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LANDSAT-2 AND LANDSAT-3 FLIGHT EVALUATION REPORT 23 JULY 1979 TO 23 JANUARY 1980

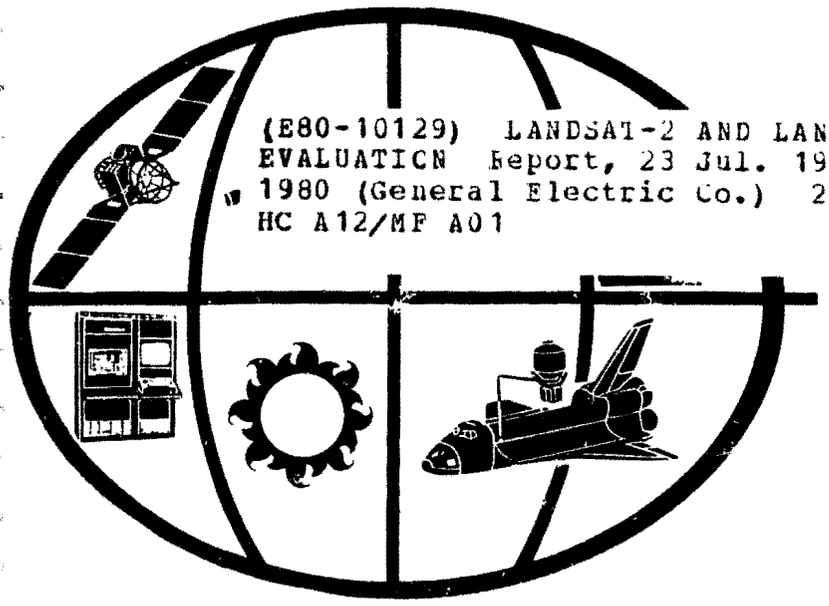
Prepared By
GE LANDSAT OPERATIONS CONTROL CENTER

For
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Goddard Space Flight Center
Greenbelt, Maryland 20771

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APPROVE _____
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INTRODUCTION

This is the 20th report in a continuing series of documents issued at launch, quarterly to July 1979, and semi-annual thereafter, to present flight performance analyses of the Landsat-2 spacecraft. Previously issued documents are:

Document No.	Title	Date
75SDS4215	Landsat-2 Launch and Flight Activation Evaluation Report, 22 to 26 January 1975, Launch through Orbit 50 and Orbit Adjust Operation.	21 March 1975
75SDS4228	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 January 1975 to 23 April 1975.	15 August 1975
75SDS4255	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 April 1975 to 23 July 1975.	10 October 1975
75SDS4266	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 July 1975 to 23 October 1975.	1 December 1975
76SDS4207	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 October 1975 to 23 January 1976.	29 February 1976
76SDS4248	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 January 1976 to 23 April 1976.	14 July 1976
76SDS4263	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 April 1976 to 23 July 1976.	15 October 1976
76SDS4278	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 July 1976 to 23 October 1976	30 November 1976
77SDS4204	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 October 1976 to 22 January 1977.	22 February 1977
77SDS4228	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 January 1977 to 23 April 1977.	23 May 1977
77SDS4244	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 April to 23 July 1977	22 August 1977

Document No.	Title	Date
77SDS4258	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 July 1977 to 23 October 1977	2 November 1977
78SDS4202	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 October 1977 to 23 January 1978	1 February 1978
78SDS4216	Landsat-1, Landsat-2, and Landsat-3 Flight Evaluation Report, 23 January 1978 to 23 April 1978	3 May 1978
78SDS4232	Landsat-2 and Landsat-3 Flight Evaluation Report, 23 April 1978 to 23 July 1978	1 August 1978
78SDS4250	Landsat-2 and Landsat-3 Flight Evaluation Report, 23 July 1978 to 23 October 1978	1 November 1978
79SDS4201	Landsat-2 and Landsat-3 Flight Evaluation Report, 23 October 1978 to 23 January 1979	1 February 1979
79SDS4227	Landsat-2 and Landsat-3 Flight Evaluation Report, 23 January 1979 to 23 April 1979	1 June 1979
79SDS4242	Landsat-2 and Landsat-3 Flight Evaluation Report, 23 April 1979 to 23 July 1979	1 August 1979

This report contains analysis of flight performance for Orbits 22730 to 25480 for Landsat-2.

SECTION 1

SUMMARY

LANDSAT-2 OPERATIONS

SECTION 1

SUMMARY LANDSAT-2 OPERATIONS

The Landsat-2 spacecraft was launched from the Western Test Range on 22 January 1975, at 022:17:55: 51.604. The launch and orbit injection phase of the space flight were nominal and deployment of the spacecraft followed predictions. All systems continue to perform normally except Forward Scanner Pressure, Forward Scanner Pressure Telemetry, Wideband Video Tape Recorder No. 1 (WBVTR-1), and Narrow Band Tape Recorder No 1 (NBTR-1). The Forward Scanner Pressure had begun leaking before launch but will not affect scanner performance. The Forward Scanner Pressure (Function 1003) telemetry became erratic in Orbit 2244 on 2 July 1975.

WBVTR-1 failed to rewind during Orbit 1021, 5 April 1975, and had intermittent operation until Orbit 2238, 2 July 1975, when normal operation was resumed. WBVTR-1 had a new anomaly in Orbit 2682 on 3 August 1975 because of failure of one of the 4 heads. As a result, it could not be used with MSS data, but performed satisfactorily with RBV data (because RBV provides a synchronizing pulse which permits data from the bad head to be isolated and eliminated). After Orbit 7181 on 20 June 1976, the recorder was used regularly in service recording RBV data until failure of a second head in Orbit 10064, 13 January 1977. All operation of WBVTR-1 had been discontinued since that date.

WBVTR-2 started to rewind but stopped prematurely in Orbit 1919, 9 June 1975, and again in Orbit 3854, 26 October 1975, with the cause unknown. Unit remains operational.

WBVTR-2 had 30% high headwheel current during playback in Orbit 9738 on 21 December 1976. The anomaly is cured by an operational procedure of toggling playback to record to playback. This anomaly occurs frequently but WBVTR-2 has operated for over 1175 hours. Unit remains operational.

Narrow Band Tape Recorder No. 1 (NBTR-1) halted after 35 seconds of playback in Orbit 20267, on 15 January 1979. Subsequent attempts at operation were unsuccessful. NBTR-1 had 18320 hours of in-flight operation over its four years of flight. The remaining good Narrow Band Tape Recorder No. 2 is being used to cover MSS, RBV, Downlinks, and Video Tape Recorder operation. One long (2.5 hour) record operation per day is scheduled for offline analysis.

Batteries 1, 2, 5, 6, 7 and 8 have been turned OFF one by one for restoration cycles and returned to service after a few weeks.

From 2 November 1977 to 2 February 1978, a series of orbit adjust burns were made to change the inclination angle of Landsat-2. Payload operation continued during this cycle as the ground track was maintained.

The DCS receiver was turned OFF in Orbit 15857, 4 March 1978. DCS operation was assumed by Landsat-3 at launch.

The RMP-2 (Ball Bearing Gyro) motor current began running high in Orbit 21672 on 25 April 1979. RMP-1 (Air Bearing Gyro) was turned ON in Orbit 21737 (30 April 1979) and enabled in Orbit 21754 on 1 May 1979 after the RMP-2 sensitivity decreased. The RMP-2 run down test indicated high friction and RMP-2 is considered to have failed.

In early July 1979 late line starts began occurring in Landsat-2 MSS data similar to the MSS late line starts on Landsat-3. In Orbit 23355 on 24 August 1979 the Scan Monitor was switched to source B. The late line starts abated and none have occurred to November 1979 when MSS operation was suspended due to the Yaw Flywheel failure. MSS operation was normal during this interval.

On 5 November 1979 the Yaw Flywheel stopped in orbit 24374. The spacecraft lost yaw attitude control. The spacecraft is presently non-operational but power and attitude is stable. A procedure for return to normal attitude using pitch momentum bias mode and magnetic MMCA gates is being developed. If successful limited operation may resume.

The Landsat-2 spacecraft was changed from operational to engineering mode on 23 January 1980. MSS operation was suspended on 5 November 1979 because of loss of attitude control and low power. Table 1-1 shows cumulative in-orbit payload system performance.

Table 1-1. In-Orbit Payload Systems Performance Launch thru Orbit 25424 (1-19-80) Landsat-2

RBV	Total Scenes Imaged	2,860
	Total Area Imaged (million sq. n mi.)	25
	ON TIME (hr.)	30.3
	ON/OFF Cycles	349
	% Real Time Images	74
	% Recorded Images	26
MSS	Total Scenes Imaged	383,942
	Total Area Imaged (million sq. n mi.)	3,347
	ON TIME (hr.)	4,002
	ON/OFF Cycles	23,984
	% Real Time Images	82
	% Recorded Images	18
DCS	Messages at OCC	1,353,058
(Not in Use)	Users	(Not in Use)
	ON TIME (hr.)	27,283
WPA-1	ON TIME (hr.)	109.5
	ON/OFF Cycles	707
WPA-2	ON TIME (hr.)	3,563
	ON/OFF Cycles	19,282
WBVTR-1	% Record Mode	38
(Not in Use)	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	Time Head-Tape Contact (hr.)	121.7
	Cycles Head-Tape Contact	1,950
	ON TIME (hr.)	154
WBVTR-2	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	MFSE Count in P/B	~10
	Time Head-Tape Contact (hr.)	1,176
	Cycles Head-Tape Contact	16,677
	ON TIME (hr.)	1,503

SECTION 2

ORBITAL PARAMETERS

LANDSAT-2

SECTION 2

ORBITAL PARAMETERS

At the close of this report period, Landsat-2's ground track error was 2.101 NM East (at the equator).

High solar activity continues to affect spacecraft drag. Consequently, several ground track maintenance orbit adjust operations were performed.

Error in longitude as a function of time since launch, orbit maintenance burns and the Pitch Position Bias Program is shown in Figure 2-1.

Figure 2-2 shows the mean local time for the spacecraft's equatorial crossing. The mean local time crossings for Landsats-2 and -3 respectively are 09:28:19 MLT and 09:27:43 MLT.

Phasing relationships between Landsats-2 and -3 are shown in Figure 2-3. Landsat-3 leads Landsat-2 at their descending equatorial crossings by 52.18 GMT minutes.

The Brouwer Mean Orbital parameters for Landsat-2 are given in Table 2-1.

Appendix B provides the spacecraft orbit reference tables which correlate calendar day, flight day, orbit, orbit day in cycle, and cycle number.

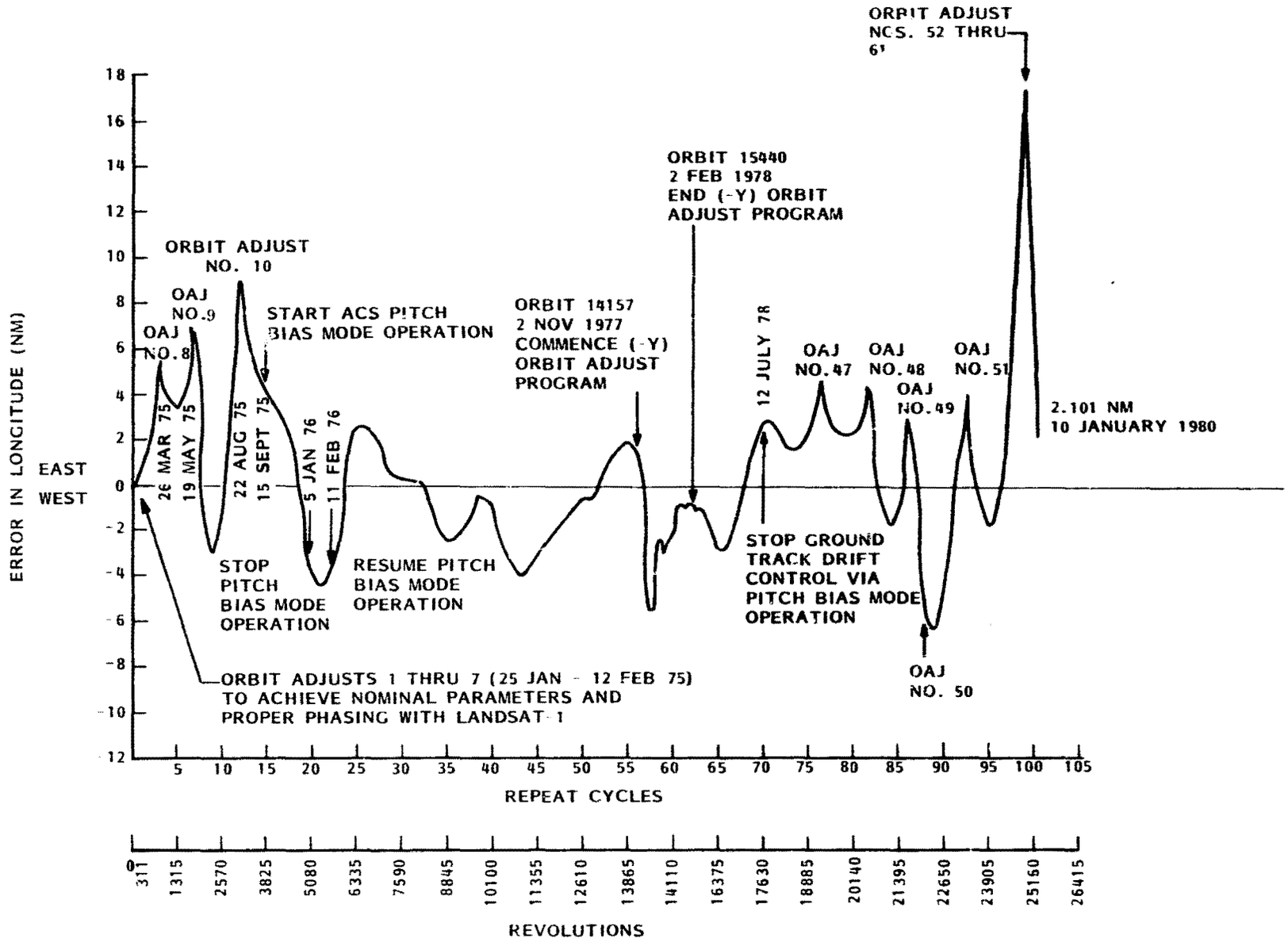


Figure 2-1. Effect of Orbit Adjusts and Pitch Position Bias Orbit Maintenance on Landsat-2's Ground Track

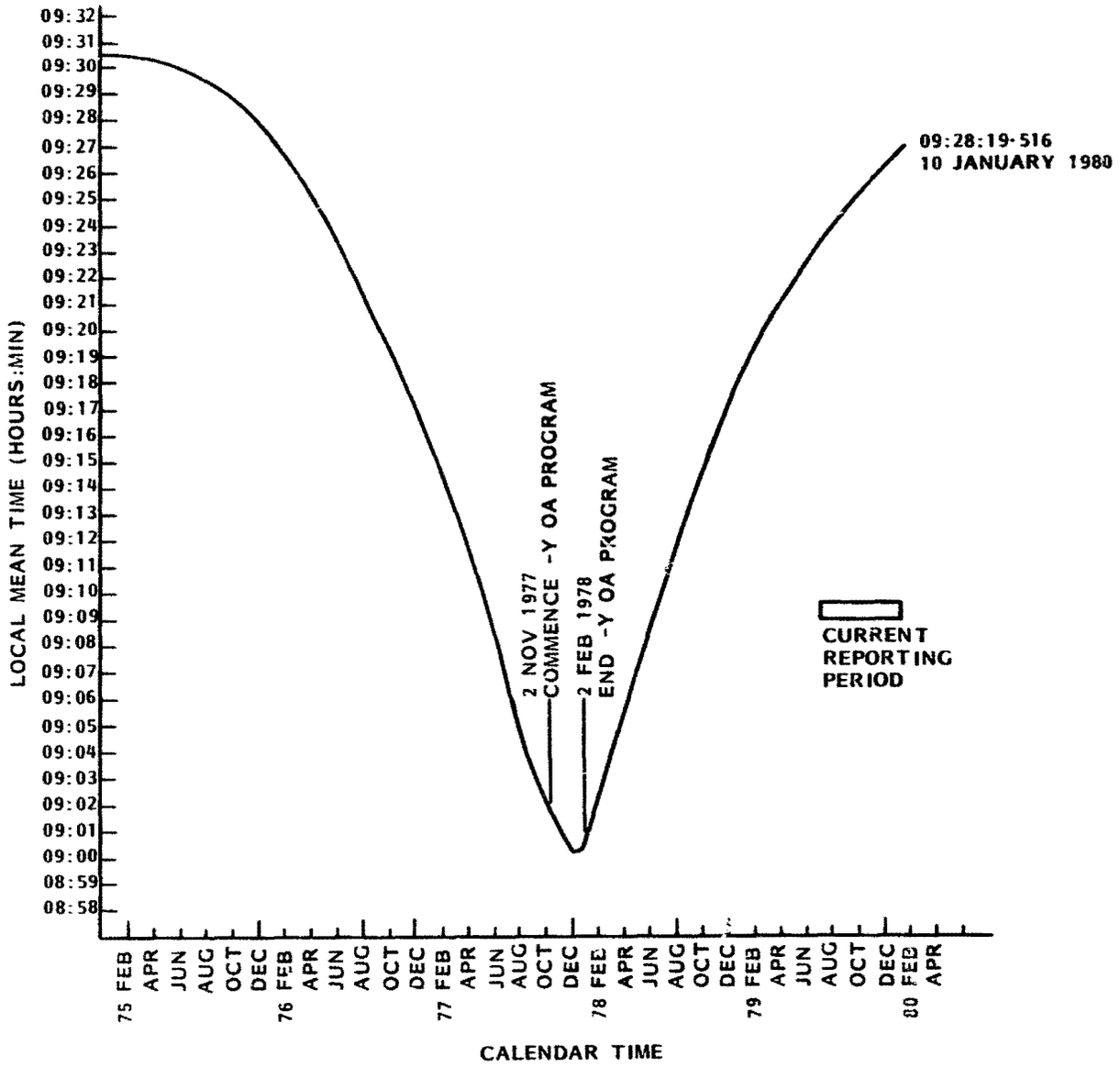


Figure 2-2. Local Mean Time of Descending Node - Landsat-2

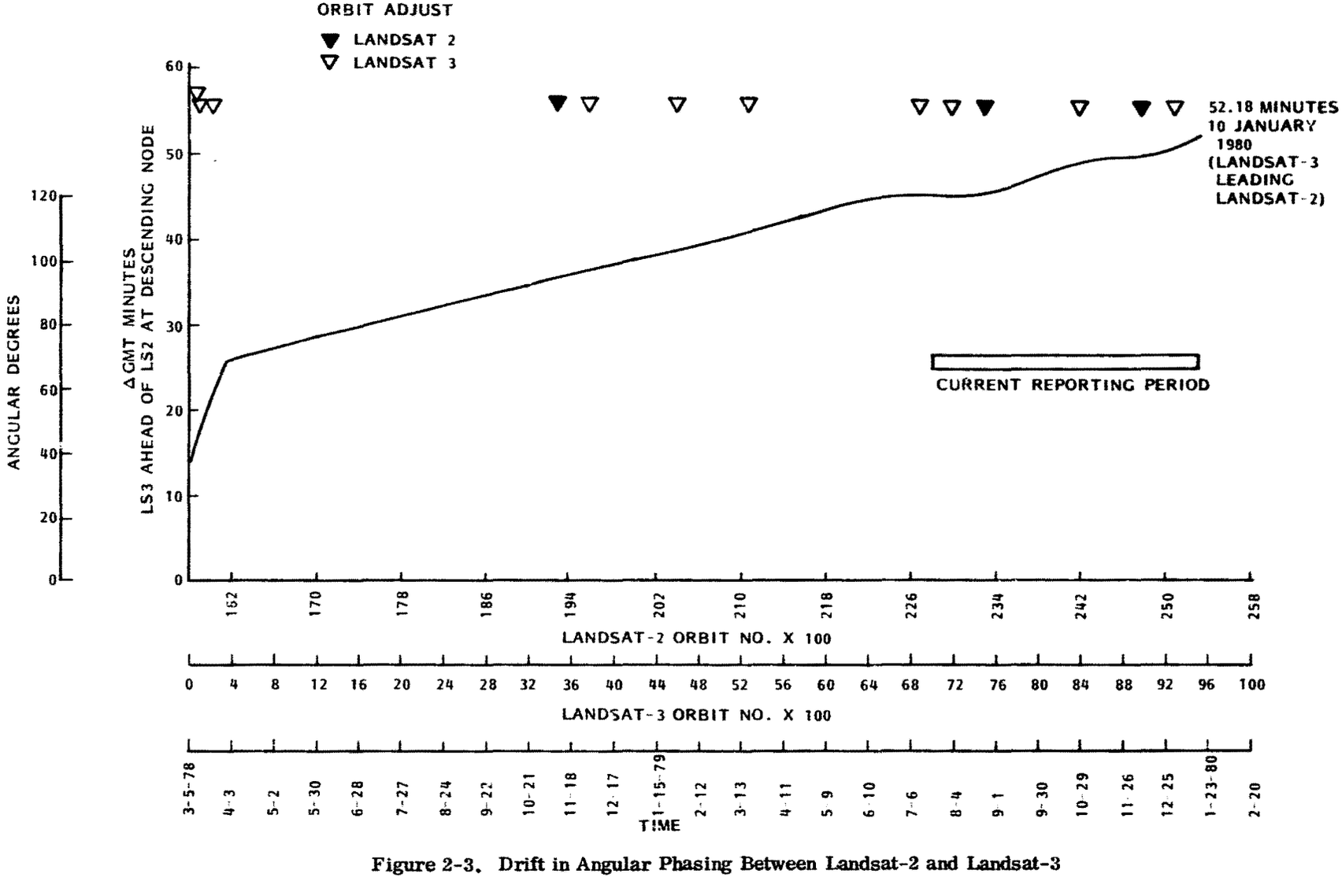


Figure 2-3. Drift in Angular Phasing Between Landsat-2 and Landsat-3

Table 2-1. Landsat-2 Brouwer Mean Orbital Parameters

Element / Date	Apogee (KM)	Perigee (KM)	Inclination (Deg.)	Semi-Major Axis (KM)	Eccentricity	Anomolistic Period (Min)	Nodal Period (Min)	Argument of Perigee (Deg)	Right Ascension (Deg)	Mean Anomaly (Deg)
25 Jan 1975[1]	915.03	901.56	99.095	7286.462	0.000925	103.165	—	272.852	86.637	139.578
6 Feb 1975[2]	916.84	898.47	99.096	7285.820	0.001260	103.151	—	256.040	99.347	134.523
24 Apr 1975	917.85	897.40	99.079	7285.788	0.001403	103.151	103.266	62.55	174.339	117.183
25 July 1975	917.45	897.68	99.071	7285.733	0.001356	103.150	103.265	166.118	264.891	13.726
23 Oct 1975	916.70	898.49	99.059	7285.762	0.001250	103.150	103.266	282.749	353.366	257.271
24 Jan 1976	917.36	897.81	99.016	7285.751	0.001342	103.150	103.266	31.621	84.584	148.179
23 Apr 1976	917.67	897.44	99.029	7285.721	0.001389	103.149	103.265	139.745	172.774	40.033
22 July 1976	916.62	898.40	99.021	7285.677	0.001251	103.148	103.264	253.964	260.924	286.054
22 Oct. 1976	916.95	898.09	99.009	7285.683	0.001251	103.148	103.264	6.744	350.795	173.119
22 Jan. 1977	917.59	897.47	98.993	7285.693	0.001381	103.149	103.265	111.579	80.587	68.155
22 Apr 1977	916.84	898.09	98.975	7285.633	0.001287	103.147	103.263	221.210	168.277	318.768
24 Jul 1977	916.47	898.46	98.967	7285.632	0.001236	103.147	103.263	334.189	257.806	205.754
23 Oct 1977	917.40	897.52	98.955	7285.627	0.001364	103.147	103.263	81.812	347.225	97.914
22 Jan 1978[3]	915.24	900.32	99.162	7285.943	0.001024	103.154	103.269	191.142	76.302	348.761
22 Apr 1978[4]	914.74	900.97	99.215	7286.022	0.000945	103.156	103.271	309.149	166.247	230.816
23 Jul 2978	915.52	899.91	99.206	7285.880	0.001071	103.153	103.268	62.192	258.093	304.755
23 Oct 1978	915.50	900.07	99.194	7285.923	0.001059	103.154	103.269	162.731	349.853	149.509
16 Jan 1979	914.70	900.89	99.179	7285.938	0.000948	103.154	103.269	296.602	74.498	103.544
22 Apr 1979	915.42	900.09	99.1631	7285.8974	0.001052	103.154	103.269	38.281	169.946	230.169
23 Jul 1979	915.52	899.77	99.154	7285.788	0.001081	103.151	103.267	139.990	261.291	73.064
21 Oct 1979	914.57	900.57	99.1424	7285.8020	0.000973	103.15153	103.267	257.8454	350.5509	312.9366
12 Jan 1980	915.33	900.17	99.1292	7285.8898	0.001041	103.15339	103.269	34.6945	72.7424	311.1705

1. Post Launch.
2. After the sequence of phasing maneuvers completed in Orbit 212.
3. Interim value - orbit adjust program commenced 2 Nov 1977 was in process.
4. Orbit adjust program completed 2 February 1978.

SECTION 3

POWER SUBSYSTEM (PWR)

LANDSAT-2

SECTION 3

POWER SUBSYSTEM (PWR)

The Power Subsystem on Landsat-2 has performed satisfactorily throughout this report period and throughout the post Yaw Flywheel failure. The failure caused a large Yaw error affecting the sun-tracking capability of the Solar Arrays. This resulted in very low power, and the spacecraft was placed in the minimum power mode by turning OFF subsystems non-essential to spacecraft stability. Both SADS were stopped at high noon (RSAD at 94^{o}, LSAD at 90^{o}), to allow solar impingement at all attitudes and to maintain ACS stability.

On several occasions, since the Yaw Flywheel Anomaly, the spacecraft attitude was affected such that the power was insufficient to meet minimum spacecraft conditions. The low power conditions tripped the Low Voltage Interlock, and upset the Spacecraft Clock. Conditions were quickly restored to normal as soon as power was adequate to maintain the minimum spacecraft condition.

The Solar Arrays continued to provide excess energy to meet minimum spacecraft requirements and will be able to track the sun and support Landsat-2 power requirements once normal attitude is obtained. The percentage degradation of the arrays is plotted as a function of days-in-orbit in Figure 3-1, along with the prelaunch predicted array degradation. The array degradation at the end of 60 months in orbit was 22.8% which is higher than predicted. The actual values of midday array current are plotted in Figure 3-2.

The battery packs on-line ranged from 7.70 to 9.74% depth of discharge (DOD) during this period. When any battery reached high charge-to-discharge current ratios (C/D) and its temperature began rising it was turned OFF for a restoration cycle of a few weeks, leaving 6 batteries on-line at all times. The history of these restoration cycles is shown in Table 3-1. All battery-pack performance remained satisfactory.

Battery voltages have been maintained within suitable limits with Landsat-2 power management procedure, excess array energy being dissipated through auxiliary loads. Temperatures ranged from $8.1^{o}C$ to $23.7^{o}C$ during this report period.

The Power Subsystem electronics have performed well during this report period with all regulated voltage stable. Table 3-2 shows major subsystem parameters and Table 3-3 shows power subsystem telemetry for selected orbits. Some parameters in Table 3-2 may be slightly different from those in Table 3-3 because Table 3-2 uses a power management time span (night followed by day), whereas the time span used in Table 3-3 is the playback period from the NBR.

The shunt limiter on Landsat-2 has operated several times since launch and has held the solar array bus voltage at specified levels.

Figure 3-3 shows the actual and predicted variation in sun angle to orbit plane and solar panels for Landsat-2.

Many orbits have again displayed the characteristics of notching in the array current telemetry. This condition is presumed to be sets of parallel solar cells with intermittent electrical connections, probably located where temperature extremes exist. The phenomenon occurred last year also.

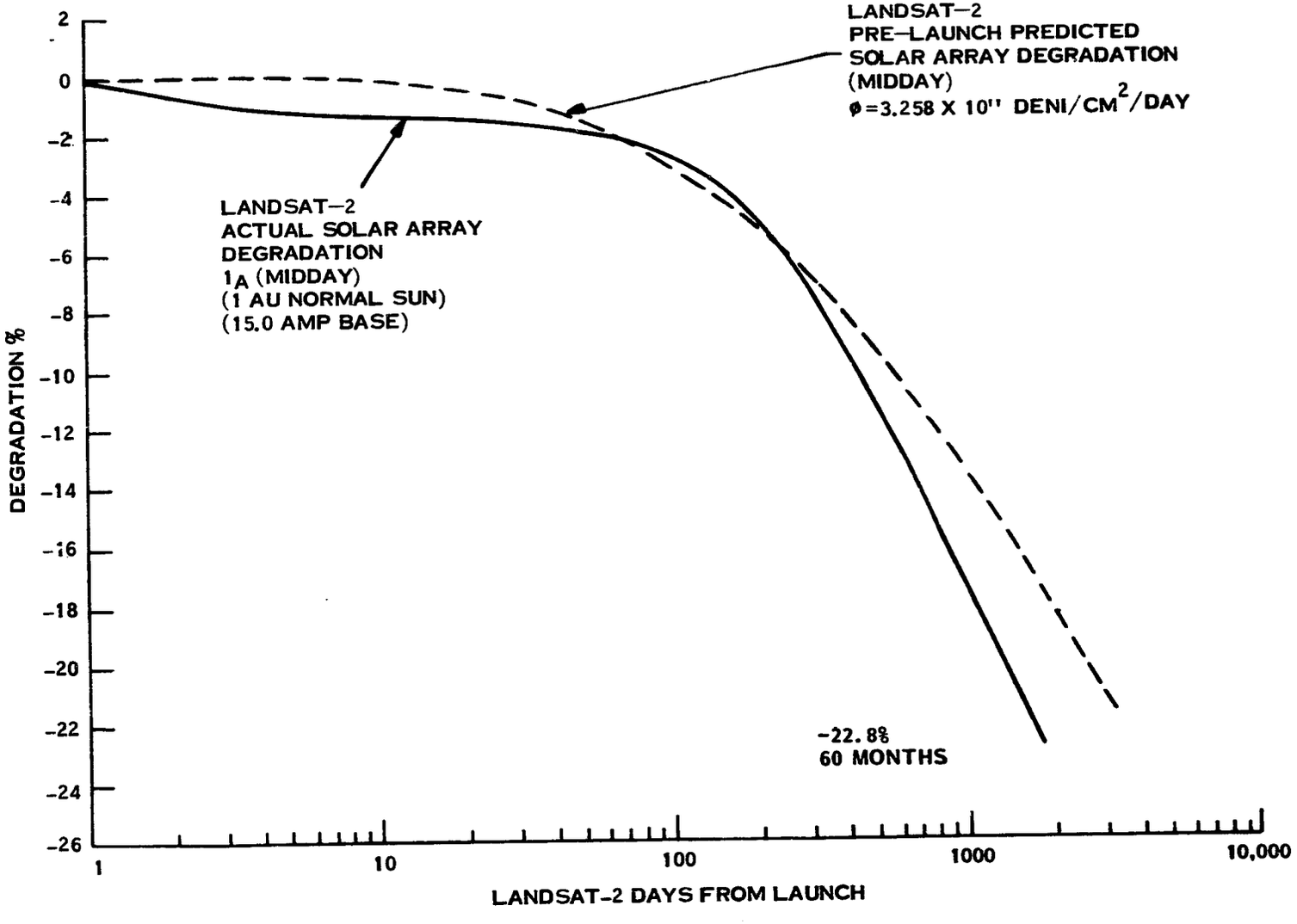
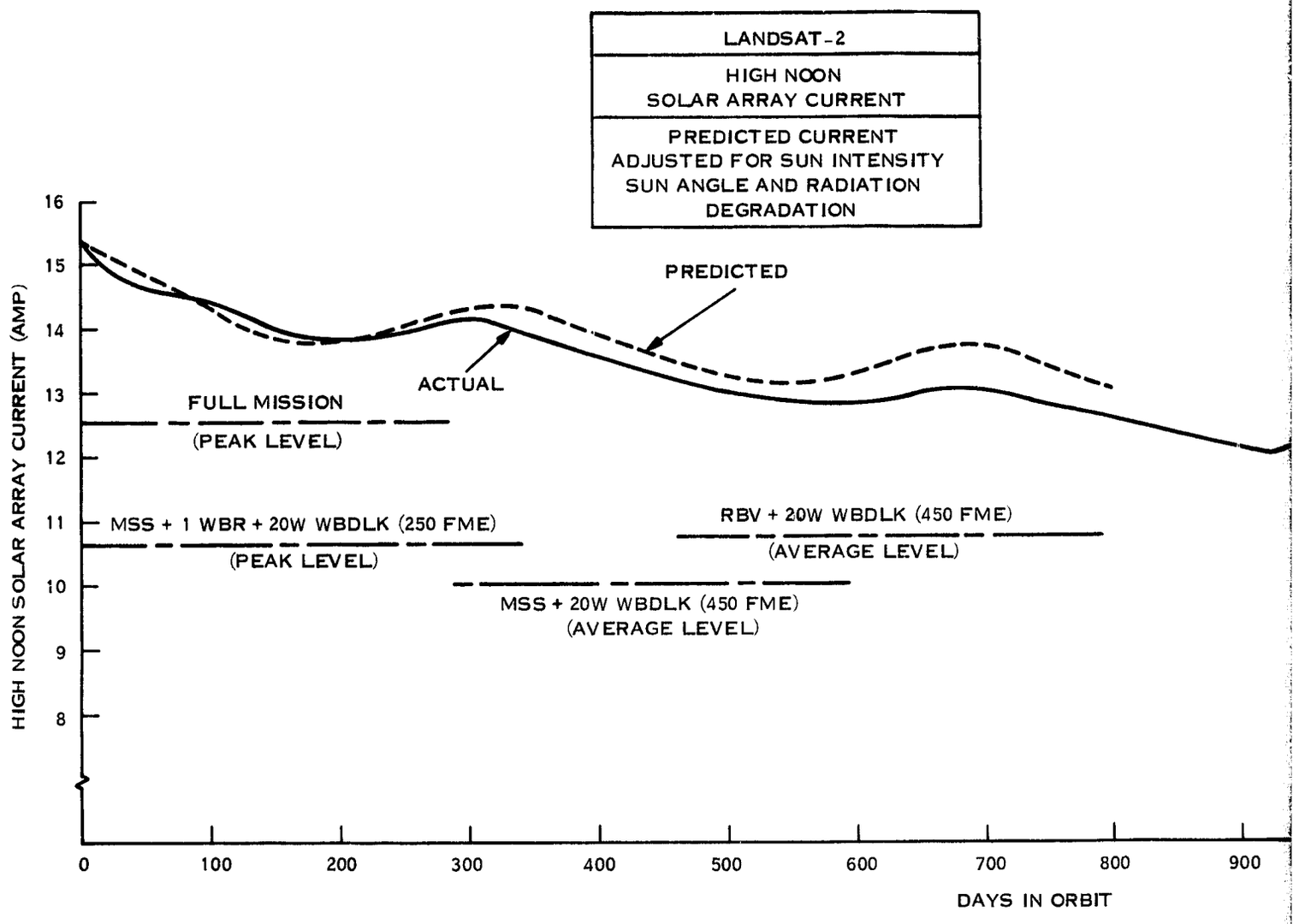


Figure 3-1. Landsat-2 Midday Solar Array Degradation vs. Days from Launch



FOLDOUT FRAME

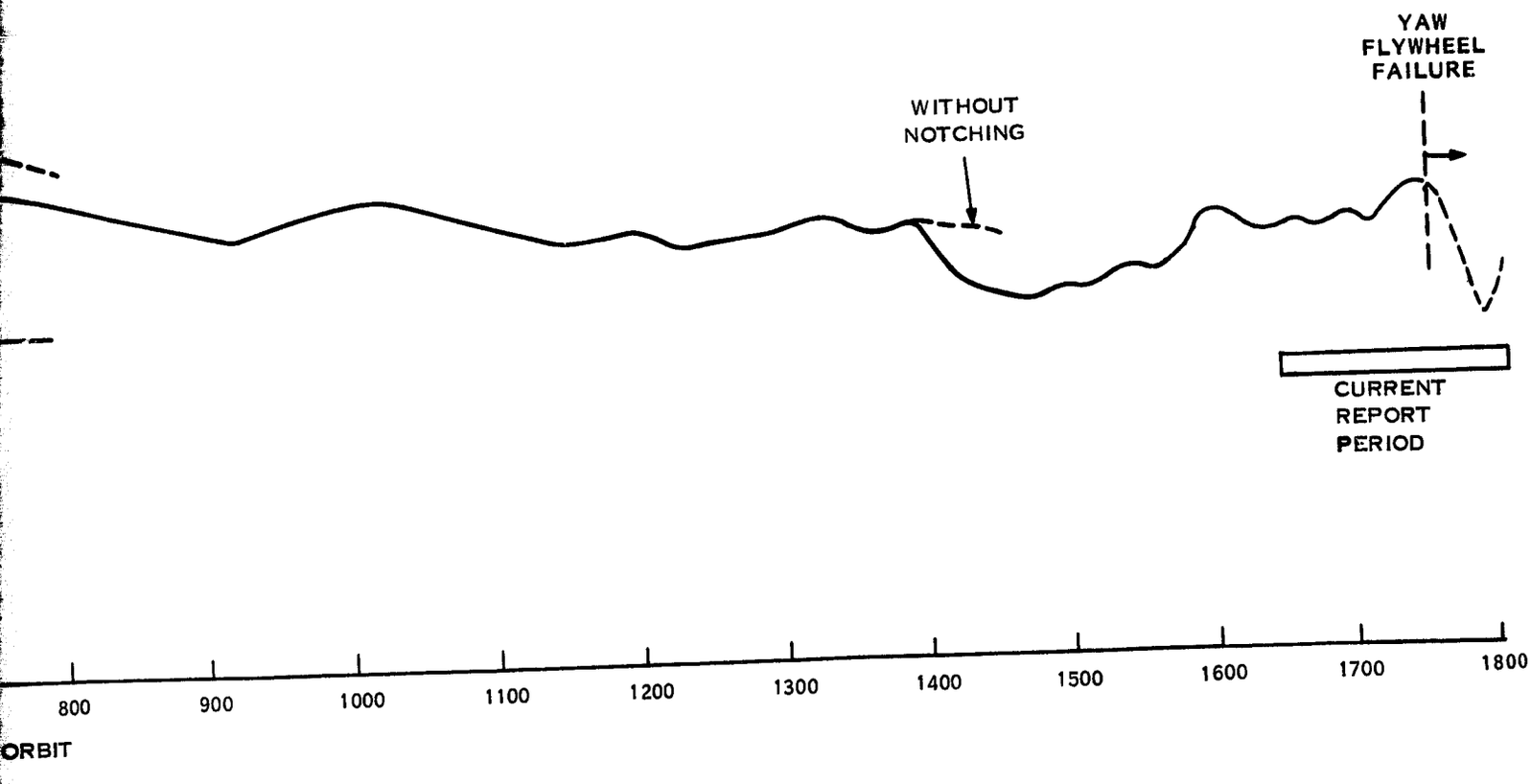


Figure 3-2. Landsat-2 Midday Solar Array Current

FOLDOUT FRAME 2

13

			1	2	3	4	5	6	7	8	9	10	11	12
BATT. 1	OFF	ORB	8029	11420	12562	13580	14870	17851	19791	20240	21931	22840	23271	24145
		DATE	8-20-76	4-20-77	7-11-77	9-22-77	12-24-77	7-27-78	12-11-78	1-13-79	5-14-79	7-18-79	8-18-79	10-19-79
	ON	ORB	8509	11947	12964	13670	15048	18088	19945	20434	22109	23032	23618	24376
		DATE	9-23-76	5-23-77	8-9-77	9-29-77	1-5-78	8-11-78	12-22-78	1-27-78	5-27-79	8-1-79	9-12-79	11-5-79
BATT. 2	OFF	ORB	12078	18279	22180	23035								
		DATE	6-6-77	8-25-79	6-1-79	8-1-79								
	ON	ORB	12272	18942	22387	23269								
		DATE	6-20-77	10-12-78	6-16-79	8-18-79								
BATT. 3	OFF	ORB												
		DATE												
	ON	ORB												
		DATE												
BATT. 4	OFF	ORB												
		DATE												
	ON	ORB												
		DATE												
BATT. 5	OFF	ORB	10249	15297	19945	20614	22840	24013	24778					
		DATE	1-26-77	1-23-78	12-22-78	3-9-78	7-18-79	10-10-79	12-4-79					
	ON	ORB	10657	15354	20236	21005	23032	24142						
		DATE	2-24-77	2-2-78	1-13-79	3-9-79	8-1-79	10-19-79						
BATT. 6	OFF	ORB	7601	8591	9662	10962	11993	12271	12965	13454	13677	14230	14571	14710
		DATE	7-20-76	10-29-76	12-7-76	3-18-77	5-31-77	6-20-77	8-9-77	9-13-77	9-29-77	11-8-77	12-2-77	12-12-77
	ON	ORB	7992	9164	10028	11311	12077	12532	13159	13486	13836	14325	14615	14755
		DATE	8-17-76	11-9-76	1-10-77	4-12-77	6-6-77	7-9-77	8-23-77	9-15-77	10-10-77	11-15-77	12-5-77	12-15-77
BATT. 7	OFF	ORB	13489	13959	18098	19900	20237	20240	22161	23035	23717			
		DATE	9-16-77	10-19-77	8-12-78	12-14-78	1-12-79	1-13-79	5-31-79	8-1-79	9-19-79			
	ON	ORB	13570	14159	18277	20002	20238	20614	22474	23168	24005			
		DATE	9-21-77	11-3-77	8-25-78	12-27-78	1-12-79	2-9-78	6-22-79	8-11-79	10-10-79			
BATT. 8	OFF	ORB	13161	19339	21878	23748								
		DATE	8-23-77	11-9-78	5-10-79	9-21-79								
	ON	ORB	13444	19737	22178	24100								
		DATE	9-12-77	12-8-78	6-1-79	10-17-79								

FOLDOUT FRAME 1

Table 3-1. Landsat-2 Battery Restoration Cycle

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
271 8-79	24145 10-19-79													
3618 12-79	24376 11-5-79													
14571 2-2-77	14710 12-12-77	15354 2-2-78	15983 3-13-78	17696 7-14-78	18265 8-24-78	18279 8-25-79	19203 10-30-78	19791 12-11-78	19998 12-26-78	20434 1-27-79	22388 6-16-79	23168 8-11-79	24110 10-17-79	24778 12-4-79
14615 2-5-77	14755 12-15-77	15550 2-10-78	16125 3-24-78	17840 7-24-78	18277 8-25-78	18436 9-5-78	19332 11-8-78	19876 12-18-78	20238 1-13-79	21858 5-9-79	22837 7-18-79	23685 9-11-79	24376 11-5-79	

FOLDOUT FRAME 2

Table 3-2. Landsat-2 Major Power Subsystem Parameters

Description	Orbit							
	50	5100	10192	15211	20252	23600	24353	25341
Batt 1 Max	33.43	32.66	32.57	32.48	F	F	F	32.48
2 Chge	33.40	32.63	32.54	32.46	32.80	32.71	32.37	32.37
3 Volts	33.35	32.57	32.57	32.41	32.92	32.75	32.57	32.41
4	33.45	32.68	32.59	32.51	32.85	32.85	32.51	32.51
5	33.42	32.65	32.56	32.56	32.91	32.73	32.56	F
6	33.41	32.64	32.56	F	32.90	F	F	F
7	33.45	32.68	32.59	32.51	F	32.76	32.51	32.42
8	33.45	32.68	32.59	32.50	32.93	32.76	32.59	32.59
Average	33.42	32.65	32.57	32.50	32.89	32.76	32.48	32.46
Batt 1 End-of-Night	29.32	29.06	28.98	28.55	F	F	F	28.63
2 Volts	29.38	29.04	28.95	28.61	28.95	28.10	28.35	28.61
3	29.32	29.07	28.89	28.64	28.89	28.12	28.30	28.72
4	29.34	29.09	28.91	28.57	28.91	28.06	28.32	28.66
5	29.40	29.06	28.97	28.63	28.97	28.12	28.29	F
6	29.31	28.96	28.88	F	28.88	F	F	F
7	29.34	29.08	29.00	28.65	F	28.03	28.31	28.65
8	29.34	29.00	28.91	28.57	28.91	28.05	28.31	28.65
Average	29.34	29.04	28.94	28.40	28.92	28.08	28.31	28.65
Batt 1 Chge	12.76	21.43	13.74	15.00	F	F	F	16.85
2 Share	11.68	11.42	11.44	13.67	16.86	16.47	20.15	17.49
3 (%)	12.24	12.48	12.41	13.64	15.81	15.23	15.64	16.45
4	11.99	11.76	11.81	13.55	14.82	14.17	14.58	15.42
5	12.84	13.24	12.95	14.48	17.25	16.02	15.29	F
6	13.35	14.32	15.14	F	17.57	F	F	F
7	12.90	12.97	11.74	14.88	F	18.48	17.14	18.44
8	12.24	11.38	10.77	13.78	15.79	17.21	15.28	14.06
Batt 1 Load	12.60	11.80	11.16	14.84	F	F	F	12.93
2 Share	12.70	13.34	14.14	15.41	18.96	20.26	18.12	16.02
3 (%)	12.67	13.74	13.94	13.80	16.90	18.05	17.93	21.38
4	12.44	12.48	13.00	13.80	15.24	15.87	15.94	19.76
5	12.34	12.36	9.96	13.80	16.87	14.71	15.18	F
6	12.70	11.56	15.27	F	17.01	F	F	F
7	12.47	12.70	11.33	14.46	F	16.09	16.19	12.41
8	12.04	12.02	11.21	13.88	15.01	14.98	16.61	17.34
Batt 1 Temp	21.46	21.94	22.71	21.78	20.67	19.39	19.49	16.46
2 in	20.25	19.94	20.30	19.60	19.77	19.33	21.89	13.19
3 (^{o}C)	18.60	17.86	17.52	17.22	17.35	16.32	16.63	9.23
4	20.83	20.36	20.36	20.97	20.46	20.00	20.24	19.92
5	24.98	27.27	30.49	34.34	28.47	24.32	23.69	29.42
6	24.26	27.28	27.69	30.39	26.72	21.69	21.53	23.93
7	24.71	26.32	27.01	29.26	25.65	25.71	24.84	26.51
8	23.63	24.41	24.55	25.66	24.50	24.17	22.76	18.99
Average	22.34	23.17	23.83	25.90	22.95	21.37	21.38	19.71
S/C Reg Bus Pwr. (W)	N	149.30	154.49	143.60	125.20	154.48	140.71	84.38
Comp Load Pwr. (W)	N	24.80	6.64	0.00	0.00	0.00	0.00	0.00
P/L Reg Bus Pwr. (W)	N	9.80	9.59	9.90	9.31	13.53	9.84	0.00
C/D Ratio	1.15	1.11	1.24	1.46	1.20	1.26	1.08	1.35
Total Charge (A-M)	271.90	223.46	223.51	243.06	201.56	243.92	213.02	233.33
Total Discharge (A-M)	237.20	201.45	180.84	166.79	168.22	195.59	200.25	174.51
Solar Array (A-M)	1106.00	1003.00	939.00	821.90	825.40*	861.30	891.20	483.10
S.A. Peak I (Amp)	16.05	14.43	13.25	11.99	12.39	12.55	13.02	10.75
Midday Array I (Amp)	N	13.72	12.86	11.92	10.99*	12.08	12.47	10.60
Sun Angle (Deg) (γ)	N	8.35	10.70	14.80	9.71	3.14	2.24	8.07
Max R Pad Temp (^{o}C)	N	63.20	58.40	53.27	+ 59.60	57.20	60.80	44.72
Min R Pad Temp (^{o}C)	N	- 35.00	- 34.40	- 36.80	- 32.60	- 35.60	- 35.00	- 54.94
Max L Pad Temp (^{o}C)	N	62.15	62.15	56.92	+ 62.15	57.69	60.00	55.38
Min L Pad Temp (^{o}C)	N	- 42.14	- 39.43	- 38.86	- 38.86	- 43.57	- 43.57	- 41.43

N - Data Not Available
F - Unit Off
* - Intermittent Temperature Sensitive Dropouts Present

Table 3-3. Landsat-2 Power Subsystem Analog Telemetry (Average Value for Data Received in NBTR Playback)

Func	Description	Unit	Orbits							
			50	6102	10192	15211	20252	23600	24353	25341
6001	Batt 1 Disc I	Amp	1.01	0.74	0.52	0.66	F	F	F	.44
6002	2		1.01	0.84	0.65	0.71	1.12	1.03	.82	.34
6003	3		1.00	0.87	0.64	0.62	0.98	.91	.81	.74
6004	4		1.00	0.78	0.60	0.63	0.90	.80	.73	.67
6005	5		0.99	0.78	0.47	0.63	0.98	.74	.67	F
6006*	6		1.02	0.73	0.70	F	0.99	F	F	F
6007	7		1.00	0.80	0.52	0.66	F	.81	.71	.43
6008	8		0.97	0.75	0.52	0.52	0.87	.77	.73	59
6011	Batt 1 Chg I	Amp	0.47	0.42	0.46	0.52	F	F	F	.60
6012	2		0.43	0.38	0.37	0.47	0.45	.61	.69	.83
6013	3		0.45	0.42	0.40	0.47	0.43	.58	.53	.79
6014	4		0.44	0.39	0.39	0.48	0.40	.54	.49	.73
6015	5		0.47	0.44	0.45	0.51	0.47	.60	.53	F
6016*	6		0.49	0.47	0.49	F	0.47	F	F	F
6017	7		0.47	0.43	0.40	0.52	F	.70	.60	.87
6018	8		0.45	0.38	0.36	0.49	0.43	.65	.53	.68
6021	Batt 1 Volt	VDC	31.50	31.11	30.79	30.71	F	F	F	30.67
6022	2		31.48	31.09	30.80	30.68	31.28	30.60	30.65	30.61
6023	3		31.49	31.10	30.81	30.70	31.30	30.61	30.67	30.68
6024	4		31.49	31.10	30.81	30.70	31.30	30.61	30.70	30.70
6025	5		31.50	31.11	30.79	30.73	31.31	30.60	30.71	F
6026*	6		31.49	31.08	30.80	F	31.31	F	F	F
6027	7		31.52	31.14	30.83	30.74	F	30.61	30.72	30.64
6028	8		31.49	31.11	30.81	30.71	31.30	30.58	30.70	30.72
6031	Batt 1 Temp	DGC	21.59	21.91	22.67	21.73	20.66	19.43	19.51	16.41
6032	2		20.53	19.90	20.36	19.51	19.74	19.39	21.82	13.18
6033	3		18.80	17.77	17.54	17.06	17.34	16.29	16.63	9.21
6034	4		20.90	20.33	20.43	20.94	20.48	19.99	20.20	19.90
6035	5		25.16	27.18	30.52	34.20	28.47	24.37	23.69	29.46
6036	6		24.37	27.19	27.67	30.32	26.72	21.76	21.57	23.92
6037	7		24.83	26.19	26.95	29.20	25.64	25.76	24.83	26.43
6038	8		23.75	24.36	24.49	25.63	24.53	24.23	22.76	18.97
6040	Rt. Pad Temp	DGC	28.96	30.90	26.11	24.98	28.46	25.46	28.40	-2.11
6041	Rt. Pad VM	VDC	33.72	32.86	32.44	30.53	32.45	32.50	32.68	31.82
6042	Rt. Pad VN	VDC	33.46	32.44	31.27	21.60	32.04	31.85	31.98	28.32
6044	Lt. Pad Temp	DGC	25.56	28.22	26.41	27.99	29.07	24.39	26.54	16.48
6045	Lt. Pad VF	VDC	34.40	33.82	33.36	33.24	34.13	33.39	33.35	33.57
6046	Lt. Pad VG	VDC	34.48	33.91	33.45	33.32	34.21	33.48	33.44	33.68
6050	S/C UR Bus V	VDC	31.73	31.33	30.93	30.99	31.56	30.82	30.85	30.96
6051	S/C RG Bus V	VDC	24.57	24.58	24.57	24.58	24.58	24.57	24.57	24.57
6052	Aux Reg AV	VDC	23.36	23.44	23.44	23.44	23.45	23.44	23.43	23.45
6053	Aux Reg BV	VDC	23.37	23.44	23.43	23.44	23.45	23.44	23.44	23.45
6054	Solar I	Amp	14.81	13.40	12.25	10.57	10.94	11.81	12.27	7.58
6056	S/C RG Bus I	Amp	7.23	6.28	6.41	5.86	5.11	5.97	6.13	3.40
6058	PC Mod T1	DGC	21.67	20.77	20.08	20.37	19.60	19.68	19.93	F
6059	PC Mod T2	DGC	20.44	19.56	19.16	18.94	18.75	18.14	18.39	F
6070	P/L RG Bus V	VDC	24.61	24.00	24.59	24.59	24.62	24.59	24.59	F
6071	P/L UR Bus V	VDC	31.85	31.40	30.97	31.03	31.65	30.87	30.90	F
6073	P Aux AV	VDC	23.47	23.51	23.50	23.50	23.50	23.51	23.50	F
6074	P Aux BV	VDC	23.46	23.51	23.50	23.50	23.50	23.51	23.50	F
6075	PR Mod T1	DGC	20.84	20.32	20.82	20.23	20.02	19.73	20.03	F
6076	PR Mod T2	DGC	22.13	21.79	22.14	21.77	21.92	21.39	21.67	F
6079	Fuse Blow V	VDC	24.48	24.49	24.48	24.49	24.48	24.47	24.46	F
6080	Shunt 1 I	Amp	0.0	0.0	0.0	0.0	0.00	.00	.00	.00
6081	2		0.0	0.0	0.0	0.0	0.00	.00	.00	.00
6082	3		0.0	0.0	0.0	0.0	0.00	.00	.00	.00
6083	4		0.0	0.0	0.0	0.0	0.00	.00	.00	.00
6084	5		0.0	0.0	0.0	0.0	0.00	.00	.00	.00
6085	6		0.0	0.0	0.0	0.0	0.00	.00	.00	.00
6086	7		0.0	0.0	0.0	0.0	0.00	.00	.00	.00
6087	8		0.0	0.0	0.0	0.0	0.00	.00	.00	.00
6100	P/L RG Bus I	Amp	0.38	0.54	0.40	0.41	0.39	.52	.41	.00
Total No. Major Frames		Frm	396	785	697	725	394	789	809	725

*Intermittent Temperature Sensitive Dropout Present

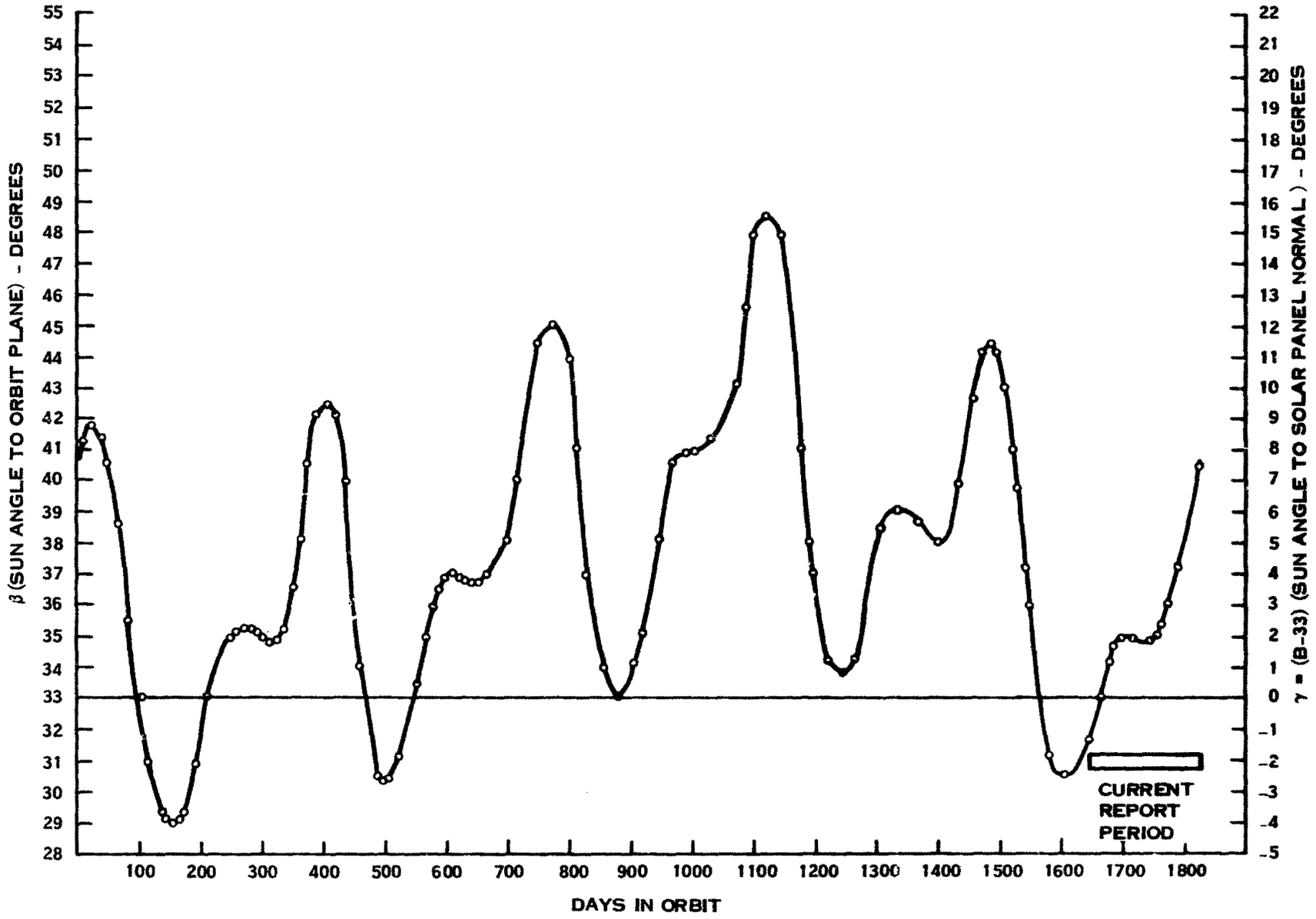


Figure 3-3. Landsat-2 Actual β (Orbit Plane) and α (Solar Panel) Sun Angles

SECTION 4

ATTITUDE CONTROL SUBSYSTEM (ACS)
LANDSAT-2

SECTION 4

ATTITUDE CONTROL SYSTEM (ACS)

Landsat-2's Attitude Control System has performed normally since launch and has consistently maintained correct spacecraft attitude up until the Yaw Flywheel failure in Orbit 24375 (5 November 1979).

Landsat-2 was switched to Roll Differential High Gain mode in Orbit 24370 (5 November 1979), to control roll pneumatic gating. The Narrow Band Recorder playback of Orbit 24373 showed RMP1 Rate High resolution and the Yaw Motor Driver Duty Cycle unusually high as the Yaw Flywheel speed went through zero (Figures 4-1 and 4-2). This anomaly got progressively worse in subsequent orbits, and in Orbit 24375, realtime telemetry indicated very low spacecraft power, RMP1 in saturation, the Yaw Motor Driver Duty Cycle at 100 percent, and the Yaw Flywheel at zero wheel speed (Figures 4-3 and 4-4). The Yaw Flywheel had failed.

Landsat-2 remains in a stable non-operational mode with Roll Differential Tachometer in High Gain, both Solar Panels stopped at high noon or 90°, Attitude Measuring System OFF, Pitch Position Bias and Pitch Momentum Bias disabled, and both RMP1 and RMP2 OFF.

RMP1 (gas bearing) was turned OFF in Orbit 24491 (14 November 1979), to conserve power on the spacecraft. RMP2 (ball bearing) which had failed and was turned OFF in Orbit 21766 (2 May 1979), was turned ON for a few orbits, but was later turned OFF when its performance began to degrade.

Both SADS tracked the sun normally; they were, however, stopped at high noon in order to maintain spacecraft stability and to obtain maximum solar impingement.

The pitch magnetic rod of the MMCA was reset to 1000 pole-cm after attempts to correct spacecraft attitude using magnetics were executed. MMCA performance was normal.

The Pitch Position Bias program (PPB) implemented to control pitch pneumatic gating was terminated in Orbit 24376 (5 November 1979). The pneumatics remains off and no freon gas is being used as the pitch and roll wheels are being unloaded by gravity gradient in the present spacecraft attitude configuration. Table 4-1 shows the bias sequences maintained during this report period.

Eleven ground track maintenance orbit adjusts were conducted during this report period. The ten orbit adjusts performed after 5 November 1979 were executed with pitch normal, roll in differential tachometer high gain mode, the yaw wheel failed, and the solar panels stopped at 90° ar high noon position. The OA and ACS performance was normal.

Figure 4-5 is a plot of freon consumption vs time with a prediction of the freon life expectancy for operation of Landsat-2. No gas has been used since the Yaw Flywheel failure; hence, the prediction will be exceeded.

Subsystems' temperatures, pressures, voltages and currents have been normal for the spacecraft status as shown in the telemetry summary, Tables 4-2, 4-3 and 4-4. Some temperature telemetry was lost when the switched telemetry power was turned off due to the power conservation requirements.

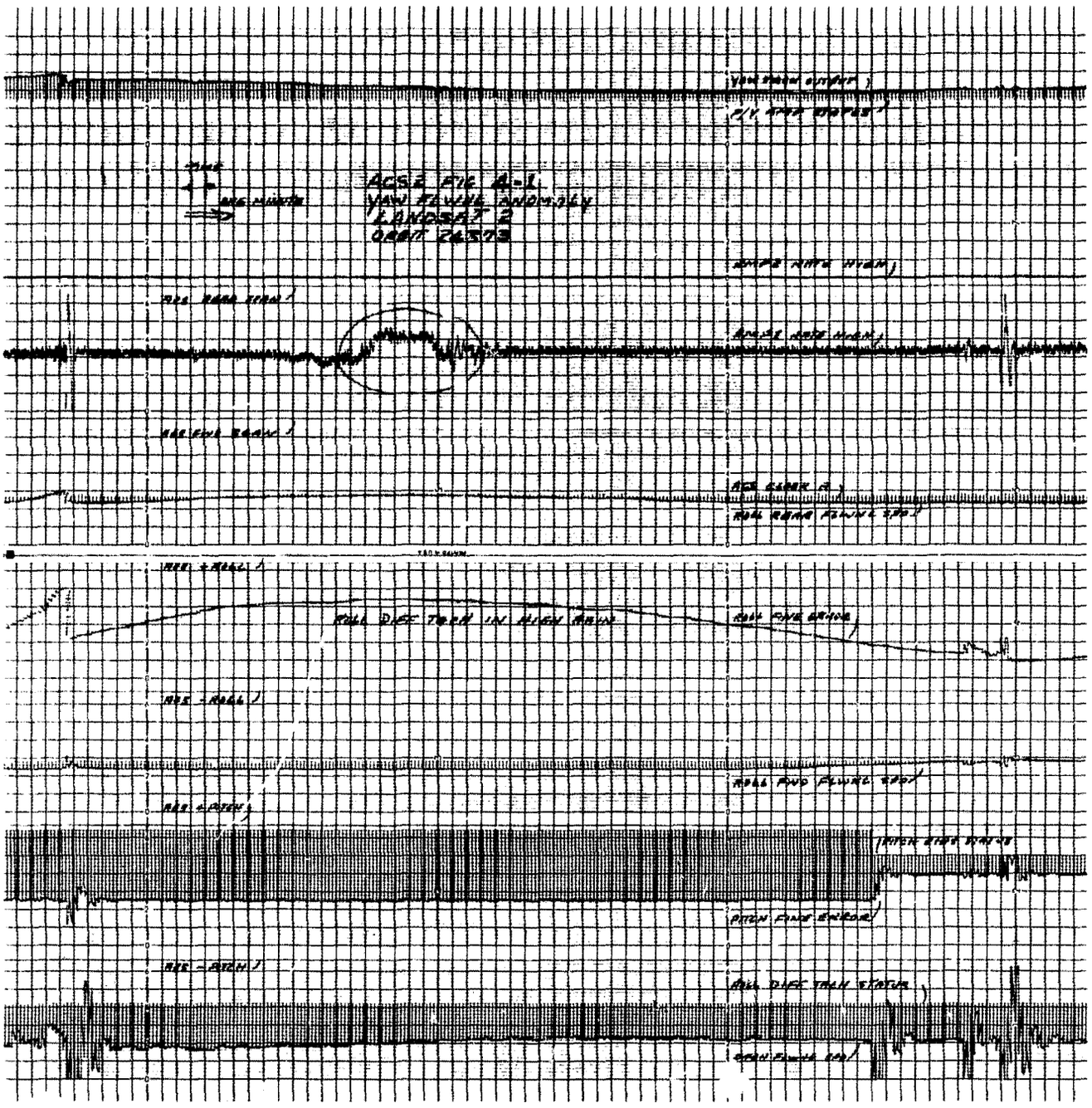


Figure 4-1. ACS 2 - Yaw Flywheel Anomaly, Orbit 24373 Landsat-2

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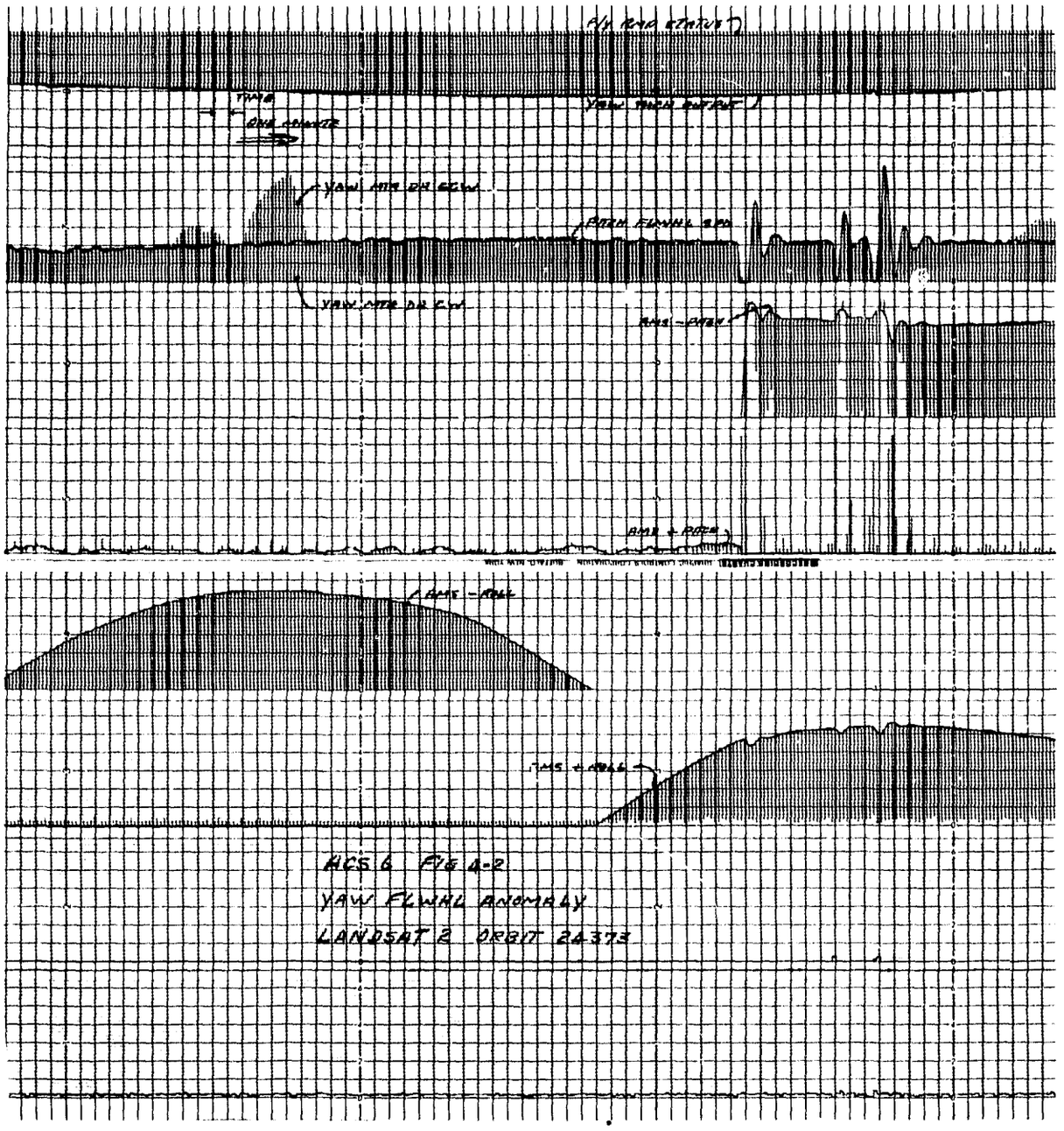


Figure 4-2. ACS-6 - Yaw Flywheel Anomaly, Orbit 24373 Landsat-2

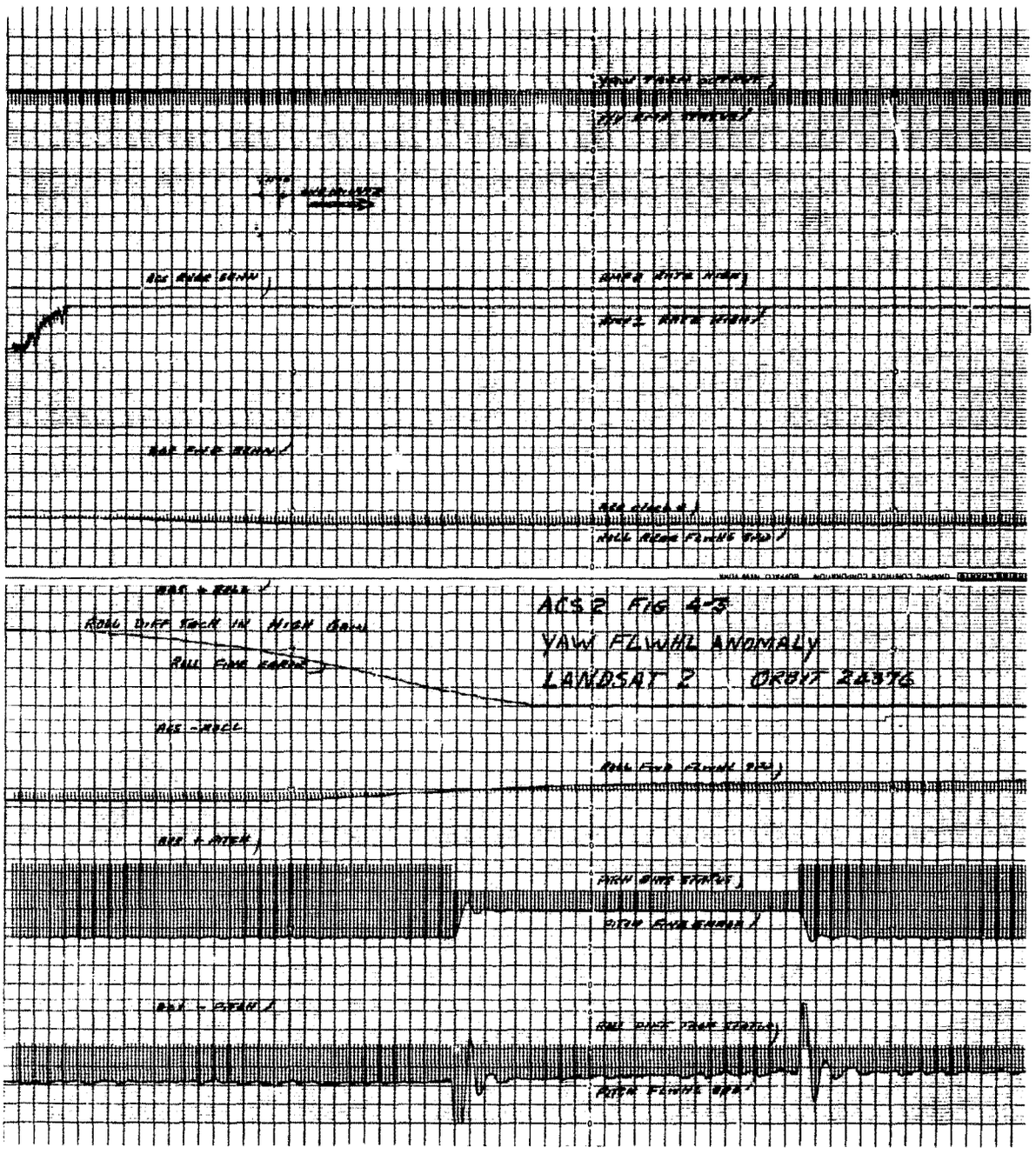


Figure 4-3. ACS 2 - Yaw Flywheel Anomaly, Orbit 24376 Landsat-2

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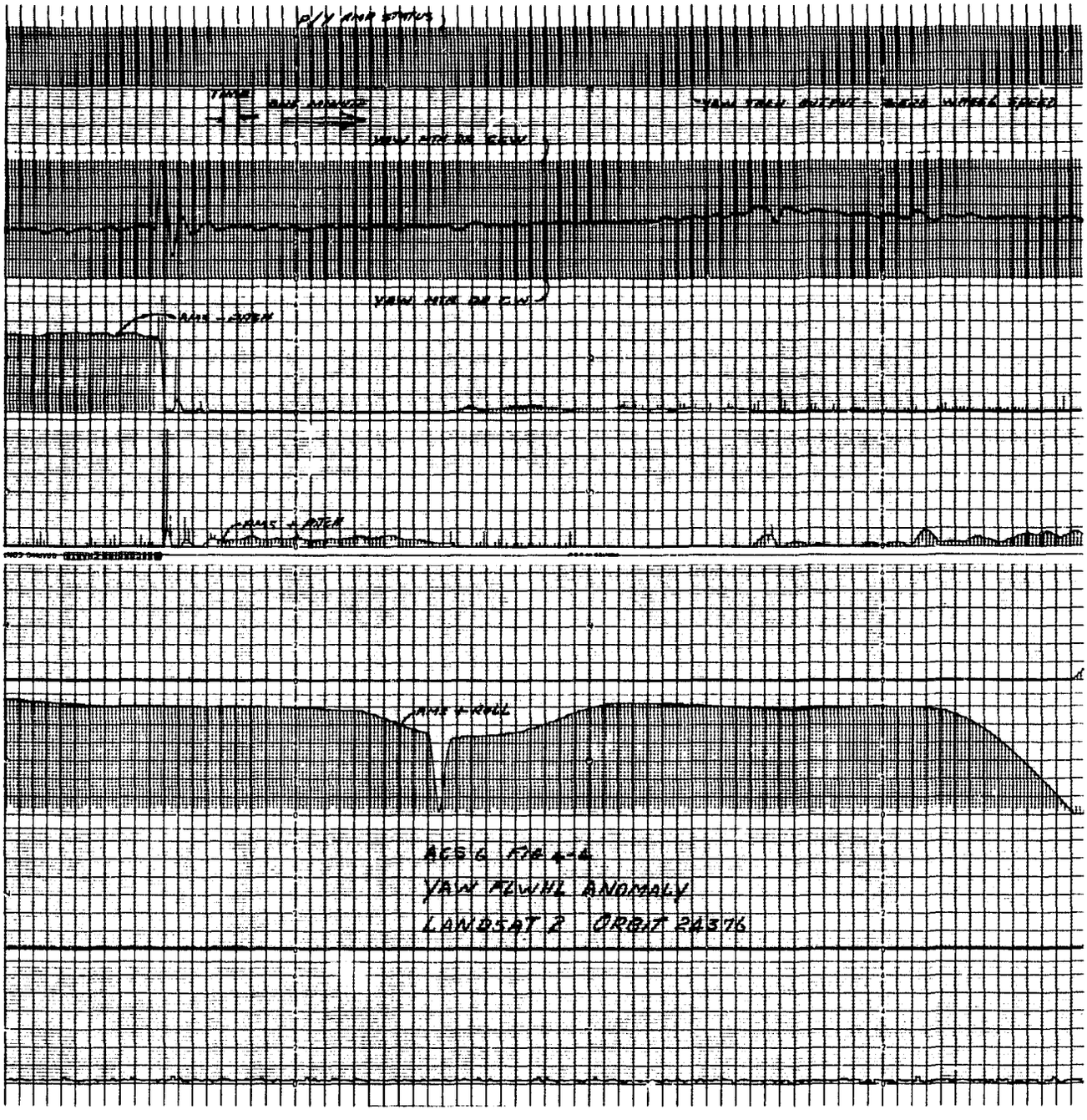


Figure 4-4. ACS 6 - Yaw Flywheel Anomaly, Orbit 24376 Landsat-2

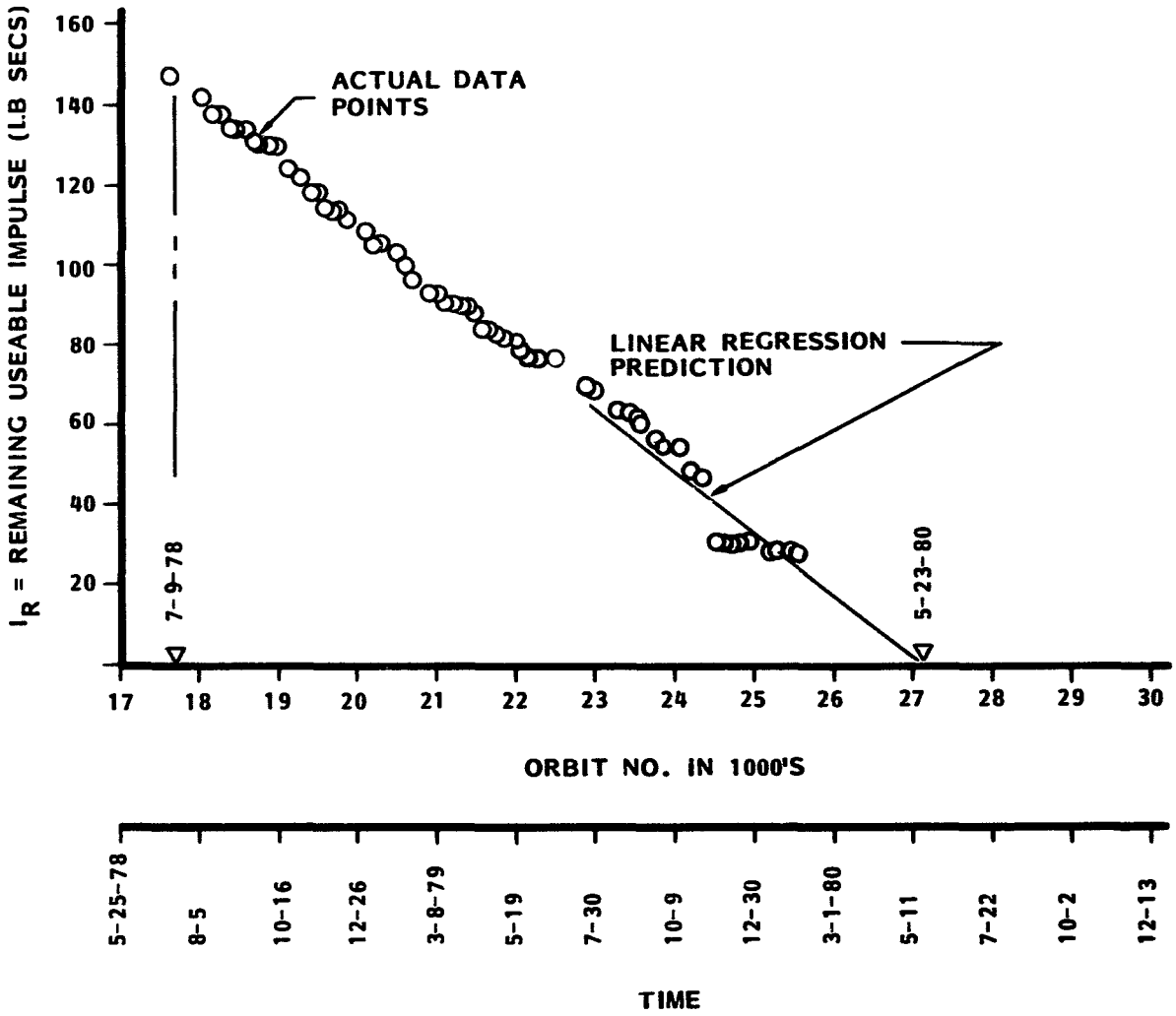


Figure 4-5. Landsat-2 Freon Life Expectancy

Table 4-1. LS-2 Pitch Position Bias Semiannual Summary

Period		Repetitive Implementation Sequence			Minutes Positioned About Satellite Midnite, T_o	
From Orbit	To Orbit	N_o	N_o +1	N_o +2	From	To
22326 11 Jun 79	23035 1 Aug 79	+2.9°	+2.9°	+2.9°	T_o - 25.0	T_o - 2
23036 1 Aug 79	23345 23 Aug 79	+2.9°	+2.9°	+2.9°	T_o - 28.0	T_o - 2
23346 23 Aug 79	23833 27 Sept 79	+2.9°	+2.9°	+2.9°	T_o - 28.0	T_o + 2
23834 27 Sept 79	24082 14 Oct 79	+2.9°	+2.9°	+2.9°	T_o - 28.0	T_o - 1
24083 14 Oct 79	24122 18 Oct 79	+2.9°	+2.9°	+2.9°	T_o - 28.0	T_o - 2
24123 18 Oct 79	24181 22 Oct 79	+2.9°	+2.9°	+2.9°	T_o - 28.0	T_o - 4.0
24182 22 Oct 79	24219 25 Oct 79	+2.9°	+2.9°	+2.9°	T_o - 26.0	T_o - 4.0
24220 25 Oct 79	24276 29 Oct 79	+2.0°	+2.0°	+2.0°	T_o - 26.0	T_o - 4.0
24277 29 Oct 79	24304 31 Oct 79	+2.0°	+2.0°	+2.0°	T_o - 26.0	T_o - 2.0
24305 31 Oct 79	24331 2 Nov 79	+2.0°	+2.0°	+2.0°	T_o - 26.0	T_o
24332 2 Nov 79	24367 5 Nov 79	+2.0°	+2.0°	+2.0°	T_o - 26	T_o - 2
24368 5 Nov 79	24376 5 Nov 79	+2.0°	+2.0°	+2.0°	T_o - 26	T_o

N_o Equals Satellite Night

Table 4-2. Landsat-2 ACS Subsystem Temperature and Pressure Average

Func	Name	Units	Orbits							
			29	5102	10191	15211	20252	23613	24423	25210
1084	RMP 1 Gyro Temperature	DGC	19.33(1)	22.69	22.70	20.21(3)	24.30	51.09	50.31	.39
1094	RMP 2 Gyro Temperature	DGC	70.00	74.26	74.50	65.14	64.23	26.49	25.77	5.00
1222	SAD RT MTR HSNG Temp.	DGC	19.50	22.98	22.73	20.08	24.45	26.71	22.65	-2.79
1242	SAD LT MTR HSNG Temp.	DGC	26.87	29.79	30.26	28.17	31.71	29.68	26.20	1.21
1223	SAD RT MTR WNDNG Temp.	DGC	21.76	24.36	23.72	20.87	25.31	27.56	21.94	-2.95
1243	SAD LT MTR WNDNG Temp.	DGC	30.23	32.83	33.15	30.47	34.69	32.76	26.73	1.80
1228	SAD RT HSG Pressure	PSI	7.26	7.18	7.00	6.77	6.77	6.70	6.55	5.92
1248	SAD LT HSG Pressure	PSI	7.28	7.21	6.91	6.46	6.36	6.06	5.90	5.33
1007	FWD Scanner MTR Temp.	DGC	22.07	23.80	23.97	21.18	25.06	25.00	24.26	-2.80
1016	Rear Scanner MTR Temp.	DGC	24.19	25.04	24.83	22.87	26.11	25.80	24.65	1.61
1003	FWD Scanner Pressure	PSI	9.59(2)	D	D	D	D	D	D	D
1012	Rear Scanner Pressure	PSI	6.21	5.62	5.11	4.47	4.09	3.91	3.69	3.28
1212	Gas Tank Pressure	PSI	1948.00	1517.04	1256.98	863.19(4)	554.94	370.15	286.34	209.75
1210	Gas Tank Temperature	DGC	20.66	24.25	24.43	22.25	26.00	25.33	24.52	.39
1213	Manifold Pressure	PSI	53.98	54.56	55.26	56.49	57.47	58.36	58.50	64.50
1211	Manifold Temperature	DGC	19.18	22.59	22.78	20.51	24.25	23.73	22.07	-1.62
1059	CLB Power Supply Card Temp	DGC	39.00	41.47	41.81	39.93	42.84	41.99	42.65	17.04
1260	TH01 EBP	DGC	24.29	27.21	27.58	25.58	29.07	26.42	24.96	T
1261	TH02 EBP	DGC	20.29	23.25	23.48	21.32	24.98	24.68	25.13	T
1262	TH03 EBP	DGC	18.29	21.46	21.29	18.99	22.91	24.87	23.01	T
1263	TH01 STS	DGC	6.54	0.52	- 1.66	- 3.67	1.52	.80	.26	T
1264	TH02 STS	DGC	D	D	D	D	D	D	D	D
1265	TH03 STS	DGC	8.46	8.67	11.66	9.78	13.54	10.06	7.42	T
1266	TH04 STS	DGC	- 2.78	- 3.26	- 0.08	- 3.56	2.63	-.23	1.90	T
1267	TH05 STS	DGC	9.62	5.57	4.24	0.97	7.23	5.53	4.43	T
1224	SAD R FSST	DGC	35.00	35.81	34.24	7.91(5)	41.79	45.94	4.41	18.31
1244	SAD L FSST	DGC	50.00	49.13	55.24	52.49	58.29	57.12	31.07	39.39

(1) RMP-1 Left off after initial test in Orbit 1
(2) Prelaunch leak - refer to text
(3) RMP1 in standby mode during orbit adjust maneuvers
(4) Pressure drop due to freon consumed during orbit adjust maneuvers
(5) Low temperature caused by large beta angle shadowing
D Defective telemetry point

Table 4-3. Landsat-2 ACS Voltages and Currents

Func	Name	Units	Orbit							
			29	5102	10191	15211	20252	23613	24423	25210
1081	RMP 1 MTR Volts	VDC	F	F	F	F	F	33.12	33.00	F
1082	RMP 1 MTR Current	Amps	F	F	F	F	F	0.22	0.22	F
1080	RMP 1 Supply Volts	VDC	F	F	F	F	F	23.61	23.59	F
1091	RMP 2 MTR Volts	VDC	29.99	29.92	29.87	29.90	29.88	F	F	F
1092	RMP 2 MTR Current	Amps	0.10	0.10	0.10	0.10	.10	F	F	F
1090	RMP 2 Supply Volts	VDC	23.63	23.59	23.58	23.61	23.58	F	F	F
1220	SAD RT MTR WNDNG Volts	VDC	5.47	4.47	4.09	4.23	4.30	4.19	4.58	F
1240	SAD LT MTR WNDNG Volts	VDC	5.08	4.72	4.57	4.53	4.75	4.76	5.38	F
1227	SAD RT -15 VDC Conv	VDC	15.14	15.16	15.15	15.18	15.12	15.12	15.10	F
1247	SAD LT -15 VDC Conv	VDC	15.23	15.21	15.22	15.21	15.19	15.21	15.19	F
1056	CLB ± 6 VDC	TMV	2.35	2.38	2.40	2.40	2.40	2.40	2.38	2.35
1055	CLB ± 10 VDC	TMV	2.88	2.92	2.94	2.94	2.95	2.95	2.93	2.89
1057	CLB Power Supply Volts	TMV	2.97	2.96	2.97	2.96	2.97	2.97	2.95	2.87

F = Unit Off

Table 4-4. Landsat-2 ACS Attitude Errors and Driver Duty Cycles

Func	Name	Units	Orbit							
			26	5102	10191	15211	20252	23613	24423	25210
1041	Pitch Fine Error	DEG	-0.15	-0.13	-0.82	-0.78	-.71*	-1.29	4.20*	-.23
1043	Pitch Flywheel Speed	RPM	-156.12	-162.97	3.39	51.87	31.41	-141.28	343.17	-100.27
1038	Pitch Mtr Drvr CCW	PCT	6.64	6.05	4.33	1.76	3.40	8.29	6.20	7.15
1039	Pitch Mtr Drvr CW	PCT	2.03	1.80	3.87	4.59	5.66	5.61	4.29	0.0
1030	Roll Fine Error	DEG	-0.13	-0.14	-0.21	-0.20	-.17	-.08	.68	-2.48
1027	Roll Rear Flywheel SPD	RPM	729.30	748.56	792.27	796.70	770.26	724.40	729.26	701.96
1026	Roll Fwd Flywheel SPD	RPM	703.02	735.81	737.44	767.93	740.43	758.77	823.57	625.49
1022	Roll Rear Mtr Drvr CCW	PCT	0.67	0.63	0.87	0.01	.29	.97	0.0	0.0
1025	Roll Rear Mtr Drvr CW	PCT	7.54	6.34	6.09	6.07	5.75	5.80	5.87	8.08
1023	Roll Fwd Mtr Drvr CCW	PCT	0.70	0.87	0.72	0.03	.64	1.03	.23	0.0
1024	Roll Fwd Mtr Drvr CW	PCT	5.46	4.01	4.34	3.20	3.55	4.35	3.70	4.95
1035	Yaw Tach	RPM	-95.73	-38.16	-163.04	-34.38	-94.37	12.41	Q	Q
1033	Yaw Mtr Drvr CW	PCT	1.98	2.01	1.91	1.81	1.71	2.58	50.56	F
1034	Yaw Mtr Drvr CCW	PCT	2.10	1.90	2.49	1.50	1.80	2.22	49.44	F
1221	SAD Right Tach	D/M	3.38	3.38	3.37	3.42	3.37	3.32	1.47	F
1241	SAD Left Tach	D/M	3.68	3.56	3.48	3.55	3.47	3.57	2.14	F

*Pitch Position Bias was implemented during this Orbit.

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

LANDSAT-2

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

The Command Clock Subsystem operated nominally.

The spacecraft clock was reset four times during this report period: during Orbit 24086 on 16 October 1979 because it was drifting beyond 2 seconds fast; during Orbit 24400 on 7 November 1979 because of clock drop-out during the yaw wheel anomaly (see Section 4); during Orbit 25000 on 20 December 1979 during the yaw wheel anomaly; and during Orbit 25160 on 1 January 1980 to accommodate the extra second in GMT during 1979.

Figure 5-1 shows the history of the spacecraft clock drift since launch. Figure 5-2 shows the cumulative clock drift, 31.105 seconds faster in 60 months; and Figure 5-3 gives drift rate of the spacecraft clock. The clock of Landsat-2 drifts in the same direction as Landsat-3. The drift rate has decreased 3% in this quarter.

Table 5-1 shows typical telemetry values since launch. All are nominal.

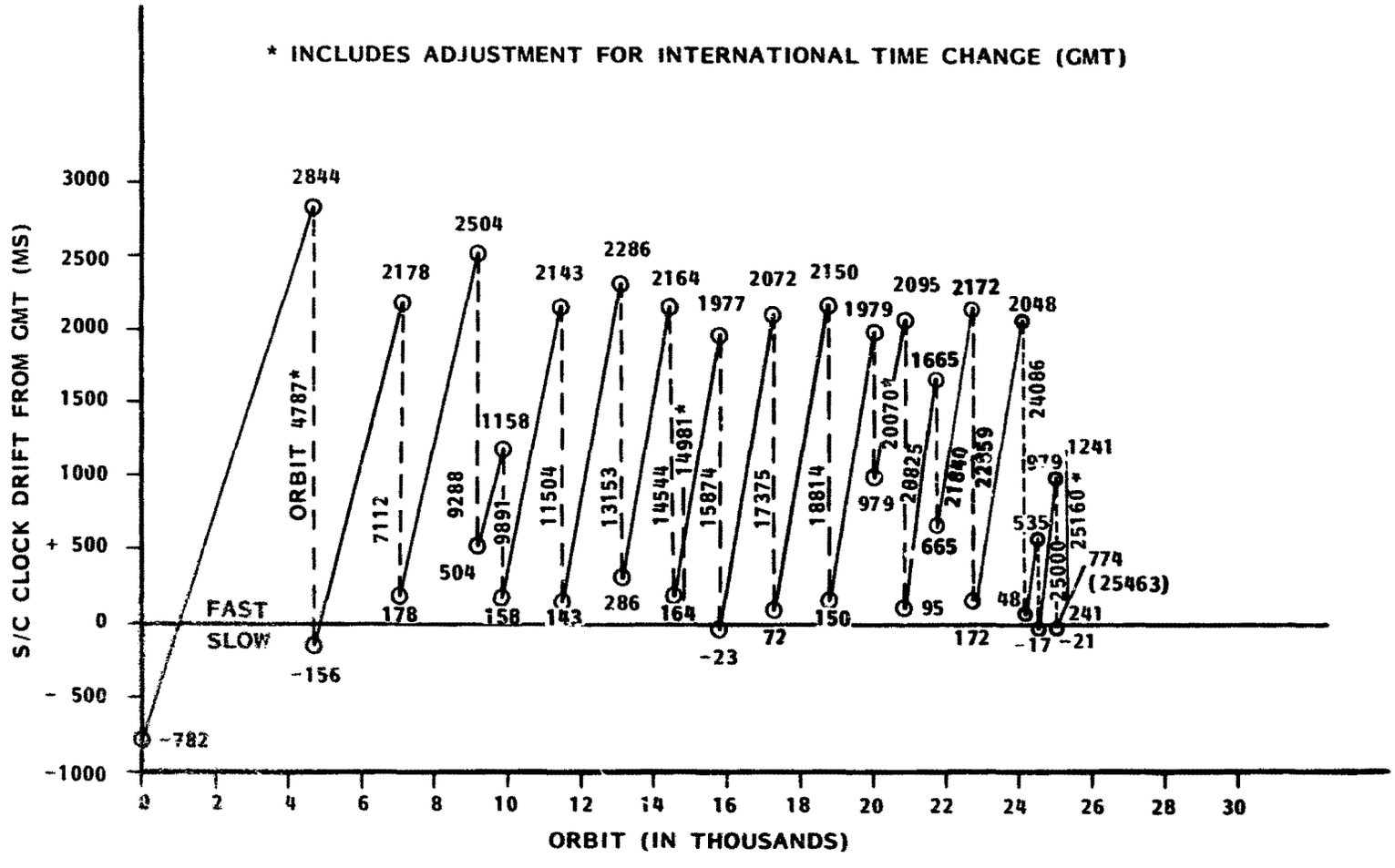


Figure 5-1. Landsat-2 Clock Drift History

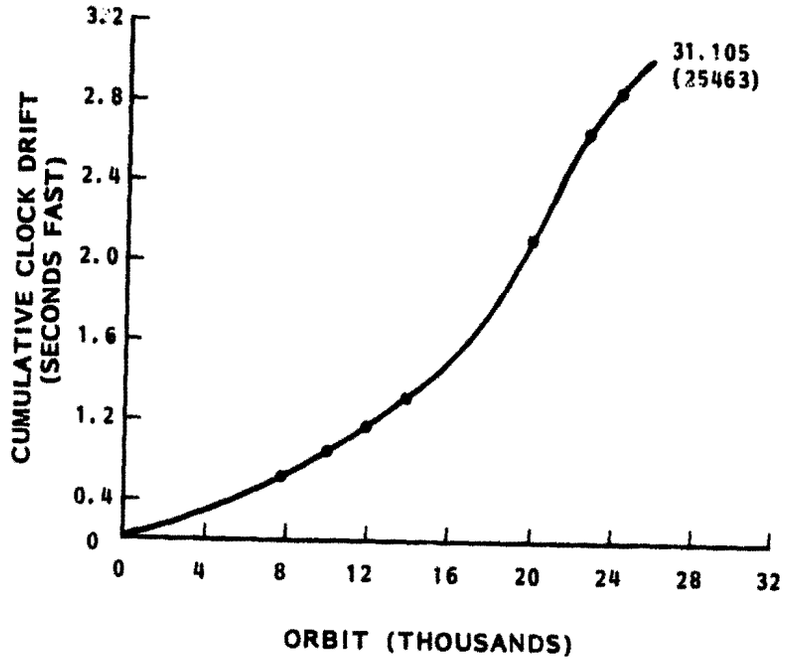


Figure 5-2. Landsat-2 Cumulative Clock Drift

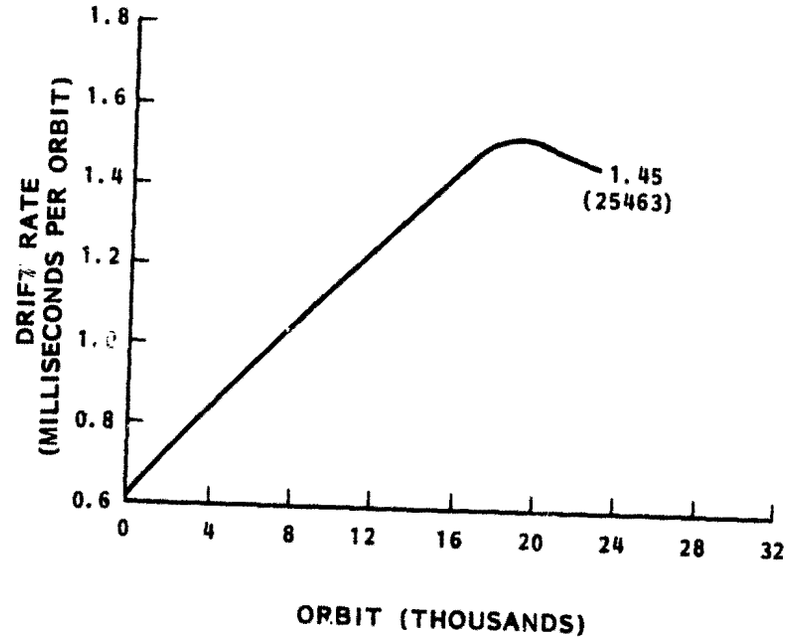


Figure 5-3. Landsat-2 Drift Rate of S/C Clock

Table 5-1. Command/Clock Telemetry Summary, Landsat-2

Function No.	Name	Units	Orbit							
			35	5091	10192	15211	20251	23613	24482	25330
8005	Pri. Power Supply Temp	DGC	38.82	39.43	39.08	39.12	39.13	38.85	42.74	36.84
8006	Red. Power Supply Temp	DGC	36.93	38.00	37.85	37.91	38.08	37.63	41.61	35.62
8007	Pri. Osc. Temp	DGC	28.70	28.70	28.56	28.69	28.67	27.71	31.24	25.22
8008	Red Osc. Temp	DGC	27.82	27.26	26.97	27.40	27.09	26.92	30.56	24.87
8009	Pri. Osc. Output	TMV	1.06	1.05	1.05	1.06	1.05	1.05	1.07	1.05
8010	Red. Osc. Output	TMV	1.17	1.18	1.18	1.18	1.18	1.18	1.20	1.17
8011	100 KHz	TMV	3.17	3.15	3.15	3.15	3.15	3.15	3.15	3.15
8012	10 KHz	TMV	3.08	3.05	3.05	3.05	3.05	3.05	3.05	3.05
8013	2.5 KHz	TMV	3.01	2.95	2.95	2.95	2.95	2.95	2.95	2.95
8014	400 Hz	TMV	4.17	4.45	4.45	4.45	4.45	4.45	4.45	4.45
8015	Pri. +4V Power Supply	TMV	N	2.05	2.05	2.05	2.05	2.05	2.05	2.04
8016	Red. +4V Power Supply	TMV	N	2.00	2.00	2.00	2.00	2.00	2.00	2.00
8017	Pri. +6V Power Supply	TMV	N	2.30	2.30	2.30	2.30	2.30	2.30	2.30
8018	Red. +6V Power Supply	TMV	N	2.30	2.30	2.30	2.30	2.30	2.30	2.30
8019	Pri. -6V Power Supply	TMV	N	5.23	5.23	5.23	5.23	5.23	5.20	5.20
8020	Red. -6V Power Supply	TMV	N	5.23	5.23	5.23	5.23	5.23	5.22	5.22
8021	Pri. -23V Power Supply	TMV	N	5.70	5.70	5.70	5.70	5.70	5.69	5.67
8022	Red -23V Power Supply	TMV	N	5.65	5.65	5.65	5.65	5.65	5.65	5.55
8023	Pri. -29V Power Supply	TMV	N	5.29	5.29	5.30	5.30	5.30	5.30	5.29
8024	Red -29V Power Supply	TMV	N	5.29	5.28	5.29	5.29	5.29	5.30	5.29
8101	CIU A - 12V	TMV	3.79	3.97	3.97	3.97	3.96	3.96	3.97	3.97
8102	CIU B - 12V	TMV	3.78	3.95	3.95	3.95	3.95	3.95	3.95	3.95
8103	CIU A - 5V	TMV	3.93	4.15	4.15	4.14	4.14	4.13	4.15	4.13
8104	CIU B - 5V	TMV	3.90	4.10	4.10	4.10	4.10	4.10	4.10	4.10
8105	CIU A Temp	DGC	26.01	21.67	21.67	22.29	21.61	21.04	23.03	20.70
8106	CIU B Temp	DGC	23.35	19.70	19.71	20.21	19.67	19.18	20.84	18.93
8201	Receiver RF-A Temp	DGC	N	29.14	28.83	28.86	28.73	28.19	T	T
8202	Receiver RF-B Temp	DGC	29.09	F	22.66	22.67	22.55	21.74	T	T
8203	D MOD A Temp	DGC	28.95	38.56	38.25	38.33	38.18	37.71	T	T
8204	D MOD B Temp	DGC	37.73	26.72	26.31	26.34	26.27	25.49	T	T
8205	Receiver A AGC	DBM	F	-91.43	-90.78	-89.02	-93.73	-90.39	-90.47	-90.15
8206	Receiver B AGC	DBM	-87.83	F	F	F	F	F	F	F
8207	Amp. A Output	TMV	F	2.54	2.75	2.66	2.25	2.59	2.28	2.25
8208	Amp. B Output	TMV	2.10	F	F	F	F	F	F	F
8209	Freq. Shift Key A Out	TMV	F	1.08	1.09	1.08	1.08	1.11	1.08	1.08
8210	Freq. Shift Key B Out	TMV	1.11	F	F	F	F	F	F	F
8211	Amp. A Output	TMV	F	1.13	1.14	1.13	1.12	1.15	1.11	1.13
8212	Amp. B Output	TMV	1.13	F	F	F	F	F	F	F
8215	D MOD A - 15V	TMV	F	4.87	4.87	4.87	4.87	4.87	4.87	4.85
8216	D MOD B - 15V	TMV	4.77	F	F	F	F	F	F	F
8217	Regulator A - 10V	TMV	F	5.40	5.40	5.40	5.40	5.40	5.40	5.37
8218	Regulator B - 10V	TMV	5.32	F	F	F	F	F	F	F
8311	ECAM Mem. Tmp	DGC	N	18.41	18.41	18.38	18.30	17.96	7.86	T
8312	ECAM Pwr Spply Temp	DGC	N	23.13	23.00	22.97	22.80	22.16	11.38	T

N - Data Not Available
F - Unit Off
T - Telemetry Off

SECTION 6

TELEMETRY SUBSYSTEM (TLM)

LANDSAT-2

SECTION 6

TELEMETRY SUBSYSTEM (TLM)

The TLM has operated nominally in this report period.

Table 6-1 shows typical telemetry values since launch. All are nominal. Functions 1264 (Thermal Shield 5 Temperature), 4002 (MMCA Board 2 Temperature) and 13200 (APU 24 Volt Input) were defective before launch but verification of these functions is acceptable by adjacent temperature and downstream voltage measurements respectively.

The memory section of the telemetry matrix remains in the 0, 0 mode.

Table 6-1. Landsat-2 TMP Telemetry Values

Func	Name	Units	Orbit							
			35	5091	10192	15211	20252	23613	24423	25210
9001	Memory Sequencer A Converter	VDC	4.45	4.45	4.45	4.45	4.45	4.45	4.45	4.45
9002	Memory Sequencer B Converter	VDC	F	F	F	F	F	F	F	F
9003	Memory Sequencer Temp	DGC	20.00	21.37	21.34	21.87	21.88	20.29	18.50	T
9004	Formatter A Converter	VDC	4.52	4.52	4.52	4.54	4.52	4.50	4.52	4.52
9005	Formatter B Converter	VDC	F	F	F	F	F	F	F	F
9006	Dig. Mux A Converter	VDC	4.22	4.22	4.22	4.23	4.22	4.21	4.21	4.20
9007	Dig. Mux B Converter	VDC	F	F	F	F	F	F	F	F
9008	Formatter/Dig Mux Temp	DGC	25.00	27.80	29.75	32.56	30.00	24.67	30.00	T
9009	Analog Mux A Converter	VDC	4.02	4.05	4.05	4.05	4.05	4.05	4.07	4.07
9010	Analog Mux B Converter	VDC	F	F	F	F	F	F	F	F
9011	A/D Converter A Voltage	VDC	4.02	4.03	4.04	4.05	4.03	4.03	4.02	4.02
9012	A/D Converter B Voltage	VDC	F	F	F	F	F	F	F	F
9013	Analog Mux, A/D Conv. Temp	DGC	25.00	27.33	27.44	29.72	27.52	27.07	25.19	T
9014	Preregulator A Voltage	VDC	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.98
9015	Preregulator B Voltage	VDC	F	F	F	F	F	F	F	F
9016	Reprogrammer Temp	DGC	22.50	24.74	25.47	28.98	24.96	22.43	22.50	T
9017	Memory A Converter	VDC	4.45	4.45	4.45	4.45	4.45	4.45	4.45	4.42
9018	Memory A Temp	DGC	17.50	17.17	17.16	16.66	16.85	14.68	12.50	F
9019	Memory B Converter	VDC	F	F	F	F	F	F	F	F
9020	Memory B Temp	DGC	17.50	17.41	17.50	17.52	17.50	16.64	14.96	T
9100	Reflected Power	dBm	18.29	14.18	14.53	15.24	14.39	13.96	14.21	T
9101	Xmtr A-20 VDC	VDC	3.80	3.97	3.98	3.98	3.97	3.97	3.97	3.97
9102	Xmtr B-20 VDC	VDC	F	F	F	F	F	F	F	F
9103	Xmtr A Temp	DGC	27.73	26.40	30.37	26.69	29.08	22.48	25.80	T
9104	Xmtr B Temp	DGC	N	27.74	31.74	37.80	30.44	23.57	27.21	T
9105	Xmtr A Power Output	dBm	27.73	26.69	26.41	26.59	26.41	26.35	26.37	26.61
9106	Xmtr B Power Output	dBm	F	F	F	F	F	F	F	F

N - Data Not Available.
F - Unit Off.
T - Telemetry Off

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

LANDSAT-2

SECTION 7

ORBIT ADJUST SUBSYSTEM

Eleven ground track maintenance orbit adjusts were conducted during this reporting period and in all instances the Orbit Adjust Subsystem performed normally.

During Orbit 23233 (15 August 1979), the minus X thruster was fired for 36.0 seconds. Spacecraft altitude increased by 115.8 meters and the burn efficiency was calculated at 108.7%.

Ten (-X) orbit adjust firings, 9.0 seconds duration in all instances, were performed to correct ground track drift due to unusual high solar activity, and because of the setback in OA schedule due to the Yaw Flywheel anomaly. All OAS were done with the Roll Differential Tachometer in High Gain, Pheumatics Disabled, and the RSAD and LSAD stopped at 94^{o} and 90^{o} respectively. The OAS performed normally with spacecraft altitude increased by 259.0 meters and burn efficiency calculated at 98.0 percent.

Summary of the OA procedures are given in Table 7-1. Each 9.0 second burn had negligible effect on the system (post burn Freon status, HZ consumption, tank pressure, etc.); hence, the overall effect on the OA system by the ten burns is tabulated in the row of Orbit Adjust No. 61 of Table 7-1.

Telemetry records of the OA procedures are shown in Figure 7-1 through Figure 7-12.

Table 7-2 shows typical telemetry values for the OAS during its quiescent periods. Variation in thrust chamber temperatures shown in Table 7-2 are consistent with variation in sun intensity and sun angle for normal attitude and loss of yaw angle control.

Table 7-1. Landsat-2 Orbit Adjust Summary

Orbit Adjust No.	Orbit No.	Epoch (Burn Start Time)	Burn Axis (-Y)	Burn Axis (± X)	Burn Duration (Seconds) (-Y)	Burn Duration (Seconds) (± X)	Post Burn Freon Status (PSIA)	Hydrazine Consumed (Lbs)	Post Burn Hydrazine Tank P. (PSIA)	Burn Efficiency (%)	Δa (Meters)	Δi (Degrees)
1	32	25 Jan 79 00:34:00.8		- X		4.8	1947.19	0.02	539.[illegible]	104.3	39	0.0
2	71	27 Jan 75 19:57:00.8		+ X		4.8	1923.78	0.02	547.46	90.1	- 36	0.0
3	79	28 Jan 75 09:49:00.8		- X		420.0	1919.50	1.62	547.46	107.0	3455	0.0
4	86	28 Jan 75 21:13:00.8		- X		420.0	1916.40	1.51	502.46	107.0	3233	0.0
5	163	3 Feb 75 10:36:00.8		+ X		420.0	1884.35	1.42	468.75	97.0	-2974	0.0
6	191	5 Feb 75 10:15:00.8		+ X		360.0	1874.51	1.15	438.71	97.5	-2421	0.0
7	212	6 Feb 75 22:31:00.8		+ X		308.8	1865.15	0.95	416.21	98.6	-2009	0.0
8	880	26 Mar 75 21:44:00.8		- X		12.8	1837.05	0.04	397.47	107.6	82	0.0
9	1632	19 May 75 18:54:00.8		- X		24.0	1757.46	0.07	401.21	107.6	154	0.0
10	2958	22 Aug 75 22:11:58.8		- X		22.0	1640.00	0.07	404.96	110.3	146	0.0
11	14157	2 Nov 77 23:47:01.2	- Y		5.2		1085.19	0.02	425.22	*	2.1	0.0
12	14171	3 Nov 77 23:47:07.2	- Y		60.0		1097.50	0.18	419.94	125.2	23.8	0.002
13	14185	4 Nov 77 23:52:49.2	- Y		60.0		1085.19	0.16	417.14	130.7	28.7	0.002
14	14324	14 Nov 77 23:07:01.2 23:11:42.4	- Y	+ X	300.0	18.8	1065.50	0.97	401.19	97.1	128.4	0.007
15	14352	16 Nov 77 23:18:01.2 23:22:42.4	- Y	+ X	300.0	18.8	1047.79	0.82	388.54	115.8	104.6	0.009
16	14382	19 Nov 77 02:06:01.2		+ X		50.0	1048.00	0.18	385.80	100.9	- 311.9	0.0
17	14514	28 Nov 77 14:08:01.2	- Y		300.0		1035.87	0.87	373.95	99.6	197.3	0.007
18	14542	30 Nov 77 14:17:01.2 14:22:41.2	- Y	+ X	420.0	80.0	1025.30	1.43	356.13	105.8	- 208.0	0.010
19	14570	2 Dec 77 14:27:31.2 14:36:11.2	- Y	+ X	600.0	80.0	999.87	1.74	336.17	103.0	- 131.0	0.014
20	14617	5 Dec 77 23:22:01.2	- Y		600.0		986.50	1.56	319.94	99.0	281.5	0.013
21	14645	7 Dec 77 23:32:01.2 23:41:05.2	- Y	+ X	600.0	56.0	986.50	1.56	305.16	100.1	- 17.6	0.012
22	14673	9 Dec 77 23:43:31.2 23:52:43.2	- Y	+ X	600.0	48.0	963.00	1.47	292.22	103.3	9.8	0.012
23	14714	12 Dec 77 22:23:00.2 22:26:14.0	- Y	+ X	599.8	46.0	961.19	1.68	278.20	100.8	31.0	0.011
24	14828	13 Dec 77 22:23:00.2 22:32:14.0	- Y	+ X	599.8	46.0	949.57	1.24	269.30	103.4	31.3	0.011
25	14807	19 Dec 77										

23	14714	12 Dec 77 22:23:00.2 22:26:14.0	- Y + X	599.8	46.0	961.19	1.68	278.20	100.8	31.0	0.011
24	14828	13 Dec 77 22:23:00.2 22:32:14.0	- Y + X	599.8	46.0	949.57	1.24	269.30	103.4	31.3	0.011
25	14807	19 Dec 77 14:21:01.2 14:30:13.2	- Y + X	600.0	48.0	937.19	1.39	259.92	101.0	30.6	0.011
26	14812	19 Dec 77 22:57:30.2 23:06:42.0	- Y + X	599.8	48.0	935.99	1.48	250.36	104.7	23.1	0.011
27	14840	21 Dec 77 23:09:00.2 23:18:04.0	- Y + X	599.8	48.0	922.21	1.36	242.44	99.4	- 42.5	0.010
28	15058	6 Jan 78 14:21:32.2 14:30:19.2	- Y + X	599.0	42.0	900.06	1.59	236.39	98.8	31.9	0.009
29	15105	9 Jan 78 22:14:31.2 23:23:49.2	- Y + X	600.0	48.0	887.88	0.77	232.22	97.0	- 12.0	0.009
30	15119	10 Jan 78 23:20:31.2 23:29:46.0	- Y + X	600.8	46.0	887.88	1.47	224.68	101.8	- 32.8	0.010
31	15127	11 Jan 78 13:06:01.2 13:15:16.0	- Y + X	600.8	46.0	878.71	1.33	218.32	101.2	- 30.8	0.009
32	15133	11 Jan 78 23:26:01.2	- Y	600.8		877.81	0.70	215.55	101.9	109.4	0.009
33	15155	13 Jan 78 13:18:01.2 13:27:48.9	- Y + X	600.8	14.0	863.19	1.31	209.91	99.5	43.5	0.009
34	15197	16 Jan 78 13:35:01.2 13:44:42.0	- Y + X	600.8	20.0	863.19	1.11	205.20	98.5	15.9	0.008
35	15211	17 Jan 78 13:41:01.2 13:50:56.0	- Y + X	601.8	7.0	854.24	0.71	202.49	96.2	61.5	0.008
36	15225	18 Jan 78 13:46:01.2 13:55:26.0	- Y + X	600.8	36.0	858.57	1.27	197.50	94.8	- 43.0	0.008
37	15295	23 Jan 78 14:15:01.2 14:24:46.0	- Y + X	600.8	16.0	835.90	0.91	194.14	99.8	27.7	0.008
38	15309	24 Jan 78 14:21:01.2 14:36:46.0	- Y + X	600.8	16.0	814.93	1.05	191.03	84.2	21.7	0.007
39	15314	24 Jan 78 22:57:00.0 23:06:50.0	- Y + X	600.0	10.0	814.13	1.02	187.50	92.2	45.0	0.007
40	15323	25 Jan 78 14:27:01.2 14:36:46.0	- Y + X	600.8	16.0	811.82	1.02	186.48	90.6	- 4.6	0.007
41	15328	25 Jan 78 23:03:31.2 23:12:02.0	- Y + X	600.8	30.0	806.81	1.03	182.05	88.8	- 32.8	0.007
42	15337	26 Jan 78 14:32:01.2 14:51:42.0	- Y + X	600.8	20.0	807.40	0.99	179.25	90.5	14.7	0.007
43	15398	30 Jan 78 23:31:54.2 23:42:12.0	- Y + X	637.8	20.0	801.57	1.04	176.34	85.3	- 1.9	0.007
44	15412	31 Jan 78 23:38:01.2 23:47:42.0	- Y + X	600.8	20.0	801.60	0.97	174.20	82.9	- 5.4	0.006
45	15426	1 Feb 78 23:44:01.2 23:53:46.0	- Y + X	600.8	16.0	801.57	0.95	172.50	88.0	4.5	0.006
46	15440	2 Feb 78 23:50:01.2	- Y	600.8		801.57	0.92	171.78	100.5	54.5	0.006
47	19246	2 Nov 78 22:39:02.0	- X		20.0	616.59	0.03	172.49	93.9	55.0	0.0

FOLDOUT FRAME 2

38	15309	24 Jan 78 14:21:01.2 14:36:46.0	- Y	+ X	600.8	16.0	814.93	1.05	191.03	84.2	21.7	0.007
39	15314	24 Jan 78 22:57:00.0 23:06:50.0	- Y	+ X	600.0	10.0	814.13	1.02	187.50	92.2	45.0	0.007
40	15323	25 Jan 78 14:27:01.2 14:36:46.0	- Y	+ X	600.8	16.0	811.82	1.02	186.48	90.6	- 4.6	0.007
41	15328	25 Jan 78 23:03:31.2 23:12:02.0	- Y	+ X	600.8	30.0	806.81	1.03	182.05	88.8	- 32.8	0.007
42	15337	26 Jan 78 14:32:01.2 14:51:42.0	- Y	+ X	600.8	20.0	807.40	0.99	179.25	90.5	14.7	0.007
43	15398	30 Jan 78 23:31:54.2 23:42:12.0	- Y	+ X	637.8	20.0	801.57	1.04	176.34	85.3	- 1.9	0.007
44	15412	31 Jan 78 23:38:01.2 23:47:42.0	- Y	+ X	600.8	20.0	801.60	0.97	174.20	82.9	- 5.4	0.006
45	15426	1 Feb 78 23:44:01.2 23:53:46.0	- Y	+ X	600.8	16.0	801.57	0.95	172.50	88.0	4.5	0.006
46	15440	2 Feb 78 23:50:01.2	- Y		600.8		801.57	0.92	171.78	100.5	54.5	0.006
47	19246	2 Nov 78 22:39:02.0		- X		20.0	616.59	0.03	172.49	93.9	55.0	0.0
48	20514	1 Feb 79 21:00.02		- X		34.0	539.50	0.05	172.50	106.6	106.0	0.0
49	21685	26 Apr 79 20:25:02		- X		44.6	468.59	0.07	172.49	109.8	143.0	0.0
50	22159	30 May 79 20:15:01.2		+ X		12.0	443.93	0.02	172.49	105.4	- 39.1	0.0
51	28233	15 Aug 79 20:50:02		- X		36.0	387.46	0.07	172.47	108.7	115.0	0.0
52	24711	29 Nov 79 20:27:01		- X		9.0						
53	24767	3 Dec 79 20:48:01		- X		9.0						
54	24795	5 Dec 79 21:01:01		- X		9.0						
55	24823	7 Dec 79 21:14:01		- X		9.0						
56	24836	8 Dec 79 19:31:01		- X		9.0						
57	24837	8 Dec 79 21:16:01		- X		9.0						
58	24838	8 Dec 79 22:58:01		- X		9.0						
59	24850	9 Dec 79 19:40:01		- X		9.0						
60	24851	9 Dec 79 21:26:01		- X		9.0						
61	24852	9 Dec 79 23:04:01		- X		9.0	230.65	0.23	170.72	98.0	259.0	0.0

LS-2

FOLDOUT FRAME 3

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Table 7-2. Landsat-2 OAS Telemetry Values

Func.	Name	Units	Orbit							
			50	5102	10191	15211	20252	23613	24423	25210
2001	Prop. Tank Temp.	DGC	23.03	23.89	23.05	24.48	23.05	21.39	18.28	18.06
2003	Thrust Chamber No. 1 (-X) Temp.*	DGC	24.84	25.12	21.75	20.83	24.16	27.38	21.75	26.07
2004	Thrust Chamber No. 2 (+X) Temp.*	DGC	37.34	38.55	37.60	35.32	37.77	37.42	37.12	-7.89
2005	Thrust Chamber No. 3 (-Y) Temp.*	DGC	47.22	46.35	49.78	78.50*	48.95	37.87	60.50	76.45
2006	Line Pressure	PSIA	545.60	413.25	419.94	205.21	172.49	172.67	172.50	171.61

* Orbit adjust heaters were ON.

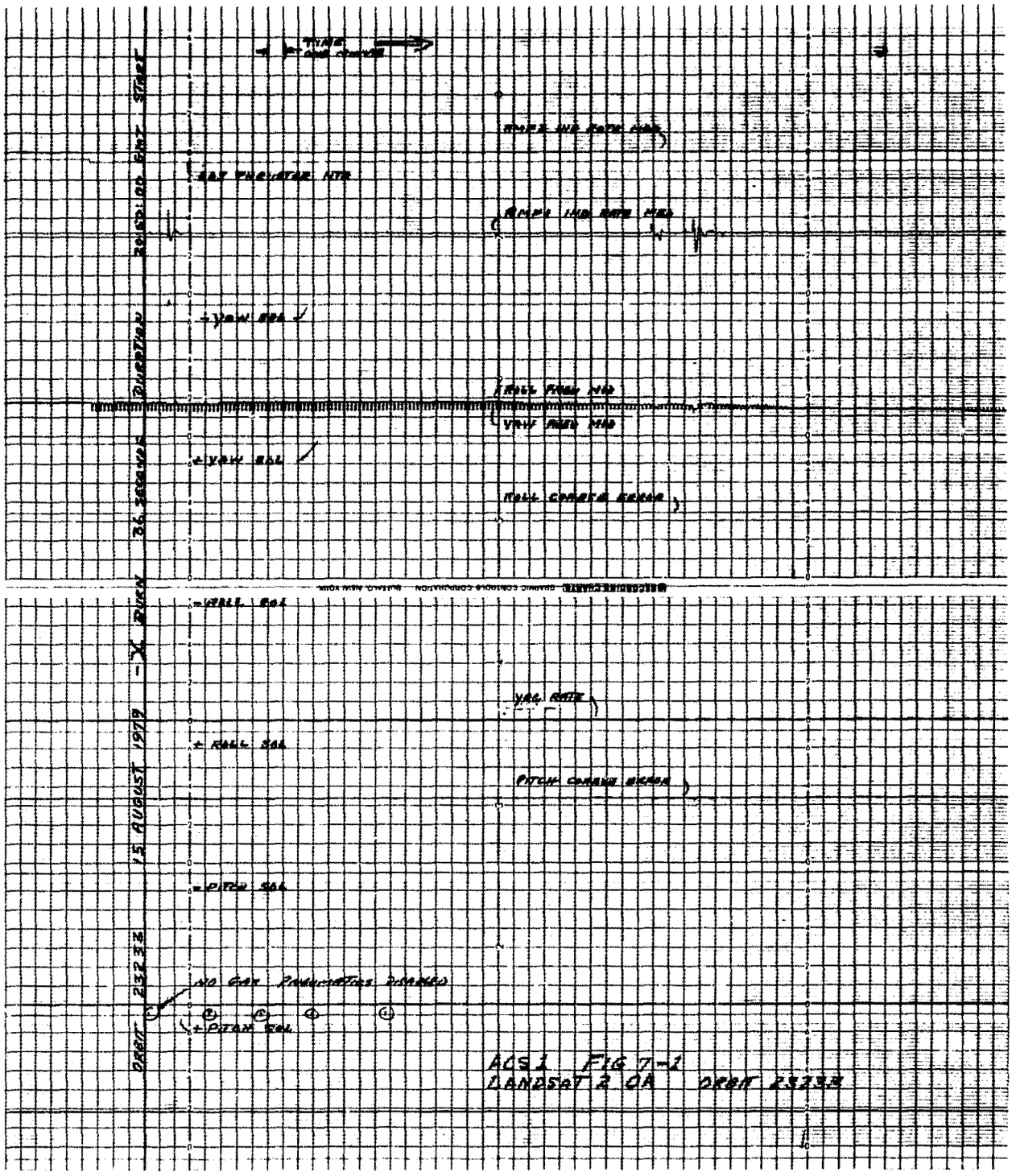


Figure 7-1. ACS 1, Landsat-2 OA, Orbit 23233

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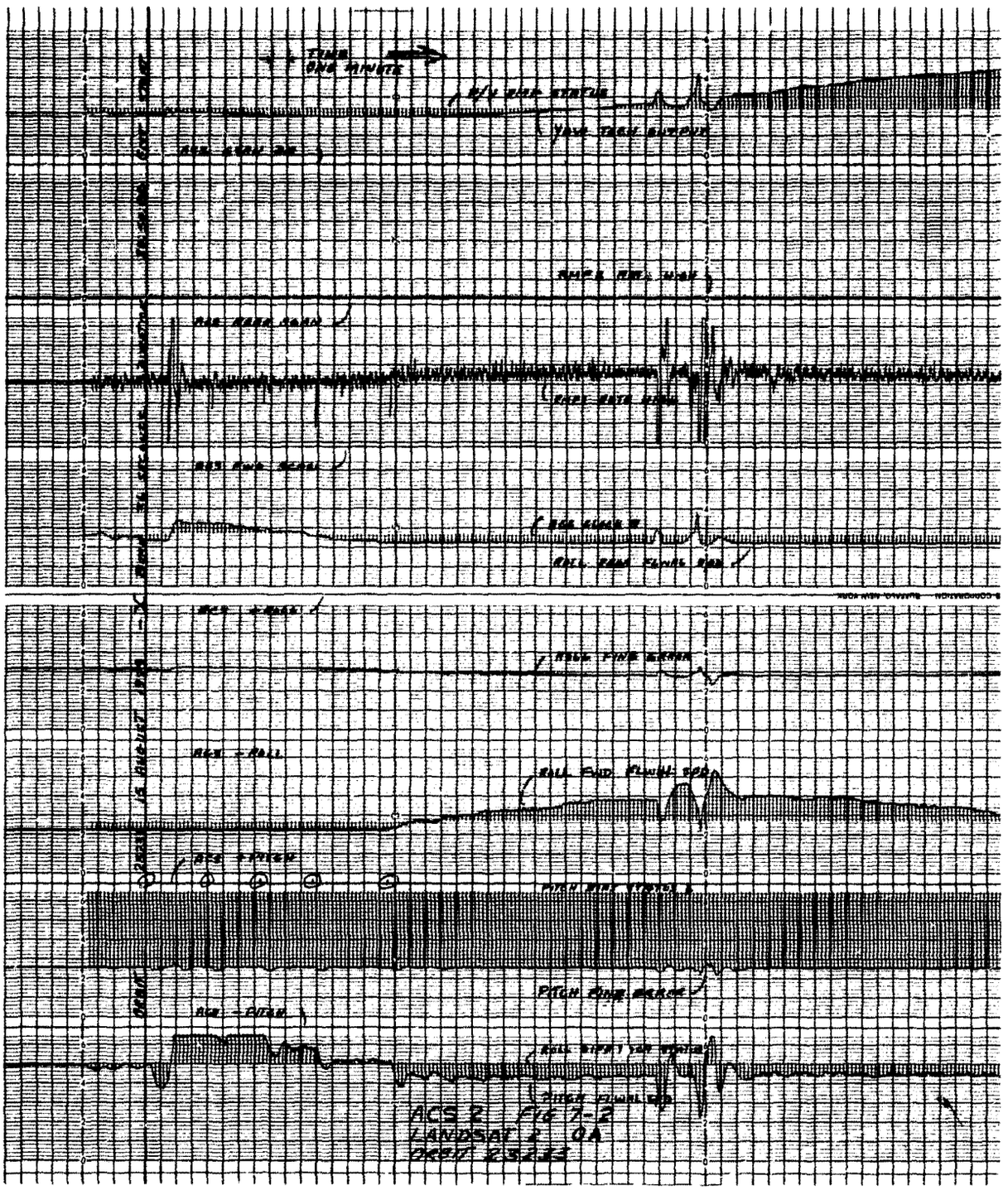


Figure 7-2. ACS 2, Landsat-2 OA, Orbit 23233

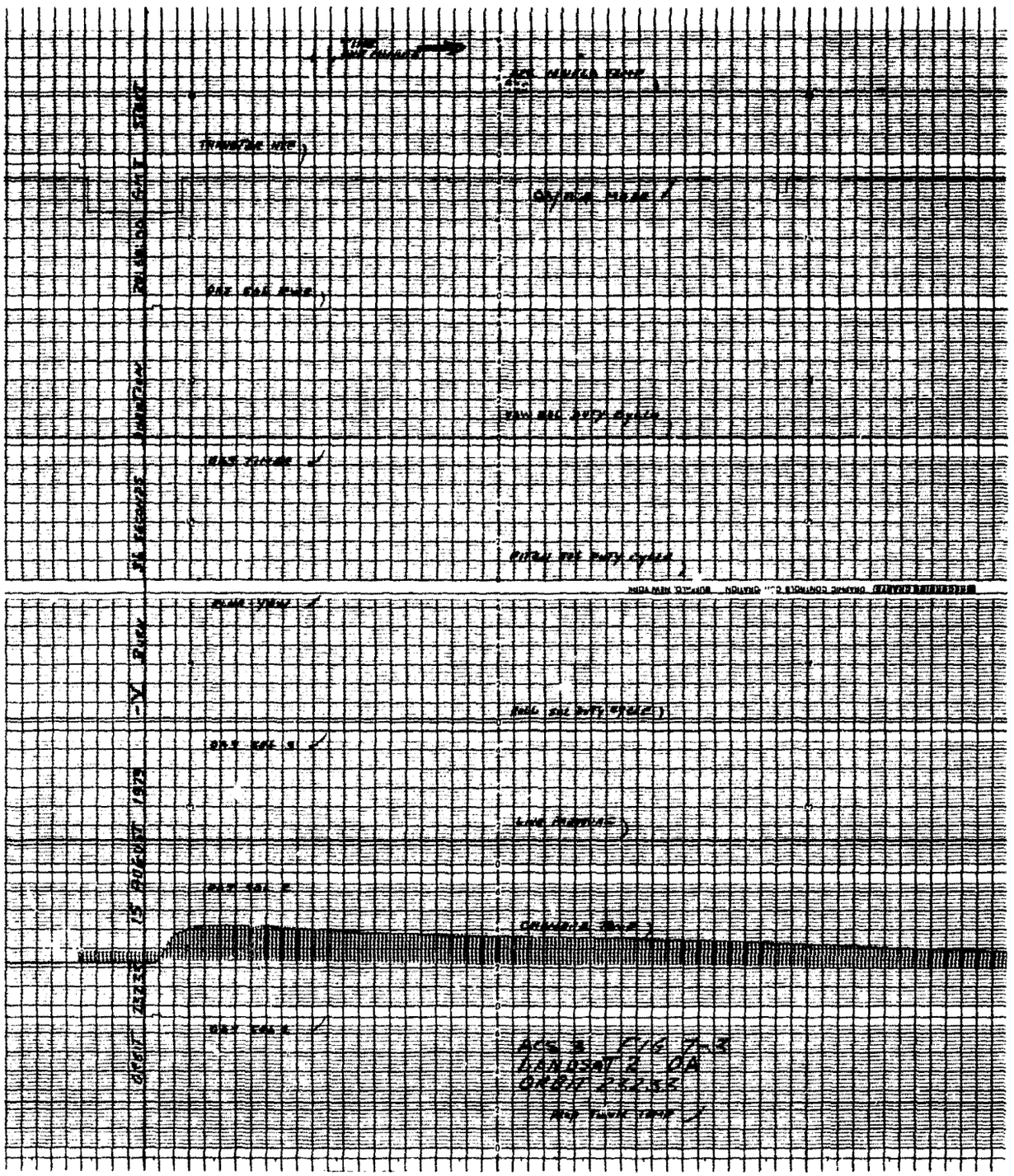


Figure 7-3. ACS 3, Landsat-2 OA, Orbit 23233

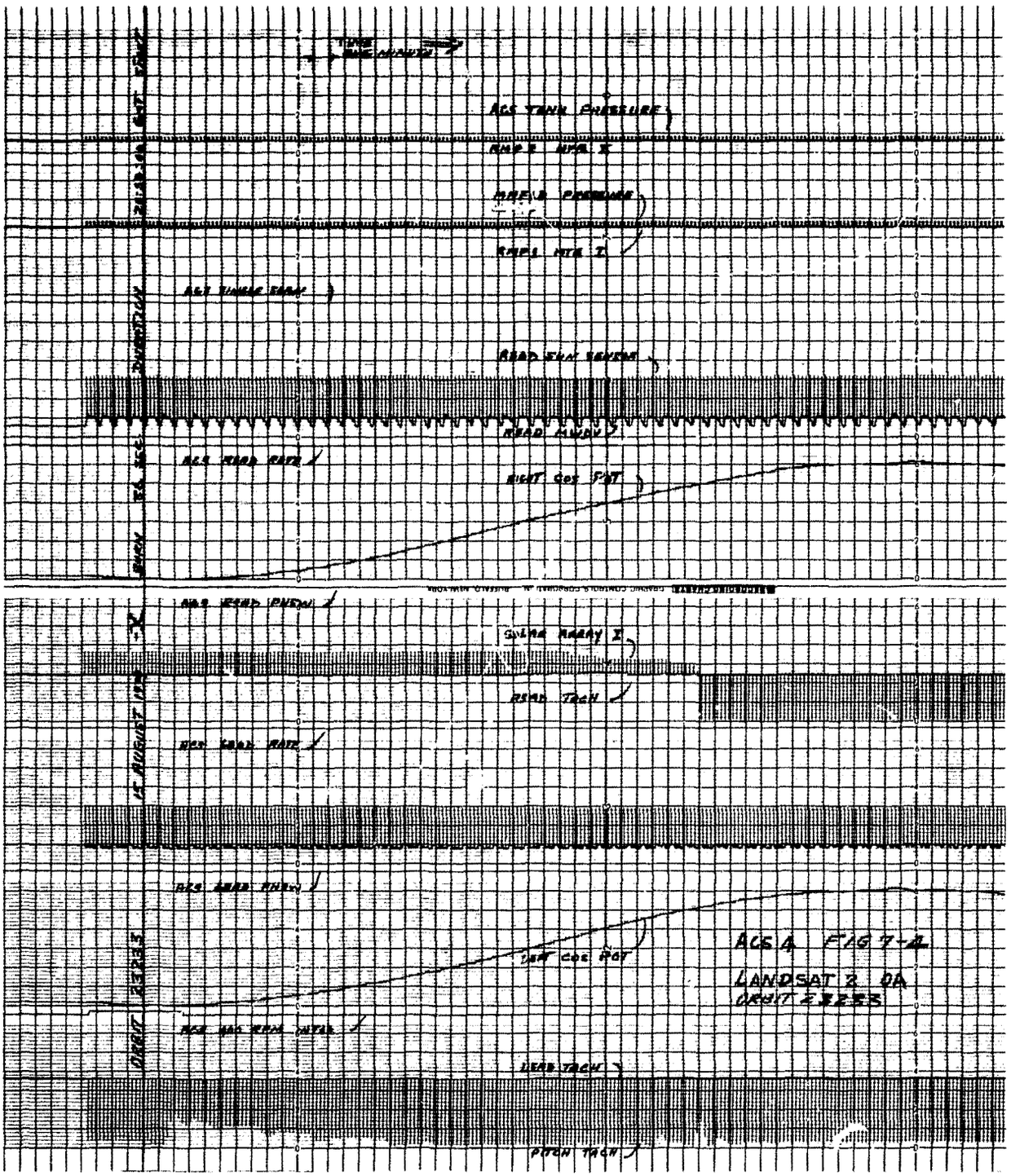


Figure 7-4. ACS 4, Landsat-2 OA. Orbit 23233

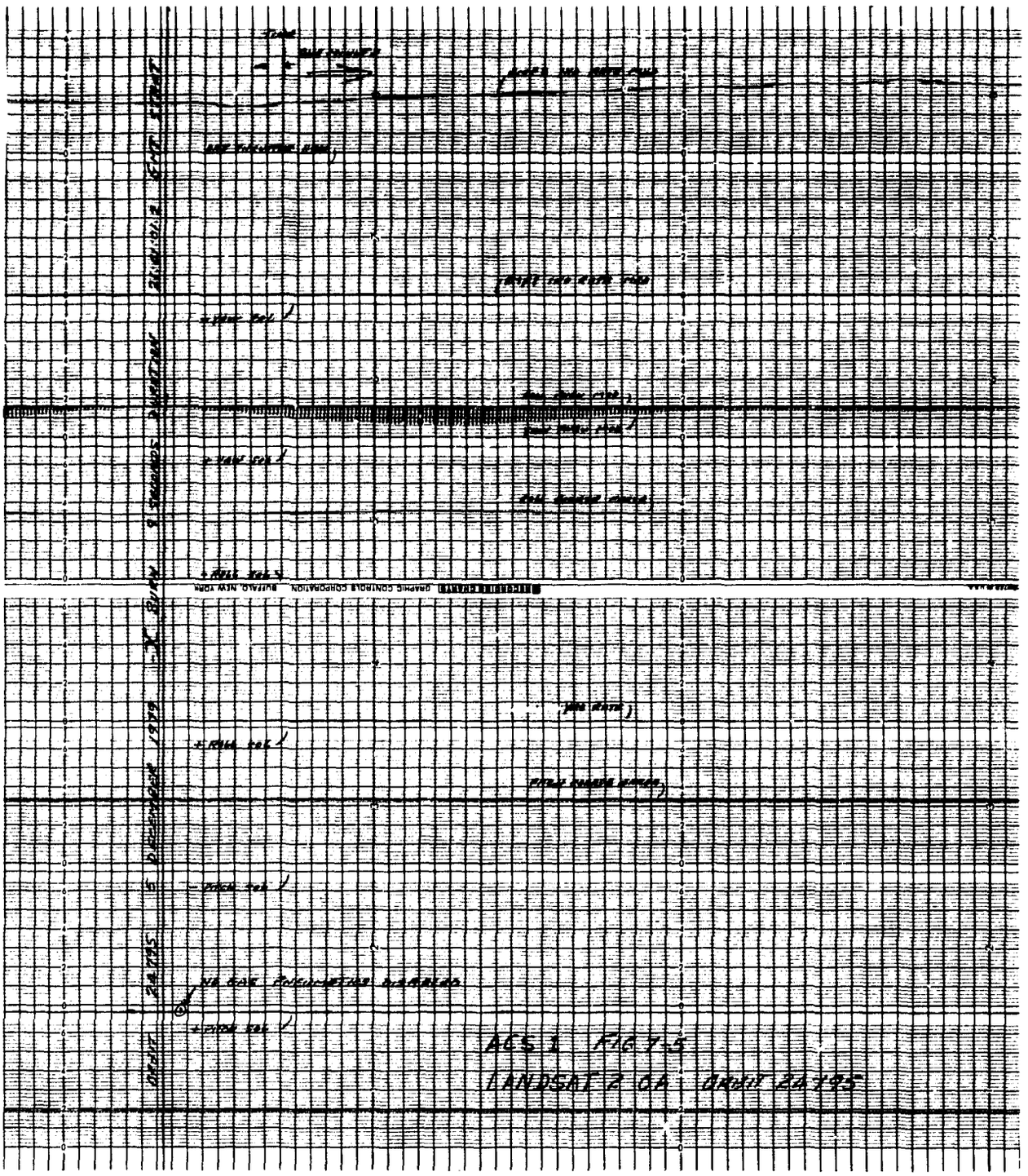


Figure 7-5. ACS 1, Landsat -2 OA, Orbit 24795

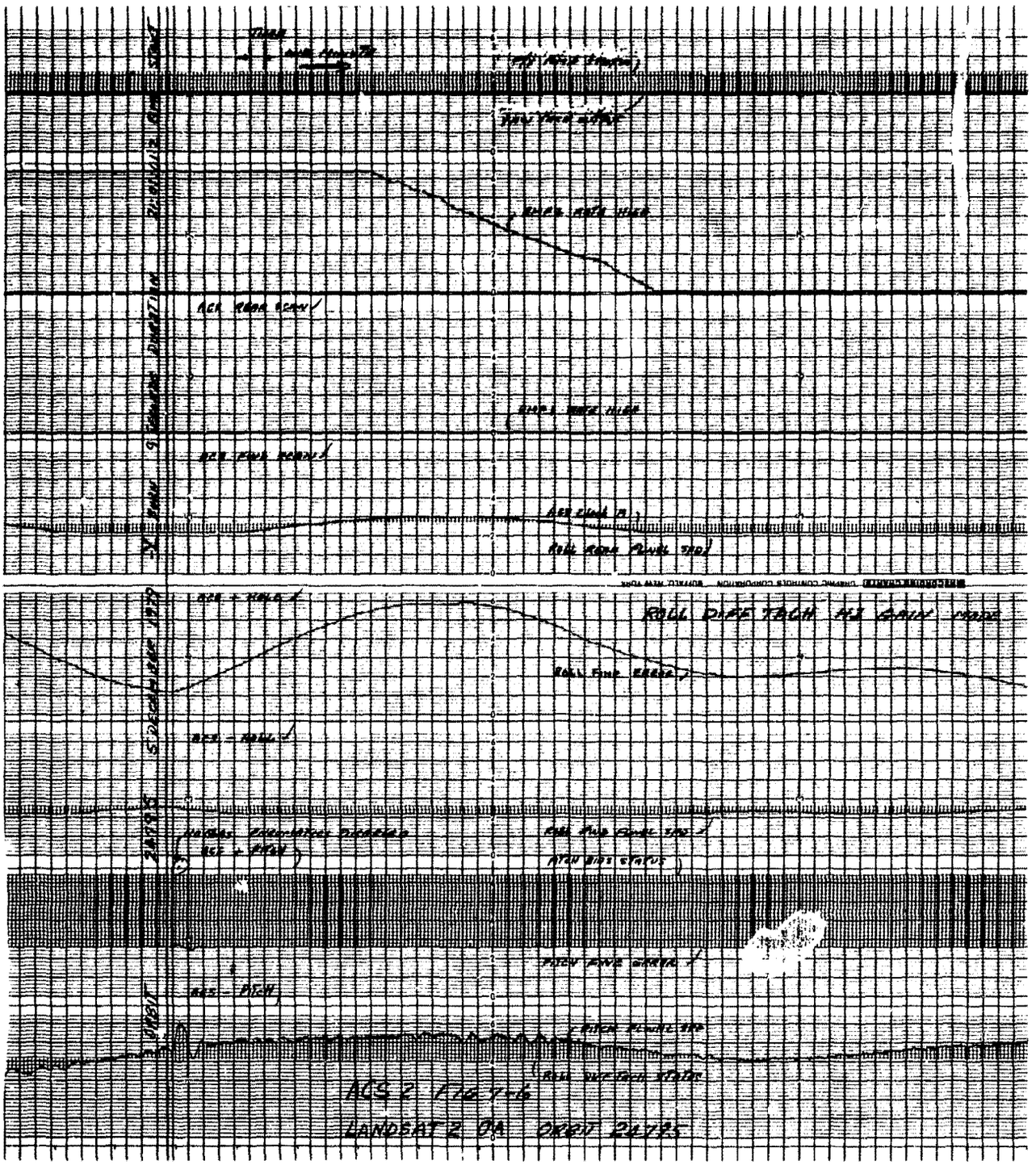


Figure 7-6. ACS 2, Landsat-2 OA, Orbit 24795

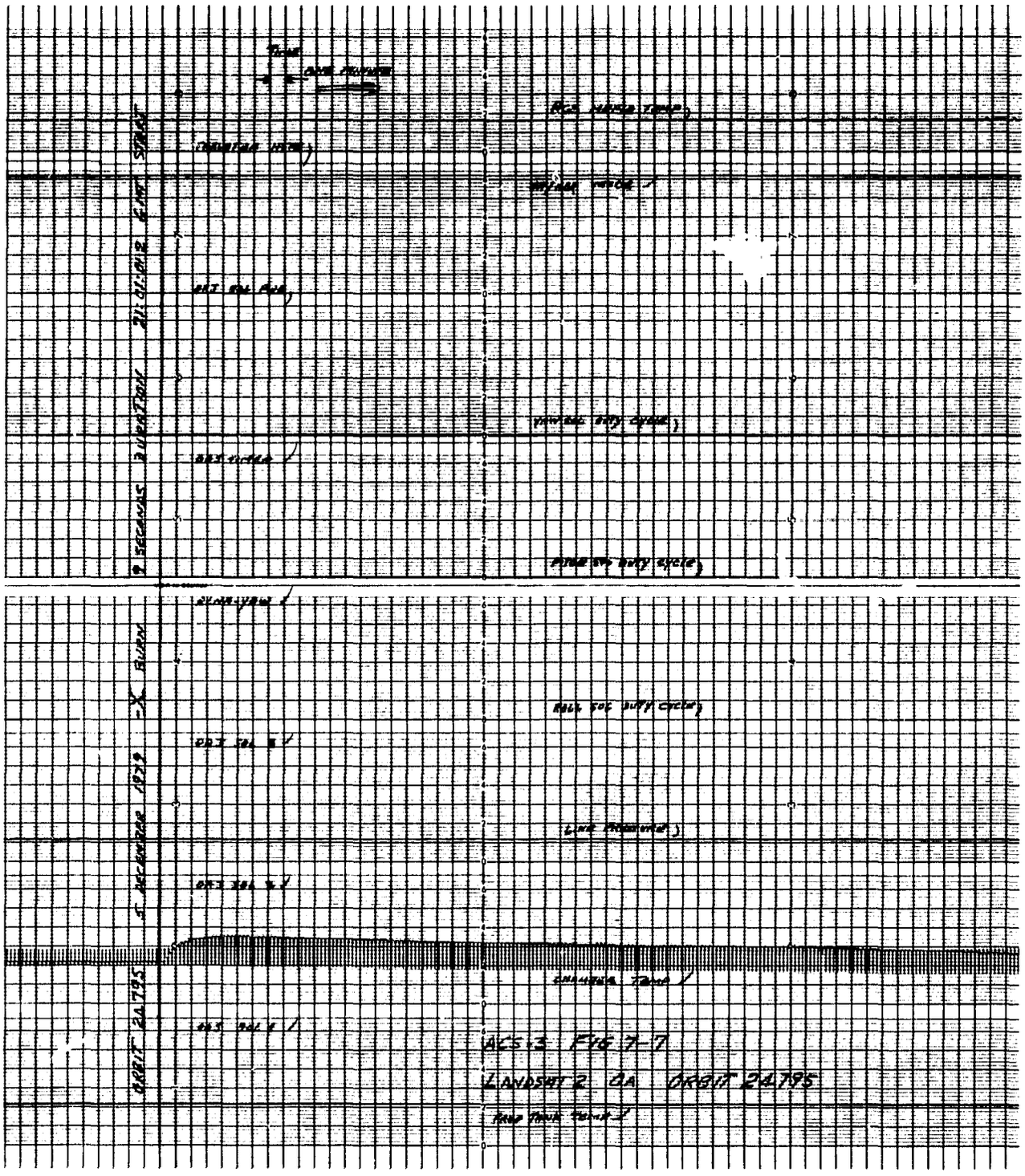


Figure 7-7. ACS 3, Landsat-2 OA, Orbit 24795

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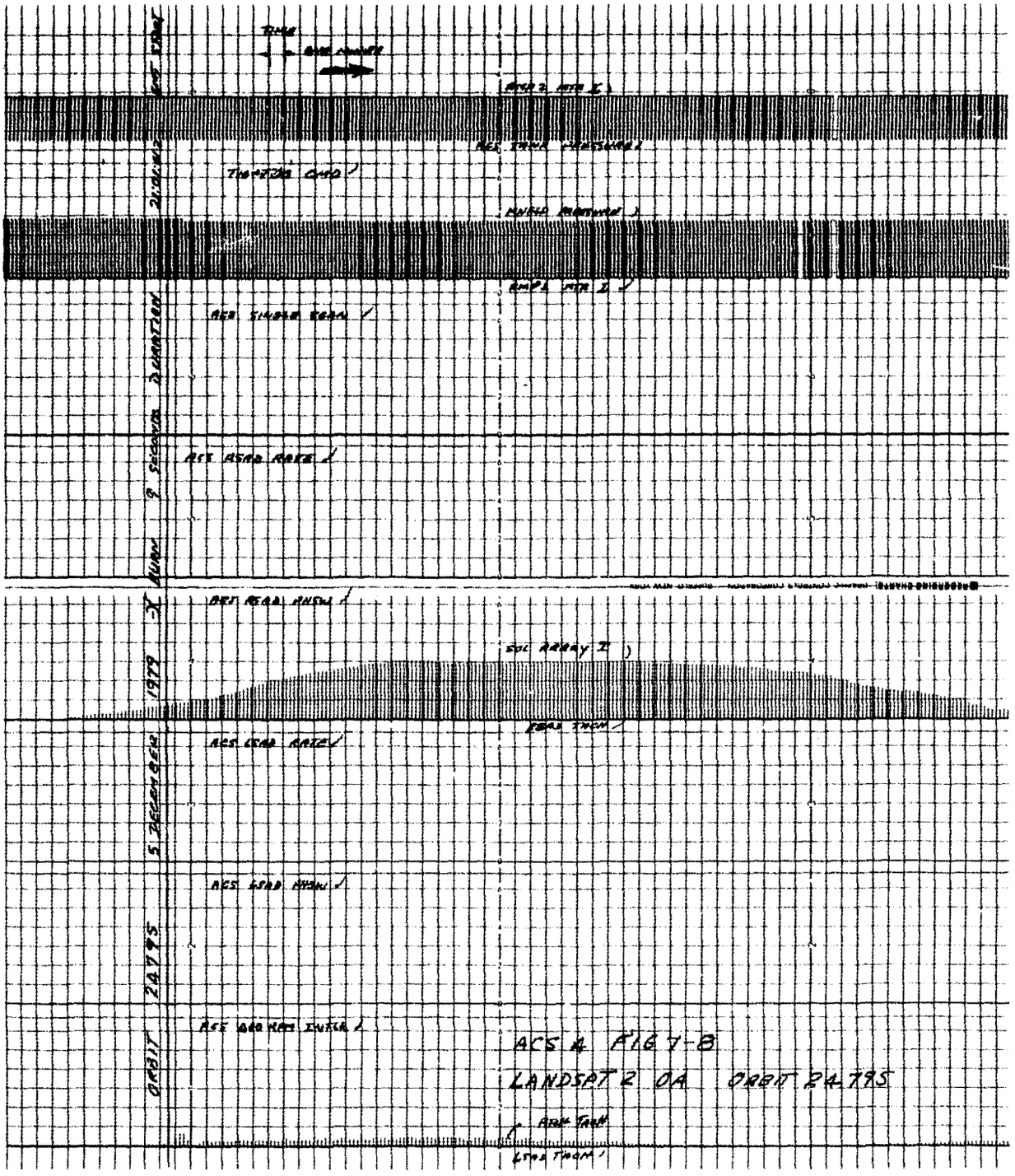


Figure 7-8. ACS 4, Landsat-2 OA, Orbit 24795

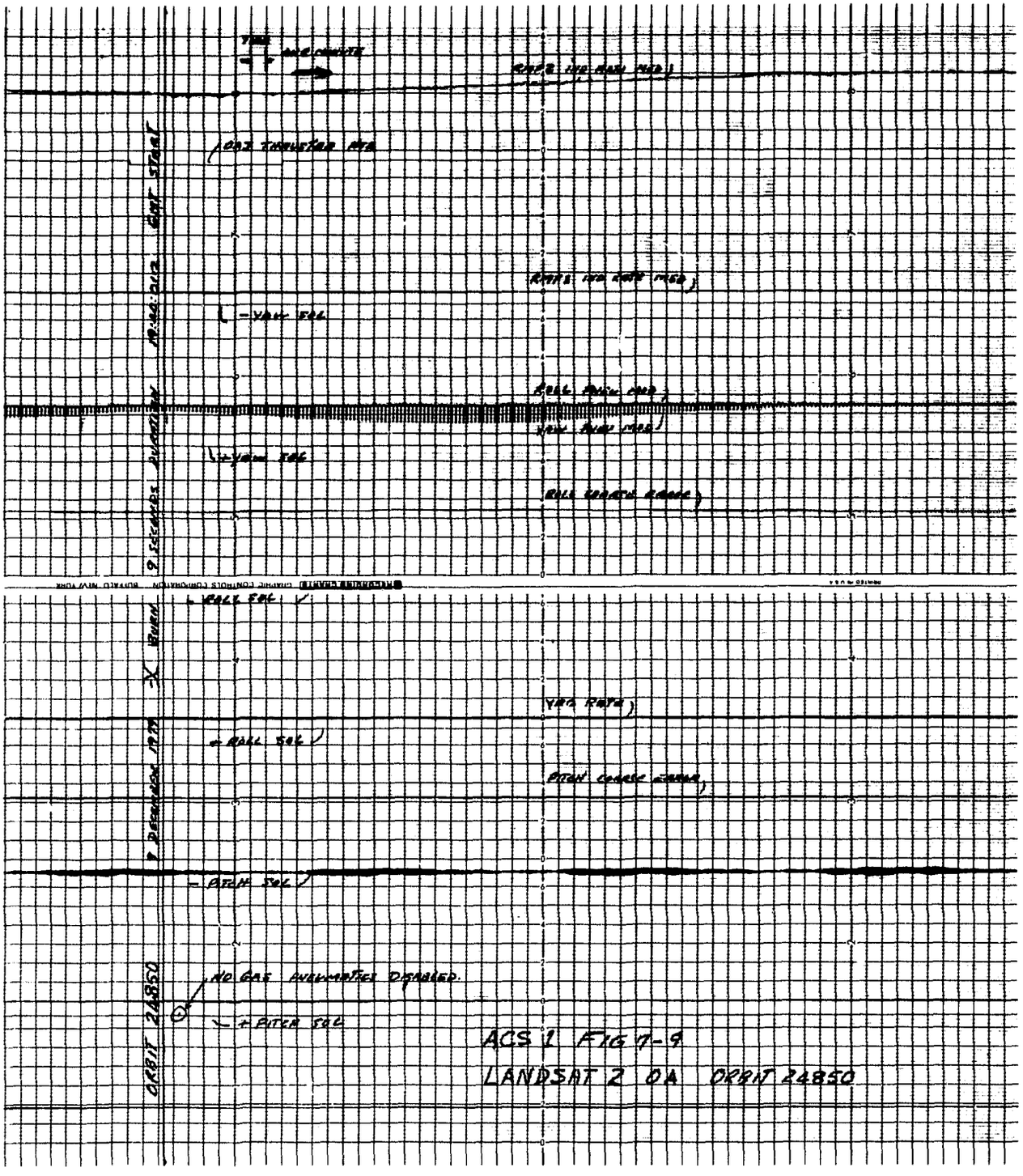


Figure 7-9. ACS 1, Landsat-2 OA, Orbit 24850

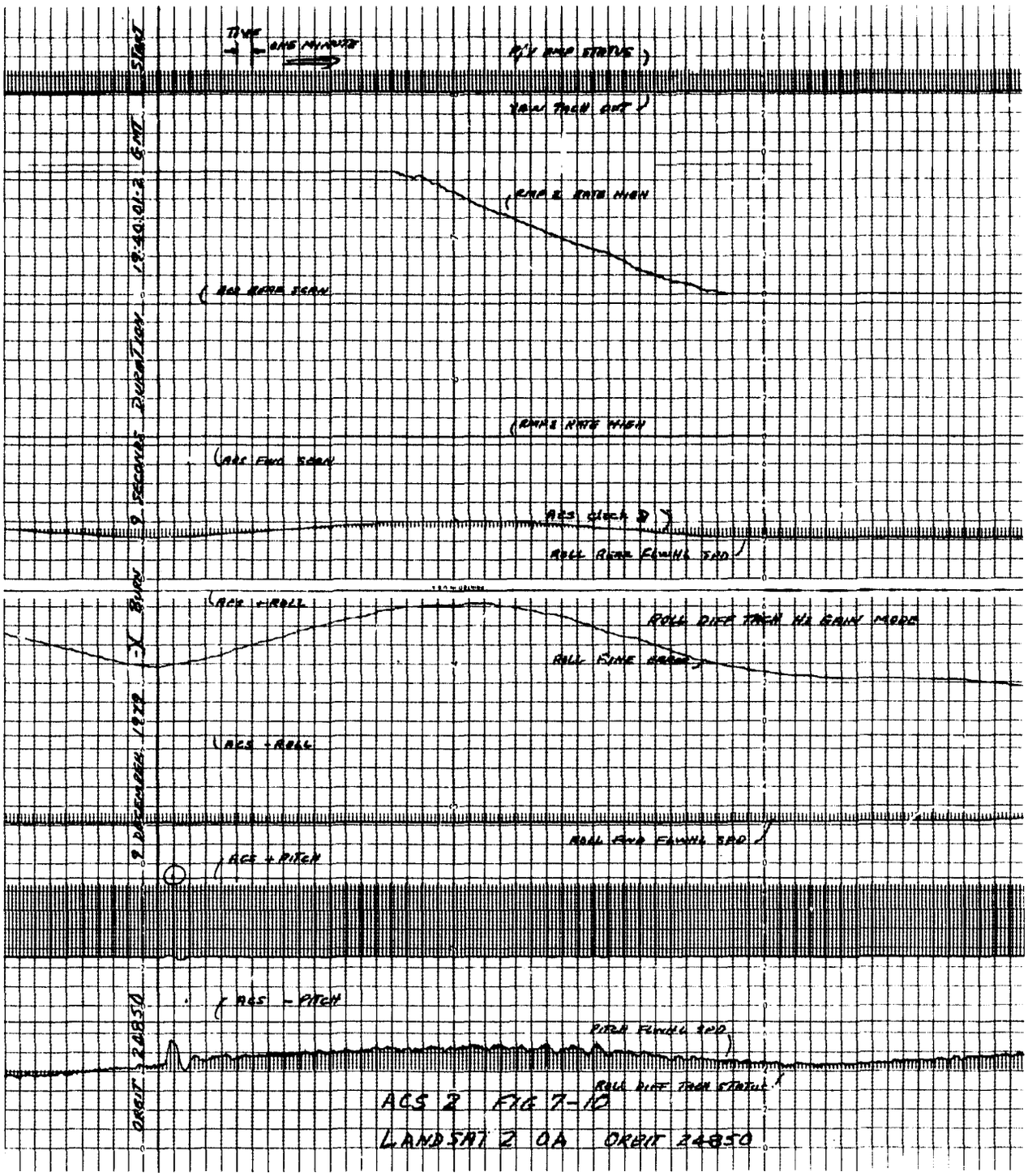


Figure 7-10. ACS 2, Landsat-2 OA, Orbit 24850

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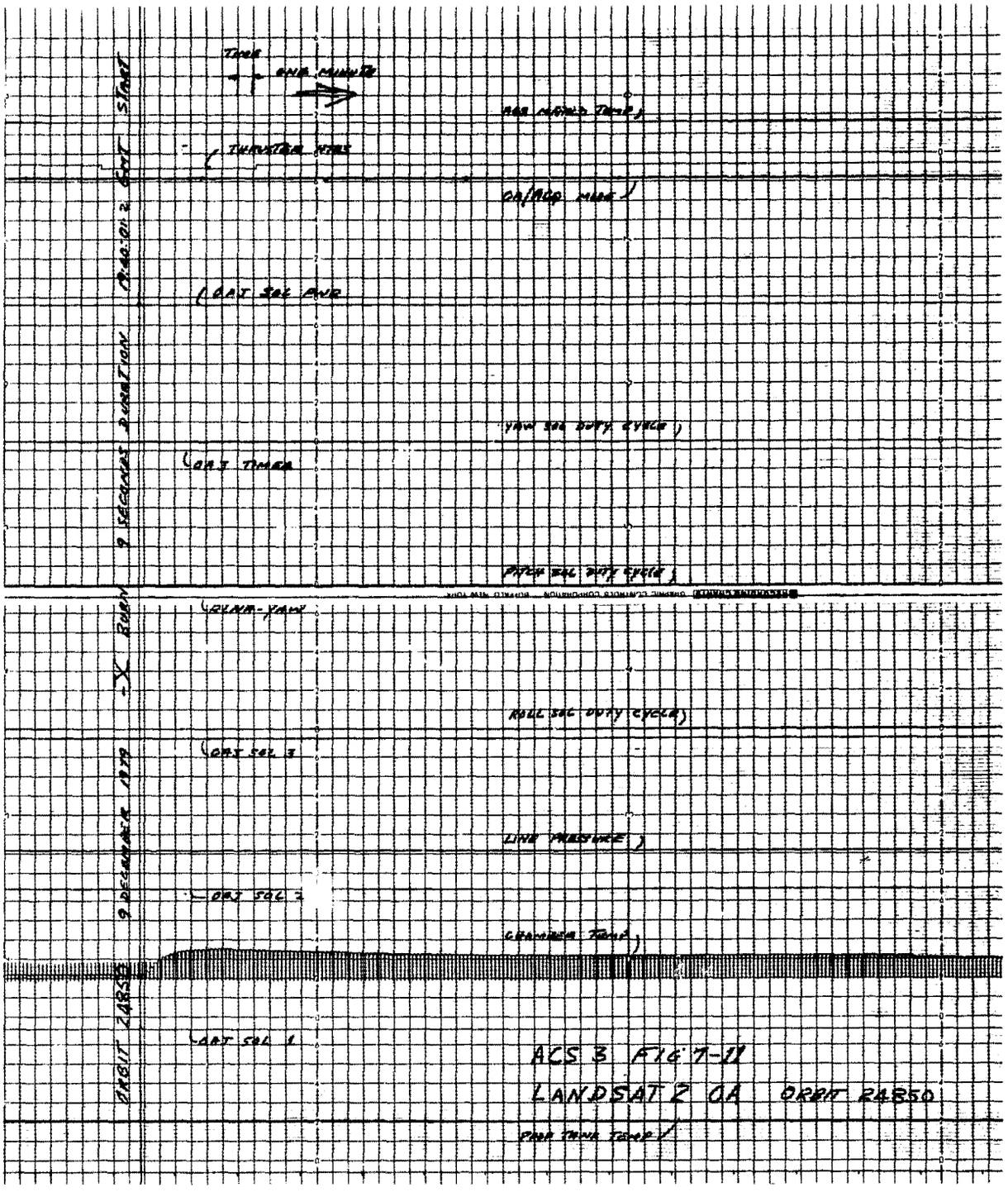


Figure 7-11. ACS 3, Landsat-2 OA, Orbit 24850

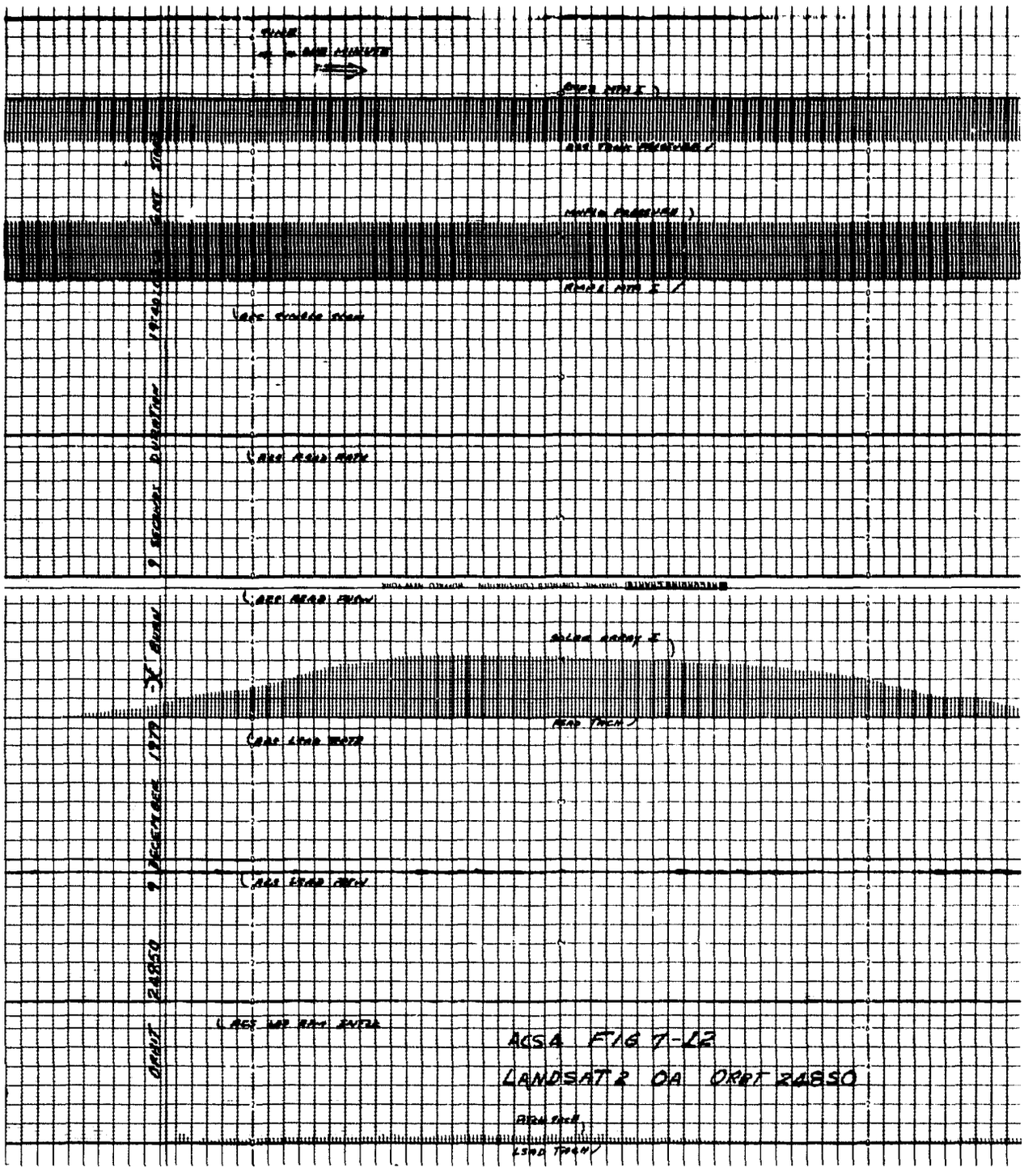


Figure 7-12. ACS 4, Landsat-2 OA, Orbit 24850

SECTION 8

MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)

LANDSAT-2

SECTION 8

MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)

The spacecraft was corrected for unbalanced magnetic moments in Orbits 293 and 321 as reported earlier. These adjustments were made on the pitch magnetic rod of the MMCA.

The pitch magnetic rod was adjusted during 6-5 November 1980 in an attempt to correct spacecraft attitude which was affected by the Yaw Flywheel failure. MMCA operation was normal but the results were unsuccessful and the pitch magnetic rod was returned to its previous setting of approximately positive 1000 pole-cm from negative saturation.

Orbital averages of MMCA telemetry functions for selected orbits are given in Table 8-1. After the Yaw Flywheel failure in Orbit 24375 temperature declined due to the reduction in spacecraft power.

Table 8-1. Landsat-2 MMCA Telemetry Values

Function	Name	Units	Orbit							
			50	5102	10191	15211	20252	23613	24423	25210
4001	A1 Board Temp	°C	20.56	19.47	19.12	18.82	18.90	18.24	17.00	12.62
4002	A2 Board Temp	°C	D	D	D	D	D	D	D	D
4003	Hall Current	TMV	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
4004	Yaw Flux Density	TMV	3.05	3.07	3.07	3.07	3.07	3.07	3.06	3.04
4005	Pitch Flux Density	TMV	3.15	2.90	2.90	2.90	2.90	2.90	*3.14	*3.14
4006	Roll Flux Density	TMV	2.99	2.97	2.97	2.97	2.97	2.07	2.95	2.95

D = Defective Telemetry Function (Pre-launch)
* = Use negative saturation calibration curve for this data when converting to magnetic flux.

SECTION 9

UNIFIED S-BAND/PREMODULATION PROCESSOR (USB/PMP)

LANDSAT-2

SECTION 9

UNIFIED S-BAND/PREMODULATION PROCESSOR (USB/PMP)

The USB Subsystem has operated nominally in this report period.

Table 9-1 shows telemetry values since launch. All are nominal. The transmitter has maintained a steady indicated power output of greater than 1.3 watts since launch.

USB transmitted signal levels measured at Goldstone with the spacecraft successively at the same points in space show continuous satisfactory USB performance.

Due to non-operational spacecraft status (Section 4), after Orbit 24375 on 5 November 1979, the switched telemetry power is OFF, and hence some functions have no telemetry readings.

Table 9-1. Landsat-2 USB/PMP Telemetry Values

Func.	Name	Units	Orbits							
			15	5091	10641	15211	20251	23613	24482	25330
11001	USB Rcvr AGC	dBm	-112.72	-124.29	-124.85	-126.13	-131.50	-121.63	-123.56	-131.56
11002	USB Xmtr Pwr	W	1.36	1.38	1.39	1.39	1.36	1.34	1.33	1.34
11003	USB Rcvr Error	kHz	- 2.15	- 2.97	- 3.43	- 4.98	- 4.35	- 5.09	- 0.88	- 5.28
11004	USB Xpond Temp	DGC	25.88	27.49	29.06	33.03	28.50	27.30	T	T
11005	USB Xpond Press	PSI	17.08	16.49	15.96	16.03	15.09	14.45	T	T
11007	USB Xmtr A -15V	VDC	2.36	F	F	F	F	F	F	F
11008	USB Xmtr B -15V	VDC	F	2.42	2.39	2.36	2.43	2.43	2.42	2.37
11009	USB Range -15V	VDC	2.07	2.06	2.06	2.06	2.05	2.05	2.05	2.05
11101	PMP Pwr A Volt	VDC	- 15.10	F	F	F	F	F	F	F
11102	PMP Pwr B Volt	VDC	F	- 14.99	- 14.99	- 14.96	- 14.99	- 14.82	- 15.04	- 15.05
11103	PMP Temp A	DGC	37.30	34.67	37.49	43.12	36.56	31.24	T	T
11104	PMP Temp B	DGC	38.34	36.08	38.64	44.11	37.64	34.29	T	T

T = Telemetry Off
F = Unit Off

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)

LANDSAT-2

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)

The Auxiliary Processing Unit (APU) consisting of Search Track Data, Time Code Data, and Back-up Timers operated satisfactorily throughout this report period. Telemetry for the APU is shown in Table 10-1, and is nominal.

Table 10-1. Landsat-2 APU Telemetry Functions

Function	Description	Unit	Orbit							
			21	5102	10192	15211	20252	23181	24353	25341
13200	APU, -24.5 VDC	TMV	D	D	D	D	D	D	D	D
13201	APU, -12 Volts	TMV	2.42	2.45	2.45	2.45	2.45	2.45	2.45	2.45
13202	APU, Temp	DGC	27.44	27.70	28.78	30.64	28.47	26.12	26.57	T

D - Defective Telemetry (Prelaunch)
T - Telemetry OFF

The Power Switch Module (PSM) containing the switching relays for power to the OAS, MSS, WBPA-1, WBPA-2, WBVTR-1, WBVTR-2, RBV and PRM, functioned normally. During this report period, the MSS, WBPA-2 and WBVTR-2 power circuits, have been operated on a regular basis until the Yaw Flywheel anomaly on 5 November 1979. RBV and WBPA-1 power circuits have been used for limited operation.

The Interface Switching Module performed all switchings normally during this report period.

SECTION 11
THERMAL SUBSYSTEM (THM)
LANDSAT-2

SECTION 11

THERMAL SUBSYSTEM (THM)

Landsat-2's Thermal Control Subsystem has provided satisfactory temperature control for all of the spacecraft equipment since launch.

Table 11-1 summarizes average subsystem temperature telemetry values taken from representative orbits that occurred over the 54 months of Landsat-2's existence.

Average temperatures in the sensory ring bays are plotted in Figure 11-1.

During this report period, sun intensity decreased from 0.969 to 1.034 times the mean value. In addition, spacecraft night length decreased as the sun angle increased. Consequently, the average spacecraft temperatures were slightly higher this report period until the Yaw Flywheel anomaly on 5 November 1979. The spacecraft was powered down due to low solar array input resulting from the large Yaw error. This reduced the electrical power dissipation within the sensory ring and payload center section resulting in large decreases in spacecraft temperatures. In addition, the PRM and switched telemetry power was turned OFF as a non-essential power consumer which disabled most of the spacecraft temperature sensors. Therefore, no temperatures are available after 5 November 1979.

A history of compensation load switching is shown in Table 11-2. All compensation loads remained OFF during this report period.

Table 11-1. Landsat-2 Thermal Subsystem Analog Telemetry
(Average Value for Frames of Data Received in NBTF Playback)

Function	Function Description	Unit	Orbits							
			21	5102	10192	15211	20252	23181	24423	25341
7001	THM TH01 STI	DGC	19.40	19.97	19.59	19.68	19.08	18.40	15.65	T
7002	THM TH02 SBO	DGC	17.18	17.47	17.65	17.36	17.15	16.99	14.57	T
7003	THM TH03 STI	DGC	18.73	18.50	18.65	18.02	17.62	16.70	13.80	T
7004	THM TH10 TCB	DGC	19.38	19.34	19.94	21.20	19.47	17.87	17.30	T
7005	THM TH04 STI	DGC	17.19	16.76	17.37	16.70	16.96	15.54	13.00	T
7006	THM TH05 SBO	DGC	17.42	16.68	16.65	16.38	16.28	15.75	14.72	T
7007	OA-X Thruster	DGC	19.66	19.65	19.44	19.70	19.50	19.34	18.45	T
7008	THM TH06 STO	DGC	14.78	13.94	13.57	13.34	13.36	12.70	11.56	T
7009	THM TH06 SBI	DGC	19.18	18.41	18.10	17.91	17.76	16.77	15.18	T
7010	THM TH07 STI	DGC	18.08	17.44	17.11	17.10	16.84	16.11	14.07	T
7011	THM TH08 STO	DGC	19.34	19.23	19.00	18.92	18.99	18.78	17.33	T
7012	THM TH09 SBI	DGC	21.44	20.93	20.94	21.48	20.84	20.21	18.67	T
7013	THM TH10 SBO	DGC	18.58	18.39	18.59	19.12	18.49	14.65	17.27	T
7014	THM TH11 STI	DGC	21.65	21.93	22.75	24.58	22.25	19.99	18.39	T
7015	THM TH12 SBO	DGC	23.93	24.68	26.86	29.56	26.07	21.66	21.43	T
7016	THM TH13 STI	DGC	22.21	23.62	25.73	29.30	24.85	20.18	22.16	T
7017	RBV Beam Ctr Ln	DGC	20.38	19.92	20.16	21.25	19.88	18.55	16.87	T
7018	THM TH14 STO	DGC	24.12	26.43	29.64	35.01	28.12	22.04	25.57	T
7019	NBR Rad Outbd B4	DGC	2.72	2.93	2.44	2.65	2.40	1.43	0.69	T
7020	THM TH15 SBI	DGC	23.07	25.56	27.07	31.02	26.22	20.77	23.14	T
7021	THM TH16 STI	DGC	23.26	25.46	25.87	29.22	25.26	21.45	23.12	T
7022	THM TH17 SBI	DGC	21.77	23.74	23.75	25.97	23.26	20.99	20.37	T
7023	THM TH18 SBO	DGC	21.67	23.36	23.69	25.27	23.23	22.93	20.27	T
7030	THM TH03 BVR	DGC	15.50	15.14	15.59	15.08	14.75	14.66	12.44	T
7033	THM TH12 BVR	DGC	23.05	24.59	27.14	31.18	26.24	21.41	23.07	T
7035	THM TH18 BVR	DGC	19.53	20.39	20.20	21.03	20.10	19.77	17.21	T
7040	THM TH01 TCB	DGC	19.42	19.72	19.96	19.66	19.07	18.74	15.90	T
7041	THM TH02 TCB	DGC	17.55	17.39	17.42	16.94	16.95	16.08	13.75	T
7042	THM TH03 TCB	DGC	16.85	16.32	18.04	17.08	16.00	16.10	12.70	T
7043	THM TH04 TCB	DGC	19.90	18.33	18.16	19.16	19.09	18.46	16.51	T
7044	THM TH05 TCB	DGC	16.42	15.75	15.44	15.17	15.27	14.57	13.31	T
7045	THM TH07 TCB	DGC	17.76	17.33	17.01	16.92	16.76	16.35	14.31	T
7046	THM TH09 TCB	DGC	19.30	18.81	18.82	19.31	18.84	18.56	17.63	T
7048	THM TH11 TCB	DGC	23.27	23.74	24.99	27.06	24.56	21.76	20.21	T
7049	THM TH12 TCB	DGC	23.04	23.94	26.83	30.59	25.79	20.60	22.75	T
7050	THM TH13 TCB	DGC	22.89	24.67	27.61	31.99	26.50	20.40	23.80	T
7051	THM TH14 TCB	DGC	25.07	27.69	31.17	36.18	29.34	22.87	26.80	T
7052	THM TH16 TCB	DGC	22.22	24.29	25.62	29.18	24.41	21.84	23.36	T
7053	THM TH17 TCB	DGC	23.52	24.86	25.00	26.83	24.94	24.08	22.06	T
7054	THM TH18 TCB	DGC	20.01	20.99	21.41	21.17	20.12	20.94	17.34	T
7060	THM Shutter By 1	DEG	22.54	26.65	27.36	24.93	18.87	12.80	0.53	T
7061	THM Shutter By 2	DEG	19.34	21.13	17.89	11.72	12.28	9.19	0.00	T

FOLDOUT FRAME

7052	THM TH16 TCB	DGC	22.22	24.29	25.62	29.18	24.41	21.84	23.36	T
7053	THM TH17 TCB	DGC	23.52	24.86	25.00	26.83	24.94	24.08	22.06	T
7054	THM TH18 TCB	DGC	20.01	20.99	21.41	21.17	20.12	20.94	17.34	T
7060	THM Shutter By 1	DEG	22.54	26.65	27.36	24.93	18.87	12.80	0.53	T
7061	THM Shutter By 2	DEG	19.34	21.13	17.89	11.72	12.28	9.19	0.00	T
7062	THM Shutter By 3	DEG	22.75	11.99	28.91	19.01	9.12	10.04	0.00	T
7063	THM Shutter By 4	DEG	33.89	33.00	32.90	27.37	30.00	27.59	3.54	T
7064	THM Shutter By 5	DEG	7.50	2.90	2.42	1.79	0.58	0.58	0.00	T
7065	THM Shutter By 7	DEG	17.06	14.11	8.88	6.89	9.55	7.05	1.36	T
7067	THM Shutter By 9	DEG	33.75	34.12	33.70	36.71	34.50	33.00	28.87	T
7068	THM Shutter By 10	DEG	37.46	37.09	40.64	48.39	38.37	29.47	16.74	T
7069	THM Shutter By 11	DEG	52.25	17.39	22.81	46.32	27.06	3.74	5.76	T
7070	THM Shutter By 12	DEG	61.38	67.46	80.70	83.62	78.36	47.19	60.32	T
7071	THM Shutter By 13	DEG	63.60	74.14	81.89	81.89	80.04	46.87	70.45	T
7072	THM Shutter By 14	DEG	59.44	72.14	72.91	71.60	70.11	39.96	62.27	T
7073	THM Shutter By 15	DEG	67.79	82.12	83.87	83.96	82.61	54.65	76.04	T
7074	THM Shutter By 16	DEG	45.20	61.13	68.30	76.93	61.63	42.75	52.31	T
7075	THM Shutter By 17	DEG	57.88	67.62	68.67	78.13	69.71	60.27	41.86	T
7076	THM Shutter By 18	DEG	40.49	45.84	47.49	46.15	40.01	43.44	2.23	T
7080	THM Q1 T Zener V	VDC	4.85	4.85	4.85	4.85	4.85	4.85	4.85	T
7081	THM Q2 T Zener V	VDC	4.90	4.90	4.90	4.90	4.90	4.90	4.90	T
7082	THM Q3 T Zener V	VDC	5.05	5.05	5.04	5.04	5.04	5.03	5.02	T
7083	THM Q1 S Zener V	VDC	4.97	4.96	4.96	4.97	4.95	4.95	4.95	T
7084	THM Q2 S Zener V	VDC	4.98	4.99	4.98	5.00	4.98	4.98	4.97	T
7085	THM Q3 S Zener V	VDC	5.15	5.15	5.15	5.15	5.15	5.15	5.15	T
7090	THM PSM Mount	DGC	21.02	21.71	21.28	22.79	21.14	18.98	17.46	T
7091	THM Ind Attitude	DGC	17.79	17.24	16.95	16.98	16.58	15.74	13.51	T
7092	THM RBV Radiator	DGC	18.01	16.24	16.71	18.06	16.70	14.46	12.80	T
7093	THM RBVC Ctr Bm	DGC	20.74	19.31	19.44	20.64	19.29	17.67	15.56	T
7094	THM WBVTR Root	DGC	16.77	15.72	13.90	14.91	13.77	12.15	10.08	T
7095	THM WBVTR Rad Ct	DGC	3.64	5.55	4.45	5.38	4.76	4.60	2.63	T
7096	THM WBVTR Strap	DGC	15.90	17.63	15.29	15.98	15.02	13.60	11.26	T
7097	THM WB Mt Bay 1	DGC	22.91	22.49	16.47	16.44	17.87	16.14	12.77	T
7098	THM WB Mat Bay 1	DGC	22.07	20.14	16.20	16.50	18.35	16.08	12.98	T
7099	THM WBVTR Sep 3	DGC	18.03	18.12	17.79	17.38	16.92	15.80	2.63	T
7100	THM WBVTR Sep 17	DGC	21.83	23.51	22.98	24.85	22.48	20.24	19.50	T
7101	THM WBVTR 1 Cent	DGC	22.45	23.78	20.33	20.91	19.93	18.29	12.77	T
7102	THM WBVTR 2 Bay	DGC	17.34	17.29	17.04	16.92	16.41	15.18	13.04	T
7103	THM WBVTR 2 Bay 15	DGC	21.77	23.87	23.50	26.26	23.08	19.24	15.96	T
7104	THM WBVTR 2 Ctr	DGC	20.74	22.34	19.94	21.14	19.86	17.24	15.43	T
7105	THM NBTR B Sep 6	DGC	17.82	17.86	17.29	17.67	17.13	14.92	13.21	T
7106	THM NBTR B Sep 1	DGC	22.11	23.85	24.92	28.10	24.23	19.73	21.12	T
7107	THM NBTR Bm Ctr	DGC	20.32	21.21	20.59	21.90	20.26	17.71	16.04	T
7108	THM MSS Mount 14	DGC	20.59	22.86	23.83	26.90	22.94	18.38	19.18	T
7109	THM OA - Y Thurster	DGC	25.64	27.51	29.91	36.27	28.45	22.10	28.93	T
7110	THM MSS WBVTR Bm	DGC	16.75	18.21	16.84	17.55	16.47	14.57	12.08	T
7111	THM OA +X Thruster	DGC	20.33	20.43	17.54	17.84	18.82	17.37	14.30	T
7130	THM Aux P1 T	DGC	30.18	29.67	12.01	8.87	13.84	4.15	16.67	T
7131	THM Aux P2 T	DGC	2.90	6.97	28.16	8.49	27.13	16.88	12.80	T

FOLDOUT FRAME 2

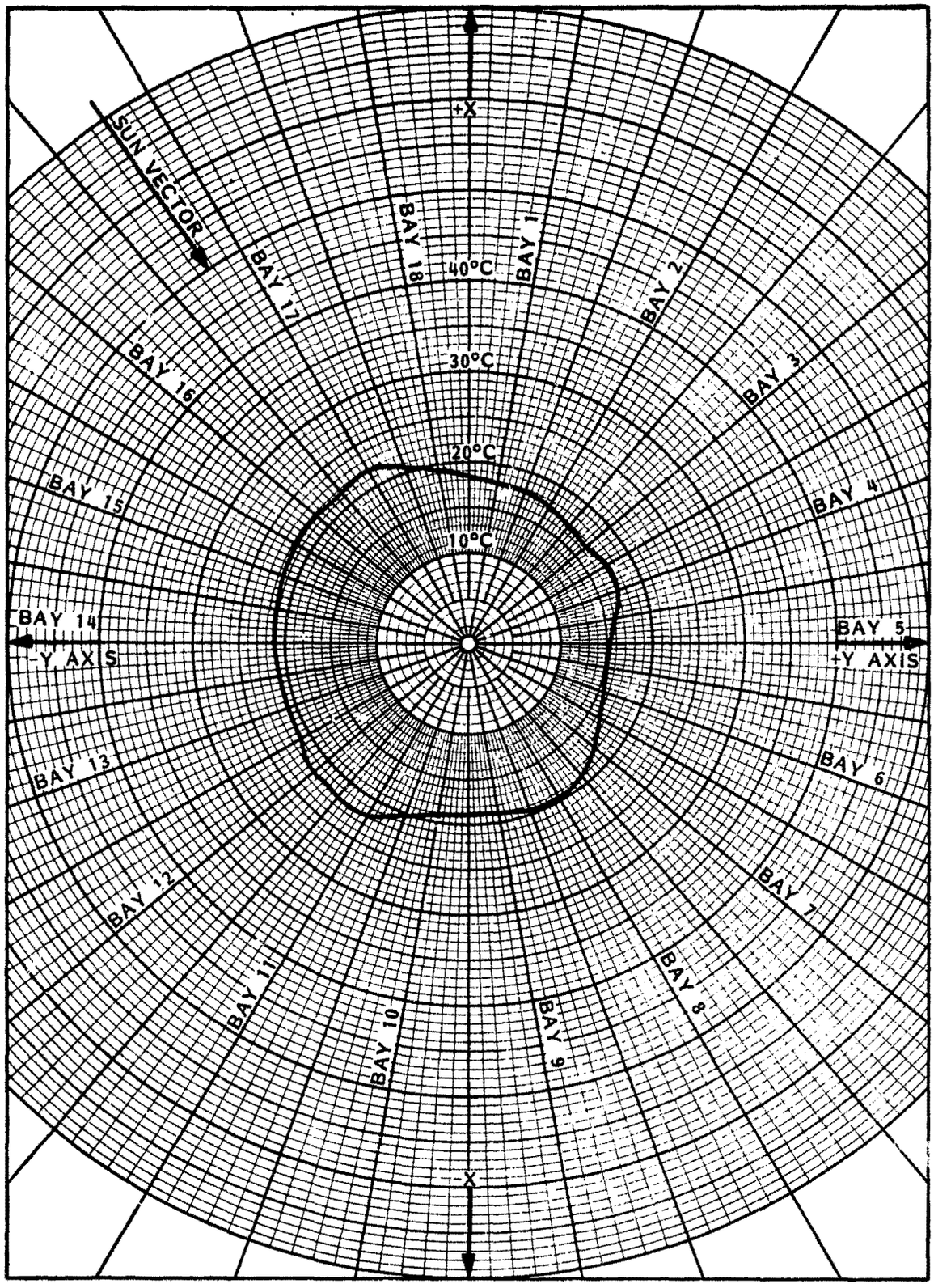


Figure 11-1. Landsat-2 Sensory Ring Average Bay Temperatures - Orbit 24353, 4 November 1979

Table 11-2. Landsat-2 Compensation Load History

Compensation Load Status*								
Orbits	1	2	3	4	5	6	7	8
Launch	O	O	O	O	O	O	O	O
2	X	X	X	X	X	O	X	X
237	X	X	X	X	X	O	O	O
272	X	X	X	X	X	O	X	X
306	X	X	O	X	X	O	O	O
572	X	X	O	X	X	O	O	X
1367	X	X	X	X	X	O	O	X
1645	X	X	O	X	X	O	O	X
1657	X	X	X	X	X	O	O	X
4202	O	O	X	X	O	O	O	O
4372	O	O	X	X	O	O	O	X
6735	O	X	X	O	O	X	O	O
8312	X	X	O	O	X	O	O	O
9753	X	X	O	O	O	O	O	O
14727	O	O	O	O	O	O	O	O

* NOTE X = ON
O = OFF

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)

LANDSAT-2

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)

NBR-A failed during a playback in Orbit 20267 on 15 January 1979. NBR-B continues to operate satisfactorily. Both recorders had alternated in Record and Playback modes with a nominal one minute overlap.

Since Orbit 24385 on 6 November 1979, NBR-2 has recorded and played back full-time every orbit, except a few in which adequate power was not available due to the Yaw Flywheel anomaly, (see Section 4).

Table 12-1 gives cumulative operating hours for both Recorders by mode, and Table 12-2 gives typical telemetry values.

Table 12-1. NBR Operating Hours by Mode

NBR	On	Off	Playback	Record
A*	18320	16724	720	17600
B	23901	19868	969	22932

Table 12-2. Narrowband Tape Recorder Telemetry Values, Landsat-2

Func	Name	Units	Orbits							
			36/37	4980/4981	11460/11461	15211/15212	20710	23507	24445	25330
10001	A - Motor I	mA								
	Record		132.0	130.2	125.50	114.68	Q	Q	Q	Q
	P/B		108.0	93.7	92.30	99.47	Q	Q	Q	Q
10101	B - Motor I	mA								
	Record		148.5	135.7	129.10	119.27	111.55	108.54	110.52	108.44
	P/B		143.6	135.7	127.65	119.09	117.59	101.00	105.52	117.59
10002	A - Pwr Sup. I	mA								
	Record		170.5	162.5	152.13	152.92	Q	Q	Q	Q
	P/B		410.0	399.3	472.26	386.14	Q	Q	Q	Q
10102	B - Pwr Sup. I	mA								
	Record		260.0	264.5	264.47	270.12	270.89	270.89	275.00	274.07
	P/B		481.0	489.2	479.90	479.70	N	473.40	489.21	486.07
10003	A - Rec. Temp.	DGC	26.1	24.2	21.64	25.40	19.68	19.68	19.87	15.21
10103	B - Rec. Temp.	DGC	27.0	26.2	24.71	23.68	21.81	22.66	25.72	21.80
10004	A - Pwr Sup	VDC	-24.87	-25.1	-25.09	-25.08	Q	Q	Q	Q
10104	B - Pwr Sup	VDC	-24.55	-24.6	-24.61	-24.73	-24.62	24.62	24.62	24.62

Q = Unit Failure
N = Data Not Available Since Loss of NBR-1

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)
LANDSAT-2

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)

The WBTS operated nominally until its use was discontinued after Orbit 24370 on 5 November 1979 due to Yaw Wheel anomaly (see Section 4). Telemetry for its last use is seen for the playback Orbit 24366.

Table 13-1 shows typical telemetry values. All are nominal.

WPA transmitted signal levels, measured at Goldstone with the spacecraft successively at the same points in space, show continuous satisfactory WPA performance.

Table 13-1. Typical Wideband Subsystem Telemetry

Func	Name	Units	Orbit							
			47	5091	10641	15211	20248	23613	24060	24366
12001 12101	Temp TWT Coll.	DGC	34.38 30.00	F 32.16	F 34.65	33.12 30.00	33.12 29.37	18.50 29.69	18.84 29.69	19.16 32.86
12002 12102	Cur. Helix	mA	4.29 4.41	F 4.59	F 4.61	3.90 4.70	3.90 4.88	F 4.76	F 4.85	F 4.82
12003 12103	Cur. Cath.	mA	46.04 46.42	F 46.00	F 44.07	44.93 44.62	44.93 45.58	F 44.12	F 44.63	F 44.52
12004 12104	Fwd. Pwr.	dBm	42.93 43.81	F 43.61	F 43.51	42.87 43.61	42.82 43.70	F 43.55	F 43.55	F 43.55
12005 12105	Refl. Pwr.	dBm	26.50 37.50	F 37.08	F 36.90	25.44 37.17	25.44 37.44	F 36.91	F 36.59	F 36.69
12227	Mod. A Loop Stress	Hz	2.14	F	1.60	1.77	1.64	1.19	1.49	1.24
12228	Mod. B Loop Stress	Hz	1.51	- 0.22	0.28	- 0.66	- 0.05	-0.39	-0.12	-0.38
12229	Temp. Mod	DGC	18.51	17.97	17.41	16.00	17.29	16.91	16.89	19.19
12232	+15 VDC Pwr Sply	TMV	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65
12234	-15 VDC Pwr Sply	TMV	4.27	4.04	3.99	4.10	4.10	4.12	4.14	4.14
12236	+5 VDC Pwr Sply	TMV	3.57	3.51	3.50	3.55	3.55	3.51	3.49	3.53
12238	-5 VDC Pwr Sply	TMV	4.20	4.07	4.02	4.08	4.07	4.09	4.09	4.09
12240	-24 VDC Unreg Pwr	TMV	6.20	5.90	5.92	5.92	5.85	5.97	5.95	5.84
12242	Temp. Inv.	DGC	24.12	22.53	22.18	22.17	22.02	21.01	21.58	22.32

F= Unit Off

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)
LANDSAT-2

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)

The AMS is a passive radiometric balance sensor which operates in the 14-16 micron IR band. AMS telemetry values are shown in Table 14-1.

The AMS performed normally since launch, but was turned OFF in Orbit 24990, (13 November 1979), to conserve power on the spacecraft.

Table 14-1. Landsat-2 AMS Temperature Telemetry

Func	Name	Units	Orbit Number							
			50	5102	10191	15211	20252	23613	24423	25210
3004	Case Temp 1	DGC	19.00	18.68	18.36	18.67	18.37	17.22	14.65	F
3005	Assembly - Temp 2	DGC	18.70	18.30	17.97	18.28	18.08	17.00	14.49	F

F = Unit Off

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)
LANDSAT-2

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)

WBVTR-2 operated nominally until payload operation was stopped after Orbit 24370 on 5 November 1979 due to the yaw flywheel anomaly (see Section 4). Telemetry for its last use is seen for the playback Orbit 24366.

WBVTR-1 has not been in use since Orbit 10249 on 26 January 1977 because of failures of two of its Record/Playback heads (head 1, Orbit 2683, 3 August 1975; head 3, Orbit 10064 on 13 January 1977).

Twice in 1975, for an undertermined reason, WBVTR-2 stopped Rewind prematurely; once during Orbit 1913 on 9 June and again during Orbit 3854 on 26 October. This abnormality has not occurred since.

On 21 December 1976, during Orbit 9738, a playback of MSS data from WBVTR-2 of Landsat-2 was unusable due to high bit error counts. This anomaly has been experienced many times since then. The condition exists due to a tape overspeed of approximately 27%, caused by the servo voltage input being zero during the time of the anomaly. A simple operational procedure (Switch from Playback to Record to Playback) restores normal operation.

Table 15-1 gives typical non-modal telemetry values for WBVTR-1 and WBVTR-2. Tables 15-2 and 15-3 show the modal telemetry values for Record, Playback, Rewind, and Standby operational modes.

Figure 15-1 shows tape usage for WBVTR-2.

Table 15-1. Telemetry Values for WBVTR-1 and 2

Func	Name	Units	Orbits							
			45/46	4879	11871	17715	20251	23181	23683	24366
13022	Tape Unit Pres	PSI	16.52	16.39	16.12	15.99	15.99	15.86	15.86	15.86
13023	Tape Unit Temp	DGC	20.74	20.12	16.69	16.30	18.12	16.69	16.75	16.73
13024	Elec U. Temp	DGC	25.00	21.68	13.85	13.46	14.98	14.62	14.51	14.80
13032	Limiter Volt	VPP	1.48	1.41	F	F	F	F	F	F
13034	+5.6 VDC Conv	VDC	5.70	5.67	F	F	F	F	F	F
13122	Tape Unit Press	PSI	16.12	15.33	14.54	13.35	13.10	12.69	12.71	12.71
13123	Tape Unit Temp	DGC	21.50	23.08	19.92	17.46	21.70	19.00	18.16	18.61
13124	Elect. U. Temp	DGC	23.50	22.72	16.63	16.92	22.25	20.50	18.65	20.17
13132	Limiter Volt	VPP	1.30	1.28	1.34	1.34	1.34	1.34	1.34	1.34
13134	+5.6 VDC Conv	VDC	5.71	5.85	5.66	5.80	5.64	5.57	5.77	5.69

F = Unit Off

Table 15-2. Function Values by Mode, Landsat-2 WBVTR-1 Telemetry

Func	Name	Units	Orbits					
			31/46	2642	4878	7628/7643	10050/10081	10249*
13029	Input P/B Voltage	VPP						
	Record		0.0	0.0	0.0	0.0	0.0	0.0
	Playback		0.60	0.32	0.30	0.32	0.35	0.35
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13028	Capstan Motor I	AMP						
	Record		0.31	0.33	0.31	0.33	0.31	0.32
	Playback		0.26	0.31	0.30	0.35	0.30	0.35
	Rewind		0.19	0.23	0.28	0.31	0.28	0.30
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13030	Headwheel Motor I	AMP						
	Record		0.50	0.50	0.53	0.50	0.56	0.52
	Playback		0.49	0.49	0.53	0.53	0.44	0.45
	Rewind		0.44	0.44	0.47	0.47	0.45	0.44
	Standby		0.45	0.45	0.46	0.44	0.44	0.44
13031	Recorder Input I	AMP						
	Record		3.69	3.69	3.62	3.62	3.62	3.52
	Playback		3.37	3.86	3.86	3.34	3.86	3.86
	Rewind		2.23	2.19	2.23	2.28	2.23	3.21
	Standby		1.78	1.95	1.95	1.81	1.95	1.86
13033	Servo Voltage	PCT						
	Record		0.0	0.0	0.0	0.0	0.0	0.0
	Playback		50.01	50.08	50.37	50.04	49.61	50.08
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13026	Capstan Motor Spd	PCT						
	Record		88.61	88.03	85.13	85.03	87.45	88.61
	Playback		88.35	86.87	85.13	87.45	94.90	88.87
	Rewind		100.2	98.48	96.73	98.48	96.00	96.52
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13027	Headwheel Mo Spd	PCT						
	Record		96.72	95.07	93.96	94.07	94.16	94.28
	Playback		97.28	94.52	92.86	92.86	94.44	94.80
	Rewind		98.6	96.73	96.73	96.73	96.73	96.60
	Standby		95.39	95.62	95.07	93.96	95.07	93.96

* Unit not used since Orbit 10249.

Table 15-2. Function Values by Mode - Landsat-2 WBVTR-2 Telemetry

Func	Name	Units	Orbits							
			31/46	4878	10198/10199	15293/15286	20249	23181	23507	24366
13129	Input P/B Voltage	VPP								
	Record		0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
	Playback		0.35	0.34	0.34	0.33	0.36	0.34	0.33	0.35
	Rewind		0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
13128	Capstan Motor I	AMP								
	Record		0.33	0.38	0.32	0.34	0.37	0.32	0.32	0.32
	Playback		0.33	0.35	0.35	0.36	0.32	0.35	0.35	0.35
	Rewind		0.20	0.15	0.18	0.18	0.18	0.14	0.14	0.14
	Standby		0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
13130	Headwheel Motor I	AMP								
	Record		0.47	0.48	0.49	0.47	0.49	0.48	0.49	0.49
	Playback		0.48	0.48	0.49	0.47	0.47	0.47	0.47	0.48
	Rewind		0.44	0.41	0.43	0.41	0.40	0.40	0.40	0.40
	Standby		0.43	0.41	0.44	0.40	0.41	0.41	0.41	0.41
13131	Recorder Input I	AMP								
	Record		2.90	2.90	2.90	2.93	2.93	2.87	2.90	2.90
	Playback		3.14	3.11	3.20	3.11	3.08	3.11	3.11	3.11
	Rewind		1.80	1.80	1.80	1.78	1.75	1.73	1.73	1.75
	Standby		1.51	1.62	1.49	1.48	1.46	1.44	1.46	1.44
13133	Servo Voltage	PCT								
	Record		0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
	Playback		49.00	49.43	49.45	49.71	50.01	49.72	49.43	49.42
	Rewind		0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
13126	Capstan Motor Spd	PCT								
	Record		112.10	105.33	105.30	103.96	102.59	101.90	102.59	102.59
	Playback		112.10	103.96	105.07	102.59	101.90	101.22	102.59	103.30
	Rewind		120.43	117.68	117.14	116.31	115.63	115.63	115.63	115.63
	Standby		0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
13127	Headwheel Mo Spd	PCT								
	Record		98.08	95.48	95.01	93.40	92.88	92.88	92.88	92.88
	Playback		97.04	94.44	94.80	93.40	92.88	92.36	92.88	92.88
	Rewind		98.6	96.52	96.81	94.44	93.92	93.40	93.40	93.40
	Standby		100.79	96.00	95.95	94.96	92.88	92.88	92.88	93.40

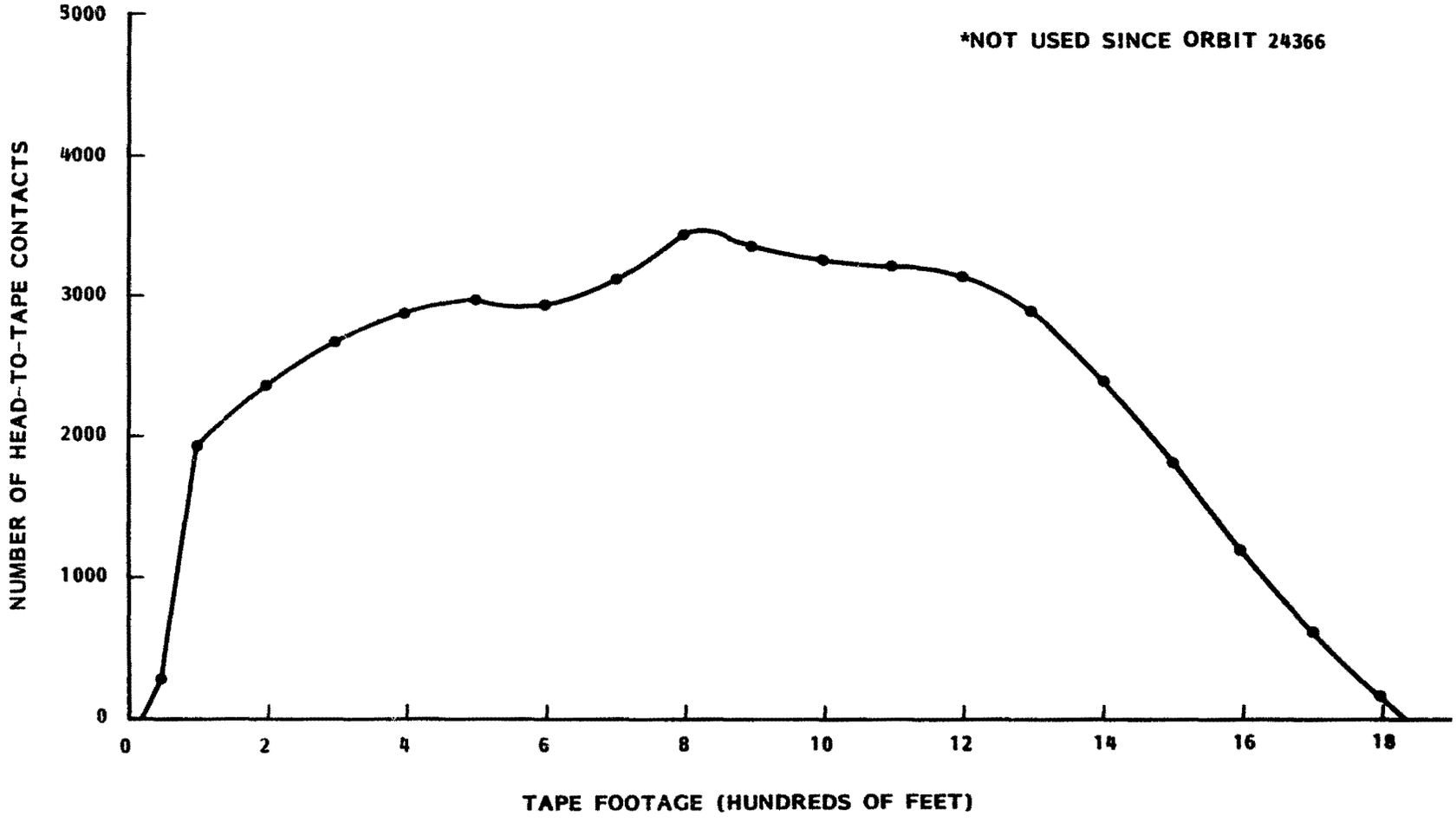


Figure 15-1. Landsat-2 WBVTR-2 Tape Usage Thru Orbit 24384*

SECTION 16
RETURN BEAM VIDICON (RBV)
LANDSAT-2

SECTION 16

RETURN BEAM VIDICON (RBV)

RBV was on for quarterly engineering test during this report period. Telemetry data was normal.

Table 16-1 gives typical telemetry values for the RBV Subsystem. Tables 16-2, 16-3 and 16-4 gives telemetry values for Prepare, Read and Hold modes for the three RBV cameras.

Table 16-1. RBV Telemetry Values

Func		Name	Units	Orbits								
				54	5662	10157	15228	17739	19075	19712	21002	23513
14001		CCC Board Temp.	DGC	19.65	20.41	20.15	21.57	18.28	18.83	19.39	19.39	18.83
14002		CCC Pwr. Sup. Temp	DGC	20.52	20.80	20.17	22.79	18.83	19.94	20.49	19.94	20.49
14003		15 VDC Sup.	TMV	3.92	4.00	3.84	3.77	3.92	3.95	3.95	3.92	3.92
14004		+6V, -5.25 VDC Sup.	TMV	2.92	3.13	3.03	2.93	3.05	3.07	3.07	3.07	3.07
14100				N	0.70	1.95	1.18	1.15	0.75	1.45	1.77	1.85
14200	*	VID Output V	TMV	1.05	1.26	0.88	1.18	0.67	1.70	2.40	1.70	1.02
14300				1.03	1.31	1.10	1.17	0.70	1.60	2.17	1.27	1.05
14102				3.85	3.82	3.70	3.85	3.80	3.92	3.80	3.80	3.92
14202	*	Comb. Align Cur.	TMV	3.91	3.88	3.92	3.91	3.97	3.87	3.97	3.97	3.97
14302				3.90	3.83	3.75	3.74	3.85	3.85	3.97	3.85	3.85
14103				24.24	26.51	23.00	29.43	22.70	23.26	26.02	26.02	24.36
14203	*	Elec Temp.	DGC	19.84	22.05	20.18	19.86	19.28	18.18	22.60	20.39	20.94
14303				25.05	29.42	23.42	35.07	22.60	23.70	29.24	29.24	26.47
14104				23.44	26.28	23.15	28.66	21.70	22.26	26.13	24.47	24.47
14204	*	LV Pwr Sup T.	DGC	18.14	20.61	18.90	18.07	17.18	16.62	21.05	17.73	21.05
14304				25.36	29.47	24.00	35.25	23.26	23.26	29.34	28.34	28.24
14105				4.00	3.96	3.84	3.84	4.00	3.97	4.00	4.00	3.97
14205	*	Defl. Pwr. Sup. +10	TMV	3.97	3.94	3.82	3.81	3.95	3.97	3.97	3.97	3.95
14305		VDC		4.00	3.96	3.96	4.00	4.00	4.00	4.00	4.00	4.00
14106				3.67	3.63	3.26	3.54	3.67	3.67	3.67	3.67	3.67
14206	*	L.V.P.S. +6V, -6.3	TMV	3.65	3.62	3.34	3.50	3.65	3.65	3.65	3.65	3.65
14306		VDC		3.70	3.68	3.42	3.72	3.70	3.70	3.70	3.70	3.65
14107				2.61	2.61	2.60	2.51	2.77	2.67	2.65	2.77	2.75
14207	*	Ther. Elec. Cur.	TMV	2.49	2.51	2.44	2.40	2.60	2.55	2.55	2.57	2.62
14307				2.57	2.57	2.71	2.44	2.72	2.57	2.67	2.67	2.75
14108				2.43	2.50	2.46	2.44	2.55	2.55	2.55	2.55	2.55
14208	*	Vid. Fil. Cur.	TMV	2.40	2.36	2.39	2.30	2.40	2.40	2.42	2.40	2.40
14308				2.58	2.54	2.59	2.47	2.60	2.60	2.57	2.57	2.57
14110				2.98	2.96	2.98	2.98	2.97	2.97	2.97	2.97	2.97
14210	*	Vid. Tgt. Volt	TMV	2.86	2.96	2.60	2.88	3.00	3.00	3.10	3.10	3.10
14310				2.63	2.58	2.37	2.52	2.62	2.62	2.67	2.62	2.67
14113				2.92	2.81	2.98	2.79	3.35	2.90	2.90	3.35	3.35
14213	*	Vert Def V	TMV	3.15	3.05	3.16	3.12	3.10	3.12	3.12	3.10	3.10
14313				3.59	3.44	3.04	3.47	4.00	4.00	3.50	3.50	3.50
14114				19.87	19.21	19.85	19.82	21.99	22.55	21.99	21.99	23.65
14214	*	Vid FPT	DGC	20.55	19.80	20.46	20.24	20.54	21.06	21.06	21.06	22.09
14314				20.65	20.56	20.38	21.57	22.40	22.86	22.86	22.40	23.33
14115				21.04	21.31	21.02	21.41	17.07	17.62	18.18	18.18	17.62
14215	*	Foc Coil T	DGC	20.67	21.26	19.17	21.06	17.62	17.62	18.18	17.62	17.62
14315				22.25	22.89	20.61	24.14	18.62	19.18	20.28	20.28	19.18

* - 141XX Refers to Camera 1
142XX Refers to Camera 2
143XX Refers to Camera 3
N - Data not available

Table 16-2. Camera #1 (Blue) Telemetry (Values in TMV)

Func	Name	Units	Mode	Orbits 054	5663	10157	15228	17739	19712	21002	23513
14101	Focus I	TMV	Prep	1.68	1.74	1.67	1.77	1.67	1.70	1.70	1.70
			Read	2.80	2.85	2.80	2.90	2.80	2.82	2.82	2.80
			Hold	0.65	0.69	0.65	0.75	0.65	0.65	0.67	0.65
14109	Grid V	TMV	Prep	0.80	0.78	0.80	0.77	0.80	0.80	0.77	0.77
			Read	2.42	2.42	2.45	2.45	2.42	2.42	2.42	2.42
			Hold	3.95	3.98	3.95	3.97	3.95	3.95	3.95	3.95
14111	Cath I	TMV	Prep	3.05	3.02	3.05	3.02	3.02	3.02	3.02	3.02
			Read	0.83	0.83	0.85	0.82	0.82	0.85	0.85	0.82
			Hold	0.38	0.37	0.37	0.37	0.37	0.37	0.37	0.37
14112	Hor Def	TMV	Prep	1.75	1.77	1.77	1.77	1.77	1.77	1.77	1.77
			Read	3.25	3.25	3.21	3.25	3.22	3.25	3.25	3.22
			Hold	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0
14120	+500 V	TMV	Prep	0.85	0.90	0.92	0.90	0.95	0.90	0.90	0.90
			Read	4.05	4.05	4.05	4.05	4.02	4.05	4.05	4.05
			Hold	4.05	4.05	4.05	4.05	4.02	4.02	4.02	4.02

Table 16-3. Camera #2 (Yellow) Telemetry (Values in TMV)

Func	Name	Units	Mode	Orbits 054	5663	10157	15228	17739	19712	21002	23513
14201	Focus I	TMV	Prep	1.56	1.54	1.50	1.50	1.50	1.50	1.50	1.50
			Read	2.65	2.65	2.65	2.65	2.62	2.62	2.62	2.65
			Hold	0.54	0.53	0.54	0.50	0.50	0.50	0.50	0.52
14209	Grid V	TMV	Prep	0.75	0.80	0.80	0.75	0.77	0.80	0.80	0.77
			Read	2.25	2.22	2.25	2.20	2.25	2.25	2.22	2.22
			Hold	4.05	4.11	4.11	4.10	4.07	4.10	4.07	4.07
14211	Cath I	TMV	Prep	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
			Read	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
			Hold	0.37	0.35	0.35	0.35	0.35	0.37	0.35	0.35
14212	Hor Def	TMV	Prep	1.85	1.87	1.87	1.85	1.85	1.85	1.85	1.85
			Read	3.25	3.31	3.24	3.30	3.30	3.30	3.30	3.30
			Hold	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0
14220	+500V	TMV	Prep	1.15	1.14	1.15	1.12	1.12	1.12	1.12	1.12
			Read	4.25	4.27	4.27	4.27	4.27	4.27	4.27	4.27
			Hold	4.25	4.27	4.27	4.27	4.27	4.27	4.27	4.27

Table 16-4. Camera #3 (Red) Telemetry (Values in TMV)

			Hold	0.54	0.53	0.54	0.50	0.50	0.50	0.50	0.52
14209	Grid V	TMV	Prep	0.75	0.80	0.80	0.75	0.77	0.80	0.80	0.77
			Read	2.25	2.22	2.25	2.20	2.25	2.25	2.22	2.22
			Hold	4.05	4.11	4.11	4.10	4.07	4.10	4.07	4.07
14211	Cath I	TMV	Prep	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
			Read	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
			Hold	0.37	0.35	0.35	0.35	0.35	0.37	0.35	0.35
14212	Hor Def	TMV	Prep	1.85	1.87	1.87	1.85	1.85	1.85	1.85	1.85
			Read	3.25	3.31	3.24	3.30	3.30	3.30	3.30	3.30
			Hold	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0
14220	+500V	TMV	Prep	1.15	1.14	1.15	1.12	1.12	1.12	1.12	1.12
			Read	4.25	4.27	4.27	4.27	4.27	4.27	4.27	4.27
			Hold	4.25	4.27	4.27	4.27	4.27	4.27	4.27	4.27

Table 16-4. Camera #3 (Red) Telemetry (Values in TMV)

				Orbit							
Func	Name	Units	Mode	054	5663	10157	15228	17739	19712	21002	23513
14301	Focus I	TMV	Prep	1.79	1.85	1.77	1.95	1.77	1.80	1.82	1.77
			Read	2.85	2.93	2.85	3.02	2.85	2.90	2.92	2.85
			Hold	0.65	0.72	0.69	0.80	0.67	0.70	0.72	0.65
14309	Grid V	TMV	Prep	0.75	0.75	0.77	0.77	0.77	0.77	0.77	0.77
			Read	2.65	2.66	2.66	2.72	2.67	2.70	2.70	2.72
			Hold	4.08	4.13	4.12	4.12	4.10	4.10	4.10	4.10
14311	Cath I	TMV	Prep	3.25	3.22	3.23	3.22	3.22	3.22	3.22	3.22
			Read	0.54	0.55	0.55	0.55	0.55	0.55	0.55	0.55
			Hold	0.39	0.40	0.40	0.40	0.40	0.40	0.40	0.40
14312	Hor Def	TMV	Prep	2.05	2.07	2.07	2.07	2.02	2.02	2.02	2.02
			Read	3.25	3.42	3.42	3.40	3.40	3.40	3.40	3.40
			Hold	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0
14320	+500 V	TMV	Prep	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
			Read	4.25	4.27	4.27	4.27	4.25	4.25	4.25	4.25
			Hold	4.25	4.27	4.27	4.27	4.25	4.25	4.25	4.25

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

LANDSAT-2

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

The MSS subsystem operated satisfactorily until its use was discontinued after Orbit 24370 on 5 November, 1979, due to the yaw flywheel anomaly (see Section 4). No late line starts were seen after substitution of Scan Monitor Source B (vice A) during Orbit 23355 on 24 August 1979.

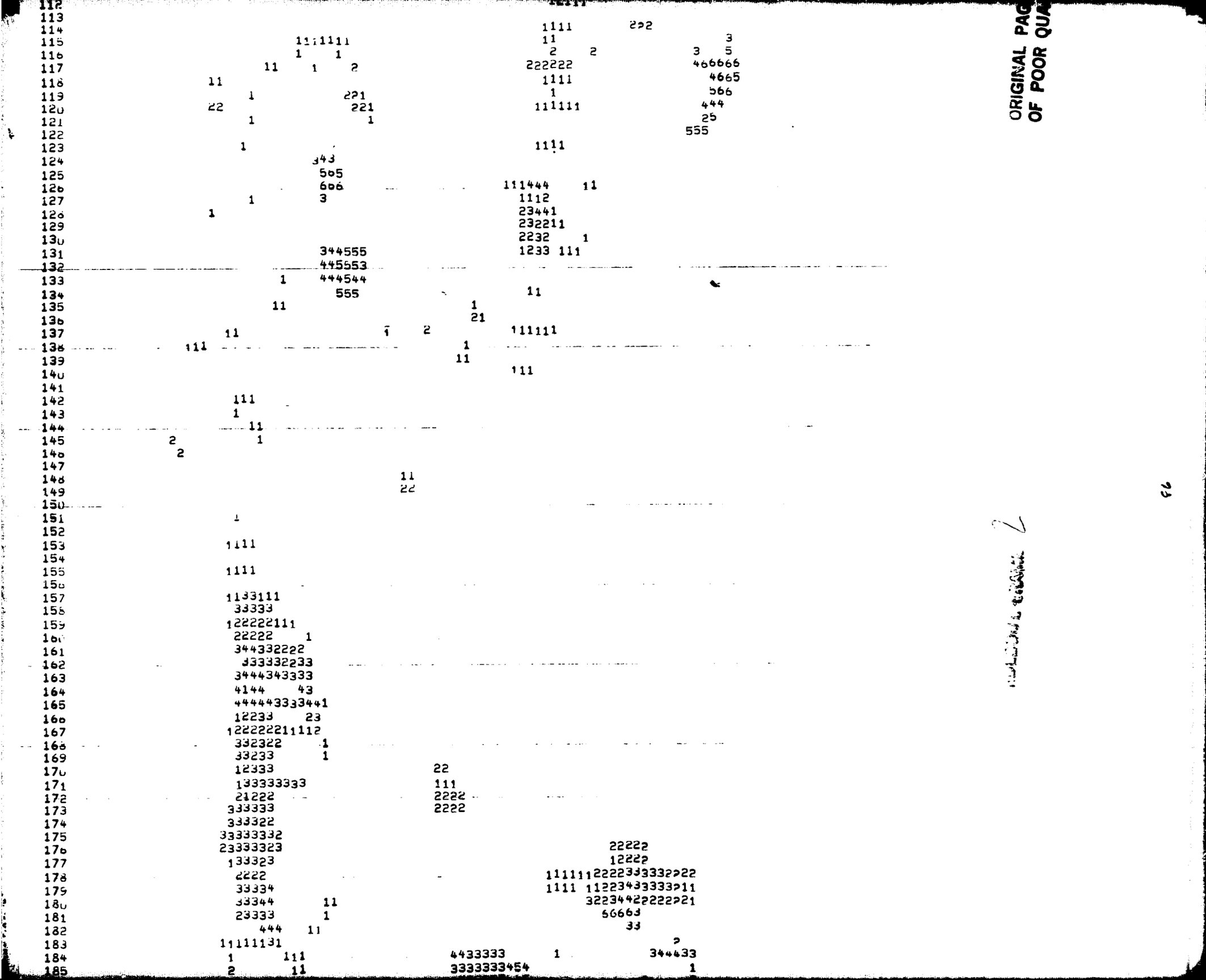
Figure 17-1 shows the number of scenes imaged at each geographic location this quarter. Figure 17-2 shows scenes imaged since launch. Only those scenes received by U. S. and Pakistan ground stations are shown. Scenes (61% of total) transmitted to Canada, Italy, Iran, Japan, Sweden, India, Australia, and Brazil are not shown.

Table 17-1 shows typical telemetry values since launch. All are nominal.

Sun calibrations, performed every month, show nominal performance. Figures 17-3 to 17-6 show the history of sensor responsivity to stimuli from six levels of illumination from the Cal lamp. One typical sensor from each of the bands is shown. They are all taken in the mode prime-low gain-compressed. Values shown with triangles were taken in the high gain mode. The line length is a satisfactory 3240 words.

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184          1      111                  4433555                1                  1
185          2       11                  3333333454                              1
186          1       11                  2555555545                         2    2
187          2   111121                  44244444                           3       2
188             111121                3534555                              1
189              11111                                                          12
190              1111
191
192              11111
193
194
195              11111
196              1111
197               11
198              111
199               11
200              11
201
202
203
204
205                                                  1
206
207                        4                         1
208                                                 11
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229
230
231
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233  11
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245
246                                                455
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248                                                                          1
249                                                 11                       1
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251
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ORIGINAL PAGE IS
OF POOR QUALITY



ORIGINAL PAGE
OF POOR QUALITY

IMAGE ACQUISITION	REQ'D	SCHED	VITA	SLAT	GOOD	BAD
TOTAL:	6800	5459	5066	5003	3141	352
	100.00%	81.89%	56.98%	56.72%	35.61%	3.99%

IMAGERY AVAILABLE	0%	10%	20%	30%	40%	50%	60%	70%	80%
	43	1077	0	265	0	0	294	0	0

ORIGINAL PAGE IS
OF POOR QUALITY

IMAGE ID	SCHED	ACQUISITION VITA	SLAT	GOOD	BAD
0	5459	5026	5003	3141	352
0%	61.89%	50.98%	56.72%	35.61%	3.99%

AVAILABLE 40%	50%	60%	70%	80%	90%	100%
0	0	294	0	0	0	1462

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Figure 17-1. MSS Scenes This Landsat-2 (Cycle

Figure 17-1. MSS Scenes This Reporting Period, Landsat-2 (Cycles 91-102)

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LANDSAT -3

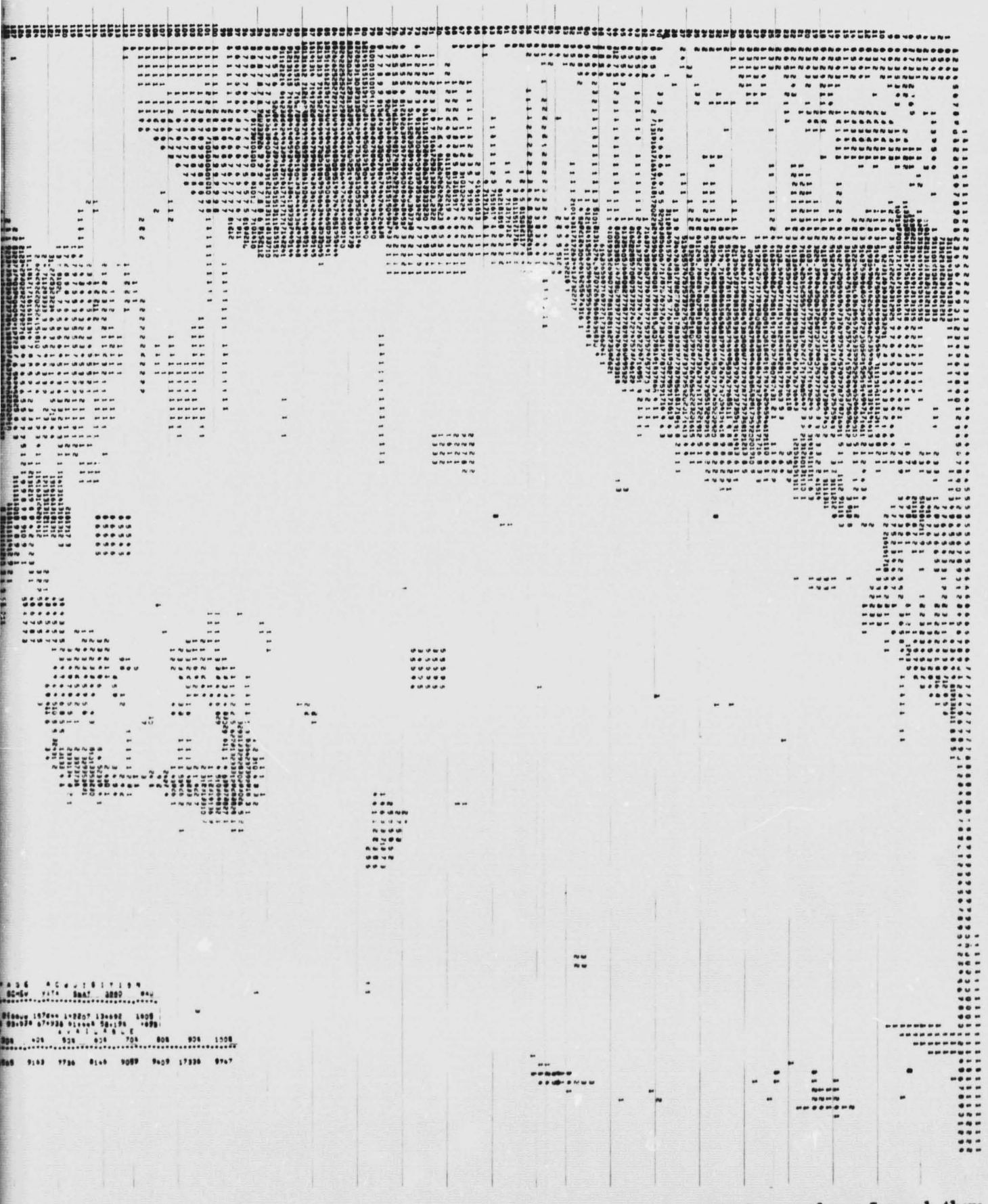


Figure 17-2. MSS Scenes from Launch thru Orbit 22649, Landsat-2

FOLDOUT FRAME 2

91

Table 17-1. MSS Telemetry - Landsat-2

Func	Name	Units	Orbits						
			27	5091	10192	15211	20242	23613	24157
15040	MUX -6 V	TMV	4.05	4.04	4.05	4.05	4.05	4.05	4.05
15041	A/D SUPPLY	TMV	5.95	5.95	5.95	5.95	5.92	5.93	5.93
15042	AVERAGE DENSITY DATA TRANS	TMV	1.[illegible]	1.95	2.62	1.98	2.12	1.96	1.97
15043	FIBER OPTICS PLATE 1 TEMP	DGC	18.13	21.75	20.15	21.04	19.33	17.97	17.79
15044	FIBER OPTICS PLATE 2 TEMP	DGC	17.87	20.28	18.54	19.50	17.62	16.10	15.90
15045	MUX TEMP	DGC	23.38	23.63	24.68	28.27	25.12	22.93	21.05
15046	ELEC COVER TEMP	DGC	20.25	22.96	20.01	21.02	19.37	18.00	17.53
15047	PWR. SUP. TEMP	DGC	19.45	21.62	20.66	21.75	19.92	18.39	17.45
15048	SCAN MIR REG. TEMP	DGC	18.30	21.13	20.94	22.37	20.19	17.93	17.02
15049	SCAN MIR DRIVE ELEC. TEMP	DGC	18.96	21.42	21.25	22.64	20.63	18.38	17.30
15050	SCAN MIR DRIVE COVER TEMP	DGC	17.26	21.21	20.85	22.25	20.06	17.82	17.09
15051	SCAN MIR TEMP	DGC	17.26	20.89	20.46	22.06	19.35	17.38	16.83
15052	ROT. SHUT HOUSING TEMP	DGC	23.26	20.28	18.58	19.58	17.74	16.20	15.94
15053	SCAN MIR REG VOLT	TMV	4.70	4.57	4.63	4.63	4.58	4.64	4.63
15054	CAL LAMP CURRENT	TMV	1.17	1.17	1.17	1.17	1.17	1.17	1.17
15055	BAND 1 15 VDC	TMV	4.98	4.97	4.97	4.97	4.97	4.97	4.96
15056	BAND 2 15 VDC	TMV	5.00	5.00	5.00	5.00	5.00	5.00	5.00
15057	BAND 3 15 VDC	TMV	4.95	4.95	4.95	4.95	4.94	4.95	4.95
15058	BAND 4 15 VDC	TMV	5.00	5.00	5.00	5.00	5.00	5.00	5.00
15059	TLM -15 V	TMV	5.06	5.07	5.07	5.07	5.07	5.07	5.07
15060	+12 V/-6 V	TMV	5.03	5.02	5.01	5.02	5.01	5.01	5.01
15061	LOGIC +5 V	TMV	4.81	4.83	4.85	4.83	4.85	4.87	4.88
15062	RECT. +19 V	TMV	5.03	5.05	5.05	5.05	5.02	5.05	5.05
15063	RECT. -19 V	TMV	3.60	3.60	3.60	3.60	3.61	3.60	3.60
15064	BAND 1 HVA	TMV	4.95	4.95	4.95	4.95	4.95	4.95	4.95
15065	BAND 1 HVB	TMV	F	F	F	F	F	F	F
15066	BAND 2 HVA	TMV	4.70	4.75	4.73	4.73	4.72	4.72	4.72
15067	BAND 2 HVB	TMV	F	F	F	F	F	F	F
15068	BAND 3 HVA	TMV	4.72	4.73	4.75	4.75	4.75	4.75	4.75
15069	BAND 3 HVB	TMV	F	F	F	F	F	F	F
15070	SHUT MOT. CONTR. INTEG	TMV	2.60	2.60	2.60	2.58	2.59	2.60	2.60
15071	SCAN MIRROR DRIVE CLOCK	TMV	2.00	2.00	2.01	2.00	2.00	2.01	2.01

F = Unit OFF

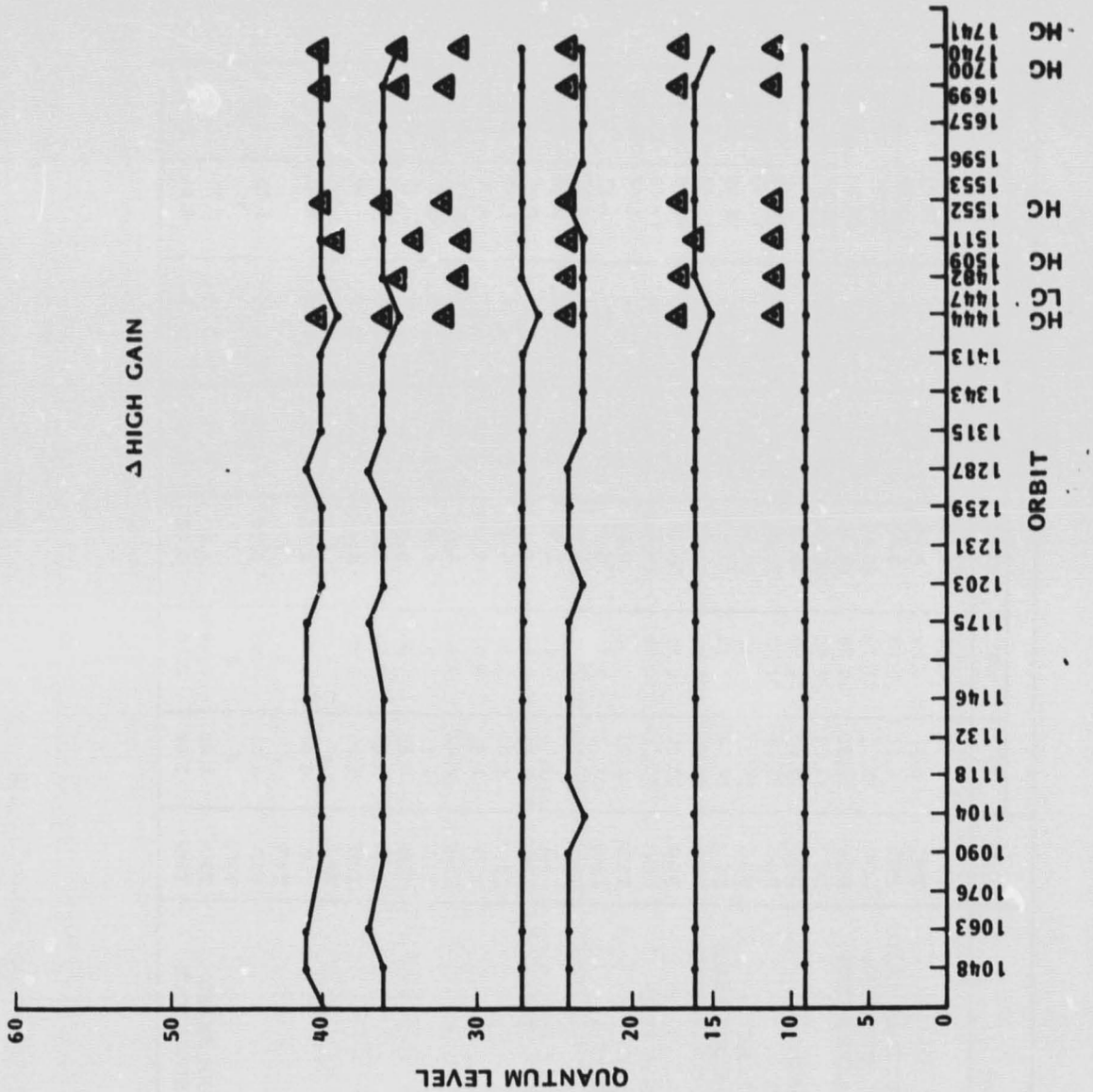


Figure 17-3. Landsat-2 Sensor 2 Response to 6 Light Levels of Cal Lamp

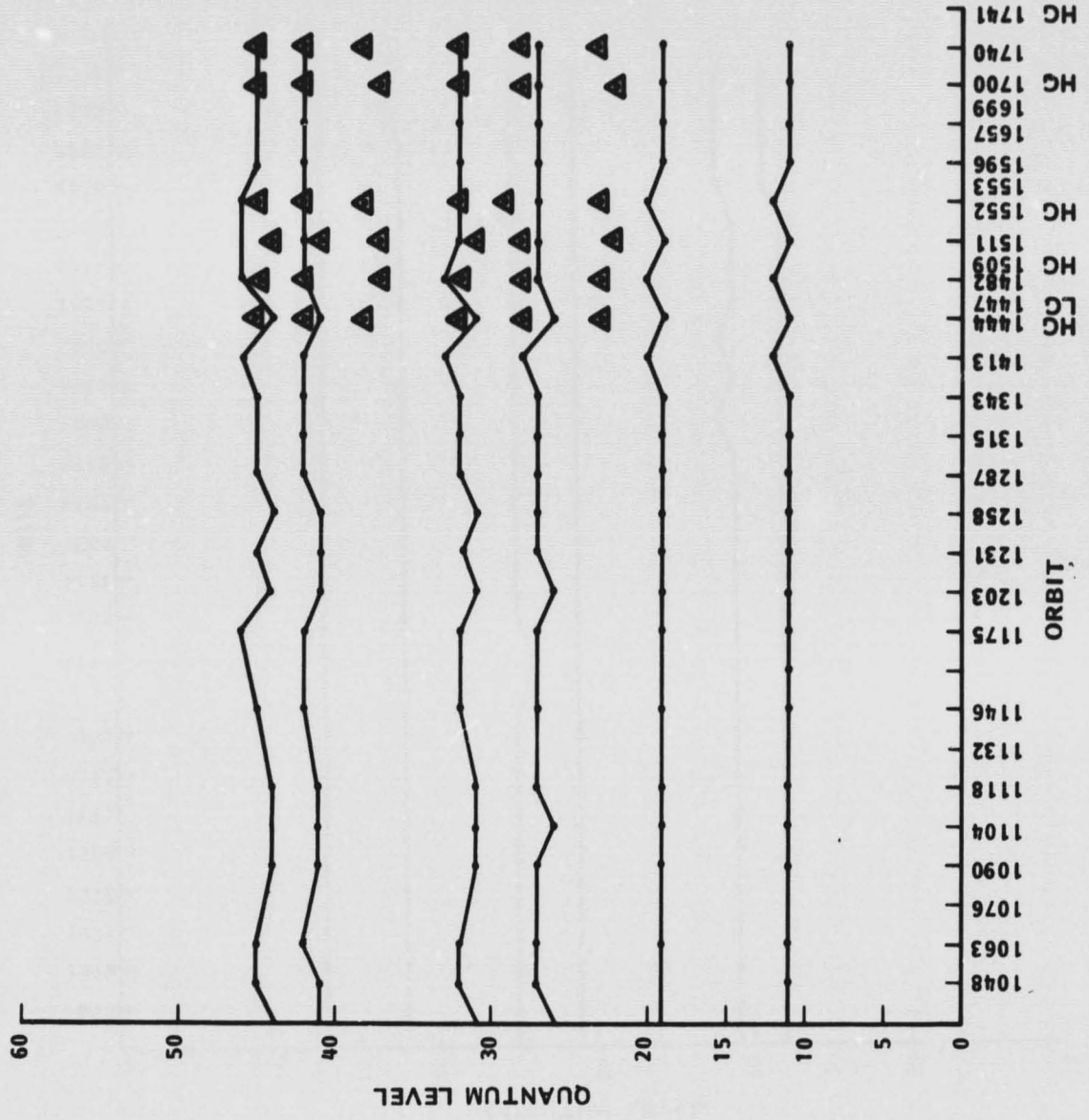


Figure 17-4. Landsat-2 Sensor 8 Response to 6 Light Levels of Cal Lamp

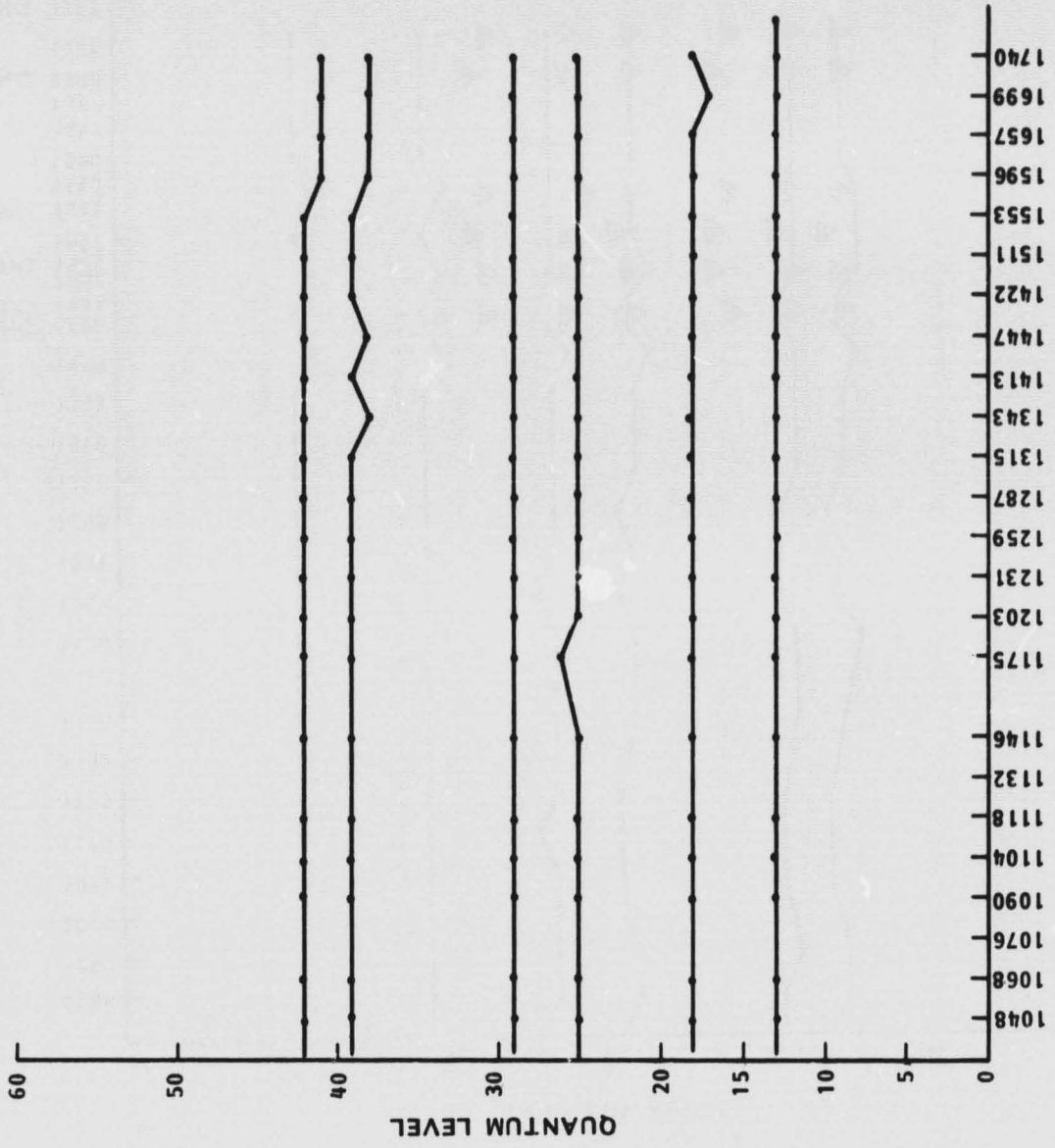


Figure 17-5. Landsat-2 Sensor 13 Response to 6 Light Levels from Cal Lamp

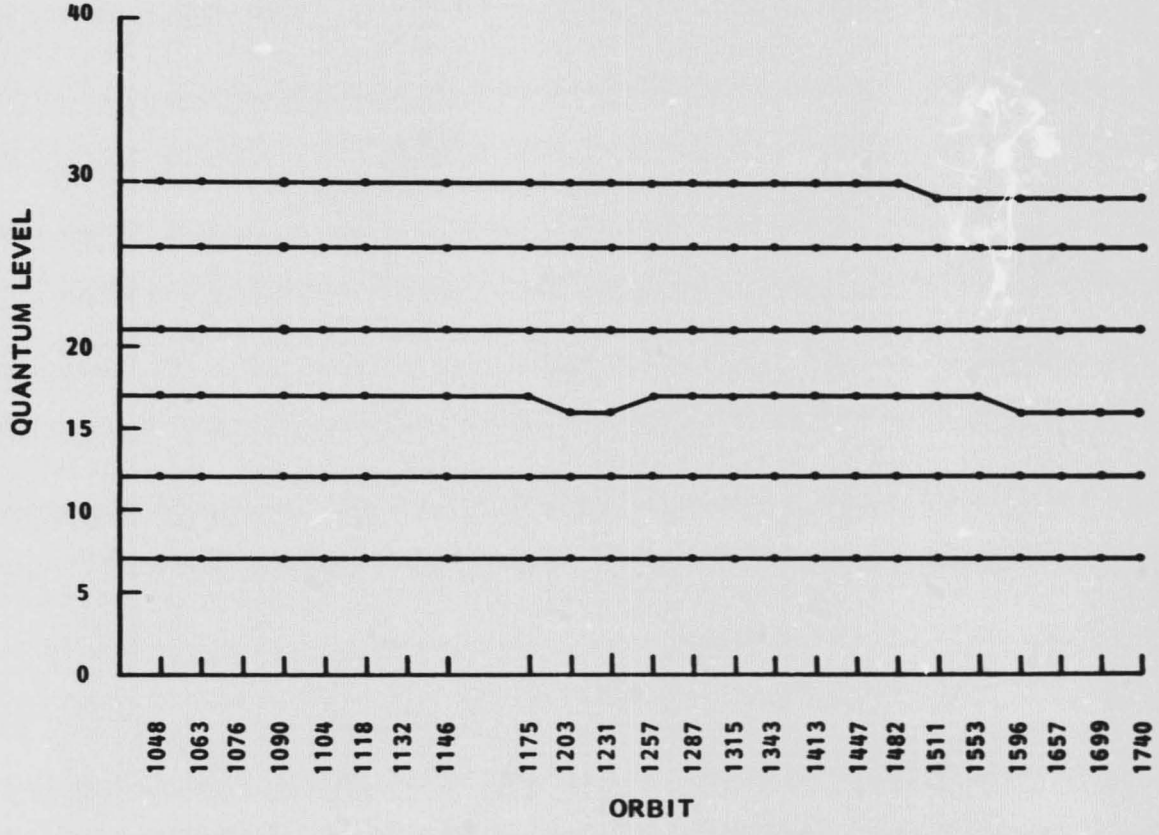


Figure 17-6. Landsat-2 Sensor 20 Response to 6 Light Levels from Cal Lamp

SECTION 18

DATA COLLECTION SUBSYSTEM (DCS)

LANDSAT-2

SECTION 18

DATA COLLECTION SUBSYSTEM (DCS)

The DCS Subsystem was turned OFF during Orbit 15857 on 4 March 1978, and the function assumed by Landsat-3. The subsystem is capable of resuming operational status if desired.

APPENDIX A

LANDSAT-2 ANOMALIES AND OBSERVATIONS

Appendix A. Landsat-2 Anomalies and Observations

Date	Anomaly/Observation	How Observed	Comments
Prelaunch	Forward Scanner Pressure Leak	Spacecraft Integration	Before launch pressure increased. After launch pressure decreased. No anticipated effect on Scanner or S/C mission.
Prelaunch	Defective TLM Functions 1264, 4002, 13200	Spacecraft Integration	Functions measure non-critical temperatures. Sensors failed prior to launch. Mission unaffected.
3/8/75	Unencoded command 781, CIU Channel B Off, received by spacecraft from RF Interference. Commands 782 or 786, switch comedecs; and commands 780 or 784, switch PWM regulator, received at other times.	On-Line	Non-Landsat OCC Authorized Unencoded commands received in Orbit 619, 640, 743, 1575, 1700, 2605, 3164, 4769, 5025, 7925, 8721, 8804, 9523, 9863, 10268, 10466, 10533, 10583, 10603, 13309, 14508, 14864, 15553, 16279, 17394, 19792, 22333
3/17/75	MMCA Pitch Flux Density TLM Drift	Off-Line	Telemetry decreased 5 counts and indicates increased flux density on charged magnet. Probable sensor drift. No apparent effect on S/C performance
4/5/75	WBVTR-1 Rewind Failure (MDR E01252)	On-Line	WBVTR-1 failed to execute Rewind command or prematurely terminated rewinds due to false BOT signal. Subsequent commands or Fool-Logic techniques allowed return to operation. Investigation Committee report issued. Problems occurred Orbit 1021, 1532, 1568, 2238. Operation restricted to 300 thru 1500 feet.
6/9/75	WBVTR-2 had Short Rewind (MDR E01255)	On-Line	WBVTR-2 started rewind but stopped prematurely in Orbit 1919 and again in Orbit 3854. Investigation Committee did not define a probable cause but assigned a momentary False BOT as reason for short rewind. Unit remains operational.
8/3/75	WBVTR-1 data did not provide sync to ground station (MDR D04930)	On-Line	One head circuit of WBVTR-1 failed to operate. 25% of data lost in data stream. Operation discontinued until early 1976, when it was used with RBV only.
11/14/75	MSS False End-of-Line Codes (MDR D04940)	Off-Line	Occasional End-of-Line codes occurring in preamble or along video data. Creates 4 black and 4 white words in scene data. Occurs over magnetic anomalies with low incidence rate. Operation continued
1/25/76	Solar Array Current Notch (MDR D04934)	On-Line	In Orbit 5123, abnormal drops in solar array current appeared for portion of satellite day. S/C operation unaffected because solar array has excess power to date.
7/20/76	Battery 6 Turned Off. Subsequent Battery 1, 2, 5, 6, 7 and 8 Turned Off.	On-Line & Off-Line	Battery 6 decreased in load share and rose in charge share thereby causing overcharge. Temperature increased and unit was turned off in Orbit 7601. (Returned to service in Orbit 7992.) See Table 3-2 for history of all battery restoration cycles.
7/29/76	WBVTR-2 Automatic Shutdown by SMART	On-Line	SMART circuits detected high headwheel currents in Orbit 7720 and shutdown WBVTR-2. WBVTR-2 operation was normal; high headwheel current assigned to slipped phase. Normal operation resumed after reset.
12/21/76	WBVTR-2 had 30% high P/B speed (MDR D04936)	On-Line	Ground equipment would not synch on WBVTR-2 P/B data during

	sequent battery 1, 2, 3, 4, 7 and 8 Turned Off.	On-Line	was turned off in Orbit 7601. (Returned to service in Orbit 7992.) See Table 3-2 for history of all battery restoration cycles.
7/25/76	WBVTR-2 Automatic Shutdown by SMART	On-Line	SMART circuits detected high headwheel currents in Orbit 7720 and shutdown WBVTR-2. WBVTR-2 operation was normal; high headwheel current assigned to slipped phase. Normal operation resumed after reset.
12/21/76	WBVTR-2 had 30% high P/B speed (MDRD04936)	On-Line	Ground equipment would not synch on WBVTR-2 P/B data during Orbit 9738 P/B. Analysis showed P/B speed was 30% high. Toggling, record to P/B, restored normal operation. Occurred frequently this quarter requiring replay of garbled data or lost data.
1/15/77	WBVTR-1 second head failed (MDR D04937)	On-Line	Observation of CRT trace during WBVTR-1 RBV P/B data in Orbit 10086 showed second head failed. Operation discontinued.
9/12/77	Payload Automatic Inhibit from ECAM by SMART	On-Line	SMART circuits detected S/C unreg bus low voltage on Orbit 13342 caused by operation problems. Inhibited further payload operation from ECAM. Reset returned S/C to normal. Recurred during Orbits 14865, 15013, 15156, 16685, 16698, 16744. Reset returned S/C to normal each time.
1/3/79	COMSTOR went to an indeterminate mode MDR #D04546	On-Line	During loading of ECAM in Orbit 20193 a command abort occurred during or at end of "Serial Data Transfer On," command 007. COMSTOR went from Activate to an indeterminate mode. COMSTOR was reloaded and is performing normally.
1/15/79	NBTR-1 failed during P/B MDR D04947	On-Line	NBTR-1 halted after 35 seconds of P/B in Orbit 20266. Subsequent operation attempts unsuccessful. Unit has 18320 in-flight operation hours. Motor current is high.
4/25/79	RMP2 (Bell Bearing Gyro) current high beginning Orbit 21672. Sensitivity decreased on 1 May 1979 (MDR D04949)	On-Line	RMP1 (Gas Bearing Gyro) turned on in Orbit 21737 (30 April 1979) and enabled in Orbit 21754 on 1 May 1979. RMP2 run-down tests indicate failure of unit.
7/1/79	MSS late line starts were detected in early July 1979	Off-Line	MSS continues to be used in normal operation. Anomaly also occurs in Landsat-3. In orbit 23355 on 24 August 1979 the Scan Monitor Source was switched from A to B. Late line starts abated.
11/5/79	Yaw Flywheel Stopped in Orbit 24374	On-Line	The Yaw Flywheel had high duty cycles while passing through zero speed in Orbits 22999 (29 July 1979), 23000, 23941, 23942, 24371, 24372, 24373. Yaw attitude lost. S/C powered down with payload operation suspended. New ACS operational mode planned in attempt to recover attitude.

APPENDIX B

LANDSAT-2 SPACECRAFT ORBIT REFERENCE TABLES

APPENDIX B

LANDSAT-2

SPACECRAFT ORBIT REFERENCE TABLES

FROM JULY 1979 THROUGH JANUARY 1981

ORBIT 22594 TO 30695

FLIGHT DAY 1621 THROUGH 2201

Landsat-2

July 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	182	1621	22594-22607	196-209	15	89
2	183	1622	22608-22621	210-223	16	89
3	184	1623	22622-22635	224-237	17	89
4	185	1624	22636-22649	238-251	18	89
5	186	1625	22650-22663	1- 14	1	90
6	187	1626	22664-22677	15- 28	2	90
7	188	1627	22678-22691	29- 42	3	90
8	189	1628	22692-22705	43- 56	4	90
9	190	1629	22706-22719	57- 70	5	90
10	191	1630	22720-22733	71- 84	6	90
11	192	1631	22734-22747	85- 98	7	90
12	193	1632	22748-22761	99-112	8	90
13	194	1633	22762-22775	113-126	9	90
14	195	1634	22776-22789	127-140	10	90
15	196	1635	22790-22802	141-153	11	90
16	197	1636	22803-22816	154-167	12	90
17	198	1637	22817-22830	168-181	13	90
18	199	1638	22831-22844	182-195	14	90
19	200	1639	22845-22858	196-209	15	90
20	201	1640	22859-22872	210-223	16	90
21	202	1641	22873-22886	224-237	17	90
22	203	1642	22887-22900	238-251	18	90
23	204	1643	22901-22914	1- 14	1	91
24	205	1644	22915-22928	15- 28	2	91
25	206	1645	22929-22942	29- 42	3	91
26	207	1646	22943-22956	43- 56	4	91
27	208	1647	22957-22970	57- 70	5	91
28	209	1648	22971-22984	71- 84	6	91
29	210	1649	22985-22998	85- 98	7	91
30	211	1650	22999-23012	99-112	8	91
31	212	1651	23013-23026	113-126	9	91

Landsat-2

August 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	213	1652	23027-23040	127-140	10	91
2	214	1653	23041-23053	141-153	11	91
3	215	1654	23054-23067	154-167	12	91
4	216	1655	23068-23081	168-181	13	91
5	217	1656	23082-23095	182-195	14	91
6	218	1657	23096-23109	196-209	15	91
7	219	1658	23110-23123	210-223	16	91
8	220	1659	23124-23137	224-237	17	91
9	221	1660	23138-23151	238-251	18	91
10	222	1661	23152-23165	1- 14	1	92
11	223	1662	23166-23179	15- 28	2	92
12	224	1663	23180-23193	29- 42	3	92
13	225	1664	23194-23207	43- 56	4	92
14	226	1665	23208-23221	57- 70	5	92
15	227	1666	23222-23235	71- 84	6	92
16	228	1667	23236-23249	85- 98	7	92
17	229	1668	23250-23263	99-112	8	92
18	230	1669	23264-23277	113-126	9	92
19	231	1670	23278-23291	127-140	10	92
20	232	1671	23292-23304	141-153	11	92
21	233	1672	23305-23318	154-167	12	92
22	234	1673	23319-23332	168-181	13	92
23	235	1674	23333-23346	182-195	14	92
24	236	1675	23347-23360	196-209	15	92
25	237	1676	23361-23374	210-223	16	92
26	238	1677	23375-23388	224-237	17	92
27	239	1678	23389-23402	238-251	18	92
28	240	1679	23403-23416	1- 14	1	93
29	241	1680	23417-23430	15- 28	2	93
30	242	1681	23431-23444	29- 42	3	93
31	243	1682	23445-23458	43- 56	4	93

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September 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	244	1683	23459-23472	57- 70	5	93
2	245	1684	23473-23486	71- 84	6	93
3	246	1685	23487-23500	85- 98	7	93
4	247	1686	23501-23514	99-112	8	93
5	248	1687	23515-23528	113-126	9	93
6	249	1688	23529-23542	127-140	10	93
7	250	1689	23543-23555	141-153	11	93
8	251	1690	23556-23569	154-167	12	93
9	252	1691	23570-23583	168-181	13	93
10	253	1692	23584-23597	182-195	14	93
11	254	1693	23598-23611	196-209	15	93
12	255	1694	23612-23625	210-223	16	93
13	256	1695	23626-23639	224-237	17	93
14	257	1696	23640-23653	238-251	18	93
15	258	1697	23654-23667	1- 14	1	94
16	259	1698	23668-23681	15- 28	2	94
17	260	1699	23682-23695	29- 42	3	94
18	261	1700	23696-23709	43- 56	4	94
19	262	1701	23710-23723	57- 70	5	94
20	263	1702	23724-23737	71- 84	6	94
21	264	1703	23738-23751	85- 98	7	94
22	265	1704	23752-23765	99-112	8	94
23	266	1705	23766-23779	113-126	9	94
24	267	1706	23780-23793	127-140	10	94
25	268	1707	23794-23806	141-153	11	94
26	269	1708	23807-23820	154-167	12	94
27	270	1709	23821-23834	168-181	13	94
28	271	1710	23835-23848	182-195	14	94
29	272	1711	23849-23862	196-209	15	94
30	273	1712	23863-23876	210-223	16	94

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October 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	274	1713	23877-23890	224-237	17	94
2	275	1714	23891-23904	238-251	18	94
3	276	1715	23905-23918	1- 14	1	95
4	277	1716	23919-23932	15- 28	2	95
5	278	1717	23933-23946	29- 42	3	95
6	279	1718	23947-23960	43- 56	4	95
7	280	1719	23961-23974	57- 70	5	95
8	281	1720	23975-23988	71- 84	6	95
9	282	1721	23989-24002	85- 98	7	95
10	283	1722	24003-24016	99-112	8	95
11	284	1723	24017-24030	113-126	9	95
12	285	1724	24031-24044*	127-140*	10	95
13	286	1725	*24045-24057	*141-153	11	95
14	287	1726	24058-24071	154-167	12	95
15	288	1727	24072-24085	168-181	13	95
16	289	1728	24086-24099	182-195	14	95
17	290	1729	24100-24113	196-209	15	95
18	291	1730	24114-24127	210-223	16	95
19	292	1731	24128-24141	224-237	17	95
20	293	1732	24142-24155	238-251	18	95
21	294	1733	24156-24169	1- 14	1	96
22	295	1734	24170-24183	15- 28	2	96
23	296	1735	24184-24197	29- 42	3	96
24	297	1736	24198-24211	43- 56	4	96
25	298	1737	24212-24225	57- 70	5	96
26	299	1738	24226-24239	71- 84	6	96
27	300	1739	24240-24253	85- 98	7	96
28	301	1740	24254-24267	99-112	8	96
29	302	1741	24268-24281	113-126	9	96
30	303	1742	24282-24295*	127-140*	10	96
31	304	1743	*24296-24308	*141-153	11	96

*Revised

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November 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	305	1744	24309-24322	154-167	12	96
2	306	1745	24323-24336	168-181	13	96
3	307	1746	24337-24350	182-195	14	96
4	308	1747	24351-24364	196-209	15	96
5	309	1748	24365-24378	210-223	16	96
6	310	1749	24379-24392	224-237	17	96
7	311	1750	24393-24406	238-251	18	96
8	312	1751	24407-24420	1- 14	1	97
9	313	1752	24421-24434	15- 28	2	97
10	314	1753	24435-24448	29- 42	3	97
11	315	1754	24449-24462	43- 56	4	97
12	316	1755	24463-24476	57- 70	5	97
13	317	1756	24477-24490	71- 84	6	97
14	318	1757	24491-24504	85- 98	7	97
15	319	1758	24505-24518	99-112	8	97
16	320	1759	24519-24532	113-126	9	97
17	321	1760	24533-24546*	127-140*	10	97
18	322	1761	*24547-24559	*141-153	11	97
19	323	1762	24560-24573	154-167	12	97
20	324	1763	24574-24587	168-181	13	97
21	325	1764	24588-24601	182-195	14	97
22	326	1765	24602-24615	196-209	15	97
23	327	1766	24616-24629	210-223	16	97
24	328	1767	24630-24643	224-237	17	97
25	329	1768	24644-24657	238-251	18	97
26	330	1769	24658-24671	1- 14	1	98
27	331	1770	24672-24685	15- 28	2	98
28	332	1771	24686-24699	29- 42	3	98
29	333	1772	24700-24713	43- 56	4	98
30	334	1773	24714-24727	57- 70	5	98

*Revised

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December 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	335	1774	24728-24741	71- 84	6	98
2	336	1775	24742-24755	85- 98	7	98
3	337	1776	24756-24769	99-112	8	98
4	338	1777	24770-24783	113-126	9	98
5	339	1778	24784-24797*	127-140*	10	98
6	340	1779	*24798-24810	*141-153	11	98
7	341	1780	24811-24824	154-167	12	98
8	342	1781	24825-24838	168-181	13	98
9	343	1782	24839-24852	182-195	14	98
10	344	1783	24853-24866	196-209	15	98
11	345	1784	24867-24880	210-223	16	98
12	346	1785	24881-24894	224-237	17	98
13	347	1786	24895-24908	238-251	18	98
14	348	1787	24909-24922	1- 14	1	99
15	349	1788	24923-24936	15- 28	2	99
16	350	1789	24937-24950	29- 42	3	99
17	351	1790	24951-24964	43- 56	4	99
18	352	1791	24965-24978	57- 70	5	99
19	353	1792	24979-24992	71- 84	6	99
20	354	1793	24993-25006	85- 98	7	99
21	355	1794	25007-25020	99-112	8	99
22	356	1795	25021-25034	113-126	9	99
23	357	1796	25035-25048*	127-140*	10	99
24	358	1797	*25049-25061	*141-153	11	99
25	359	1798	25062-25075	154-167	12	99
26	360	1799	25076-25089	168-181	13	99
27	361	1800	25090-25103	182-195	14	99
28	362	1801	25104-25117	196-209	15	99
29	363	1802	25118-25131	210-223	16	99
30	364	1803	25132-25145	224-237	17	99
31	365	1804	25146-25159	238-251	18	99

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January 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	1	1805	25160-25173	1- 14	1	100
2	2	1806	25174-25187	15- 28	2	100
3	3	1807	25188-25201	29- 42	3	100
4	4	1808	25202-25215	43- 56	4	100
5	5	1809	25216-25229	57- 70	5	100
6	6	1810	25230-25243	71- 84	6	100
7	7	1811	25244-25257	85- 98	7	100
8	8	1812	25258-25271	99-112	8	100
9	9	1813	25272-25285	113-126	9	100
10	10	1814	25286-25299*	127-140*	10	100
11	11	1815	*25300-25312	*141-153	11	100
12	12	1816	25313-25326	154-167	12	100
13	13	1817	25327-25340	168-181	13	100
14	14	1818	25341-25354	182-195	14	100
15	15	1819	25355-25368	196-209	15	100
16	16	1820	25369-25382	210-223	16	100
17	17	1821	25383-25396	224-237	17	100
18	18	1822	25397-25410	238-251	18	100
19	19	1823	25411-25424	1- 14	1	101
20	20	1824	25425-25438	15- 28	2	101
21	21	1825	25439-25452	29- 42	3	101
22	22	1826	25453-25466	43- 56	4	101
23	23	1827	25467-25480	57- 70	5	101
24	24	1828	25481-25494	71- 84	6	101
25	25	1829	25495-25508	85- 98	7	101
26	26	1830	25509-25522	99-112	8	101
27	27	1831	25523-25536	113-126	9	101
28	28	1832	25537-25550*	127-140*	10	101
29	29	1833	*25551-25563	*141-153	11	101
30	30	1834	25564-25577	154-167	12	101
31	31	1835	25578-25591	168-181	13	101

*Revised

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February 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	32	1836	25592-25605	182-195	14	101
2	33	1837	25606-25619	196-209	15	101
3	34	1838	25620-25633	210-223	16	101
4	35	1839	25634-25647	224-237	17	101
5	36	1840	25648-25661	238-251	18	101
6	37	1841	25662-25675	1- 14	1	102
7	38	1842	25676-25689	15- 28	2	102
8	39	1843	25690-25703	29- 42	3	102
9	40	1844	25704-25717	43- 56	4	102
10	41	1845	25718-25731	57- 70	5	102
11	42	1846	25732-25745	71- 84	6	102
12	43	1847	25746-25759	85- 98	7	102
13	44	1848	25760-25773	99-112	8	102
14	45	1849	25774-25787	113-126	9	102
15	46	1850	25788-25801	127-140	10	102
16	47	1851	25802-25814	141-153	11	102
17	48	1852	25815-25828	154-167	12	102
18	49	1853	25829-25842	168-181	13	102
19	50	1854	25843-25856	182-195	14	102
20	51	1855	25857-25870	196-209	15	102
21	52	1856	25871-25884	210-223	16	102
22	53	1857	25885-25898	224-237	17	102
23	54	1858	25899-25912	238-251	18	102
24	55	1859	25913-25926	1- 14	1	103
25	56	1860	25927-25940	15- 28	2	103
26	57	1861	25941-25954	29- 42	3	103
27	58	1862	25955-25968	43- 56	4	103
28	59	1863	25969-25982	57- 70	5	103
29	60	1864	25983-25996	71- 84	6	103

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March 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	61	1865	25997-26010	85- 98	7	103
2	62	1866	26011-26024	99-112	8	103
3	63	1867	26025-26038	113-126	9	103
4	64	1868	26039-26051	127-139	10	103
5	65	1869	26052-26065	140-153	11	103
6	66	1870	26066-26079	154-167	12	103
7	67	1871	26080-26093	168-181	13	103
8	68	1872	26094-26107	182-195	14	103
9	69	1873	26108-26121	196-209	15	103
10	70	1874	26122-26135	210-223	16	103
11	71	1875	26136-26149	224-237	17	103
12	72	1876	26150-26163	238-251	18	103
13	73	1877	26164-26177	1-14	1	104
14	74	1878	26178-26191	15-28	2	104
15	75	1879	26192-26205	29-42	3	104
16	76	1880	26206-26219	43-56	4	104
17	77	1881	26220-26233	57-70	5	104
18	78	1882	26234-26247	71-84	6	104
19	79	1883	26248-26261	85-98	7	104
20	80	1884	26262-26275	99-112	8	104
21	81	1885	26276-26289	113-126	9	104
22	82	1886	26290-26302	127-139	10	104
23	83	1887	26303-26316	140-153	11	104
24	84	1888	26317-26330	154-167	12	104
25	85	1889	26331-26344	168-181	13	104
26	86	1890	26345-26358	182-195	14	104
27	87	1891	26359-26372	196-209	15	104
28	88	1892	26373-26386	210-223	16	104
29	89	1893	26387-26400	224-237	17	104
30	90	1894	26401-26414	238-251	18	104
31	91	1895	26415-26428	1-14	1	105

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April 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	92	1896	26429-26442	15- 28	2	105
2	93	1897	26443-26456	29- 42	3	105
3	94	1898	26457-26470	43- 56	4	105
4	95	1899	26471-26484	57- 70	5	105
5	96	1900	26485-26498	71- 84	6	105
6	97	1901	26499-26512	85- 98	7	105
7	98	1902	26513-26526	99-112	8	105
8	99	1903	26527-26540	113-126	9	105
9	100	1904	26541-26553	127-139	10	105
10	101	1905	26554-26567	140-153	11	105
11	102	1906	26568-26581	154-167	12	105
12	103	1907	26582-26595	168-181	13	105
13	104	1908	26596-26609	182-195	14	105
14	105	1909	26610-26623	196-209	15	105
15	106	1910	26624-26637	210-223	16	105
16	107	1911	26638-26651	224-237	17	105
17	108	1912	26652-26665	238-251	18	105
18	109	1913	26666-26679	1- 14	1	106
19	110	1914	26680-26693	15- 28	2	106
20	111	1915	26694-26707	29- 42	3	106
21	112	1916	26708-26721	43- 56	4	106
22	113	1917	26722-26735	57- 70	5	106
23	114	1918	26736-26749	71- 84	6	106
24	115	1919	26750-26763	85- 98	7	106
25	116	1920	26764-26777	99-112	8	106
26	117	1921	26778-26791	113-126	9	106
27	118	1922	26792-26804	127-139	10	106
28	119	1923	26805-26818	140-153	11	106
29	120	1924	26819-26832	154-167	12	106
30	121	1925	26833-26846	168-181	13	106

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May 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	122	1926	26847-26860	182-195	14	106
2	123	1927	26861-26874	196-209	15	106
3	124	1928	26875-26888	210-223	16	106
4	125	1929	26889-26902	224-237	17	106
5	126	1930	26903-26916	238-251	18	106
6	127	1931	26917-26930	1-14	1	107
7	128	1932	26931-26944	15-28	2	107
8	129	1933	26945-26958	29-42	3	107
9	130	1934	26959-26972	43-56	4	107
10	131	1935	26973-26986	57-70	5	107
11	132	1936	26987-27000	71-84	6	107
12	133	1937	27001-27014	85-98	7	107
13	134	1938	27015-27028	99-112	8	107
14	135	1939	27029-27042	113-126	9	107
15	136	1940	27043-27055	127-139	10	107
16	137	1941	27056-27069	140-153	11	107
17	138	1942	27070-27083	154-167	12	107
18	139	1943	27084-27097	168-181	13	107
19	140	1944	27098-27111	182-195	14	107
20	141	1945	27112-27125	196-209	15	107
21	142	1946	27126-27139	210-223	16	107
22	143	1947	27140-27153	224-237	17	107
23	144	1948	27154-27167	238-251	18	107
24	145	1949	27168-27181	1-14	1	108
25	146	1950	27182-27195	15-28	2	108
26	147	1951	27196-27209	29-42	3	108
27	148	1952	27210-27223	43-56	4	108
28	149	1953	27224-27237	57-70	5	108
29	150	1954	27238-27251	71-84	6	108
30	151	1955	27252-27265	85-98	7	108
31	152	1956	27266-27279	99-112	8	108

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June 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	153	1957	27280-27293	113-126	9	108
2	154	1958	27294-27306	127-139	10	108
3	155	1959	27307-27320	140-153	11	108
4	156	1960	27321-27334	154-167	12	108
5	157	1961	27335-27348	168-181	13	108
6	158	1962	27349-27362	182-195	14	108
7	159	1963	27363-27376	196-209	15	108
8	160	1964	27377-27390	210-223	16	108
9	161	1965	27391-27404	224-237	17	108
10	162	1966	27405-27418	238-251	18	108
11	163	1967	27419-27432	1-14	1	109
12	164	1968	27433-27446	15-28	2	109
13	165	1969	27447-27460	29-42	3	109
14	166	1970	27461-27474	43-56	4	109
15	167	1971	27475-27488	57-70	5	109
16	168	1972	27489-27502	71-84	6	109
17	169	1973	27503-27516	85-98	7	109
18	170	1974	27517-27530	99-112	8	109
19	171	1975	27531-27544	113-126	9	109
20	172	1976	27545-27557	127-139	10	109
21	173	1977	27558-27571	140-153	11	109
22	174	1978	27572-27585	154-167	12	109
23	175	1979	27586-27599	168-181	13	109
24	176	1980	27600-27613	182-195	14	109
25	177	1981	27614-27627	196-209	15	109
26	178	1982	27628-27641	210-223	16	109
27	179	1983	27642-27655	224-237	17	109
28	180	1984	27656-27669	238-251	18	109
29	181	1985	27670-27683	1-14	1	110
30	182	1986	27684-27697	15-28	2	110

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July 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	183	1987	27698-27711	29-42	3	110
2	184	1988	27712-27725	43-56	4	110
3	185	1989	27726-27739	57-70	5	110
4	186	1990	27740-27753	71-84	6	110
5	187	1991	27754-27767	85-98	7	110
6	188	1992	27768-27781	99-112	8	110
7	189	1993	27782-27795	113-126	9	110
8	190	1994	27796-27808	127-139	10	110
9	191	1995	27809-27822	140-153	11	110
10	192	1996	27823-27836	154-167	12	110
11	193	1997	27837-27850	168-181	13	110
12	194	1998	27851-27864	182-195	14	110
13	195	1999	27865-27878	196-209	15	110
14	196	2000	27879-27892	210-223	16	110
15	197	2001	27893-27906	224-237	17	110
16	198	2002	27907-27920	238-251	18	110
17	199	2003	27921-27934	1-14	1	111
18	200	2004	27935-27948	15-28	2	111
19	201	2005	27949-27962	29-42	3	111
20	202	2006	27963-27976	43-56	4	111
21	203	2007	27977-27990	57-70	5	111
22	204	2008	27991-28004	71-84	6	111
23	205	2009	28005-28018	85-98	7	111
24	206	2010	28019-28032	99-112	8	111
25	207	2011	28033-28046	113-126	9	111
26	208	2012	28047-28059	127-139	10	111
27	209	2013	28060-28073	140-153	11	111
28	210	2014	28074-28087	154-167	12	111
29	211	2015	28088-28101	168-181	13	111
30	212	2016	28102-28115	182-195	14	111
31	213	2017	28116-28129	196-209	15	111

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August 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	214	2018	28130-28143	210-223	16	111
2	215	2019	28144-28157	224-237	17	111
3	216	2020	28158-28171	238-251	18	111
4	217	2021	28172-28185	1-14	1	112
5	218	2022	28186-28199	15-28	2	112
6	219	2023	28200-28213	29-42	3	112
7	220	2024	28214-28227	43-56	4	112
8	221	2025	28228-28241	57-70	5	112
9	222	2026	28242-28255	71-84	6	112
10	223	2027	28256-28269	85-98	7	112
11	224	2028	28270-28283	99-112	8	112
12	225	2029	28284-28297	113-126	9	112
13	226	2030	28298-28310	127-139	10	112
14	227	2031	28311-28324	140-153	11	112
15	228	2032	28325-28338	154-167	12	112
16	229	2033	28339-28352	168-181	13	112
17	230	2034	28353-28366	182-195	14	112
18	231	2035	28367-28380	196-209	15	112
19	232	2036	28381-28394	210-223	16	112
20	233	2037	28395-28408	224-237	17	112
21	234	2038	28409-28422	238-251	18	112
22	235	2039	28423-28436	1-14	1	113
23	236	2040	28437-28450	15-28	2	113
24	237	2041	28451-28464	29-42	3	113
25	238	2042	28465-28478	43-56	4	113
26	239	2043	28479-28492	57-70	5	113
27	240	2044	28493-28506	71-84	6	113
28	241	2045	28507-28520	85-98	7	113
29	242	2046	28521-28534	99-112	8	113
30	243	2047	28535-28548	113-126	9	113
31	244	2048	28549-28561	127-139	10	113

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September 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	245	2049	28562-28575	140-153	11	113
2	246	2050	28576-28589	154-167	12	113
3	247	2051	28590-28603	168-181	13	113
4	248	2052	28604-28617	182-195	14	113
5	249	2053	28618-28631	196-209	15	113
6	250	2054	28632-28645	210-223	16	113
7	251	2055	28646-28659	224-237	17	113
8	252	2056	28360-28673	238-251	18	113
9	253	2057	28674-28687	1-14	1	114
10	254	2058	28688-28701	15-28	2	114
11	255	2059	28702-28715	29-42	3	114
12	256	2060	28716-28729	43-56	4	114
13	257	2061	28730-28743	57-70	5	114
14	258	2062	28744-28757	71-84	6	114
15	259	2063	28758-28771	85-98	7	114
16	260	2064	28772-28785	99-112	8	114
17	261	2065	28786-28799	113-126	9	114
18	262	2066	28800-28812	127-139	10	114
19	263	2067	28813-28826	140-153	11	114
20	264	2068	28827-28840	154-167	12	114
21	265	2069	28841-28854	168-181	13	114
22	266	2070	28855-28868	182-195	14	114
23	267	2071	28869-28882	196-209	15	114
24	268	2072	28883-28896	210-223	16	114
25	269	2073	28897-28910	224-237	17	114
26	270	2074	28911-28924	238-251	18	114
27	271	2075	28925-28938	1-14	1	115
28	272	2076	28939-28952	15-28	2	115
29	273	2077	28953-28966	29-42	3	115
30	274	2078	28967-28980	43-56	4	115

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October 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	275	2079	28981-28994	57-70	5	115
2	276	2080	28995-29008	71-84	6	115
3	277	2081	29009-29022	85-98	7	115
4	278	2082	29023-29036	99-112	8	115
5	279	2083	29037-29050	113-126	9	115
6	280	2084	29051-29063	127-139	10	115
7	281	2085	29064-29077	140-153	11	115
8	282	2086	29078-29091	154-167	12	115
9	283	2087	29092-29105	168-181	13	115
10	284	2088	29106-29119	182-195	14	115
11	285	2089	29120-29133	196-209	15	115
12	286	2090	29134-29147	210-223	16	115
13	287	2091	29148-29161	224-237	17	115
14	288	2092	29162-29175	238-251	18	115
15	289	2093	29176-29189	1-14	1	116
16	290	2094	29190-29203	15-28	2	116
17	291	2095	29204-29217	29-42	3	116
18	292	2096	29218-29231	43-56	4	116
19	293	2097	29232-29245	57-70	5	116
20	294	2098	29246-29259	71-84	6	116
21	295	2099	29260-29273	85-98	7	116
22	296	2100	29274-29287	99-112	8	116
23	297	2101	29288-29301	113-126	9	116
24	298	2102	29302-29314	127-139	10	116
25	299	2103	29315-29328	140-153	11	116
26	300	2104	29329-29342	154-167	12	116
27	301	2105	29343-29356	168-181	13	116
28	302	2106	29357-29370	182-195	14	116
29	303	2107	29371-29384	196-209	15	116
30	304	2108	29385-29398	210-223	16	116
31	305	2109	29399-29412	224-237	17	116

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November 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	306	2110	29413-29426	238-251	18	116
2	307	2111	29427-29440	1-14	1	117
3	308	2112	29441-29454	15-28	2	117
4	309	2113	29455-29468	29-42	3	117
5	310	2114	29469-29482	43-56	4	117
6	311	2115	29483-29496	57-70	5	117
7	312	2116	29497-29510	71-84	6	117
8	313	2117	29511-29524	85-98	7	117
9	314	2118	29525-29538	99-112	8	117
10	315	2119	29539-29552	113-126	9	117
11	316	2120	29553-29565	127-139	10	117
12	317	2121	29566-29579	140-153	11	117
13	318	2122	29580-29593	154-167	12	117
14	319	2123	29594-29607	168-181	13	117
15	320	2124	29608-29621	182-195	14	117
16	321	2125	29622-29635	196-209	15	117
17	322	2126	29636-29649	210-223	16	117
18	323	2127	29650-29663	224-237	17	117
19	324	2128	29664-29677	238-251	18	117
20	325	2129	29678-29691	1-14	1	118
21	326	2130	29692-29705	15-28	2	118
22	327	2131	29706-29719	29-42	3	118
23	328	2132	29720-29733	43-56	4	118
24	329	2133	29734-29747	57-70	5	118
25	330	2134	29748-29761	71-84	6	118
26	331	2135	29762-29775	85-98	7	118
27	332	2136	29776-29789	99-112	8	118
28	333	2137	29790-29803	113-126	9	118
29	334	2138	29804-29816	127-139	10	118
30	335	2139	29817-29830	140-153	11	118

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December 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	336	2140	29831-29844	154-167	12	118
2	337	2141	29845-29858	168-181	13	118
3	338	2142	29859-29872	182-195	14	118
4	339	2143	29873-29886	186-209	15	118
5	340	2144	29887-29900	210-223	16	118
6	341	2145	29901-29914	224-237	17	118
7	342	2146	29915-29928	238-251	18	118
8	343	2147	29929-29942	1-14	1	119
9	344	2148	29943-29956	15-28	2	119
10	345	2149	29957-29970	29-42	3	119
11	346	2150	29971-29984	43-56	4	119
12	347	2151	29985-29998	57-70	5	119
13	348	2152	29999-30012	71-84	6	119
14	349	2153	30013-30026	85-98	7	119
15	350	2154	30027-30040	99-112	8	119
16	351	2155	30041-30054	113-120	9	119
17	352	2156	30055-30067	127-139	10	119
18	353	2157	30068-30081	140-153	11	119
19	354	2158	30082-30095	154-167	12	119
20	355	2159	30096-30109	168-181	13	119
21	356	2160	20110-30123	182-195	14	119
22	357	2161	30124-30137	196-209	15	119
23	358	2162	30138-30151	210-223	16	119
24	359	2163	30152-30165	224-237	17	119
25	360	2164	30166-30179	238-251	18	119
26	361	2165	30180-30193	1-14	1	120
27	362	2166	30194-30207	15-28	2	120
28	363	2167	30208-30221	29-42	3	120
29	364	2168	30222-30235	43-56	4	120
30	365	2169	30236-30249	57-70	5	120
31	366	2170	30250-30263	71-84	6	120

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January 1981

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	1	2171	30264-30277	85-98	7	120
2	2	2172	30278-30291	99-112	8	120
3	3	2173	30292-30305	113-126	9	120
4	4	2174	30306-30318	127-139	10	120
5	5	2175	30319-30332	140-153	11	120
6	6	2176	30333-30346	154-167	12	120
7	7	2177	30347-30360	168-181	13	120
8	8	2178	30361-30374	182-195	14	120
9	9	2179	30375-30388	196-209	15	120
10	10	2180	30389-30402	210-223	16	120
11	11	2181	30403-30416	224-237	17	120
12	12	2182	30417-30430	238-251	18	120
13	13	2183	30431-30444	1-14	1	121
14	14	2184	30445-30458	15-28	2	121
15	15	2185	30459-30472	29-42	3	121
16	16	2186	30473-30486	43-56	4	121
17	17	2187	30487-30500	57-70	5	121
18	18	2188	30501-30514	71-84	6	121
19	19	2189	30515-30528	85-98	7	121
20	20	2190	30529-30542	99-112	8	121
21	21	2191	30543-30556	113-126	9	121
22	22	2192	30557-30569	127-139	10	121
23	23	2193	30570-30583	140-153	11	121
24	24	2194	30584-30597	154-167	12	121
25	25	2195	30598-30611	168-181	13	121
26	26	2196	30612-30625	182-195	14	121
27	27	2197	30626-30639	196-209	15	121
28	28	2198	30640-30653	210-223	16	121
29	29	2199	30654-30667	224-237	17	121
30	30	2200	30668-30681	238-251	18	121
31	31	2201	30682-30695	1-14	1	122

APPENDIX C

LANDSAT-2 DOCUMENTS ISSUED THIS REPORT PERIOD

APPENDIX C

LANDSAT-2 DOCUMENTS ISSUED THIS REPORT PERIOD

No.	Document No.	
1	1N20-LS-266	Landsat Operational Statistics dated 2 October 1979
2	1N20-LS-2-268	Landsat-2 Inoperative Yaw Flywheel dated 15 November 1979
3	1N20-LS-2 & 3-270	Subsidence of MSS Anomaly in Landsats 2 and 3 dated 14 September 1979

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INTRODUCTION

This is the 8th report in a continuing series of documents issued at launch, quarterly to July 1979, and semi-annual thereafter, to present flight performance analyses of the Landsat-3 spacecraft. The previously issued documents are:

Document No.	Title	Date
78SDS4203	Landsat-3 Launch and Flight Activation Evaluation Report 5 to 9 March 1978, through Orbit 50 and Orbit Adjust Operation.	17 March 1978
78SDS4216	Landsat-1, Landsat-2, and Landsat-3 Flight Evaluation Report, 23 January 1978 to 23 April 1978	3 May 1978
78SDS4232	Landsat-2 and Landsat-3 Flight Evaluation Reports, 23 April 1978 to 23 July 1978	1 August 1978
78SDS4250	Landsat-2 and Landsat-3 Flight Evaluation Report 23 July 1978 to 23 October 1978	1 November 1978
79SDS4201	Landsat-2 and Landsat-3 Flight Evaluation Report, 23 October 1978 to 23 January 1979	1 February 1979
79SDS4227	Landsat-2 and Landsat-3 Flight Evaluation Report 23 January 1979 to 23 April 1979	1 June 1979
79SDS4242	Landsat-2 and Landsat-3 Flight Evaluation Report, 23 April 1979 to 23 July 1979	1 August 1979

This report contains analysis of flight performance for Orbits 6860 to 9611 for Landsat 3.

SECTION 1

SUMMARY

LANDSAT-3 OPERATIONS

SECTION 1

SUMMARY LANDSAT-3 OPERATIONS

The Landsat-3 spacecraft was launched from the Western Test Range on 5 March 1978 at 064:17:54:00.551 GMT. The launch and orbital injection phase of the spacecraft were nominal and deployment of the spacecraft followed predictions.

All systems performed normally until Orbit 41, 8 March 1978, when cell 4 of the "B" COMSTOR would not load and verify properly. Subsequent orbits would not verify and dummy commands "000" were used in cell 4 until 18 March 1978, when cell 4 changed to all "ones." The "B" COMSTOR was then taken out of operational use until Orbit 1897 (19 June 1978) when it was activated for processing spacecraft commands after a test for its stability.

The ECAM halted on 4 May 1978 due to a fixed core checksum error. It again halted on 31 May 1978 when core location 0403 (octal) contained a discrepancy. Neither error affects spacecraft operation. The onboard checksum value for ECAM has been changed to accommodate the core errors and ECAM operation has been normal since then.

The RBV Camera 1 had intermittent white level saturation during an RBV image which was first detected in Orbit 55, 9 March 1978. It was more prevalent in the first 5% of occasional images. Operational use of the RBV was not interrupted.

The Band 5 sensors are continuously contaminated by gas molecules and output response declines with molecular build-up. The gas molecules are removed by periodic outgassing cycles The Band 5 sensors also have a long term sensor decline as measured by initial measurements after outgassing. Response at turn off in Orbit 5410 was only 0.67 the initial value at launch.

On 11 July 1978, sensor 25 showed no output when Band 5 was turned ON after the seventh outgas cycle. Only sensor 26 is active in Band 5.

Band 5 was turned off in Orbit 5410 on 28 March 1979 during the investigation of the MSS late line start anomaly and has remained off to the end of this report period.

In late August 1978, processed MSS data showed occasional late line starts. The anomaly increased in frequency in September 1978, but after a switch-to-scan monitor source B was not seen between October 1978 and January 1979. In January and February 1979, the anomaly began appearing again. In late March 1979, intermittent burst of late line starts became severe enough to disrupt processing. Several tests were made in March and April 1979 without success in identifying the anomaly cause. From early April to late July 1979 the anomaly has been infrequent. Beginning in late July the late line start anomaly increased. At the beginning of September 1979 the MSS was configured to Inverter A, Shutter source A, and Scan Monitor source A with subsequent improvement in late line start occurrence. From September 1979 to January 1980 late line start occurred at sporadic intervals. Beginning in January 1980 late line starts were increasing.

In early December 1978, data from Brazil and from processing the MSS data revealed extra scan monitor pulses occurring as early line starts or extra end of line codes (4 black, 4 white pixels) in the scene data. They occur only over magnetic anomalies, i.e., Brazil and Africa, at a low incidence rate. Landsat-1 and Landsat-2 had similar occurrences.

The RMP2 (Ball Bearing Gryo) input current increased and returned to normal. RMP 1 (Gas Bearing Gyro) was turned on in Orbit 6207 (24 May 1979) and enabled in Orbit 6220 on 25 May 1979. RMP2 rundown tests were normal indicating RMP2 can serve as a backup to RMP1.

During a playback of WBVTR-1 in Orbit 6351 on 4 June 1979, the MSS data suddenly became noisy, with MFSE counts of about 2000. Operation with RBV data was normal. WBVTR-1 was returned to service for RBV data only, during Orbit 6701 on 29 June 1979, and operates satisfactorily in that capacity.

The rear scanner was first erratic in a single Orbit 7294 (10 August 1979). It was erratic for scattered short intervals between 31 October 1979 to 19 November 1979. In Orbit 8718 (19 November 1979) the rear scanner was disabled and the spacecraft controlled by the single forward scanner. The rear scanner is being monitored and continues to show widely separated burst of erratic output signal. It can be used in the event of an emergency.

The spacecraft continues to perform its mission satisfactorily (except as qualified in above text) with MSS, RBV, DSC, and both Wideband Telemetry Systems in use. Table 1-1 shows cumulative on-orbit payload system performance.

Table 1-1. In-Orbit Payload Systems Performance-Launch thru Orbit 9555 (1/19/80), Landsat-3

RBV	Total Scenes Imaged	73,784
	Total Area Imaged (million sq. n mi.	644
	ON TIME (hr.)	637
	ON/OFF Cycles	5,829
	% Real Time Images	94
	% Recorded Images	6
MSS	Total Scenes Imaged	132,680
	Total Area Imaged (million sq. n mi.)	1,174
	ON TIME (hr.)	1,567
	ON/OFF Cycles	10,367
	% Real Time Images	81
	% Recorded Images	19
DCS	Messages at OCC	575,554
	Users	31
	ON TIME (hr.)	16,437
WPA-1	ON TIME (hr.)	763
	ON/OFF Cycles	4,882
WPA-2	ON TIME (hr.)	1,428
	ON/OFF Cycles	7,558
WBVTR-1	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	Time Head-Tape Contact (hr.)	173
	Cycles Head-Tape Contact	2,562
	ON TIME (hr.)	230
WBVTR-2	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	MFSE Count in P/B	~ 8
	Time Head-Tape Contact (hr.)	419
	Cycles Head-Tape Contact	6,968
	ON TIME (hr.)	512

SECTION 2

ORBITAL PARAMETERS

LANDSAT-3

SECTION 2

ORBITAL PARAMETERS

At the close of this report period, Landsat-3's ground track error was 1.206 NM East (longitude) at the equator.

High solar activity continues to affect spacecraft drag. Consequently, one plus X axis and two minus X axis orbit adjusts were performed to maintain the spacecraft's ground track.

Error in longitude as a function of time since launch, orbit maintenance burns and the Pitch Position Bias Program are shown in Figure 2-1.

Figure 2-2 shows the mean local time for the spacecraft's descending equatorial crossings. The mean local time crossings for Landsats-2 and -3 respectively are 09:28:19 MLT and 09:27:43 MLT.

Phasing relationships between Landsats-2 and -3 are shown in Figure 2-3. Landsat-3 leads Landsat-2 at their descending equatorial crossings by 45.58 GMT minutes.

The Brouwer Mean Orbital parameters for Landsat-3 are given in Table 2-1.

Appendix B provides the spacecraft orbit reference tables which correlate calender day, flight day, orbit, orbit day in cycle, and cycle number.

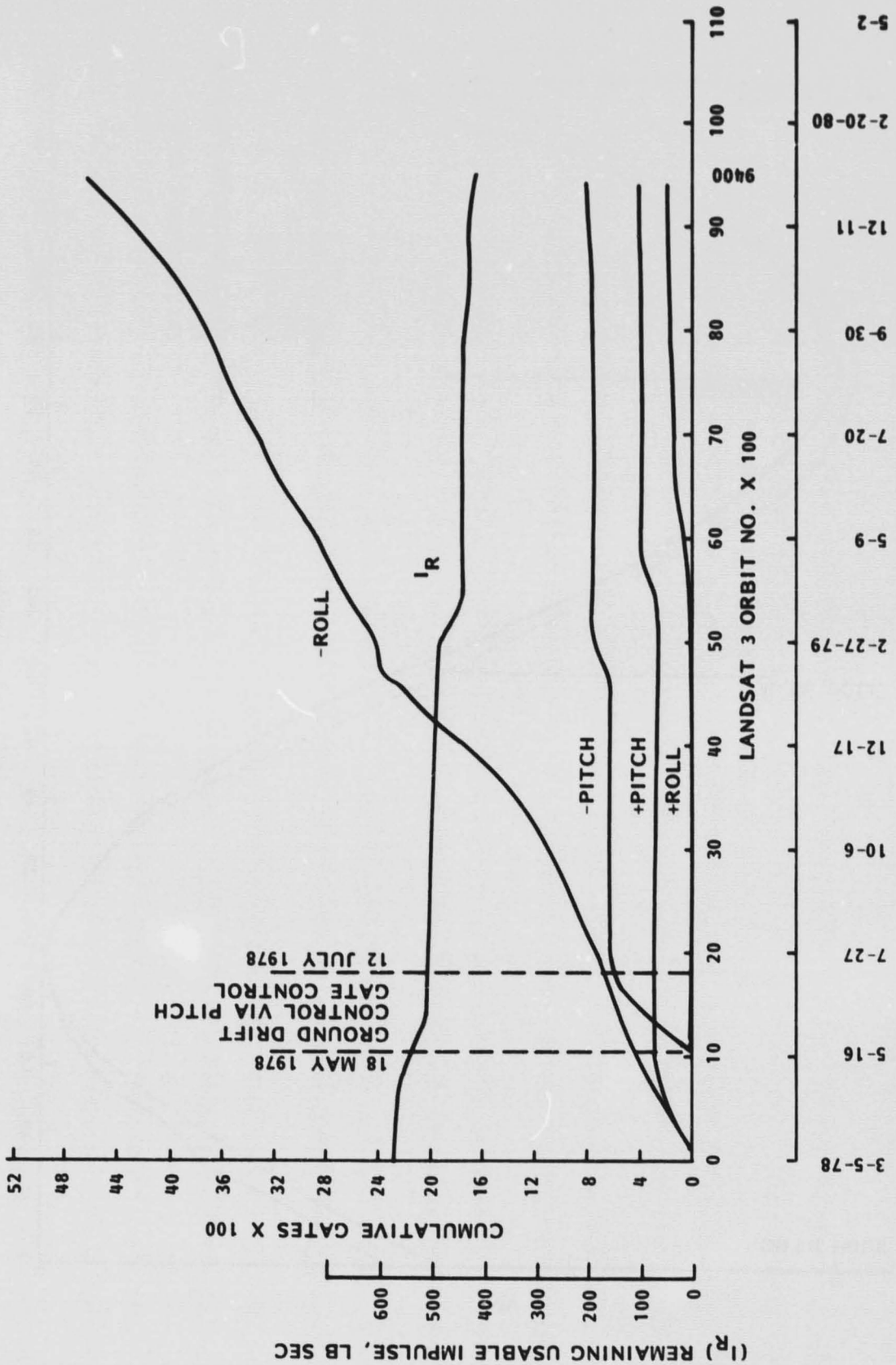


Figure 4-2. Landsat-3 Cumulative Gating History

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Figure 2-1. Landsat-3 Ground Track

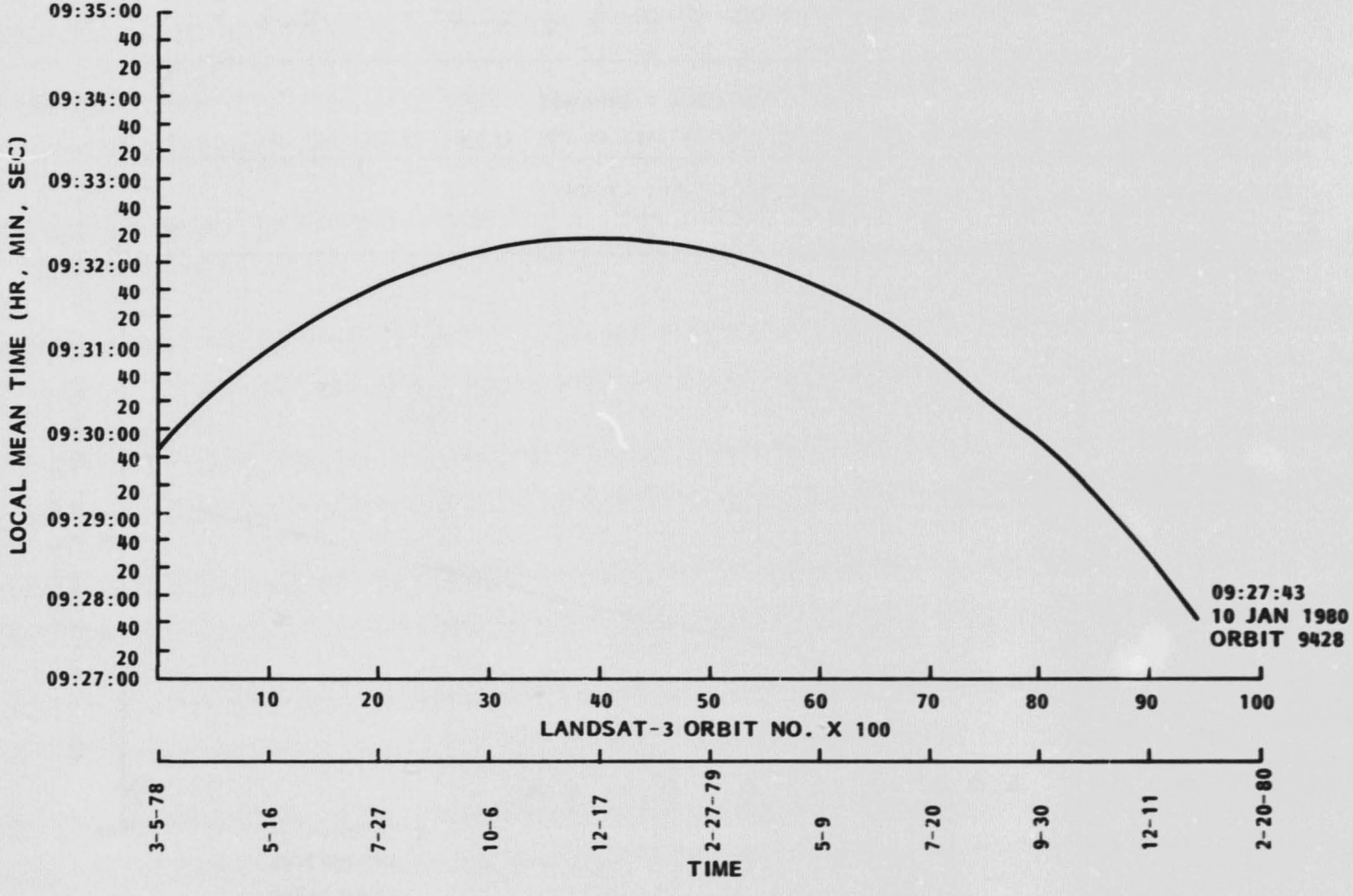


Figure 2-2. Local Mean Time at Descending Node, Landsat-3

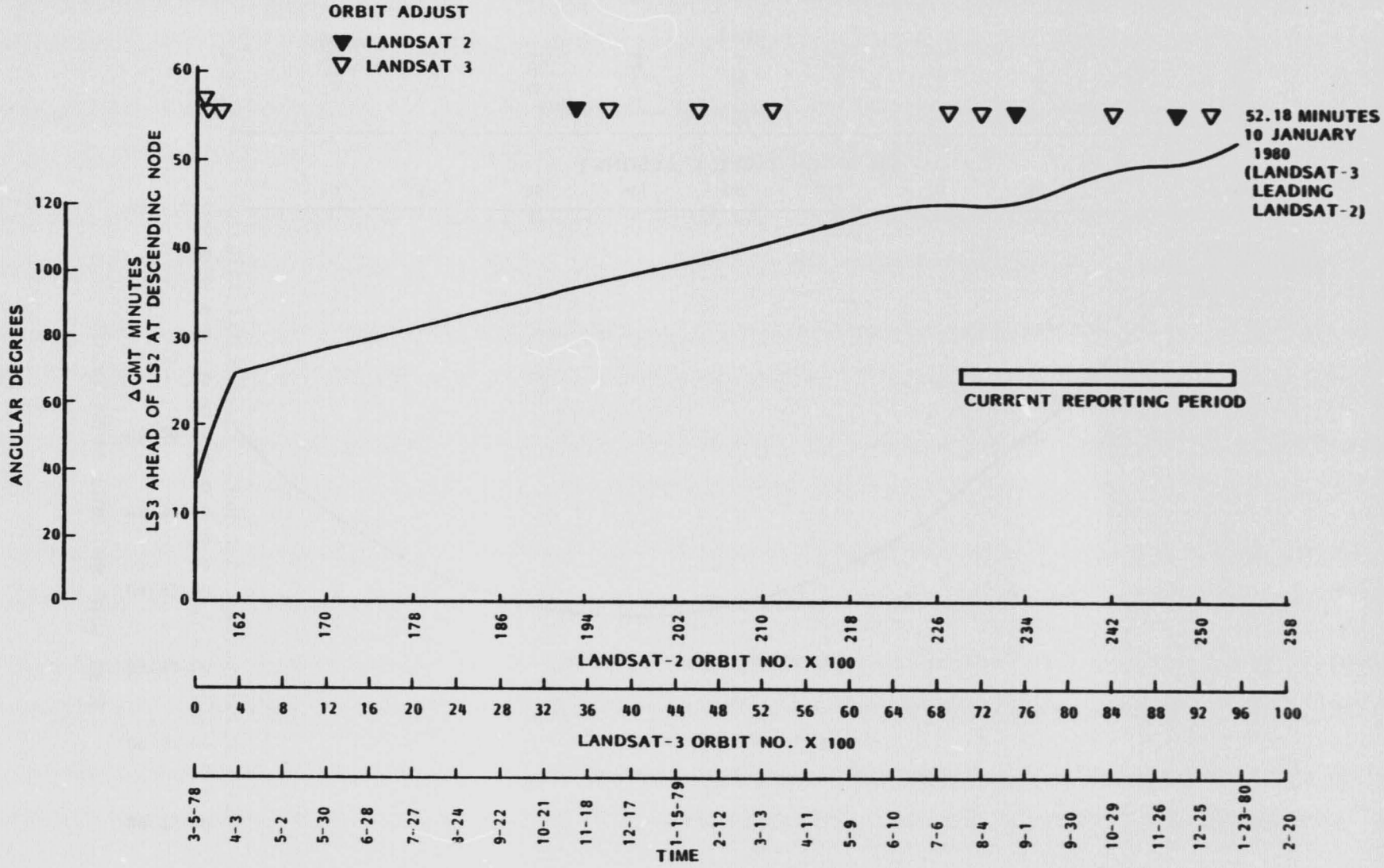


Figure 2-3. Drift in Angular Phasing Between Landsat-2 and Landsat-3

Table 2-1. Landsat-3 Brouwer Mean Orbital Parameters

Element / Date	Apogee (KM)	Perigee (KM)	Inclination (Deg.)	Semi-Major Axis (KM)	Eccentricity	Anomolistic Period (Min)	Nodal Period (Min)	Argument of Perigee (Deg)	Right Ascension (Deg)	Mean Anomaly (Deg)
Nominal	915.99	899.67	99.1487	7285.9970	0.001120	103.15516	103.269	302.5609	125.6747	98.1039
5 Mar 1978[1]	913.96	897.30	99.1348	7283.7988	0.001143	103.10848	103.2	306.5555	125.6244	94.3356
14 Mar 1978[2]	916.67	898.83	99.1249	7285.9149	0.001225	103.15341	103.26	258.6162	133.8339	281.4021
20 Apr 1978	917.37	897.84	99.1213	7285.7685	0.001340	103.15031	103.266	154.0432	171.2200	25.7708
23 July 1978	916.56	898.66	99.1116	7285.7740	0.001228	103.15042	103.266	261.2939	263.2883	213.2205
23 Oct 1978	917.14	898.21	99.0994	7285.8163	0.001299	103.15184	103.266	14.6621	354.1226	56.7372
16 Jan 1979	917.92	897.60	99.0866	7285.9014	0.001395	103.15364	103.269*	136.6106	77.9191	35.4071
24 Apr 1979	916.79	898.47	99.0693	7285.7693	0.001257	103.15084	103.267	227.3165	174.3771	145.8921
23 July 1979	916.69	898.64	99.0612	7285.8090	0.001239	103.15168	103.267	348.2335	262.8420	28.8221
23 Oct 1979	917.20	897.74	99.0487	7285.6078	0.001336	103.14740	103.263	94.9445	353.1723	247.1584
10 Jan 1980	916.80	898.46	99.0362	7285.7747	0.001259	103.15095	103.267	235.5326	70.6187	332.6174

1. Post Launch.
2. After the sequence of phasing maneuvers completed in Orbit 115.
3. * Corrected since previous report.

SECTION 3

POWER SUBSYSTEM (PWR)

LANDSAT-3

SECTION 3

POWER SUBSYSTEM (PWR)

The Power Subsystem on Landsat-3 has performed satisfactorily throughout this report period.

The solar arrays continued to provide excess energy above spacecraft and payload requirements and are expected to support the Landsat-3 mission through 1981. The percentage degradation of the arrays is plotted as a function of days in orbit in Figure 3-1, along with the pre-launch predicted array degradation. The array degradation at the end of 22 months in orbit was 9.78%. The projected values of midday array current for the first year are plotted in Figure 3-2. Here the array current is adjusted for sun intensity and array degradation, as well as sun angle. Along with the same curve is plotted the actual telemetry values observed until the end of the current report period.

The battery packs on-line ranged from 7.55 to 9.96% depth of discharge (DOD) during this report period. Battery voltages have been maintained within suitable limits with Landsat-3 power management procedure, excess array energy being dissipated through auxiliary loads. Temperatures ranged from 16.80°C to 24.30°C during this report period.

The power subsystem electronics have performed well during this report period with all regulated voltages stable. Table 3-1 shows major subsystem parameters and Table 3-2 shows power subsystem telemetry for selected orbits. Some parameters in Table 3-1 may be slightly different from those in Table 3-2 because Table 3-1 uses a power management time span (night followed by day), whereas the time span used in Table 3-2 is the playback period from the NBR.

Figure 3-3 shows the actual and predicted variation in sun angle to orbit plane and solar panels for Landsat-3.

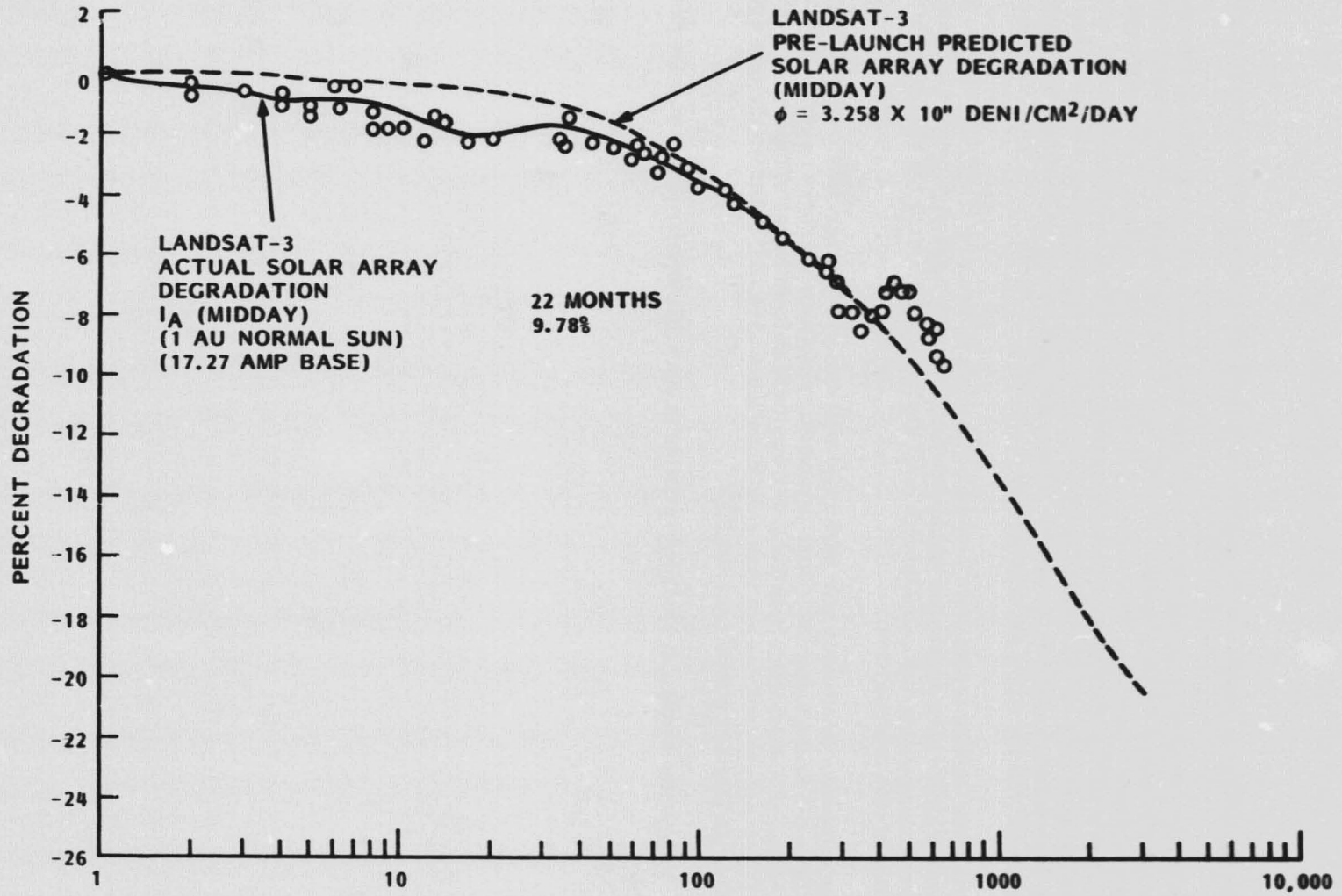


Figure 3-1. Landsat-3 I_A (Midday) Degradation vs Days

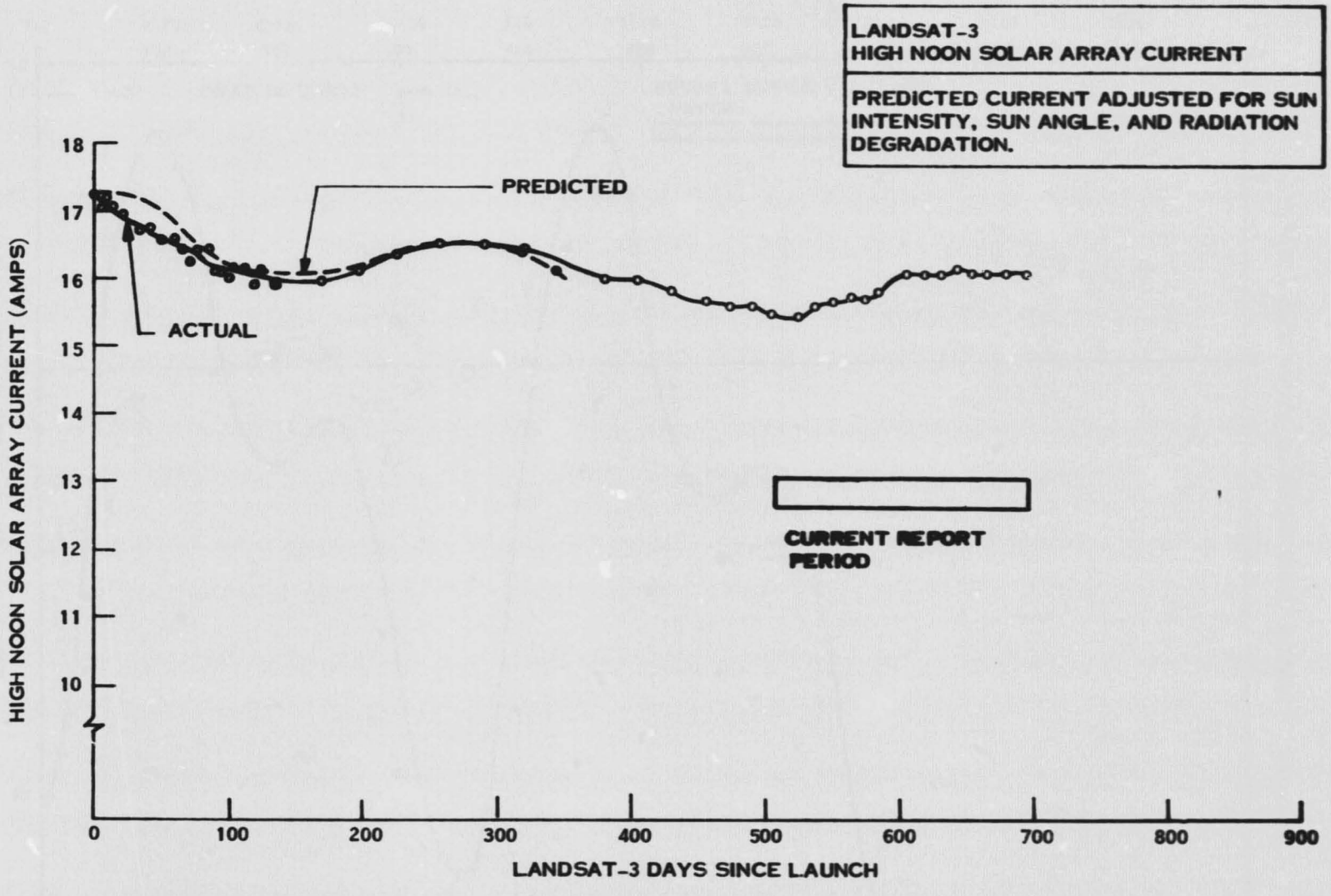


Figure 3-2. Landsat-3 Midday Solar Array Current

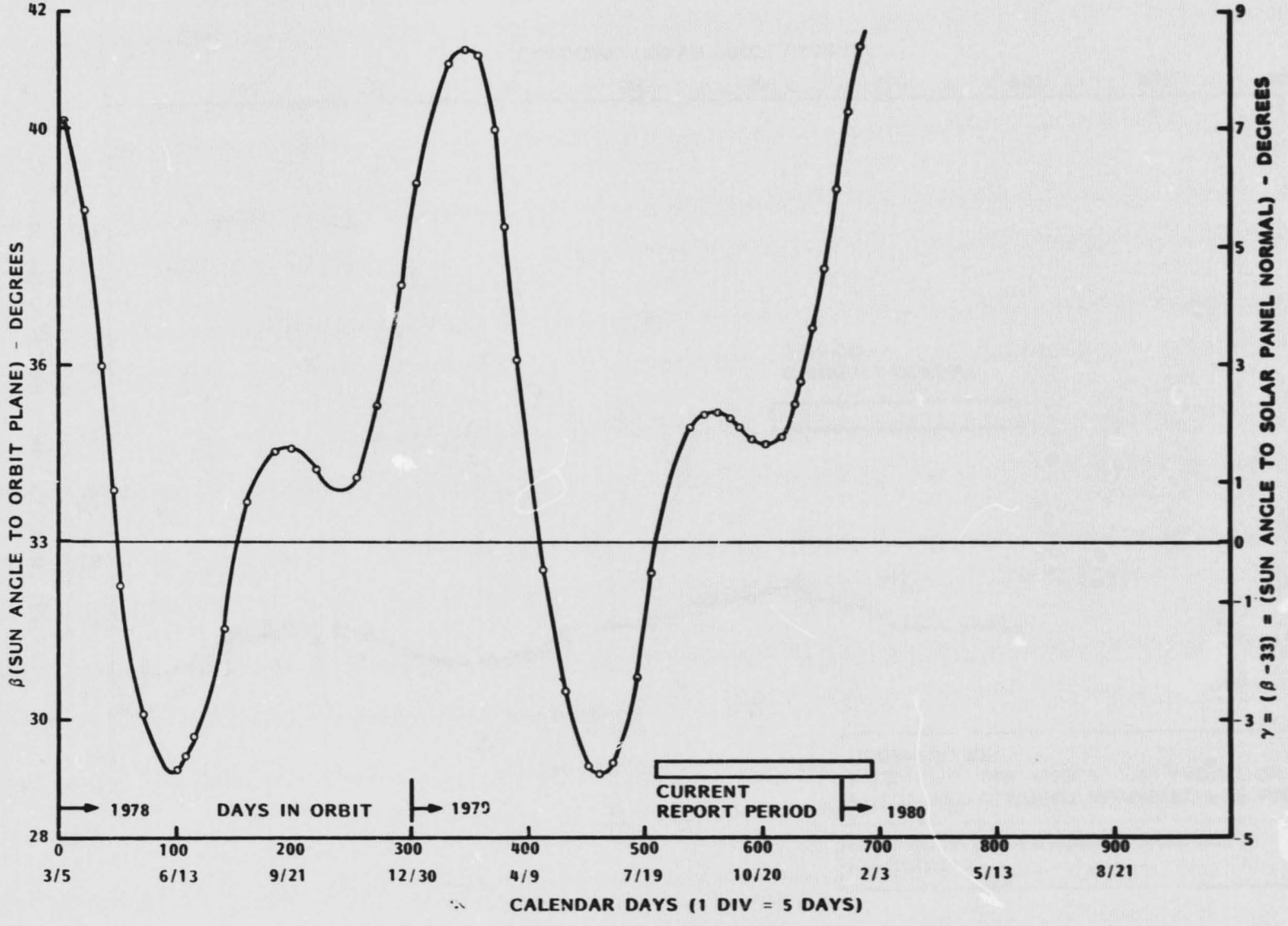


Figure 3-3. Landsat-3 Actual β (Orbit Plane) and α (Solar Panel) Sun Angles

Table 3-1. Landsat-3 Major Power Subsystem Parameters

Description	Orbit							
	65	1464	2711	4001	5262	7671	8602	9352
Batt 1 Max	32.41	32.92	32.92	33.00	32.83	33.17	33.51	33.09
2 Chge	32.41	32.83	32.92	33.00	32.83	33.17	33.51	33.00
3 Volt*	32.50	33.00	33.00	33.09	32.92	33.25	33.67	33.09
4	32.32	32.83	32.83	33.00	32.75	33.09	33.34	33.00
5	32.41	32.92	32.92	33.00	32.83	33.26	33.43	33.09
6	32.41	32.92	33.00	33.09	32.92	33.26	33.60	33.09
7	32.54	33.04	33.04	33.21	32.96	33.38	33.46	33.21
8	32.32	32.84	32.92	33.00	32.75	33.09	33.34	33.00
Average	32.41	32.91	32.94	33.05	32.85	33.21	33.48	33.07
Batt 1 End-of-Night	29.60	29.51	28.58	29.94	29.51	29.77	29.77	29.85
2 Volt*	29.51	29.51	28.49	29.85	29.51	29.77	29.68	29.77
3	29.75	29.67	28.75	30.09	29.67	29.92	29.92	30.00
4	29.51	29.51	28.49	29.85	29.51	29.68	29.68	29.77
5	29.60	29.60	28.66	29.94	29.60	29.85	29.77	29.85
6	29.60	29.60	28.58	29.94	29.51	29.85	29.77	29.85
7	29.76	29.68	28.75	30.10	29.68	29.93	29.93	30.01
8	29.51	29.43	28.94	29.85	29.43	29.68	29.68	29.77
Average	29.60	29.56	28.60	29.94	29.55	29.81	29.78	29.86
Batt 1 Chge	12.51	12.79	12.70	12.85	12.71	12.51	12.92	12.64
2 Share	11.79	12.43	11.90	12.33	11.88	11.96	12.21	12.21
3 (%)	11.64	11.90	12.16	11.82	11.75	11.96	12.33	11.98
4	12.31	12.16	12.50	12.06	12.31	12.37	12.31	12.03
5	14.25	13.17	13.65	13.71	13.89	13.32	13.33	14.05
6	12.54	12.77	12.30	12.38	12.60	12.63	12.81	12.51
7	12.84	12.40	12.63	12.48	12.69	12.30	12.12	12.48
8	12.11	12.39	12.17	12.37	12.16	12.96	11.96	12.09
Batt 1 Load	12.85	12.94	12.66	12.86	12.97	13.12	12.88	13.10
2 Share	11.94	12.28	11.73	12.04	11.73	12.09	12.07	12.14
3 (%)	11.99	12.53	12.77	12.64	12.89	13.16	13.07	13.06
4	12.06	12.33	11.97	11.66	11.51	11.34	11.30	10.98
5	13.88	12.96	12.84	12.82	12.62	12.62	11.81	12.45
6	11.97	12.34	13.40	13.86	14.36	14.36	14.12	14.59
7	12.80	12.63	12.37	11.99	11.75	11.76	11.94	11.86
8	12.51	11.99	12.26	12.12	12.17	11.55	11.81	11.83
Batt 1 Temp	15.70	16.67	16.86	19.31	17.98	18.45	19.37	19.57
2 in	14.31	16.20	15.82	18.68	16.53	17.26	18.33	18.61
3 (°C)	15.26	20.33	16.68	18.55	17.34	17.76	18.92	18.86
4	19.46	20.33	20.79	22.12	21.41	22.12	22.99	22.98
5	19.57	17.74	19.45	22.12	22.03	20.96	22.10	24.22
6	15.49	17.16	16.91	18.49	17.38	17.83	18.74	18.66
7	20.71	19.80	20.99	23.04	22.67	22.43	23.30	24.74
8	17.55	17.88	18.44	21.48	20.59	20.82	21.50	22.49
Average	17.26	17.86	18.24	20.47	19.49	19.71	20.66	21.26
S/C Reg Bus Pwr. (W)	148.90	151.90	150.43	164.00	132.06	132.59	160.15	146.86
Comp Load Pwr. (W) (P/O S/C Reg Bus Pwr)	0.00	5.89	5.39	5.39	5.39	0.000	0.000	0.000
P/L Reg Bus Pwr. (W)	14.30	10.60	30.14	27.69	11.52	14.82	30.88	11.61
C/D Ratio	1.26	1.44	1.06	1.13	1.14	1.18	1.28	1.10
Total Charge (A-M)	253.00	274.31	310.63	275.53	221.05	247.93	356.61	220.54
Total Discharge (A-M)	200.70	190.94	293.80	243.99	193.53	210.99	278.98	201.23
Solar Array (A-M)	1252.00	1132.00	1152.00	1183.50	1162.20	1114.3	1155.4	1167.8
S.A. Peak I (Amp)	16.08	16.93	16.85	17.29	16.93	16.32	16.93	17.20
Midday Array I (Amp)	17.38	16.05	16.14	16.49	15.97	15.53	16.49	16.05
Sun Angle (Deg) (γ)	7.40	- 3.77	1.64	3.43	5.69	2.14	1.08	6.69
Max R Pad Temp (°C)	58.40	59.60	59.60	+ 65.60	60.80	59.60	63.20	65.60
Min R Pad Temp (°C)	- 38.67	- 42.67	- 39.34	- 40.00	- 37.40	-38.67	-39.34	-37.40
Max L Pad Temp (°C)	53.84	53.07	54.61	+ 58.46	56.15	54.61	58.46	60.00
Min L Pad Temp (°C)	- 40.71	- 45.43	- 43.57	- 43.57	- 40.71	-42.86	-43.57	-41.43

* All Voltages are Negative

Table 3-2. Landsat-3 Power Subsystem Analog Telemetry (Average Value for Data Received in NBTR Playback)

Function	Description	Unit*	Orbit							
			56	1464	2711	4001	5261	7671	8602	9352
6001	Batt 1 Disc I	Amp	0.74	0.73	1.00	0.79	0.77	0.73	0.76	0.75
6002	2		0.69	0.70	0.94	0.75	0.73	0.70	0.73	0.73
6003	3		0.60	0.71	0.99	0.76	0.71	0.72	0.77	0.74
6004	4		0.73	0.70	0.96	0.72	0.71	0.66	0.67	0.66
6005	5		0.80	0.73	1.06	0.81	0.81	0.75	0.76	0.77
6006	6		0.64	0.69	0.98	0.78	0.73	0.75	0.78	0.76
6007	7		0.74	0.72	1.01	0.75	0.74	0.70	0.71	0.72
6008	8		0.72	0.68	0.98	0.75	0.73	0.66	0.70	0.70
6011	Batt 1 Chg I	Amp	0.62	0.63	0.59	0.62	0.34	0.44	0.58	0.45
6012	2		0.59	0.63	0.55	0.59	0.32	0.42	0.55	0.44
6013	3		0.62	0.59	0.57	0.57	0.31	0.42	0.55	0.43
6014	4		0.63	0.58	0.58	0.58	0.33	0.43	0.55	0.43
6015	5		0.72	0.61	0.63	0.66	0.37	0.47	0.60	0.50
6016	6		0.62	0.58	0.57	0.60	0.34	0.45	0.58	0.45
6017	7		0.66	0.59	0.59	0.60	0.34	0.43	0.54	0.45
6018	8		0.62	0.64	0.57	0.59	0.32	0.45	0.54	0.43
6021	Batt 1 Volt	VDC	31.06	31.50	31.25	31.59	31.53	31.58	31.84	31.43
6022	2		31.04	31.47	31.23	31.56	31.49	31.54	31.80	31.39
6023	3		31.18	31.60	31.26	31.69	31.62	31.67	31.93	31.53
6024	4		31.00	31.43	31.18	31.52	31.45	31.49	31.75	31.34
6025	5		31.09	31.52	31.27	31.61	31.55	31.60	31.85	31.45
6026	6		31.10	31.54	31.29	31.63	31.56	31.61	31.87	31.46
6027	7		31.24	31.66	31.41	31.75	31.68	31.73	31.98	31.58
6028	8		31.00	31.43	31.19	31.53	31.46	31.49	31.76	31.35
6031	Batt 1 Temp	DGC	15.79	16.71	16.92	19.22	18.20	18.37	19.51	19.49
6032	2		14.55	16.18	15.95	18.53	16.83	17.24	18.63	18.61
6033	3		15.33	17.07	16.72	18.46	17.59	17.85	19.03	18.88
6034	4		19.47	20.36	20.78	22.07	21.54	22.27	23.04	23.04
6035	5		19.58	17.81	19.45	22.06	22.15	21.07	22.15	24.28
6036	6		15.56	17.17	16.93	18.40	17.61	17.93	18.86	18.70
6037	7		20.71	19.83	21.01	22.99	22.79	22.67	23.38	24.90
6038	8		17.63	17.87	18.50	21.38	20.85	20.69	21.64	22.37
6040	Rt. Pad Temp	DGC	28.58	24.33	26.76	29.98	29.19	27.07	28.16	21.90
6041	Rt. Pad VM	VDC	34.03	34.75	34.43	34.67	34.70	35.46	35.68	34.54

6036	6		15.56	17.17	16.93	18.40	17.61	17.93	18.86	18.70
6037	7		20.71	19.83	21.01	22.99	22.79	22.67	23.38	24.90
6038	8		17.63	17.87	18.50	21.38	20.85	20.69	21.64	22.37
6040	Rt. Pad Temp	DGC	28.58	24.33	26.76	29.98	29.19	17.07	28.16	21.90
6041	Rt. Pad VM	VDC	34.03	34.75	34.43	34.67	34.70	35.46	35.68	34.54
6042	Rt. Pad VN	VDC	33.83	34.80	34.47	34.66	34.51	34.87	35.06	34.19
6044	Lt. Pad Temp	DGC	23.63	18.08	21.63	24.58	25.05	12.27	23.22	17.42
6045	Lt. Pad VF	VDC	34.05	34.76	34.44	34.67	34.66	34.84	35.03	34.54
6046	Lt. Pad VG	VDC	33.65	34.36	34.04	34.27	34.27	34.44	34.62	34.14
6050	S/C UR Bus V	VDC	31.26	31.76	31.50	31.79	31.74	31.76	32.04	31.53
6051	S/C RG Bus V	VDC	24.58	24.60	24.60	24.61	24.61	24.61	24.62	24.62
6052	Aux Reg AV	VDC	23.52	23.52	23.52	23.52	23.52	23.52	23.52	23.52
6053	Aux Reg BV	VDC	23.52	23.52	23.52	23.52	23.52	23.52	23.52	23.52
6054	Solar I	Amp	16.73	15.89	15.85	16.18	15.70	15.10	15.82	15.53
6055	S/C RG Bus I	Amp	T	T	T	T	T	T	T	T
6056	S/C RG Bus I	Amp	6.08	6.20	6.24	6.65	5.36	5.31	5.73	5.82
6058	PC Mod T1	DGC	20.30	21.67	20.95	23.25	21.09	21.65	22.74	22.65
6059	PC Mod T2	DGC	18.44	19.99	19.49	21.47	20.12	20.43	21.47	21.44
6070	P/L RG Bus V	VDC	24.64	24.66	24.66	24.66	24.66	24.66	24.66	24.65
6071	P/L UR Bus V	VDC	31.27	31.76	31.51	31.79	31.76	31.74	32.05	31.55
6072	P/L RG Bus I	Amp	T	T	T	T	T	T	T	T
6073	P Aux AV	VDC	23.63	23.65	23.70	23.69	23.64	23.66	23.68	23.66
6074	P Aux BV	VDC	23.68	23.68	23.72	23.70	23.70	23.69	23.70	23.69
6075	PR Mod T1	DGC	17.36	18.61	18.45	20.05	18.65	18.75	19.89	19.93
6076	PR Mod T2	DGC	16.77	18.21	17.95	19.61	18.36	18.49	19.94	19.68
6079	Fuse Blow V	VDC	24.66	24.68	24.69	24.69	24.68	24.69	24.69	24.69
6080	Shunt 1 I	Amp	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
6081	2		0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
6082	3		0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
6083	4		0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
6084	5		0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
6085	6		0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
6086	7		0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
6087	8		0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
6100	P/L RG Bus I	Amp	0.58	0.43	1.23	0.97	0.46	0.56	0.80	0.46
Total No.	Major Frames	Frm	372	785	388	785	382	491	786	468

* All Voltages are Negative
T - Telemetry OFF

SECTION 4

ATTITUDE CONTROL SUBSYSTEM (ACS)
LANDSAT-3

SECTION 4

ATTITUDE CONTROL SYSTEM (ACS)

Since launch, Landsat-3's Attitude Control System has consistently maintained correct spacecraft attitude.

In order to conserve freon, Pitch and Roll pneumatic gating is minimized by Pitch Position Bias programs that are implemented during spacecraft night. Stored Pitch Position Bias sequences maintain Pitch flywheel speed below the gating threshold while Roll wheel momentum is unloaded, as required, by two to three night scheduled momentary enables. When it is necessary to unload Roll wheel momentum in daylight, real time momentary enables are commanded, provided payloads are OFF.

Solar activity was unusually high during this reporting period and frequent PPB adjustments were required to maintain low Pitch flywheel speeds. Similarly, more real-time momentary enables were commanded during satellite days to unload the roll wheel.

Table 4-1 lists the PPB sequences implemented during this reporting period and Figures 4-1 and 4-2 summarize Landsat-3's pneumatic gating patterns since launch.

Flywheel duty cycles remain low (3 to 8 percent).

As shown in Figures 4-3 and 4-4, both SADS continue to track the sun. However, since Orbit 1870 (17 July 1978) the LSAD's motor winding voltage has been gradually increasing (ref. PIR 14N0-L3-261). Friction buildup in the second and/or third stage (Wabble Gear) gear reduction is suspected.

LSAD average motor winding voltage has been fluctuating between 8.34 volts and 7.40 volts during this reporting period. LSAD average motor winding voltage vs. time since launch is plotted in Figure 4-5. Data during this report period does not follow the second order polynominal or linear regression prediction and indicates the LSAD may be returning to normal. LSAD performance, however, will be monitored closely in the future.

Landsat-3 was switched to the Single Scanner mode in Orbit 8718 (20 November 1979), due to increasing incidents of momentary Rear Scanner 'glitches' causing momentary high pitch error and small error in Roll (ref. PIR 14N0-L3-265 and PIR 14N0-L3-269), Figures 4-6 and 4-7.

Three orbit adjusts were conducted (see Section 7) with ACS in Orbit Adjust mode and with pneumatics enabled. Spacecraft attitude was successfully maintained during each procedure.

Other than the anomalies discussed earlier, systems' temperatures, pressures, voltages and currents have all been normal as shown in the telemetry summary, Tables 4-2, 4-3 and 4-4.

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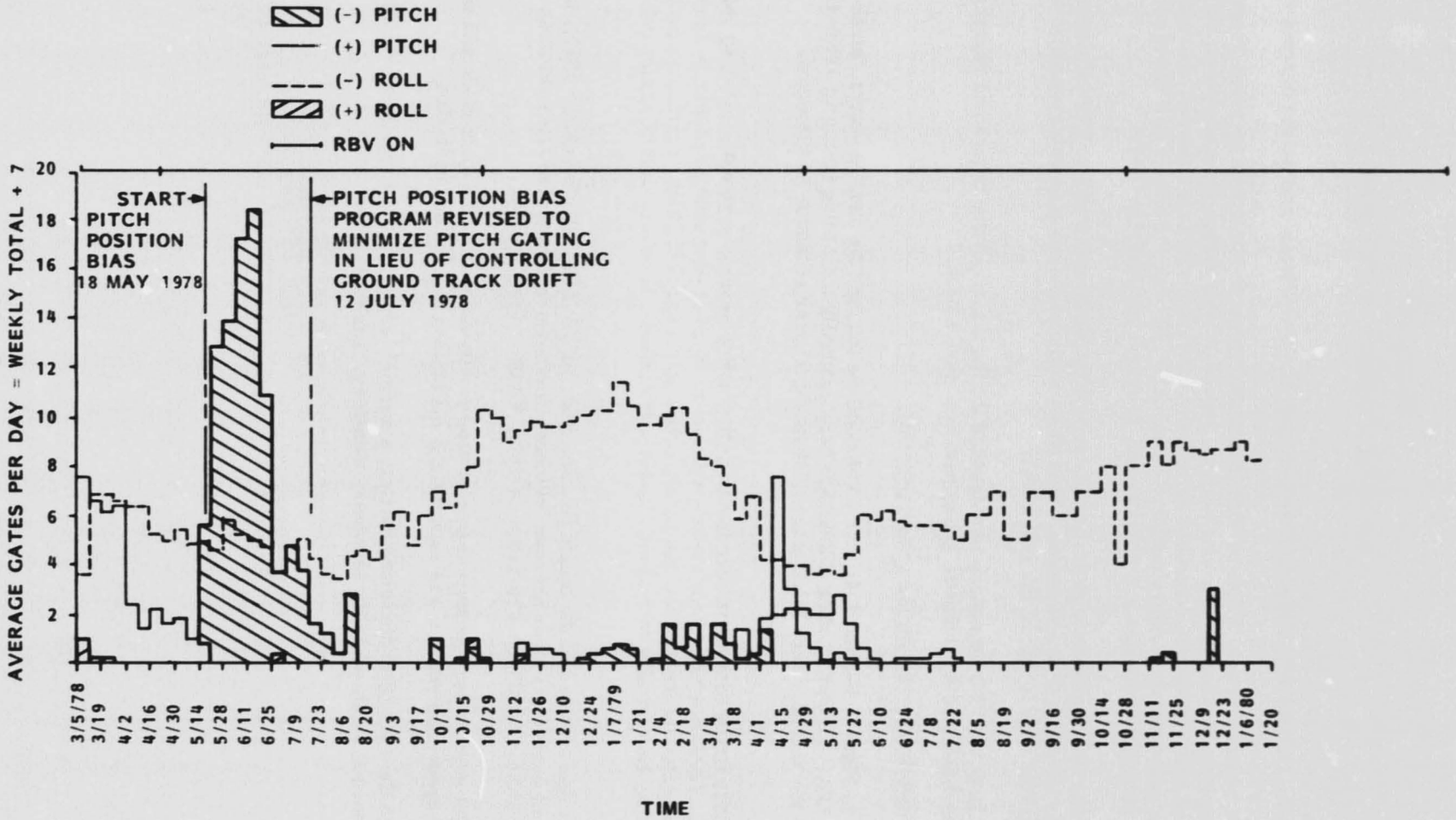


Figure 4-1. Landsat-3 Gating Frequency vs Time

Figure 4-2. Landsat-3 Cumulative Gating History

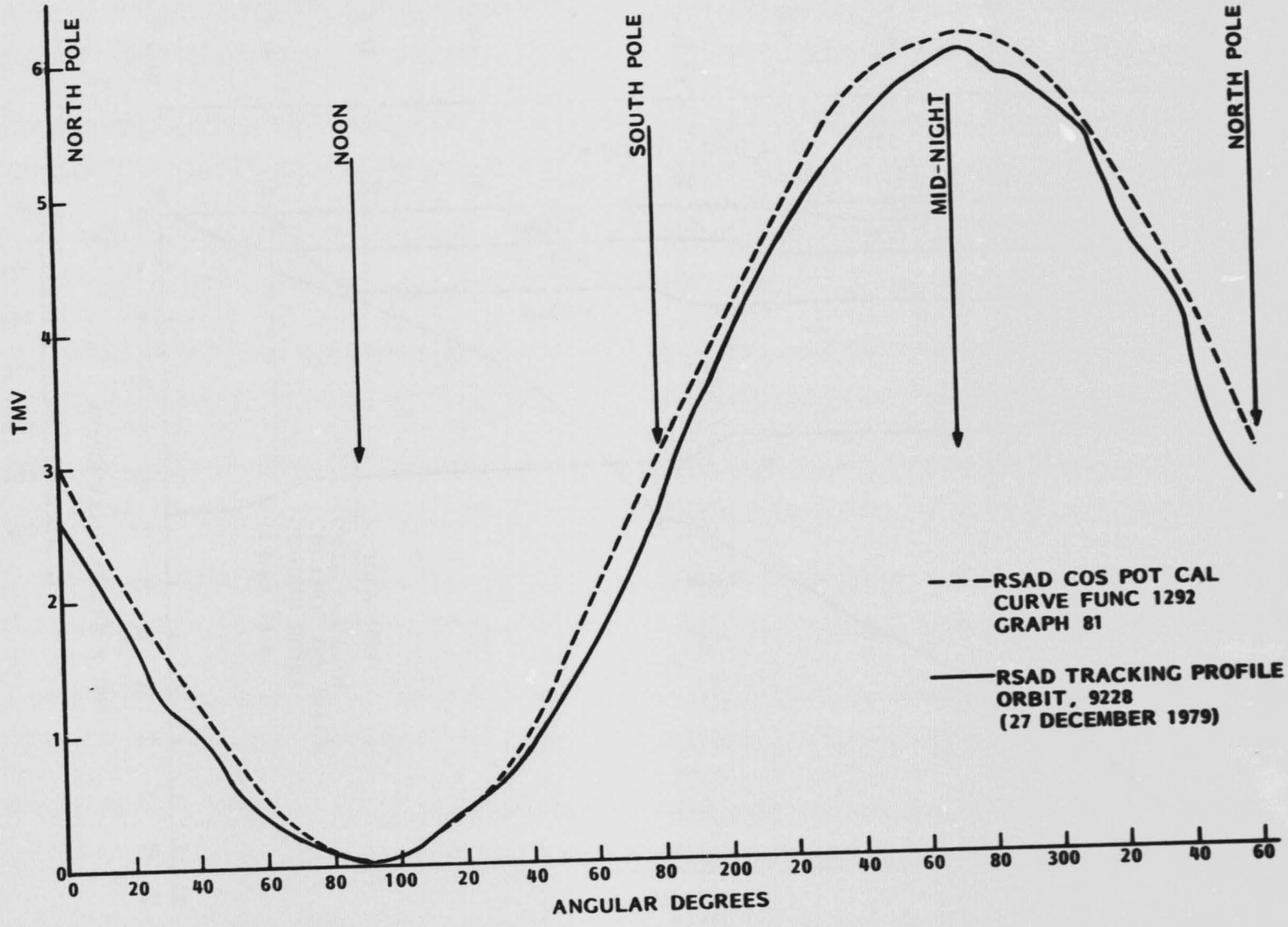


Figure 4-3. Landsat-3 RSAD Tracking Profile

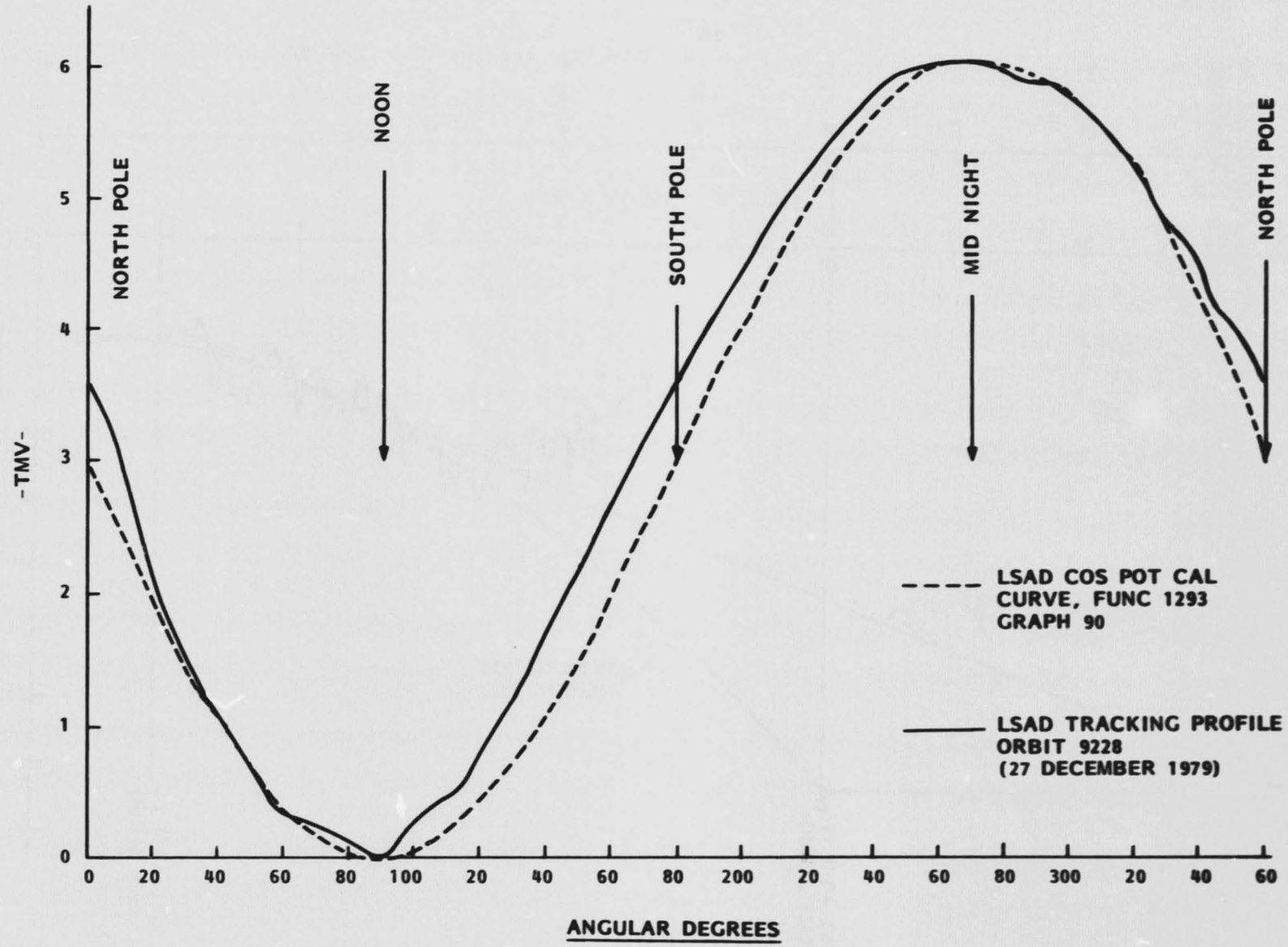


Figure 4-4. Landsat-3 LSAD Tracking Profile

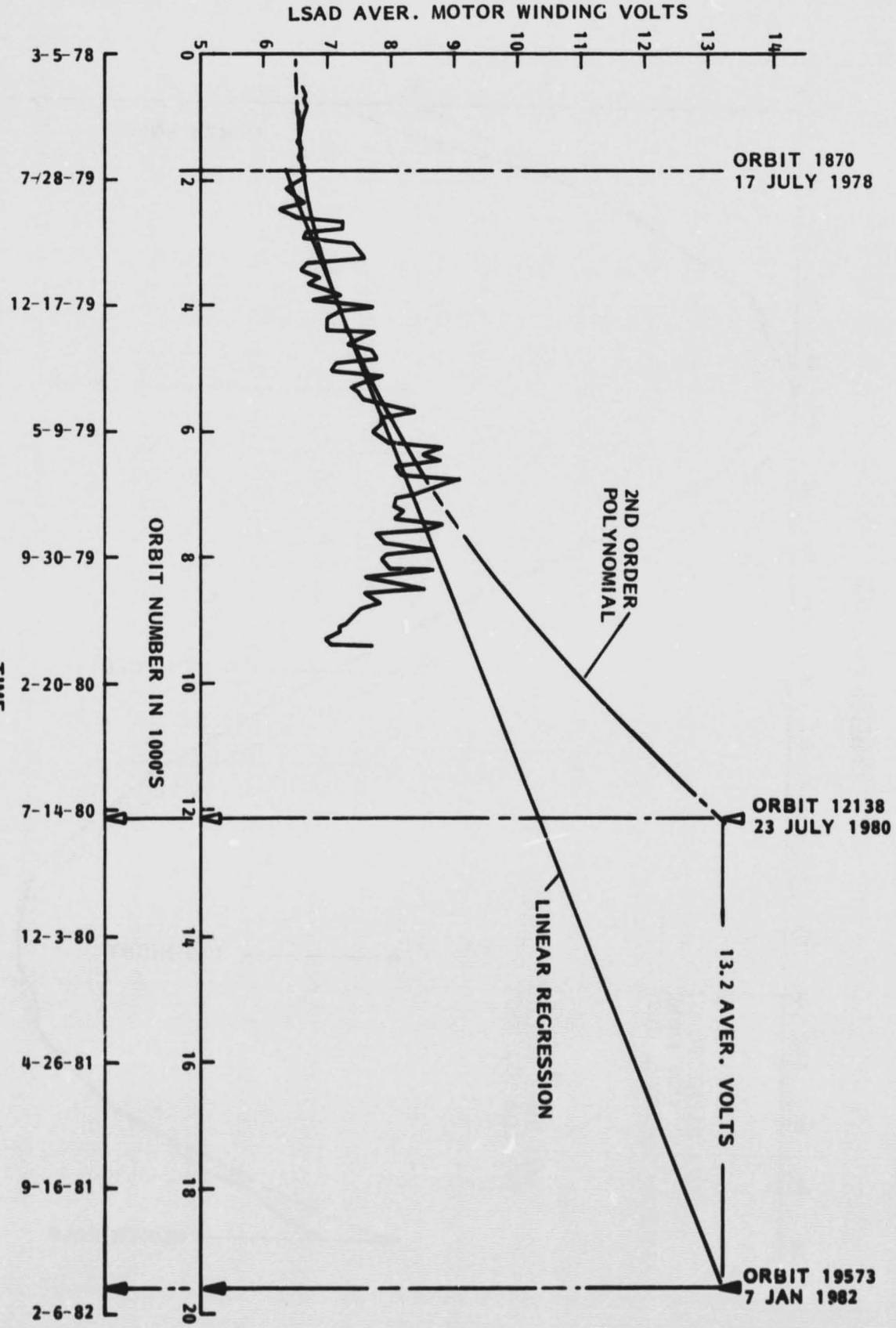


Figure 4-5. Landsat-3 LSAD Motor Winding Volts vs Time

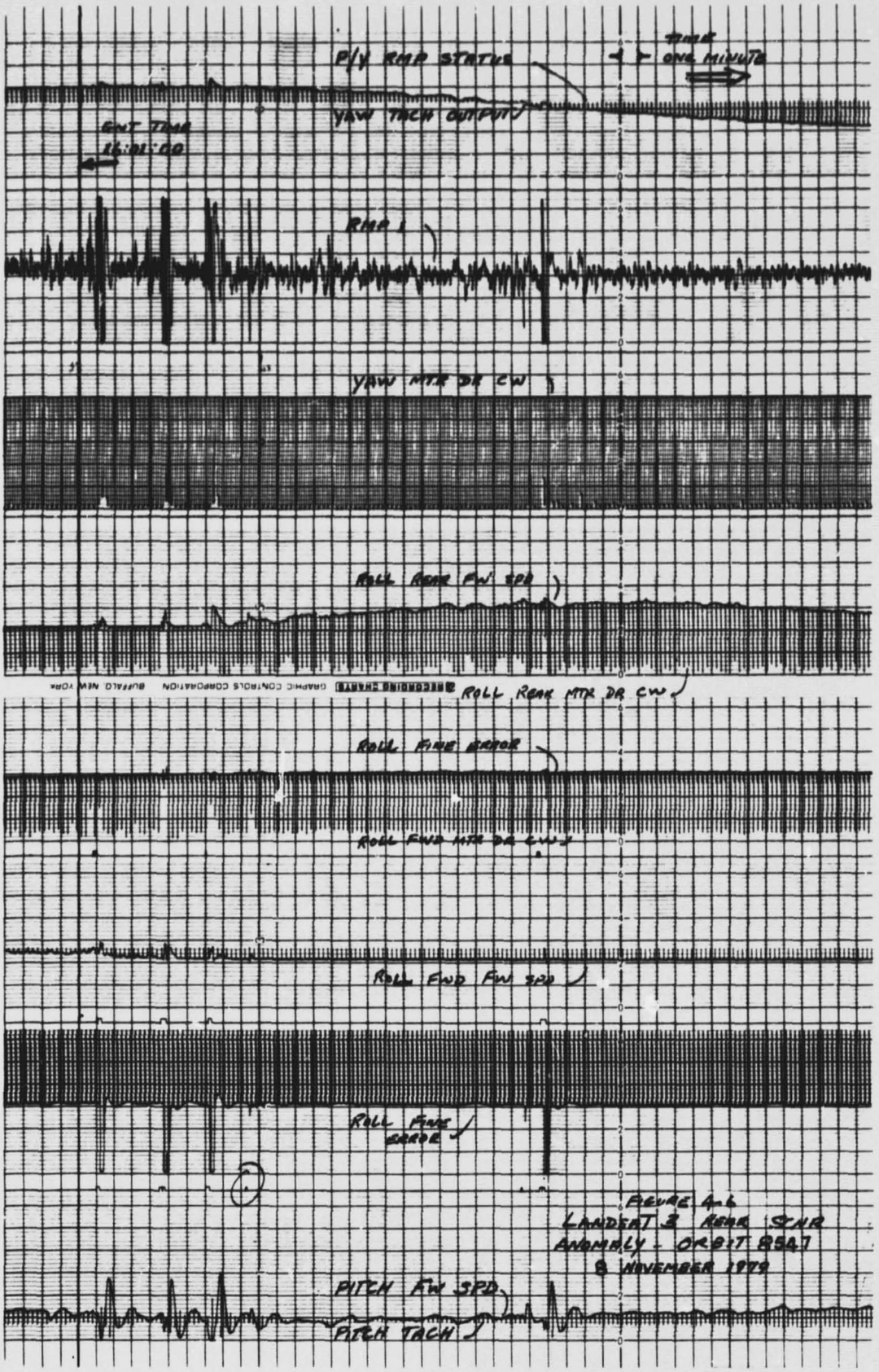


Figure 4-6. Landsat-3 Rear Scanner Anomaly - Orbit 8547, 8 November 1979

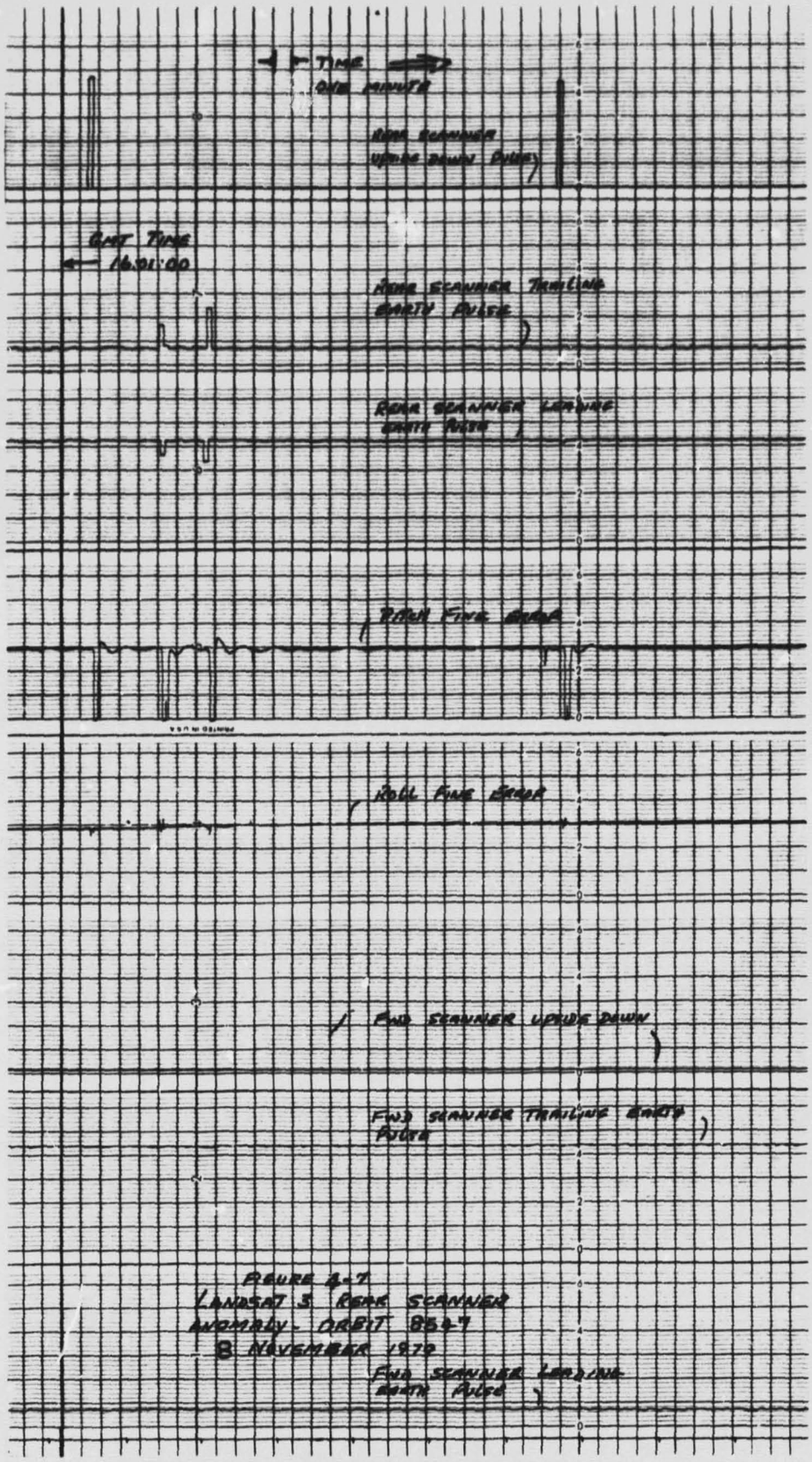


Figure 4-7. Landsat-3 Rear Scanner Anomaly - Orbit 8547, 8 November 1979

Table 4-1. Landsat-3 Pitch Position Bias, Pneumatic Gating Summary

Period		Repetitive Implementation Sequence			Minutes Positioned About Satellite Midnight, T_o		Resulting Average Number of Pitch Gates
From Orbit	To Orbit	N_o	$N_o + 1$	$N_o + 2$	From	To	
6177 22 May 79	7280 9 Aug 79	+2.0	+2.0	+2.0	$T_o - 7.0$	$T_o + 7.0$	.08 (-P)
7281 9 Aug 79	7530 27 Aug 79	+2.0	+2.0	+2.0	$T_o - 10.0$	$T_o + 9.0$	.09 (+P)
7531 27 Aug 79	7571 30 Aug 79	+2.0	+2.0	+2.0	$T_o - 9.0$	$T_o + 6.0$	.17 (-P)
7572 30 Aug 79	7655 5 Sept 79		Same		$T_o - 8.0$	$T_o + 5.0$	1.02 (-P)
7656 5 Sept 79	8314 22 Oct 79		Same		$T_o - 6.0$	$T_o + 5.0$	.99 (+P)
8315 22 Oct 79	8368 26 Oct 79		Bias Out				1.0 (-P)
8369 26 Oct 79	8438 31 Oct 79	+0.6	+0.6	+0.6	$T_o - 7.0$	$T_o + 7.0$	1.4 (-P)
8439 31 Oct 79	8546 8 Nov 79	+0.6	+0.6	+0.6	$T_o - 8.0$	$T_o + 9.0$	1.8 (-P)
8547 8 Nov 79	8564 9 Nov 79	+0.6	+0.6	+0.6	$T_o - 7.0$	$T_o + 7.0$	2.0 (-P)
8565 9 Nov 79	8578 10 Nov 79	+0.6	+0.6	+0.6	$T_o - 6.0$	$T_o + 6.0$	2.0 (-P)
8579 10 Nov 79	8600 12 Nov 79		Bias Out				1.9 (-P)
8601 12 Nov 79	8616 13 Nov 79	-0.6	-0.6	-0.6	$T_o - 5.0$	$T_o + 5.0$	1.91 (-P)
8617 13 Nov 79	8701 19 Nov 79	-0.6	-0.6	-0.6	$T_o - 10.0$	$T_o + 10.0$	3.83 (-P)
8702 19 Nov 79	8840 29 Nov 79	-0.6	-0.6	-0.6	$T_o - 8.0$	$T_o + 7.0$	.8 (+P)
8841 29 Nov 79	9063 15 Dec 79	-0.6	-0.6	-0.6	$T_o - 5.0$	$T_o + 5.0$	1.0 (+P)
9064 15 Dec 79	9426 10 Jan 80	-0.6	-0.6	-0.6	$T_o - 4.0$	$T_o + 4$	.08 (+P)
9427 10 Jan 80	9611 23 Jan 80	-0.6	-0.6	-0.6	$T_o - 3.0$	$T_o + 3.0$	.08 (-P)

Table 4-2. Landsat-3 ACS Voltages and Currents

Func	Name	Units	Orbits							
			50	1431	2700	4001	5152	7671	8602	9352
1081	RMP 1 MTR Volts	VDC	F	F	F	F	F	32.85	32.82	32.83
1082	RMP 1 MTR Current	Amps	F	F	F	F	F	.21	.21	.21
1080	RMP 1 Supply Volts	VDC	F	F	F	F	F	23.59	23.56	23.56
1091	RMP 2 MTR Volts	VDC	30.50	30.57	30.56	30.51	30.54	F	F	F
1092	RMP 2 MTR Current	Amps	0.11	0.11	0.11	0.11	0.11	F	F	F
1090	RMP 2 Supply Volts	VDC	23.66	23.65	23.63	23.60	23.61	F	F	F
1220	SAD RT MTR WNDNG Volts	VDC	4.64	4.05	4.10	4.09	4.15	4.26	4.11	4.20
1240	SAT LT MTR WNDNG Volts	VDC	6.30	6.50	7.09	7.20	7.26	8.16	7.57	7.06
1227	SAT RT -15 VDC Conv.	VDC	15.48	15.48	15.48	15.48	15.48	15.48	15.49	15.48
1247	SAT LT -15 VDC Conv.	VDC	14.93	14.94	14.94	14.94	14.94	14.94	14.94	14.94
1056	CLB $\pm$ 6 VDC	TMV	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35
1055	CLB $\pm$ 10 VDC	TMV	2.88	2.88	2.87	2.88	2.87	2.87	2.87	2.87
1057	CLB Power Supply Volts	TMV	2.94	2.90	2.90	2.90	2.89	2.88	2.88	2.88

Table 4-3. Landsat-3 ACS Attitude Errors and Driver Duty Cycles

Func	Name	Units	Orbit							
			051	1431	2700	4001	5152	7671	8602	9352
1041	Pitch Fine Error	DGC	- 0.13	- 1.27*	0.40	- 0.64	- 0.18	- .48	- .01	- .03
1043	Pitch Flywheel Speed	RPM	-199.25	311.67	151.87	- 8.81	131.48	-129.10	216.06	- 45.67
1038	Pitch Mtr Drvr CCW	PCT	5.04	2.02	4.83	6.20	2.89	7.39	2.89	5.86
1039	Pitch Mtr Drvr CW	PCT	2.92	5.41	6.85	6.19	4.77	6.08	5.44	4.80
1030	Roll Fine Error	DEG	- 0.13	- 0.19	- 0.18	- 0.14	- 0.17	- .07	- .09	- .09
1027	Roll Rear Flywheel SPD	RPM	765.38	801.37	804.05	772.98	770.35	705.50	741.37	734.41
1026	Roll Fwd Flywheel SPD	RPM	761.61	746.75	744.37	748.07	730.17	734.76	739.66	752.50
1022	Roll Rear Mtr Drvr CCW	PCT	1.05	0.04	0.59	0.74	0.57	.91	.56	1.53
1025	Roll Rear Mtr Drvr CW	PCT	6.94	6.00	7.12	6.97	6.56	5.65	5.56	6.23
1023	Roll Fwd Mtr Drvr CCW	PCT	1.03	0.01	0.33	0.78	0.72	.76	.26	1.24
1024	Roll Fwd Mtr Drvr Cw	PCT	7.49	5.30	6.83	7.72	7.32	7.61	7.61	9.22
1035	Yaw Tach	RPM	24.29	2.80	5.44	- 15.53	13.27	- 46.52	66.67	111.75
1033	Yaw Mtr Drvr CW	PCT	2.90	1.52	2.43	2.18	1.95	2.11	2.01	3.04
1034	Yaw Mtr Drvr CCW	PCT	2.72	1.42	2.00	2.00	1.76	2.44	1.60	2.33
1221	SAD Right Tach	D/M	3.22	4.06	4.00	3.98	3.97	3.99	3.97	3.96
1241	SAD Left Tach	D/M	3.75	3.76	3.76	3.75	3.73	3.71	3.73	3.72

* Pitch Position Bias Implemented in this Orbit

Table 4-4. Landsat-3 ACS Subsystem Temperature and Pressure Averages

Func	Name	Units	Orbit							
			50	1431	2700	4001	5152	7671	8602	9352
1084	RMP 1 Gyro Temperature	DGC	18.78	22.30	23.20	25.47	23.94	54.14	55.73	55.50
1094	RMP 2 Gyro Temperature	DGC	77.52	77.99	78.00	78.00	78.00	26.39	28.39	28.51
1222	SAD RT MTR HSNG Temp	DGC	21.32	26.71	27.31	29.33	27.49	30.78	32.54	31.85
1242	SAD LT MTR HSNG Temp	DGC	26.72	30.10	31.52	33.82	32.78	32.47	34.09	34.17
1223	SAD RT MTR WNDNG Temp	DGC	19.94	25.37	25.68	27.54	25.43	28.66	30.42	29.38
1243	SAD LT MTR WNDNG Temp	DGC	27.03	29.47	30.97	33.29	32.29	32.67	33.92	33.76
1228	SAD RT HSG Pressure	PSI	6.93	7.00	7.00	7.01	6.87	6.81	6.81	6.75
1248	SAD LT HSG Pressure	PSI	7.31	7.31	7.25	7.26	5.69	5.65	5.63	5.62
1007	FWD Scanner MTR Temp	DGC	21.59	24.35	26.30	29.97	27.36	28.76	31.48	31.45
1016	Rear Scanner MTR Temp	DGC	22.64	24.86	26.17	29.06	27.22	29.03	31.62	31.65
1003	FWD Scanner Pressure	PSI	7.27	6.19	5.98	5.84	5.46	4.91	4.82	4.72
1012	Rear Scanner Pressure	PSI	6.93	7.14	7.04	6.88	6.69	6.39	6.29	6.19
1212	Gas Tank Pressure	PSI	1999.29	1963.84	1937.44	1912.31	1787.44	1687.50	1665.96	1612.44
1210	Gas Tank Temperature	DGC	19.70	23.31	24.54	27.14	25.51	26.42	28.48	28.50
1213	Manifold Pressure	PSI	59.21	59.98	59.45	59.50	59.82	59.95	60.10	60.02
1211	Manifold Temperature	DGC	19.80	23.42	24.68	27.31	25.68	26.60	28.67	28.71
1059	CLG Power Sup Card Temp	DGC	32.36	34.73	36.07	38.20	37.02	37.07	38.75	38.81
1260	THO1 EBP	DGC	23.15	25.68	27.50	29.87	28.90	27.59	29.64	29.83
1261	THO2 EBP	DGC	18.71	21.90	23.49	25.87	24.56	25.42	27.50	27.47
1262	THO3 EBP	DGC	16.64	20.93	22.00	24.26	22.65	26.29	28.23	27.93
1263	THO1 STS	DGC	- 1.25	0.14	2.44	3.92	3.41	3.23	5.89	5.29
1264	THO2 STS	DGC	- 10.75	- 9.90	- 7.24	- 6.43	- 6.29	- 7.65	- 3.70	- 5.31
1265	THO3 STS	DGC	5.33	4.66	9.62	10.75	11.71	8.85	12.96	12.50
1266	THO4 STS	DGC	- 11.52	- 7.46	- 3.79	- 1.23	- 2.46	- 2.46	1.26	.20
1267	THO5 STS	DGC	6.37	6.39	9.91	10.51	10.80	9.55	12.78	12.45
1224	SAD R FSST	DGC	31.58	40.59	40.37	41.79	39.78	40.52	42.63	40.30
1244	SAD L FSST	DGC	40.97	41.54	42.91	44.14	44.15	43.54	44.40	44.55

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

LANDSAT-3

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

The Command Clock subsystem operated nominally in this report period.

The spacecraft clock was reset during Orbit 8218 on 16 October, 1979 from 2059 ms fast to 50 ms fast; and again during Orbit 9292 on 1 January, 1980 from 1736 ms fast to 264 ms slow.

Figures 5-1, 5-2, and 5-3 show clock performance since launch.

Table 5-1 shows typical telemetry values since launch. All telemetry values are nominal.

Table 5-1. Command Clock Telemetry Summary

Fun	Name	Units	Orbit							
			34	1431	2711	4001	5152	7692	8572	9442
8005	Pri. Power Supply Temp	DGC	41.25	42.97	42.81	44.04	43.09	44.32	44.60	44.00
8006	Red. Power Supply Temp	DGC	41.59	43.37	43.18	44.41	43.75	44.81	45.03	44.42
8007	Pri. Osc. Temp	DGC	30.28	30.77	30.34	31.95	31.11	32.00	32.22	31.96
8008	Red. Osc. Temp	DGC	31.21	31.61	31.15	32.53	31.62	32.53	32.62	32.30
8009	Pri. Osc. Output	TMV	1.05	1.06	1.06	1.08	1.07	1.08	1.08	1.08
8010	Red. Soc. Output	TMV	1.24	1.25	1.25	1.25	1.25	1.25	1.26	1.25
8011	100 KHz	TMV	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13
8012	10 KHz	TMV	3.07	3.07	3.06	3.07	3.06	3.07	3.07	3.07
8013	2.5 KHz	TMV	2.95	2.95	2.95	2.95	2.95	2.95	2.95	2.95
8014	400 Hz	TMV	4.45	4.45	4.45	4.45	4.45	4.45	4.45	4.45
8015	Pri. + 4V Power Supply	VDC	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
8016	Red. + 4V Power Supply	VDC	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97
8017	Pri. + 6V Power Supply	VDC	2.28	2.27	2.27	2.27	2.27	2.27	2.27	2.27
8018	Red. + 6V Power Supply	VDC	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
8019	Pri. - 6V Power Supply	VDC	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25
8020	Red. - 6V Power Supply	VDC	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23
8021	Pri. - 23V Power Supply	VDC	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70
8022	Red. - 23V Power Supply	VDC	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80
8023	Pri. - 29V Power Supply	VDC	5.42	5.43	5.43	5.43	5.43	5.43	5.43	5.43
8024	Red. - 29V Power Supply	VDC	5.38	5.40	5.39	5.40	5.40	5.40	5.40	5.40
8101	CIU A - 12V	VDC	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95
8102	CIU B - 12V	VDC	3.98	3.98	3.99	3.99	3.99	3.99	3.99	3.99
8103	CIU A - 5V	VDC	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12
8104	CIU B - 5V	VDC	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
8105	CIU A Temp.	DGC	22.53	22.01	22.02	23.04	22.63	23.28	23.40	23.30
8106	CIU B Temp.	DGC	20.36	19.96	19.98	20.83	20.48	21.02	21.13	21.00
8201	Receiver RF-A Temp.	DGC	28.70	28.79	28.48	30.06	29.10	30.20	30.23	29.66
8202	Receiver RF-B Temp.	DGC	21.74	21.76	21.30	23.37	22.11	23.54	23.60	22.78
8203	D MOD A Temp	DGC	36.00	36.55	36.35	37.59	36.94	38.00	37.84	37.46
8204	D MOD B Temp	DGC	25.27	25.50	25.21	26.79	25.91	27.16	26.98	26.48
8205	Receiver A AGC	DBM	-84.89	-86.05	-88.71	-92.78	-86.70	-87.85	-89.56	-86.19
8206	Receiver B AGC	DBM	F	F	F	F	F	F	F	F
8207	Amp. A Output	TMV	2.41	2.35	2.44	2.39	2.48	2.47	2.30	2.49
8208	Amp. B Output	TMV	F	F	F	F	F	F	F	F
8209	Freq. Shift Key A Out	TMV	1.09	1.08	1.08	1.08	1.09	1.08	1.08	1.08
8210	Freq. Shift Key B Out	TMV	F	F	F	F	F	F	F	F
8211	Amp. A Output	TMV	1.12	1.10	1.11	1.10	1.12	1.10	1.10	1.10
8212	Amp. B Output	TMV	F	F	F	F	F	F	F	F
8215	D MOD A - 15V	TMV	5.01	5.02	5.02	5.02	5.02	5.02	5.02	5.02
8216	D MOD B - 15V	TMV	F	F	F	F	F	F	F	F
8217	Regulator A - 10V	TMV	5.52	5.52	5.52	5.52	5.52	5.52	5.52	5.52
8218	Regulator B - 10V	TMV	F	F	F	F	F	F	F	F
8311	ECAM Memory Temp	DGC	16.18	15.43	15.22	16.79	15.93	16.43	16.99	16.80
8312	ECAM Pwr. Sup Temp	DGC	19.59	16.80	16.43	18.99	17.70	18.64	19.31	18.84

F = Unit OFF

Figure 5-1. Landsat-3 Clock Drift from GMT

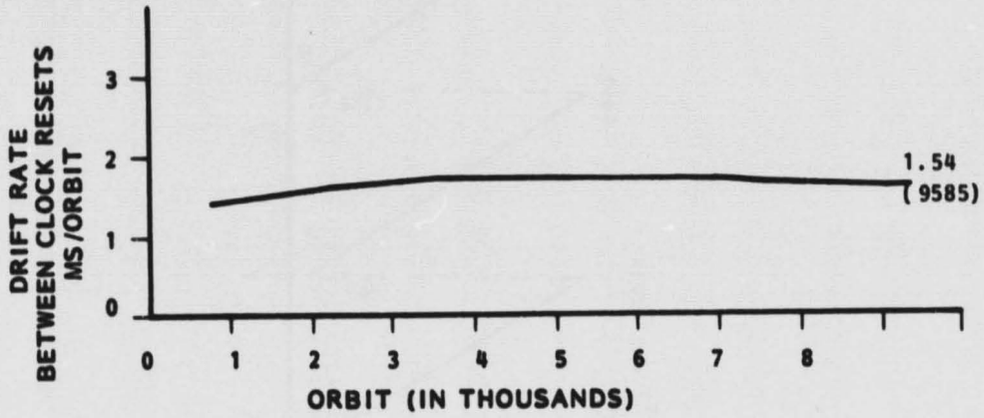


Figure 5-2. Landsat-3 Cumulative Clock Drift

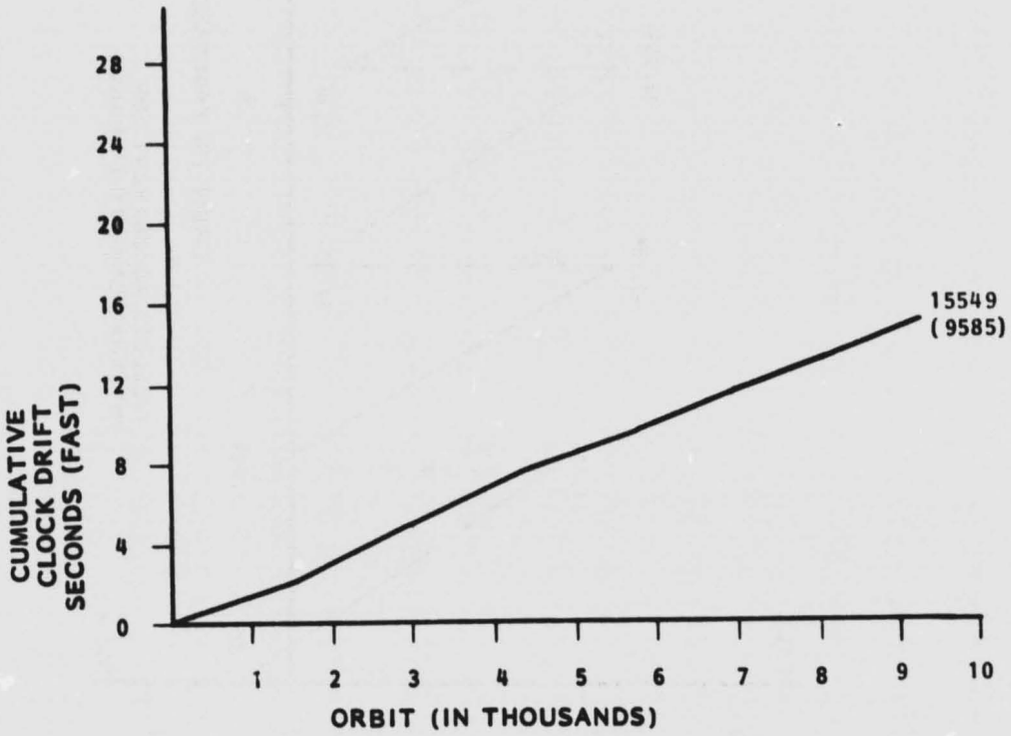


Figure 5-3. Landsat-3 Clock Drift Rate

SECTION 6

TELEMETRY SUBSYSTEM (TLM)

LANDSAT-3

SECTION 6

TELEMETRY SUBSYSTEM (TLM)

The TLM Subsystem has operated nominally during this report period. Table 6-1 shows typical telemetry values since launch. All are nominal. Landsat-3 has redundant capability and "A" units have been operated since launch. Telemetry format "0" (fast verify) is in use.

Table 6-1. TMP Telemetry Values

Func	Name	Units	Orbit							
			33	1431	2711	4001	5152	7671	8602	9352
09001	Power Supply A +5V	TMV	4.70	4.69	4.69	4.68	4.68	4.69	4.68	4.68
09002	Power Supply B +5V	TMV	F	F	F	F	F	F	F	F
09003	Power Supply A +15V	TMV	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
09004	Power Supply B +15V	TMV	F	F	F	F	F	F	F	F
09005	Power Supply A -6V	TMV	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65
09006	Power Supply B -6V	TMV	F	F	F	F	F	F	F	F
09007	Power Supply A -15V	TMV	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97
09008	Power Supply B -15V	TMV	F	F	F	F	F	F	F	F
09009	Power Supply A -22V	TMV	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
09010	Power Supply B -22V	TMV	F	F	F	F	F	F	F	F
09011	Power Supply A +6V	TMV	4.82	4.82	4.82	4.82	4.81	4.82	4.82	4.81
09012	Power Supply B +6V	TMV	F	F	F	F	F	F	F	F
09013	Power Supply A Temp	DGC	26.66	26.85	27.81	30.38	30.88	28.86	30.30	31.65
09014	Power Supply B Temp	DGC	25.10	23.50	24.56	27.50	28.06	25.83	27.42	28.94
09015	Temperature C	DGC	19.19	19.48	20.60	23.74	24.28	21.98	23.61	25.27
09100	Reflected Power	DBM	7.61	7.79	6.94	7.05	6.31	7.24	7.20	6.36
09101	XMTR A -20 VDC	TMV	3.87	3.90	3.90	3.90	3.90	3.90	3.90	3.90
09102	XMTR B -20 VDC	TMV	F	F	F	F	F	F	F	F
09103	XMTR A - Temp	DGC	21.01	17.73	19.16	21.49	22.43	20.13	21.02	23.43
09104	XMTR B - Temp	DGC	21.89	18.60	20.05	22.43	23.45	21.08	21.99	24.50
09105	XMTR A Power Output	DBM	28.72	28.86	28.90	28.96	28.90	28.65	28.67	28.78
09106	XMTR B Power Output	DBM	F	F	F	F	F	F	F	F

F = Unit OFF

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

LANDSAT-3

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

Three ground track maintenance orbit adjusts were conducted during this report period and in all instances the Orbit Adjust Subsystem performed normally.

Figures 7-1 thru 7-12 show the OA and ACS system's performance during the orbit adjust maneuvers.

Table 7-1 summarizes all of the OAS system's operations since launch.

Table 7-2 shows typical telemetry values for the OAS during its quiescent periods. Variations in thrust chamber temperatures shown in Table 7-2 are consistent with variations in sun intensity and sun angle.

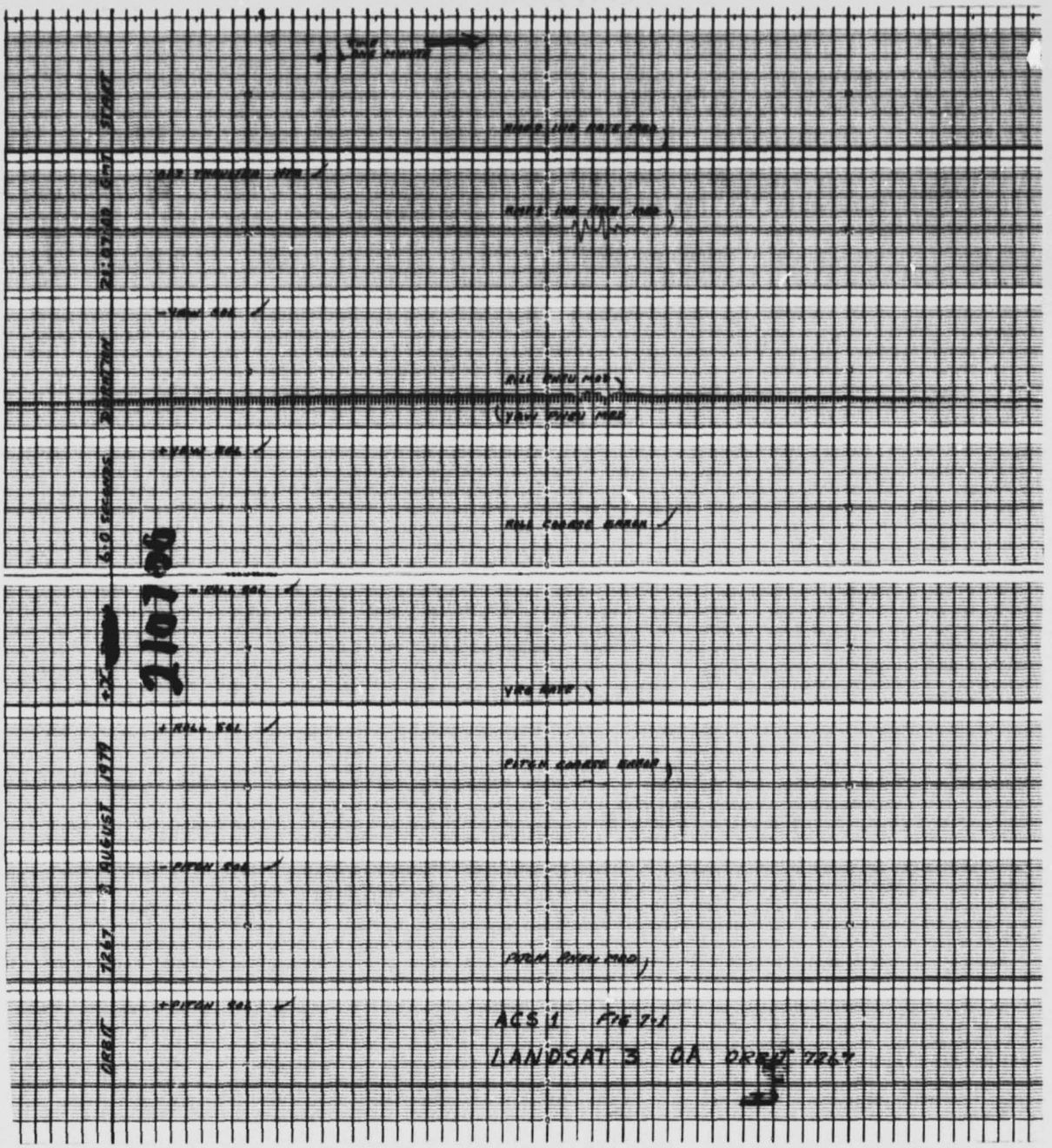


Figure 7-1. ACS 1 - Landsat-3 OA Orbit 7267

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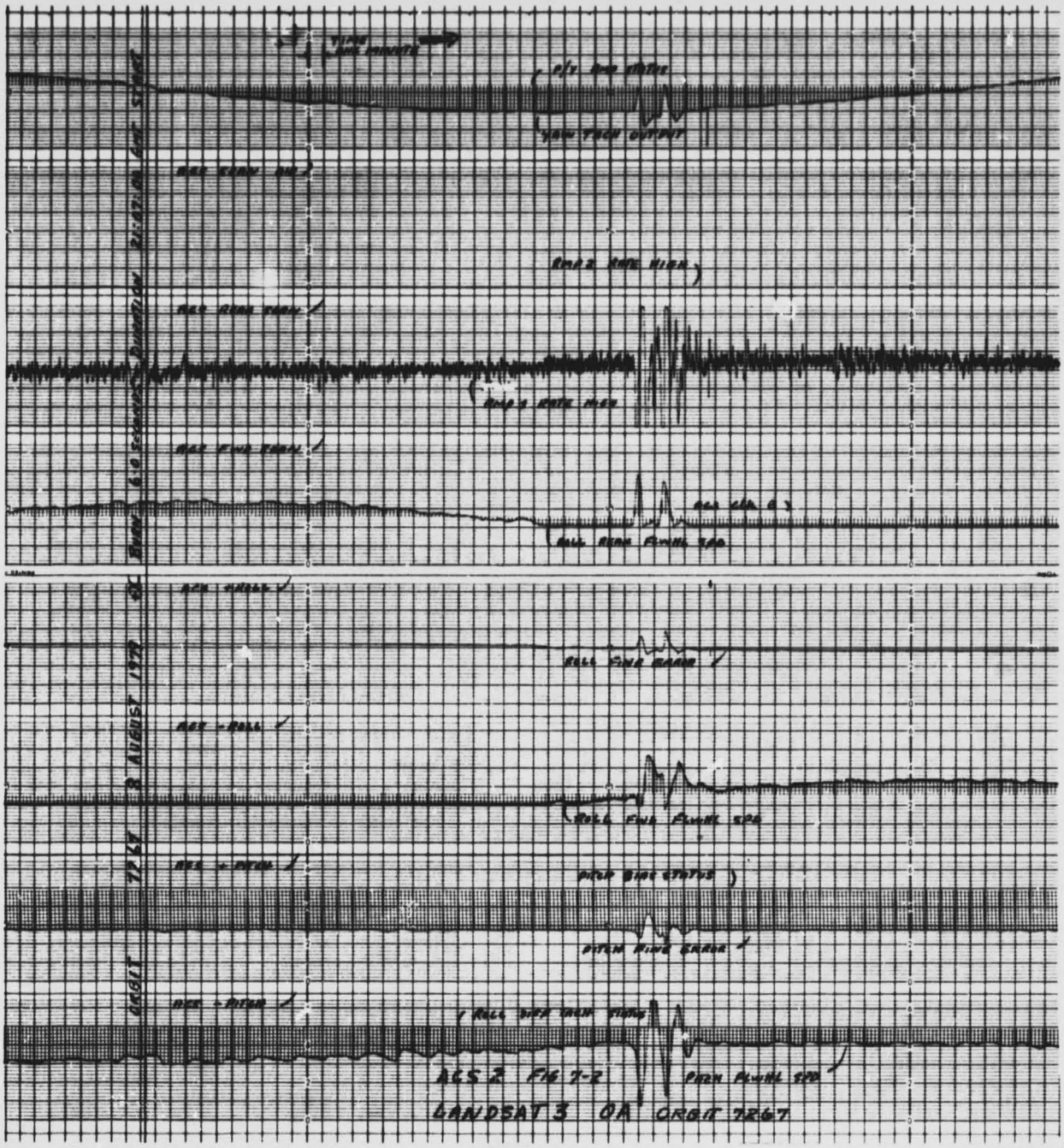


Figure 7-2. ACS 2 - Landsat-3 OA Orbit 7267

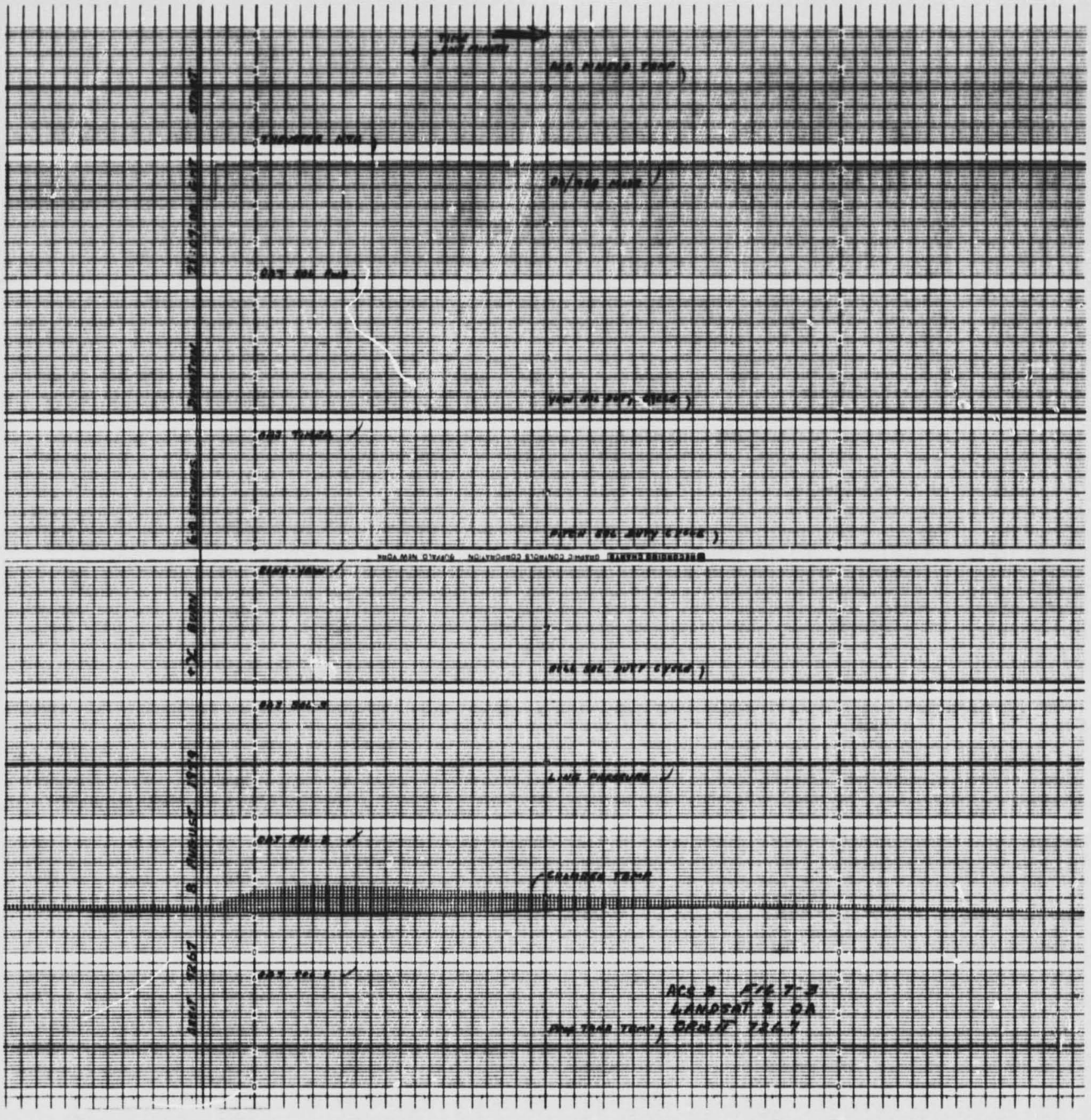


Figure 7-3. ACS 3 - Landsat-3 OA Orbit 7267

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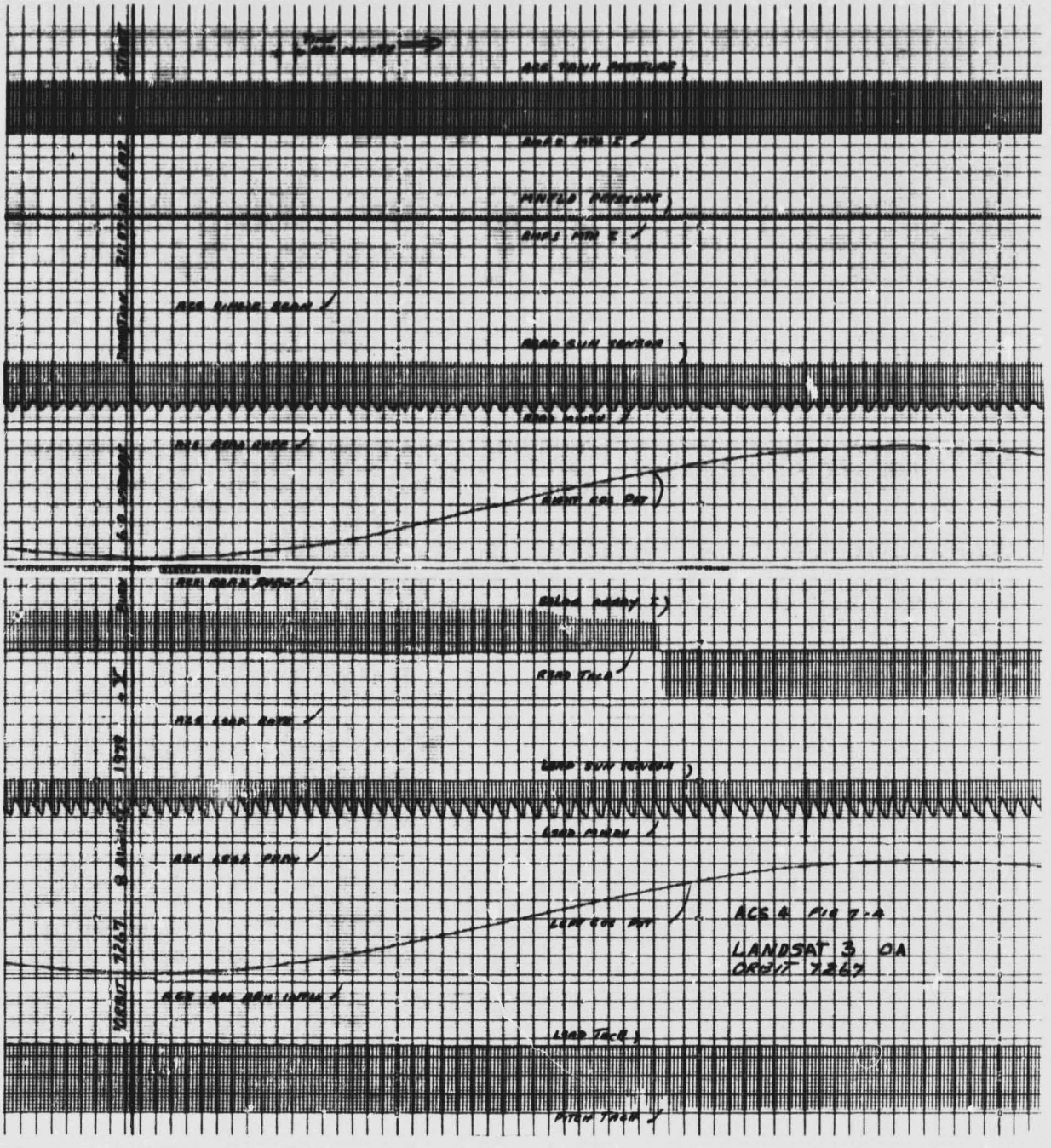


Figure 7-4. ACS 4 - Landsat-3 OA Orbit 7267

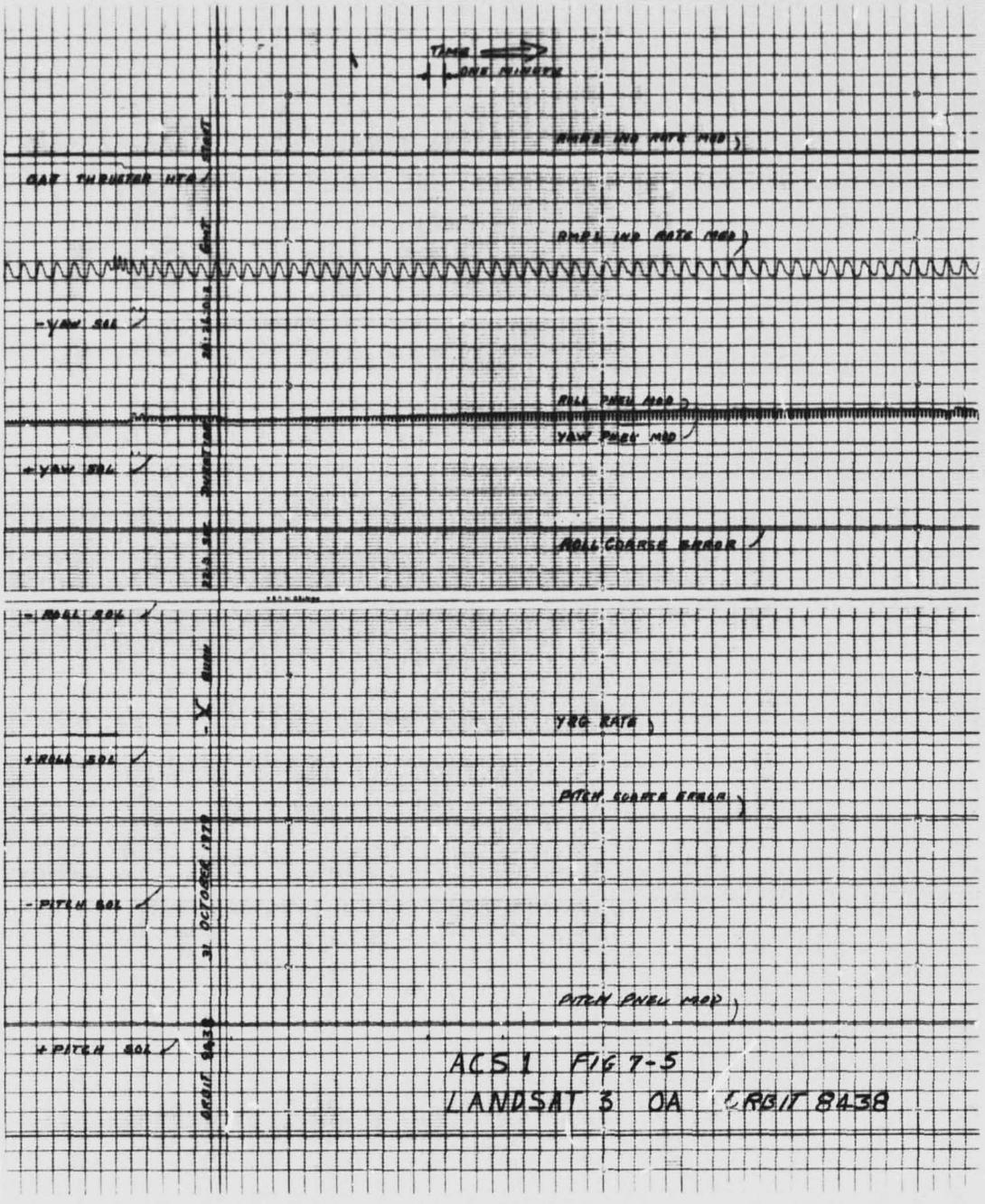


Figure 7-5. ACS 1 - Landsat-3 OA Orbit 8438

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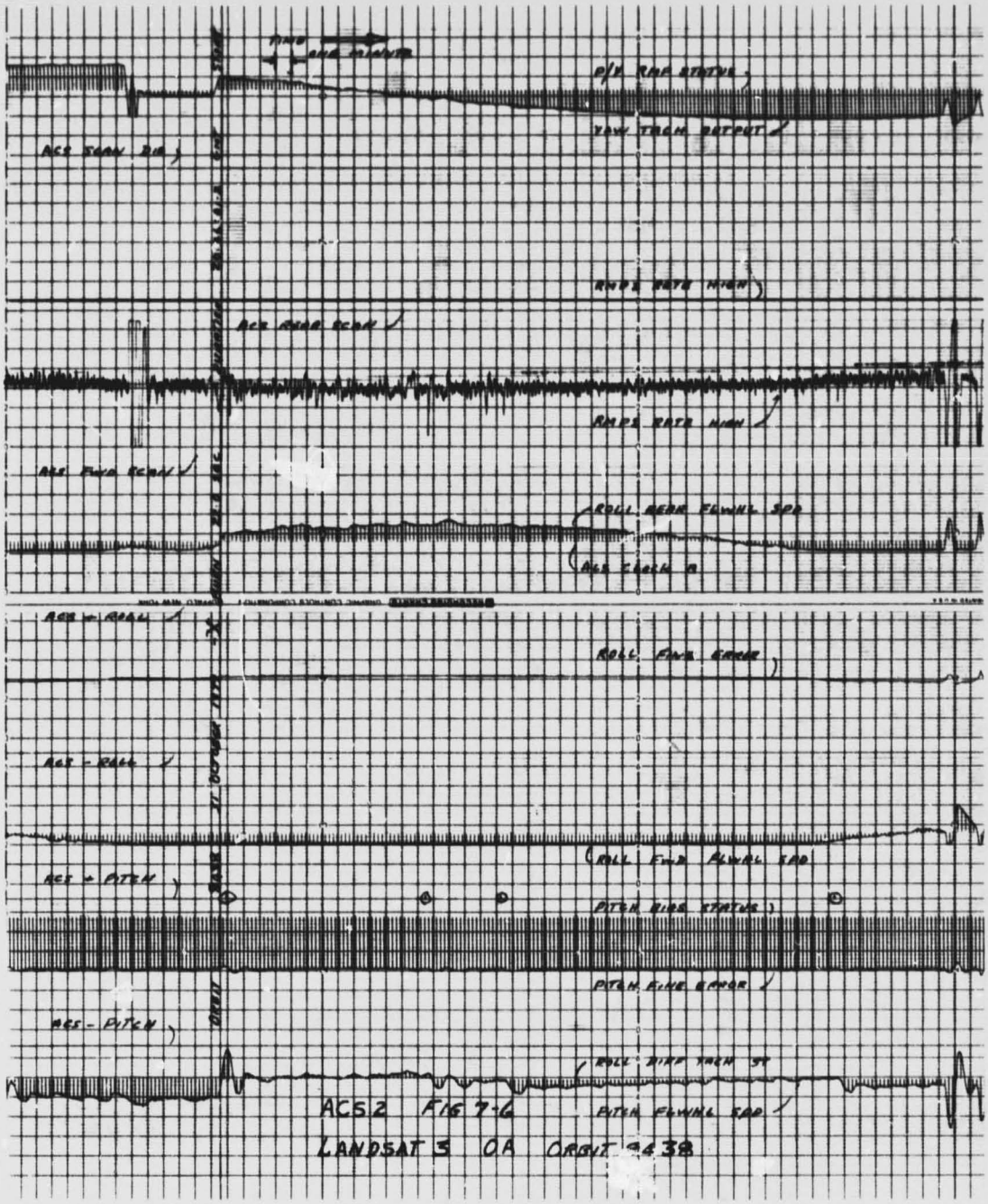


Figure 7-6. ACS 2 - Landsat-3 OA Orbit 8438

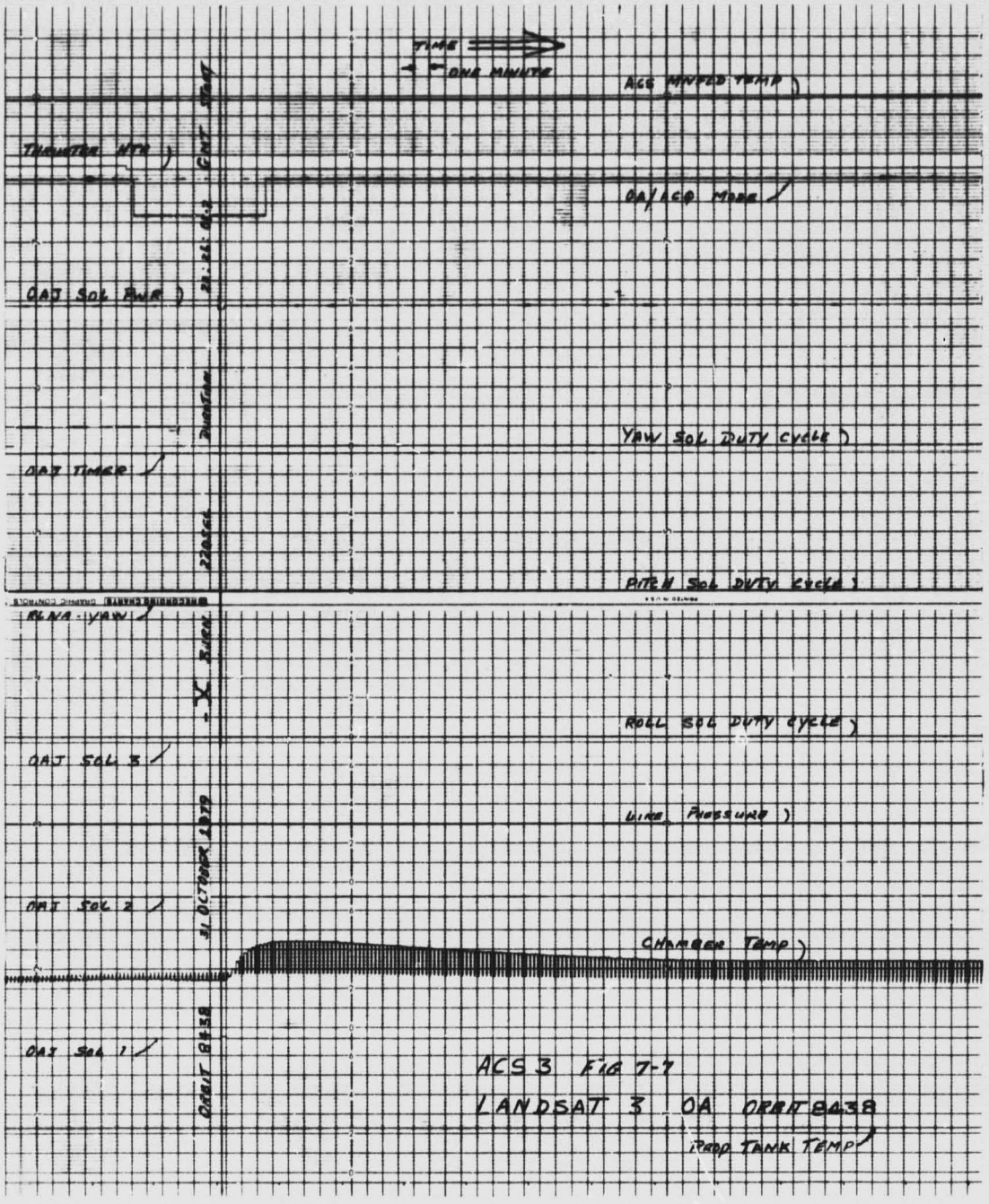


Figure 7-7. ACS 3 - Landsat-3 OA Orbit 8438

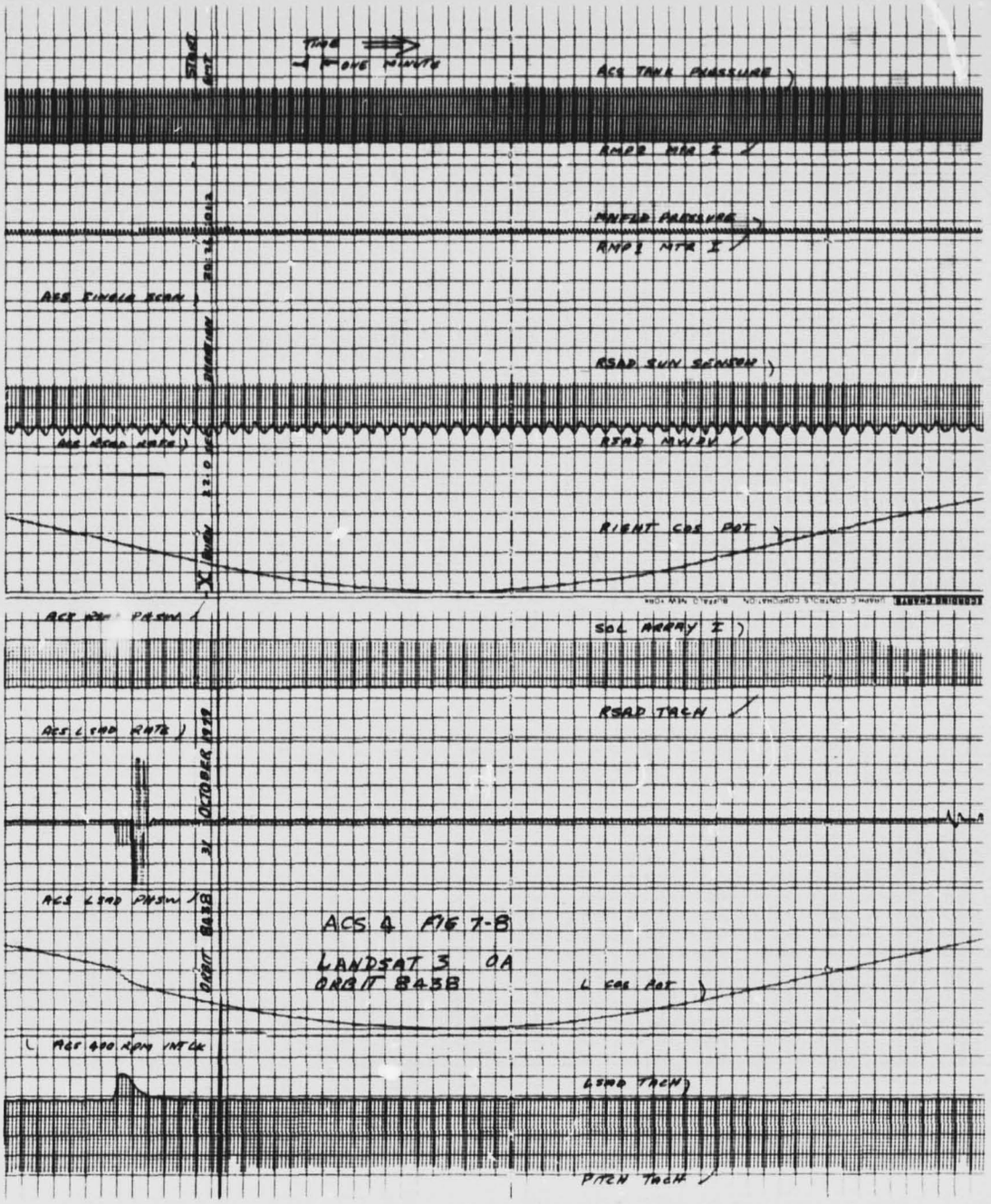


Figure 7-8. ACS 4 - Landsat-3 OA Orbit 8438

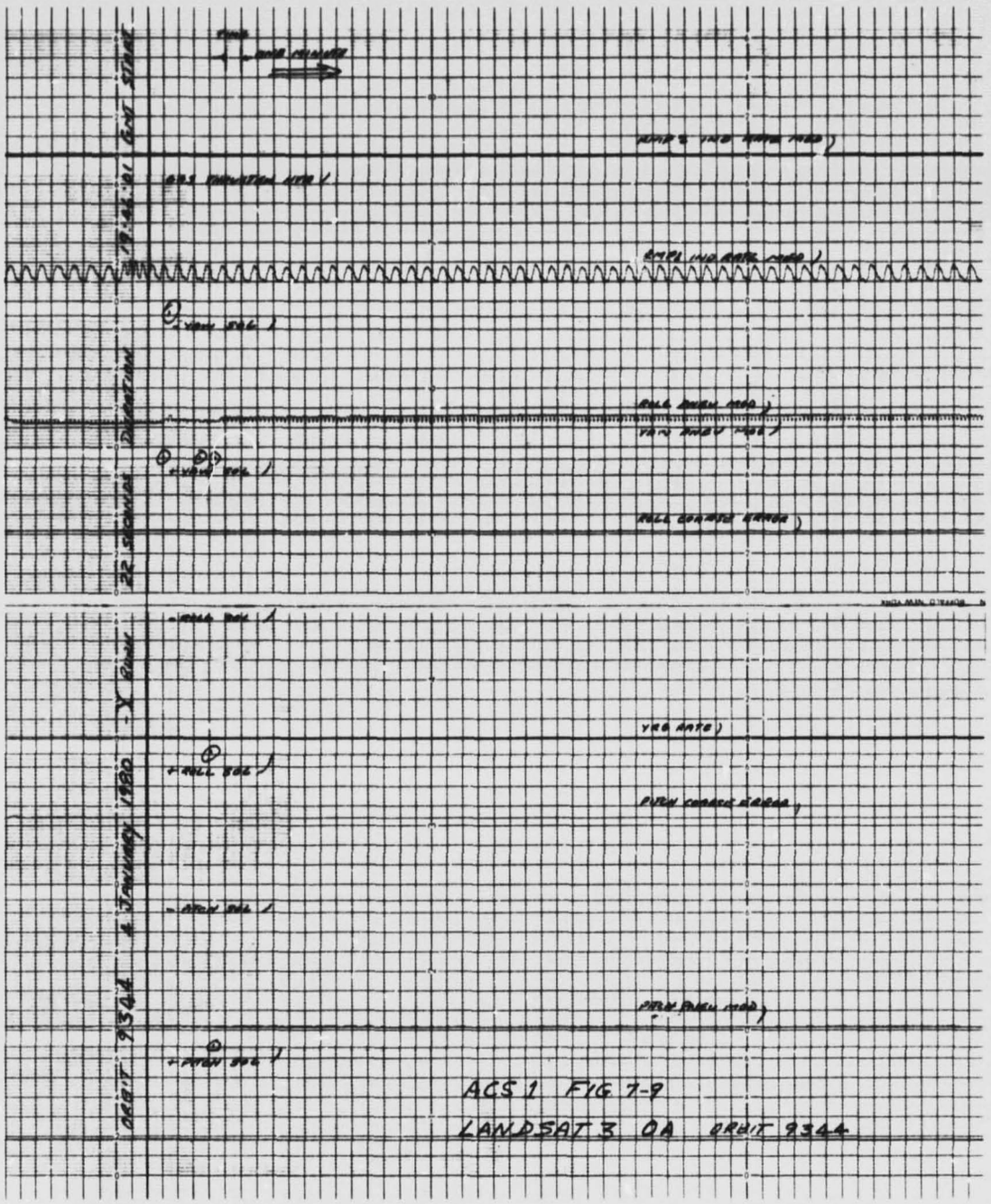


Figure 7-9. ACS 1 - Landsat-3 OA Orbit 9344

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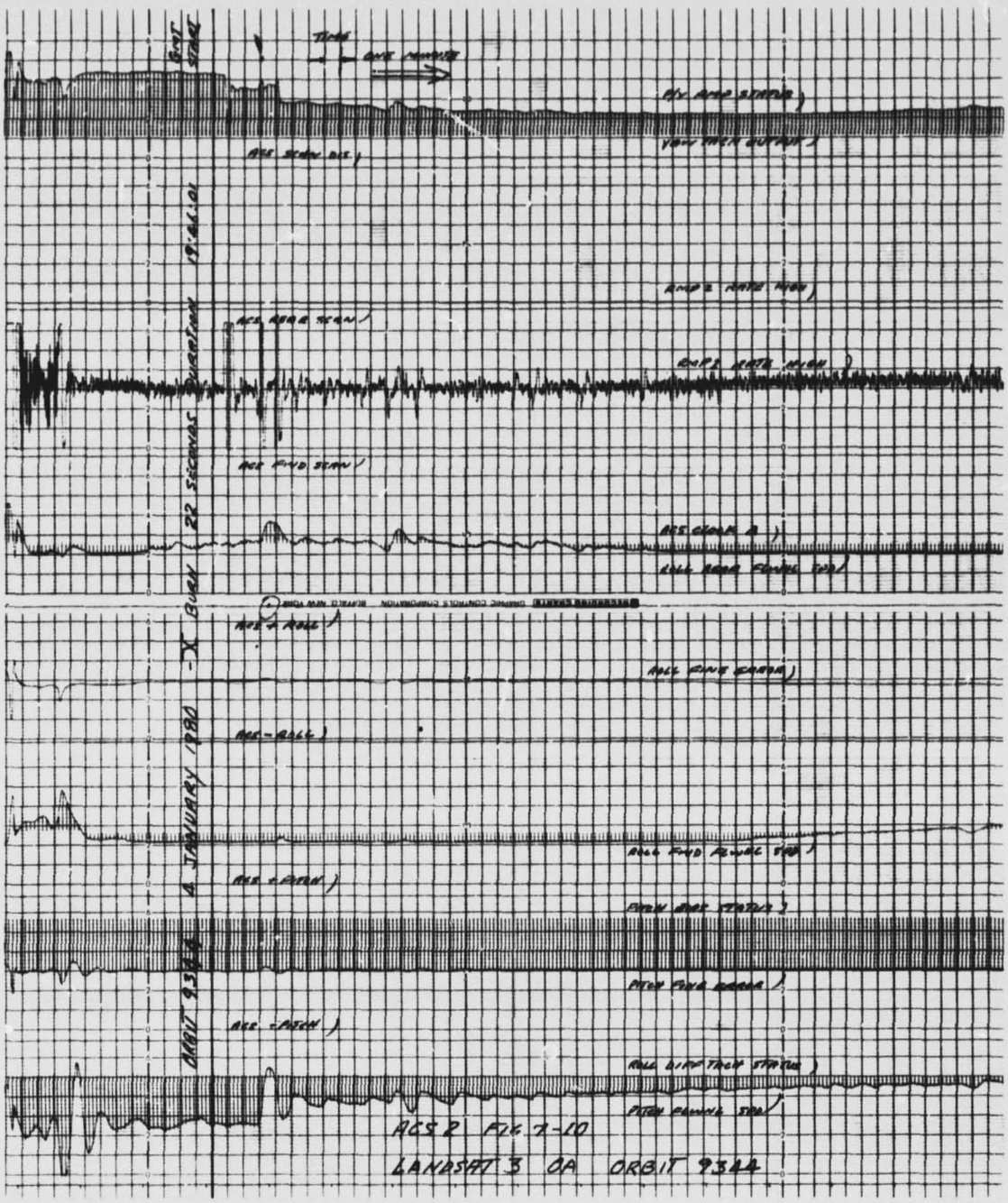


Figure 7-10. ACS 2 - Landsat-3 OA Orbit 9344

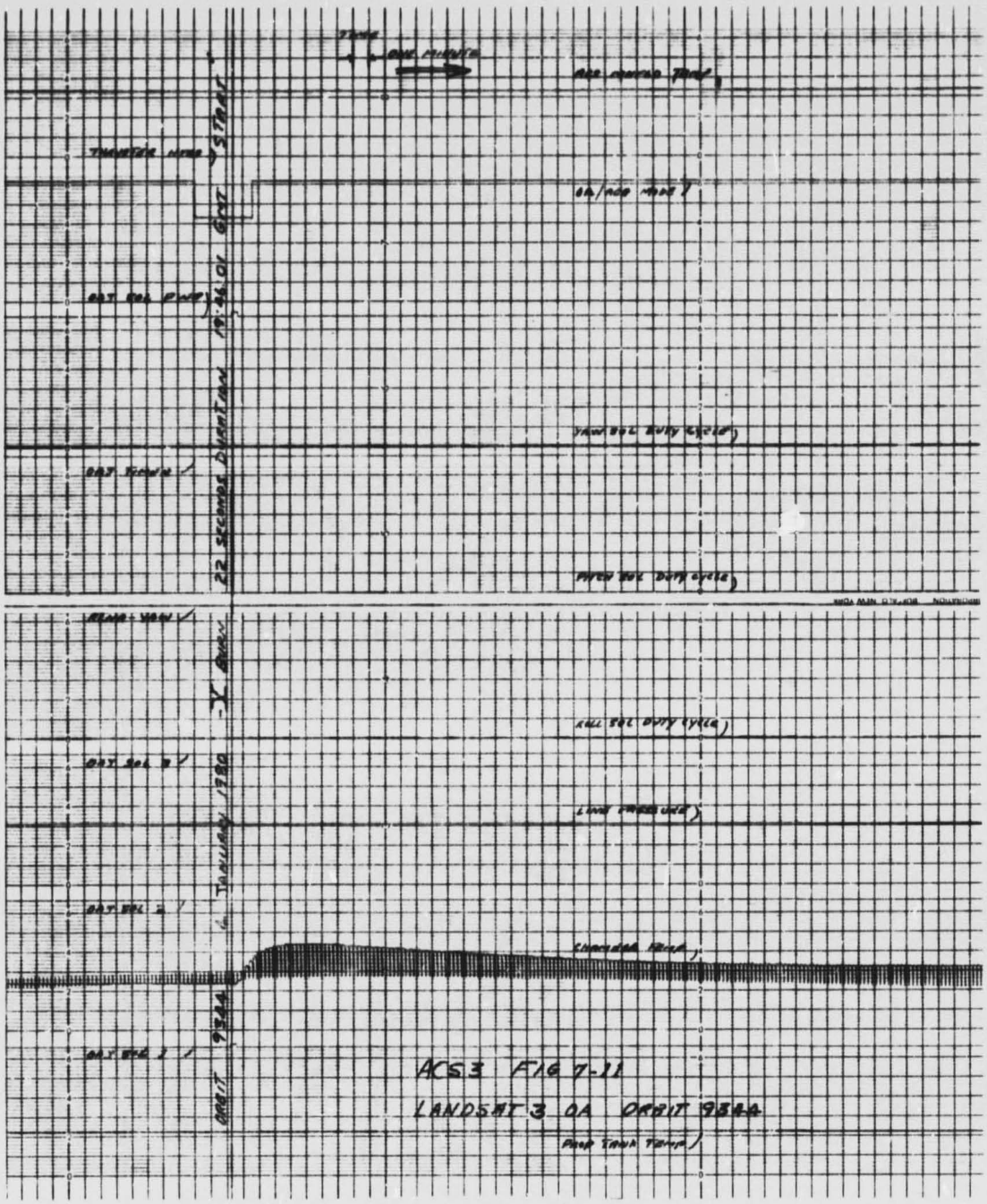


Figure 7-11. ACS 3 - Landsat-3 OA Orbit 9344

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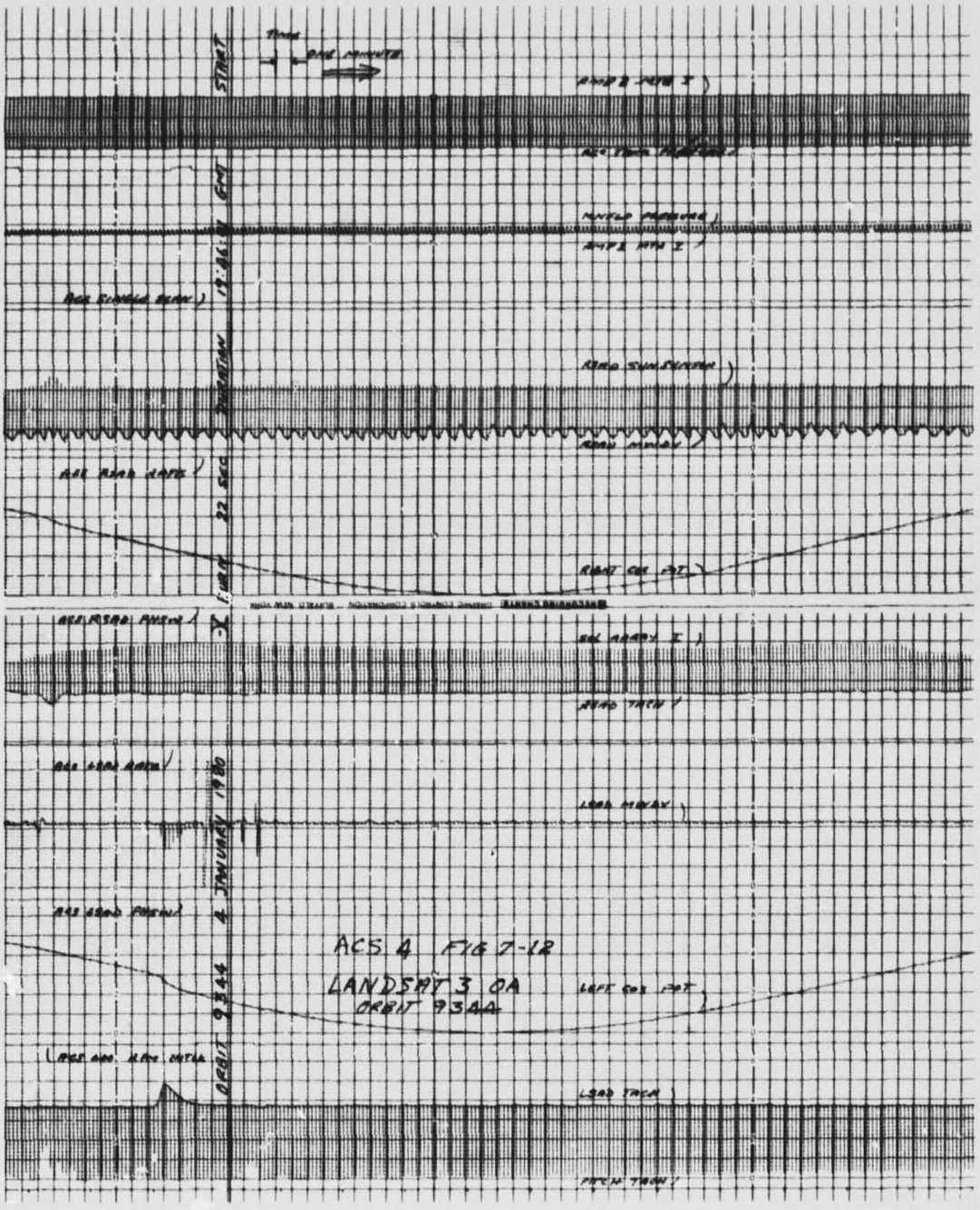


Figure 7-12. ACS 4 - Landsat-3 OA Orbit 9344

Table 7-1. Landsat-3 Orbit Adjust Summary

Orbit Adjust No.	Orbit No.	Epoch (Burn Start Time)	Burn Axis	Burn Duration (secs)	Post-Burn Freon Status (psia)	Hydrazine Consumed (lbs)	Post-Burn Hz Tank P (psia)	Burn Efficiency (%)	Δa (Meters)	Δi (degrees)
1	26	7 Mar 78 14:33:11.4	+X	5.2	N	0.02	532.44	N	N	0.0
2	26	7 Mar 78 14:40:01.2	-X	5.2	2006.12	0.02	532.44	N	N	0.0
3	30	7 Mar 78 21:23:01.2	+X	420.0	2012.09	1.58	532.44	107.2	-3662.2	0.0
4	109	13 Mar 78 21:00:01.2	-X	660.0	2004.51	2.30	476.20	103.7	4932.5	0.0
5	115	13 Mar 78 23:43:09.2	-X	112.0	2016.25	0.36	424.17	108.1	804.0	0.0
6	253	22 Mar 78 21:00:01.2	+X	4.8	2012.46	0.01	419.94	109.5	- 35.7	0.0
7	4059	21 Dec 78 19:47:01.2	-X	12.8	1899.96	0.04	434.96*	101.1	85.7	0.0
8	5301	20 Mar 79 21:20:03	-X	18.8	1779.94	0.06	434.94	109.7	137.7	0.0
9	6848	9 July 79 19:55:01.2	-X	16.0	1724.96	0.05	431.21	112.3	118.0	0.0
10	7267	8 Aug 79 21:07:02	+X	6.0	1699.94	0.05	433.95	107.4	- 45.0	0.0
11	8438	31 Oct 79 20:26:01	-X	22.0	1674.88	0.08	434.94	110.5	161.0	0.0
12	9344	4 Jan 80 19:46:01	-X	22.0	1612.44	.11	434.94	110.7	160.8	0.0

N - Data Not Available

* - Pressure increased due to seasonal temperature increase.

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Table 7-2. Landsat-3 OAS Telemetry Values

Func	Name	Units	Orbit							
			140	1430	2700	4001	5152	7671	8602	9352
2001	Prop. Tank Temp.	DGC	15.55	17.64	18.05	19.72	19.72	18.48	19.72	20.11
2003	Thrust Chamber No. 1 (-x) Temp.	DGC	28.15	35.34	32.15	33.01	30.03	32.91	34.28	31.82
2004	Thrust Chamber No. 2 (+x) Temp.	DGC	32.88	36.77	35.91	38.21	35.34	33.03	37.61	34.79
2005	Thrust Chamber No. 3 (-y) Temp.	DGC	50.31	36.51	43.96	49.62	53.01	43.86	46.28	53.40
2006	Line Pressure	psia	416.59	427.44	430.62	434.94	436.08	433.52	434.94	434.94

SECTION 8

MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)

LANDSAT-3

SECTION 8

MAGNETIC MOMENT COMPENSATION ASSEMBLY (MMCA)

The MMCA's operational mode has not been altered from its launch configuration.

Presently, no plan exists to implement MMCA compensation. Payload operations have not generated unusual magnetic torques that result in buildup of spacecraft momentum.

MMCA telemetry values are shown in Table 8-1.

Table 8-1. MMCA Telemetry Values

Func	Name	Units	Orbit							
			4	1431	2700	4001	5152	7671	8602	9352
4001	A1 Board Temp	DGC	17.66	17.52	17.56	18.23	17.79	17.64	18.36	18.23
4002	[illegible] Board Temp	DGC	20.31	20.23	20.31	21.06	20.59	20.41	21.21	21.08
4003	Hall Current	TMV	3.65	3.62	3.62	3.62	3.62	3.62	3.62	3.62
4004	Yaw Flux Density	TMV	3.24	3.22	3.23	3.23	3.23	3.25	3.25	3.25
4005	Pitch Flux Density	TMV	3.20	3.19	3.20	3.18	3.19	3.20	3.20	3.20
4006	Roll Flux Density	TMV	3.15	3.12	3.12	3.11	3.12	3.12	3.12	3.12

SECTION 9

UNIFIED S-BAND/PREMODULATION PROCESSOR (USB/PMP)

LANDSAT-3

SECTION 9

UNIFIED S-BAND/PREMODULATION PROCESSOR (USB/PMP)

The USB Subsystem has operated nominally in this report period.

Table 9-1 shows telemetry values since launch. All are nominal. The transmitter has maintained a steady indicated power output of about 1.6 watts since launch.

USB transmitter signal levels measured at Goldstone with the spacecraft successively at the same points in space show continuous satisfactory USB performance. The performance of the USB (in conjunction with DCS) was studied at extreme range, and showed nominal performance out to the 3222 km horizon.

C-3

Table 9-1. Landsat-3 USB/PMP Telemetry Values

Func	Description	Units	Orbit							
			50	1521	2721	4001	5152	7691	8572	9442
11001	USB Rcvr AGC	dBm	-101.62	-93.62	-109.30	-108.06	-90.23	-108.42	-131.46	-93.95
11002	USB Xmtr Pwr	W	1.65	1.65	1.67	1.69	1.66	1.66	1.64	1.64
11003	USB Rcvr Error	KHz	1.81	3.63	2.92	3.76	4.52	1.95	4.01	2.82
11004	USB Xpond Temp	DGC	24.63	22.50	23.81	25.78	26.57	26.59	25.78	26.95
11005	USB Xpond Press	PSI	17.00	16.95	17.00	17.00	17.00	17.00	17.00	17.00
11007	USB Xmtr A -15V	VDC	F	F	F	F	F	F	F	F
11008	USB Xmtr B -15V	VDC	2.35	2.36	2.36	2.36	2.36	2.36	2.36	2.35
11009	USB Rcvr -15V	VDC	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
11101	PMP Pwr A Volt	VDC	F	F	F	F	F	F	F	F
11102	PMP Pwr B Volt	VDC	- 15.11	-15.10	- 15.10	- 15.06	-15.06	- 15.00	- 15.07	-15.12
11103	PMP Temp A	DGC	21.48	17.29	19.79	22.71	24.75	22.95	22.82	25.98
11104	PMP Temp B	DGC	25.96	22.18	24.48	27.64	29.77	28.83	27.70	30.16

F = Unit OFF

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)

LANDSAT-3

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)

Search Track Data and Backup Timers in the Auxiliary Processing Unit (APU) operated satisfactorily throughout this report period. Telemetry for the APU is shown in Table 10-1.

The Power Switching Module (PSM), containing the switching relays for power to the OAS, MSS, WBVTR No. 1 and No. 2, RBV and PRM, functioned normally. During this report period, the MSS, RBV, WBVTR-1 and WBVTR No. 2 power circuits, have been operated on a regular basis.

The Interface Switching Module performed all switchings normally during this report period.

The Auxiliary Load Controller (ALC) performed all switching normally during this report period.

Table 10-1. Landsat-3 APU Telemetry Functions

Func	Description	Unit	Orbit							
			43	1464	2700	4001	5152	7292	8602	9352
13200	APU, -24.5 Vdc	TMV	2.62	2.62	2.63	2.63	2.63	2.63	2.63	2.63
13201	APU, -12 Volts	TMV	2.42	2.43	2.43	2.43	2.43	2.43	2.43	2.43
13202	APU Temp	DGC	24.43	23.24	23.78	25.00	24.75	24.38	25.19	25.66

SECTION 11

THERMAL SUBSYSTEM (THM)

LANDSAT-3

APPENDIX B

TECHNICAL SUPPLEMENT (TS-2)

LANDSAT-2

SECTION 11

THERMAL SUBSYSTEM (THM)

Since launch Landsat-3's Thermal Control Subsystem has provided satisfactory temperature control for all of the spacecraft equipment.

Table 11-1 summarizes average subsystem temperature telemetry values occuring over the 22 months of Landsat-3's existence.

Average temperatures in the sensory ring bays are plotted in Figure 11-1.

During this report period, sun intensity decreased from 0.969 to 1.034 times the mean value. In addition, spacecraft night length decreased as the sun angle increased. Consequently, the average spacecraft temperatures were slightly higher this quarter.

A history of compensation load switching is shown in Table 11-2.

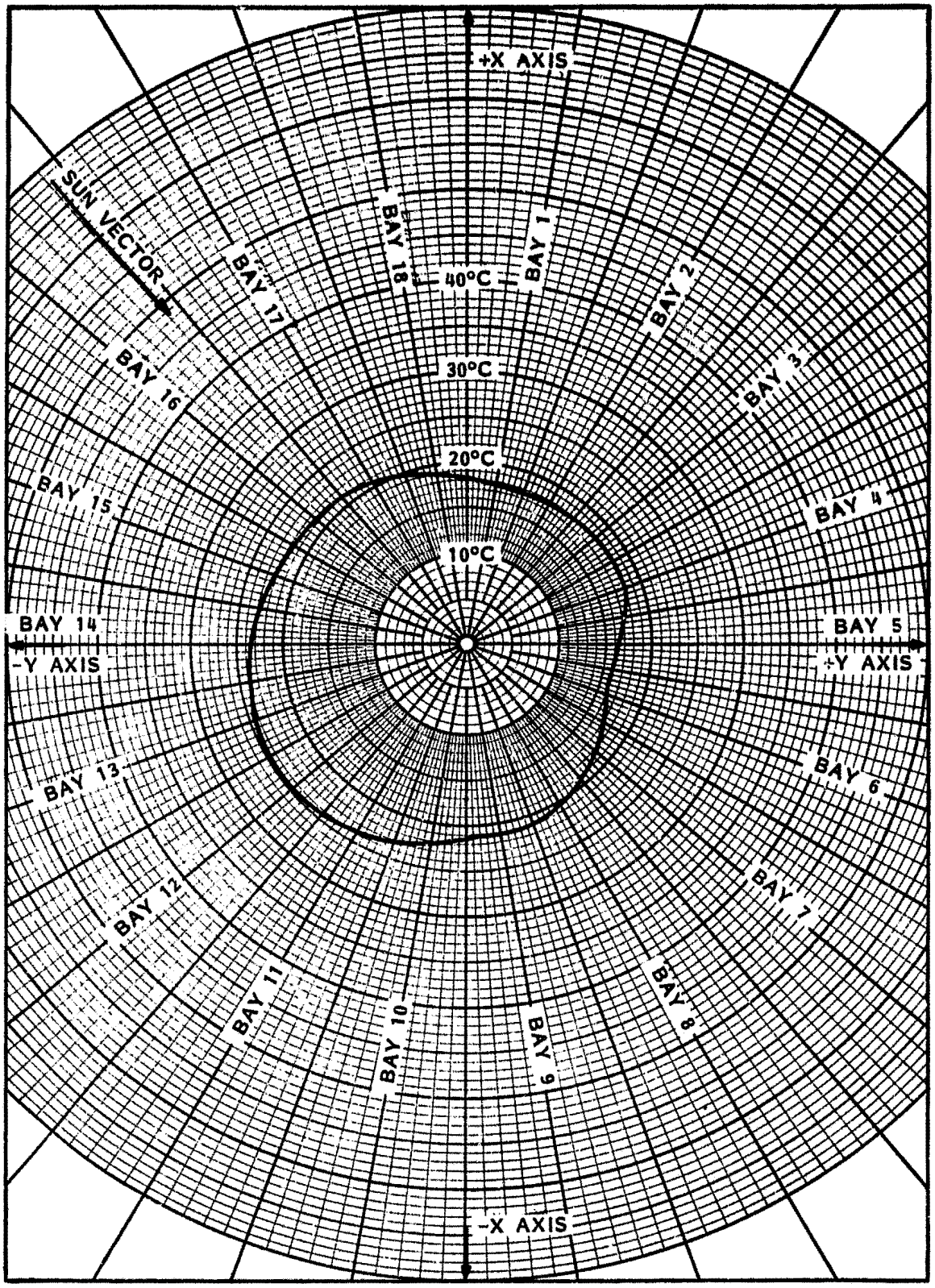


Figure 11-1. LS-3 Sensory Ring Average Temperatures - Orbit 9352, 5 January 1980

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OF POOR QUALITY

FOLDOUT FRAME 1

Table 11-1. Landsat-3 Thermal Subsystem Analog Telemetry (Average Value for Frames of Data Received in NBTR Playback)

Function No.	Name	Unit	Orbit							
			50	1464	2700	4001	5152	7671	8602	9352
7001	THM TH02SBM	DGC	15.52	14.89	15.31	17.27	16.38	15.68	16.96	16.83
7002	THM TH01SBO	DGC	16.73	15.99	16.59	18.30	17.60	17.00	18.16	17.89
7003	THM TH03SBI	DGC	16.40	16.13	16.30	18.38	17.15	16.49	18.02	18.23
7004	THM TH10TCB	DGC	19.92	19.09	19.77	21.21	20.92	20.66	21.40	21.92
7005	THM TH11SBM	DGC	21.11	19.84	20.75	22.42	22.38	21.71	22.61	23.49
7006	THM TH05SBA	DGC	15.74	15.97	15.39	17.00	16.23	16.11	17.09	17.12
7007	OA-X THRUSTER	DGC	20.20	21.05	20.88	21.90	21.05	21.59	23.37	22.08
7008	THM TH02TCB	DGC	16.55	15.91	16.64	18.17	17.39	16.76	17.98	17.89
7009	THM TH07SBM	DGC	16.08	16.48	16.08	17.90	16.48	16.87	17.96	17.74
7010	THM TH08SBI	DGC	17.93	18.02	17.97	19.59	18.47	18.88	19.83	19.72
7011	THM TH09SBM	DGC	20.02	20.07	20.17	21.48	20.74	21.05	21.87	21.84
7012	THM TH10SBO	DGC	18.84	18.61	18.94	20.03	19.55	19.50	20.36	20.41
7013	THM TH04SBM	DGC	16.47	16.69	16.44	18.19	16.99	16.66	17.85	18.06
7014	THM TH11STO	DGC	20.46	19.41	20.20	21.60	21.60	20.87	21.77	22.45
7015	THM TH12SBI	DGC	21.64	19.51	20.92	22.93	23.46	22.07	22.95	24.65
7016	THM TH12STO	DGC	21.45	19.36	20.52	22.57	23.22	21.49	22.31	24.08
7017	REV BEAM CTR LN	DGC	20.89	20.14	20.61	22.30	21.82	21.75	22.57	23.02
7018	THM TH13SBM	DGC	21.88	18.94	20.59	22.99	23.74	21.59	22.59	24.81
7019	NBR RAD OUTBDB4	DGC	2.73	2.53	2.68	3.68	3.26	3.04	3.77	3.80
7020	THM TH13STM	DGC	22.42	19.84	21.24	23.52	24.30	22.32	23.15	25.32
7021	THM TH14SBI	DGC	20.86	17.50	19.42	22.12	23.04	20.36	21.65	24.01
7022	THM TH14STO	DGC	20.48	17.00	19.17	21.48	22.47	20.00	21.19	23.30
7023	THM TH15SBM	DGC	19.95	16.18	18.42	21.37	22.64	18.99	20.85	23.33
7030	THM TH15STO	DGC	19.43	15.90	18.31	21.05	22.04	19.00	20.75	22.74
7031	THM TH16SBM	DGC		14.76	16.60	19.51	20.31	17.07	19.10	21.00
7032	THM TH17SBI	DGC		16.95	18.45	20.98	21.12	18.85	20.68	21.83
7033	THM TH05TCB	DGC	16.17	16.41	16.63	17.61	16.98	16.98	17.87	17.82
7034	THM TH18SBM	DGC		16.15	17.43	19.56	19.34	18.01	19.46	20.05
7035	THM TH18STM	DGC	18.04	16.47	17.53	19.23	19.05	17.49	18.96	19.34
7040	THM TH01TCB	DGC	16.45	15.64	16.29	18.07	17.44	16.68	17.75	17.39
7041	THM TH06STO	DGC	13.27	13.52	13.48	14.77	13.85	13.93	14.89	14.80
7042	THM TH03TCB	DGC	16.49	16.88	15.96	18.54	16.68	16.28	17.71	18.17
7043	THM TH04TCB	DGC	17.98	18.16	18.07	19.25	18.41	18.19	19.05	19.23
7044	THM TH17STO	DGC	17.99	16.13	17.22	19.95	19.68	17.33	19.49	20.54
7045	THM TH07TCB	DGC	16.16	16.41	16.36	18.03	16.64	17.26	18.06	17.80
7046	THM TH09TCB	DGC	18.83	18.84	19.14	20.03	19.69	19.99	20.64	20.61
7048	THM TH11TCB	DGC	21.59	20.07	21.18	22.75	23.10	22.26	22.95	24.23
7049	THM TH12TCB	DGC	21.45	18.86	20.22	22.33	23.20	21.24	21.95	24.13
7050	THM TH13TCB	DGC	22.25	19.31	20.99	23.27	23.92	21.92	22.80	25.05
7051	THM TH14TCB	DGC	20.75	16.97	19.35	22.05	23.39	20.14	21.68	24.17
7052	THM TH16TCB	DGC	19.57	17.00	18.73	21.49	22.20	19.40	21.30	23.03
7053	THM TH17TCB	DGC	18.98	17.58	18.52	20.76	20.36	19.19	20.61	21.31
7054	THM TH18TCB	DGC	17.23	15.95	16.89	18.29	18.05	17.00	18.18	18.39
7060	THM SHUTTER BAY 1	DEG	9.90	2.14	7.17	28.60	21.84	15.68	25.76	24.45
7061	THM SHUTTER BAY 2	DEG								

7042	THM TH03TCB	DGC	16.49	16.88	15.96	18.94	18.68	18.36	19.41	20.00
7043	THM TH04TCB	DGC	17.98	18.16	18.07	19.25	18.41	18.19	19.05	19.23
7044	THM TH17STO	DGC	17.99	16.13	17.22	19.95	19.68	17.33	19.49	20.54
7045	THM TH07TCB	DGC	16.16	16.41	16.36	18.03	16.64	17.26	18.06	17.80
7046	THM TH09TCB	DGC	18.83	18.84	19.14	20.03	19.69	19.99	20.64	20.61
7048	THM TH11TCB	DGC	21.59	20.07	21.18	22.75	23.10	22.26	22.95	24.23
7049	THM TH12TCB	DGC	21.45	18.86	20.22	22.33	23.20	21.24	21.95	24.13
7050	THM TH13TCB	DGC	22.25	19.31	20.99	23.27	23.92	21.92	22.80	25.05
7051	THM TH14TCB	DGC	20.75	16.97	19.35	22.05	23.39	20.14	21.68	24.17
7052	THM TH16TCB	DGC	19.57	17.00	18.73	21.49	22.20	19.40	21.30	23.03
7053	THM TH17TCB	DGC	18.98	17.58	18.52	20.76	20.36	19.19	20.61	21.31
7054	THM TH18TCB	DGC	17.23	15.95	16.89	18.29	18.05	17.00	18.18	18.39
7060	THM SHUTTER BAY 1	DEG	9.90	2.14	7.17	28.60	21.84	15.68	25.76	24.45
7061	THM SHUTTER BAY 2	DEG	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00
7062	THM SHUTTER BAY 3	DEG	1.07	7.02	1.07	21.36	4.77	2.39	16.18	18.93
7063	THM SHUTTER BAY 4	DEG	6.60	9.78	12.79	21.24	15.35	14.04	22.11	21.43
7064	THM SHUTTER BAY 5	DEG	6.00	3.33	3.34	4.67	6.11	10.00	11.34	7.3
7065	THM SHUTTER BAY 7	DEG	0.00	1.08	0.00	11.54	3.11	6.52	14.33	14.05
7067	THM SHUTTER BAY 9	DEG	28.82	28.00	30.02	35.45	33.75	35.45	39.81	38.92
7068	THM SHUTTER BAY 10	DEG	30.27	23.56	28.97	39.49	37.81	36.98	41.16	45.38
7069	THM SHUTTER BAY 11	DEG	40.32	29.52	36.78	47.31	50.02	44.33	48.38	57.36
7070	THM SHUTTER BAY 12	DEG	40.17	24.08	33.63	48.54	54.20	42.60	46.42	63.48
7071	THM SHUTTER BAY 13	DEG	36.13	15.57	28.23	43.10	46.66	34.81	40.16	53.95
7072	THM SHUTTER BAY 14	DEG	13.76	0.00	6.80	25.64	35.01	13.41	24.44	40.02
7074	THM SHUTTER BAY 16	DEG	17.35	0.00	7.71	31.09	35.41	18.74	31.88	37.70
7075	THM SHUTTER BAY 17	DEG	18.29	1.30	11.20	33.68	32.43	28.85	33.89	37.90
7076	THM SHUTTER BAY 18	DEG	11.42	0.00	4.59	21.69	20.70	9.49	21.03	25.91
7080	THM Q1 T ZENER V	TMV	4.93	4.92	4.92	4.93	4.93	4.93	4.93	4.93
7081	THM Q2 T ZENER V	TMV	5.08	5.09	5.09	5.09	5.10	5.10	5.09	5.10
7082	THM Q3 T ZENER V	TMV	5.05	5.05	5.05	5.06	5.06	5.06	5.06	5.06
7083	THM Q1 S ZENER V	TMV	5.01	5.00	5.01	5.01	5.02	5.01	5.02	5.02
7084	THM Q2 S ZENER V	TMV	4.90	4.90	4.90	4.91	4.91	4.90	4.91	4.91
7085	THM Q3 S ZENER V	TMV	5.03	5.04	5.04	5.05	5.05	5.05	5.05	5.05
7090	THM TH ECAM M	DGC	19.34	17.31	17.50	19.43	18.34	18.38	19.89	19.69
7091	THM IND ATTITUDE	DGC	21.11	18.05	19.78	22.42	23.27	20.91	22.07	24.43
7092	THM RBV RADIATOR	DGC	13.10	12.15	12.65	14.67	14.01	13.72	14.82	15.32
7093	THM RBVC CTR BM	DGC	17.80	16.70	17.22	19.63	18.79	18.60	19.67	20.27
7094	THM WBVTR BOOT	DGC	10.23	9.71	10.37	12.41	12.16	10.21	11.96	12.40
7095	THM WBVTR RAD CT	DGC	- 1.22	- 0.55	- 0.09	1.57	0.82	-0.07	1.53	1.38
7096	THM WBVTR STRAP	DGC	12.84	12.03	12.85	14.76	14.48	12.74	14.40	14.77
7097	THM WBMT BAY 1	DGC	17.05	13.95	16.34	16.71	17.17	14.98	16.51	16.38
7098	THM WBMT BAY 18	DGC	16.50	13.48	15.34	16.39	16.91	14.46	16.06	16.05
7099	THM WBVTR SEP 3	DGC	15.40	14.69	15.23	16.98	16.26	15.26	16.66	16.93
7100	THM WBVTR SEP 17	DGC	18.42	16.38	17.78	19.82	20.05	17.87	19.53	20.40
7101	THM WBVTR 1 CENT	DGC	16.46	14.89	16.15	17.74	17.75	15.98	17.49	17.94
7102	THM VTR2 BAY 4	DGC	15.75	15.46	15.67	17.28	16.57	15.87	17.12	17.34
7103	THM VTR2 BAY 15	DGC	18.42	15.87	17.28	19.84	20.56	17.68	19.41	20.95
7104	THM WBVTR2 CTR	DGC	16.52	15.00	15.89	17.96	18.22	15.95	17.55	18.27
7105	THM NBTRB SEP 6	DGC	15.98	15.54	15.78	17.26	16.93	16.32	17.53	17.58
7106	THM NBTRB SEP 1	DGC	20.40	17.72	19.24	21.79	22.49	20.21	21.47	23.38
7107	THM NBTR BM CTR	DGC	17.71	16.40	16.99	19.45	19.08	17.75	19.11	19.77
7108	THM MSS MOUNT 14	DGC	16.14	14.79	15.72	18.69	19.05	16.24	17.91	19.67
7109	OA-Y THRUSTER	DGC	23.15	18.41	21.05	23.89	25.20	21.84	23.39	26.03
7110	THM MSS WBVTR BM	DGC	13.97	13.76	14.01	16.23	15.88	13.97	15.67	16.18
7111	OA +X THRUSTER	DGC	16.80	14.47	16.06	17.14	17.07	15.22	16.85	16.66
7130	THM AUX P1 T	DGC	36.47	34.99	24.69	40.35	24.84	34.21	33.22	24.35
7131	THM AUX P2 T	DGC	33.24	16.09	34.33	14.68	34.66	24.07	26.20	34.23

Table 11-2. Landsat-3 Compensation Load History

Orbits	Compensation Load Status*							
	1	2	3	4	5	6	7	8
Launch	0	0	0	0	0	0	0	0
3	0	0	X	X	X	0	X	X
34	0	0	X	X	X	X	X	X
48	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	X
3074	X	X	X	X	X	0	X	X
3081	0	0	0	0	0	0	0	X
5571	0	0	0	0	0	0	0	0

*Note: X = ON
0 = OFF

SECTION 12
NARROWBAND TAPE RECORDERS (NBR)
LANDSAT-3

SECTION 12
NARROWBAND TAPE RECORDERS (NBR)
LANDSAT-4

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)

The Narrowband Recorder Subsystem operated satisfactorily throughout the entire report period, both Recorders alternating in Record and Playback modes with a nominal one minute overlap.

Table 12-1 gives cumulative operating hours for both Recorders by mode, and Table 12-2 gives typical telemetry values.

Table 12-1. NBR Operating Hours by Mode

NBR	On	Off	Playback	Record
A	8624	7912	339	8285
B	8624	7912	339	8285

Table 12-2. Narrow Band Tape Recorder Telemetry Values

			Orbits							
Func	Name	Units	30/31	1524/25	2795/96	3903/3911	5151/5152	7662/	8610/8611	9338/9347
10001	A-Motor Current	mA								
	Record		182.47	182.47	182.47	182.47	182.42	184.02	184.02	184.02
	P/B		179.38	177.83	177.83	177.83	177.83	180.93	177.83	182.47
10101	B-Motor Current	mA								
	Record		150.00	143.88	139.29	140.81	133.15	128.57	127.04	125.51
	P/B		142.34	142.34	134.69	133.16	128.57	122.45	122.45	122.45
10002	A-Pwr Supply Cur	mA								
	Record		167.57	170.95	167.57	170.95	167.57	167.57	170.95	170.95
	P/B		387.12	383.75	380.39	383.75	383.75	387.13	387.13	393.89
10102	B-Pwr Supply Cur	mA								
	Record		186.67	186.66	183.33	186.66	186.66	186.66	186.66	186.66
	P/B		406.62	419.95	419.95	413.32	413.32	413.32	416.64	416.64
10003	A-Recorder Temp	DGC	20.43	17.61	20.43	22.39	22.61	21.30	21.30	21.95
10103	B-Recorder Temp	DGC	19.35	21.30	21.52	20.87	23.04	21.74	22.61	22.83
10004	A-Pwr Supply	VDC	-24.37	-24.38	-24.50	-24.50	-24.50	-24.50	-24.50	-24.50
10104	B-Pwr Supply	BDC	-24.38	-24.38	-24.50	-24.62	-24.62	-24.50	-24.50	-24.50

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)

LANDSAT-3

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)

The WBTS has operated nominally in this report period.

Table 13-1 shows typical telemetry values.

Signal levels measured at Goldstone with the spacecraft successively at the same points in space, show continuously satisfactory performance.

Table 13-1. Typical Wideband Subsystem Telemetry

Func*	Name	Units	Orbit							
			34/50	1521	2721	4001	5151/5152	7691	8572	9336
12001	Temp TWT Coll	DGC	39.38	39.13	38.13	34.81	31.88	31.88	31.25	40.00
12101			29.07	30.00	26.60	29.07	26.37	26.60	26.60	30.00
12002	Cur. Helix	mA	4.73	4.79	4.80	4.71	4.67	4.71	4.83	4.86
12102			6.50	6.22	6.06	6.12	6.05	5.98	6.06	6.05
12003	Cur. Cath	mA	44.50	44.40	44.03	43.88	43.94	43.78	43.85	43.87
12103			40.32	39.53	39.41	39.32	39.50	39.13	39.13	39.15
12004	Forward Power	dBm	42.04	42.25	42.26	42.25	42.26	42.24	42.22	42.23
12104			42.46	42.79	42.79	42.75	42.74	42.70	42.72	42.71
12005	Refl. Pwr.	dBm	30.00	30.00	28.62	28.65	28.74	28.34	28.59	28.60
12105			31.80	31.74	31.35	31.31	31.44	31.16	31.24	21.08
12227	Mod A Loop Stress	MHz	+1.45	-0.81	-1.04	-1.34	-1.25	-1.82	-1.73	-1.77
12228	Mod B Loop Stress	MHz	1.26	0.10	0.05	0.01	-0.06	0.04	0.08	0.06
12229	Temp. Mod	DGC	14.51	17.25	17.14	18.36	16.00	20.54	18.76	18.92
12232	+15 VDC Pwr Supply	TMV	2.68	2.69	2.69	2.68	2.69	2.70	2.69	2.70
12234	-15 VDC Pwr Supply	TMV	4.38	4.34	4.35	4.33	4.38	4.37	4.33	4.35
12236	+5 VDC Pwr Supply	TMV	4.05	4.05	4.05	4.05	4.04	4.05	4.05	4.05
12238	-5 VDC Pwr Supply	TMV	5.18	5.13	5.13	5.16	5.16	5.15	5.15	5.15
12240	-24 VDC Unreg Pwr	TMV	6.15	6.12	6.12	6.08	6.10	6.15	6.08	6.07
12242	Temp. Inv.	DGC	18.45	17.75	18.30	19.81	19.05	20.97	20.04	20.04

* 120XX applies to WPA-1; 121XX applies to WPA-2; 122XX applies to modulator.

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)
LANDSAT-3

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)

The AMS is a passive radiometric balance sensor which operates in the 14 - 16 micron IR Band. AMS Telemetry Values are shown in Table 14-1.

The AMS was launched in the OFF mode (CMD 774). It was turned ON during Orbits 5 and 17 and has been performing normally since then.

Table 14-1. AMS Telemetry Values

Func	Name	Unit	Orbits							
			6	1431	2700	4001	5152	7671	8602	9352
3004	Case - Temp 1	DGC	19.23	17.71	19.25	21.70	22.41	20.32	21.59	23.53
3005	Assembly - Temp 2	DGC	19.62	18.30	19.79	22.27	23.08	20.91	22.27	24.09

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)

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The AMS was launched in the OFF mode (CMD 774). It was turned ON during Orbits 5 and 17 and has been performing normally since then.

Table 14-1. AMS Telemetry Values

Func	Name	Unit	Orbits							
			6	1431	2700	4001	5152	7671	8602	9352
3004	Case - Temp 1	DGC	19.23	17.71	19.25	21.70	22.41	20.32	21.59	23.53
3005	Assembly - Temp 2	DGC	19.62	18.30	19.79	22.27	23.08	20.91	22.27	24.09

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)
LANDSAT-3

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)

WBVTR-1 has not been able to reproduce MSS data satisfactorily since Orbit 6351 on 4 June 1979. However, it continues to reproduce RBV data satisfactorily, and has been used in that capacity ever since.

WBVTR-2 continues to operate satisfactorily. MFSE counts average about five (5) per 10-second interval.

Table 15-1, 15-2 and 15-3 show typical telemetry values for various recorded functions and modes. Figure 15-1 shows tape usage for Recorders 1 and 2.

Table 15-1. Telemetry Values for WBVTR-1 and -2

Func	Name	Unit	Orbits							
			42/45	1525/30	2795/96	4021	5152	7691	8562	9347
13022	Tape Unit Press	PSI	16.25	16.12	16.12	16.12	16.00	15.73	15.73	15.73
13023	Tape Unit Temp	DGC	16.08	13.62	15.92	15.54	16.93	15.49	15.92	15.54
13024	Elect U. Temp	DGC	18.42	12.69	15.38	14.10	15.79	14.37	14.45	13.85
13032	Limiter Volt	VPP	1.38	1.38	1.38	1.40	1.40	1.40	1.41	1.41
13034	+ 5.6 VDC Conv	VDC	5.67	5.47	5.30	5.65	5.64	5.57	5.54	5.57
13122	Tape Unit Press	PSI	17.15	17.00	17.00	17.13	17.15	17.00	17.00	17.00
13123	Tape Unit Temp	DGC	16.75	16.30	15.26	18.45	17.84	18.21	17.35	18.23
13124	Elect. U. Temp	DGC	19.62	18.07	14.79	19.41	17.33	20.29	15.68	18.84
13132	Limiter Volt	VPP	1.31	1.31	1.33	1.31	1.32	1.32	1.33	1.32
13134	+ 5.6 VDC Conv	VDC	5.42	5.27	5.70	5.53	5.61	5.49	5.73	5.45

Table 15-2. Telemetry Values for WBVTR-1

Func	Name	Units	Orbit							
			42/45	1524/25	2795/96*	3903	5151/2	7285/7288/7300	8610	9338
13029	InputP/B Voltage	VPP								
	Record		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0
	Playback		0.89	0.86	0.45	0.70	0.79	0.71	0.84	0.85
	Rewind		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0
	Standby		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0
13028	Capstan Motor 1	AMP								
	Record		0.35	0.33	0.35	0.32	0.28	0.26	0.28	0.28
	Playback		0.40	0.34	0.30	0.28	0.28	0.34	0.30	0.34
	Rewind		0.23	0.16	0.17	0.17	0.17	0.17	0.17	0.17
	Standby		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0
13030	Headwheel Motor 1	AMP								
	Record		0.50	0.48	0.47	0.45	0.45	0.44	0.45	0.42
	Playback		0.48	0.42	0.48	0.45	0.44	0.43	0.43	0.41
	Rewind		0.41	0.37	0.40	0.37	0.37	0.35	0.35	0.34
	Standby		0.43	0.37	0.41	0.38	0.36	0.36	0.34	0.34
13031	Recorder Input I	AMP								
	Record		3.17	2.89	3.03	2.82	2.82	2.82	2.89	2.72
	Playback		3.03	2.58	3.24	2.65	2.61	2.47	2.47	2.47
	Rewind		1.60	1.42	1.64	1.40	1.37	1.37	1.35	1.35
	Standby		1.28	1.25	1.32	1.10	1.07	1.05	1.15	1.15
13033	Servo Voltage	PCT								
	Record		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0
	Playback		49.10	49.43	49.27	49.60	49.60	49.60	49.71	49.71
	Rewind		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0
	Standby		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0
13026	Capstan Motor Spd	PCT								
	Record		101.64	102.82	101.64	102.23	102.23	101.64	101.64	106.64
	Playback		101.05	102.82	100.45	102.23	102.23	102.23	102.23	102.23
	Rewind		108.15	106.38	107.56	105.68	105.78	105.78	105.19	105.19
	Standby		0.69	0.00	0.00	0.00	0.00	0.0	0.0	0.0
13027	Headwheel Motor Spd	PCT								
	Record		101.13	101.13	102.18	101.13	101.13	101.13	101.13	101.65
	Playback		101.65	101.13	100.60	101.13	101.65	101.13	101.65	101.13
	Rewind		102.71	102.18	103.23	102.18	102.18	102.70	102.18	102.18
	Standby		102.71	102.18	101.65	100.60	101.65	100.60	102.70	102.70

* WBR payloads switched in this period to MSS to WBR 1; RBV to WBR-2

Table 15-3. Telemetry Values for WBVTR-2

Func	Name	Units	Orbit								
			42/45	1530	2795/96*	3903	5151/55	7288/7300	7662	8610/11	9347
13129	Input P/B Voltage	VPP									
	Record		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0
	Playback		0.58	0.61	0.80	0.58	0.55	0.58	0.58	0.59	0.55
	Rewind		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0
	Standby		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0
13128	Capstan Motor 1	AMP									
	Record		0.45	0.37	0.32	0.27	0.28	0.32	0.29	0.31	0.36
	Playback		0.28	0.37	0.28	0.30	0.33	0.30	0.32	0.32	0.30
	Rewind		0.18	0.20	0.13	0.17	0.18	0.13	0.13	0.15	0.15
	Standby		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0
13130	Headwheel Motor 1	AMP									
	Record		0.43	0.48	0.45	0.47	0.50	0.48	0.47	0.48	0.48
	Playback		0.47	0.47	0.45	0.45	0.47	0.45	0.45	0.46	0.46
	Rewind		0.40	0.41	0.40	0.40	0.41	0.38	0.38	0.40	0.40
	Standby		0.42	0.42	0.39	0.40	0.40	0.41	0.38	0.40	0.40
13131	Recorder Input 1	AMP									
	Record		2.39	2.67	2.15	2.15	2.39	2.18	2.30	2.55	2.39
	Playback		2.79	2.64	1.82	2.24	2.36	2.15	2.15	2.14	2.27
	Rewind		1.20	1.28	1.00	1.03	1.13	1.05	1.05	1.03	1.03
	Standby		1.03	1.05	0.91	0.84	0.91	0.89	0.84	0.93	0.89
13133	Servo Voltage	PCT									
	Record		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0
	Playback		50.29	50.49	50.68	50.68	50.68	50.58	50.97	50.58	50.58
	Rewind		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0
	Standby		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0
13126	Capstan Motor Spd	PCT									
	Record		98.35	98.35	99.00	98.35	98.35	98.35	98.35	97.70	98.35
	Playback		96.41	97.06	99.00	97.06	97.06	97.06	96.41	96.41	96.41
	Rewind		98.35	99.00	97.70	97.70	97.70	97.70	97.06	97.35	97.06
	Standby		0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0
13127	Headwheel Motor Spd	PCT									
	Record		104.09	104.09	103.48	103.48	104.09	103.48	104.09	104.70	104.09
	Playback		102.87	102.87	104.09	102.87	102.87	102.87	102.87	103.48	103.47
	Rewind		103.97	105.32	104.70	104.70	105.32	103.48	104.70	104.54	104.70
	Standby		104.10	105.32	104.70	102.87	105.32	105.32	105.32	105.93	105.32

* WBR payloads switched in this period to MSS to WBR-1; RBV to WBR-2

Figure 15-1. Landsat-3 WBVTR Footage thru Orbit 9599

15-4

SECTION 16

RETURN BEAM VIDICON (RBV)

LANDSAT-3

SECTION 16

RETURN BEAM VIDICON (RBV)

The RBV operated satisfactorily during this period.

The white-clip anomaly continues to occur occasionally in the first five percent of the image format of Camera 1. No cause has been determined to date.

RBV scenes are transmitted to Canada, Brazil, India, Japan, as well as to U.S. stations.

Table 16-1 gives typical telemetry values for the RBV subsystem. Tables 16-2 and 16-3 give telemetry values for Prepare, Read and Hold modes for the two RBV Cameras.

Table 16-1. RBV Telemetry Values

Func	Name	Unit	Orbit							
			34	1525	2795	3903	5155	7691	8572	9338
14001	CCC Board Temp	DGC	21.84	20.49	21.05	21.60	22.15	22.98	22.68	22.70
14002	CCC Pwr. Sup. Temp	DGC	23.39	21.60	22.15	23.26	23.81	24.97	24.22	24.91
14003	15 Vdc Sup.	TMV	4.00	4.00	4.00	3.97	3.97	3.98	3.98	3.97
14004	+6 V, -5, VDC Sup.	TMV	3.07	3.07	3.07	3.05	3.05	3.05	3.05	3.05
14100 *	VID Output V	TMV	0.83	1.10	2.17	3.20	1.15	1.78	2.11	1.80
14200			0.76	1.50	1.92	2.22	1.77	2.79	1.79	1.92
14102 *	Comb. Align Cur.	TMV	4.15	4.15	4.17	4.15	4.15	4.15	4.15	4.15
14202			4.13	4.15	4.15	4.15	4.15	4.15	4.14	4.15
14103 *	Elec Temp	DGC	19.23	18.28	18.28	20.49	19.39	22.22	20.55	20.49
14203			23.45	20.39	22.60	26.47	26.47	27.63	25.71	27.57
14104 *	LV Pwr Sup T.	DGC	19.05	18.39	17.83	21.15	20.05	22.59	20.57	20.60
14204			23.10	19.94	22.15	26.02	26.02	26.71	25.07	26.57
14105 *	Defl. Pwr. Sup. +10 VDC	TMV	4.02	4.00	4.02	4.02	4.02	4.02	4.02	4.02
14205			4.05	4.05	4.07	4.07	4.07	4.05	4.05	4.07
14106 *	L.V.P.S. +6 V, -6.3 VDC	TMV	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77
14206			3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
14107 *	Ther. Elec. Cur.	TMV	3.02	3.52	2.70	2.72	2.72	2.85	2.85	2.70
14207			2.57	2.57	2.50	2.55	2.57	2.57	2.57	2.55
14108 *	Vid. Fil. Cur.	TMV	2.62	2.57	2.60	2.57	2.55	2.57	2.57	2.57
14208			2.38	2.62	2.65	2.60	2.57	2.57	2.57	2.57
14110 *	Vid. Tgt. Volt	TMV	3.55	3.52	3.37	3.37	3.37	3.43	3.41	3.37
14210			3.06	3.32	3.32	3.45	3.42	3.42	3.42	3.47
14113 *	Vert Def V	TMV	3.20	2.95	3.05	3.02	3.02	3.03	3.03	2.95
14213			2.78	2.97	2.95	2.95	2.95	2.88	2.88	2.95
14114 *	Face Plate Temp	DGC	24.10	23.10	23.65	22.55	22.55	20.17	19.78	23.10
14214			23.90	22.09	22.60	21.57	21.57	21.20	21.08	21.57
14115	Foc Coil T	DGC	19.80	18.18	18.73	21.49	21.49	23.85	22.15	23.15
14215			20.00	18.18	18.73	21.49	22.05	23.49	22.26	23.15

* 141XX refers to Camera 1; 142XX refers to Camera 2

Table 16-2. Camera No. 1 Telemetry (Values in TMV)

Func	Name	Units	Mode	Orbit							
				34	1525	2795	3903	5155	7662	8611	9338
14101	Focus I	TMV	Prep	1.65	1.62	1.62	1.65	1.65	1.65	1.65	1.65
			Read	2.77	2.77	2.77	2.80	2.77	2.82	2.82	2.82
			Hold	0.55	0.52	0.55	0.55	0.52	0.55	0.55	0.55
14109	Grid V	TMV	Prep	0.70	0.72	0.72	0.72	0.72	0.72	0.75	0.75
			Read	2.20	2.22	2.22	2.20	2.20	2.22	2.22	2.25
			Hold	4.15	4.17	4.15	4.17	4.17	4.17	4.17	4.17
14111	Cath I	TMV	Prep	3.10	3.12	3.12	3.10	3.10	3.10	3.10	3.12
			Read	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
			Hold	0.40	0.40	0.40	0.40	0.37	0.40	0.40	0.40
14112	Hor Def	TMV	Prep	2.00	2.00	2.02	2.02	2.02	2.02	2.02	2.02
			Read	3.42	3.45	3.47	3.45	3.45	3.47	3.47	3.47
			Hold	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02
14120	+ 500 V	TMV	Prep	1.07	1.05	1.07	1.05	1.05	1.05	1.05	1.05
			Read	4.17	4.17	4.20	4.20	4.17	4.20	4.20	4.20
			Hold	4.17	4.17	4.20	4.17	4.20	4.17	4.17	4.17

Table 16-3. Camera No. 2 Telemetry (Values in TMV)

Func	Name	Units	Mode	Orbit							
				34	1525	2795	3903	5155	7662	8611	9338
14201	Focus I	TMV	Prep	1.57	1.55	1.57	1.57	1.60	1.62	1.62	1.62
			Read	2.70	2.67	2.70	2.70	2.72	2.72	2.75	2.75
			Hold	0.50	0.47	0.50	0.50	0.52	0.50	0.52	0.55
14209	Grid V	TMV	Prep	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
			Read	1.90	1.92	1.92	1.90	1.90	1.90	1.90	1.92
			Hold	4.15	4.17	4.17	4.20	4.17	4.17	4.17	4.20
14211	Cath I	TMV	Prep	3.30	3.32	3.32	3.30	3.30	3.32	3.32	3.32
			Read	0.90	0.92	0.92	0.90	0.90	0.90	0.92	0.92
			Hold	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
14212	Hor Def	TMV	Prep	1.67	1.72	1.65	1.70	1.70	1.70	1.70	1.70
			Read	3.45	3.05	3.05	3.02	3.02	3.02	3.05	3.07
			Hold	0.00	0.02	0.05	0.00	0.00	0.02	0.02	0.02
14220	+ 500 V	TMV	Prep	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
			Read	4.25	4.25	4.25	4.25	4.22	4.25	4.25	4.25
			Hold	4.25	4.25	4.25	4.25	4.22	4.22	4.17	4.17

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SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

LANDSAT-3

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

The MSS subsystem has operated satisfactorily in this period. Very few missed line starts were seen after Orbit 7655 on 5 September 1979, when during a systematic series of configuration changes, the combination of Inverter A, Scan Monitor A and Shutter Monitor A was selected.

Table 17-1 shows typical telemetry values since launch. All are nominal.

Figure 17-1 shows the number of scenes imaged at each geographic location this period. Band 5 was OFF throughout this period; therefore, no scenes were taken in the N-S (night) passage.

Figure 17-2A and 2B similarly show the number of scenes imaged at each geographic location since launch. Figure 17-2A shows the scenes taken during the north-to-south passage. Figure 17-2B shows the scenes taken during the south-to-north passage (the night side of the earth) by the IR Sensors of Band 5. Antarctica is at the top of Figure 17-2B, and the northernmost latitudes are at the bottom. Only those scenes received by the U.S. ground stations are shown in Figures 17-1 and 2. Scenes transmitted to Canada, Brazil, Iran, Japan, India, Australia, Sweden, and Italy (63% of total) are not shown.

Figure 17-3 to 17-6 show the history of sensor responsivity to stimuli from six (6) levels of illumination from the Cal lamp. A typical sensor from each of Band 1 thru 4 are shown. They are all taken in the prime-low gain-compressed mode. Values shown with triangles were taken in high gain.

Band 5 continues in its 17th outgas cycle. Table 17-2 shows the history of the gain of Sensor 26 when it was operating.

Table 17-1. MSS Analog Telemetry - Landsat 3

Func	Name	Units	Orbit							
			50	1521	2721	4001	5152	7691	8572	9462
15021	Band 5 15V	TMV	F	4.80	F	4.75	4.75	F	F	F
15022	Band 5 PA Case Temp	DGC	11.15	13.80	14.27	17.16	16.28	13.61	14.44	15.67
15025	Ch 25 Bias	TMV	F	3.67	Q	Q	Q	Q	Q	Q
15026	Ch 26 Bias	TMV	F	3.61	F	3.68	3.55	F	F	F
15040	Mux -6 V	VDC	6.19	6.17	6.18	6.18	6.19	6.19	6.19	6.18
15041	A/D Conv Ref. Voltage	VDC	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
15042	Avg Den Data Trans	TMV	1.92	2.13	2.06	2.20	2.17	2.12	2.10	1.99
15043	Fiber Opt Plate 1 Temp	DGC	13.92	15.31	16.70	19.09	18.62	15.46	17.03	18.22
15044	Fiber Opt Plate 2 Temp	DGC	12.66	13.59	14.62	17.18	16.57	13.45	14.75	16.10
15045	Multiplexer Temp	DGC	18.37	17.29	17.87	21.05	18.88	20.52	20.92	19.79
15046	Elect. Cover Temp	DGC	14.23	17.99	18.81	21.40	20.12	16.16	17.65	18.21
15047	Power Supply Temp	DGC	14.31	15.70	16.77	19.76	18.25	16.07	17.62	18.34
15048	Scan Mirror Reg Temp	DGC	12.61	13.77	15.17	18.16	16.74	14.94	16.55	17.41
15049	Scan Mirror Drive Elect. T.	DGC	12.94	14.45	15.76	18.99	17.13	15.66	17.27	17.73
15050	Scan Mirror Drive Coil T	DGC	12.69	13.85	15.27	18.14	17.02	14.94	16.58	17.45
15051	Scan Mirror Temp	DGC	12.25	13.16	14.73	17.45	16.60	14.34	16.00	17.20
15052	Rot Sht Hsg Temp	DGC	13.93	15.11	16.40	18.78	18.19	14.80	16.46	17.67
15053	Scn Mirror Reg Volt	VDC	24.02	23.34	23.35	23.35	23.38	23.37	23.35	23.38
15054	Cal Lamp Current	mA	112.50	112.56	112.50	112.50	112.50	110.00	110.00	110.00
15055	BD 1 15V	TMV	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07
15056	BD 2 15 V	TMV	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
15057	BD 3 15 V	TMV	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
15058	BD 4 15 V	TMV	5.02	5.02	5.02	5.01	5.02	5.02	5.02	5.02
15059	TLM -15 V	VDC	- 15.17	- 15.17	- 15.17	- 15.17	-15.17	-15.17	-15.17	-15.17
15060	SM Reg +12 V/-6 V	TMV	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
15061	Logic +5 V	TMV	4.87	4.87	4.85	4.87	4.87	4.86	4.86	4.86
15062	+19 V Rect Out	TMV	5.90	5.89	6.02	5.90	5.89	6.02	6.02	6.02
15063	-19 V Rect Out	TMV	4.30	4.22	4.31	4.22	4.22	4.32	4.32	4.32
15064	BD 1 HVA	TMV	5.00	5.00	5.02	5.02	5.02	5.02	5.02	5.02
15065	BD 1 HVB	TMV	F	F	F	F	F	F	F	F
15066	BD 2 HVA	TMV	5.04	5.05	5.05	5.05	5.05	5.05	5.05	5.05
15067	BD 3 HVB	TMV	F	F	F	F	F	F	F	F
15068	BD 3 HVA	TMV	5.00	5.02	5.02	5.02	5.02	5.02	5.02	5.02
15069	BD 3 HVB	TMV	F	F	F	F	F	F	F	F
15070	Shtr Mtr Con. Int.	TMV	2.55	2.54	2.53	2.53	2.54	2.55	2.55	2.54
15071	Scan Mirror Drive	VDC	- 7.95	- 7.99	- 8.01	- 8.02	- 8.01	-8.02	-7.99	-8.02
15080	RAD Cool 1st Stg T	DGC	F	-112.60	-112.63	-111.81	-112.97	-27.88	-26.75	-25.63
15081	RAD Cool 2nd Stg W T	DGC	F	-181.00	-181.00	-181.00	-181.00	-28.12	-26.91	-26.91
15082	RAD Cool 2nd Stg N T	DGC	F	-180.52	-180.89	-180.47	-180.68	*	*	*

F = Unit Off
Q = Unit Failure

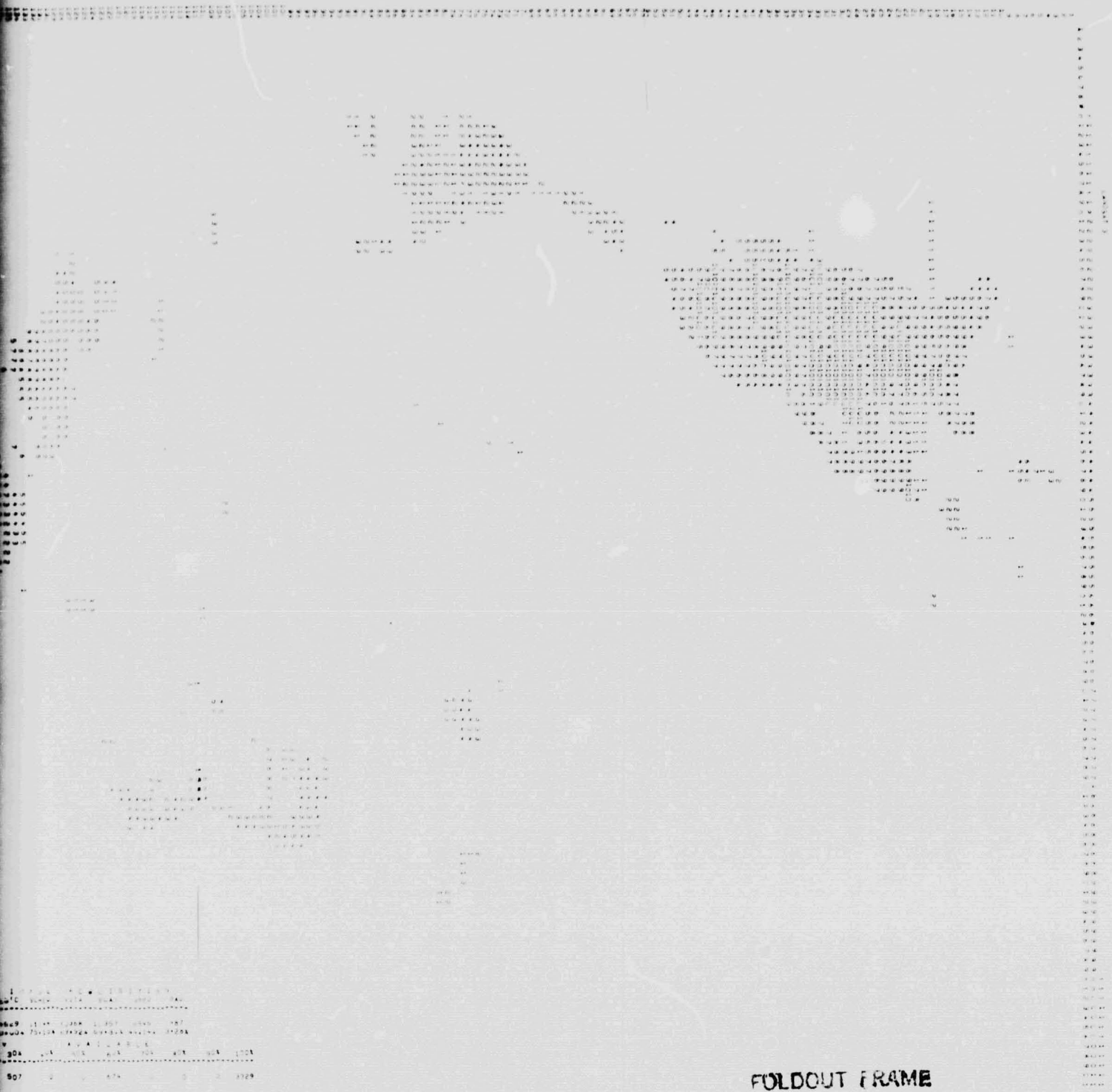
* Out of Calibration Range

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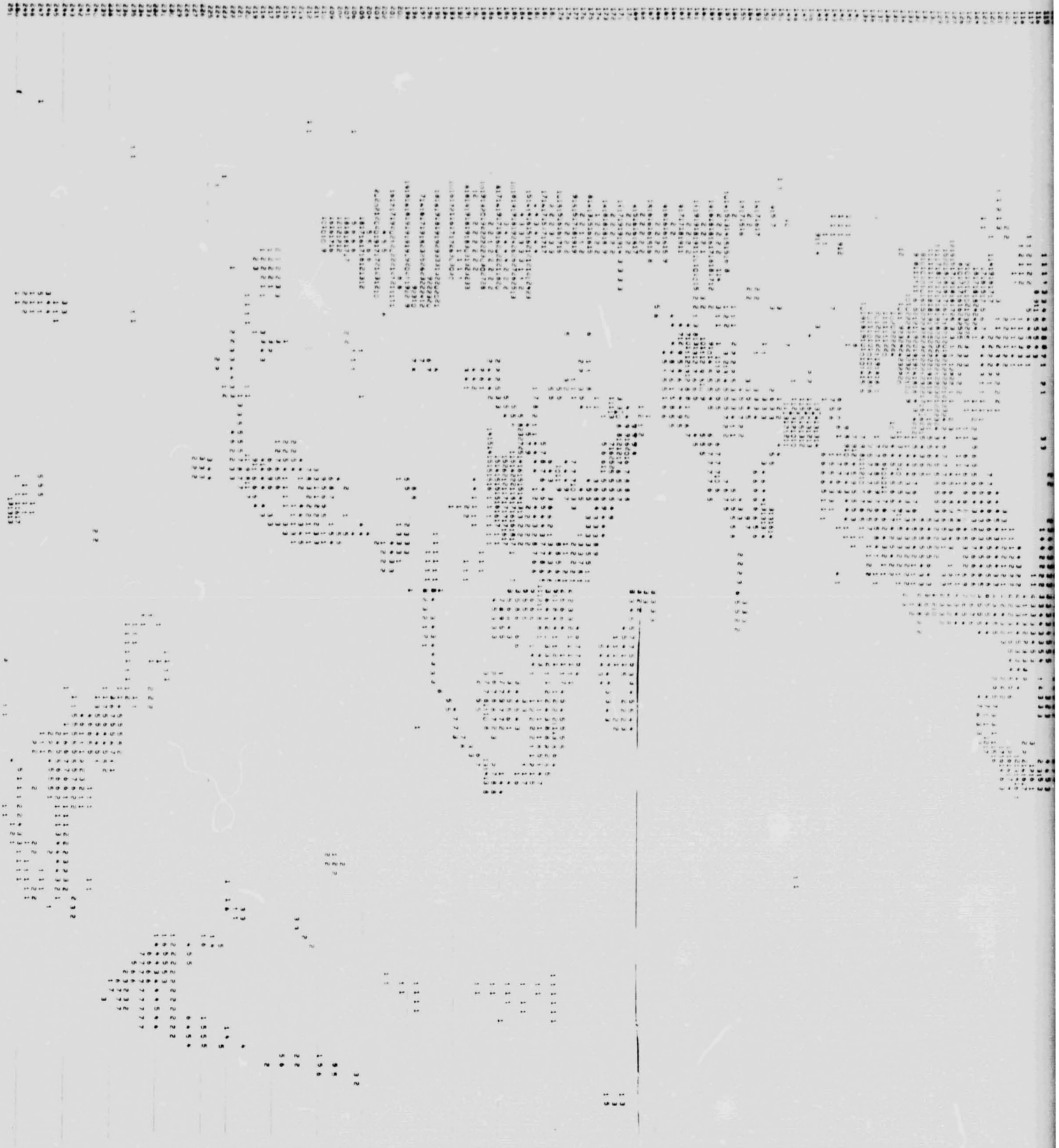
ORIGINAL PAGE IS
OF POOR QUALITY

FOLDOUT FRAME



FOLDOUT FRAME

Figure 17-1. MSS Scenes in This Reporting Period - Landsat-3 Cycles 28-37



FOLDOUT FRAME)

ORIGINAL PAGE IS
OF POOR QUALITY

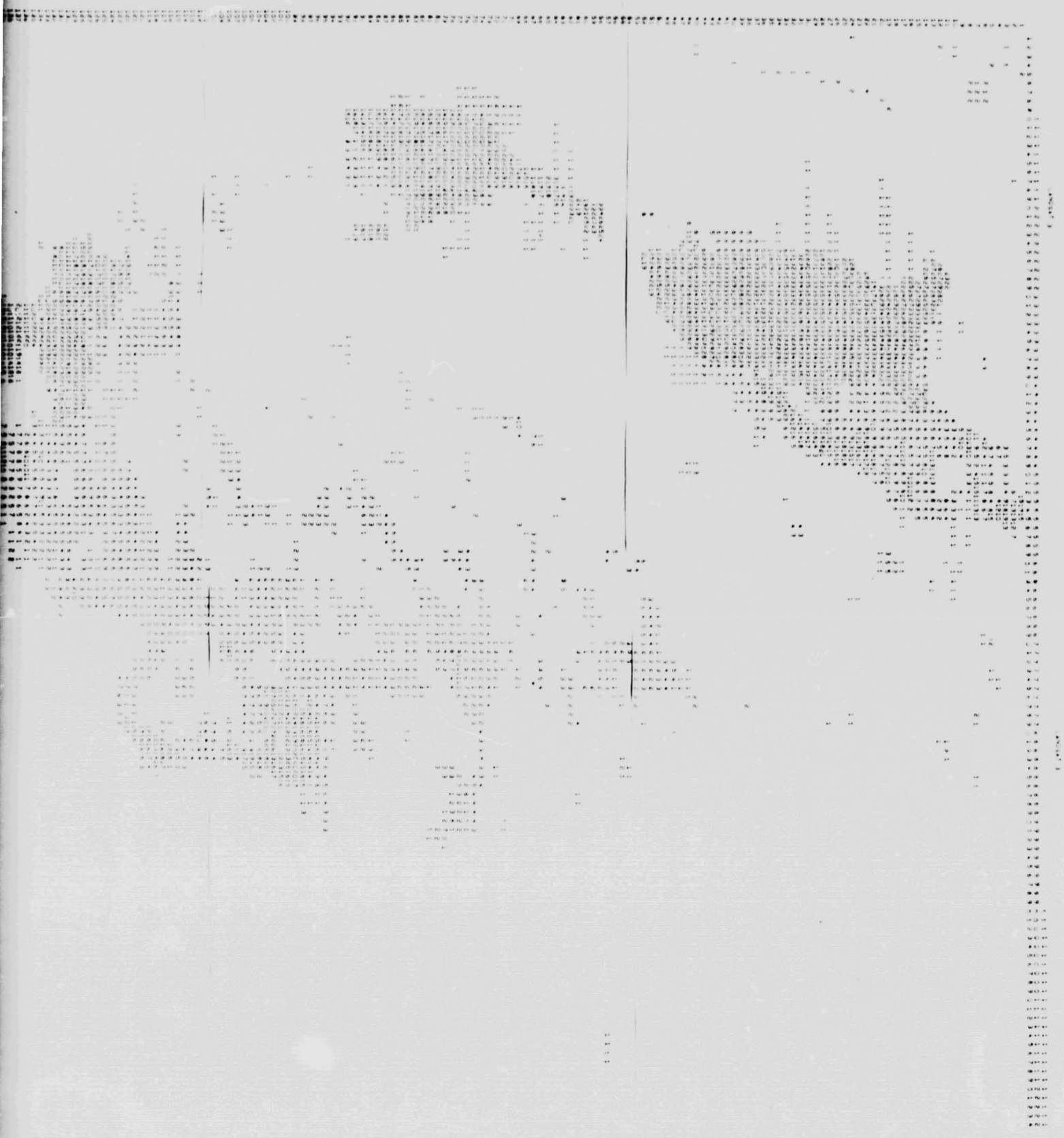
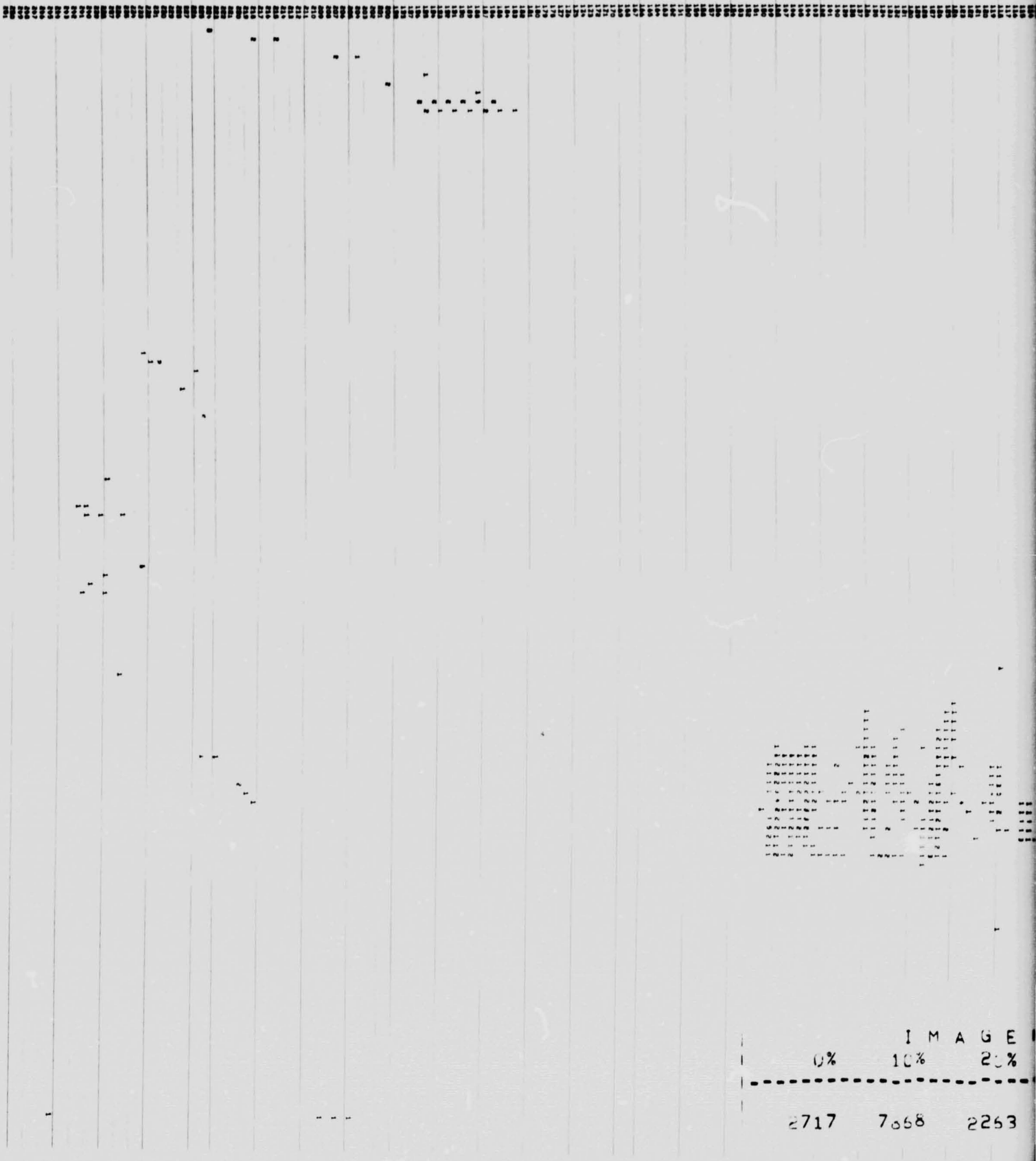


Figure 17-2A. Map of MSS Scenes in S-N Passages (Daylight) Since Launch Landsat-3 Cycles 1-37

FOLDOUT FRAME 2



ORIGINAL PAGE IS
OF POOR QUALITY

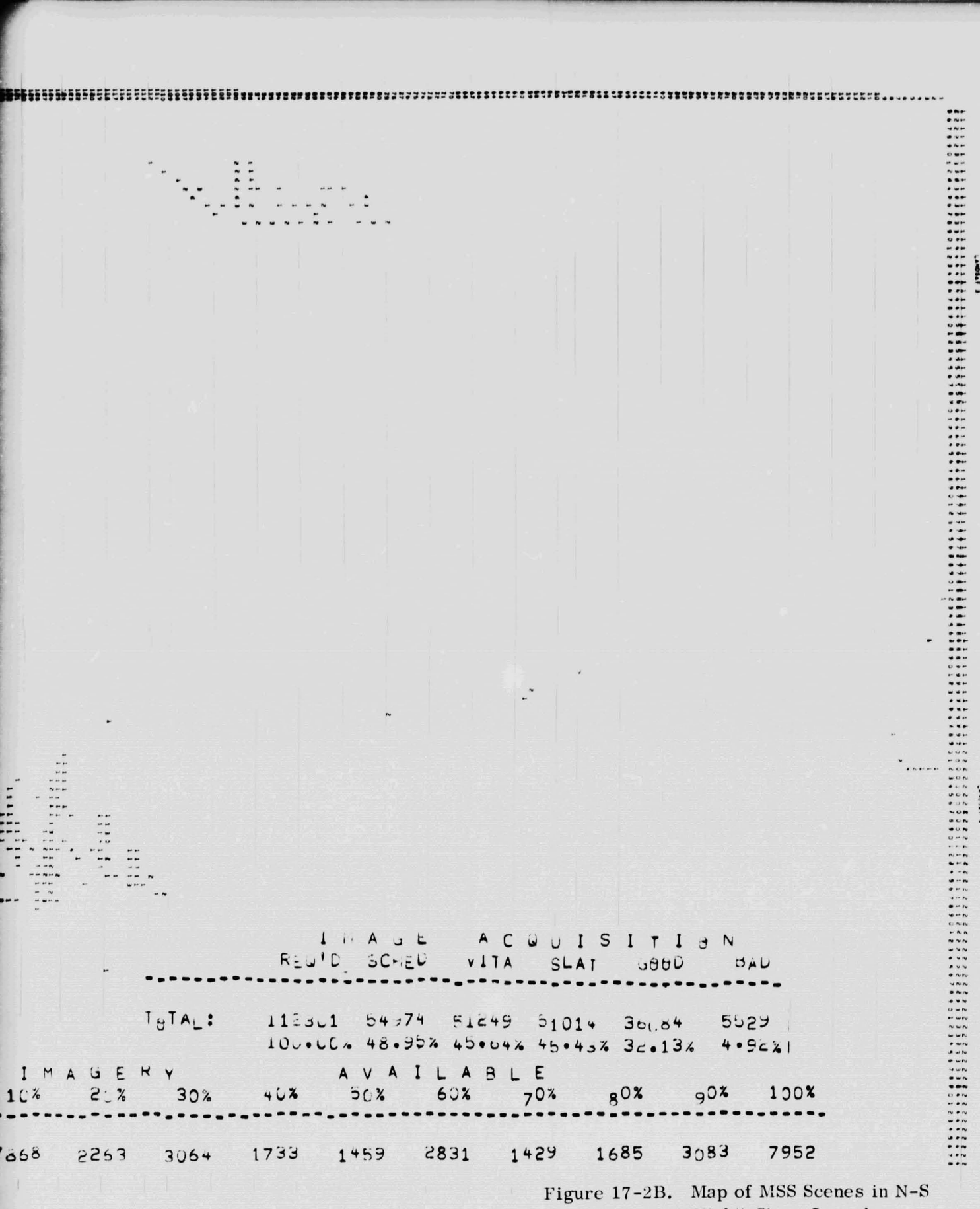


Figure 17-2B. Map of MSS Scenes in N-S Passages (Night) Since Launch Landsat-3 Cycles 1-37

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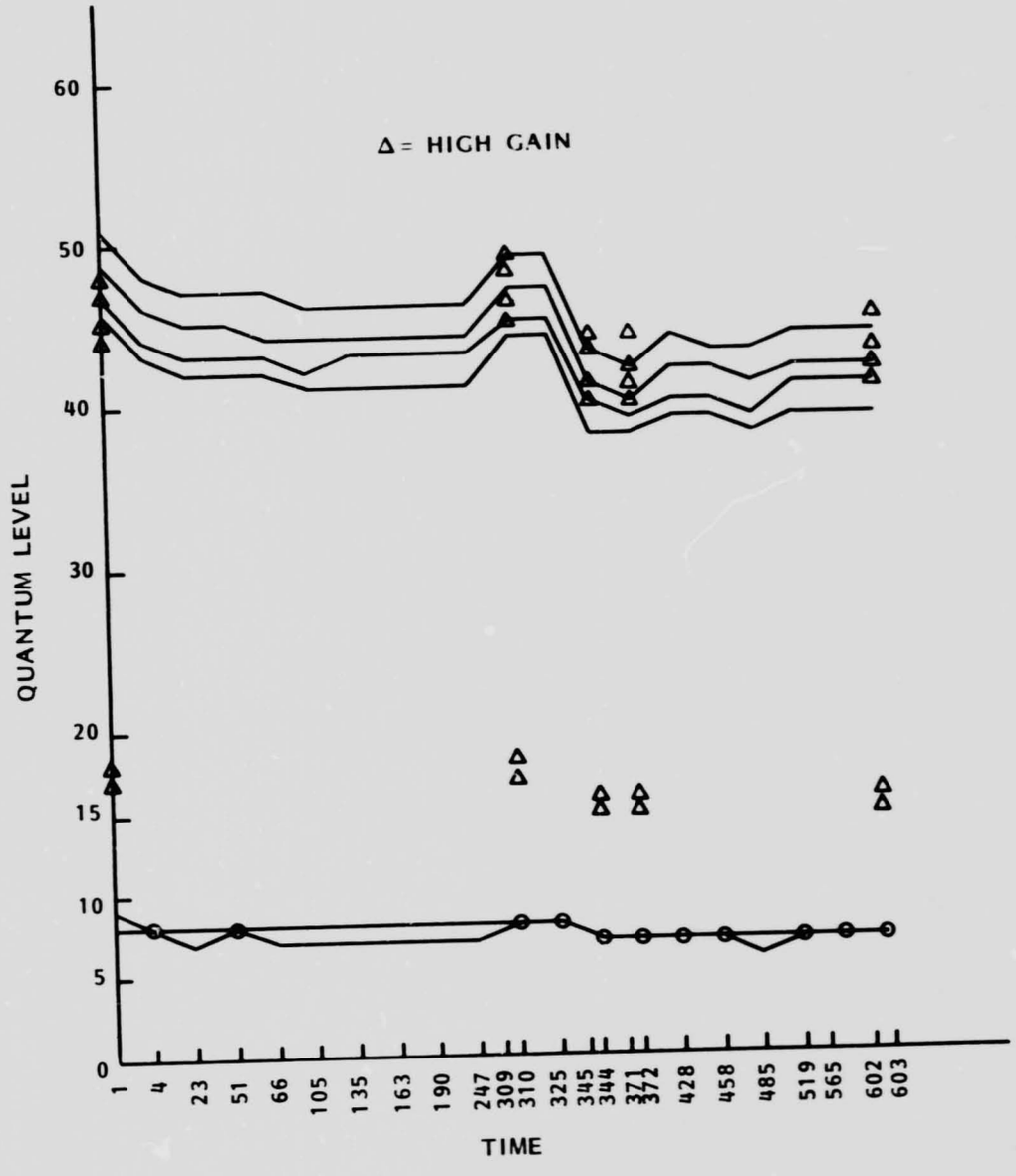


Figure 17-3. Landsat-3 Sensor 2 Response to Six Positions in the Cal Wedge

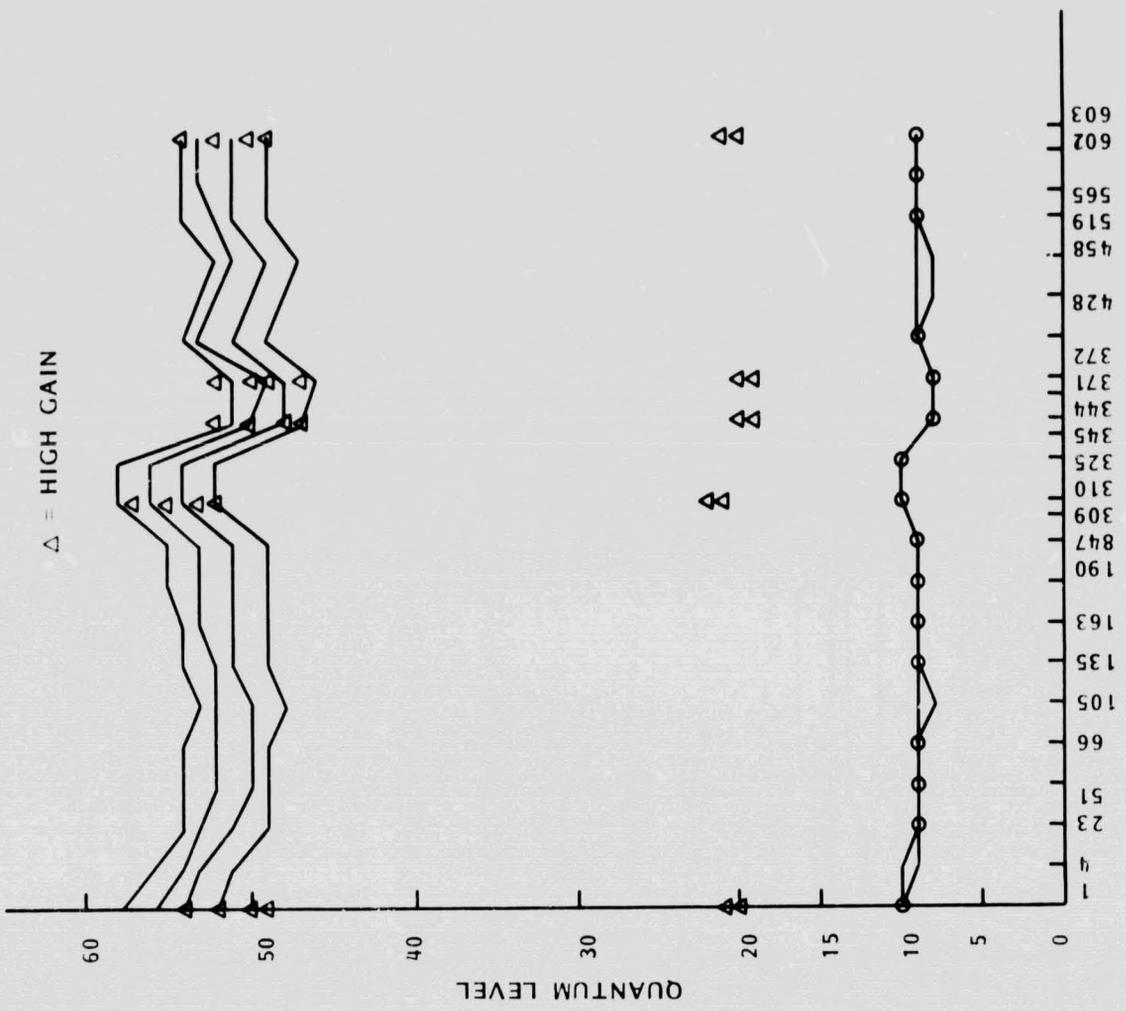


Figure 17-4. Landsat-3 Sensor 8 Response to Six Light Levels from Cal Lamp

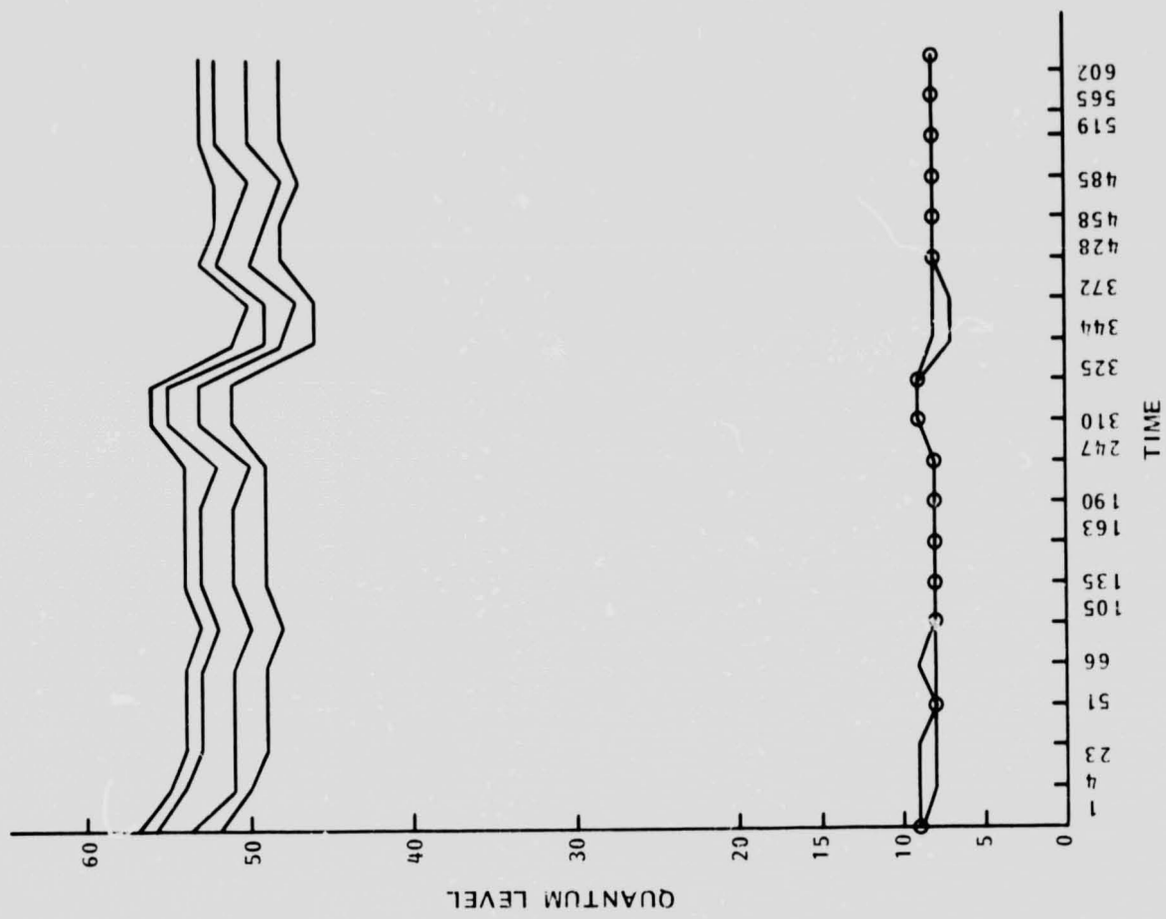


Figure 17-5. Landsat-3 Sensor 13 Response to Six Light Levels from Cal Lamp

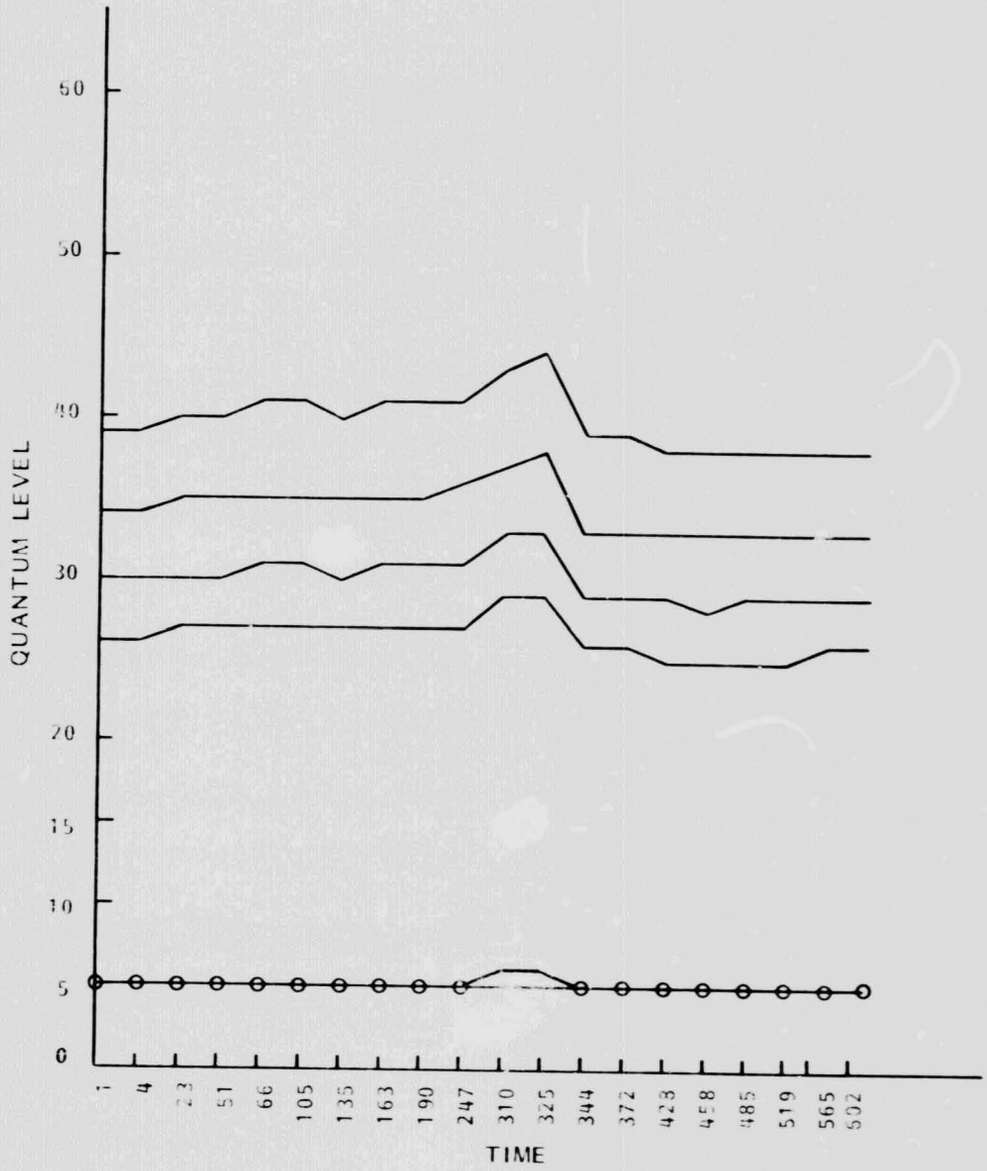


Figure 17-6. Landsat-3 Sensor 22 Response to Six Light Levels from Cal Lamp

Table 17-2. Gain for Sensors Measured Immediately After Cooldown and Normalized to Gain Step 6

Date	After Outgas Cycle	Orbit	Sens. 25	Sens. 26	Comment
1978:					
3-21	1	222	42.72	39.54	
4-3	2	403	(38.95)	(35.66)	36 hours after Cooldown
4-17	3	598	42.45	39.17	
5-3	4	821	(40.11)	(37.42)	2 hours after Cooldown
5-25	5	1120	40.23	38.14	
6-19	6	1476	35.47	34.61	
7-12	7	1790	Q	33.57	
8-11	8	2215	Q	32.63	
9-8	9	2606	Q	31.16	
10-13	10	3095	Q	31.18	
11-9	11	3471	Q	29.67	
12-7	12	3861	Q	28.11	
1979:					
1-2	13	4224	Q	27.45	
1-29	14	4600	Q	27.32	
2-23	15	4949	Q	26.81	
3-19	16	5283	Q	26.78	

Q = Sensor Failed

SECTION 18
DATA COLLECTION SYSTEM (DCS)
LANDSAT-3

SECTION 18

DATA COLLECTION SUBSYSTEM (DCS)

The DCS Subsystem performed nominally during this report period. The performance of the DCS subsystem (in conjunction with the USB) was studied at extreme range, and showed nominal performance at the 3222 km horizon.

Figure 18-1 shows the number of DCS messages received in each 18-day cycle at OCC. The percentage of good messages is currently above 98%. The declining number of DCS messages is due to the transfer of this function from Landsat to the GOES satellite by Government users.

There are 22 users and 212 DCP's in the data base. Of these DCP's about 27 are currently active daily.

Table 18-1 shows telemetry values since launch. All are nominal.

Table 18-1. DCS Telemetry Values

Func	Name	Units	Orbit							
			43	1521	2721	4001	5152	7691	8572	9442
16001	Receiver 1 Sig Strength	dBm	-125.00	-127.21	-123.45	-128.11	-130.01	-130.51	-124.46	-123.17
16002	Receiver 1 Temp	DGC	19.05	19.00	20.17	21.68	22.09	21.88	21.97	23.48
16003	Rec-1 Pwr Input Volt	VDC	2.35	2.34	2.35	2.36	2.37	2.37	2.37	2.38
16004	Receiver 2 Sig Strength	dBm	F	F	F	F	F	F	F	F
16005	Receiver 2 Temp.	DGC	F	F	F	F	F	F	F	F
16006	Receiver 2 Input Volt	VDC	F	F	F	F	F	F	F	F

F = Unit Off

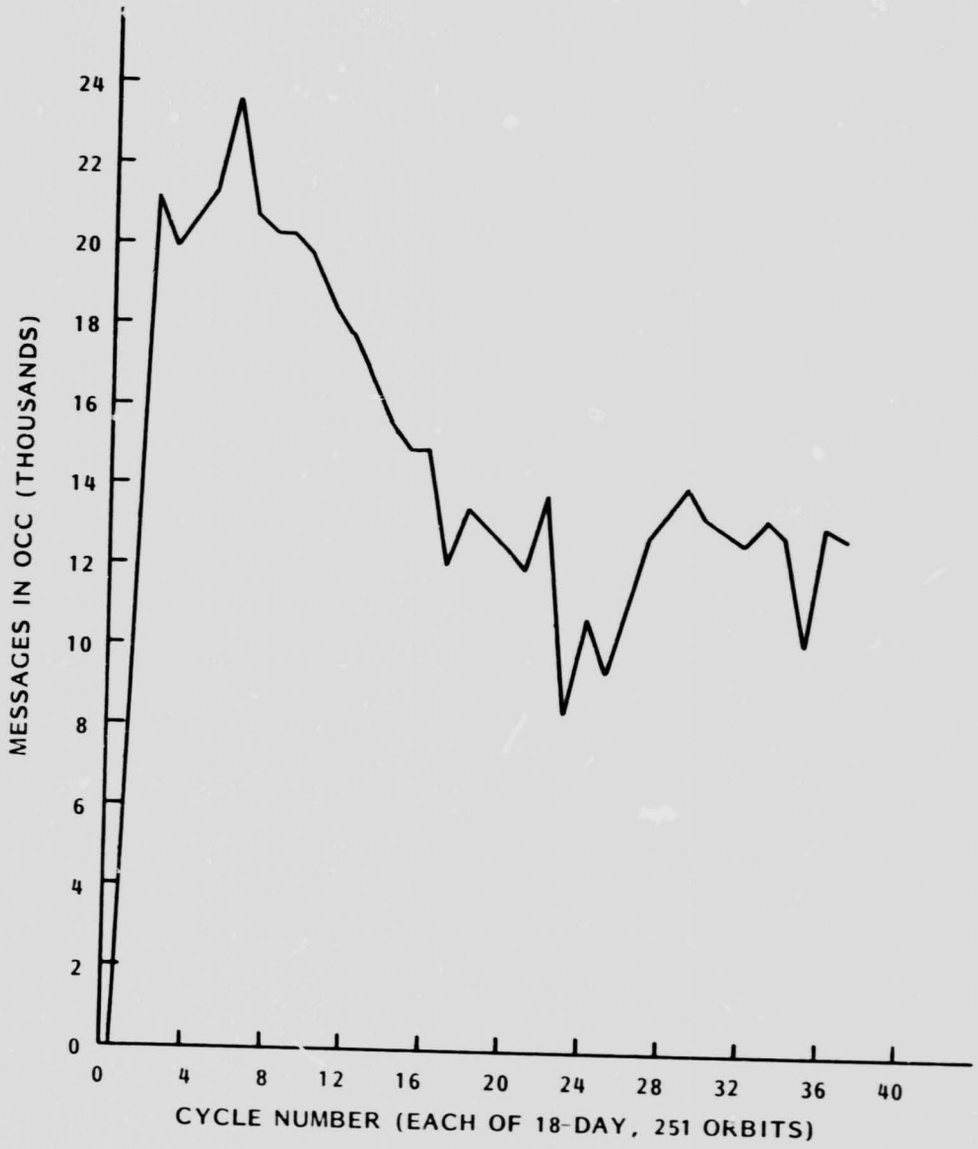


Figure 18-1. Landsat-3 Number of DCS Messages for Each 18-Day Cycle

APPENDIX A

LANDSAT-3 ANOMALIES AND OBSERVATIONS

Date	Anomaly/Observation	How Observed	
3/8/78	Cell 4 of B COMSTOR would not verify. MDR D04942	On-Line	Cell 4 of B COMSTOR woul when all "1's" appeared in operational.
3/9/78	RBV had intermittent white level saturation in first 5% of image. MDR D04939	Off-Line	White level saturation occu
4/3/78	Sensor responsivity was observed to be successively lower at first turn-on after each outgas cycle.	Off-Line	Study being made to determ tamination.
5/4/78	ECAM halted on checksum. MDR D04941	On-Line	ECAM halted on internal ch changed and operation conti changed and returned to ope
7/11/78	No output from sensor 25 video on MSS Band 5. MDR D04943	On-Line	First operation after 7th ou 1-4 normal.
7/16/78	SMART #6 analog WBVTR-1 EOT detection fired while in monitor mode (Orbit 1857)	On-Line	Variable end of tape (EOT) normal detection. No effec
7/19/78	SMART #4 and 5 digital EOT detection for WBVTR-1 and WBVTR-2 fired in Orbit 1897	On-Line	Operation to end of tape cau matic shutdown and inhibit
7/24/78	SMART #2 fired due to WBVTR-1 high headwheel current (HWI) in Orbit 1971	On-Line	Subsequent test operation sh reset.
8/27/78	Intermittent delayed line start pulse on MSS. MDR D04944	Off-Line	Delayed line start generated when commanded on. Switc still not visible when comm peak in late March 1979 and in early September 1979 the Source A. Late line starts occurrences were increasin
11/4/78	SMART #7 analog WBVTR-2 EOT detection fired while in monitor mode (Orbit 2465)	On-Line	Variable end of tape (EOT) normal detection. No effec
11/17/78	SMART #1 fired due to low unregulated voltage in Orbit (3576)	On-Line	Simultaneous MSS and RBV voltage reached -26.5 volts, and normal operation resum occurrence in Orbit 3939 (12 error which has been corre 1979), 9307 (1 January 1980)
12/6/78	MSS False End-of-Line Codes (MDR D04948)	Off-Line	Occasional extra scan monit 4 black and 4 white (End-of- rate; i.e., Brazil, Africa.
5/24/79	RMP2 (Ball Bearing Gyro) current high then returned to normal. (MRD D04950)	On-Line	RMP1 (Gas Bearing Gyro) tu rundown test showed RMP2
6/4/79	WBVTR-1 Minor Frame Sync Errors increased from 8 to 2000 during Playback in Orbit 6351 on 4 June 1979. (MDR D04951)	On-Line	WBVTR-1 tests show MSS d is operational. Cause of an
8/10/79	Rear scanner generated erratic output signal which caused short disturbances in LS-3 attitude	On-Line	The rear scanner first show observed in Orbits 8457, 85 1979, the rear scanner was scanner can be selected for

APPENDIX A

LANDSAT-3 ANOMALIES AND OBSERVATIONS

	How Observed	Comments
004942	On-Line	Cell 4 of B COMSTOR would not load properly in Orbits 41, 45 and 48. Opeational use discontinued on 3/18/78 when all "1's" appeared in cell 4. Tested and operation resumed in Orbit 1897 on 19 July 1978 with cell 4 non-operational.
irst	Off-Line	White level saturation occurred in first 5% of images at intermittent occurrence.
itively	Off-Line	Study being made to determine if responsivity decline due to sensor deterioration or to non-water vapor contamination.
	On-Line	ECAM halted on internal check on Orbit 839 (5 May 1978). Memory fault not critical and stable. Checksum changed and operation continued. Reoccurred at new non-critical memory location on 31 May 1978. Checksum changed and returned to operation.
MDR	On-Line	First operation after 7th outgas cycle showed no output from sensor 25. Sensor 26 operated nominally. Bands 1-4 normal.
d while	On-Line	Variable end of tape (EOT) protection circuit presently set inside normal operating range and fires indicating normal detection. No effect on operation as circuit is in monitor mode.
TR-1 and	On-Line	Operation to end of tape caused SMART #4 and 5 circuit to fire before primary mechanical EOT switch. Automatic shutdown and inhibit of payloads occurred. Recorder returned to operation and SMART #4 and 5 reset.
el current	On-Line	Subsequent test operation showed normal HWI and normal operation of recorder resumed. SMART #2 was reset.
MDR	Off-Line	Delayed line start generated by mux after apparent miss of scan monitor pulseNo. 1. Mid scan code not visible when commanded on. Switched to scan monitor light source B. Anomaly not seen in this mode. Mid scan code still not visible when commanded on. Anomaly absent October 1978 to January 1979. Occurrences built up to a peak in late March 1979 and then subsided. Recurrences began in mod May 1979 and peaked in late August 1979. In early September 1979 the MSS configuration was changed to inverter A, Shutter Source A, and Scan Monitor Source A. Late line starts subsided but still occurred on an intermittent schedule. In January 1980 late line starts occurrences were increasing.
d while	On-Line	Variable end of tape (EOT) protection circuit presently set inside normal operating range and fires indicating normal detection. No effect on operation as circuit is in monitor mode.
in Orbit	On-Line	Simultaneous MSS and RBV playbacks during spacecraft night discharged the batteries until the unregulated bus voltage reached -26.5 volts. The SMART triggered and shut down payload operation. The SMART #1 was reset and normal operation resumed. Mission planning instructed to prohibit dual simultaneous P/B at night. Reoccurrence in Orbit 3939 (12/13/78) during night playback due to low power caused by power management program error which has been corrected. Reoccurred in Orbit 5639 (13 April 1979), 8034 (20 October 1979), 9085 (25 November 1979), 9307 (1 January 1980). SMART #1 was reset and normal operation resumed.
	Off-Line	Occasional extra scan monitor pulses occurring in preamble or along video data caused early line starts or extra 4 black and 4 white (End-of-Line Code) pixels in scene data. Occurs over magnetic anomalies with low incident rate; i.e., Brazil, Africa. Operation continued.
turned	On-Line	RMP1 (Gas Bearing Gyro) turned on in Orbit 6207 (24 May 1979) and enabled in Orbit 6220 (25 May 1979). RMP2 rundown test showed RMP2 normal and can serve as a backup.
d from ne 1979.	On-Line	WBVTR-1 tests show MSS data is bad but RBV data is good. WBVTR-1 assigned to RBV only on 29 June 1979 and is operational. Cause of anomaly not established.
hich	On-Line	The rear scanner first showed erratic behavior in Orbit 7294 on 10 August 1979. Additional erratic glitches were observed in Orbits 8457, 8557, 8572, 8573, 8640, 8643, 8657, 8700, 8703, 8716. In Orbit 8718 on 19 November 1979, the rear scanner was disabled and attitude control maintained by the single forward scanner. The rear scanner can be selected for use in an emergency.

APPENDIX B

LANDSAT-3 SPACECRAFT ORBIT REFERENCE TABLES

APPENDIX B

LANDSAT-3

SPACECRAFT ORBIT REFERENCE TABLES

FROM JULY 1979 THROUGH 31 JANUARY 1981

ORBITS 6726 TO 14827

FLIGHT DAY 483 THROUGH 1063

Landsat-3

July 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	182	483	6726-6739	71- 84	6	27
2	183	484	6740-6753	85- 98	7	27
3	184	485	6754-6767	99-112	8	27
4	185	486	6768-6781	113-126	9	27
5	186	487	6782-6794	127-139	10	27
6	187	488	6795-6808	140-153	11	27
7	188	489	6809-6822	154-167	12	27
8	189	490	6923-6836	168-181	13	27
9	190	491	6837-6850	182-195	14	27
10	191	492	6851-6864	196-209	15	27
11	192	493	6865-6878	210-223	16	27
12	193	494	6879-6892	224-237	17	27
13	194	495	6893-6906	238-251	18	27
14	195	496	6907-6920	1- 14	1	28
15	196	497	6921-6934	15- 28	2	28
16	197	498	6935-6948	29- 42	3	28
17	198	499	6949-6962	43- 56	4	28
18	199	500	6963-6976	57- 70	5	28
19	200	501	6977-6990	71- 84	6	28
20	201	502	6991-7004	85- 98	7	28
21	202	503	7005-7018	99-112	8	28
22	203	504	7019-7032	113-126	9	28
23	204	505	7033-7045	127-139	10	28
24	205	506	7046-7059	140-153	11	28
25	206	507	7060-7073	154-167	12	28
26	207	508	7074-7087	168-181	13	28
27	208	509	7088-7101	182-195	14	28
28	209	510	7102-7115	196-209	15	28
29	210	511	7116-7129	210-223	16	28
30	211	512	7130-7143	224-237	17	28
31	212	513	7144-7157	238-251	18	28

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August 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	213	514	7158-7171	1-14	1	29
2	214	515	7172-7185	15-28	2	29
3	215	516	7186-7199	29-42	3	29
4	216	517	7200-7213	43-56	4	29
5	217	518	7214-7227	57-70	5	29
6	218	519	7228-7241	71-84	6	29
7	219	520	7242-7255	85-98	7	29
8	220	521	7256-7269	99-112	8	29
9	221	522	7270-7283	113-126	9	29
10	222	523	7284-7296	127-139	10	29
11	223	524	7297-7310	140-153	11	29
12	224	525	7311-7324	154-167	12	29
13	225	526	7325-7338	168-181	13	29
14	226	527	7339-7352	182-195	14	29
15	227	528	7353-7366	196-209	15	29
16	228	529	7367-7380	210-223	16	29
17	229	530	7381-7394	224-237	17	29
18	230	531	7395-7408	238-251	18	29
19	231	532	7409-7422	1-14	1	30
20	232	533	7423-7436	15-28	2	30
21	233	534	7437-7450	29-42	3	30
22	234	535	7451-7464	43-56	4	30
23	235	536	7465-7478	57-70	5	30
24	236	537	7479-7492	71-84	6	30
25	237	538	7493-7506	85-98	7	30
26	238	539	7507-7520	99-112	8	30
27	239	540	7521-7534	113-126	9	30
28	240	541	7535-7548*	127-140*	10	30
29	241	542	7549*-7561	141*-153	11	30
30	242	543	7562-7575	154-167	12	30
31	243	544	7576-7589	168-181	13	30

*Revised

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September 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	244	545	7590-7603	182-195	14	30
2	245	546	7604-7617	196-209	15	30
3	246	547	7618-7631	210-223	16	30
4	247	548	7632-7645	224-237	17	30
5	248	549	7646-7659	238-251	18	30
6	249	550	7660-7673	1-14	1	31
7	250	551	7674-7687	15-28	2	31
8	251	552	7688-7701	29-42	3	31
9	252	553	7702-7715	43-56	4	31
10	253	554	7716-7729	57-70	5	31
11	254	555	7730-7743	71-84	6	31
12	255	556	7744-7757	85-98	7	31
13	256	557	7758-7771	99-112	8	31
14	257	558	7772-7785	113-126	9	31
15	258	559	7786-7799*	127-140*	10	31
16	259	560	7800*-7812	141*-153	11	31
17	260	561	7813-7826	154-167	12	31
18	261	562	7827-7840	168-181	13	31
19	262	563	7841-7854	182-195	14	31
20	263	564	7855-7868	196-209	15	31
21	264	565	7869-7882	210-223	16	31
22	265	566	7883-7896	224-237	17	31
23	266	567	7897-7910	238-251	18	31
24	267	568	7911-7924	1-14	1	32
25	268	569	7925-7938	15-28	2	32
26	269	570	7939-7952	29-42	3	32
27	270	571	7953-7966	43-56	4	32
28	271	572	7967-7980	57-70	5	32
29	272	573	7981-7994	71-84	6	32
30	273	574	7995-8008	85-98	7	32

*Revised

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October 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	274	575	8009-8022	99-112	8	32
2	275	576	8023-8036	113-126	9	32
3	276	577	8037-8050*	127-140*	10	32
4	277	578	8051*-8063	141*-153	11	32
5	278	579	8064-8077	154-167	12	32
6	279	580	8078-8091	168-181	13	32
7	280	581	8092-8105	182-195	14	32
8	281	582	8106-8119	196-209	15	32
9	282	583	8120-8133	210-223	16	32
10	283	584	8134-8147	224-237	17	32
11	284	585	8148-8161	238-251	18	32
12	285	586	8162-8175	1-14	1	33
13	286	587	8176-8189	15-28	2	33
14	287	588	8190-8203	29-42	3	33
15	288	589	8204-8217	43-56	4	33
16	289	590	8218-8231	57-70	5	33
17	290	591	8232-8245	71-84	6	33
18	291	592	8246-8259	85-98	7	33
19	292	593	8260-8273	99-112	8	33
20	293	594	8274-8287	113-126	9	33
21	294	595	8288-8301*	127-140*	10	33
22	295	596	8302*-8314	141*-153	11	33
23	296	597	8315-8328	154-167	12	33
24	297	598	8329-8342	168-181	13	33
25	298	599	8343-8356	182-195	14	33
26	299	600	8357-8370	196-209	15	33
27	300	601	8371-8384	210-223	16	33
28	301	602	8385-8398	224-237	17	33
29	302	603	8399-8412	238-251	18	33
30	303	604	8413-8426	1-14	1	34
31	304	605	8427-8440	15-28	2	34

*Revised

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November 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	305	606	8441-8454	29- 42	3	34
2	306	607	8455-8468	43- 56	4	34
3	307	608	8469-8482	57- 70	5	34
4	308	609	8483-8496	71- 84	6	34
5	309	610	8497-8510	85- 98	7	34
6	310	611	8511-8524	99-112	8	34
7	311	612	8525-8538	113-126	9	34
8	312	613	8539-8552*	127-140*	10	34
9	313	614	8553*-8565	141*-153	11	34
10	314	615	8566-8579	154-167	12	34
11	315	616	8580-8593	168-181	13	34
12	316	617	8594-8607	182-195	14	34
13	317	618	8608-8621	196-209	15	34
14	318	619	8622-8635	210-223	16	34
15	319	620	8636-8649	224-237	17	34
16	320	621	8650-8663	238-251	18	34
17	321	622	8664-8677	1- 14	1	35
18	322	623	8678-8691	15- 28	2	35
19	323	624	8692-8705	29- 42	3	35
20	324	625	8706-8719	43- 56	4	35
21	325	626	8720-8733	57- 70	5	35
22	326	627	8734-8747	71- 84	6	35
23	327	628	8748-8761	85- 98	7	35
24	328	629	8762-8775	99-112	8	35
25	329	630	8776-8789	113-126	9	35
26	330	631	8790-8803*	127-140*	10	35
27	331	632	8804*-8816	141*-153	11	35
28	332	633	8817-8830	154-167	12	35
29	333	634	8831-8844	168-181	13	35
30	334	635	8845-8858	182-195	14	35

* Revised

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December 1979

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	335	636	8859-8872	196-209	15	35
2	336	637	8873-8886	210-223	16	35
3	337	638	8887-8900	224-237	17	35
4	338	639	8901-8914	238-251	18	35
5	339	640	8915-8928	1- 14	1	36
6	340	641	8929-8942	15- 28	2	36
7	341	642	8943-8956	29- 42	3	36
8	342	643	8957-8970	43- 56	4	36
9	343	644	8971-8984	57- 70	5	36
10	344	645	8985-8998	71- 84	6	36
11	345	646	8999-9012	85- 98	7	36
12	346	647	9013-9026	99-112	8	36
13	347	648	9027-9040	113-126	9	36
14	348	649	9041-9054*	127-140*	10	36
15	349	650	9055*-9067	141*-153	11	36
16	350	651	9068-9081	154-167	12	36
17	351	652	9082-9095	168-181	13	36
18	352	653	9096-9109	182-195	14	36
19	353	654	9110-9123	196-209	15	36
20	354	655	9124-9137	210-223	16	36
21	355	656	9138-9151	224-237	17	36
22	356	657	9152-9165	238-251	18	36
23	357	658	9166-9179	1- 14	1	37
24	358	659	9180-9193	15- 28	2	37
25	359	660	9194-9207	29- 42	3	37
26	360	661	9208-9221	43- 56	4	37
27	361	662	9222-9235	57- 70	5	37
28	362	663	9236-9249	71- 84	6	37
29	363	664	9250-9263	85- 98	7	37
30	364	665	9264-9277	99-112	8	37
31	365	666	9278-9291	113-126	9	37

* Revised

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January 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	1	667	9292-9305*	127-140*	10	37
2	2	668	9306*-9318	141*-153	11	37
3	3	669	9319-9332	154-167	12	37
4	4	670	9333-9346	168-181	13	37
5	5	671	9347-9360	182-195	14	37
6	6	672	9361-9374	196-209	15	37
7	7	673	9375-9388	210-223	16	37
8	8	674	9389-9402	224-237	17	37
9	9	675	9403-9416	238-251	18	37
10	10	676	9417-9430	1- 14	1	38
11	11	677	9431-9444	15- 28	2	38
12	12	678	9445-9458	29- 42	3	38
13	13	679	9459-9472	43- 56	4	38
14	14	680	9473-9486	57- 68	5	38
15	15	681	9487-9500	71- 84	6	38
16	16	682	9501-9514	85- 98	7	38
17	17	683	9515-9528	99-112	8	38
18	18	684	9529-9542	113-126	9	38
19	19	685	9543-9555	127-139	10	38
20	20	686	9556-9569	140-153	11	38
21	21	687	9570-9583	154-167	12	38
22	22	688	9584-9597	168-181	13	38
23	23	689	9598-9611	182-195	14	38
24	24	690	9612-9625	196-209	15	38
25	25	691	9626-9639	210-223	16	38
26	26	692	9640-9653	224-237	17	38
27	27	693	9654-9667	238-251	18	38
28	28	694	9668-9681	1- 14	1	39
29	29	695	9682-9695	15- 28	2	39
30	30	696	9696-9709	29- 42	3	39
31	31	697	9710-9723	43- 56	4	39

* Revised

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February 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	32	698	9724-9737	57- 70	5	39
2	33	699	9738-9751	71- 84	6	39
3	34	700	9752-9765	85- 98	7	39
4	35	701	9766-9779	99-112	8	39
5	36	702	9780-9793	113-126	9	39
6	37	703	9794-9807	127-140	10	39
7	38	704	9808-9820	141-153	11	39
8	39	705	9821-9834	154-167	12	39
9	40	706	9835-9848	168-181	13	39
10	41	707	9849-9862	182-195	14	39
11	42	708	9863-9876	196-209	15	39
12	43	709	9877-9890	210-223	16	39
13	44	710	9891-9904	224-237	17	39
14	45	711	9905-9918	238-251	18	39
15	46	712	9919-9932	1- 14	1	40
16	47	713	9933-9946	15- 28	2	40
17	48	714	9947-9960	29- 42	3	40
18	49	715	9961-9924	43- 56	4	40
19	50	716	9975-9988	57- 70	5	40
20	51	717	9989-10002	71- 84	6	40
21	52	718	10003-10016	85- 98	7	40
22	53	719	10017-10030	99-112	8	40
23	54	720	10031-10044	113-126	9	40
24	55	721	10045-10058	127-140	10	40
25	56	722	10059-10071	141-153	11	40
26	57	723	10072-10085	154-167	12	40
27	58	724	10086-10099	168-181	13	40
28	59	725	10100-10113	182-195	14	40
29	60	726	10114-10127	196-209	15	40

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March 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	61	727	10128-10141	210-223	16	40
2	62	728	10142-10155	224-237	17	40
3	63	729	10156-10169	238-251	18	40
4	64	730	10170-10183	1- 14	1	41
5	65	731	10184-10197	15- 28	2	41
6	66	732	10198-10211	29- 42	3	41
7	67	733	10212-10225	43- 56	4	41
8	68	734	10226-10239	57- 70	5	41
9	69	735	10240-10253	71- 84	6	41
10	70	736	10254-10267	85- 98	7	41
11	71	737	10268-10281	99-112	8	41
12	72	738	10282-10295	113-126	9	41
13	73	739	10296-10309	127-140	10	41
14	74	740	10310-10322	141-153	11	41
15	75	741	10323-10336	154-167	12	41
16	76	742	10337-10350	168-181	13	41
17	77	743	10351-10364	182-195	14	41
18	78	744	10365-10378	196-209	15	41
19	79	745	10379-10392	210-223	16	41
20	80	746	10393-10406	224-237	17	41
21	81	747	10407-10420	238-251	18	41
22	82	748	10421-10434	1- 14	1	42
23	83	749	10435-10448	15- 28	2	42
24	84	750	10449-10462	29- 42	3	42
25	85	751	10463-10476	43- 56	4	42
26	86	752	10477-10490	57- 70	5	42
27	87	753	10491-10504	71- 84	6	42
28	88	754	10505-10518	85- 98	7	42
29	89	755	10519-10532	99-112	8	42
30	90	756	10533-10546	113-126	9	42
31	91	757	10547-10560	127-140	10	42

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April 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	92	758	10561-10573	141-153	11	42
2	93	759	10574-10587	154-167	12	42
3	94	760	10588-10601	168-181	13	42
4	95	761	10602-10615	182-195	14	42
5	96	762	10616-10629	196-209	15	42
6	97	763	10630-10643	210-223	16	42
7	98	764	10644-10657	224-237	17	42
8	99	765	10658-10671	238-251	18	42
9	100	766	10672-10685	1- 14	1	43
10	101	767	10686-10699	15- 28	2	43
11	102	768	10700-10713	29- 42	3	43
12	103	769	10714-10727	43- 56	4	43
13	104	770	10728-10741	57- 70	5	43
14	105	771	10742-10755	71- 84	6	43
15	106	772	10756-10769	85- 98	7	43
16	107	773	10770-10783	99-112	8	43
17	108	774	10784-10797	113-126	9	43
18	109	775	10798-10811	127-140	10	43
19	110	776	10812-10825	141-154	11	43
20	111	777	10826-10838	155-167	12	43
21	112	778	10839-10852	168-181	13	43
22	113	779	10853-10866	182-195	14	43
23	114	780	10867-10880	196-209	15	43
24	115	781	10881-10894	210-223	16	43
25	116	782	10895-10908	224-237	17	43
26	117	783	10909-10922	238-251	18	43
27	118	784	10923-10936	1- 14	1	44
28	119	785	10937-10950	15- 28	2	44
29	120	786	10951-10964	29- 42	3	44
30	121	787	10965-10978	43- 56	4	44

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May 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	122	788	10979-10992	57-70	5	44
2	123	789	10993-11006	71-84	6	44
3	124	790	11007-11020	85-98	7	44
4	125	791	11021-11034	99-112	8	44
5	126	792	11035-11048	113-126	9	44
6	127	793	11049-11062	127-139	10	44
7	128	794	11063-11076	140-153	11	44
8	129	795	11077-11089	154-167	12	44
9	130	796	11090-11103	168-181	13	44
10	131	797	11104-11117	182-195	14	44
11	132	798	11118-11131	196-209	15	44
12	133	799	11132-11145	210-223	16	44
13	134	800	11146-11159	224-237	17	44
14	135	801	11160-11173	238-261	18	44
15	136	802	11174-11187	1-14	1	45
16	137	803	11188-11201	15-28	2	45
17	138	804	11202-11215	29-42	3	45
18	139	805	11216-11229	43-56	4	45
19	140	806	11230-11243	57-70	5	45
20	141	807	11244-11257	71-84	6	45
21	142	808	11258-11271	85-98	7	45
22	143	809	11272-11285	99-112	8	45
23	144	810	11286-11299	113-126	9	45
24	145	811	11300-11313	127-139	10	45
25	146	812	11314-11327	140-153	11	45
26	147	813	11328-11340	154-167	12	45
27	148	814	11341-11354	168-181	13	45
28	149	815	11355-11368	182-195	14	45
29	150	816	11369-11382	196-209	15	45
30	151	817	11383-11396	210-223	16	45
31	152	818	11397-11410	224-237	17	45

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June 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	153	819	11411-11424	238-251	18	45
2	154	820	11425-11438	1-14	1	46
3	155	821	11439-11452	15-28	2	46
4	156	822	11453-11466	29-42	3	46
5	157	823	11467-11480	43-56	4	46
6	158	824	11481-11494	57-70	5	46
7	159	825	11495-11508	71-84	6	46
8	160	826	11509-11522	85-98	7	46
9	161	827	11523-11536	99-112	8	46
10	162	828	11537-11550	113-126	9	46
11	163	829	11551-11564	127-139	10	46
12	164	830	11565-11578	140-153	11	46
13	165	831	11579-11591	154-167	12	46
14	166	832	11592-11605	168-181	13	46
15	167	833	11606-11619	182-195	14	46
16	168	834	11620-11633	196-209	15	46
17	169	835	11634-11647	210-223	16	46
18	170	836	11648-11661	224-237	17	46
19	171	837	11662-11675	238-251	18	46
20	172	838	11676-11689	1-14	1	47
21	173	839	11690-11703	15-28	2	47
22	174	840	11704-11717	29-42	3	47
23	175	841	11718-11731	43-56	4	47
24	176	842	11732-11745	57-70	5	47
25	177	843	11746-11759	71-84	6	47
26	178	844	11760-11773	85-98	7	47
27	179	845	11774-11787	99-112	8	47
28	180	846	11788-11801	113-126	9	47
29	181	847	11802-11815	127-139	10	47
30	182	848	11816-11829	140-153	11	47

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July 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	183	849	11830-11842	154-167	12	47
2	184	850	11843-11856	168-181	13	47
3	185	851	11857-11870	182-195	14	47
4	186	852	11871-11884	196-209	15	47
5	187	853	11885-11898	210-223	16	47
6	188	854	11899-11912	224-237	17	47
7	189	855	11913-11926	238-251	18	47
8	190	856	11927-11940	1-14	1	48
9	191	857	11941-11954	15-28	2	48
10	192	858	11955-11968	29-42	3	48
11	193	859	11969-11982	43-56	4	48
12	194	860	11983-11996	57-70	5	48
13	195	861	11997-12010	71-84	6	48
14	196	862	12011-12024	85-98	7	48
15	197	863	12025-12038	99-112	8	48
16	198	864	12039-12052	113-126	9	48
17	199	865	12053-12066	127-139	10	48
18	200	866	12067-12080	140-153	11	48
19	201	867	12081-12093	154-167	12	48
20	202	868	12094-12097	168-181	13	48
21	203	869	12098-12121	182-195	14	48
22	204	870	12122-12135	196-209	15	48
23	205	871	12136-12149	210-223	16	48
24	206	872	12150-12163	224-237	17	48
25	207	873	12164-12177	238-251	18	48
26	208	874	12178-12191	1-14	1	49
27	209	875	12192-12205	15-28	2	49
28	210	876	12206-12219	29-42	3	49
29	211	877	12220-12233	43-56	4	49
30	212	878	12234-12247	57-70	5	49
31	213	879	12248-12261	71-84	6	49

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August 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	214	880	12262-12275	85-98	7	49
2	215	881	12276-12289	99-112	8	49
3	216	882	12290-12303	113-126	9	49
4	217	883	12304-12317	127-139	10	49
5	218	884	12318-12331	140-153	11	49
6	219	885	12332-12344	154-167	12	49
7	220	886	12345-12358	168-181	13	49
8	221	887	12359-12372	182-195	14	49
9	222	888	12373-12386	196-209	15	49
10	223	889	12387-12400	210-223	16	49
11	224	890	12401-12414	224-237	17	49
12	225	891	12415-12428	238-251	18	49
13	226	892	12429-12442	1-14	1	50
14	227	893	12443-12456	15-28	2	50
15	228	894	12457-12470	29-42	3	50
16	229	895	12471-12484	43-56	4	50
17	230	896	12485-12498	57-70	5	50
18	231	897	12499-12512	71-84	6	50
19	232	898	12513-12526	85-98	7	50
20	233	899	12527-12540	99-112	8	50
21	234	900	12541-12554	113-126	9	50
22	235	901	12555-12568	127-139	10	50
23	236	902	12569-12582	140-153	11	50
24	237	903	12583-12595	154-167	12	50
25	238	904	12596-12609	168-181	13	50
26	239	905	12610-12623	182-195	14	50
27	240	906	12624-12637	196-209	15	50
28	241	907	12638-12651	210-223	16	50
29	242	908	12652-12665	224-237	17	50
30	243	909	12666-12679	238-251	18	50
31	244	910	12680-12693	1-14	1	51

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September 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	245	911	12694-12707	15-28	2	51
2	246	912	12708-12721	29-42	3	51
3	247	913	12722-12735	43-56	4	51
4	248	914	12736-12749	57-70	5	51
5	249	915	12750-12763	71-84	6	51
6	250	916	12764-12777	85-98	7	51
7	251	917	12778-12791	99-112	8	51
8	252	918	12792-12805	113-126	9	51
9	253	919	12806-12819	127-139	10	51
10	254	920	12820-12833	140-153	11	51
11	255	921	12834-12847	154-167	12	51
12	256	922	12848-12860	168-181	13	51
13	257	923	12861-12874	182-195	14	51
14	258	924	12875-12888	196-209	15	51
15	259	925	12889-12902	210-223	16	51
16	260	926	12903-12916	224-237	17	51
17	261	927	12917-12930	238-251	18	51
18	262	928	12931-12944	1-14	1	52
19	263	929	12945-12958	15-28	2	52
20	264	930	12959-12972	29-42	3	52
21	265	931	12973-12986	43-56	4	52
22	266	932	12987-13000	57-70	5	52
23	267	933	13001-13014	71-84	6	52
24	268	934	13015-13028	85-98	7	52
25	269	935	13029-13042	99-112	8	52
26	270	936	13043-13056	113-126	9	52
27	271	937	13057-13070	127-139	10	52
28	272	938	13071-13084	140-153	11	52
29	273	939	13085-13098	154-167	12	52
30	274	940	13099-13111	168-181	13	52

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October 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	275	941	13112-13125	182-195	14	52
2	276	942	13126-13139	196-209	15	52
3	277	943	13140-13153	210-223	16	52
4	278	944	13154-13167	224-237	17	52
5	279	945	13168-13181	238-251	18	52
6	280	946	13182-13195	1-14	1	53
7	281	947	13196-13209	15-28	2	53
8	282	948	13210-13223	29-42	3	53
9	283	949	13224-13237	43-56	4	53
10	284	950	13238-13251	57-70	5	53
11	285	951	13252-13265	71-84	6	53
12	286	952	13266-13279	85-98	7	53
13	287	953	13280-13293	99-112	8	53
14	288	954	13294-13307	113-126	9	53
15	289	955	13308-13321	127-139	10	53
16	290	956	13322-13335	140-153	11	53
17	291	957	13336-13349	154-167	12	53
18	292	958	13350-13362	168-181	13	53
19	293	959	13363-13376	182-195	14	53
20	294	960	13377-13390	196-209	15	53
21	295	961	13391-13404	210-223	16	53
22	296	962	13405-13418	224-237	17	53
23	297	963	13419-13432	238-251	18	53
24	298	964	13433-13446	1-14	1	54
25	299	965	13447-13460	15-28	2	54
26	300	966	13471-13474	29-42	3	54
27	301	967	13475-13488	43-56	4	54
28	302	968	13489-13502	57-70	5	54
29	303	969	13503-13516	71-84	6	54
30	304	970	13517-13530	85-98	7	54
31	305	971	13531-13544	99-112	8	54

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November 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	306	972	13545-13558	113-126	9	54
2	307	973	13559-13572	127-139	10	54
3	308	974	13573-13586	140-153	11	54
4	309	975	13587-13600	154-167	12	54
5	310	976	13601-13613	168-181	13	54
6	311	977	13614-13627	182-195	14	54
7	312	978	13628-13641	196-209	15	54
8	313	979	13642-13655	210-223	16	54
9	314	980	13656-13669	224-237	17	54
10	315	981	13670-13683	238-251	18	54
11	316	982	13684-13697	1-14	1	55
12	317	983	13698-13711	15-28	2	55
13	318	984	13712-13725	29-42	3	55
14	319	985	13726-13739	43-56	4	55
15	320	986	13740-13753	57-70	5	55
16	321	987	13754-13767	71-84	6	55
17	322	988	13768-13781	85-98	7	55
18	323	989	13782-13795	99-112	8	55
19	324	990	13796-13809	113-126	9	55
20	325	991	13810-13823	127-139	10	55
21	326	992	13824-13837	140-153	11	55
22	327	993	13838-13851	154-167	12	55
23	328	994	13852-13864	168-181	13	55
24	329	995	13865-13878	182-195	14	55
25	330	996	13879-13892	196-209	15	55
26	331	997	13893-13906	210-223	16	55
27	332	998	13907-13920	224-237	17	55
28	333	999	13921-13934	238-251	18	55
29	334	1000	13935-13948	1-14	1	56
30	335	1001	13949-13962	15-28	2	56

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December 1980

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	336	1002	13963-13976	29-42	3	56
2	337	1003	13977-13990	43-56	4	56
3	338	1004	13991-14004	57-70	5	56
4	339	1005	14005-14018	71-84	6	56
5	340	1006	14019-14032	85-98	7	56
6	341	1007	14033-14046	99-112	8	56
7	342	1008	14047-14060	113-126	9	56
8	343	1009	14061-14074	127-139	10	56
9	344	1010	14075-14088	140-153	11	56
10	345	1011	14089-14102	154-167	12	56
11	346	1012	14103-14115	168-181	13	56
12	347	1013	14116-14129	182-195	14	56
13	348	1014	14130-14143	196-209	15	56
14	349	1015	14144-14157	210-223	16	56
15	350	1016	14158-14171	224-237	17	56
16	351	1017	14172-14185	238-251	18	56
17	352	1018	14186-14199	1-14	1	57
18	353	1019	14200-14213	15-28	2	57
19	354	1020	14214-14227	29-42	3	57
20	355	1021	14228-14241	43-56	4	57
21	356	1022	14242-14255	57-70	5	57
22	357	1023	14256-14269	71-84	6	57
23	358	1024	14270-14283	85-98	7	57
24	359	1025	14284-14297	99-112	8	57
25	360	1026	14298-14311	113-126	9	57
26	361	1027	14312-14325	127-139	10	57
27	362	1028	14326-14339	140-153	11	57
28	363	1029	14340-14353	154-167	12	57
29	364	1030	14354-14366	168-181	13	57
30	365	1031	14367-14380	182-195	14	57
31	366	1032	14381-14394	196-209	15	57

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January 1981

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	1	1033	14395-14408	210-223	16	57
2	2	1034	14409-14422	224-237	17	57
3	3	1035	14423-14436	238-251	18	57
4	4	1036	14437-14450	1-14	1	58
5	5	1037	14451-14464	15-28	2	58
6	6	1038	14465-14478	29-42	3	58
7	7	1039	14479-14492	43-56	4	58
8	8	1040	14493-14506	57-70	5	58
9	9	1041	14507-14520	71-84	6	58
10	10	1042	14521-14534	85-98	7	58
11	11	1043	14535-14548	99-112	8	58
12	12	1044	14549-14562	113-126	9	58
13	13	1045	14563-14576	127-139	10	58
14	14	1046	14577-14590	140-153	11	58
15	15	1047	14591-14604	154-167	12	58
16	16	1048	14605-14618	168-181	13	58
17	17	1049	14619-14631	182-195	14	58
18	18	1050	14632-14645	196-209	15	58
19	19	1051	14646-14659	210-223	16	58
20	20	1052	14660-14673	224-237	17	58
21	21	1053	14674-14687	238-251	18	58
22	22	1054	14688-14701	1-14	1	59
23	23	1055	14702-14715	15-28	2	59
24	24	1056	14716-14729	29-42	3	59
25	25	1057	14730-14743	43-56	4	59
26	26	1058	14744-14757	57-70	5	59
27	27	1059	14758-14771	71-84	6	59
28	28	1060	14772-14785	85-98	7	59
29	29	1061	14786-14799	99-112	8	59
30	30	1062	14800-14813	113-126	9	59
31	31	1063	14814-14827	127-139	10	59

APPENDIX C

LANDSAT-3 DOCUMENTS ISSUED THIS REPORT PERIOD

APPENDIX C

LANDSAT-3 DOCUMENTS ISSUED THIS REPORT PERIOD

No.	Document No.	Title and Date
1	14N0-L-3-262	MSS Line-Start Anomaly Interim Report dated 16 August 1979
2	14N0-L-3-263	Landsat-3 MSS Line-Start Anomaly Suggested Test dated 21 August 1979
3	14N0-L-3-264	MSS Anomalies, Landsat-3; Recommended Tests dated 4 September 1979
4	14N0-L-3-265	Landsat-3 Rear Scanner Anomaly dated 4 September 1979
5	14N0-LS-266	Landsat Operational Statistics dated 2 October 1979
6	14N0-LS-3-267	Reflective Analysis of Landsat-3 MSS Late Line Starts dated 23 October 1979
7	1N20-L-3-269	Landsat-3 Rear Scanner Anomaly dated 16 November 1979
8	1N20-LS-2&3-270	Subsidence of MSS Anomaly in Landsat 2 and 3 dated 14 September 1979
9	1N20-LS-3-271	Landsat-3 MSS Line-Start Anomaly Apparent Correlation with Hi-Gain Mode dated 2 December 1979
10	1N20-L-3-272	Satisfactory Range Performance of DCP-DCS/USB-ETC Links in Landsat-3 dated 4 December 1979