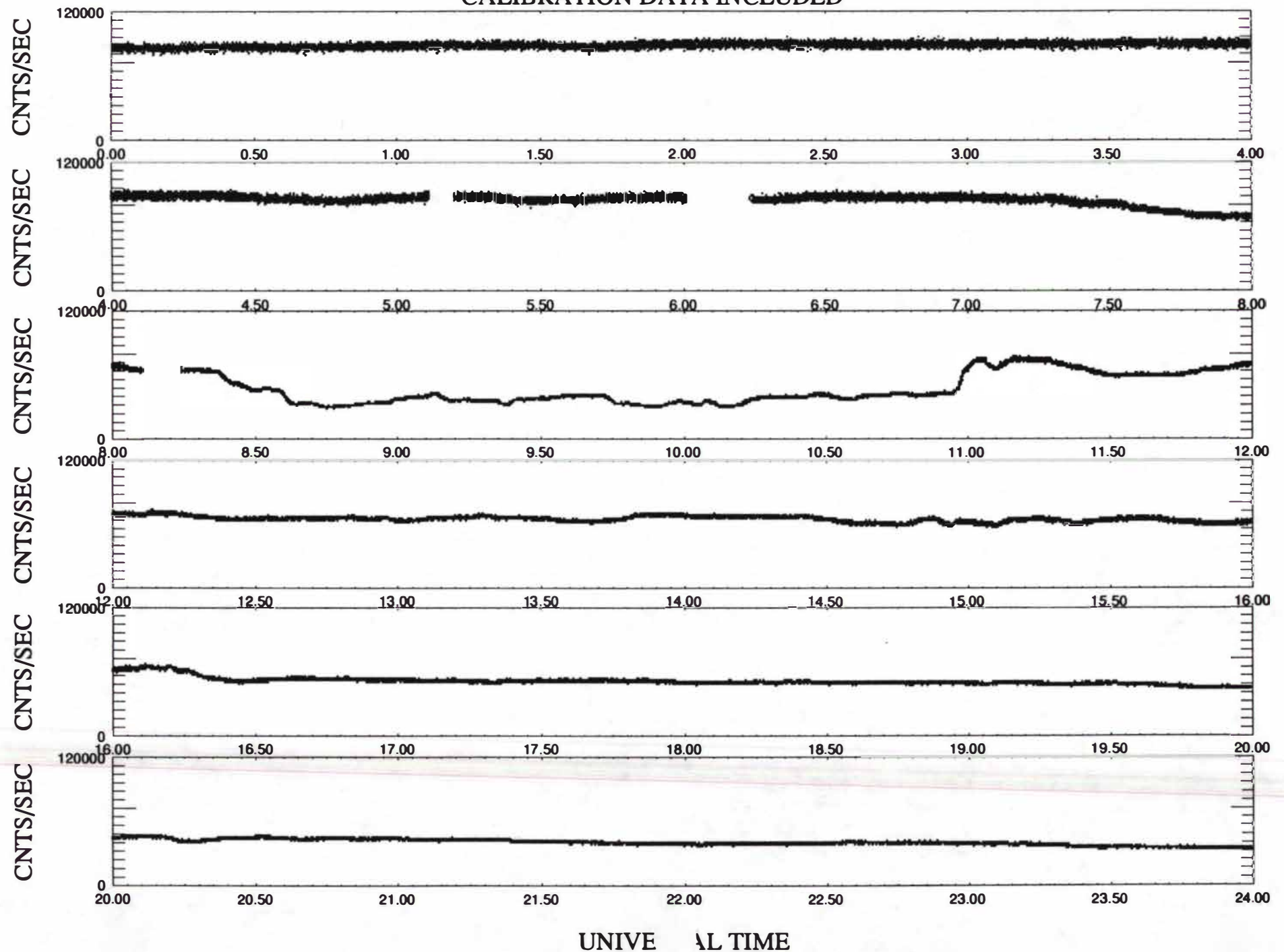
Plot created: 96/11/26, 1909

Background not subtracted
Background not subtracted
Sample average = 10

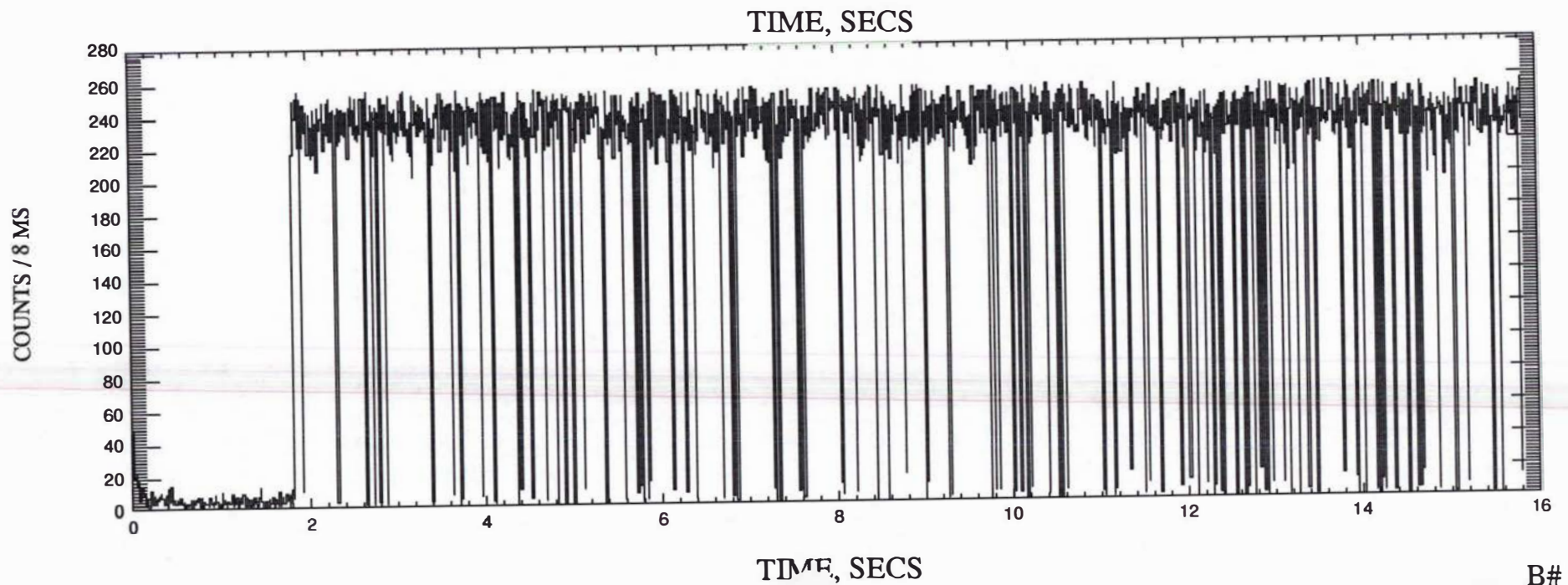
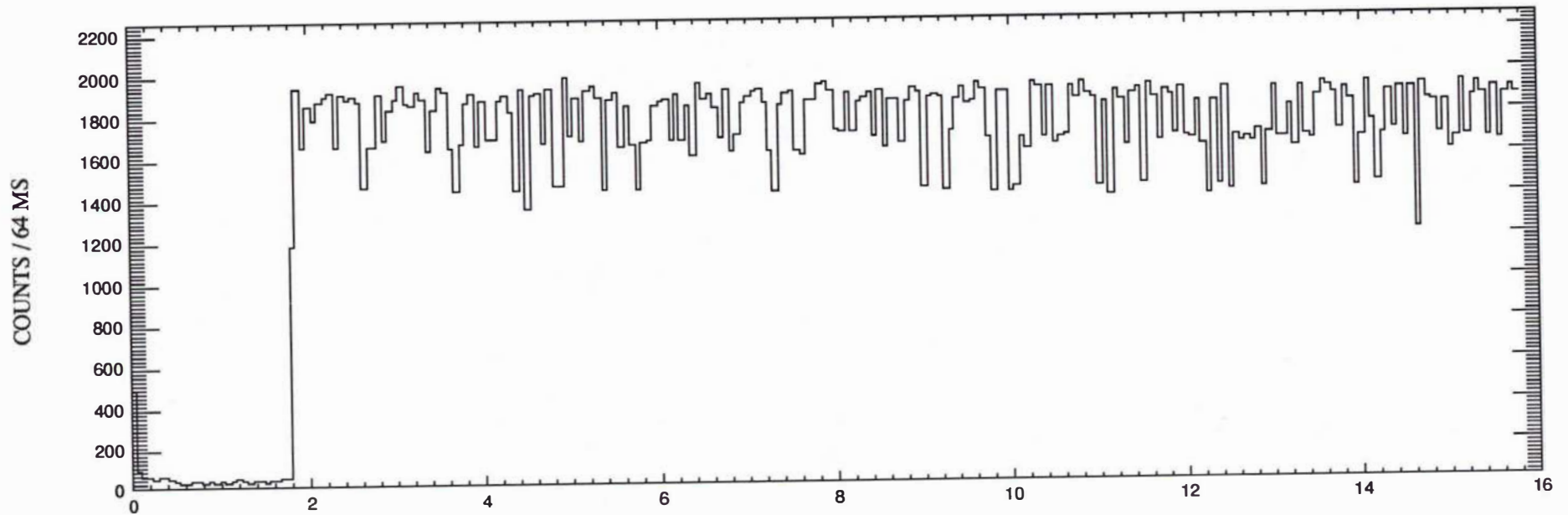
BURST NUMBER 15, 0 - 15, 0 - 6



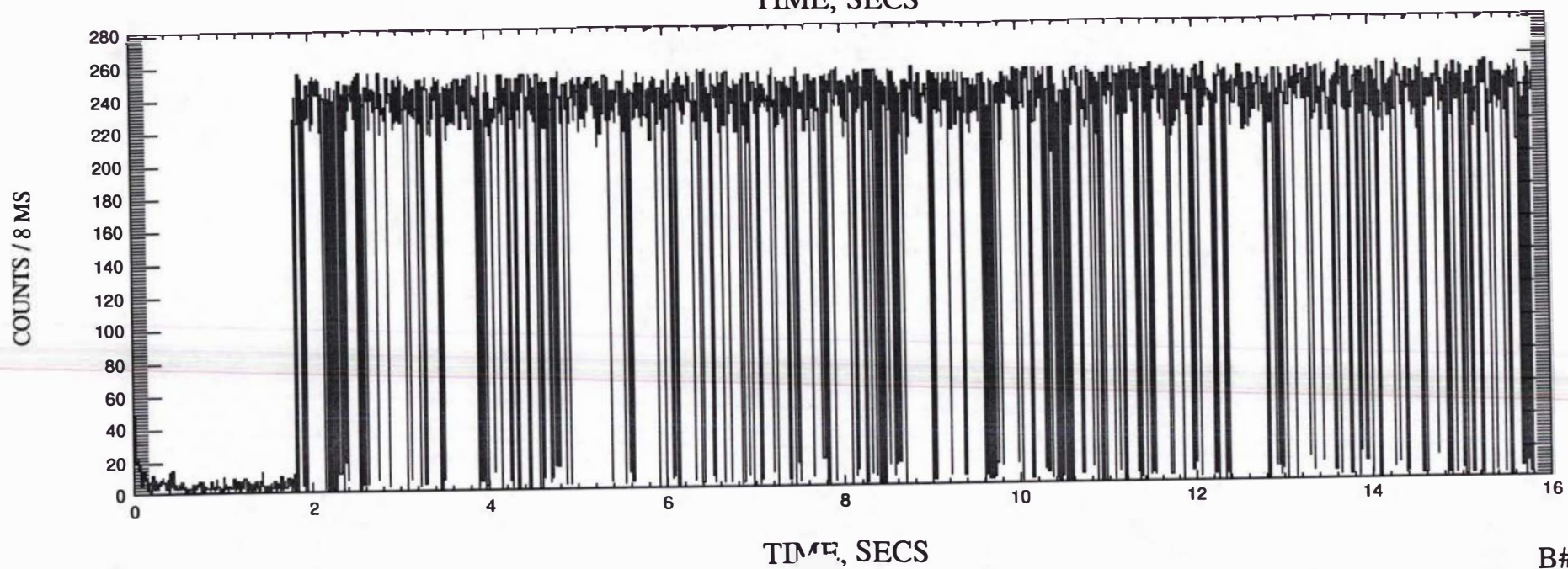
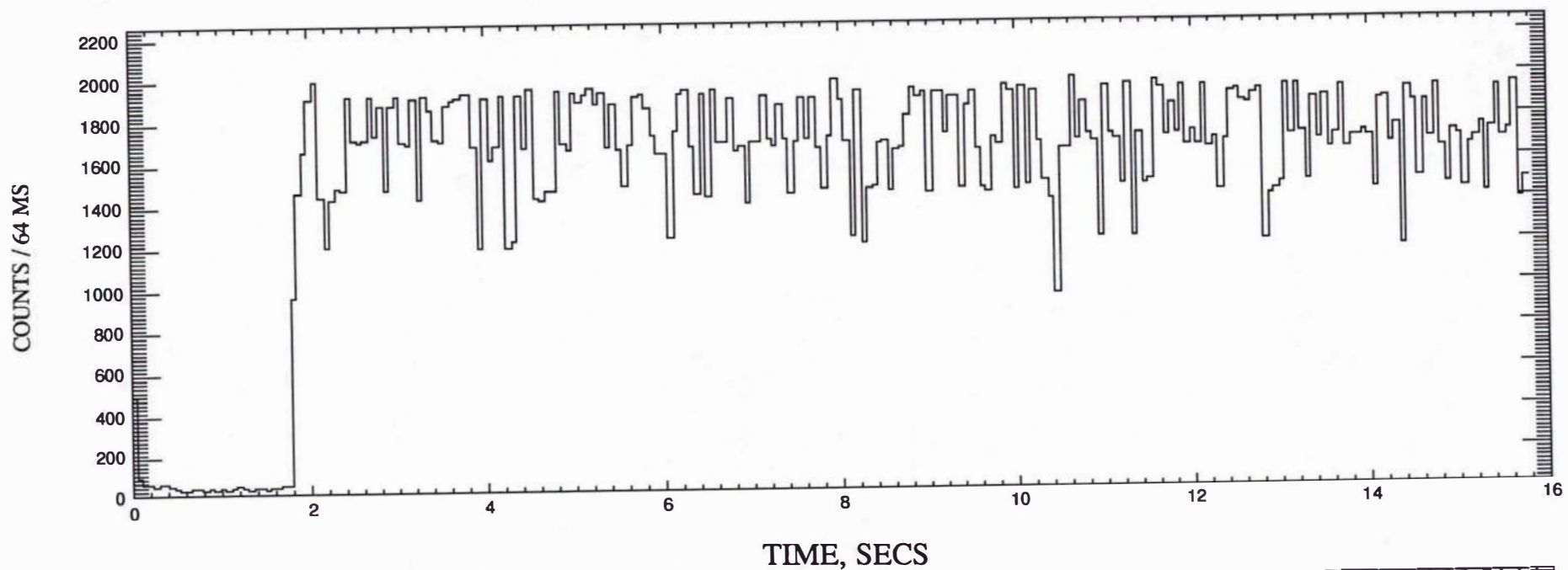
CALIBRATION DATA INCLUDED



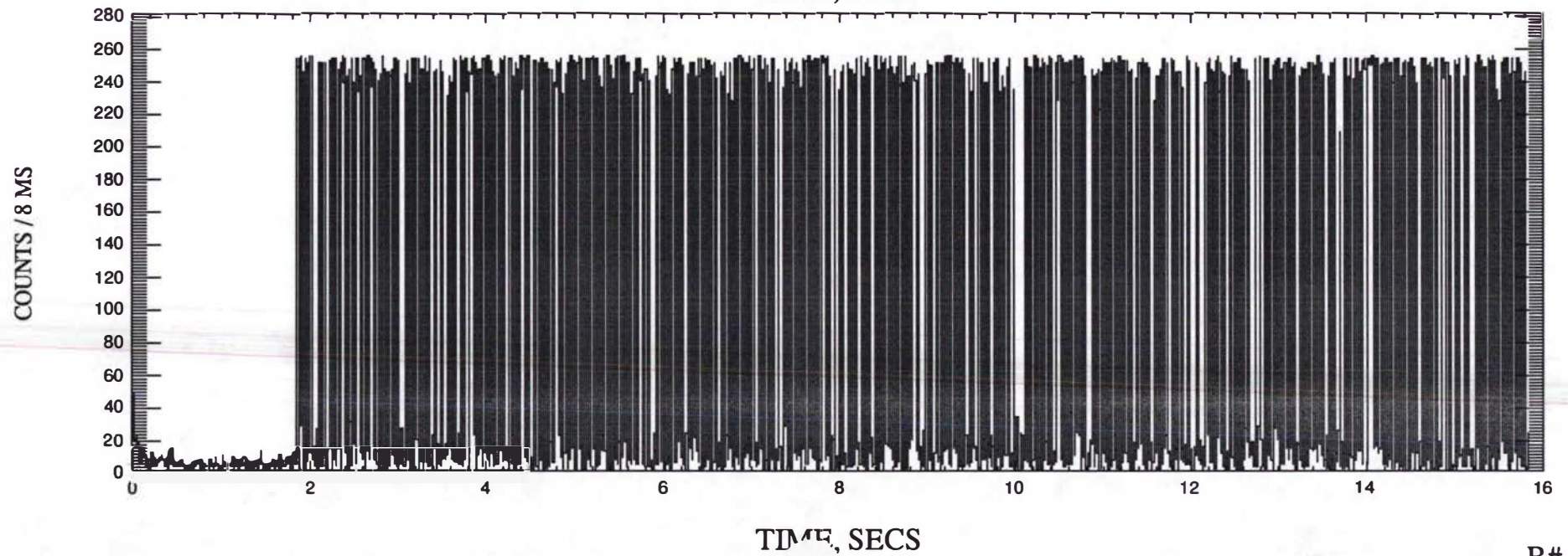
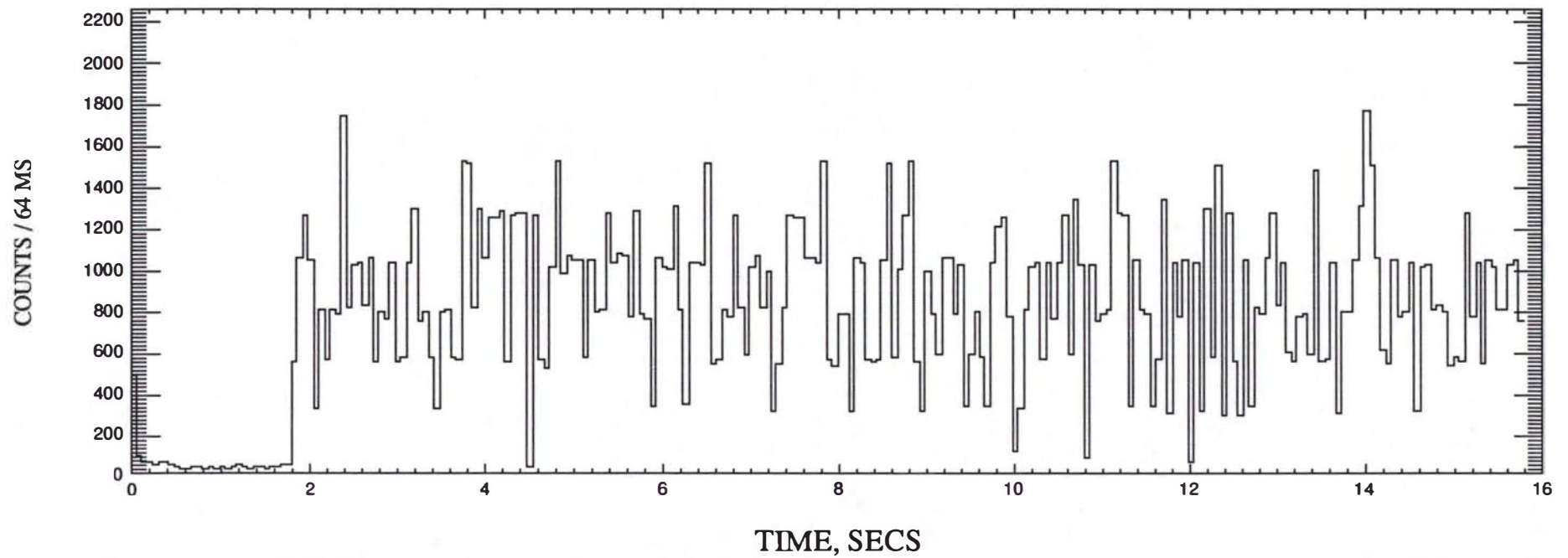
Burst Counter 15 at UT= 0.015638156467 h= 56.297 s 00:00:56.297



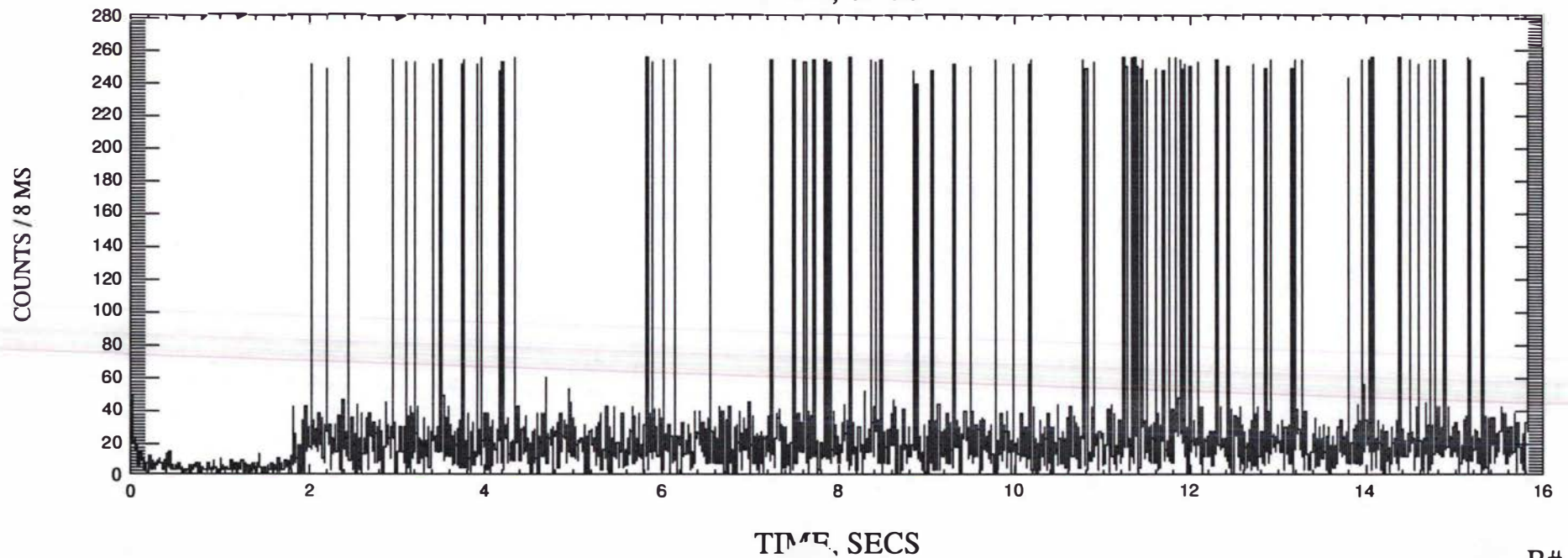
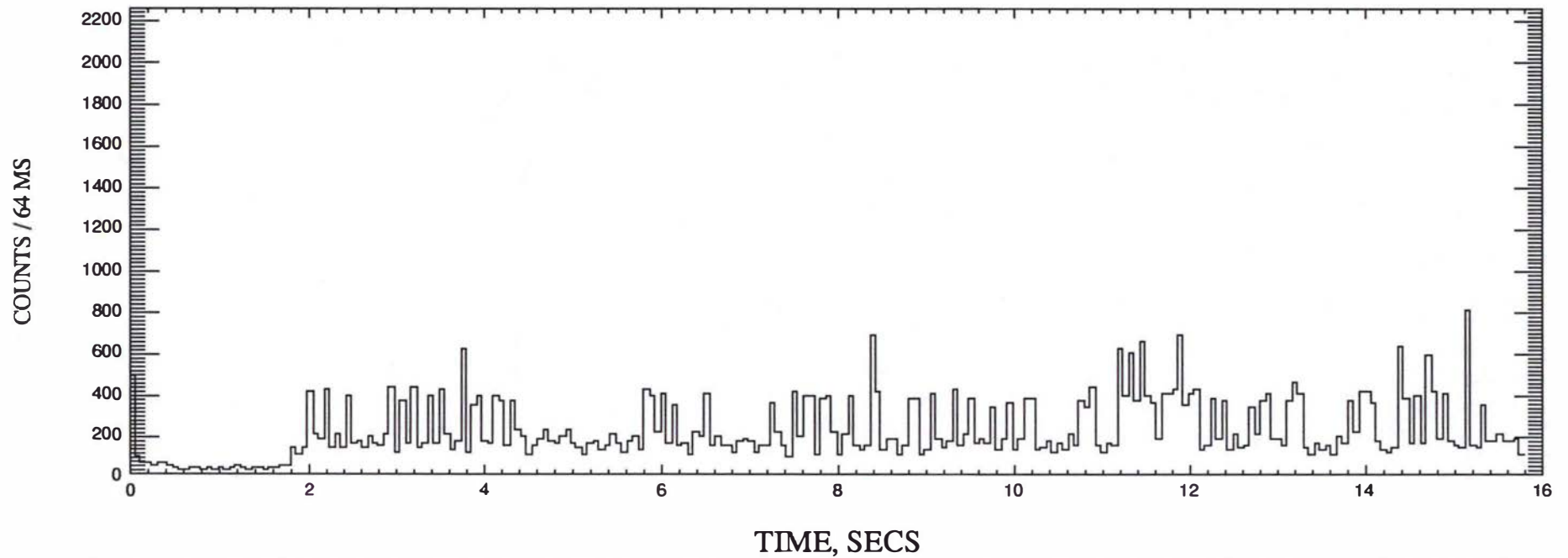
Burst Counter 0 at UT= 0.717873213026 h= 2584.344 s 00:43:04.344



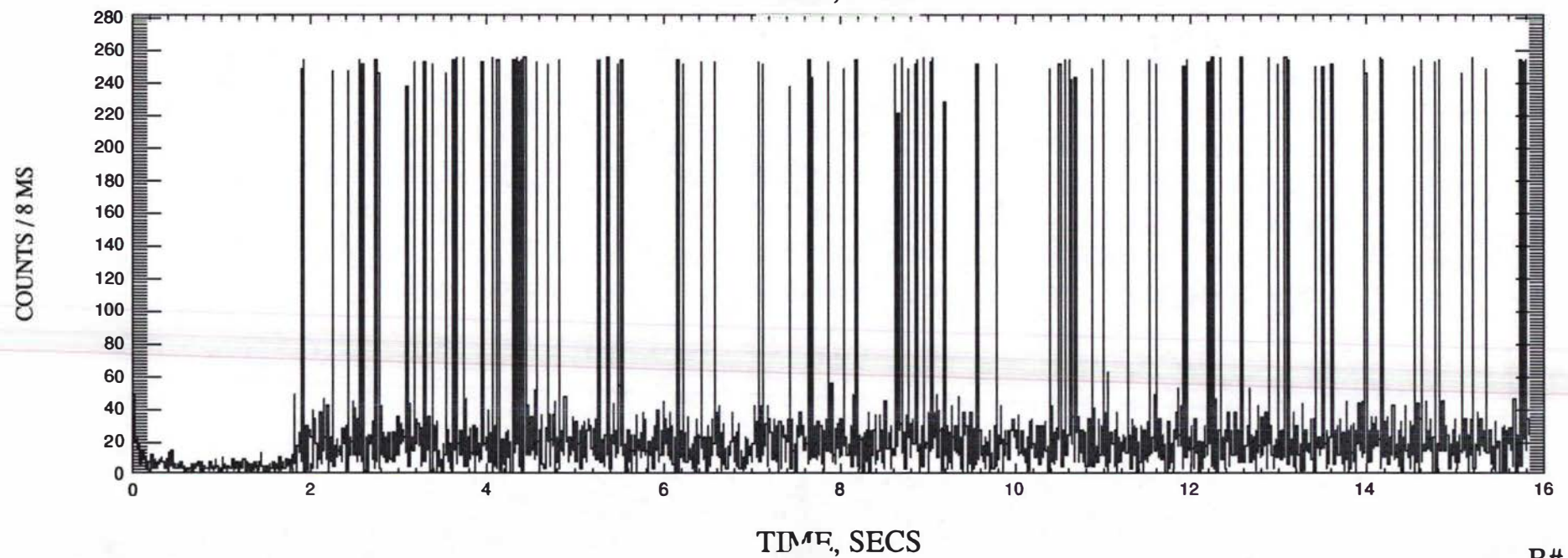
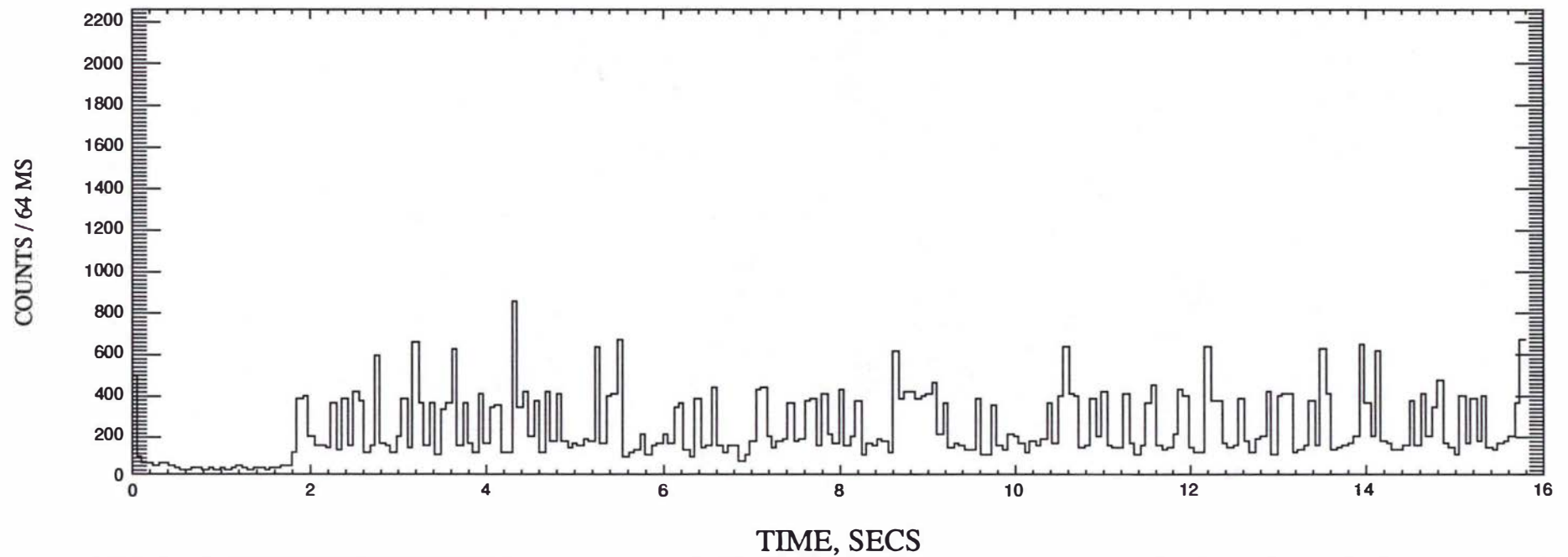
Burst Counter 1 at UT= 1.420108269586 h= 5112.390 s 01:25:12.390



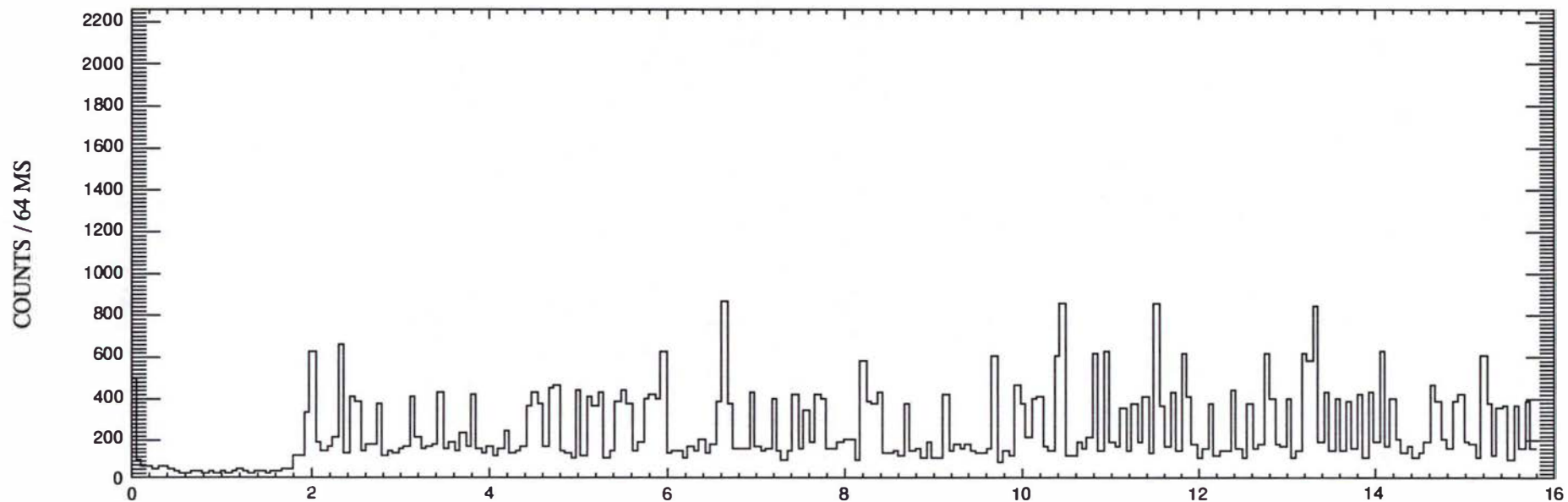
Burst Counter 2 at UT= 2.122343326145 h= 7640.436 s 02:07:20.436



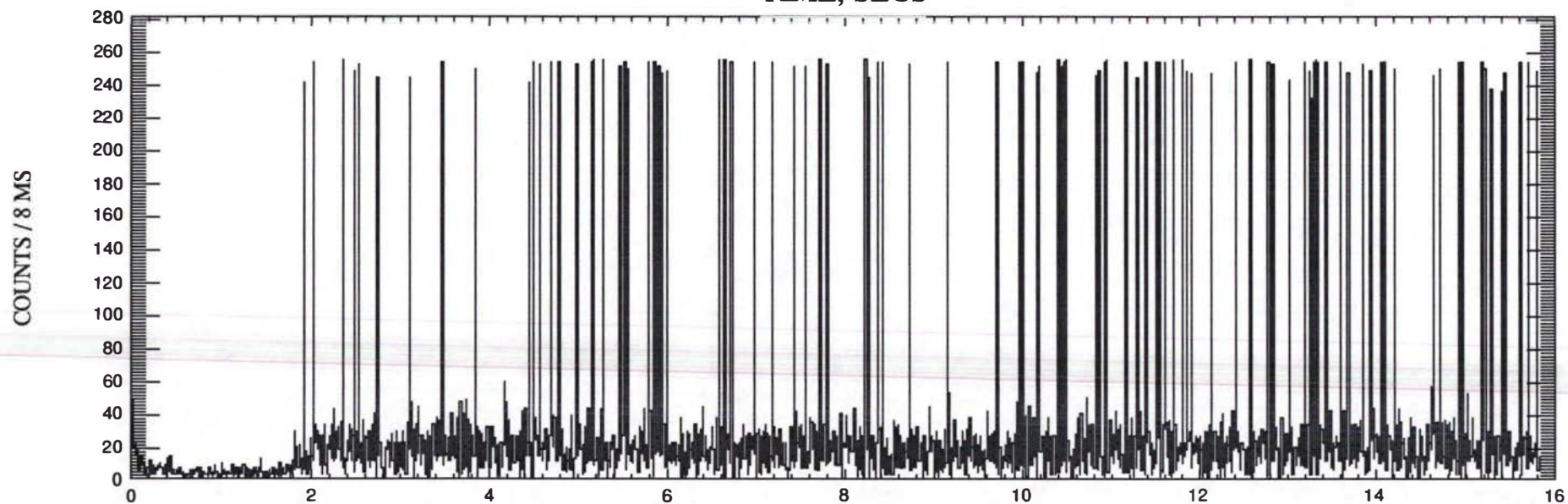
Burst Counter 3 at UT= 2.824578386943 h=10168.482 s 02:49:28.482



Burst Counter 4 at UT= 3.526812159220 h=12696.524 s 03:31:36.524

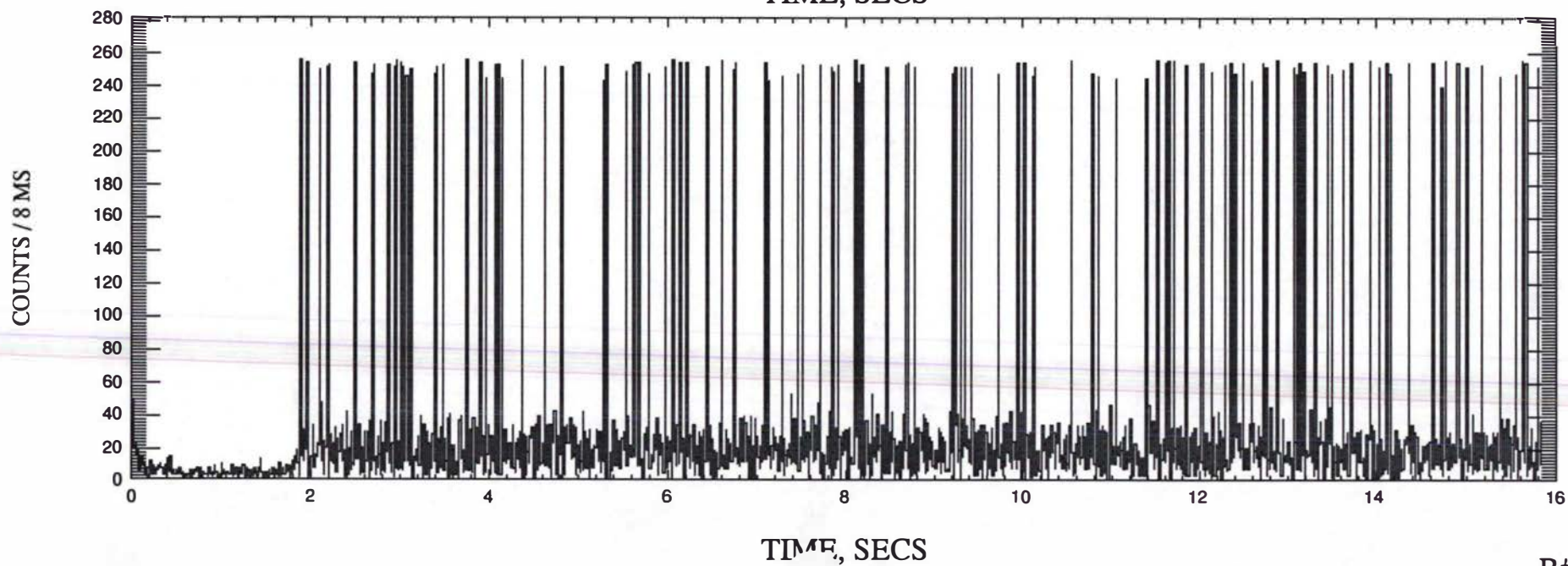
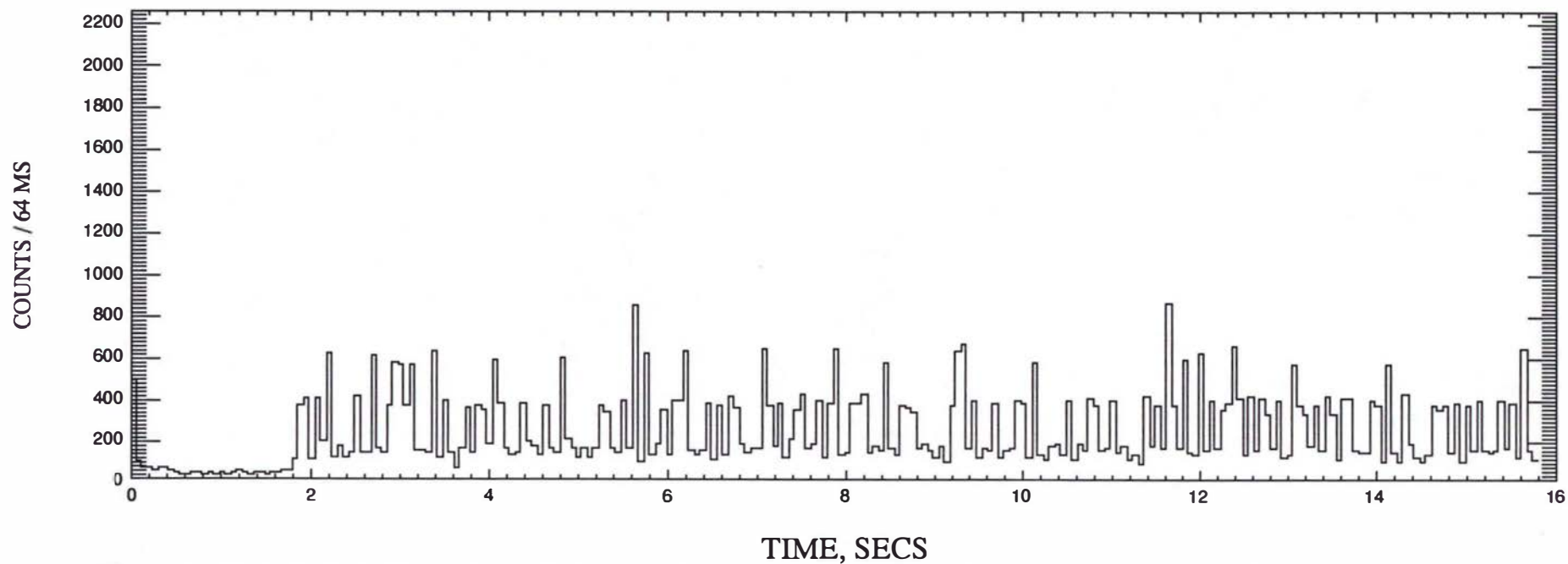


TIME, SECS

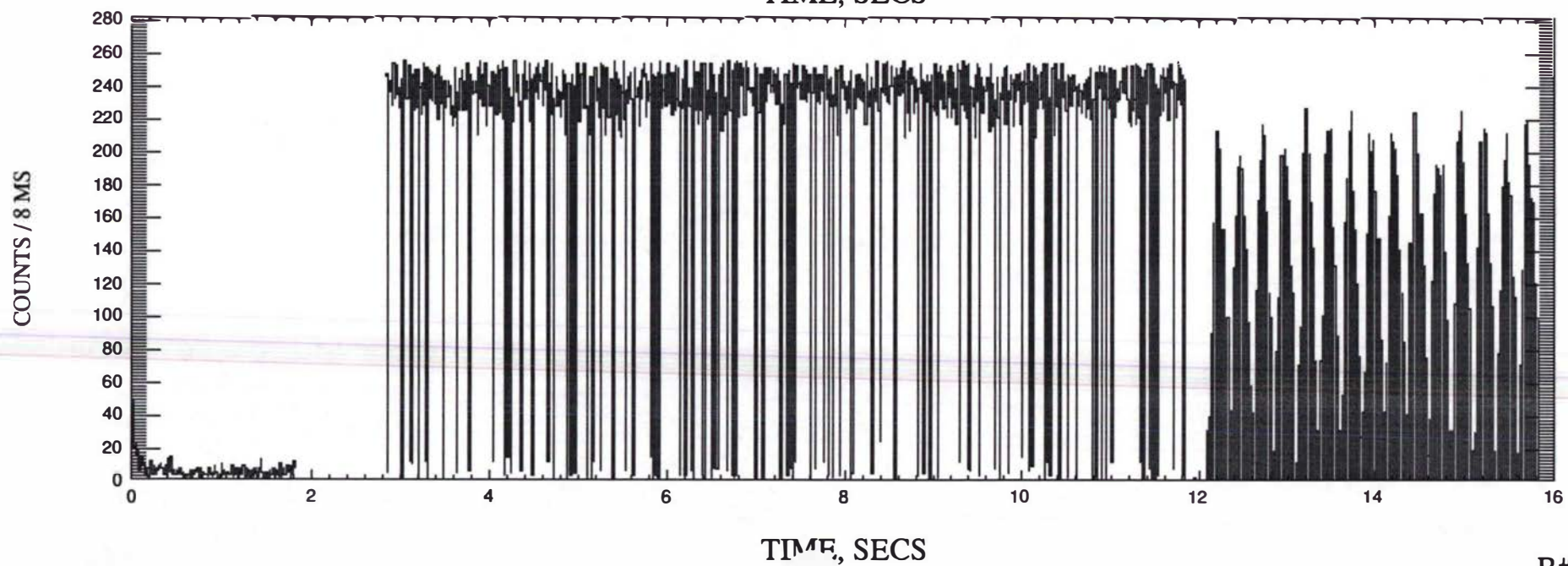
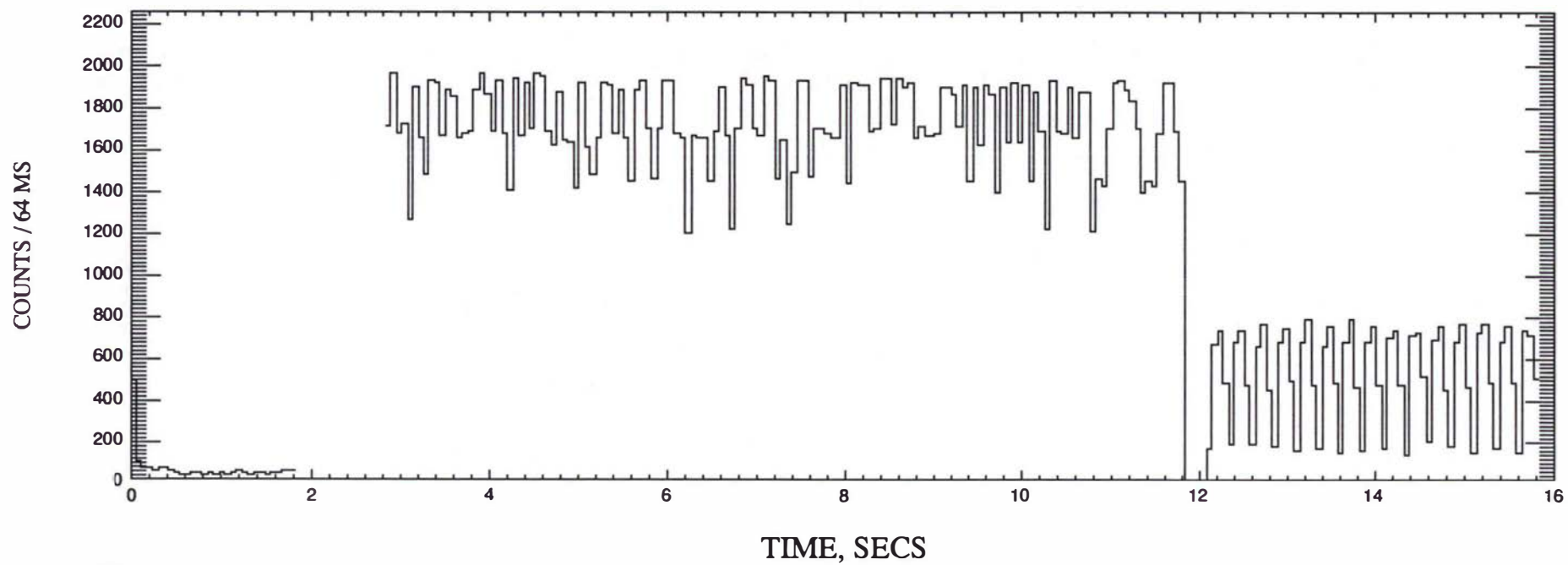


TIME, SECS

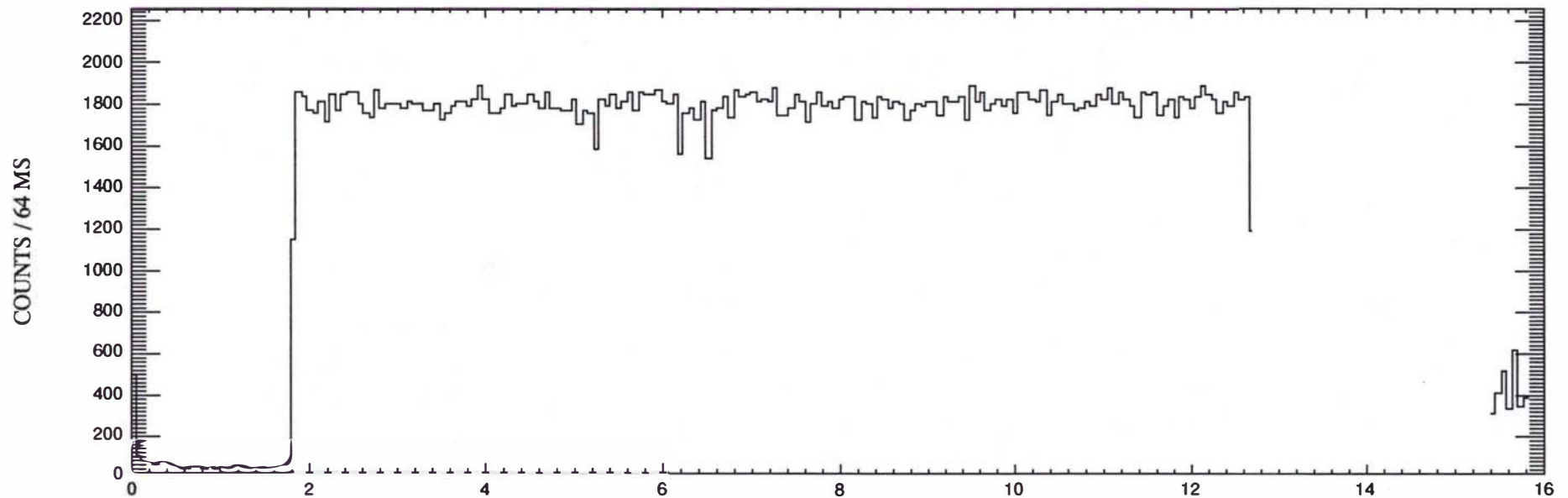
Burst Counter 5 at UT= 4.229047220018 h=15224.570 s 04:13:44.570



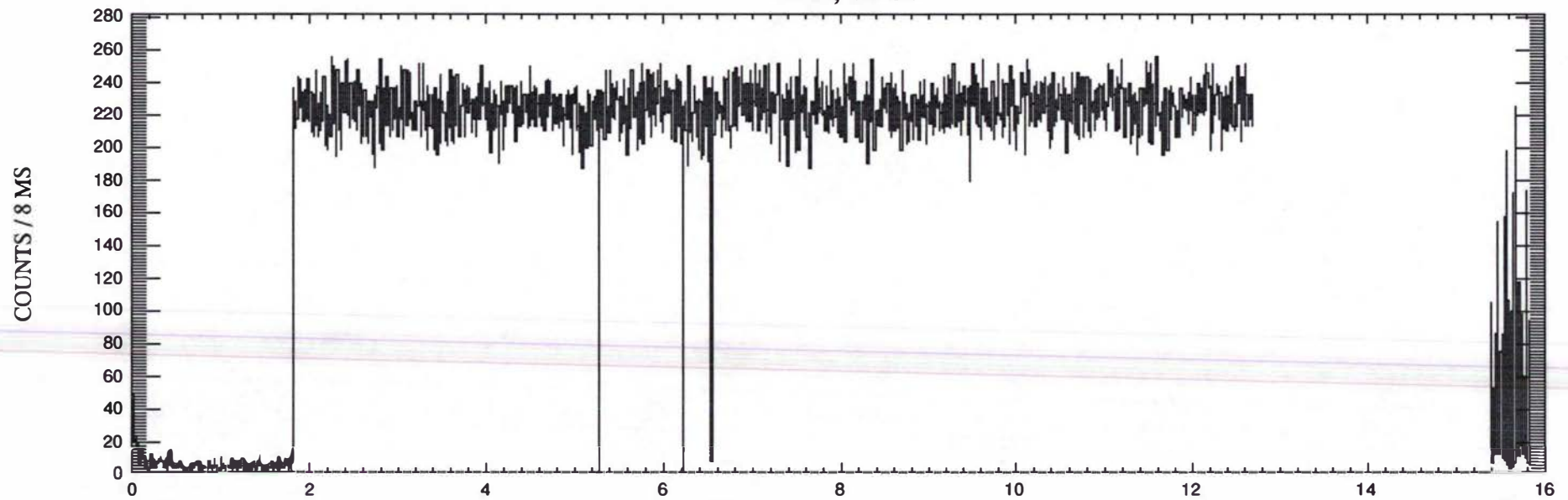
Burst Counter 6 at UT= 4.931282276577 h=17752.616 s 04:55:52.616



Burst Counter 7 at UT= 5.633517333137 h=20280.662 s 05:38:00.662

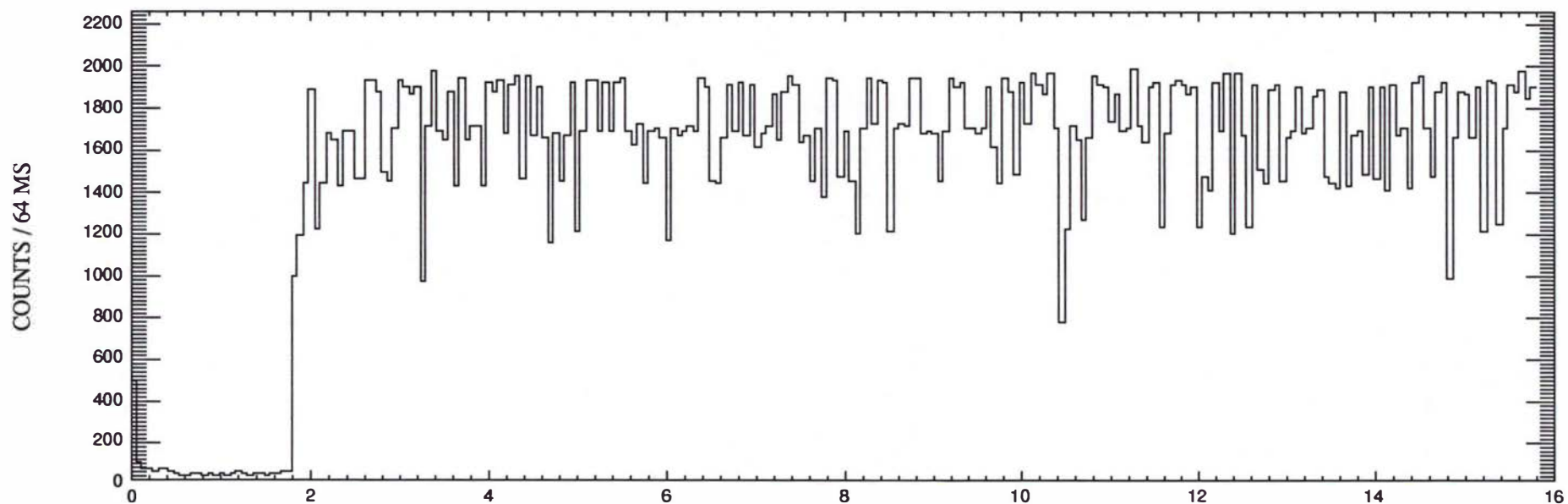


TIME, SECS

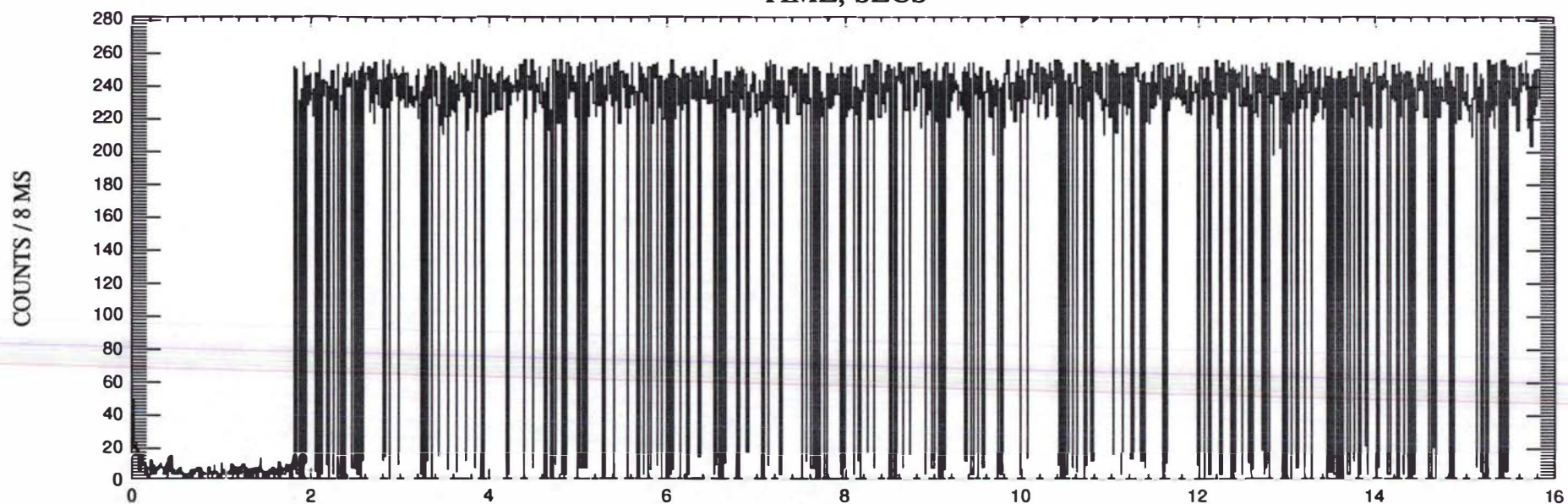


TIME, SECS

Burst Counter 9 at UT= 7.037987768385 h=25336.756 s 07:02:16.756

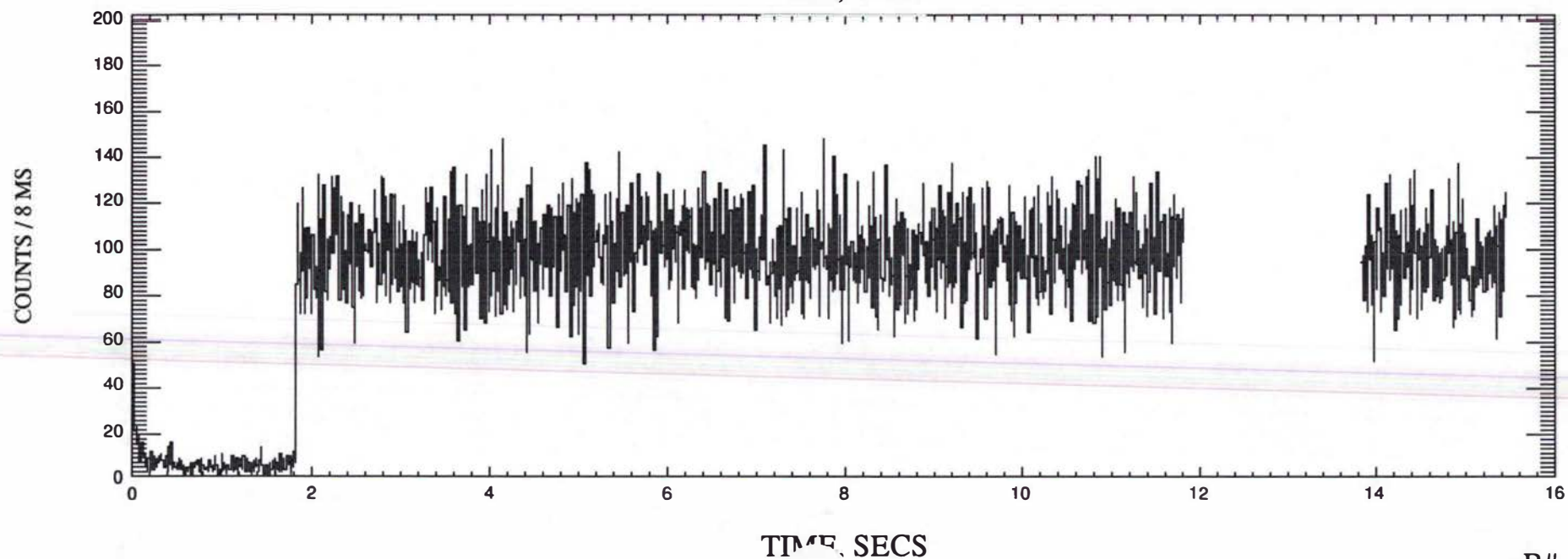
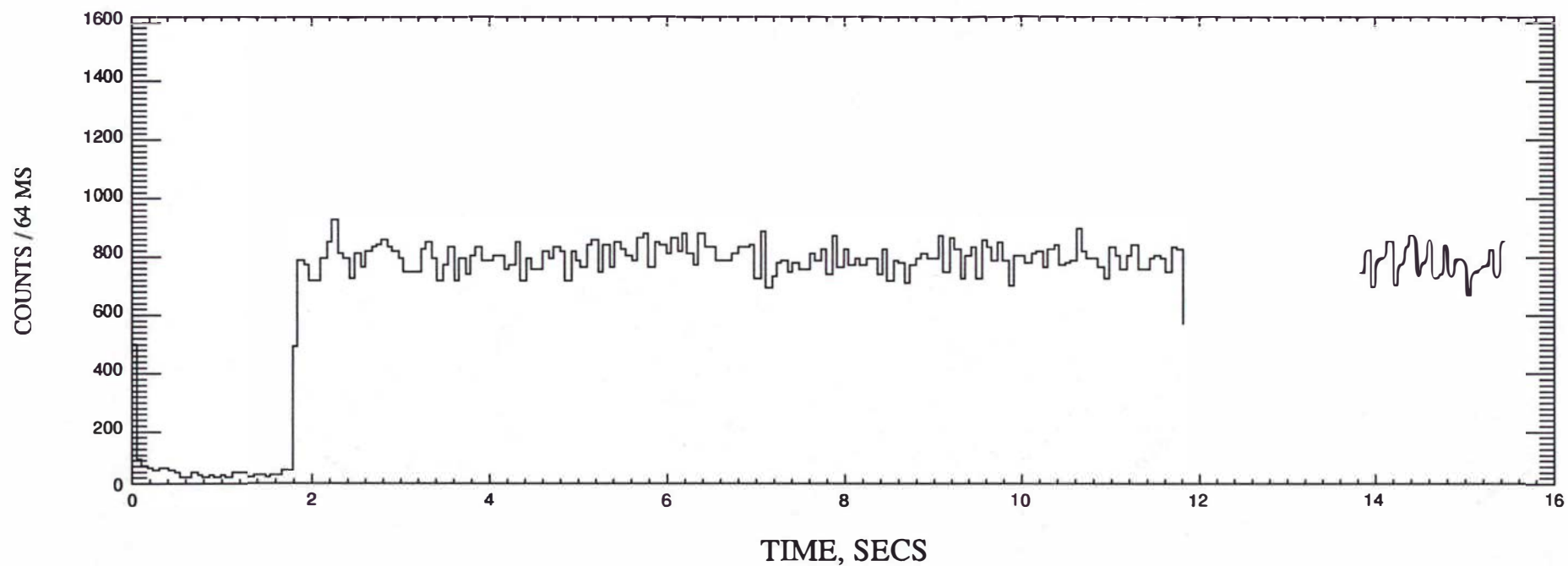


TIME, SECS

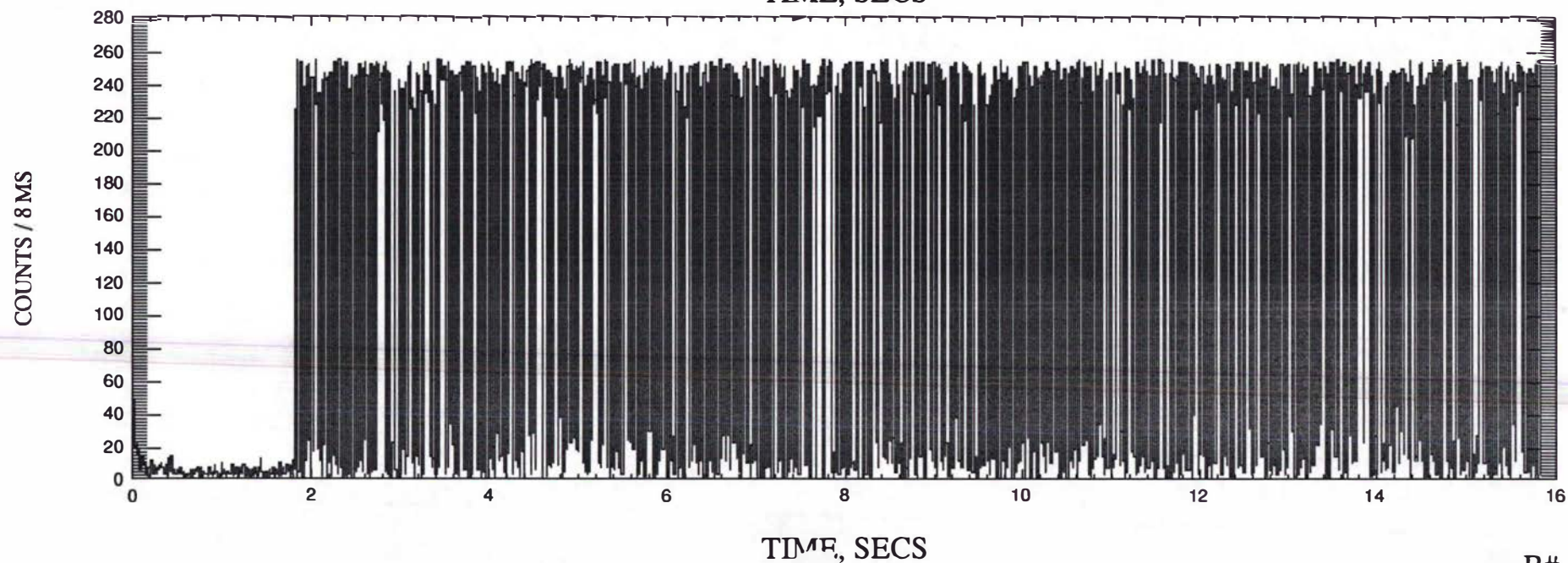
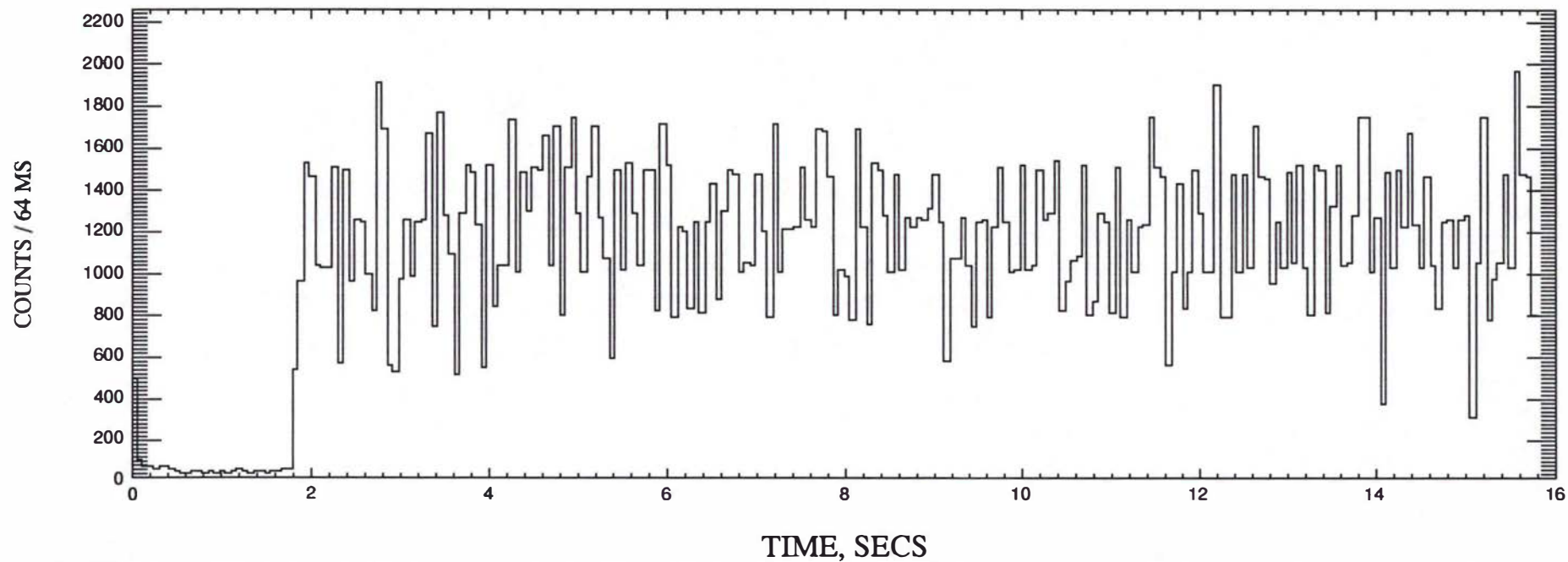


TIME, SECS

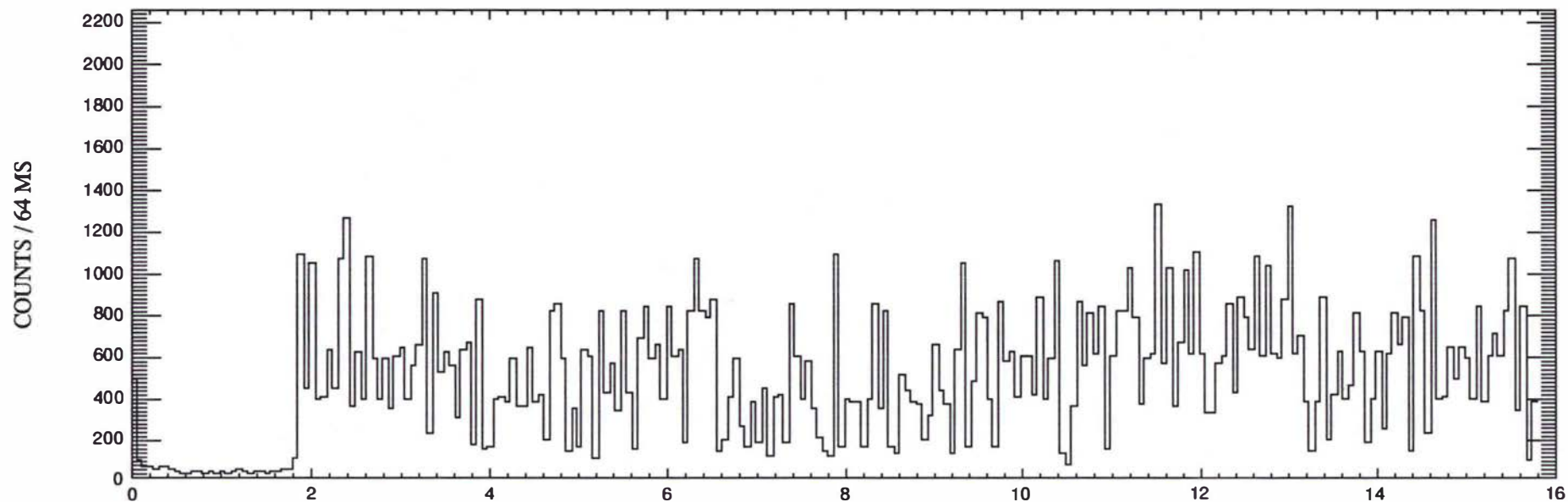
Burst Counter 10 at UT= 7.740222829183 h=27864.802 s 07:44:24.802



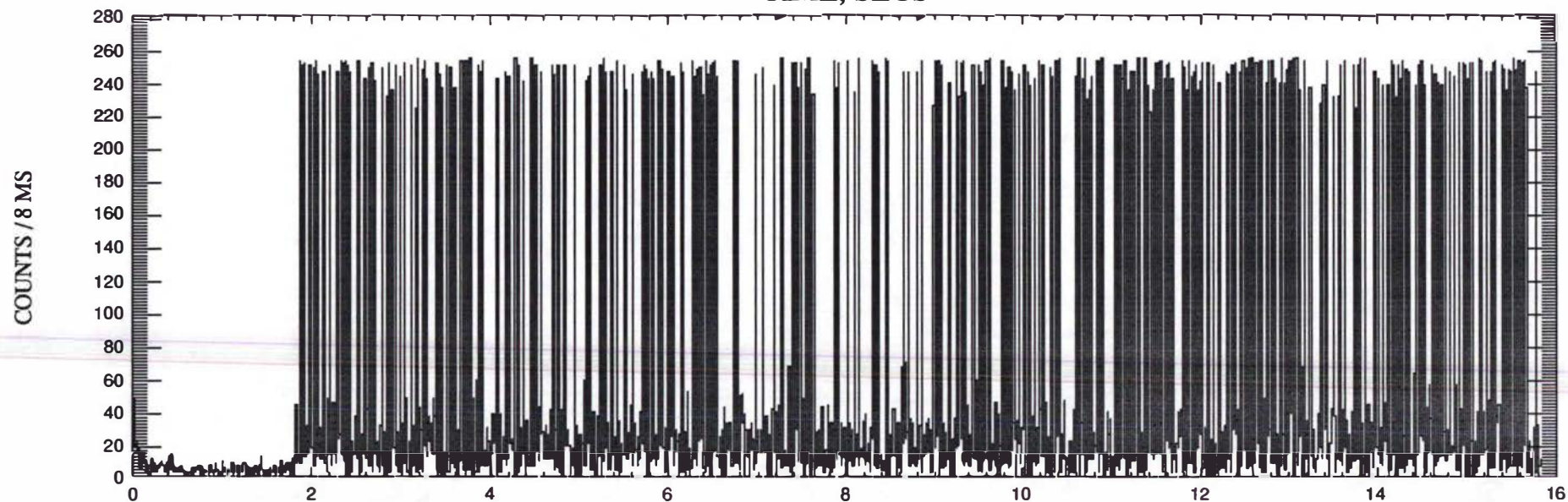
Burst Counter 11 at UT= 8.780240156386 h=31608.865 s 08:46:48.865



Burst Counter 12 at UT=10.042482914395 h=36152.938 s 10:02:32.938

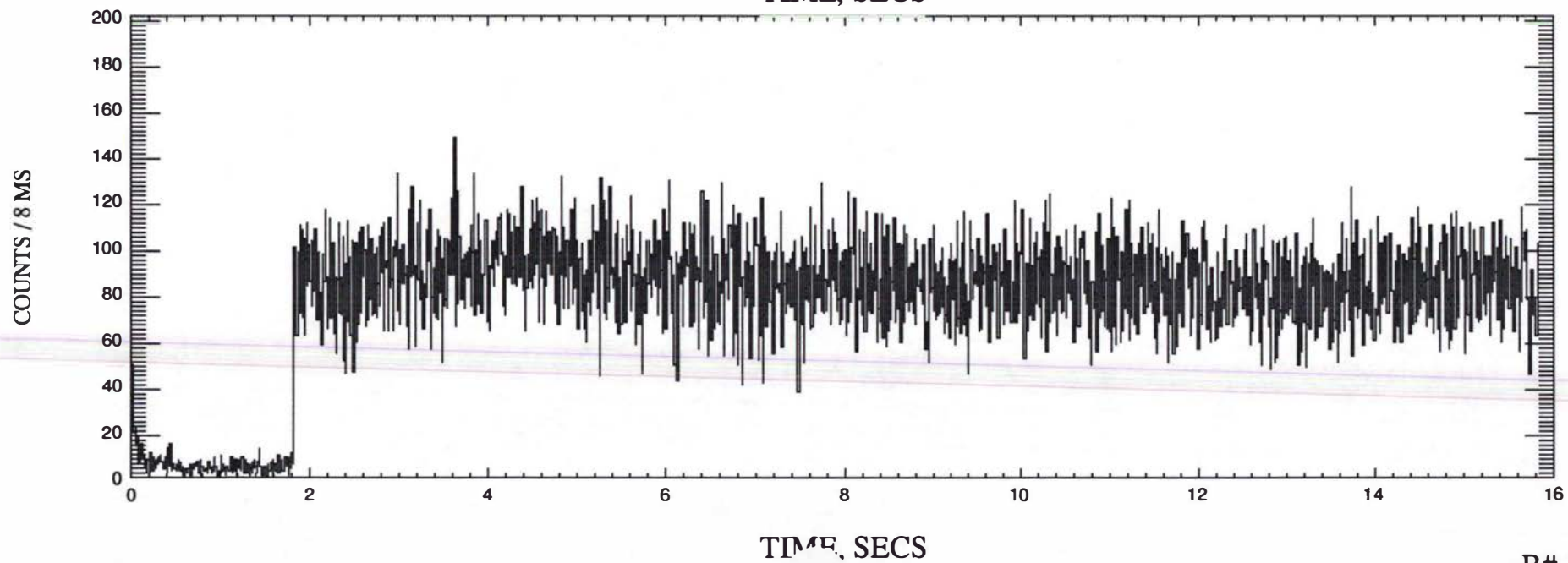
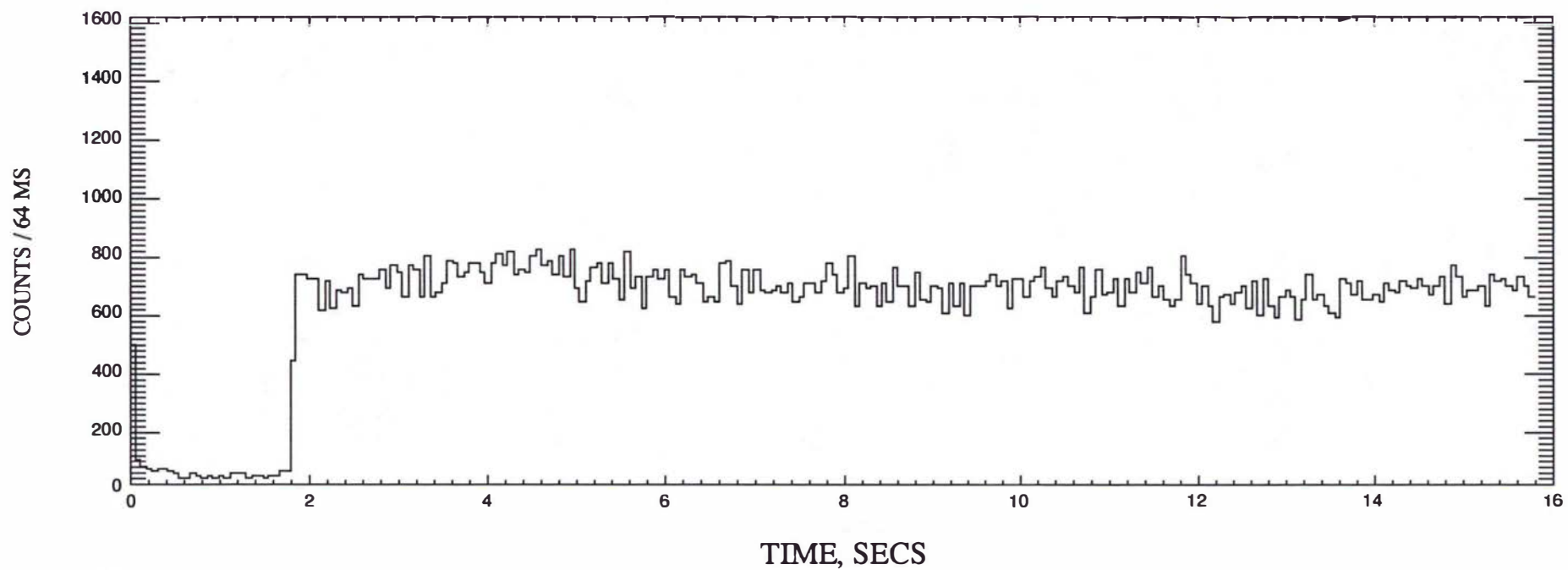


TIME, SECS

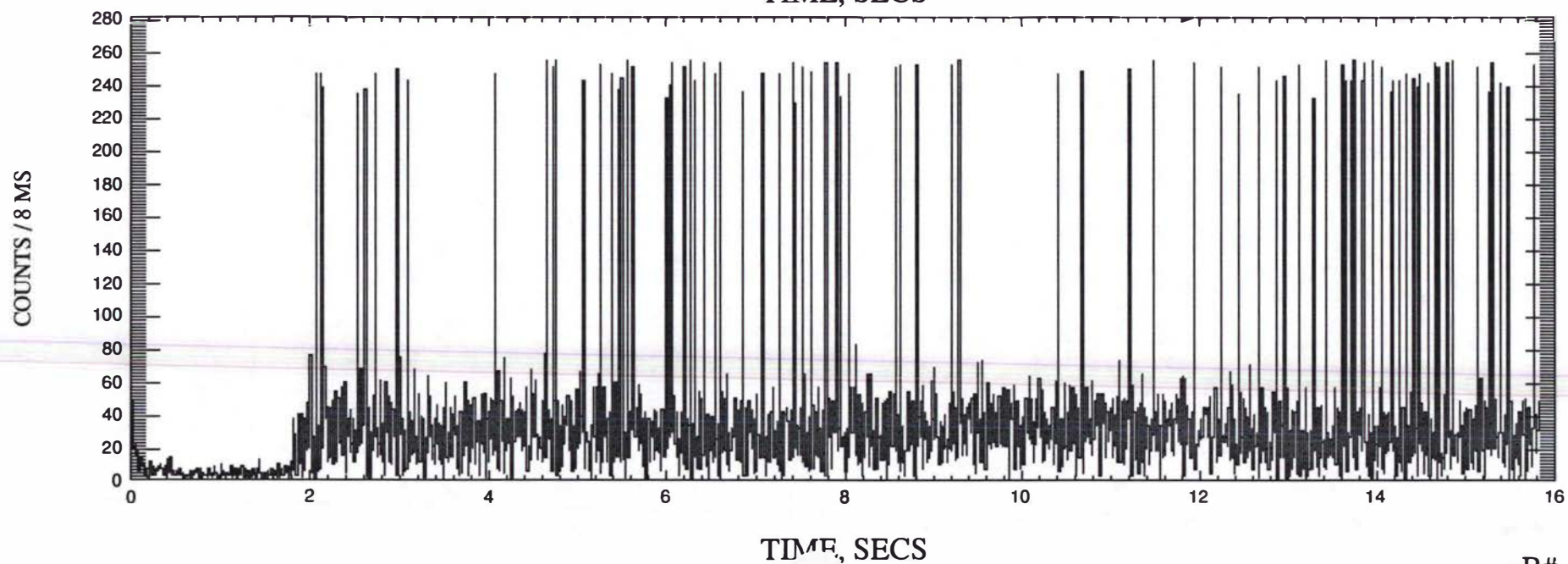
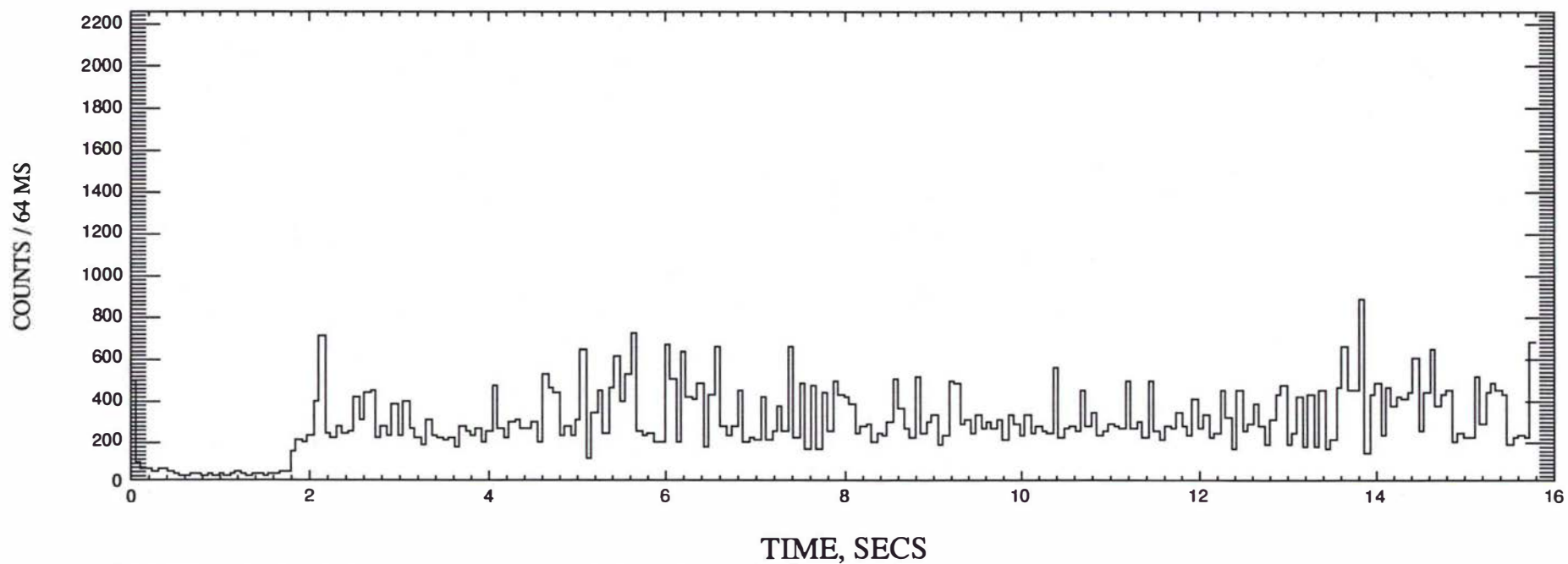


TIME, SECS

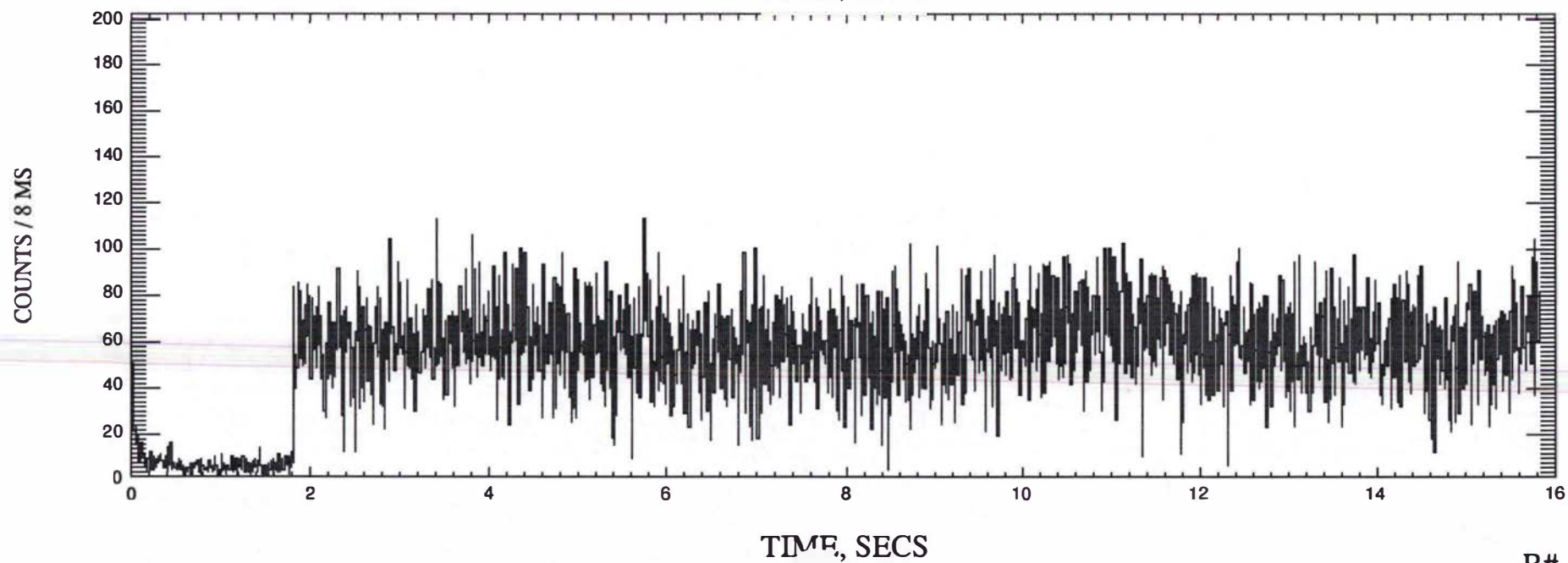
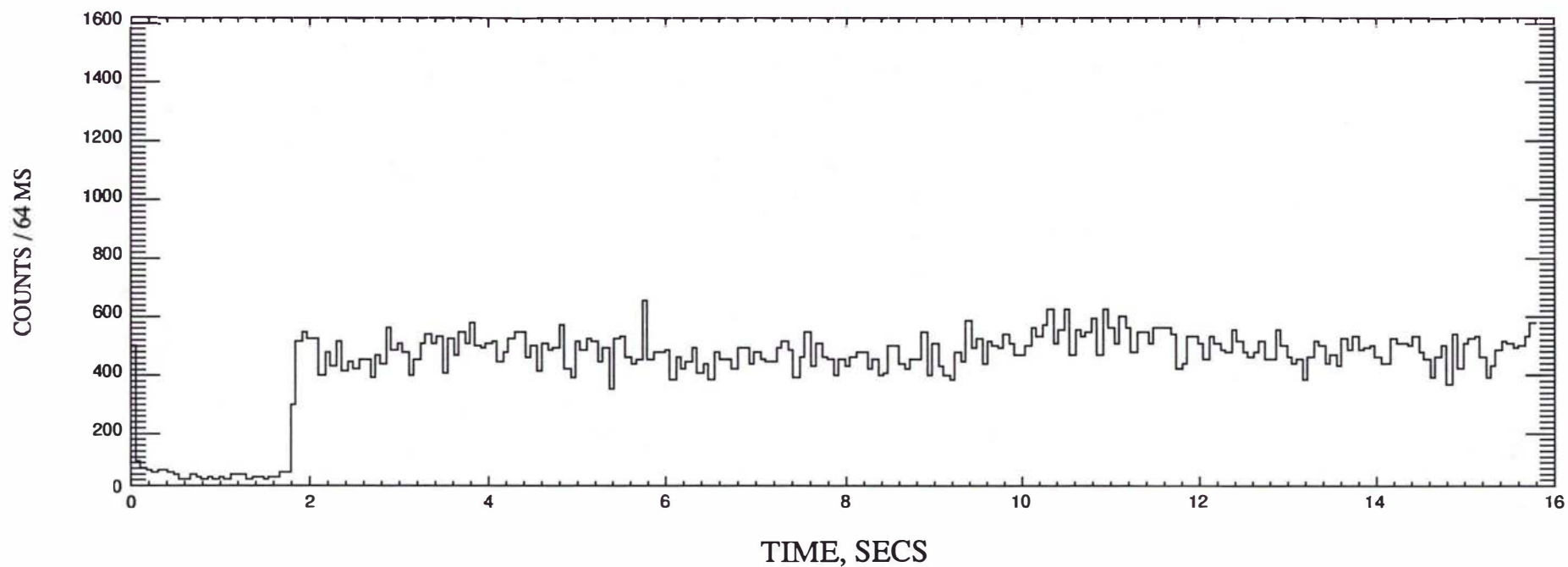
Burst Counter 13 at UT=11.304728240967 h=40697.022 s 11:18:17.022



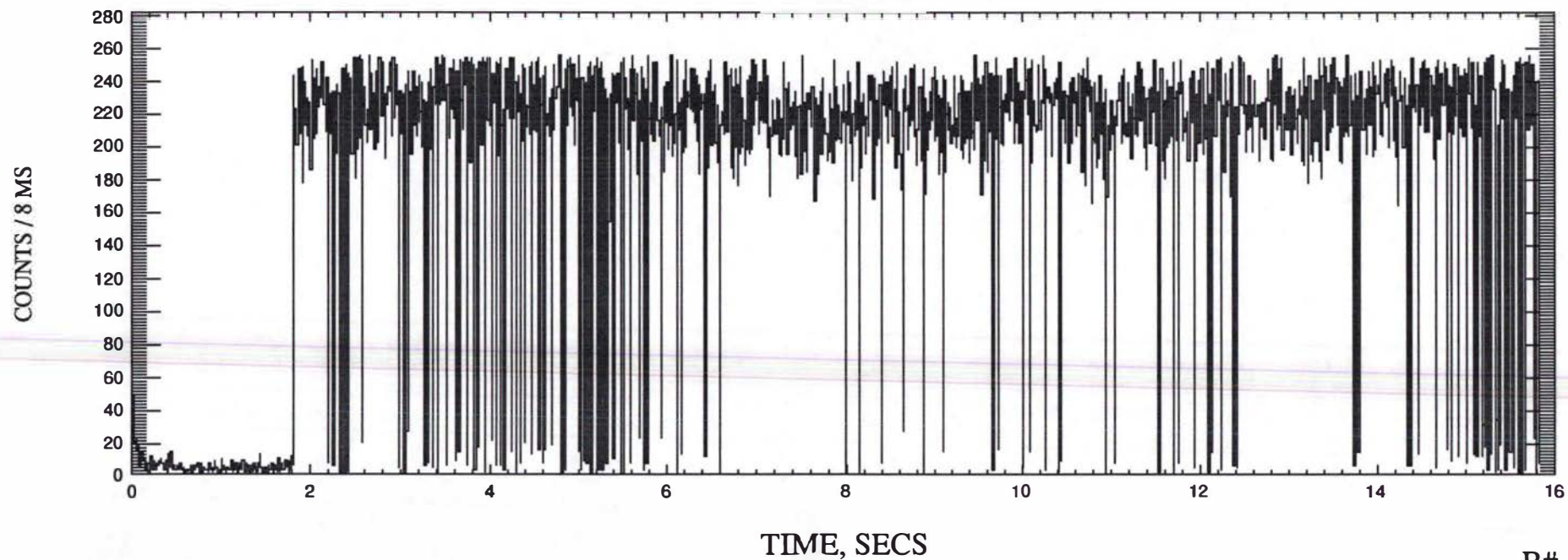
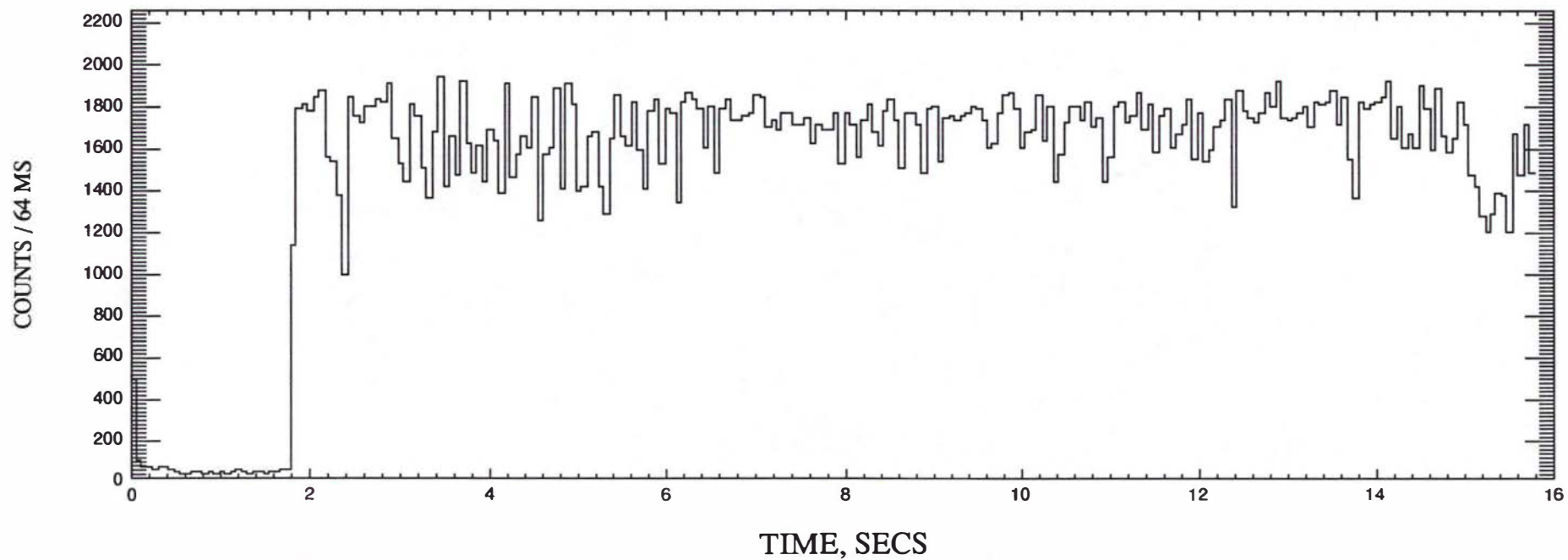
Burst Counter 14 at UT=12.566973567539 h=45241.105 s 12:34:01.105



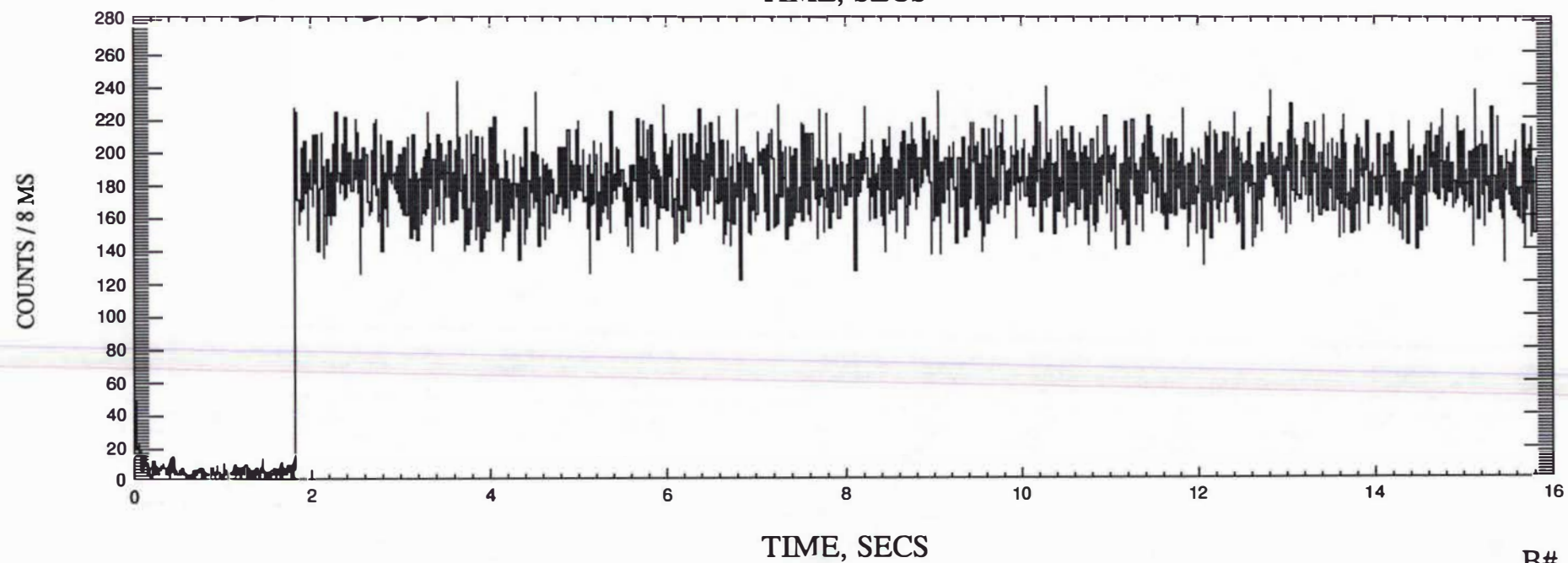
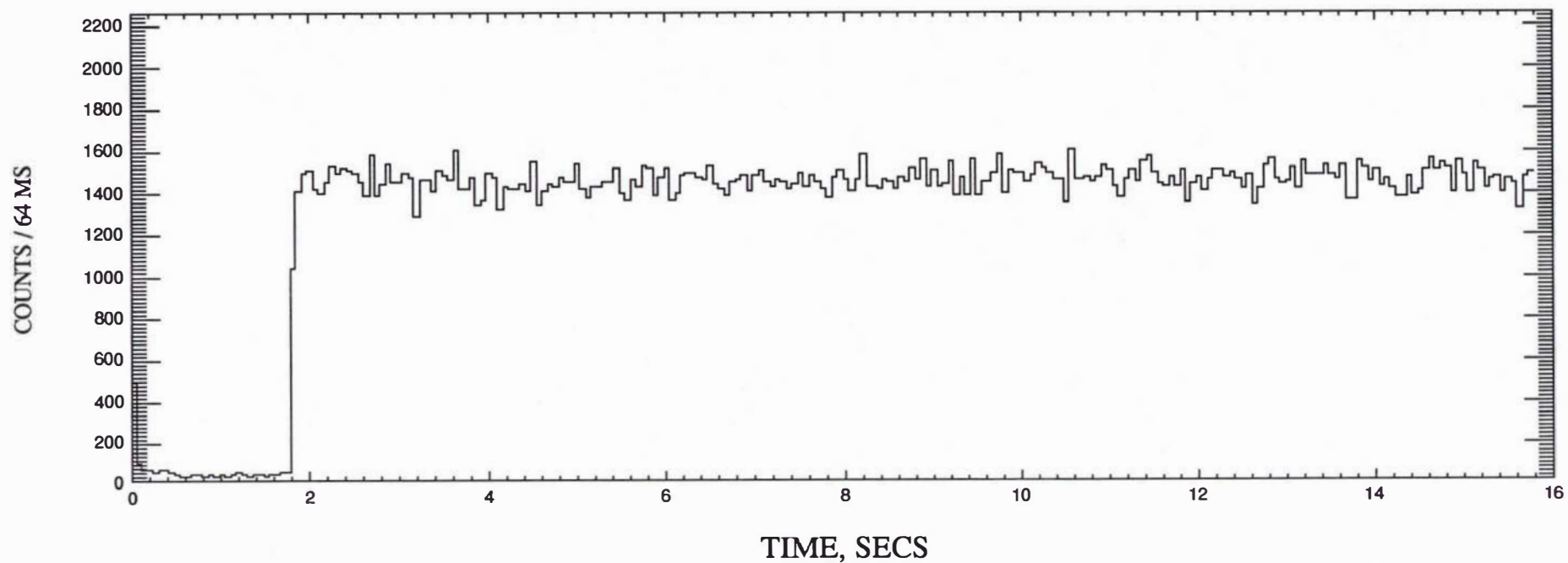
Burst Counter 15 at UT=13.829218894111 h=49785.188 s 13:49:45.188



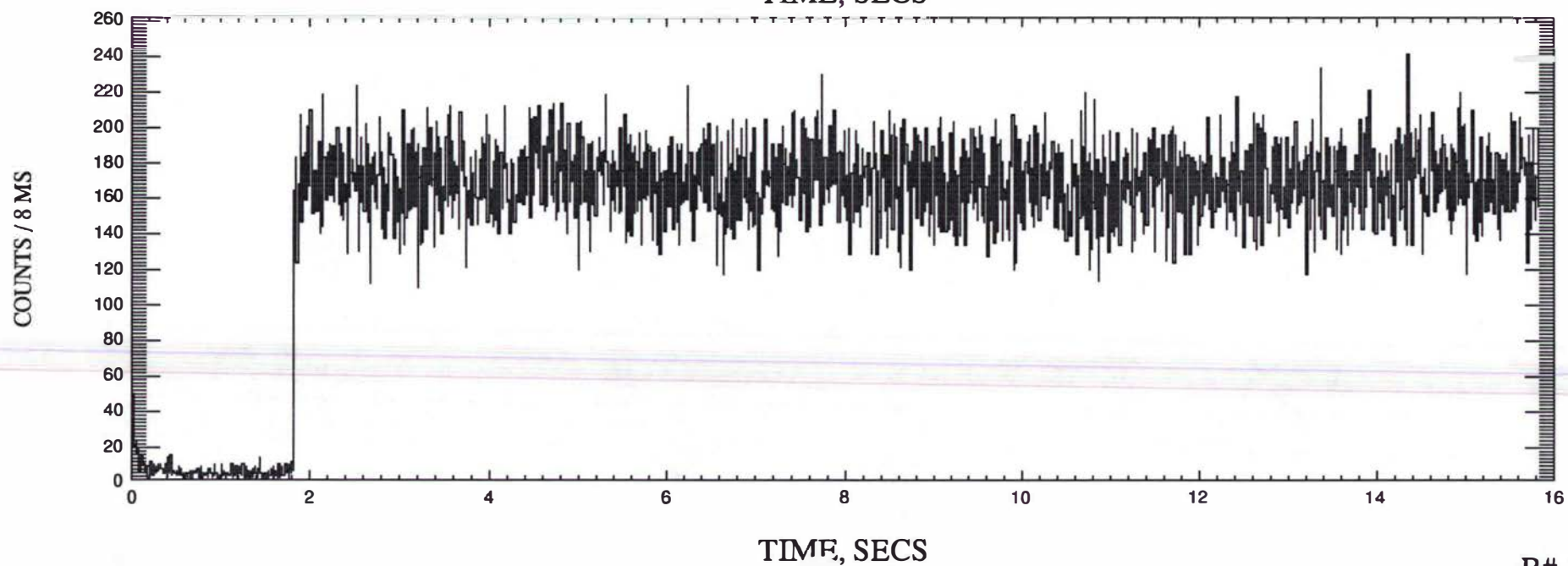
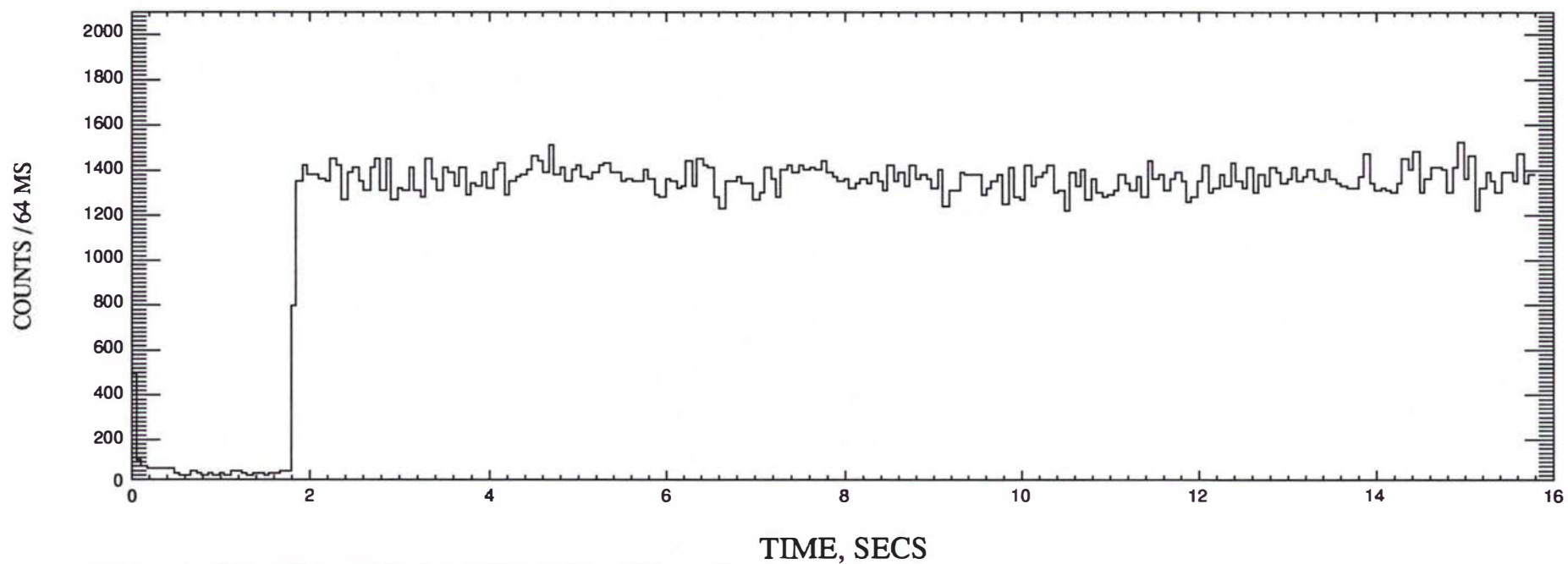
Burst Counter 0 at UT=15.091464220683 h=54329.271 s 15:05:29.271



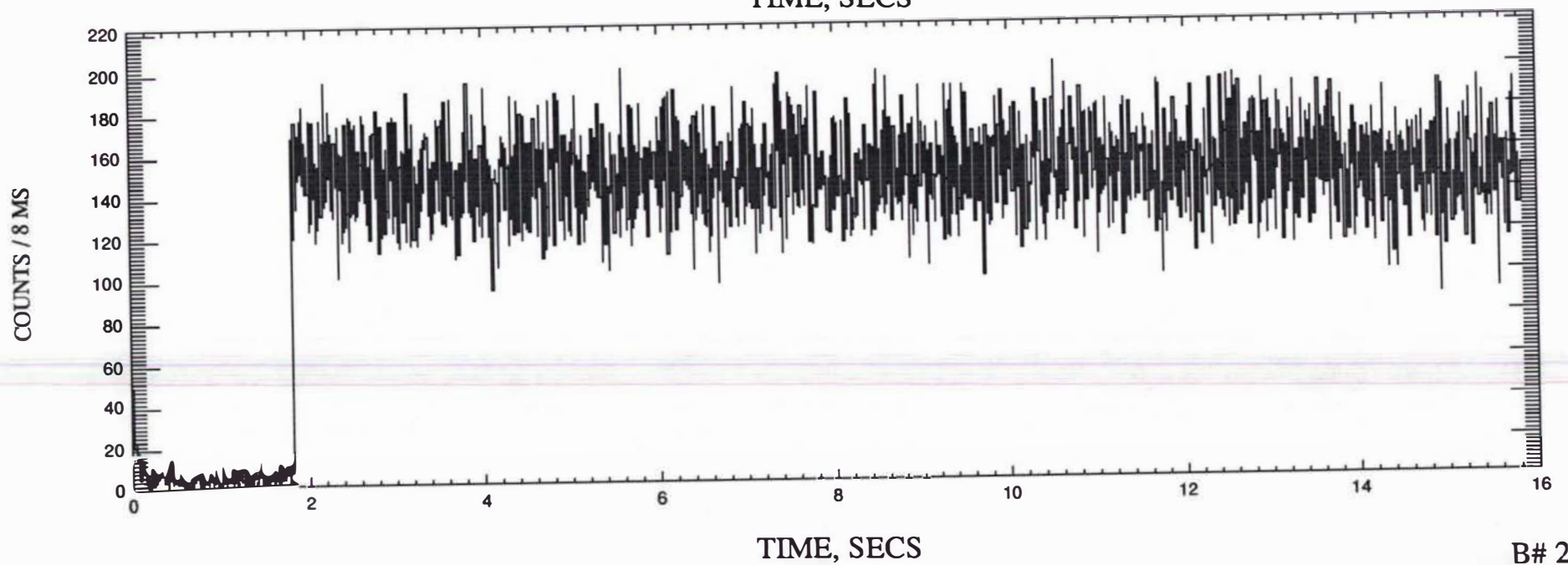
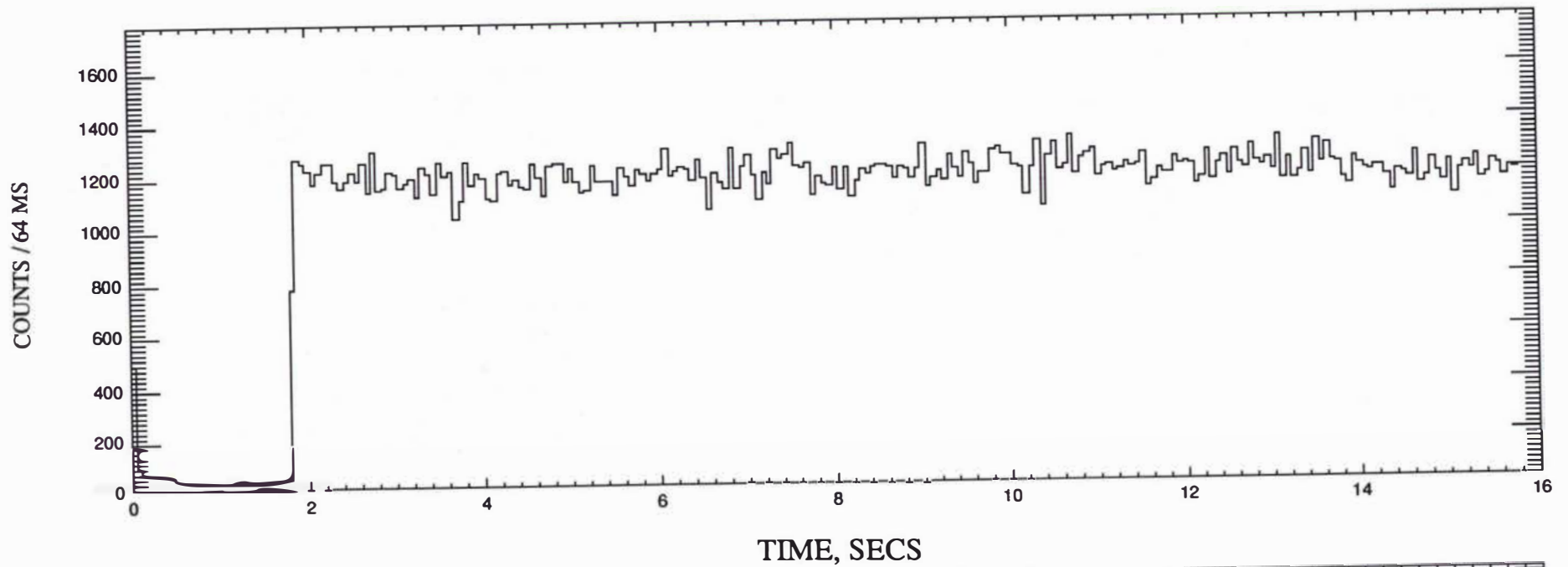
Burst Counter 1 at UT=16.353709547255 h=58873.354 s 16:21:13.354



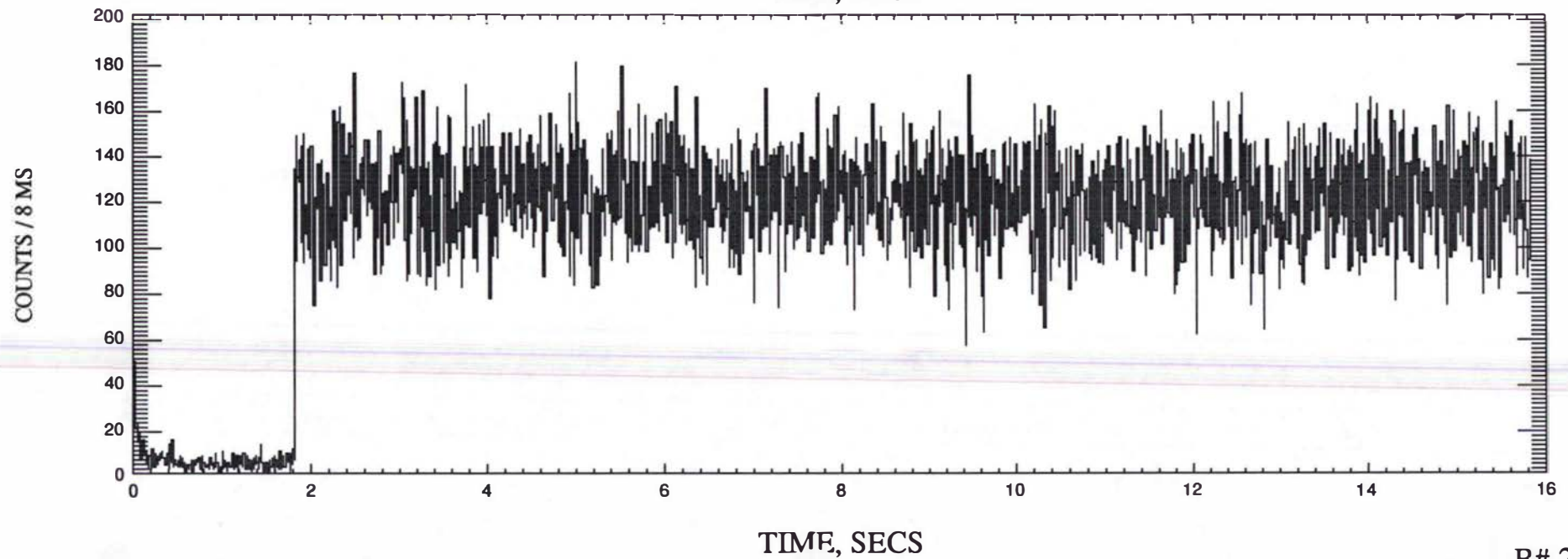
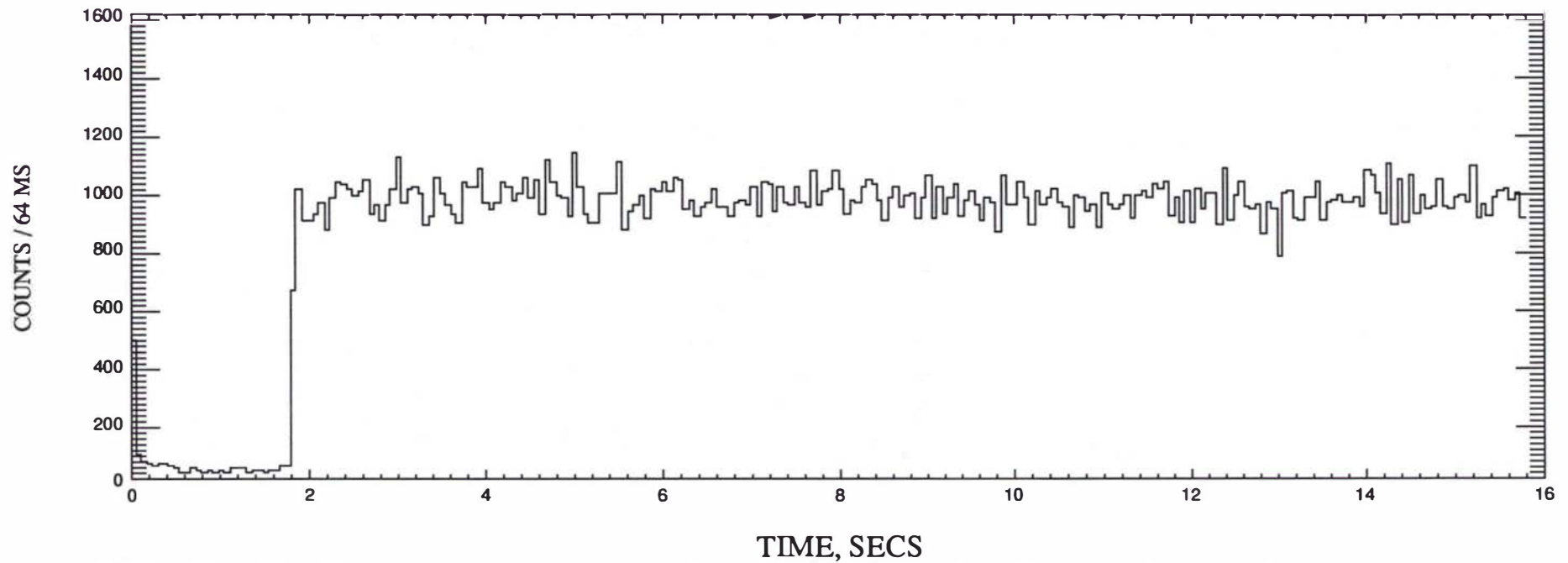
Burst Counter 2 at UT=17.615954873827 h=63417.438 s 17:36:57.438



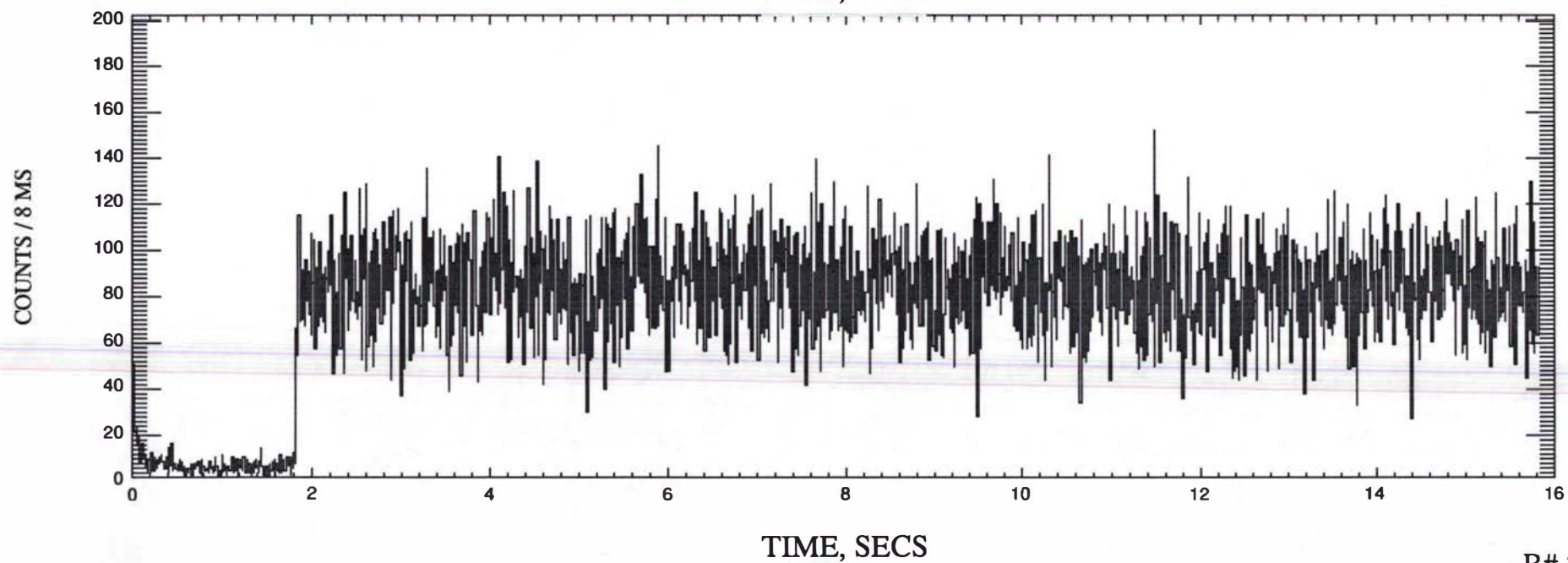
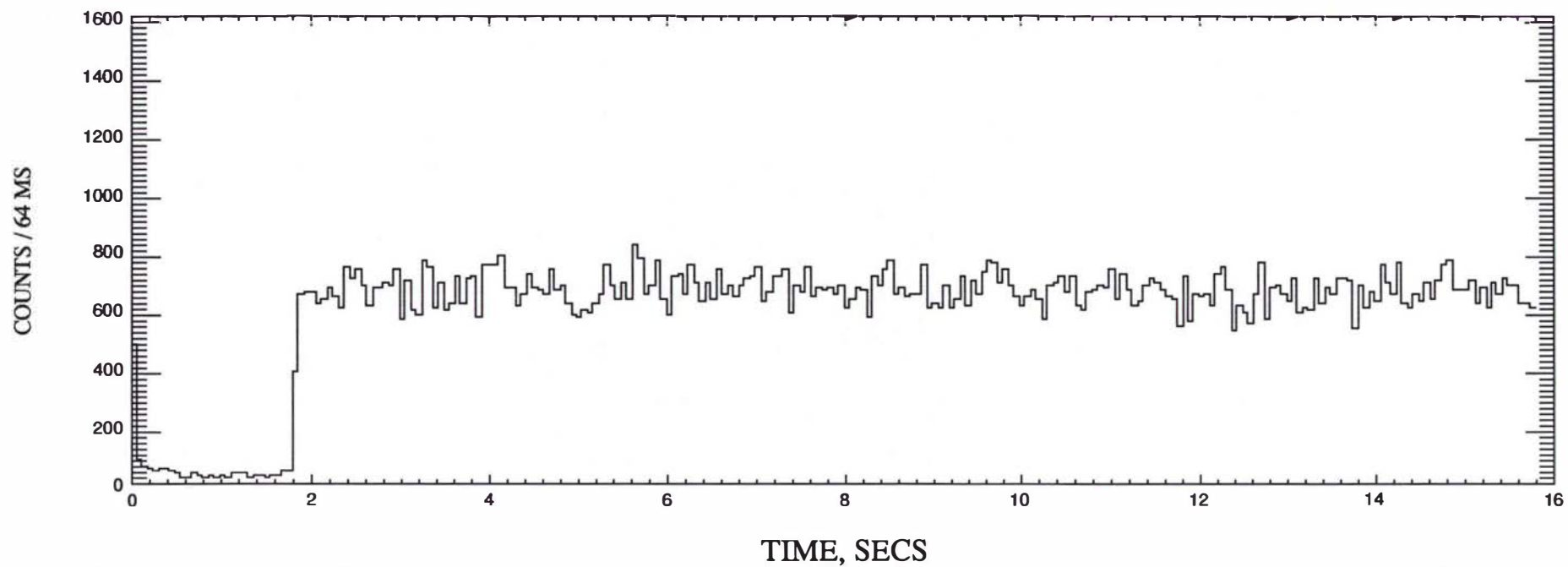
Burst Counter 3 at UT=18.878200200399 h=67961.521 s 18:52:41.521



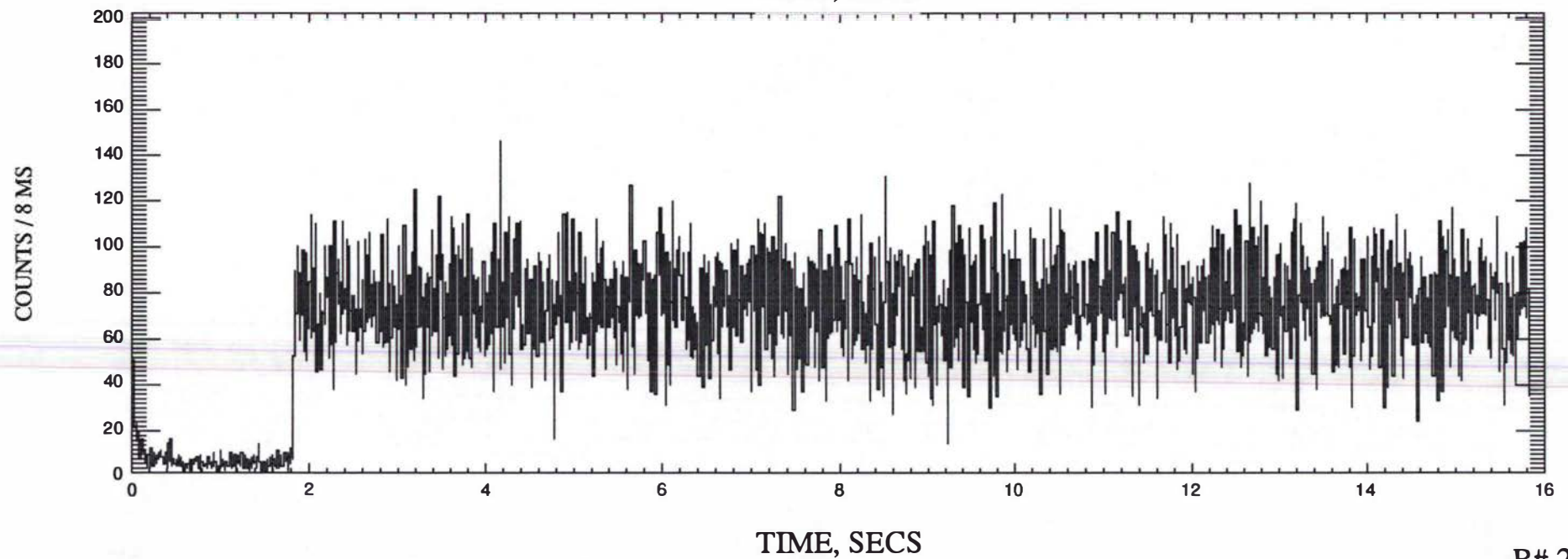
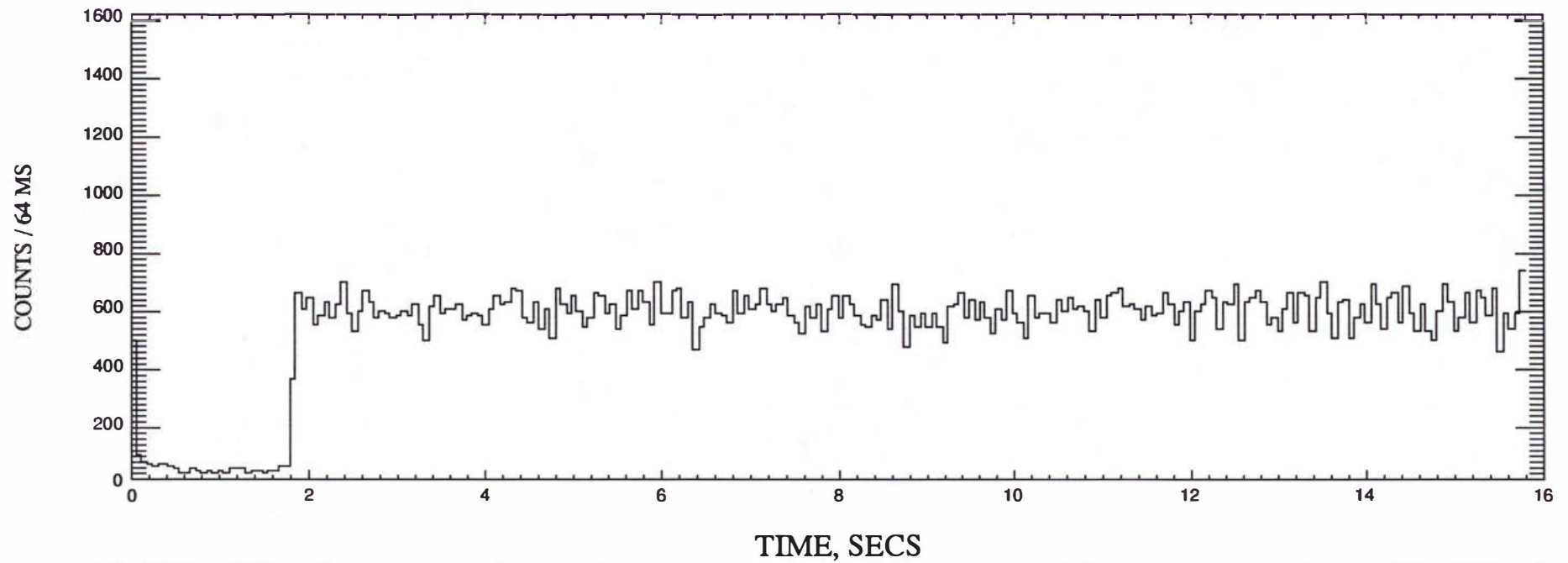
Burst Counter 4 at UT=20.140442958408 h=72505.595 s 20:08:25.595



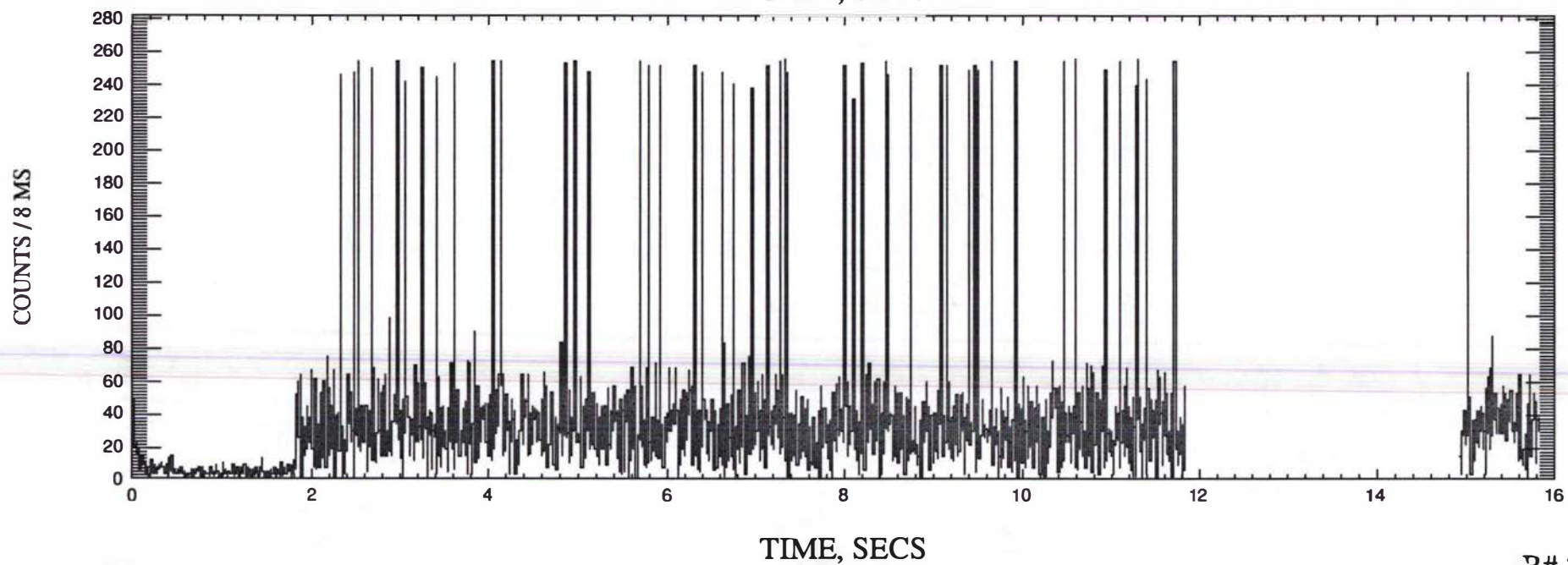
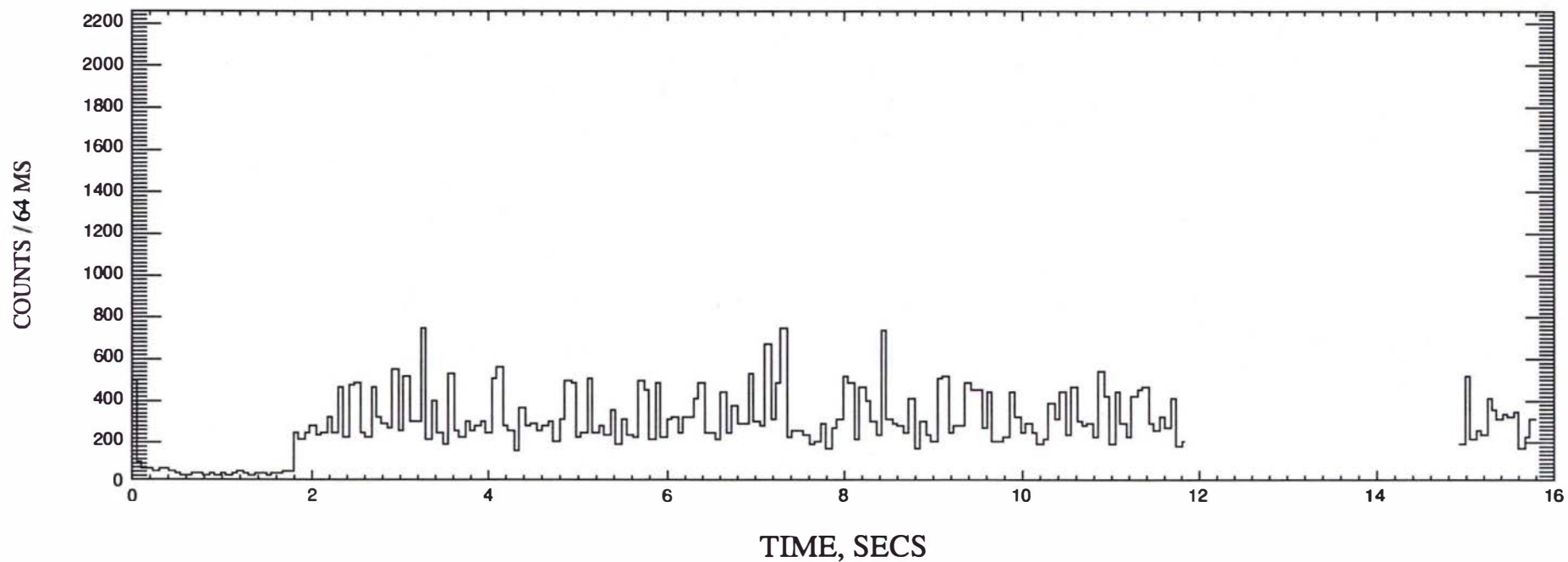
Burst Counter 5 at UT=21.402688284980 h=77049.678 s 21:24:09.678

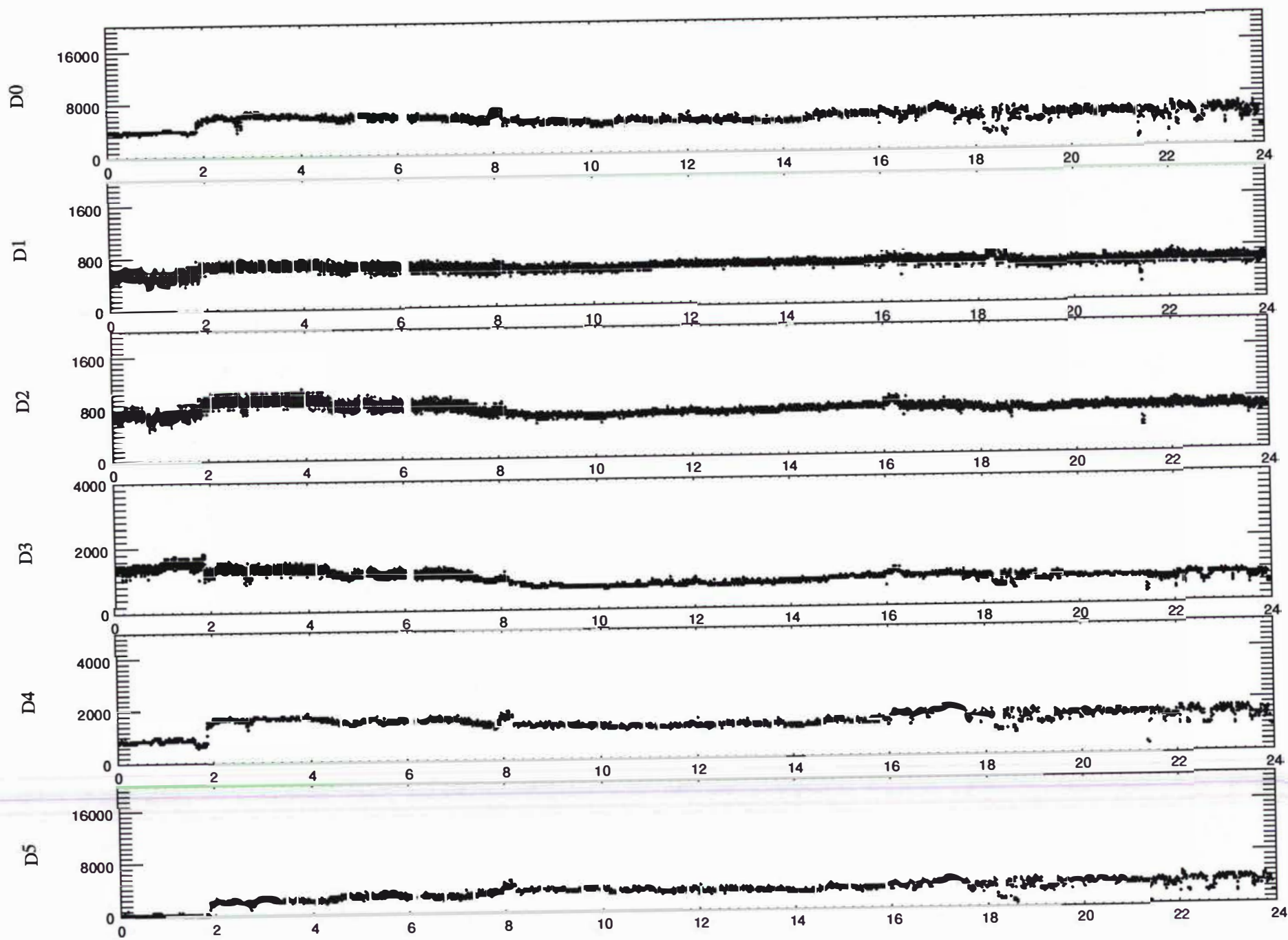


Burst Counter 6 at UT=22.664933611552 h=81593.761 s 22:39:53.761



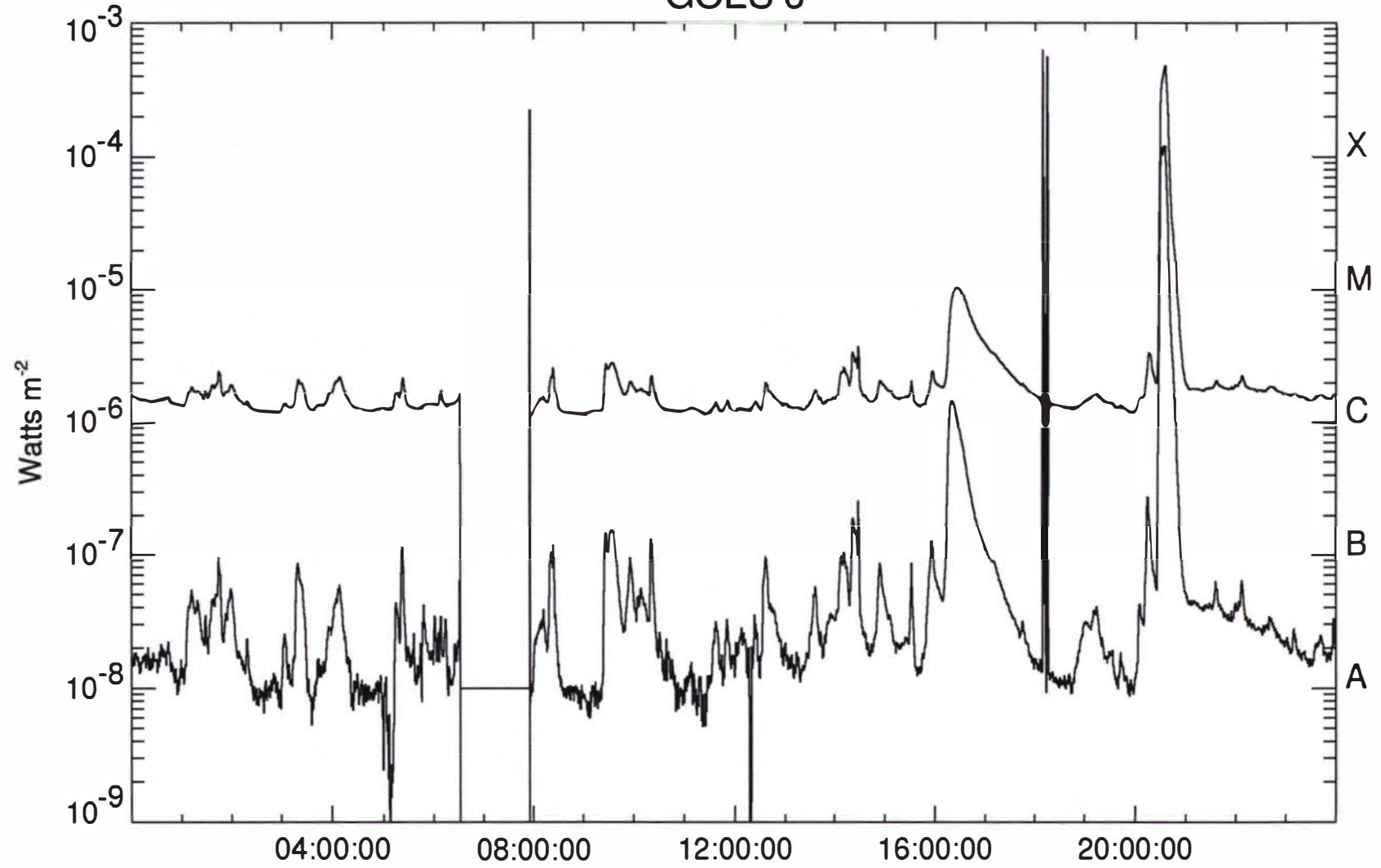
Burst Counter 7 at UT=23.927178938124 h=86137.844 s 23:55:37.844





UNIVERSAL TIME

GOES 6



Data Start: 91/03/26, 0000:02

Channel

1 (1.0 - 8.0 Angstroms)

2 (0.5 - 4.0 Angstroms)

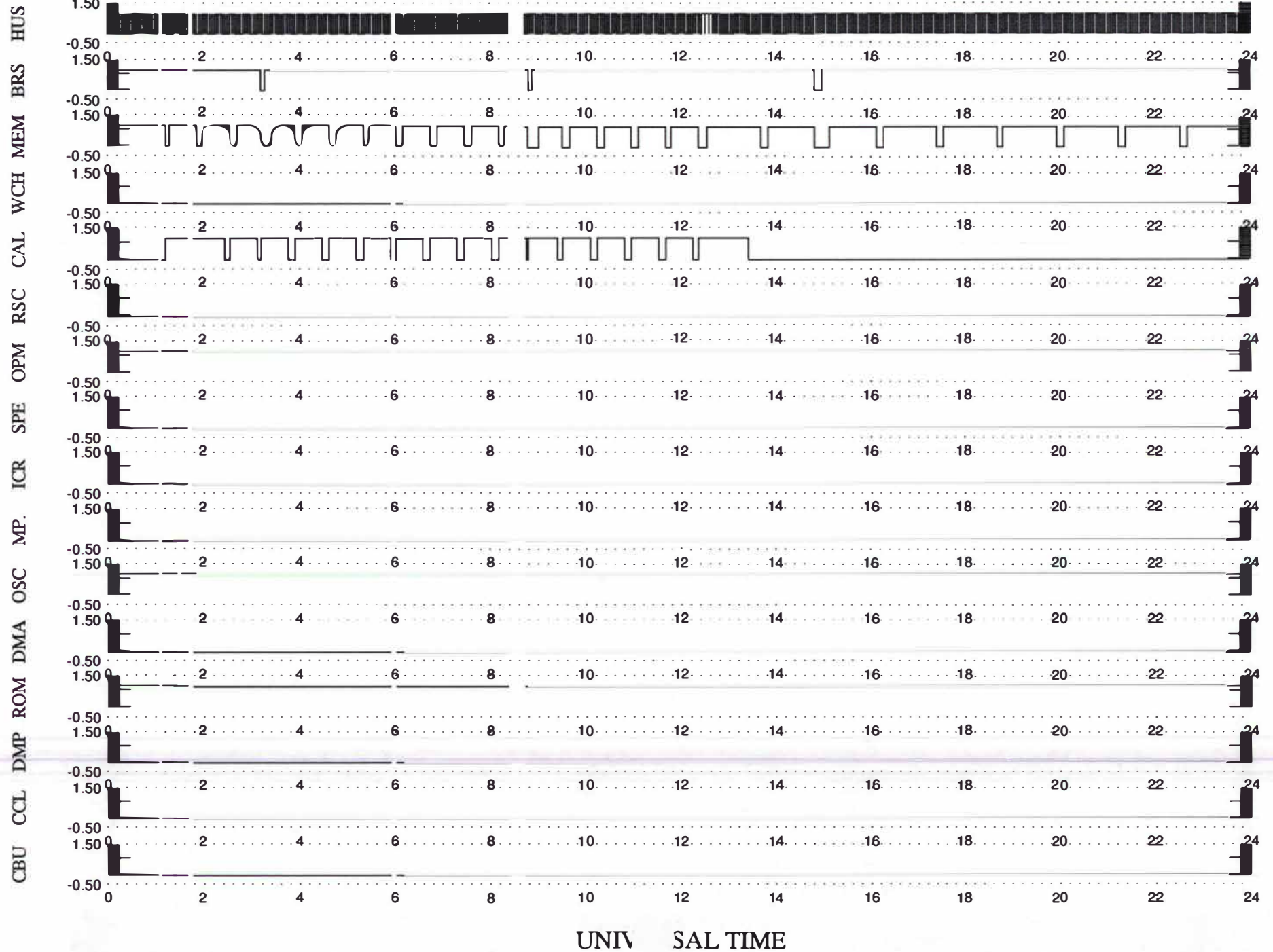
Plot created: 96/11/26, 1912

Background not subtracted

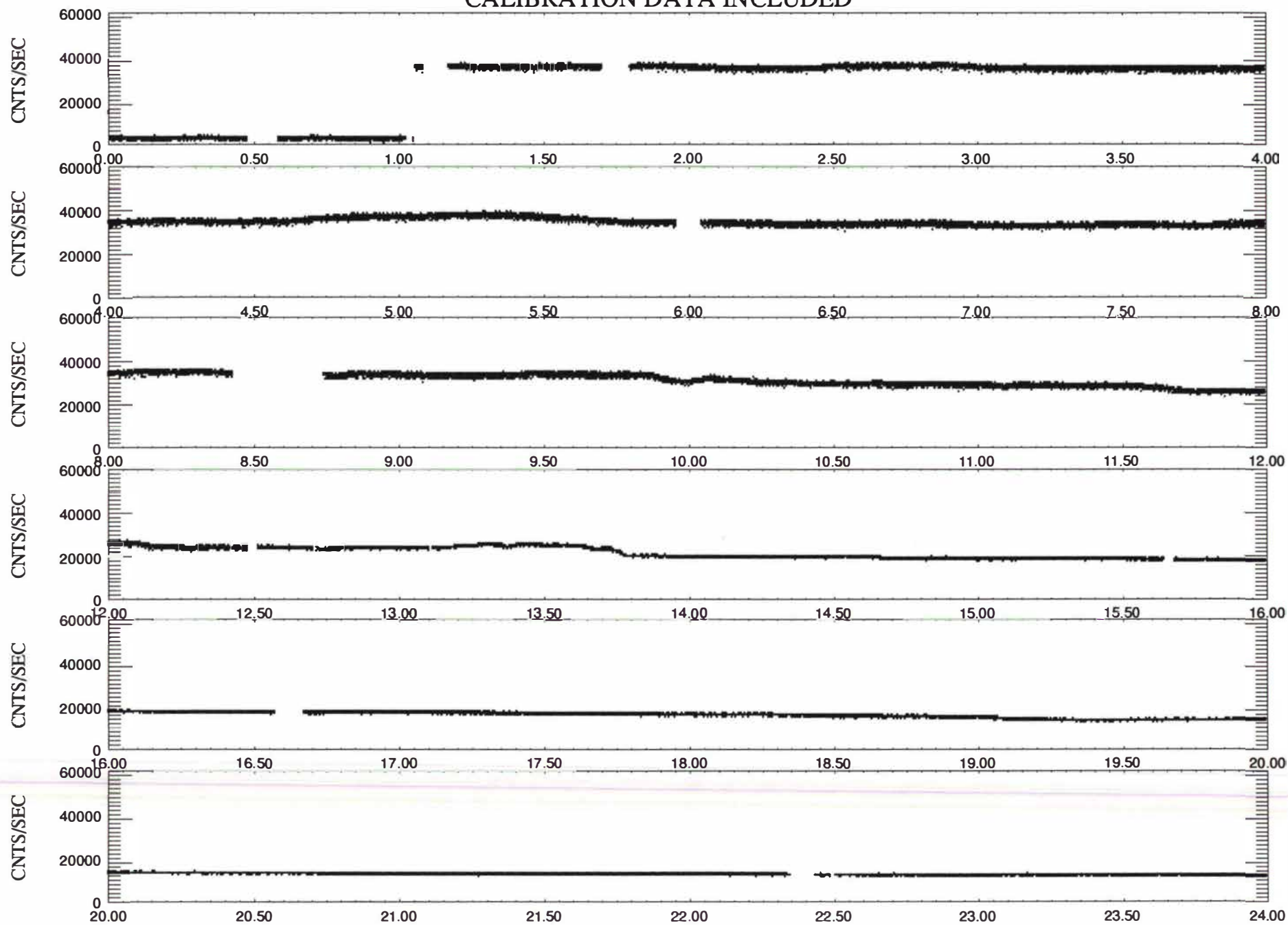
Background not subtracted

Sample average = 10

BURST NUMBER 7 - 15, 0 - 15, 0, 1

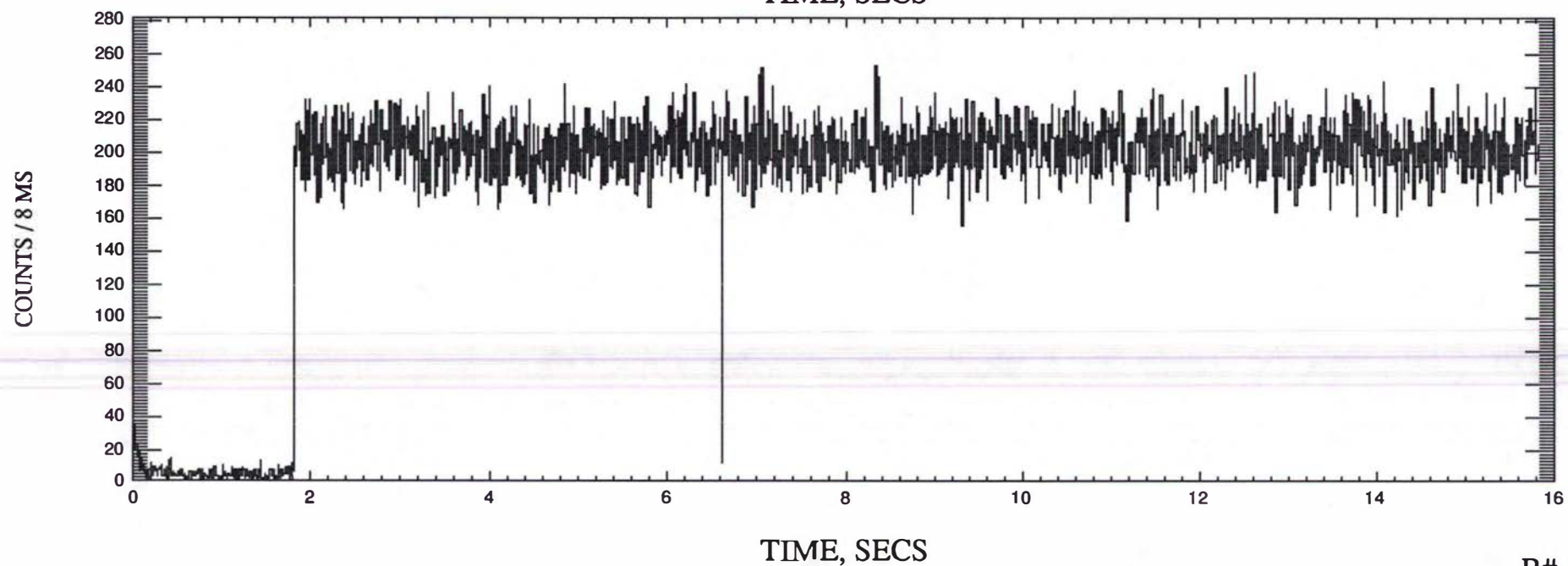
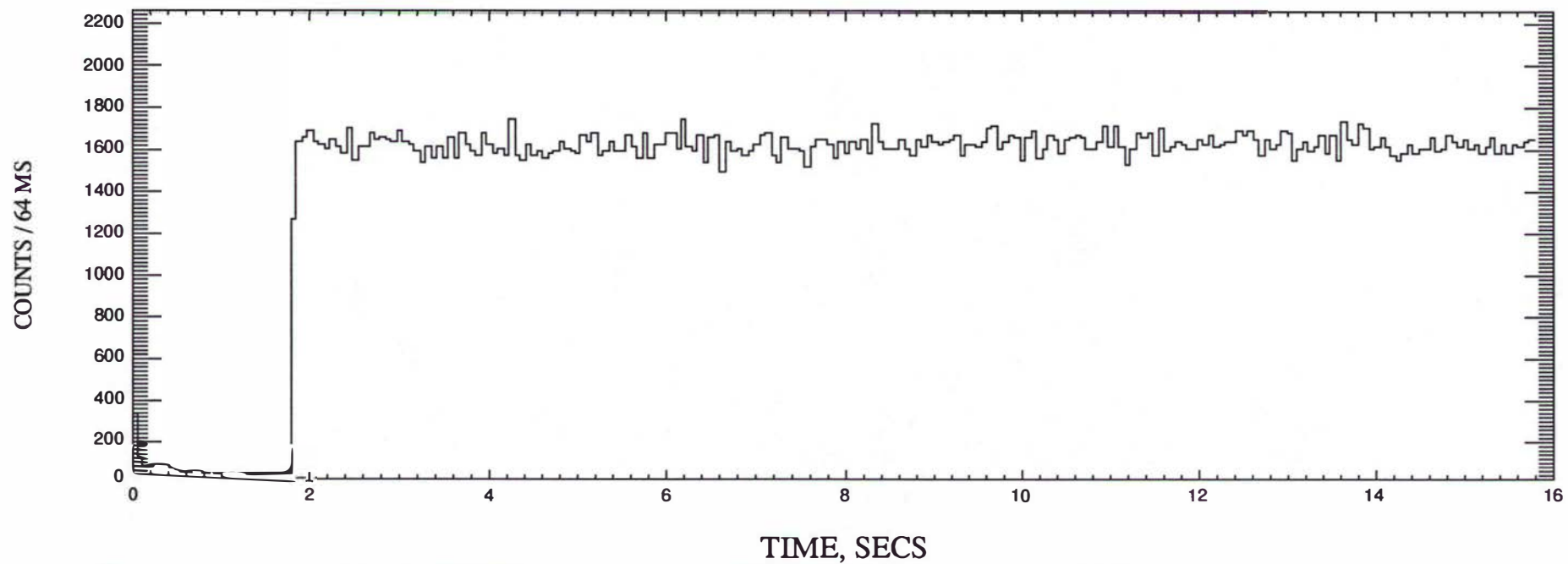


CALIBRATION DATA INCLUDED

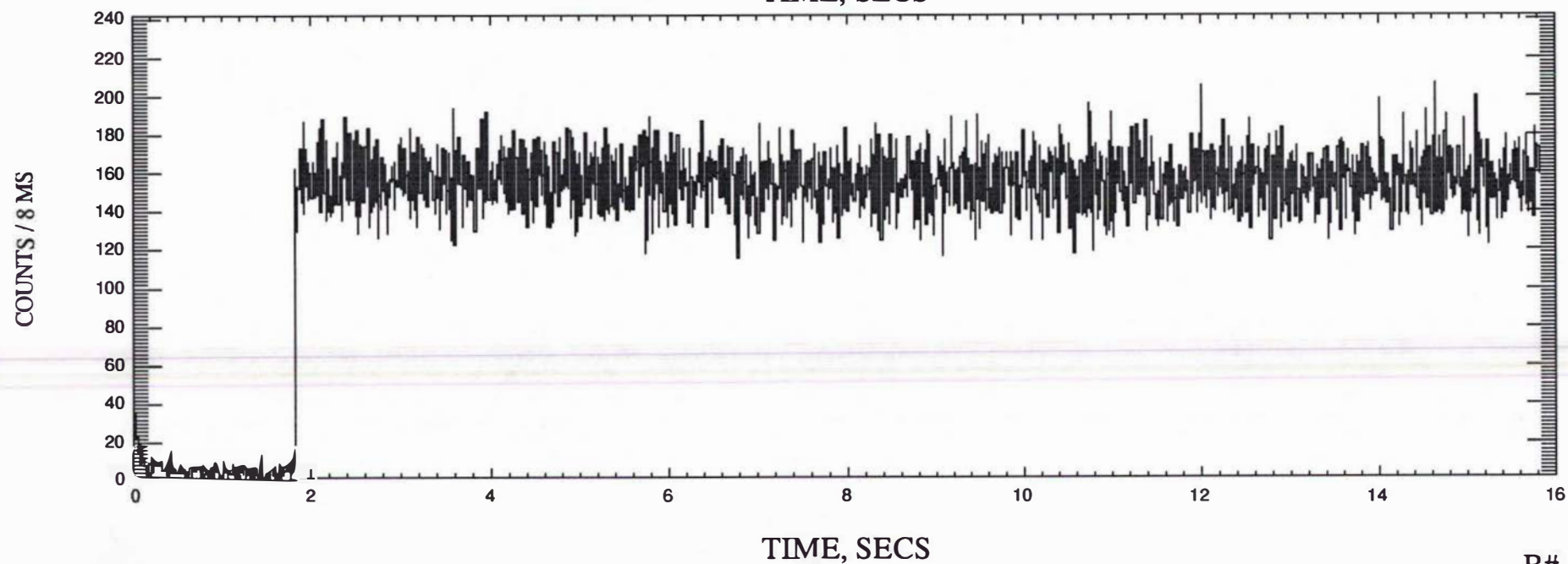
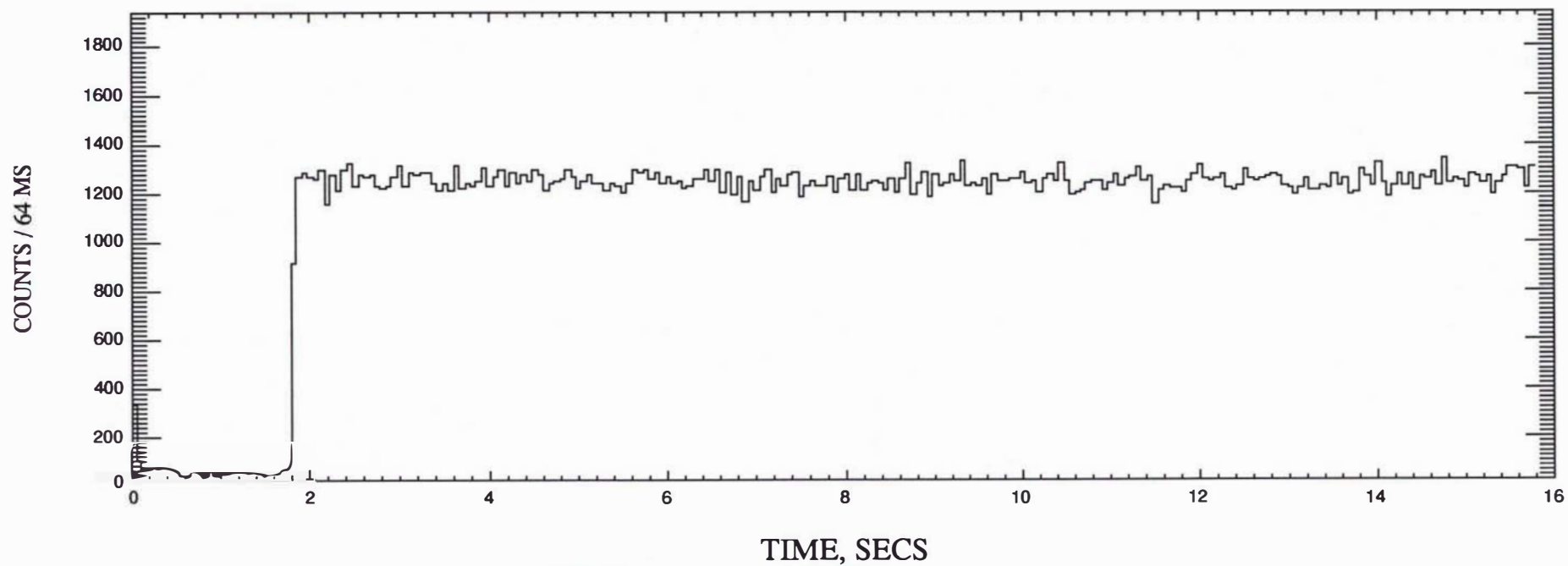


UNIV `SAL TIME

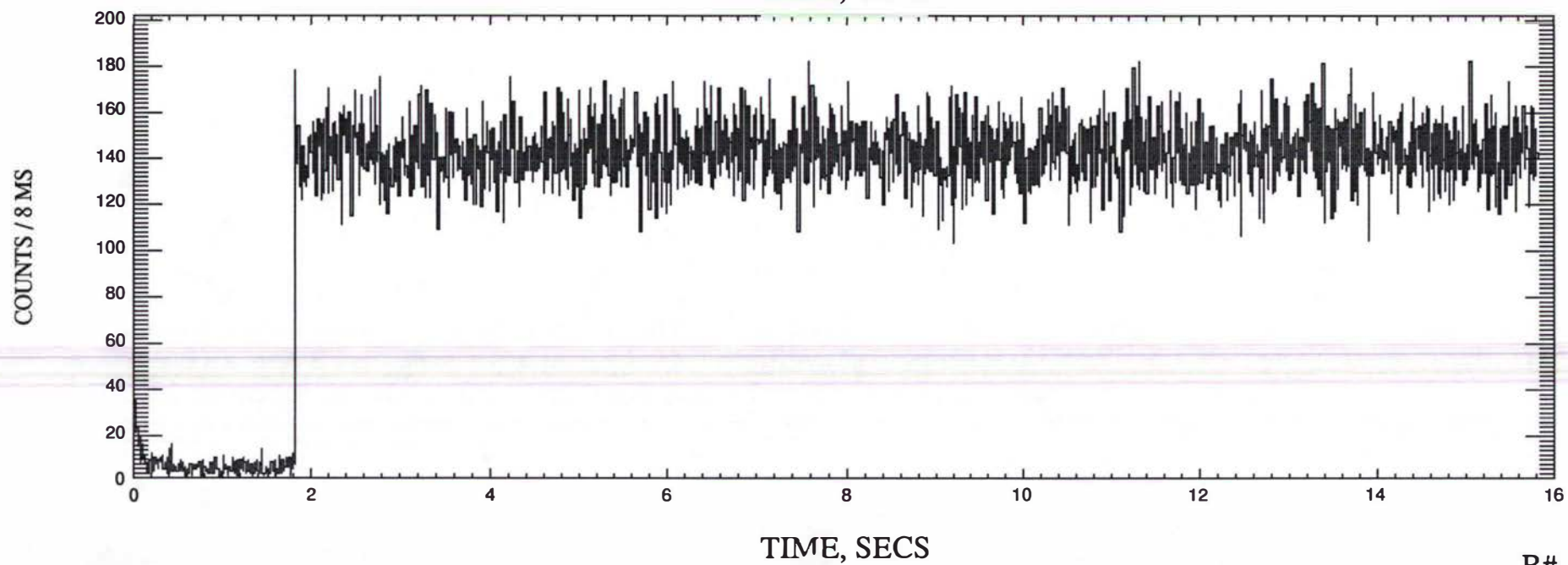
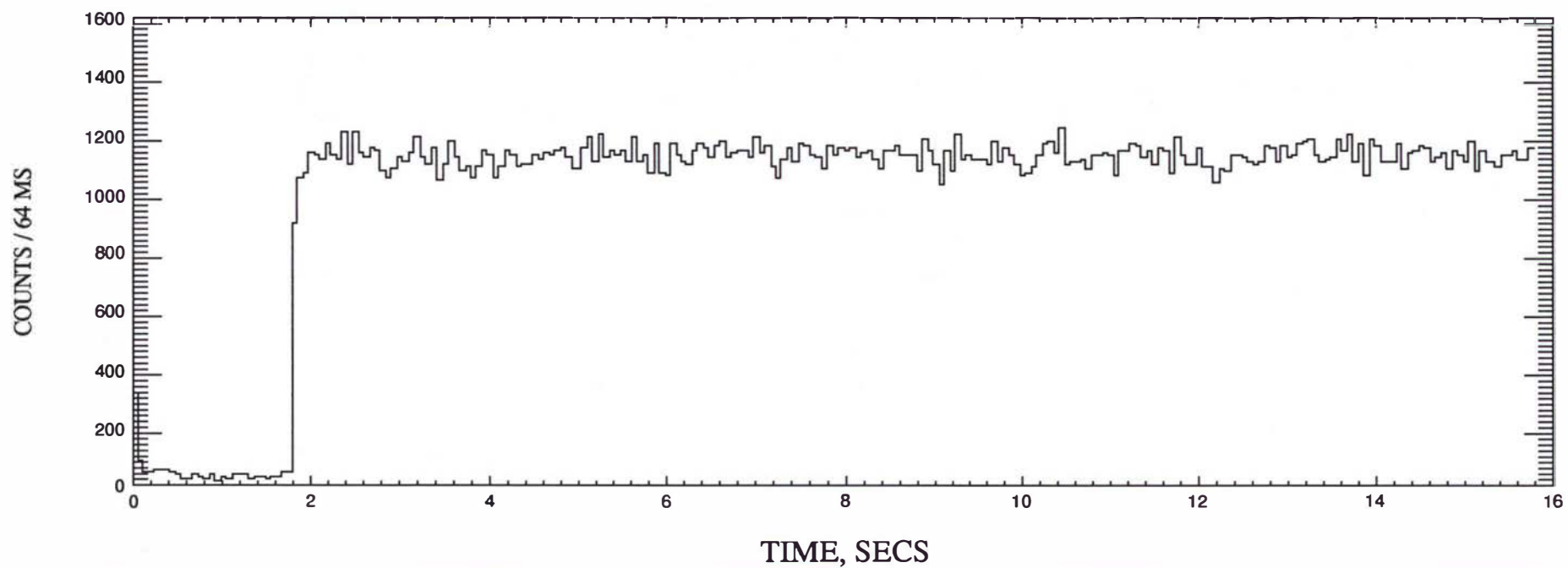
Burst Counter 9 at UT=13.598540585836 h=48954.746 s 13:35:54.746



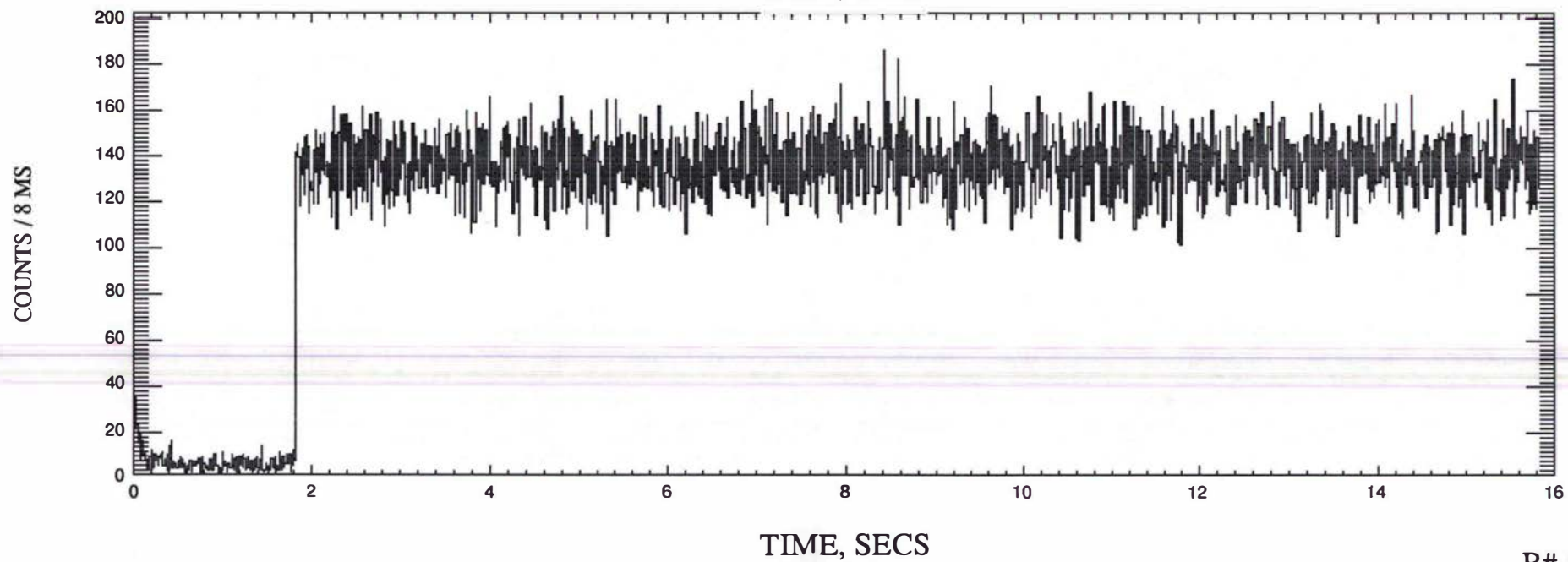
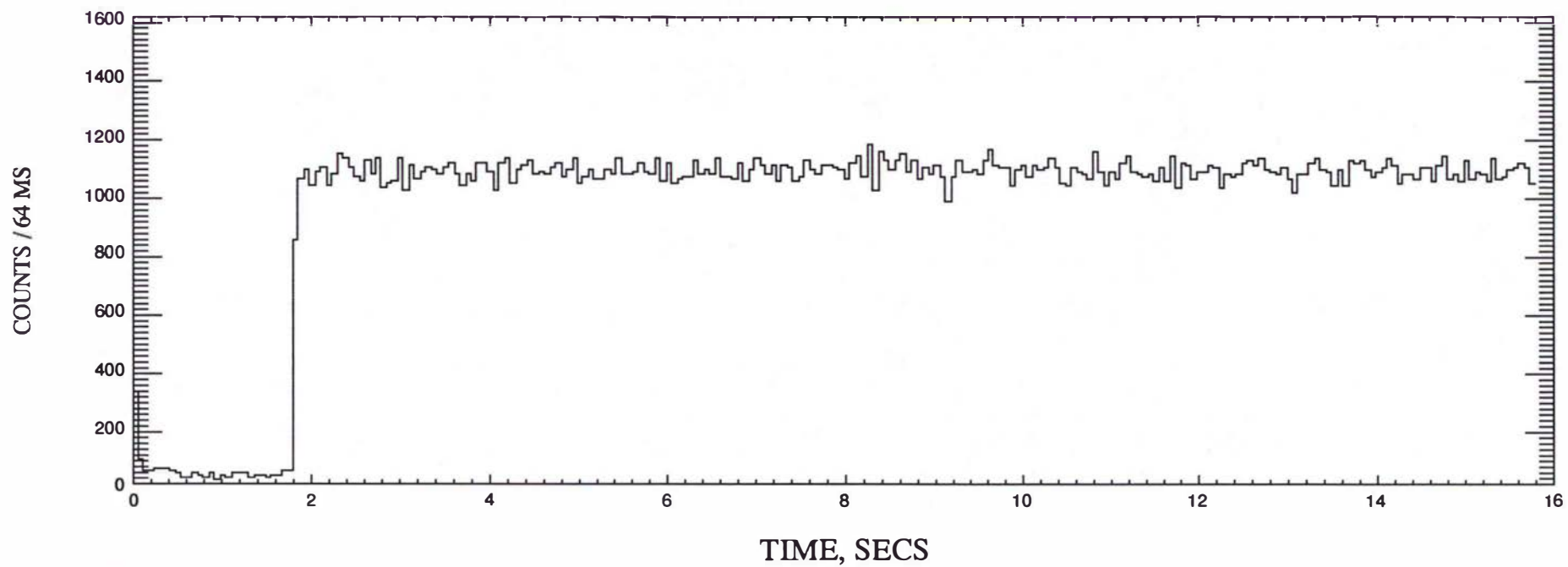
Burst Counter 10 at UT=14.860785912408 h=53498.829 s 14:51:38.829



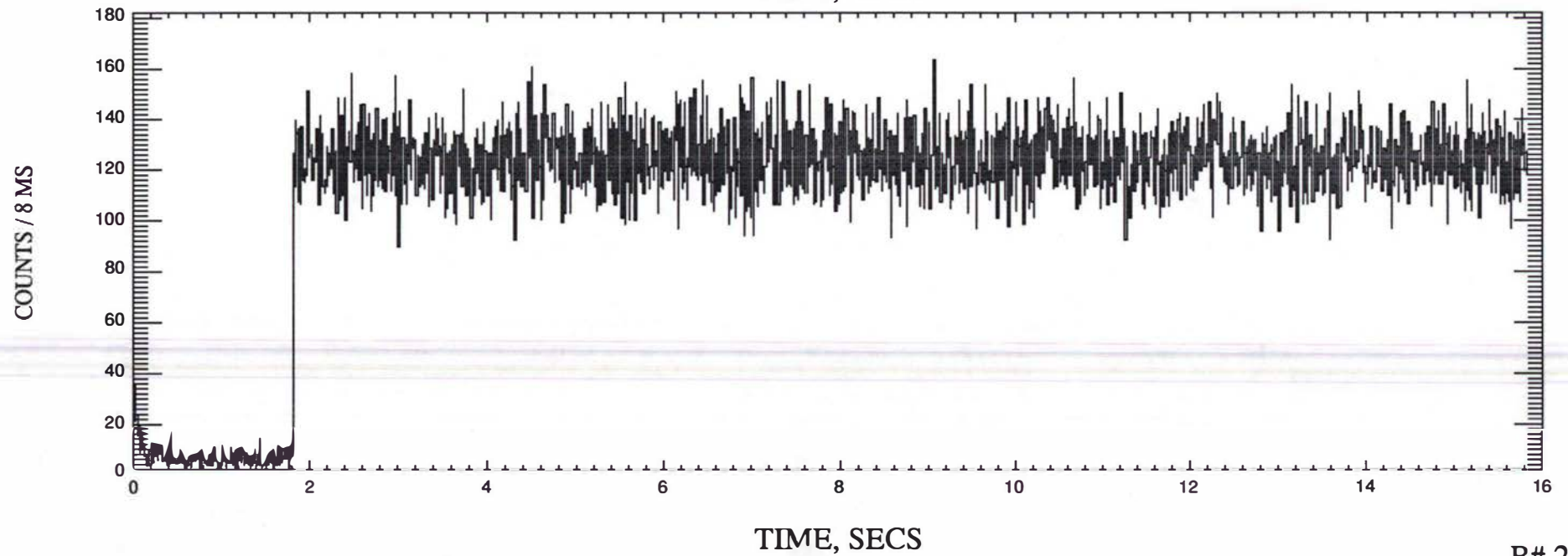
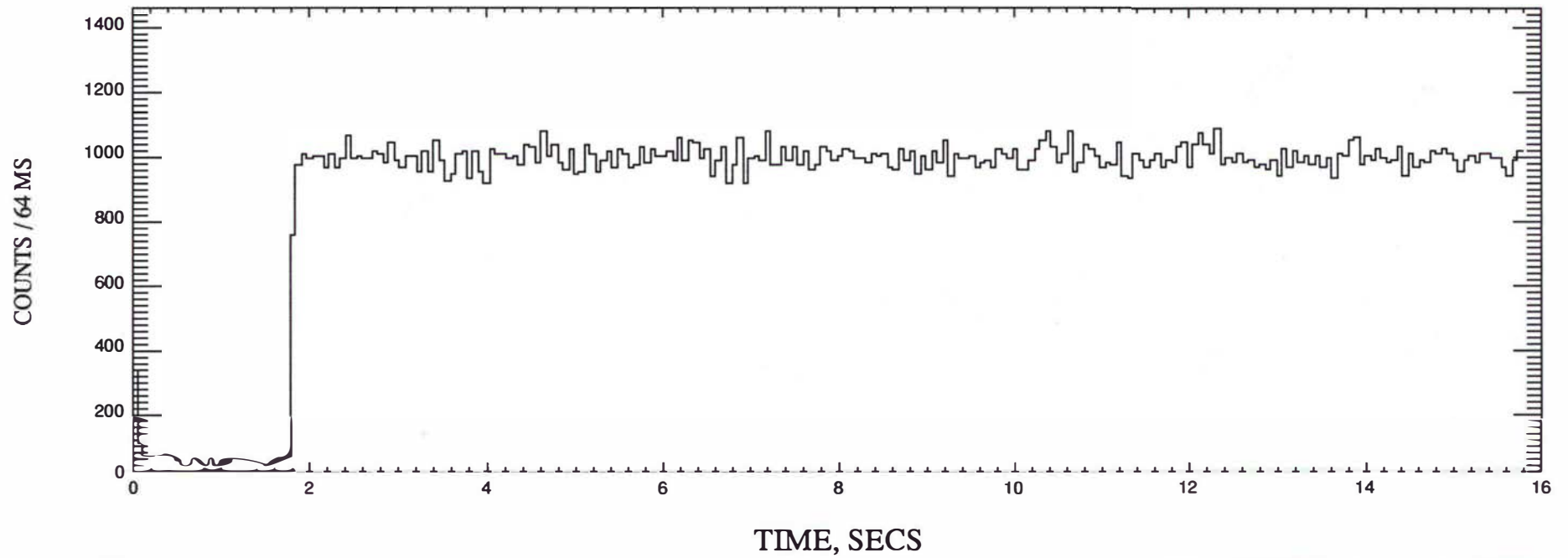
Burst Counter 11 at UT=16.123028670417 h=58042.903 s 16:07:22.903



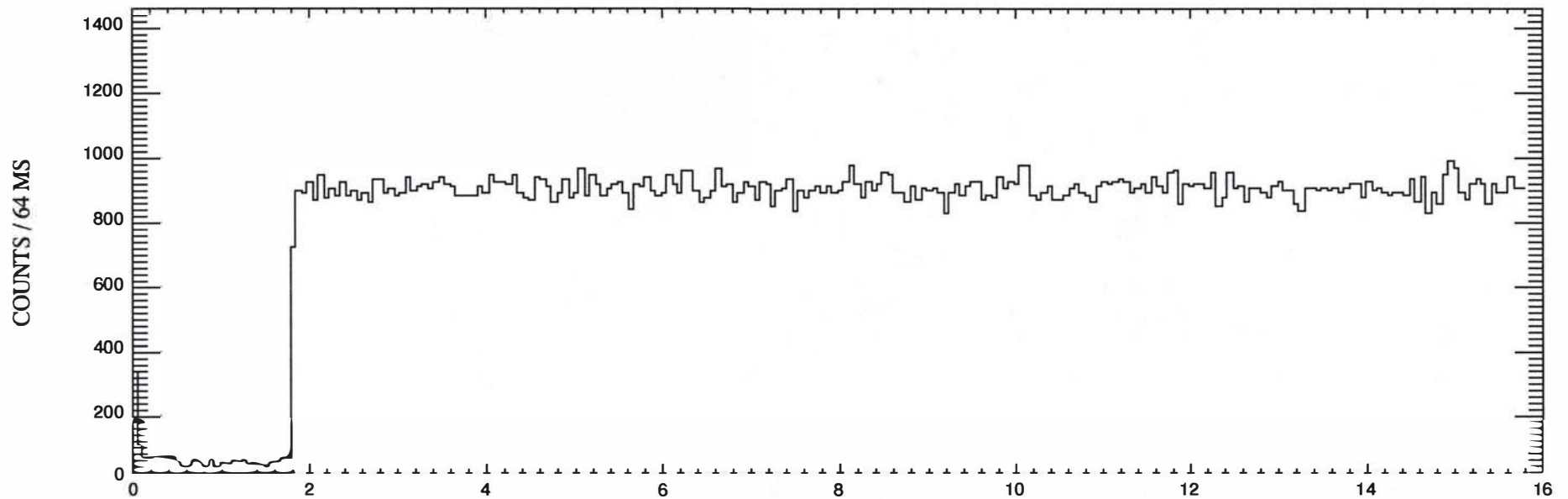
Burst Counter 12 at UT=17.385273996989 h=62586.986 s 17:23:06.986



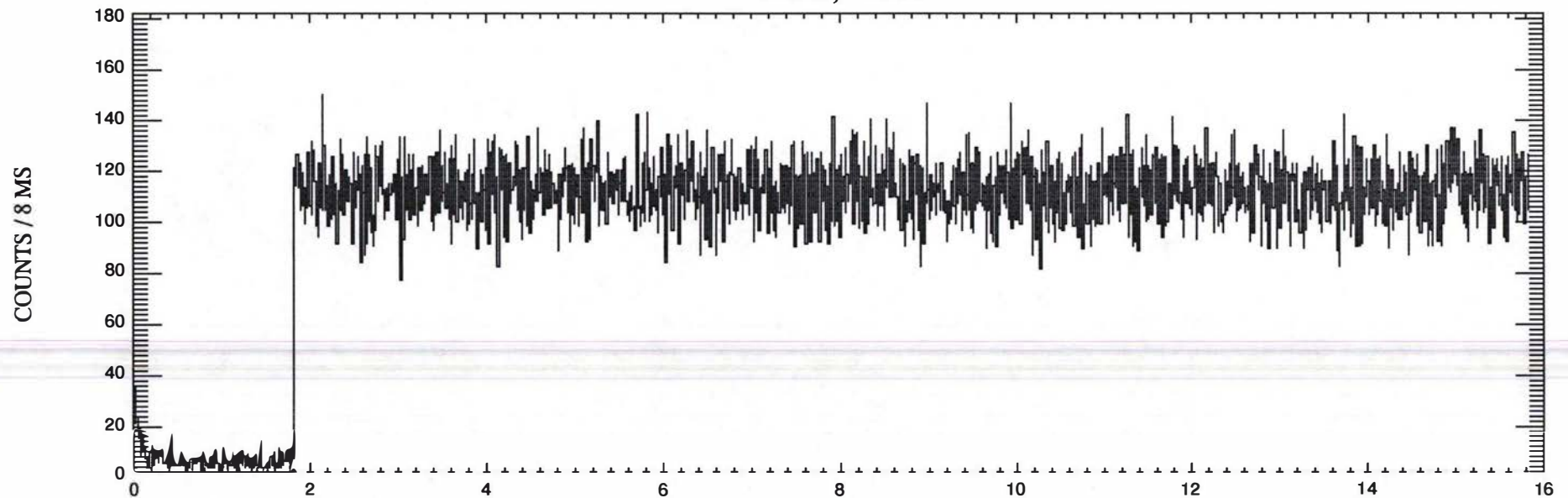
Burst Counter 13 at UT=18.647521493700 h=67131.077 s 18:38:51.077



Burst Counter 14 at UT=19.909764650133 h=71675.153 s 19:54:35.153

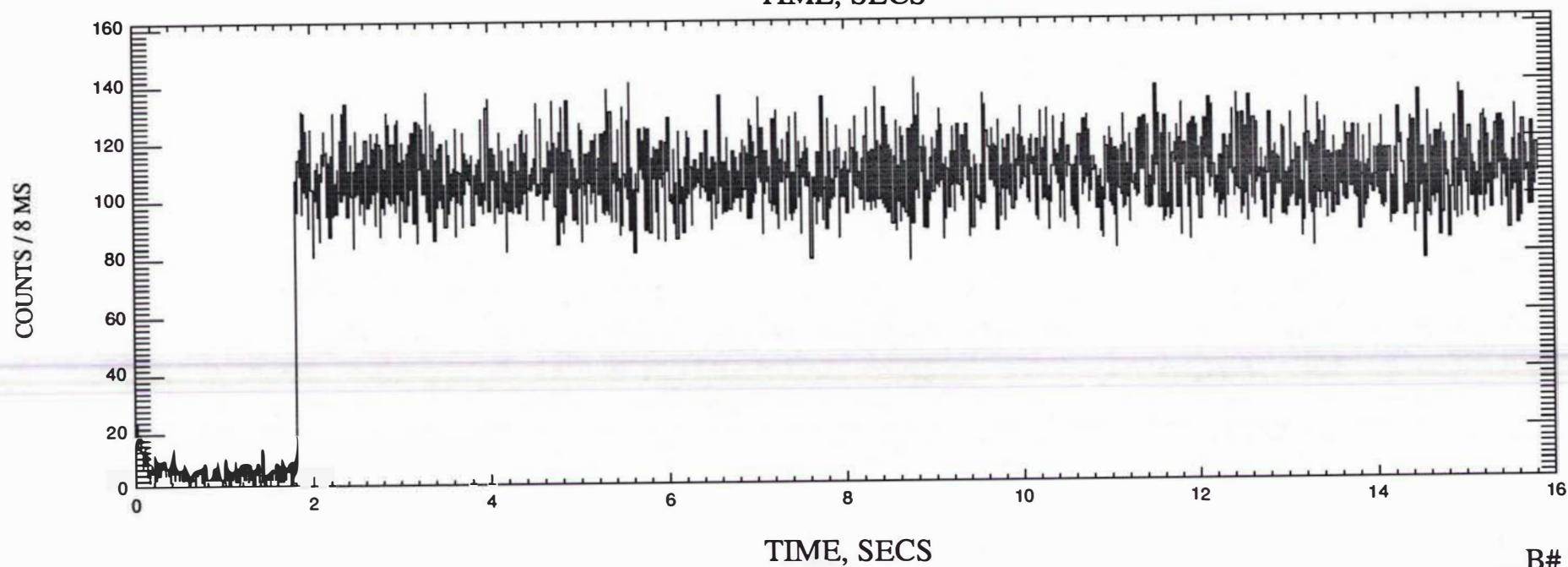
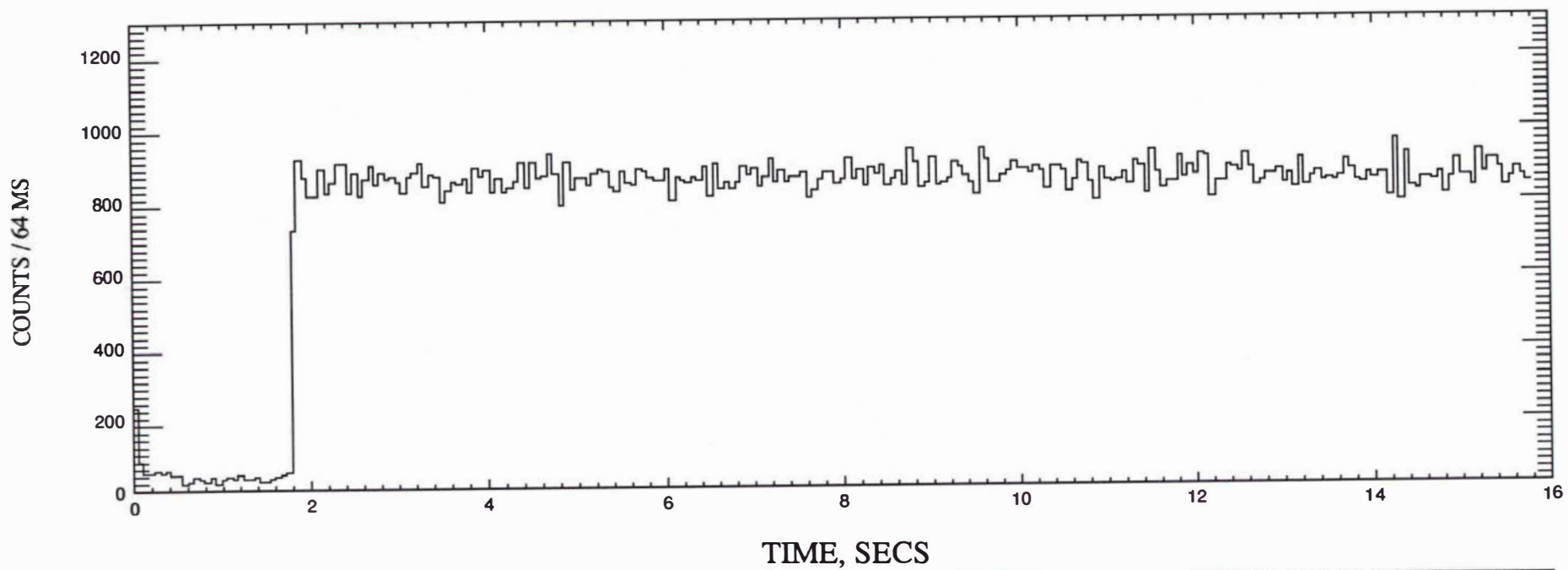


TIME, SECS

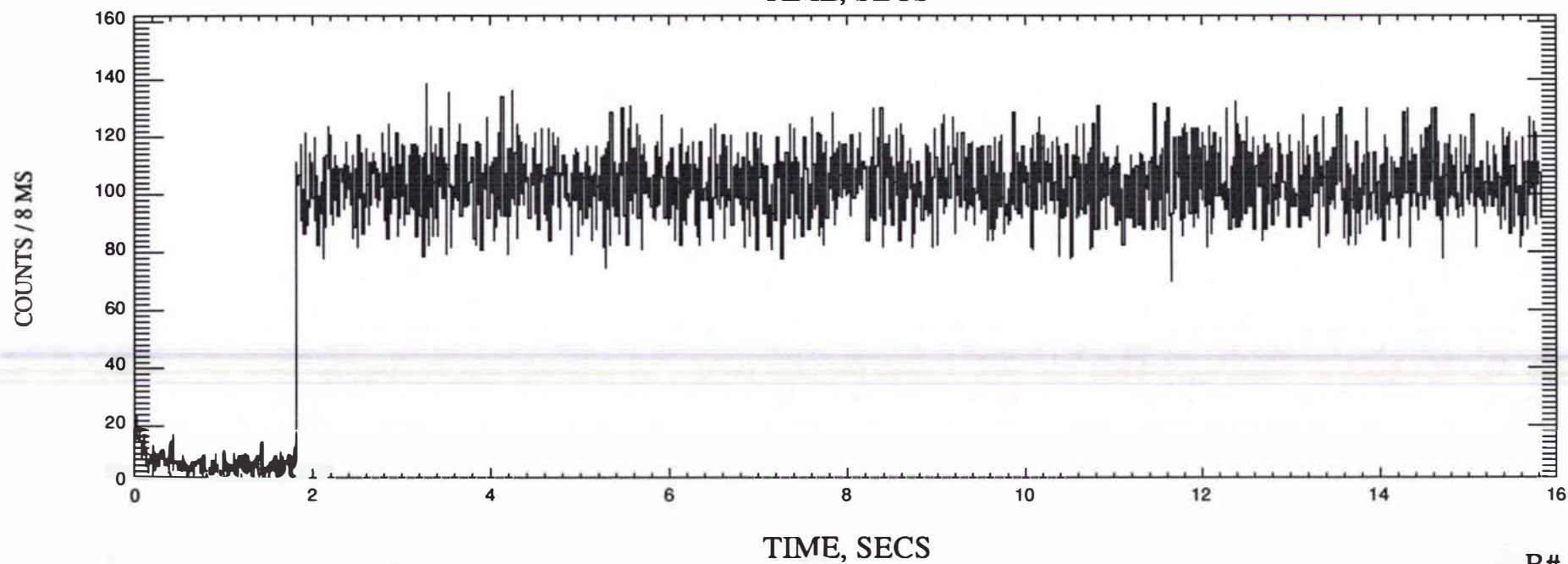
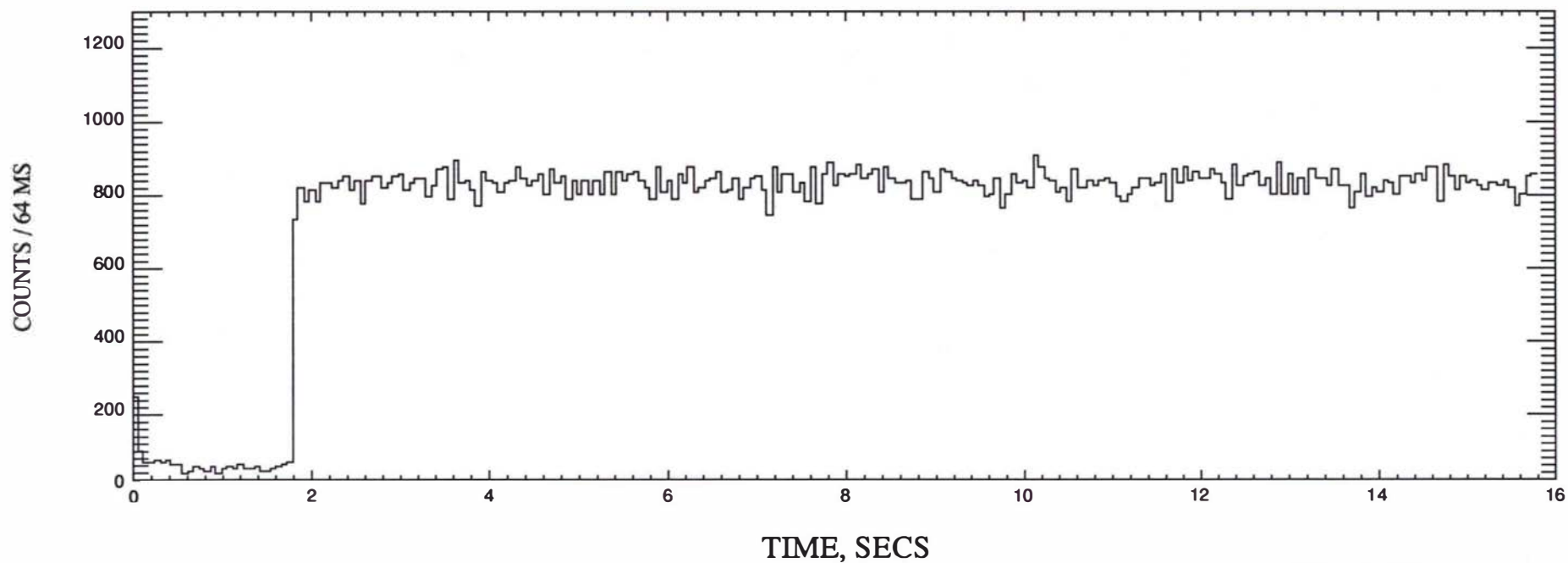


TIME, SECS

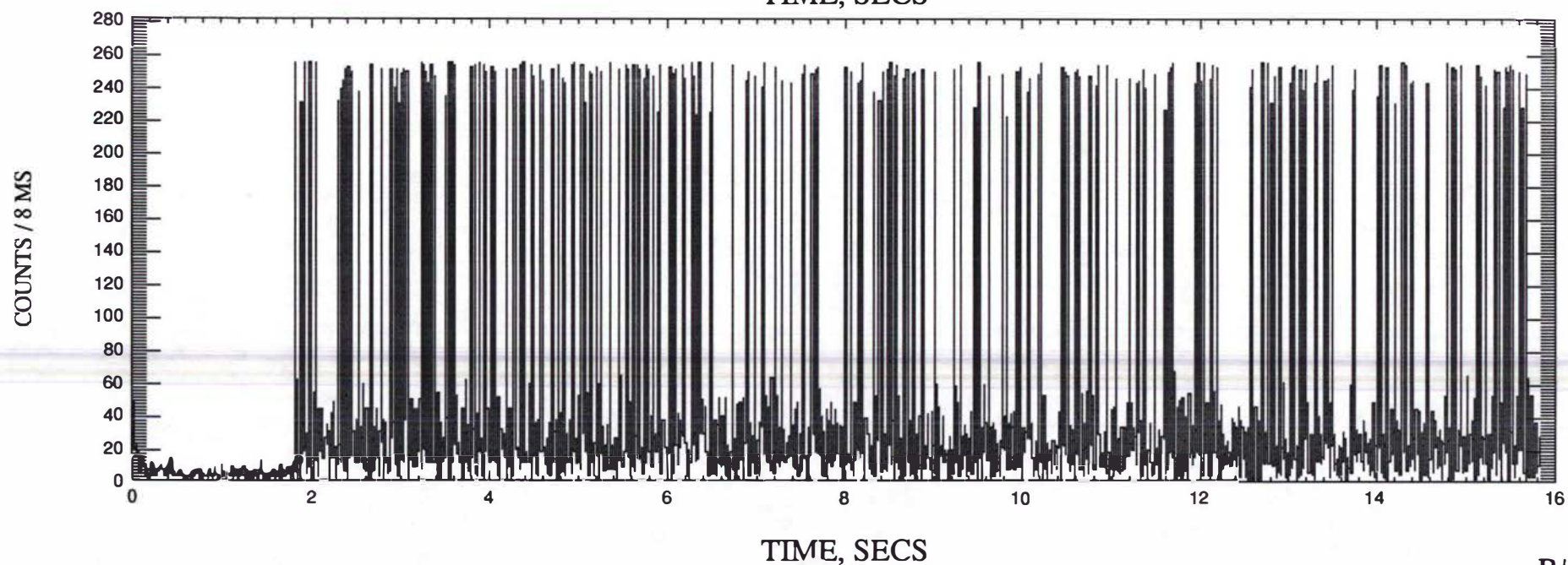
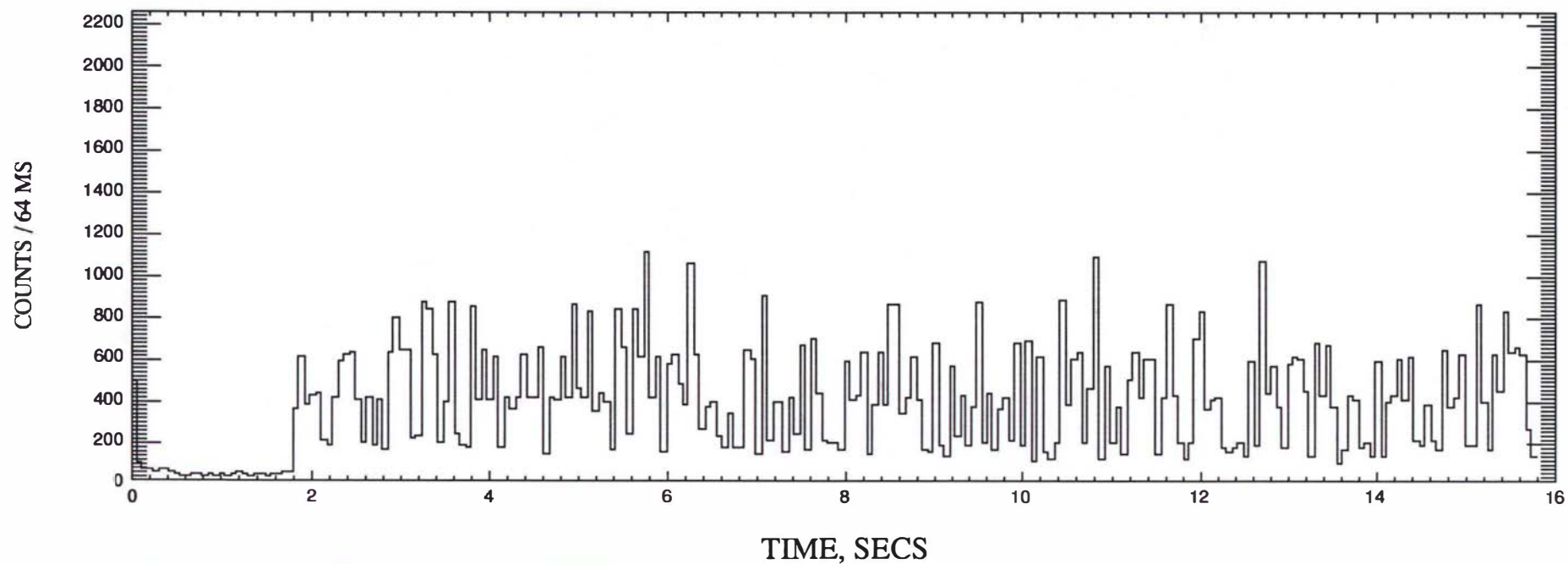
Burst Counter 15 at UT=21.172012146844 h=76219.244 s 21:10:19.244



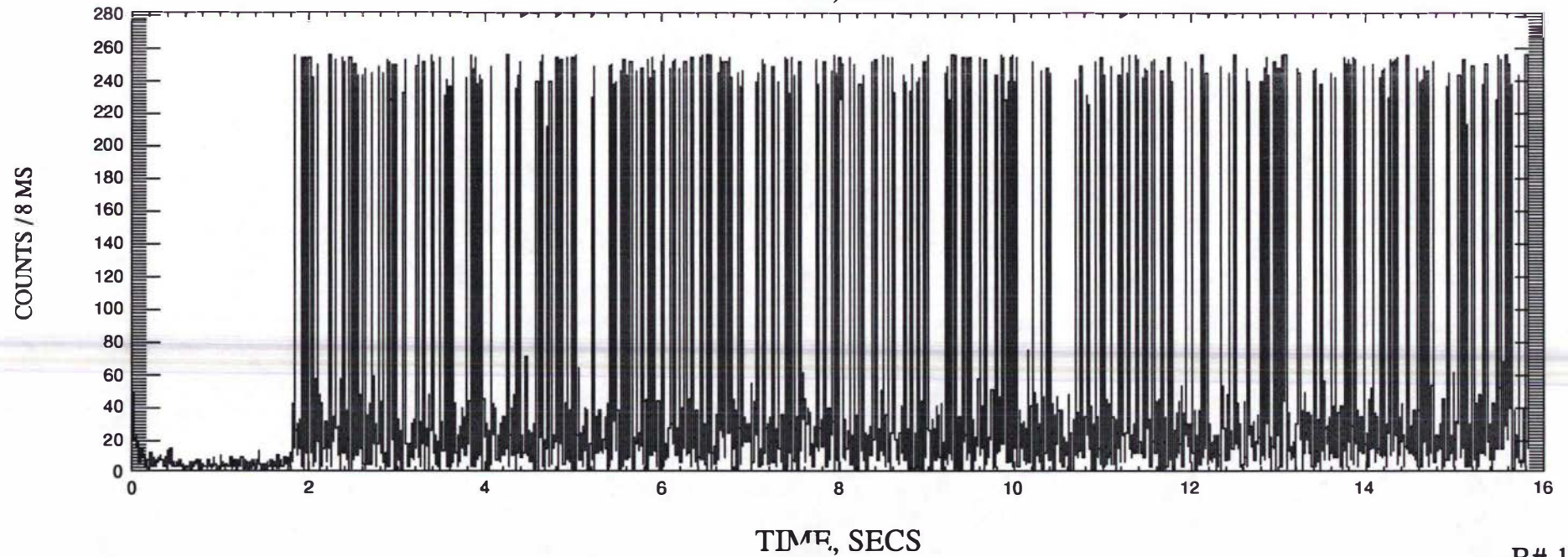
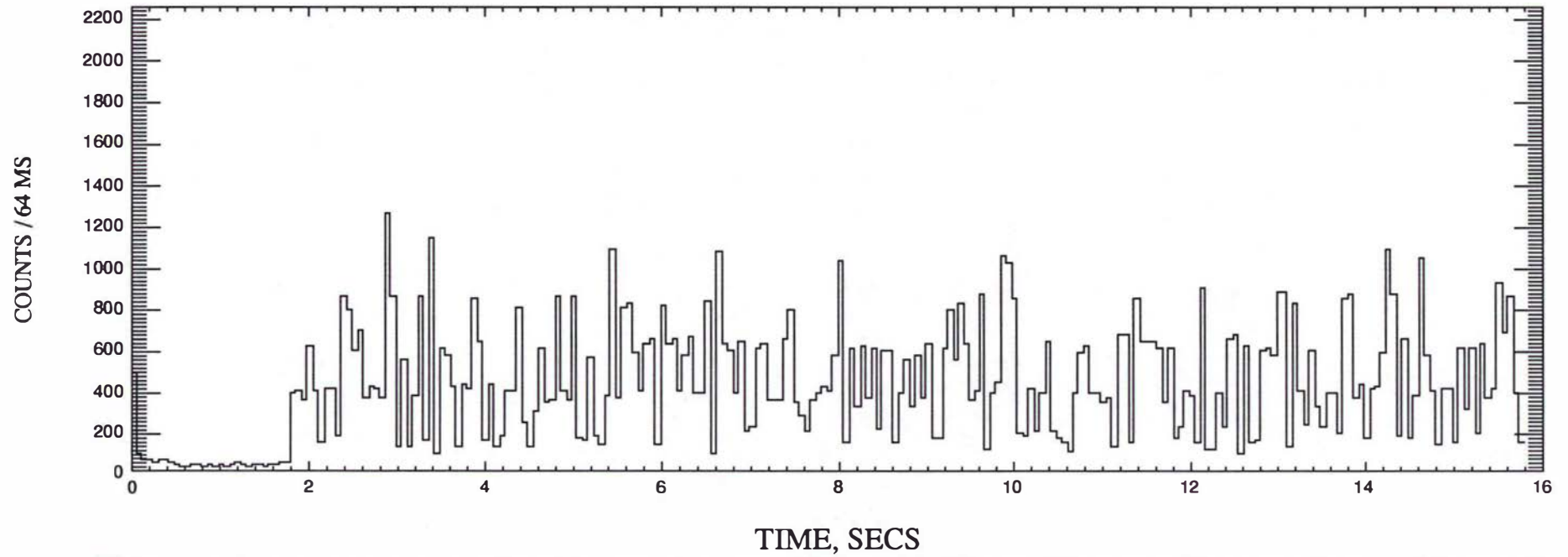
Burst Counter 0 at UT=22.434257473416 h=80763.327 s 22:26:03.327



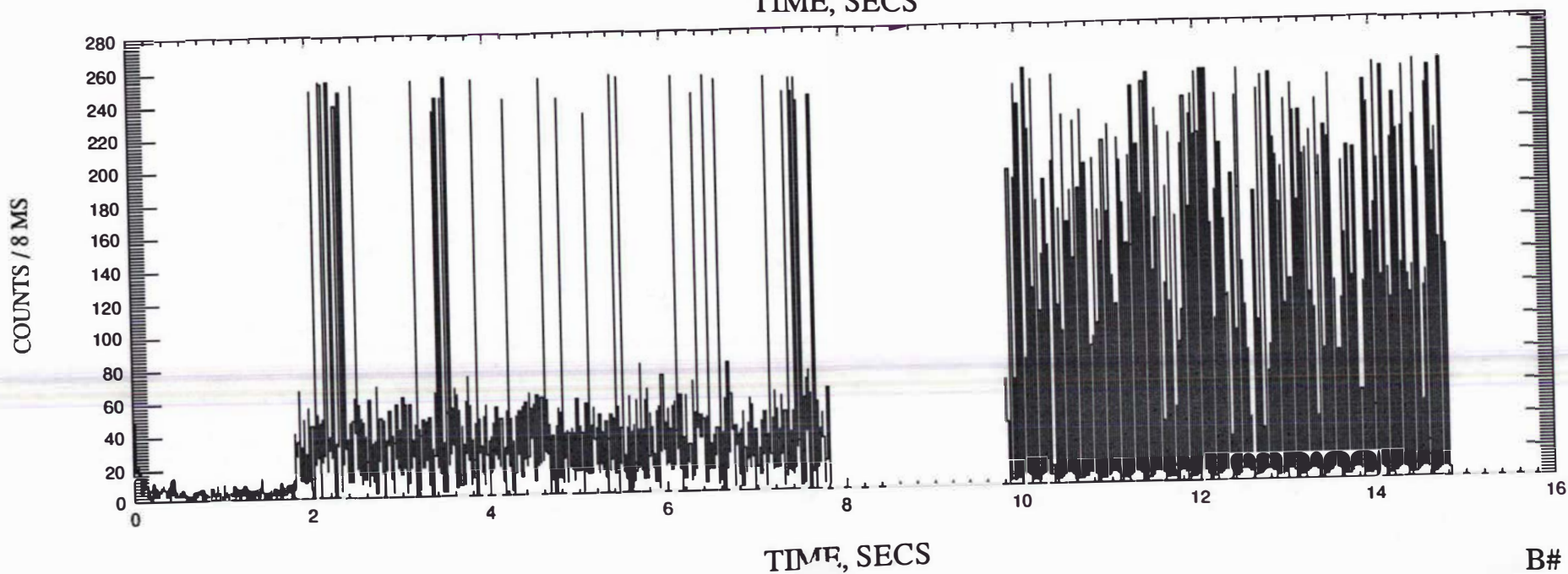
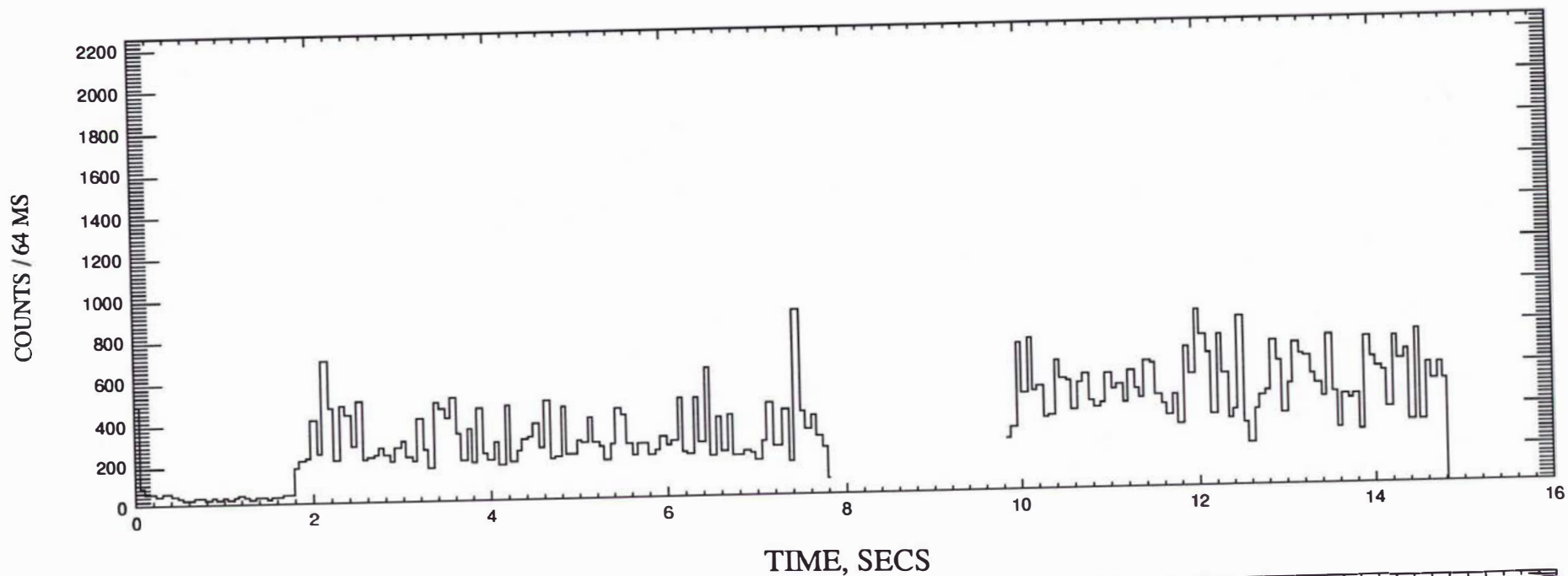
Burst Counter 0 at UT= 6.727304081387 h=24218.295 s 06:43:38.295



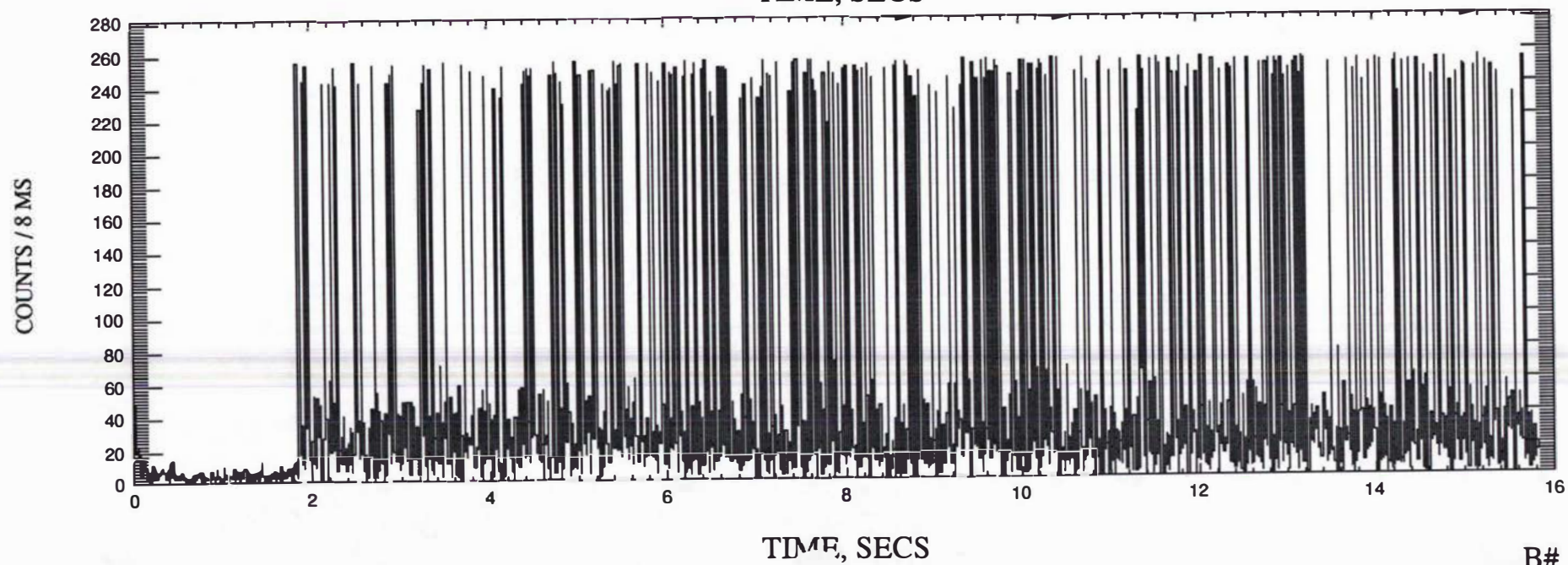
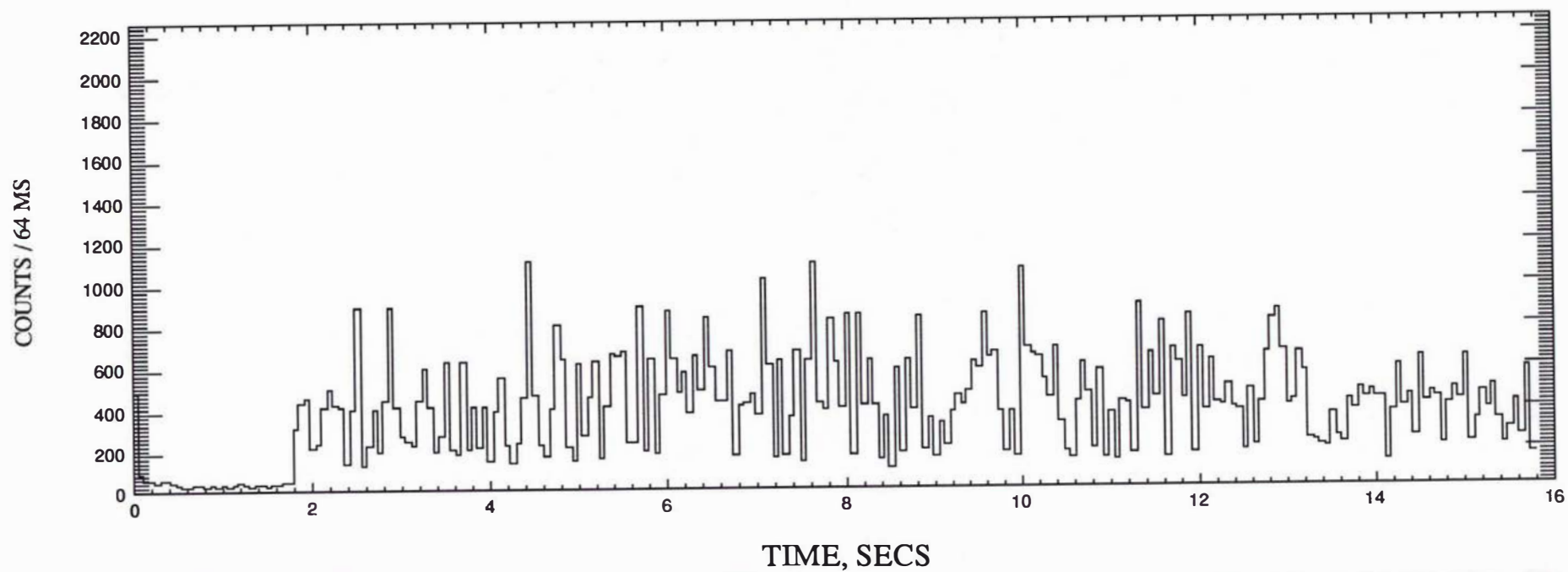
Burst Counter 1 at UT= 7.429539142185 h=26746.341 s 07:25:46.341



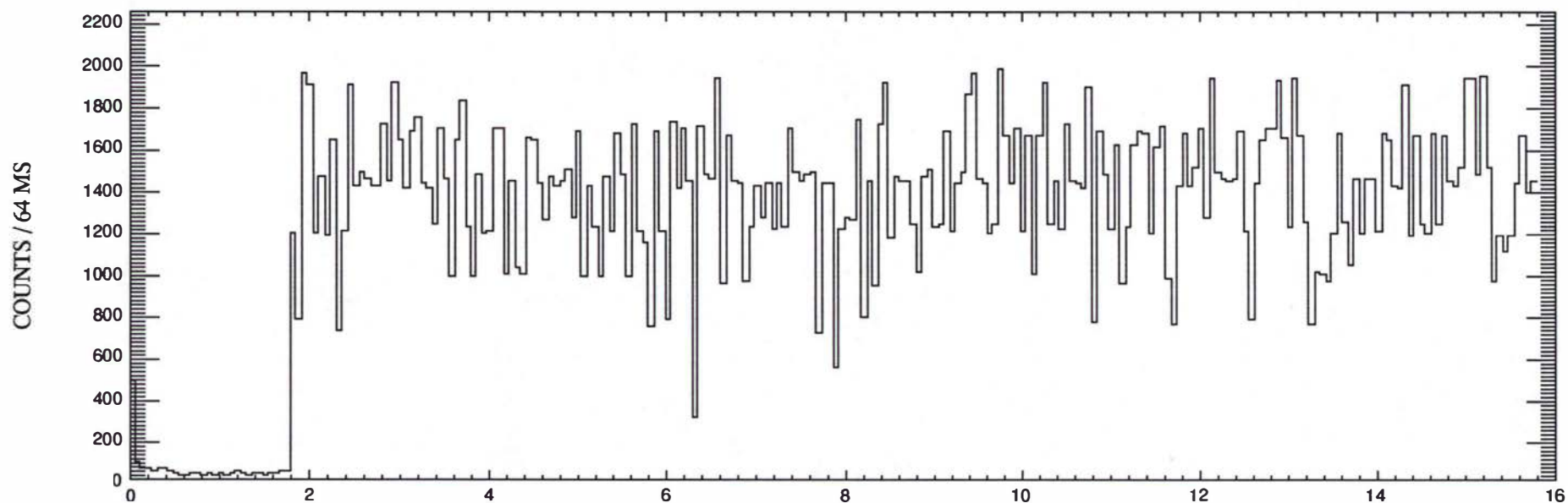
Burst Counter 2 at UT= 8.131774198744 h=29274.387 s 08:07:54.387



Burst Counter 4 at UT= 9.536243031820 h=34330.475 s 09:32:10.475



Burst Counter 5 at UT=10.238478088379 h=36858.521 s 10:14:18.521

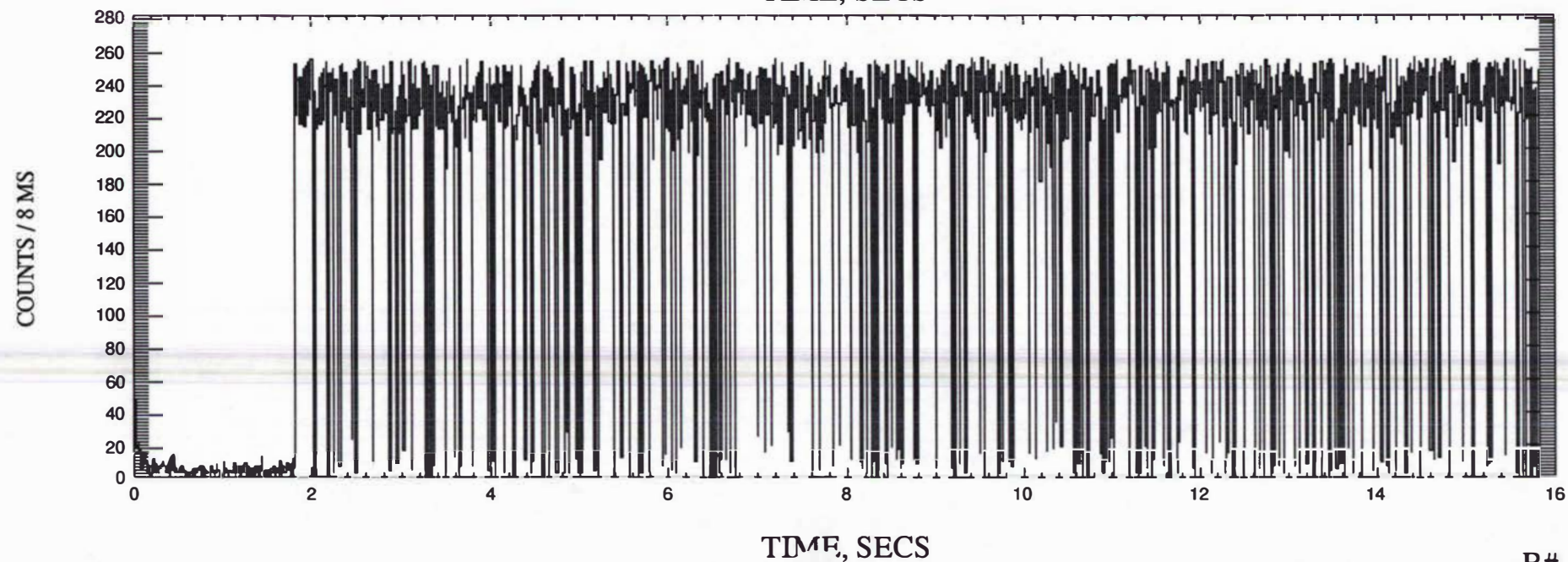
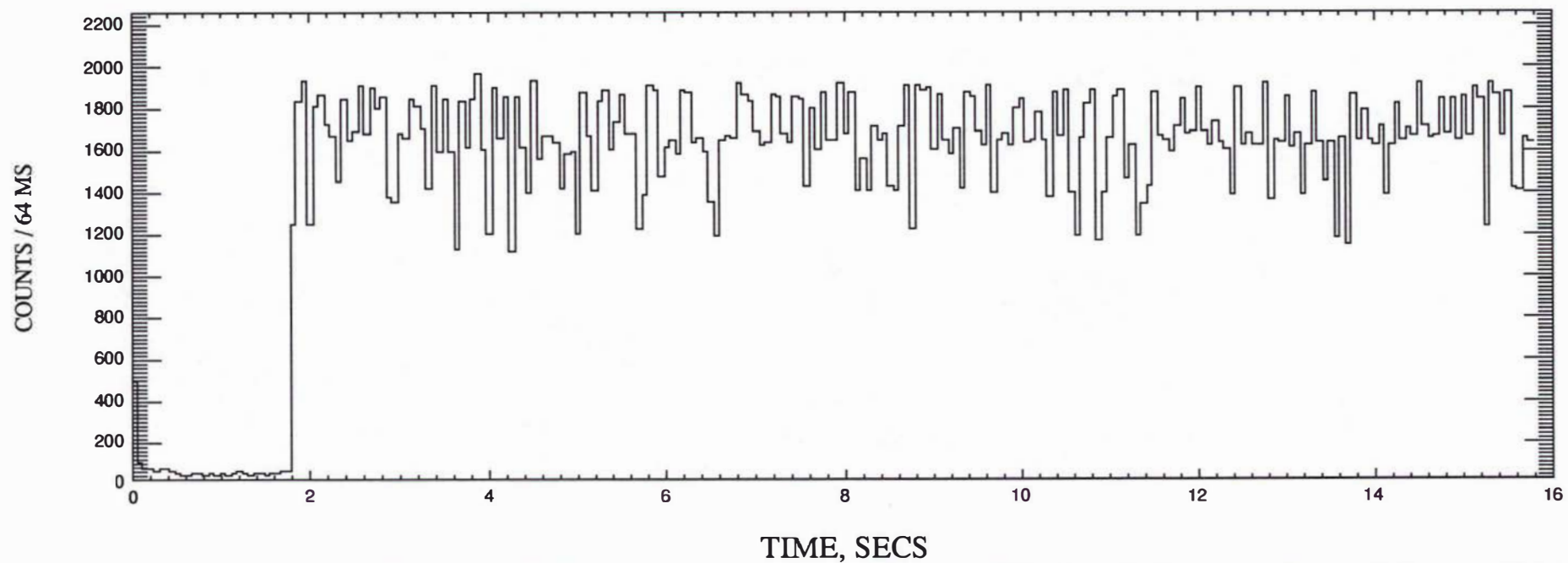


TIME, SECS

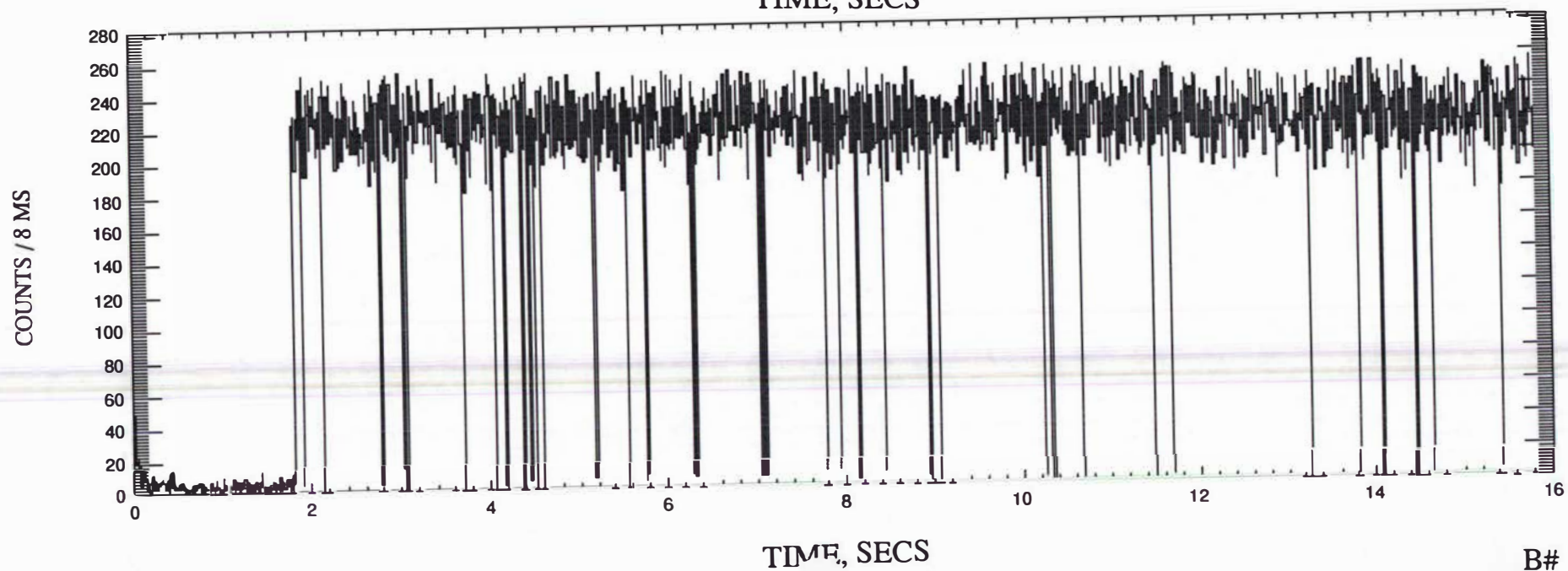
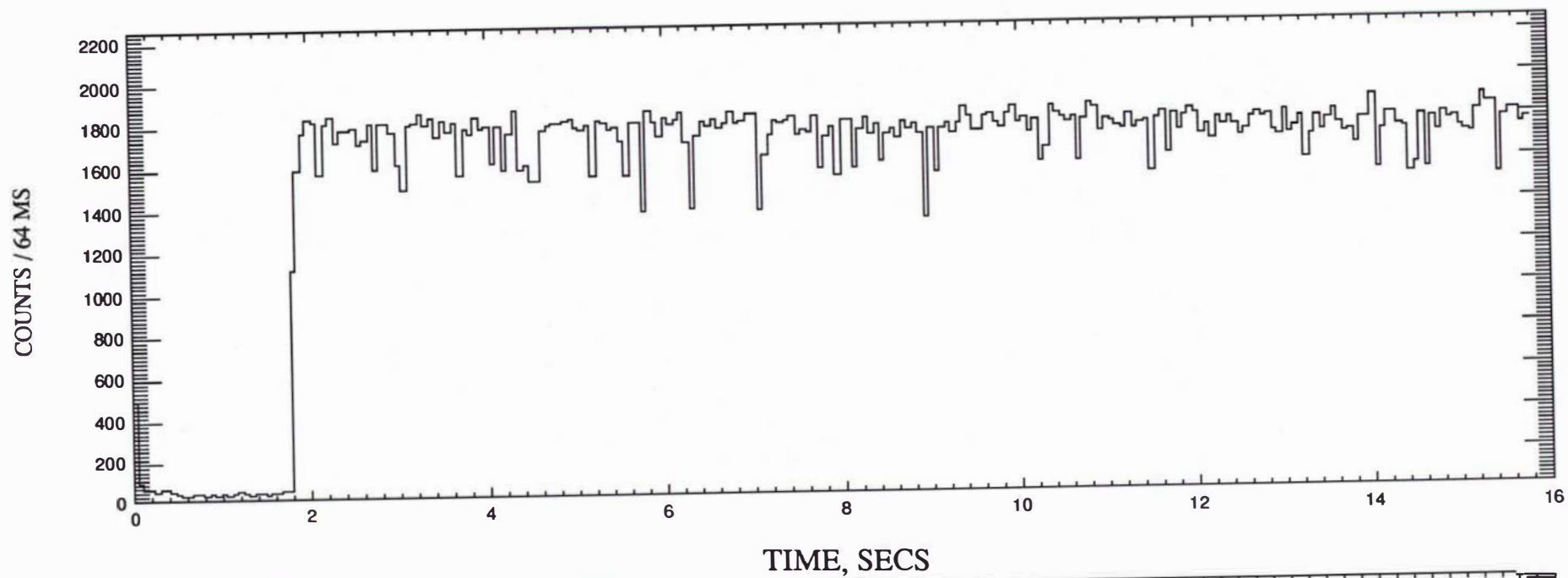


TIME, SECS

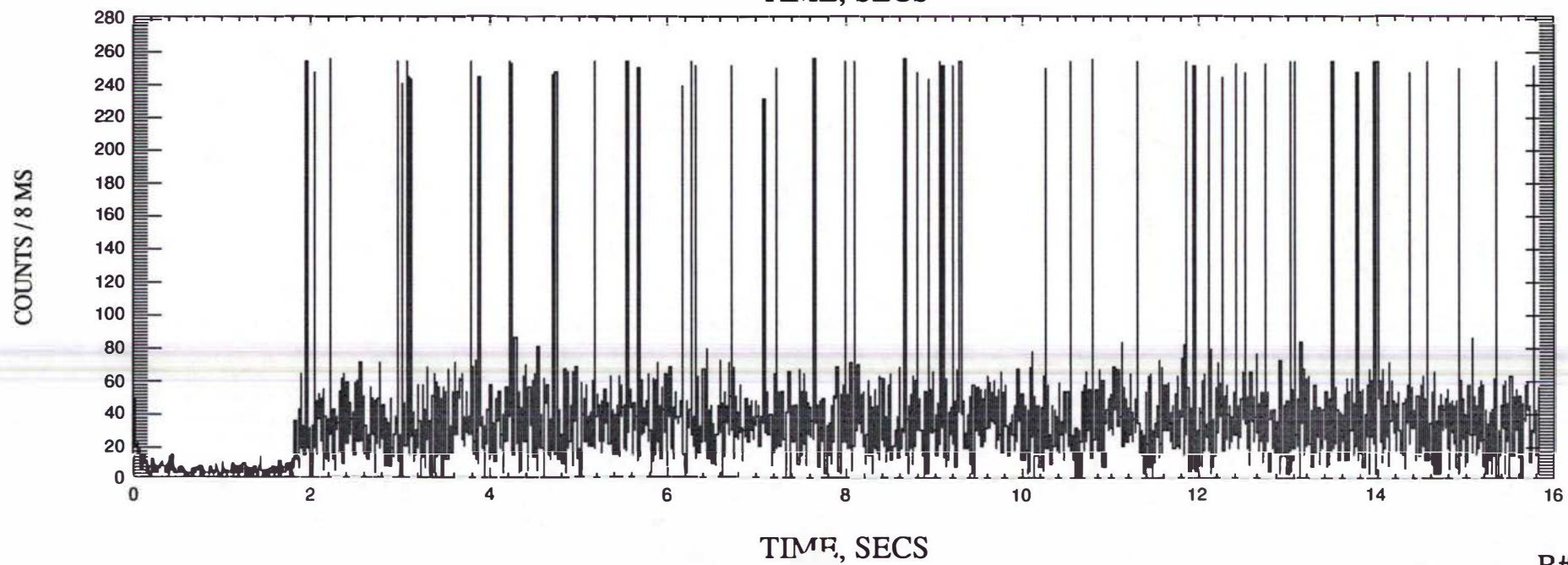
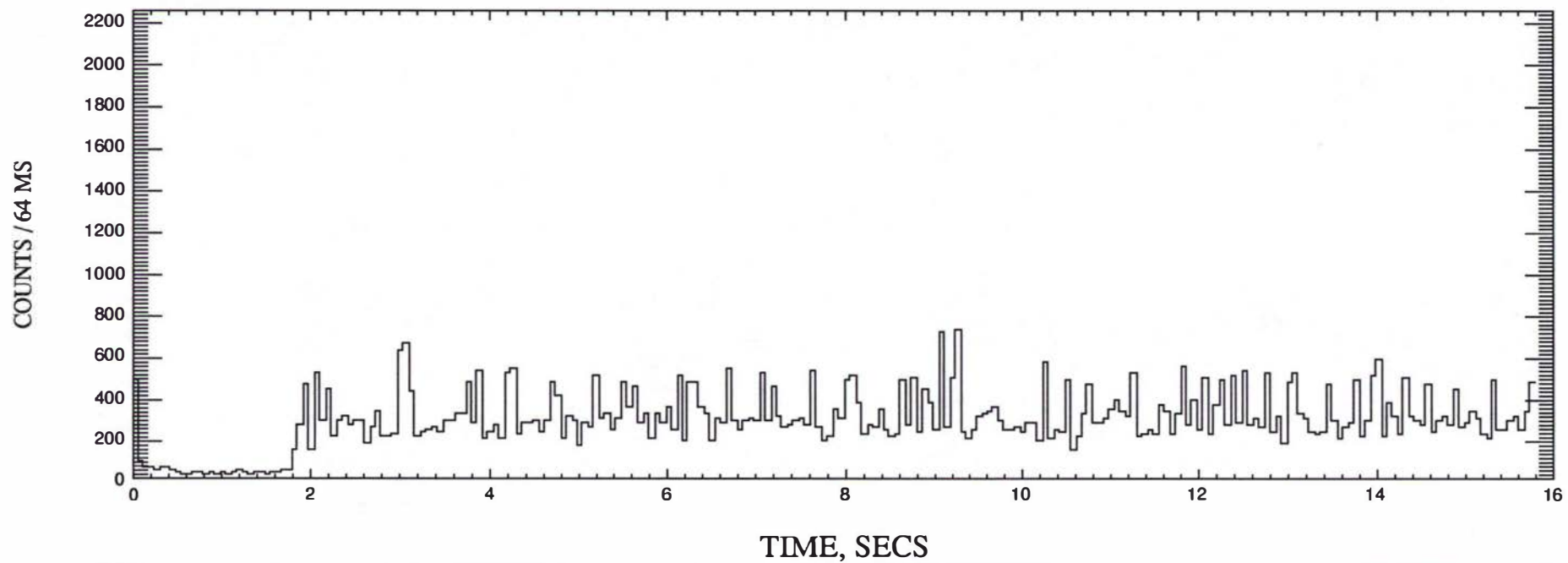
Burst Counter 6 at UT=10.940713144938 h=39386.567 s 10:56:26.567



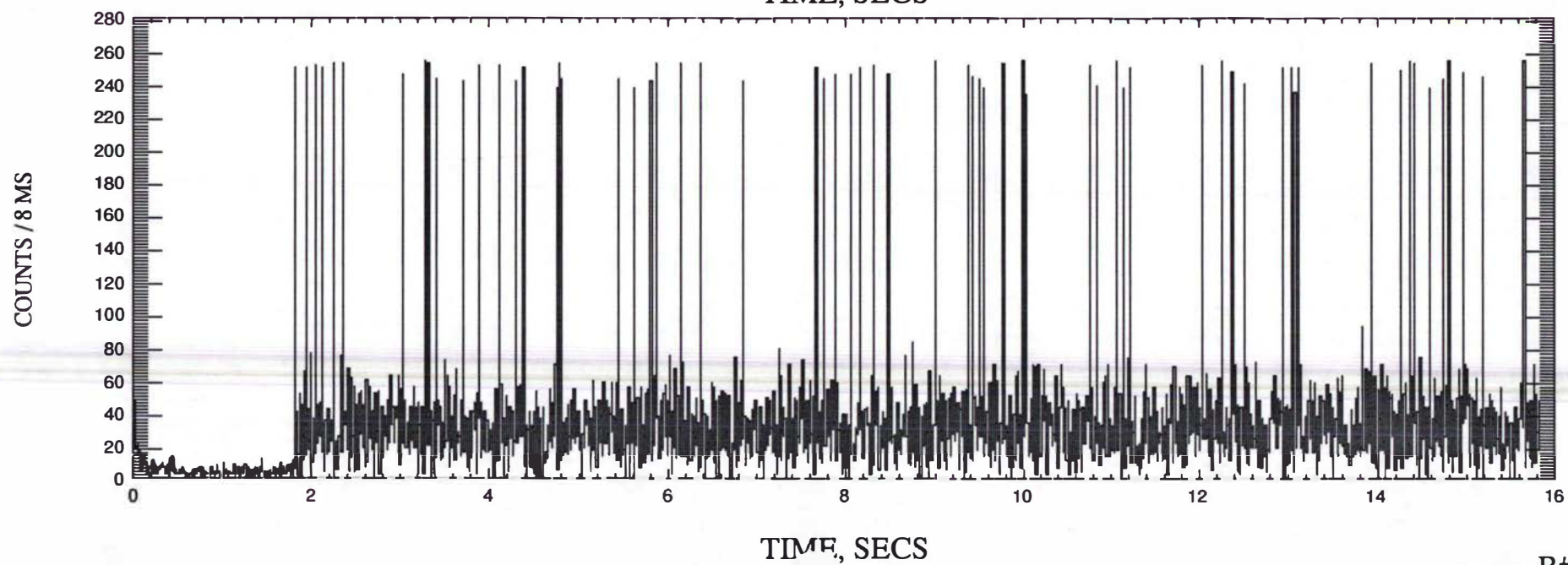
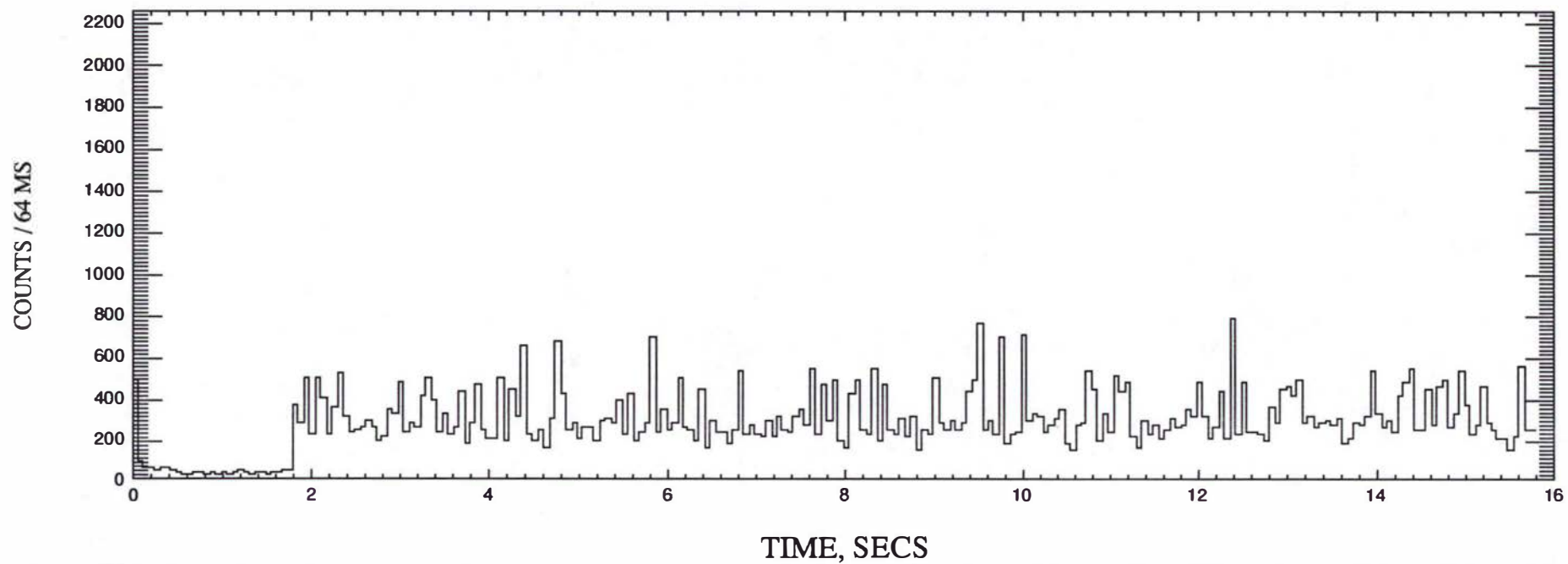
Burst Counter 7 at UT=11.642948205736 h=41914.614 s 11:38:34.614



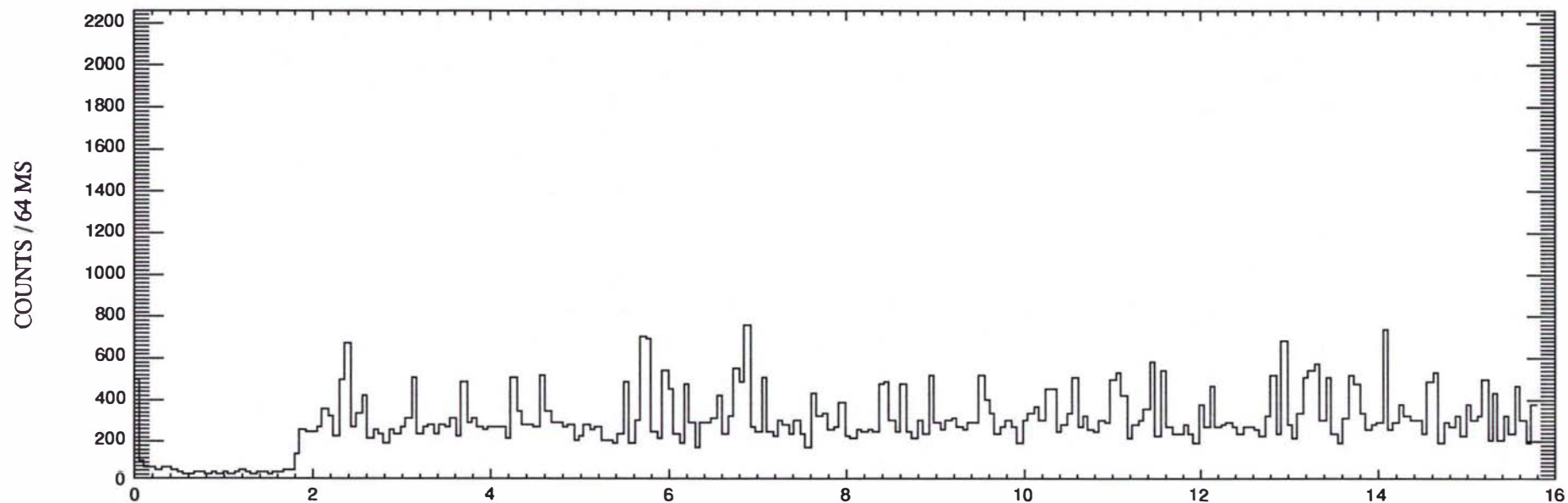
Burst Counter 8 at UT= 1.020533447266 h= 3673.920 s 01:01:13.920



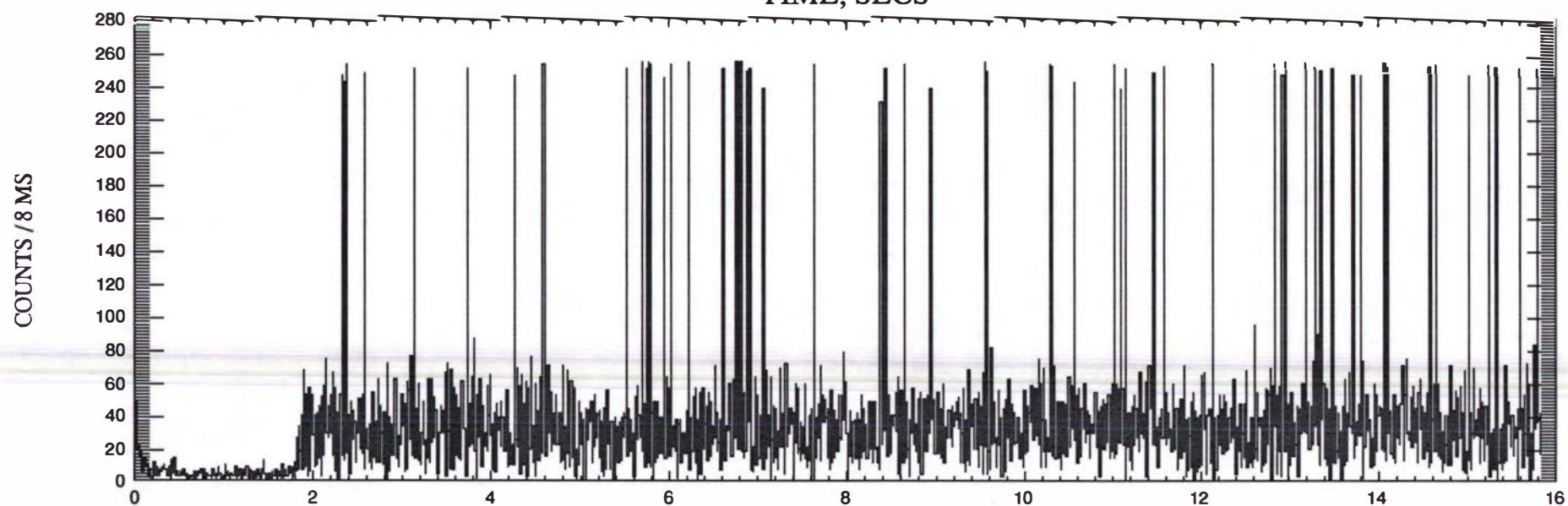
Burst Counter 9 at UT= 1.669434530470 h= 6009.964 s 01:40:09.964



Burst Counter 10 at UT= 2.513895339966 h= 9050.023 s 02:30:50.023

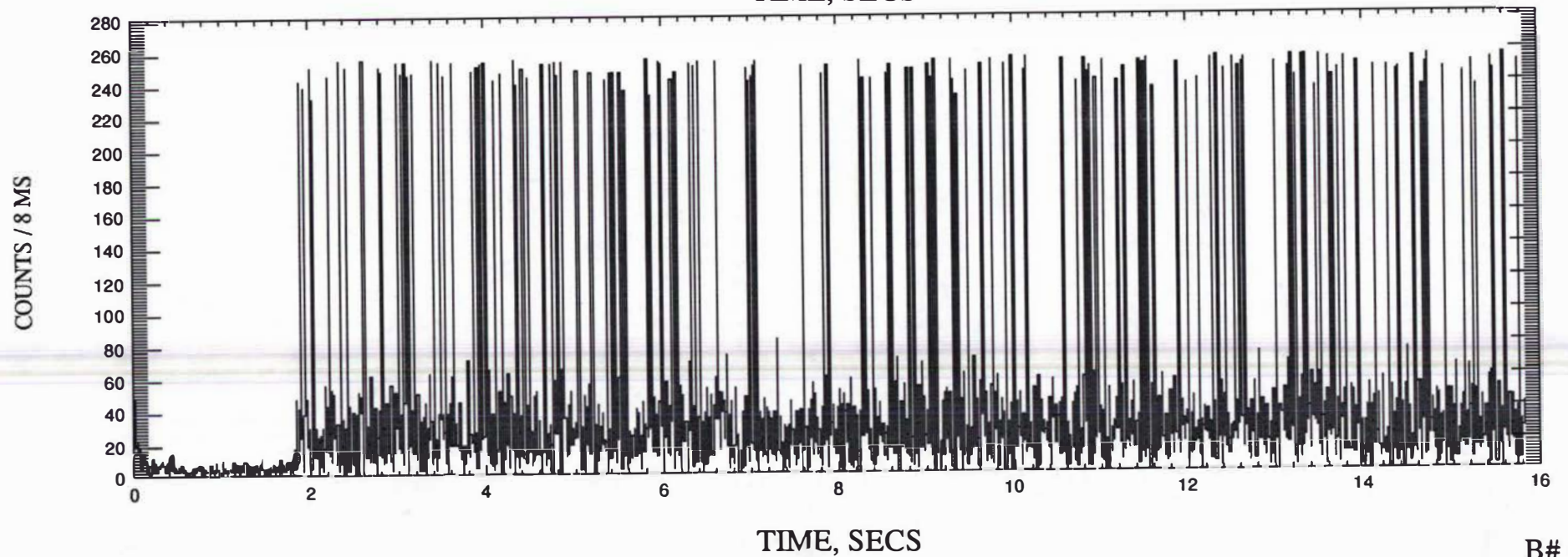
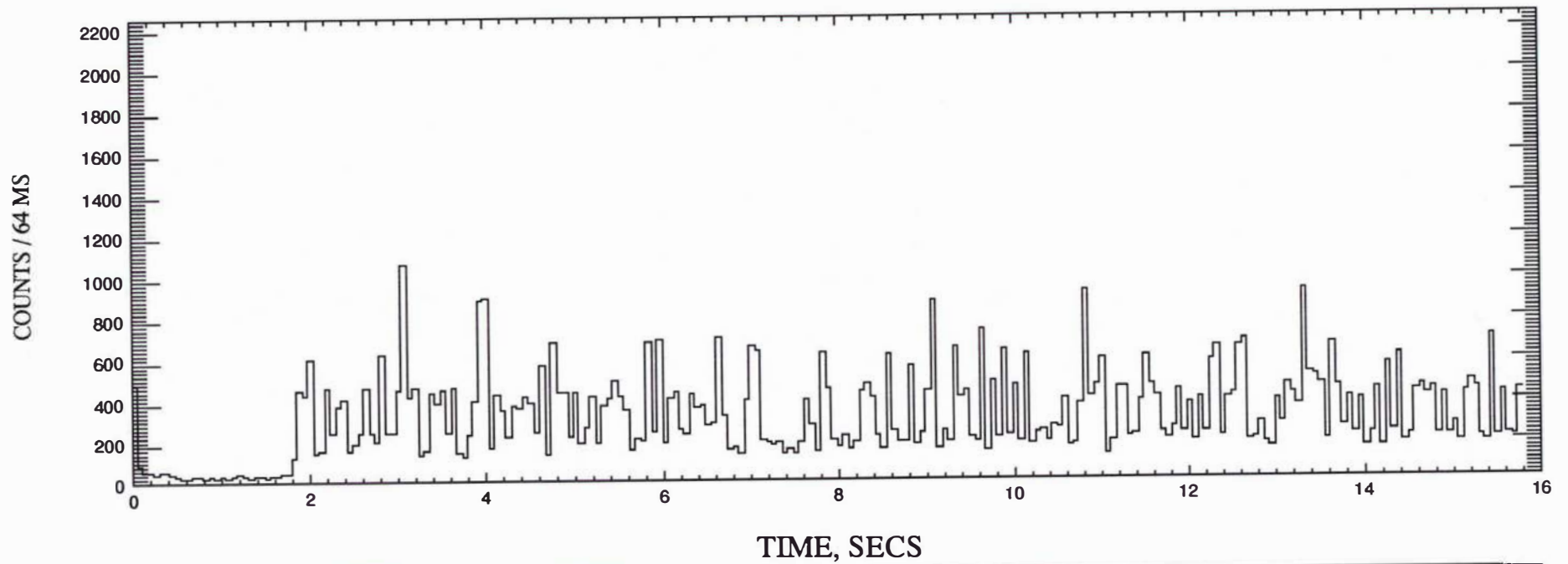


TIME, SECS

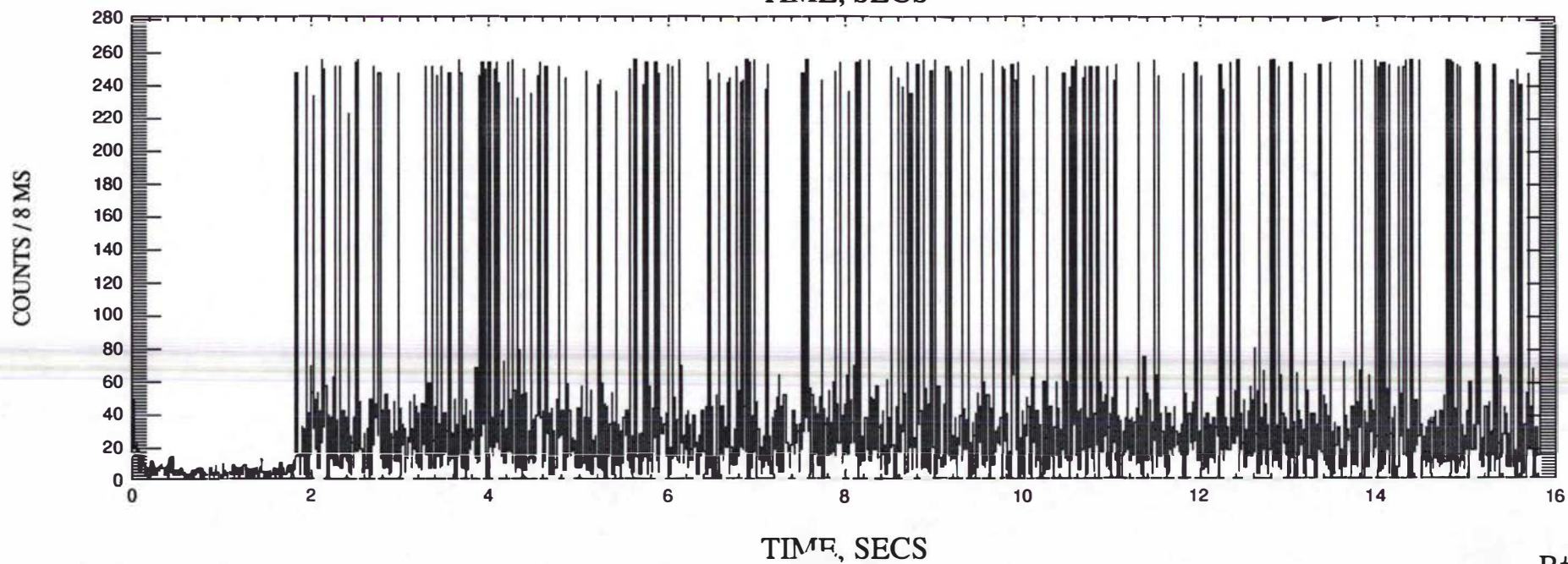
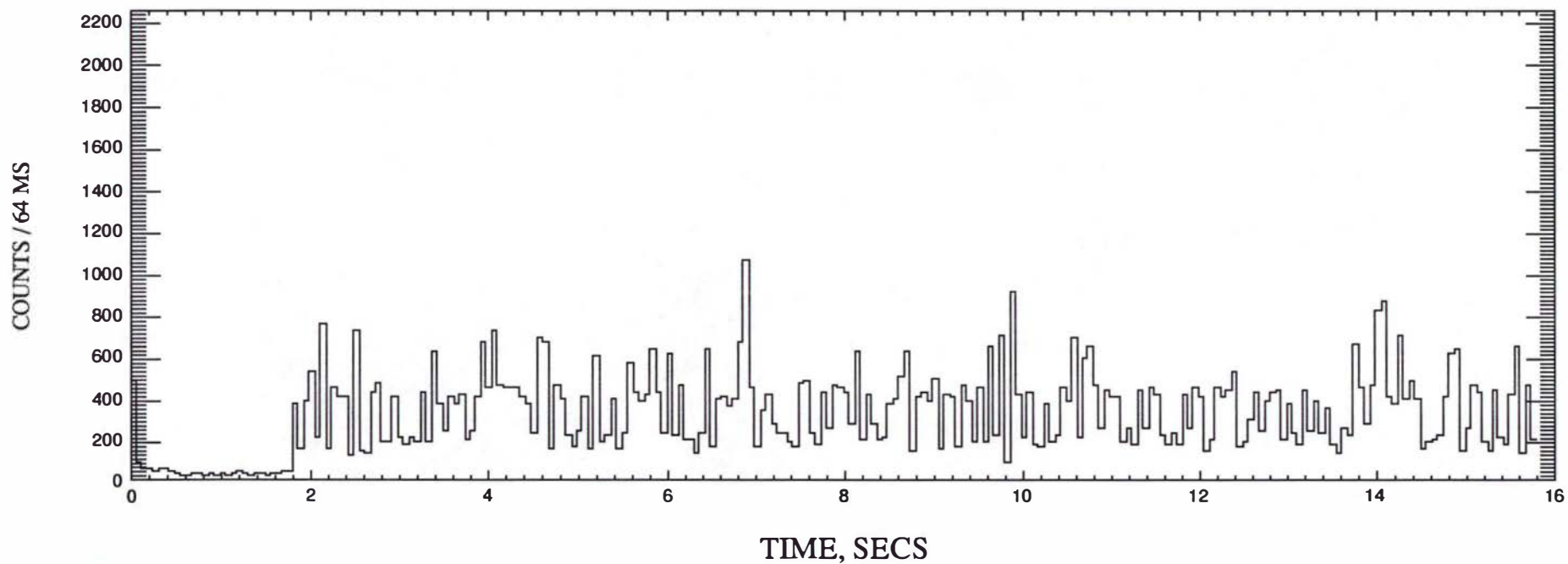


TIME, SECS

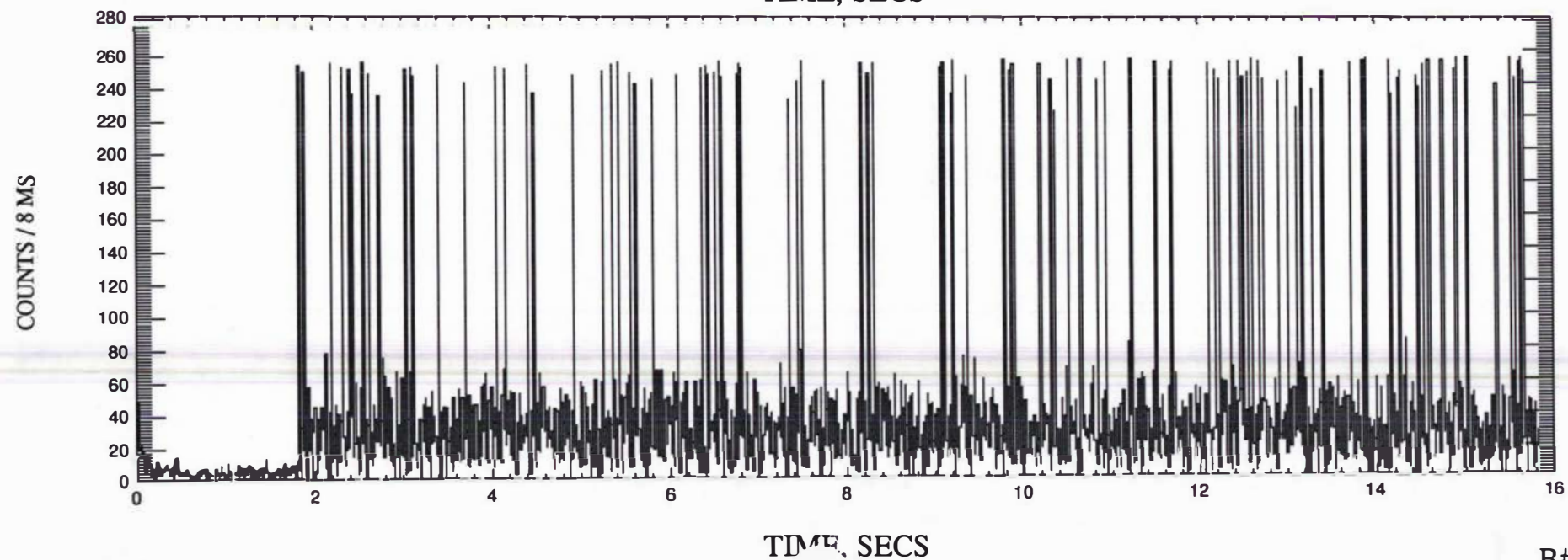
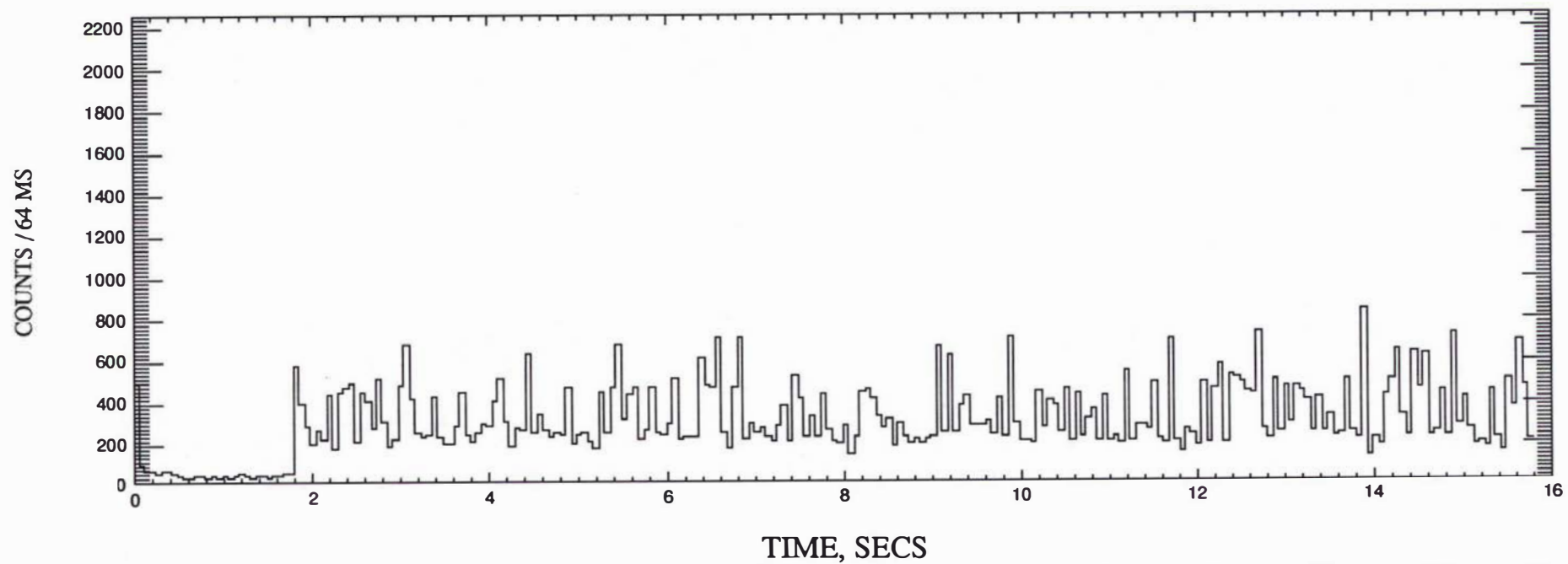
Burst Counter 11 at UT= 3.216130396525 h=11578.069 s 03:12:58.069



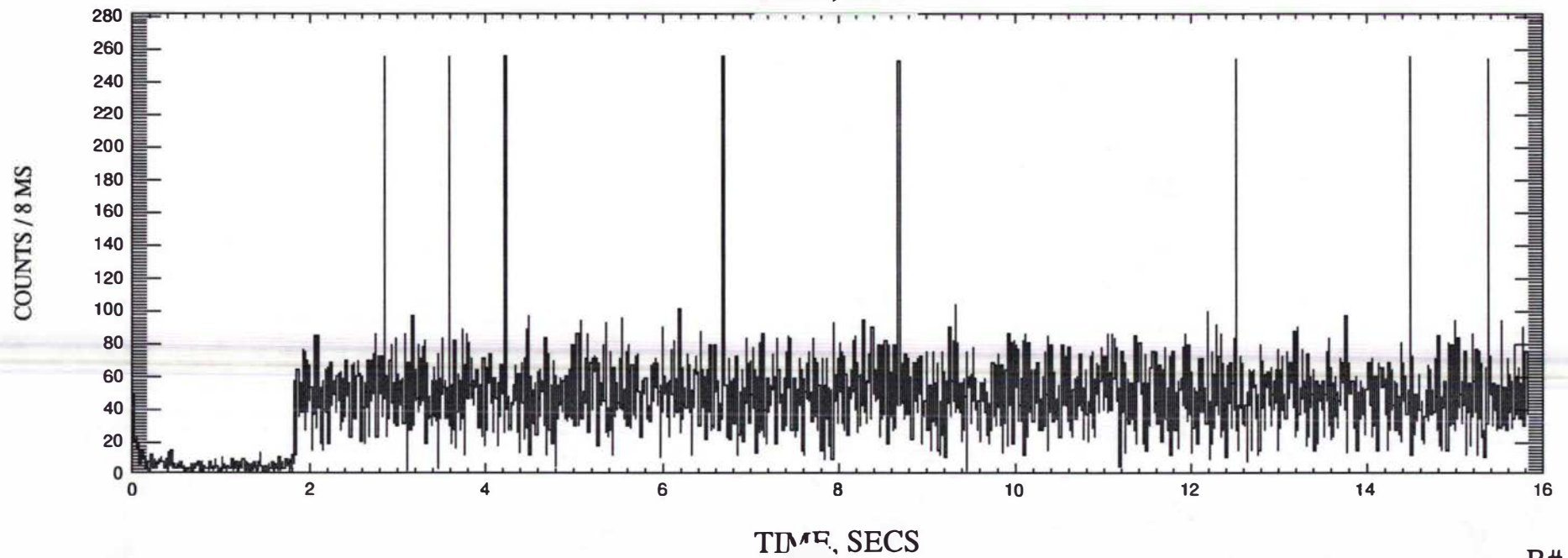
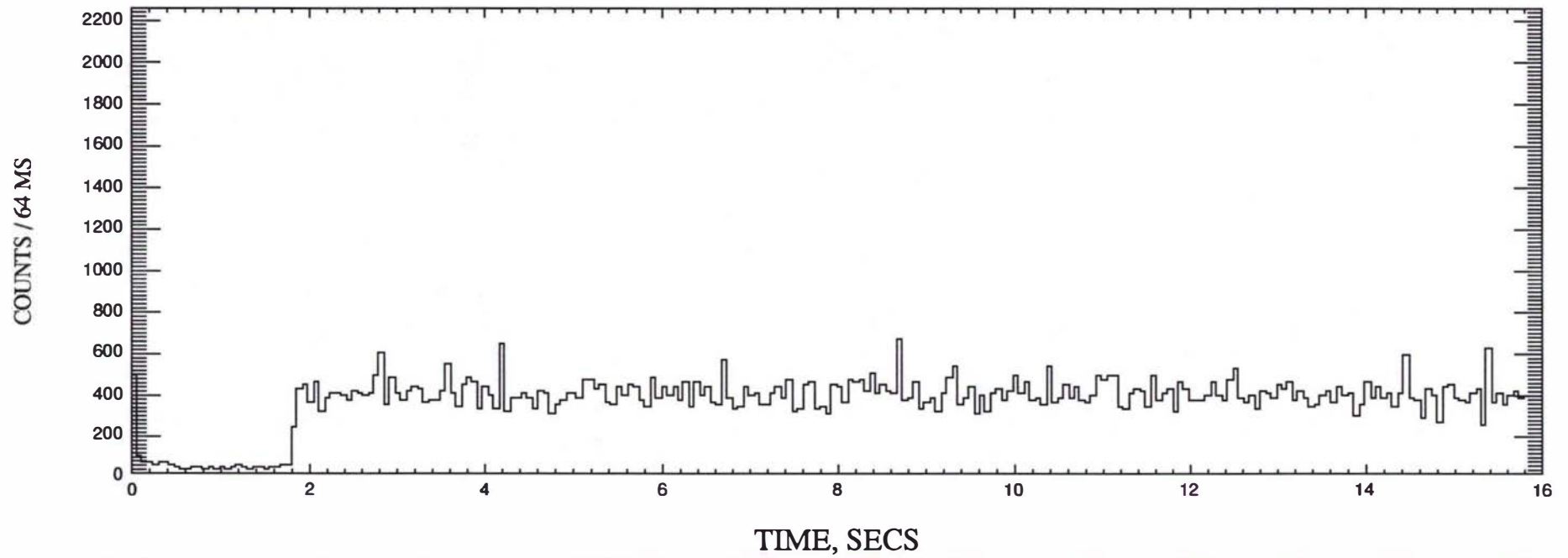
Burst Counter 12 at UT= 3.918364173041 h=14106.111 s 03:55:06.111



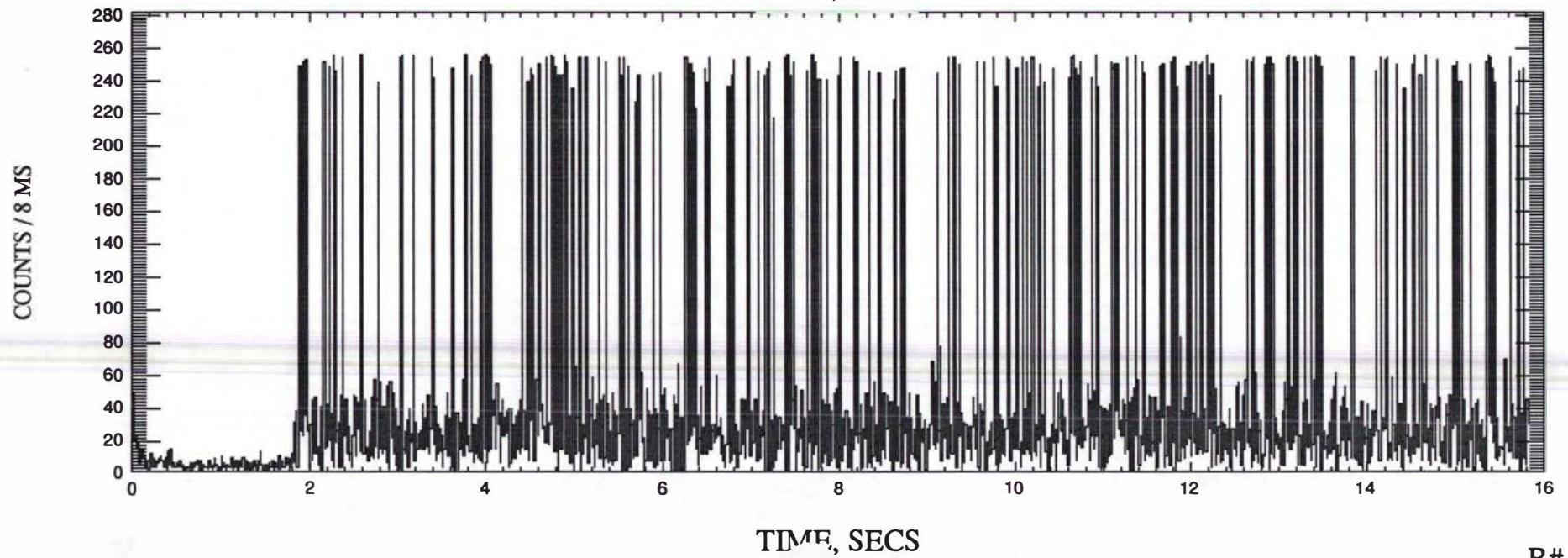
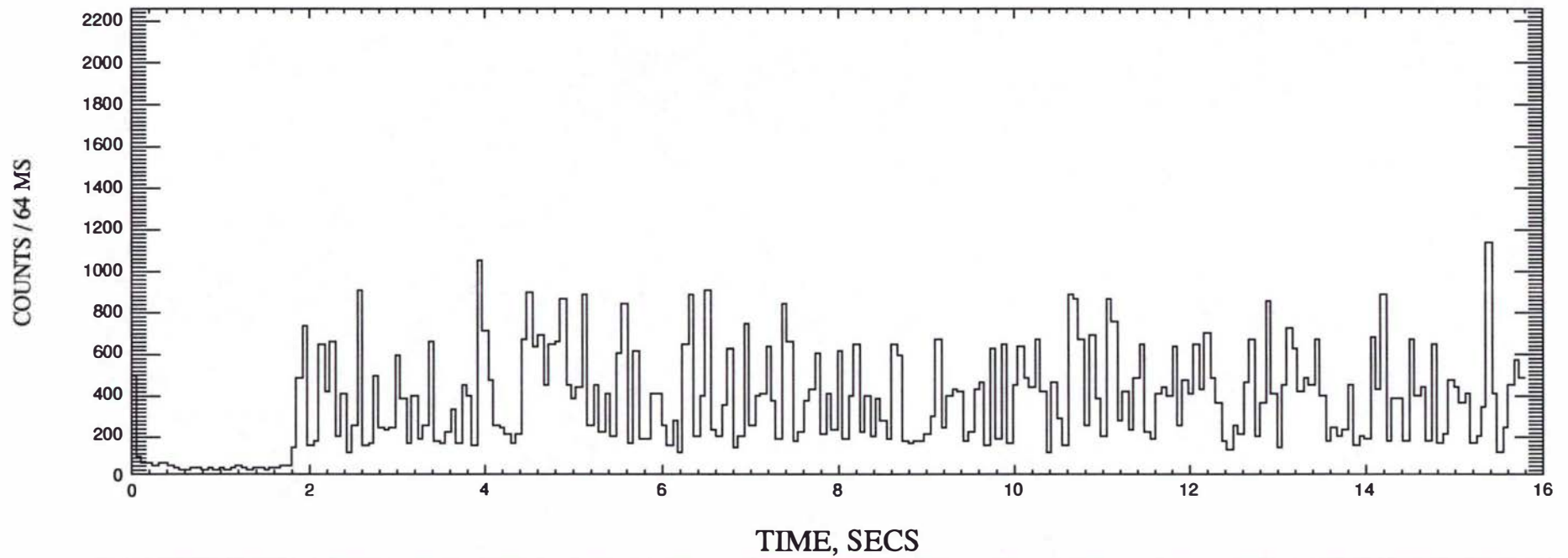
Burst Counter 13 at UT= 4.620599229601 h=16634.157 s 04:37:14.157

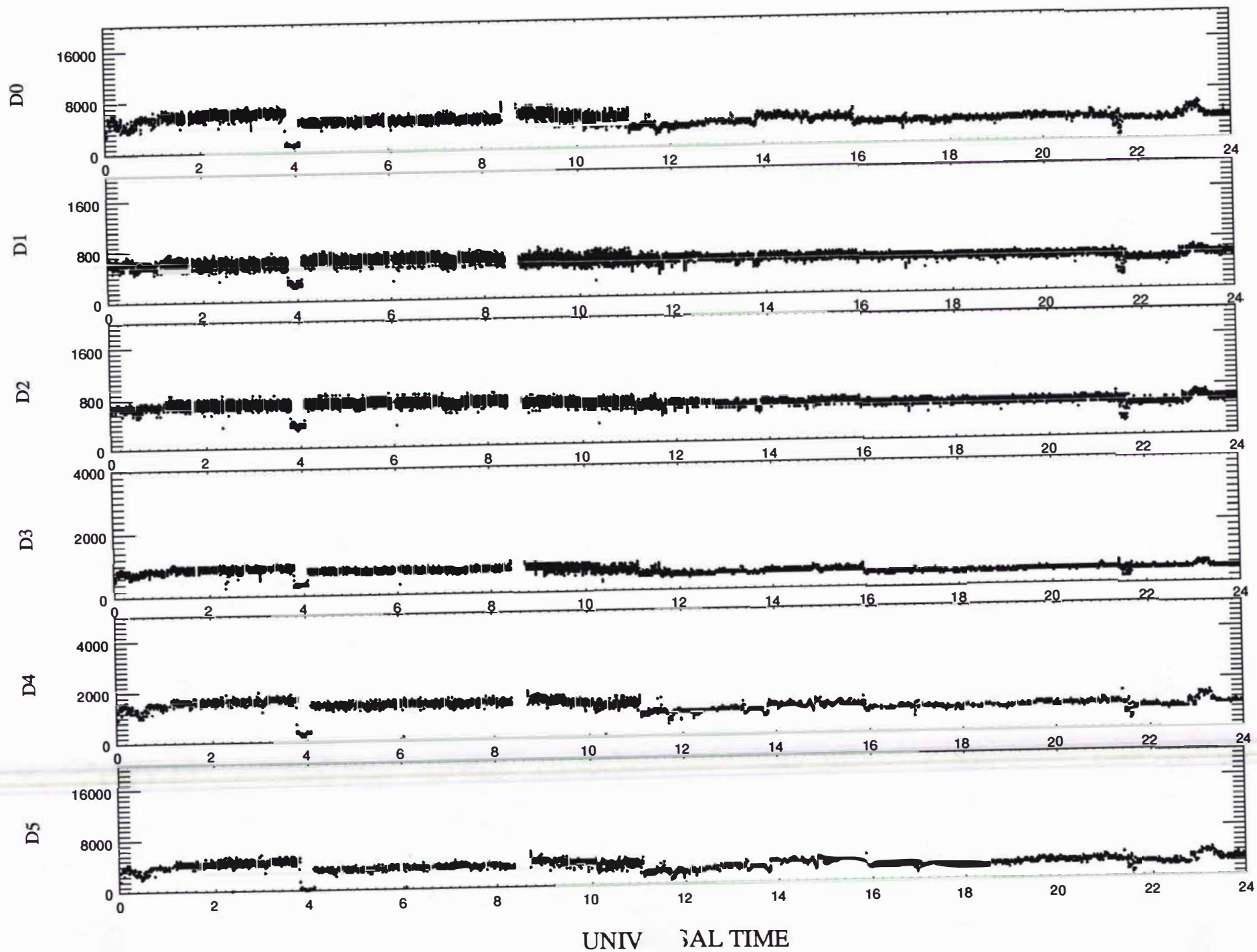


Burst Counter 14 at UT= 5.322834286160 h=19162.203 s 05:19:22.203

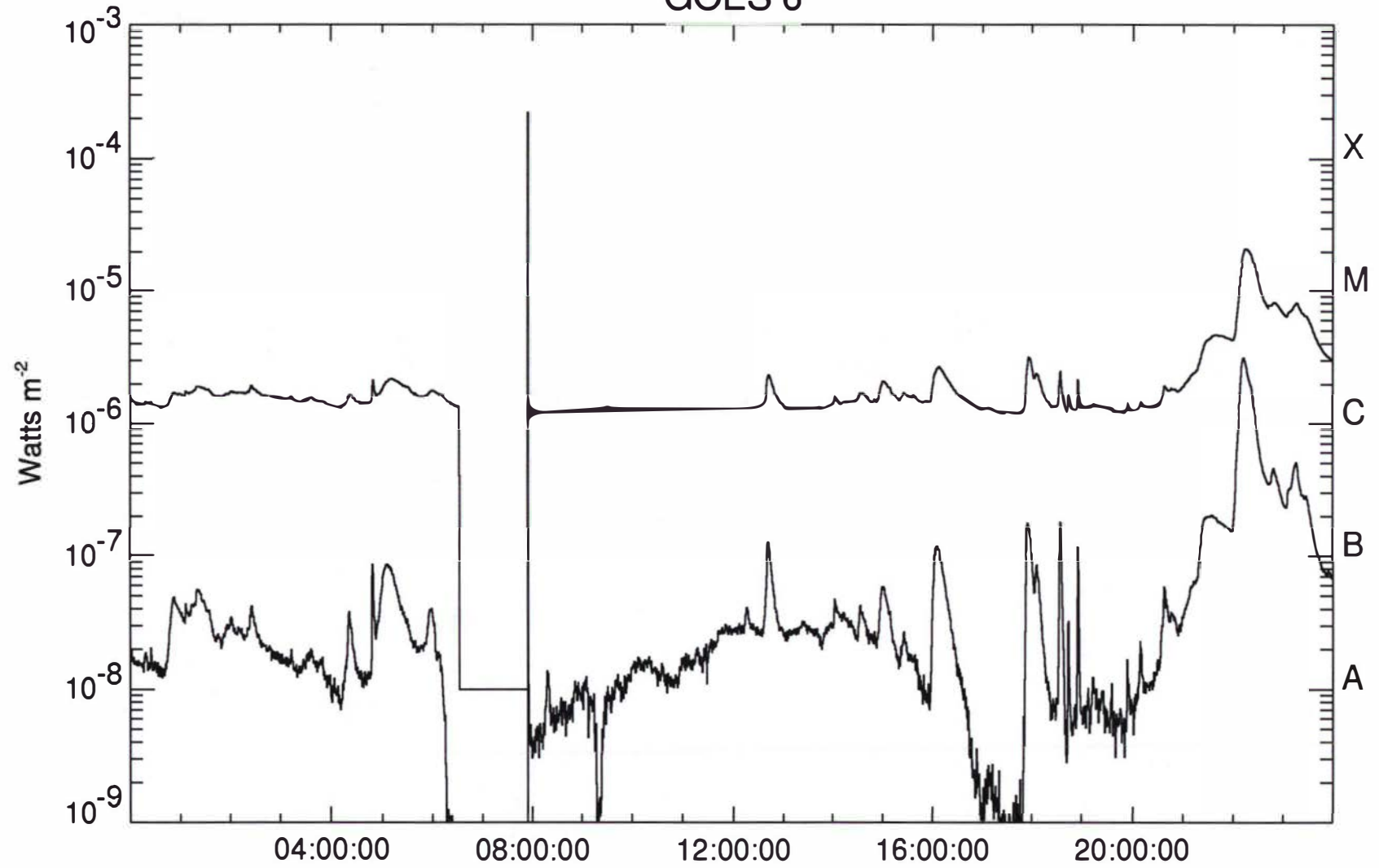


Burst Counter 15 at UT= 5.953956951565 h=21434.245 s 05:57:14.245





GOES 6

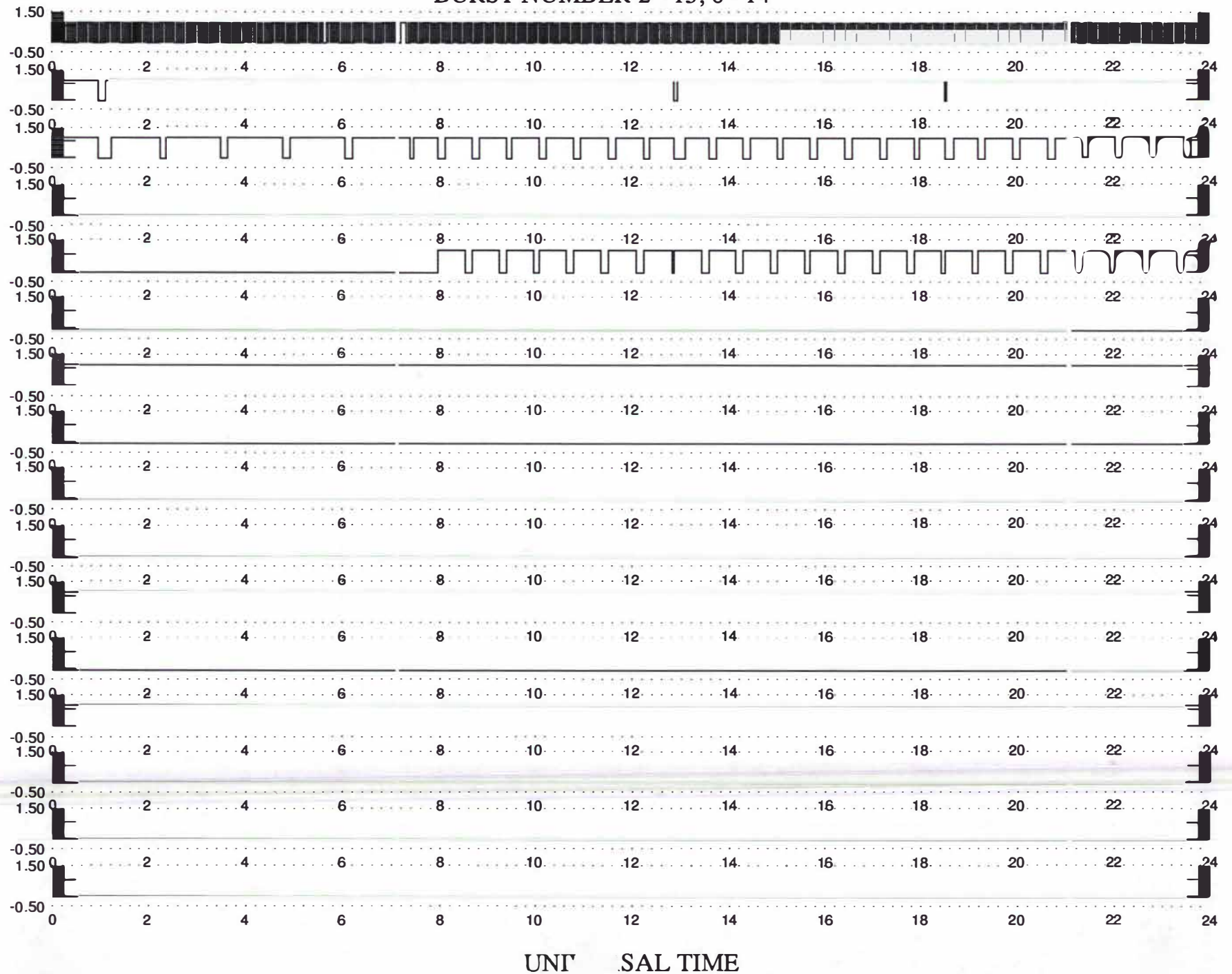


Data Start: 91/03/27, 0000:02

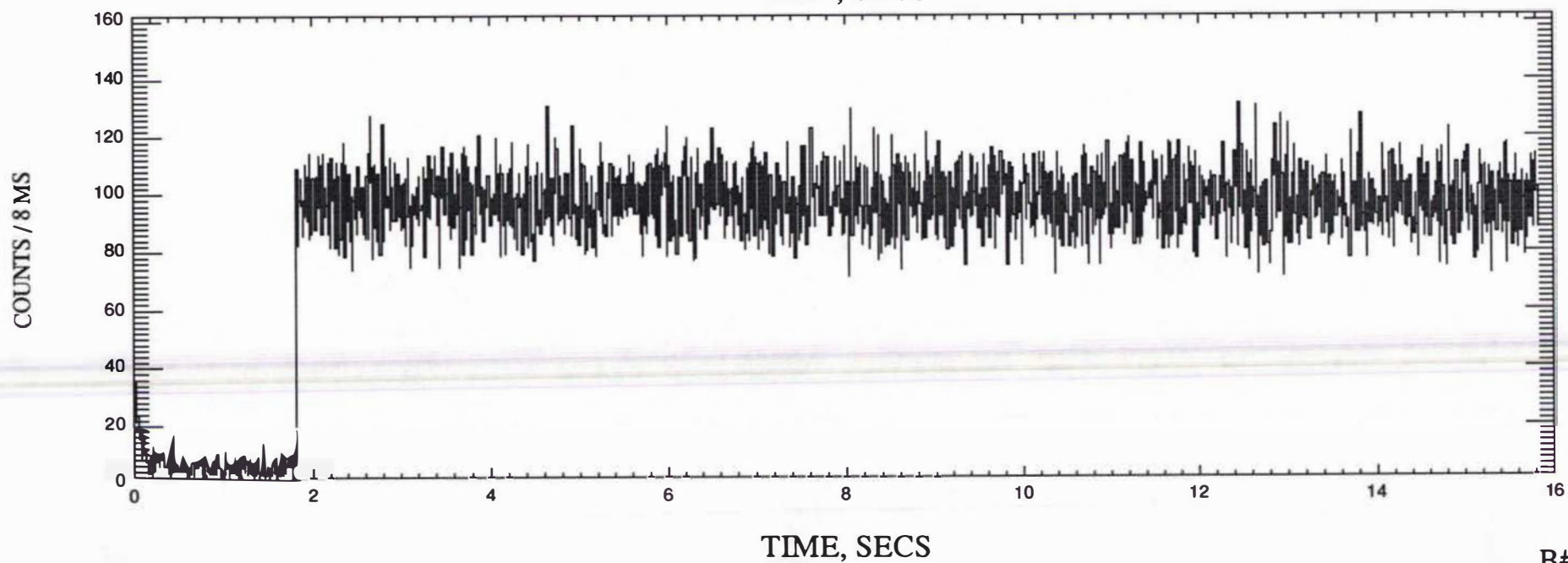
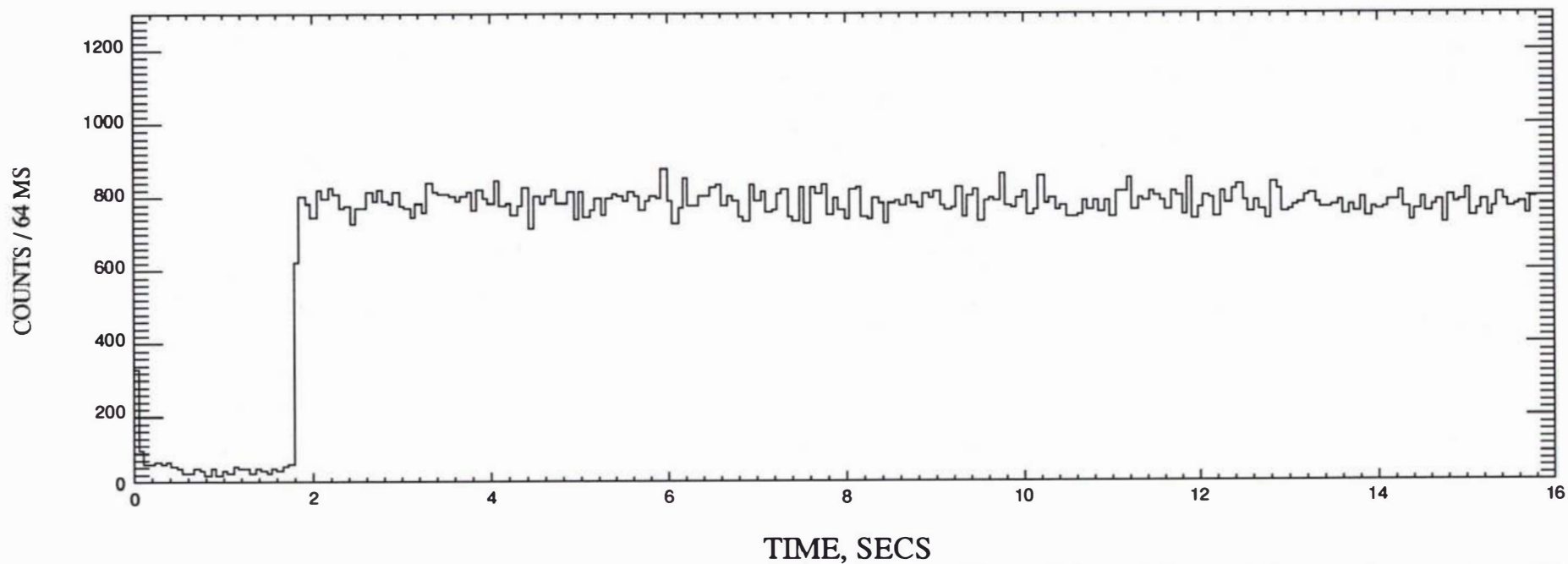
Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

Plot created: 96/11/26, 1915

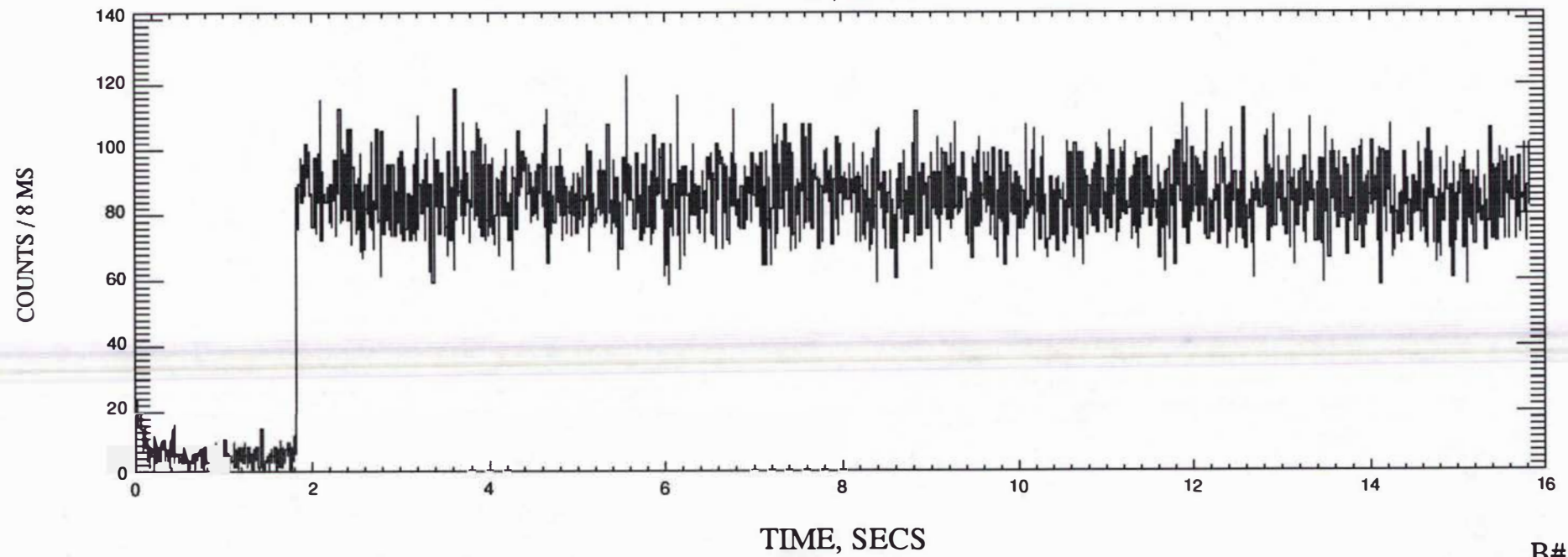
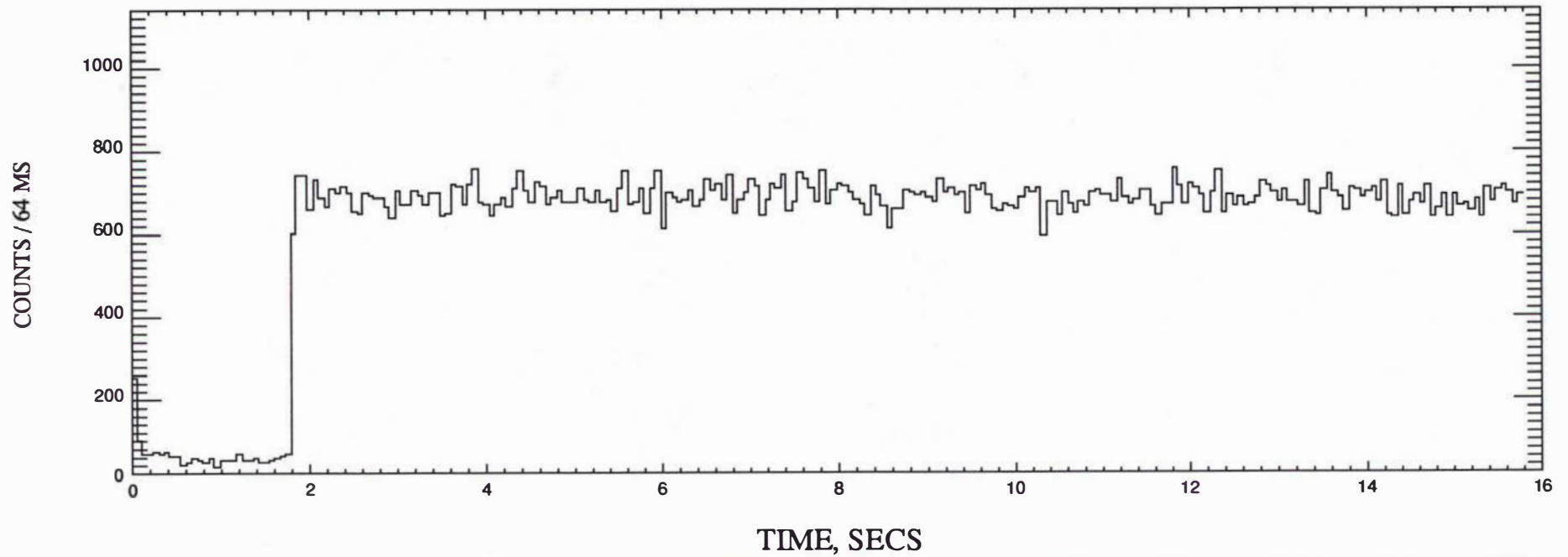
Background not subtracted
Background not subtracted
Sample average = 10

[illegible]

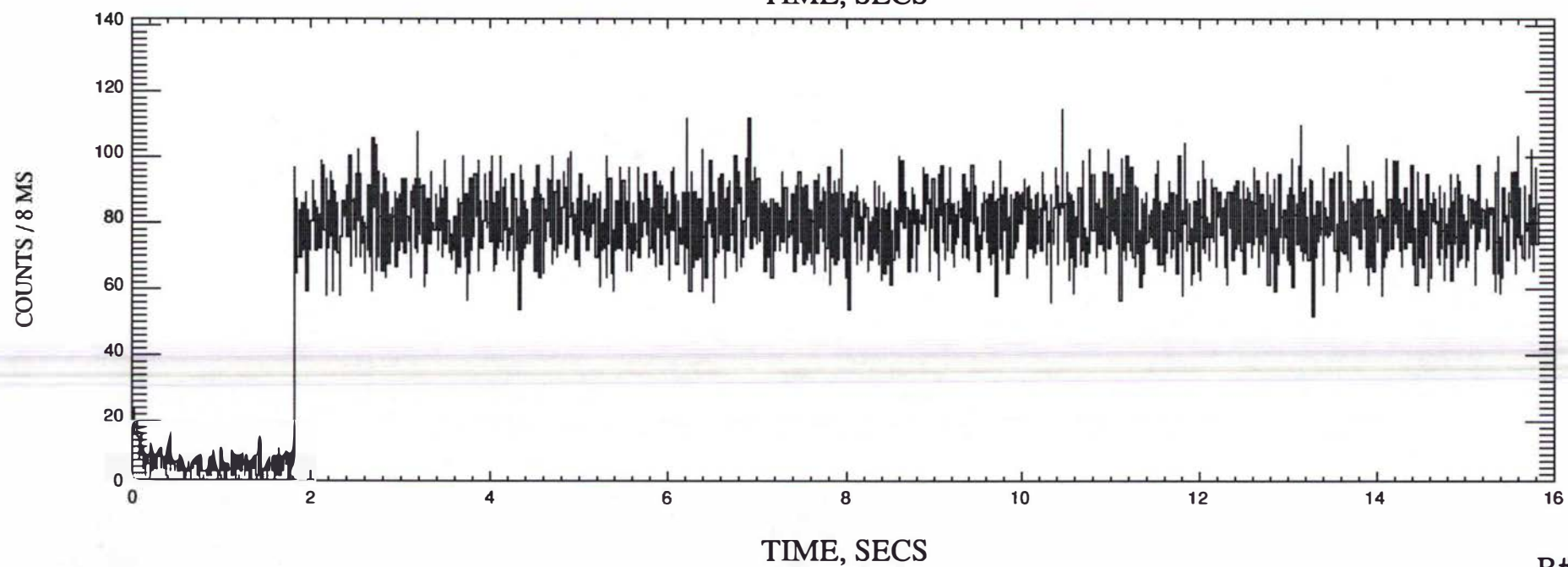
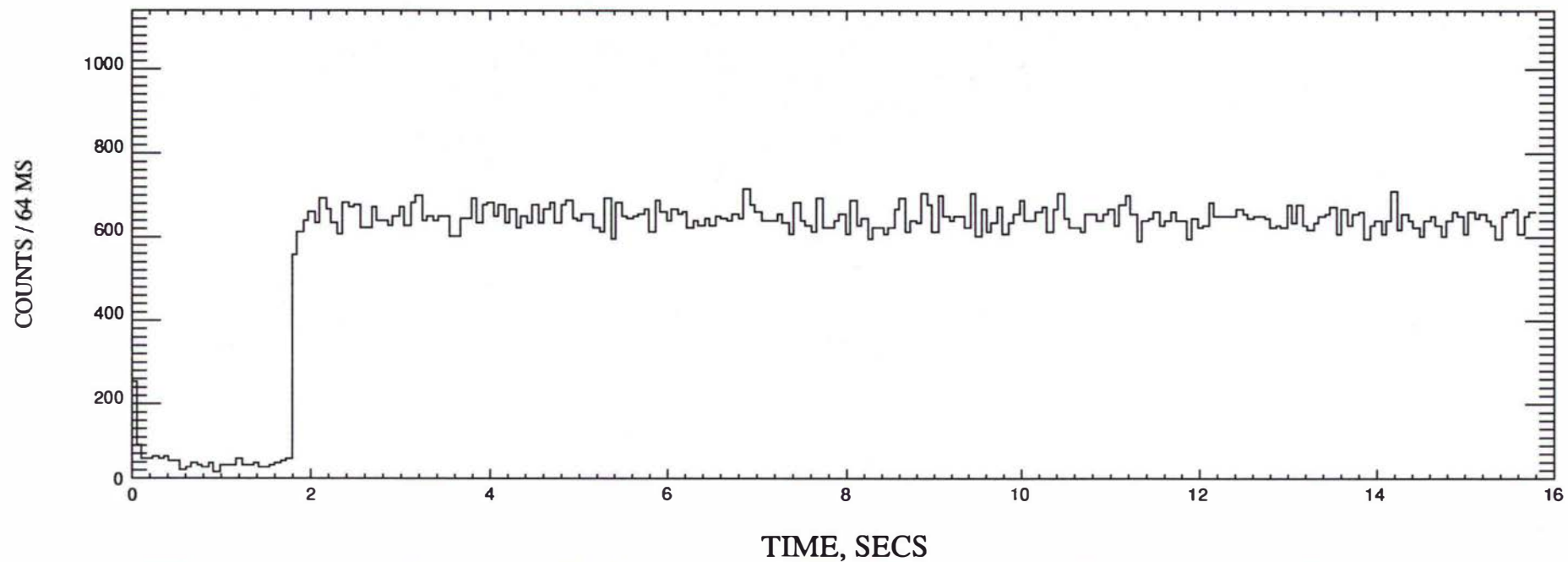
Burst Counter 3 at UT= 2.220990884569 h= 7995.567 s 02:13:15.567



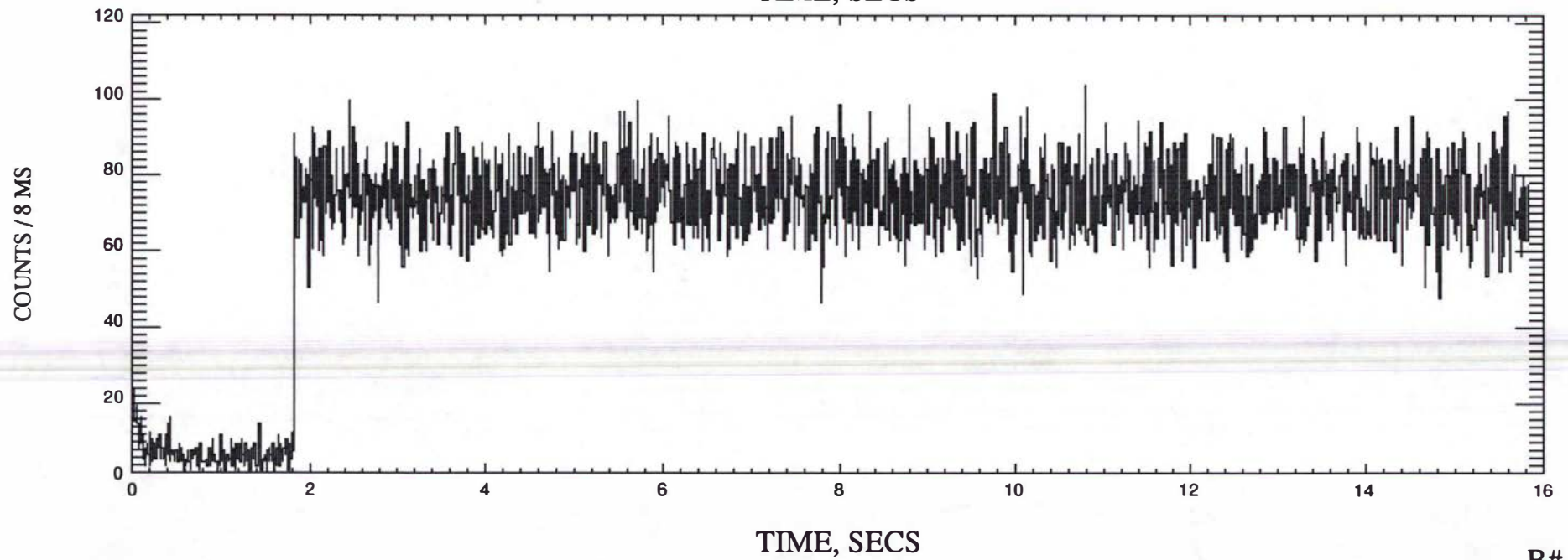
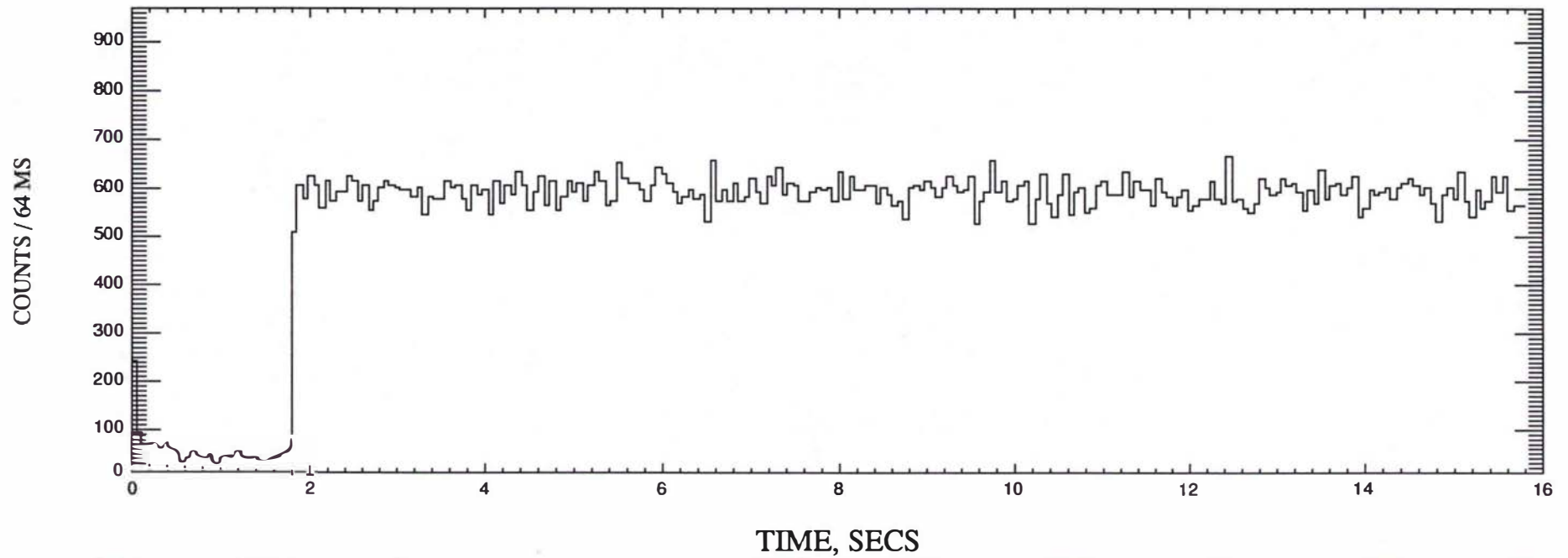
Burst Counter 4 at UT= 3.483236211141 h=12539.650 s 03:28:59.650



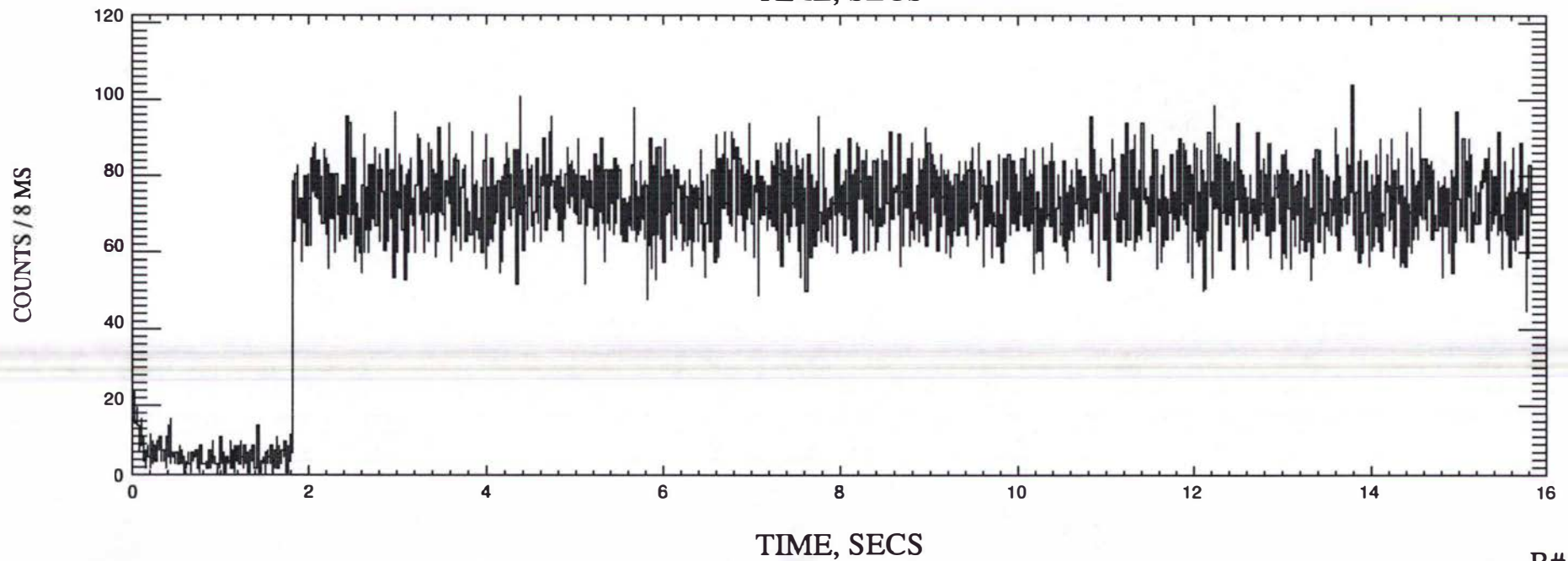
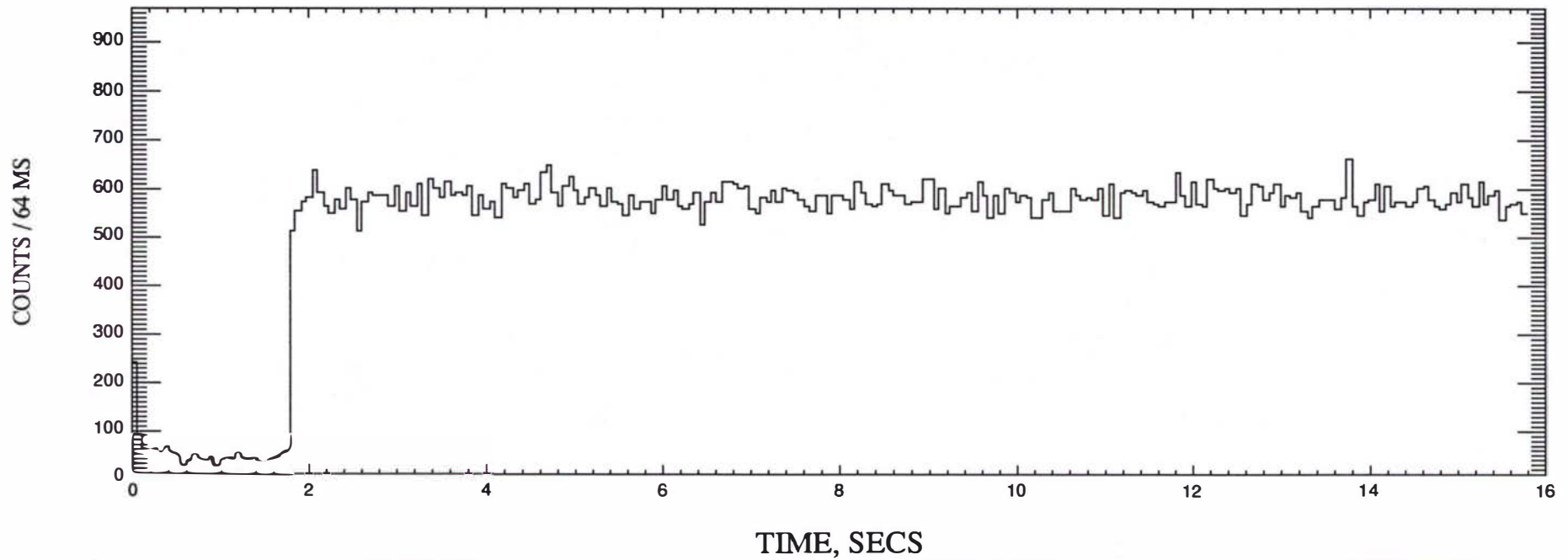
Burst Counter 5 at UT= 4.745481537713 h=17083.734 s 04:44:43.734



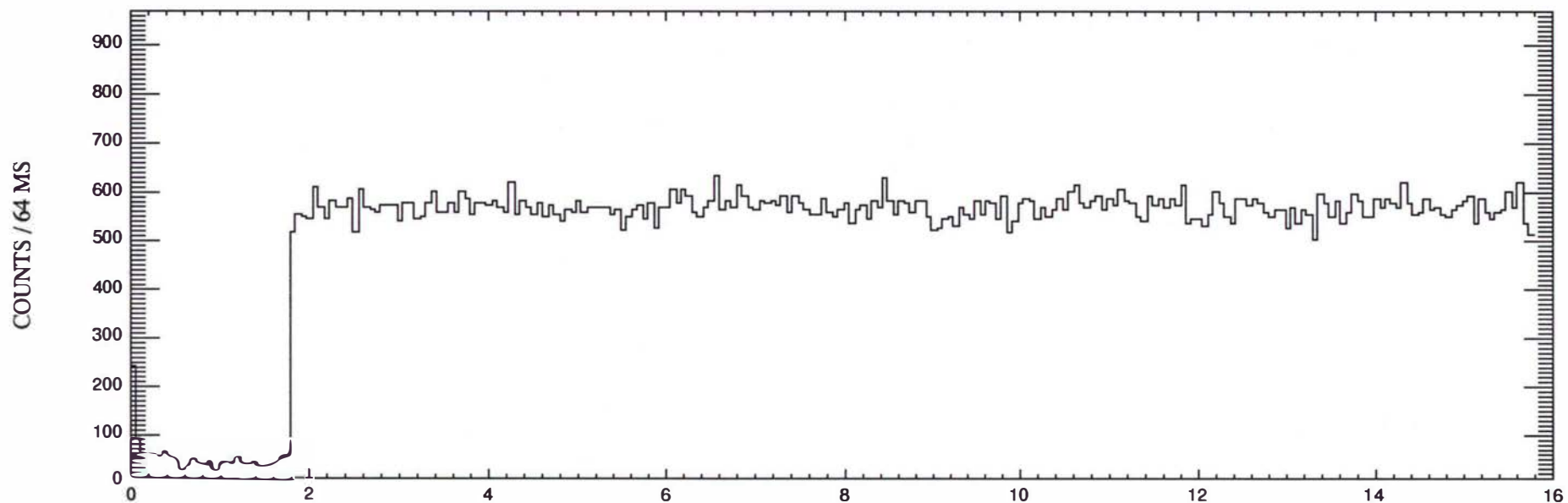
Burst Counter 6 at UT= 6.007726864285 h=21627.817 s 06:00:27.817



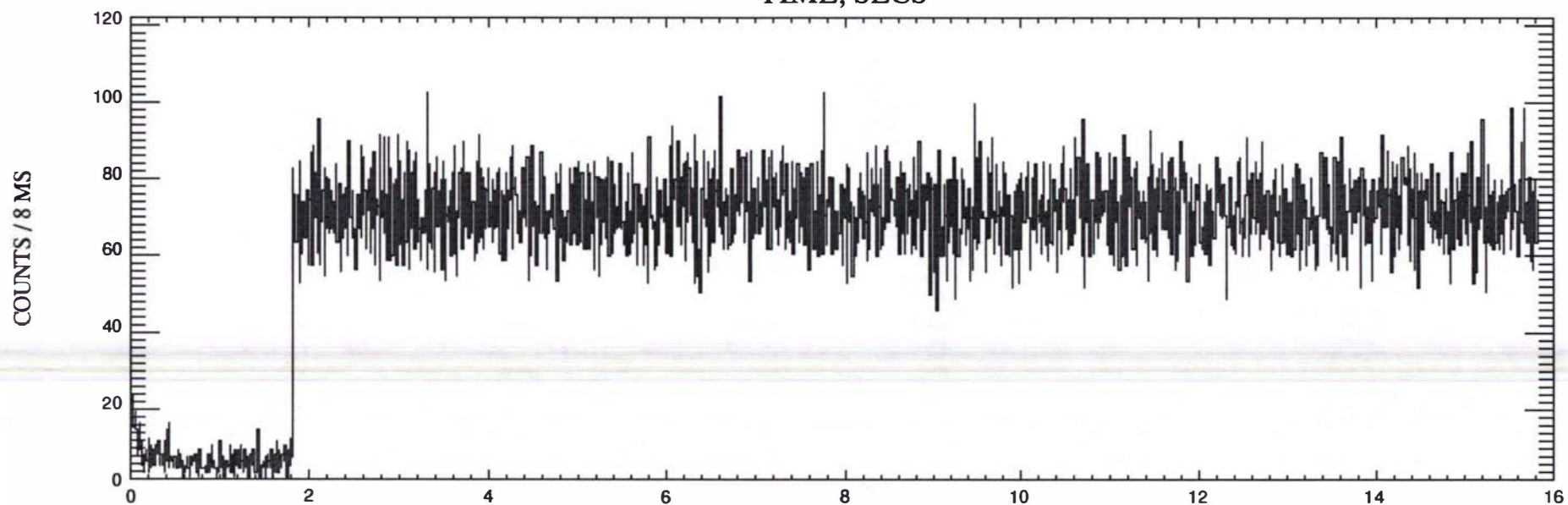
Burst Counter 7 at UT= 7.269975140889 h=26171.911 s 07:16:11.911



Burst Counter 8 at UT= 7.972208209568 h=28699.950 s 07:58:19.950

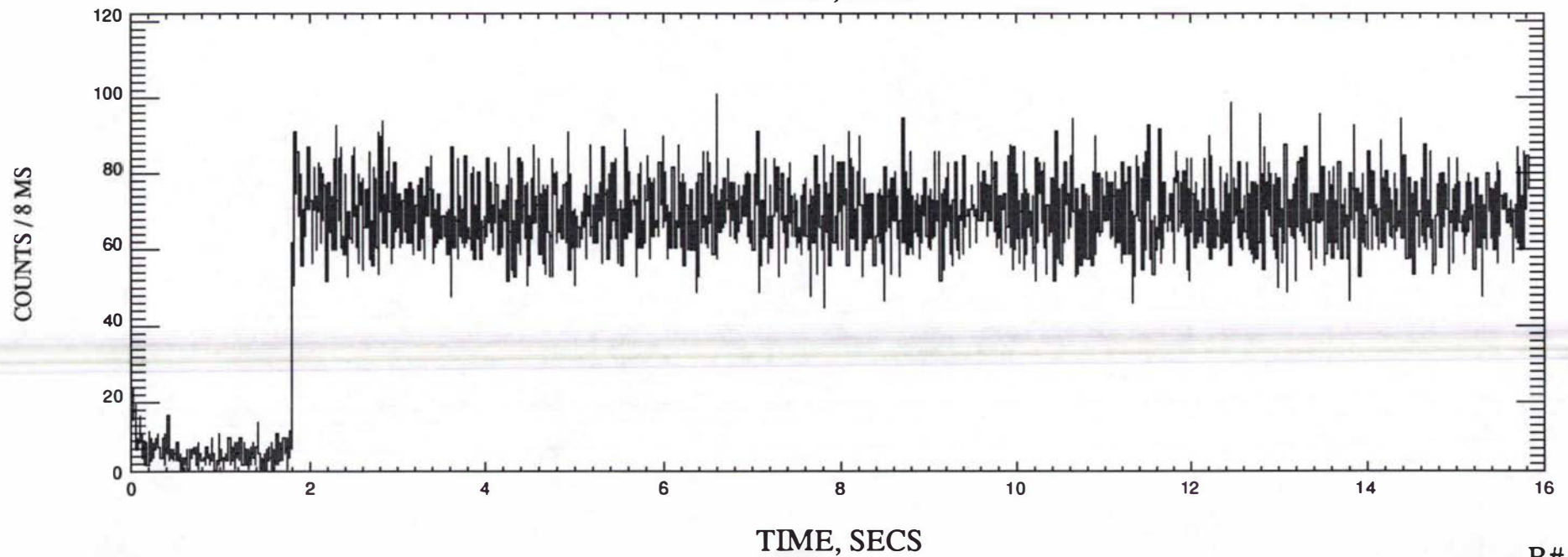
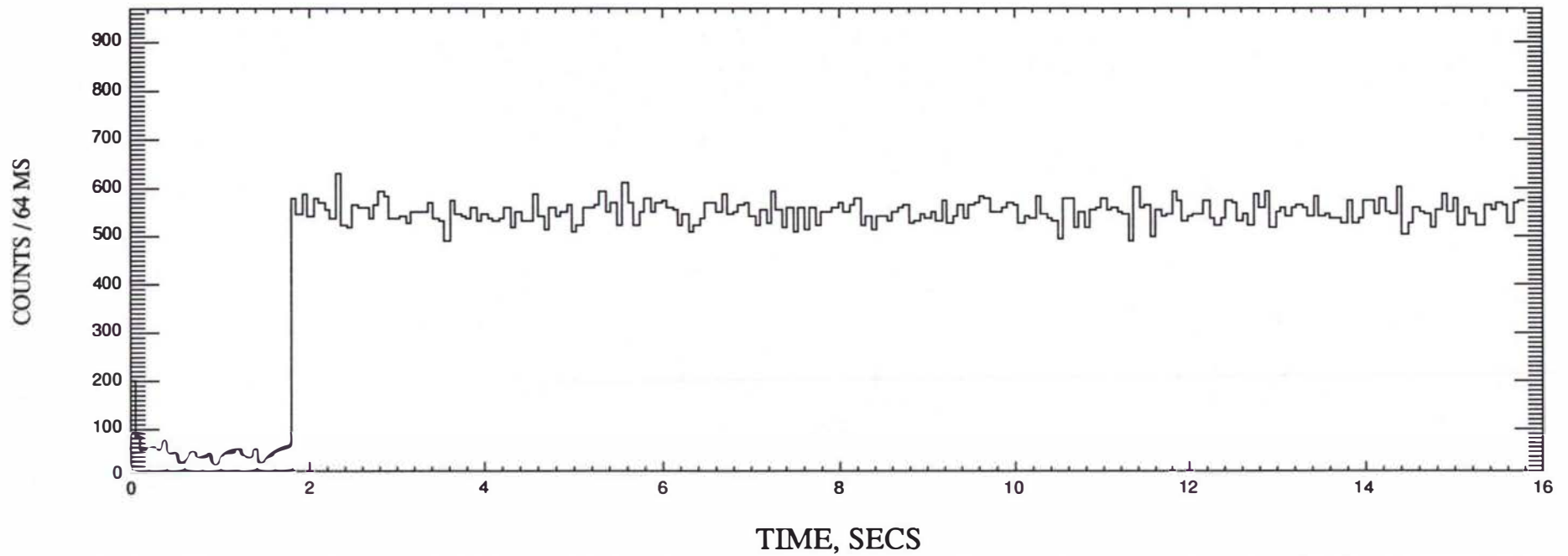


TIME, SECS

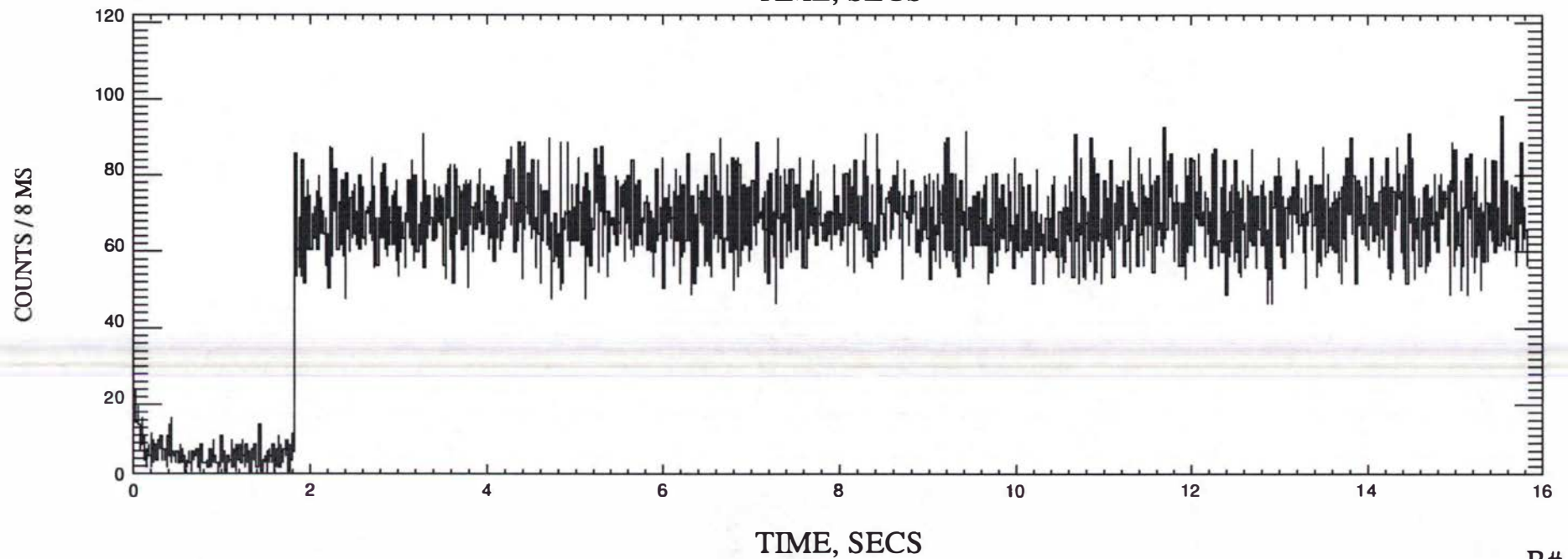
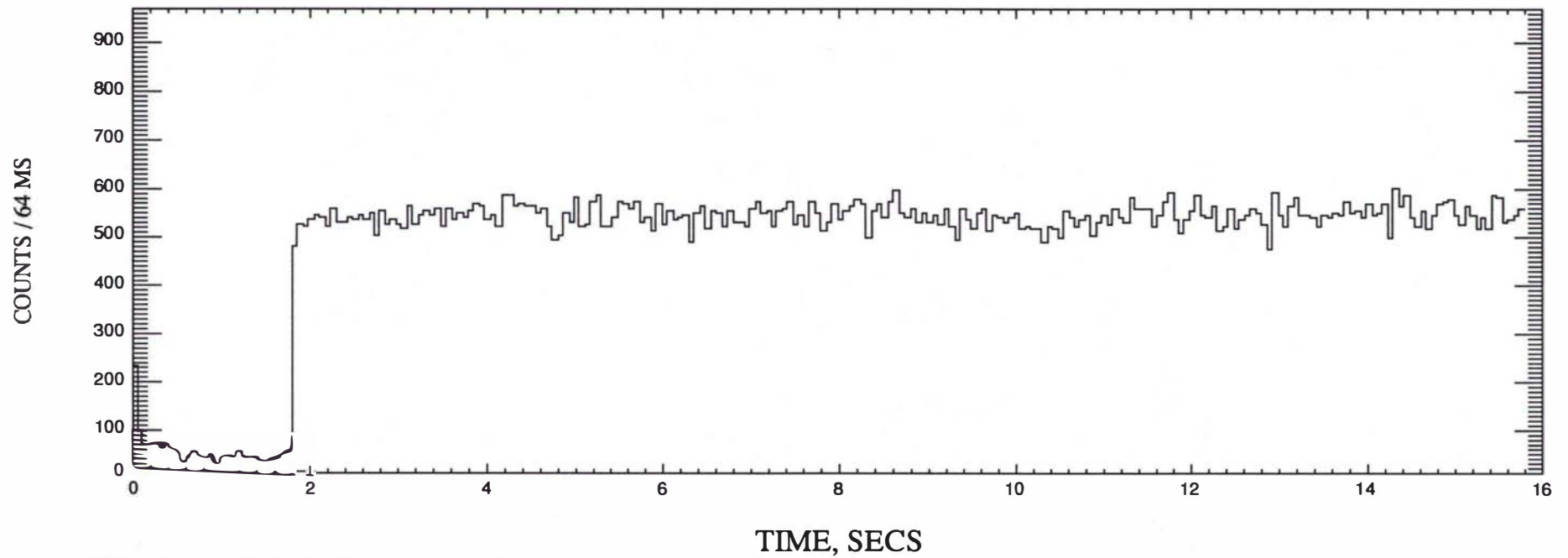


TIME, SECS

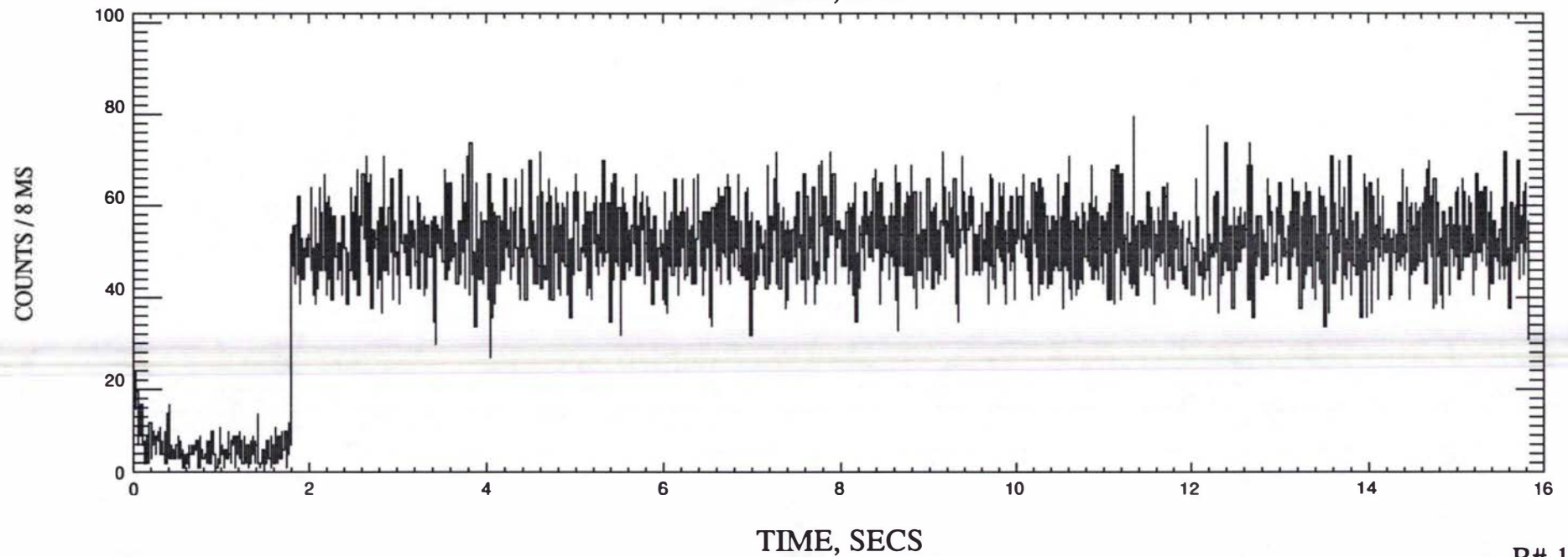
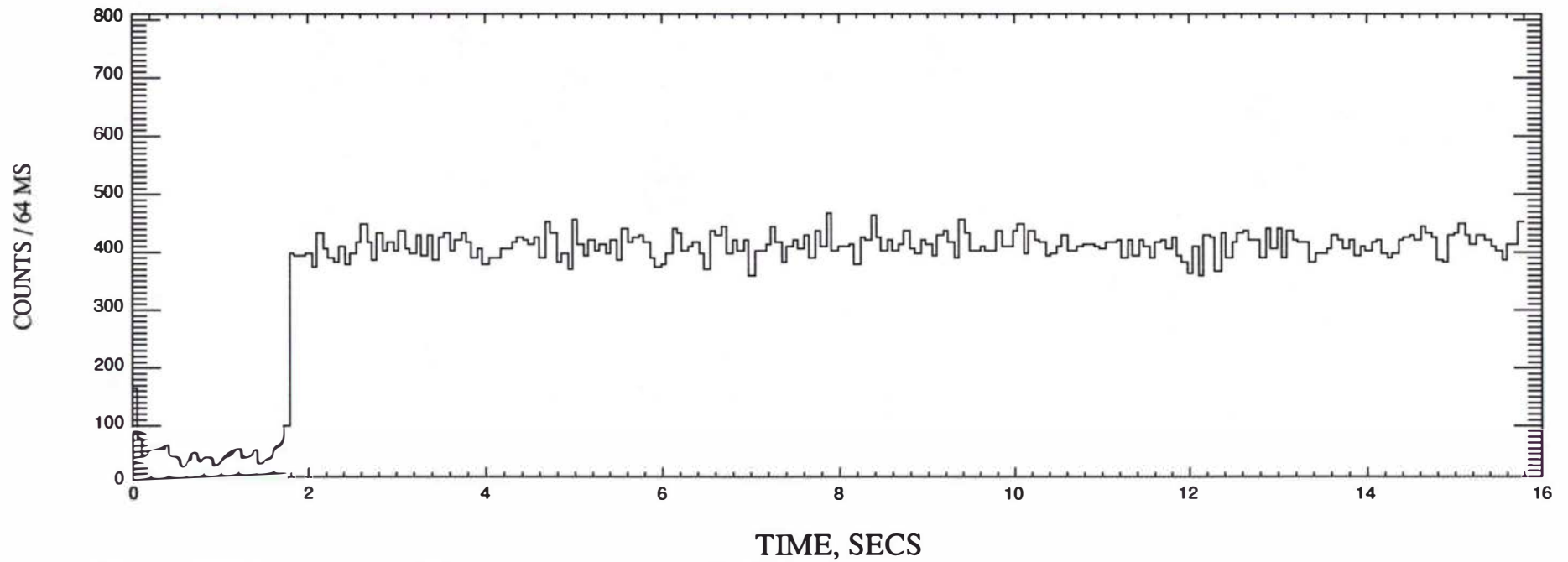
Burst Counter 9 at UT= 8.674445436266 h=31228.004 s 08:40:28.004



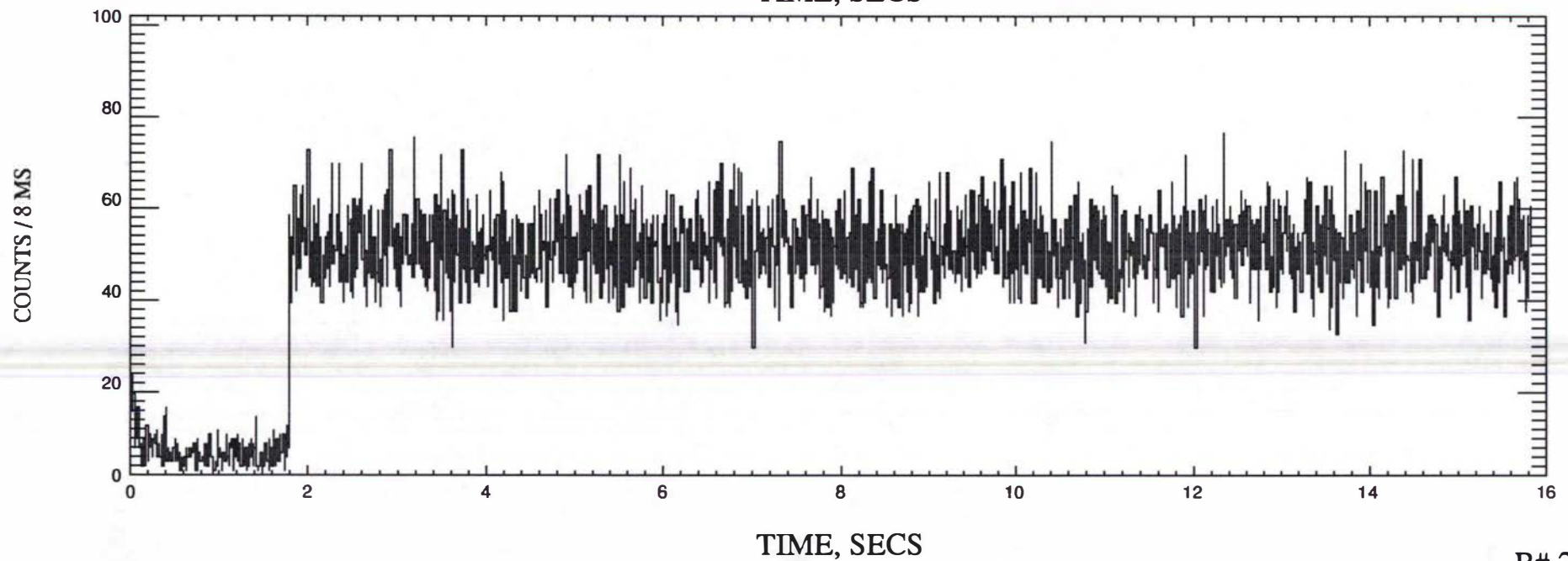
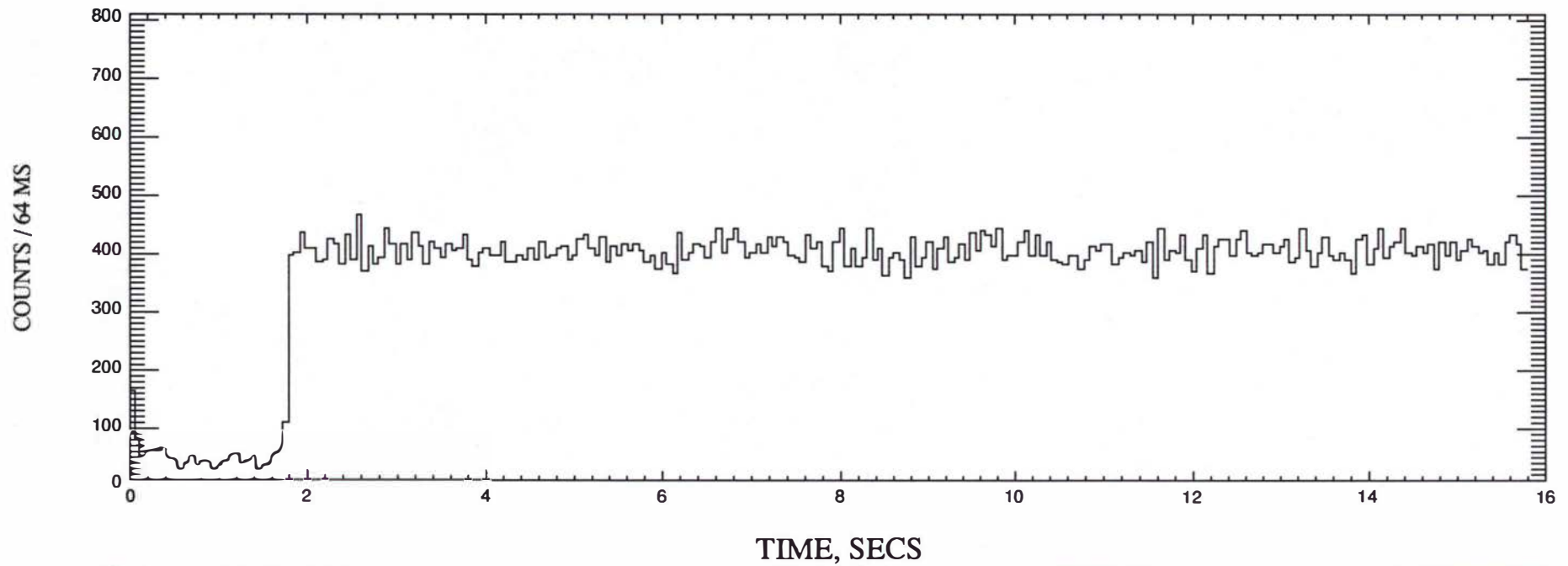
Burst Counter 10 at UT= 9.376678322686 h=33756.042 s 09:22:36.042



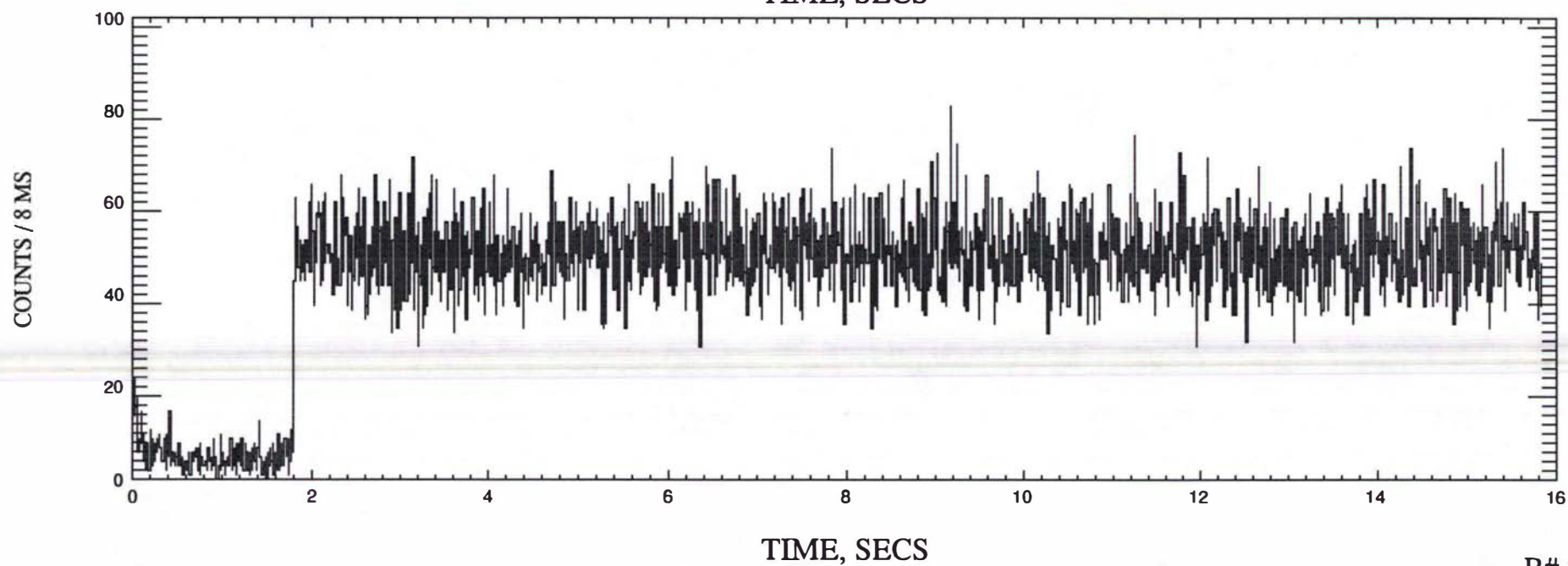
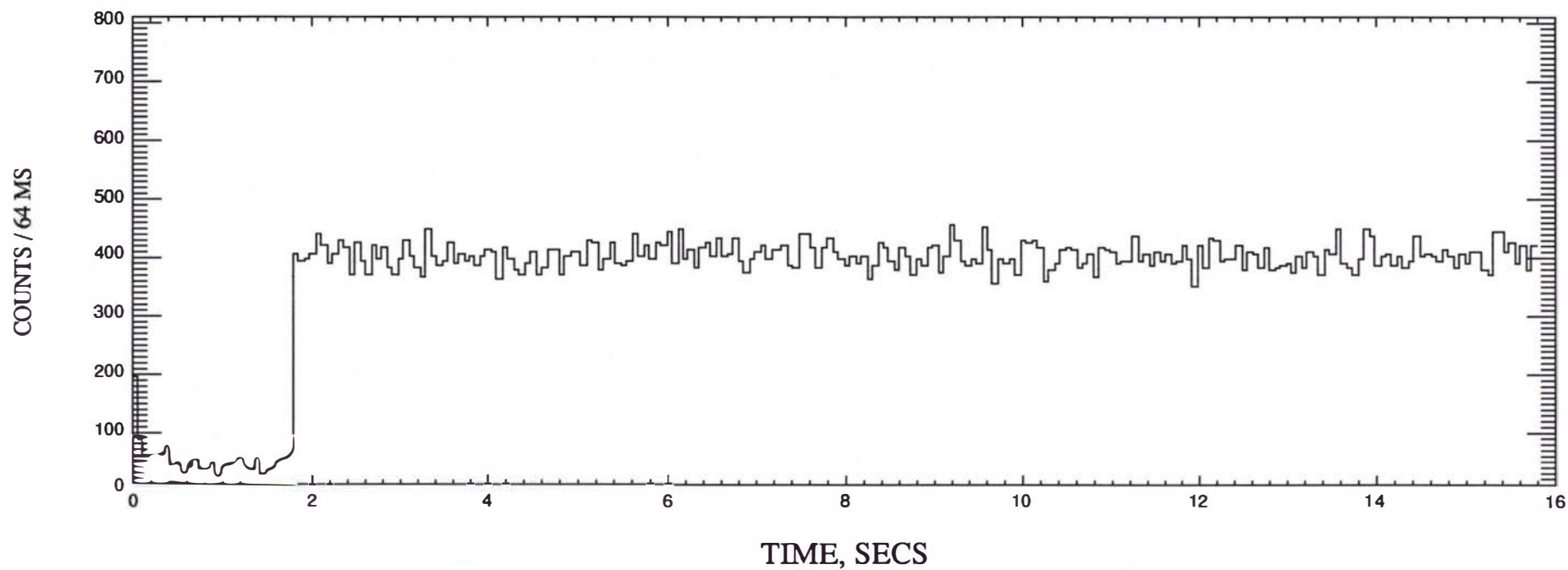
Burst Counter 4 at UT=16.399031956991 h=59036.515 s 16:23:56.515



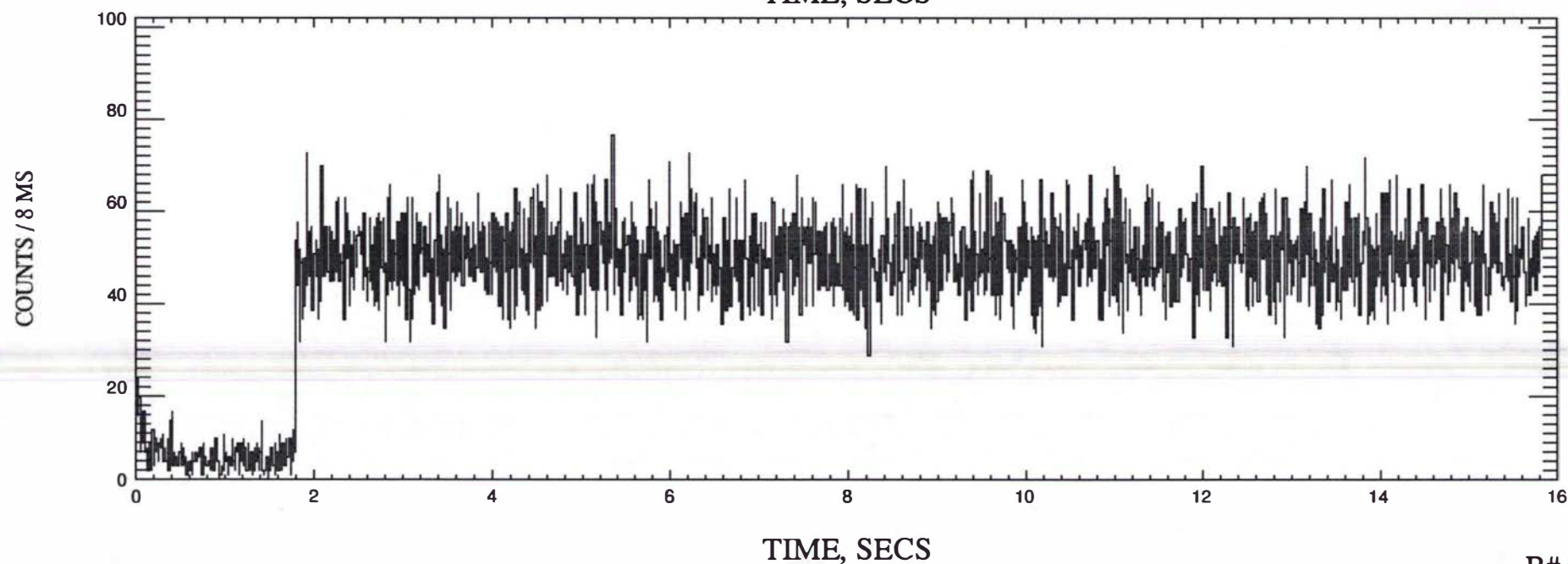
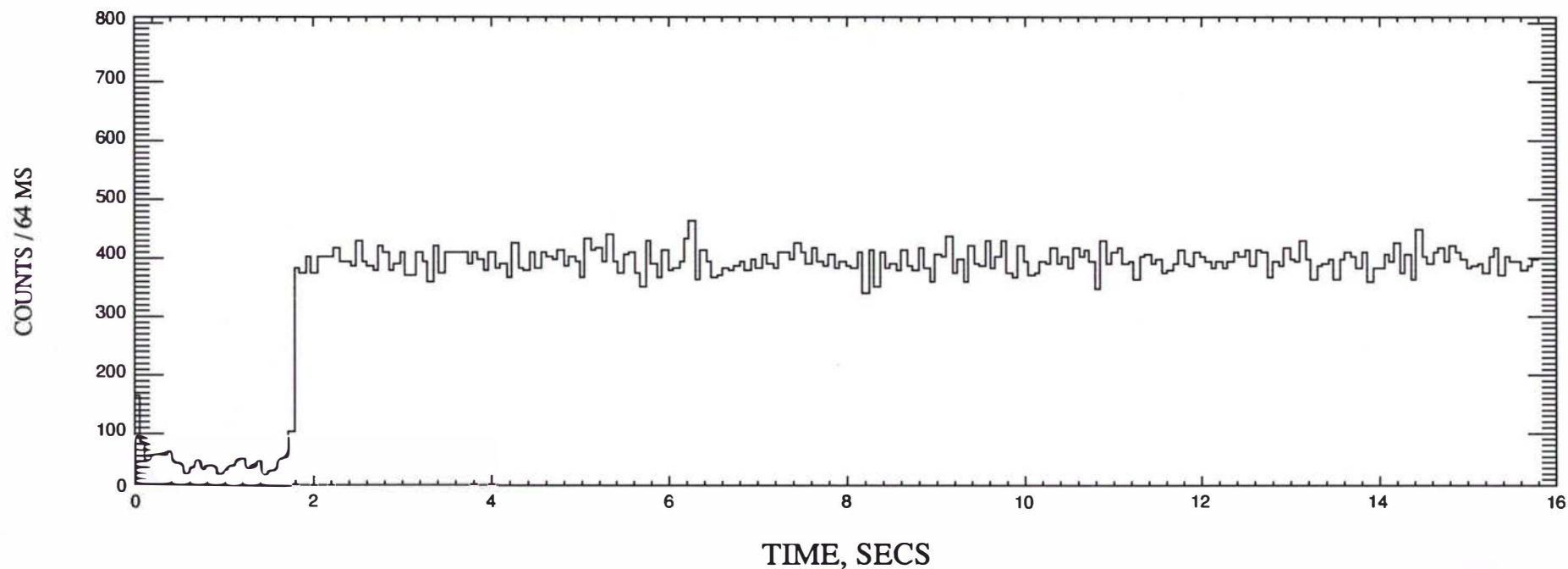
Burst Counter 5 at UT=17.101267017788 h=61564.561 s 17:06:04.561



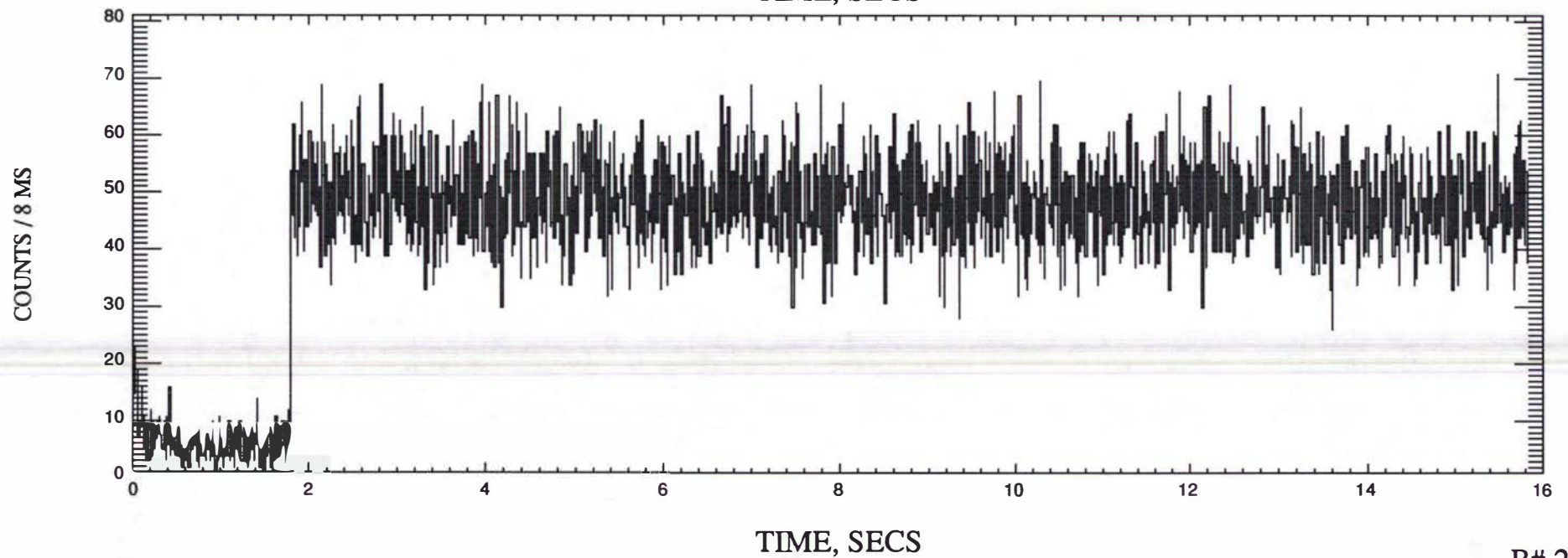
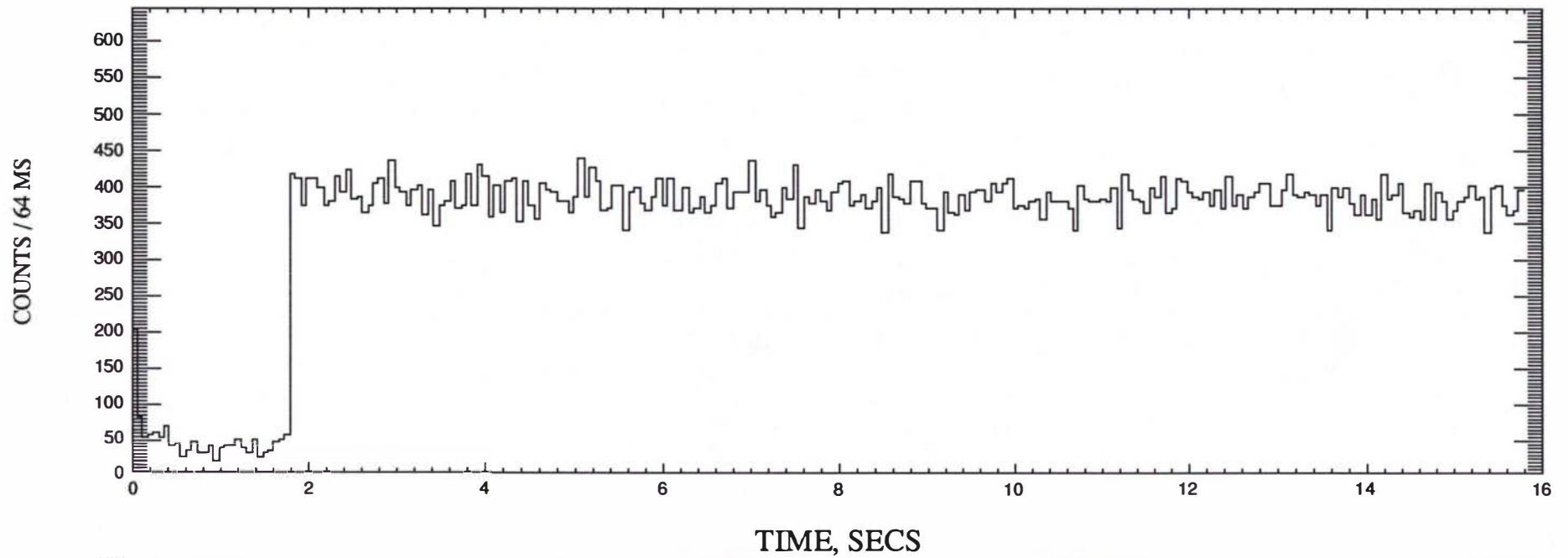
Burst Counter 6 at UT=17.803499904209 h=64092.600 s 17:48:12.600



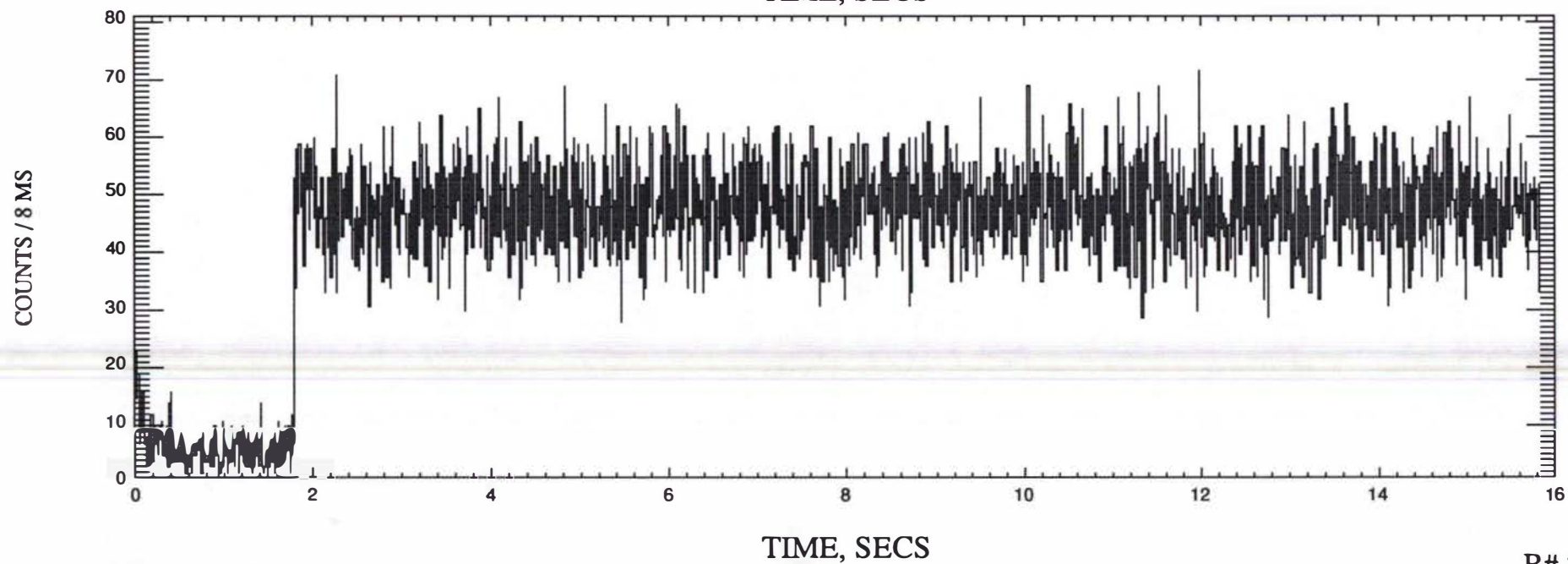
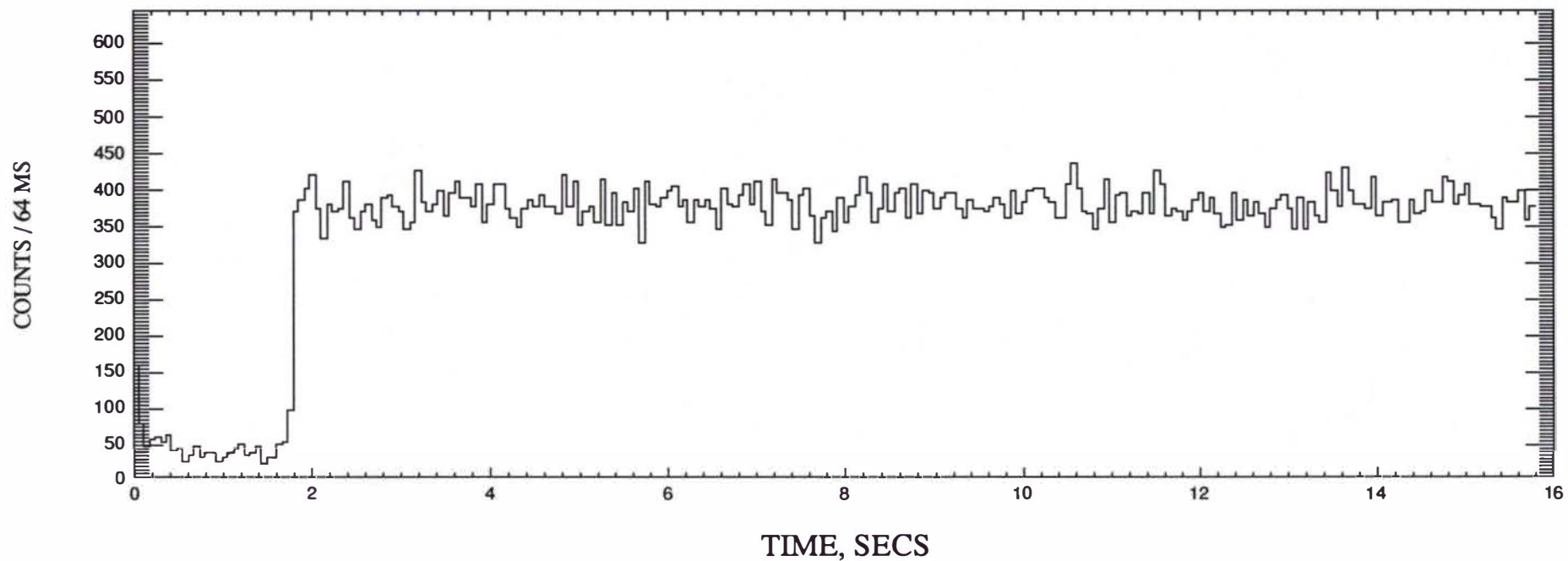
Burst Counter 7 at UT=18.505737130907 h=66620.654 s 18:30:20.654



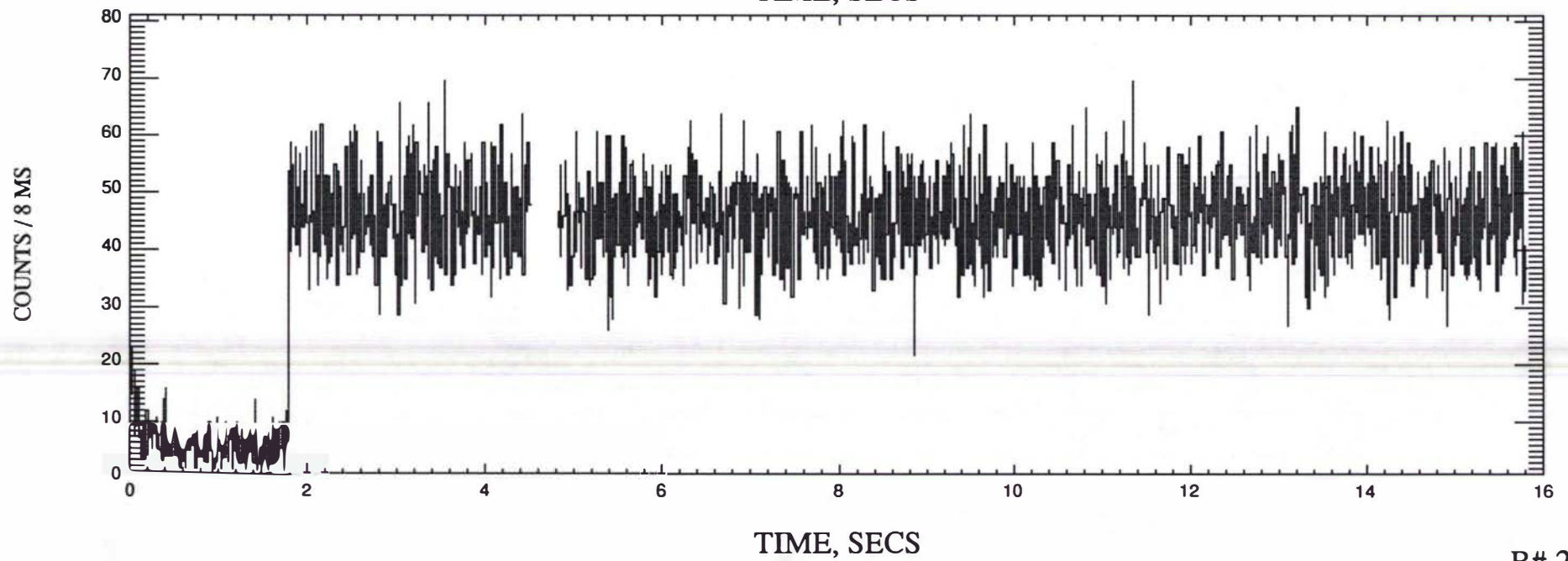
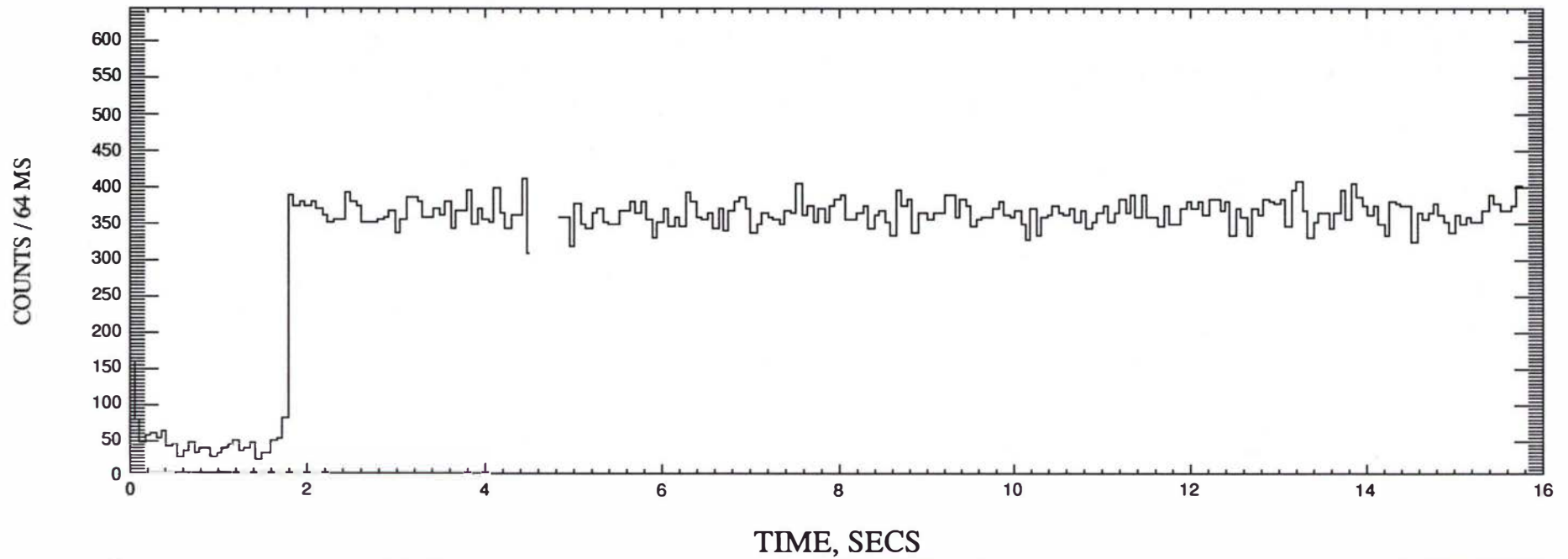
Burst Counter 8 at UT=19.207968737284 h=69148.687 s 19:12:28.687



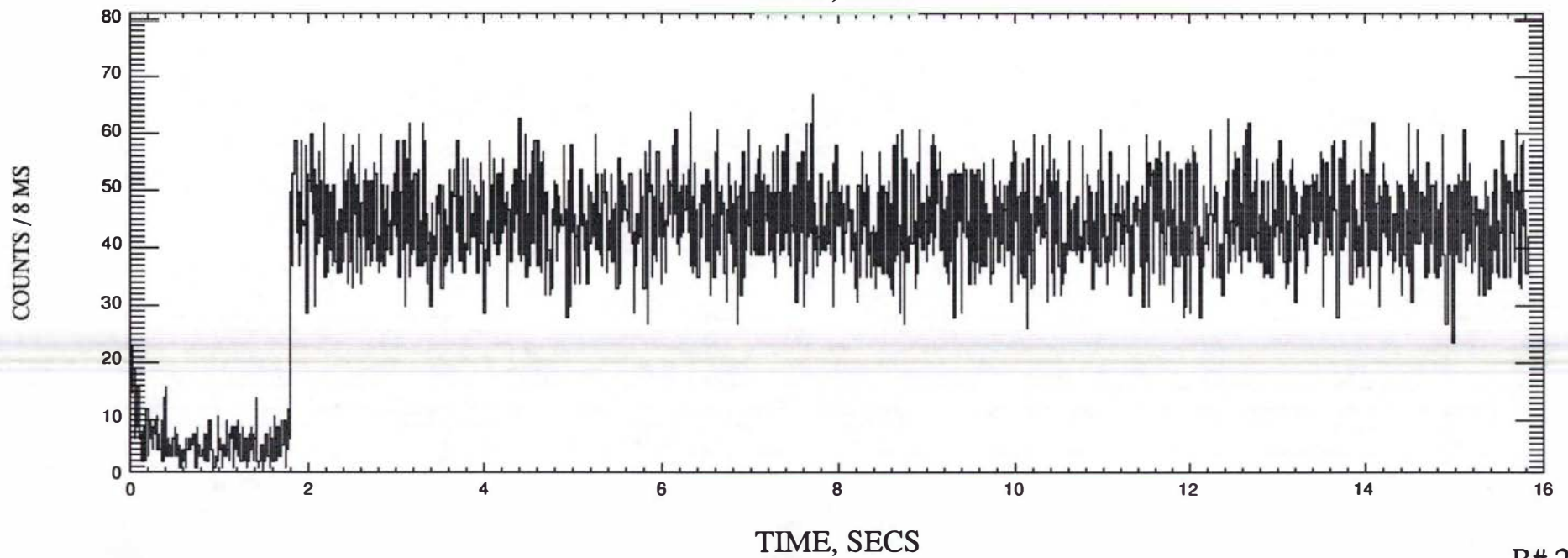
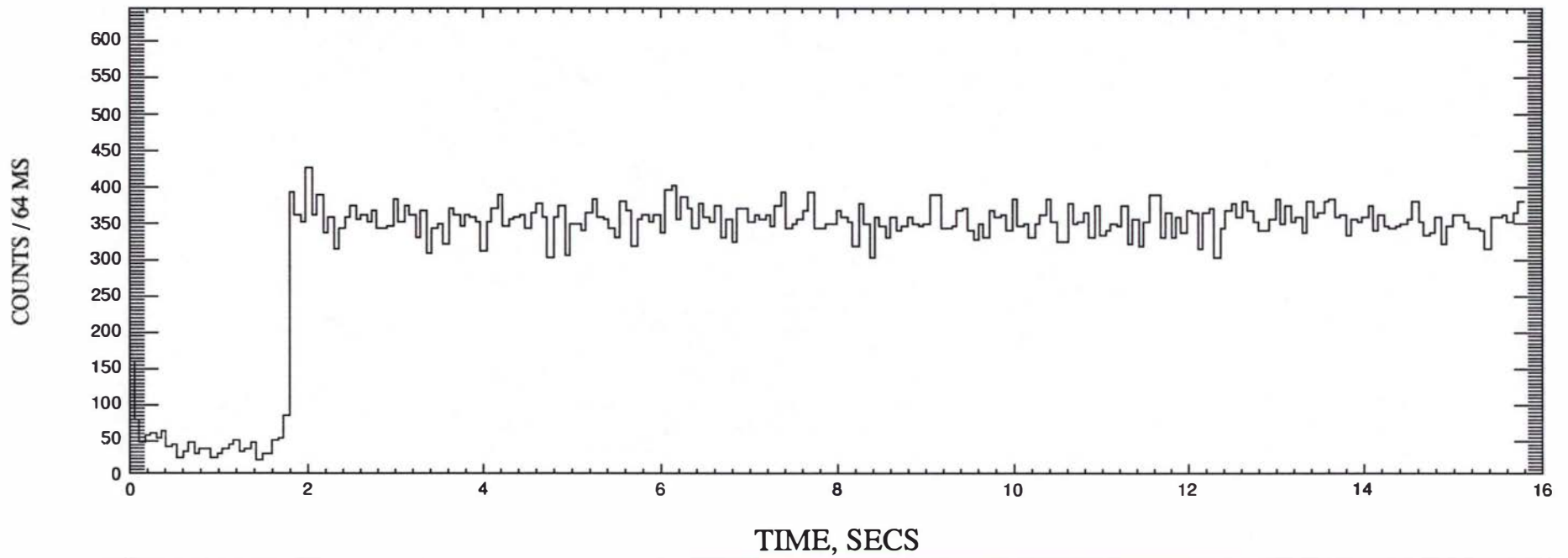
Burst Counter 9 at UT=19.910205963982 h=71676.741 s 19:54:36.741



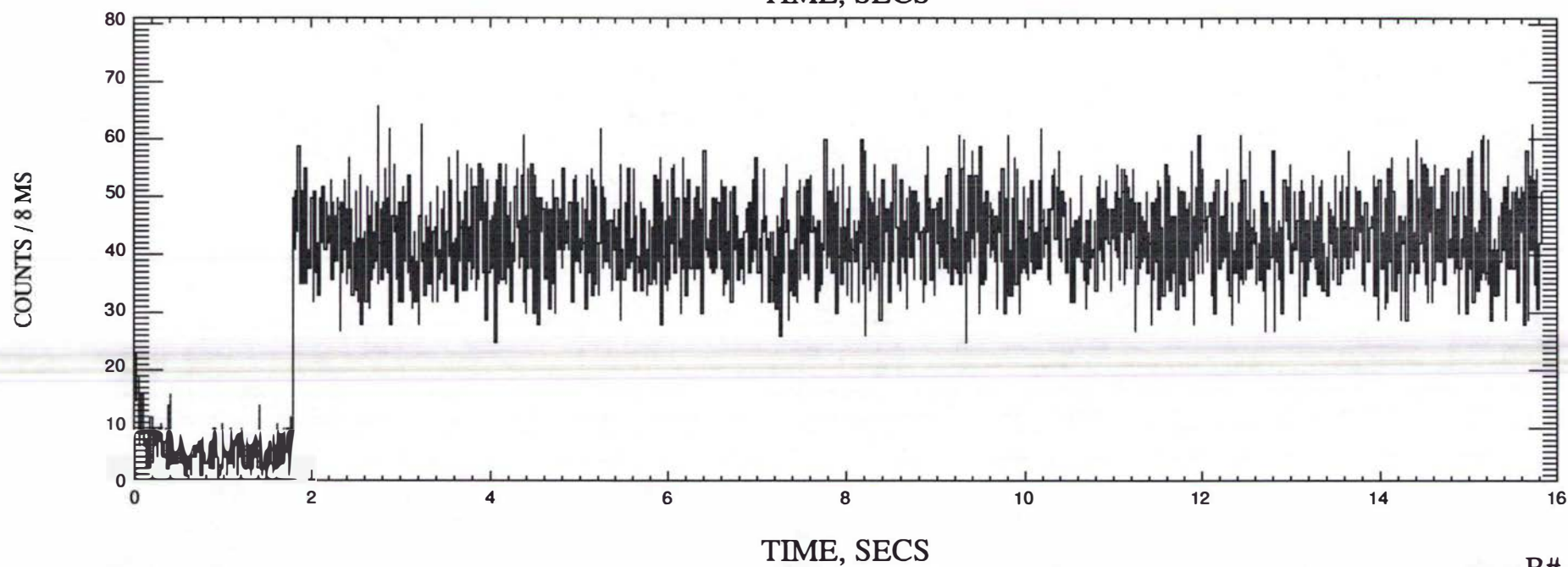
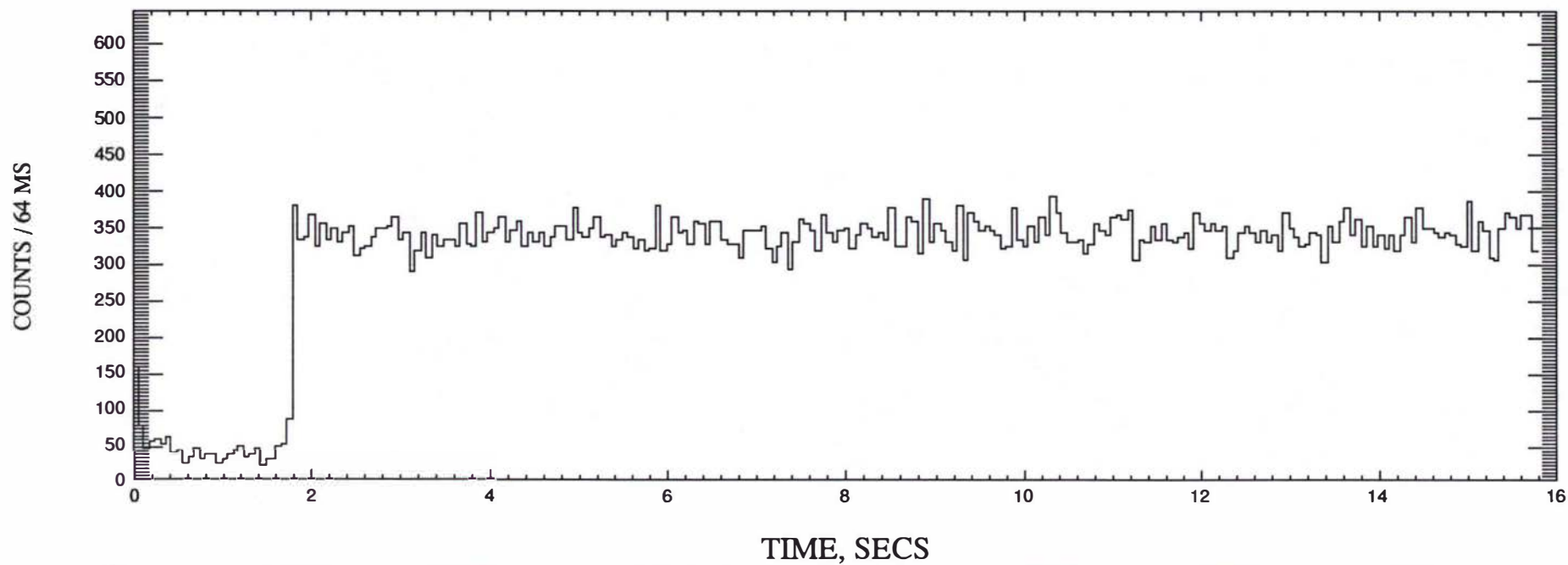
Burst Counter 10 at UT=20.612441020542 h=74204.788 s 20:36:44.788



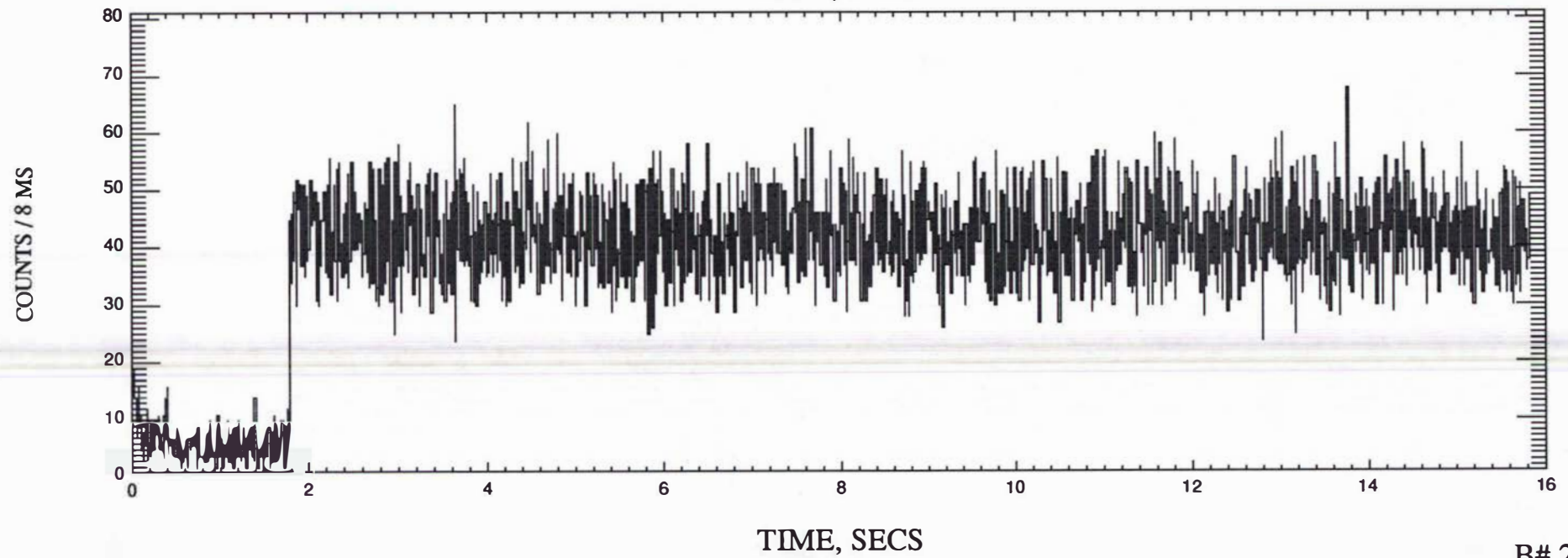
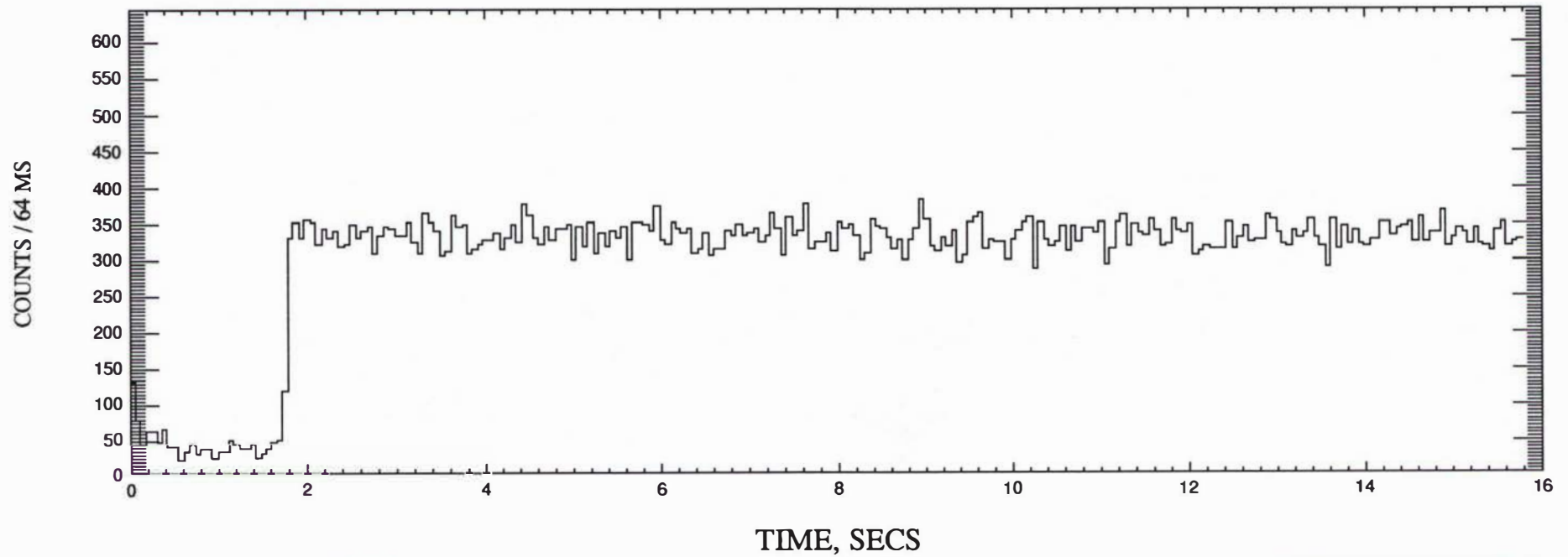
Burst Counter 11 at UT=21.314675759210 h=76732.833 s 21:18:52.833



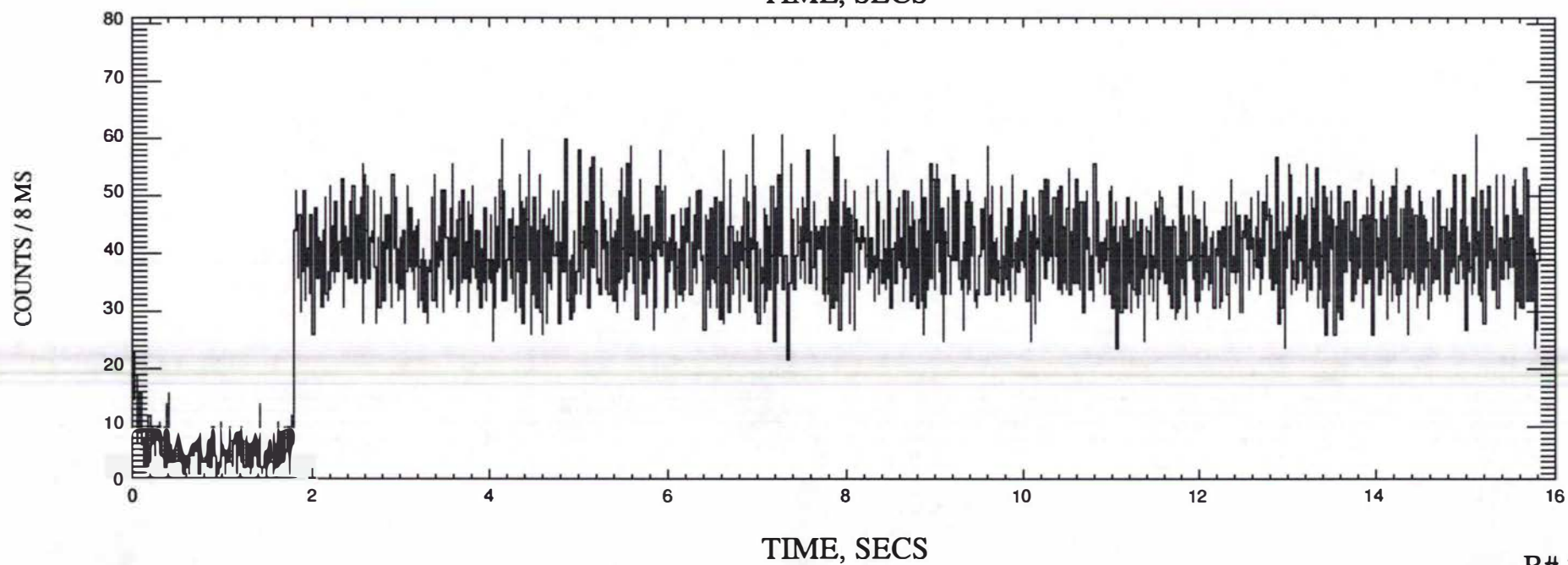
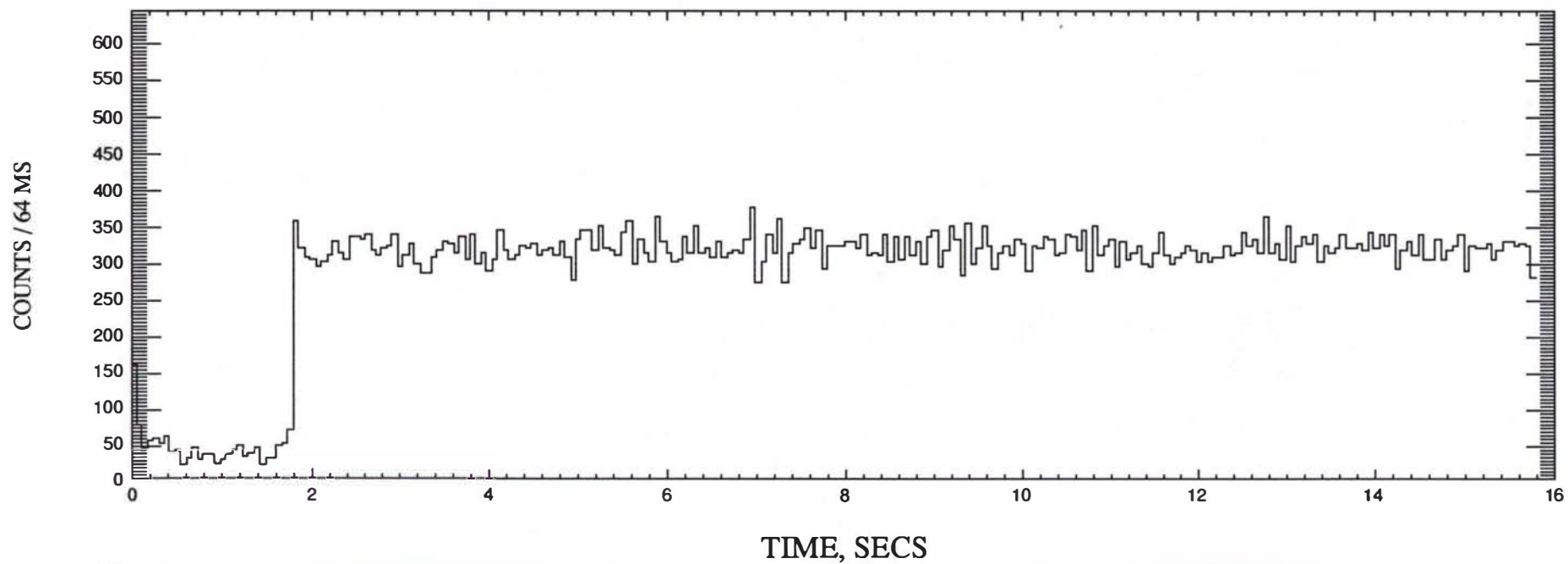
Burst Counter 12 at UT=22.016910815769 h=79260.879 s 22:01:00.879



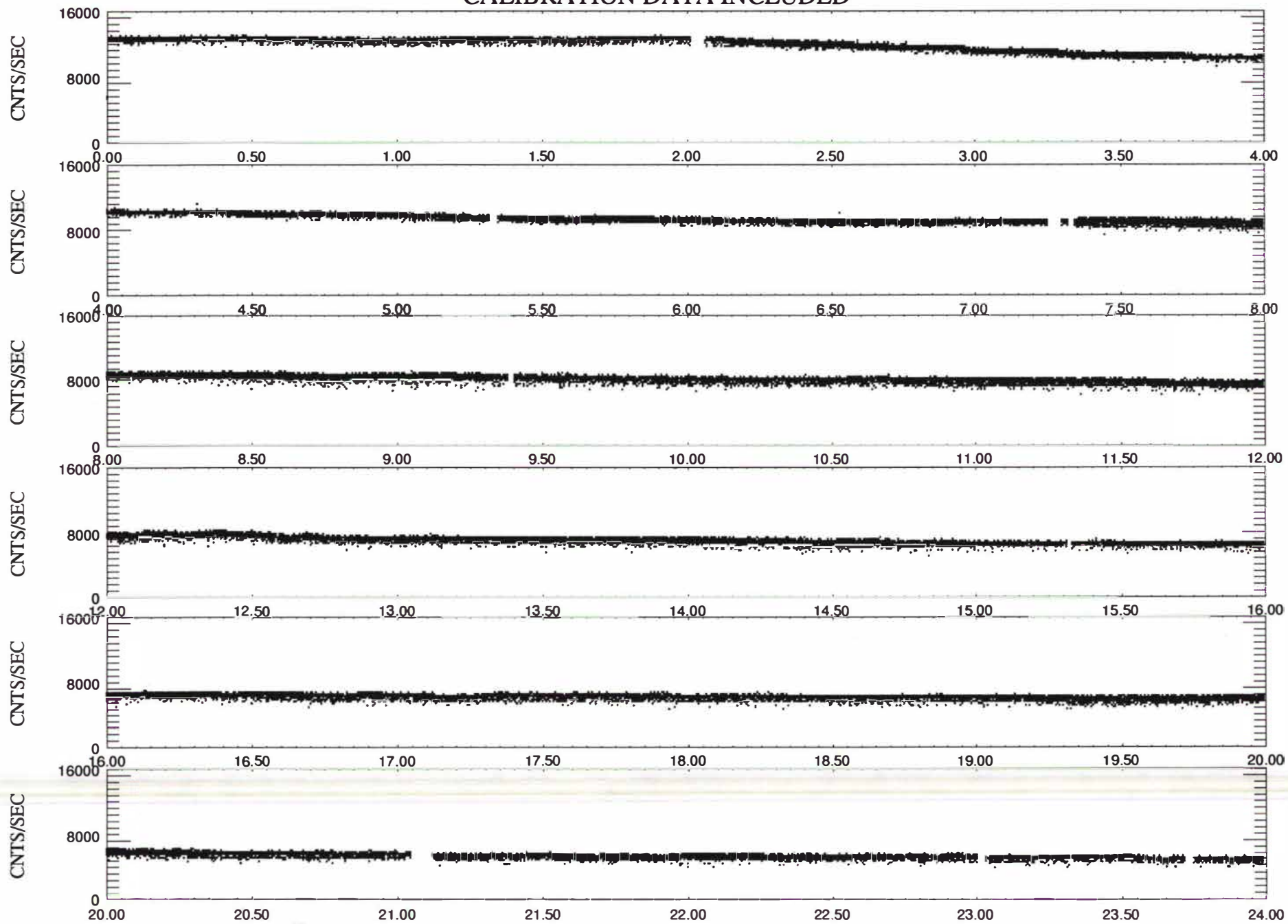
Burst Counter 13 at UT=22.719148046705 h=81788.933 s 22:43:08.933



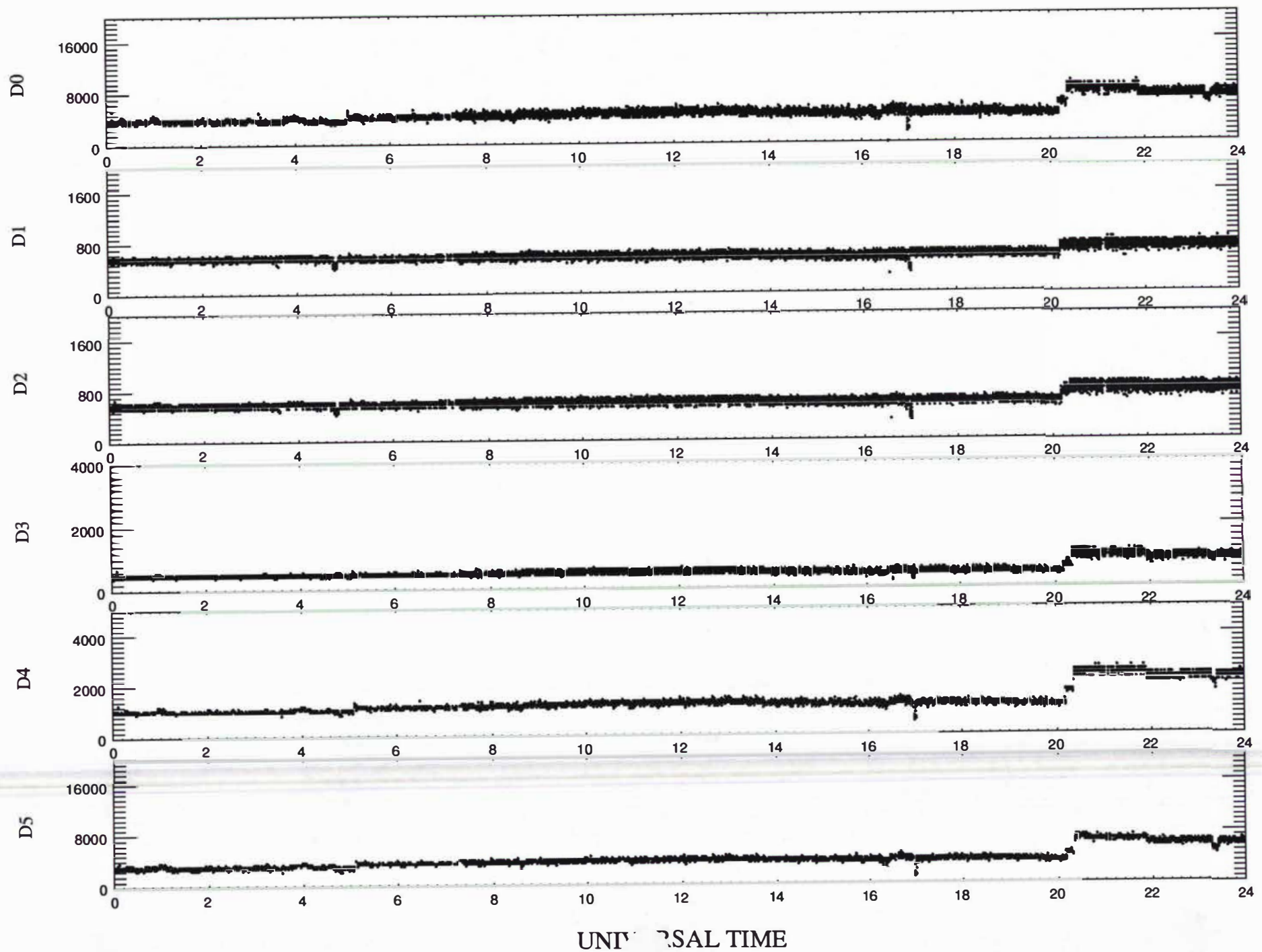
Burst Counter 14 at UT=23.421380933126 h=84316.971 s 23:25:16.971

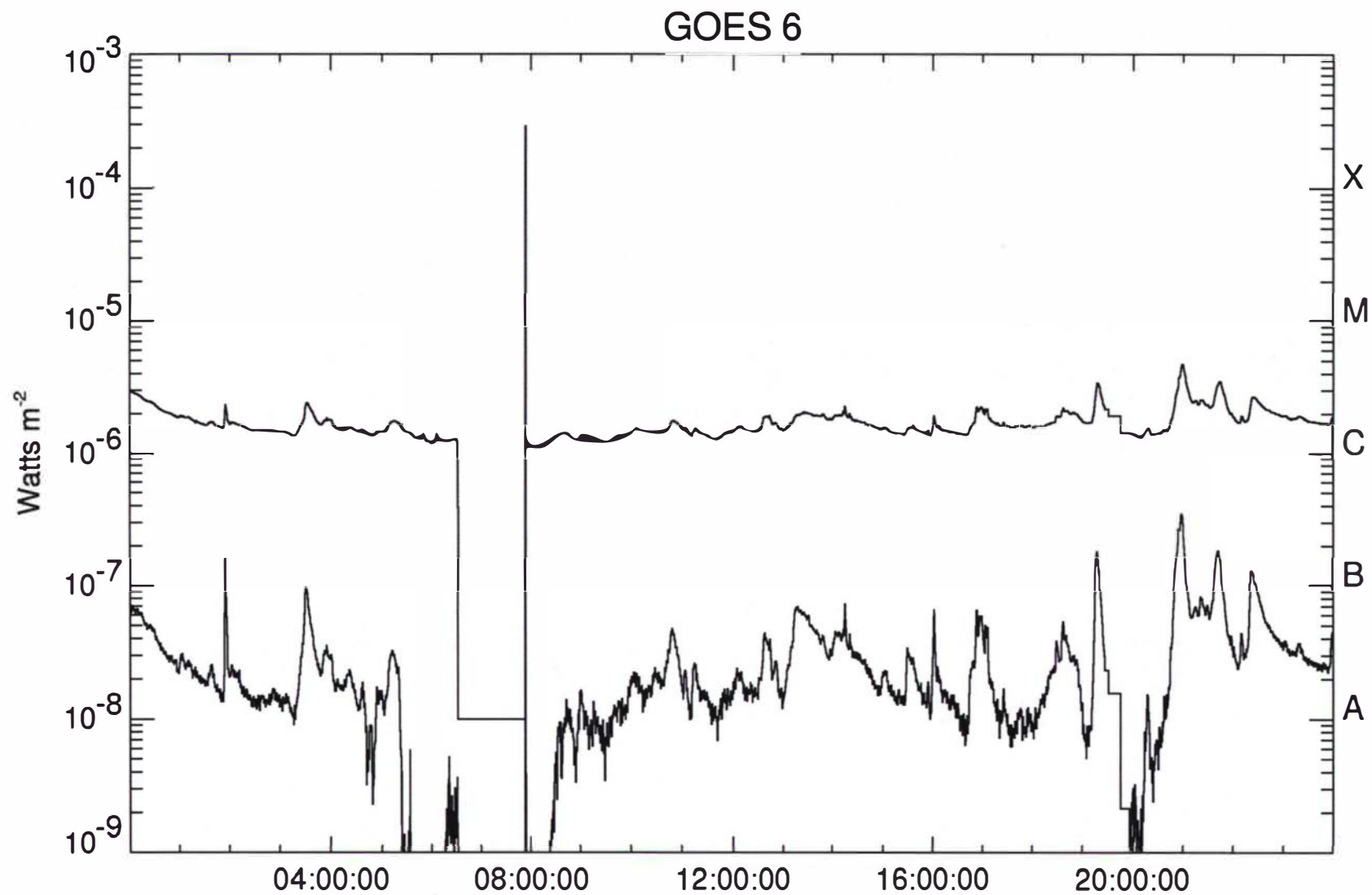


CALIBRATION DATA INCLUDED



UNIFORM SAL TIME





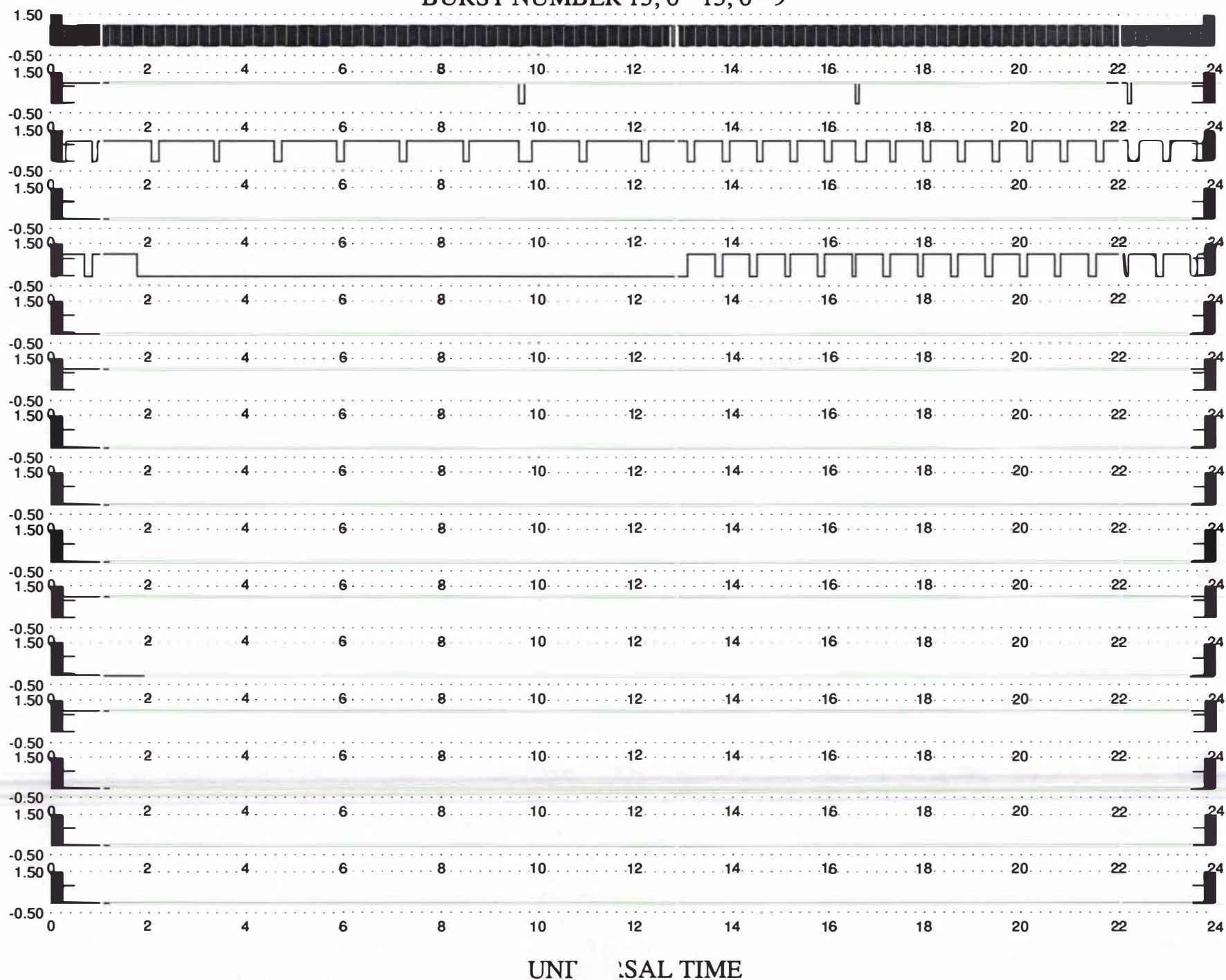
Data Start: 91/03/28, 0000:00

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

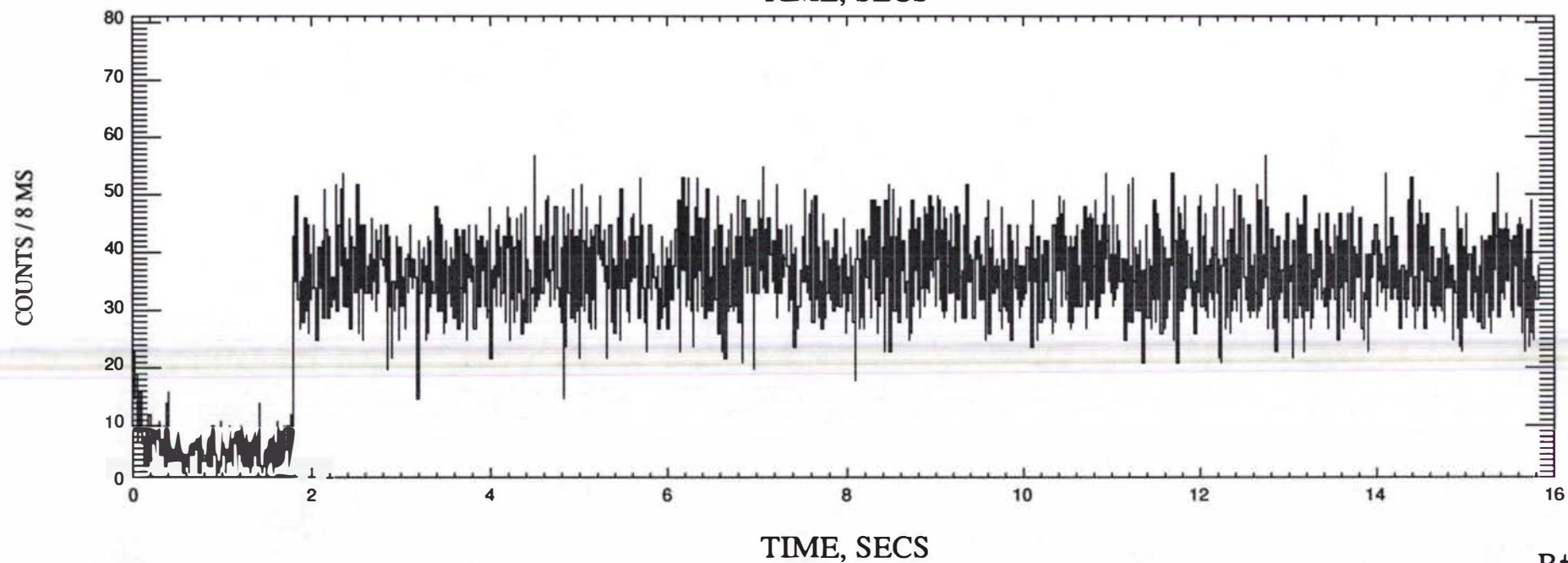
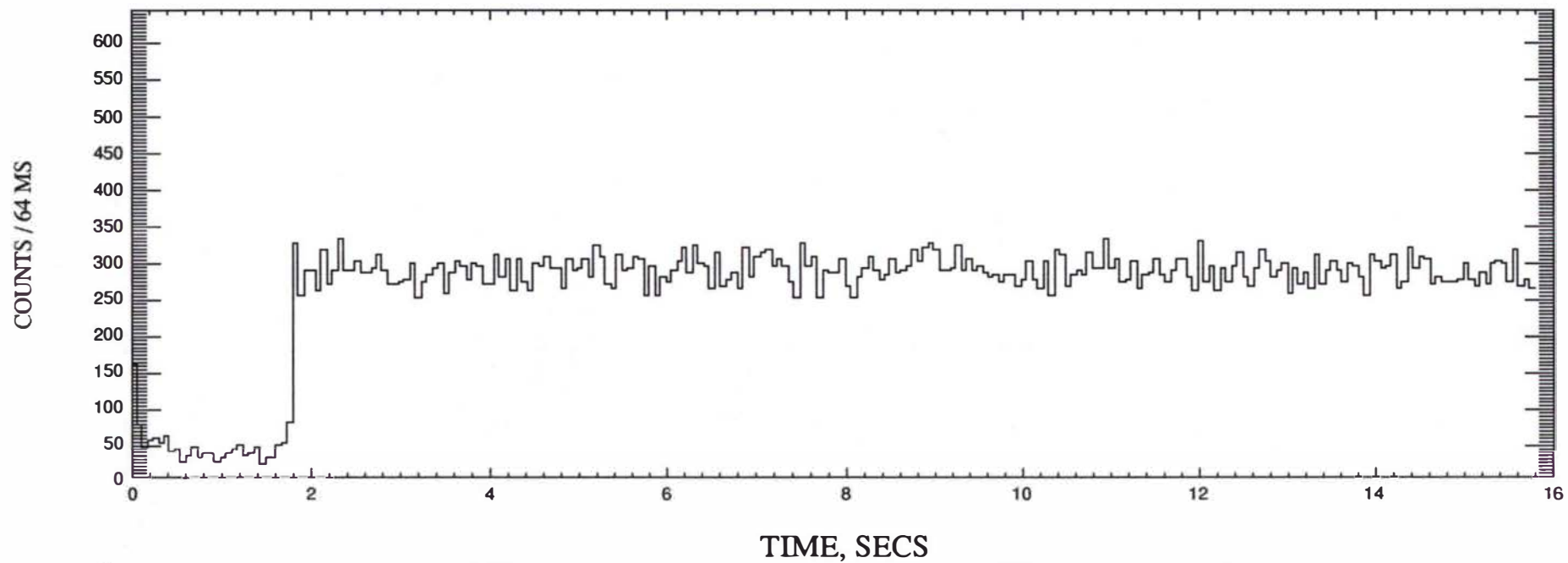
Plot created: 96/11/26, 1918

Background not subtracted
Background not subtracted
Sample average = 10

CBU	CCL	DMP	ROM	DMA	OSC	MP.	ICR	SPE	OPM	RSC	CAL	WCH	MEM	BRS	HUS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

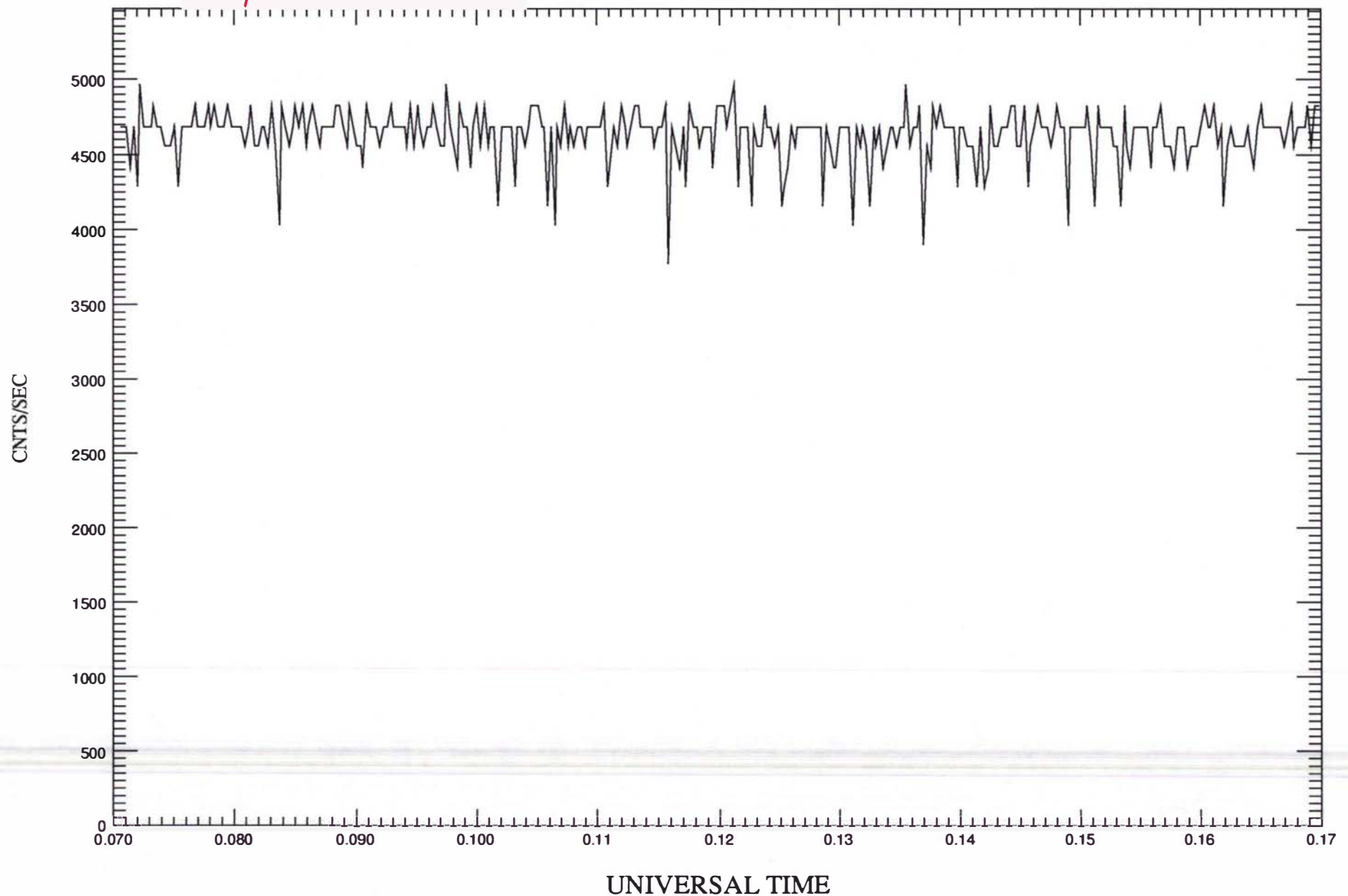


Burst Counter 15 at UT= 0.123615989685 h= 445.018 s 00:07:25.018

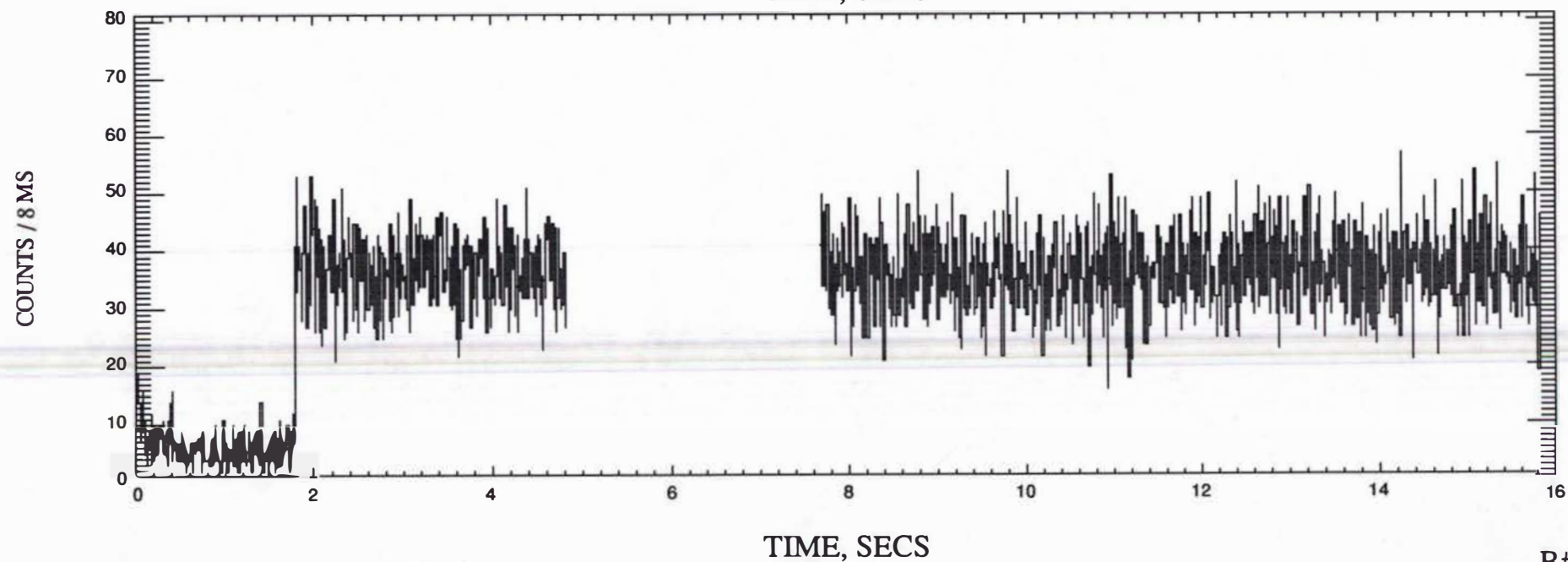
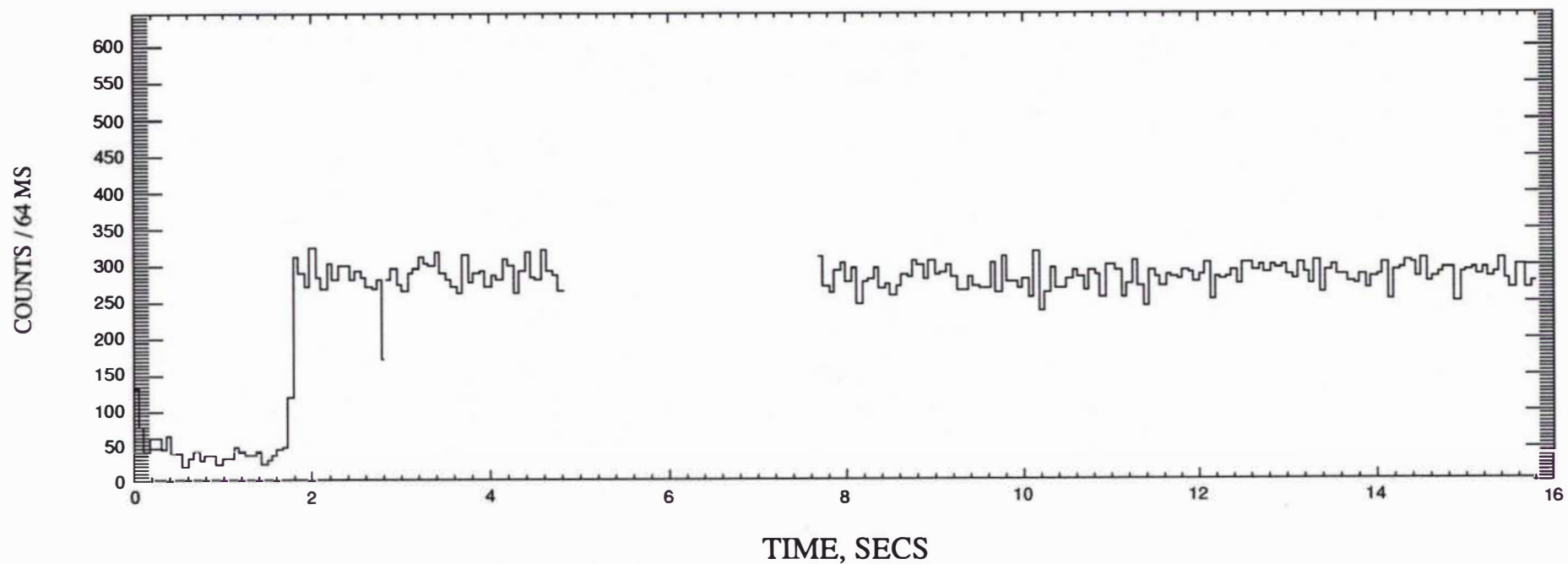


CALIBRATION DATA INCLUDED

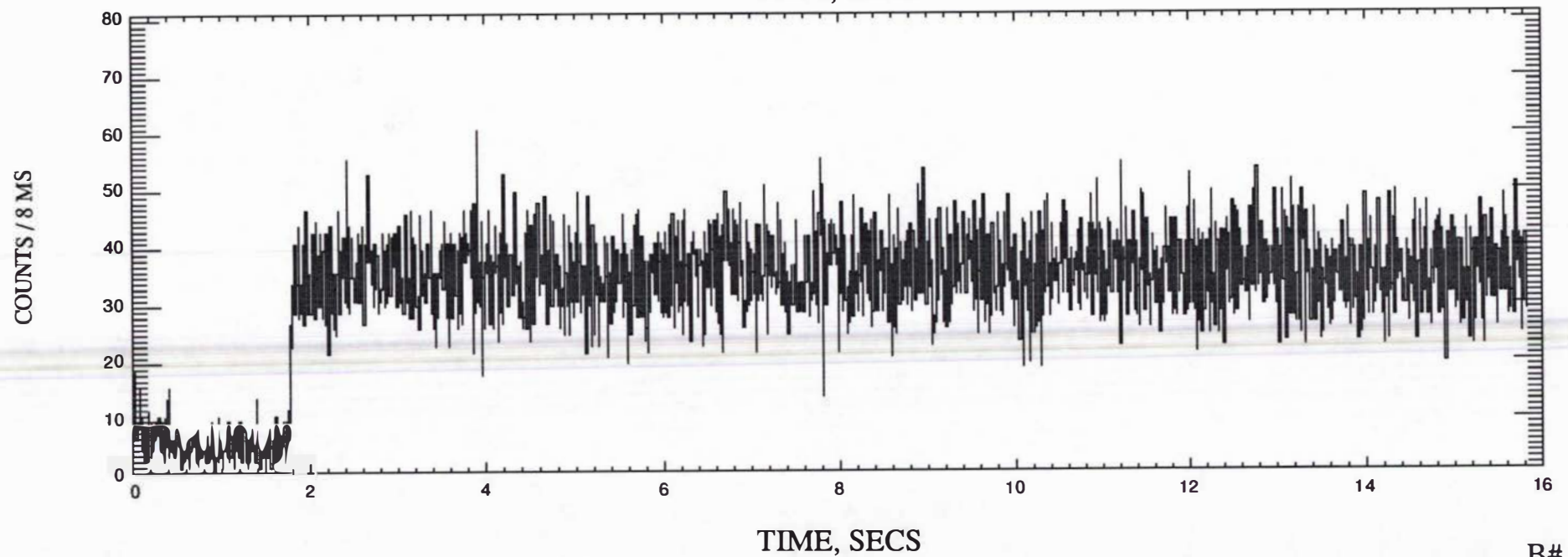
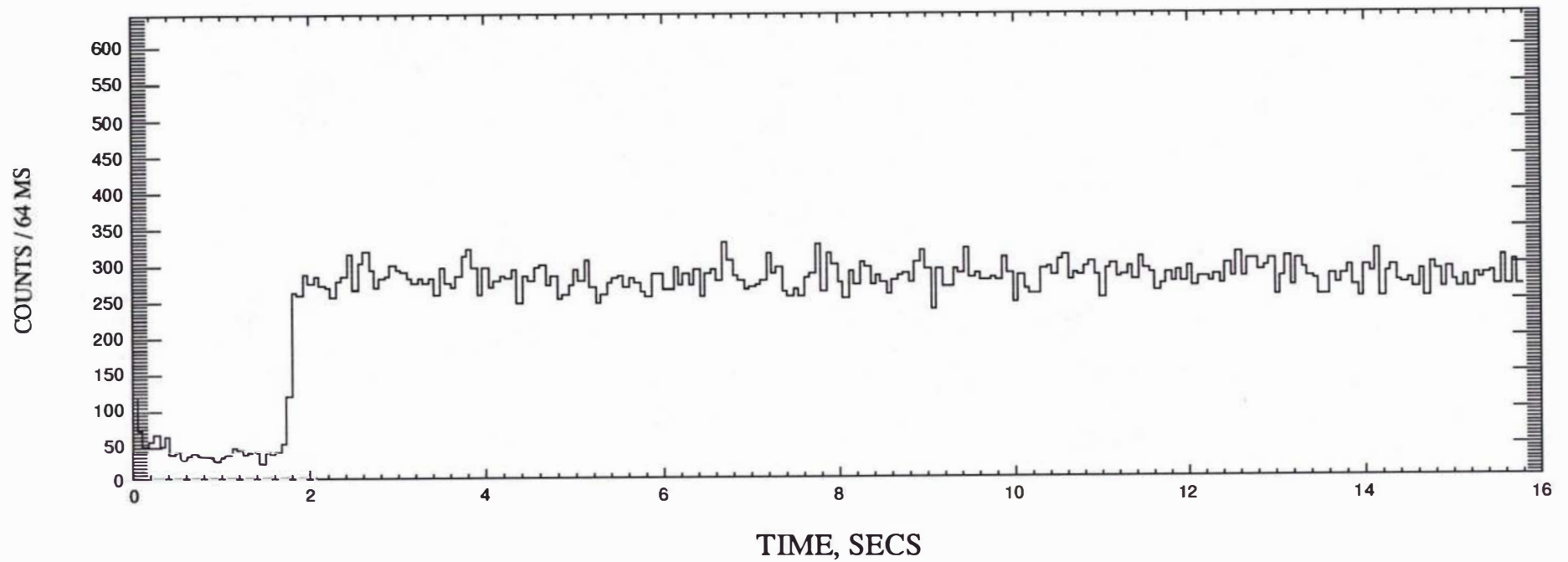
They all look like this - no increase evident in RT count rates



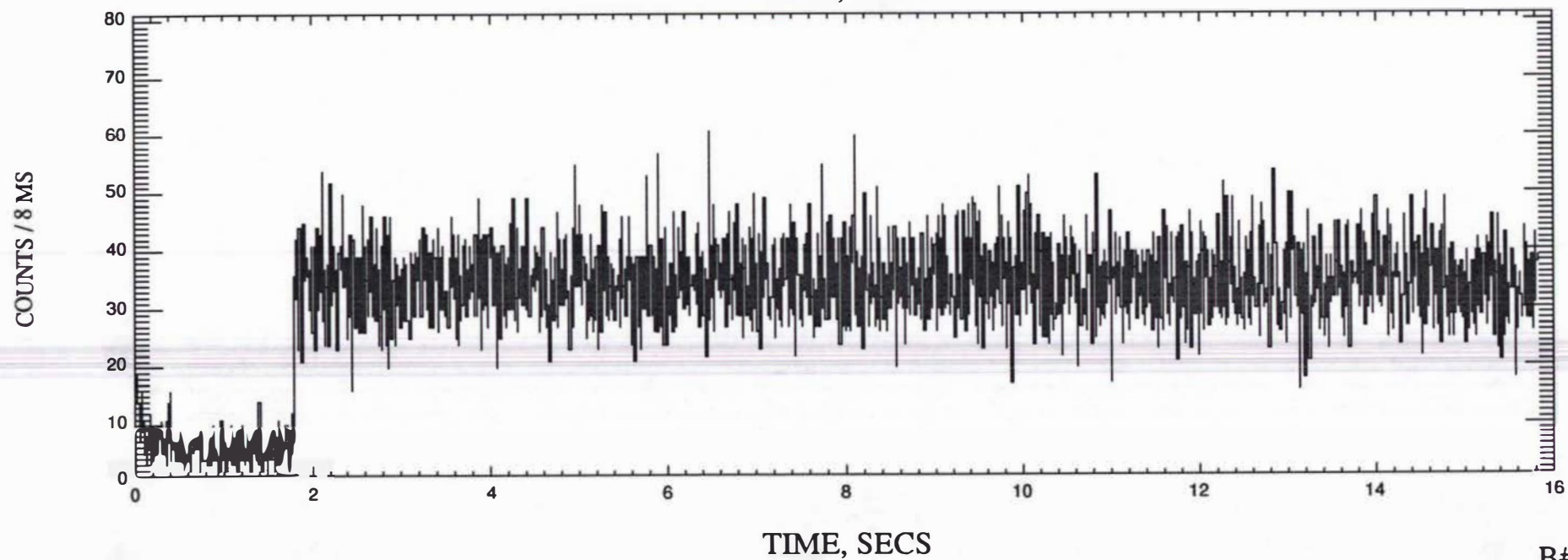
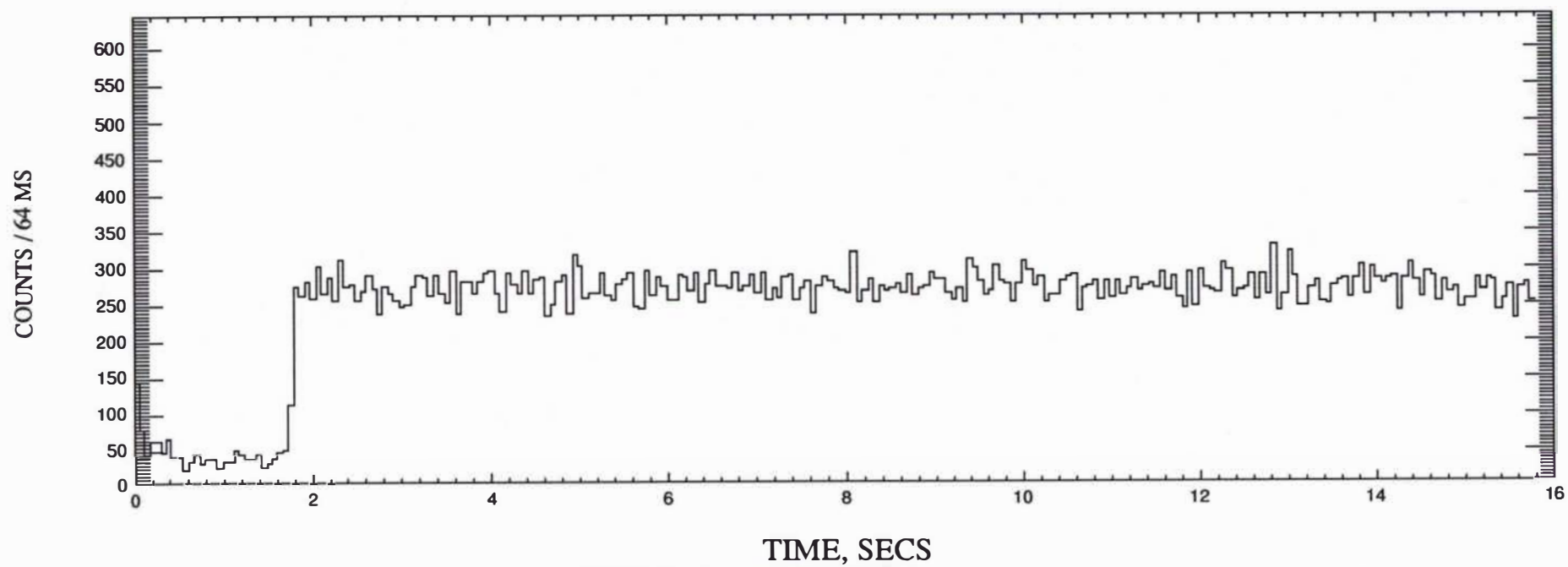
Burst Counter 0 at UT= 0.825851936340 h= 2973.067 s 00:49:33.067



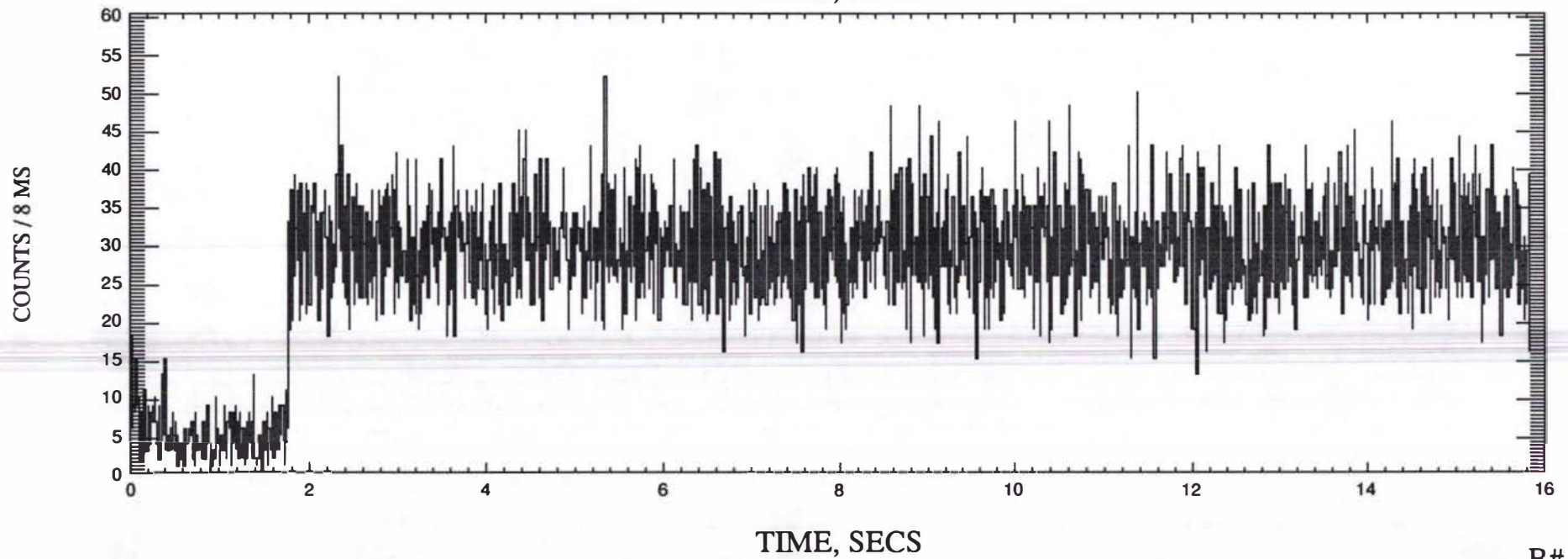
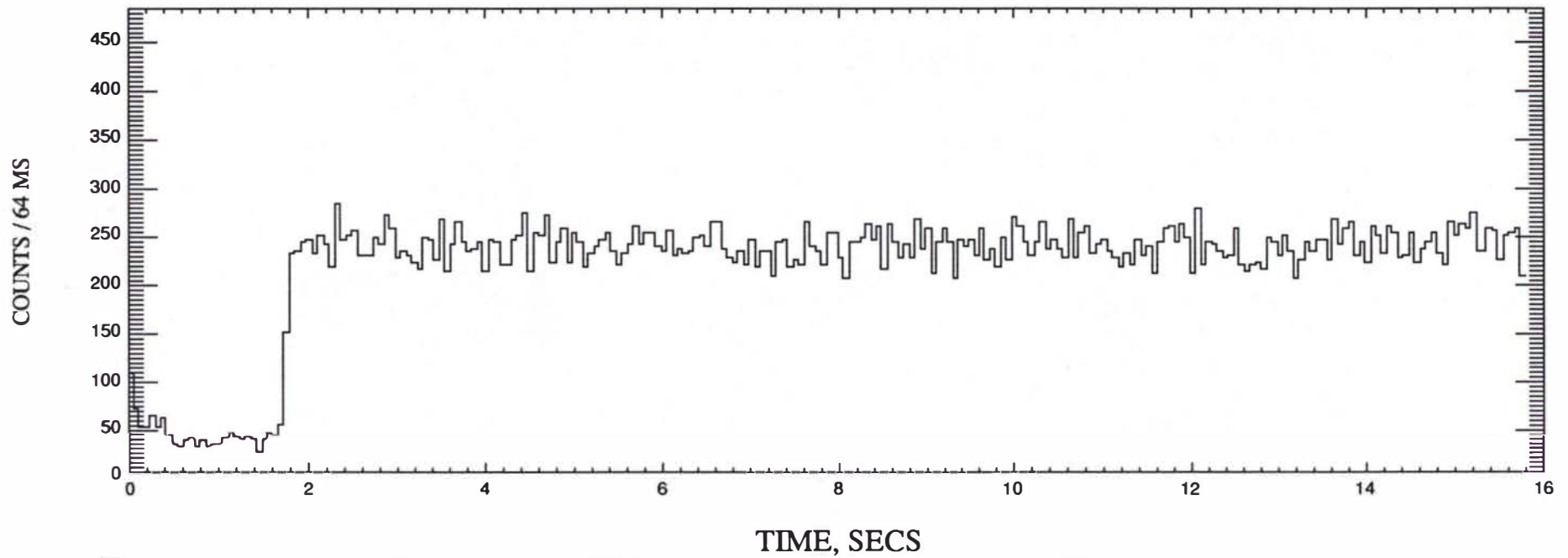
Burst Counter 1 at UT= 2.025873998006 h= 7293.146 s 02:01:33.146



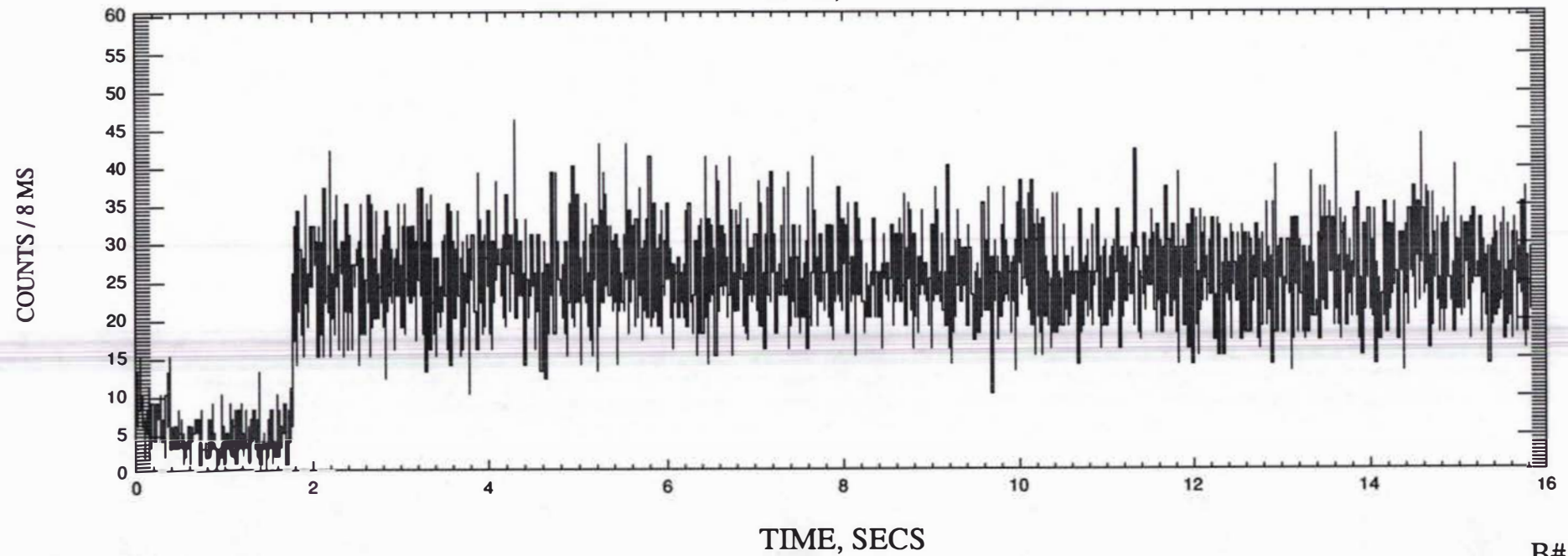
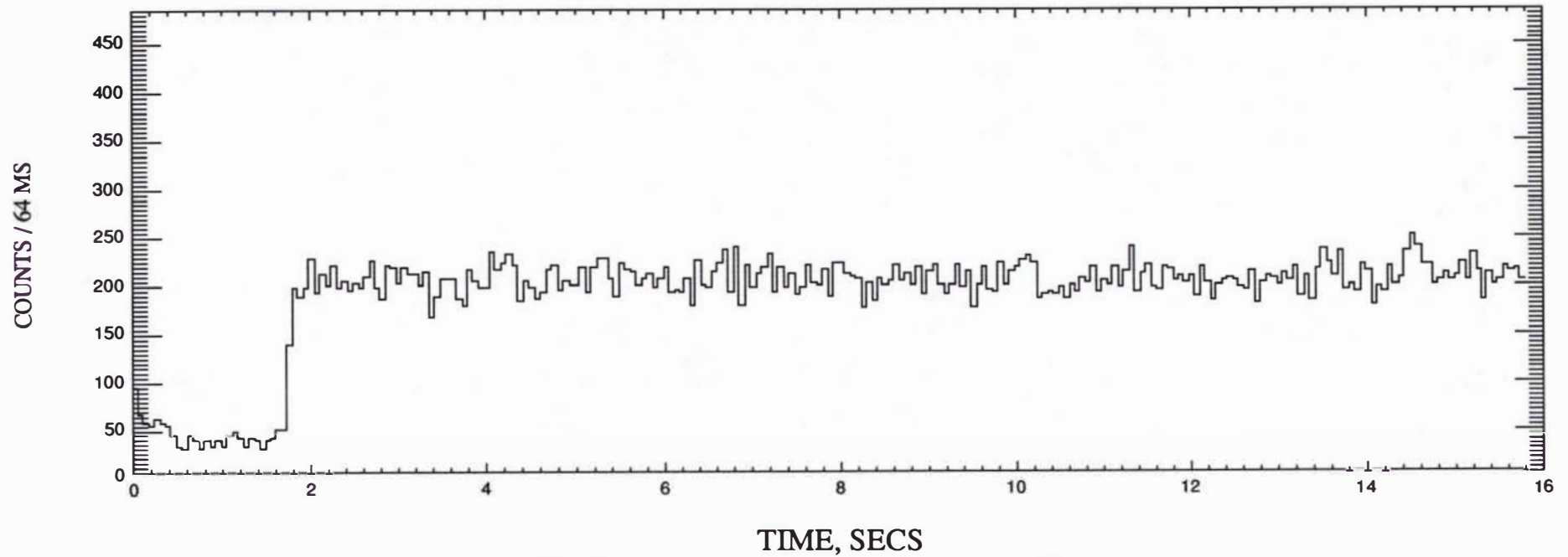
Burst Counter 2 at UT= 3.288117154439 h=11837.222 s 03:17:17.222



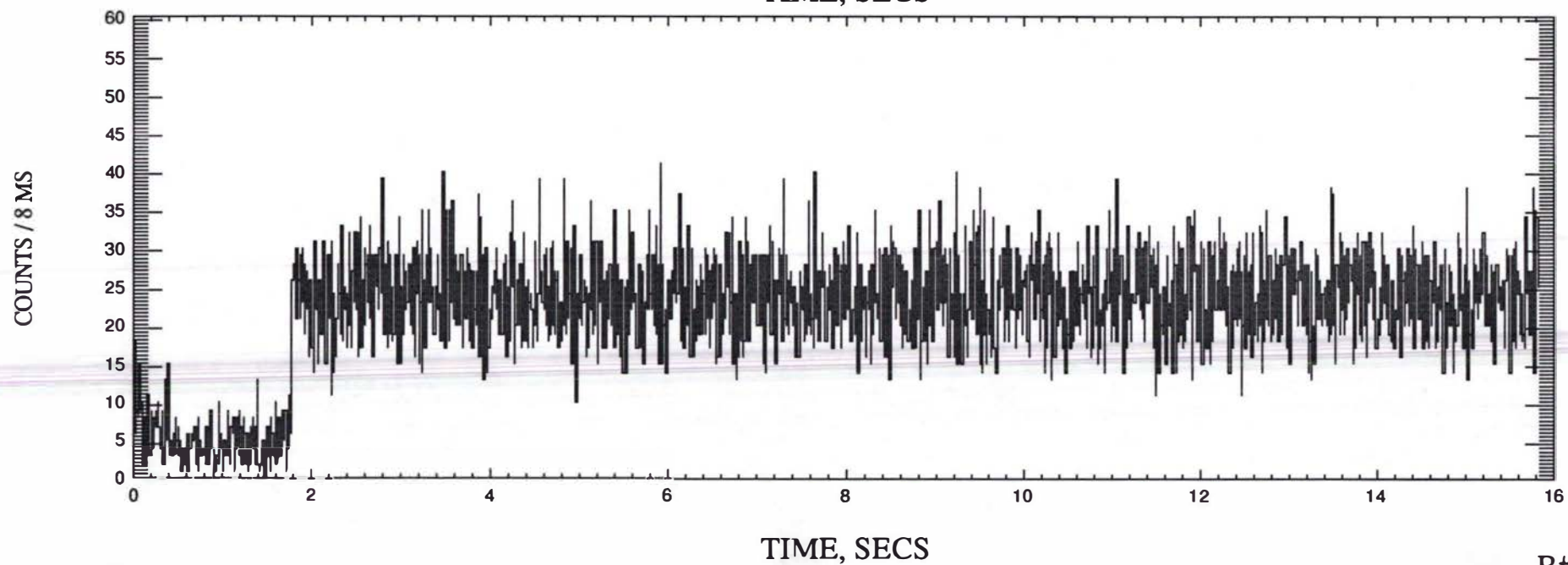
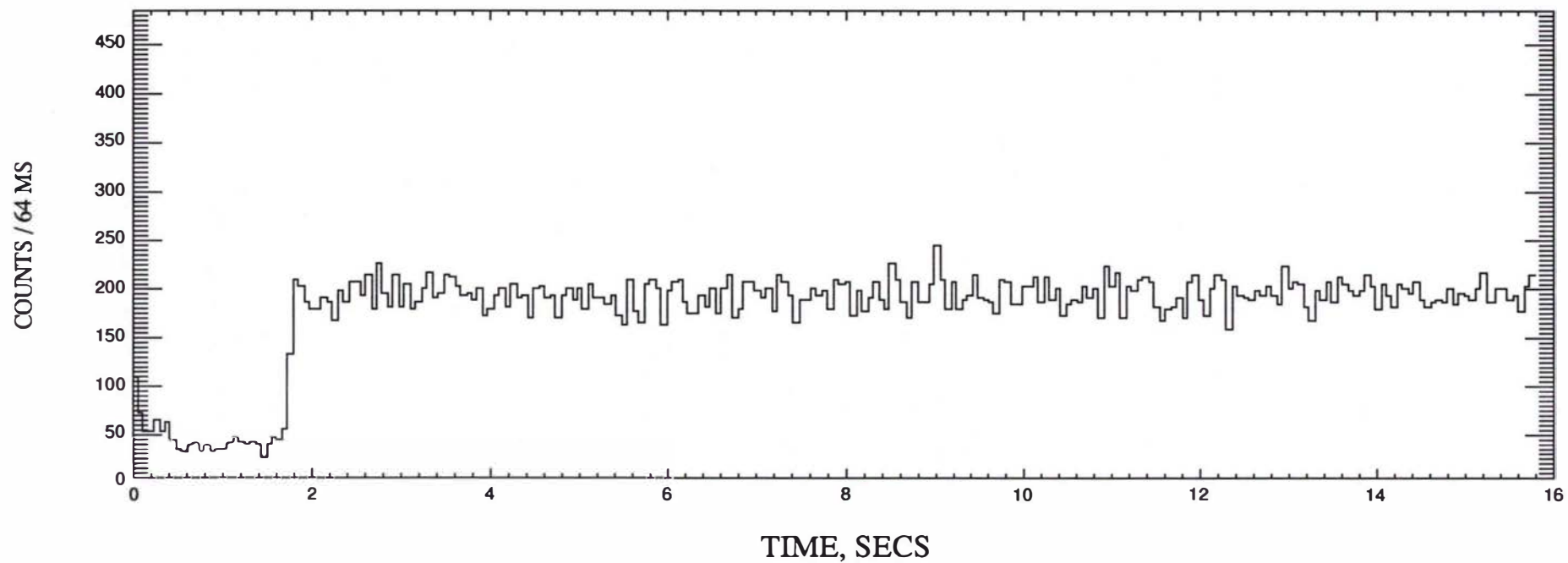
Burst Counter 3 at UT= 4.550366821289 h=16381.321 s 04:33:01.321



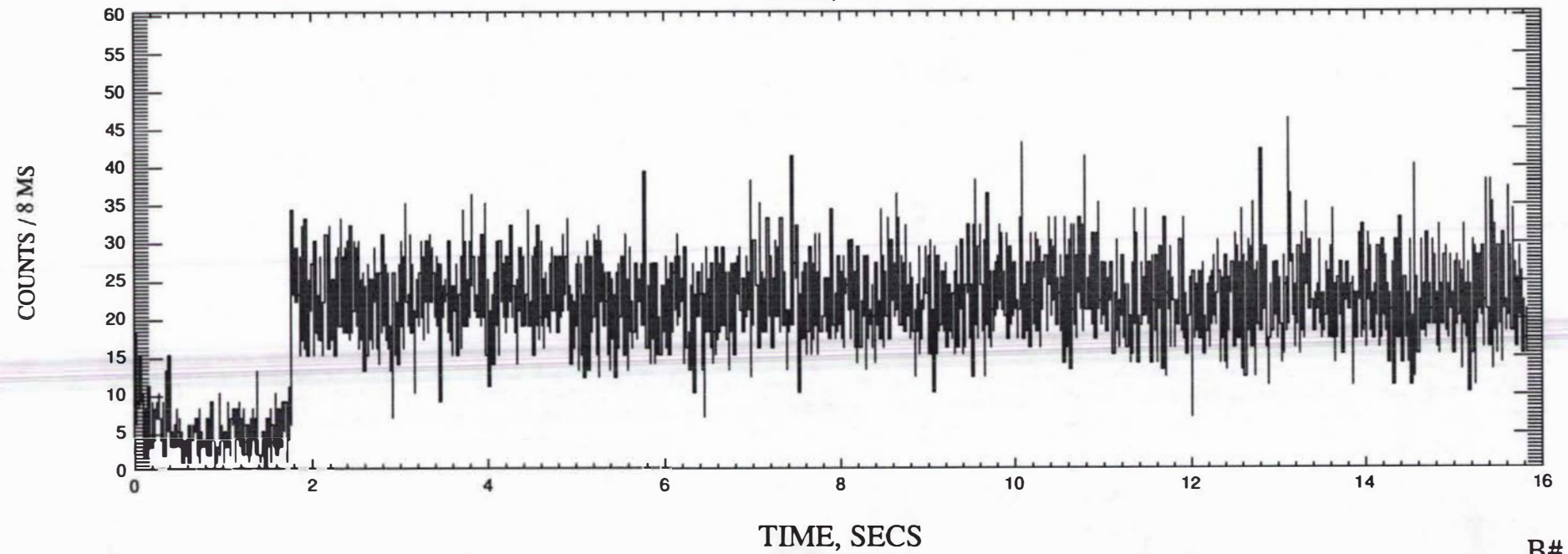
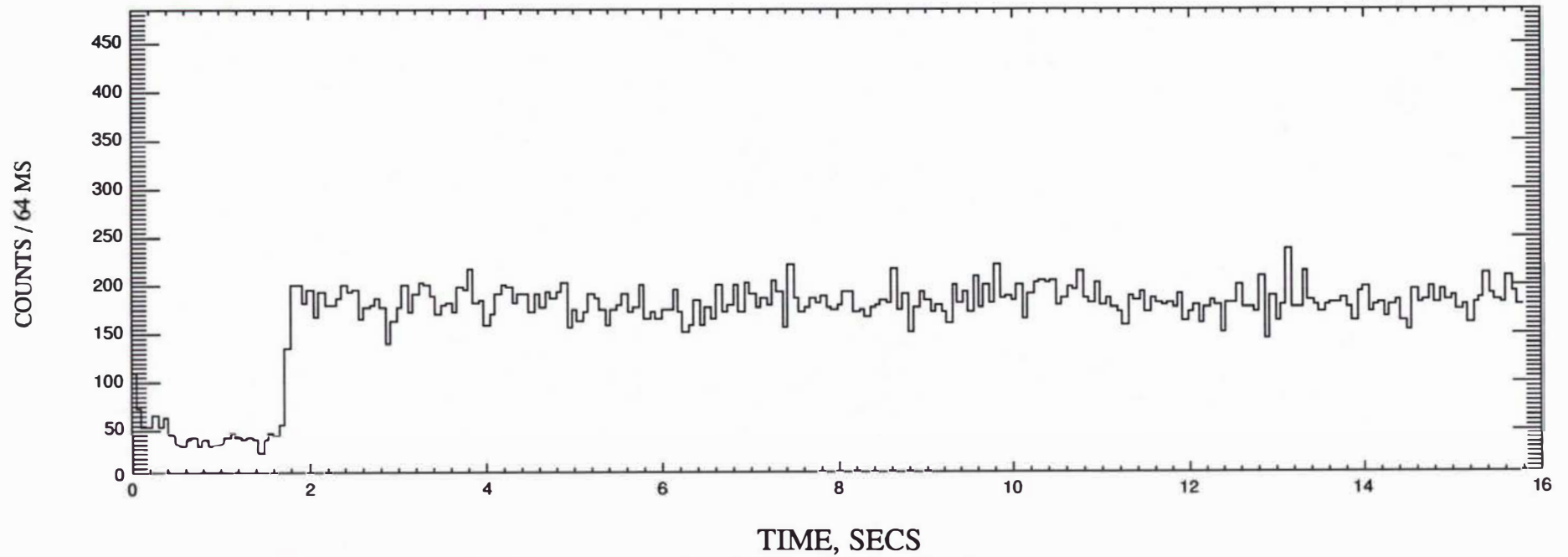
Burst Counter 4 at UT= 5.812614318000 h=20925.412 s 05:48:45.412



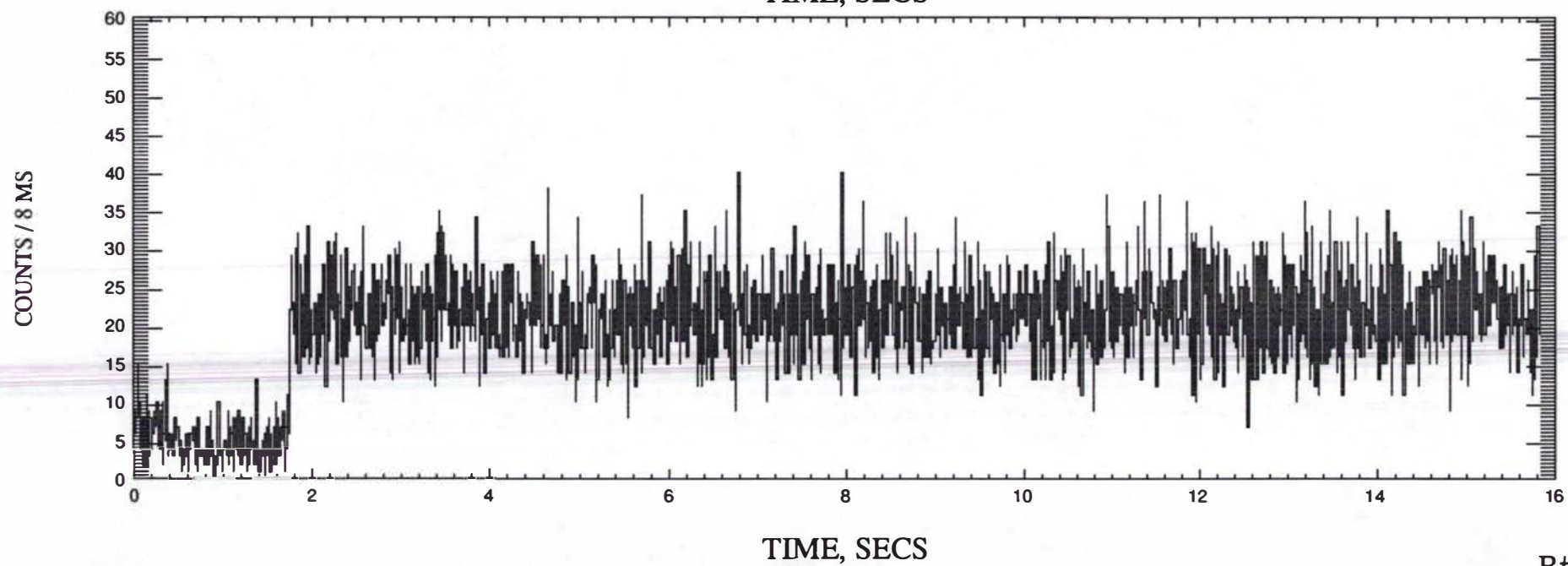
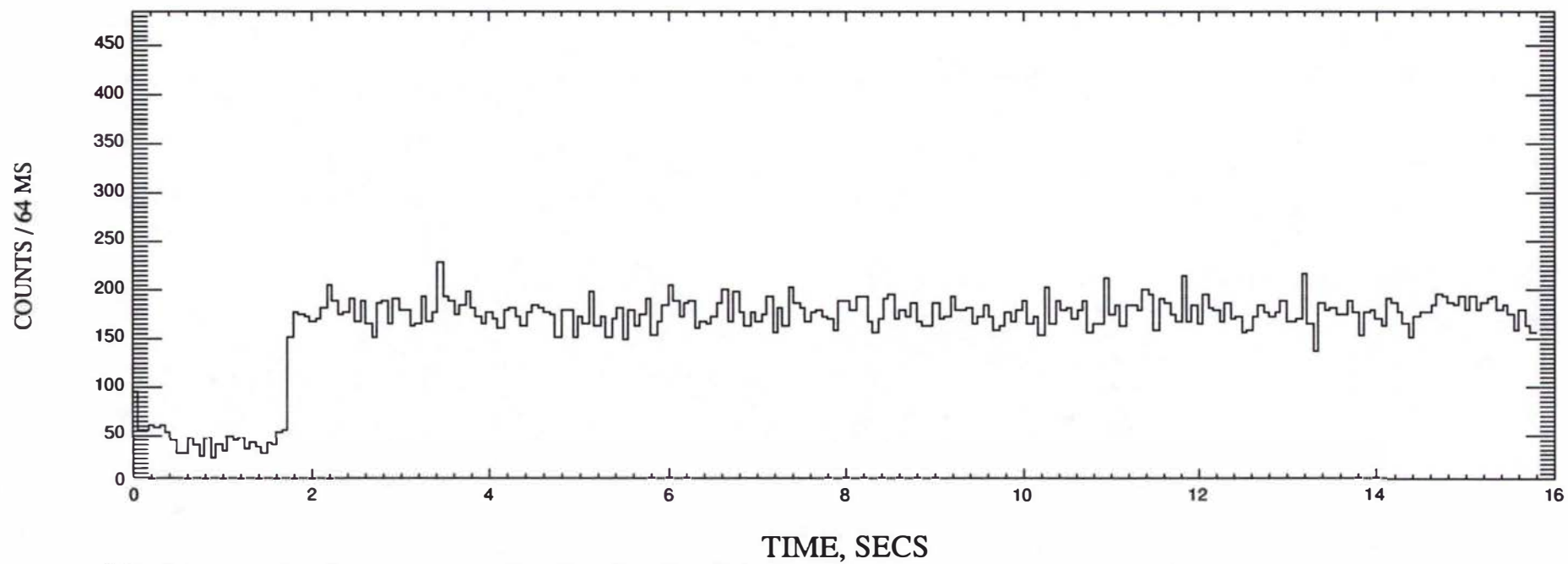
Burst Counter 5 at UT= 7.074859644572 h=25469.495 s 07:04:29.495



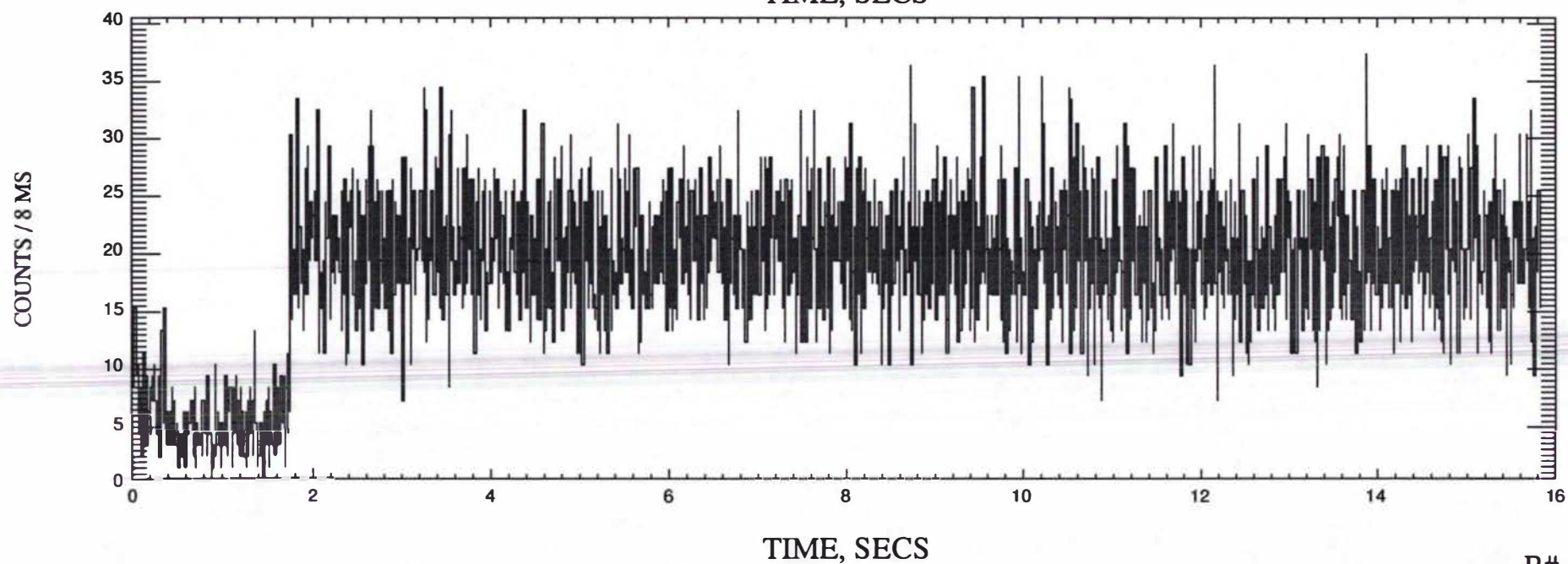
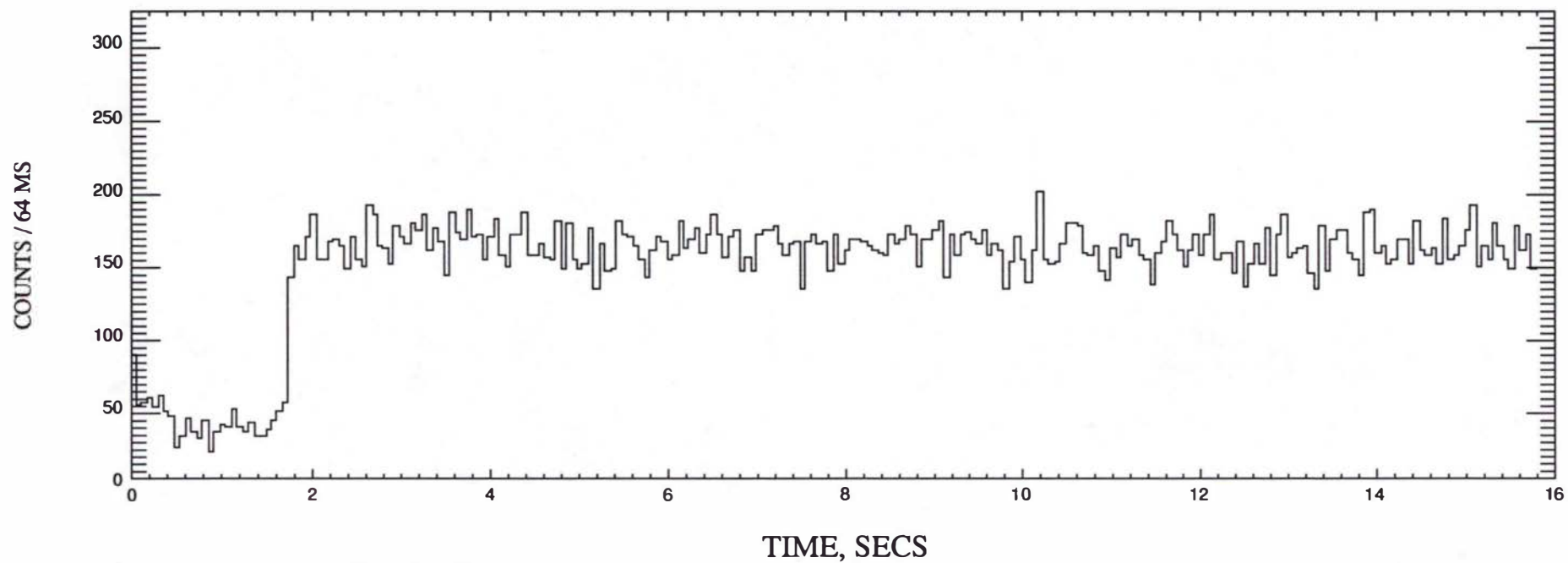
Burst Counter 6 at UT= 8.337102801005 h=30013.570 s 08:20:13.570



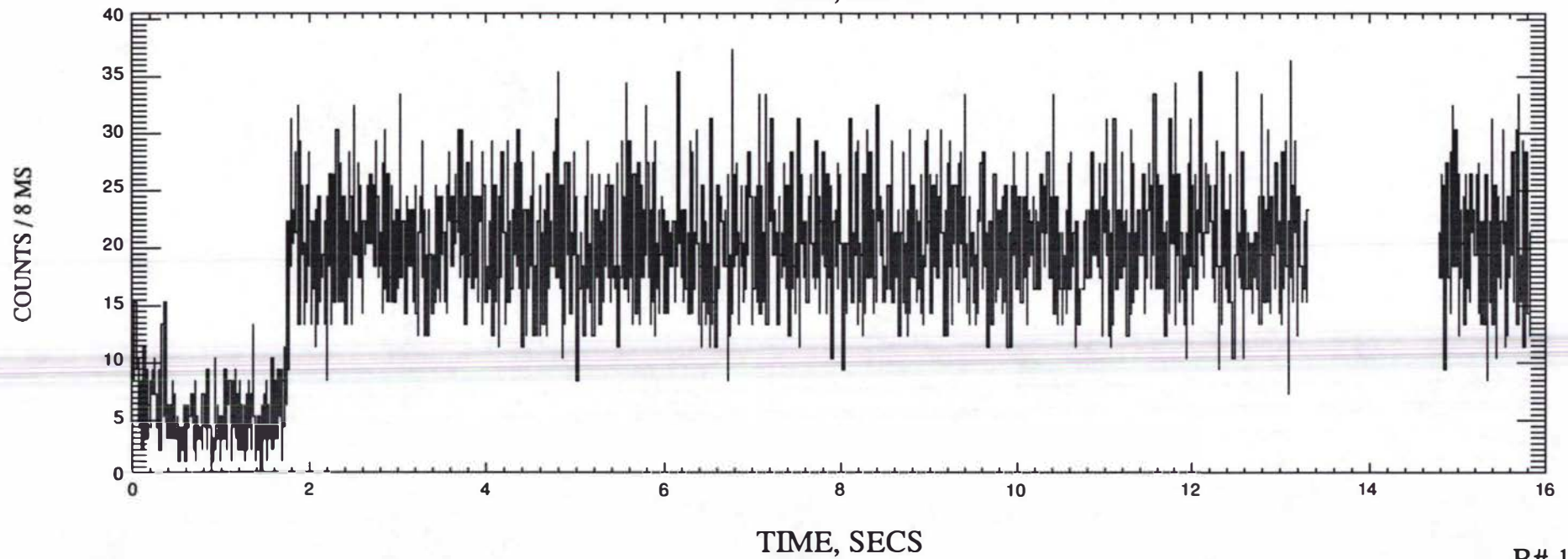
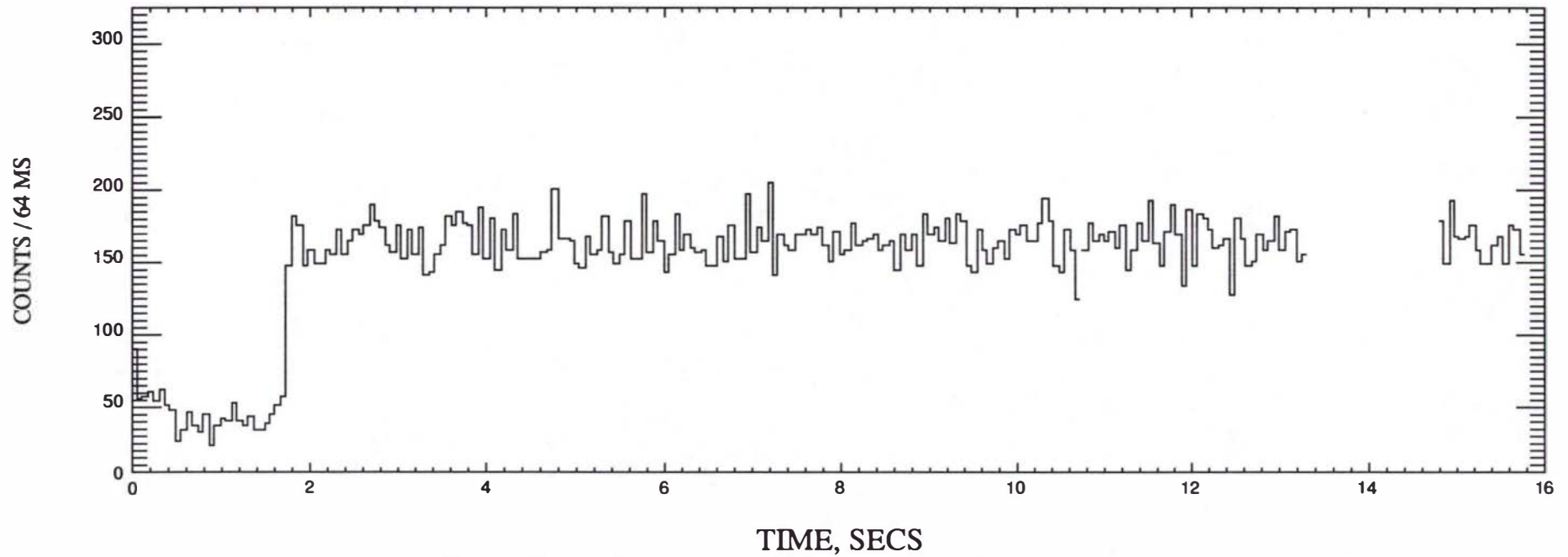
Burst Counter 7 at UT= 9.599352467855 h=34557.669 s 09:35:57.669



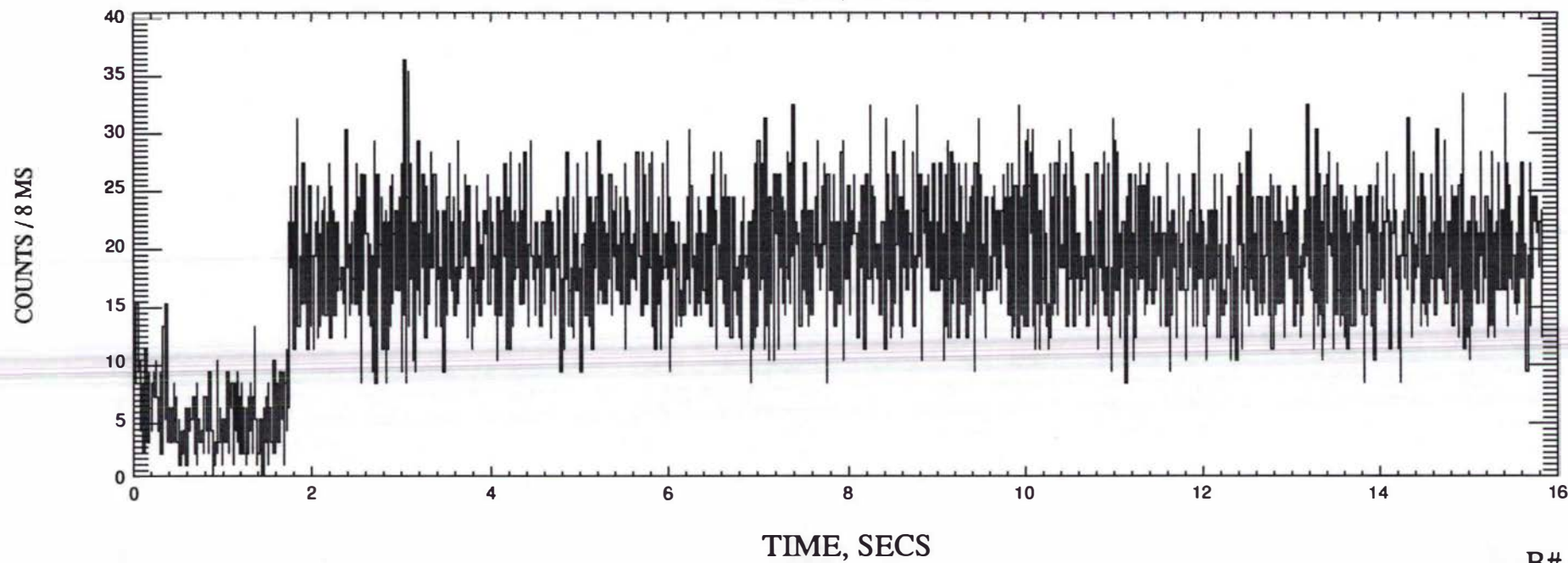
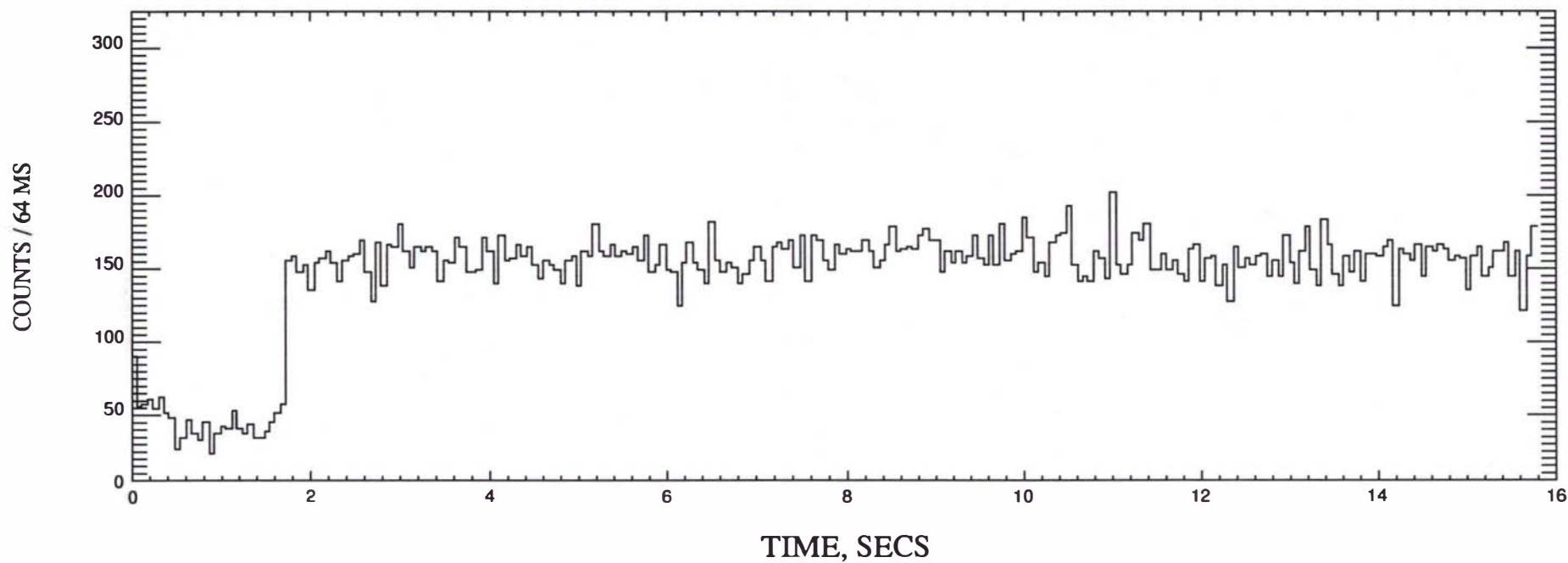
Burst Counter 8 at UT=10.861597396003 h=39101.751 s 10:51:41.751



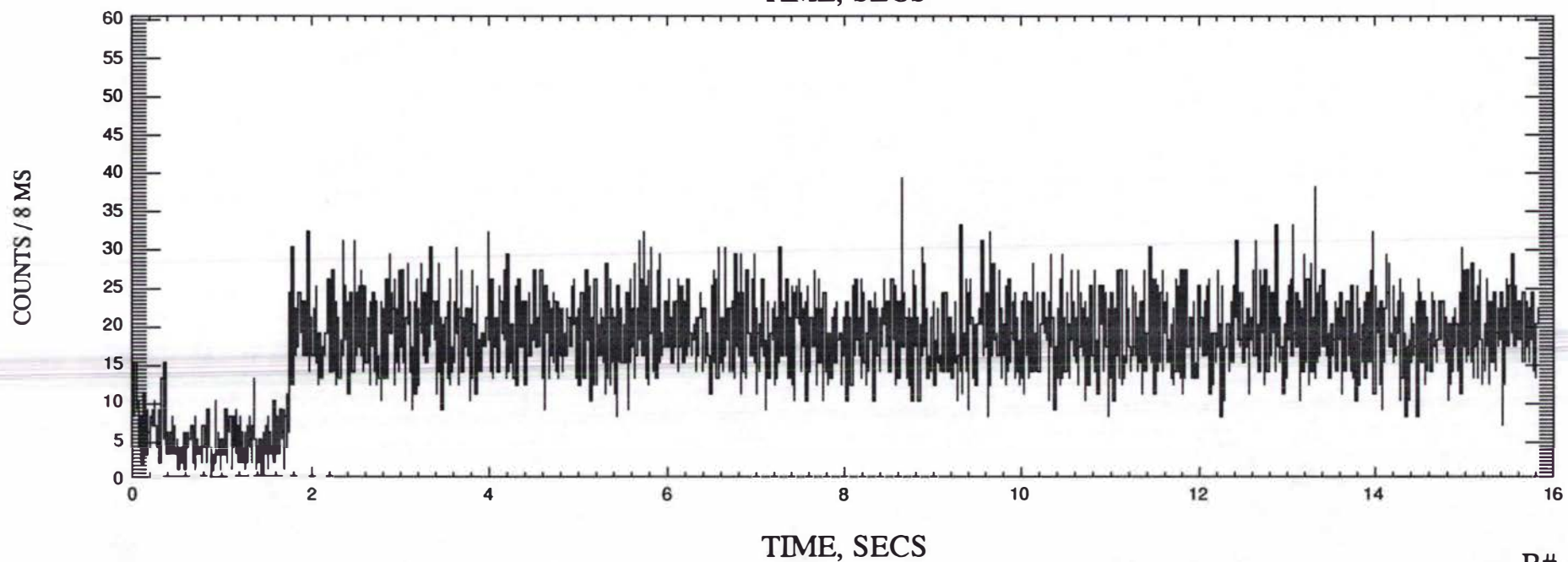
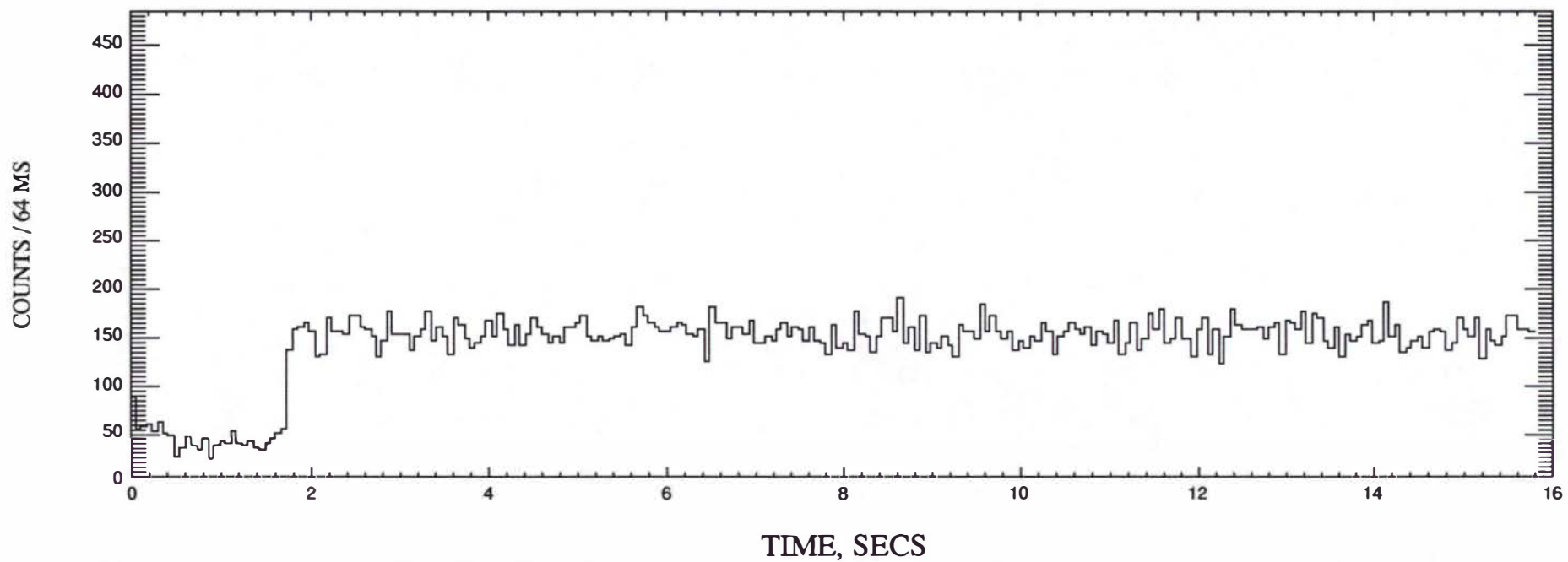
Burst Counter 9 at UT=12.123842722575 h=43645.834 s 12:07:25.834



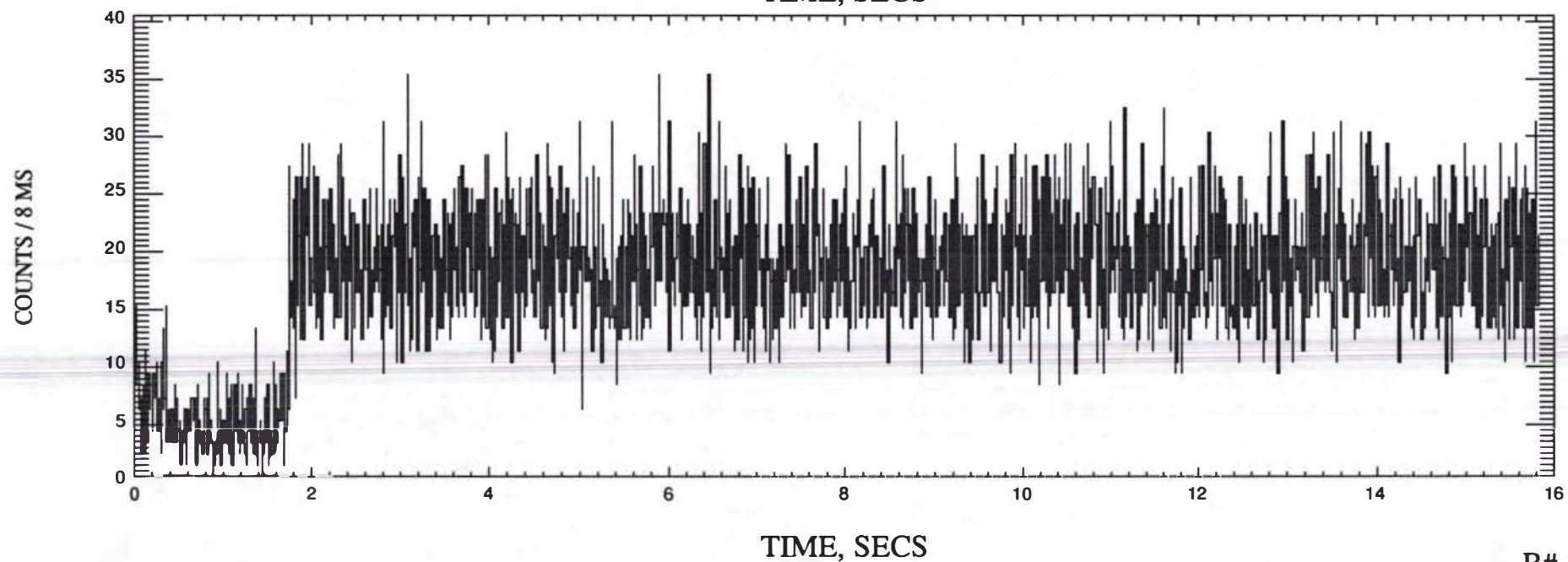
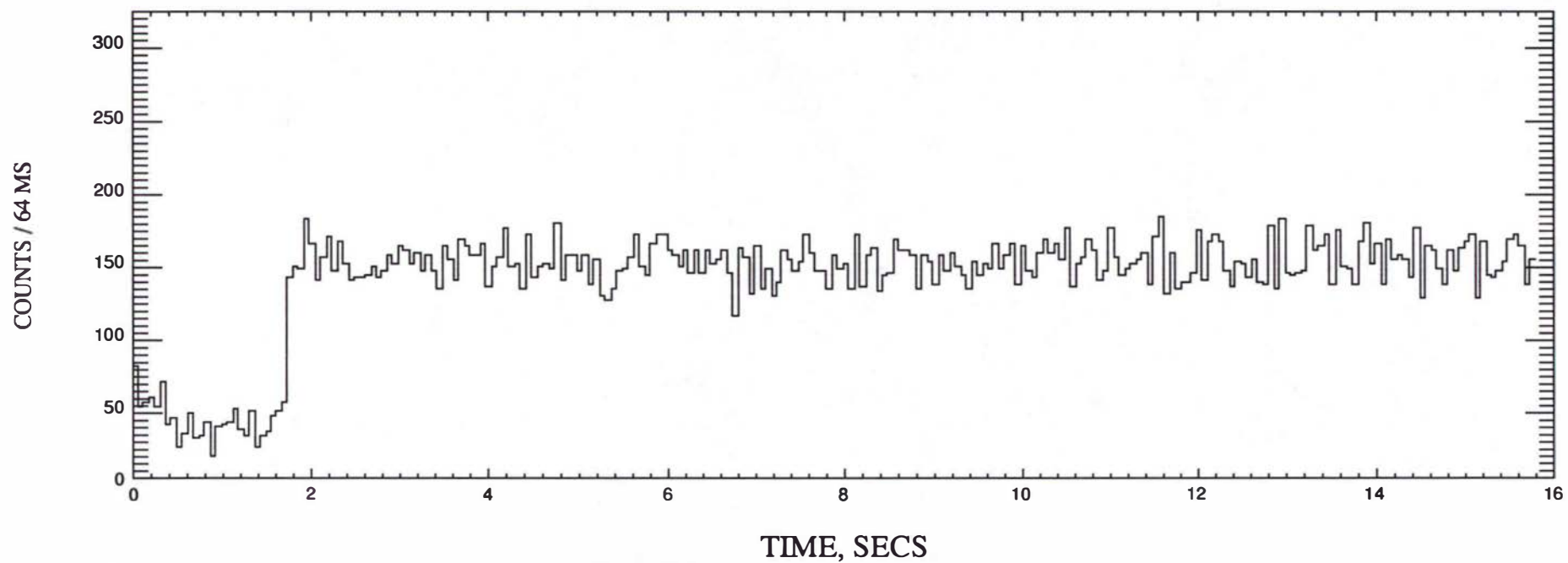
Burst Counter 10 at UT=13.074972767300 h=47069.902 s 13:04:29.902



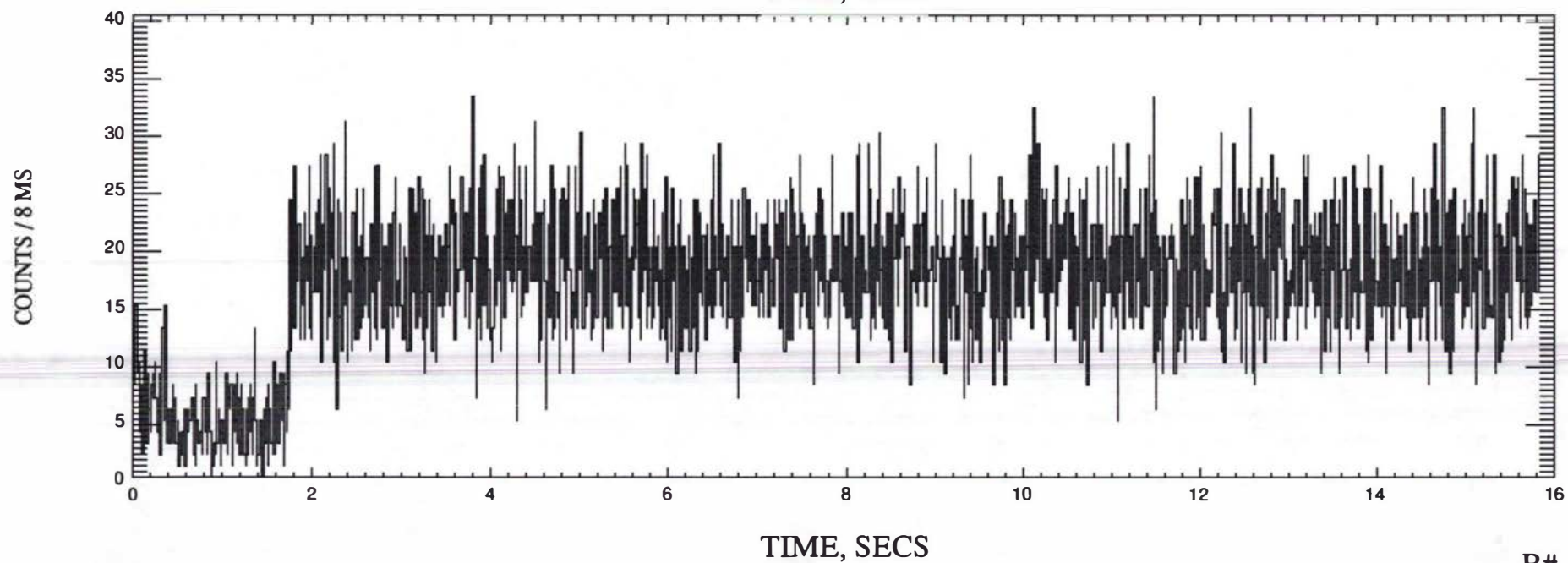
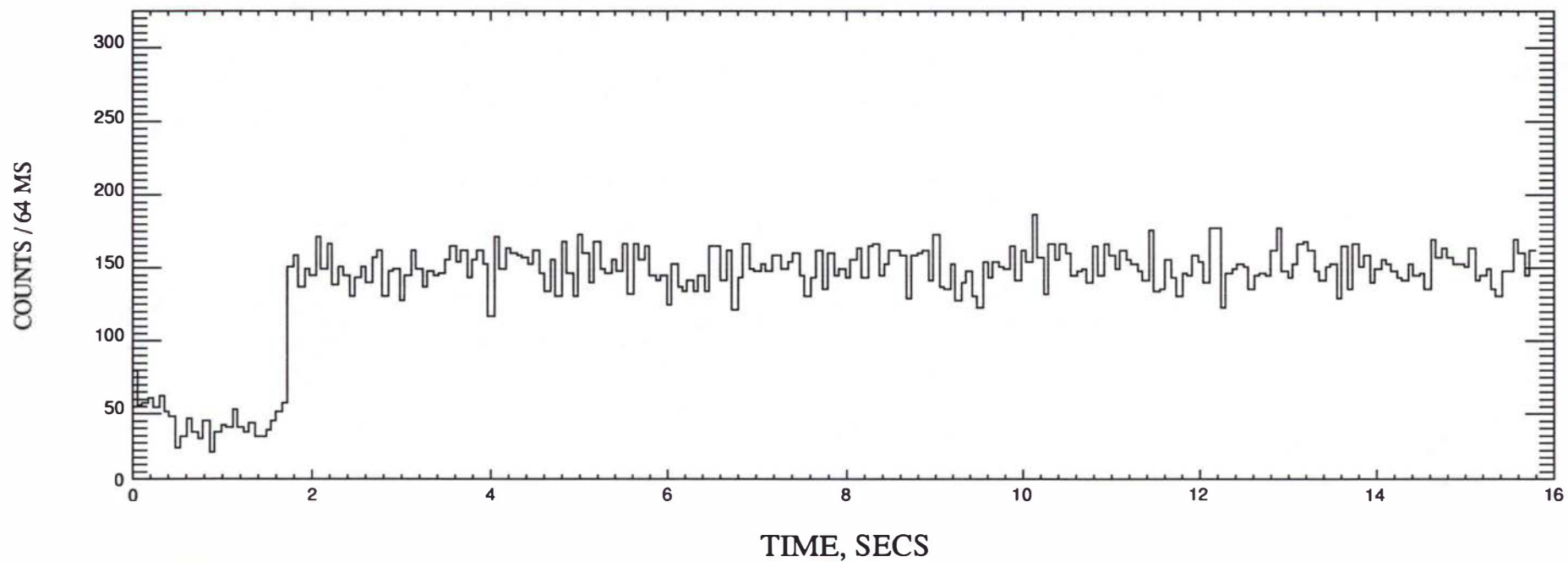
Burst Counter 11 at UT=13.777207823859 h=49597.948 s 13:46:37.948



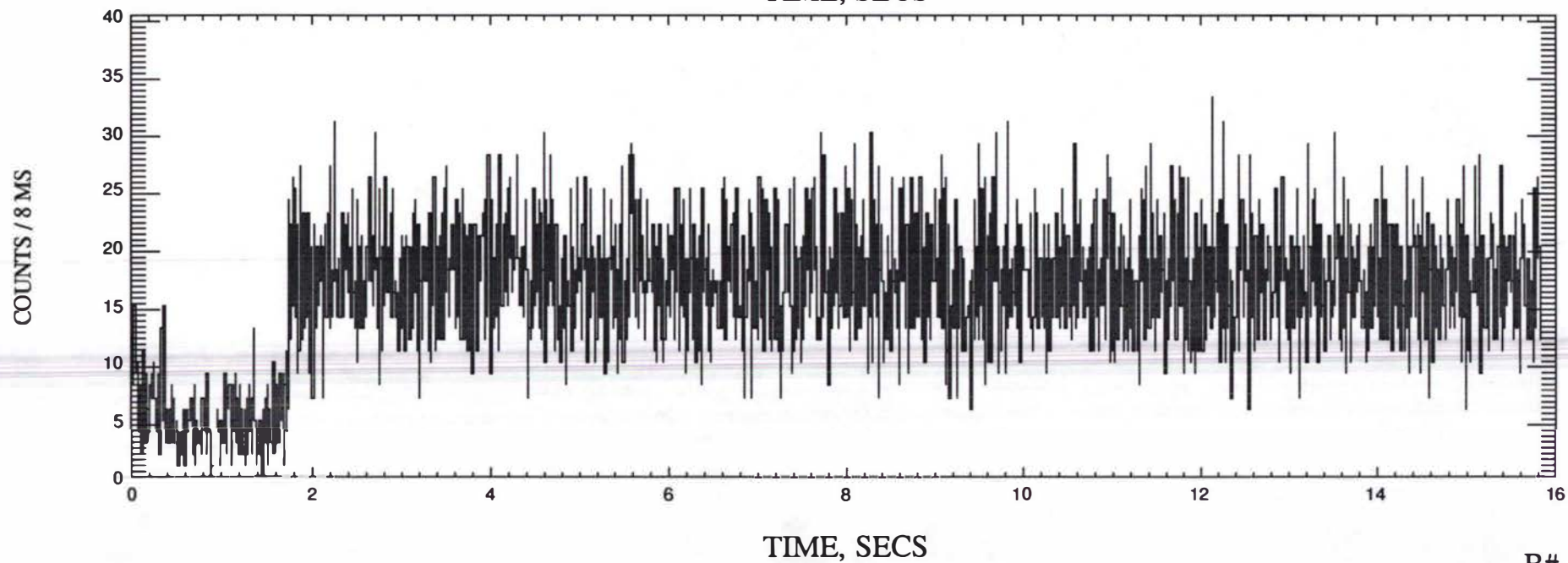
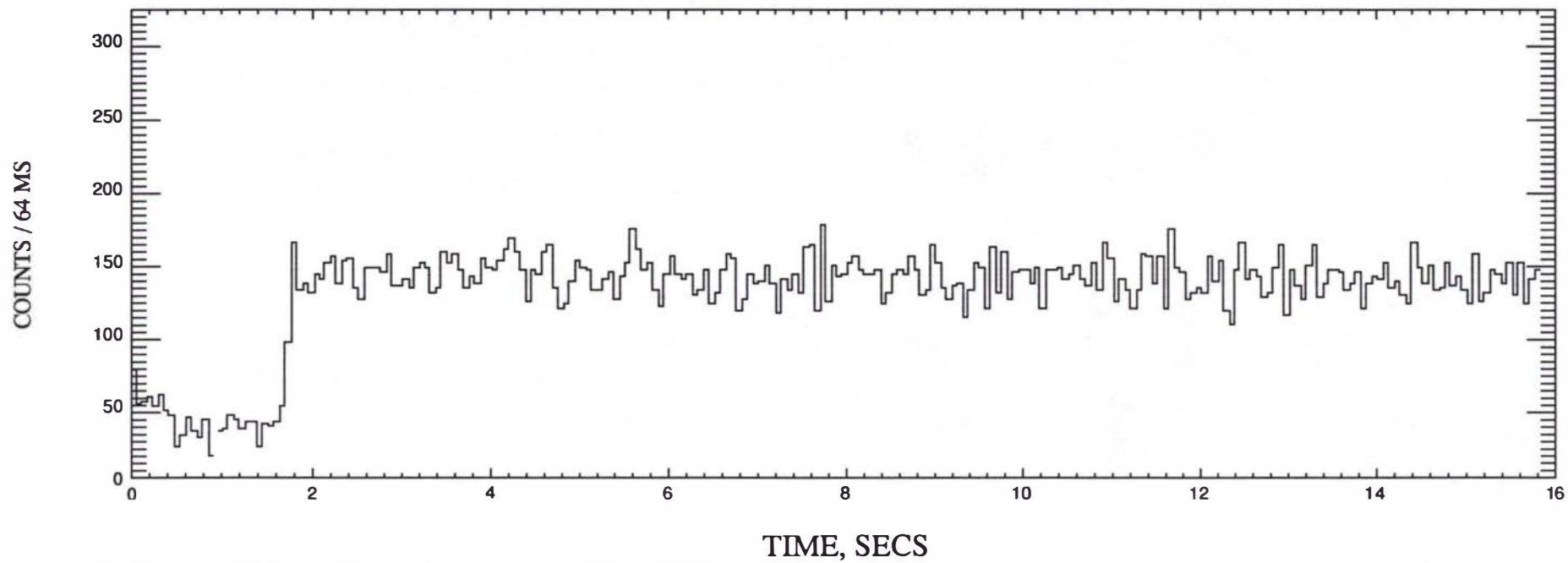
Burst Counter 12 at UT=14.479445050557 h=52126.002 s 14:28:46.002



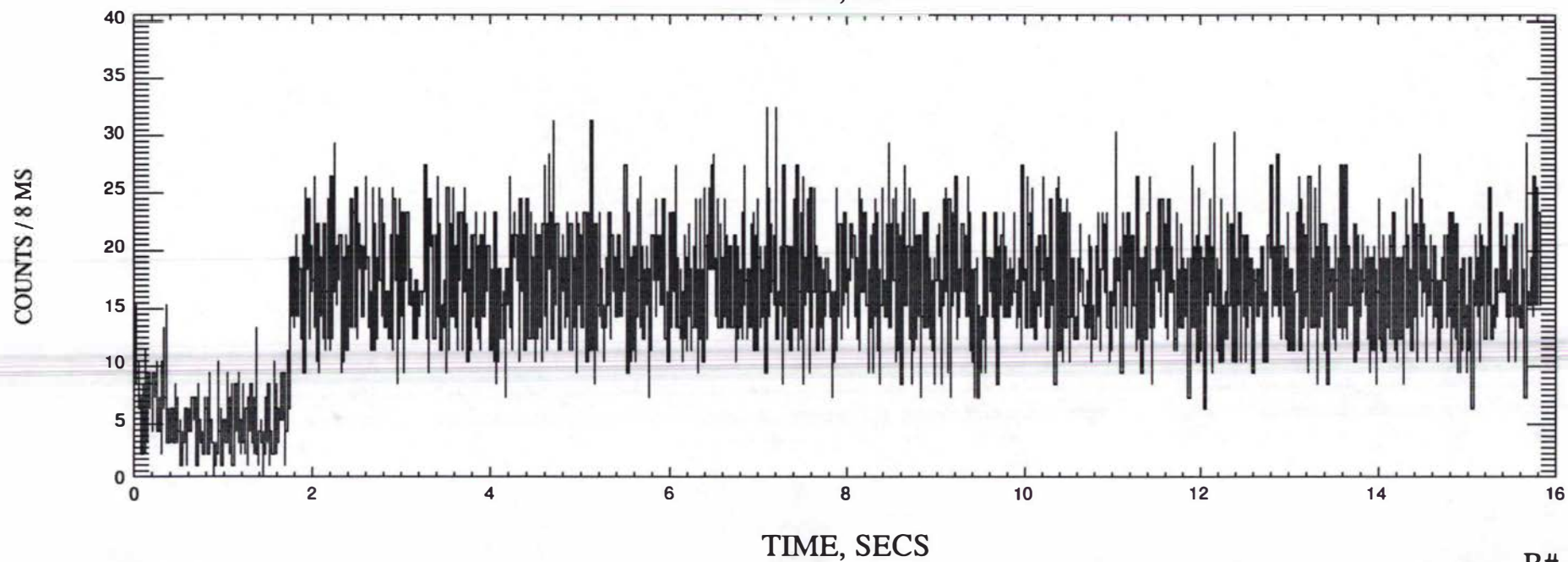
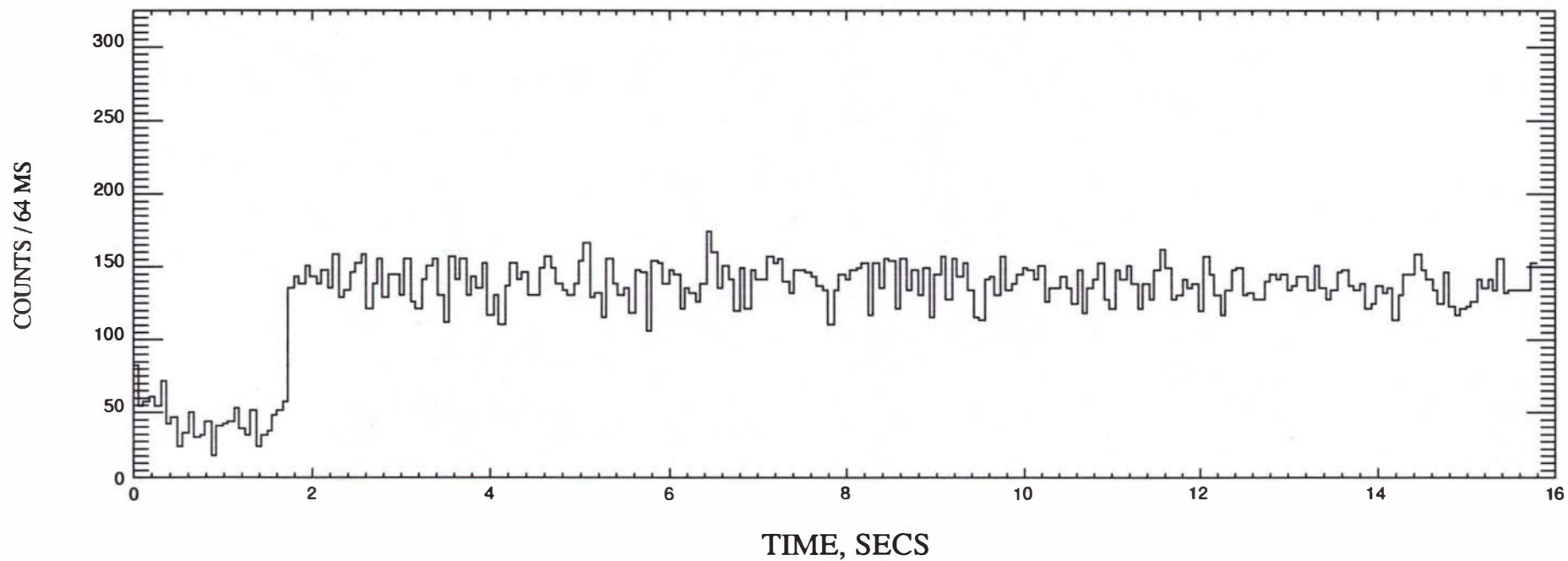
Burst Counter 13 at UT=15.181677941216 h=54654.041 s 15:10:54.041



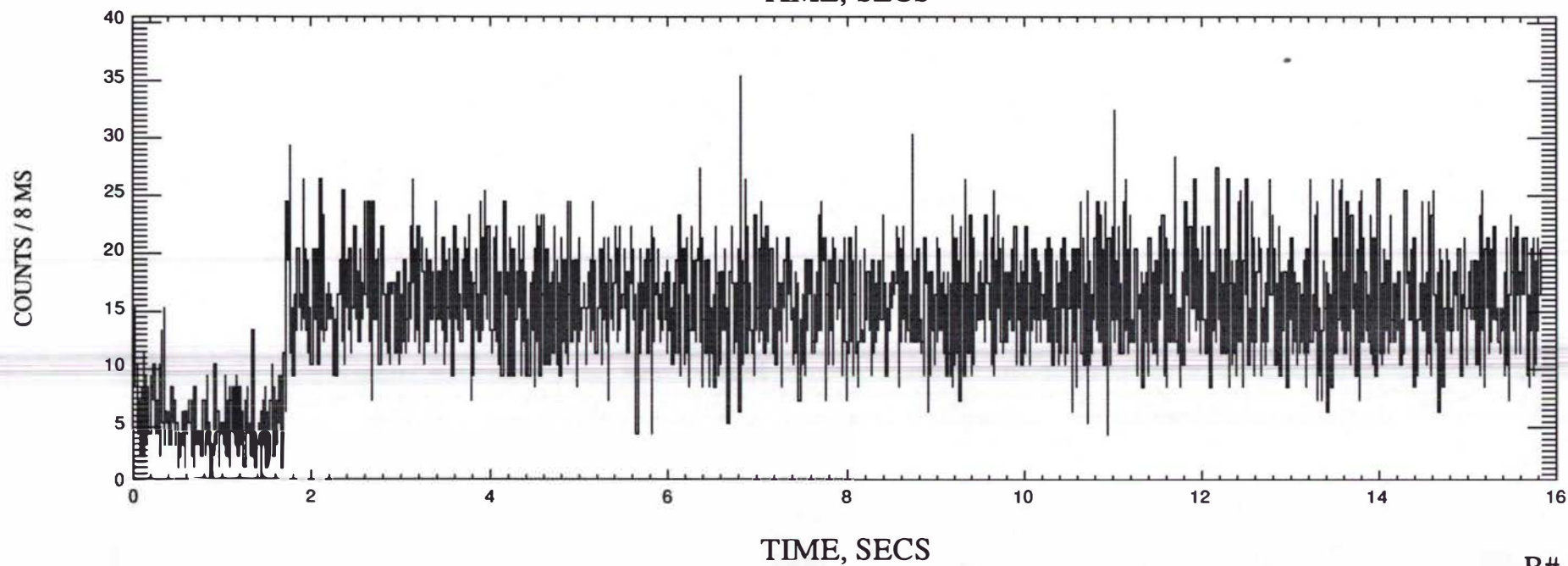
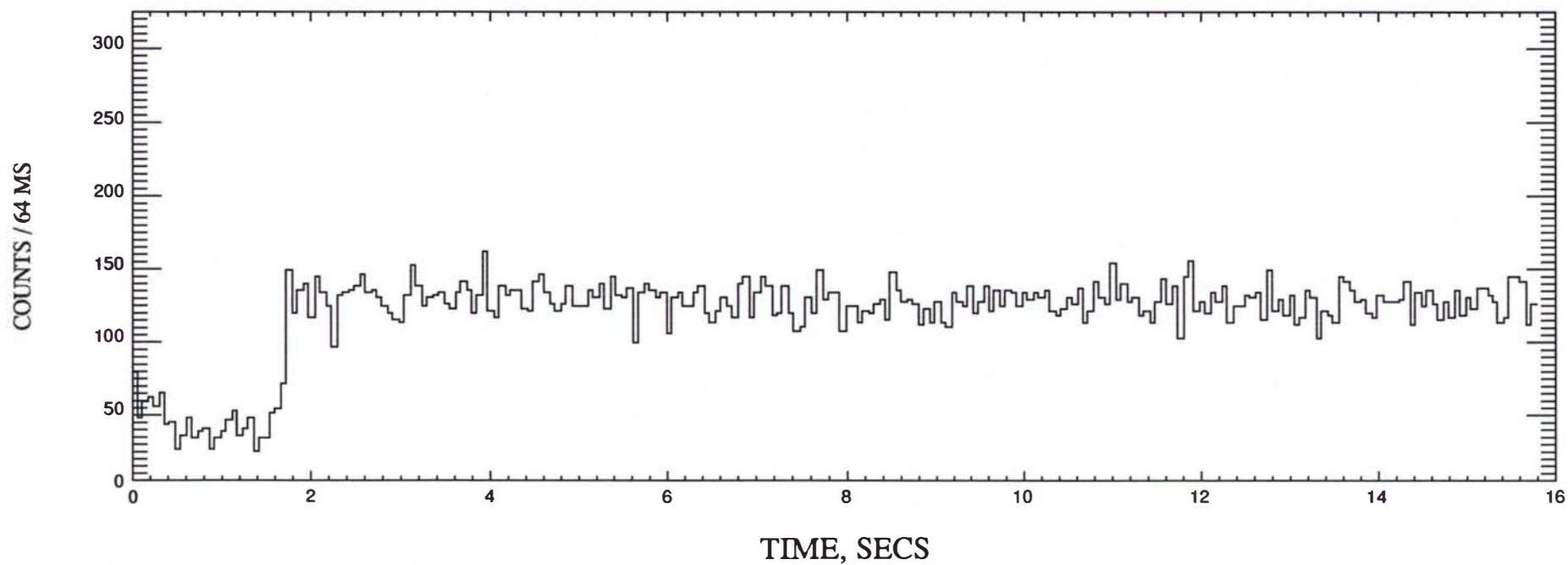
Burst Counter 14 at UT=15.883912997776 h=57182.087 s 15:53:02.087



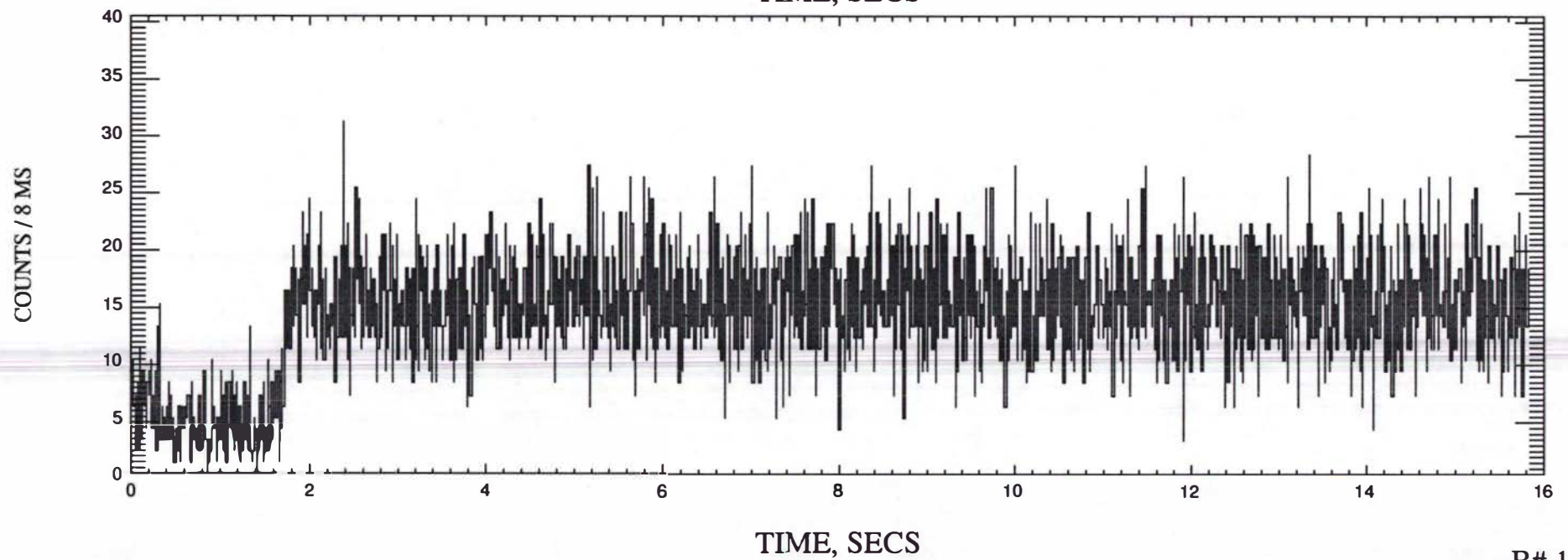
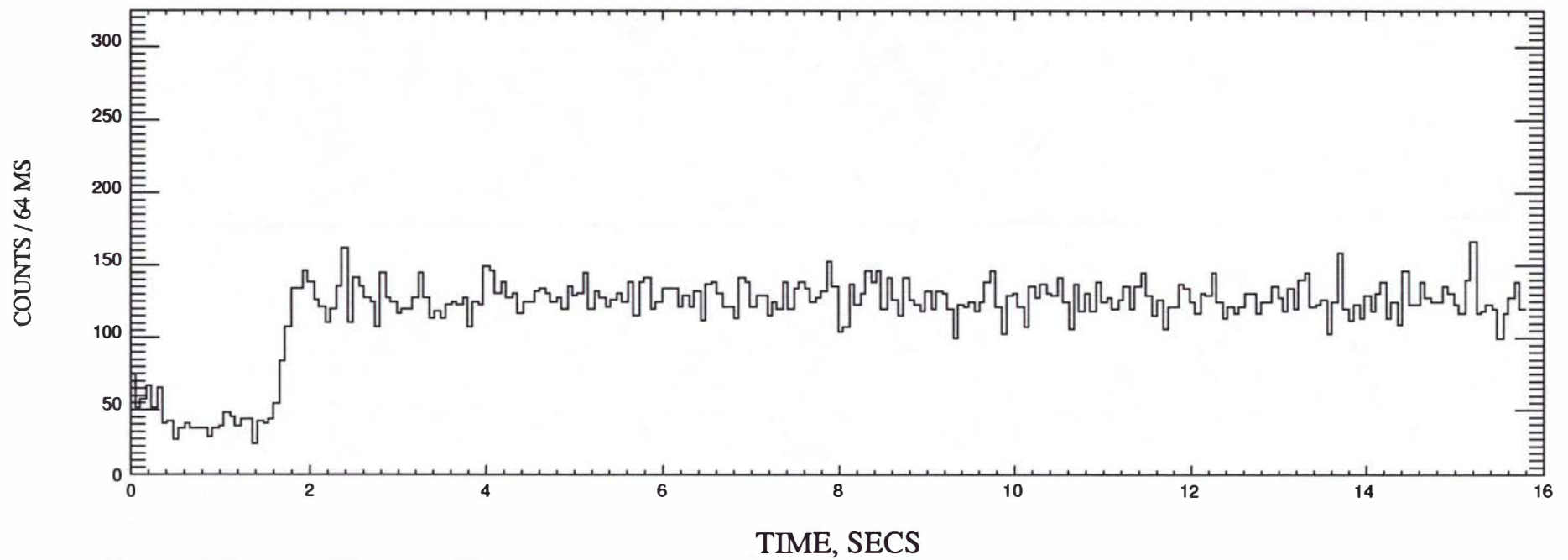
Burst Counter 15 at UT=16.586150224474 h=59710.141 s 16:35:10.141



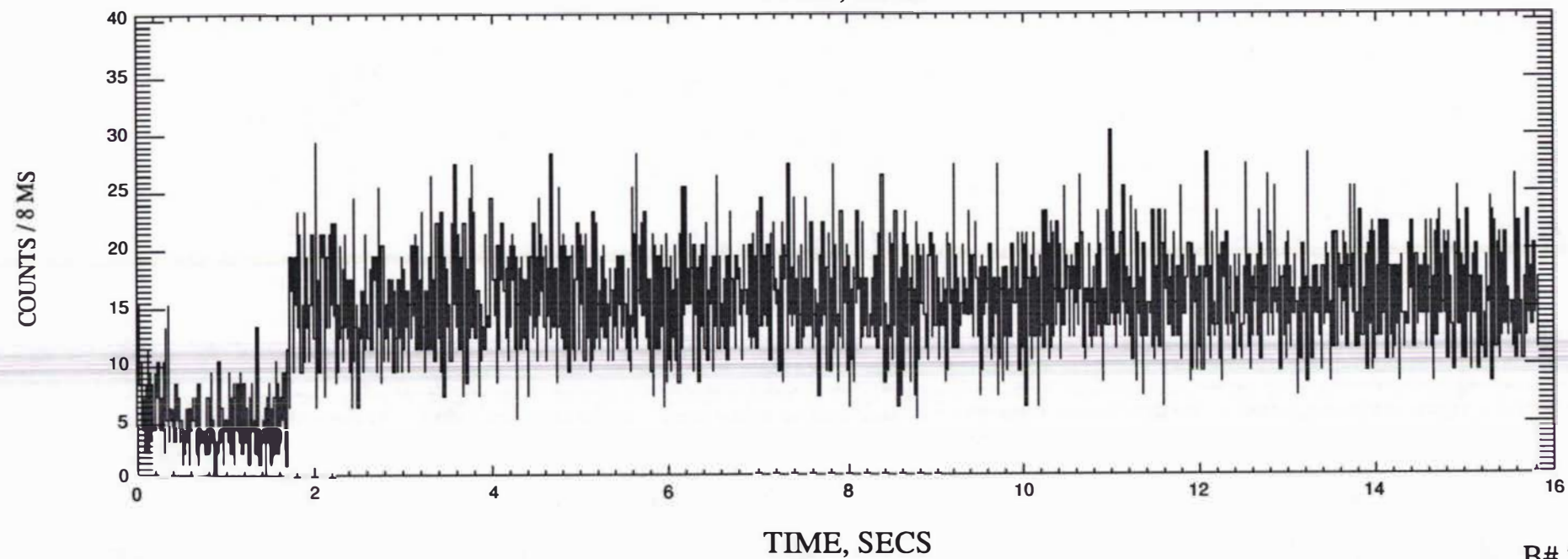
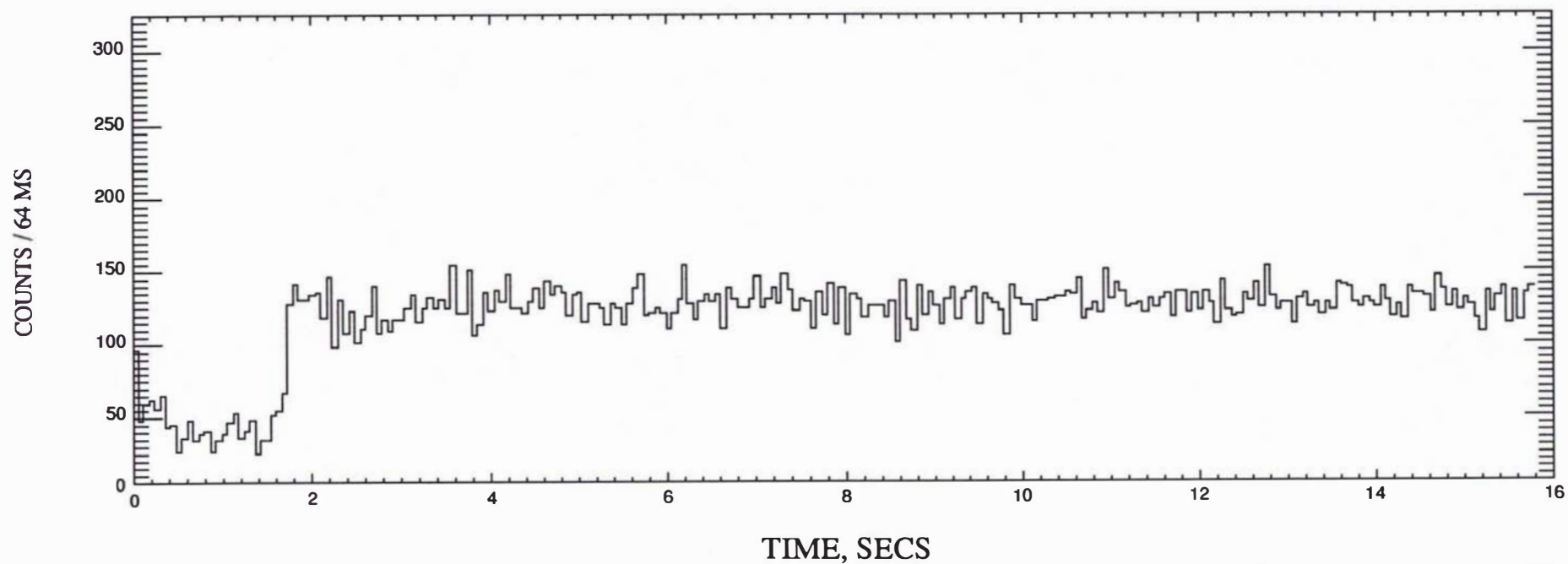
Burst Counter 0 at UT=17.288386171129 h=62238.190 s 17:17:18.190



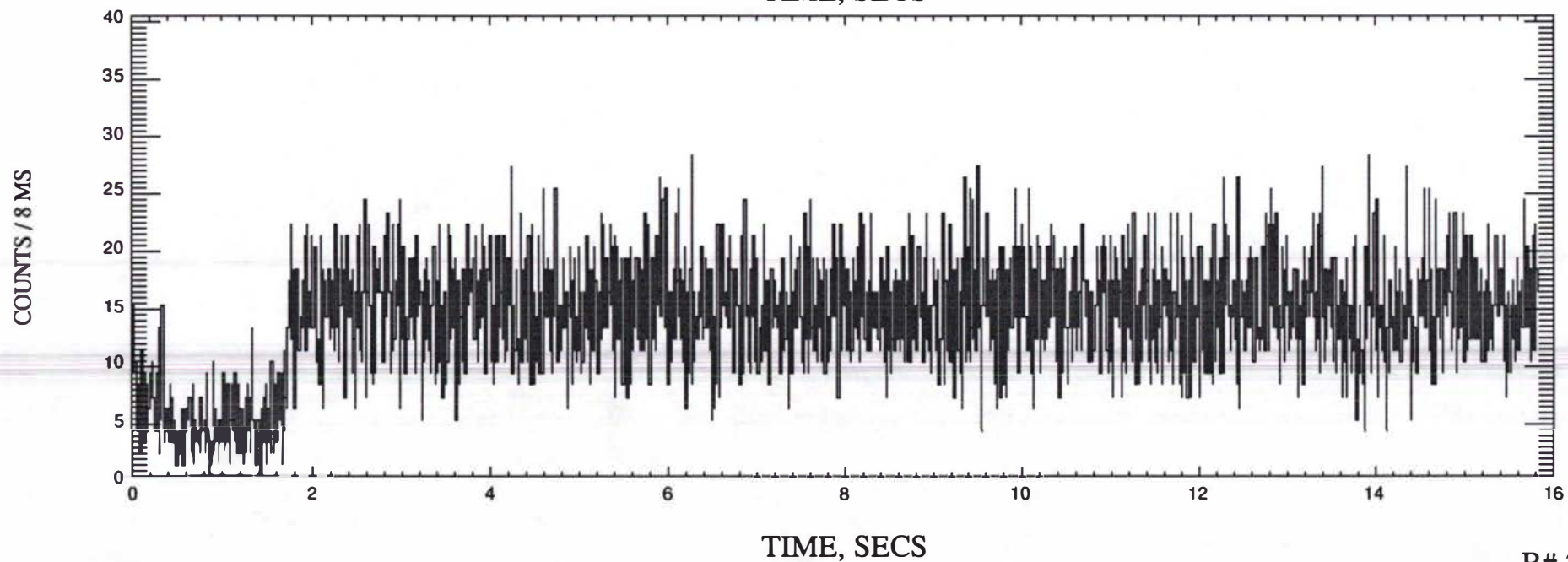
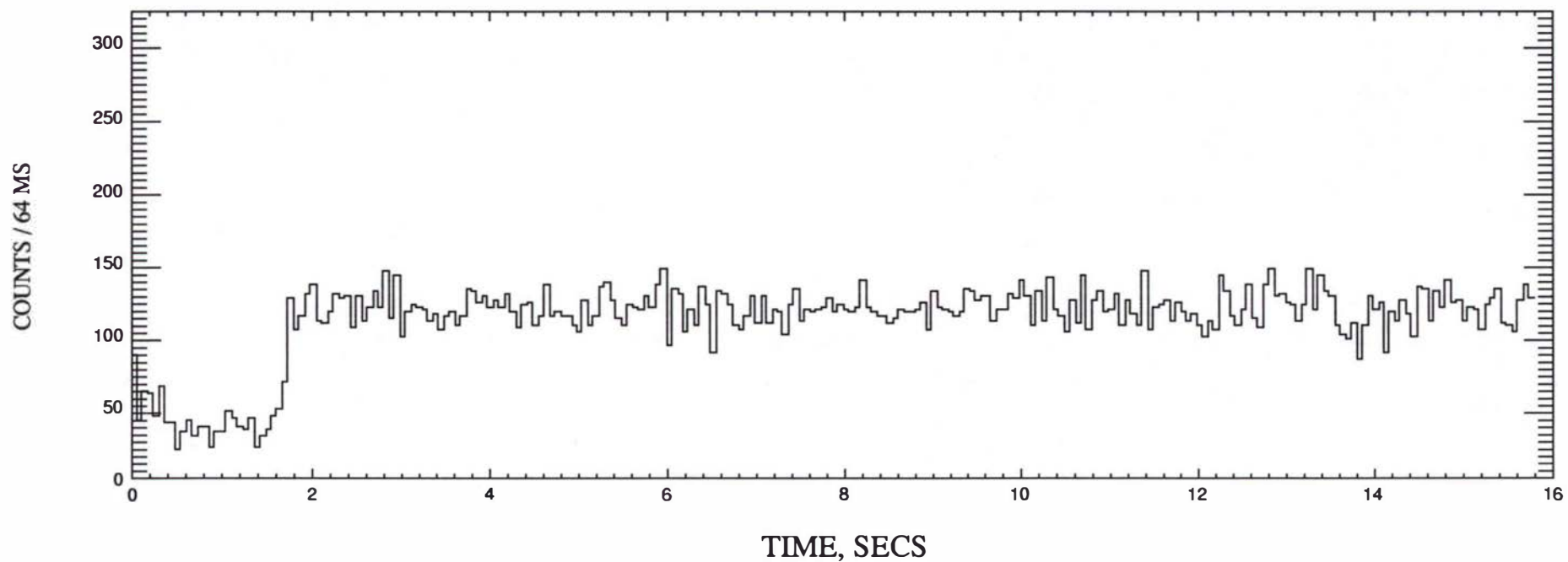
Burst Counter 1 at UT=17.990625567966 h=64766.252 s 17:59:26.252



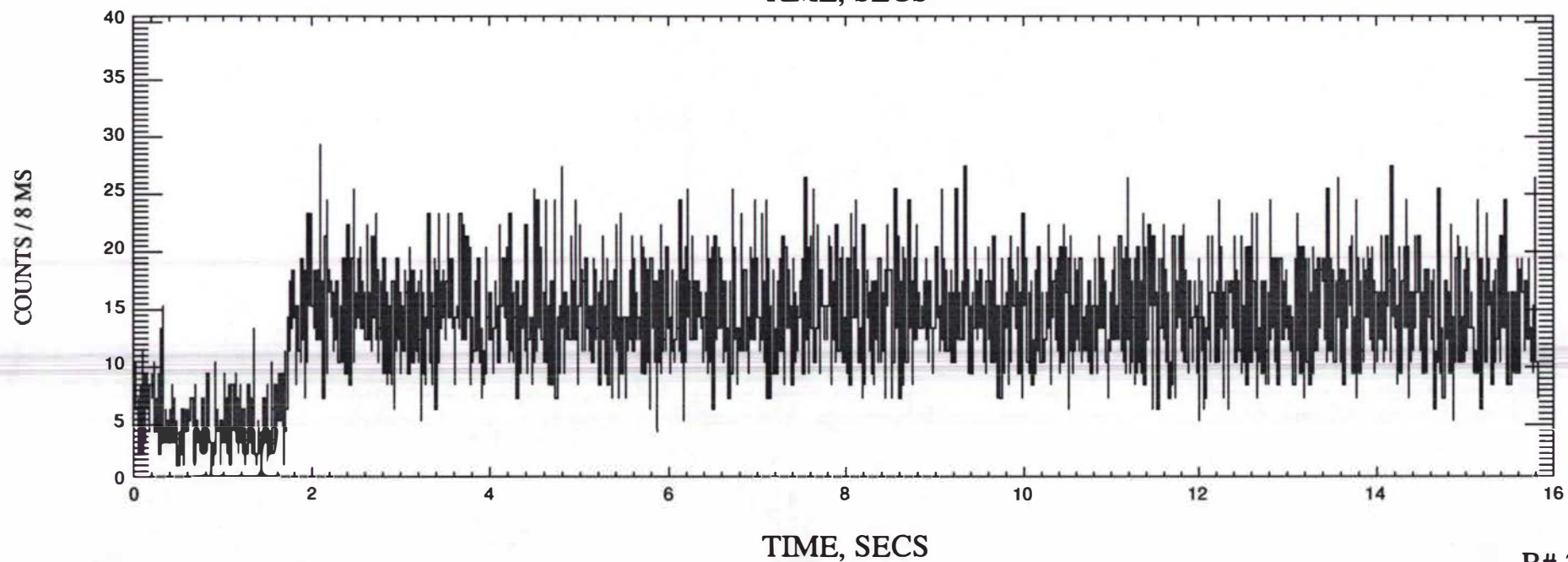
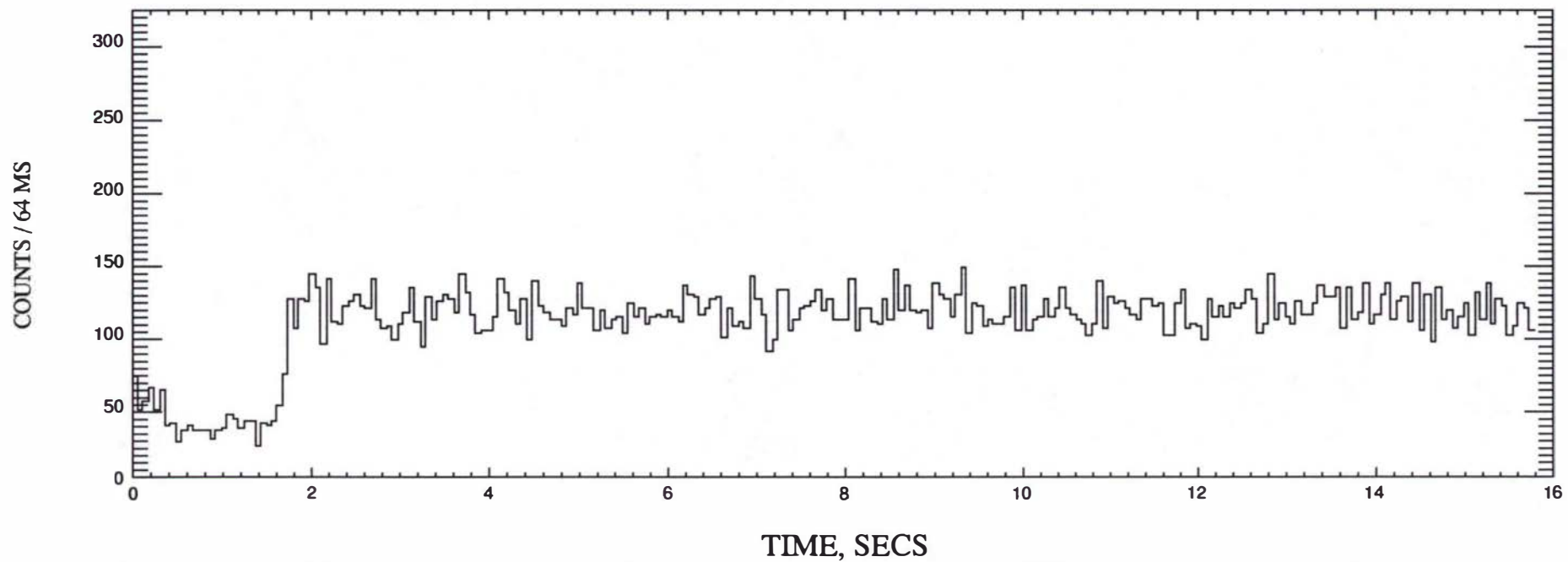
Burst Counter 2 at UT=18.692856284248 h=67294.283 s 18:41:34.283



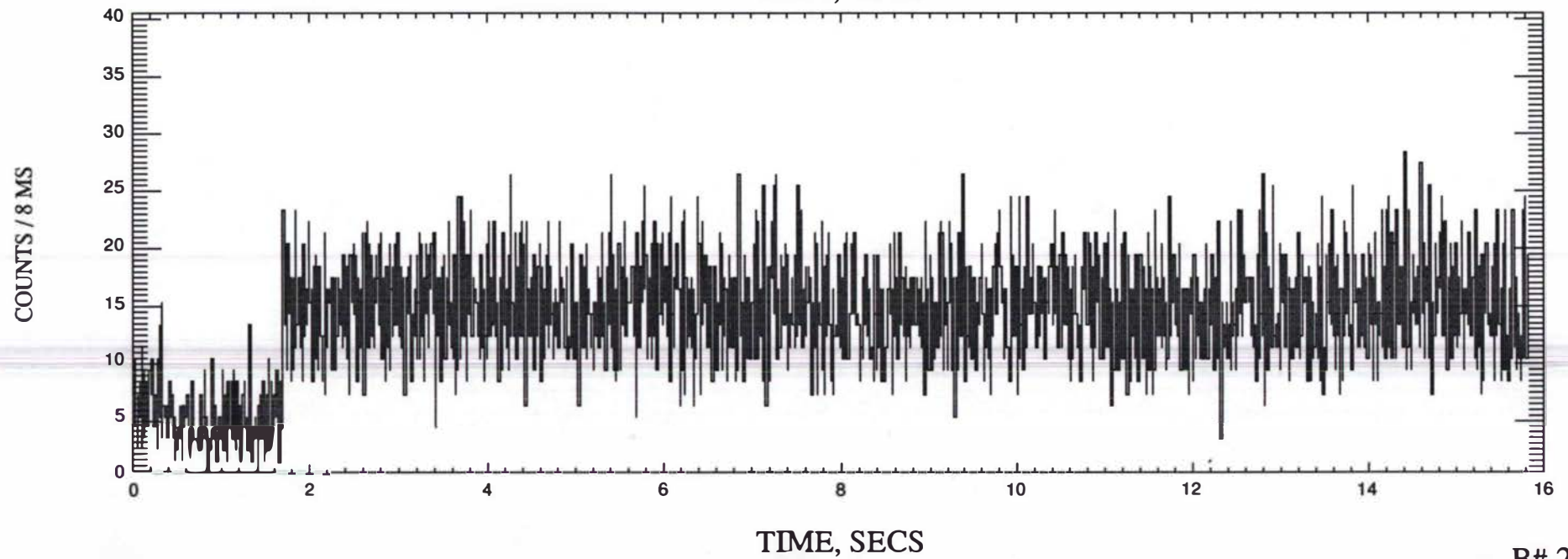
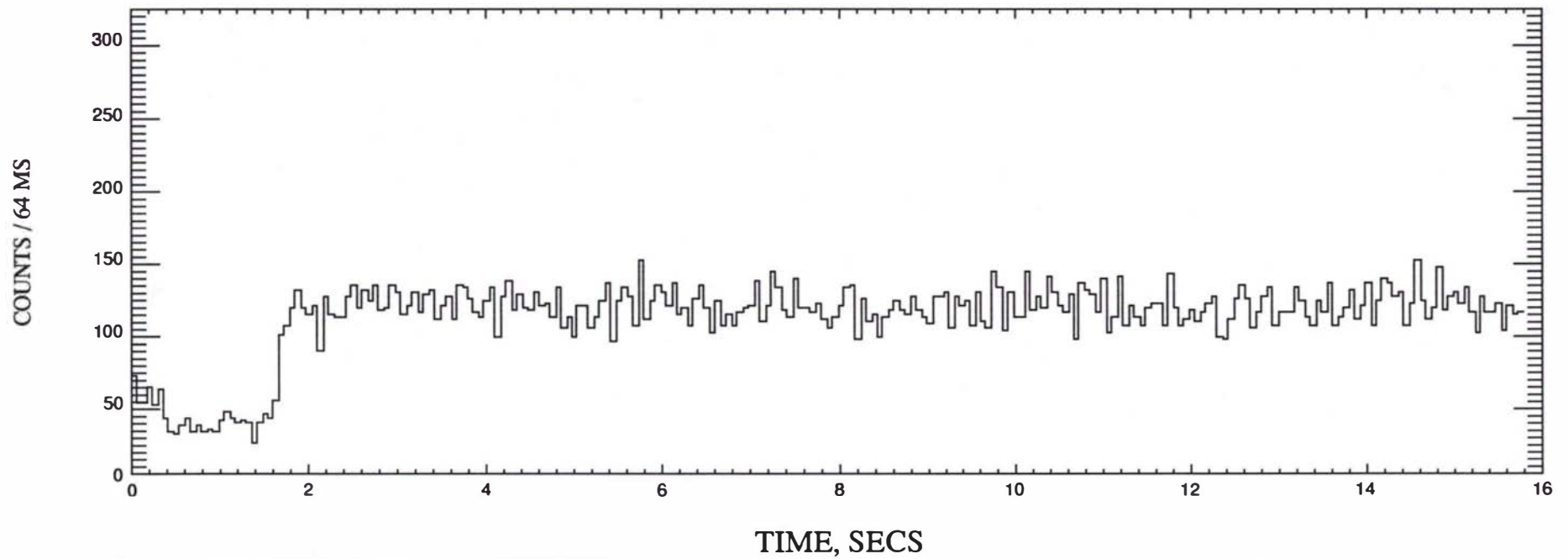
Burst Counter 3 at UT=19.395093515184 h=69822.337 s 19:23:42.337



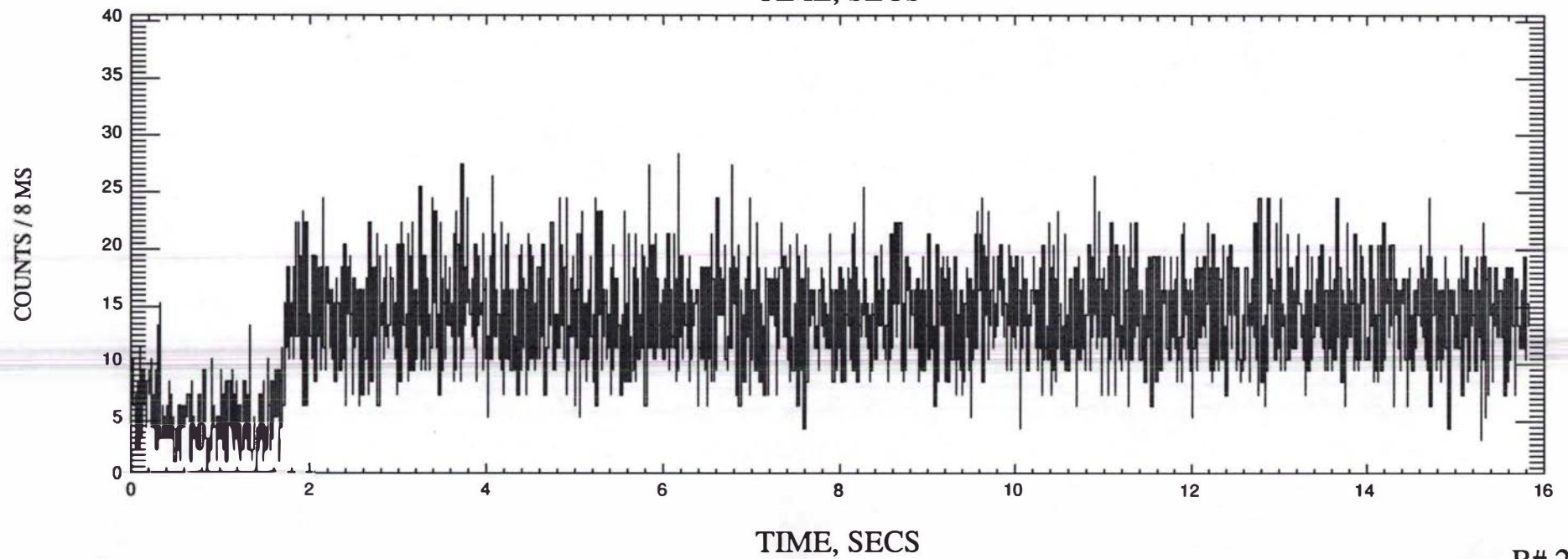
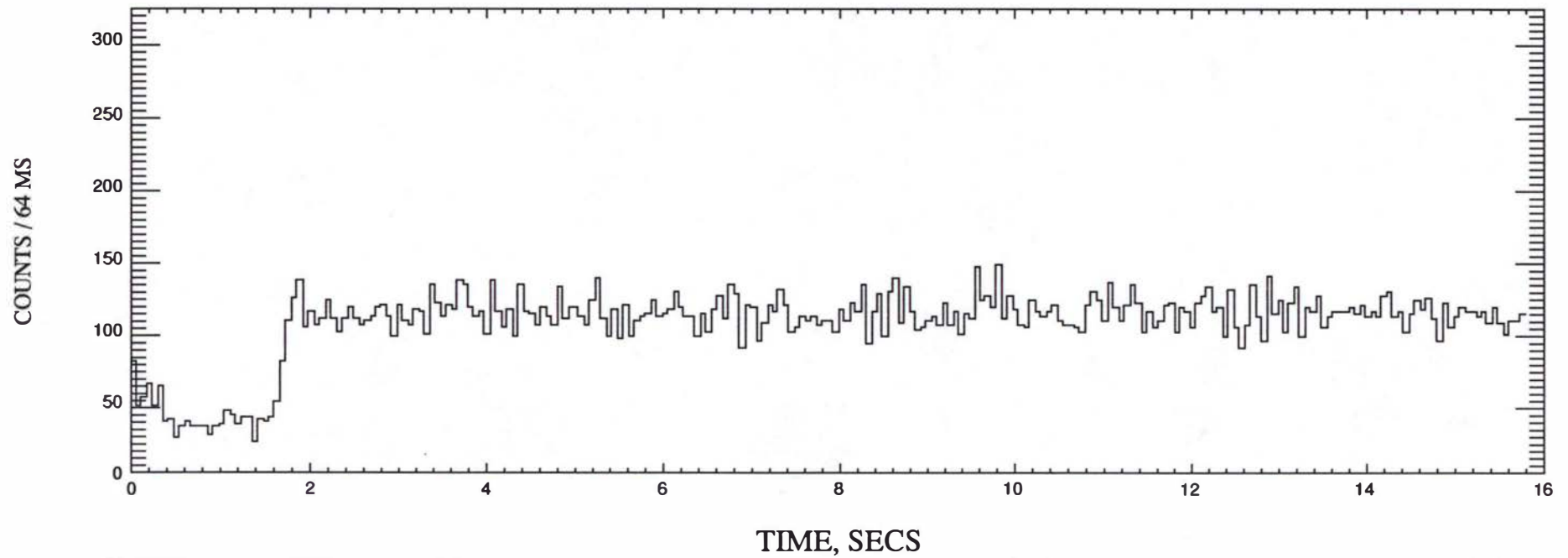
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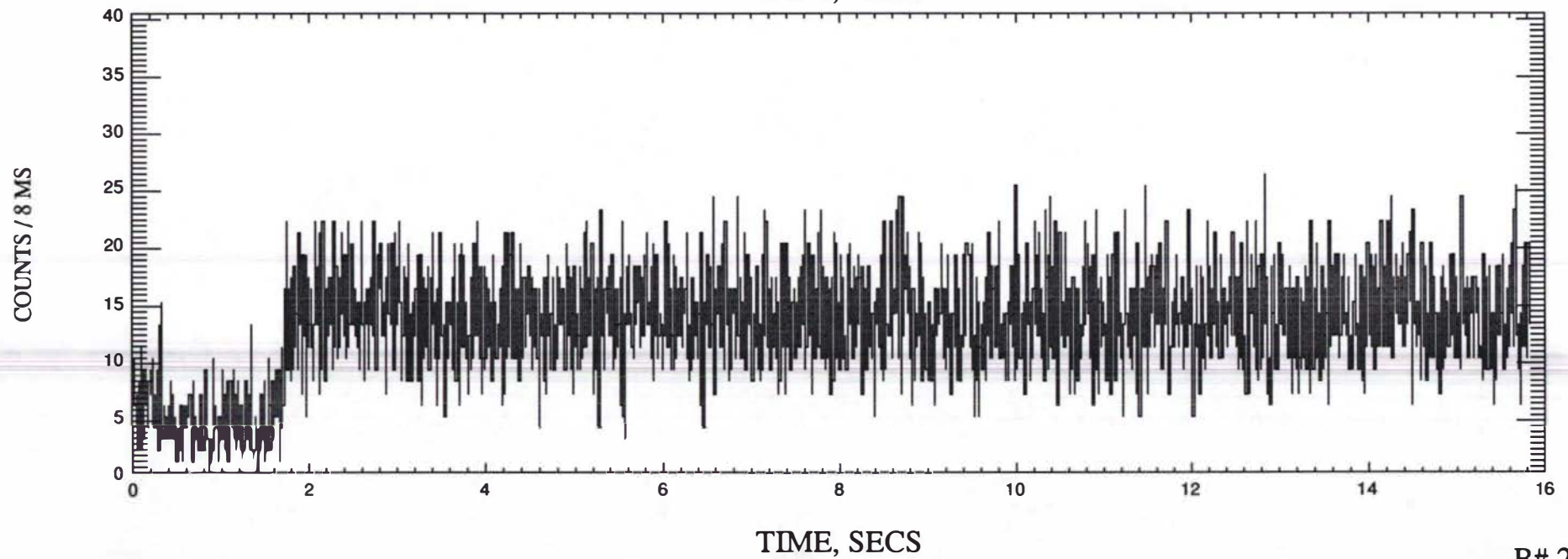
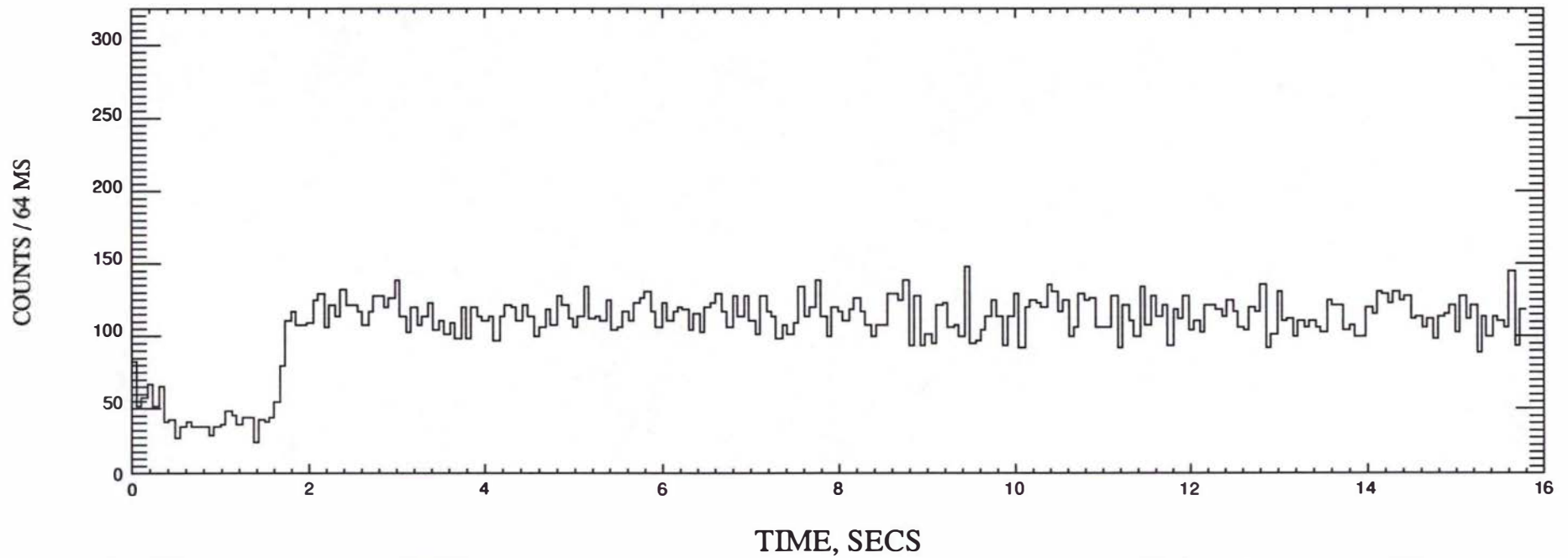
Burst Counter 5 at UT=20.799567968580 h=74878.445 s 20:47:58.445



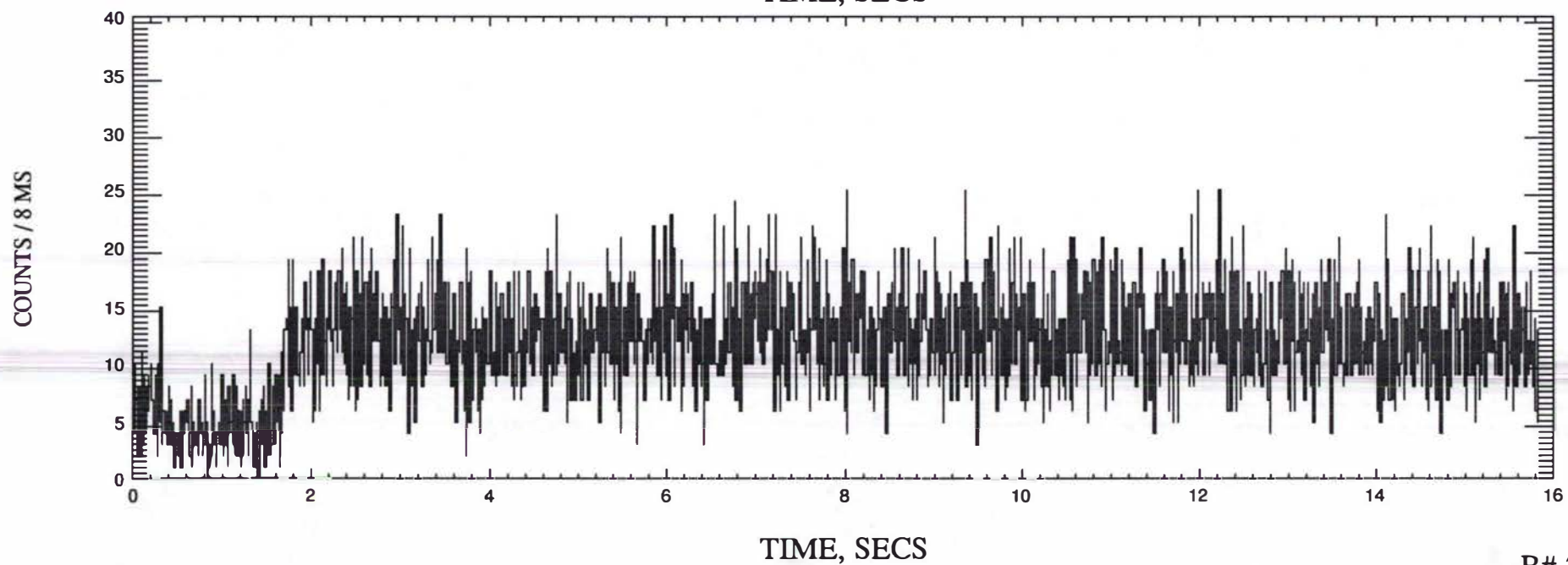
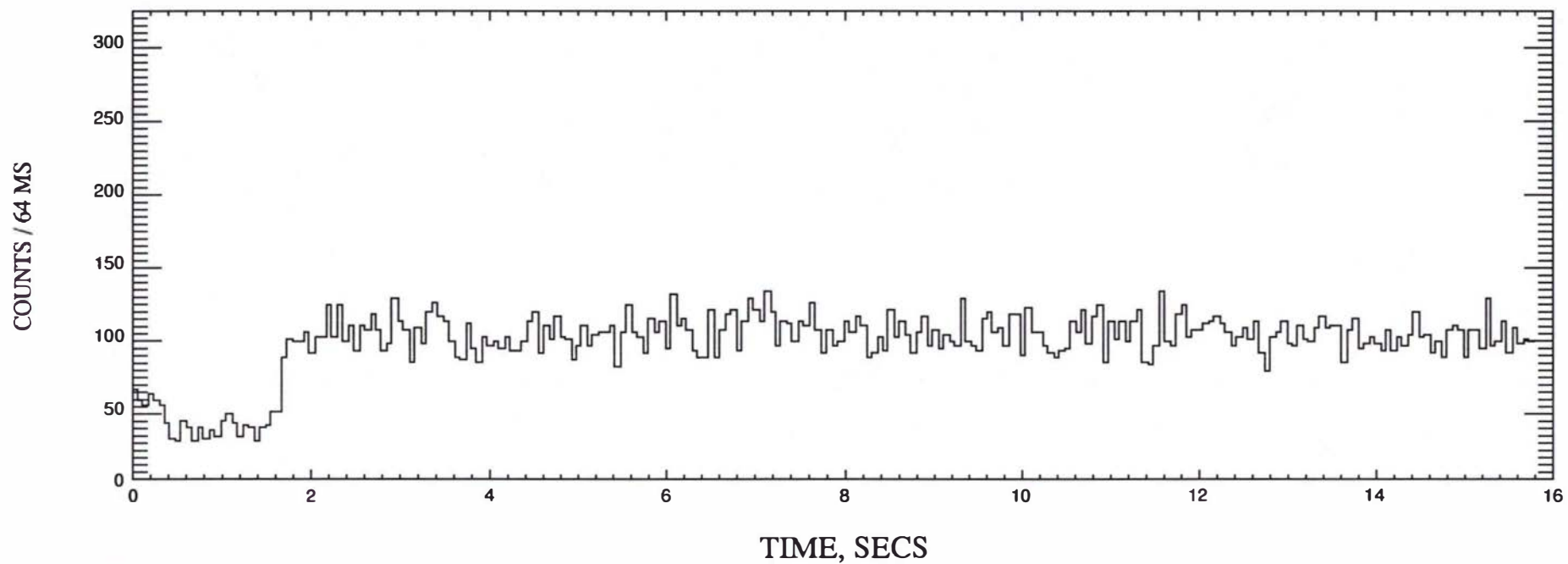
Burst Counter 6 at UT=21.501800855001 h=77406.483 s 21:30:06.483



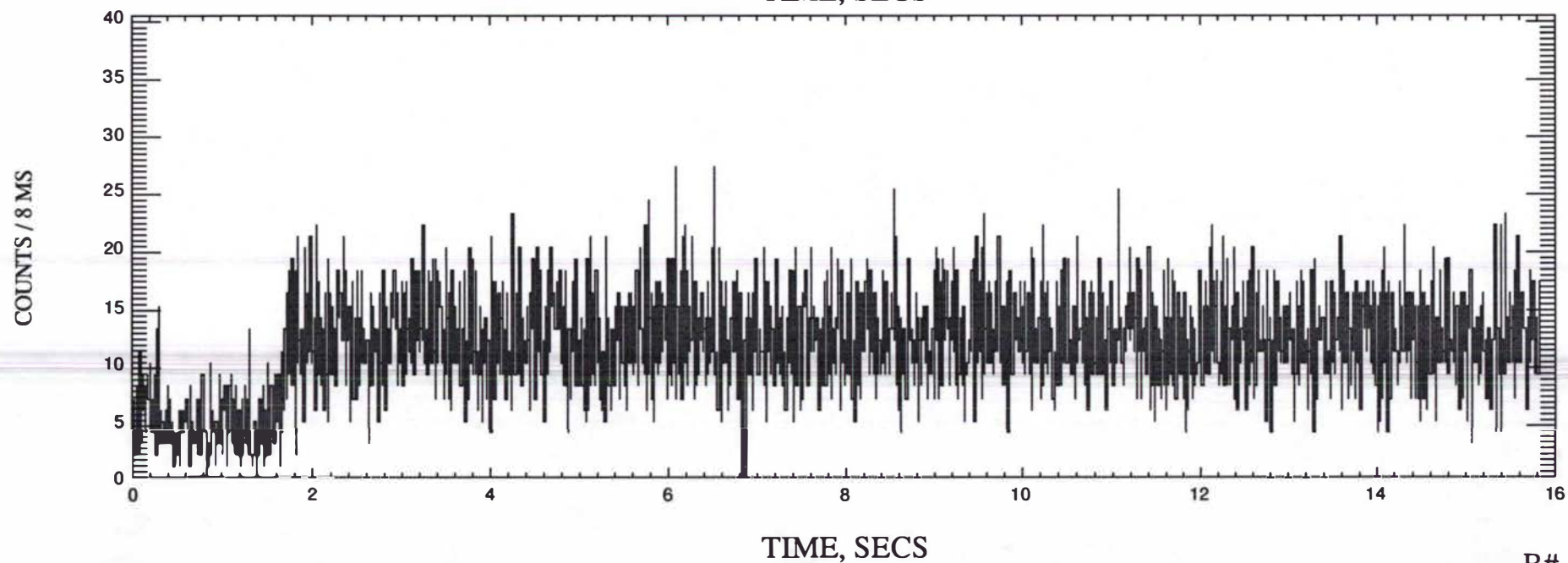
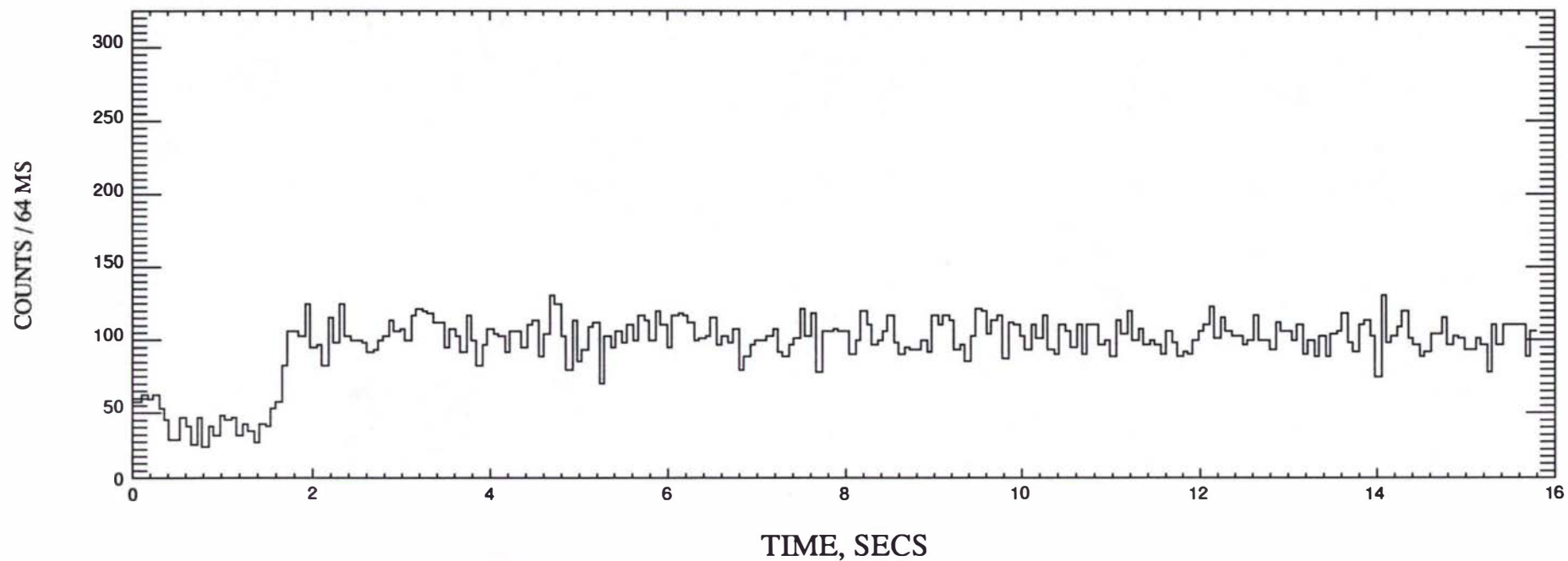
Burst Counter 7 at UT=22.204036555820 h=79934.532 s 22:12:14.532



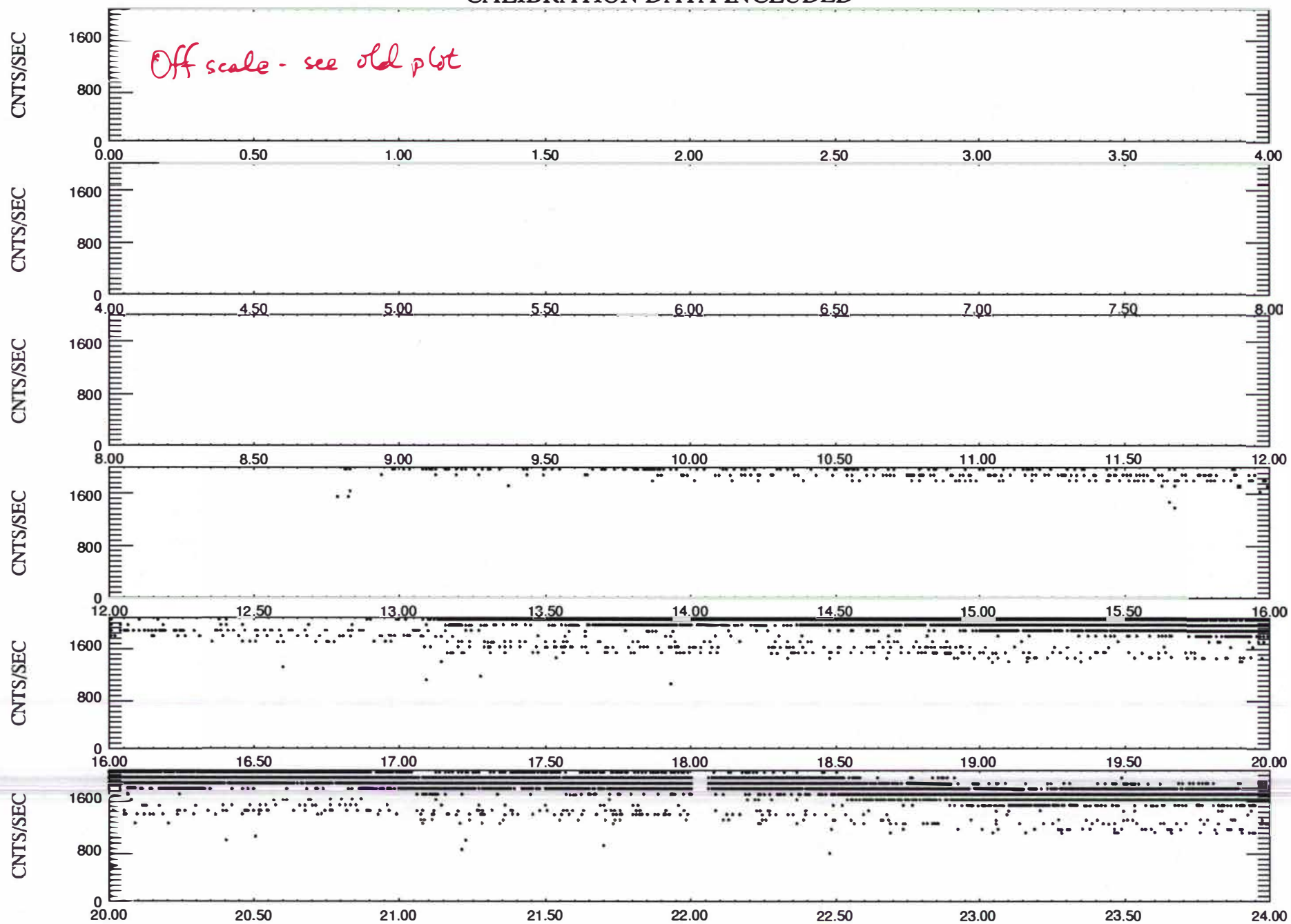
Burst Counter 8 at UT=22.906274672614 h=82462.589 s 22:54:22.589



Burst Counter 9 at UT=23.608511899312 h=84990.643 s 23:36:30.643

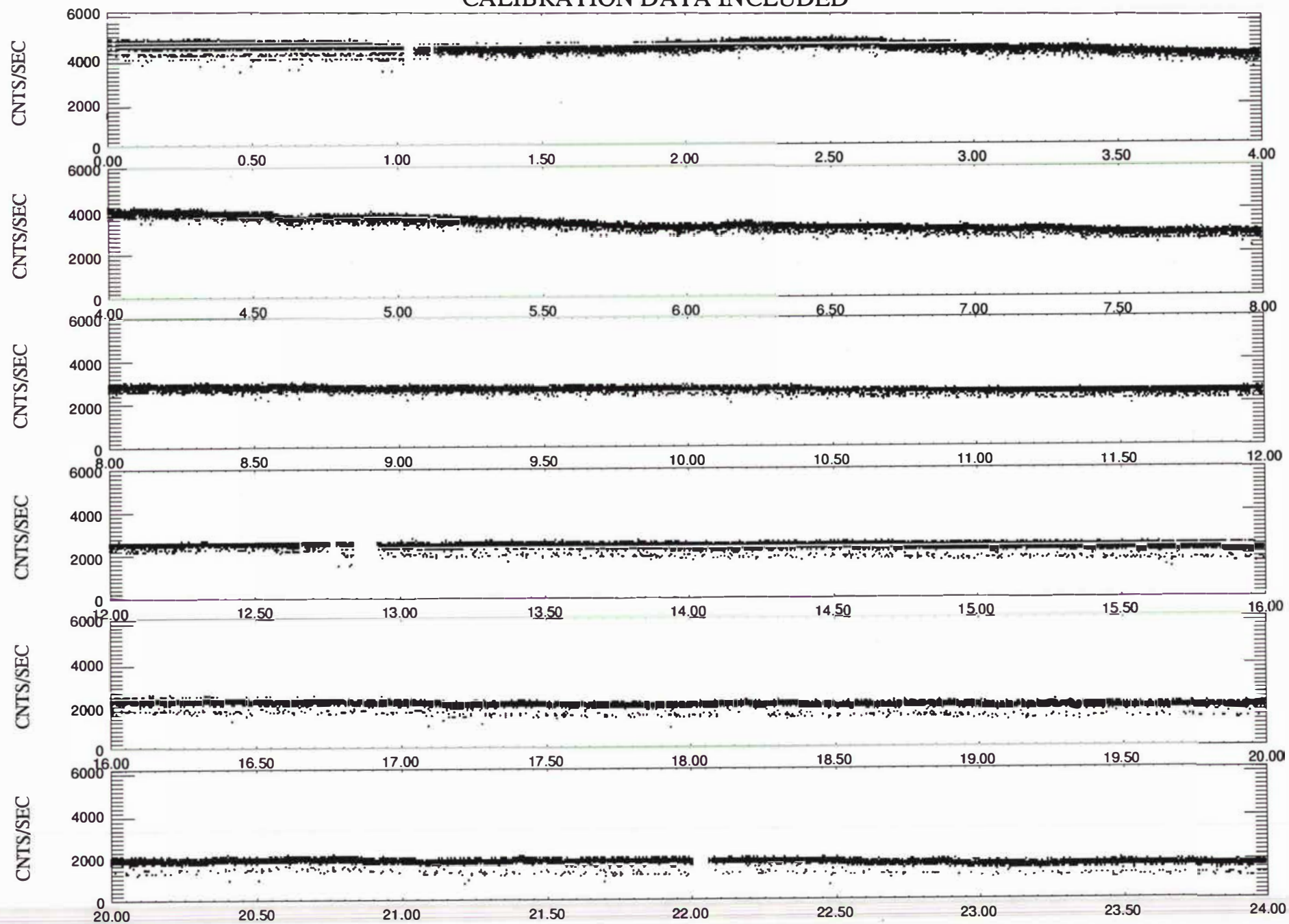


CALIBRATION DATA INCLUDED

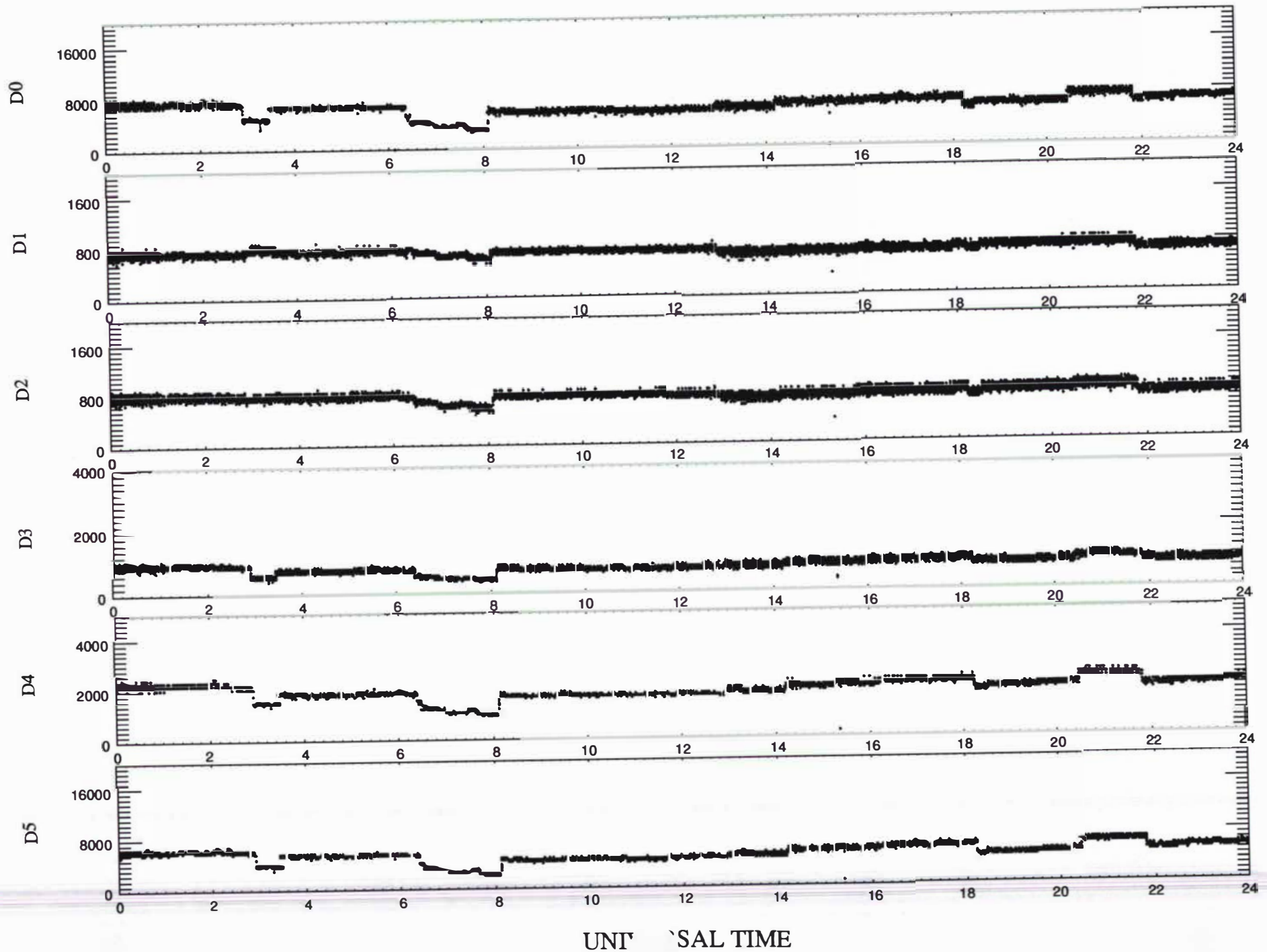


UNIFORM SAL TIME

CALIBRATION DATA INCLUDED

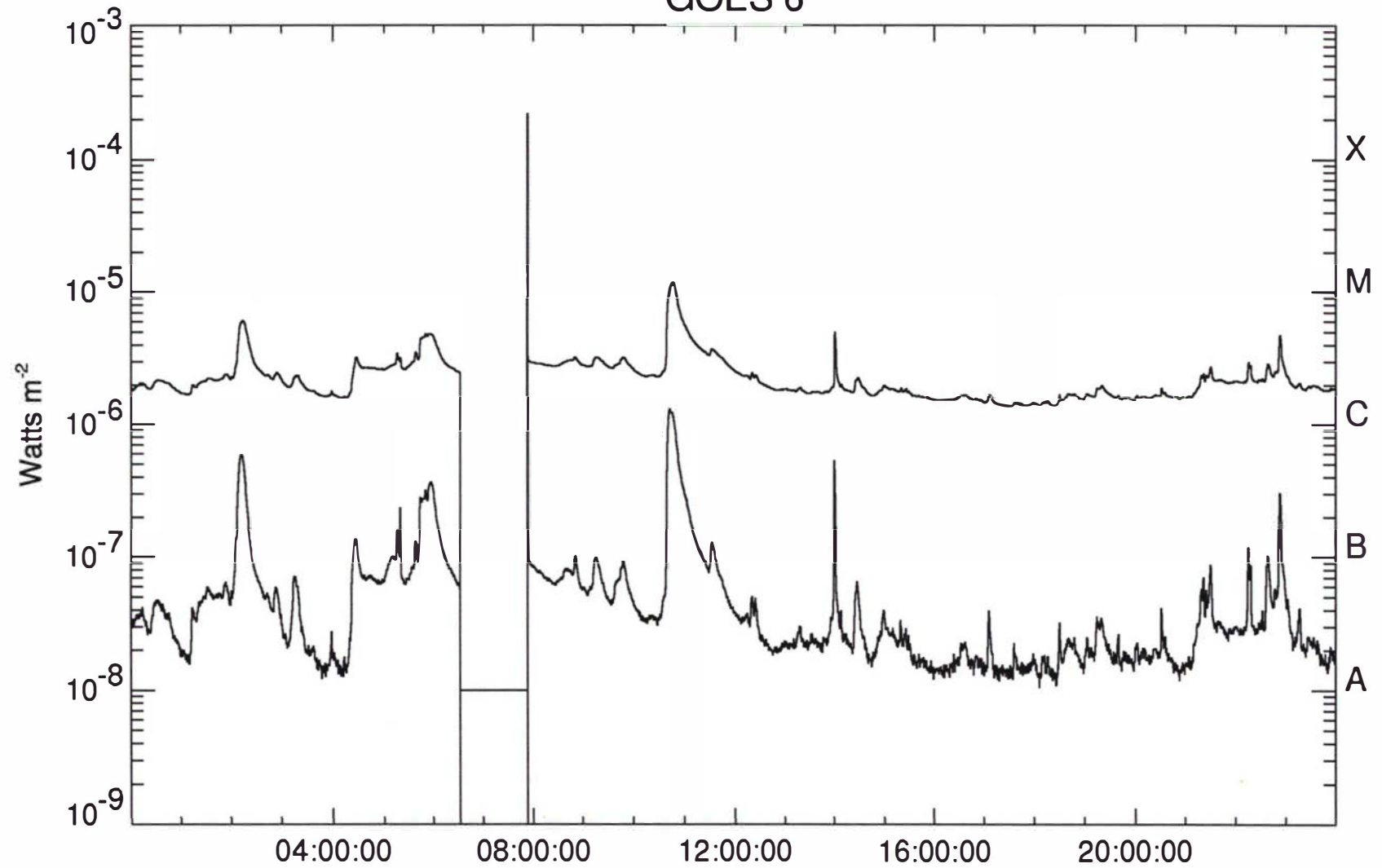


UNIVERSAL TIME



DATE	U.T.	Nr UGB	Event Nature
1990-12-24	15:34:32.617	216-a	Solar Flare
1991-01-06	16:39:57.526	218-a	GRB
1991-01-17	00:57:12.234	223-a	GRB ?
1991-01-18	14:03:26.738	224-a	Solar Flare
1991-01-21	00:18:12.304	227-a	Solar Flare
1991-01-22	15:13:50.333	228-a	GRB
1991-01-25	06:29:38.745	231-a	Solar Flare
1991-02-01	11:44:54.779	233-a	Solar Flare
1991-02-01	18:46:17.191	233-b	Solar Particles
1991-02-02	20:57:39.170	234-a	GRB ?
1991-02-04	08:58:45.821	235-a	GRB
1991-02-04	10:48:08.317	235-b	Solar Flare
1991-02-04	14:50:33.480	235-c	Solar Flare
1991-02-06	06:10:53.398	236-a	Solar Flare
1991-02-06	06:45:52.285	236-b	Solar Flare
1991-02-06	08:45:28.852	236-c	GRB
1991-02-10	17:35:33.692	237-a	Solar Flare
1991-02-11	03:25:22.425	237-b	GRB
1991-02-19	09:23:07.760	239-a	Solar Flare
1991-03-12	12:43:02.596	252-a	Solar Flare
1991-03-13	02:59:14.539	254-a	Solar Flare
1991-03-13	08:01:48.347	254-b	Solar Flare
1991-03-14	13:31:08.601	255-a	Solar Flare
1991-03-14	18:11:50.507	255-b	Solar Flare
1991-03-14	22:56:15.309	255-c	GRB
1991-03-22	20:07:59.817	256-a	Solar Flare
1991-03-22	22:42:51.228	256-b	Solar Flare
1991-03-23	01:51:17.475	256-c	Solar Flare
1991-03-23	14:34:35.610	257-a	Solar Particles
1991-03-23	14:48:54.705	257-b	Solar Particles
1991-03-23	15:01:31.774	257-c	Solar Particles
1991-03-29	06:44:19.108	260-a	Solar Flare
1991-03-31	13:45:30.490	261-a	Solar Flare
1991-03-31	19:08:38.993	261-b	Solar Flare
1991-04-02	14:27:44.130	262-a	GRB

GOES 6



Data Start: 91/03/29, 0000:01

Plot created: 96/11/26, 1921

Channel 1 (1.0 - 8.0 Angstroms)

Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms)

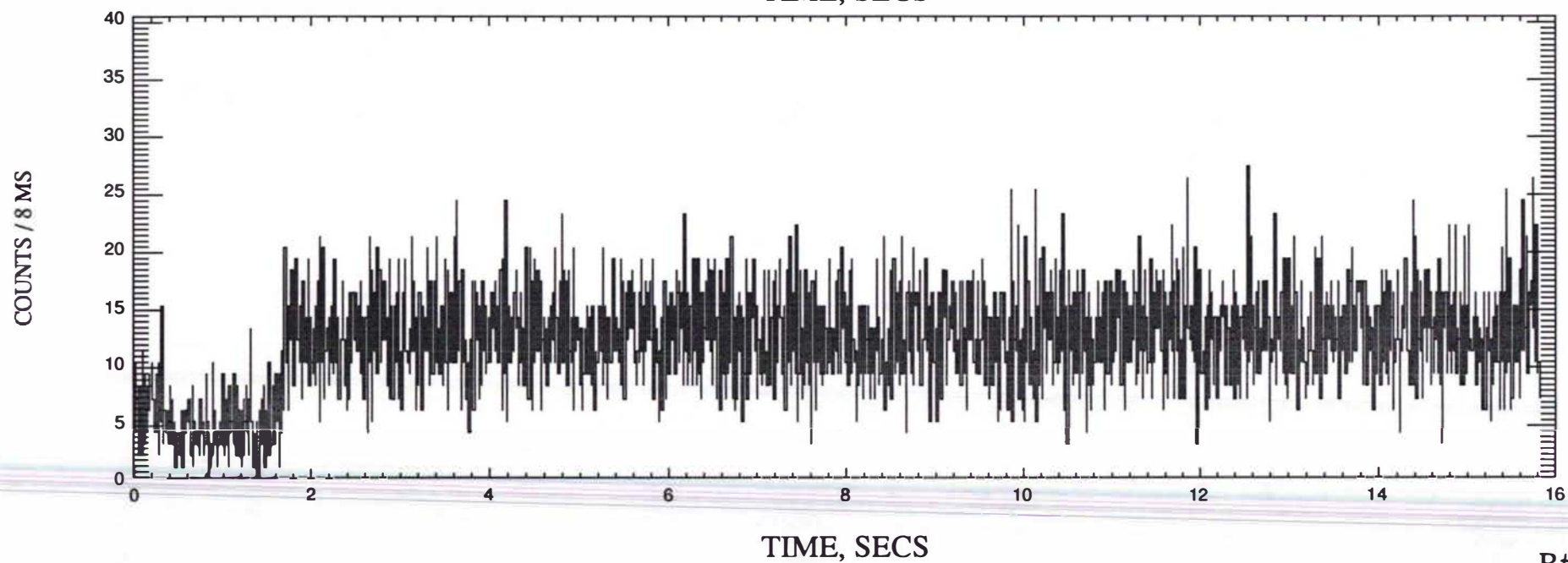
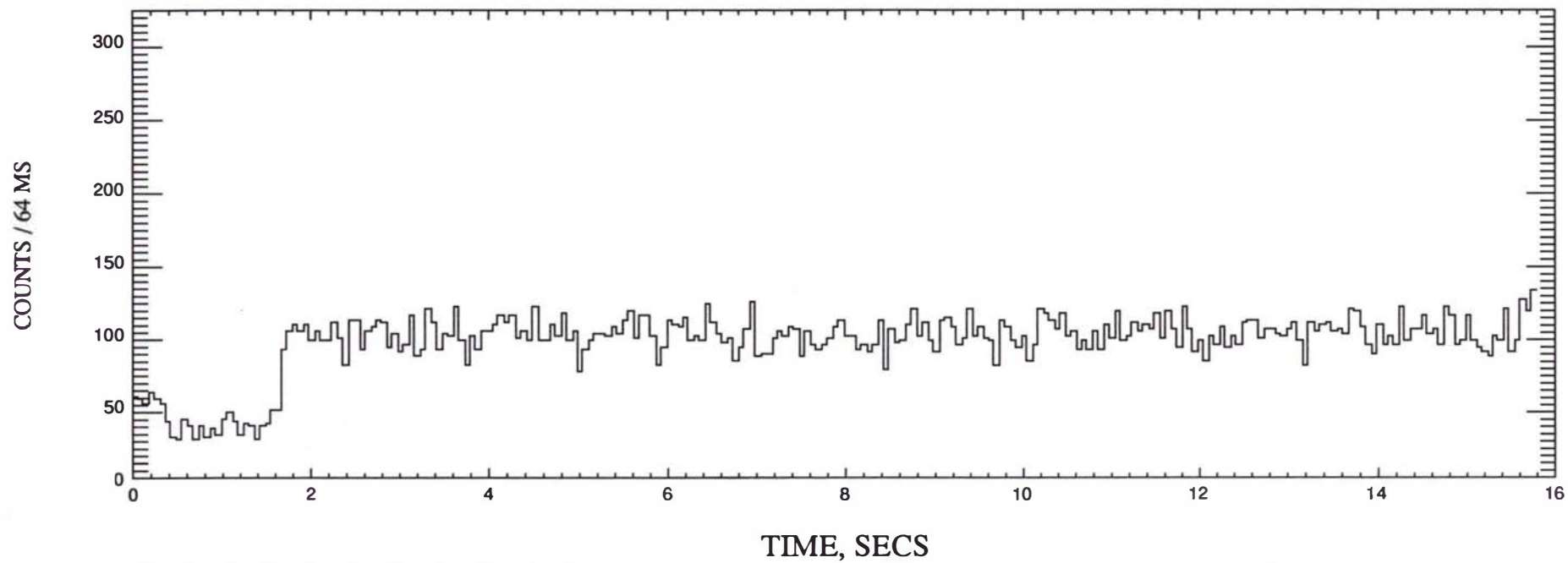
Background not subtracted

Sample average = 10

BURST NUMBER 10 - 15, 0 - 15, 0 - 3

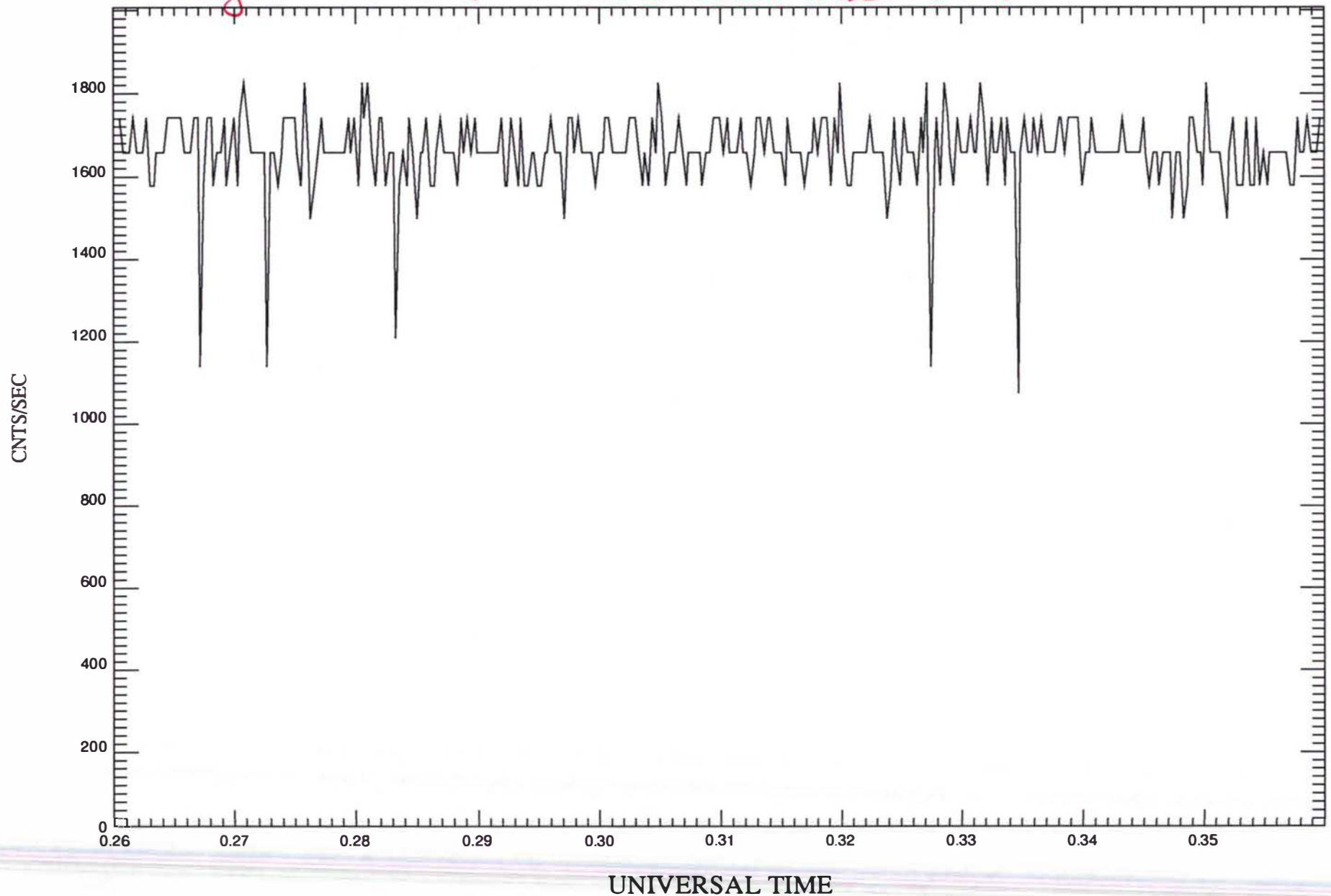


Burst Counter 10 at UT= 0.310744785733 h= 1118.681 s 00:18:38.681

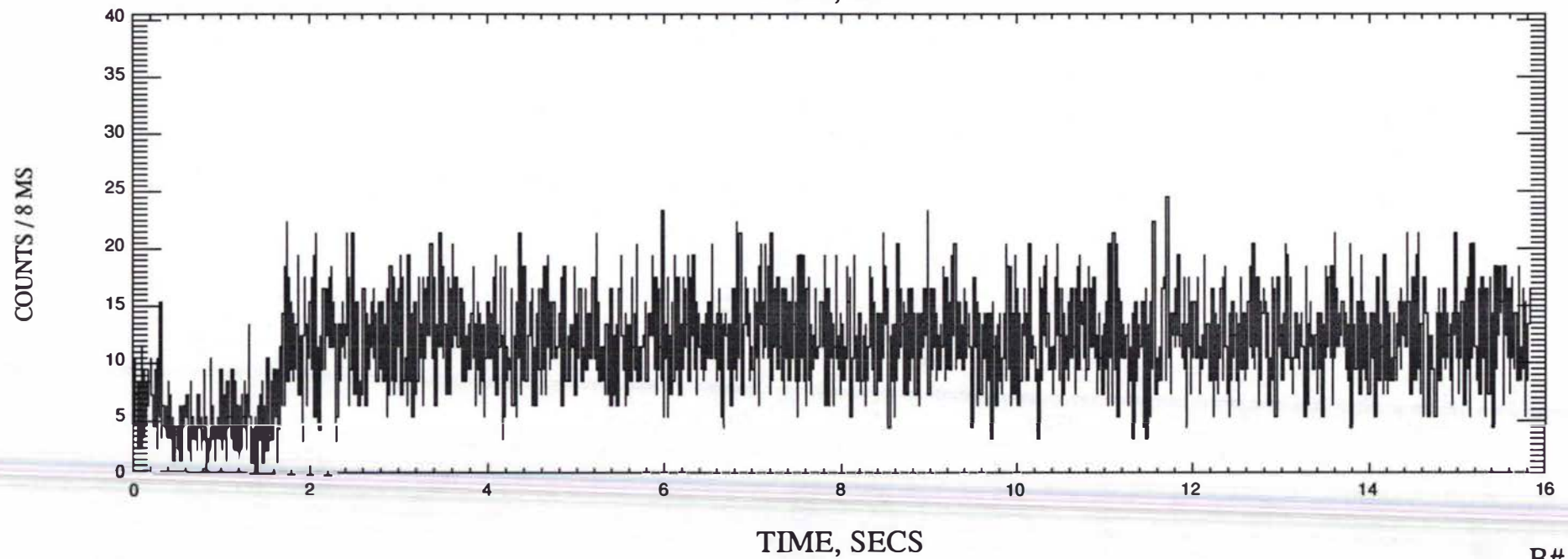
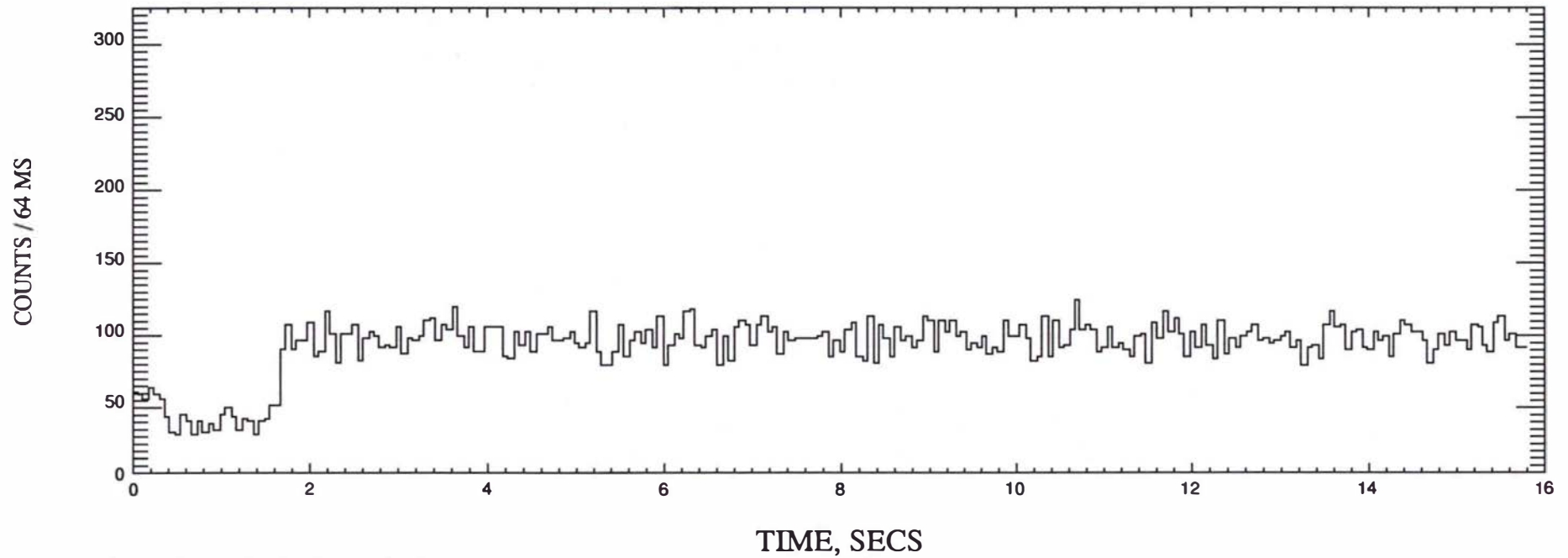


CALIBRATION DATA INCLUDED

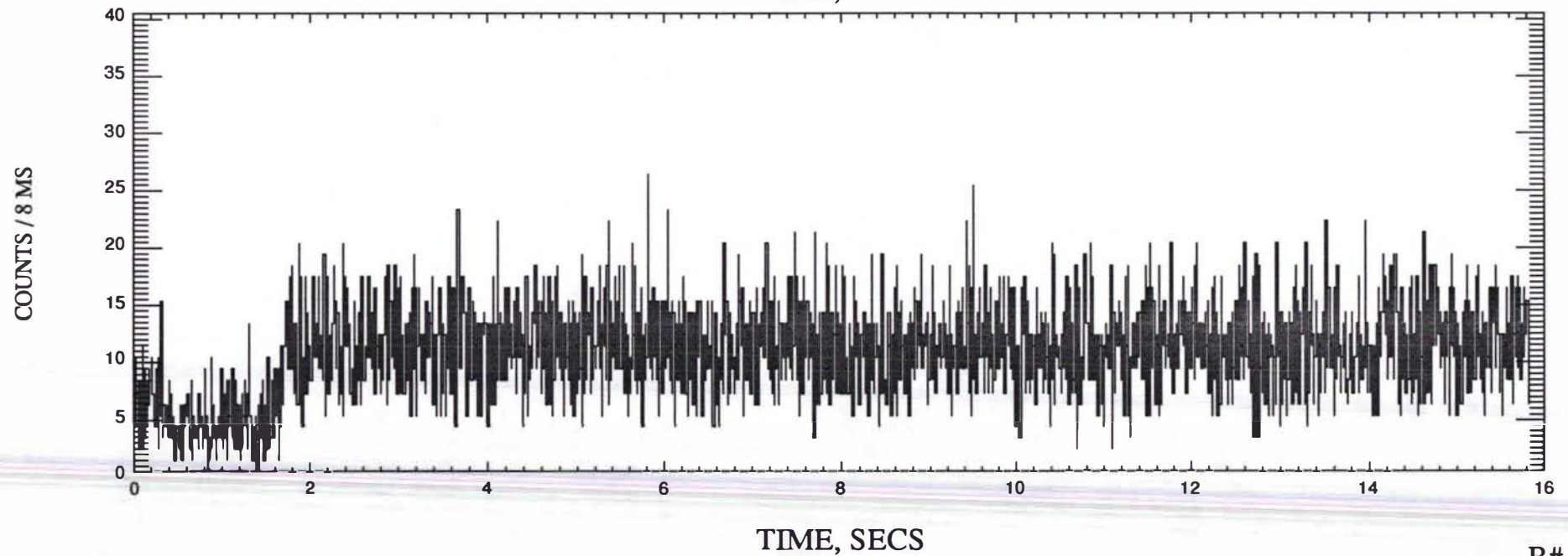
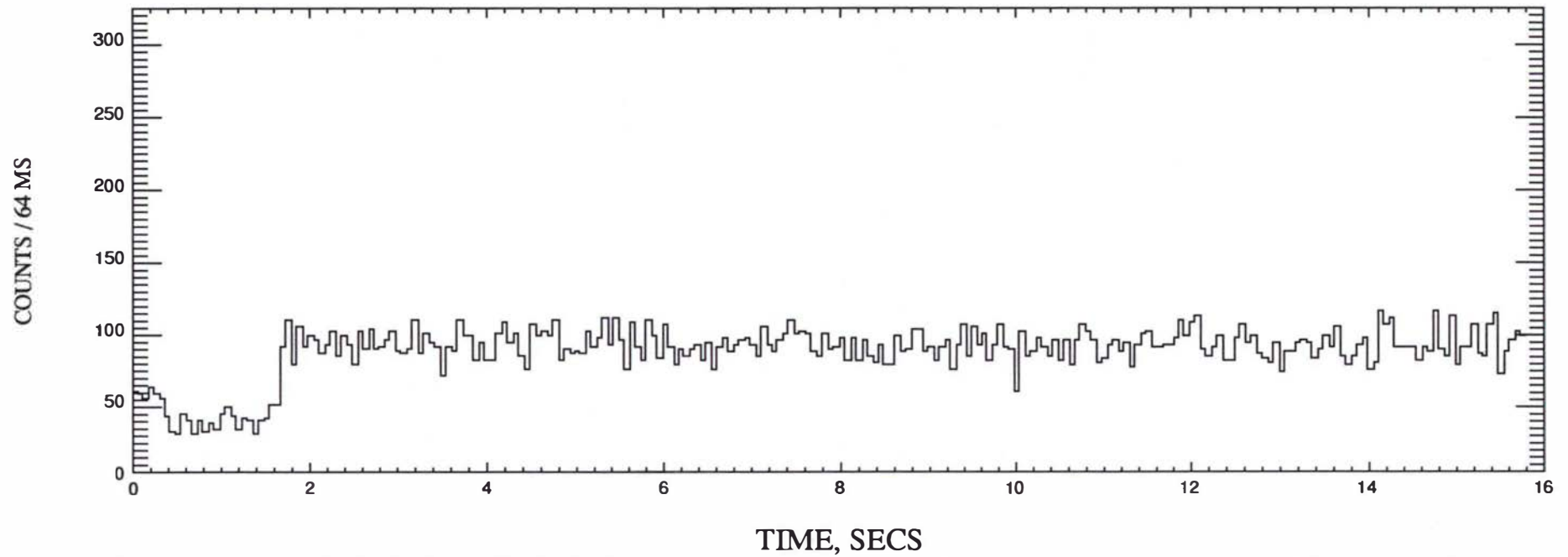
They all look like this - no increase evident in the RT data



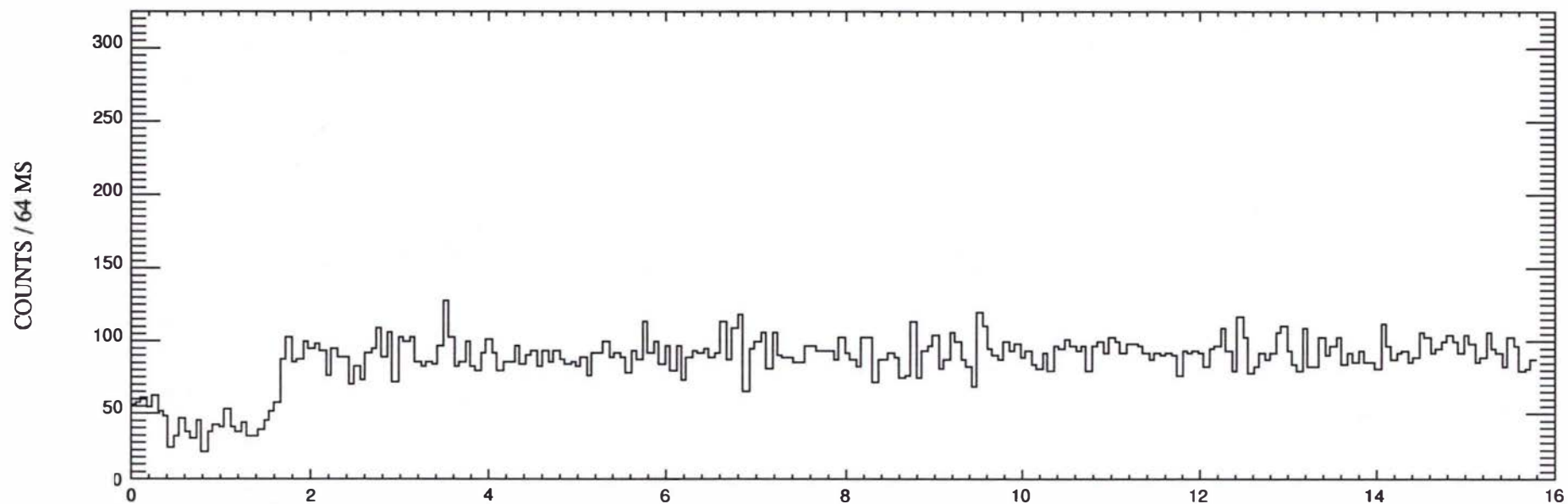
Burst Counter 11 at UT= 1.012979842292 h= 3646.727 s 01:00:46.727



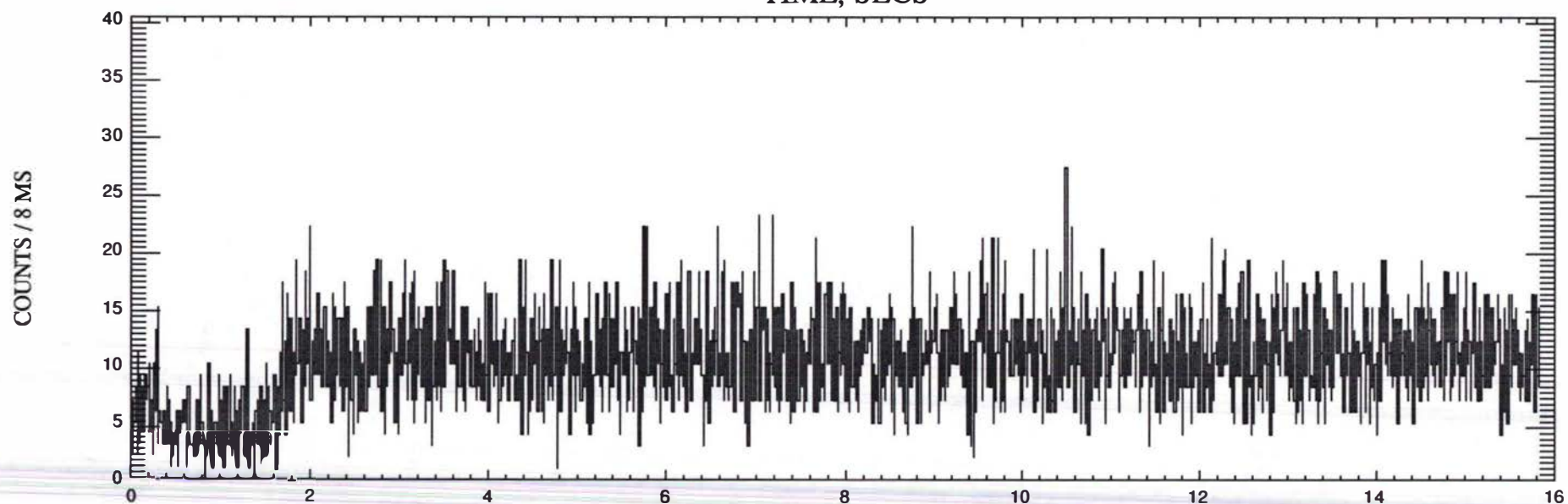
Burst Counter 12 at UT= 2.275222922431 h= 8190.803 s 02:16:30.803



Burst Counter 13 at UT= 3.537472589281 h=12734.901 s 03:32:14.901

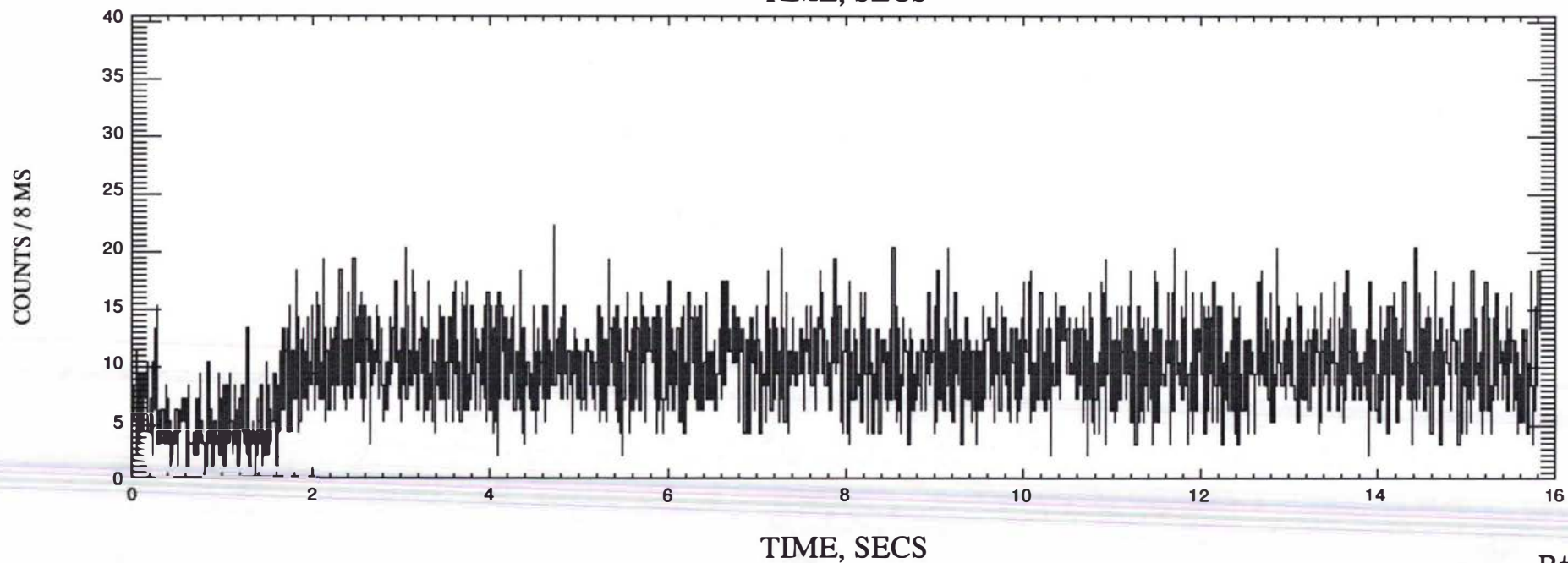
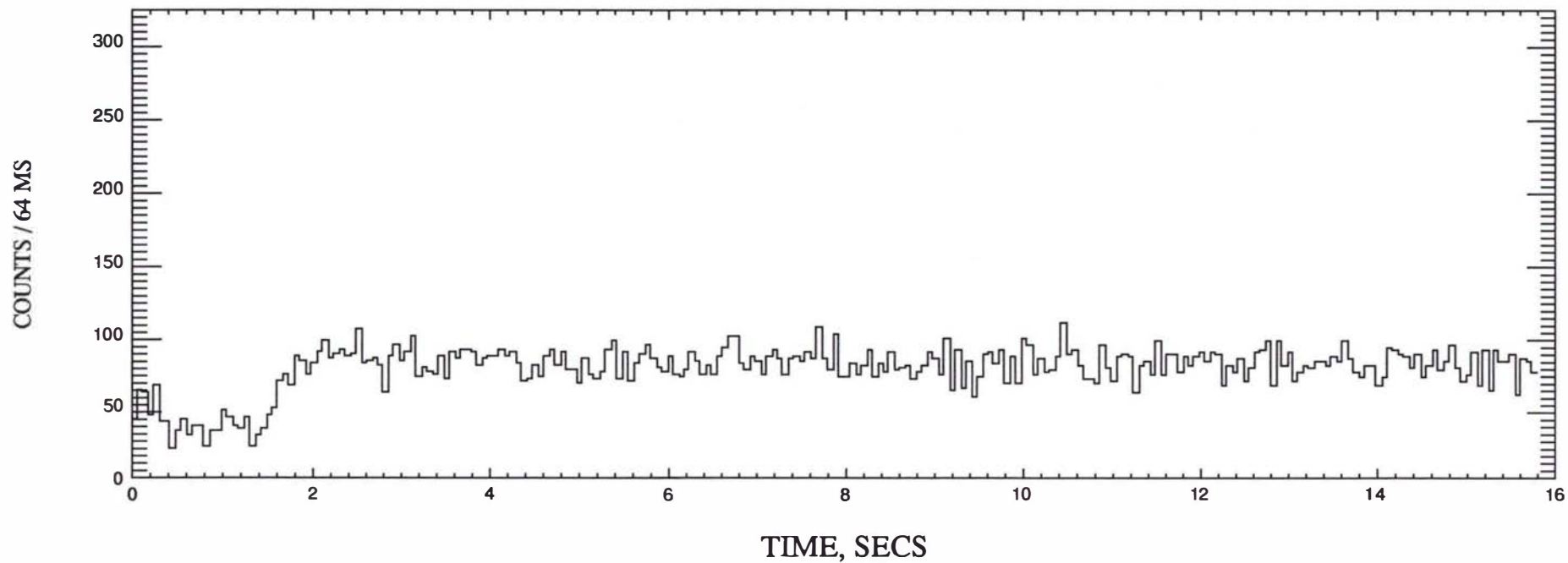


TIME, SECS

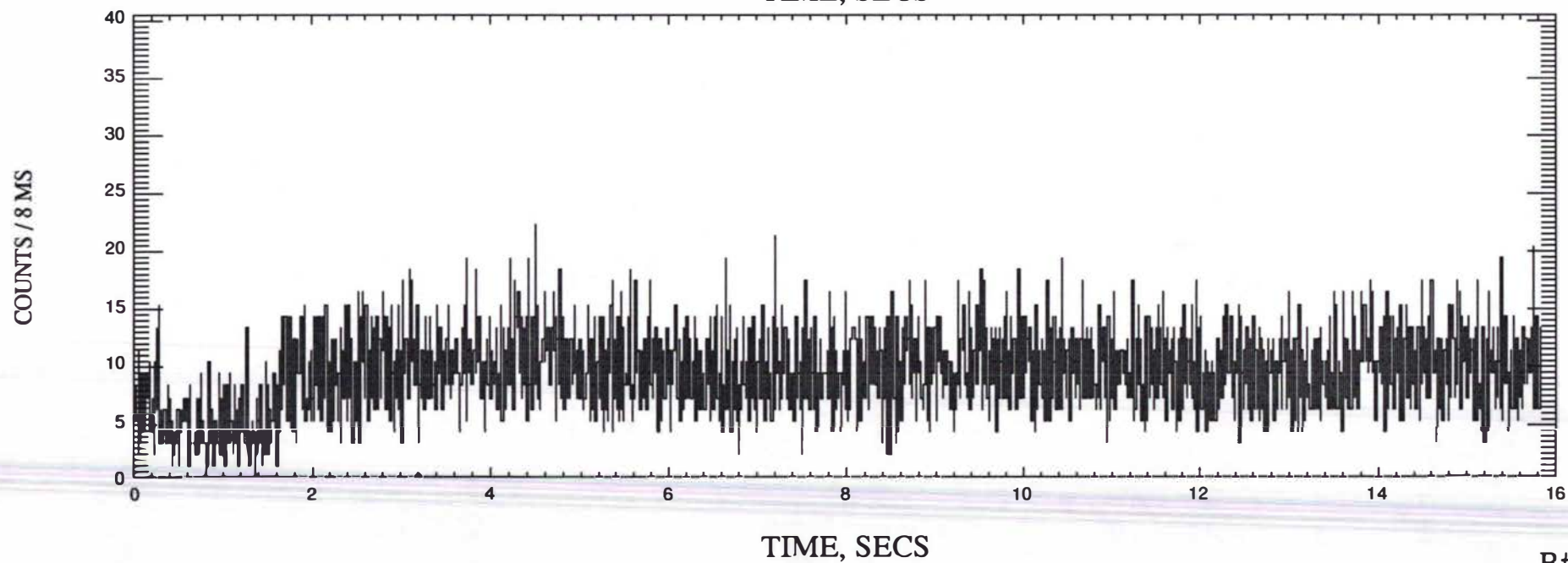
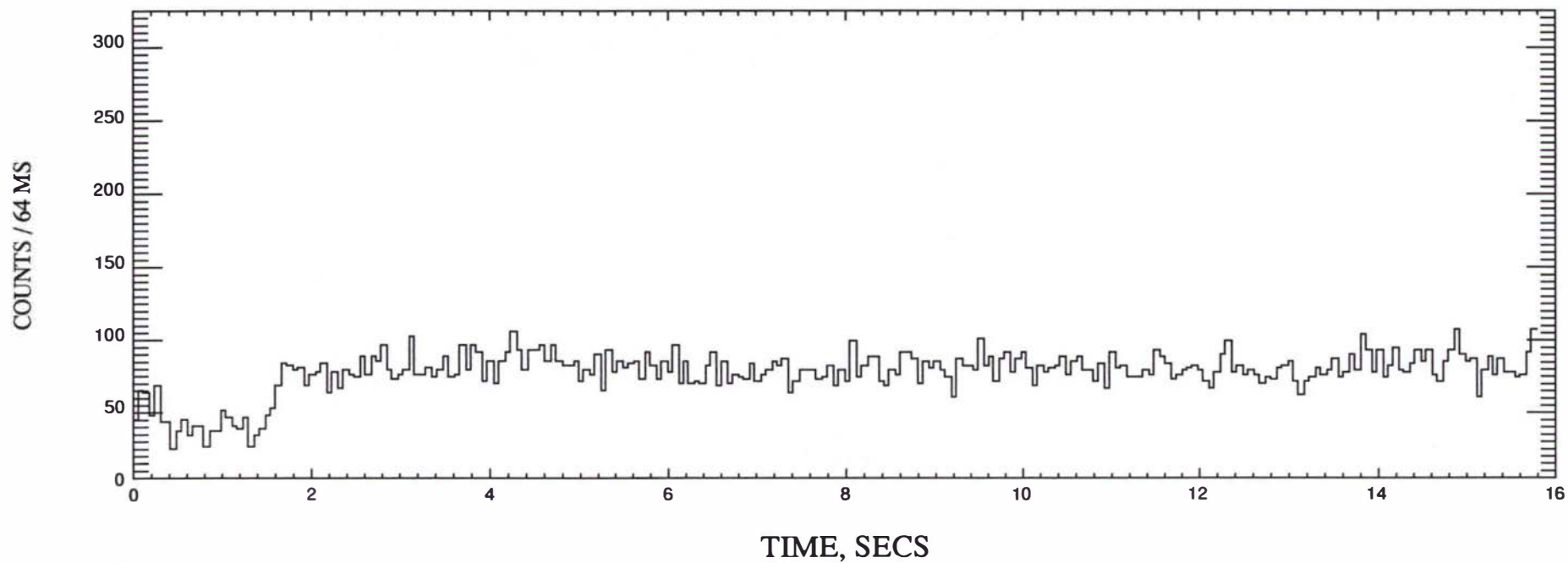


TIME, SECS

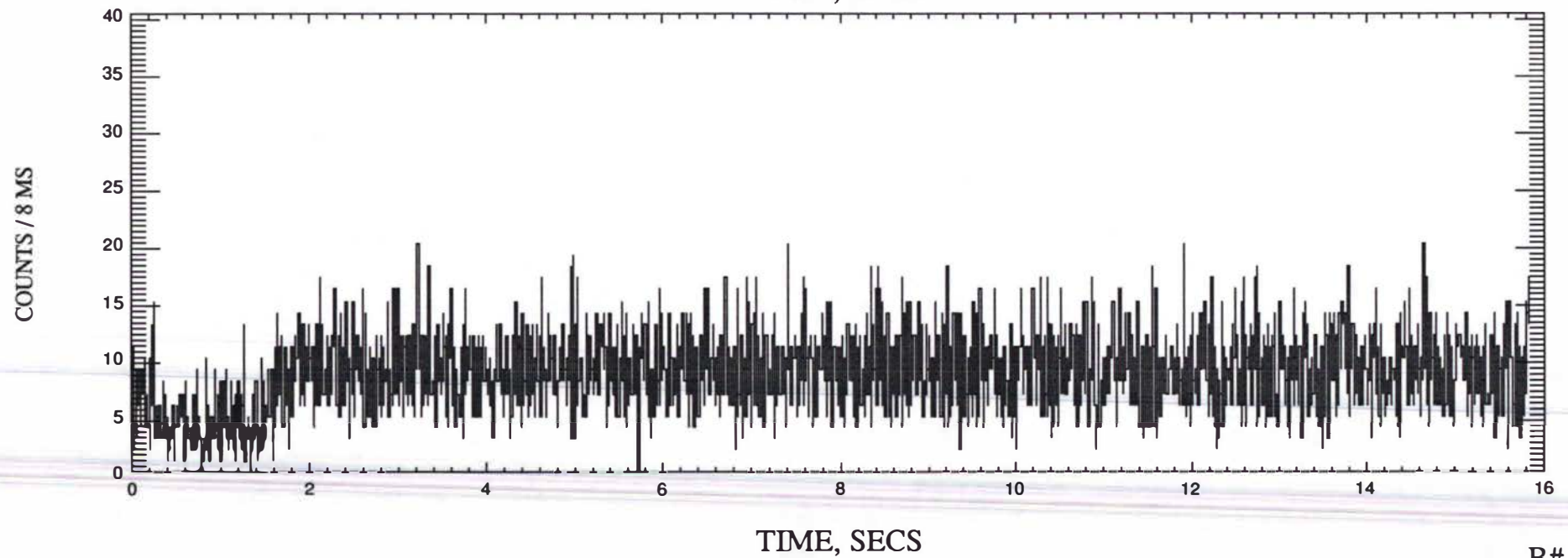
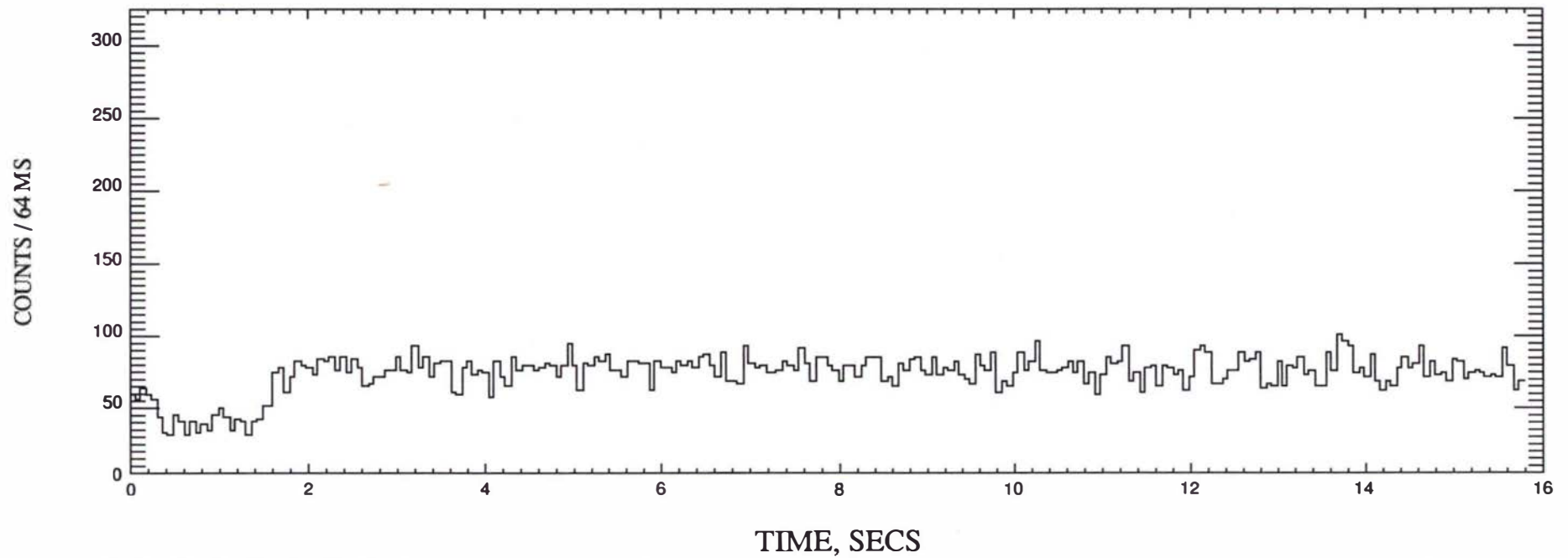
Burst Counter 14 at UT= 4.799724426270 h=17279.008 s 04:47:59.008



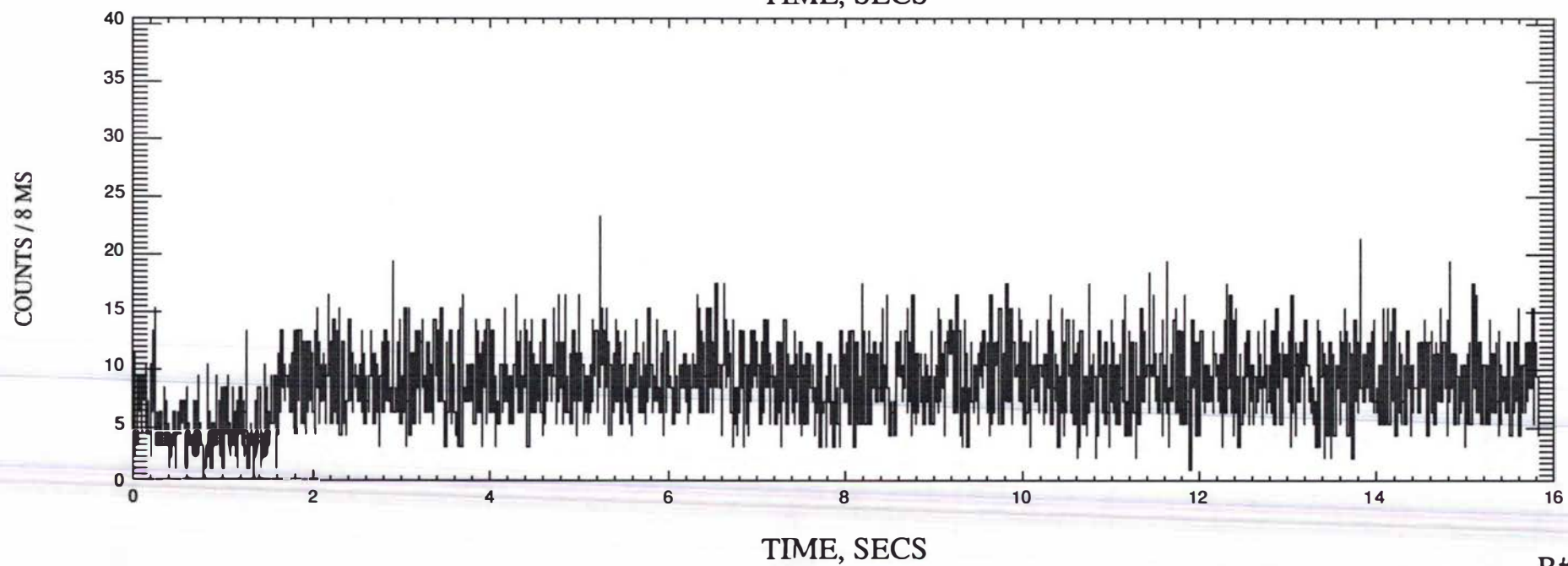
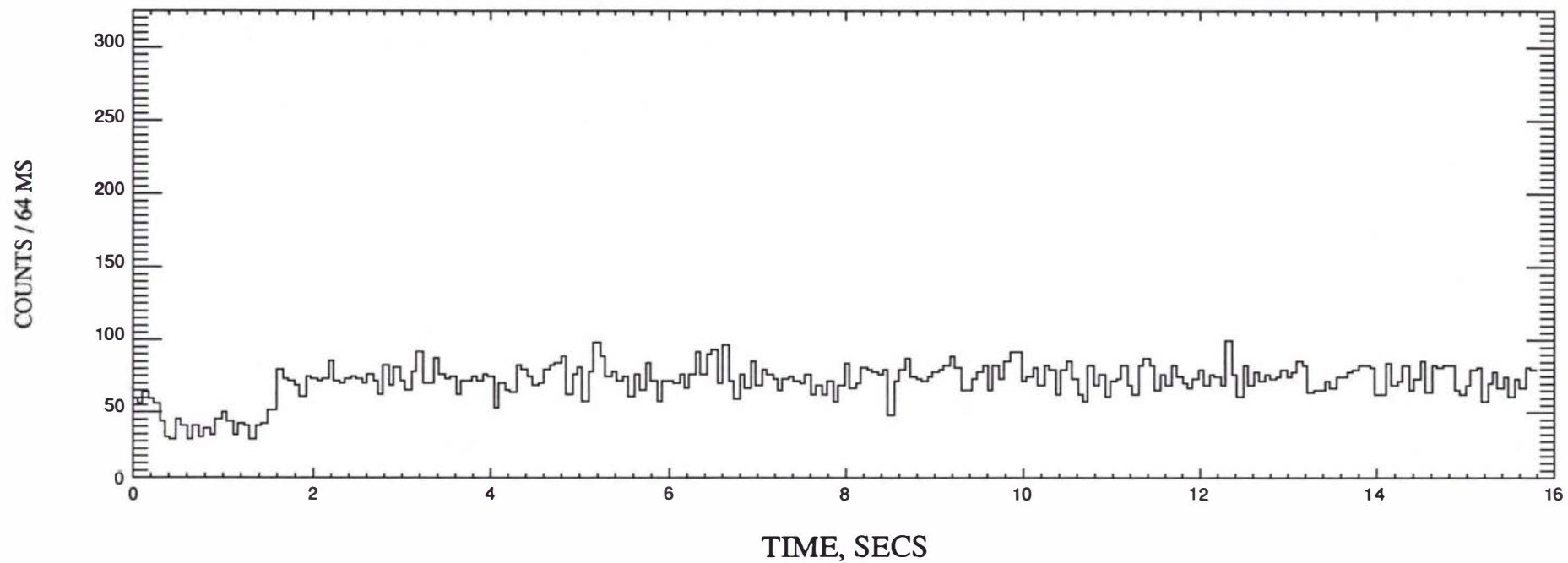
Burst Counter 15 at UT= 6.061969752842 h=21823.091 s 06:03:43.091



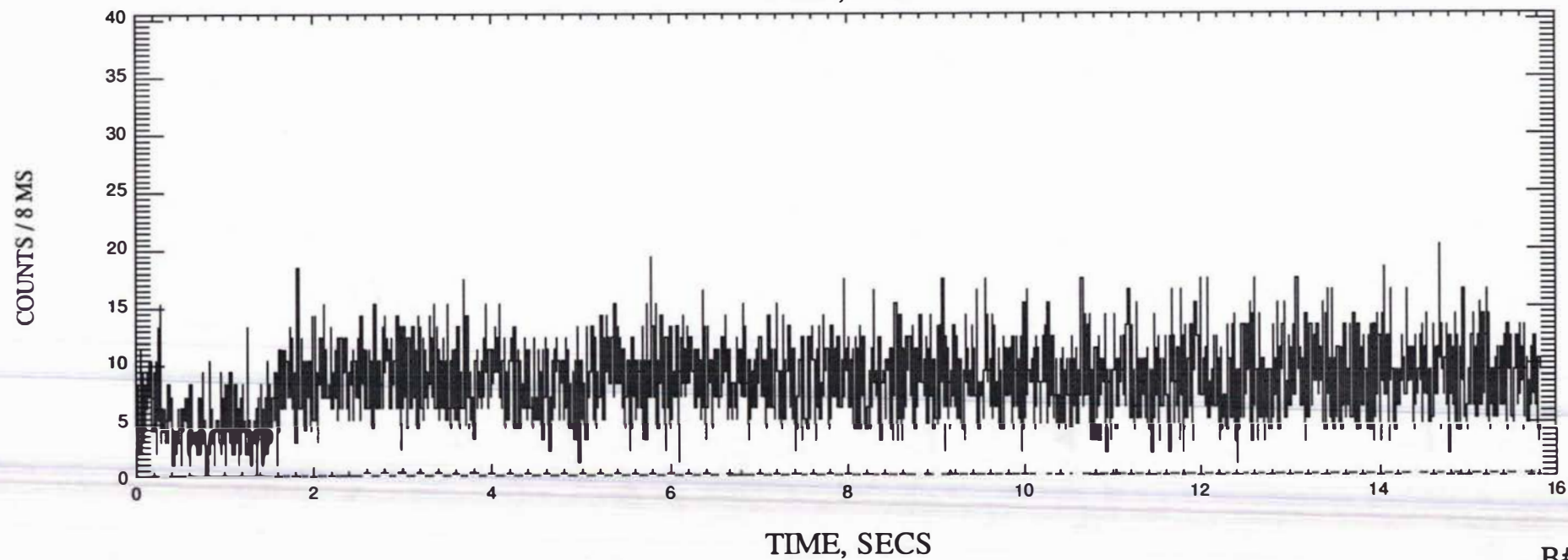
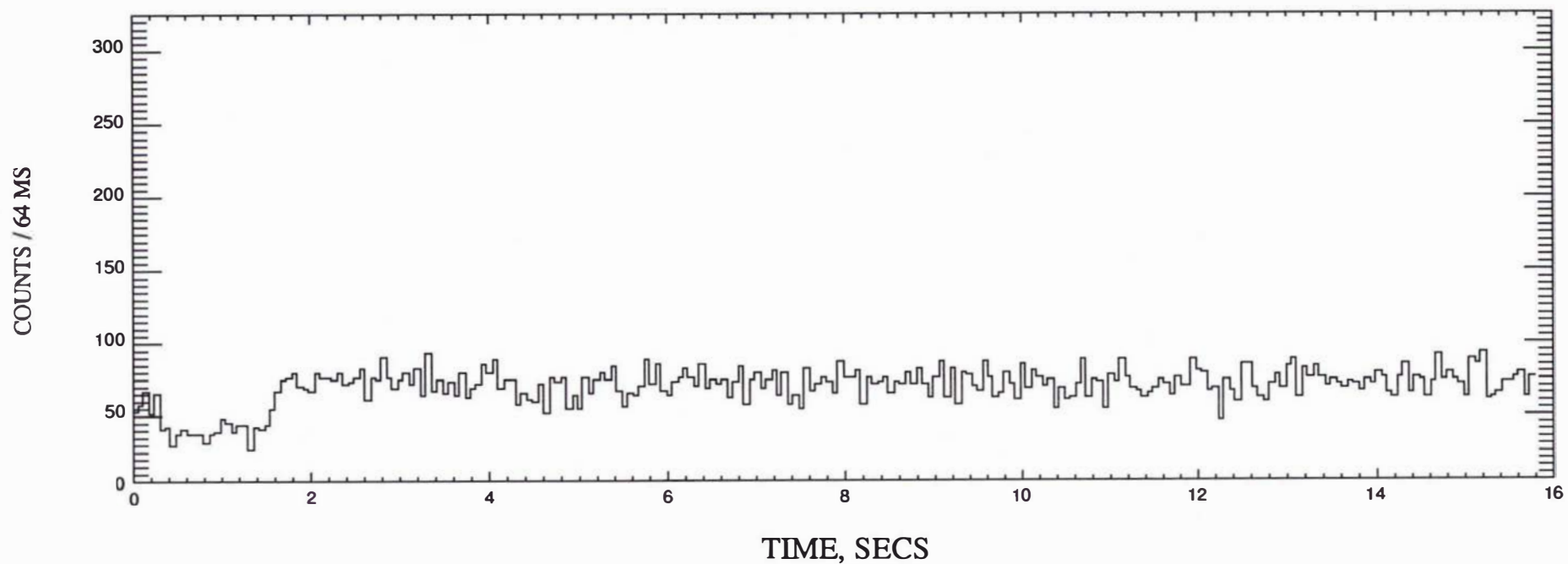
Burst Counter 0 at UT= 7.324221589830 h=26367.198 s 07:19:27.198



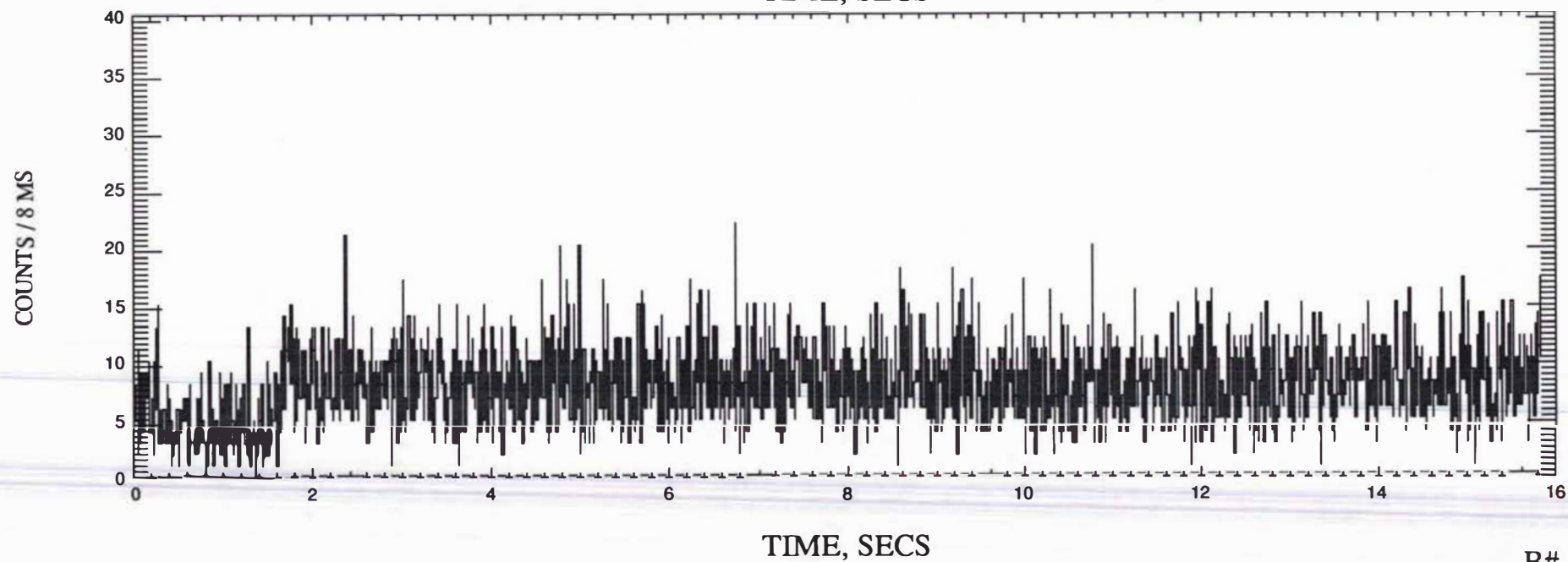
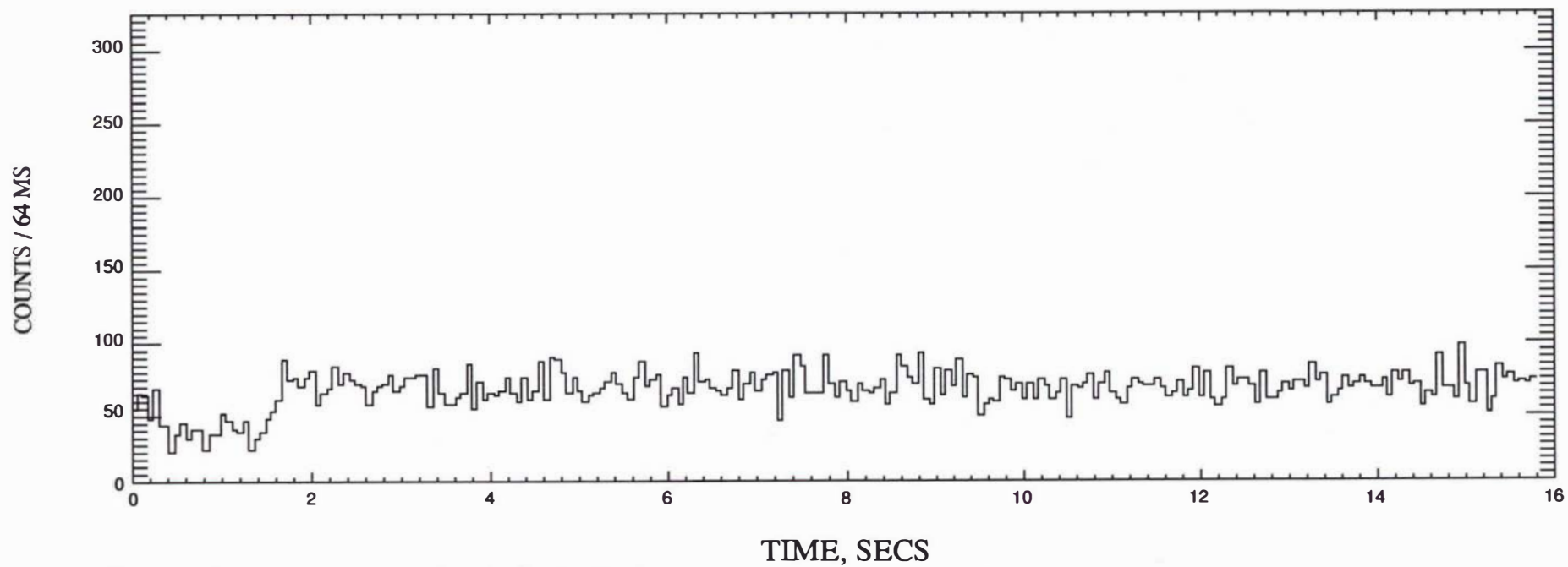
Burst Counter 1 at UT= 8.586466916402 h=30911.281 s 08:35:11.281



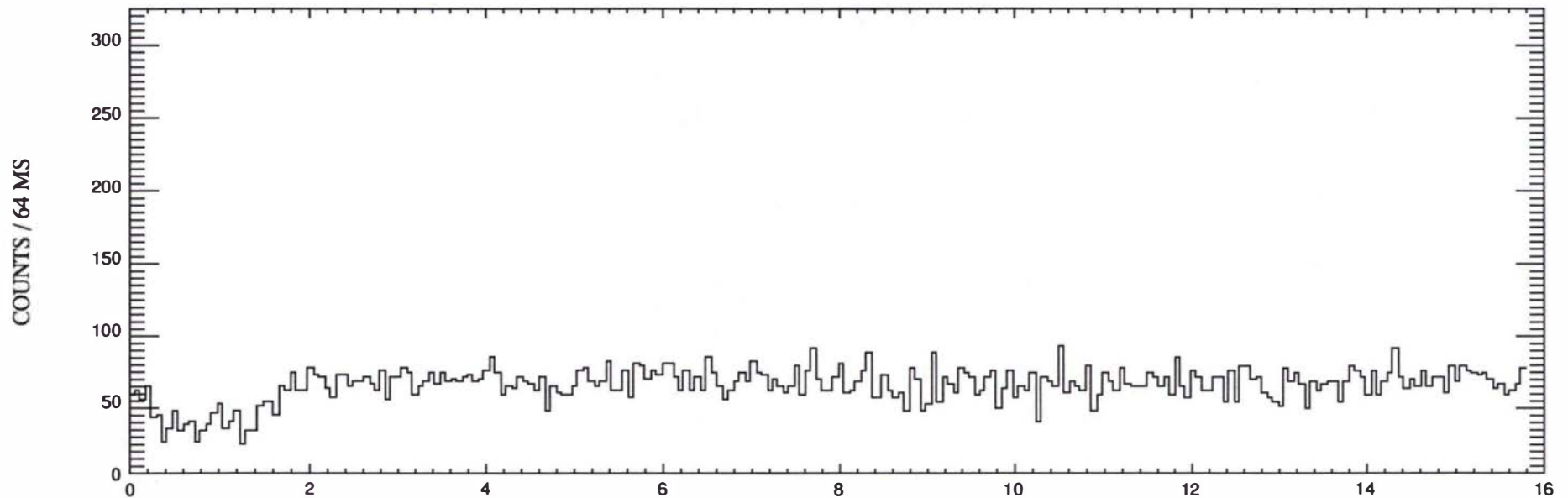
Burst Counter 2 at UT= 9.848707902696 h=35455.348 s 09:50:55.348



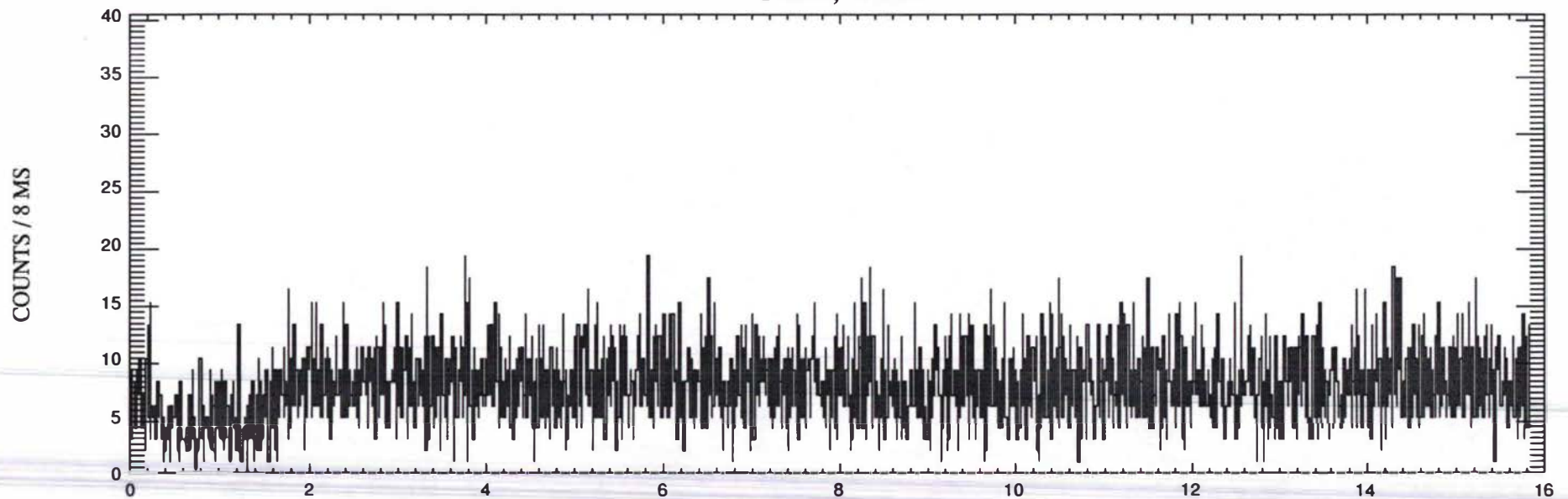
Burst Counter 3 at UT=11.110948490567 h=39999.415 s 11:06:39.415



Burst Counter 4 at UT=12.373209008111 h=44543.552 s 12:22:23.552

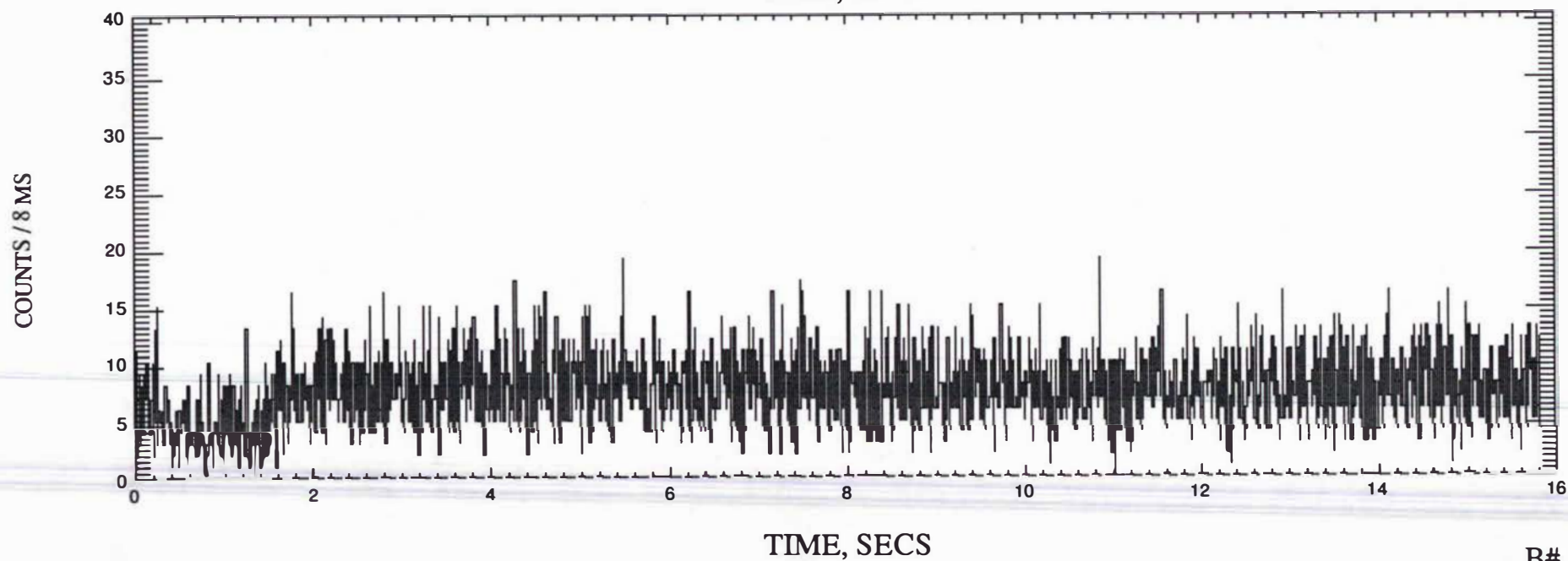
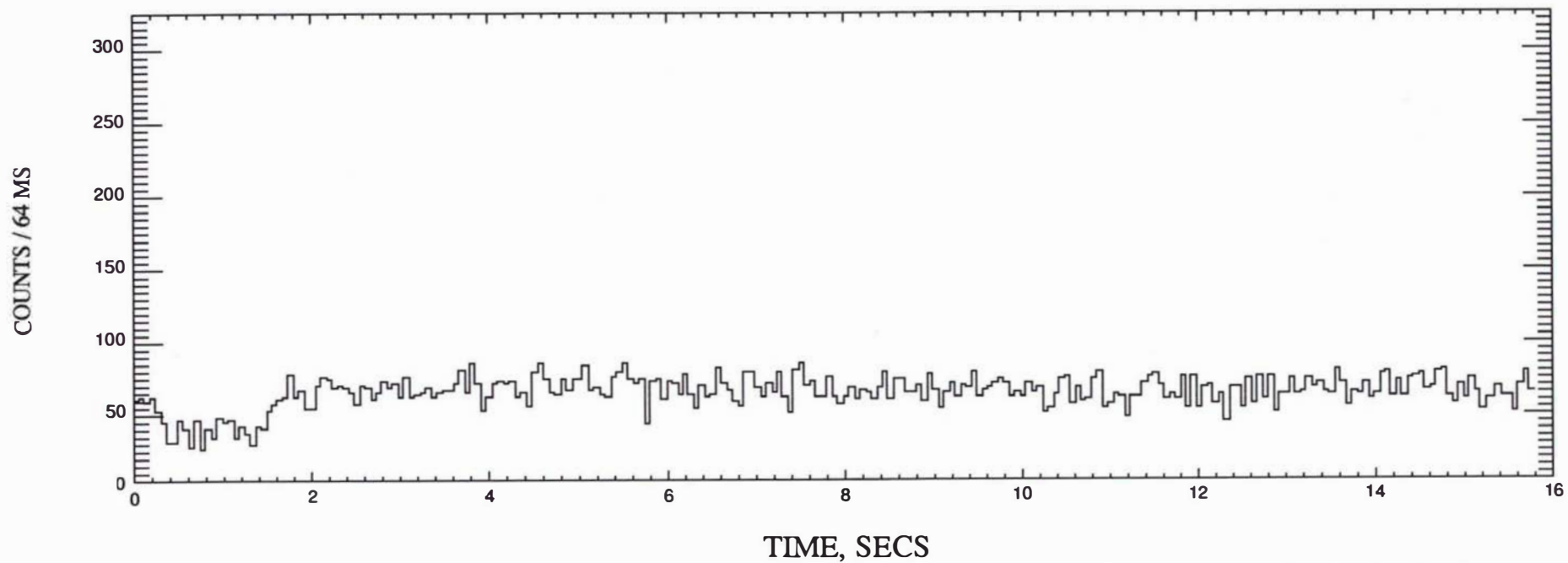


TIME, SECS

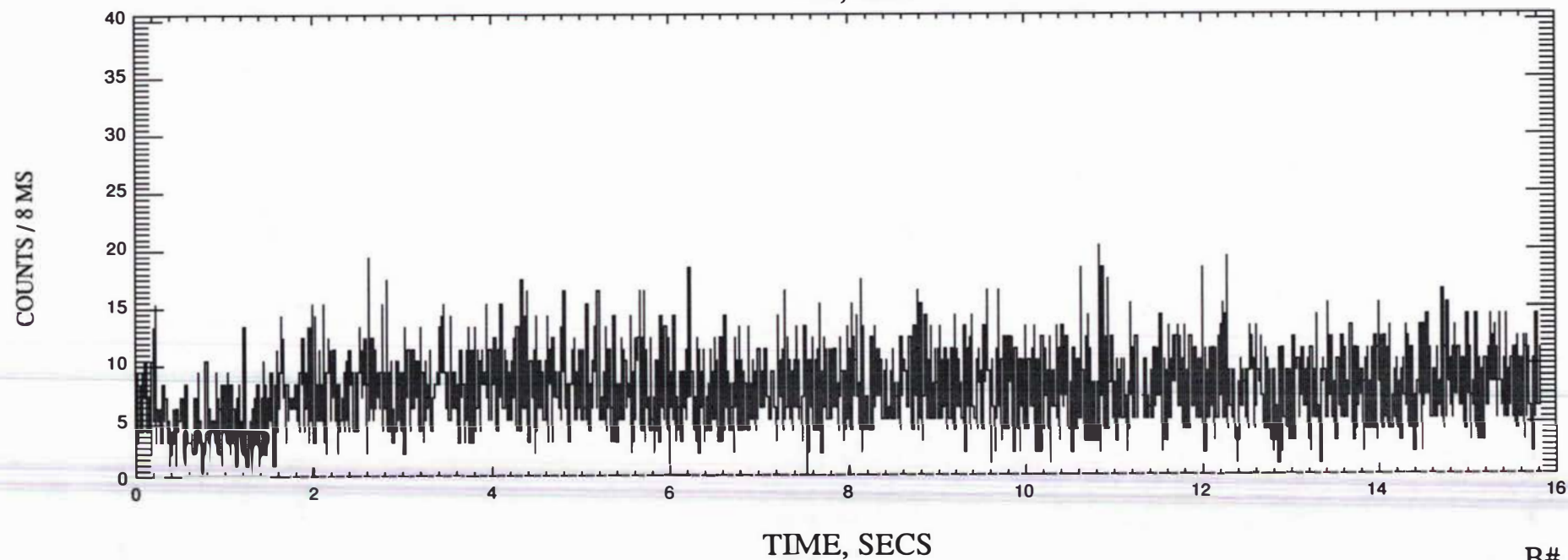
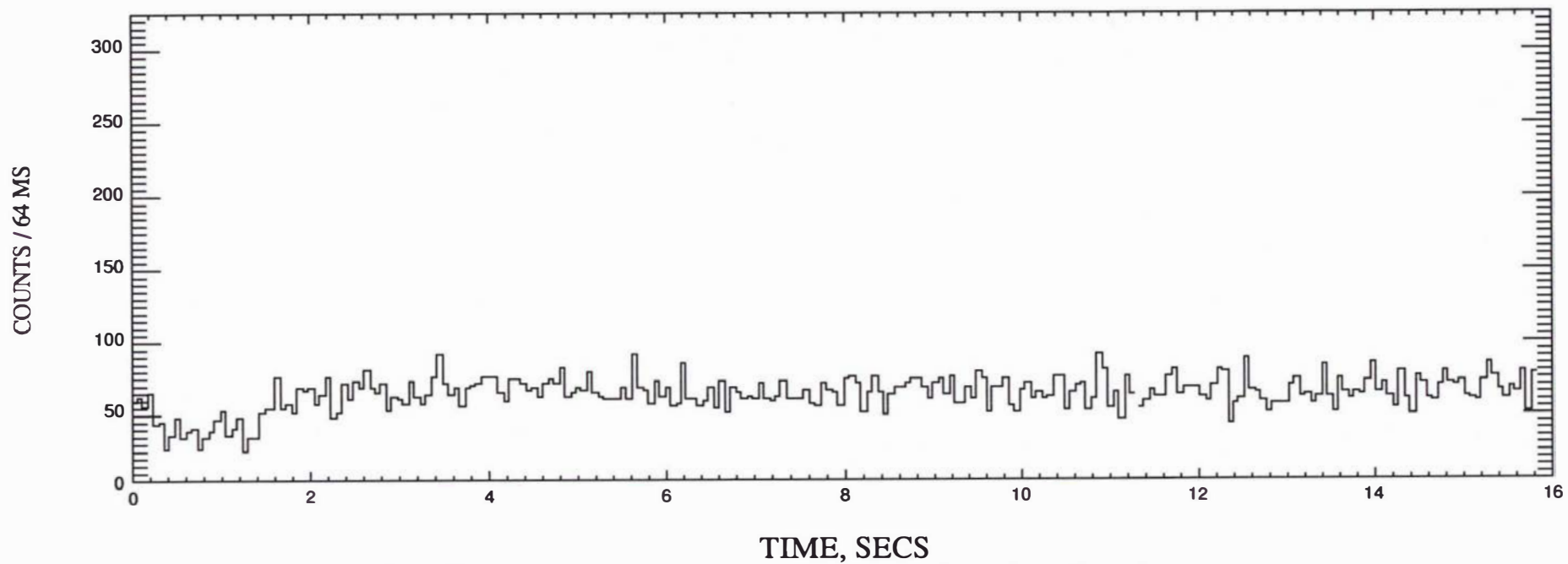


TIME, SECS

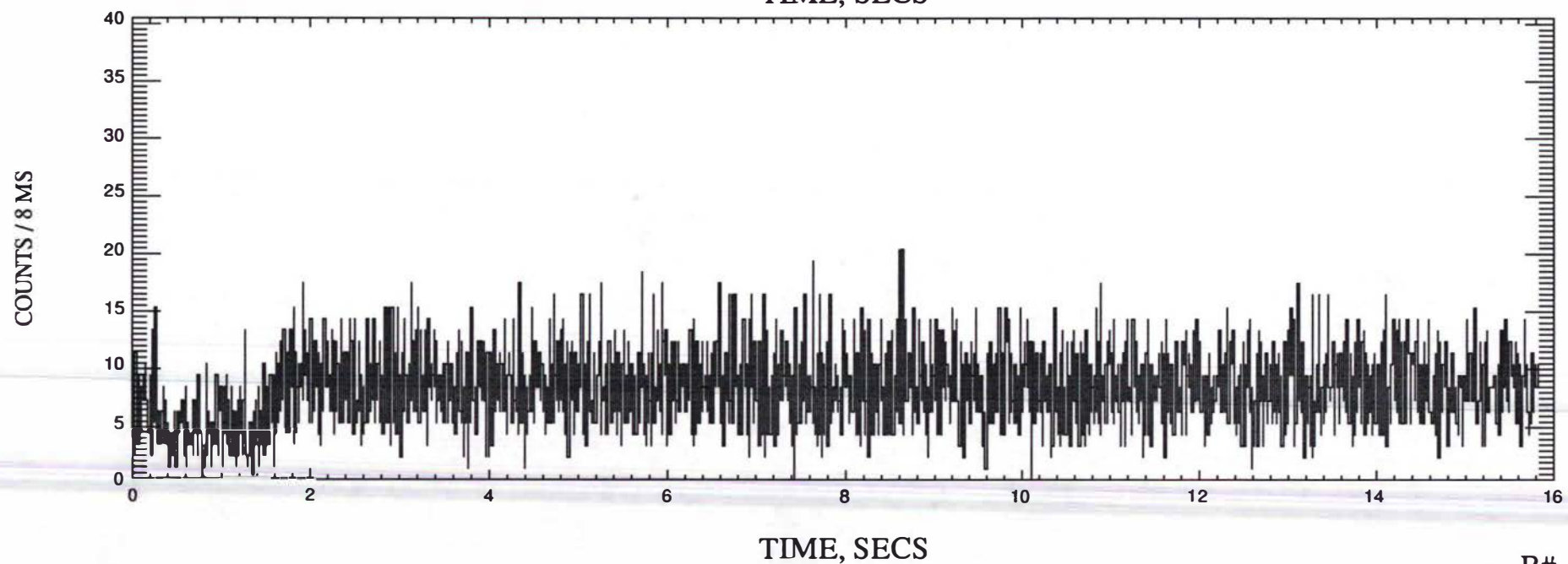
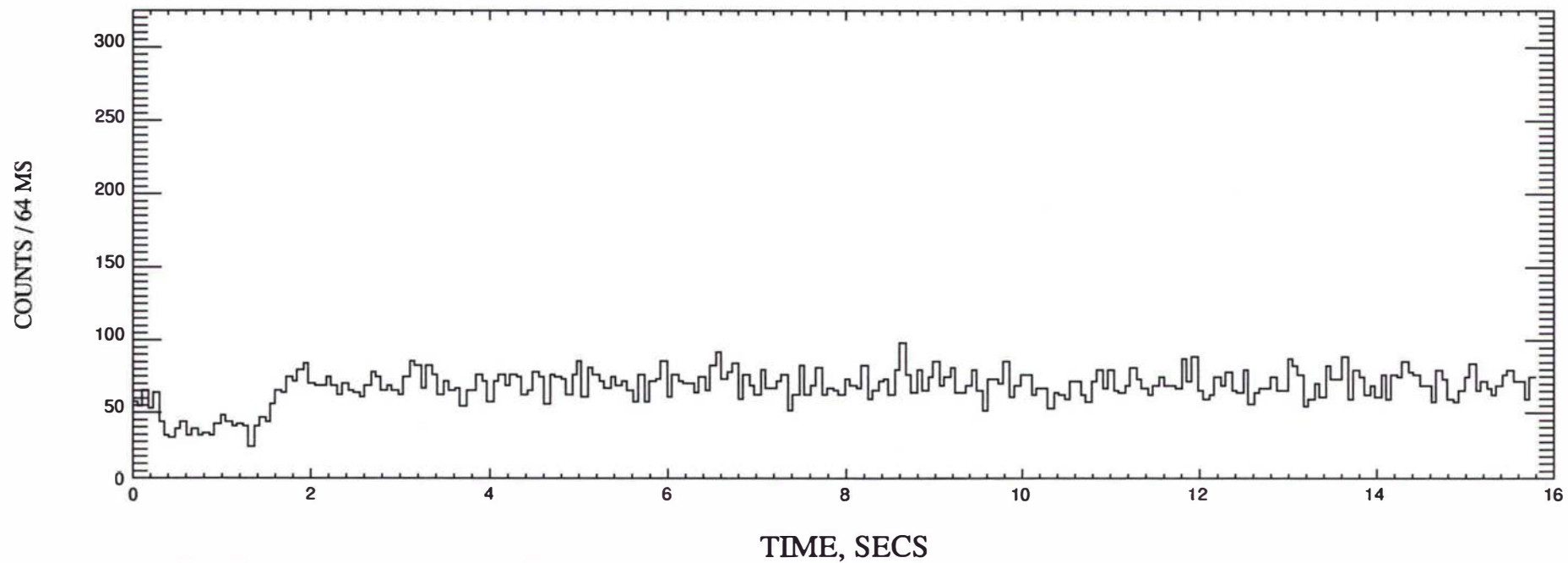
Burst Counter 6 at UT=14.346573376126 h=51647.664 s 14:20:47.664



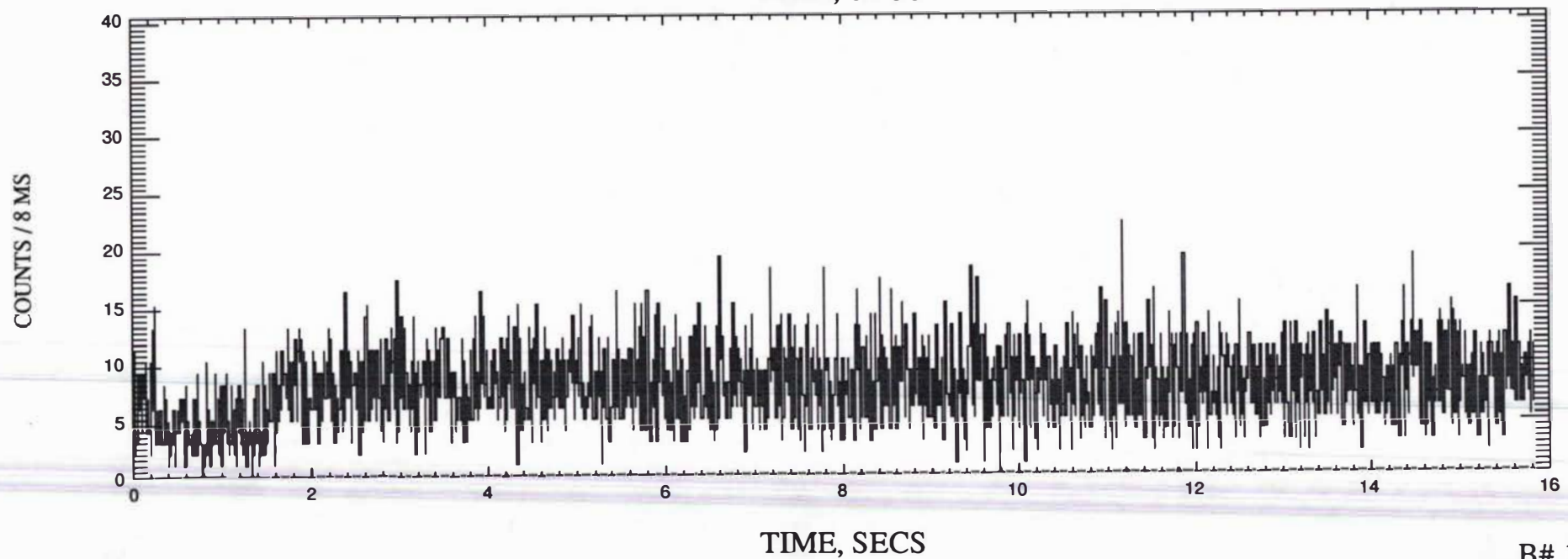
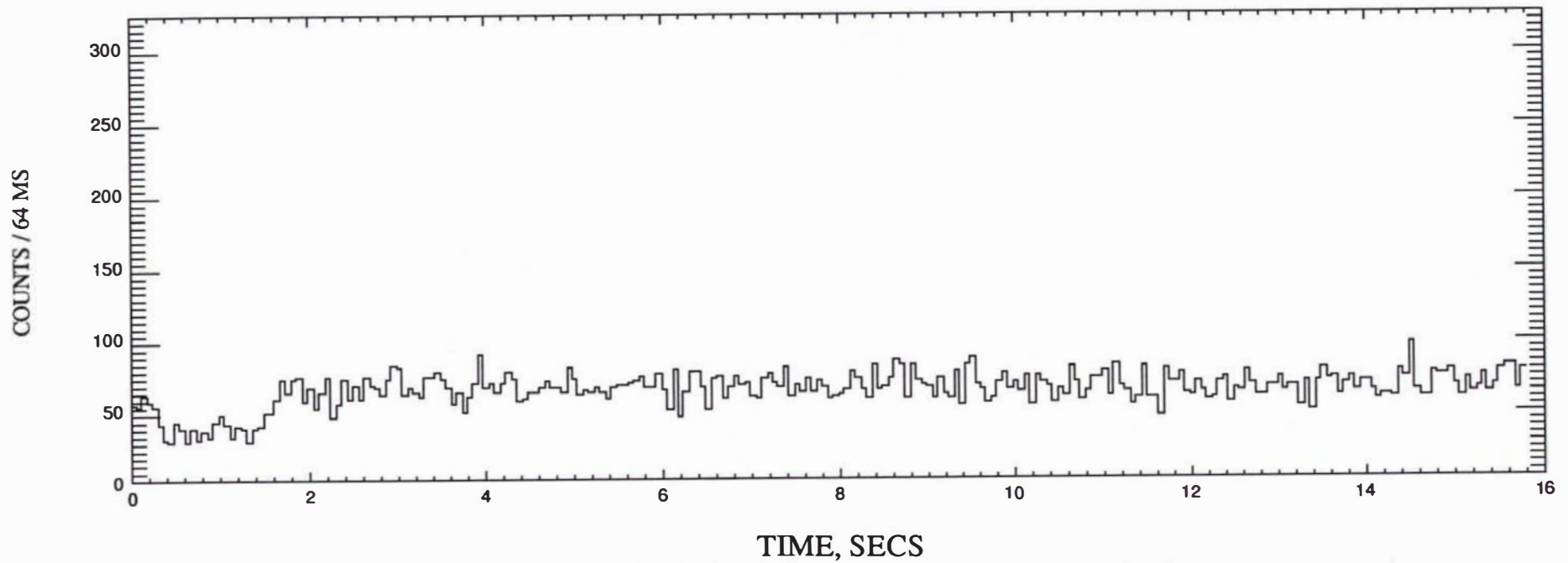
Burst Counter 7 at UT=15.048814943102 h=54175.734 s 15:02:55.734



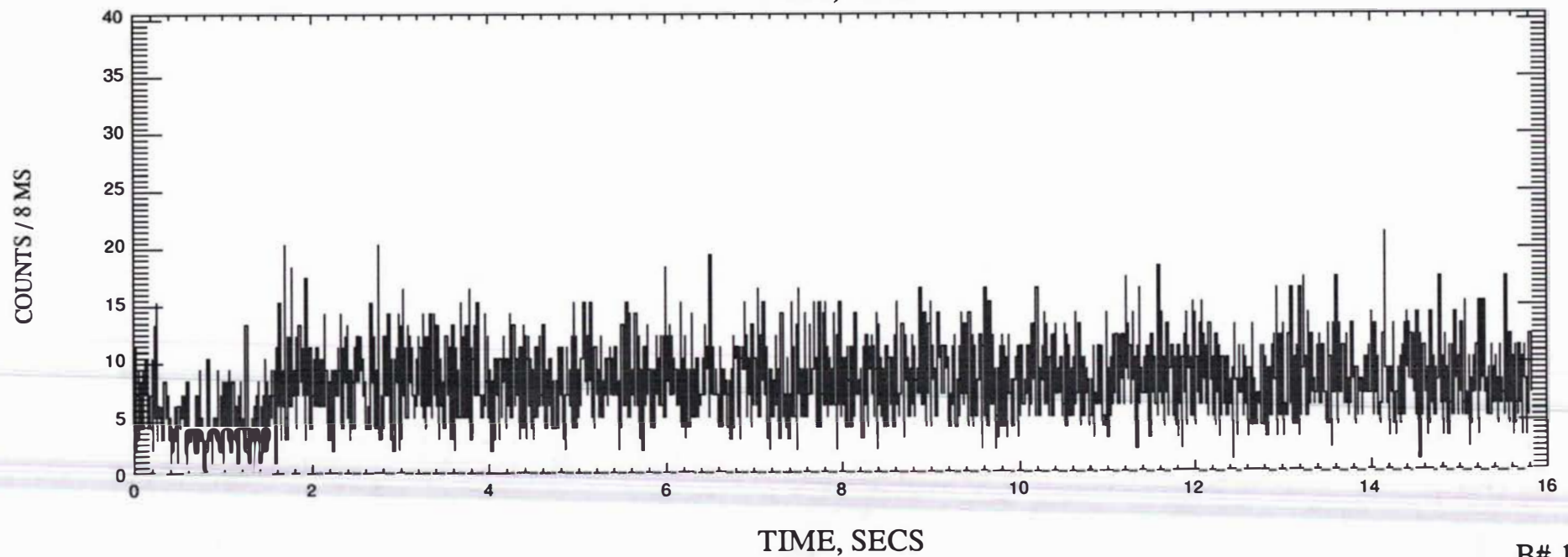
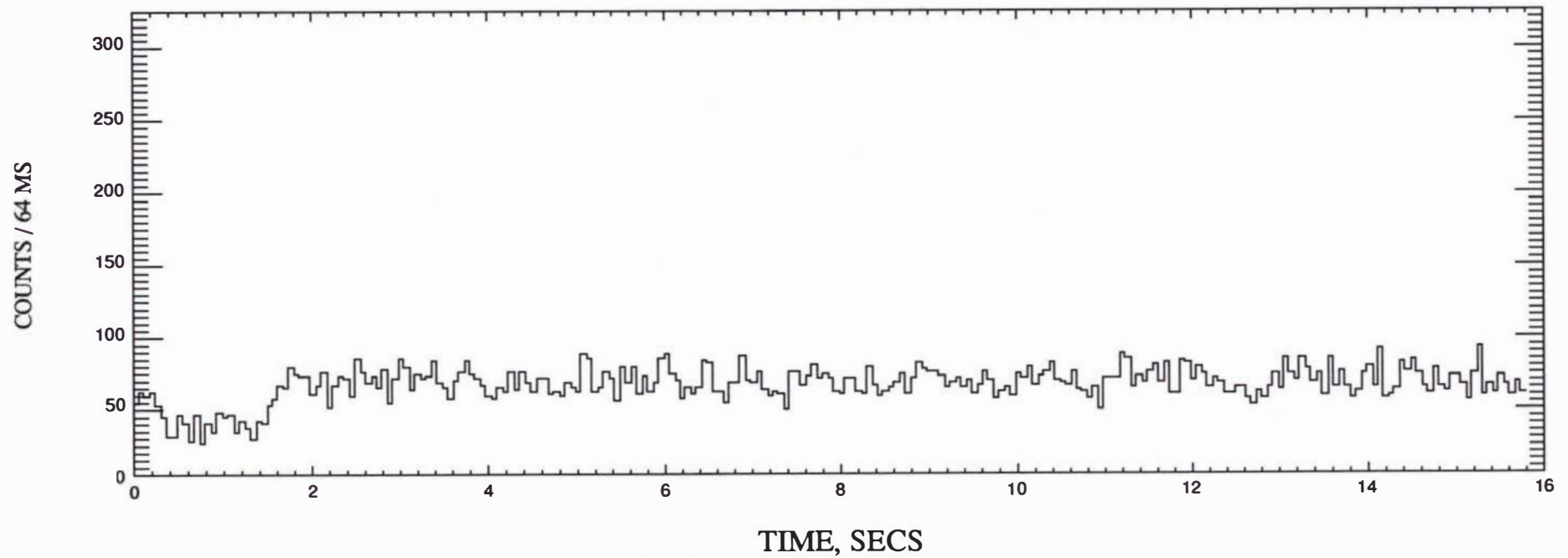
Burst Counter 9 at UT=16.453274209764 h=59231.787 s 16:27:11.787



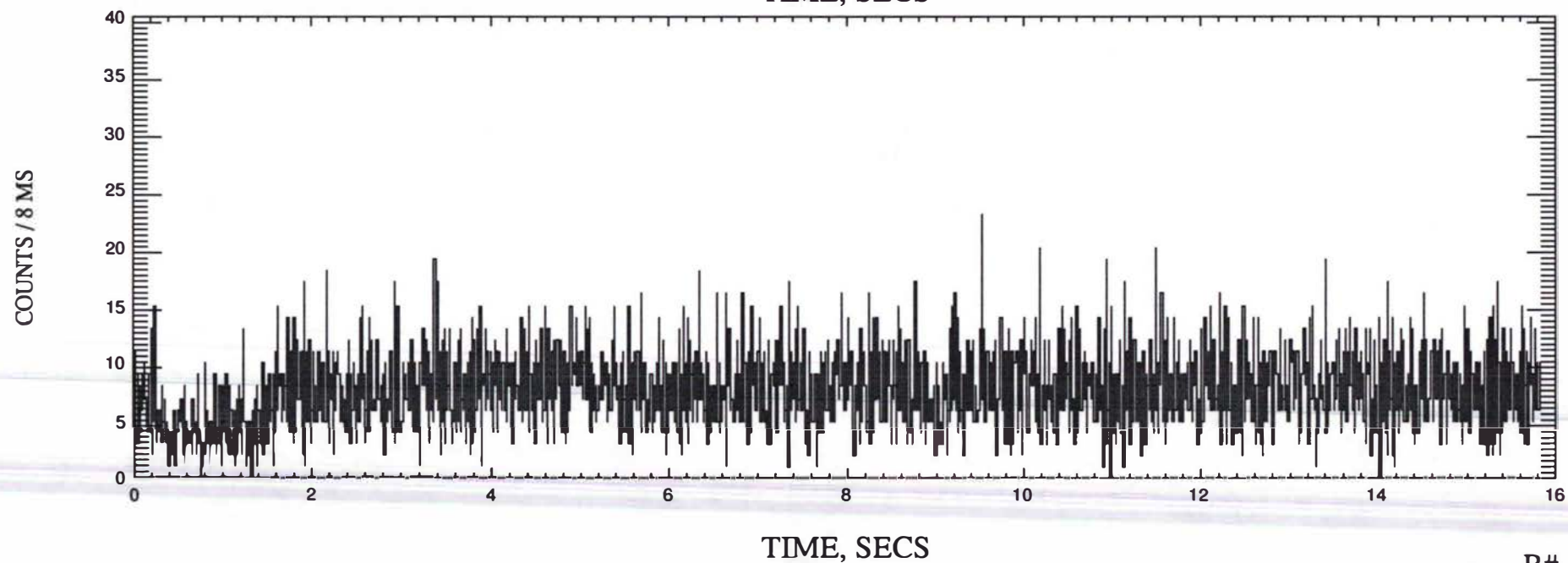
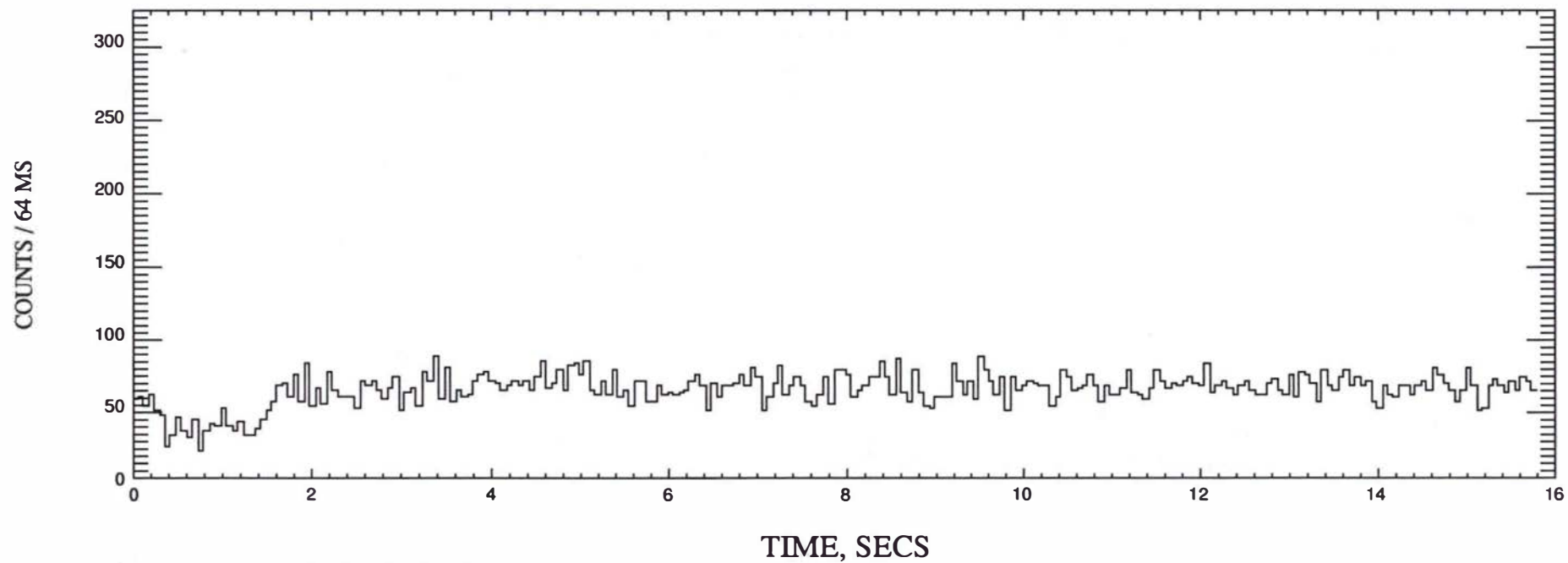
Burst Counter 10 at UT=17.155511436462 h=61759.841 s 17:09:19.841



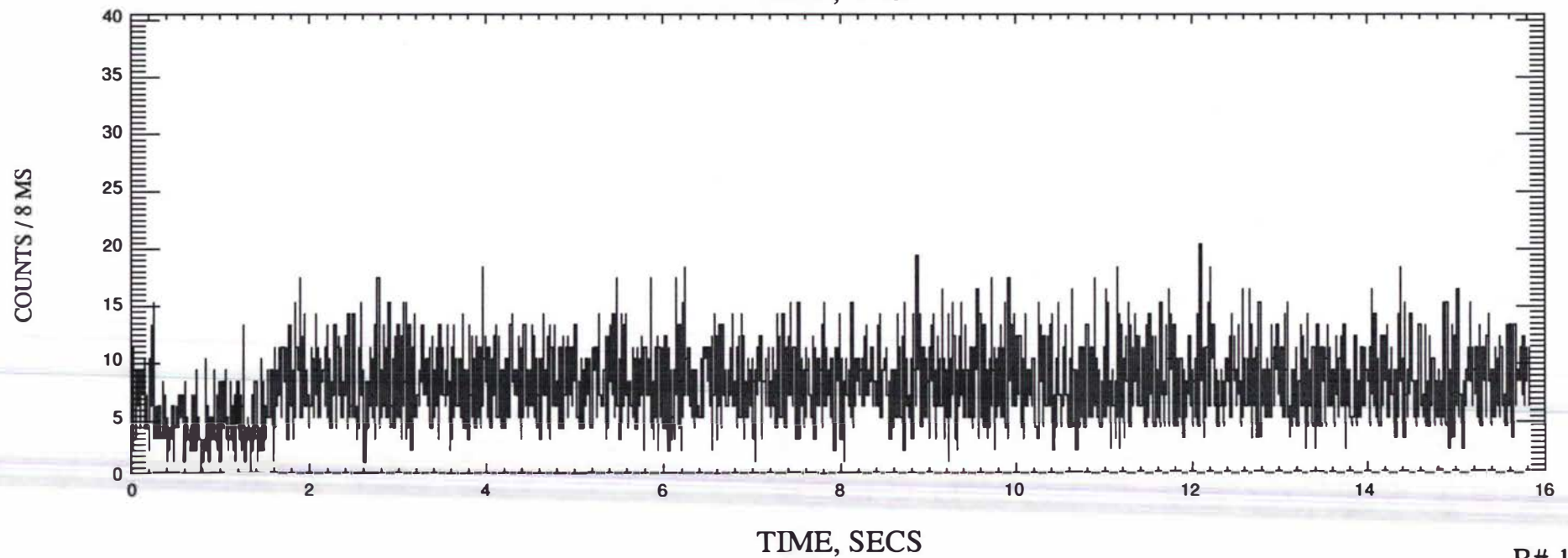
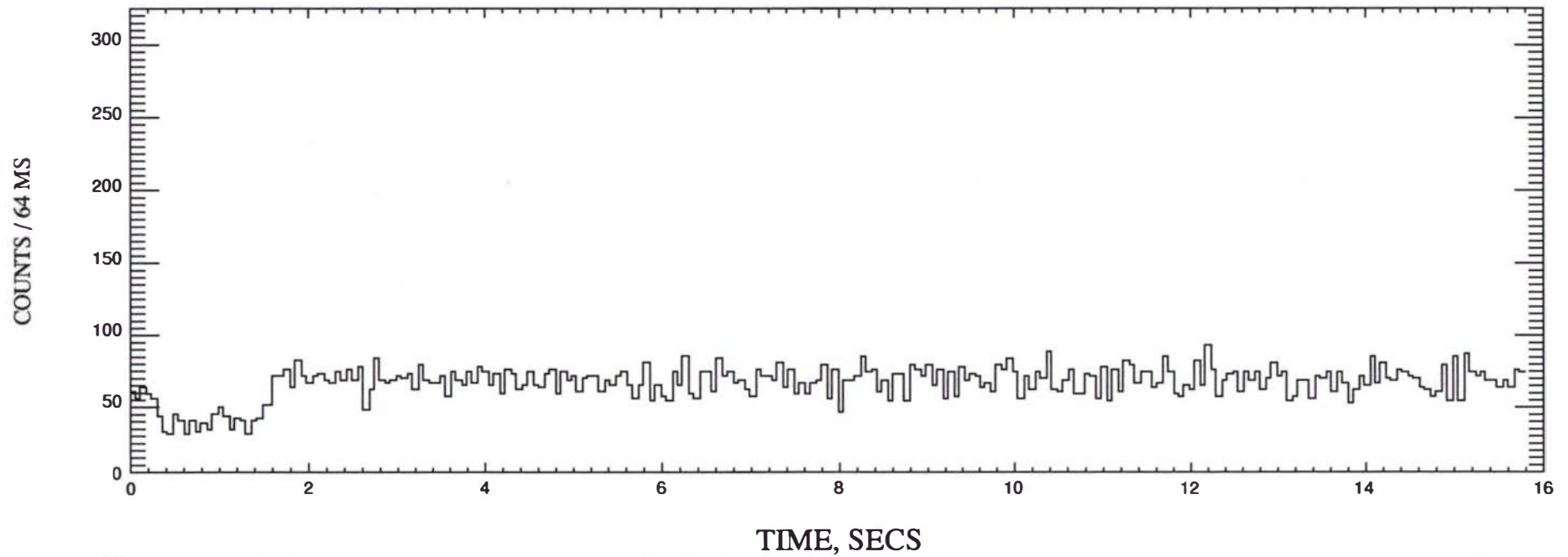
Burst Counter 11 at UT=17.857747378879 h=64287.891 s 17:51:27.891



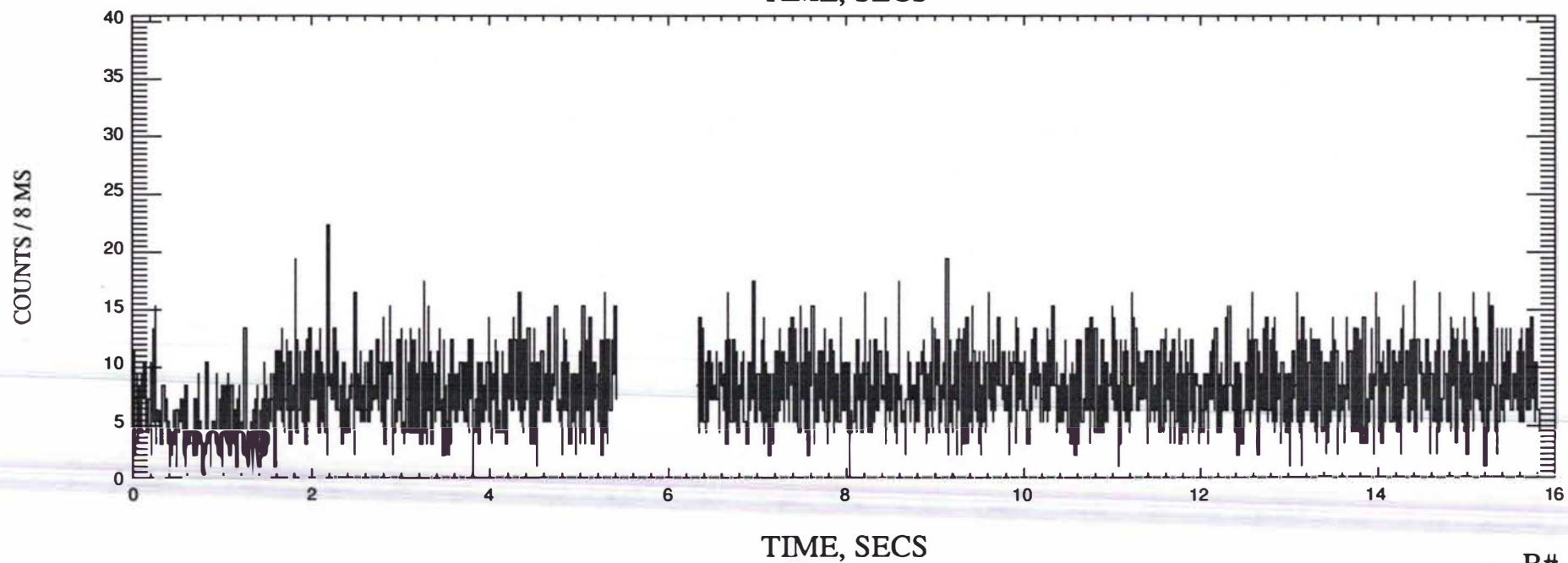
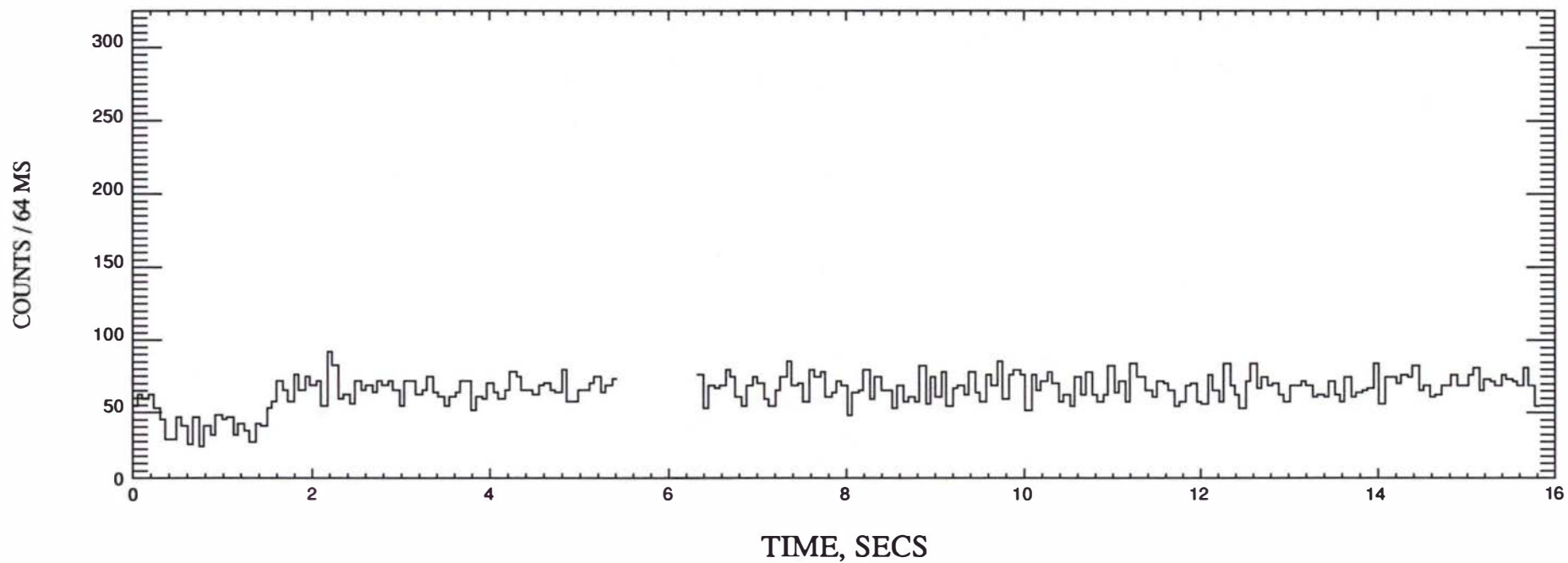
Burst Counter 12 at UT=18.559984609816 h=66815.945 s 18:33:35.945



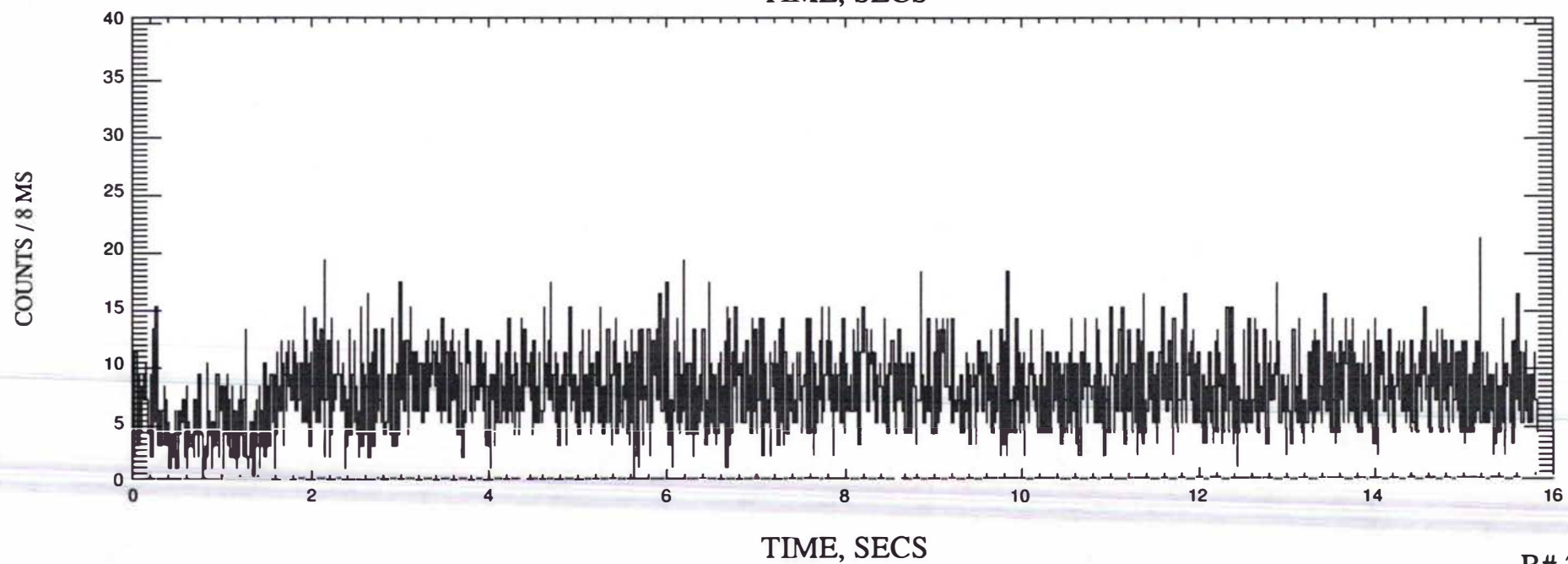
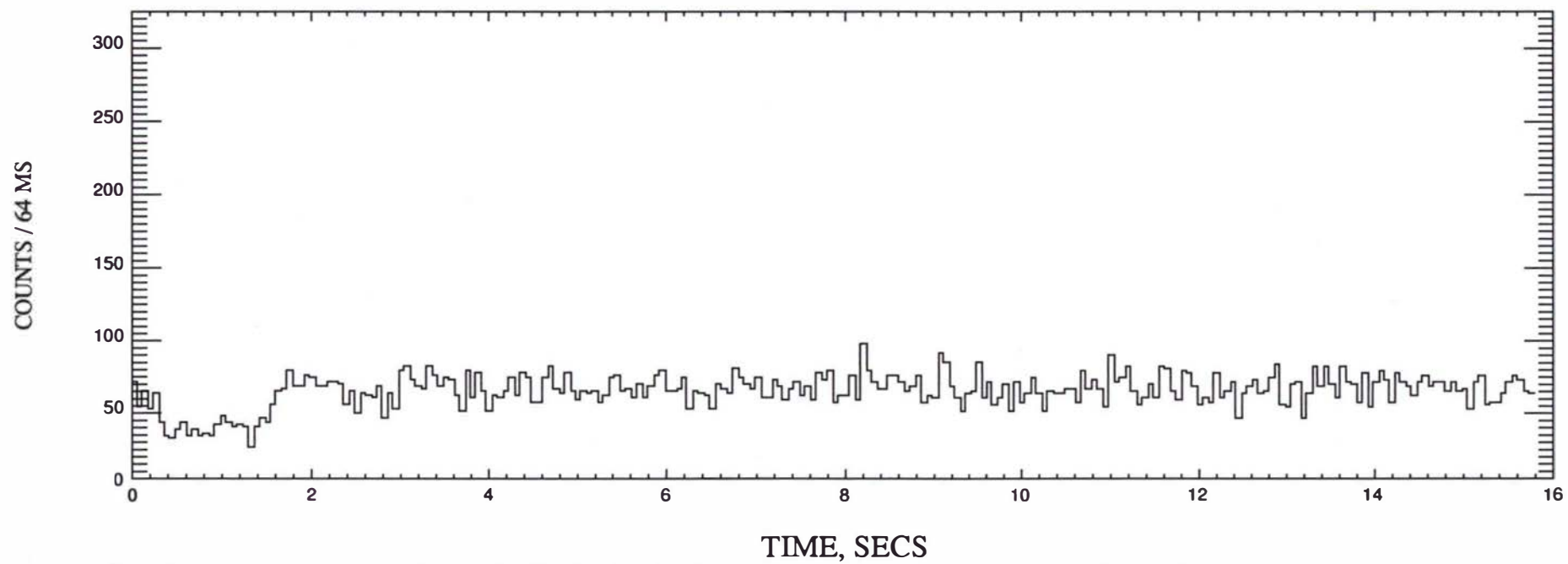
Burst Counter 13 at UT=19.262217496236 h=69343.983 s 19:15:43.983



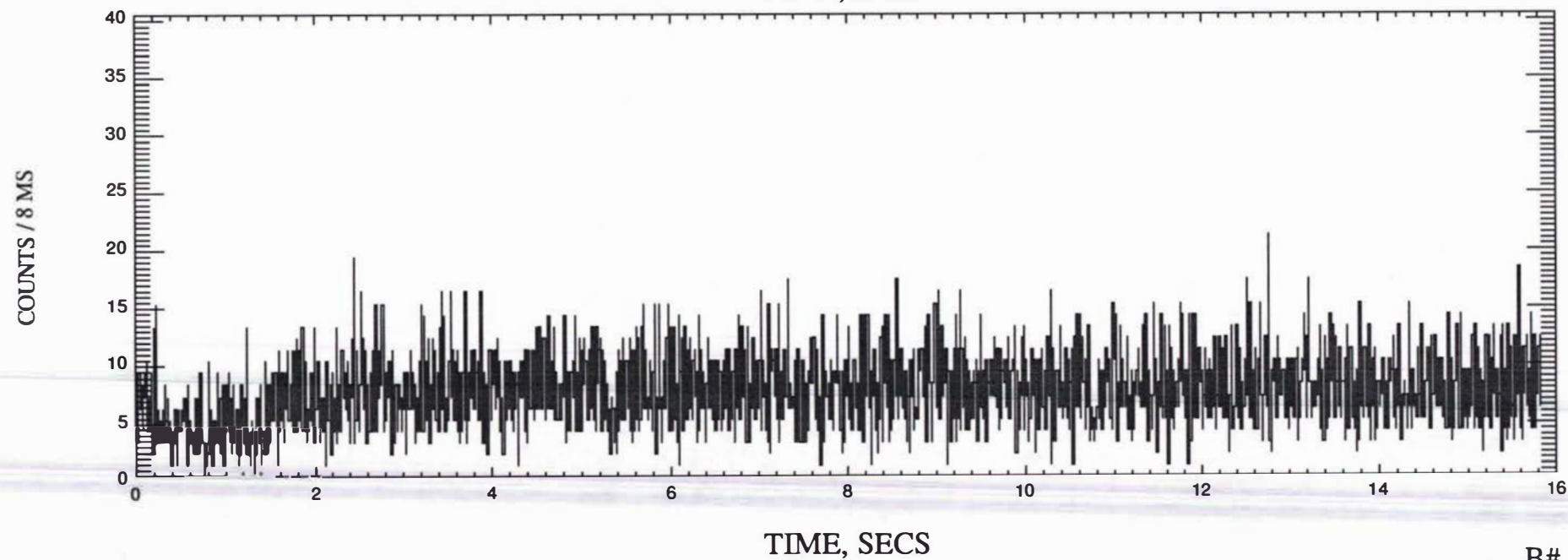
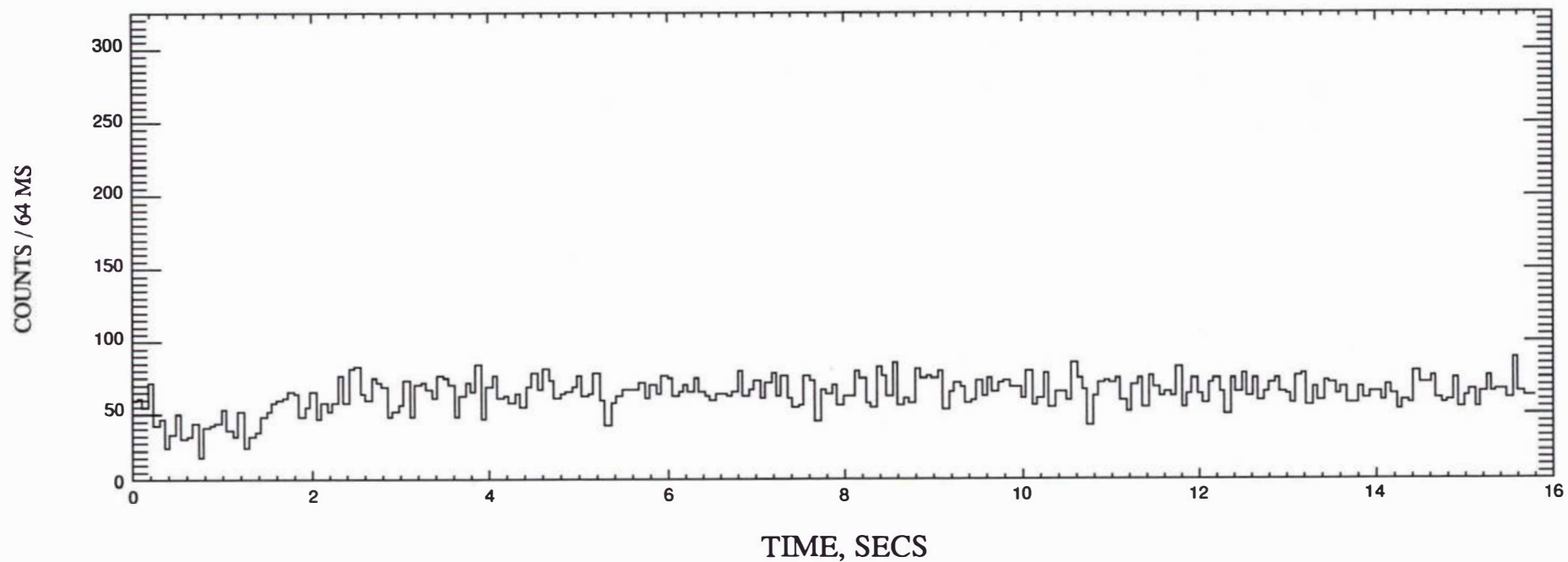
Burst Counter 14 at UT=19.964452552795 h=71872.029 s 19:57:52.029



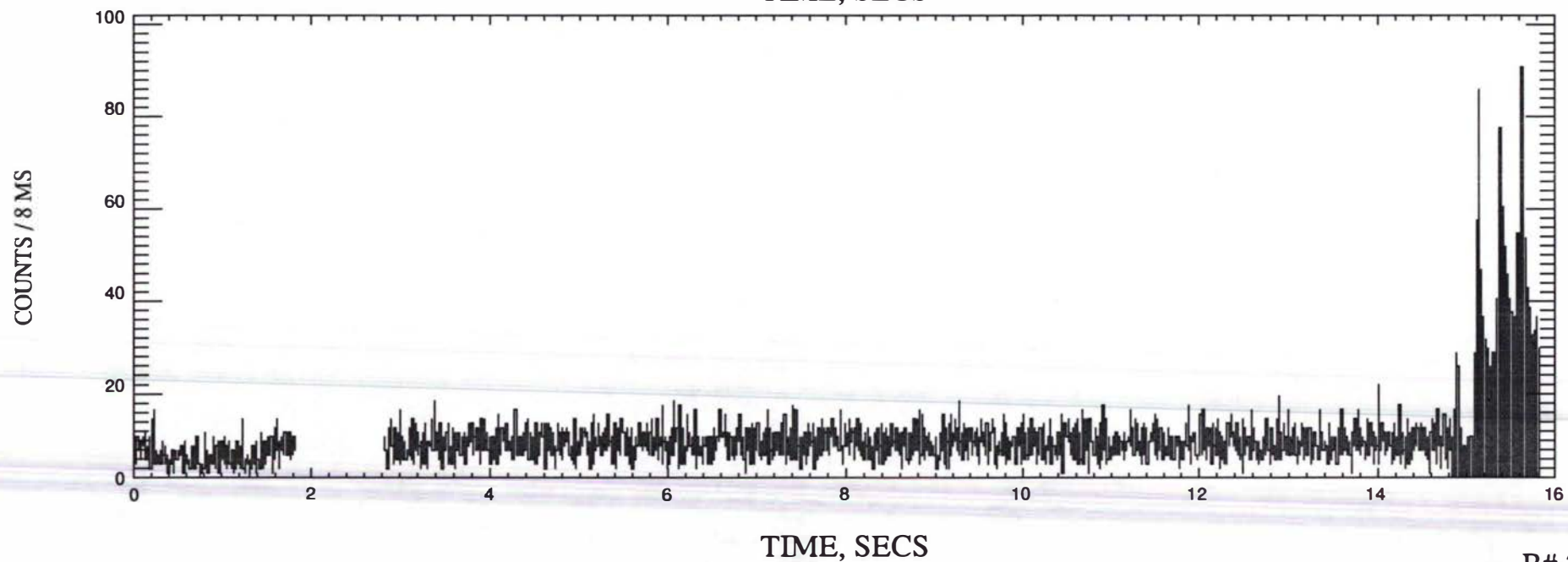
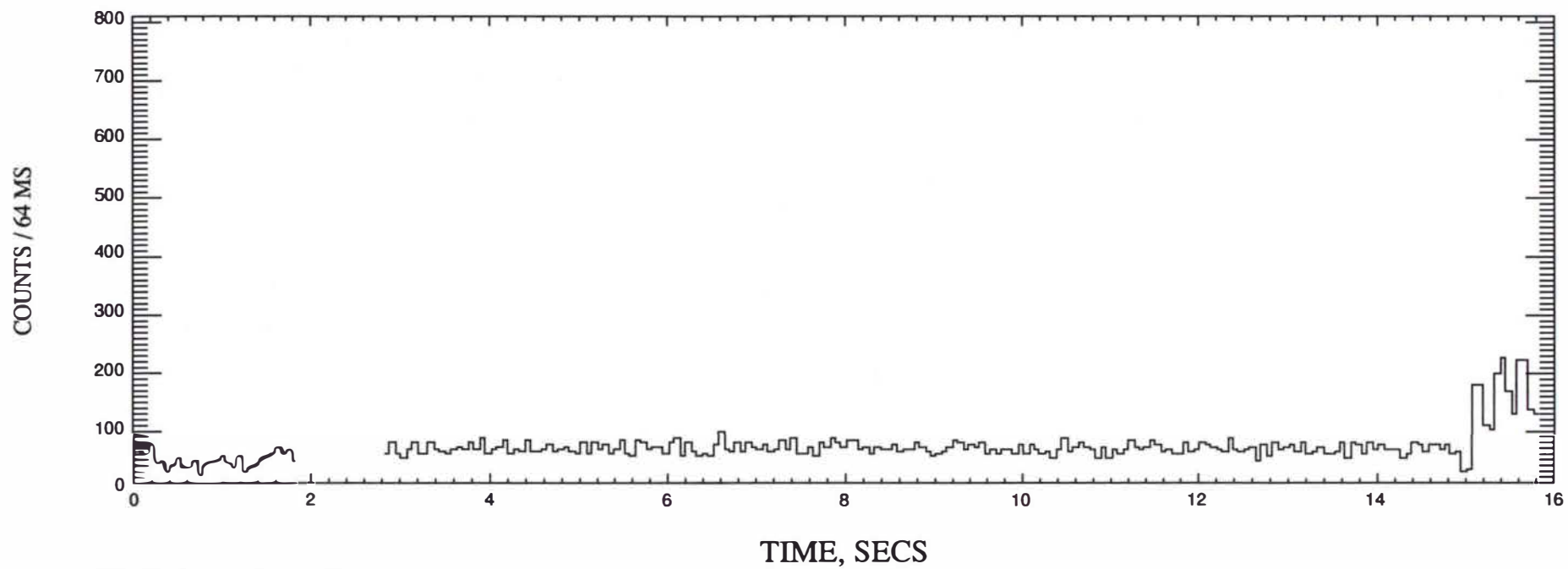
Burst Counter 15 at UT=20.666683273315 h=74400.060 s 20:40:00.060



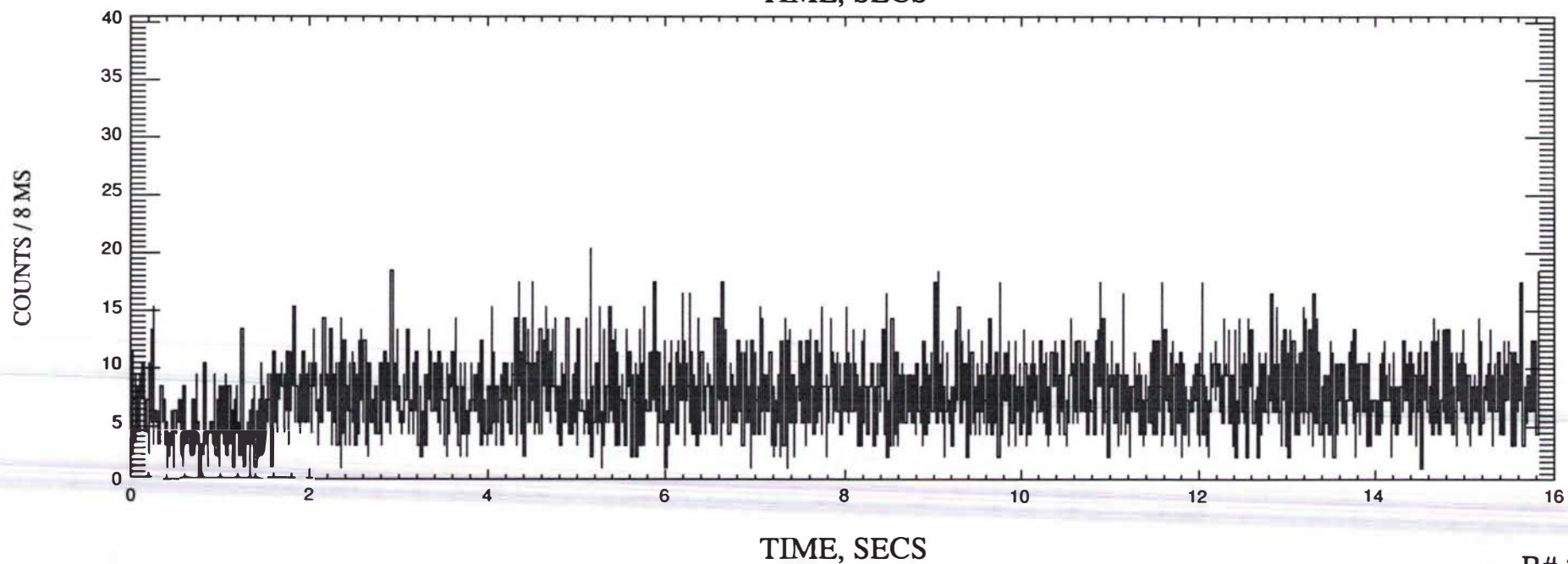
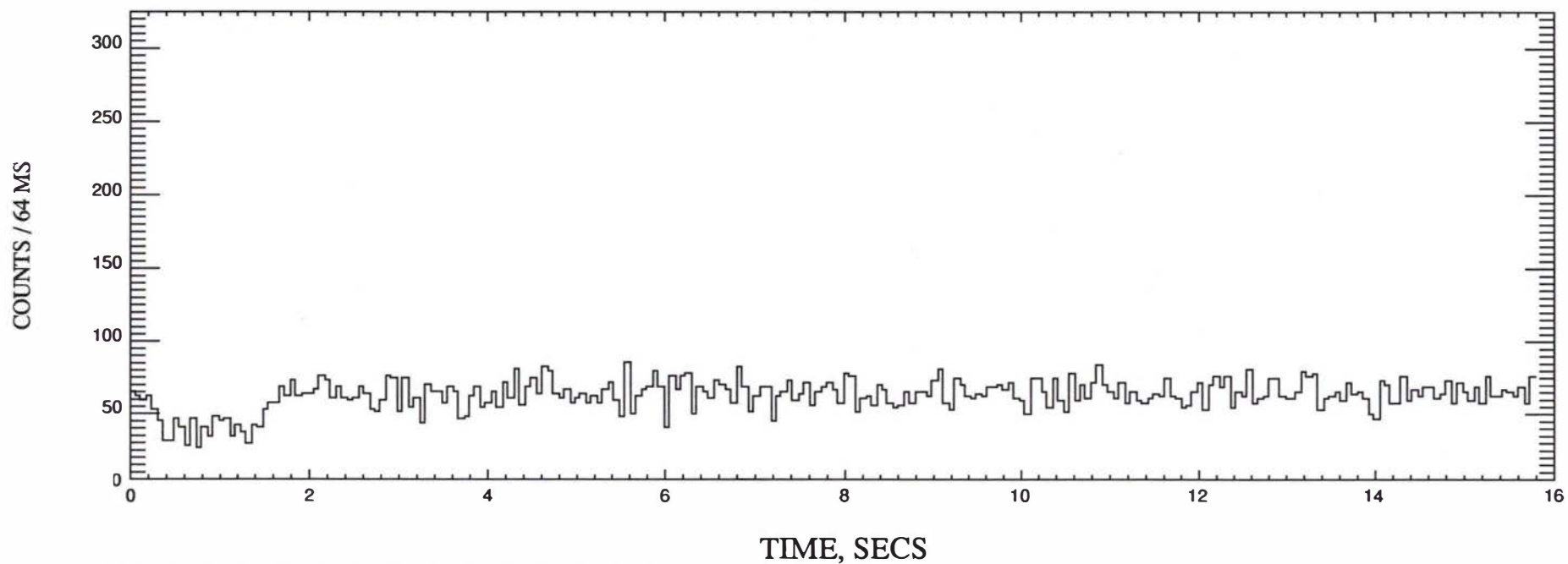
Burst Counter 0 at UT=21.368927010430 h=76928.137 s 21:22:08.137



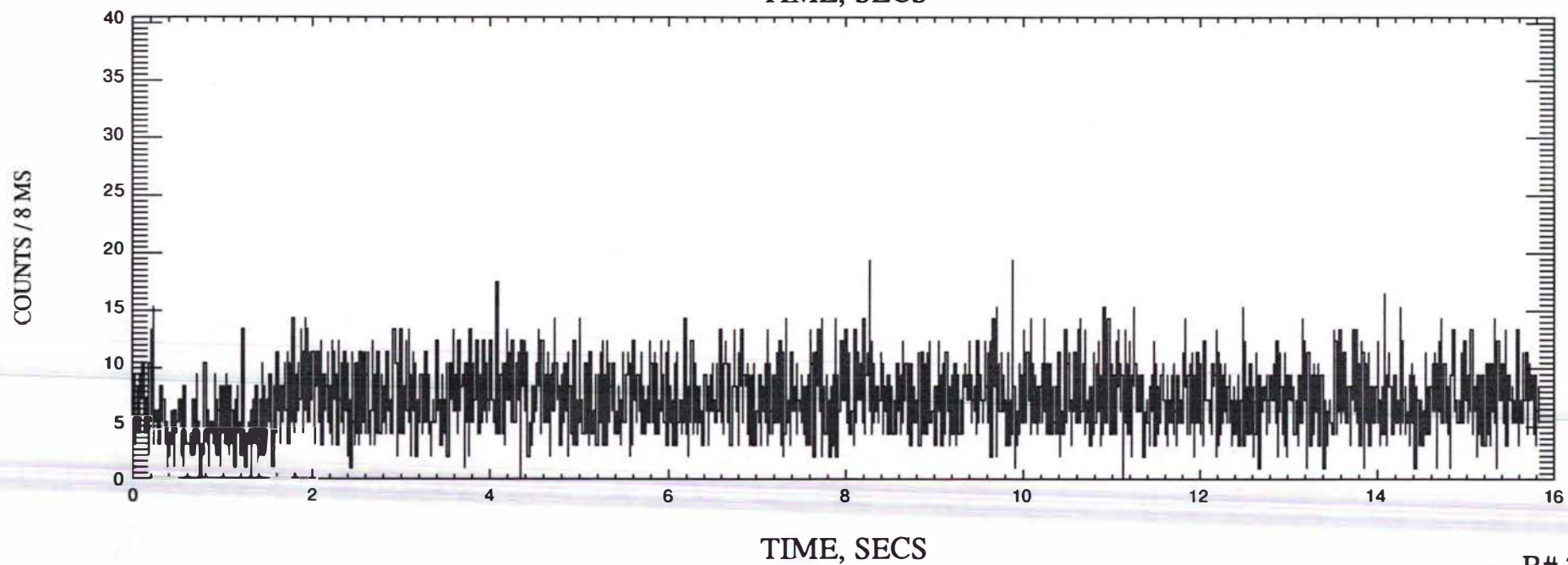
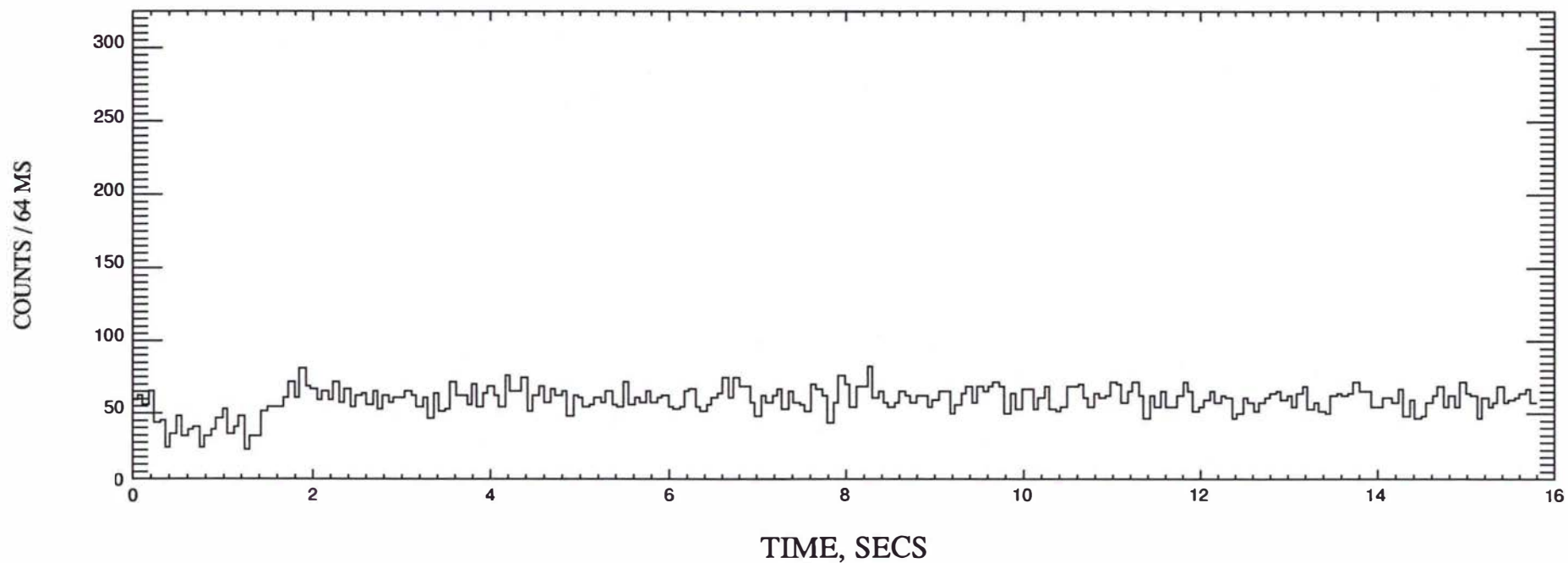
Burst Counter 1 at UT=22.071162066989 h=79456.183 s 22:04:16.183



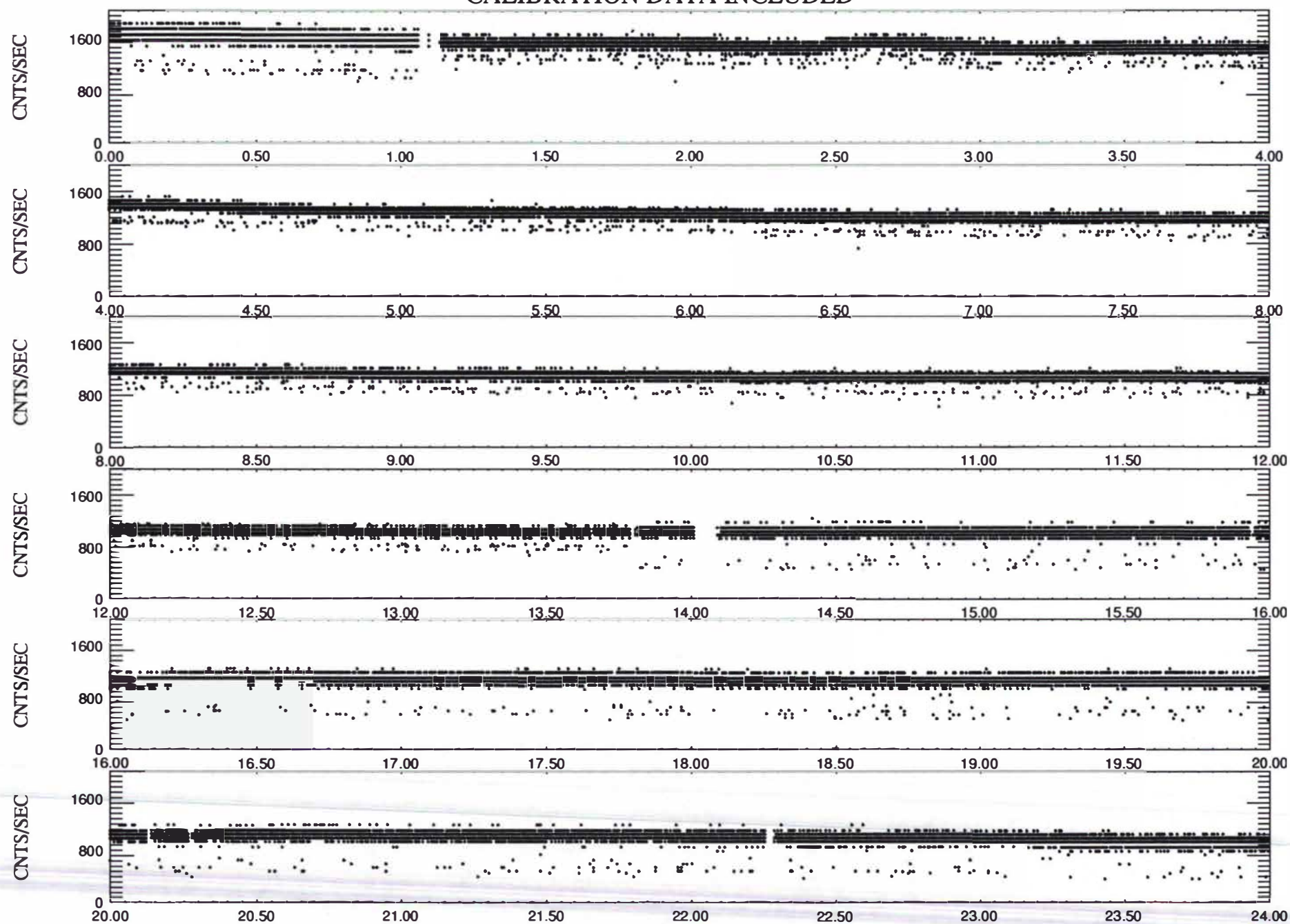
Burst Counter 2 at UT=22.773391821120 h=81984.211 s 22:46:24.211



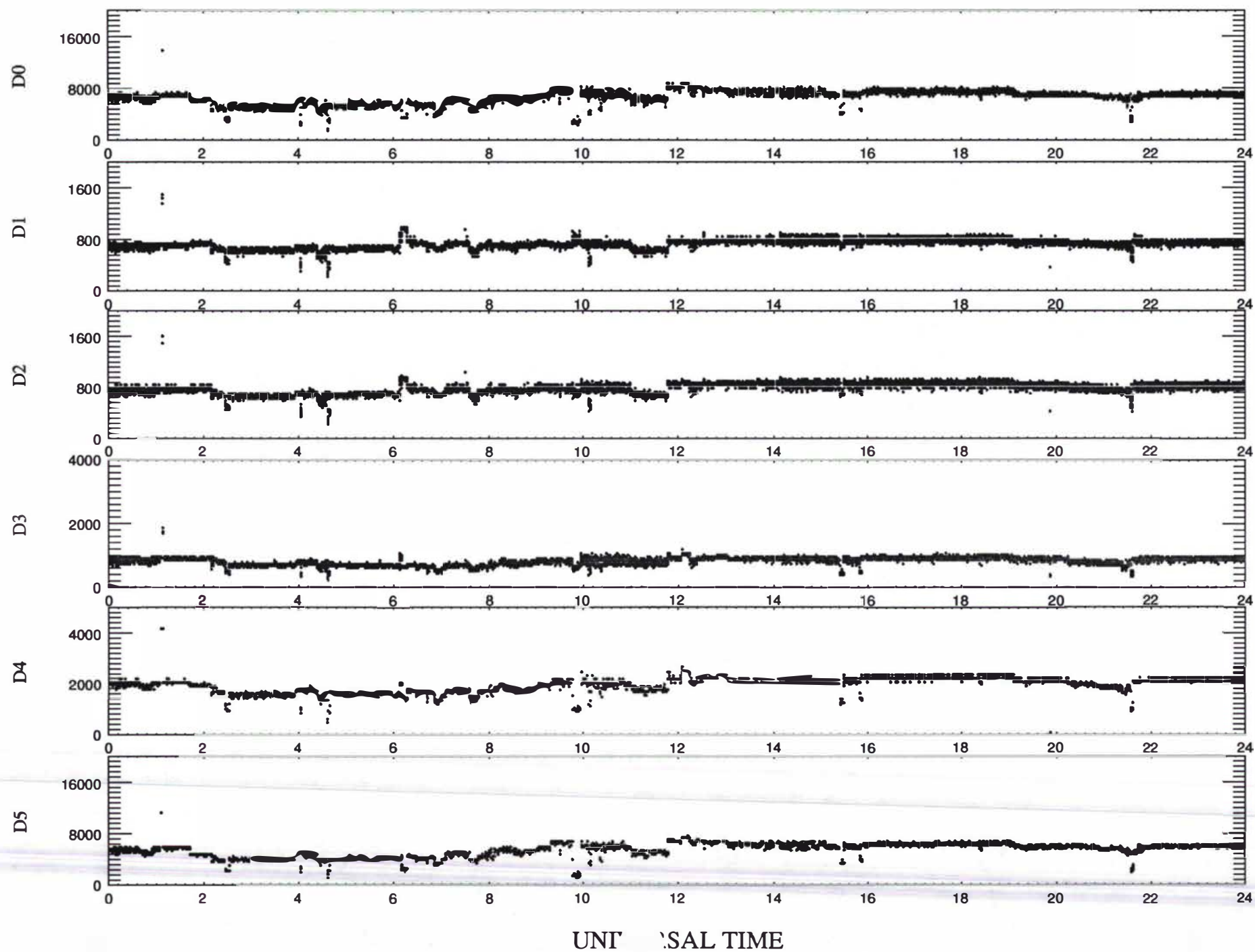
Burst Counter 3 at UT=23.475632108053 h=84512.276 s 23:28:32.276



CALIBRATION DATA INCLUDED



UNITS



2 6 / 9 / 9 5

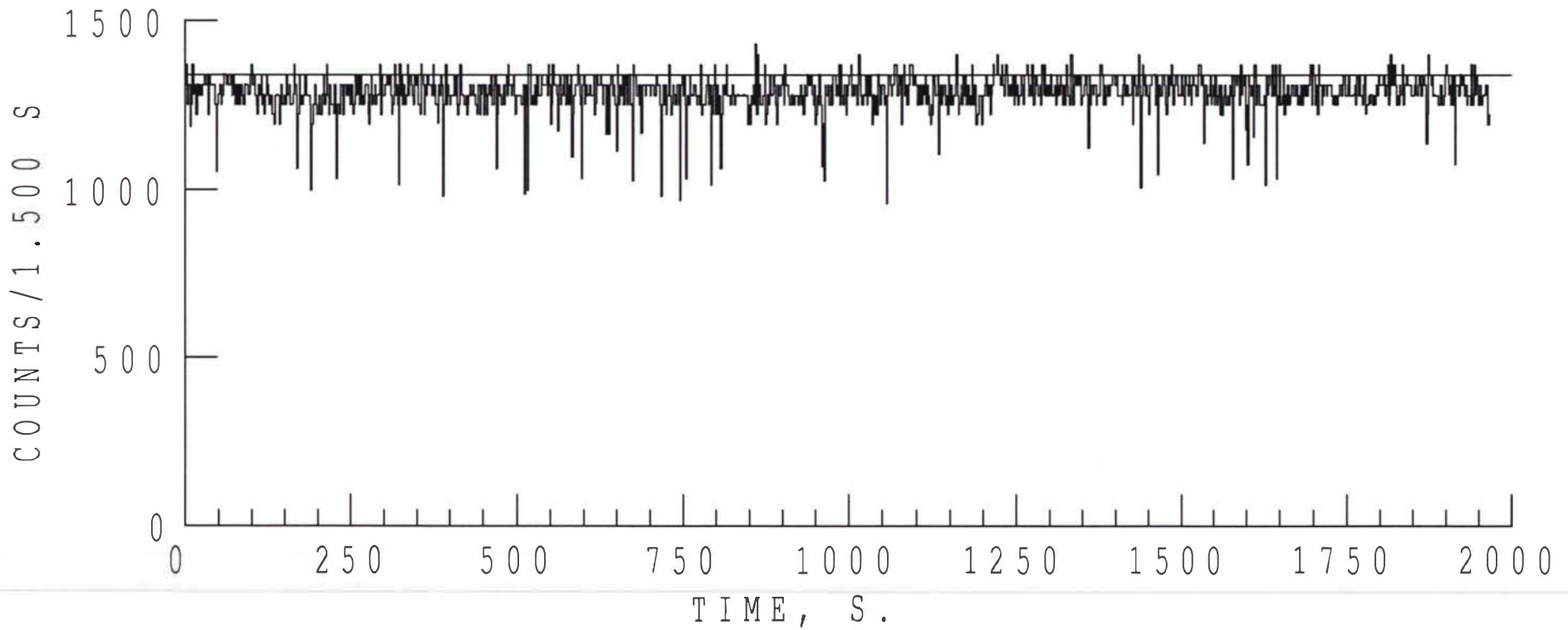
ULYSSES RT

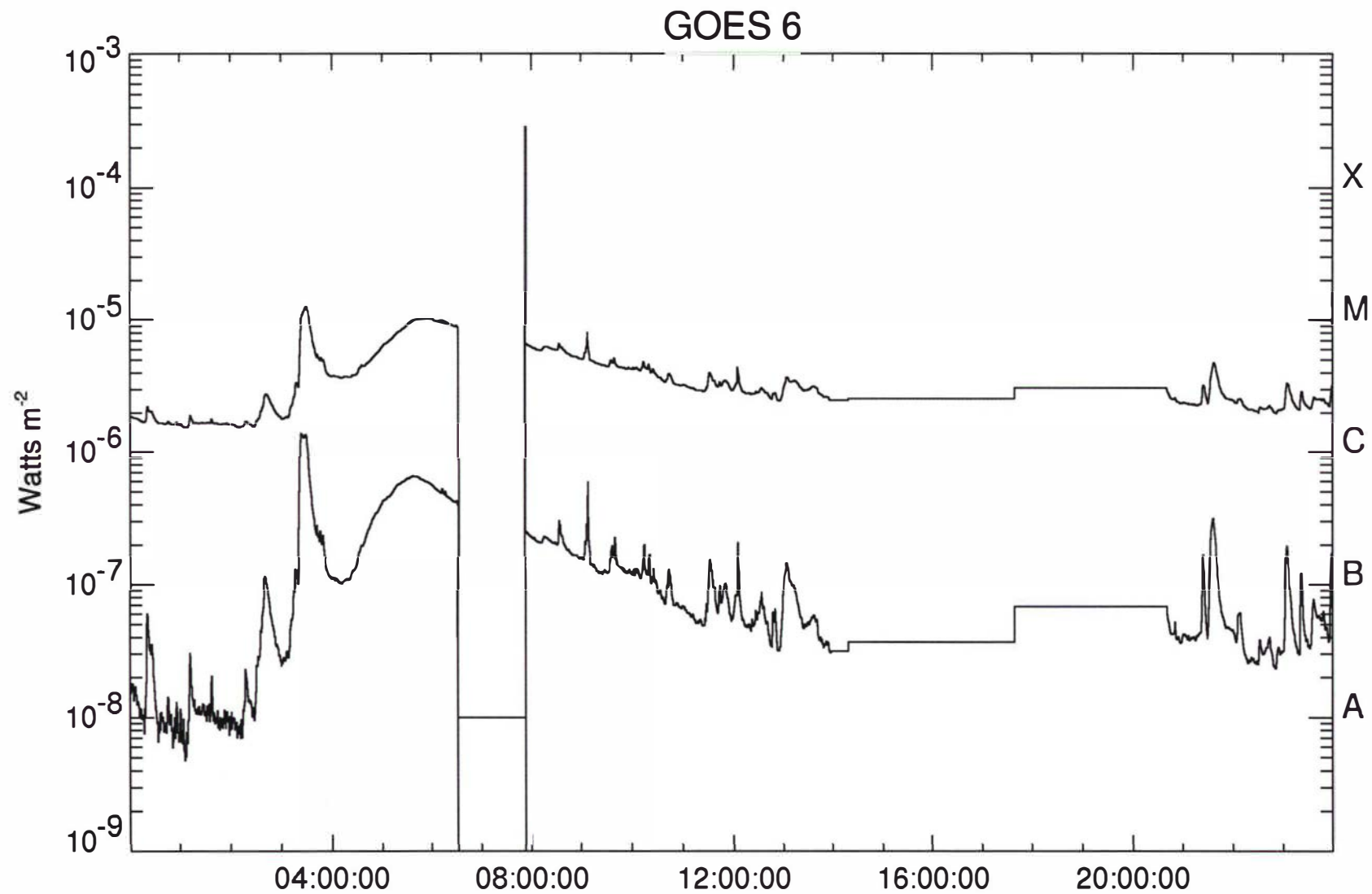
30 / 3 / 91 69312.344 s

0.500 S INTERVALS REGROUPED BY 3

0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS





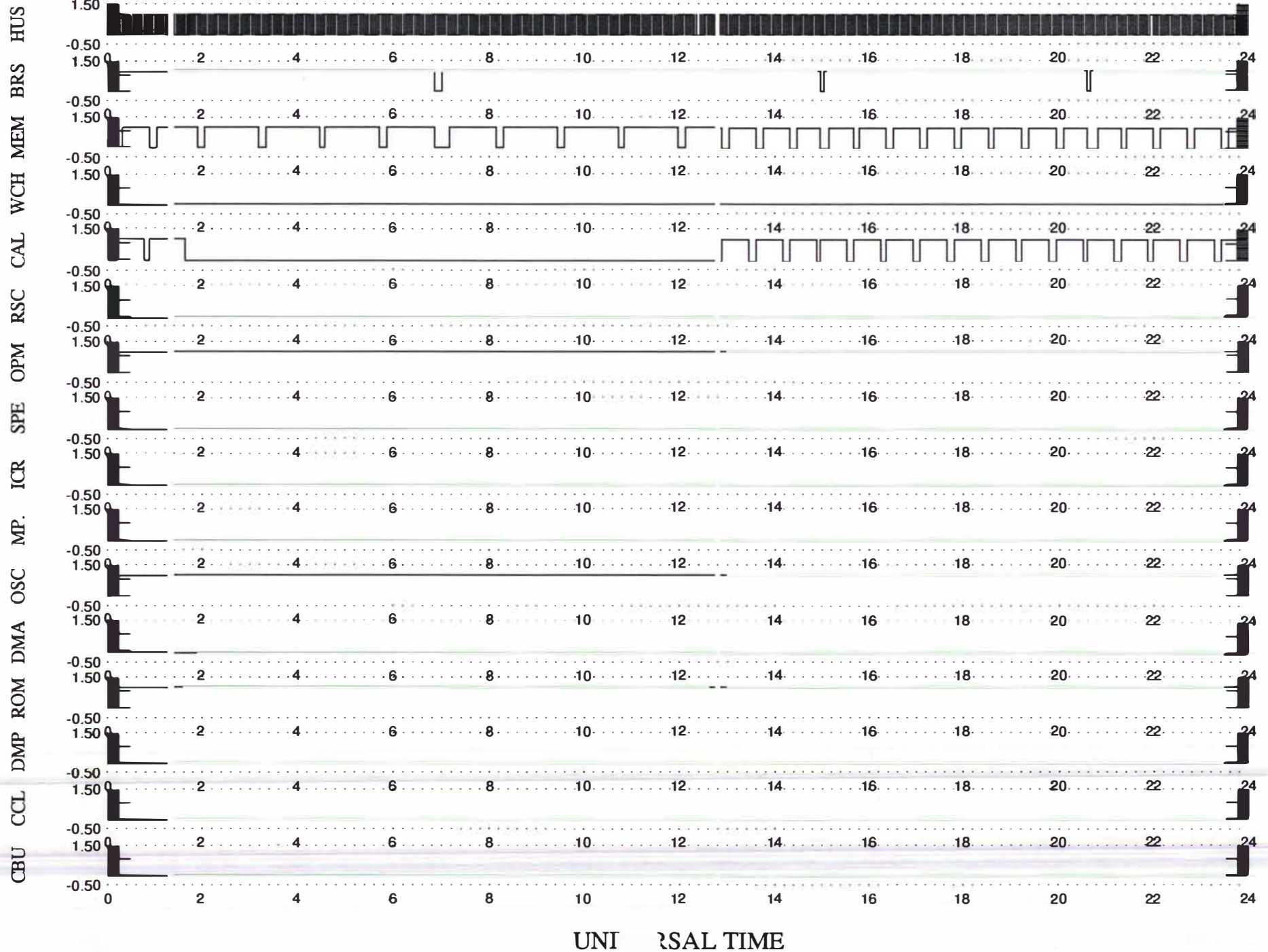
Data Start: 91/03/30, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
2 (0.5 - 4.0 Angstroms)

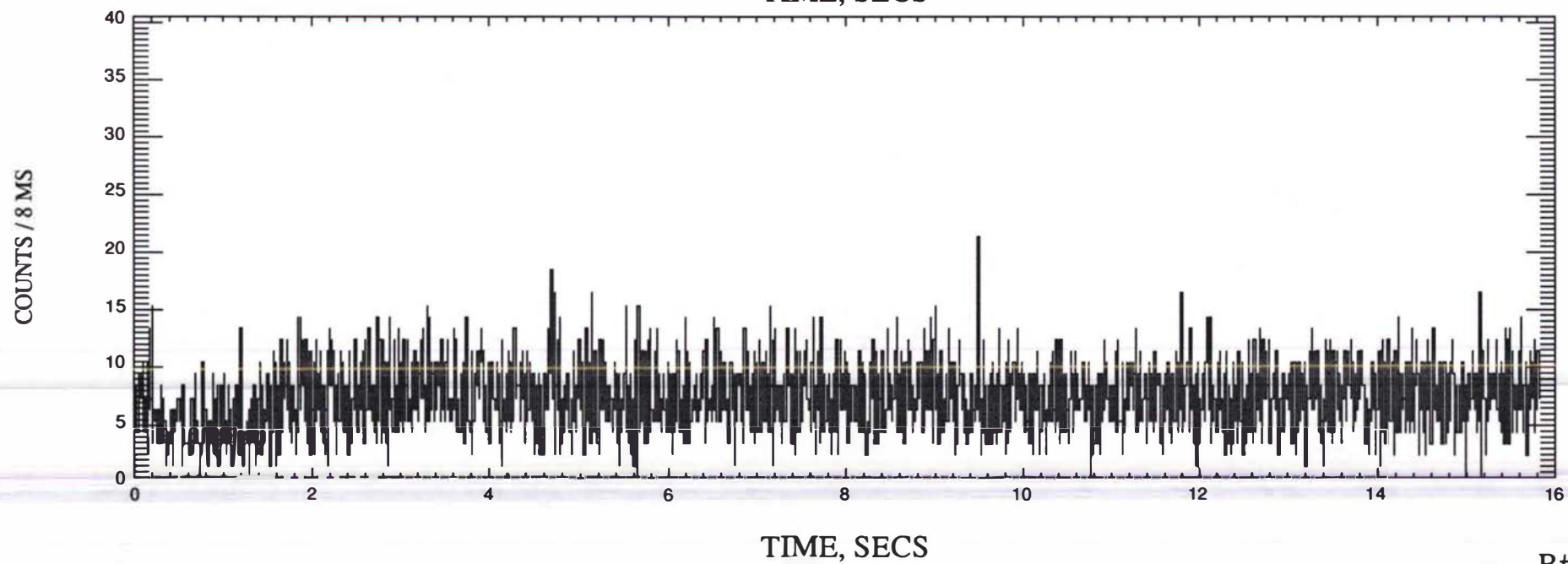
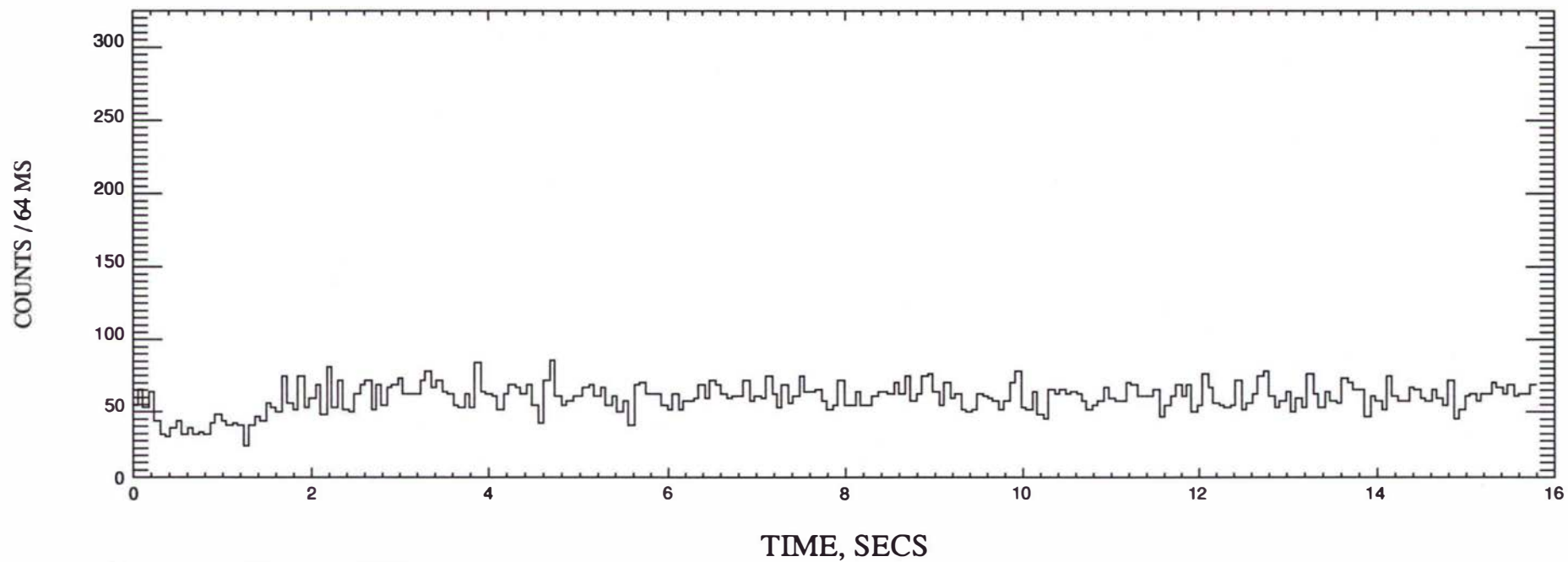
Plot created: 96/11/26, 1923

Background not subtracted
Background not subtracted
Sample average = 10

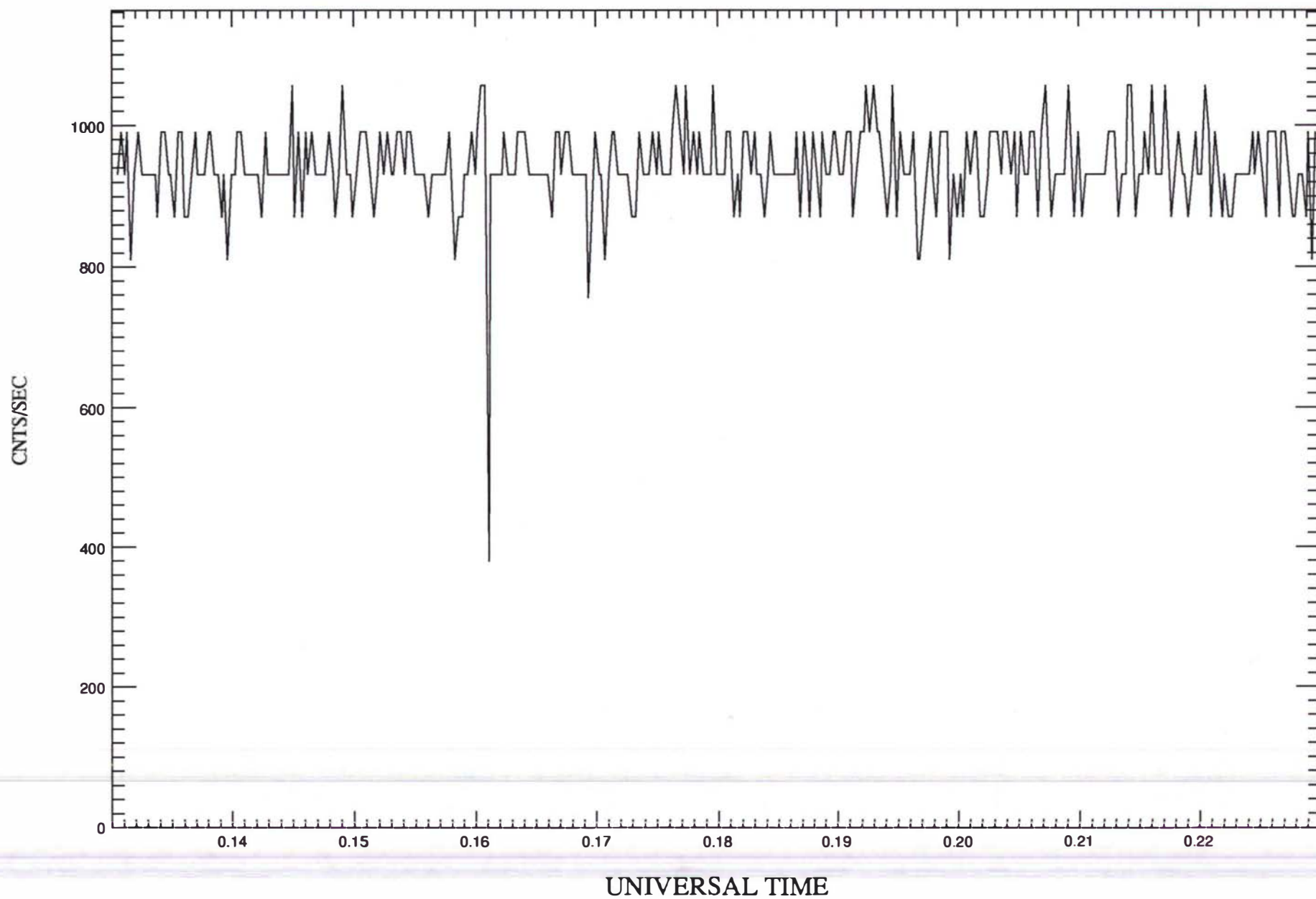
BURST NUMBER 4 - 15, 0 - 14



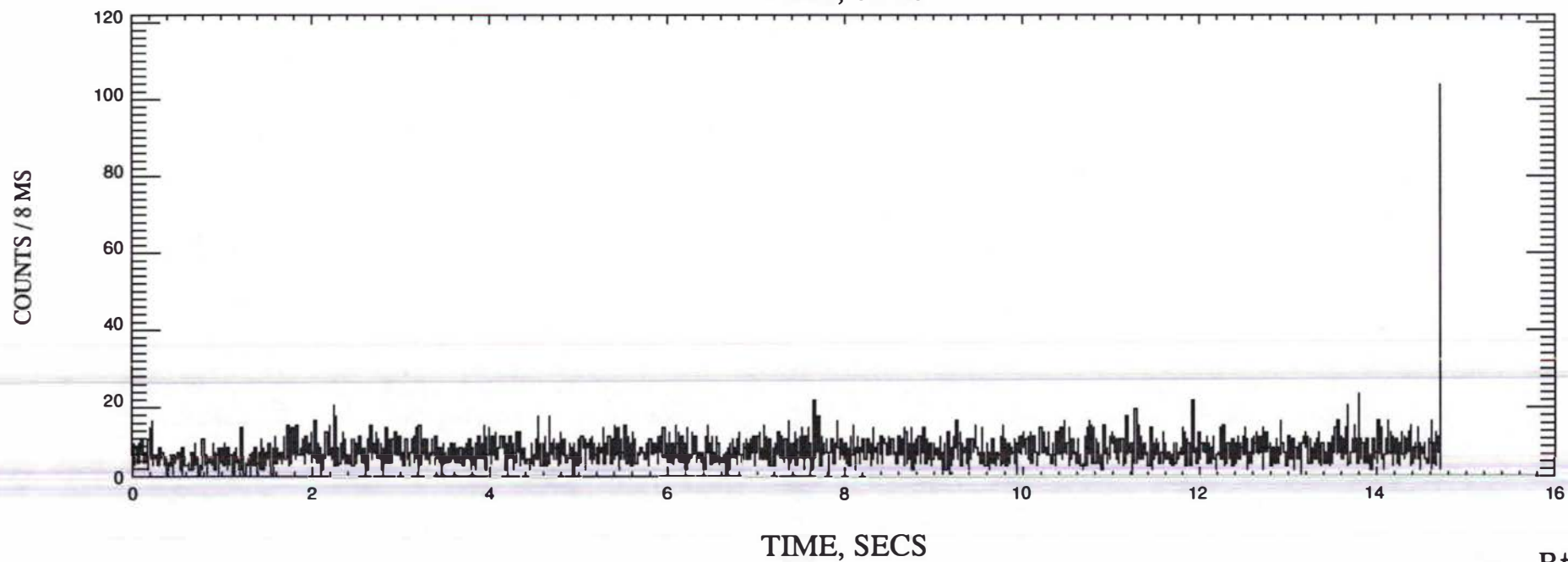
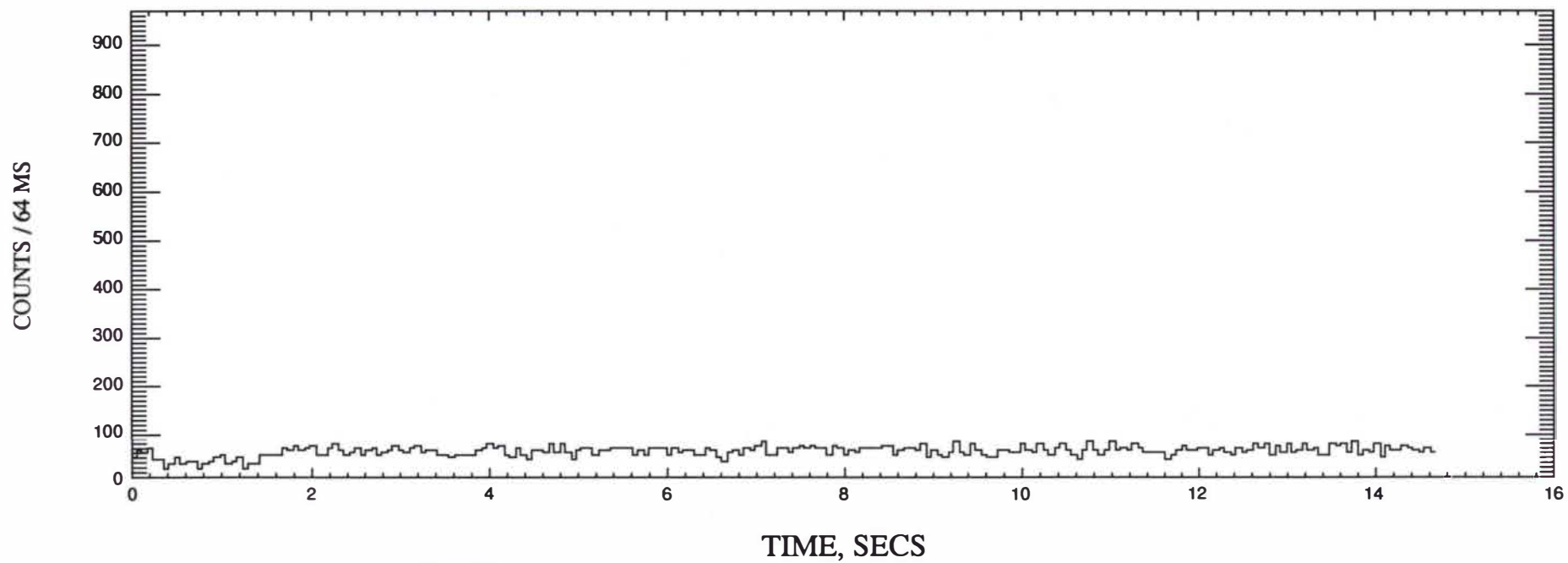
Burst Counter 4 at UT= 0.177873675028 h= 640.345 s 00:10:40.345



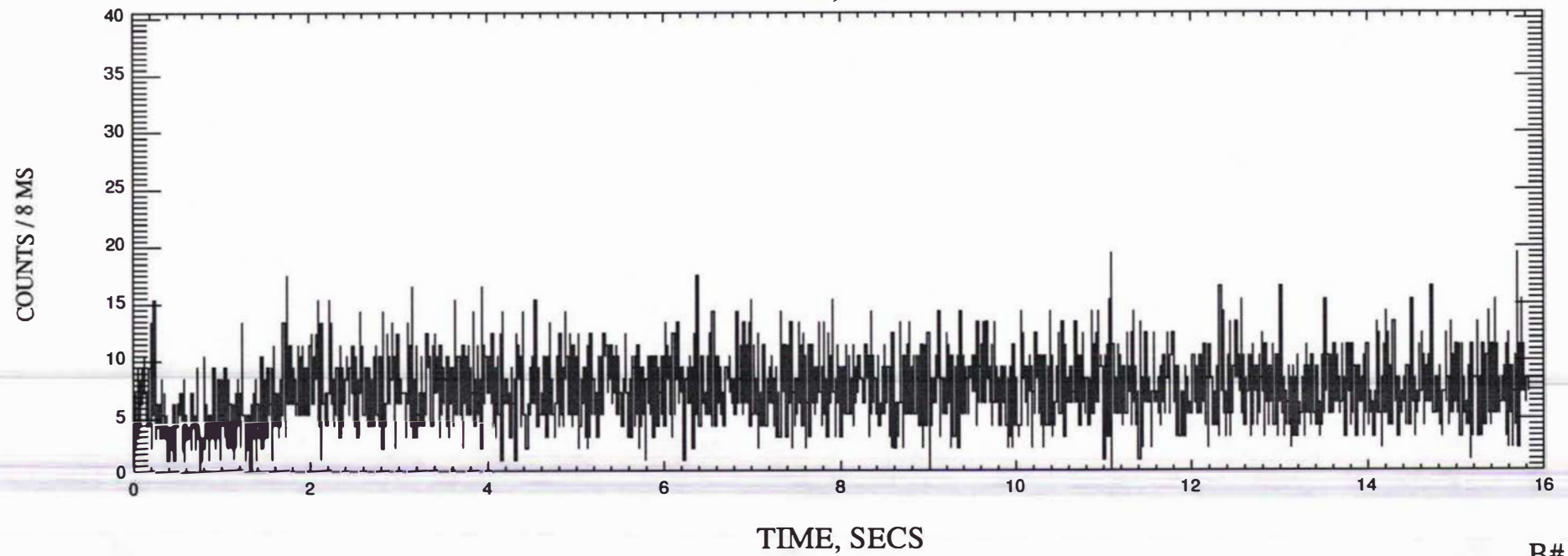
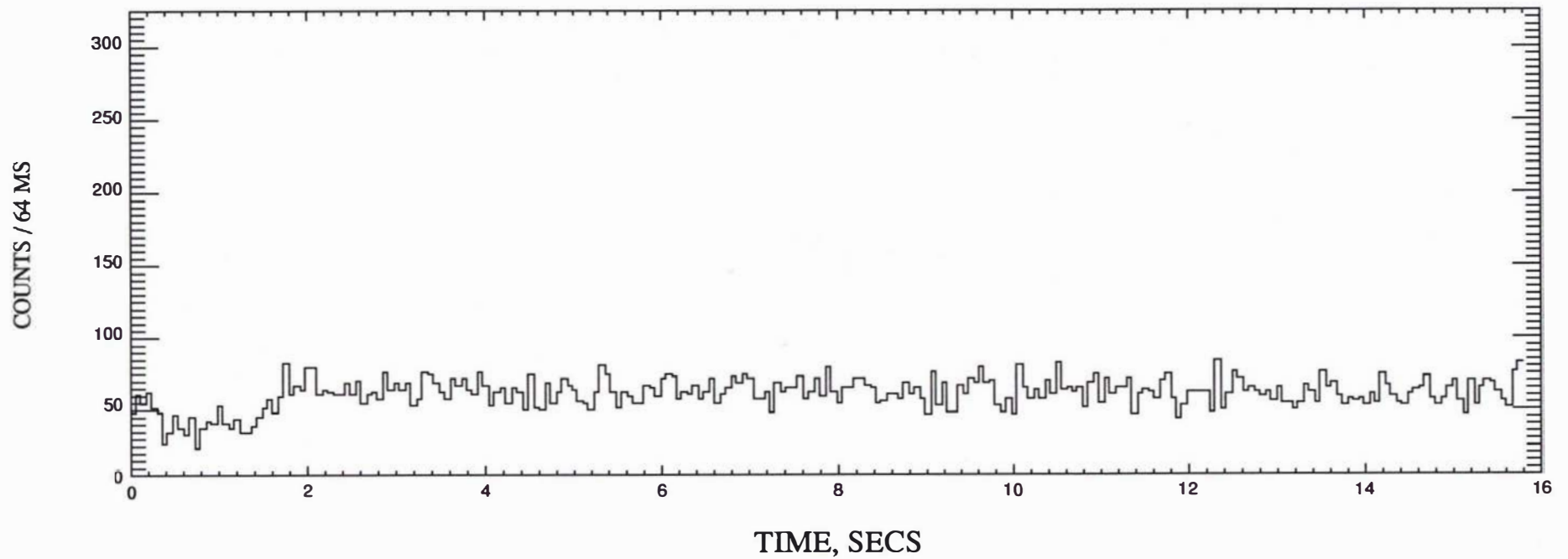
CALIBRATION DATA INCLUDED



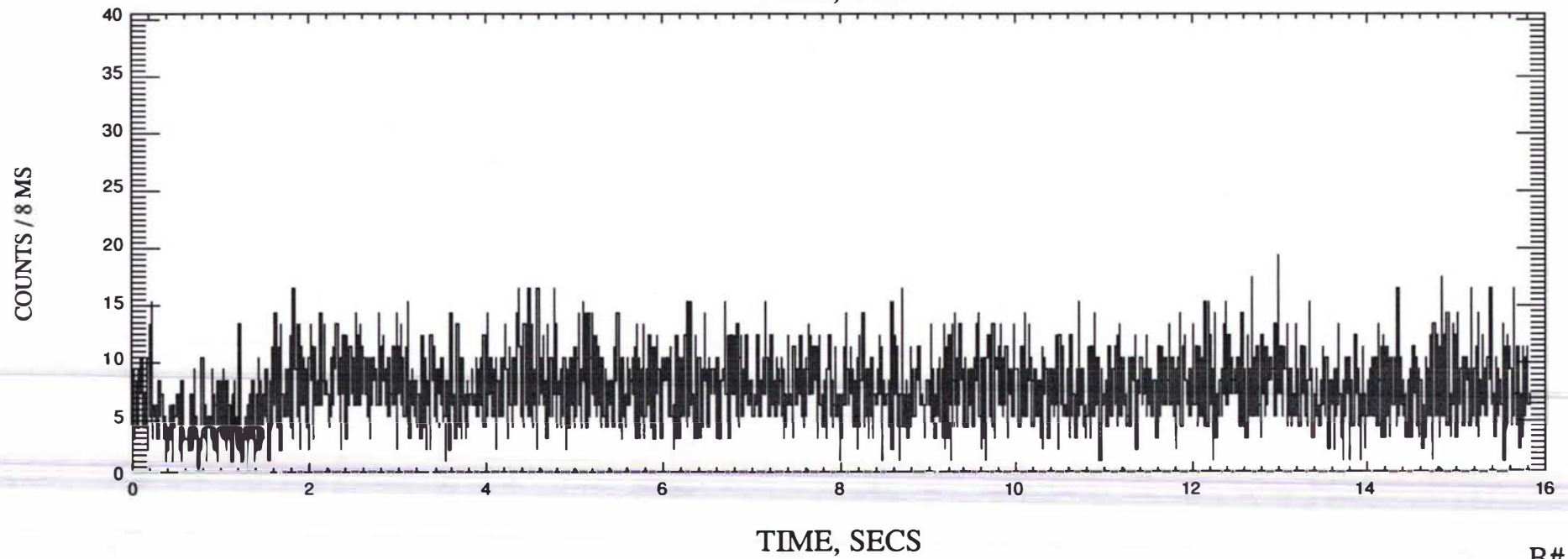
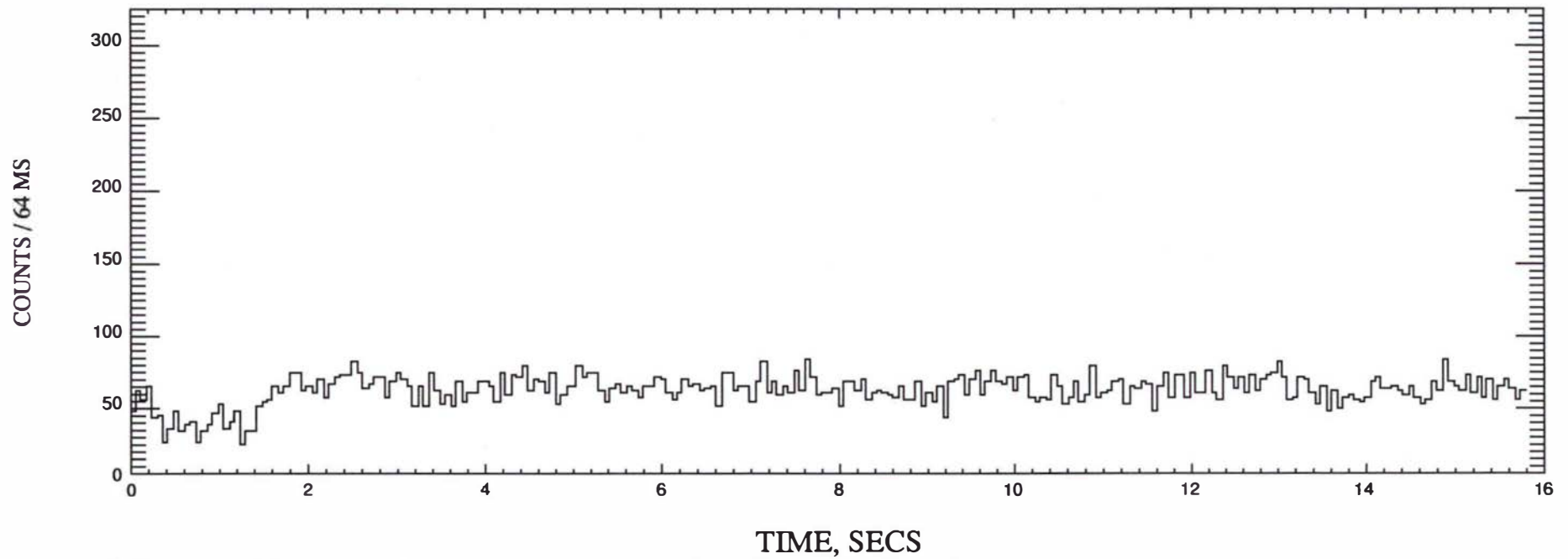
Burst Counter 5 at UT= 0.880102221171 h= 3168.368 s 00:52:48.368



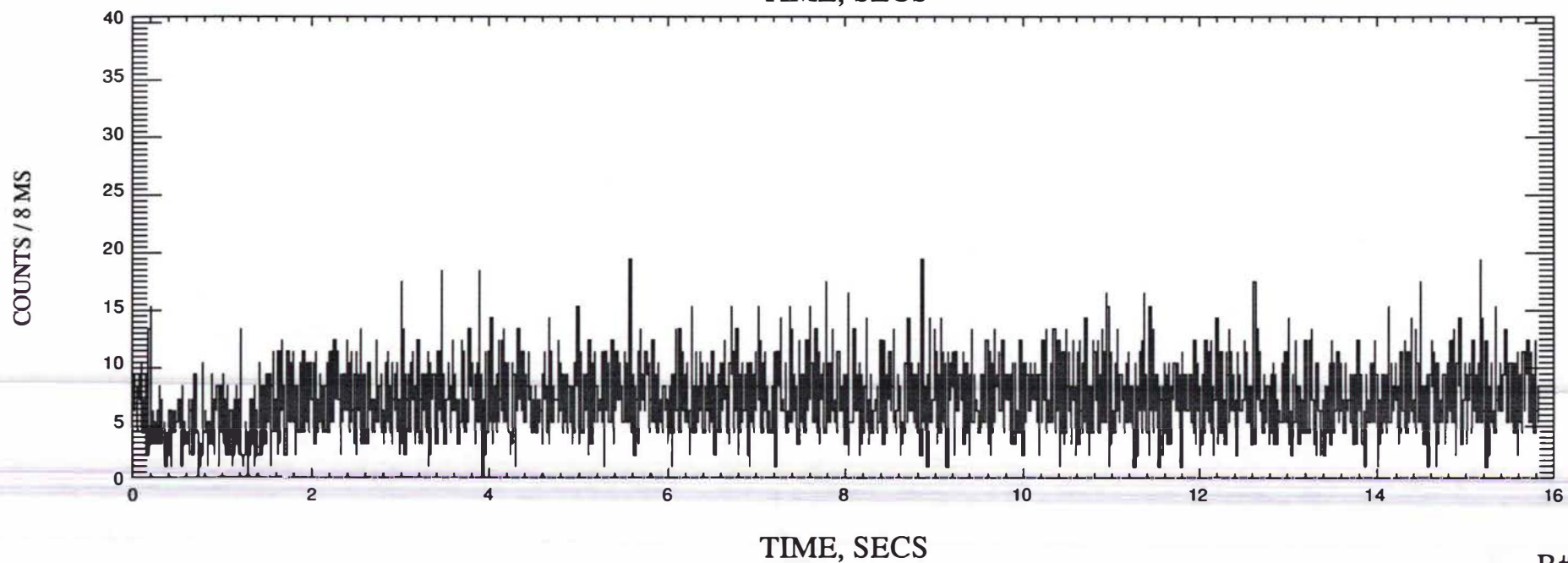
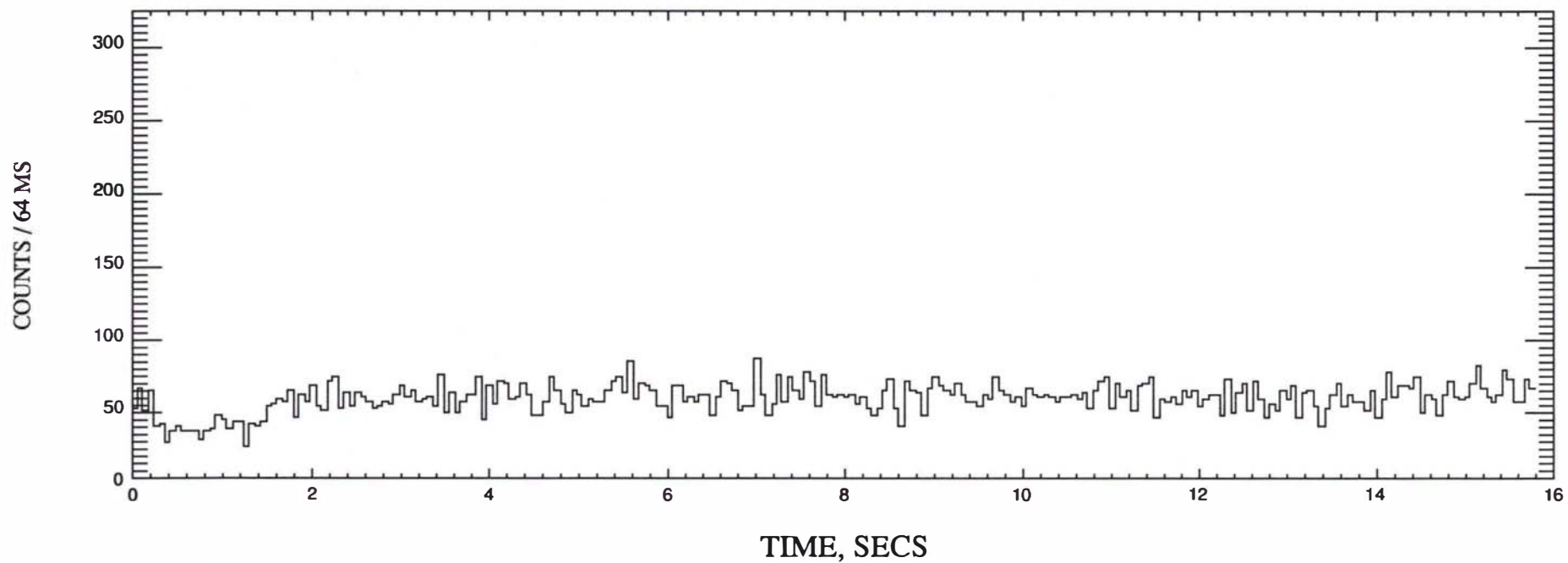
Burst Counter 6 at UT= 1.849005627102 h= 6656.420 s 01:50:56.420



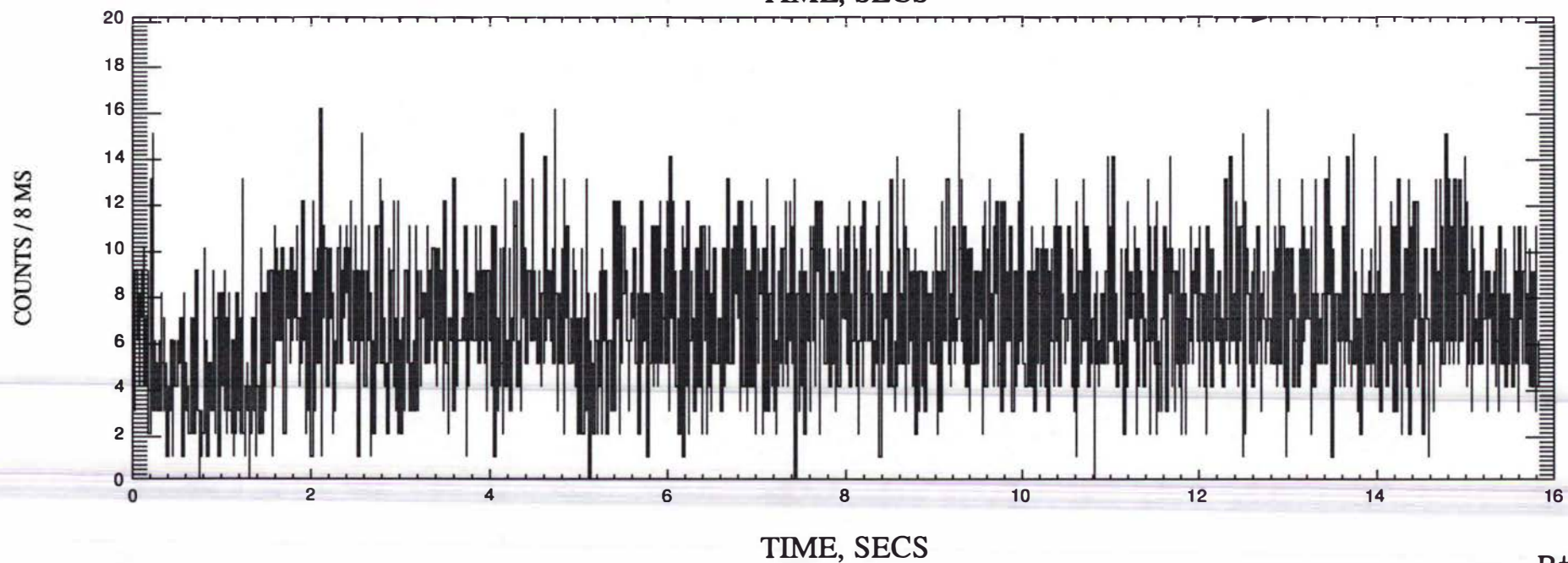
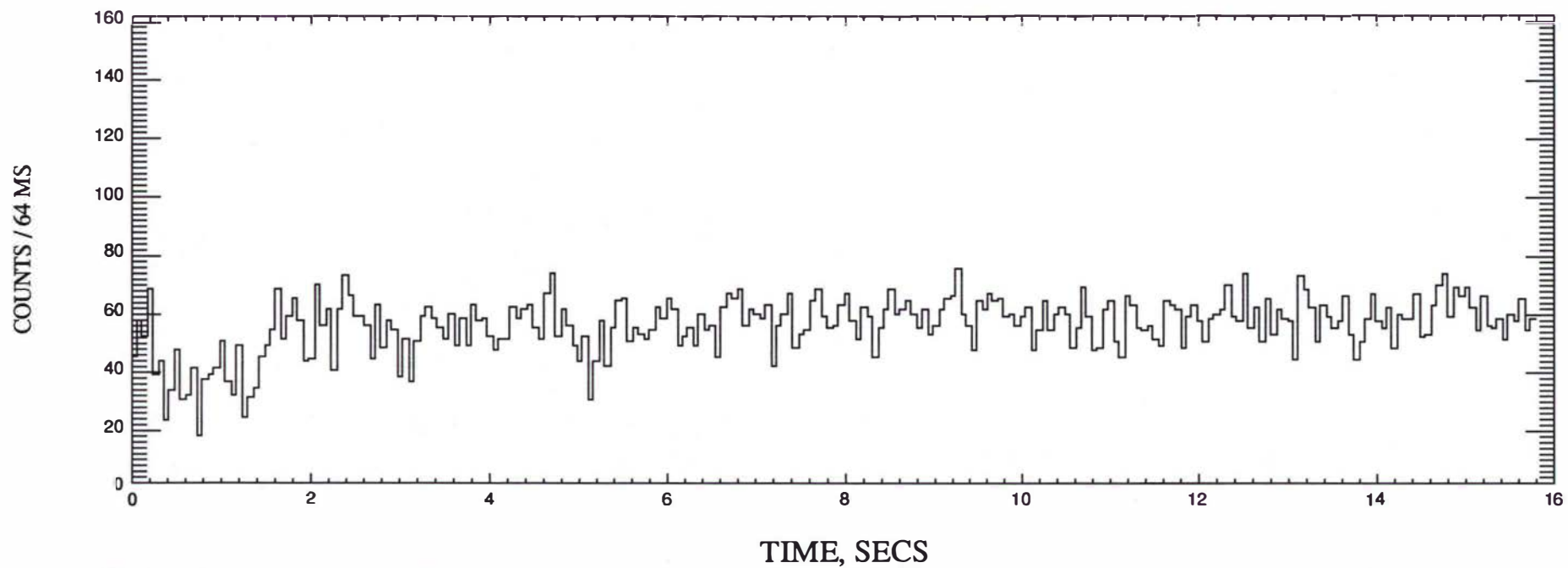
Burst Counter 7 at UT= 3.111253123813 h=11200.511 s 03:06:40.511



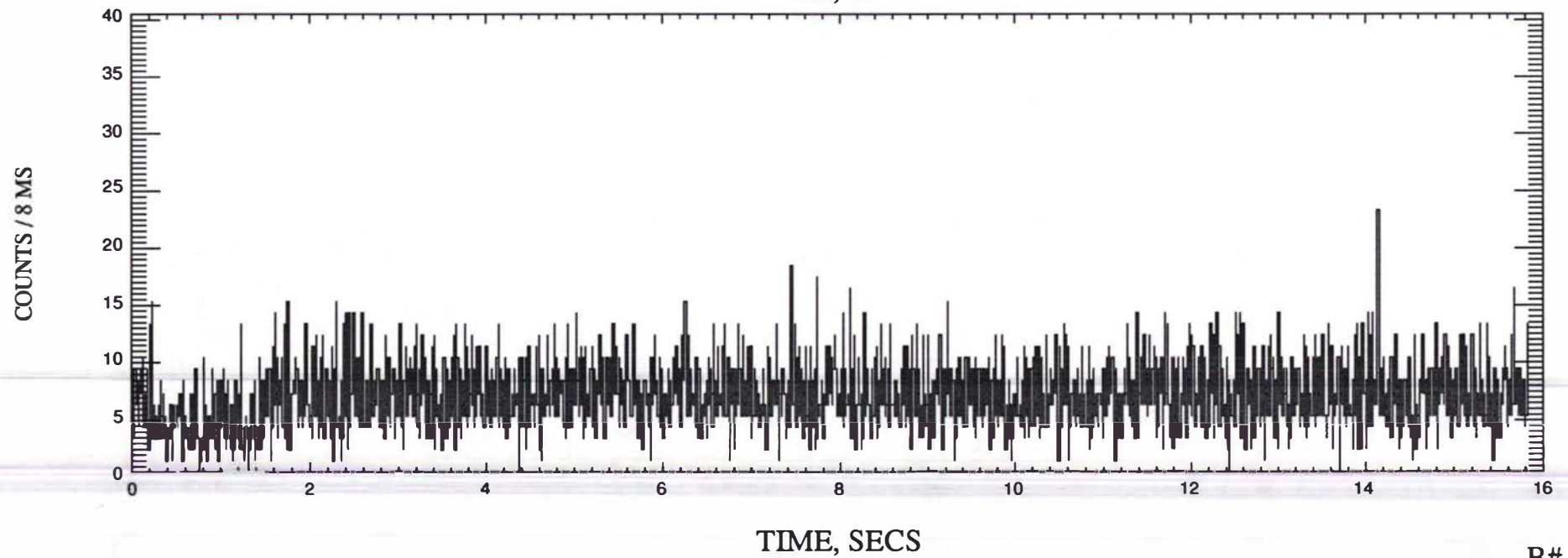
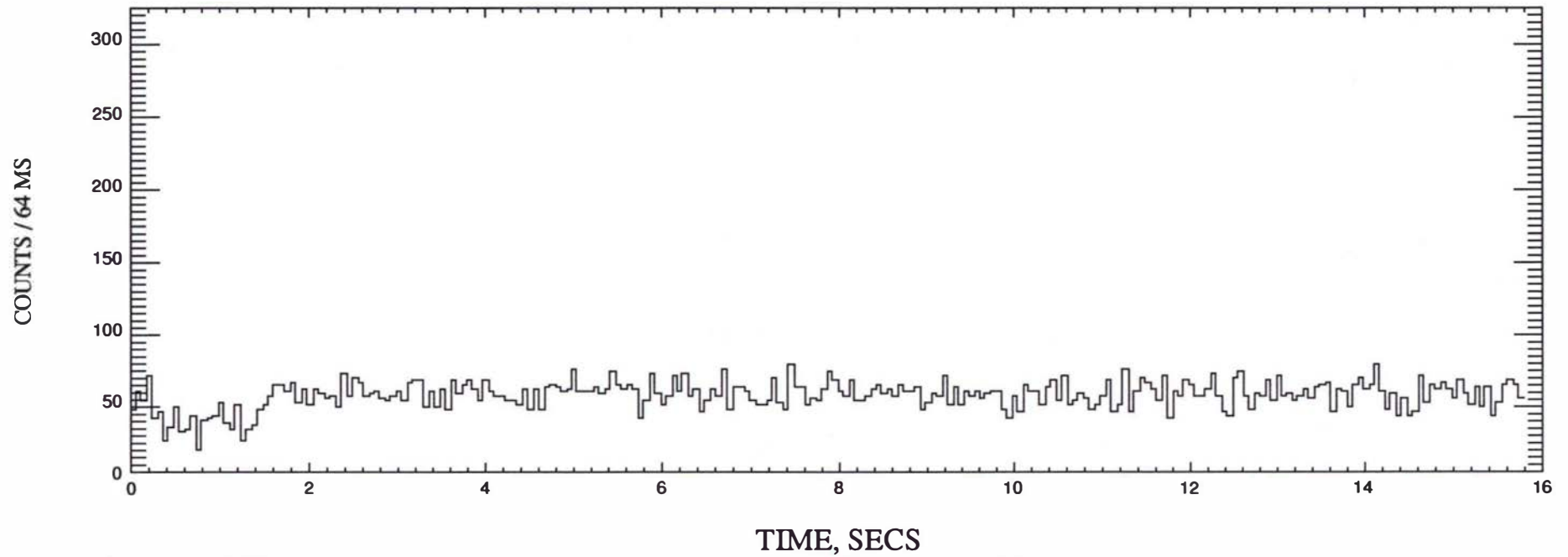
Burst Counter 8 at UT= 4.373502790663 h=15744.610 s 04:22:24.610



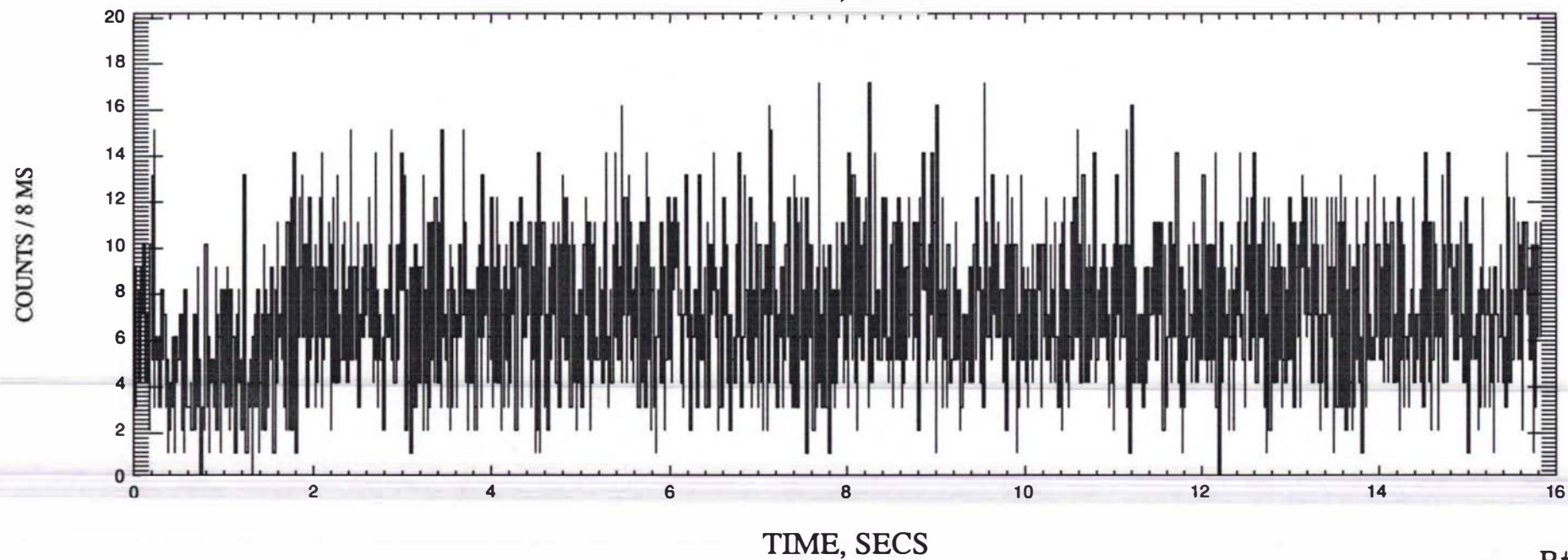
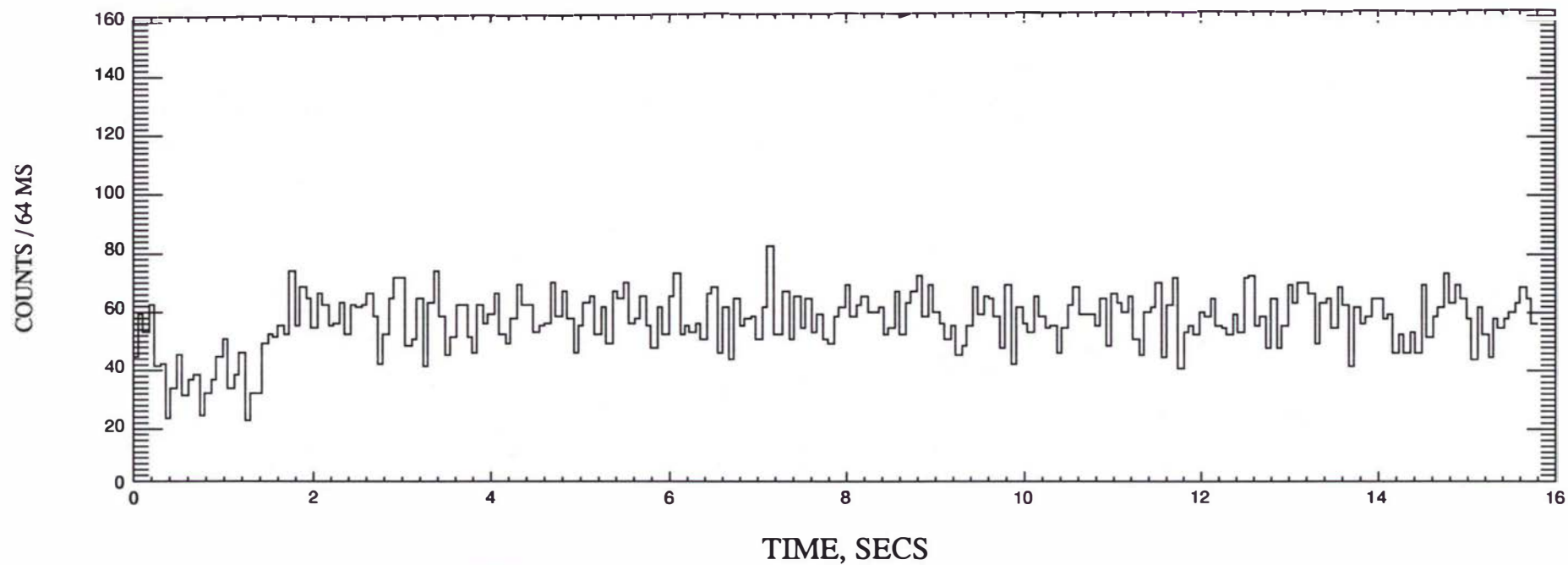
Burst Counter 9 at UT= 5.635741606818 h=20288.670 s 05:38:08.670



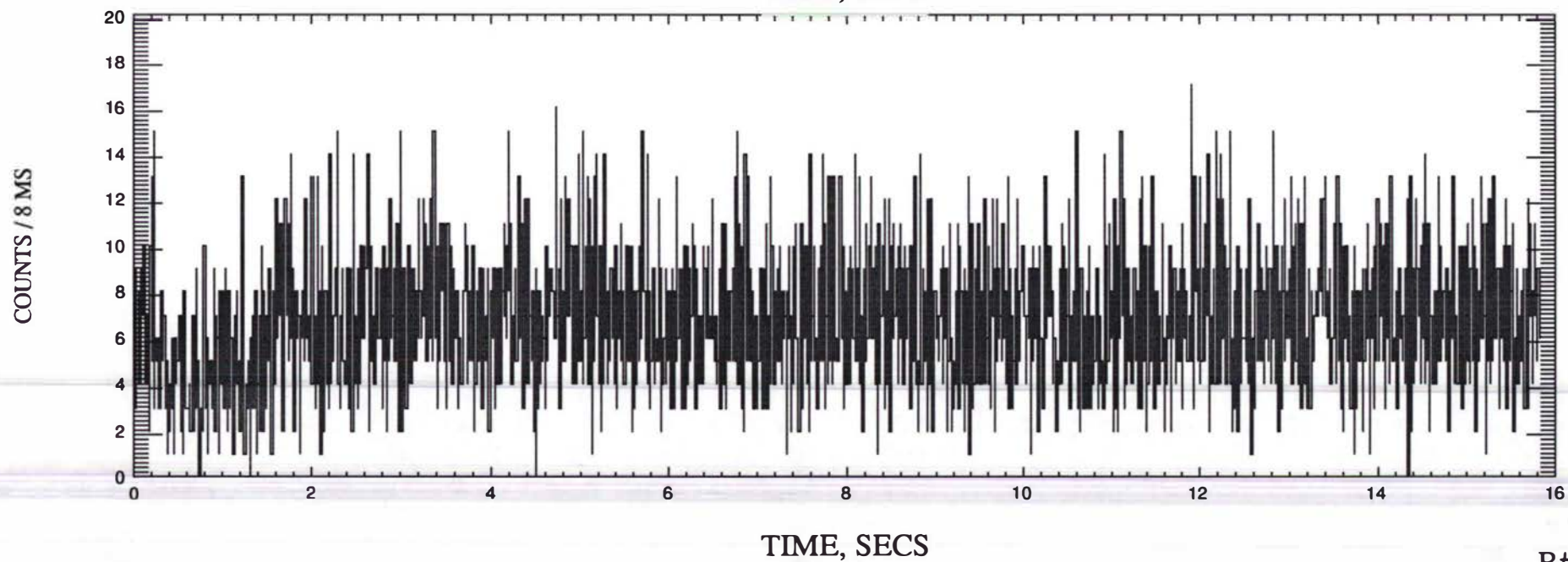
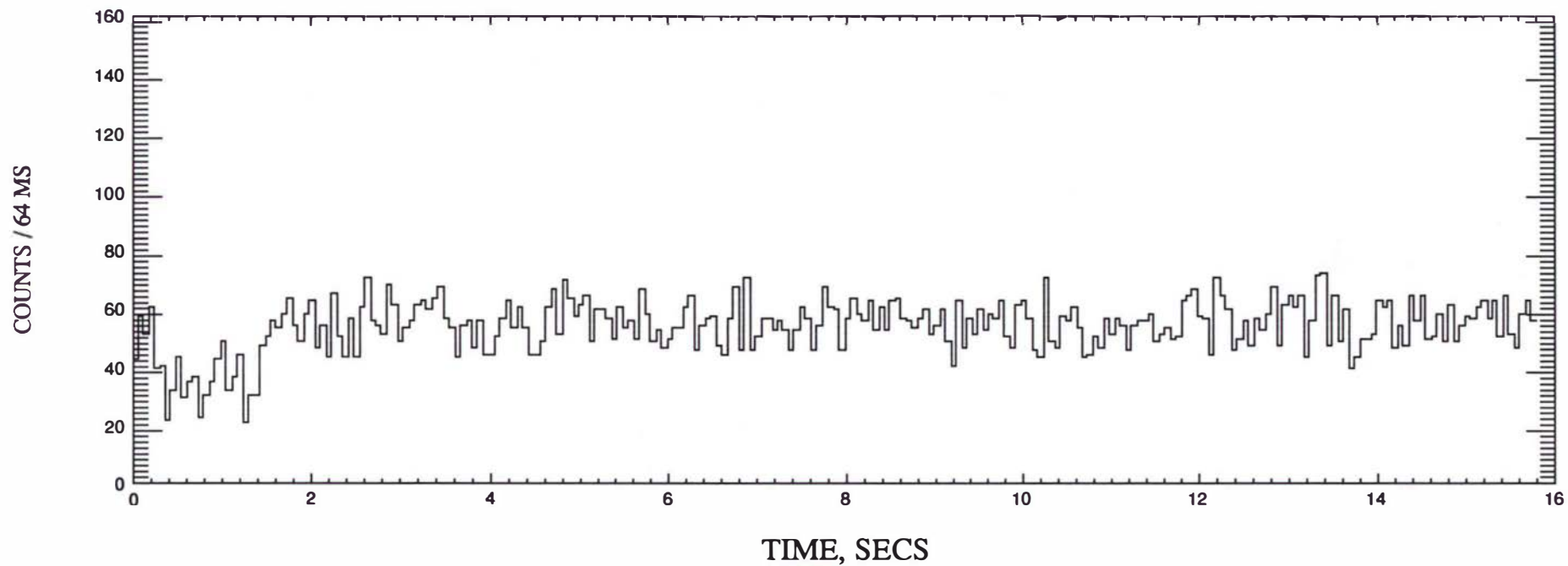
Burst Counter 10 at UT= 6.897986933390 h=24832.753 s 06:53:52.753



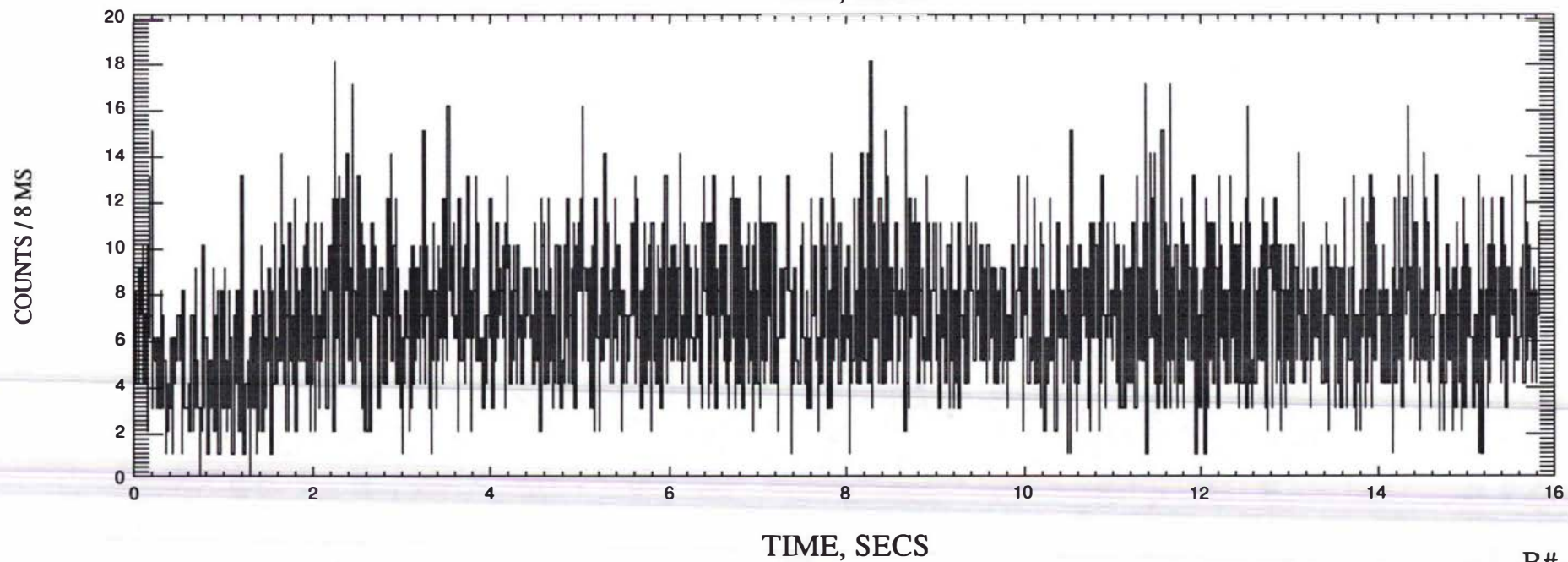
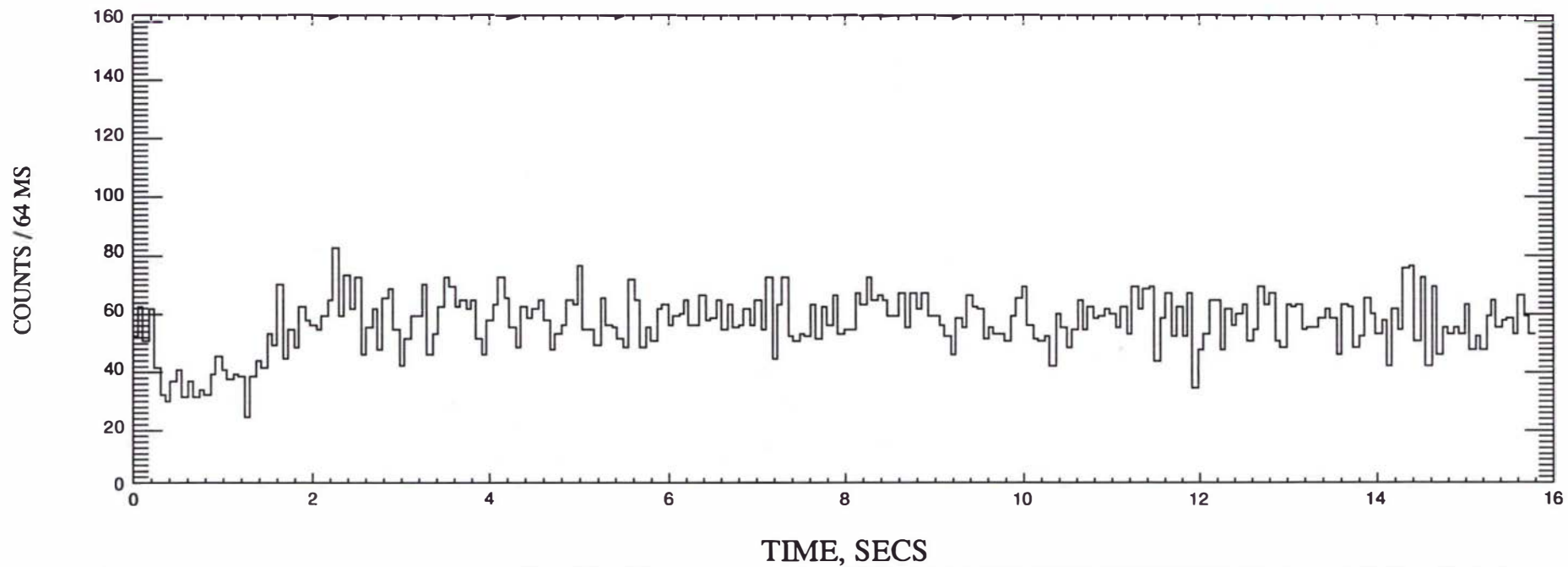
Burst Counter 11 at UT= 8.160231861538 h=29376.835 s 08:09:36.835



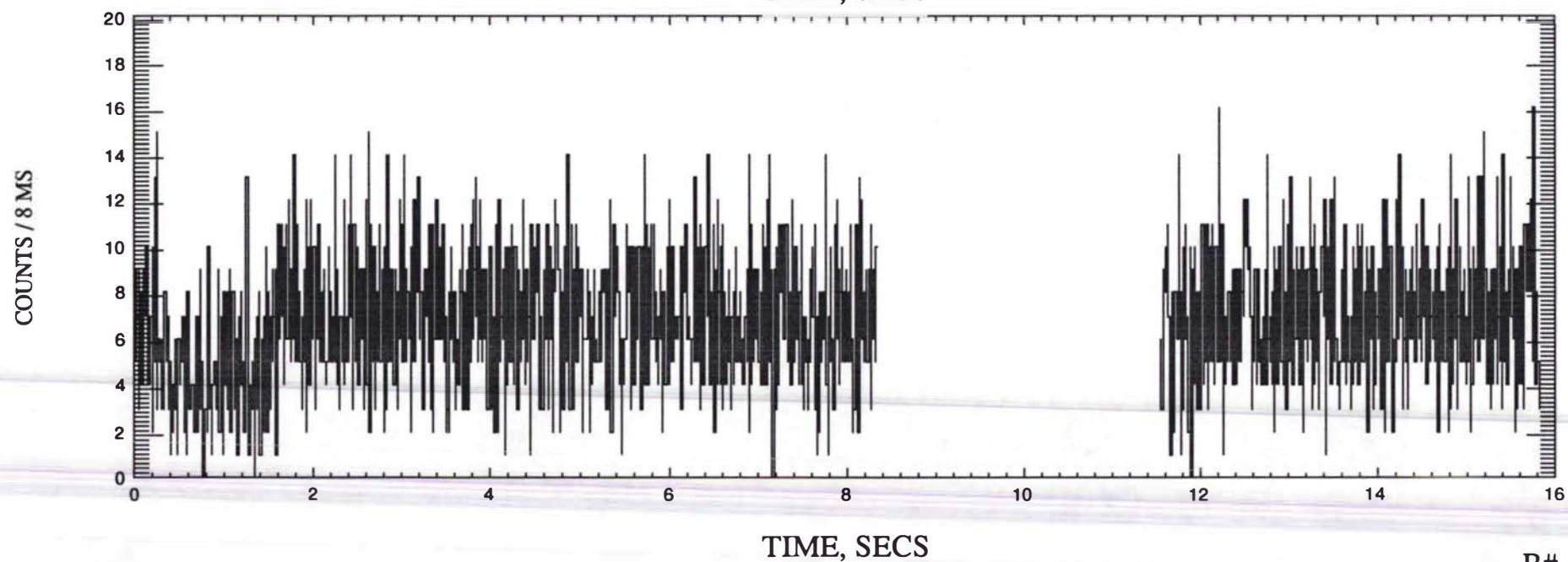
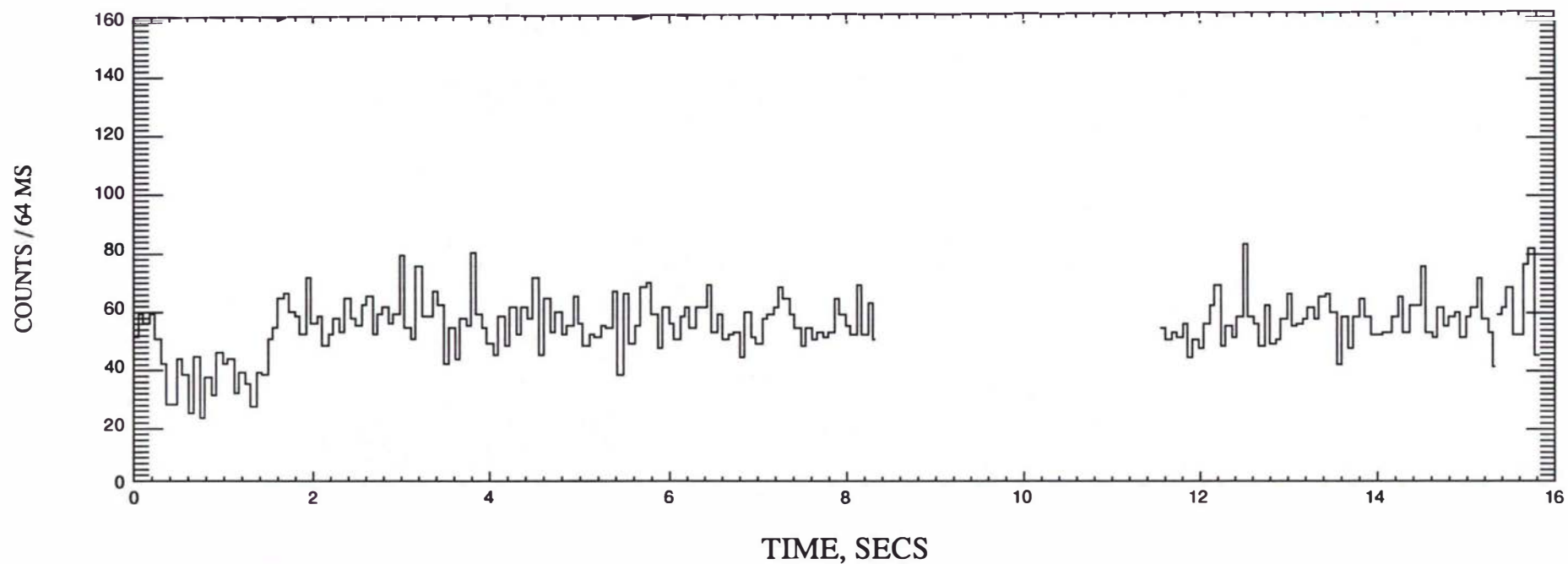
Burst Counter 12 at UT= 9.422477188110 h=33920.918 s 09:25:20.918



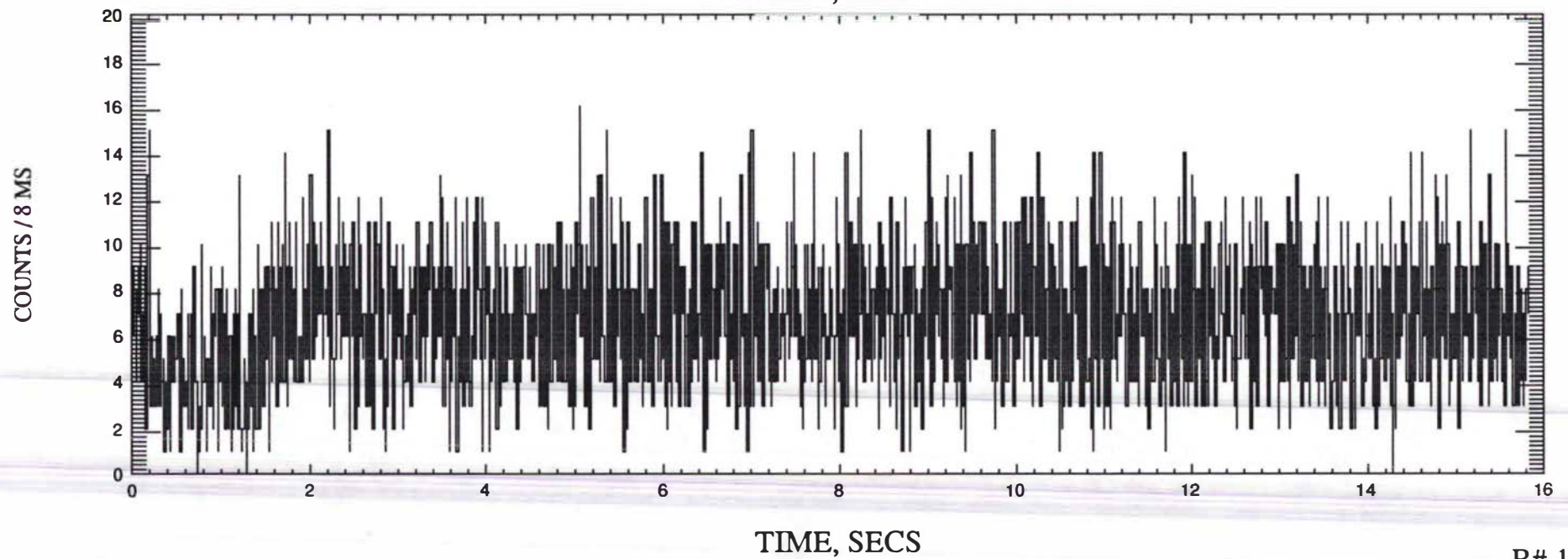
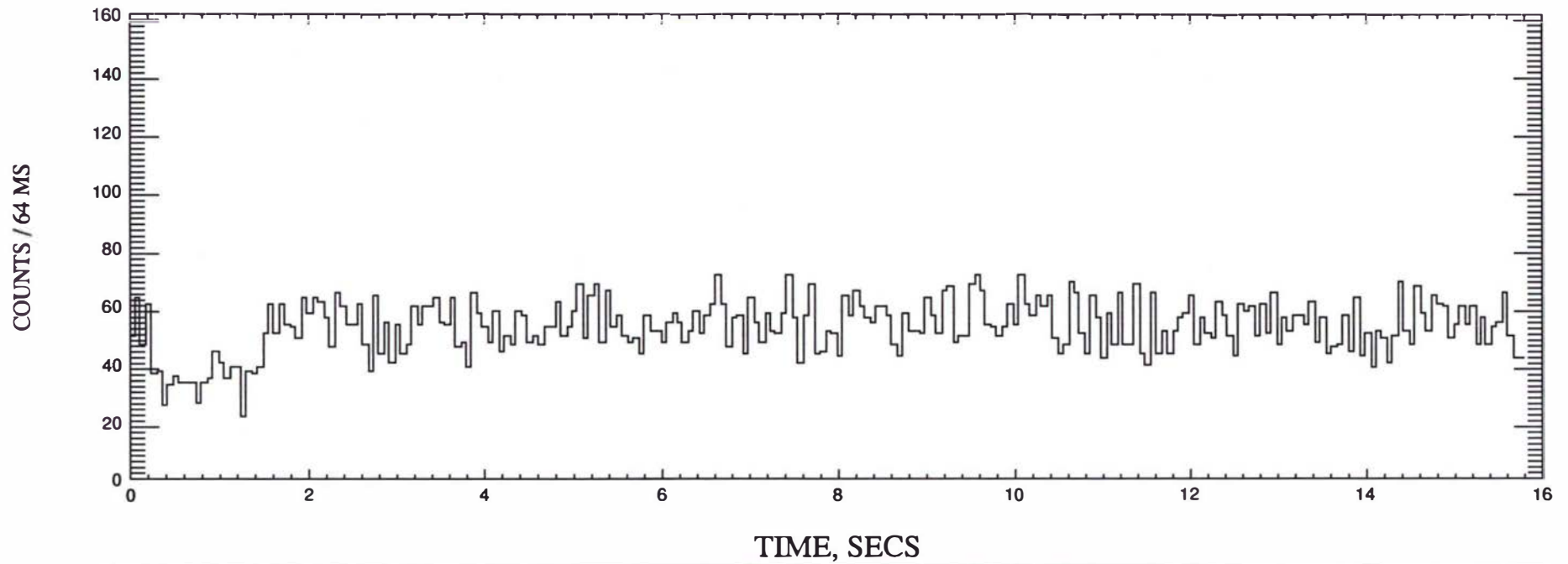
Burst Counter 13 at UT=10.684729025099 h=38465.024 s 10:41:05.024



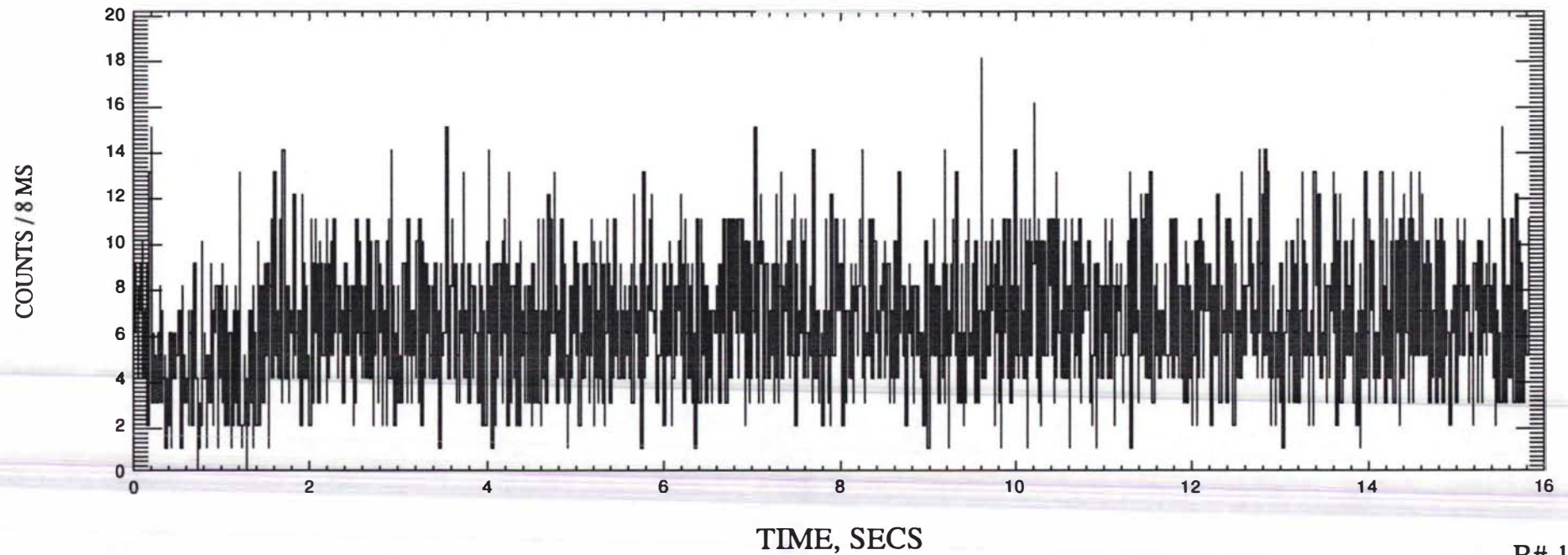
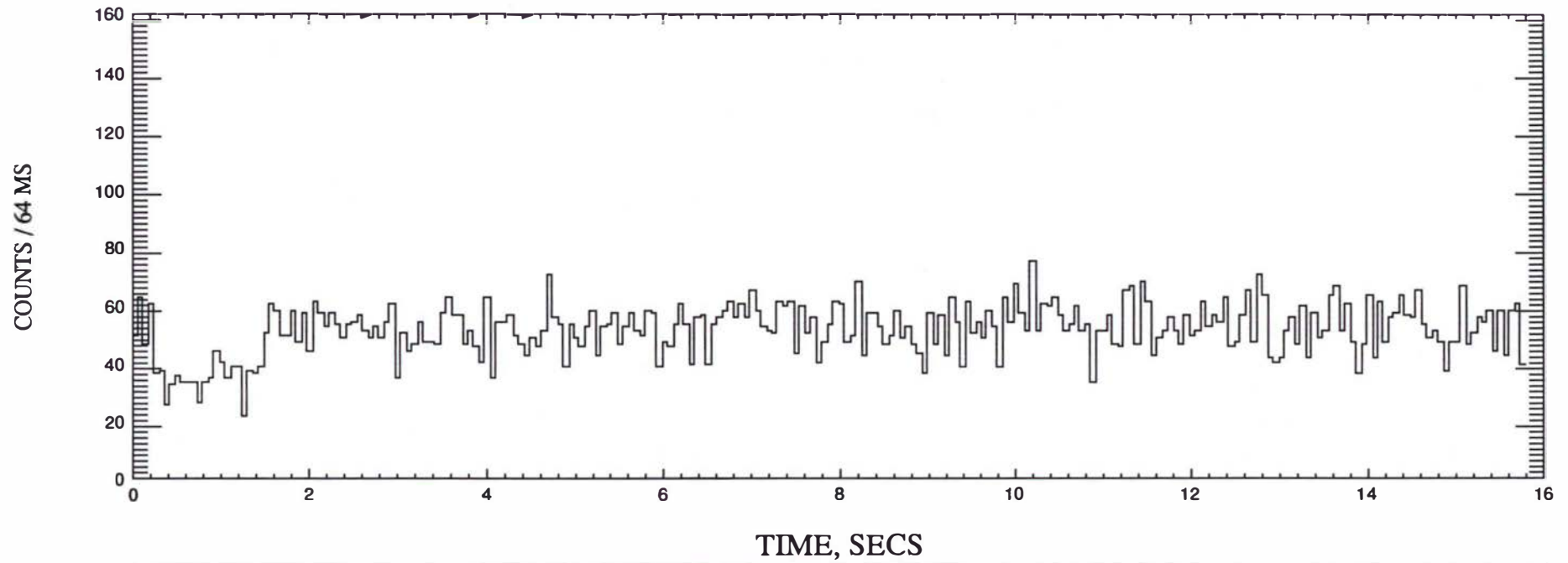
Burst Counter 14 at UT=11.946963500977 h=43009.069 s 11:56:49.069



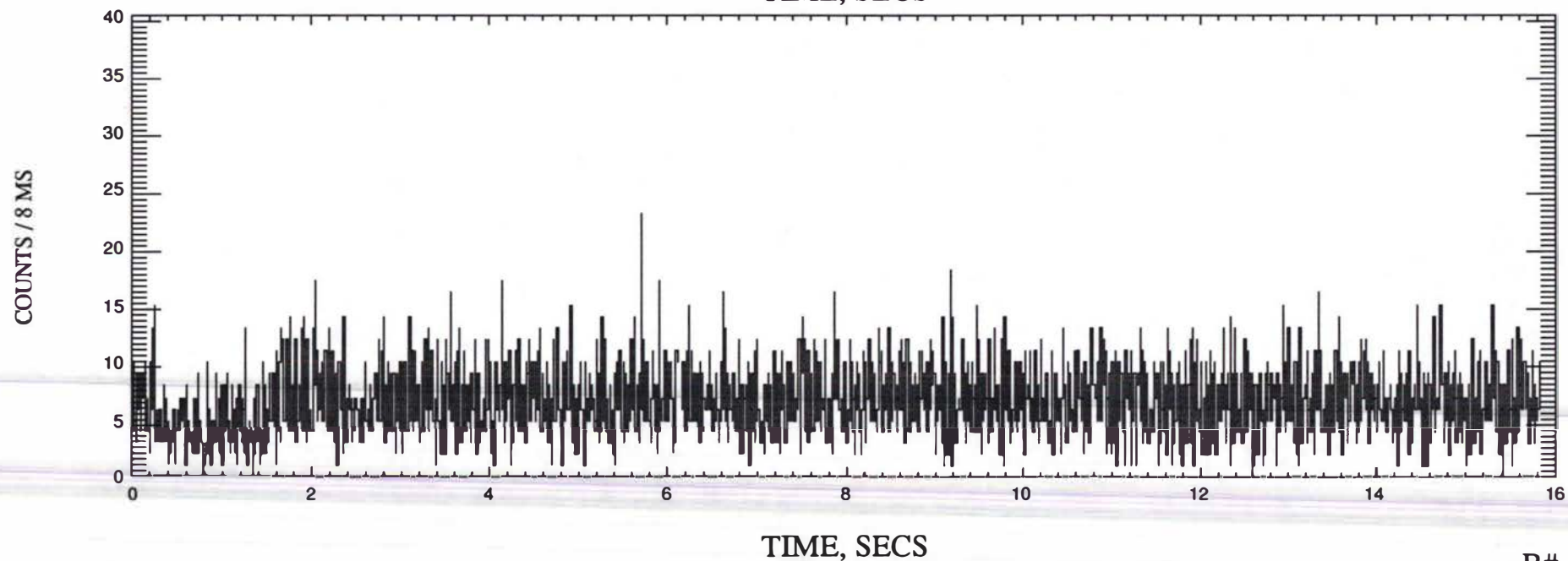
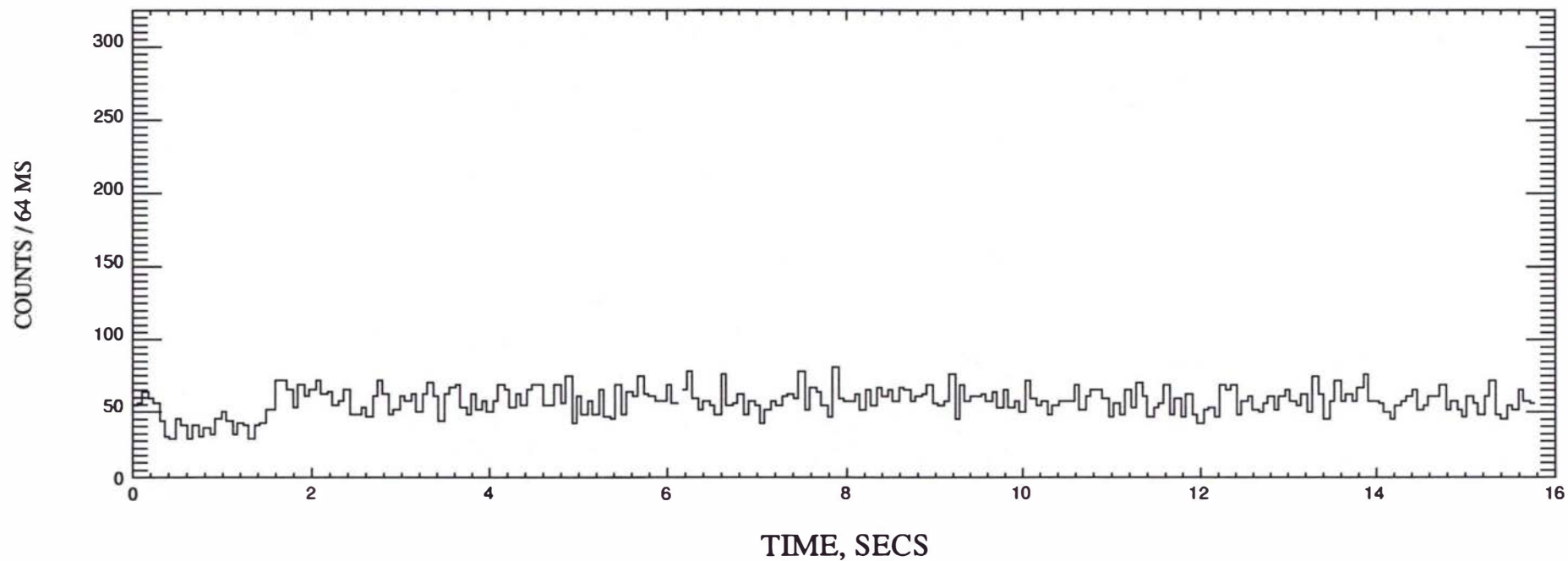
Burst Counter 15 at UT=12.738099657694 h=45857.159 s 12:44:17.159



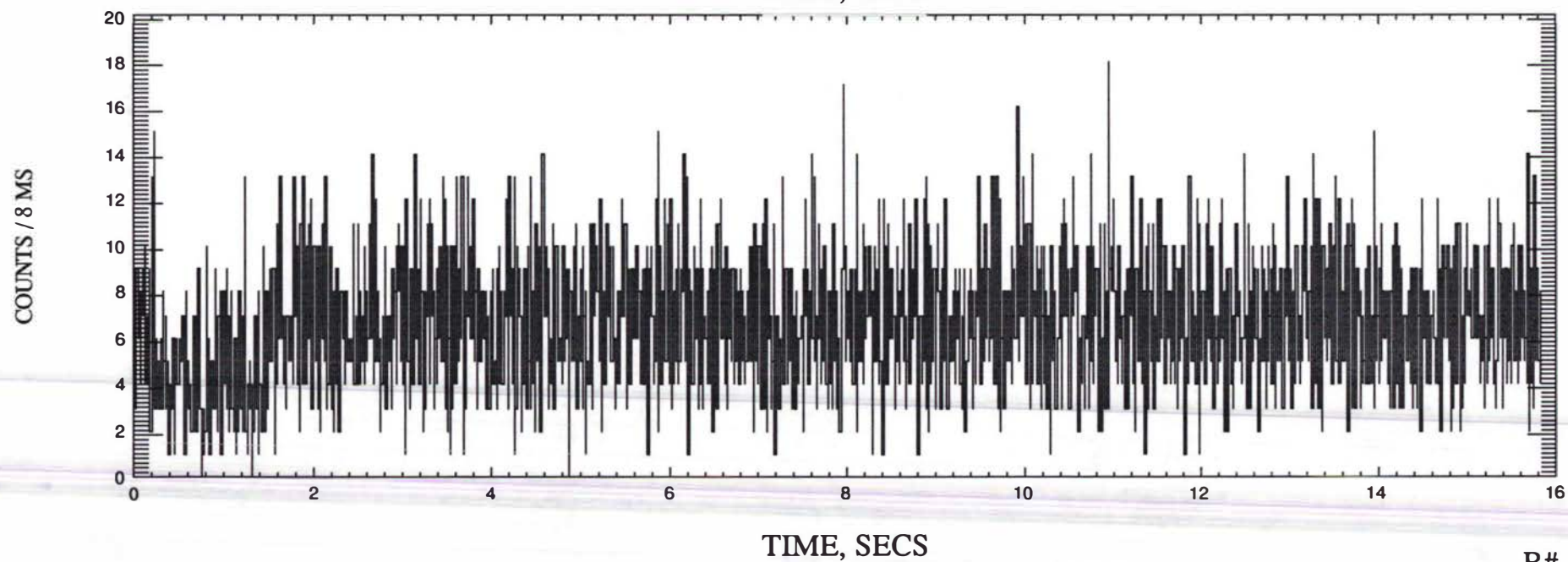
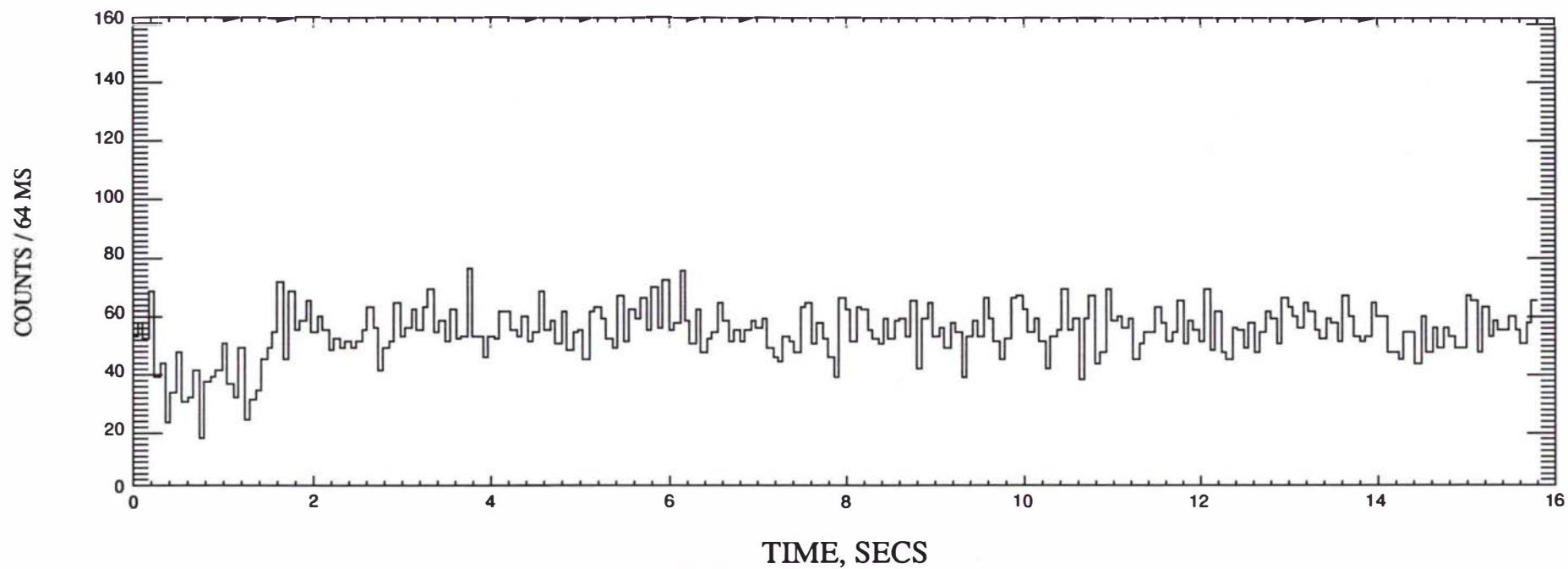
Burst Counter 0 at UT=13.582558542887 h=48897.211 s 13:34:57.211



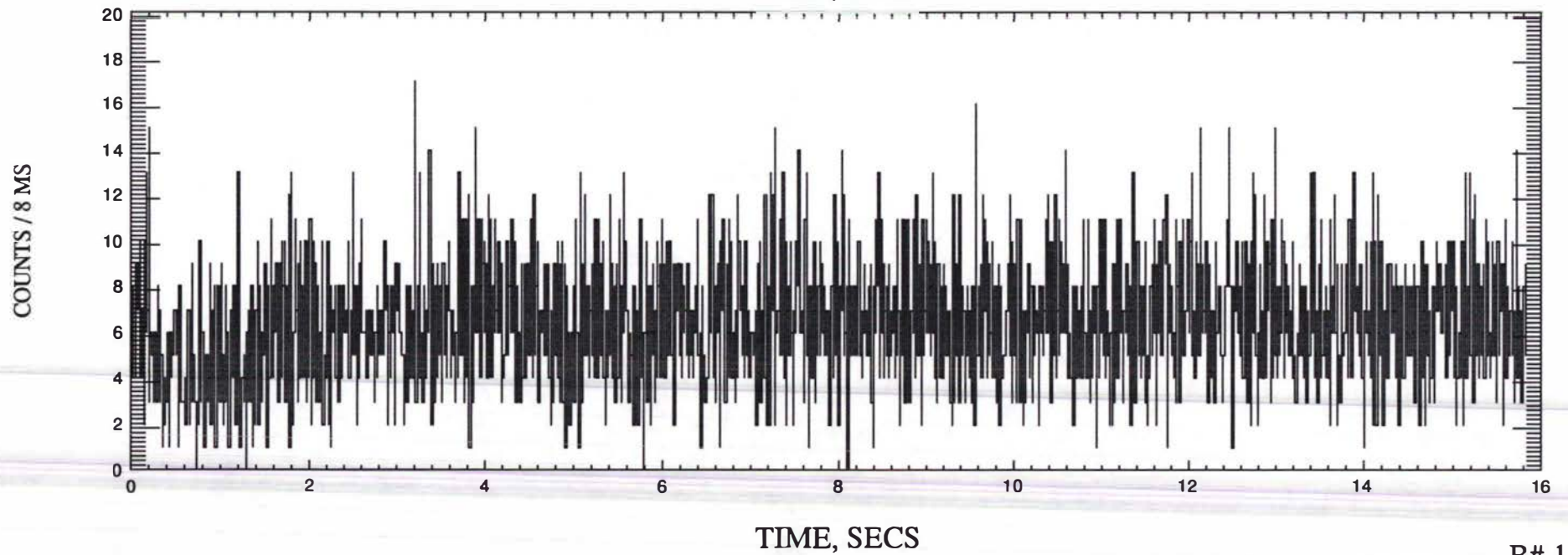
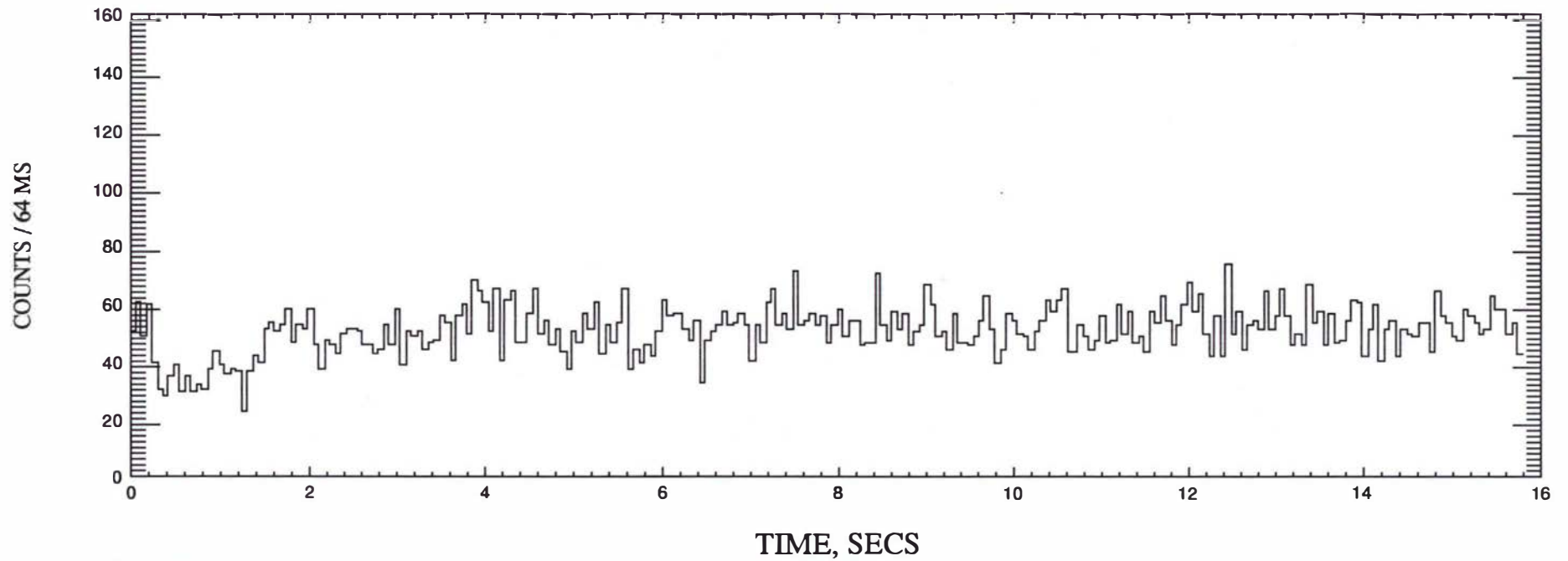
Burst Counter 1 at UT=14.284780578613 h=51425.210 s 14:17:05.210



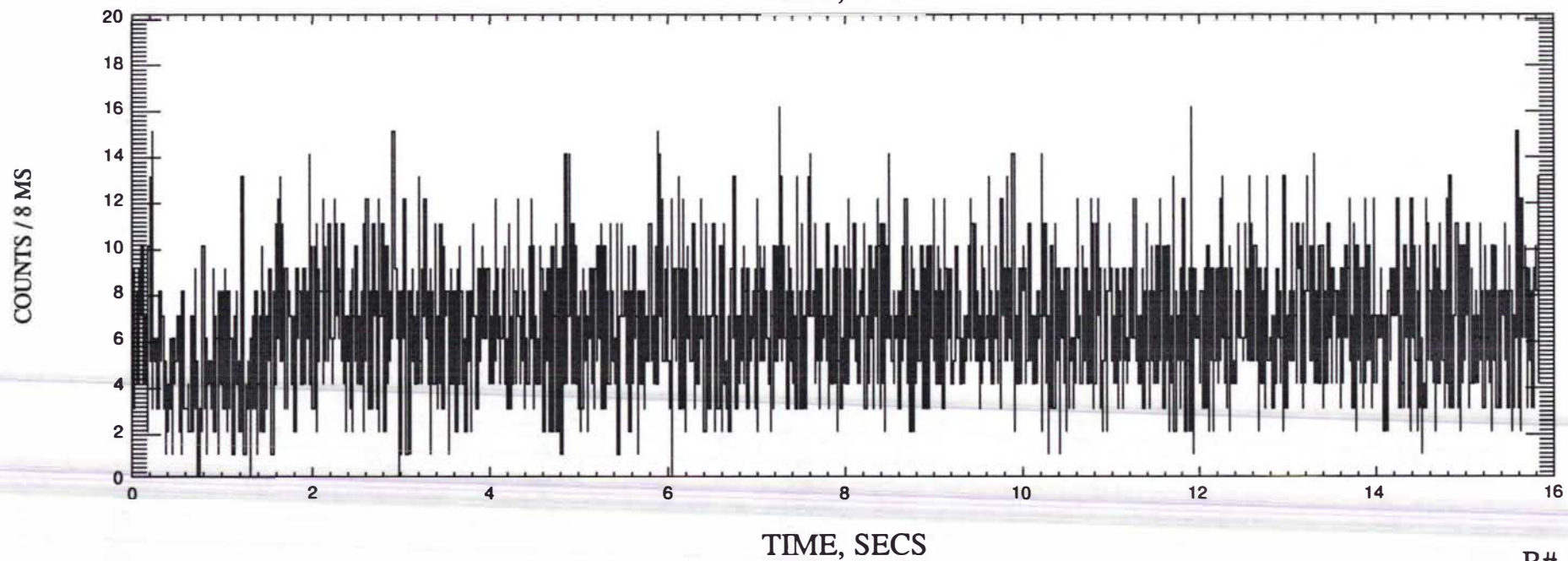
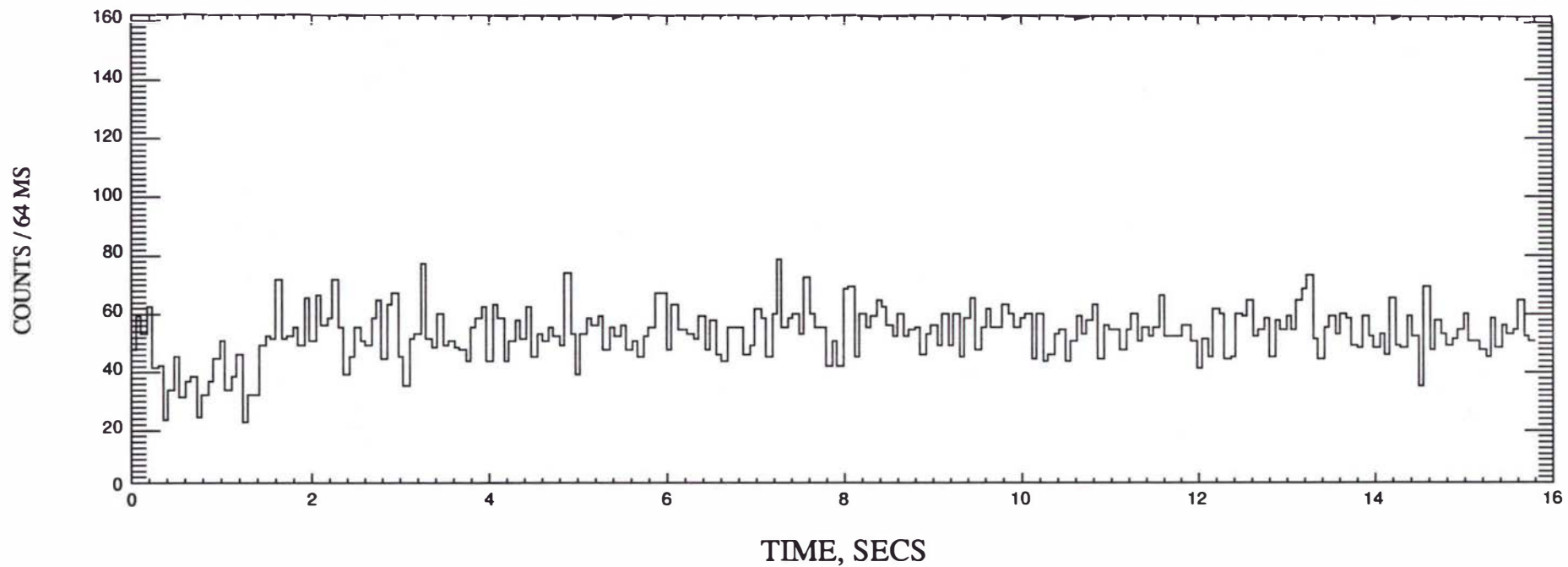
Burst Counter 2 at UT=14.987022145589 h=53953.280 s 14:59:13.280



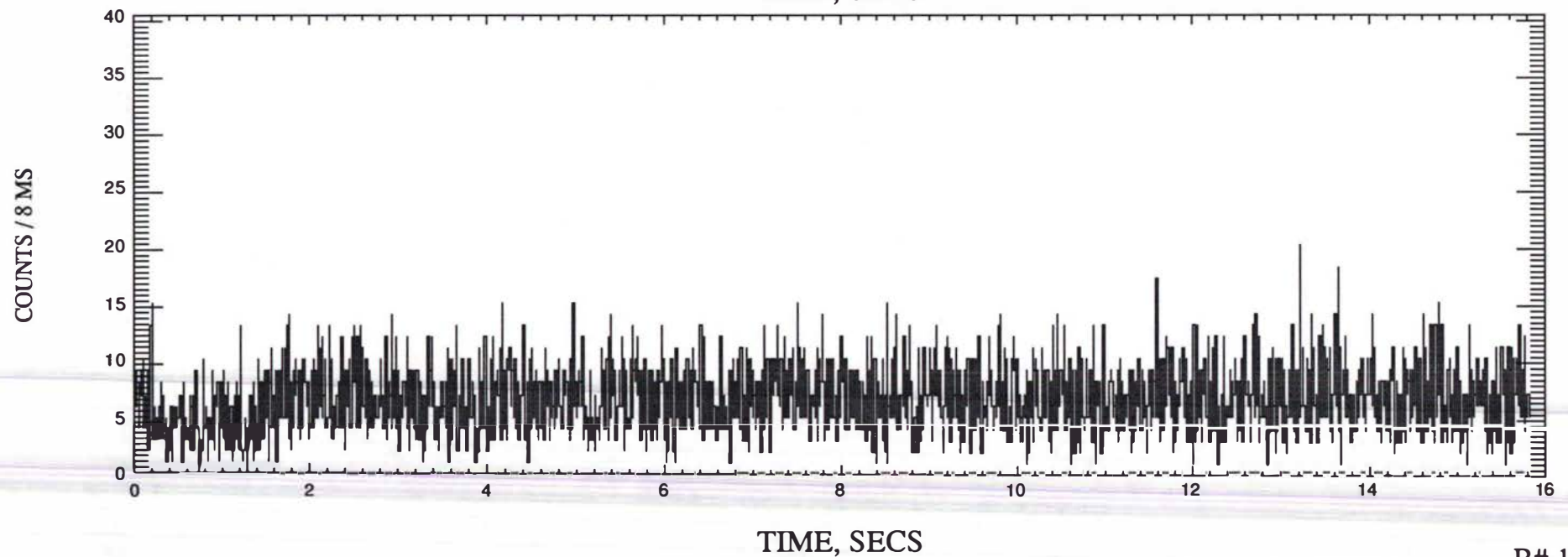
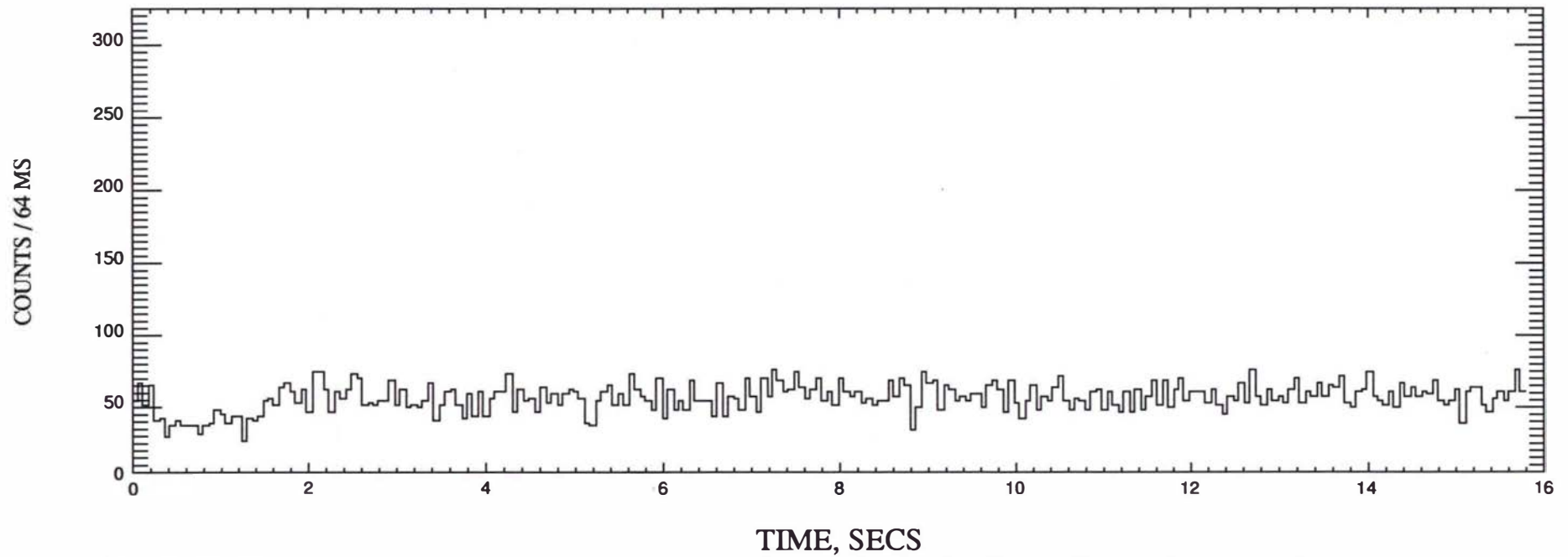
Burst Counter 3 at UT=15.689264602661 h=56481.353 s 15:41:21.353



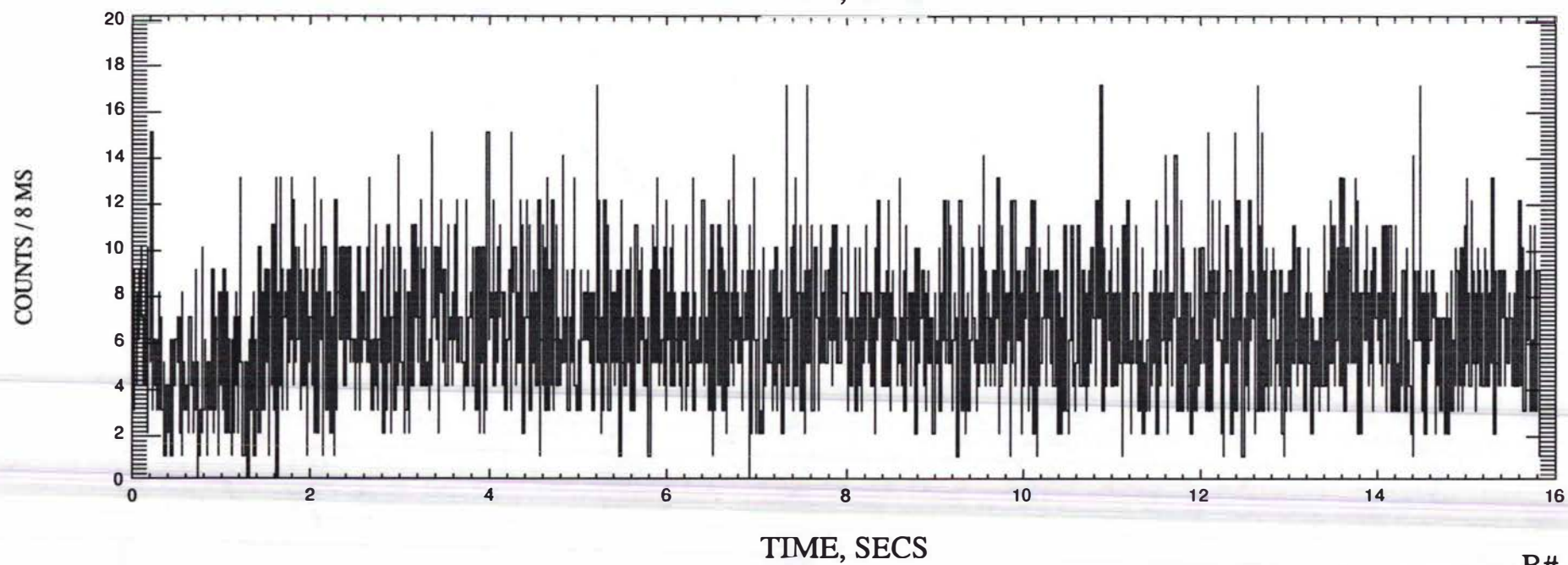
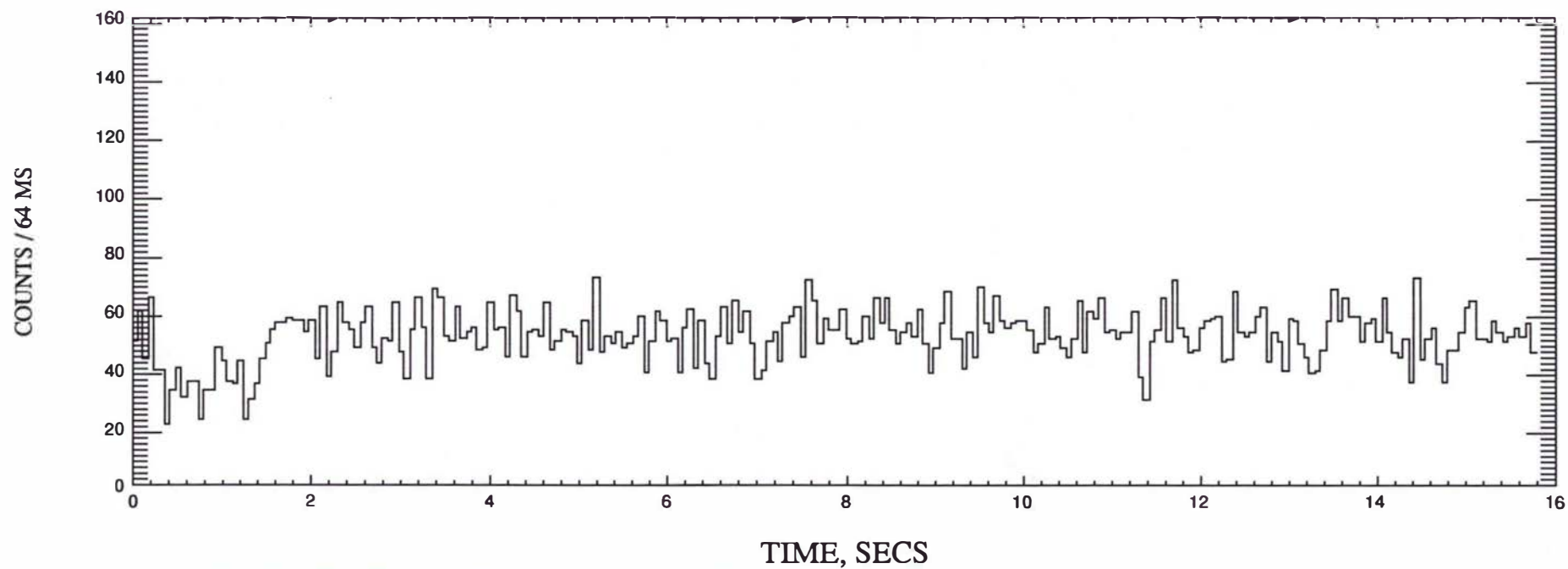
Burst Counter 4 at UT=16.391493148804 h=59009.375 s 16:23:29.375



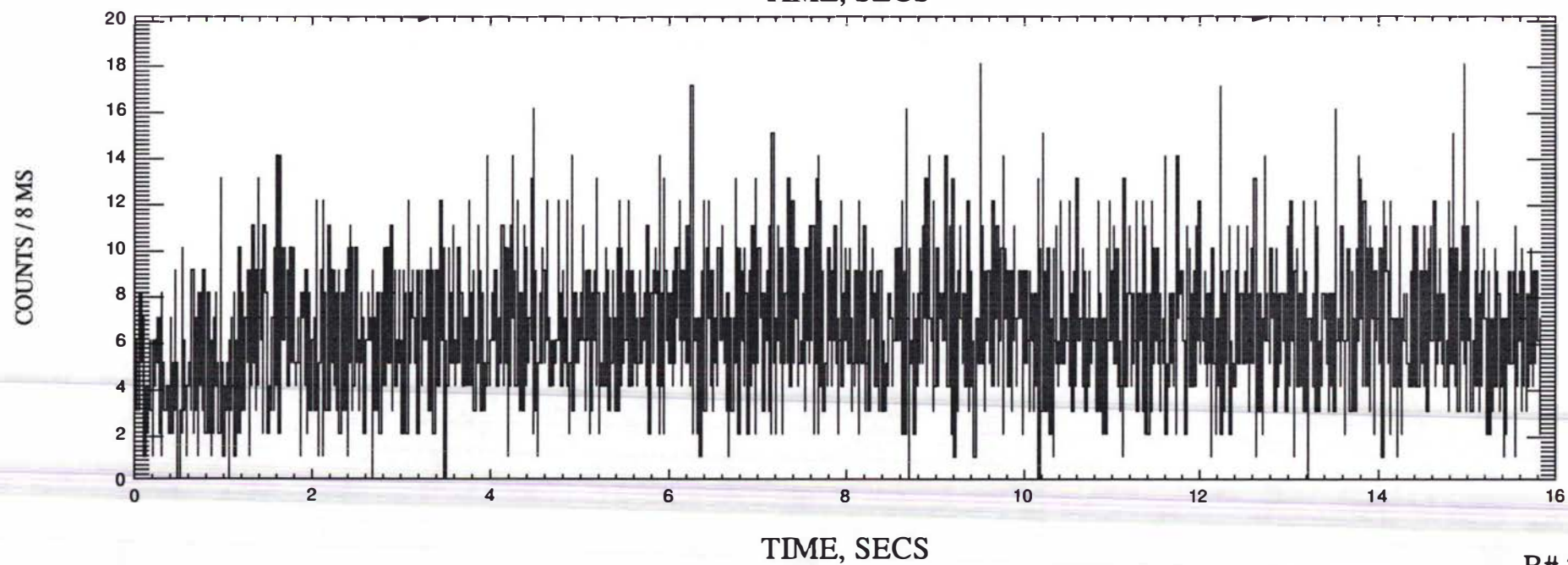
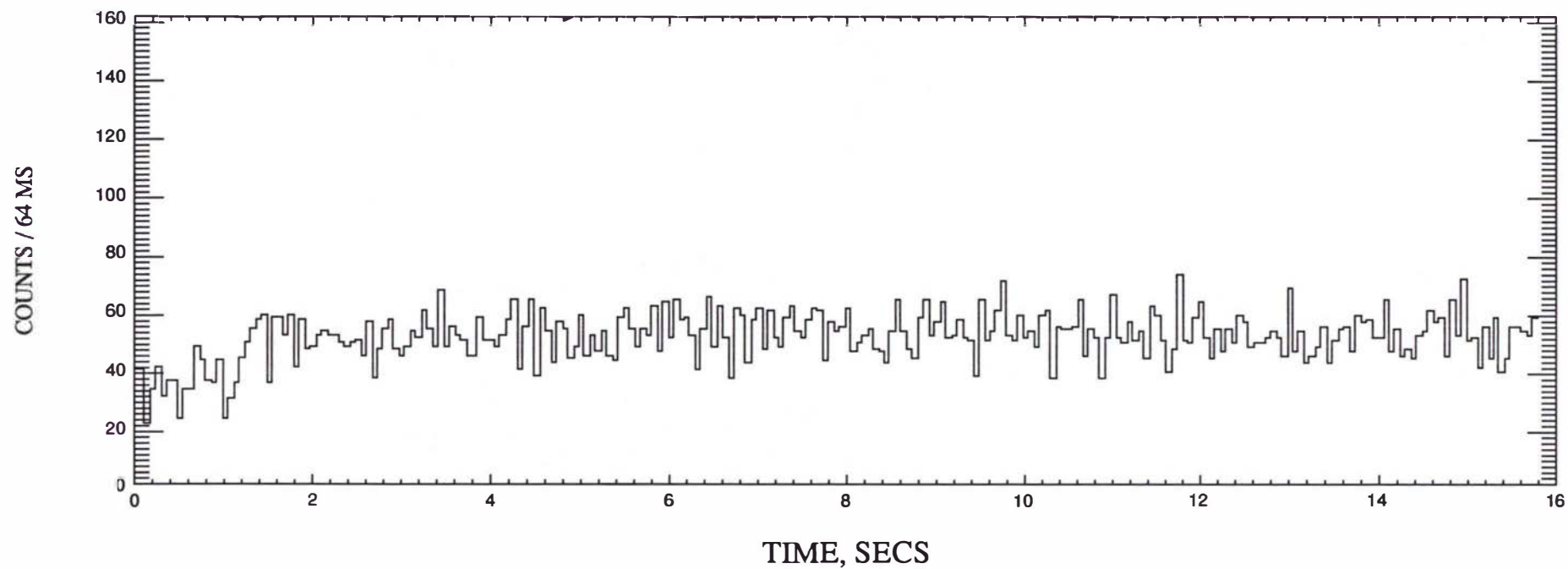
Burst Counter 5 at UT=17.093732545641 h=61537.437 s 17:05:37.437



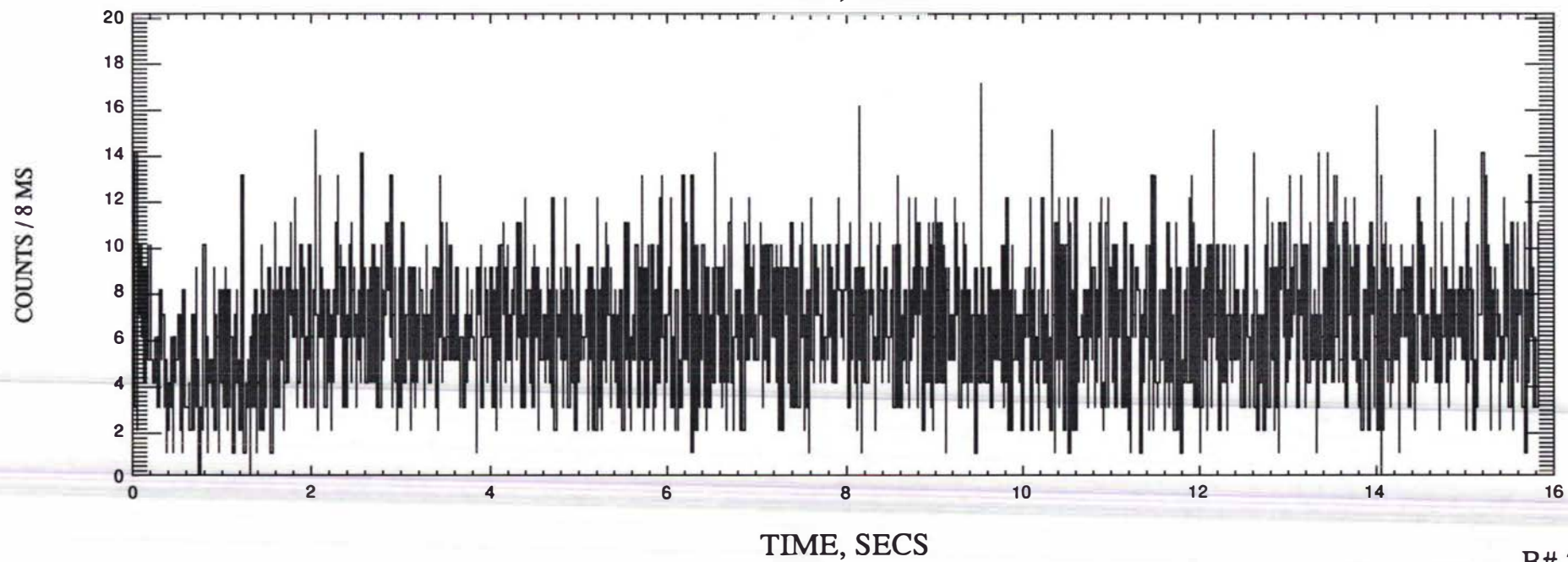
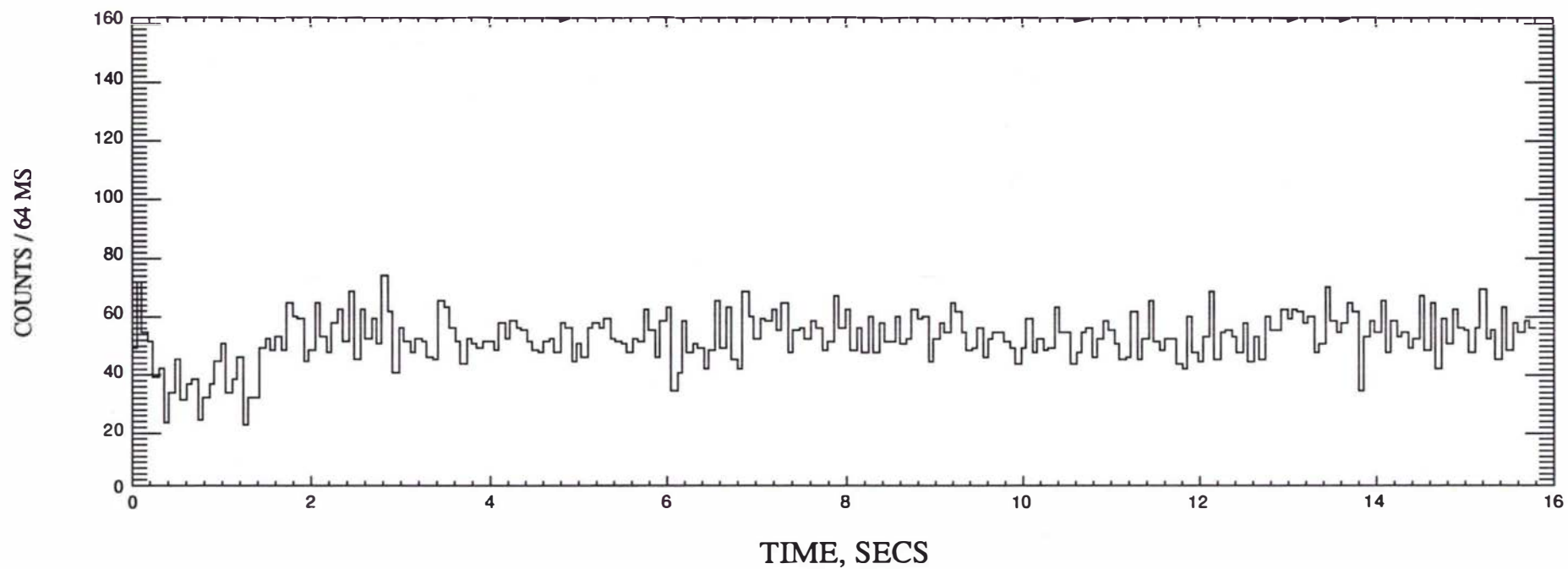
Burst Counter 6 at UT=17.795965436300 h=64065.476 s 17:47:45.476



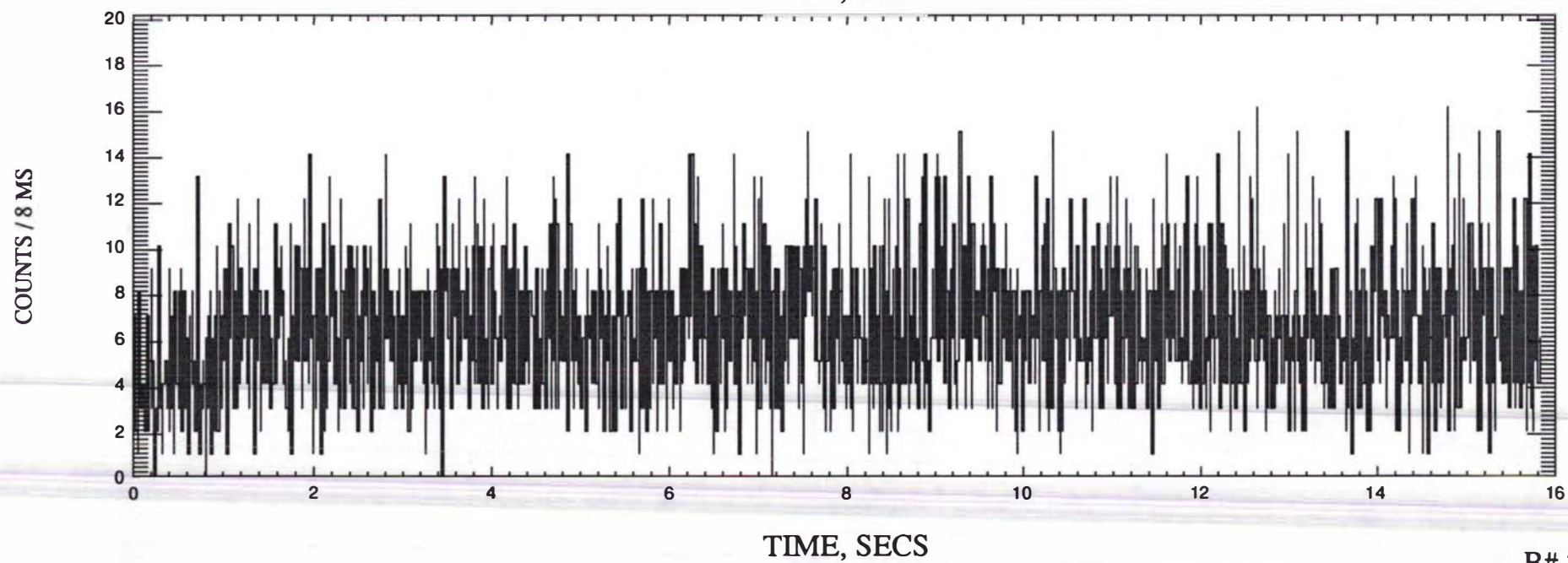
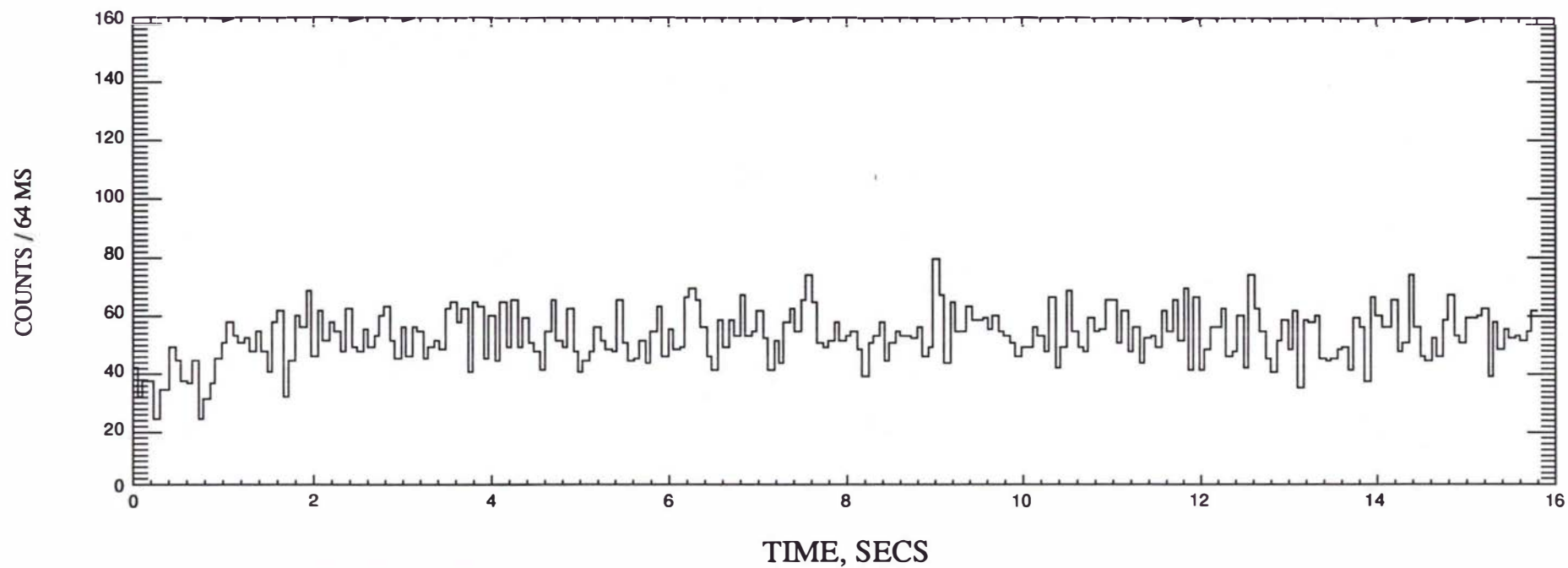
Burst Counter 7 at UT=18.498269937303 h=66593.772 s 18:29:53.772



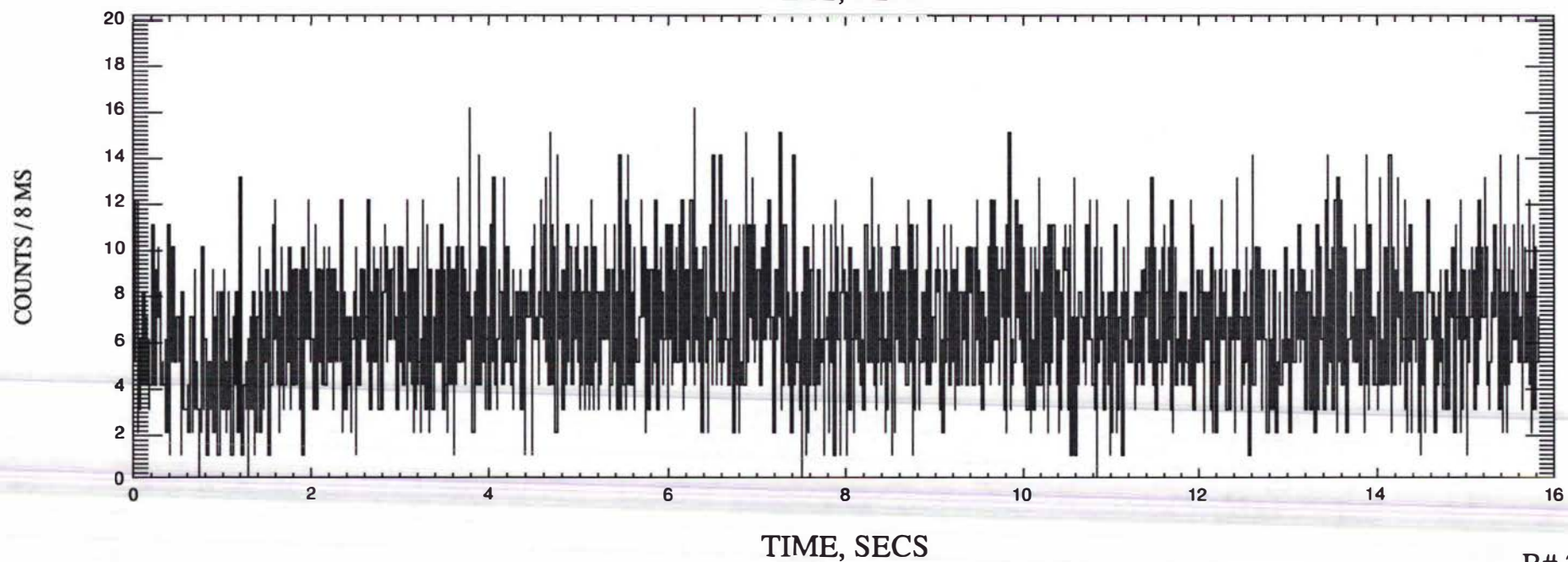
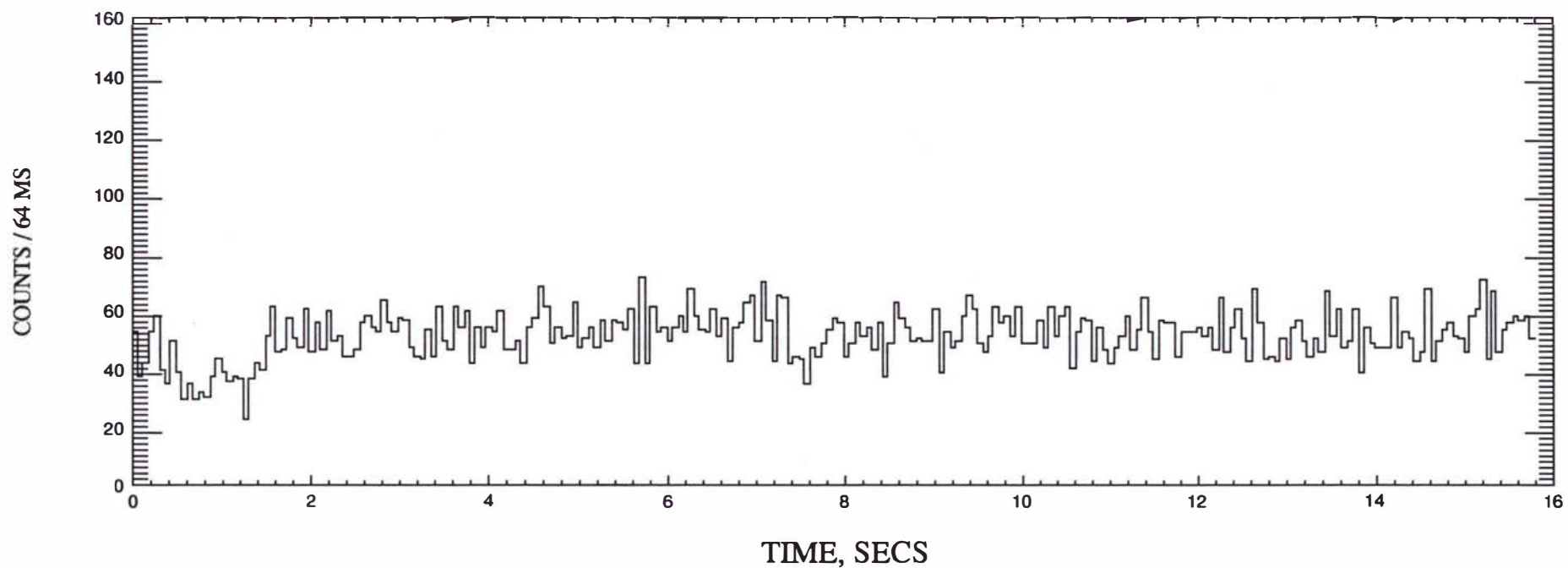
Burst Counter 8 at UT=19.200433379279 h=69121.560 s 19:12:01.560



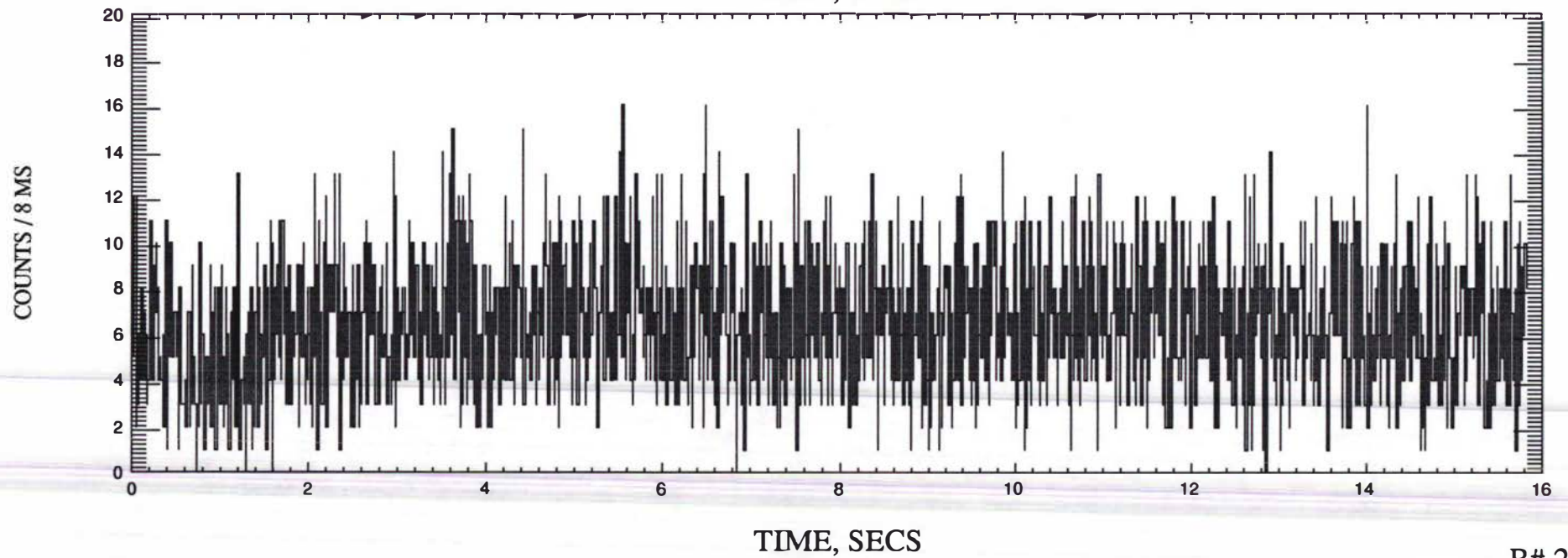
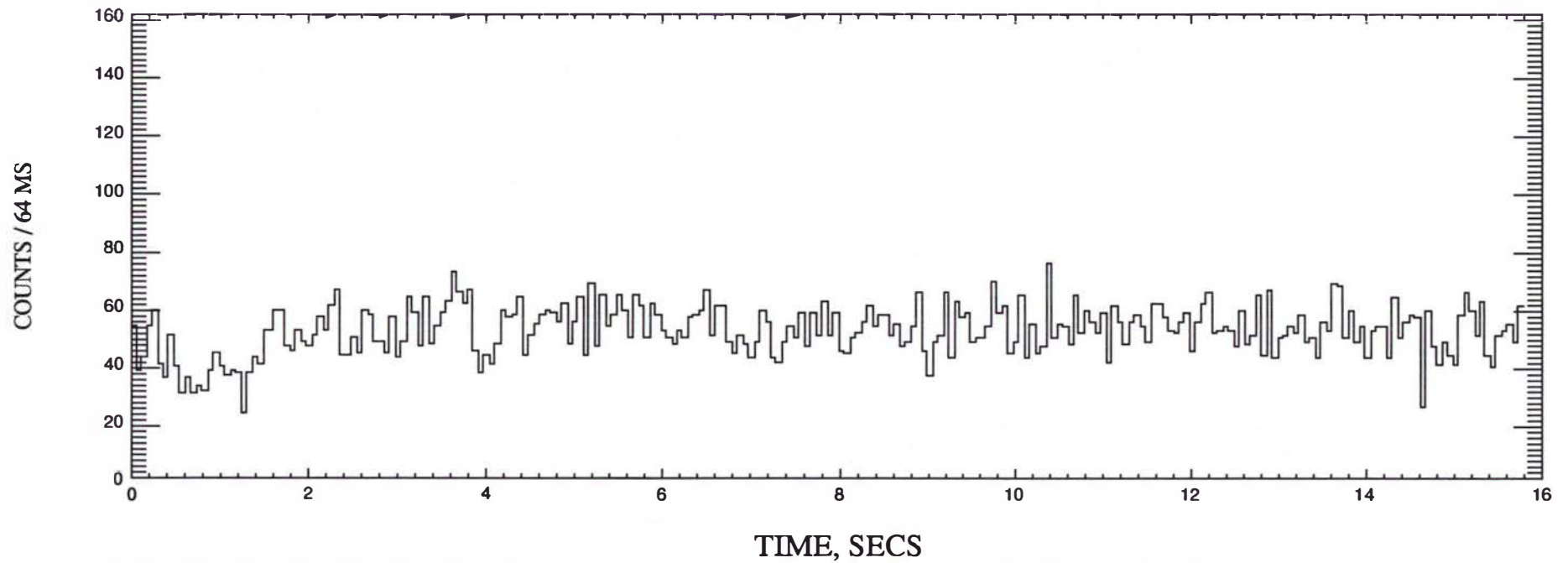
Burst Counter 9 at UT=19.902809494866 h=71650.114 s 19:54:10.114



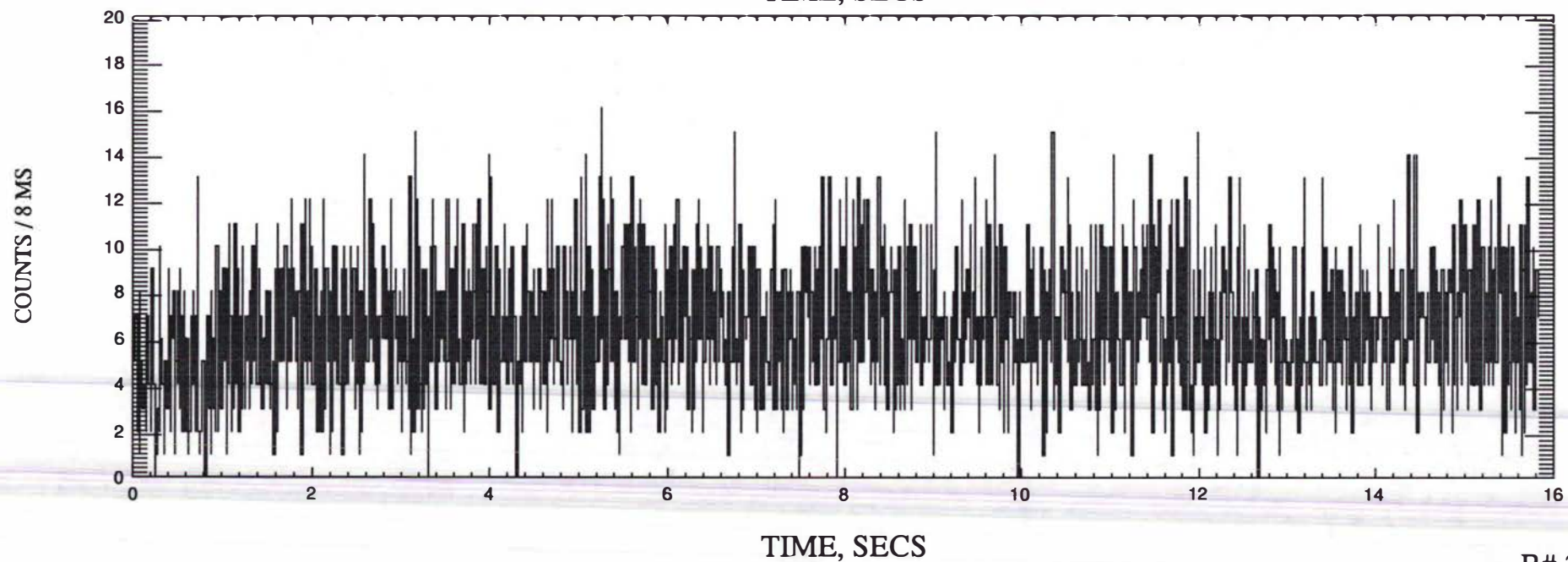
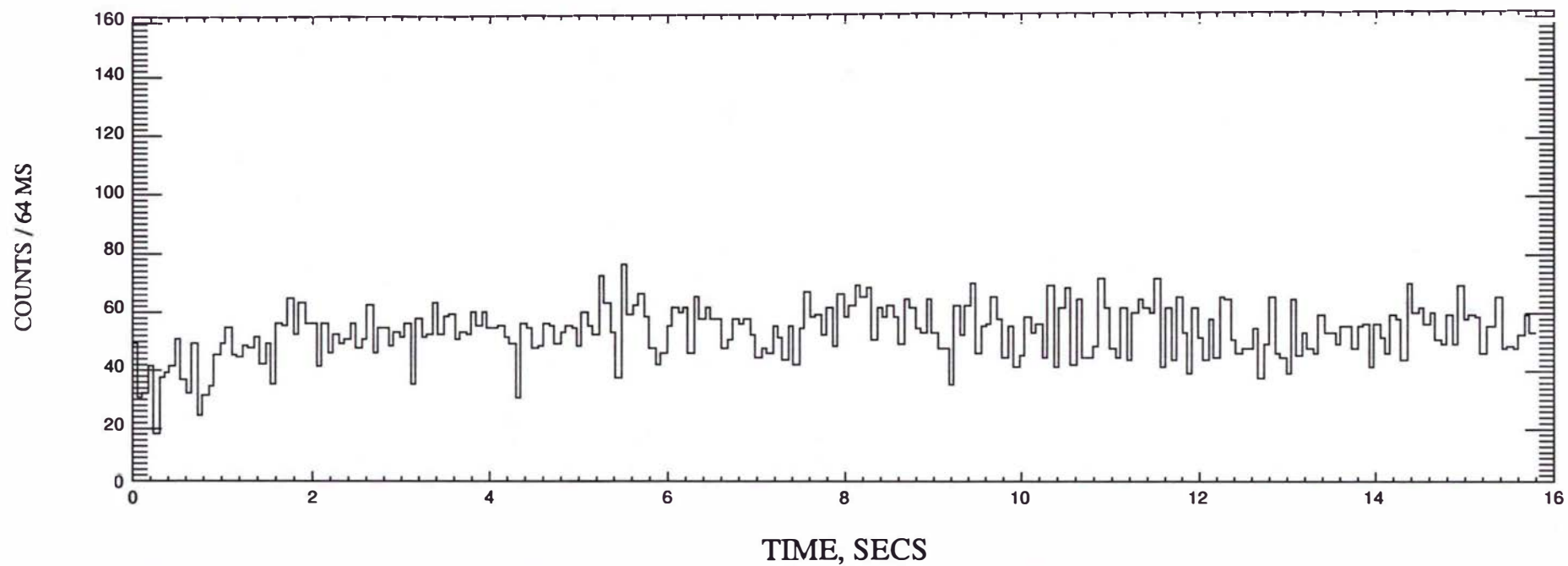
Burst Counter 10 at UT=20.604910007053 h=74177.676 s 20:36:17.676



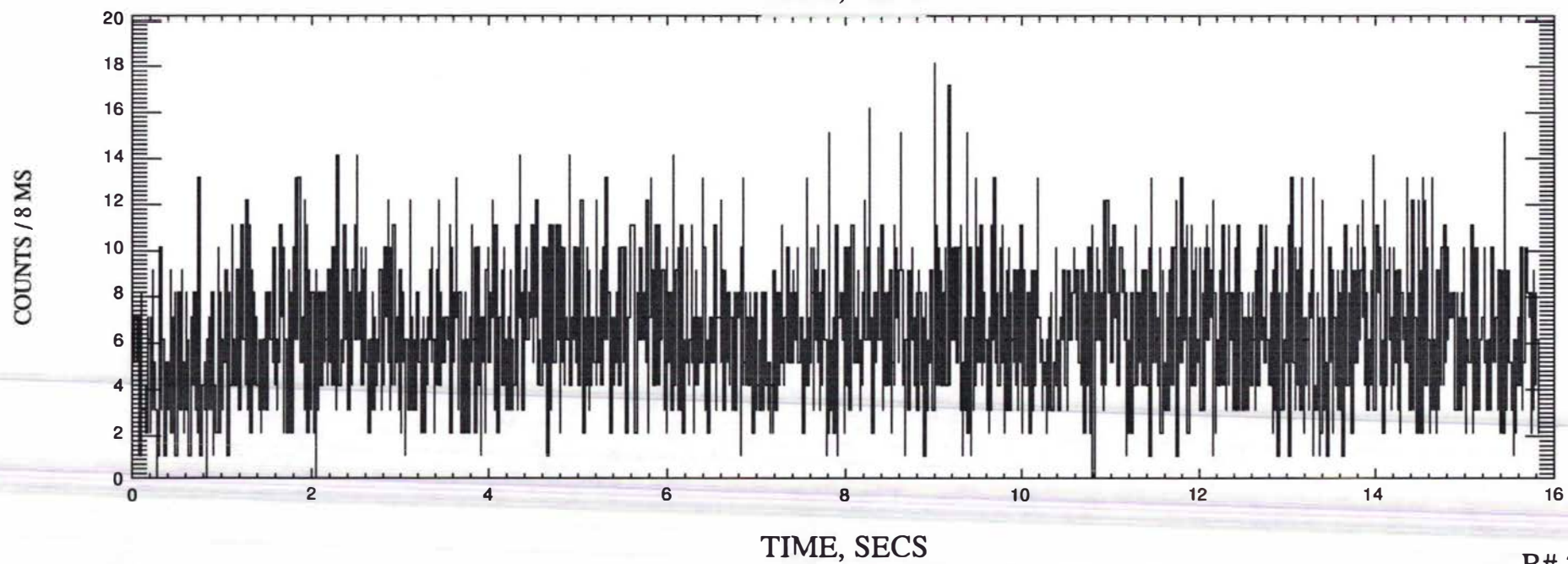
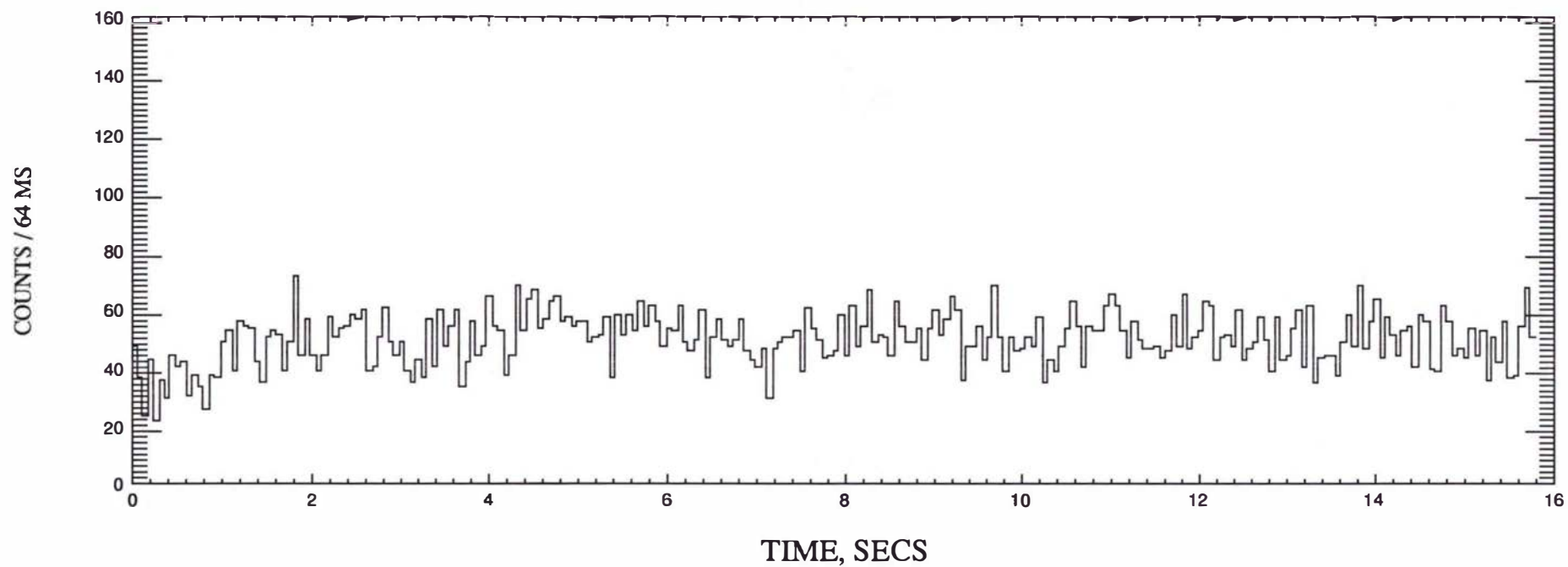
Burst Counter 11 at UT=21.307143779331 h=76705.718 s 21:18:25.718



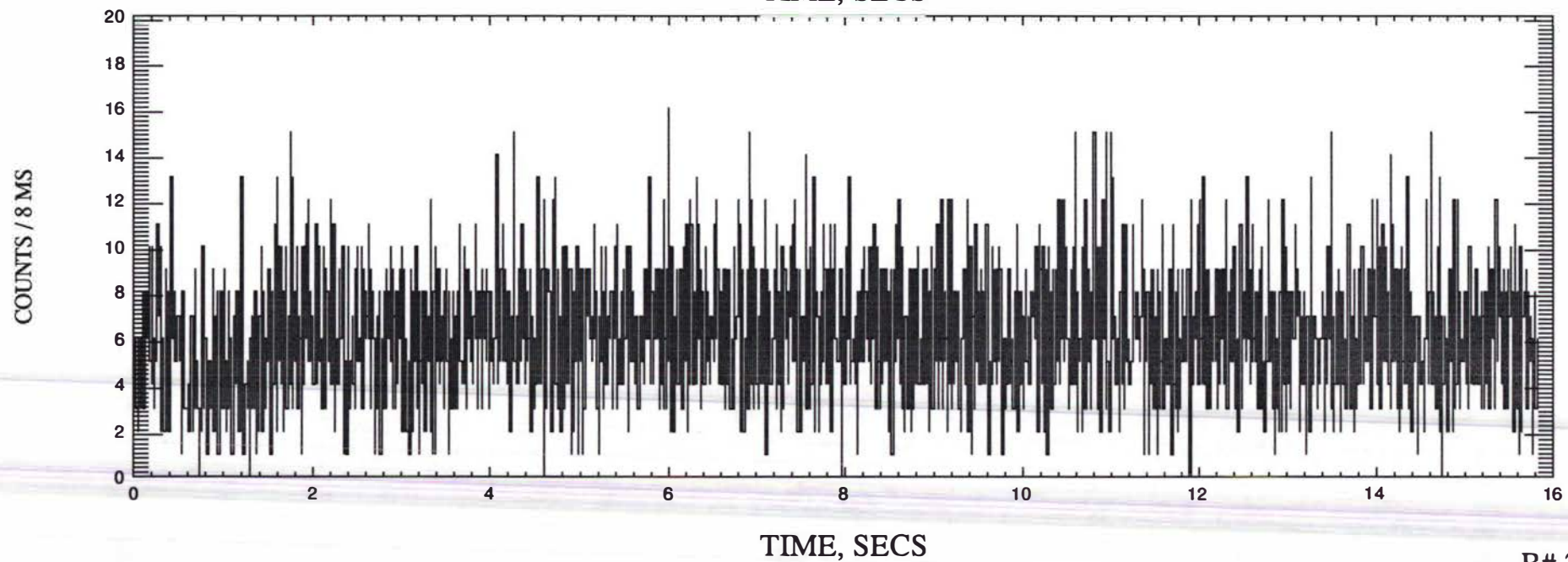
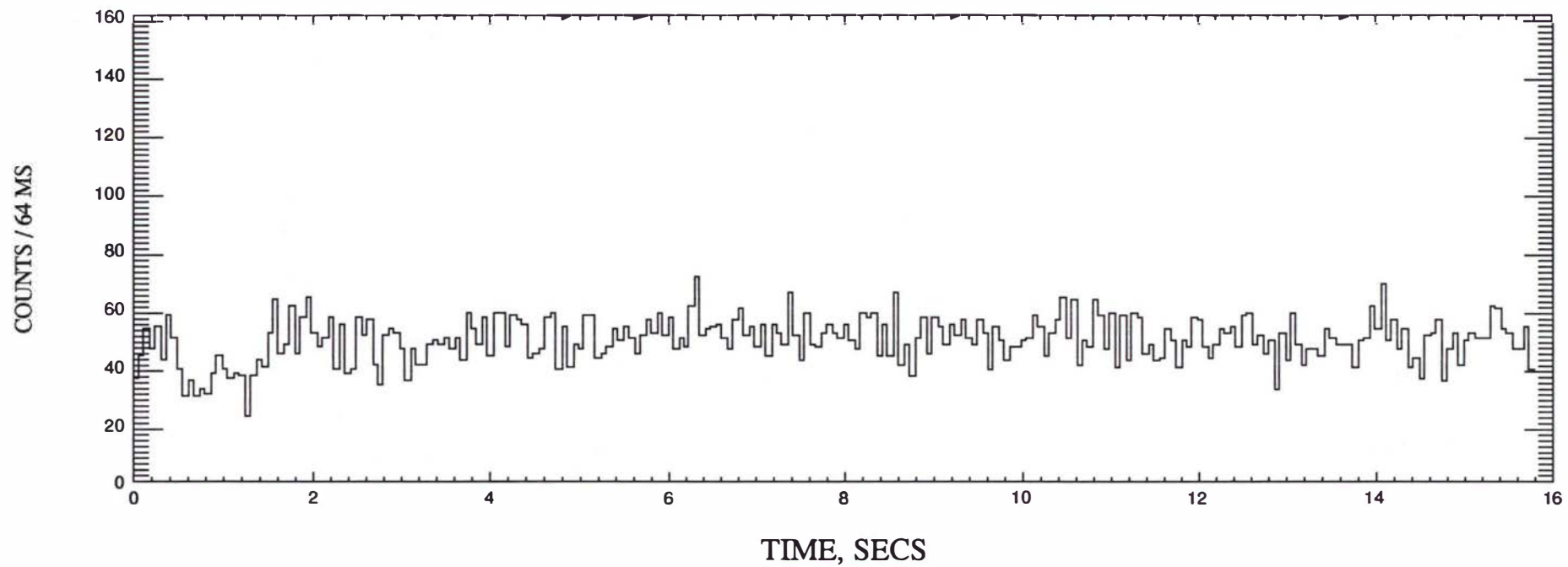
Burst Counter 12 at UT=21.938396653069 h=78978.228 s 21:56:18.228



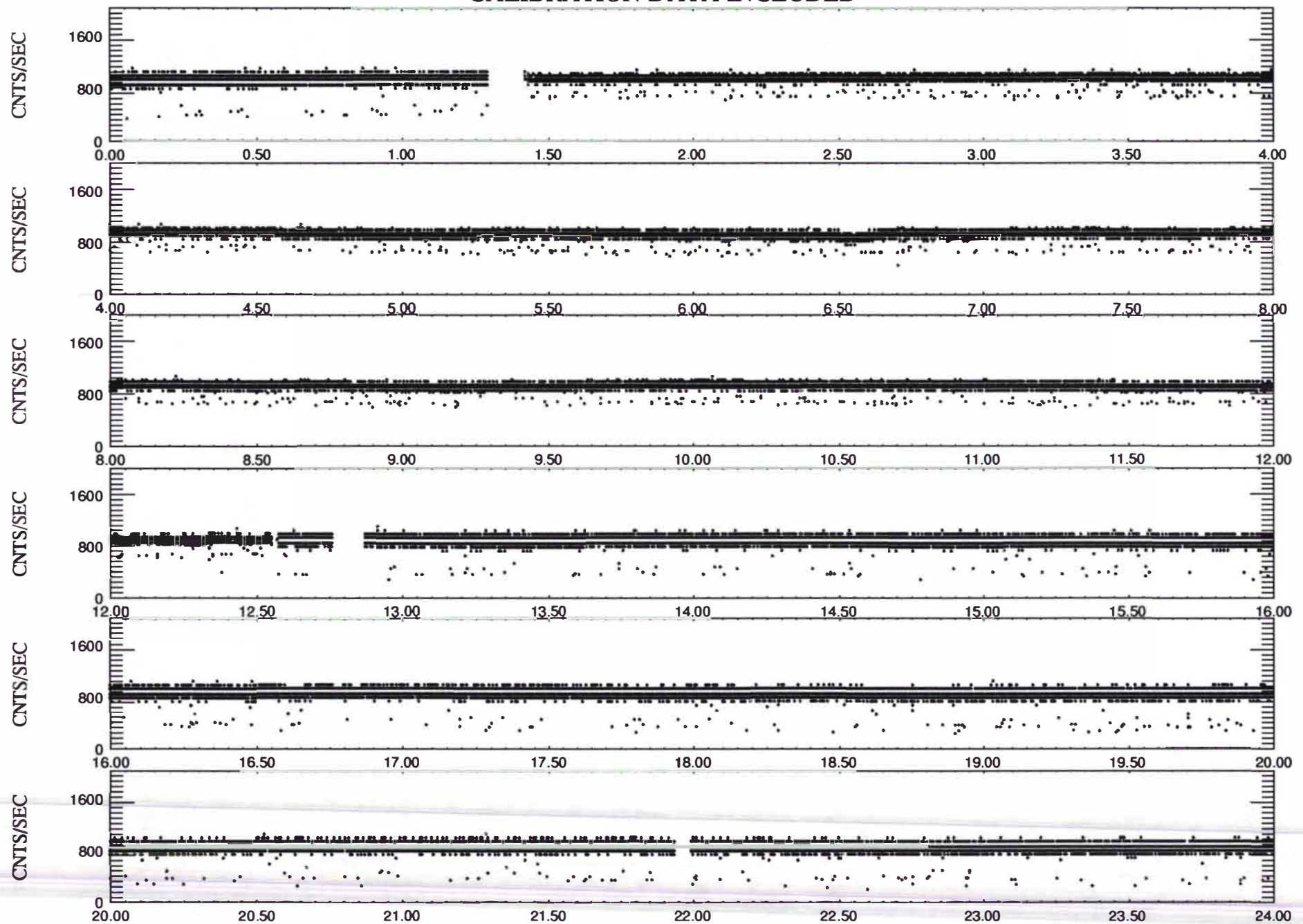
Burst Counter 13 at UT=22.711740082635 h=81762.264 s 22:42:42.264



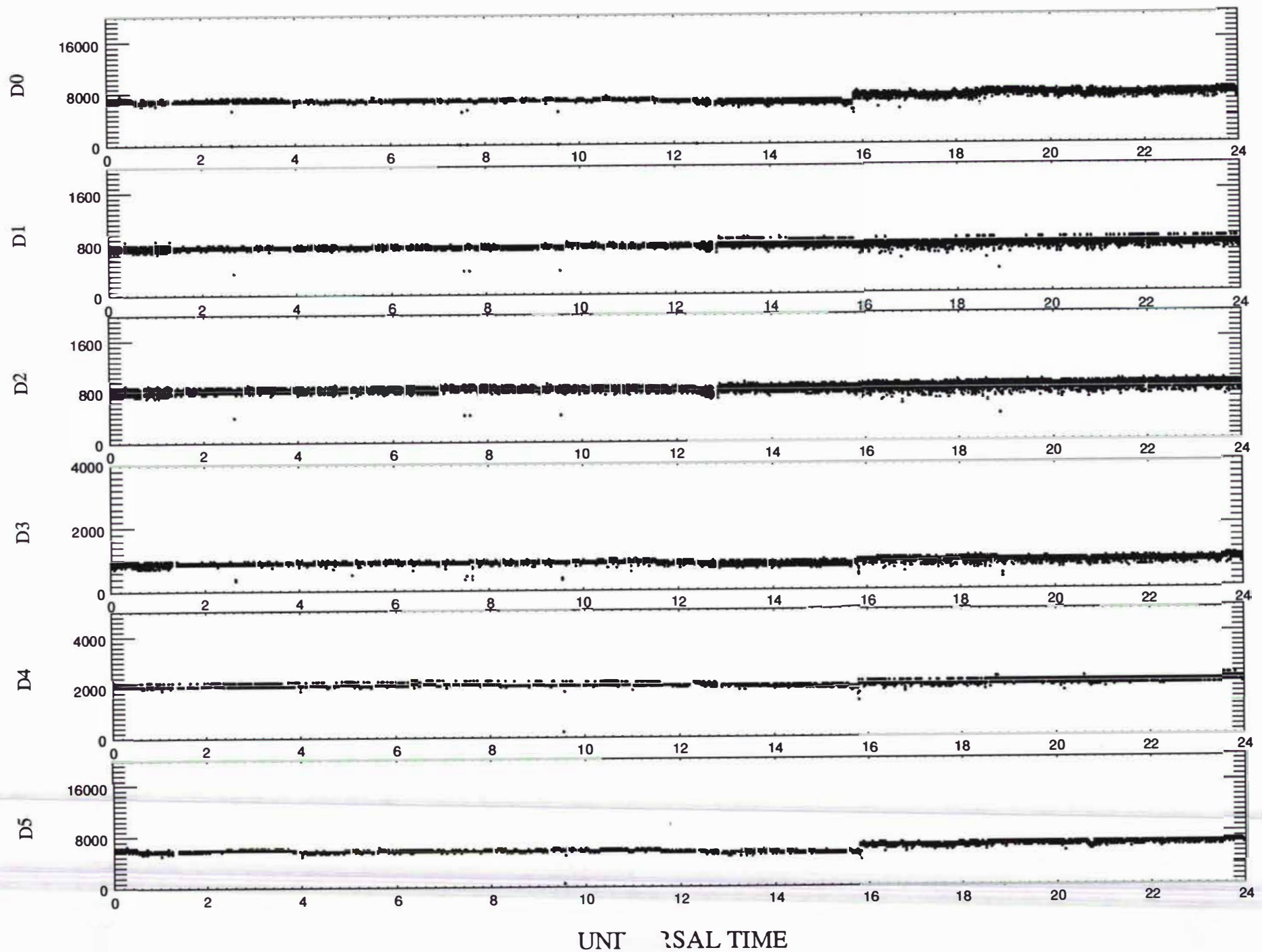
Burst Counter 14 at UT=23.413849275377 h=84289.857 s 23:24:49.857



CALIBRATION DATA INCLUDED

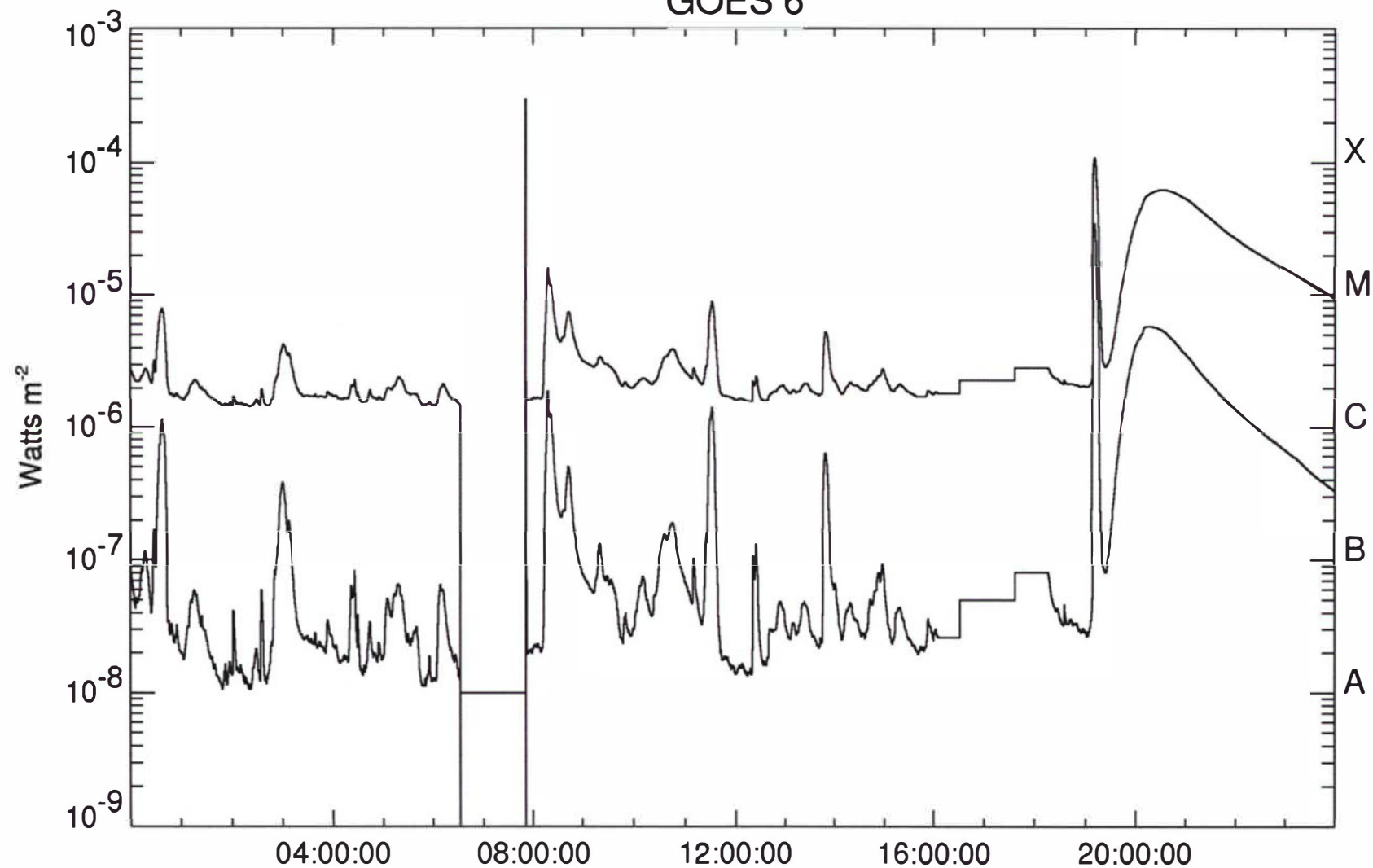


UNIT VS. SAL TIME



DATE	U.T.	Nr UGB	Event Nature
1990-12-24	15:34:32.617	216-a	Solar Flare
1991-01-06	16:39:57.526	218-a	GRB
1991-01-17	00:57:12.234	223-a	GRB ?
1991-01-18	14:03:26.738	224-a	Solar Flare
1991-01-21	00:18:12.304	227-a	Solar Flare
1991-01-22	15:13:50.333	228-a	GRB
1991-01-25	06:29:38.745	231-a	Solar Flare
1991-02-01	11:44:54.779	233-a	Solar Flare
1991-02-01	18:46:17.191	233-b	Solar Particles
1991-02-02	20:57:39.170	234-a	GRB ?
1991-02-04	08:58:45.821	235-a	GRB
1991-02-04	10:48:08.317	235-b	Solar Flare
1991-02-04	14:50:33.480	235-c	Solar Flare
1991-02-06	06:10:53.398	236-a	Solar Flare
1991-02-06	06:45:52.285	236-b	Solar Flare
1991-02-06	08:45:28.852	236-c	GRB
1991-02-10	17:35:33.692	237-a	Solar Flare
1991-02-11	03:25:22.425	237-b	GRB
1991-02-19	09:23:07.760	239-a	Solar Flare
1991-03-12	12:43:02.596	252-a	Solar Flare
1991-03-13	02:59:14.539	254-a	Solar Flare
1991-03-13	08:01:48.347	254-b	Solar Flare
1991-03-14	13:31:08.601	255-a	Solar Flare
1991-03-14	18:11:50.507	255-b	Solar Flare
1991-03-14	22:56:15.309	255-c	GRB
1991-03-22	20:07:59.817	256-a	Solar Flare
1991-03-22	22:42:51.228	256-b	Solar Flare
1991-03-23	01:51:17.475	256-c	Solar Flare
1991-03-23	14:34:35.610	257-a	Solar Particles
1991-03-23	14:48:54.705	257-b	Solar Particles
1991-03-23	15:01:31.774	257-c	Solar Particles
1991-03-29	06:44:19.108	260-a	Solar Flare
1991-03-31	13:45:30.490	261-a	Solar Flare
1991-03-31	19:08:38.993	261-b	Solar Flare
1991-04-02	14:27:44.130	262-a	GRB

GOES 6



Data Start: 91/03/31, 0000:02

Channel 1 (1.0 - 8.0 Angstroms)
 Channel 2 (0.5 - 4.0 Angstroms)

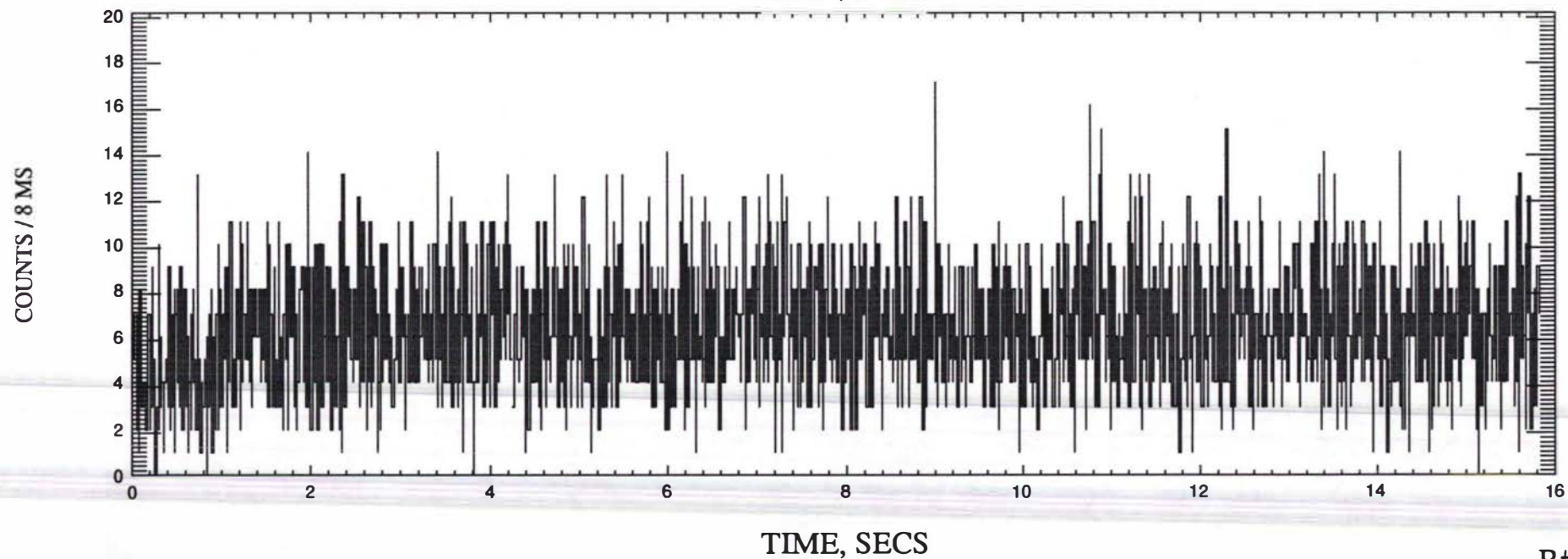
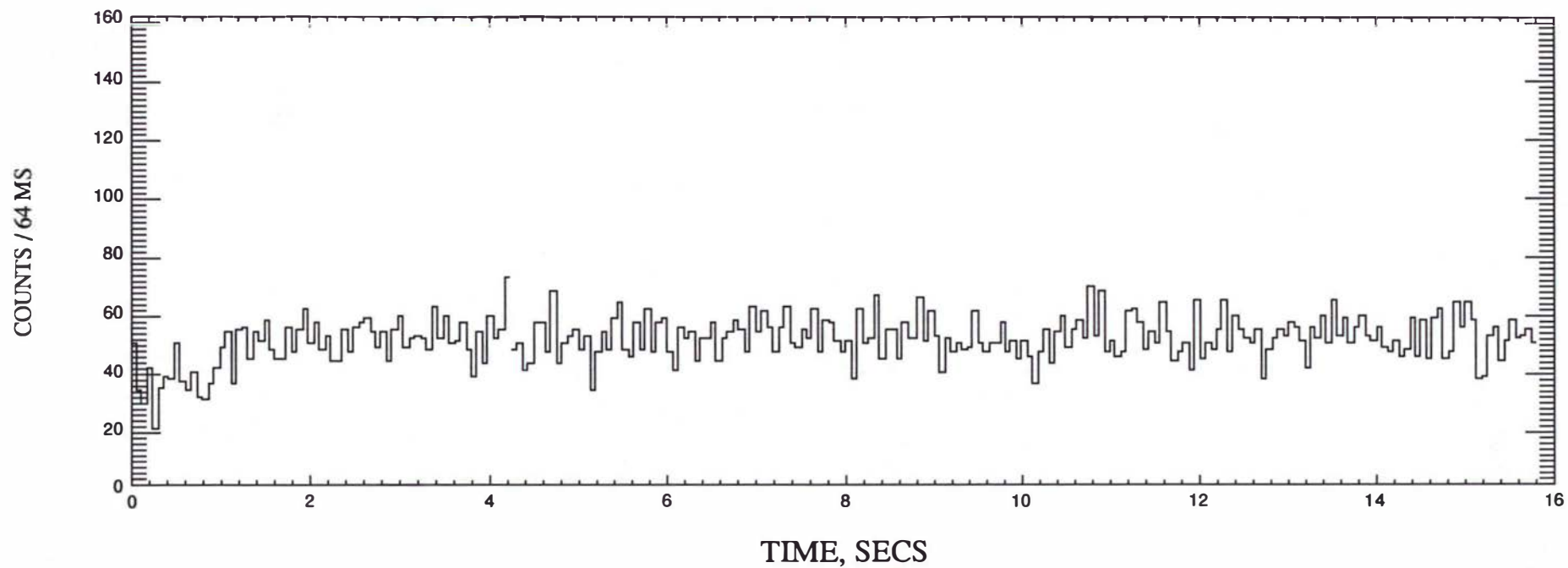
Plot created: 96/11/26, 1926

Background not subtracted
 Background not subtracted
 Sample average = 10

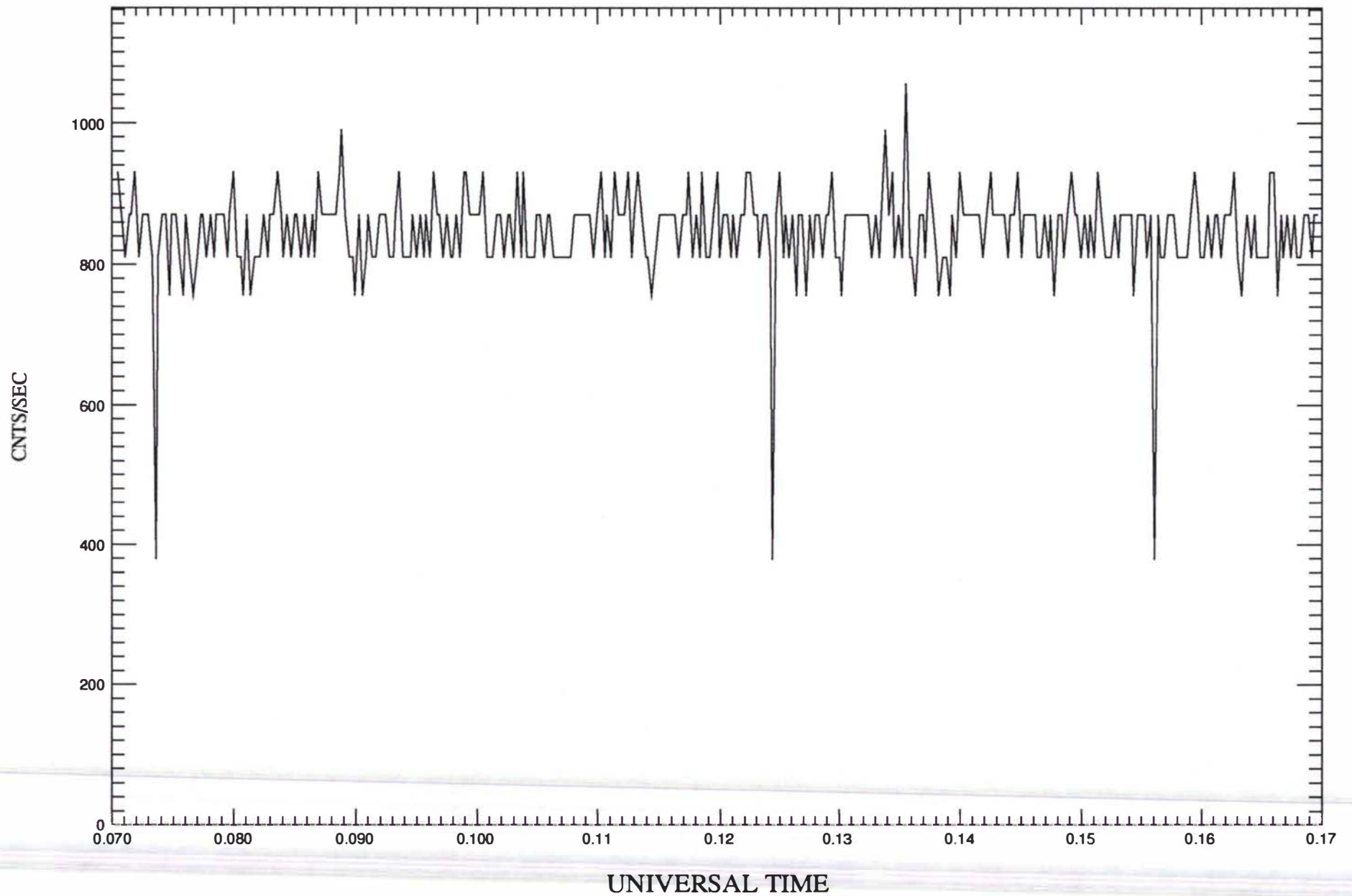
BURSTNUMBER 15, 0 - 15, 0 - 9



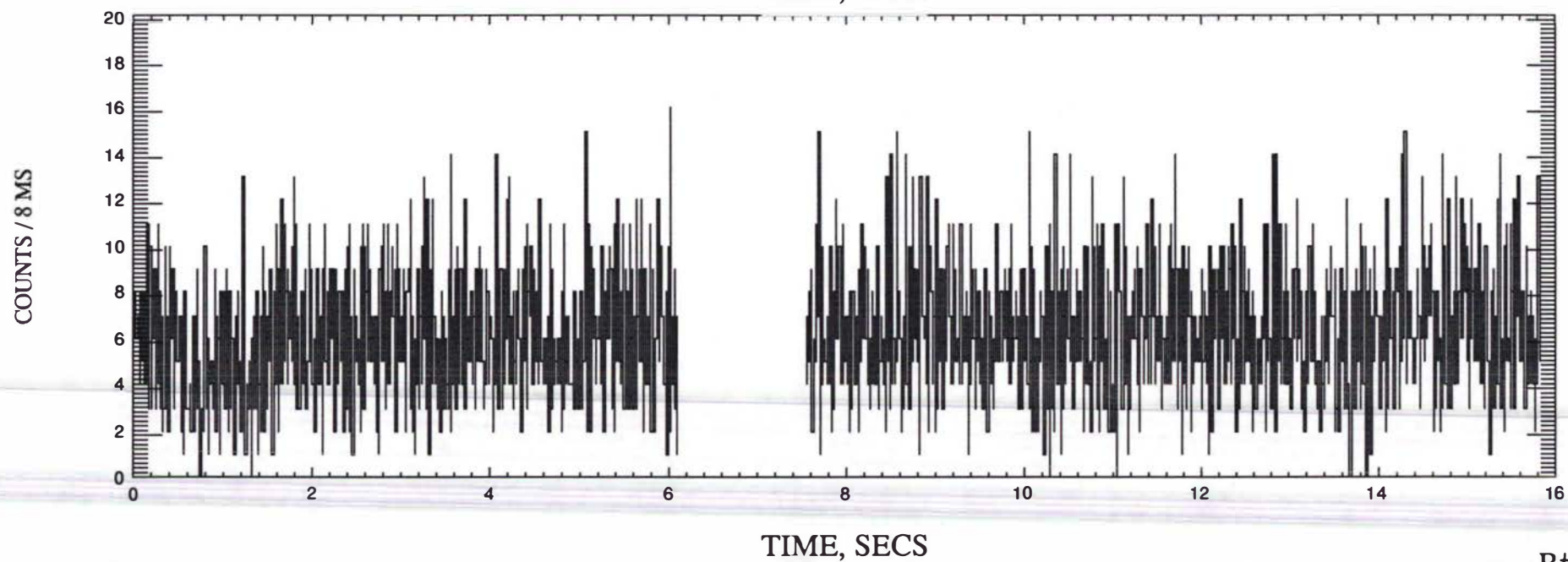
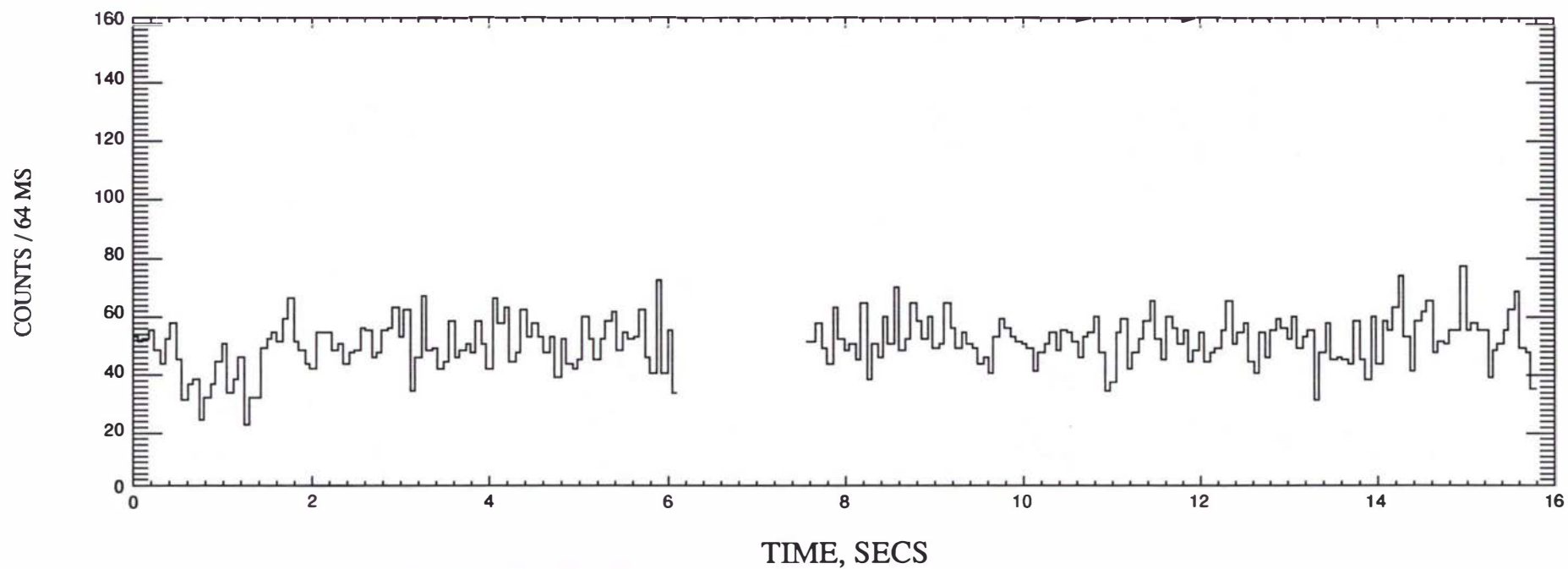
Burst Counter 15 at UT=0.116212370131 h= 418.365 s 00:06:58.365



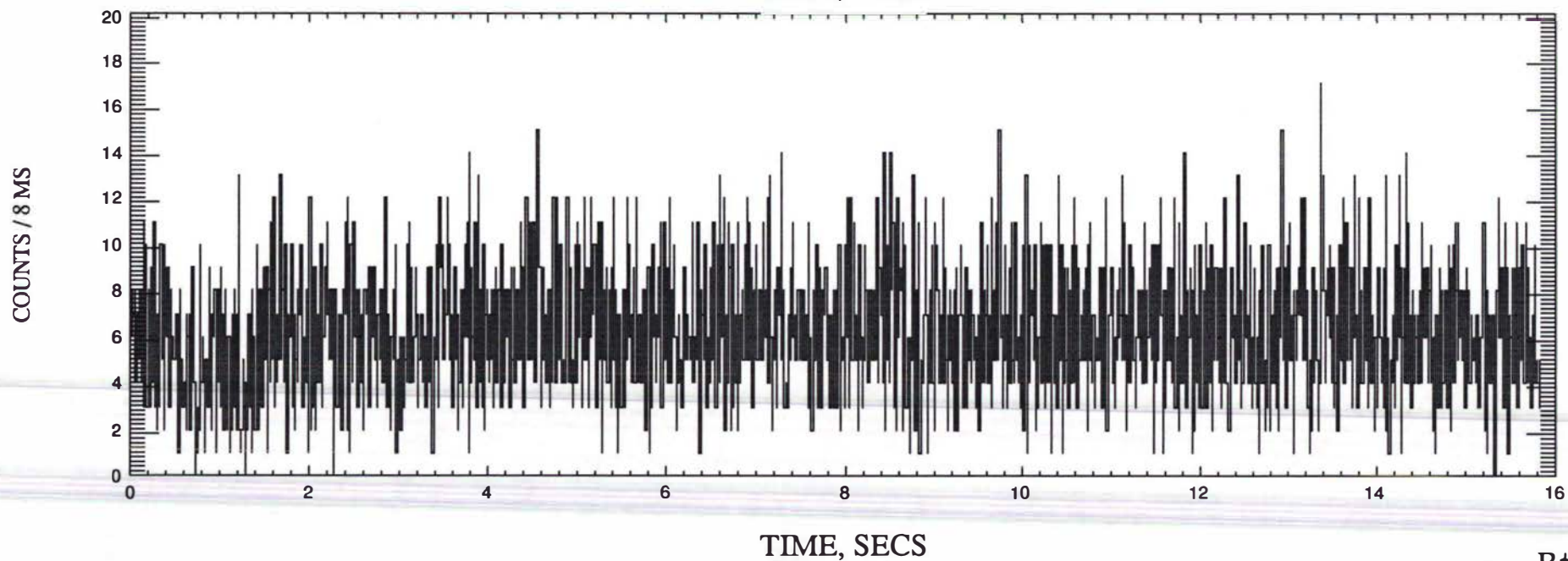
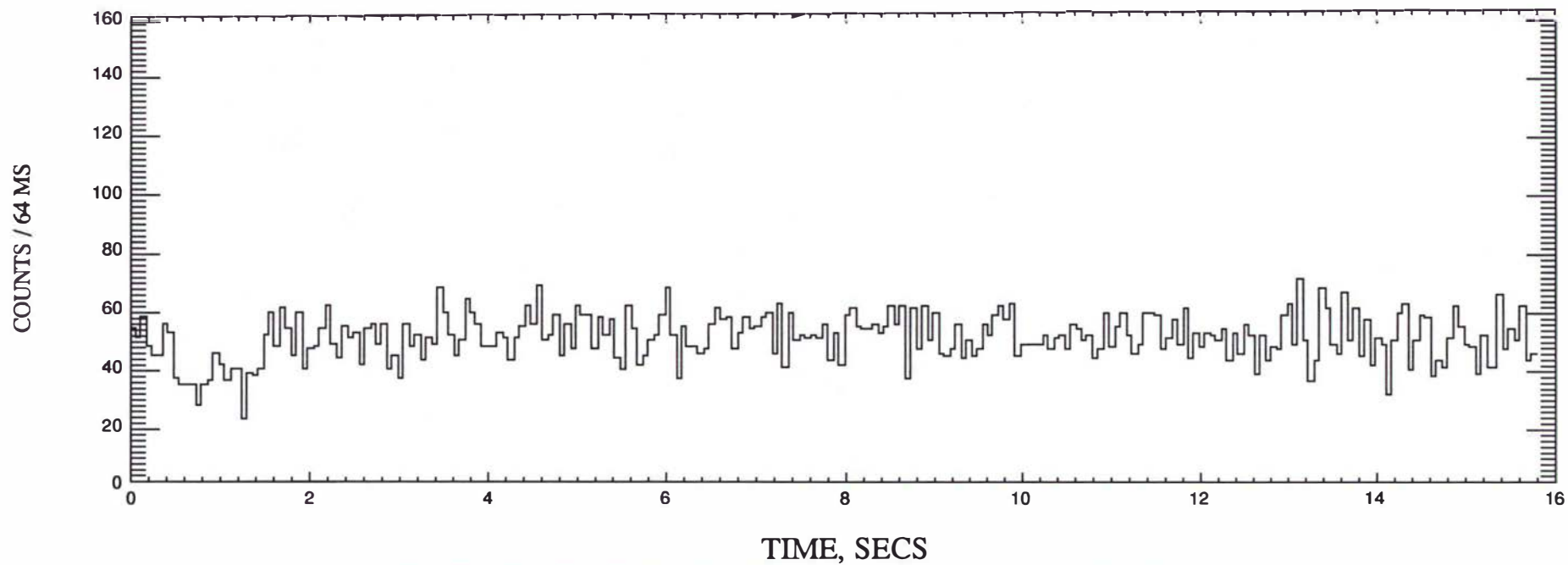
CALIBRATION DATA INCLUDED



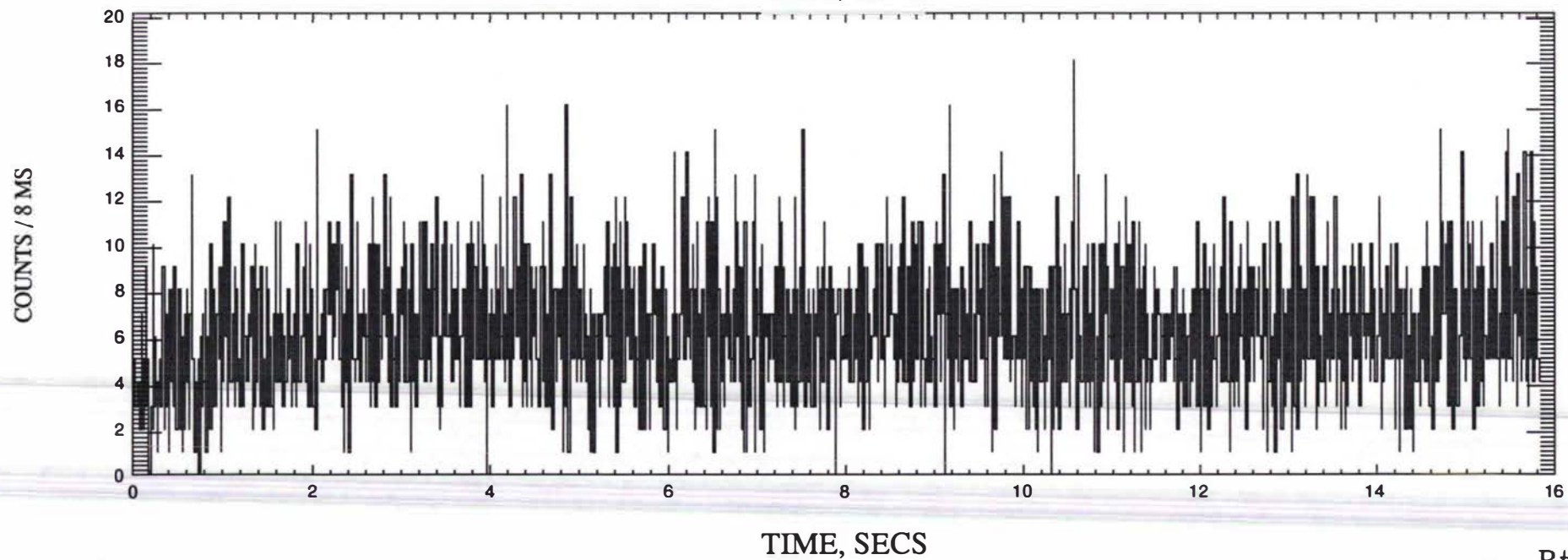
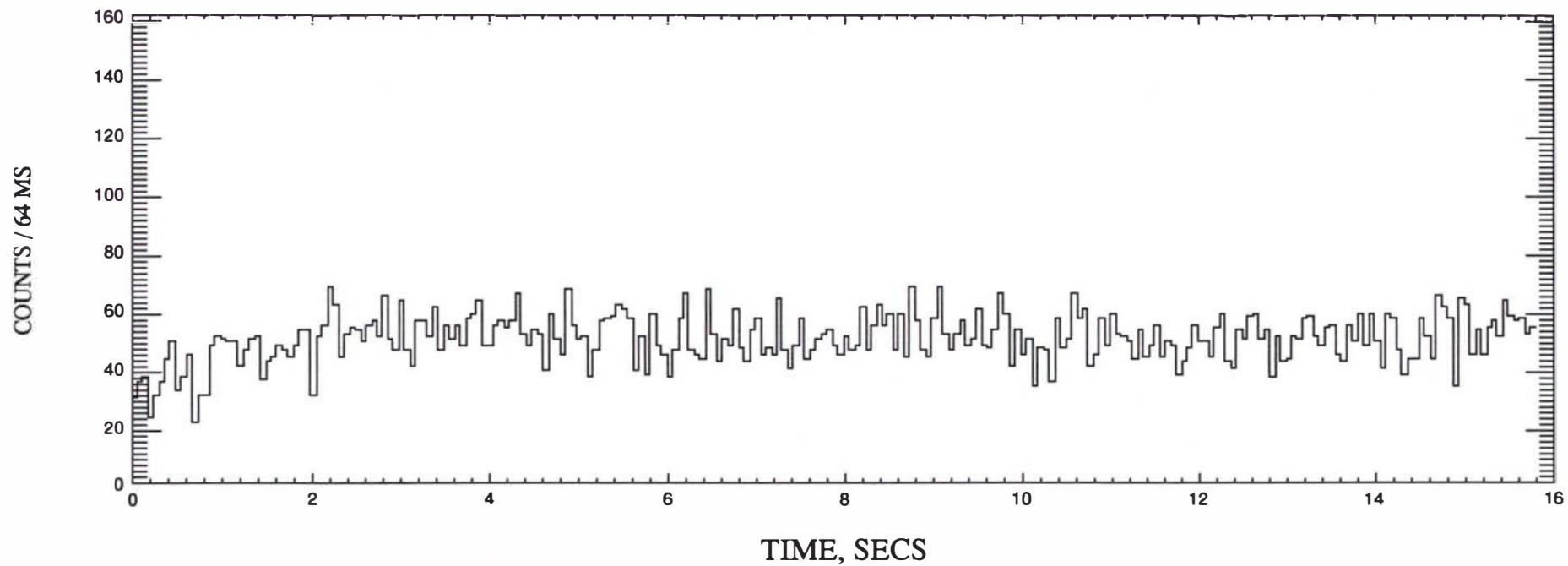
Burst Counter 0 at UT= 0.818312878079 h= 2945.926 s 00:49:05.926



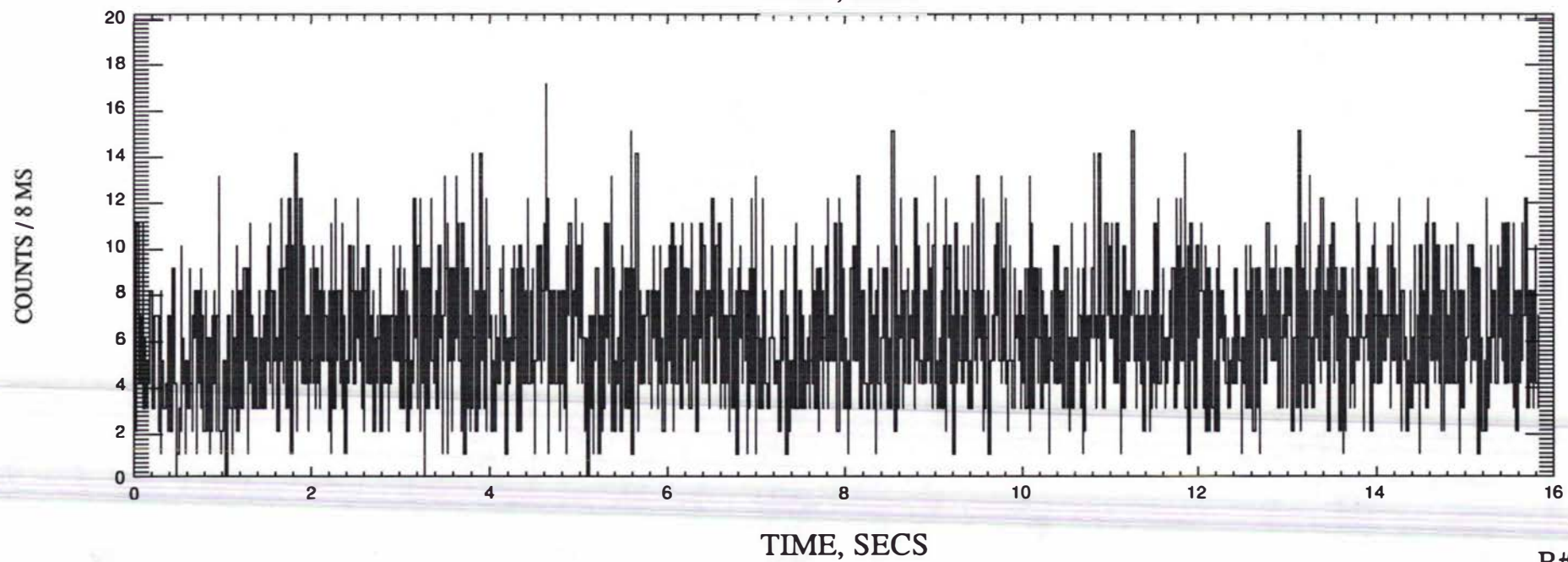
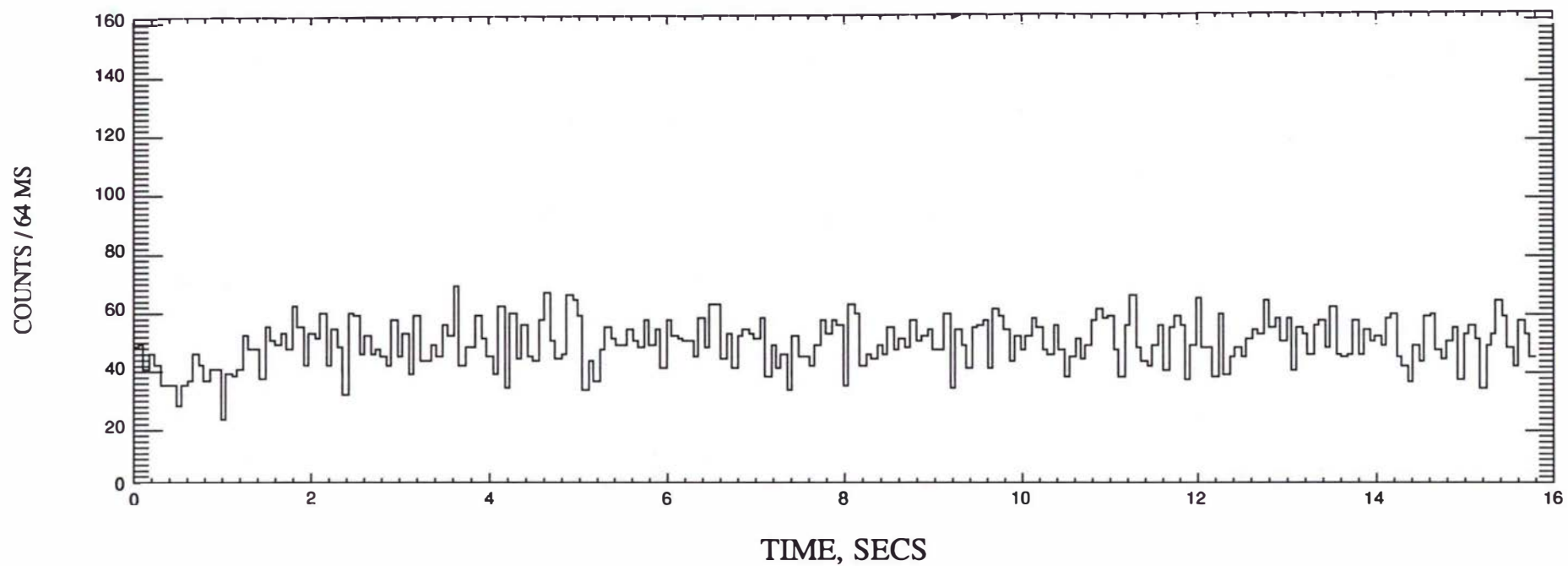
Burst Counter 1 at UT= 2.080560298496 h= 7490.017 s 02:04:50.017



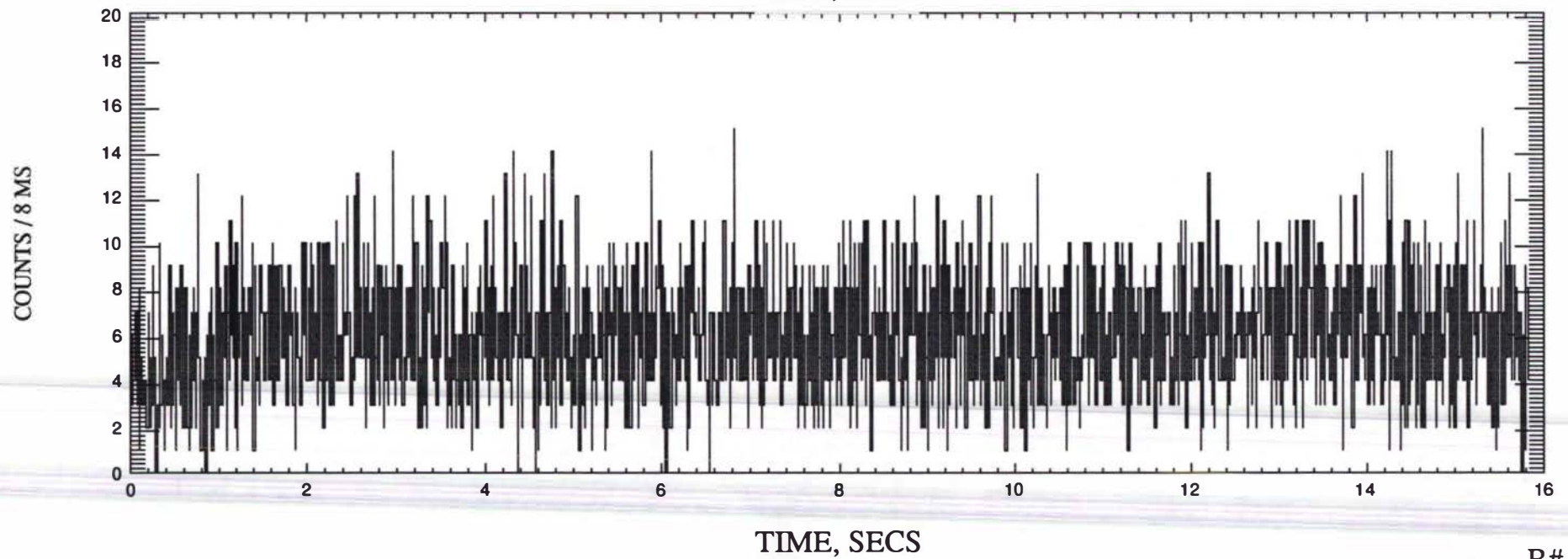
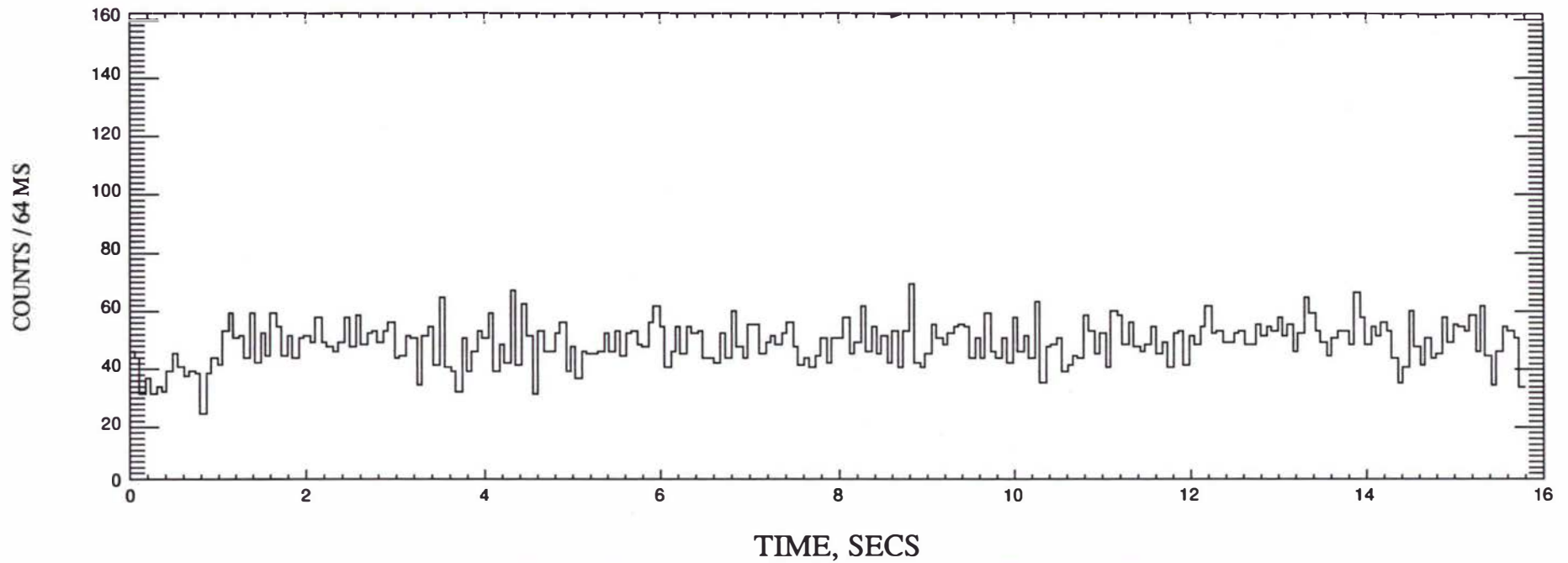
Burst Counter 2 at UT= 3.342959704929 h=12034.655 s 03:20:34.655



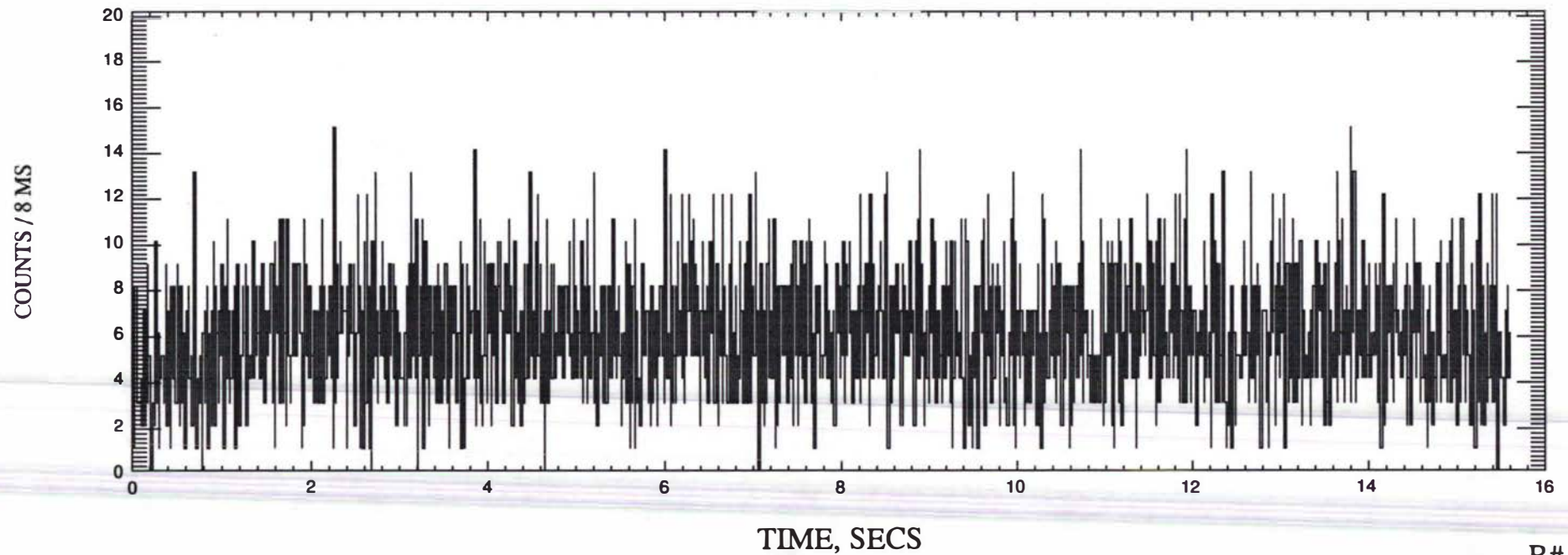
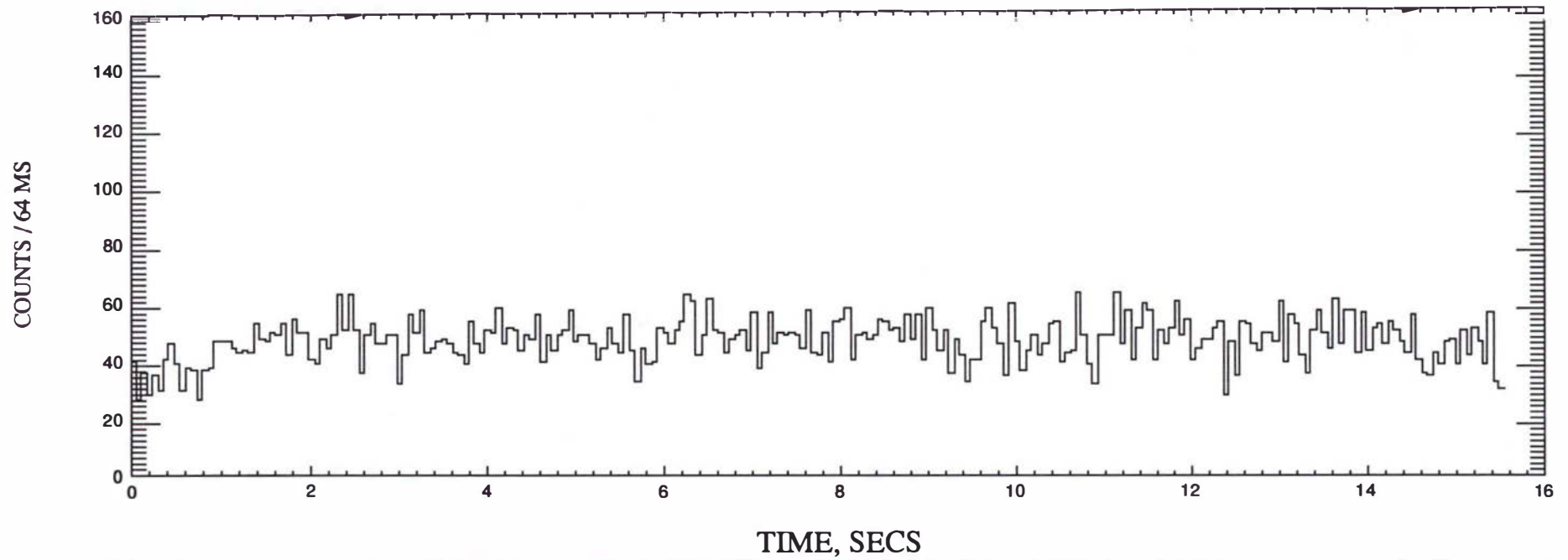
Burst Counter 3 at UT= 4.605120396084 h=16578.433 s 04:36:18.433



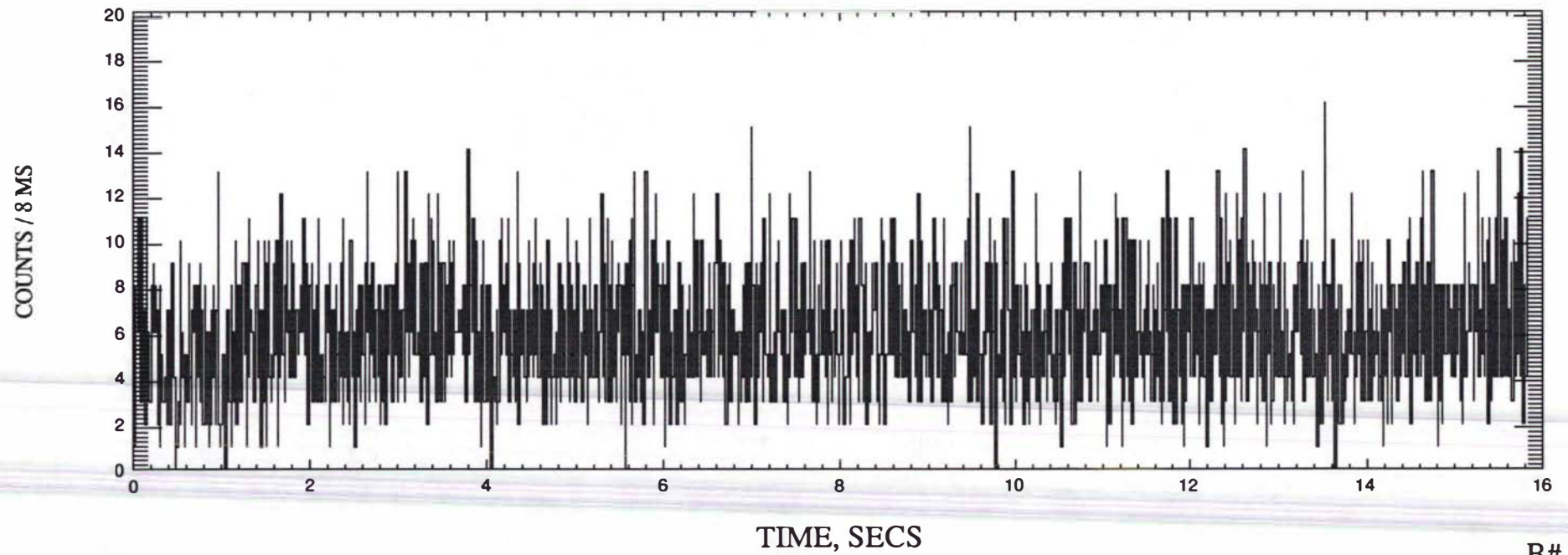
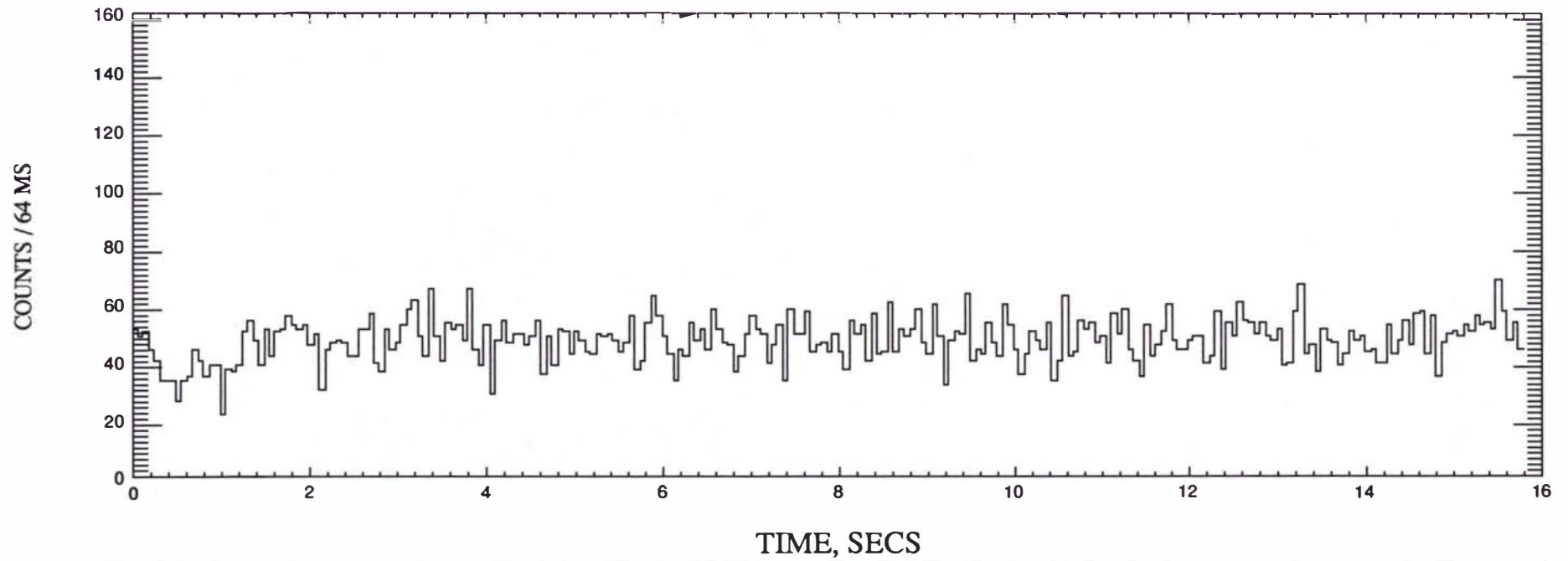
Burst Counter 4 at UT= 5.867419976128 h=21122.712 s 05:52:02.712



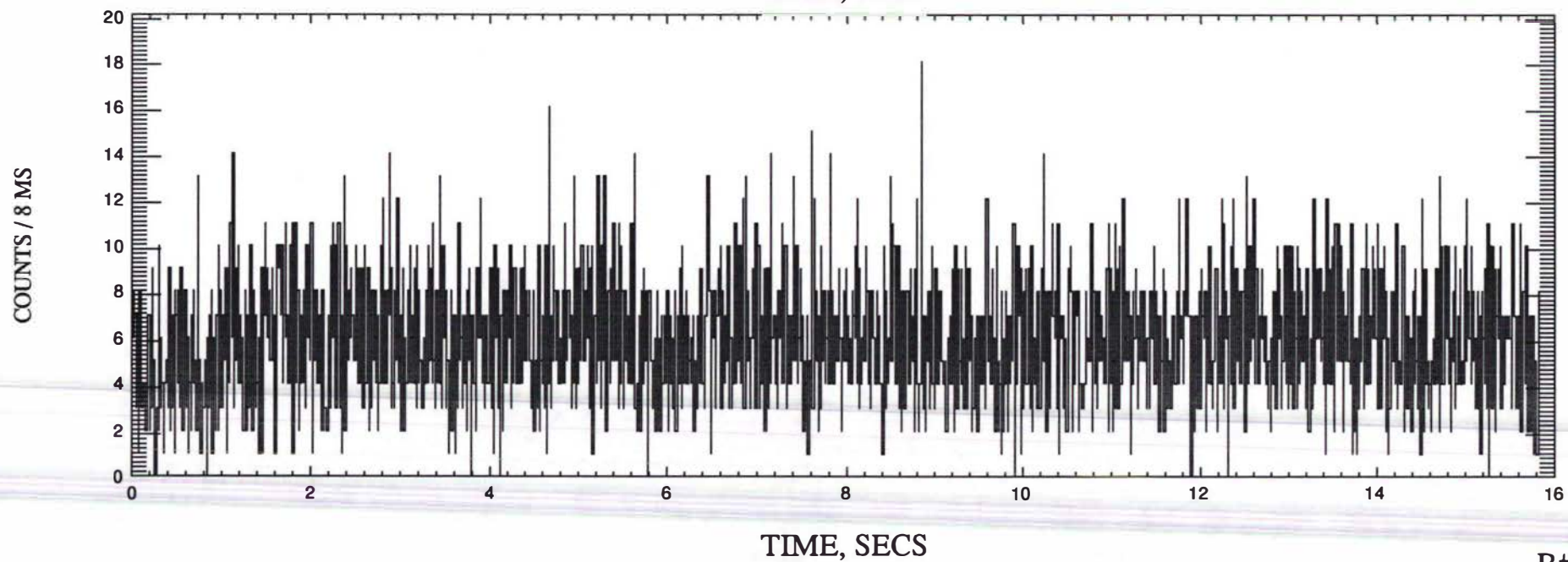
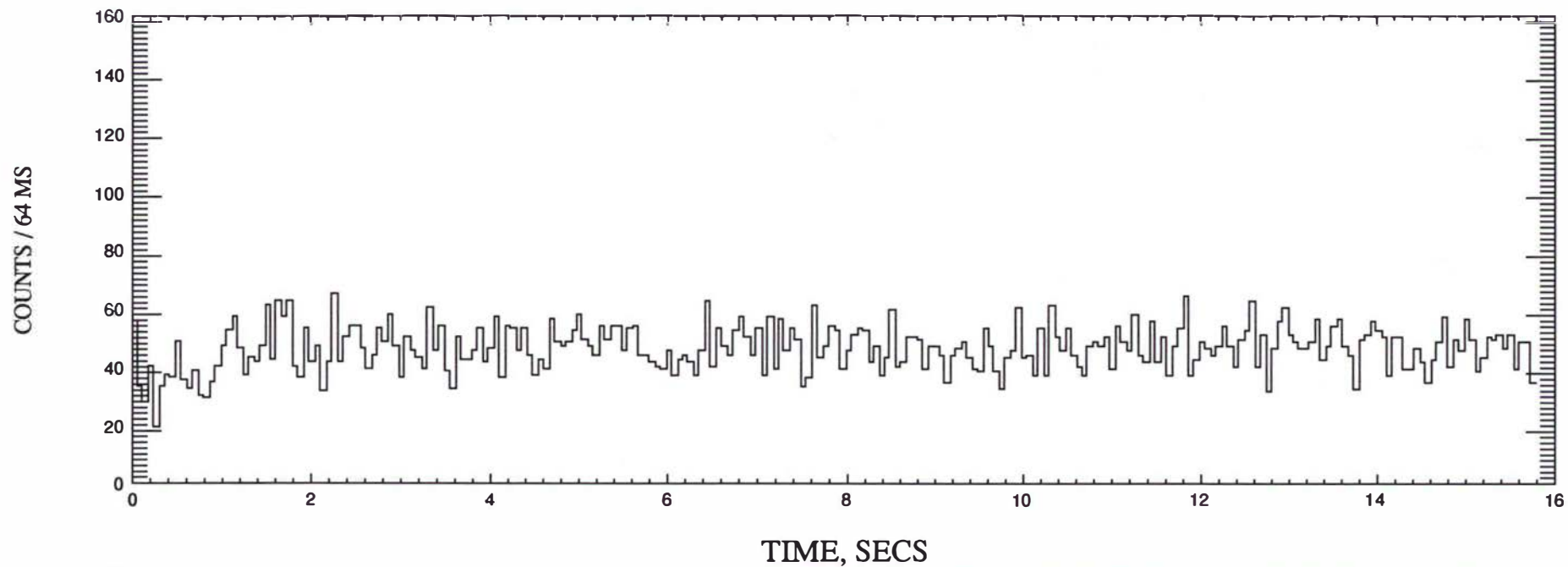
Burst Counter 5 at UT= 7.129684833950 h=25666.865 s 07:07:46.865



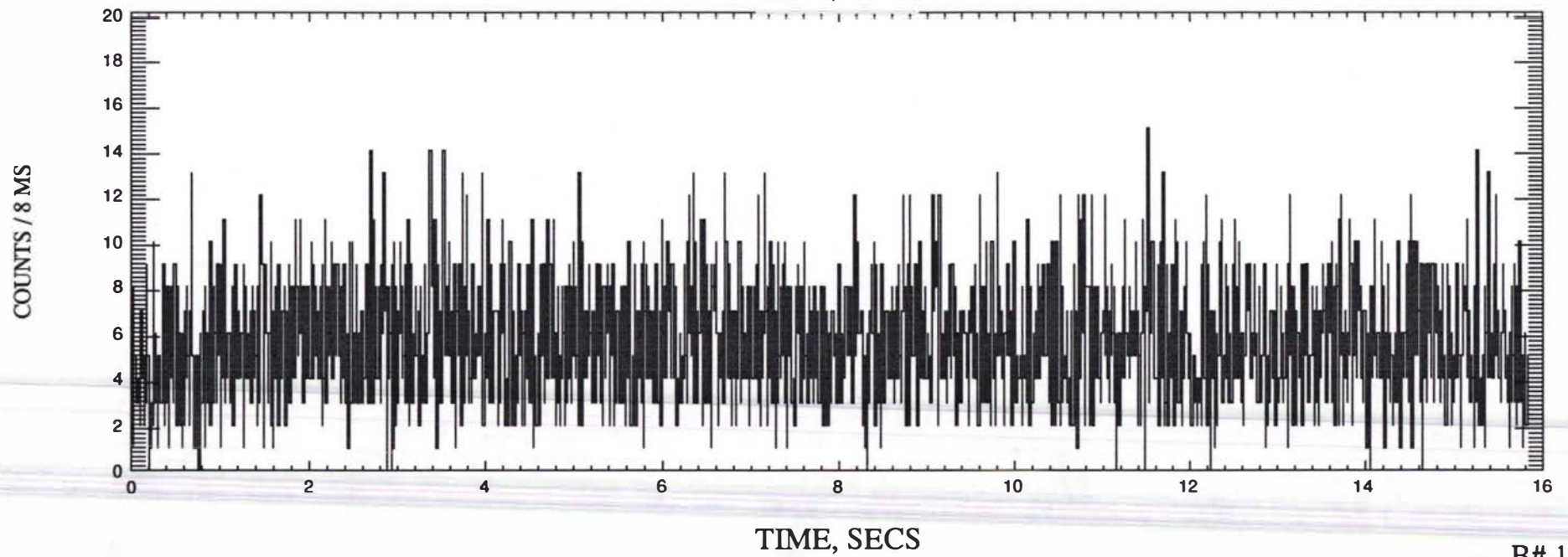
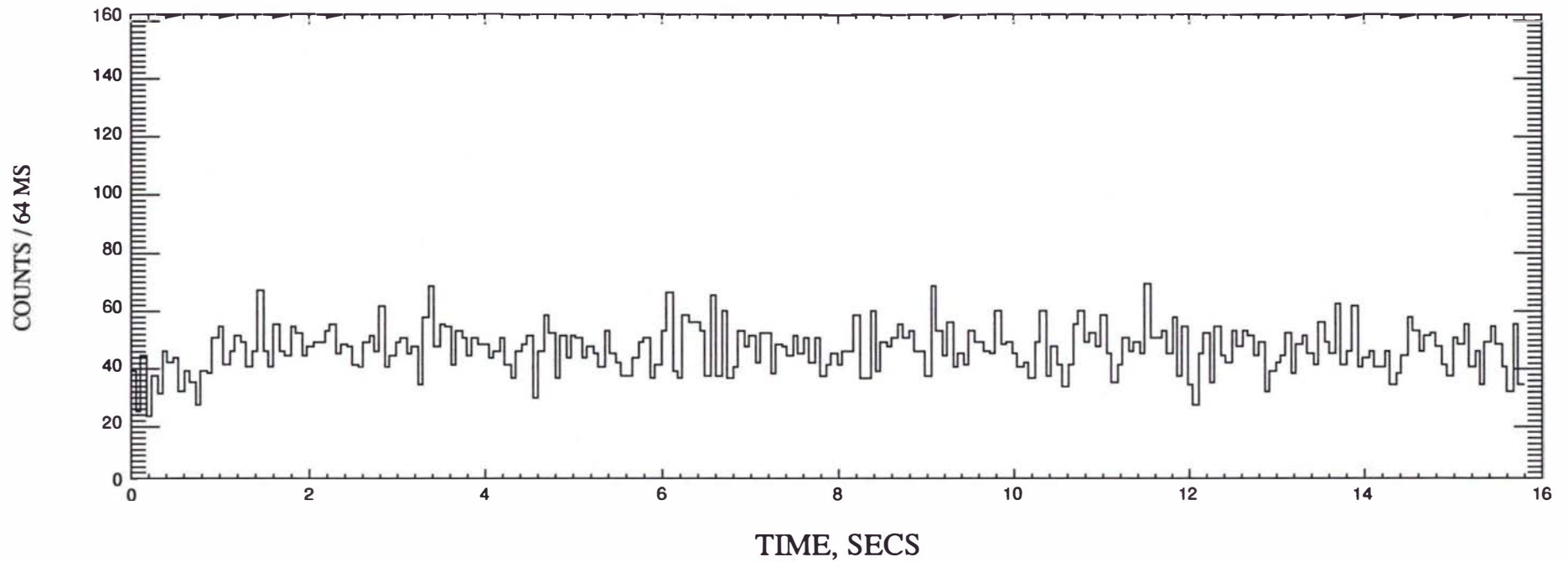
Burst Counter 6 at UT= 8.391856375800 h=30210.683 s 08:23:30.683



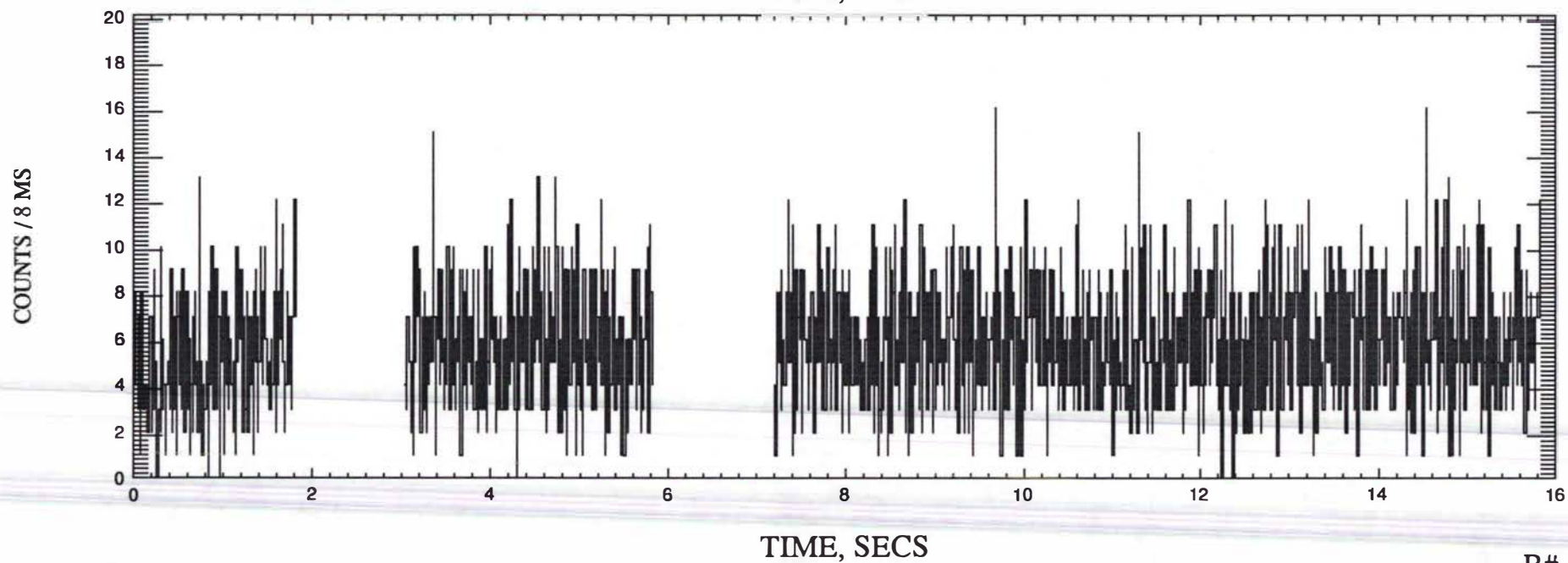
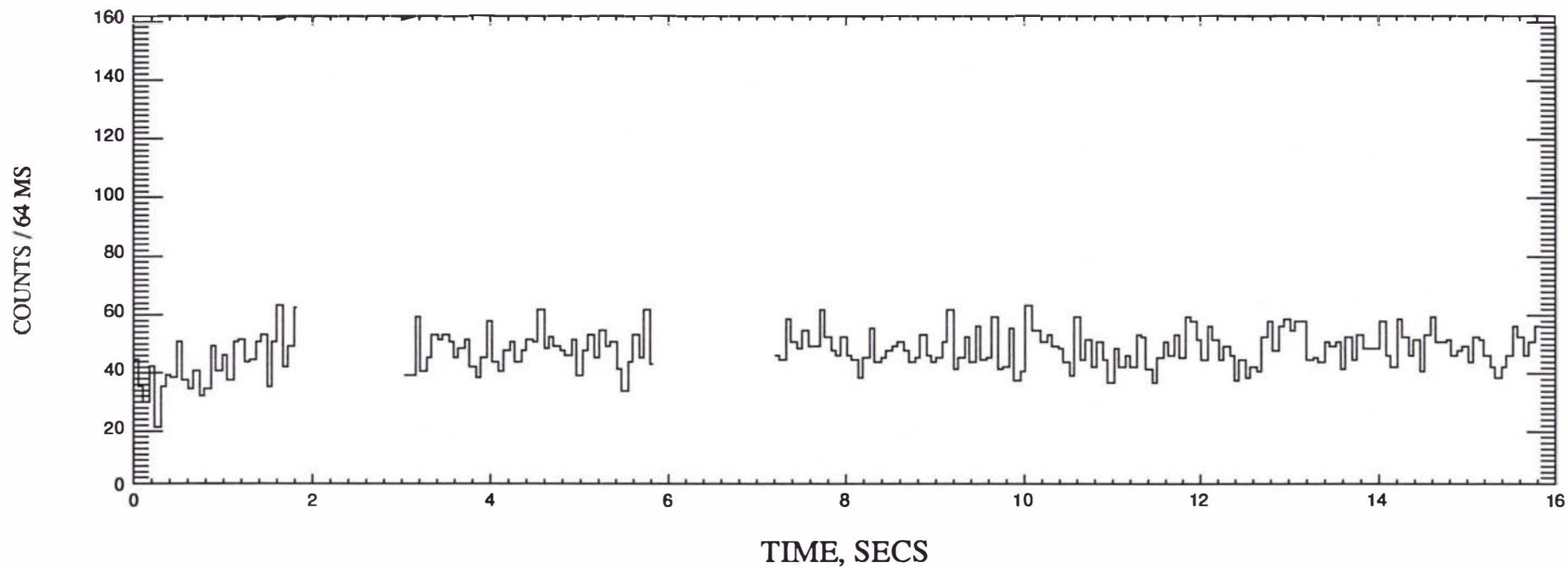
Burst Counter 7 at UT= 9.654162466261 h=34754.985 s 09:39:14.985



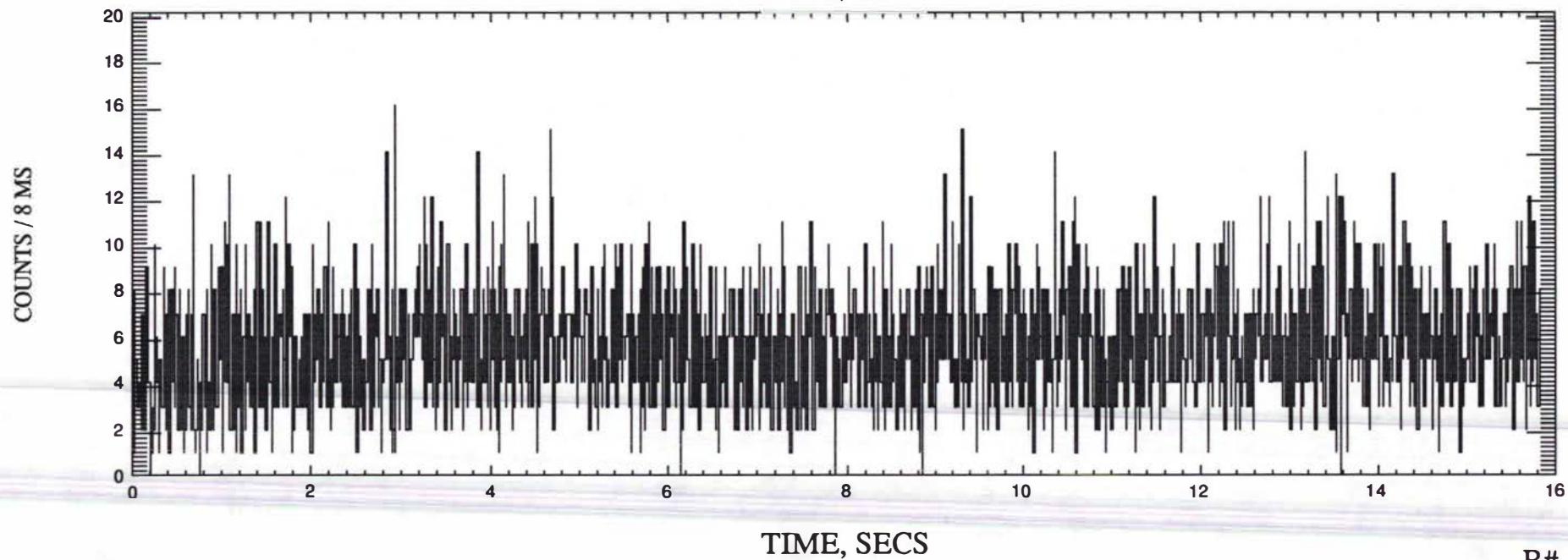
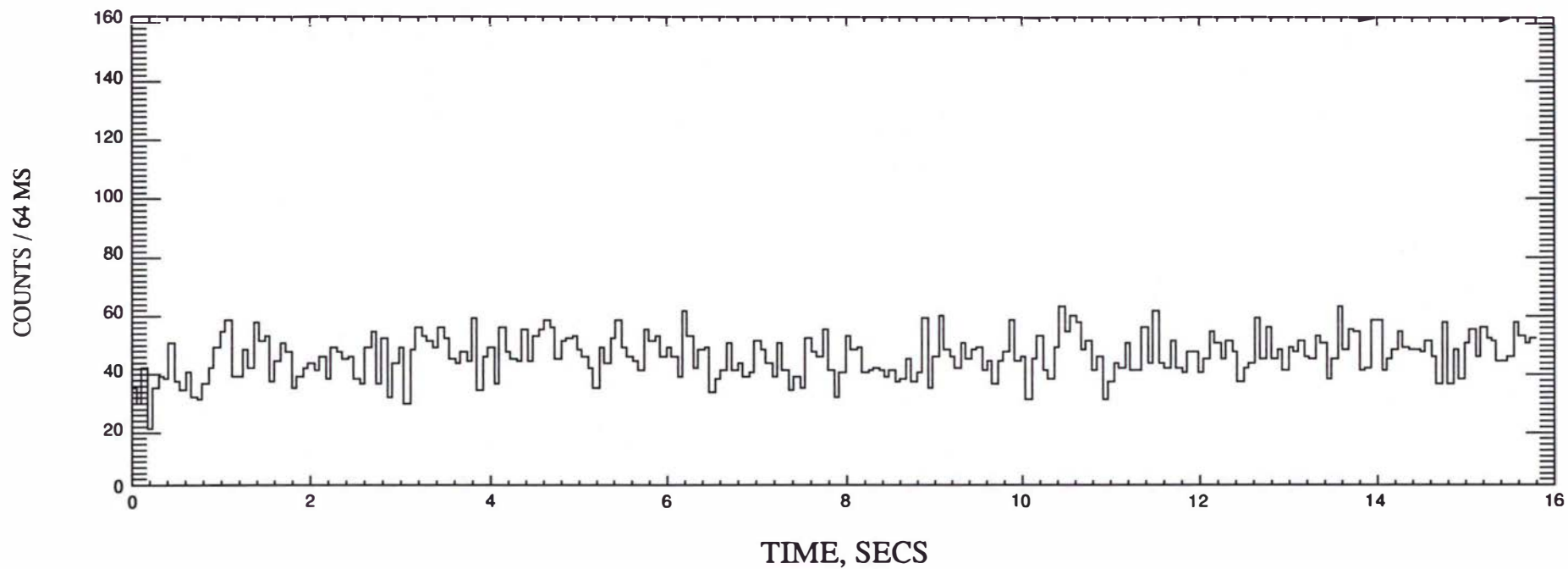
Burst Counter 8 at UT=10.916422983805 h=39299.123 s 10:54:59.123



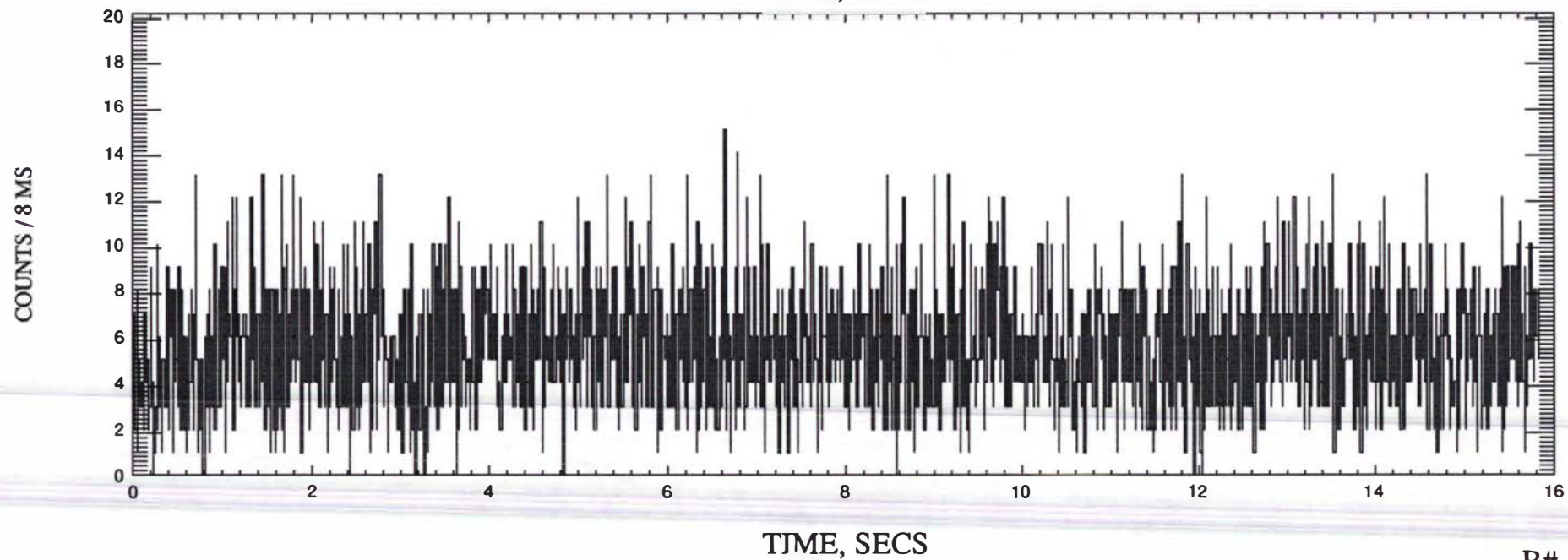
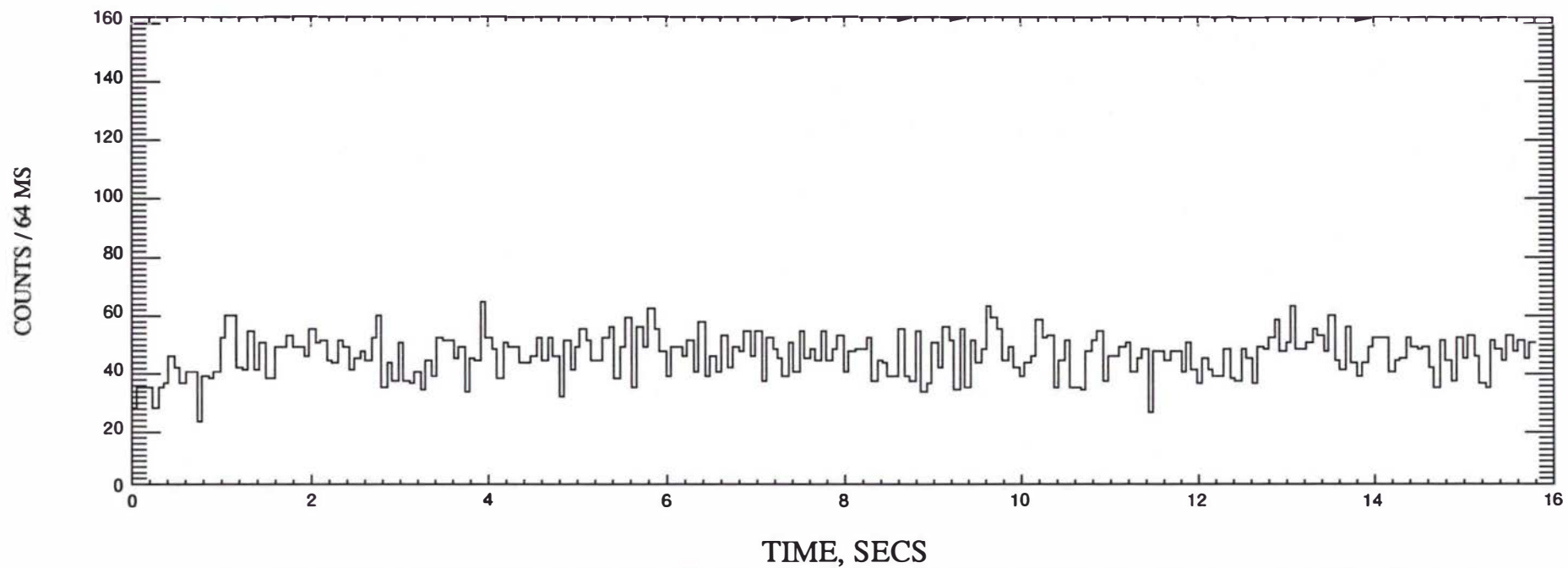
Burst Counter 9 at UT=12.178650550842 h=43843.142 s 12:10:43.142



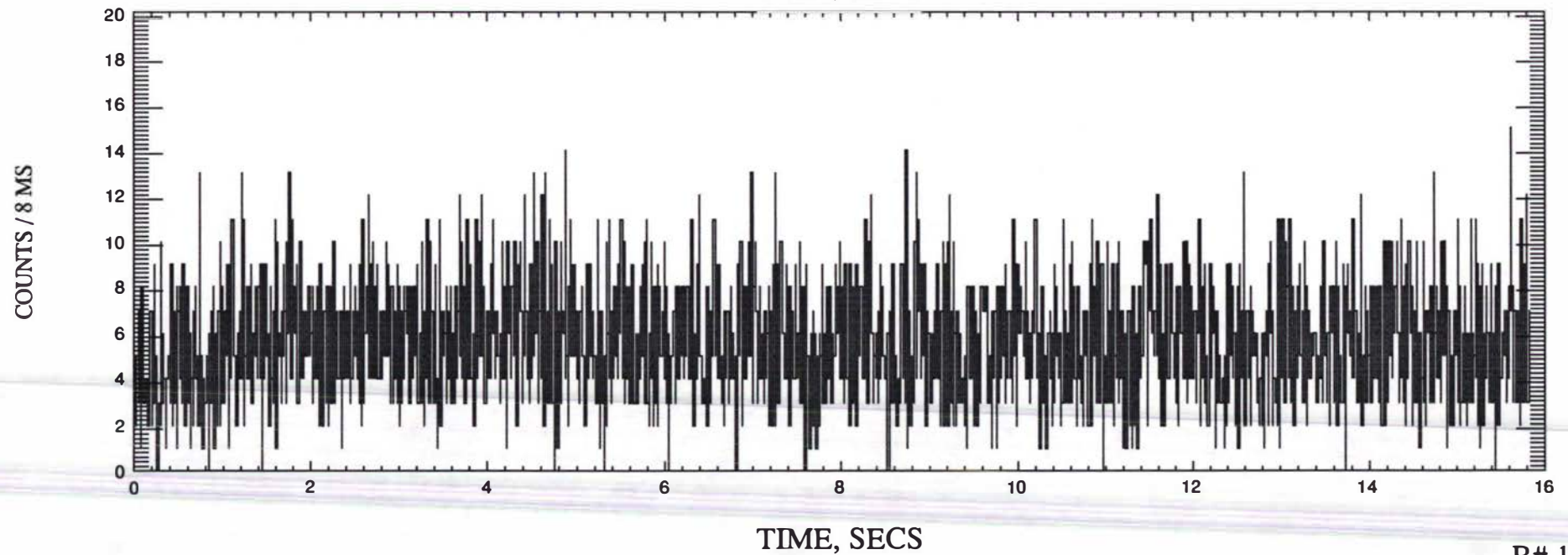
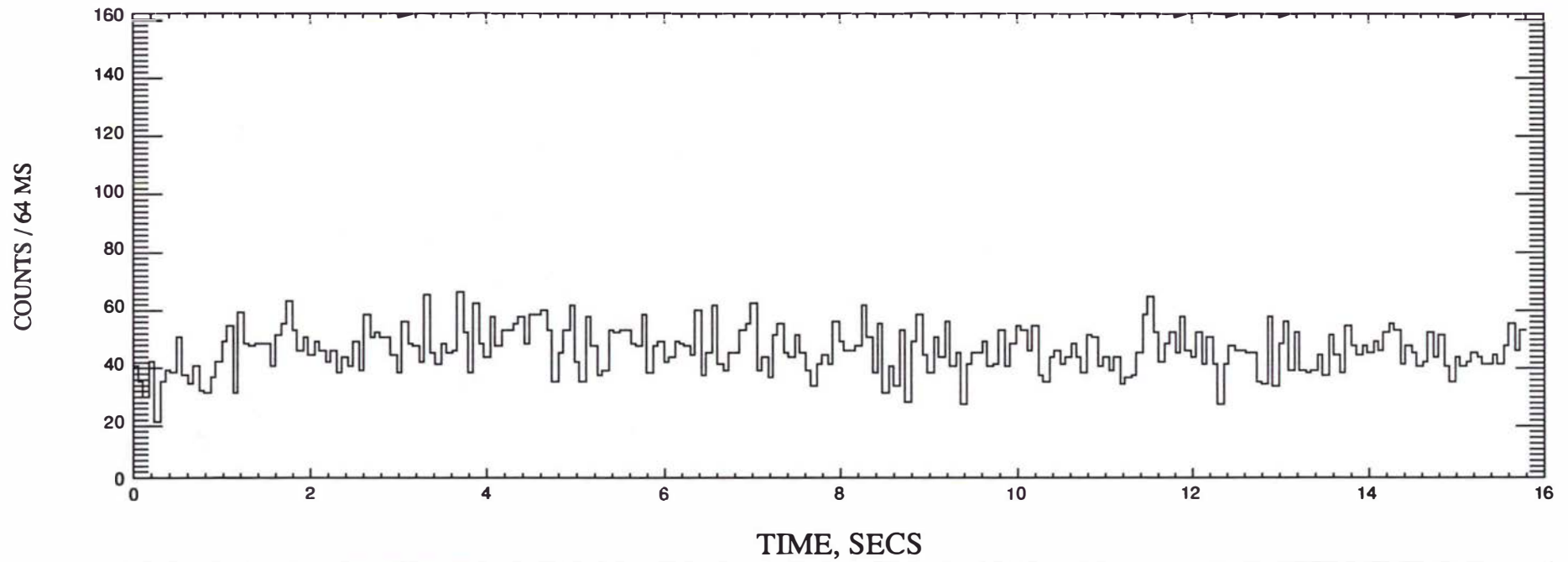
Burst Counter 11 at UT=13.680918371412 h=49251.306 s 13:40:51.306



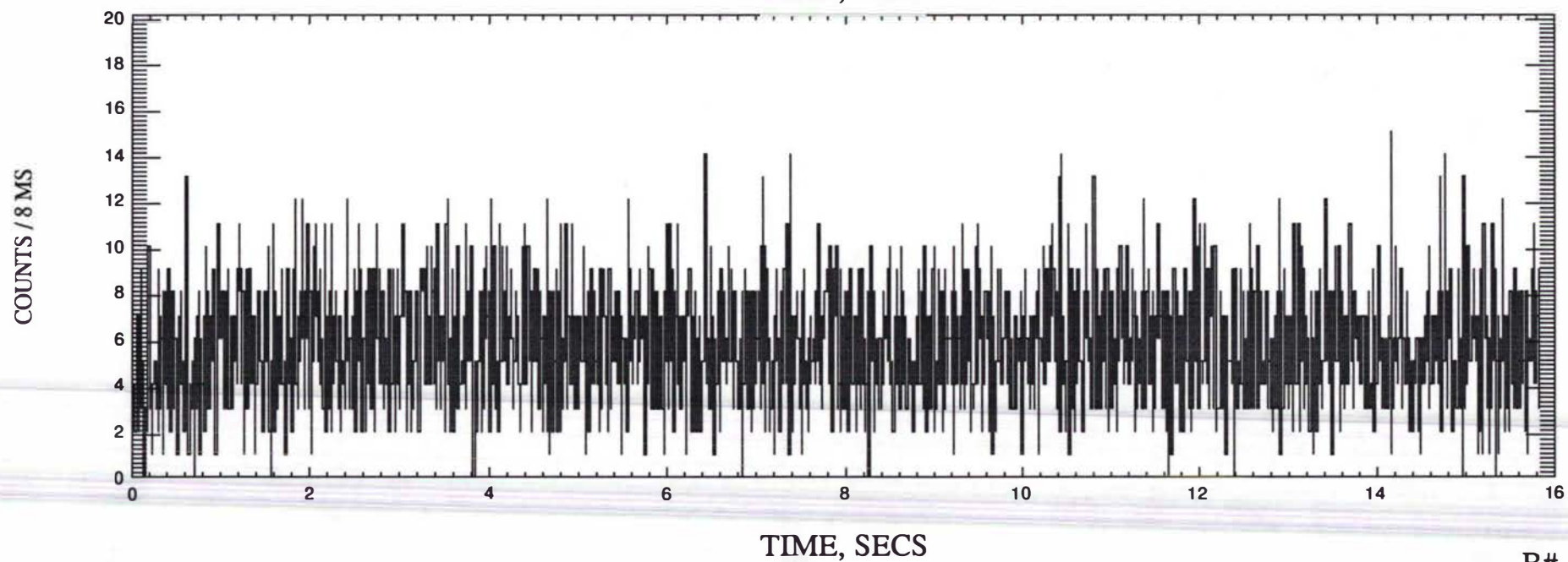
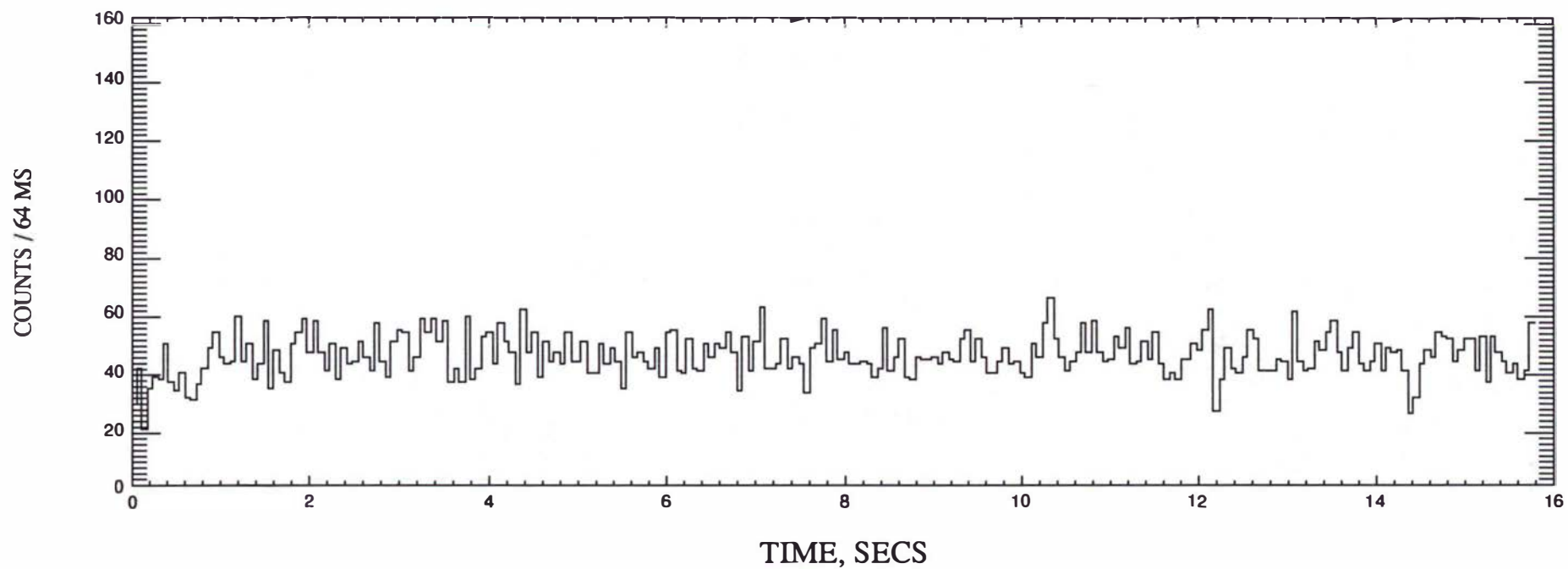
Burst Counter 12 at UT=14.383144751655 h=51779.321 s 14:22:59.321



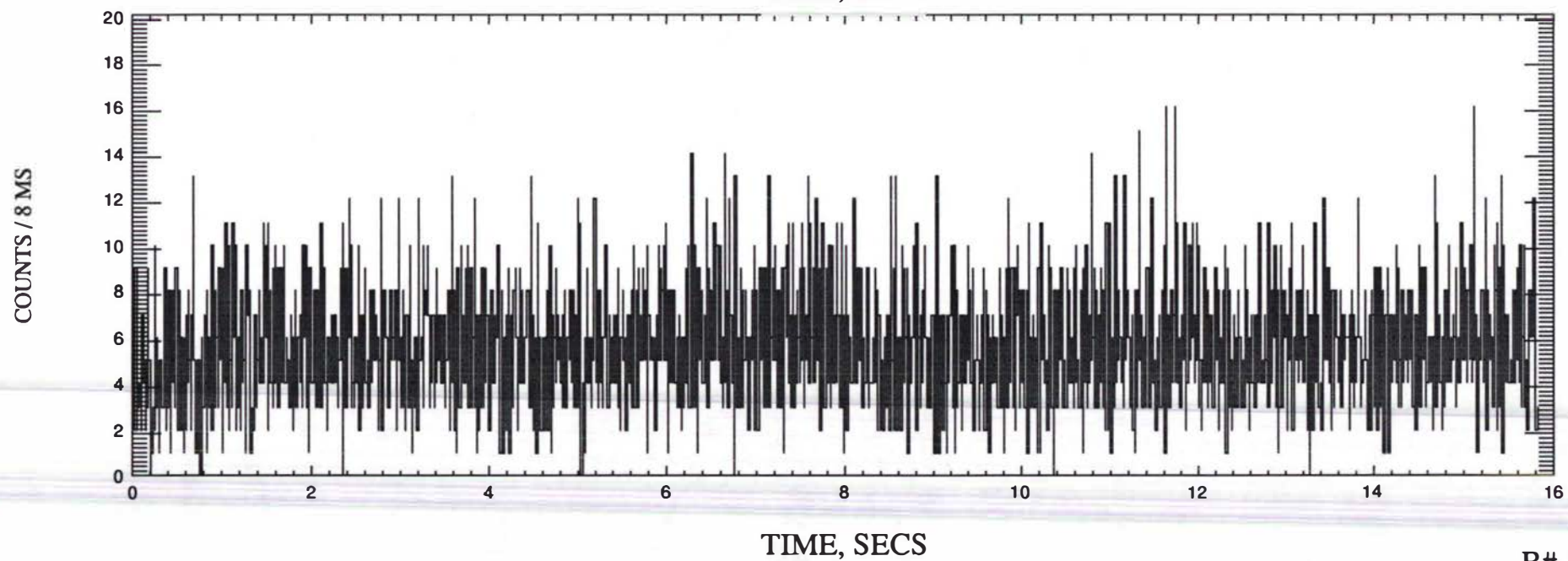
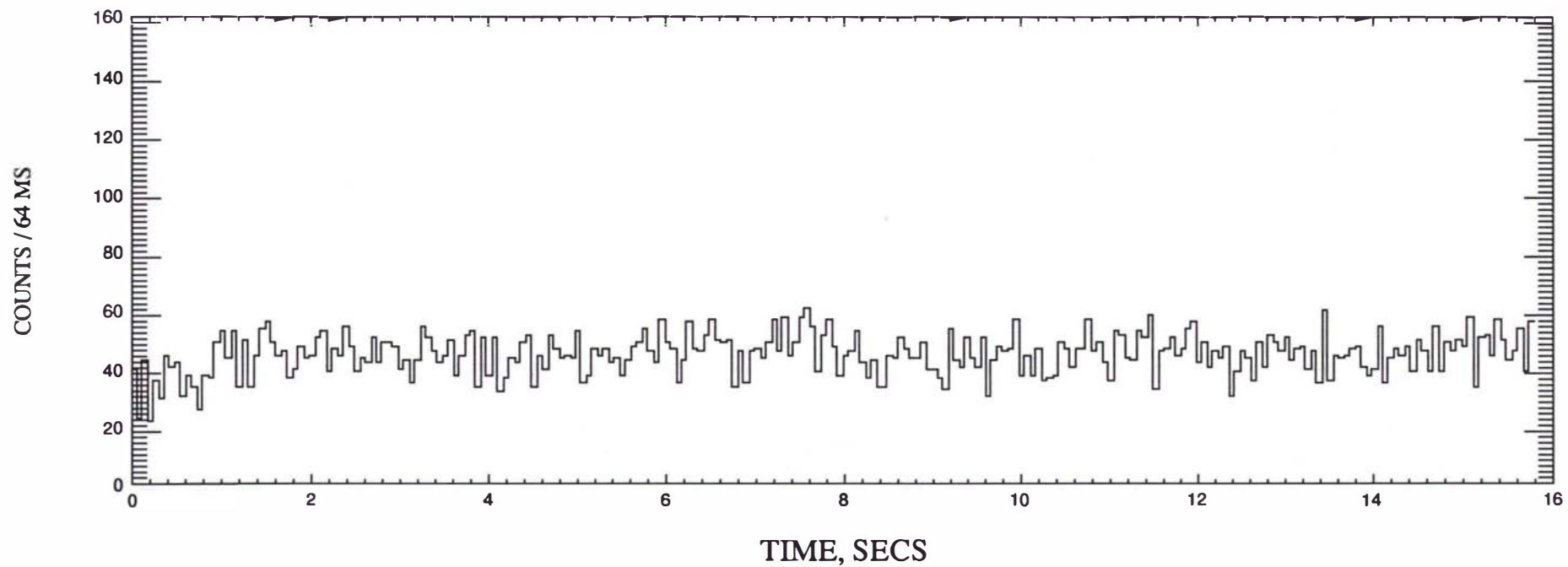
Burst Counter 13 at UT=15.085371127658 h=54307.336 s 15:05:07.336



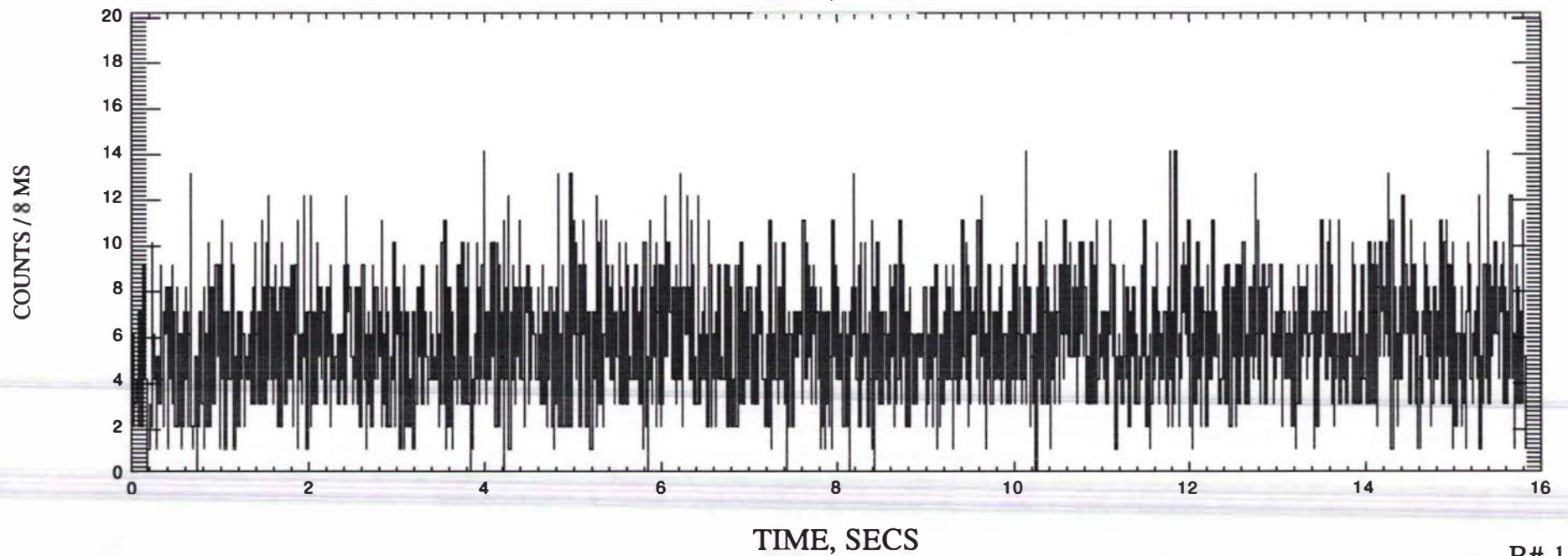
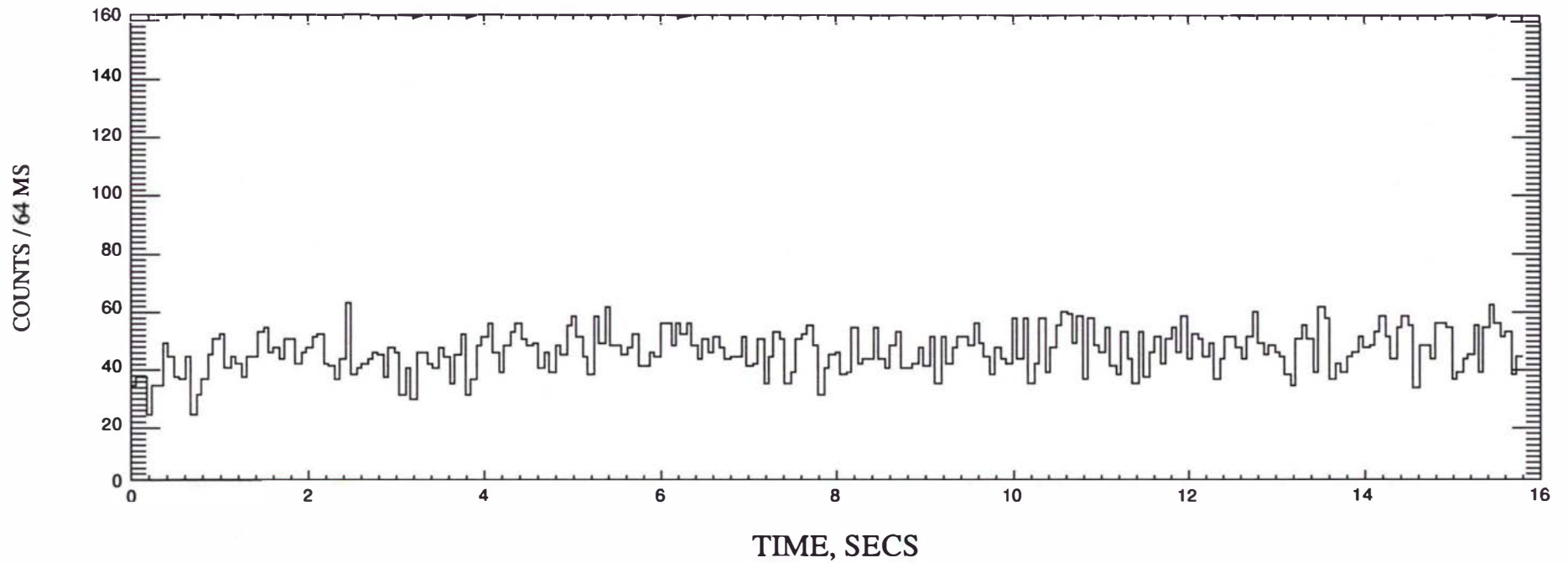
Burst Counter 14 at UT=15.787640906440 h=56835.507 s 15:47:15.507



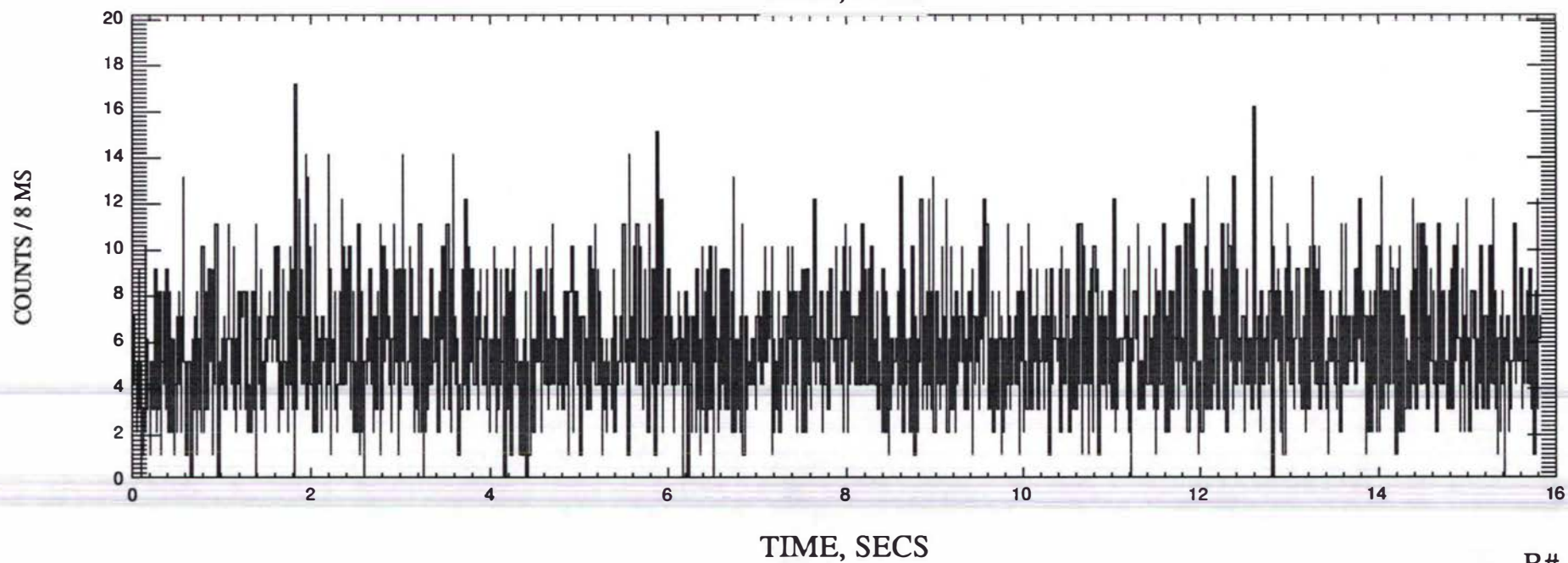
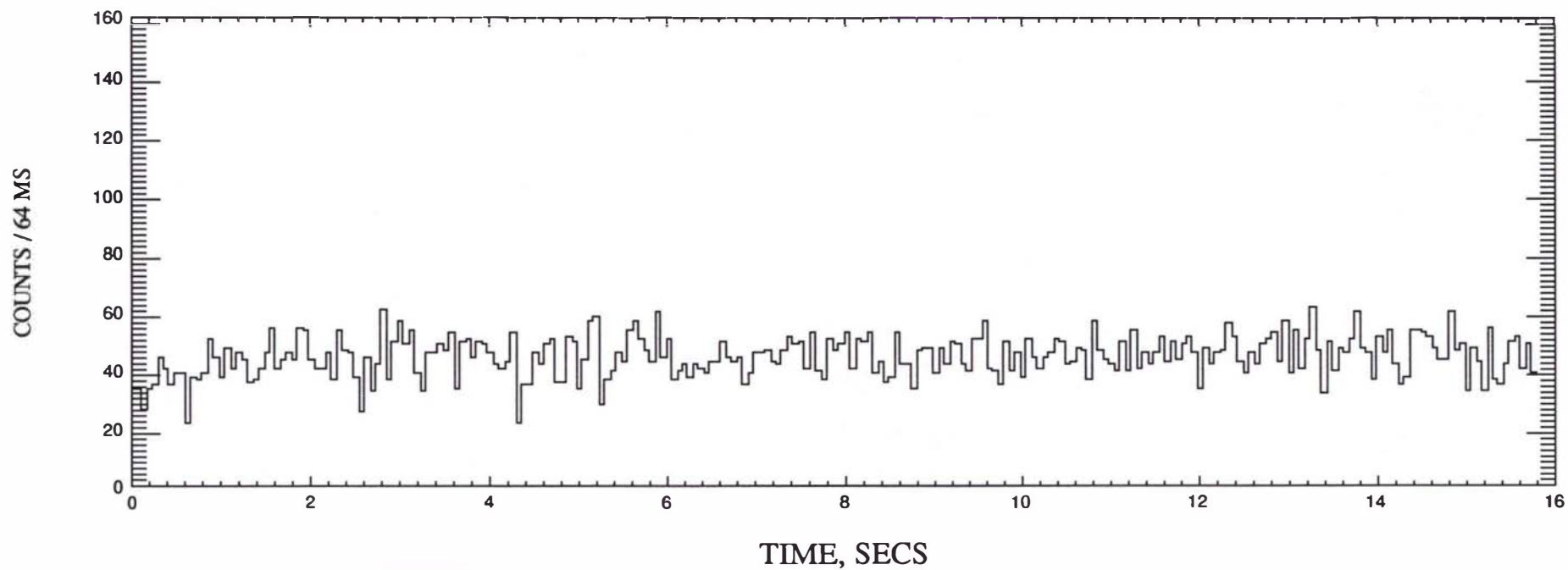
Burst Counter 15 at UT=16.489856431749 h=59363.483 s 16:29:23.483



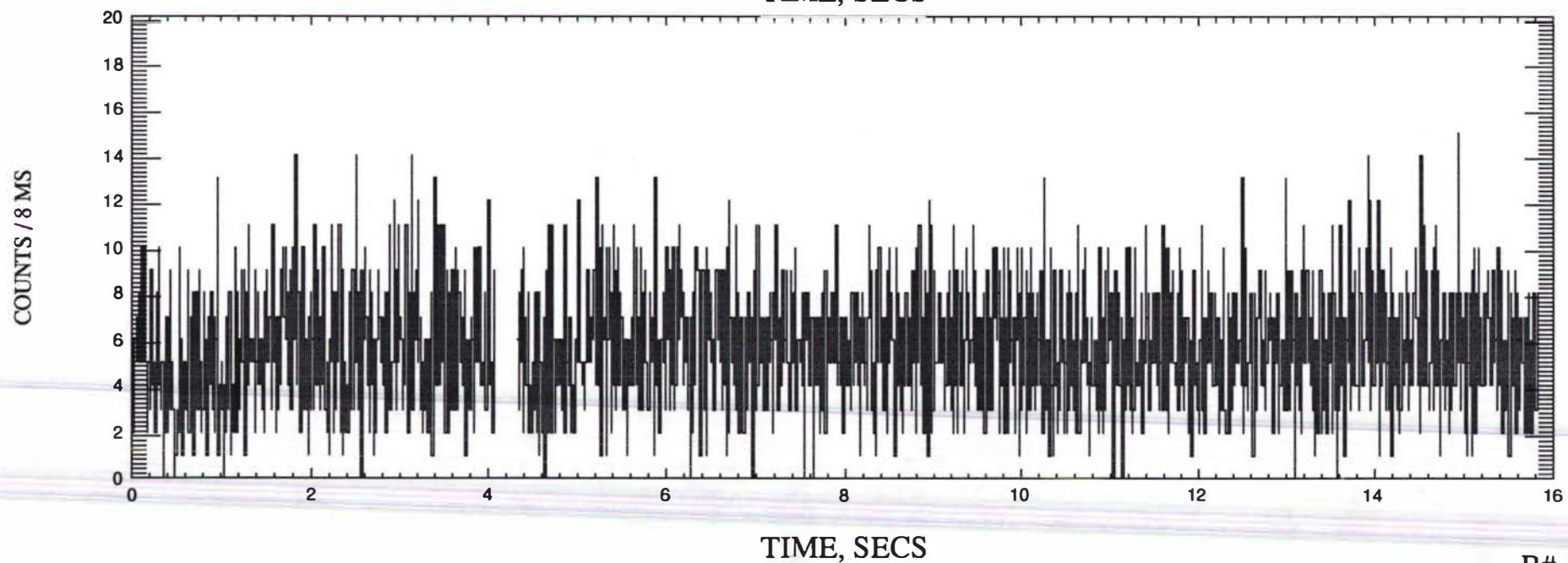
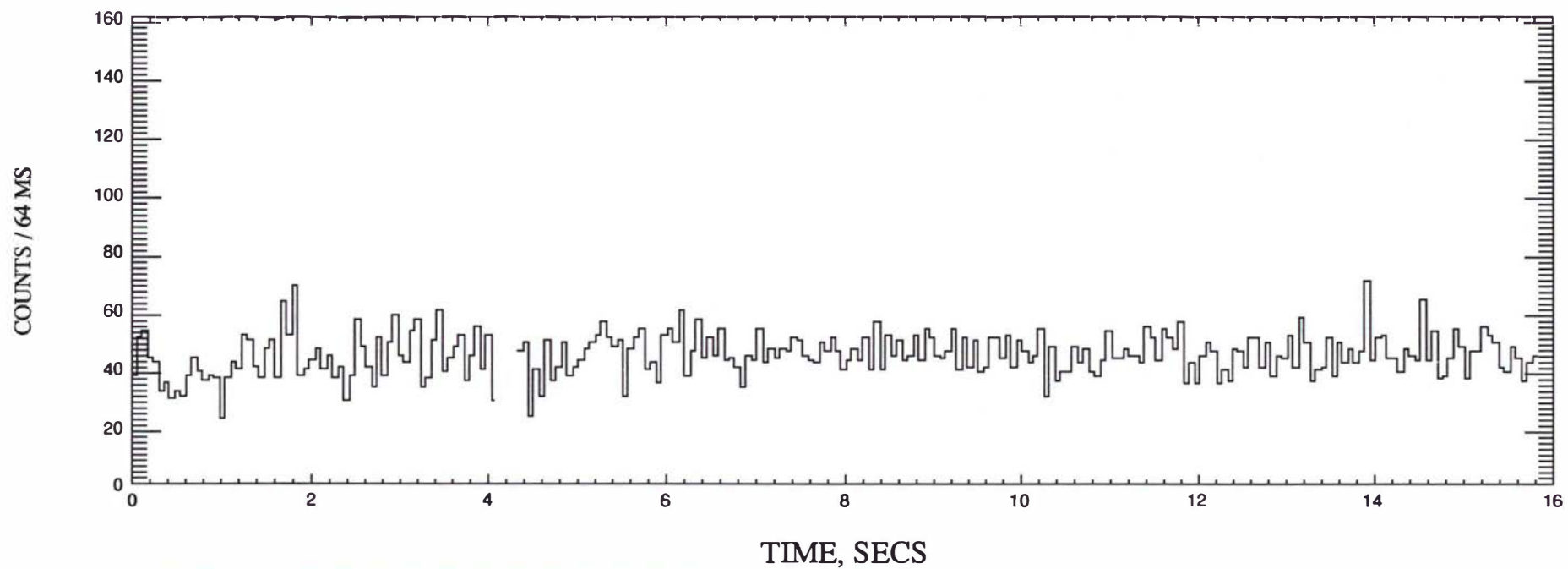
Burst Counter 0 at UT=17.192100173102 h=61891.561 s 17:11:31.561



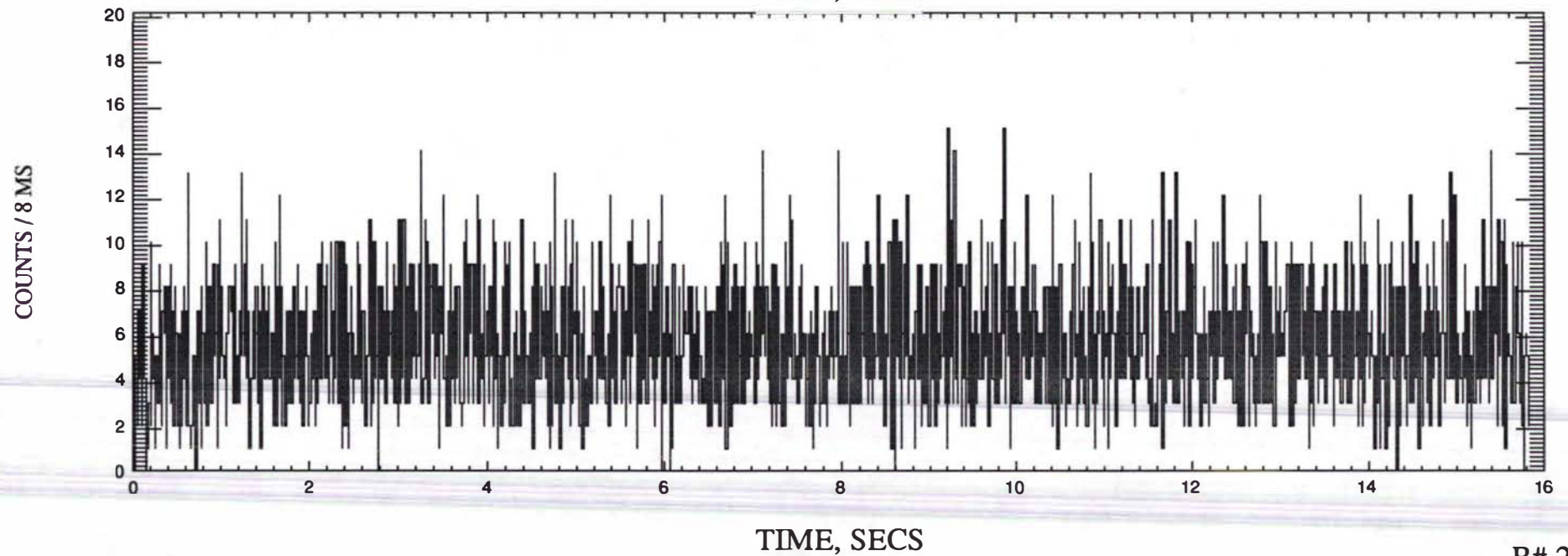
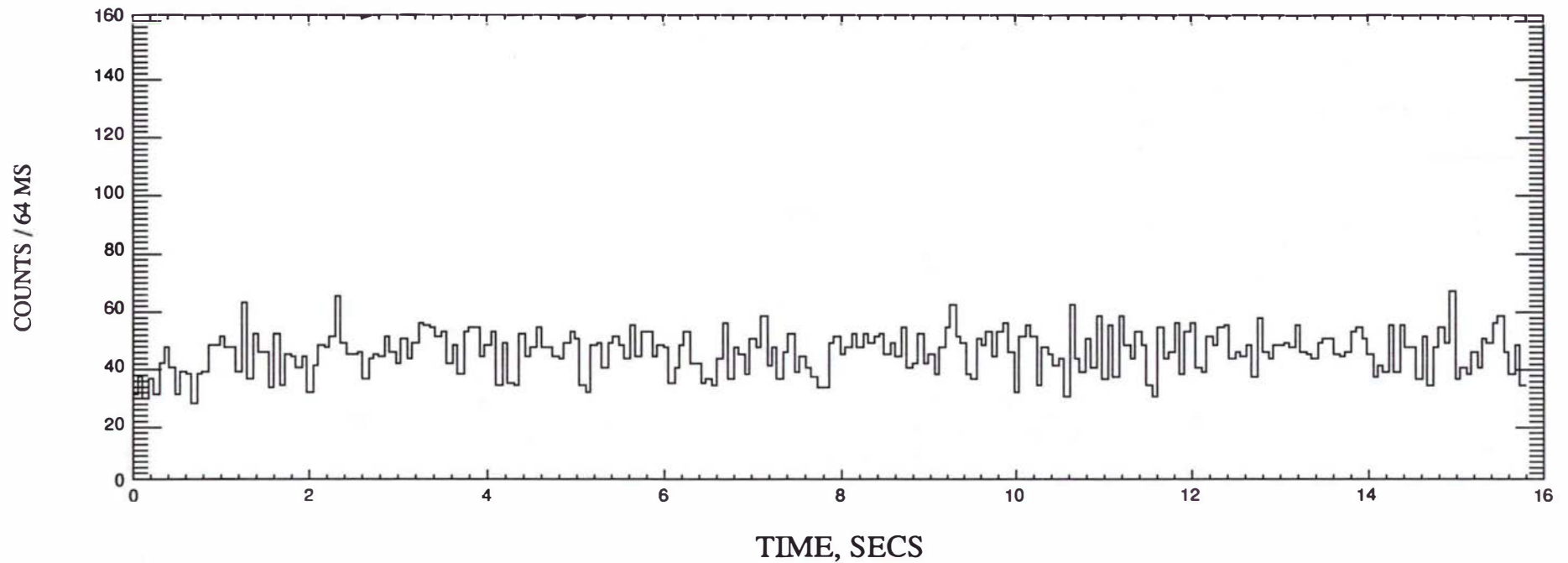
Burst Counter 1 at UT=17.894353476630 h=64419.673 s 17:53:39.673



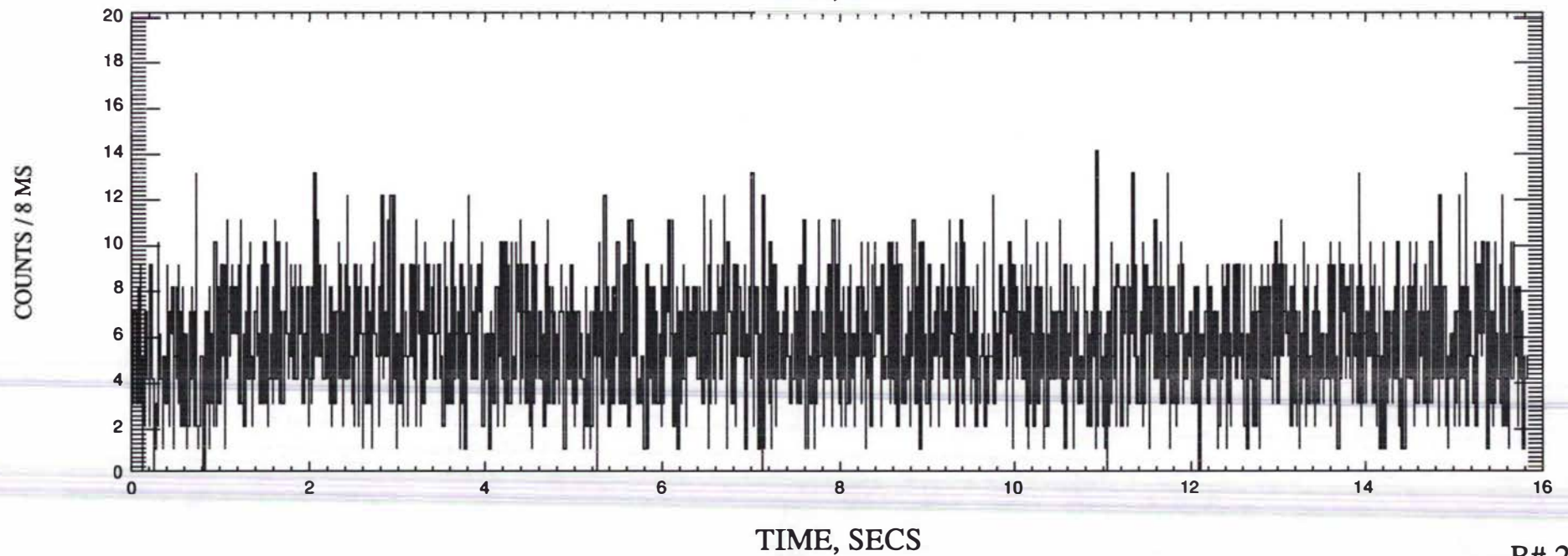
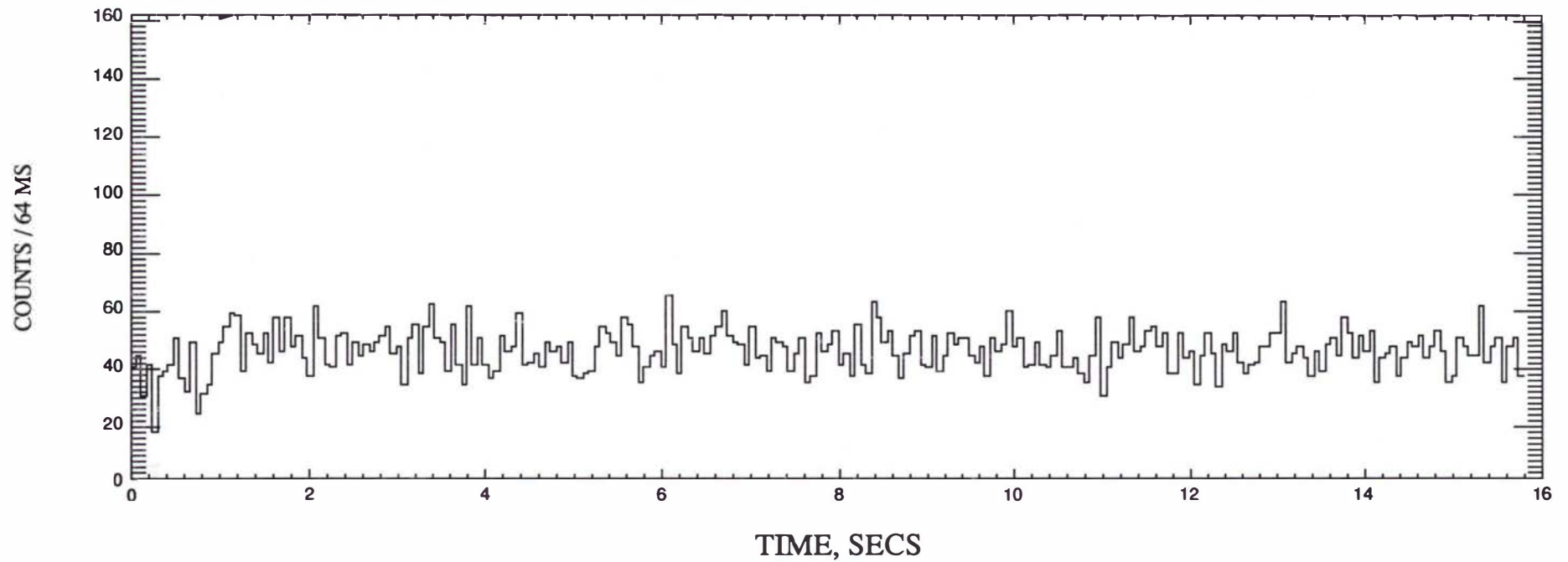
Burst Counter 2 at UT=18.596486536662 h=66947.352 s 18:35:47.352



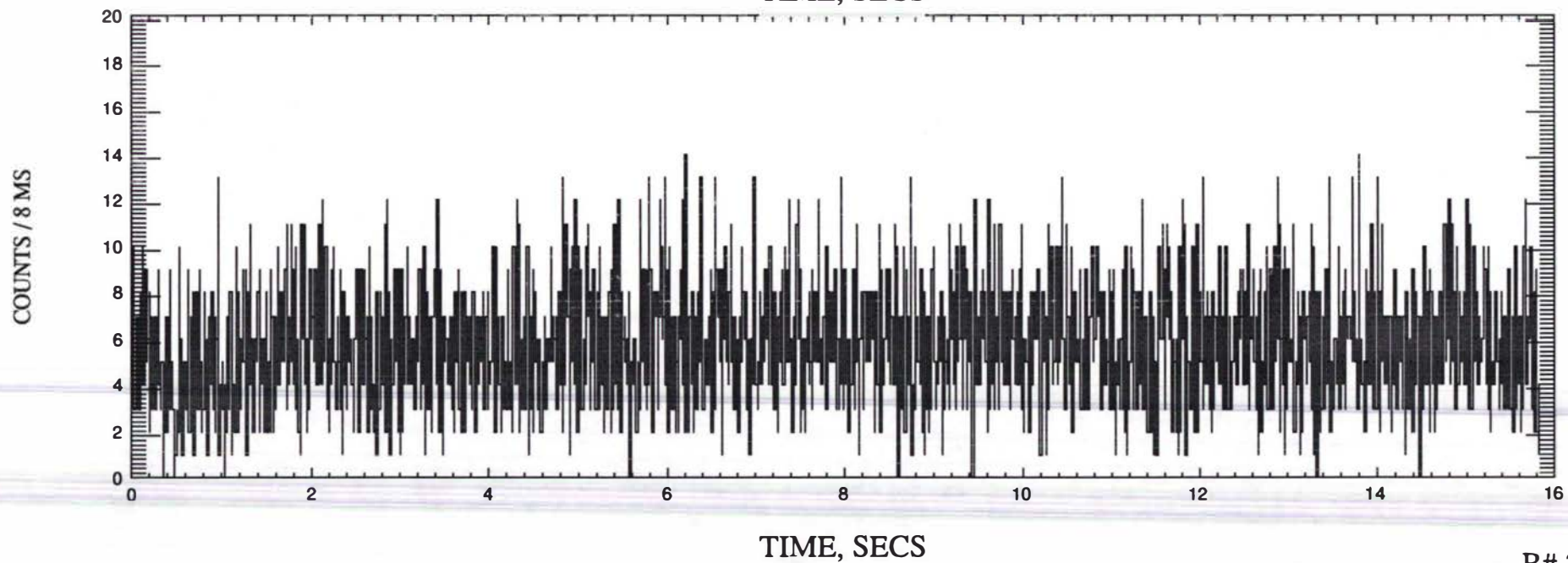
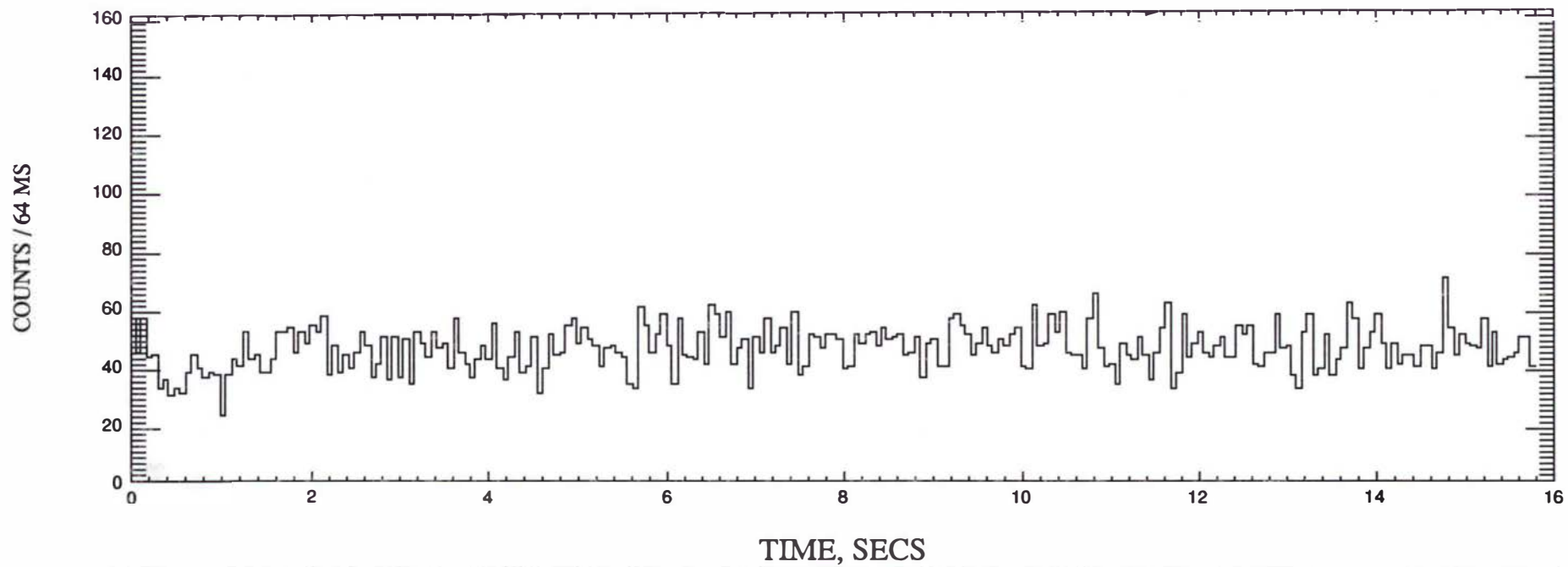
Burst Counter 3 at UT=19.298810573154 h=69475.718 s 19:17:55.718



Burst Counter 4 at UT=20.001017417908 h=72003.663 s 20:00:03.663



Burst Counter 5 at UT=20.703191710578 h=74531.490 s 20:42:11.490



244

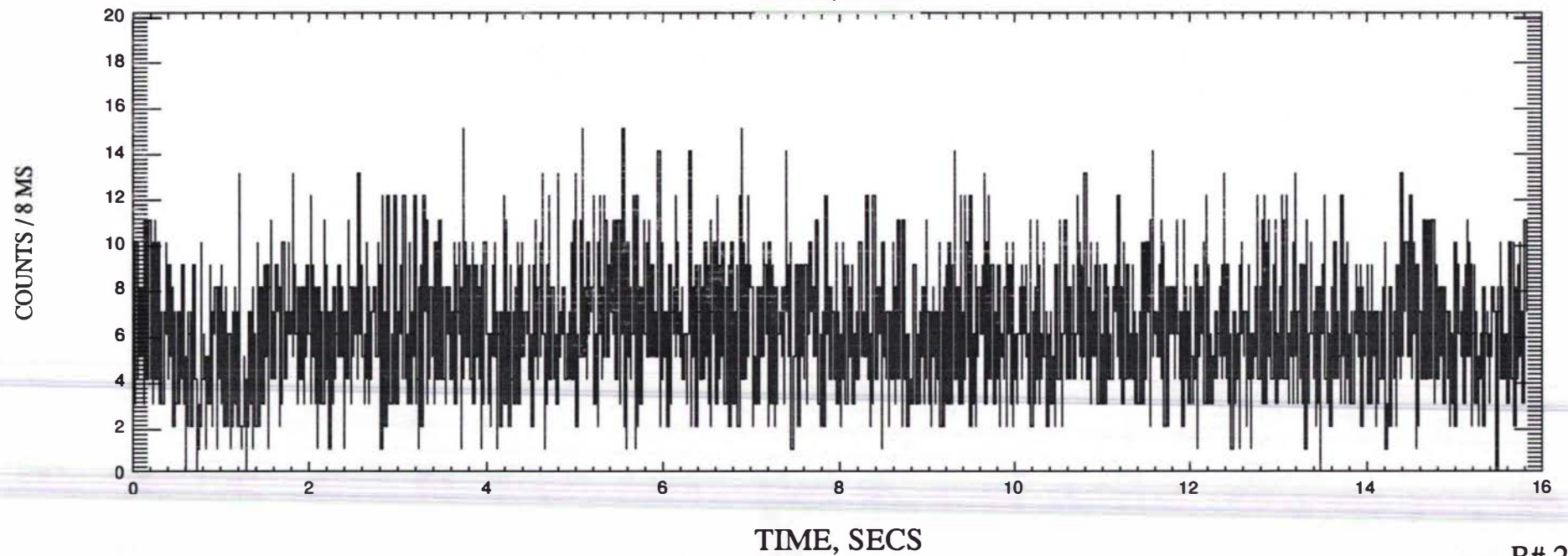
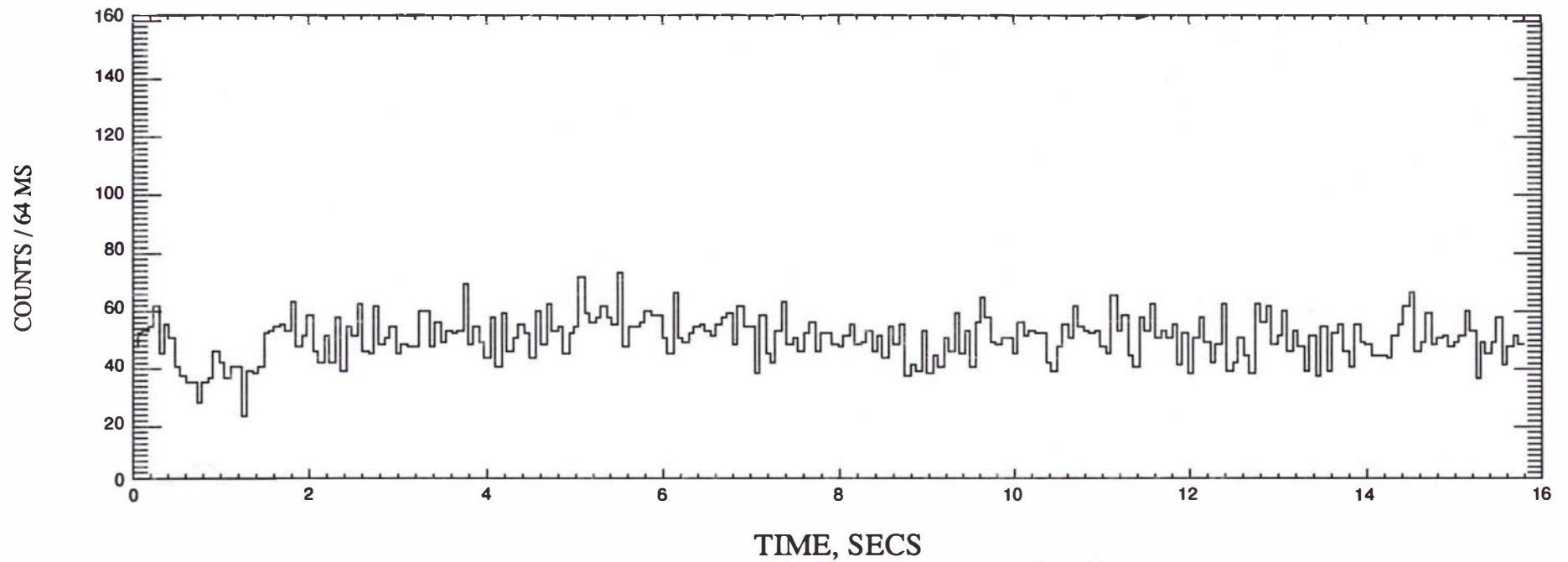
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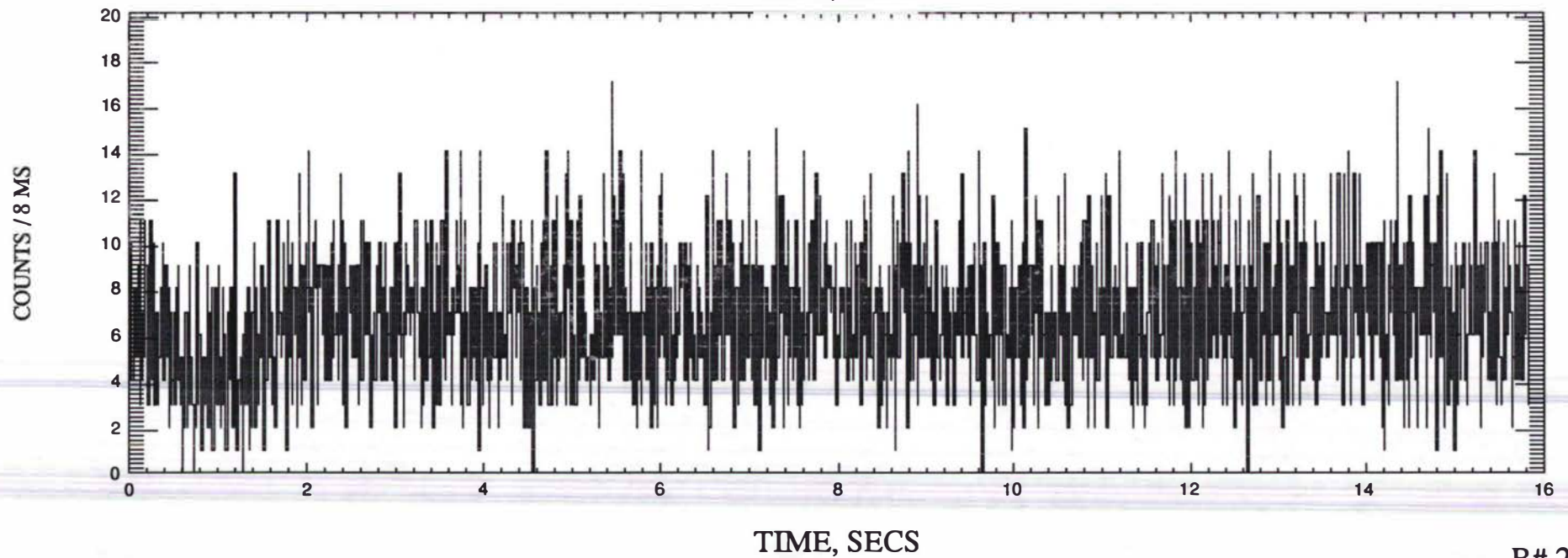
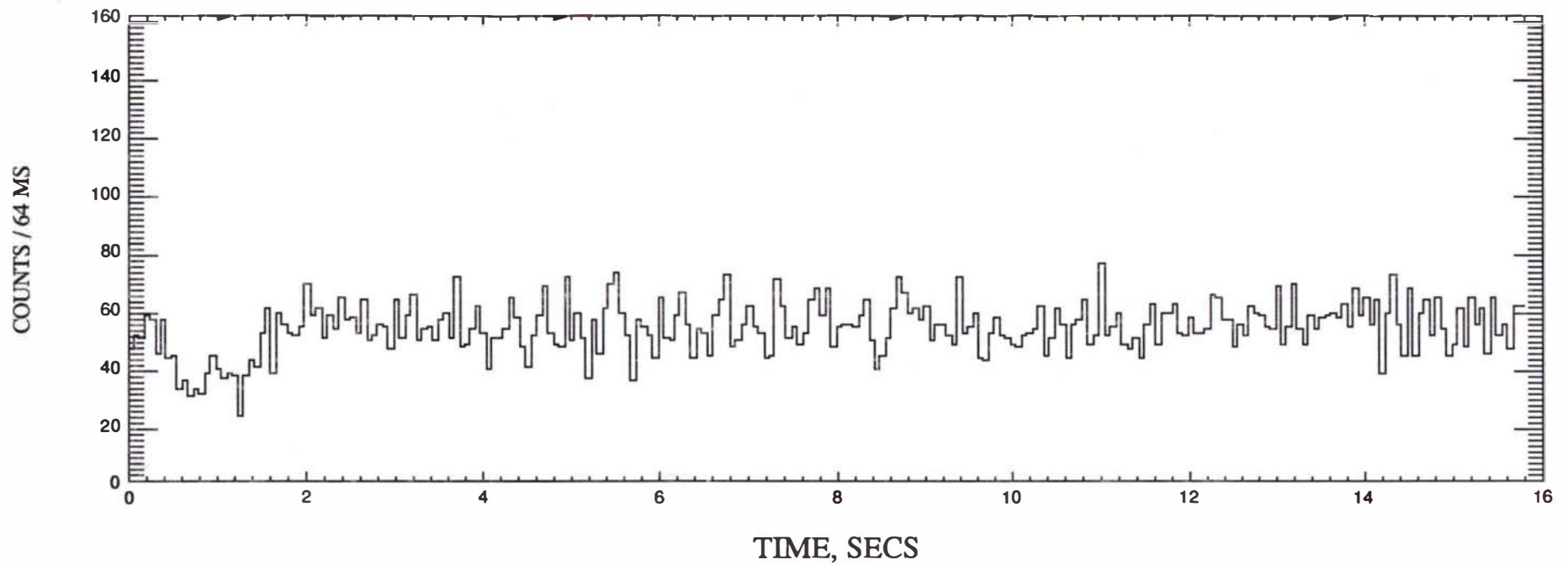
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11/53/06

Burst Counter 6 at UT=21.405355156793 h=77059.279 s 21:24:19.279

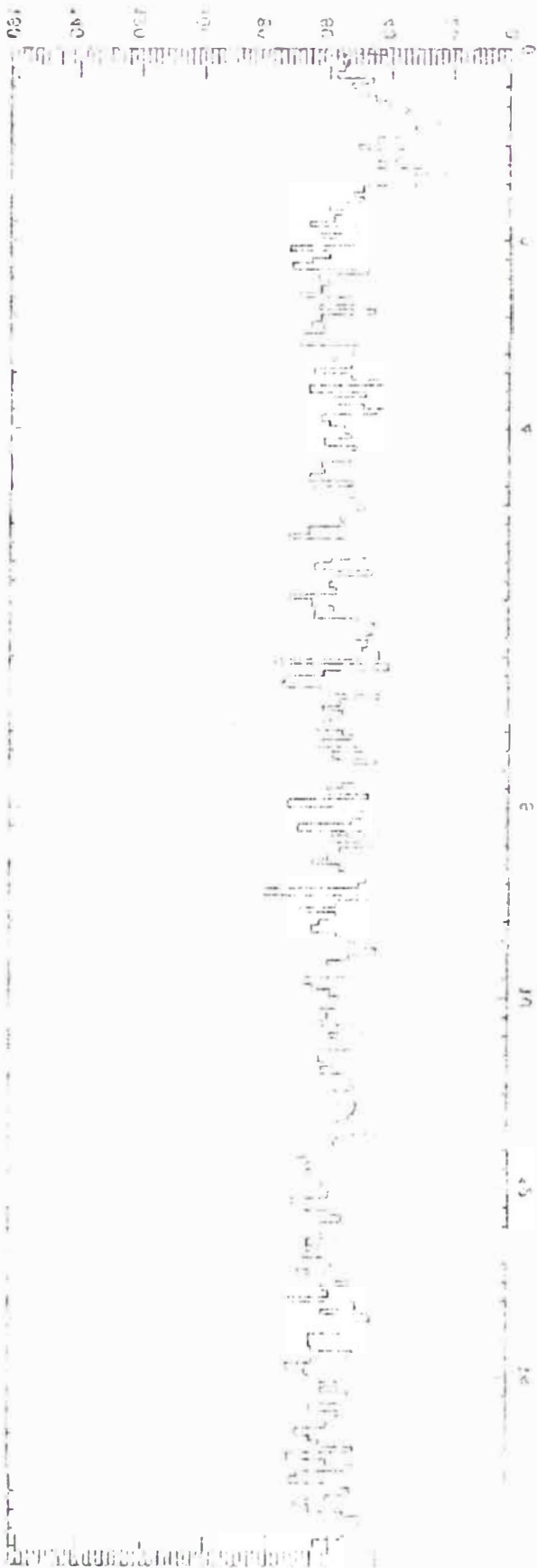


Burst Counter 7 at UT=22.107592383491 h=79587.333 s 22:06:27.333





LINE 2102

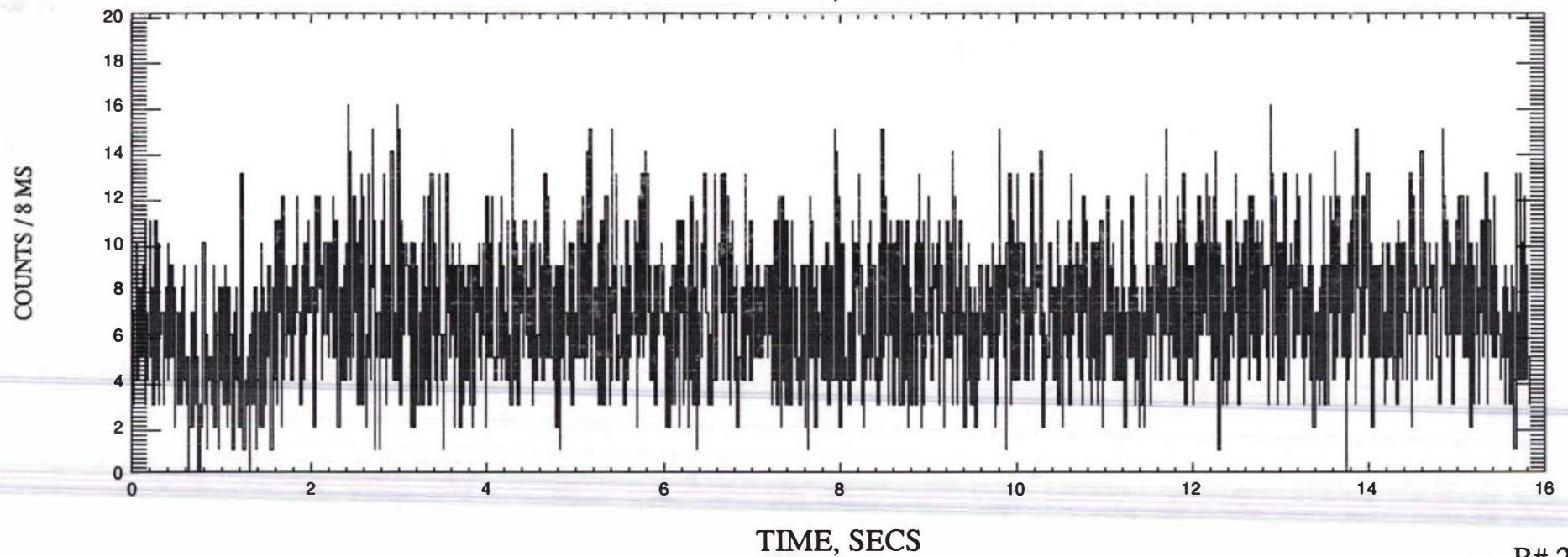
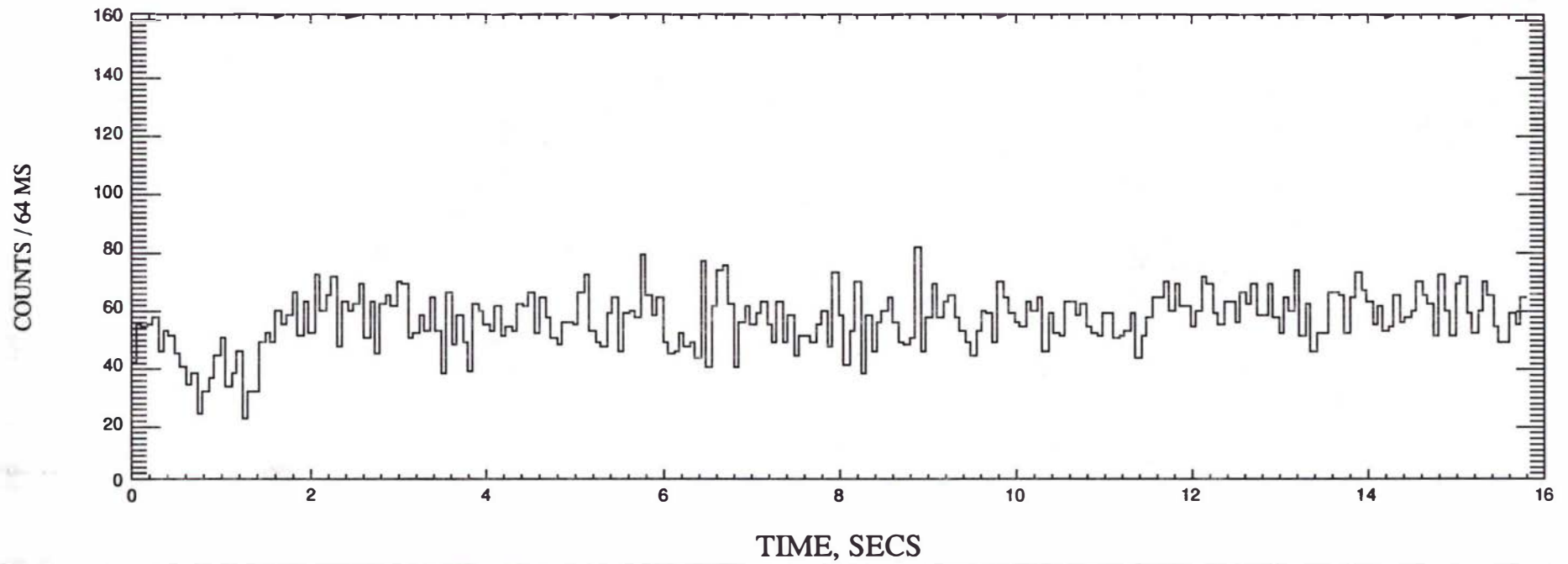


LINE 2102

LINE 2102

LINE 2102

Burst Counter 8 at UT=22.809821573893 h=82115.358 s 22:48:35.358



1. The first part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atomic nucleus. It is shown that the nucleus is a system of protons and neutrons, which are bound together by the strong interaction. The properties of the nucleus, such as its mass, size, and stability, are determined by the number of protons and neutrons and the way they are arranged.

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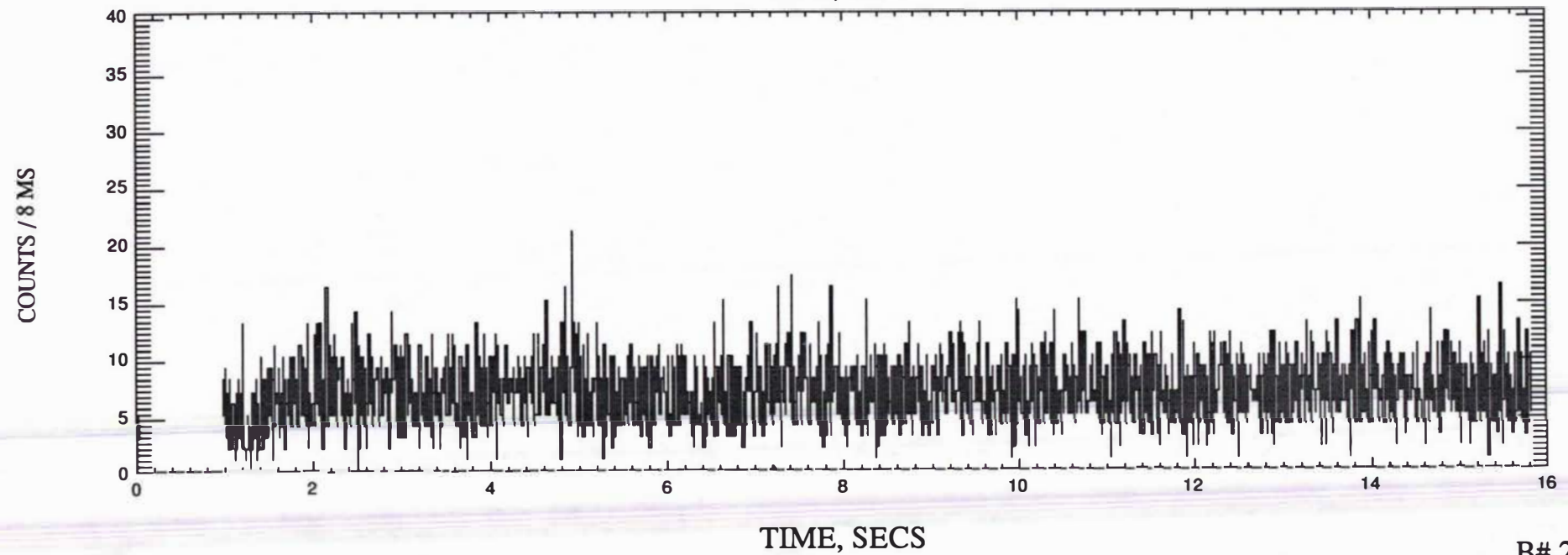
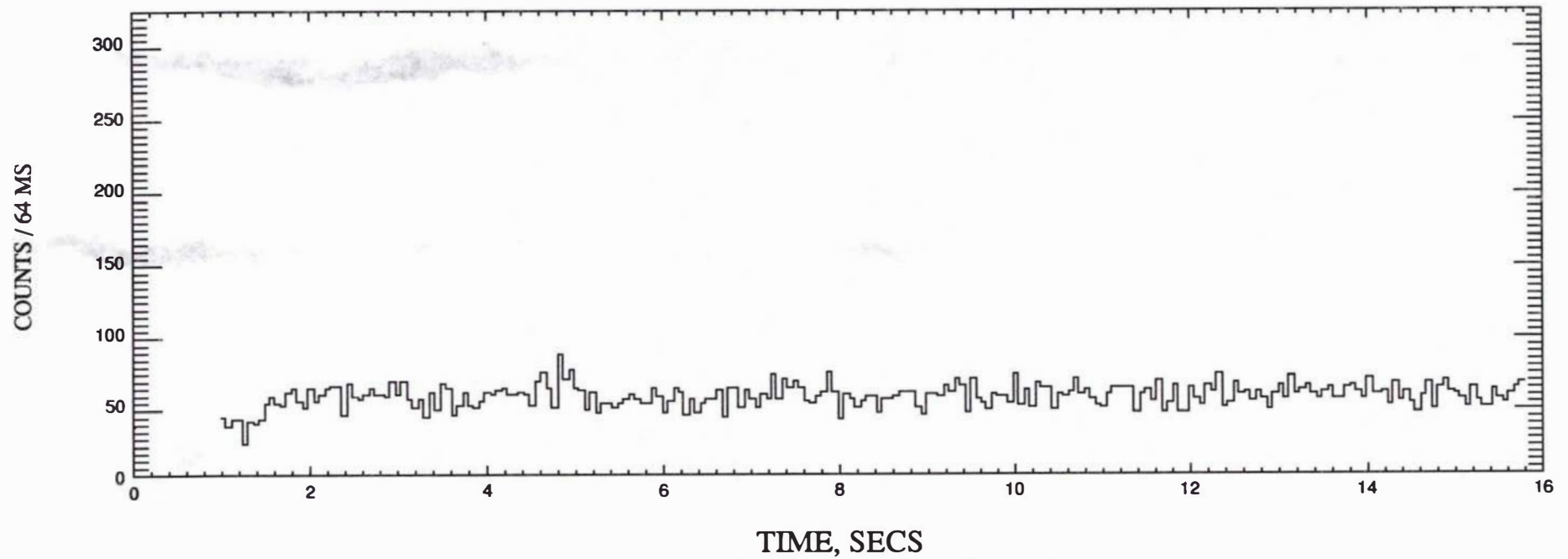


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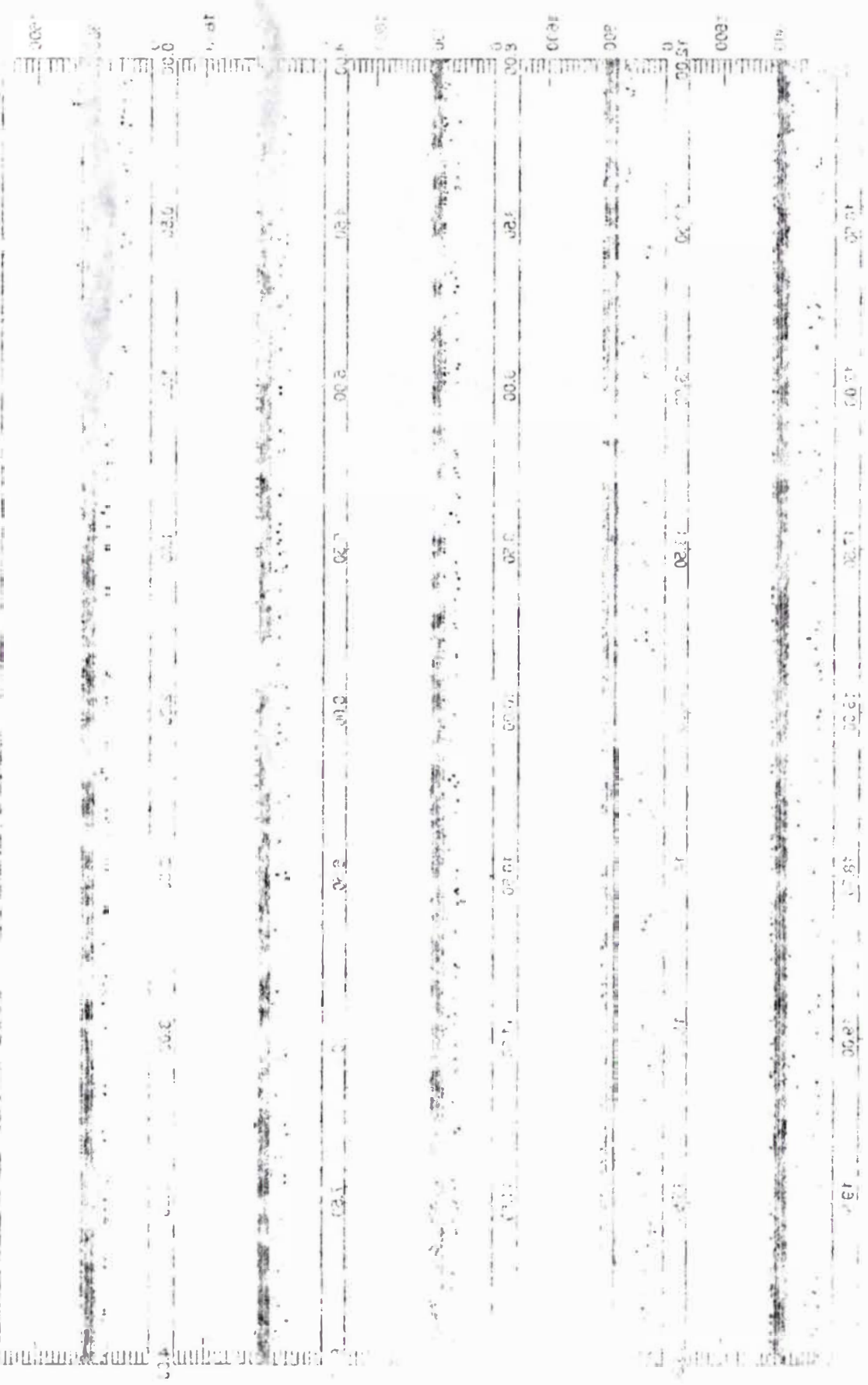
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Burst Counter 9 at UT=23.512059686449 h=84643.415 s 23:30:43.415

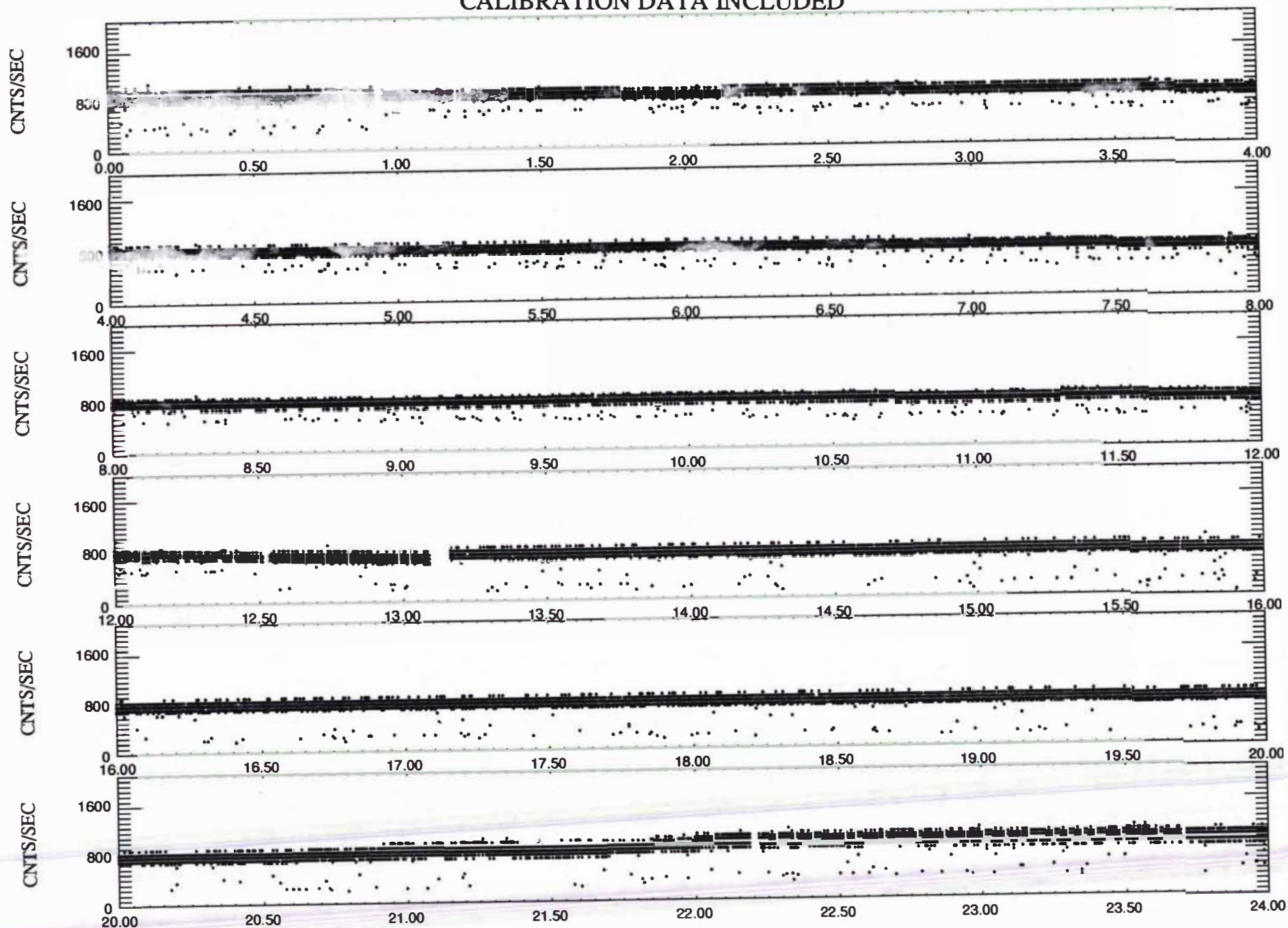


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FIG. 3 COUNTS VS. TIME

11/23/70

