1878-1978

LANDSAT-1, LANDSAT-2, AND LANDSAT-3 FLIGHT EVALUATION REPORT 23 JANUARY 1978 TO 23 APRIL 1978

Prepared By

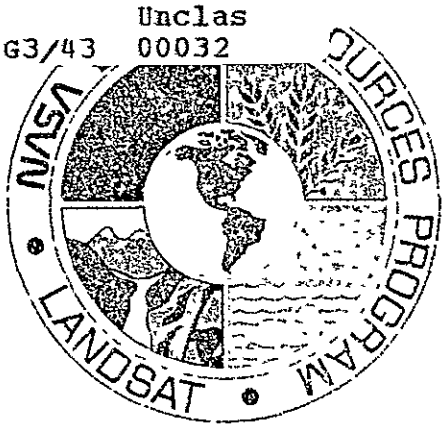
GE LANDSAT OPERATIONS CONTROL CENTER

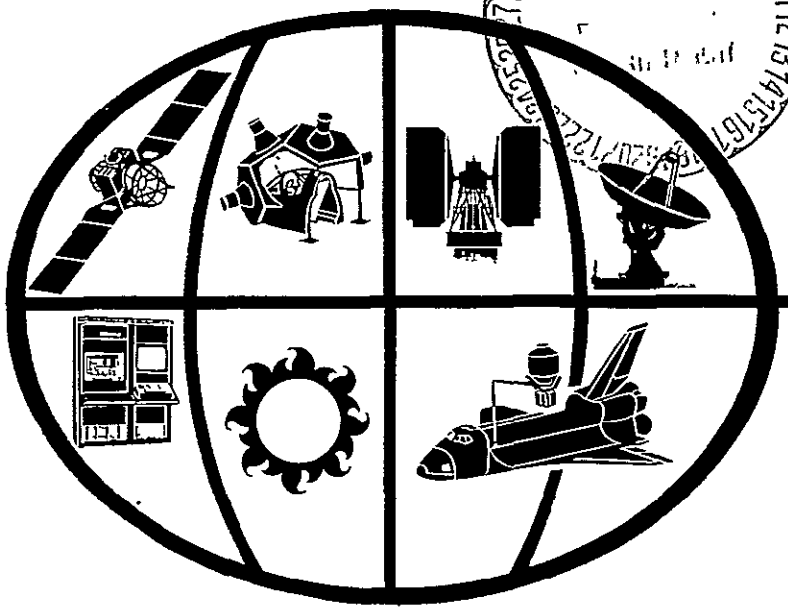
For

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Goddard Space Flight Center

Greenbelt, Maryland 20771





space division

Contract NAS5-21808

GENERAL ELECTRIC

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GENERAL ELECTRIC

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SECTION 1

SUMMARY LANDSAT-1 OPERATIONS

Landsat-1 discontinued payload operation on January 8, 1978 while the spacecraft was going through its seasonal elevated temperature cycle. The spacecraft entered continuous sun light which forced elevated temperatures on the sun side of the spacecraft. The spacecraft was functional, and in March, when the spacecraft returned to day and night, the payload mission could have been resumed. However, with the successful launch and operation of Landsat-3, a decision was made to retire Landsat-1. On March 23, 1978, the spacecraft was configured for retirement mode and in Orbit 28854, the VHF beacon transmitter was turned OFF. Landsat-1 will not be monitored or contacted unless it is recalled for active service. This report concludes the Landsat-1 activities and no further reports will be made unless recalled.

The Landsat-1 spacecraft was launched from the Western Test Range on 23 July 1972, at 18:08:06.508Z. The launch and orbital injection phase of the space flight was nominal and deployment of the spacecraft followed predictions.

Orbital operations of the spacecraft and payload subsystems were satisfactory until Orbit 147, 3 August 1972, when an internal short circuit disabled one of the Wideband Video Tape Recorders (WBVTR-2).

In Orbit 196, 6 August 1972, the Return Beam Vidicon failed to comply when commanded off. The RBV was commanded off via alternate channels. Landsat-1 continued to perform its imaging mission with the Multi-spectral Scanner and the remaining Wideband Video Tape Recorder. The remaining Wideband Tape Recorder (WBVTR-1) experienced four suspensions of operation, the last being in Orbit 9881 on 2 July 1974, and has not been used operationally since.

In Orbit 4396, 3 July 1973, an integrated circuit chip in the TMP failed, disabling four TLM functions.

COMSTOR "B" has an intermittent problem with cell 12, and is not being used operationally.

The "B" section of the USB with full power output of 1.5 Watts was substituted for the "A" section in Orbit 10068, 15 July 1974, because of excessive decline of transmitter power.

The pitch flywheel stopped for 2 minutes in Orbit 8040, 20 February 1974; and for 8 hours, 2 minutes in Orbits 11125 to 11130, 29 September 1974. It has been kept close to zero speed ever since, using pitch-bias control.

The RMP was switched from B to A in Orbit 11257, 8 October 1974, as a precautionary measure after RMP B began showing current variations.

The DCS subsystem was turned off after Orbit 12790, 19 January 1975, and the function assumed by DCS in Landsat-2.

Narrow Band Recorder 2 became noisy and was turned off in Orbit 13015, 12 February 1975. Operation of NBR 2 resumed in Orbit 14116, 2 May 1975, until failure in Orbit 15253, 22 July 1975, when its operation was terminated.

Battery 6 was turned off during Orbit 13346, 7 March 1975, because of high charge to discharge ratio and rising temperature. It was returned to service in Orbit 15100, 30 April 1978. Battery 6 was again turned off in Orbit 14780, 18 June 1975, because of rising temperature and high C/D. When it was turned back on in Orbit 15467, 6 August 1975, high current transients occurred. The battery turn-on command has been prohibited from use in Landsat-1 ever since.

In Orbit 28811 before Landsat-1 retirement, the "All Battery On" command was sent. The command executed properly without a current transient indicating the short had cleared. Battery 6 was turned off again in Orbit 23832, 28 March 1977, due to high temperature and was not returned to service because of the battery "ON" command problem except during the pre-retirement test. It was immediately turned off after the test.

The pitch flywheel stopped again for 45 minutes in Orbit 15309, 26 July 1975, and 3 minutes in Orbit 15312, 26 July 1975. Pitch flywheel motor driver duty cycle remained high from Orbit 15191, 18 July 1975 to Orbit 15393, 1 August 1975, when it returned to normal. MSS operation was suspended during the pitch flywheel anomaly between Orbit 15309, 26 July 1975, and Orbit 15393, 1 August 1975.

Battery 8 was turned off in Orbit 15588, 15 August 1975, due to electrical characteristics causing high temperature and will not be returned to service because of the battery "ON" command problem. Six batteries remained on-line.

The rear ACS scanner had intermittent electrical failures beginning in Orbit 19078, 21 April 1976, and it failed to Orbit 19086, 22 April 1976. The spacecraft was switched to single scanner mode (forward scanner) in Orbit 19089, 22 April 1976, and normal ACS operation was resumed.

A series of Orbit Adjust firings from October 20 to November 9, 1976; and from January 7 to January 28, 1977, were performed to adjust time phasing between Landsat-1 and Landsat-2. This also changed the repeat cycle pattern coverage of Landsat-1 and Landsat-2 from a 9 day/ 9 day to a 12 day/ 6 day coverage. Landsat-1 was designated non-operational from October 20, 1976 to January 28, 1977, while the orbit adjust sequence was in progress.

Battery 5 was turned off in Orbit 22605, 31 December 1976, due to electrical characteristics causing high temperature and will not be returned to service because of the battery "ON" command problem. Five batteries remained on line.

Sensors 1 through 6 (Band 1) of the MSS were turned off because of a power supply failure during Orbit 23480 on 3 March 1977. The MSS is now operating with only 3 of its 4 spectral bands.

Battery 7 was turned off during Orbit 26024 on 1 September 1977 due to high temperatures and C/D ratio. It will not be returned to service because of the battery "ON" command problem. Four batteries are now on line.

MSS and WBPA-2 were last used during Orbit 27805 on 7 January 1978, when Landsat-1 was placed in an orbital maintenance mode to support preparations for the launch of Landsat-3.

The Pitch Flywheel stopped in Orbit 27810 (8 January 1978) and restarted spontaneously in Orbit 27813 (8 January 1978). Subsequent operation has been normal.

Five and one-half years after launch, the cumulative precession of the Landsat-1 orbital plane has now rotated the orbit (about the earth axis) so that the entire orbit is in sunlight. It will remain in continuous sun until mid-March when the apparent sun motion will return the orbit to partial night for about five months. The right solar panel was stopped at 165° and the left solar panel was allowed to track. This maintained battery energy levels in the spacecraft while in "stand-by" mode which was maintained until Landsat-1 retirement on 23 March 1978.

A pre-retirement test of the RBV was conducted in Orbit 28835, 22 March 1978. This was the first operation since Orbit 196, 6 August 1972. The RBV electrical operation was normal with degraded images.

In Orbit 28854, (23 March 1978) both solar panels were stopped, various loads were turned off to reduce power consumption, and the VHF Beacon Transmitter was turned off. The Landsat-1 was officially retired and will not be contacted or tracked though it is subject to recall if required.

Final in-orbit payload system performance summary is shown on Table 1-1

Table 1.1. Landsat-1 Final In-Orbit Payload System Performance, Launch Thru Retirement on Orbit 28854 (3/23/78)

RBV	Total Scenes Imaged	1,690
	Avg. Scenes/Day	139
	Total Area Imaged (millions of sq. n. mi.)	14.7
	ON TIME (hr.)	14.0
	ON/OFF Cycles	91
	% Real Time Images	57
	% Recorded Images	43
MSS	Total Scenes Images	271,786
	Avg. Scenes/Day	157
	Total Area Imaged (millions of sq. n. mi.)	2,368
	ON TIME (hr.)	2,806
	ON/OFF Cycles	19,067
	% Real Time Images	83
	% Recorded Images	17
DCS	Messages at OCC	1,152,045
	Non-Perfect MSGS	90,691
	Max. DCP's ACTIVE/DAY	114
	Users	44
	Avg. MSG/ACTIVE Orbit	181
	ON TIME (hr.)	21,820.2
WPA-1	% Real Time Mode	55
	% Playback Mode	45
	ON TIME (hr.)	32.2
	ON/OFF Cycles	314
WPA-2	% Real Time Mode	80
	% P/B Mode	20
	ON TIME (hr.)	2,707
	ON/OFF Cycles	16,799
WBVTR-1	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	Minor Frame Sync Error Count in P/B (Failed Orbit 9,881)	
	Time Head-Tape Contact (hr.)	733
	Cycles Head-Tape Contact	11,954
	ON TIME (hr.)	927.6
WBVTR-2	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	MFSE Count in P/B (Failed Orbit 148)	
	Time Head-Tape Contact (hr.)	5.1
	Cycles Head-Tape Contact	44
	ON TIME (hr.)	6.5

SECTION 2

ORBITAL PARAMETERS

LANDSAT-1

SECTION 2

ORBITAL PARAMETERS

The initial orbit of Landsat-1 required some correction during Orbits 38, 44 and 59 to achieve the desired 18-day repeat cycle.

During Orbits 938, 2416, 6390 and 7826 it was necessary to fire the -X thruster of the orbit adjust system to maintain the ground trace in the desired 18-day repeat pattern of ± 10 nm.

On 29 September 1974, the ACS control system fired gas during a spacecraft emergency (pitch flywheel stoppage) which resulted in an unplanned orbit change similar to firing the -X thruster

The +X thruster was fired during Orbits 11367, 11464, 13611, 19747 and 19871 in order to maintain the 18-day repeat cycle ground trace within ± 10 nm.

A 101 day orbit adjust program commenced in Orbit 21613 (20 October 1976) and lasted through Orbit 23007 (28 January 1977). This program increased the time separation between the Landsat spacecrafts by 12.17 minutes to remain within the operational time limits for ground station turn-around time to track the spacecrafts in successive passes Another consequence of the 101-day orbit-adjust program was the change of the Landsat-1 - Landsat-2 combined earth coverage repeat cycle from a nine day - nine day schedule to a twelve day - six day schedule; i.e., Landsat-2 will pass over a point on earth twelve days after Landsat-1's passage Six days after Landsat-2 crosses this point, Landsat-1 will pass over it again.

Current orbital parameters are given in Table 2-1.

Figure 2-1 shows the longitude error as a function of time and orbit maintenance burns. The longitude errors have been maintained within ± 10 nm in the east-west direction at the equator as planned. Figure 2-2 shows mean local time at the descending node

Appendix B gives the ground trace repeat cycle predictions.

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

Element / Date	Apogee (km)	Perigee (km)	Inclination (Deg)	Semi Major Axis (km)	Eccentricity	Anomalistic Period (Min)	Nodal Period (Min)	Argument of Perigee (Deg)	Right Ascension (Deg)	Mean Anomaly (Deg)
25 Oct 1972	917.3	898.1	99.103	7285.850	0 00132	103.152	103.268	93.721	1.060	86.484
25 Jan 1973	922.3	893.1	99.090	7285.865	0 00200	103.153	103.268	133.693	91.805	52.797
25 Apr 1973	911.056	888.763	99.073	7285.767	0.00073	103.151	103.267	168.857	181.411	11.098
25 Jul 1973	914 341	900.810	99.068	7285.741	0.00093	103.150	103.266	95.602	268.944	84.301
25 Oct 1973	922.913	893.229	99.056	7285.786	0.00198	103.151	103.266	65.071	0.291	301.002
25 Jan 1974	915.873	899.111	99.041	7285.657	0.00115	103.148	103.264	160.866	88.606	19.049
24 Apr 1974	920.090	912.672	99.023	7285.691	0.000802	103.149	103.265	117.631	176.743	62.319
23 Jul 1974	922 363	892.629	99.017	7285.661	0.002041	103.148	103.264	109.225	269.779	70.540
23 Oct 1974	918.657	896.316	99.004	7285.652	0 00153	103.148	103.264	150.750	354 743	29.110
24 Jan 1975	914 18	900 67	98.990	7285.590	0.000928	103.147	103.262	278.848	85.403	261.138
24 Apr 1975	914.74	900.05	98.972	7285.559	0.001008	103.146	103.262	37.047	173.043	142.764
25 Jul 1975	915.12	899.63	98 964	7285 541	0.001063	103.145	103 261	138.138	262 528	41.661
23 Oct 1975	914 19	900.54	98.951	7285.531	0.000937	103 145	103.261	250.370	349.952	289.612
24 Jan 1976	914.39	900.32	98.936	7285.523	0.000966	103.145	103.261	2.826	80.147	177.049
23 Apr 1976	915.28	899 41	98 919	7285 511	0.001089	103 145	103.261	110.622	167.275	69 142
22 Jul 1976	914.24	900.35	98 911	7285.464	0.000953	104 144	103 260	218.207	254.289	321 741
23 Oct 1976	914.33	900.42	98.894	7285 543	0 000955	103.145	103.262	332.337	343 897	207 595
28 Jan 1977	913.57	900.95	98.878	7285.427	0 000867	103 143	103.254	60.280	77.333	119.515
24 Apr 1977	913.35	901.18	98.865	7285 432	0 000835	103 143	103.260	180.132	158.417	359.749
24 July 1977	912.53	901.92	98.858	7285.391	0.000729	103.142	103.259	295.005	246.843	244.951
23 Oct 1977	913.47	900.97	98.847	7285.386	0.000857	103.142	103.259	45.423	335.165	134.388
24 Jan 1978	919 57	894.90	98 830	7285 375	0 001693	103 142	103 259	138 957	64 300	41 059
18 Mar 1978	912 90	901.45	98.8236	7285 342	0 000786	103 141	103.258	3.223	115.032	176 653

FOLDOUT FRAME 1

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FOLDOUT FRAME 2

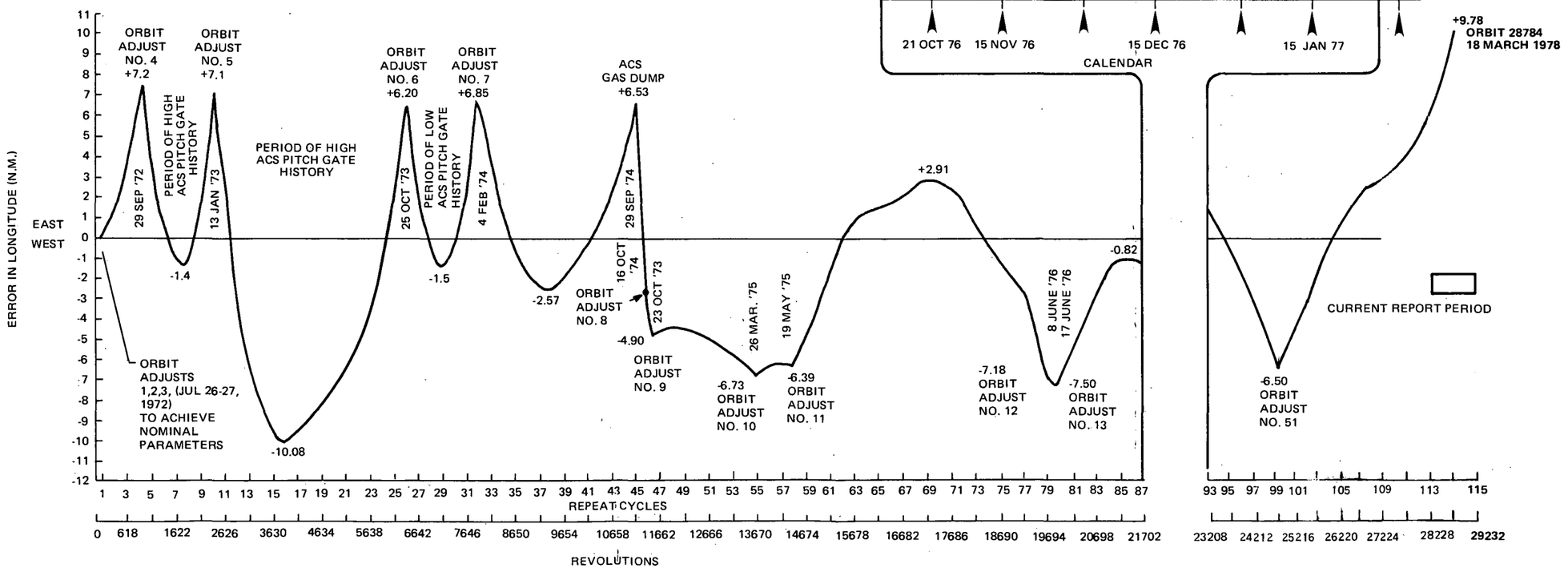

Figure 2-1. Effects of Orbit Adjust on Landsat-1's Ground Tracker

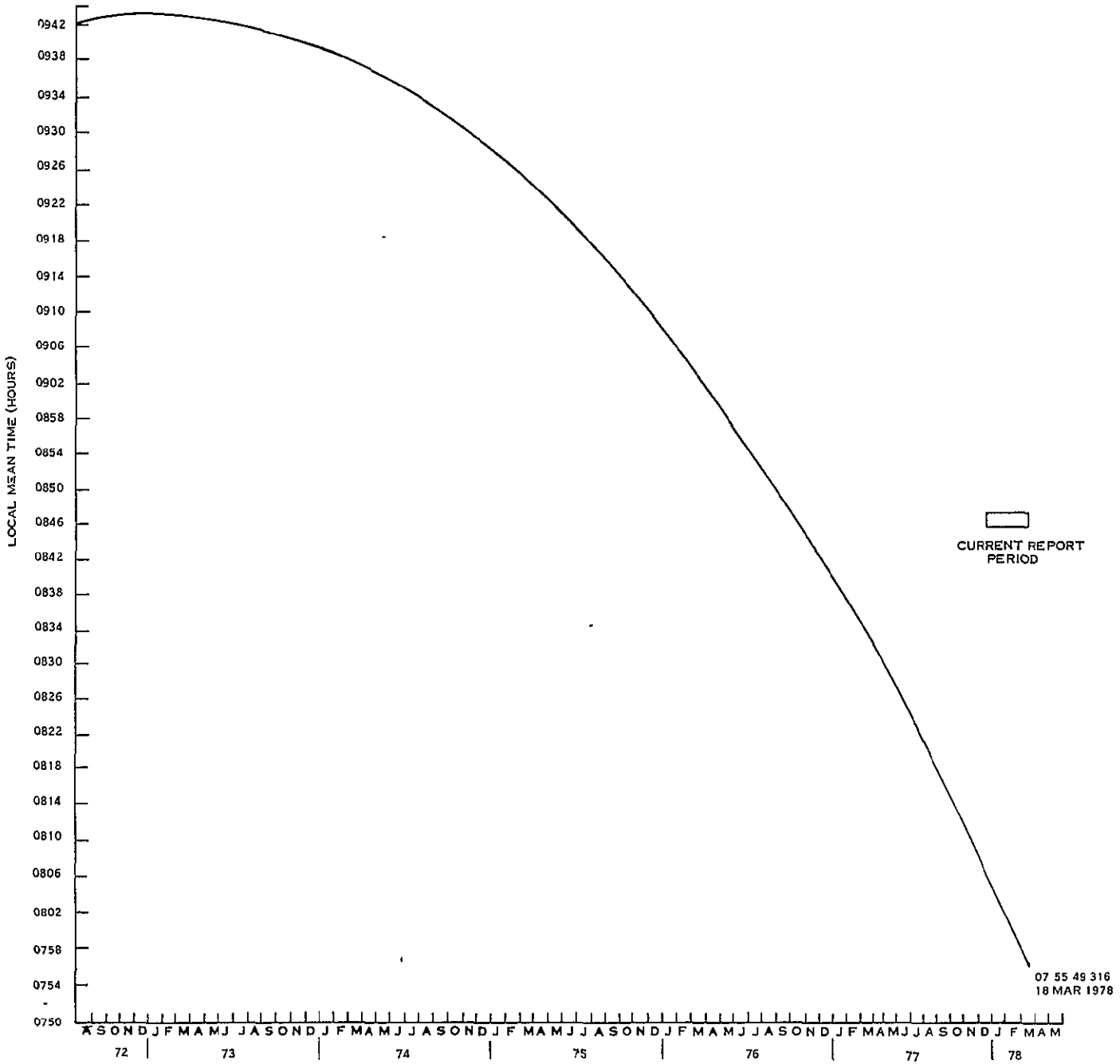

Figure 2-2 Landsat Local Mean Time of Descending Node

SECTION 3

POWER SUBSYSTEM (PWR)

LANDSAT-1

SECTION 3

POWER SUBSYSTEM (PWR)

The solar array continued to provide energy for the spacecraft load throughout this report period The spacecraft experienced complete sunlight due to high sun beta angles from approximately 4 January 1978 until its retirement 23 March 1978, Orbit 28854 Auxiliary loads dissipated the excess power above the battery and load requirements using Landsat-1 power management procedures No compensation loads were used

Midday solar array current is shown in Figure 3-1 Figure 3-2 shows actual and predicted midday solar array degradation.

Solar array degradation was 40 1% at the end of 68 months in orbit Figure 3-3 shows actual sun angles to the spacecraft and solar panels Figure 3-4 is a prediction of sun angle through 1979 for Landsat-1

The right solar array panel was stopped at various angles in flight to compensate for continuous sun and large beta angles This method also provided the necessary power until the final orbit 28854

Since 30 August 1975, the batteries have been kept slightly undercharged to avert possible recurrence of a run away condition In Orbit 28811, 20 March 1978, "All Battery On" command was executed successfully without any anomalies Batteries 4, 5, 6, 7 and 8 were turned off due to run-away conditions Temperatures ranged from 17 4^{O} to 51 6^{O}C. Table 3-3 is a history of Landsat-1 battery restoration cycles and turn-off

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

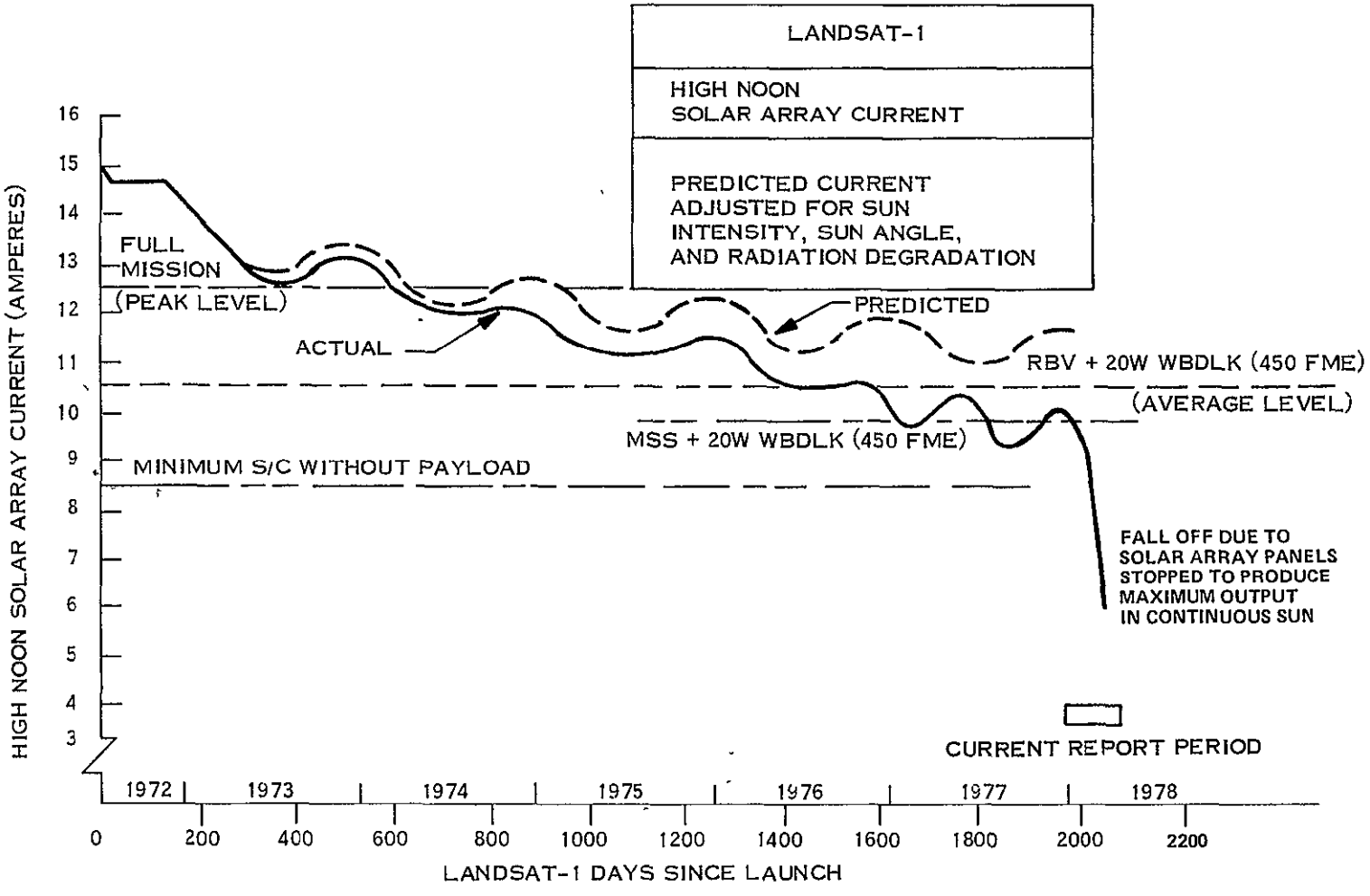

Figure 3-1. Midday Solar Array Current

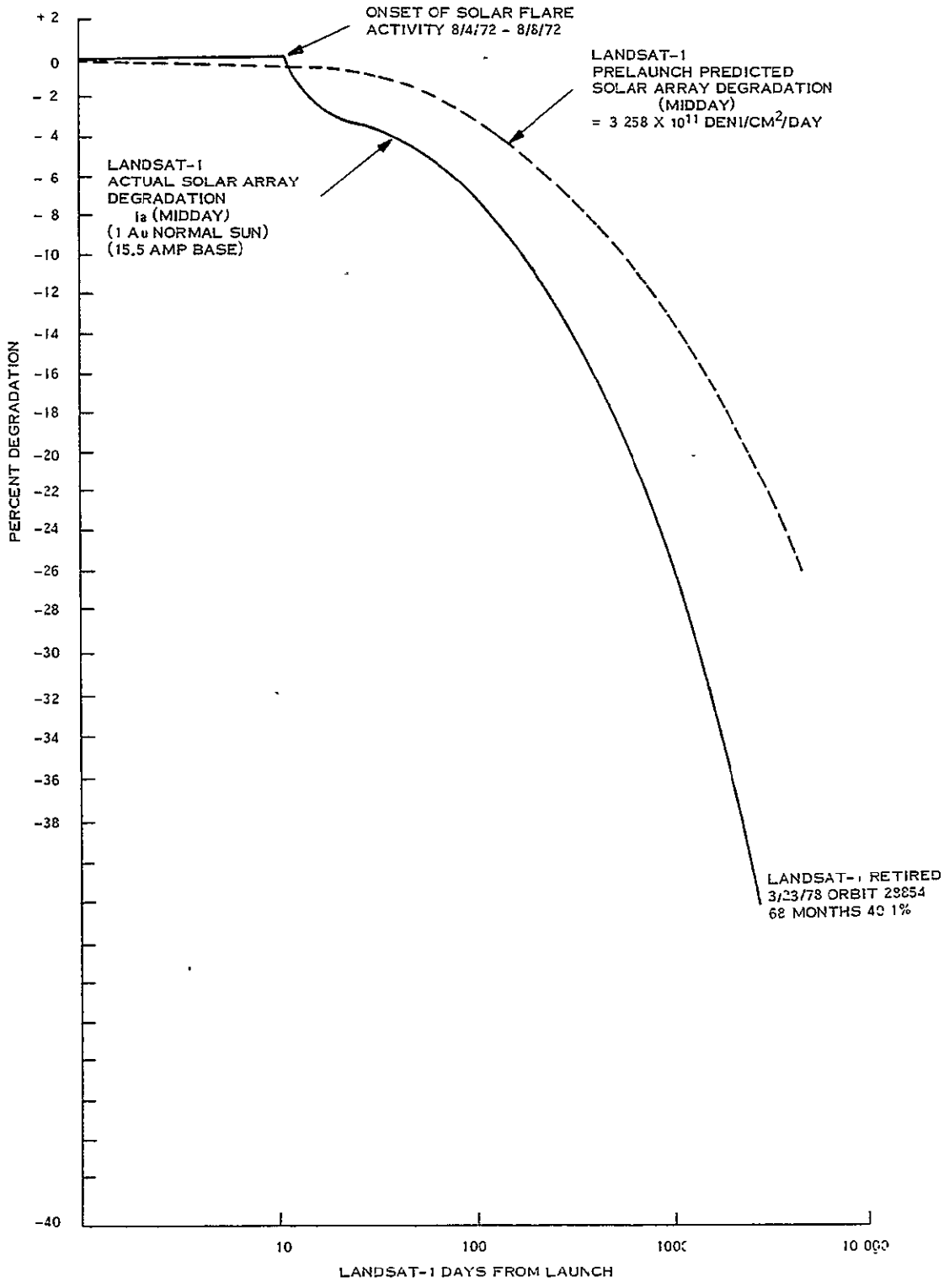

Figure 3-2. I_A (Midday) Degradation vs Days

Figure 3-3. Actual β and α (Paddle) Sun Angles, Landsat-1

Figure 3-4. Landsat-1 Predicted Beta Angle, 1977, 1978, 1979

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

ORBIT NO.	26	5098	10178	15254	20363	25455	29750	28424	28854
BATT 1 MAX	32.48	32 91	33.25	33.16	32.48	32,99	32 39	F	30.94
2 CHGE	32 48	32 91	33 16	33 16	32 48	32,99	32,48	30.18	31.02
3 -VOLTS	32.48	32 99	33 25	33 16	32 48	33,08	32.57	30.18	31.02
4	32 48	32 99	33 25	33.16	32.48	33.08	32.57	30,18	F
5	32 48	32 99	33 33	33.25	32 97	F	F	F	F
6	32 31	32 91	33.25	F	32.48	F	F	F	F
7	32 22	32 91	33 25	33 16	32 48	33,08	F	F	F
8	32.14	32 91	33.25	33.16	F	F	F	F	F
AVERAGE-	32.38	32.92	33 25	33 17	32.49	33.04	32 54	30 18	30.96
BATT 1 END	28 81	28 30	28 98	29.15	29 23	29.15	29 92	F	30.30
2 OF	28.81	28 30	28.98	29 15	29 23	29,15	29 92	26.24	30.20
3 NIGHT	28.81	28.30	28 98	29 15	29.23	29,15	29 92	26.24	30.20
4 -VOLTS	28.89	28.38	28.98	29 15	29.32	29,15	30.00	26,24	F
5	28 89	28 38	29 06	29.23	29.32	F	F	F	F
6	28.81	28 30	28.98	F	29.23	F	F	F	F
7	28 81	28 30	28 98	29.15	29 23	29,15	F	F	F
8	28.81	28.30	28.98	29 15	F	F	F	F	F
AVERAGE	28 84	28 32	28 99	29 16	29.26	29,15	29.94	26,24	30 20
BATT 1	13 11	13 58	13 96	15 27	14 45	20,73	31 97	F	38 70
2* SHARE	12,93	13 58	13 96	15.27	15.06	21,32	32,68	3 54	39.58
3 (%)	11 38	11 38	11 95	13.59	13 26	17,97	17 10	46 54	31 72
4	12.39	11.95	12 28	14.06	14 19	19,18	18.26	49.48	F
5	12 32	11 85	11 93	13 63	14 32	F	F	F	F
6	12 80	12 35	11.79	F	14 39	F	F	F	F
7	12.62	12.42	12.13	13 59	14 11	20 31	F	F	F
8	12 45	12 10	11 93	14 54	F	F	F	F	F
BATT 1 LOAD	12.71	12 44	12.58	14.67	14.32	30,15	11,79	F	18 96
2 SHARE	12 90	13 62	13 70	15.88	14 39	21 27	31,49	32,44	43.27
3 (%)	11.43	11 91	12,23	13.85	13.54	19,62	37 24	31 84	48 87
4	12.77	13 01	13,12	14.91	14 81	21,06	29 46	35,06	F
5	12,54	12 42	12,60	14.02	14.31	F	F	F	F
6	12,53	12 21	11,30	F	13.73	F	F	F	F
7	12.80	12 41	12 50	13.77	14 38	17,97	F	F	F
8	12.32	11.96	11.97	12 98	F	F	F	F	F
BATT 1 TEMP	21.11	24.65	24 76	23.12	21.47	21,37	33 49	29,09	31,87
2 IN	18.74	21.42	20 99	19 32	17.91	17,86	21 41	20,15	19,16
3 (°C)	18,77	20 29	20 16	18 77	17 25	16,97	18,69	17 35	15,41
4	21 57	23 17	23 32	22.71	21 64	21,27	26 22	25,95	24 61
5	21,82	23 85	24 09	23.69	24 40	23,49	47 71	51,58	49 55
6	21.21	24.37	24 78	22 10	23.52	27,21	44 07	47,44	45.24
7	21 41	25.01	24.96	23 75	23.23	27,92	40,79	43,54	41.85
8	21.82	26.14	25.24	24.59	22 15	24,56	35 93	37,04	35 93
AVERAGE	20,81	23 49	23.53	22.25	21 43	23.47	33,41	34,02	33.07
S/C REG BUS PWR (W)	176.8	153 4	165.0	137.9	123.49	108,0	105,8	109,1	98 86
COMP LOAD PWR (W) (P/O S/C REG BUS PWR)	49.0	34.8	41.9	29.4	17.4	0	0	0	0
P/L REG BUS PWR (W)	16.2	13 7	8.9	8.9	9.13	8.9	9 0	6 5	3.9
C/D RATIO	1 06	1.13	1.31	1.18	1.04	1,14	1,59	0 60	3,27
TOTAL CHARGE (A-M)	309.2	290.21	259 3	229 29	172 42	158,68	94 53	50 21	155 16
TOTAL DISCHARGE (A-M)	290 8	256.28	214.2	194.13	168.31	138,72	59 50	100.37	67 63
SOLAR ARRAY (A-M)	1044.0	906.0	832 0	876 0	754	718.0	688 0	5.25	7 28
S.A. PEAK 1 (AMP)	15.8	13.68	12.44	11.60	10.88	10,08	9,44	8.00	8 32
MIDDAY ARRAY I (AMP)	15.01	13.80	N	11 04	10.58	9.76	8 24	6.24	6 53
SUN ANGLE (DEG)	-8.33	-8.54	-1.82	1.49	6.4	13,9	27,5	64	61
MAX R PAD TEMP (°C)	+62.00	+66.00	63.20	62 0	58 40	55,12	37,80	26,16	29 04
MIN R PAD TEMP (°C)	-62.00	-59.00	-42.79	-42 18	-38.54	-35,50	-56 00	-60 06	-59.00
MAX L PAD TEMP (°C)	+67.90	+60 50	58 00	56.00	55.12	55,12	59,80	58 37	55 12
MIN L PAD TEMP (°C)	-67.00	-64.00	-47 00	-46 25	-43 18	-37,32	20,08	34,20	35.40

* After the telemetry failure in Orbit 4396 Battery 2 charge share was taken equal to Battery 1 charge share as an approximation in order to derive a charge share value of each battery.

F - Unit Off

Table 3-2. Landsat-1 Power Subsystem Analog Telemetry (Average Value For Data Received in NBTR Playback)

Function	Description	Unit	Orbits								
			26	5089	10182	15254	20364	25455	27950	28424	28354
6001	BATT 1 DISC	AMP	0.94	0.81	0.81	0.91	0.81	0.99	0.84	F	0.21
6002	2		0.95	N	N	N	N	1.02	0.48	0.87	0.30
6003	3		0.84	0.78	0.80	0.86	0.75	0.94	0.41	0.26	0.28
6004	4		0.93	0.86	0.86	0.92	0.84	1.03	0.46	0.29	F
6005	5		0.92	0.82	0 82	0.87	0.79	F	F	F	F
6006	6		0.91	0.78	0.72	F	0.78	F	F	F	F
6007	7		0.94	0.82	0.80	0.85	0.80	0.89	F	F	F
6008	8		0 91	0.77	0.78	0.80	F	F	F	F	F
6011	BATT 1 CHG	AMP	0.58	0 58	0.69	0 52	0.35	0.46	0.54	F	0.56
6012	2		0.57	D	D	D	D	D	D	D	D
6013	3		0.50	0.48	0 60	0 46	0.33	0.40	0.36	0.34	0.36
6014	4		0.54	0.51	0.60	0.48	0.35	0.42	0.37	0.37	F
6015	5		0 54	0.50	0 58	0 46	0.35	F	F	F	F
6016	6		0.57	0 52	0 56	F	0.35	F	F	F	F
6017	7		0.55	0.53	0.60	0.46	0.35	0.46	F	F	F
6018	8		0.55	0.52	0.58	0.49	F	F	F	F	F
6021	BATT 1 VOLT	VDC	30.87	31.24	31.64	31.62	31.20	31.53	31.15	24.71	30.78
6022	2		30.87	31.25	31.66	31 62	31.19	31.52	31.30	28.78	30.94
6023	3		30.87	31.25	31.66	31.62	31.18	31.52	31.29	28.77	30.93
6024	4		30.90	31.28	31.70	31.65	31.22	31.55	31.33	28.81	29.66
6025	5		30.95	31.33	31.75	31.71	31.28	F	F	F	F
6026	6		30.86	31.24	31 65	F	31.18	F	F	F	F
6027	7		30.89	31.27	31.68	31.64	31.21	31.53	F	F	F
6028	8		30.89	31.27	31.68	31.63	F	F	F	F	F
6031	BATT 1 TEMP	DGC	21.17	24.48	26.09	23 02	21 48	23.30	33.83	29.09	31.87
6032	2		18.80	21.29	22.81	19 28	17.80	17.84	31.45	20.15	19.16
6033	3		18.76	20.17	21.26	18.76	17.21	16.95	18.72	17.35	16.41
6034	4		31.67	28.04	28.88	22.69	21.60	21.25	26.24	25.95	24.61
6035	5		21.84	23 77	24.78	23.64	24.86	23.49	47.67	51.58	49.55
6036	6		21.24	24 27	25 78	22 08	23.61	27.31	44.11	47.44	45.24
6037	7		21.43	24 88	26 09	23.67	23.18	27.37	40.80	43.54	41.85
6038	8		21.96	25 02	26.21	24 51	22 14	24.64	36.02	37.04	35.93
6040	RT PAD TEMP	DGC	25.82	27 22	27 10	27 29	25 24	25.05	-0.37	19.20	47.00
6041	R PAD V N	VDC	33.40	33.85	34.36	34.18	33 06	32.50	28.16	24.66	32.93
6042	R PAD V M	VDC	33.29	33 50	33.80	32 92	31.75	31.57	21.31	19.01	19.94
6044	LT PAD TEMP	DGC	14 14	16.61	19 11	19 84	22.62	24.81	43.65	41.05	42.65
6045	L PAD V F	VDC	33.69	34 16	34.67	34.63	33.84	34.23	33.09	30.38	32.62
6046	L PAD V G	VDC	33.68	34.19	34.72	34.68	33.88	34.27	33.13	30.41	32.65
6050	S/C UR BUS V	VDC	31.24	31.68	32.60	32.07	31.61	31.99	31.60	28 92	31.20
6051	S/C RG BUS V	VDC	24.54	24.55	24.55	24.54	24.55	24.54	24.55	24.52	24.56
6052	AUX REG A V	VDC	23.41	23 48	23.47	23 49	23 49	23.50	23.50	23.48	23.49
6053	AUX REG B V	VDC	23.50	23.50	23.50	23 50	23.50	23.50	23.50	23.50	23.50
6054	SOLAR I	AMP	14.87	12 69	11.60	10.83	10.17	9.36	7.31	6.24	6.53
6055*	S/C RG BUS I	AMP	7.11	6.27	6.80	5.63	5.04	4.34	3.34	3.35	3.34
6056*	S/C RG BUS I	AMP	7.11	6.27	6.79	5.62	5.02	4.33	3.34	3.35	3.34
6058	PC MOD T 1	DGC	21.82	22.23	23.22	20.63	19.54	18.68	18.33	18.43	18.43
6059	PC MOD T 2	DGC	21.66	22.53	23.00	21.17	20.14	19.38	19.22	19.39	19.39
6070	P/L RG BUS V	VDC	24.66	24.66	24.66	24.68	24 67	24.68	24.76	24 67	24.74
6071	P/L UR BUS V	VDC	31.08	31.53	31.92	31.92	31 46	31.83	31.46	28.80	31.03
6072*	P/L RG BUS I	AMP	0.57	0.56	0.36	0 36	0.37	0.37	0.17	0.42	N
6073	P AUX A V	VDC	23.51	23 51	23.50	23.50	23.50	23.50	23.50	23.50	23.50
6074	P AUX B V	VDC	23 51	23 51	23 50	23.50	23.50	23.50	23.50	23.50	23.50
6075	PR MOD T 1	DGC	21.56	23.13	23.62	21.44	20.69	20.20	21.02	21.30	21.30
6076	PR MOD T 2	DGC	20.34	21.45	21.84	19.86	19.35	18.96	19.84	20.08	20.08
6079	FUSE BLOW V	VDC	24.56	24.57	24.60	24.59	24.58	24.58	24.65	24.56	24.63
6080	SHUNT 1 I	AMP	0.00	0.00	0 00	0.00	0.00	0.00	0.00	0.00	0.00
6081	SHUNT 2 I	AMP	0.00	0.00	0.00	0 00	0.00	0 00	0.00	0.00	0.00
6082	SHUNT 3 I	AMP	0.00	0 00	0.00	0.00	0.00	0 00	0 00	0.00	0.00
6083	SHUNT 4 I	AMP	0.00	0.00	0.00	0 00	0.00	0.00	0.00	0.00	0.00
6084	SHUNT 5 I	AMP	0.00	0 00	0.00	0 00	0.00	0.00	0.00	0.00	0.00
6085	SHUNT 6 I	AMP	0.00	0 00	0.00	0.00	0 00	0 00	0 00	0.00	0.00
6086	SHUNT 7 I	AMP	0.00	0.00	0.00	0.00	0.00	0 00	0.00	0.00	0.00
6087	SHUNT 8 I	AMP	0.00	0.00	0.00	0 00	0 00	0.00	0 00	0.00	0.00
6100	P/L RG BUS I	AMP	0.58	0.56	0.36	0.36	0.37	0.36	0.16	0 18	0.16
Total No.	MAJOR FRAMES	FRM	784.0	389.0	384.0	795	788	795	632	8 08	8 10

* FUNC 6055, 6056, 6072 data is derived from Pseudo FUNC 6155, 6156, 6172 used after change to Mode 11
F - Unit Off.
N - Data Not Available
D - Telemetry Defective

FOLDOUT FRAME 1

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FOLDOUT FRAME 2

Table 3-3. Landsat-1 Battery Restoration Cycles

Restoration Cycle			1	2	3	4
Batt 1	Off	Orbit	28087			
		Date	1-27-78			
	On	Orbit	28811			
		Date	3-20-78			
Batt 2	Off	Orbit				
		Date				
	On	Orbit				
		Date				
Batt 3	Off	Orbit				
		Date				
	On	Orbit				
		Date				
Batt 4	Off	Orbit	28811			
		Date	3-20-78			
	On	Orbit				
		Date				
Batt 5	Off	Orbit	26605	28811		
		Date	12-30-76	3-20-78		
	On	Orbit	28811			
		Date	3-20-78			
Batt 6	Off	Orbit	13346	14780	23832	28811
		Date	3-7-75	6-18-75	3-28-77	3-20-78
	On	Orbit	15100	15467*	28811	
		Date	4-30-75	8-6-75	3-20-78	
Batt 7	Off	Orbit	26024	28811		
		Date	9-1-77	3-20-78		
	On	Orbit	28811			
		Date	3-20-78			
Batt 8	Off	Orbit	15583	28811		
		Date	8-15-75	3-20-78		
	On	Orbit	28811			
		Date	3-20-78			

* Although "ALL BATTERY ON" command had not been used since Orbit 15467 on 8-6-75, the "ALL BATTERY ON" command was sent in Orbit 28811 on 3-20-78 with no anomalies. Batteries 4, 5, 6, 7, 8 were then turned OFF and remained OFF when the S/C was retired on Orbit 23854.

SECTION 4

ATTITUDE CONTROL SUBSYSTEM (ACS)
LANDSAT-1

SECTION 4

ATTITUDE CONTROL SYSTEM

On 24 March 1978, during Orbit 28854, Landsat-1 was commanded into retirement and its ACS system was placed in a minimal activity control mode

Pneumatics were disabled; both Solar Array drives were stopped

The LSAD was positioned at the 45° location and the RSAD at 135°. This configuration will provide optimum exposure of the solar arrays while the spacecraft is in daylight.

Pitch Position Bias was disabled, however, the Roll Diff Tach High Gain mode remained enabled to minimize Pitch Flywheel speed.

RMP2 remained the prime operating subsystem

Prior to retirement and during this report period, the ACS system functioned normally in the Forward Single Scanner mode. There were no Pitch Flywheel stoppages. Solar Array output was maximized semi-manually, i.e., the RSAD remained stationary in the 165° position while the LSAD was manually maintained within $\pm 20^{\circ}$ of its true position.

ACS pressures and temperatures were satisfactory.

Figures 4-1, 4-2 and 4-3 show the performance of the ACS pneumatics during this quarter while Tables 4-1, 4-2 and 4-3 provide a summary of selected telemetry values.

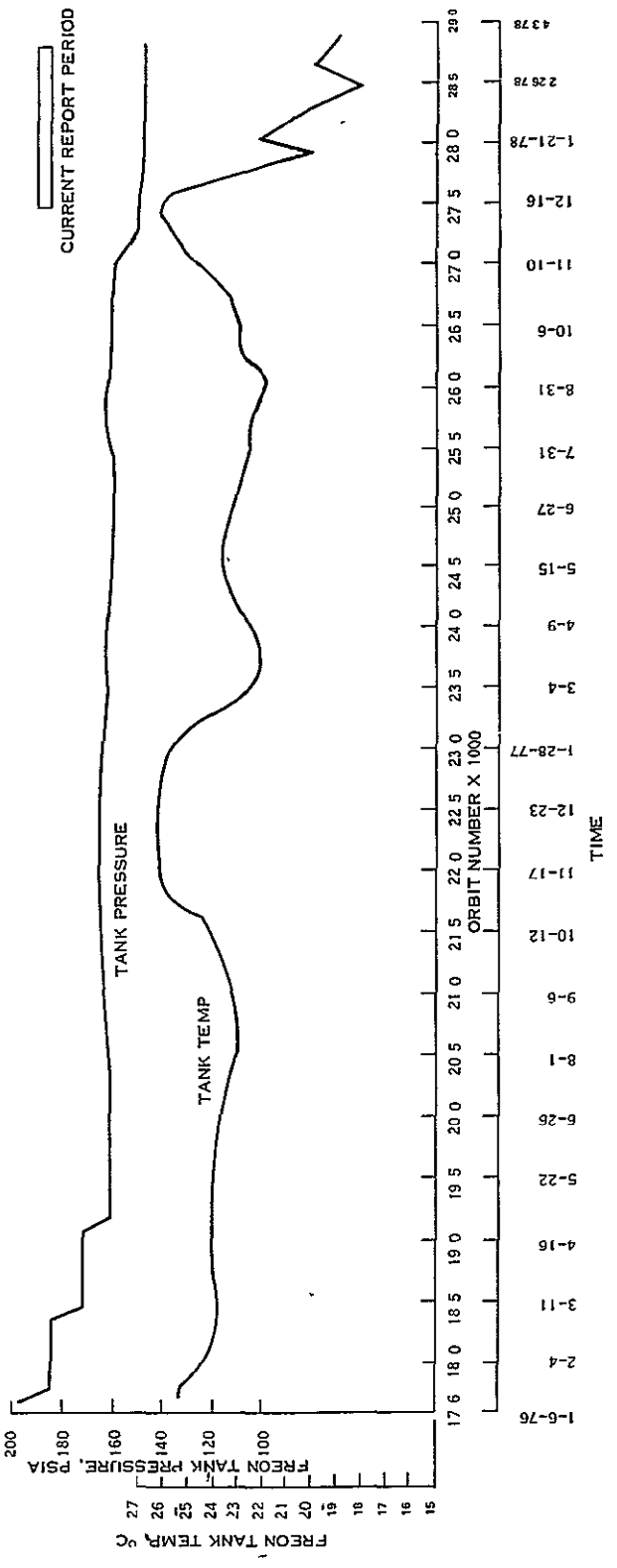


Figure 4-1. Landsat-1 Freon History (Telemetry Values)

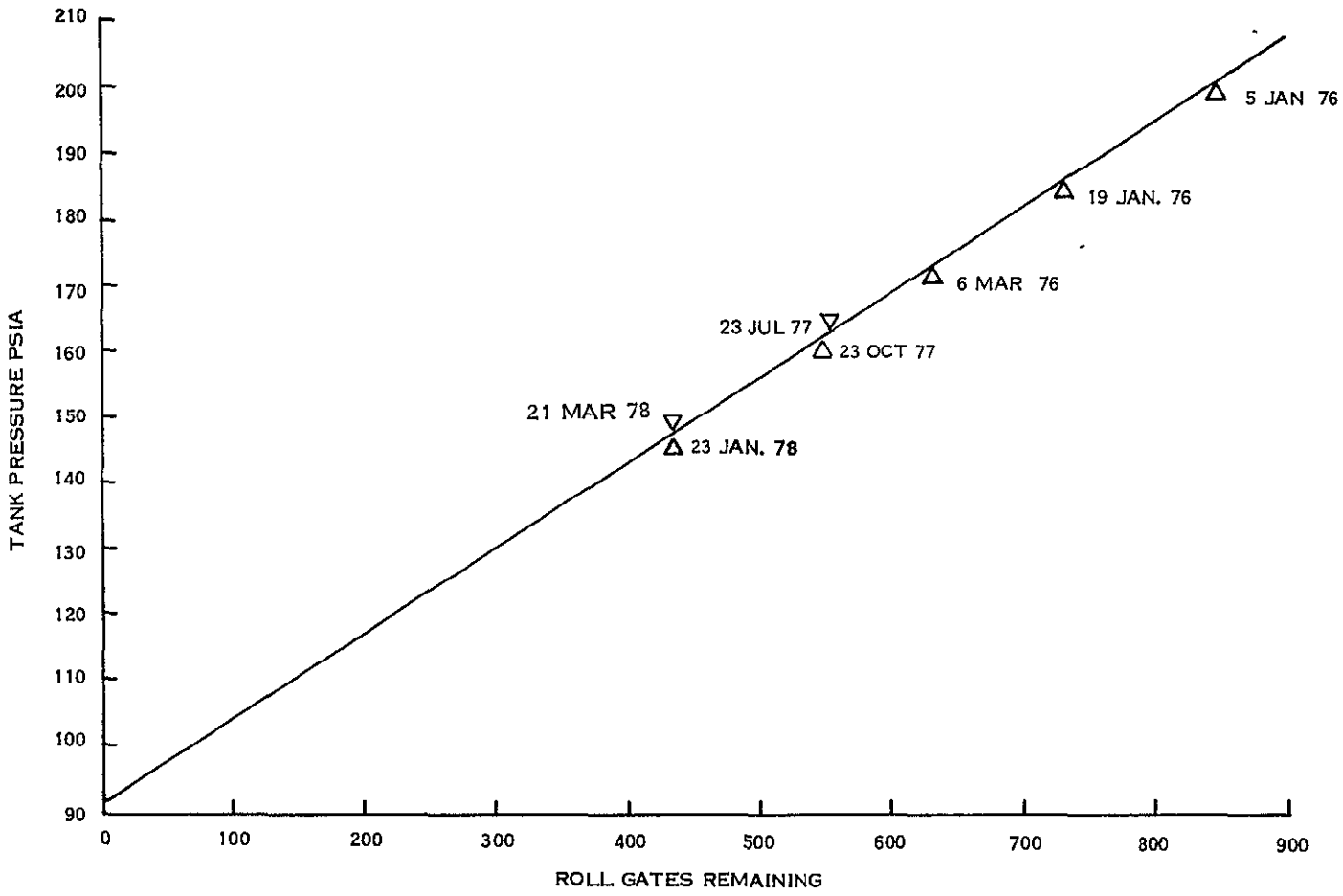
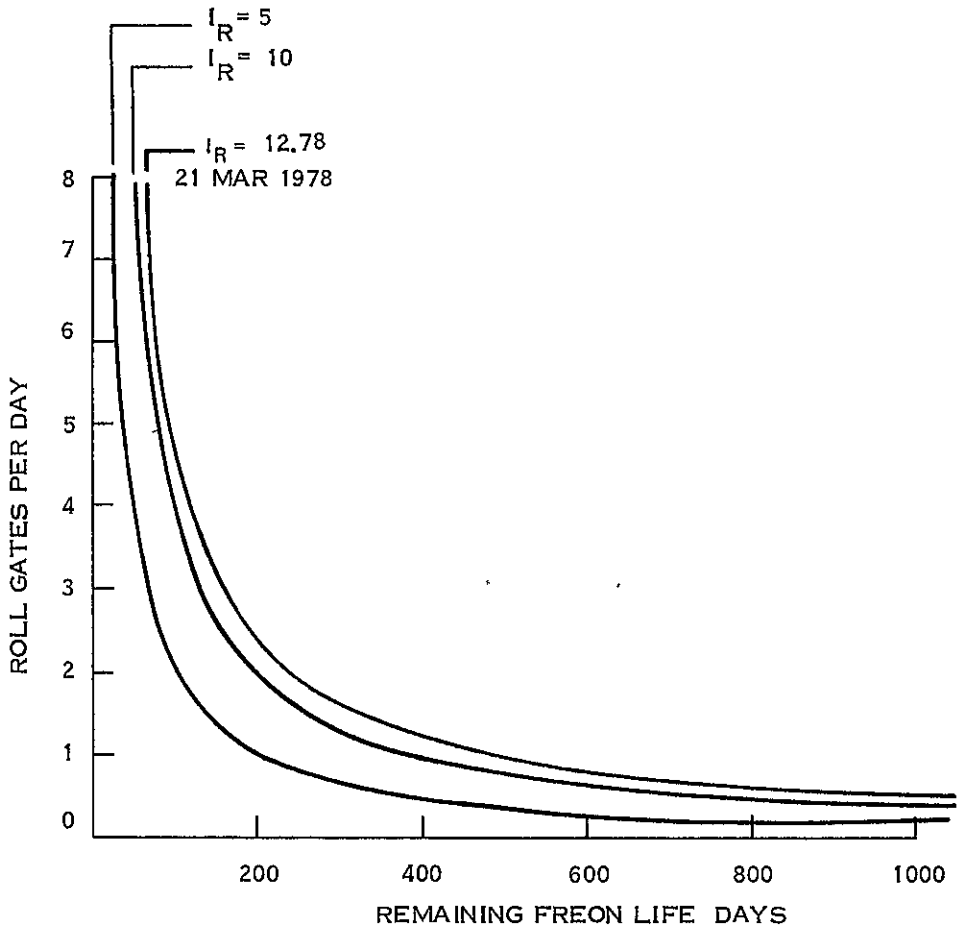


Figure 4-2. Landsat-1 Pressure - Roll Gate Prediction



I_R; REMAINING USEABLE IMPULSE, LB SECS.

Figure 4-3. Landsat-1 Remaining Freon Life vs Gating Frequency

Table 4-1. Landsat-1 ACS Temperature and Pressure Telemetry Summary

Function	Units	Orbit								
		31	5099	10182	15254	20304	25455	27950	28424	28821
1084 RMP 1 Gyro Temperature	DGC	44.5	23.06	21.22	42.40	41.47	40.71	38.13	35.47	36 13
1094 RMP 2 Gyro Temperature	DGC	74.3	75.10	43.45	24.05	23.49	23.15	23.45	21.70	22.47
1222 SAD RT MTR HSING Temp	DGC	21.1	22.00	20.55	22.89	21.70	20.73	14.26	11.73	12.56
1242 SAD LT MTR HSING Temp	DGC	27.0	30.38	28.18	29.53	28.88	28.32	28 78	26 33	27.61
1223 SAD RT MTR WNDNG Temp	DGC	25.3	26.54	24.63	27.06	25.74	24.15	13.35	10.72	11 41
1243 SAD LT MTR WNDNG Temp	DGC	28.7	32.92	30.32	31.98	31.40	30.72	31.65	29 09	30 40
1228 SAD RT HSG Pressure	PSI	7.6	7.35	7.12	6.88	6.70	6.45	6.06	6.06	6.05
1248 SAD LT HSG Pressure	PSI	7.0	6.86	6.47	6.18	5.90	5.64	5.44	5 44	5.38
1007 FWD Scanner MTR Temp	DGC	19.8	19.88	18.46	20.36	19.16	18.20	16.84	15.16	15 74
1016 Rear Scanner MTR Temp	DGC	20.5	19.83	17.86	19.24	18.87	17.94	17.00	15 34	15 88
1003 FWD Scanner Pressure	PSI	4.6	4.02	3.50	3.00	2.60	2.00	1.99	1.98	1.80
1012 Rear Scanner Pressure	PSI	7.8	7.87	7.44	6.97	6.74	6.28	6.05	6.04	6 04
1212 Gas Tank Pressure	PSI	1988.0	1702.34	1454.19	235.44	162.92	163.20	148.70	148 70	148 70
1210 Gas Tank Temperature	DGC	22.6	24.30	22.56	24.36	23.22	22.56	20.59	18.29	18.99
1213 Manifold Pressure	PSI	56.7	57.44	58.73	61.67	61.66	61.66	62.43	62.08	62.32
1211 Manifold Temperature	DGC	21.9	23.62	21.77	23.82	22.69	21.83	19.77	16.98	17.83
1059 CLB Power Supply Card Temp	DGC	37.1	40.54	38.83	40.58	39.55	38.99	38 94	37 21	37 79
1260 ACS Baseplate 1	DGC	25.4	27.93	25.36	26.54	26.01	25.61	T	T	T
1261 ACS Baseplate 2	DGC	22.9	24.73	23.00	25.05	24.21	23.58	T	T	T
1262 ACS Baseplate 3	DGC	23.4	23.69	21.97	24.95	23.89	23.01	T	T	T
1263 THO1 STS	DGC	-6.8	-0.97	-3.41	1.22	1.86	1.57	T	T	T
1264 THO2 STS	DGC	-14.6	-9.42	-8.27	-4.50	-3.17	-2.93	T	T	T
1265 THO3 STS	DGC	-3.1	9.31	7.58	12.92	15.02	16.80	T	T	T
1266 THO4 STS	DGC	-13.9	2.85	-1.85	2.40	3.05	3.15	T	T	T
1267 THO5 STS	DGC	-8.9	-1.16	-5.17	2.92	4.80	4.61	T	T	T
1224-SAD R FSST	DGC	39.5	60.21	63.25	64.74	62.86	56.55	12.94	2.10	2 84
1244 SAD L FSST	DGC	27.1	51.11	53.21	54.69	53.22	52.90	62.78	57.70	61 31

T - Switched Telemetry Off

Table 4-2. Landsat-1 ACS Voltages and Currents

Function	Units	Orbit								
		1	5099	10152	15254	20364	25455	27950	28424	28821
1037 CLB Power Supply Volts	1MV	2 8	2 78	2 78	2,78	2 77	2 77	2 77	2 77	2 77
1081 RMP 1 MTR Volts	VDC	1	1	1	-30 11	-30 11	-30 14	-30 14	-30 14	-30 14
1082 RMP 1 MTR Current	Amps	1	1	1	11	11	0.11	0 11	0 11	0 11
1080 RMP 1 Supply Volts	VDC	F	1	1	-2 78	-2, 79	-23 80	-23 84	-23 85	-23 87
1091 RMP 2 MTR Volts	VDC	-29.7	-29 6,	-29 6,	1	1	F	- 3 36	F	1
1092 RMP 2 MTR Current	Amps	0 10	0 10	0 11	F	1	F	0 03	1	F
1090 RMP 2 Supply Volts	VDC	-23 1	-23 41	-23 50	1	1	F	-17 09	1	1
1220 SAD R1 MTR WNDNG Volts	VDC	-1 8	-1 25	-1 89	-, 85	-1 20	- 3 68	1	1	1
1210 SAD L1 MTR WNDNG Volts	VDC	-1 8	-1 09	-, 36	-3 11	-, 65	- 3 35	- 3 18	- 3 56	- 3 53
1227 SAD R1 -15 VDC Conv	VDC	14 9	14 88	14 89	11 87	11 87	11 87	T	1	1
1217 SAD L1 -15 VDC Conv	VDC	15 2	15 1,	15 11	15 06	15 11	15.10	15 07	15 08	15 08
1056 CLB _6 VDC	1MV	2 1	2 15	2 15	2 15	2 15	2 35	2 15	2 14	2 15
1055 CLB +10 VDC 1MV	1MV	2 75	2 75	2 71	2 71	2 7,	2 79	2 73	2 73	2 7,

T - Switched Telemetry Off

F - Unit Off

Table 4-3. Landsat-1 ACS Attitude Errors and Driver Duty Cycles

Function	Units	Orbits								
		13198	13569	14001	15254	20364	25455	27950	28424	28821
1141 Pitch Time-Error *	DEG	- 0 40	- 0 08	- 0 02	- 2 13	- 11	- 0 96	- 0,80	- 0 06	- 0 06
1143 Pitch Flywheel Speed	RPM	- 10 49	- 26 86	- 1 21	12 92	-76 17	- 58 01	- 87 04	- 85 12	- 60 92
1038 Pitch MTR DRVR CCW	PCT	4 96	5 81	1 55	3 28	2 69	1 73	1 22	1.54	1 45
1039 Pitch MTR DRVR CW	PCT	2 29	2 17	5 10	19 65	1 01	0 26	0 11	0 18	0 08
1030 Roll Time Error **	DEG	- 2 25	- 0 20	- 0 20	- 2 52	-2 70	- 2 68	- 2 55	- 2 02	- 2 41
1127 Roll Rear Flywheel Speed	RPM	715 78	756 92	782 08	714 05	720 2,	718.12	728 21	735 33	721 64
1126 Roll Fwd Flywheel Speed	RPM	641 82	671 47	69, 31	641 32	640 80	640 29	646 50	658 40	645 90
1022 Roll Rear MTR DRVR CCW	PCT	0 01	0 65	0 90	13	96	0 00	0 00	0 00	0 00
1025 Roll Rear MTR DRVR CW	PCT	1 26	5 22	5 52	1 17	5 61	1 85	5 53	5 43	5 22
1023 Roll Fwd MTR DRVR CCW	PCT	0 01	0 66	0 72	08	99	0.02	0 00	0 00	0 00
1024 Roll Fwd MTR DRVR CW	PCT	1.15	1 91	5 15	4 24	5 16	4 32	4 41	4 93	4 78
1035 Yaw Tach	RPM	-206 08	-116 50	- 93 72	-169 52	-200 01	-225 26	-156 82	-179 32	-190 77
1033 Yaw MTR DRVR CW	PCT	0 04	1 53	1 84	09	05	0 00	0 12	0 17	0 17
1031 Yaw MTR DRVR CCW	PCT	0 07	1 60	1 76	68	67	0.73	0 53	0 61	0 63
1221 SAD Right Tach	DEG/MIN	3 37	3 37	2 91	3 37	, 10	3 46	18 00	18 00	18 00
1211 SAD Left Tach	DEG/MIN	2 80	2 81	2 91	2 79	2 79	2 82	2 75	2 80	2 78

NOTE Tabulation of these functions began after the pitch flywheel anomaly (stopped) in Orbit 11125

Pitch Time Error is high due to use of Pitch Position Bias (PPB) to control Pitch wheel speed on some orbits which raise the average error above that of normal attitude without PPB

Roll Time Error is high due to use of High Gain Roll Differential Tachometer mode to control Roll wheel speed which raises the average error above that of normal attitude in Normal Gain Roll Differential Tachometer mode

SECTION 5

COMMAND CLOCK SUBSYSTEM (CMD)

LANDSAT-1

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

The Command Clock Subsystem operated nominally in this report period. Figure 5-1 shows the history of the S/C clock drift since launch. Figure 5-2 shows the cumulative clock drift, 17 598 seconds slower in 68 months Figure 5-3 gives the drift rate of the S/C clock. The clock in Landsat-1 drifts in opposite direction from the clock of Landsat-2.

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

Table 5-2 is a list of the commands which put Landsat-1 into a retirement status.

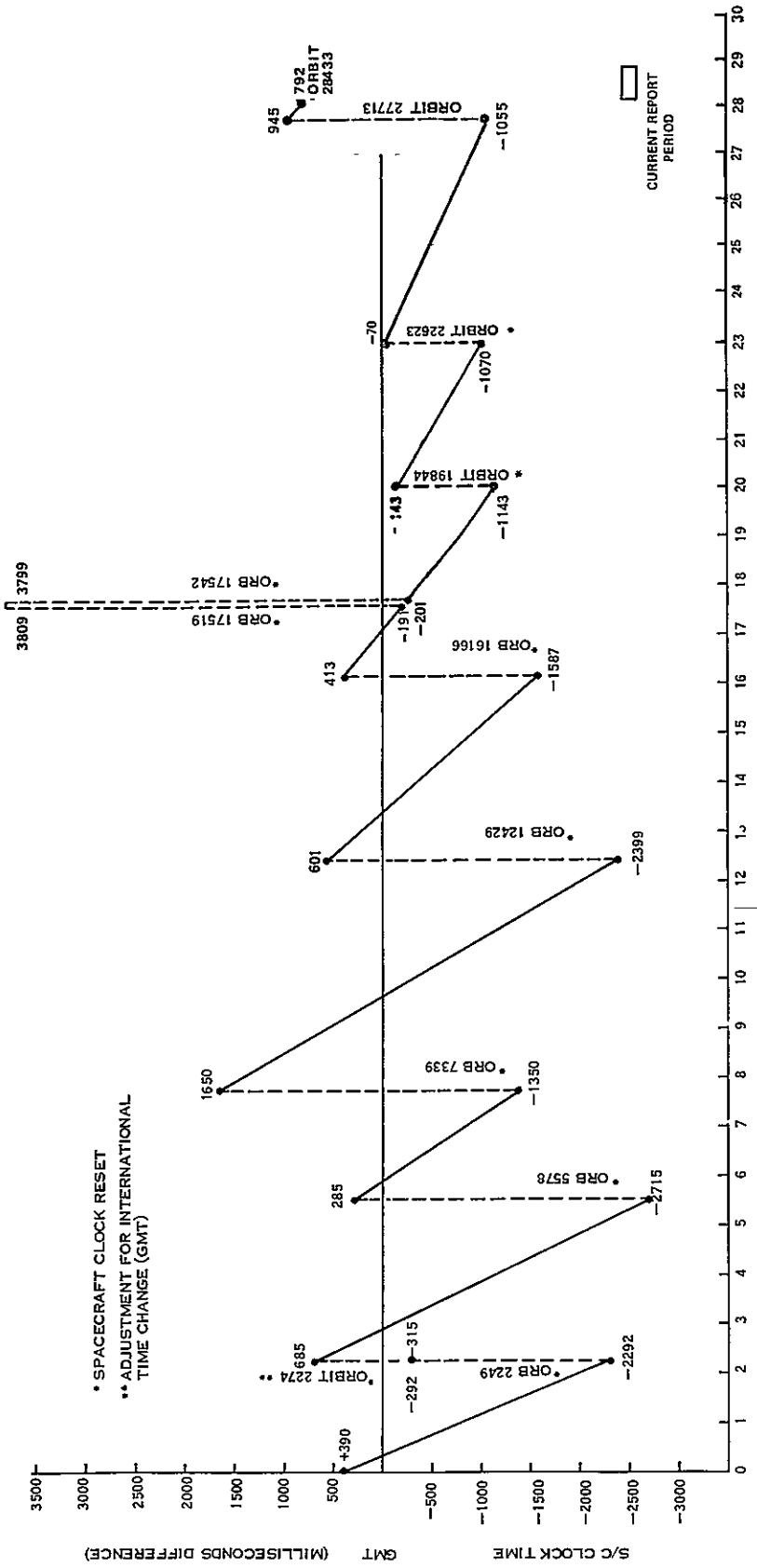


Figure 5-1. Landsat-1 Spacecraft Clock Drift History

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Table 5-1. Landsat-1 Command Clock Telemetry Summary

Function No	Name	Mode	Units	Orbit										
				35	5099	10182	15233	20364	25455	26943	27443	27950	28363	28821
8005	Pri Power Supply Temp	-	°C	37 31	39 37	39 50	38 26	38 06	36 96	37 70	37 89	32 31	32 57	33 01
8006	Red Power Supply Temp	-	°C	35 73	38 08	38 38	37 06	37 33	36 05	36 80	37 03	23 13	23 55	23 60
8007	Pri Osc Temp	-	°C	31 14	31 98	32 11	31 14	31 04	29 61	31 11	31 94	30 25	30 70	31.06
8008	Red Osc Temp	-	°C	30 47	31 39	31 42	30 48	30 18	28 70	30 48	31 14	29 53	29 84	30 39
8009	Pri Osc Output	-	TMV	0 95	0 96	0 97	0 97	0 95	0 95	0 95	0 96	0 95	0 95	0 95
8010	Red Osc Output	-	TMV	F	F	F	F	F	F	1 00	1 01	1 00	1 00	1 00
8011	100 kHz	Pri -Red	TMV	3 11	3 10	3 11	3 12	3 11	3 10	3 10	3 10	3 10	3 10	3 08
8012	10 kHz	Pri -Red	TMV	3 10	3 07	3 08	3 08	3 08	3 07	3 07	3 07	3 05	3 05	3 05
8013	2 5 kHz	Pri -Red	TMV	2 95	2 95	2 95	2 96	2 95	2 95	2 95	2 95	2 93	2 93	2 92
8014	400 Hz	Pri -Red	TMV	4 40	4 40	4 40	4 40	4 40	4 40	4 40	4 40	4 40	4 39	4 40
8015	Pri +4 V Power Supply	Pri Clk ON	VDC	4 10	4 10	4 10	4 10	4 08	4 06	4 07	4 08	4 05	4 05	4 05
8016	Red +4 V Power Supply	Red Clk ON	VDC	3 95	3 95	3 95	3 95	3 92	3 91	3 91	3 90	F	F	F
8017	Pri +6 V Power Supply	Pri Clk ON	VDC	6 06	6 07	6 07	6 11	6 06	6 06	6 07	6 07	6 06	6 06	6 06
8018	Red +6 V Power Supply	Red Clk ON	VDC	6 00	5 94	5 94	5 97	5 93	5 93	5 93	5 93	F	F	F
8019	Pri -6 V Power Supply	Pri Clk On	VDC	-6 02	-6 02	-6 03	-6 04	-6 02	- 6 02	-6 02	-6 02	- 6 02	- 6 02	- 6 02
8020	Red -6 V Power Supply	Red Clk ON	VDC	-5 99	-6 00	- 600	-6 01	-5 99	- 5 99	-5 99	-5 99	F	F	F
8021	Pri -23 V Power Supply	Pri Clk ON	VDC	-22 88	-22 89	-22 89	-22 95	-22 88	-22.88	-22 89	-22 89	-22 88	-22 88	-22 88
8022	Red -23 V Power Supply	Red Clk ON	VDC	-22 98	-23 00	-23 01	-23 06	-22 99	-22 98	-22 99	-22 99	F	F	F
8023	Pri -29 V Power Supply	Pri Clk ON	VDC	-29 13	-29 16	-29 15	-29 15	-29 16	-29 15	-29 15	-29 15	-29 09	-29 08	-29 11
8024	Red -29 V Power Supply	Red Clk ON	VDC	-29 07	-29 21	-29 21	-29 21	-29 21	-29 21	-29 21	-29 21	F	F	F
8101	CIU A -12 V	CIA A ON	VDC	-12 33	-12 33	-12 34	-12 35	-12 34	-12 34	-12 35	-12 35	-12 35	-12 36	-12 36
8102	CIU B -12 V	CIU B ON	VDC	-12 26	-12 23	-12.23	-12 20	-12 24	-12 24	-12 36	-12 26	-12 24	-12 27	-12 36
8103	CIU A -5 V	CIU A ON	VDC	-5 32	-5 34	-5 34	-5 34	-5 34	- 5 34	-5 34	-5 34	- 5 34	- 5 35	- 5 35
8104	CIU B -5 V	CIU B ON	VDC	55 31	-5 31	-5 31	-5 31	-5 31	- 5 31	-5 31	-5 31	- 5 31	- 5 31	- 5 31
8105	CIU A Temp	CIU A ON	°C	24 47	34 77	25 04	24 09	24 11	23 79	25 35	25 90	26 07	27 13	26 76
8106	CIU B Temp	CIU B ON	°C	24 96	25 31	25 45	24 48	24 44	24 01	25 66	26 19	26 35	27 39	27 03
8201	Receiver RF-A Temp	-	°C	F	F	28 67	27 53	26 88	25 89	27 17	27 49	T	26 78	T
8202	Receiver RF-B Temp	-	°C	27 98	28 22	F	F	17 47	16 22	17 98	18 32	T	17 51	T
8203	D MOD A Temp	-	°C	25 41	25 73	37 98	37 31	36 40	35.62	36 81	37 20	T	36.57	T
8204	D MOD B Temp	-	°C	35 03	35 61	26 12	25 27	24 10	22 83	24 72	25 18	T	24 25	T
8205	Receiver A AGC	Receiver A ON	DBM	F	F	-96 77	-85 62	-95 73	-92 73	-96 32	-92 95	-93 42	-90 03	-92 49
8206	Receiver B AGC	Receiver B ON	DMB	-94 74	-84 67	F	F	F	F	F	F	F	F	F
8207	Amp A Output	Receiver A ON	TMV	F	F	2 31	2 94	2 46	2 66	2 37	2 55	2 66	2 54	2 67
8208	Amp B Output	Receiver B ON	TMV	2 81	3 22	F	F	F	F	F	F	F	F	F
8209	Freq Shift Key A Out	Receiver A ON	TMV	F	F	1 10	1 11	1 10	1 10	1 11	1 10	1 11	1 10	1 10
8210	Freq Shift Key B Out	Receiver B ON	TMV	1 10	1 11	F	F	F	F	F	F	F	F	F
8211	Amp A Output	Receiver A ON	TMV	F	F	1 10	1 10	1 10	1 11	1 11	1 11	1 11	1 11	1 11
8212	Amp B Output	Receiver B ON	TMV	1 13	1 13	F	F	F	F	F	F	F	F	F
8215	D MOD A -15 V	Receiver A ON	TMV	F	F	5 00	5 00	4 99	4 98	5 00	5 00	4 98	4.98	4 98
8216	D MOD B -15 V	Receiver B ON	TMV	5 00	5 00	F	F	F	F	F	F	F	F	F
8217	Regulator A -10 V	Receiver A ON	TMV	F	F	5 40	5 39	5 38	5.38	5 39	5 39	5 37	5 38	5 38
8218	Regulator B -10 V	Receiver B ON	TMV	5 50	5 50	F	F	F	F	F	F	F	F	F

F - Unit Off.
T - Switched Telemetry Off

Table 5-2. Landsat-1 Final Command List at Guan (GWM) Orbit 28854; 23 March 1978

***	LANDSAT A		R T COMMANDS			ORBIT		ON PASS			***
***	MSG	CMD	CMD NAME	XMIT TIME	PETR	ACK	A/R	XMIT	TLM	DELTA MODE	CRIT ***
***	326	005	PRI COMSTOR OFF	21:36:00		A	A	VER	VER		YES ***
***	000	344	LEFT SAD DISABLE	00:00:00							YES ***
***	327	325	LEFT SAD HIGH RATE	21:36:59		A	A	VER	VER		YES ***
***	329	344	LEFT SAD DISABLE	21:40:44		A	A	VER	VER		YES ***
***	330	244	LEFT SAD NORML RATE	21:41:10		A	A	VER	NON		***
***	331	503	TMR POWER 1 OFF	21:41:34		A	A	VER	VER		YES ***
***	332	442	POWER 2 OFF	21:42:01		A	A	VER	NON		YES ***
***	333	167	VHF XMTR PWR 1 OFF	21:43:02		A	A	VER	NON		YES ***
***	334	211	VHF XMT PWR 2 OFF	21:43:20		A	A	VER	NON		YES ***
***											***
***	000	887		22:00:05							***
***	000	026	RED COMSTOR ACTVATE	22:01:34							***
***			LOS ASC	22:11:52							***
***											***
***											***
***											***
***											***
***											***
***											***
***											***

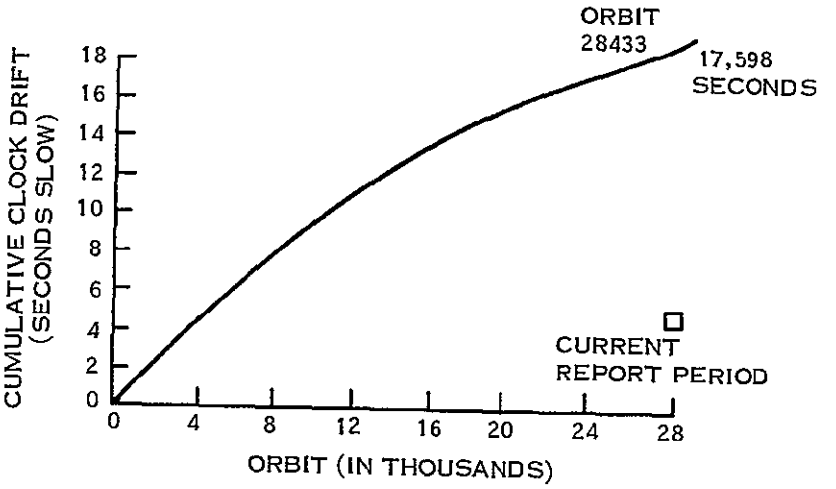

Figure 5-2. Cumulative Clock Drift

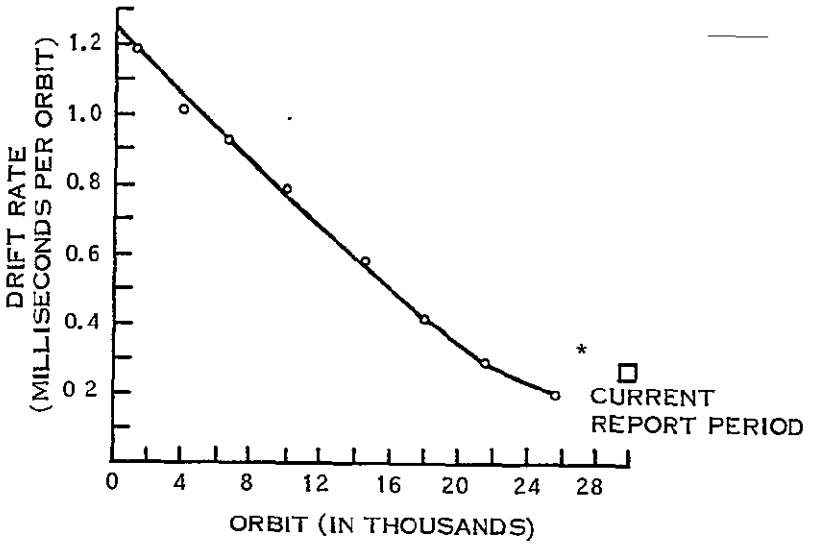

Figure 5-3. Drift Rate of Spacecraft Clock

SECTION 6

TELEMETRY SUBSYSTEM (TLM)
LANDSAT-1

SECTION 6

TELEMETRY SUBSYSTEM (TLM)

The Telemetry Subsystem has performed nominally during this report period

Landsat-1 used Memory Section 0 0 until Orbit 12,565, 10 January 1975, after which it was reprogrammed to Memory Section 1.1 to be compatible with Landsat-2 telemetry matrix. Memory Section 1 1 continues to be used in the telemetry matrix Total performance has been excellent except for one integrated circuit chip failure, containing four functions (6012, 7011, 12238, 7010) in Orbit 4396.

Table 6-1 shows typical telemetry values since launch Components increased temperature in this report period reflecting the fact that the satellite is in sunlight during its entire orbit.

The Beacon VHF Transmitter power (1 and 2) was turned off in Orbit 28854 when Landsat-1 was placed in a retired status

Table 6-1. TLM Telemetry Summary

Function No	Function Name	Unit	Orbit								
			35	5099	10392	15233	20364	25455	27950	28363	28821
9001	Memory Sequencer A Converter	VDC	6.35	6.33	6 33	6 33	6 33	6.33	6.35	6 31	6 35
9002	Memory Sequencer B Converter	VDC	I	I	F	I	I	I	I	I	I
9003	Memory Sequencer Temp	°C	19.59	21.06	21.30	21.94	20 78	21 60	I	29 15	F
9004	Formatter A Converter	VDC	5.99	5.99	5.99	5.99	5 99	6 00	6 06	6 09	6 08
9005	Format B Converter	VDC	I	I	I	I	F	I	I	F	I
9006	Dig. Mux A Converter	VDC	10.01	10 04	10 07	10 07	10.07	10.07	10 09	10.13	10 13
9007	Dig. Mux B Converter	VDC	I	I	F	I	I	F	I	F	I
9008	Formatter/Dig Mux Temp	°C	22.50	24.89	25.00	23.55	25 00	29.96	I	52 50	I
9009	Analog Mux A Converter	VDC	26 01	21.18	26 20	26 32	26.35	26 35	26 15	26 35	26 35
9010	Analog Mux B Converter	VDC	I	F	I	I	I	I	F	F	I
9011	A/D Converter A Voltage	VDC	10 00	10.07	10 07	10 07	10.07	10.07	10 07	10 07	10 07
9012	A/D Converter B Voltage	VDC	F	I	I	I	I	I	I	I	I
9013	Analog Mux Aux	°C	25.00	26 83	27.49	25.63	26 56	28 49	7	42 50	F
9014	Preregulator A Voltage	VDC	19.93	19.95	19.94	19.98	19 90	19 93	19 99	20 00	20 00
9015	Preregulator B Voltage	VDC	I	I	I	I	F	I	I	F	I
9016	Reprogrammer Temp	°C	22 00	22 50	22 53	22.50	22.50	25 93	I	45 00	I
9017	Memory A Converter	VDC	6.00	5.99	6 00	5.97	5 97	5 97	6 00	6 00	6 00
9018	Memory A Temp	°C	17.51	17.50	17.50	17 50	17 47	17 50	I	22 39	F
9019	Memory B Converter	VDC	I	I	I	I	I	F	I	I	I
9020	Memory B Temp	°C	17 68	17 63	17 51	17 50	16 93	17.51	I	26 80	I
9100	Reflected Power	dBm	11 95	12.32	12 38	11 37	11 45	12 50	I	16 19	I
9101	Xmtr A -20 VDC	VDC	-19.75	-19.76	-19 75	-19.84	-19 75	-19.75	-19 75	-19 87	-19 82
9102	Xmtr B -20 VDC	VDC	I	I	I	I	I	I	I	I	I
9103	Xmtr A Temp	°C	20.95	21 11	22.01	21 98	23 02	29.58	I	50 00	I
9104	Xmtr B Temp	°C	21 69	21 95	22 76	22 91	23 92	30.88	I	50 00	I
9105	Xmtr A Power Output	dBm	25 12	25 35	25 21	25.00	24.57	24 62	25 60	25 84	25 82
9106	Xmtr B Power Output	dBm	I	I	I	I	I	I	I	I	I

F = Unit Off
I = Telemetry Off

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)
LANDSAT-1

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

The Orbit Adjust Subsystem has been fired 51 times, 26 times using the -X thruster and 25 times using the +X thruster.

The subsystem pressure/temperature parameters continue to be normal. There are 64.43 pounds of hydrazine fuel remaining from an initial pre-launch load of 67.00 pounds. Figure 2-1 shows spacecraft ground track drift from standard orbit tracks and the effects of orbit adjustment Table 7-1 is a summary of OAS performance to date, and Table 7-2 gives average telemetry values for the off (quiescent) state.

Table 7-1. Landsat-1 Orbit Adjust Summary

Orbit	Orbit Adjust No.	Ignition Epoch	Burn Duration (Seconds)	+ Δ n (Meters)	Engine Performance Efficiency	Fuel[1] Used (Lbs)	Tank Pressure (PSIA)	Tank Temperature (°F)	Axis Thruster
38	1	26 Jul 72 11 25 0.0	4 8	12	80%		540	75	-X
44	2	26 Jul 72 21 44 46	250 0	1976	103 4%	2 15	U[2]	U[2]	-X
59	3	27 Jul 72 23 34 45	315 0	2391	101.5%		516	73 9	-X
838	4	29 Sep 72 00.30 00	12 8	86	110.0%	0.036	U[2]	U[2]	-X
2816	5	13 Jan 73 00 21 30	20 4	154	105.0%	0.071	489 4	75 4	-X
8390	6	25 Oct 73 00 04 10 8	14 8	110	100 0%	0 048	486 8	73.9	-X
7838	7	4 Feb 74 23 27 10 4	14 7	113	101.3%	0 048	490.59	75.4	-X
11367	8	16 Oct 74 22 42 10 8	8.0	-65	100 0%	0 026	490 59	74 0	+X
11464	9	23 Oct 74 21 40 00 4	8 4	-66	102 0%	0.027	490 58	73 9	+X
13611	10	26 Mar 75 19 39 00 8	2 8	-22 8	101.8%	0.01	490 09	72.5	+X
14365	11	19 May 1975 21 19 00.8	1.6	-13	102 4%	0 01	486 84	71 8	+X
19747	12	8 June 76 19 55 00 4	2.4	-19.3	102 1%	0 01	490 59	70.1	+X
19871	13	17 June 76 17 22 00 4	2 4	-19 9	105 8%	0.01	486.84	69.4	+X
21613	14*	20 Oct 76 15 23 01 2	2.4	-16.2	85 3%	0 01	494 34	73 2	+X
21616	15*	20 Oct 76 20 34 01 2	2 4	15 3	86 0%	0.01	494 34	73 2	-X
21627	16	21 Oct 76 15 33 01 2	5.2	39 2	103 2%	0 02	494.34	73.2	-X
21641	17	22 Oct 76 15 38 01 2	5 2	39.9	105 0%	0 02	494 34	72 4	-X
21655	18	23 Oct 76 15 47 01 2	5.2	40 0	105 3%	0 02	494 34	72.4	-X
21669	19	24 Oct 76 15 50 01.2	5.2	39.0	103 4	02	490 59	72 4	-X
21683	20	25 Oct 76 15 57 01.2	5.2	39.1	103 7	.02	490 59	72 4	-X
21697	21	26 Oct 76 16 06 01.2	5.2	37.8	100 3	02	490 59	72.4	-X
21710	22	27 Oct 76 14 24 01	5 2	42.4	112 5	02	490 59	72.4	-X
21724	23	28 Oct 76 14 30 01 2	5.2	39 6	105 0	02	490 59	72.4	-X
21738	24	29 Oct 76 14 36 01.2	5 2	40 5	107.4	.02	490 59	72.4	-X
21752	25	30 Oct. 76 14 44 01.2	5.2	40 7	108 0	02	490 59	72.4	-X
21766	26	31 Oct. 76 14-47 01.2	5.2	36.5	96 8	02	490 59	72 4	-X
21780	27	1 Nov 76 14 52-01.2	5 2	42.4	113.1	.02	486 84	73 2	-X
21794	28	2 Nov 76 14 59 01.2	5 2	42 0	112.0	.02	486 84	73 2	-X
21808	29	3 Nov 76 15 07 01.2	5 2	35 5	96.8	02	486 84	73 2	-X
21822	30	4 Nov 76 15 10 01 2	5 2	38.0	101 3	02	486 84	73 2	-X
21836	31	5 Nov 76 15 16 01.2	5.2	40 3	107 5	02	486 84	73 2	-X
21878	32	8 Nov 76 15 34 01.2	5.2	39.7	105 9	02	486.84	73 2	-X
21892	33	9 Nov 76 15 45 01 2	5 2	37.9	101 1	02	486 84	73 2	-X
22714	34	7 Jan 77 14 36 01.2	5 2	-40.7	100.7	.02	490 59	76 9	+X
22756	35	10 Jan. 77 14 50 01.2	5 2	-41 2	102.0	02	490 59	76.9	+X
22770	36	11 Jan. 77 15 02 01.2	5.2	-41.4	102.5	02	490 59	77.9	+X
22799	37	13 Jan 77 16 52 00	5 2	-41 6	103.0	.02	490.59	77 5	+X
22812	38	14 Jan. 77 15 14 01 2	5 2	-39 8	98.5	.02	490.59	77 6	+X
22826	39	15 Jan. 77 15 18 41 2	5 2	-40 2	99 5	.02	490.59	77.8	+X
22840	40	16 Jan 77 15 23 01 2	5 2	-41 7	103 2	02	490.59	78 4	+X
22854	41	17 Jan 77 15 31 01.2	5 2	-40 6	100.5	02	490.59	78 1	+X
22868	42	18 Jan. 77 15 36 01.2	5.2	-41 8	103 5	02	490 59	79.1	+X
22882	43	19 Jan. 77 15 42 01 2	5.0	-48 5	104.1	.02	490 59	79 1	+X
22896	44	20 Jan. 77 15 48 01.2	5.0	-48 7	104 5	02	490 59	79.1	+X
22910	45	21 Jan 77 15 53 01.2	5.0	-47.0	100.9	.02	490 59	79 1	+X
22923	46	22 Jan 77 14 17 01.2	5.0	-48.2	103.4	.02	490 59	79 1	+X
22937	47	23 Jan 77 14 25 01.2	5 0.0	-47.8	102.6	.02	490 59	79 1	+X
22951	48	24 Jan. 77 14 31 01 2	5.0	-47.4	102 4	02	486 84	79 1	+X
22965	49	26 Jan 77 14 34 01.2	5 0	-47 6	102.3	.02	486.84	79 1	+X
23007	50	28 Jan 77 14 51 01 2	1.2	-9.9	109 1	00	486 84	79.9	+X
24622	51	7 June 77 18 23 01 2	4 8	-35 5	98 1	02	472 21	68.5	+X

*Test Burns

1 Initial Fuel Capacity - 67 lbs
2 Unavailable

Table 7-2. Landsat-1 OAS Telemetry Values

Function No.	Name	Units	35	5099	10182	15254	20364	25455	27950	28424	28821
2001	Prop. Tank Temp	°C	22.03	22.86	23.28	21.62	21.20	21 61	30.33	32 85	32 43
2003	Thrust Chamber No. 1 (-x) Temp. **	°C	29.57	29.93	30.55	30.52	27.62	22.62	15 28	11.98	13.11
2004	Thrust Chamber No. 2 (+x) Temp. **	°C	38.76	40.28	38.91	36.25	35.20	32.93	31 78	29.20	31.32
2005	Thrust Chamber No. 3 (-y) Temp. **	°C	34.55	34.41	36.09	38.45	43.88	53.63	113.01	133.02	122 51
2006	Line Pressure	psia	539.29	486.87	490.61	486.78	489.66	475.66	505 54	513.12	513.08

** Wide spread of temperature is due to nozzle locations and satellite day/night transitions relative data averaged Typical orbital range is from 19 to 59 DGC.

SECTION 8

MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)

LANDSAT-1

SECTION 8

MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)

From launch through this report period Landsat-1's MMCA has been energized eleven times in seven orbits, i e., Orbits 73, 85, 110, 220, 11181, 11185* and 11186*. The MMCA was operated in the early orbits to reduce +Roll pneumatic gating. (*Energized 3 times in one orbit).

In Orbits 11181 and 11186, it was energized in the plus and minus Yaw dipole configuration respectively in order to save freon gas by reducing the amplitude of the Pitch flywheel orbit frequency oscillation In a short successful test during Orbit 11185 the plus Roll dipole was temporarily energized to determine if a positive roll dipole at the poles could unload the pitch flywheel. Upon test completion the Roll dipole was returned to 500 pole-cm.

No dipole adjustments were made during this report period.

The current dipole values are

Pitch	+2950 Pole-Cm
Roll	-500 Pole-Cm
Yaw	-3600 Pole-Cm

Telemetry Measurement shown in Table 8-1 shows that the dipoles are holding steady without drift.

Table 8-1. MMCA Telemetry Summary (Landsat-1)

Number	Name	Units	Orbits								
			35	5099	10182	15254	20364	25455	27950	28424	28821
4001	A1 Board Temp	°C	19.77	19.03	19.11	17.59	16.69	16.14	18 26	18 47	18.68
4002	A2 Board Temp	°C	23.58	23.05	23.13	21.83	21.05	20.60	22.30	22.50	22 63
4003	Hall Current	TMV	3.48	3.48	3.48	3.47	3.48	3.48	3.47	3 47	3.47
4004	Yaw Flux Density	TMV	3.11	3.11	3.15	4.02	4.03	4.04	4.04	4 03	4.04
4005	Pitch Flux Density	TMV	3.13	2.51	2.52	2.52	2.52	2.52	2 52	2.52	2.52
4006	Roll Flux Density	TMV	3.19	3.19	3.20	3.28	3.28	3.28	3 28	3.28	3 29

SECTION 9

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

LANDSAT-1

SECTION 9

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

The USB subsystem continued to transmit telemetry data satisfactorily until Landsat-1 was retired after Orbit 28854 on 23 March 1978, at which time all USB activity stopped It had not been used for command functions since 11 January 1978, because of unreliable operation, first experienced on 6 January 1978. High PMP temperatures are believed to have caused the anomalous operation.

Table 9-1 shows telemetry values since launch All are nominal

Figure 9-1 shows the USB power output history since launch AGC readings at Goldstone continue to show nominal operational values

Table 9-1. USB/PMP Telemetry Values

Functions			Orbit								
No.	Name	Units	35	5099	10592	15233	20364	25455	27921	28363	28843
11001	USB Rcvr AGC	DBM	-122.78	-131.99	-129.81	-105.41	-132.06	-126.09	-131.98	-131.98	-131 98
11002	USB Xmtr Pwr	WTS	1.60	0.29	1.54	1.53	1.55	1.44	1 48	1 42	1 45
11003	USB Rcvr Error	KHZ	21.79	-21.32	-23.25	-18.01	-21.76	-23.02	- 20.69	- 19 03	- 20.86
11004	USB Xpond Temp	DGC	22.92	22.64	25.64	25.11	25.37	28.59	44 82	48.99	48 99
11005	USB Xpond Press	PSI	15.91	15.91	15.92	15.94	15.90	16.19	17.00	17.00	17 00
11007	USB Xmtr A -15V	VDC	-15.20	-15.20	F	F	F	F	F	F	F
11008	USB Xmtr B -15V	VDC	F	F	-15.20	-15.20	-15.20	-15.20	- 15 20	- 15 20	- 15 20
11109	USB Range -15V	VDC	-14.76	-14.76	-14.58	-14 58	-14.58	-14.58	- 14 58	- 14 58	- 14.58
11101	PMP Pwr A Volt	VDC	-15.12	-15.18	F	F	F	F	F	F	F
11102	PMP Pwr B Volt	VDC	F	F	-15.12	-15.12	-15.12	-15.12	- 15.14	- 15.16	- 15 16
11103	PMP Temp A	DGC	30.44	30.23	26.60	26.09	26.62	32.67	55.57	70 *	86 *
11104	PMP Temp B	DGC	F	F	31.64	31.67	31.12	37.04	60.92	72 *	88 *

F - Unit Off
* - Extrapolated

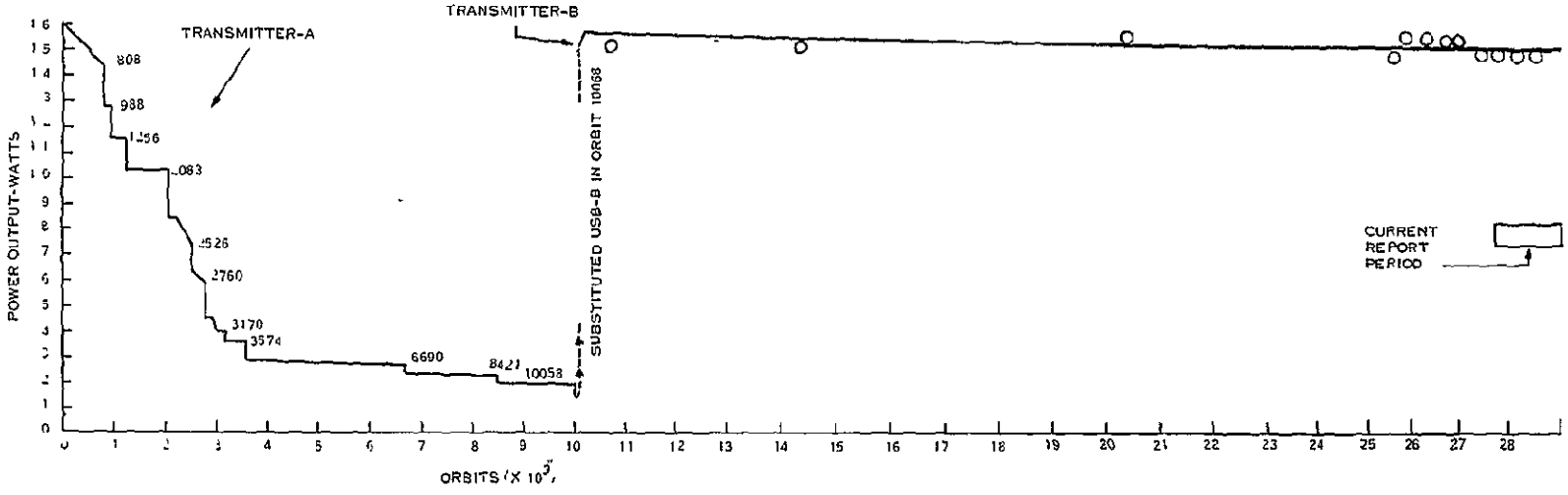

Figure 9-1. USB Power Output History (Landsat-1)

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)
LANDSAT-1

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)

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

Table 10-1. Landsat-1 APU Telemetry Functions

			Orbit							
Functions	Description	Unit	7	5098	10182	15254	20364	25455	27784	28383
13200	APU, -24.5 VDC	VDC	-24 90	-24.90	-24 91	-24.90	-24 90	-24 89	-24.90	-24 90
13201	APU, -12 Volts	VDC	-12.08	-12.08	-12 07	-12.06	-12.05	-12.04	-12.04	-12 04
13202	APU Temp.	DGC	25.49	26 95	27.15	26.82	27 31	28.93	40.3	41 3

The Power Switching Module (PSM), containing the switching relays for power to Orbit Adjust, MSS, WBPA-1, WBPA-2, WBVTR-1, WBVTR-2, RBV and PRM, functioned normally. The MSS and WBPA-2 power circuits operated until 7 January 1978, during orbit 27805, when the MSS was shut down--possibly put into an indefinite "STAND-BY" position (see Section 17). Although the power relay for the RBV remained in a failed closed condition since Orbit 196, the RBV system was switched on in Orbit 28835 and successfully operated.

The Interface Switching Module (ISM) performed all switching normally during this report period

SECTION 11

THERMAL SUBSYSTEM (THM)
LANDSAT-1

SECTION 11

THERMAL SUBSYSTEM (THM)

The Thermal Subsystem continued to operate satisfactorily until retirement on 23 March 1978, Orbit 28854.

Since the time of launch, the right sun sensor on Landsat-1 has registered temperatures higher than expected. This is due to the particular location and bonding techniques used for the sensor. During Orbit 4396 (3 June 1973) telemetry function 7101 (THM TH07 ST1) became disabled when four telemetry gates mounted on one integrated circuit chip failed.

Landsat-1 experiences an annual cycle of high and low temperatures due to a combination of high sun intensity and sun angle, and to longer satellite days. The cycles of sun angle and length of satellite day reach higher and higher peaks in successive years due to the drift in the satellite's orbital plane. During this report period, the satellite experienced continuous sun which caused temperatures to increase substantially along Bays 11 through 17.

During this report period the sun intensity ranged between 1.032 and 1.000 times the mean annual value and the spacecraft temperatures increased. Figure 11-1 shows a typical thermal profile for average bay temperatures of the sensor ring at the beginning of this report period.

Table 11-1 shows average analog telemetry values from data recorded on the NBR, for selected orbits since launch.

The compensation load configuration on Landsat-1 has been switched several times to balance temperatures among spececraft components. During this report period all comp loads have remained off. A history of compensation load switching is given in Table 11-2.

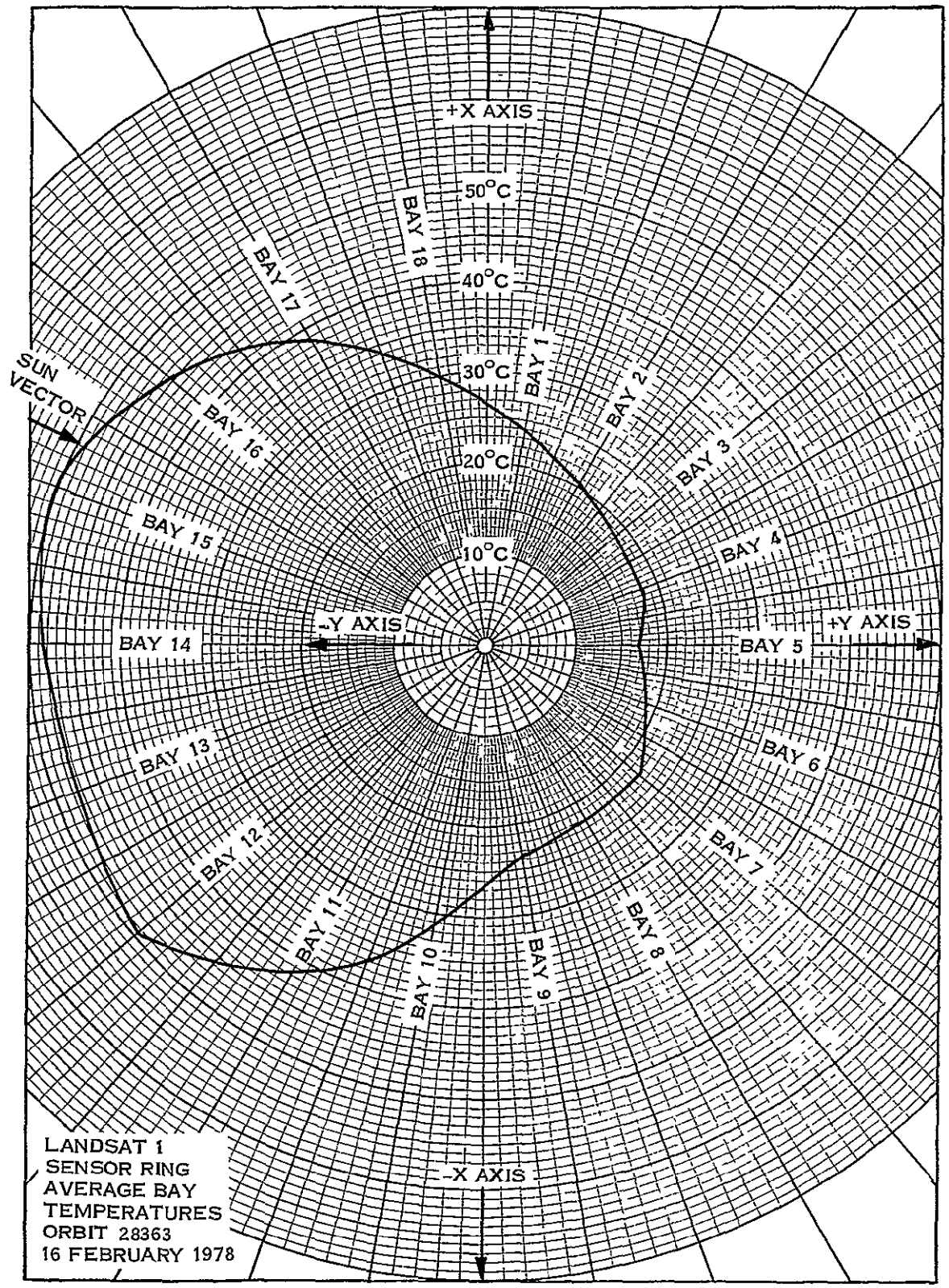

Figure 11-1. Landsat-1 Sensory Ring Thermal Profile

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

Function			Orbit							
No.	Description	Unit	26	5098	10182	15254	20364	25455	27986	28363
7001	THM TH01 ST1	DGC	19.62	20.85	21.65	19.48	18.72	19.37	27.57	26.40
7002	THM TH02 SBO	DGC	18.60	19.95	20.60	18.62	17.87	17.68	21.75	20.16
7003	THM TH03 STI	DGC	18.48	20.16	20.87	18.11	17 20	16.79	21.50	20.82
7004	THM TH10 TCB	DGC	19.47	20.25	20.36	19.76	19.75	20.05	30.72	32.08
7005	THM TH04 STI	DGC	18.39	19 71	20.35	17.86	17.09	16.45	19.69	19.04
7006	THM TH05 SBO	DGC	17.67	18.39	18.81	17.20	16 47	16.12	18 02	16 57
7007	OA-X THRUSTER	DGC	21.95	22.95	22.90	22.25	21 33	20.02	21.27	20.46
7008	THM TH06 STO	DGC	15.95	16.61	16.90	15.34	14.52	13.94	15.59	14.19
7009	THM TH06 SBI	DGC	19.38	20.35	20.93	18.98	17.86	17.34	20.34	19.07
7010	THM TH07 STI	DGC	18.61	*	*	*	*	*	*	*
7011	THM TH08 STO	DGC	21.78	22.77	22.88	22.03	21.17	19.88	19.97	18.58
7012	THM TH09 SBI	DGC	21.81	22.87	23.08	22.20	21 66	20.53	25.10	24 80
7013	THM TH10 SBO	DGC	18.73	19.53	19.64	19.00	18 56	18.14	24.97	125.00
7014	THM TH11 STI	DGC	22 37	23.35	23.57	22.80	22.88	23.52	35.37	36.88
7015	THM TH12 SBO	DGC	22.37	23.17	23.03	22.86	23 71	26.48	44.88	47.20
7016	THM TH13 STI	DGC	20.95	22.02	22.47	22.00	22 89	26.00	46.59	48.95
7017	RBV BEAM CTR LN	DGC	21.53	22.62	22.84	21.88	21 63	20.98	29.52	30.28
7018	THM TH14 STO	DGC	20.38	21.40	21.93	21.83	23.19	23.89	54.08	56.49
7019	NBR RAD OUTBD B4	DGC	5.09	5.86	6.00	4.37	3.31	3.00	5.98	6.03
7020	THM TH15 SBI	DGC	21.14	23.24	23.99	22.18	23.06	27.64	48.99	51.32
7021	THM TH16 STI	DGC	20.78	22.90	23.68	21.64	21.68	25.14	44.13	46.83
7022	THM TH17 SBI	DGC	20.22	22.76	23.56	21.47	20.83	23.83	39.58	40.81
7023	THM TH18 SBO	DGC	21.90	24 29	25.19	23.47	22.56	24.63	37.36	36.05
7030	THM TH03 BUR	DGC	16.05	17 07	17.42	15.35	14.62	14.10	15.85	15.04
7031	THM TH06 BUR	DGC	13.59	14.17	14 28	12.67	12.07	11.32	12.56	10.95
7032	THM TH09 BUR	DGC	19.92	20.75	20.74	20.17	19.64	18.88	22.29	22.14
7033	THM TH12 BUR	DGC	21.51	22.16	22.76	22.65	23.67	27.16	48.60	51.24
7034	THM TH15 BUR	DGC	19.70	21.67	22.38	21.33	22.23	27.22	50.91	53.58
7035	THM TH18 BUR	DGC	20.11	21.36	22 02	20.54	20.07	21.15	29.40	28.22
7040	THM TH01 TCB	DGC	19.27	20.46	21.26	19.19	18.59	18.86	24.06	22.63
7041	THM TH02 TCB	DGC	17.99	19.23	19.89	17.80	17.11	16.90	20.21	19.13
7042	THM TH03 TCB	DGC	18.84	19.94	20.92	17.79	17.16	16.26	18.58	17.78
7043	THM TH04 TCB	DGC	18.95	19.94	20.26	18.60	18.00	17.62	19.42	18.59
7044	THM TH05 TCB	DGC	16.27	16.98	17.32	15 90	15.22	14.86	16.59	15.46
7045	THM TH07 TCB	DGC	18.41	19.21	19.45	18.25	17.46	16.56	17.89	16.86
7046	THM TH09 TCB	DGC	19.38	20.37	20.64	19.85	19.17	18.69	23.64	22.86
7048	THM TH11 TCB	DGC	21.98	22.94	23.18	22.80	23.18	24.50	37.84	39.79
7049	THM TH12 TCB	DGC	21.92	22.46	22.35	22.30	23.35	27.37	47.96	50.48
7050	THM TH13 TCB	DGC	21.21	21.99	22.29	22.26	23.62	29.14	52.84	55 50
7051	THM TH14 TCB	DGC	21.38	22.88	23.62	22.74	23.83	28.19	53.35	56.68
7052	THM TH16 TCB	DGC	21.30	23.95	25.13	22.68	23 00	27.04	47.15	49.46
7053	THM TH17 TCB	DGC	21.73	24.03	25.02	23.38	21.89	24.18	37.84	37.95
7054	THM TH18 TCB	DGC	20.02	22.20	23.35	21.04	20.10	21.42	31.66	27,00
7060	THM SHUTTER BY 1	DEG	25.85	33.13	38.62	24.41	19.19	21.17	54.37	50.33
7061	THM SHUTTER BY 2	DEG	6 62	8.65	13.28	1.73	0.00	0.00	18.75	20.33
7062	THM SHUTTER BY 3	DEG	10.96	23.58	30.24	17.30	12.44	8.27	10.78	17.70
7063	THM SHUTTER BY 4	DEG	30.60	35.71	37.92	29.50	25.00	20.20	28.03	27.00
7064	THM SHUTTER BY 5	DEG	15.03	16.25	15.00	8.08	4.62	2.31	6.92	5,77
7065	THM SHUTTER BY 7	DEG	17.14	24.64	21.96	14.50	8.00	4.50	5.00	5.50
7067	THM SHUTTER BY 9	DEG	33.26	38.44	39.50	38.24	37.50	36.56	68.33	66.68
7068	THM SHUTTER BY 10	DEG	24.68	28.68	27 31	26.03	24.26	0.00	0.00	0.00
7069	THM SHUTTER BY 11	DEG	39.66	46.89	48.96	46.97	48.40	54.65	63.75	63.75
7070	THM SHUTTER BY 12	DEG	43.81	46.63	45.68	45.95	52.19	66.56	66.54	66.56
7071	THM SHUTTER BY 13	DEG	40.39	46.38	44.79	42.84	44.43	62.25	62.62	62.61
7072	THM SHUTTER BY 14	DEG	34.20	39.70	41.91	34.28	34.65	42.35	42.35	42.35
7073	THM SHUTTER BY 15	DEG	45.40	58.74	64 79	55 15	63.60	79.59	80.36	80.26
7074	THM SHUTTER BY 16	DEG	24.50	48 46	53.54	38.76	40.06	60.09	65.25	65.12
7075	THM SHUTTER BY 17	DEG	39.06	54.96	61.88	51.06	39 95	57.03	80.00	80.00
7076	THM SHUTTER BY 18	DEG	29.70	43.15	51.20	35.12	28.09	38.26	60.05	60.05
7080	THM Q1 T ZENER V	VDC	8.19	8.19	8.19	8.19	8.19	8.19	8.19	8.19
7081	THM Q2 T ZENER V	VDC	8.40	8.40	8 40	8 40	8.40	8.40	8.40	8.40
7082	THM Q3 T ZENER V	VDC	8.31	8.31	8.32	8.31	8.31	8.31	8.32	8.31
7083	THM Q1 S ZENER V	VDC	8 31	8.32	8.35	8.31	8.31	8.31	8.36	8.35
7084	THM Q2 S ZENER V	VDC	8.19	8.19	8 20	8.19	8.19	8.19	8.23	8.23
7085	THM Q3 S ZENER V	VDC	8.15	8 15	8.15	8.15	8 15	8.15	8.19	8.18
7090	THM PSM MOUNT	DGC	21.60	22.54	22.98	21.43	20 98	21.40	32.41	33.18
7091	THM IND ATTITUDE	DGC	19.40	20.42	20.88	19 13	18.23	17.48	21.21	20.40
7092	THM RBV RADIATOR	DGC	15.65	17.22	17.47	16.55	16.52	13.53	22.90	23.85
7093	THM RBVC CTR BM	DGC	20.30	21.61	21.87	20.73	20.69	18.71	28.57	29.59
7094	THM WBVTR ROOT	DGC	12.96	15.71	16.07	13.77	12.00	12.74	23.09	23.89
7095	THM WBVTR RAD CT	DGC	4.81	8.17	8.68	6.99	5 99	8.18	12.63	12,93
7096	THM WBVTR STRAP	DGC	16.62	19 32	19.66	17.29	14 72	15.46	25.45	25.84
7097	THM WB MT BAY 1	DGC	20.56	19.52	21.37	16.97	16.35	16.57	24.49	24.70
7098	THM WB MAT BAY 1	DGC	20.22	18.90	20.39	17.12	16.65	17.28	26.64	27.17
7099	THM WBVTR SEP 3	DGC	18.60	20.55	21.05	18.45	17.09	17.02	23.23	22.69
7100	THM WBVTR SEP 17	DGC	21.31	23.66	24.23	22.02	20.96	23.35	38.03	39.10
7101	THM WBVTR 1 CENT	DGC	21.49	23.72	24.01	21.63	18 28	19.20	29.57	29.71
7102	THM WBVTR 2 BAY	DGC	17.46	18.92	19.32	17.23	16.31	16.11	20.93	20.08
7103	THM WBVTR 2 BY 15	DGC	21.00	23.16	23.82	21.73	21.33	24.43	42.74	44.88
7104	THM WBVTR 2 CTR	DGC	19.35	21.51	21.81	19.54	17.53	18.67	30.71	31.87
7105	THM NBTR B SEP 6	DGC	18.06	19.30	19.79	17.82	16.74	16.47	22.14	22 55
7106	THM NBTR B SEP 1	DGC	20.82	22.35	22.89	21.61	22.04	25.47	45.04	47.41
7107	THM NBTR BM CTR	DGC	19 37	21.04	21.34	19.51	18.94	19.52	31.00	32.26
7108	THM MSS MOUNT 14	DGC	19.18	21.15	21.70	20.06	20.70	24.29	43.90	46.17
7109	THM OA -Y THRUSTER	DGC	22.21	23.80	24 69	24.40	26.22	32.05	55.24	58.00
7110	THM MSS WBVTR BM	DGC	18.14	20.06	20.53	18.18	17.38	17.48	25.93	26.72
7111	THM OA +X THRUSTER	DGC	20.30	19 92	21.22	18.07	17.57	17.93	22.92	25.56
7130	THM AUX P1 T	DGC	15.69	8.49	-18.90	9.68	10.29	13.92	-2.34	10.24
7131	THM AUX P2 T	DGC	10.63	1.69	.41	5.64	25.81	28.79	36.41	49.91

*Function 7010 became invalid after an integrated circuit chip failure in the TMP on Orbit 4396.

Table 11-2. Landsat-1 Compensation Load History

Orbits	Compensation Load Status*							
	1	2	3	4	5	6	7	8
Launch	0	0	0	0	0	0	0	0
2	0	0	X	X	X	0	X	X
6	X	X	X	X	X	0	X	X
118	0	0	0	0	0	0	0	0
156	X	X	X	X	X	0	X	X
194	0	0	0	0	0	0	0	0
197	X	X	X	X	X	0	X	X
701	X	X	0	X	X	0	X	X
1410	X	X	0	X	X	0	0	X
3484	X	X	X	X	X	0	0	X
3644	X	X	0	X	X	0	0	X
3646	X	X	X	X	X	0	0	X
4177	X	X	0	X	X	0	0	X
6872	X	X	X	X	X	0	0	X
6966	X	X	0	X	X	0	0	X
8291	X	X	X	X	X	0	0	X
8348	X	X	0	X	X	0	0	X
8449	X	X	X	X	X	0	0	X
8472	X	X	0	X	X	0	0	X
8538	X	X	X	X	X	0	0	X
8928	X	X	0	X	X	0	0	X
9898	X	X	X	X	X	0	0	X
10410	X	X	0	X	X	0	0	X
11125	0	0	0	0	0	0	0	0
11126	X	X	0	X	X	0	0	X
11127	0	0	0	0	0	0	0	0
11133	X	X	0	X	X	0	0	X
12604	X	X	X	X	X	0	0	X
13206	X	X	0	X	X	0	0	0
15584	X	X	0	0	X	0	0	0
22487	X	X	0	0	0	0	0	0
23113	0	0	0	0	0	0	0	0

* Note: X = ON
O = OFF

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)
LANDSAT-1

SECTION 12

NARROW BAND TAPE RECORDERS (NBR)

Narrowband Recorder-A operated satisfactorily during this report period, and has provided coverage for MSS real-time operations as well as approximately 3-1/2 hours daily of normal orbital telemetry recording and playback functions.

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

Table 12-1. NBR Operating Hours by Modes, Landsat-1

NBR	ON	OFF	Playback	Record
A	18,860	30,897	758	18,102
B(F)	11,909	12,666	476	11,433

F - Not used since Orbit 15,253, 22 July 1975

Table 12-2. Narrowband Tape Recorder Telemetry Values, Landsat-1

Function		Typical Telemetry Values - Orbits								
No.	Name	6	3750-3751	10862	15256	20375	25368	27950-27969	28363	28821
10001	A - Motor Cur, (ma)									
	Record	190.10	189.20	186.31	192.63	196 20	183.26	175 36	172 11	171 94
	P/B	180.00	178 69	180 00	N	192 60	198.41	175 26	174 73	175 72
10101	B - Motor Cur. (ma)									
	Record	193.26	193.04	198 95	198.95	F	F	F	I	I
	P/B	188.18	185.44	187.89	202.1	F	F	I	I	I
10002	A - Pwr Sup. Cur. (ma)									
	Record	320 56	338.20	339 81	343.24	343 20	341 74	341 92	341 55	342 96
	P/B	535.78	568.38	567.75	N	572 90	576.97	536 06	566 39	564 83
10102	B - Pwr Sup. Cur. (ma)									
	Record	317.62	336.05	350 00	346.75	F	I	I	I	I
	P/B	570.78	553.63	567.50	580.51	F	F	I	I	I
10003	A - Rec. Temp (DGC)	25 47	34.40	23.60	22 00	20 80	22.88	28 02	29 08	29 10
10103	B - Rec. Temp (DGC)	24.58	23.41	23.41	23 18	18 40	18.40	22 99	24 01	23 99
10004	A - Supply (VDC)	-24 47	-24.44	-24 62	-24.62	-24.60	-24 58	-24.53	-24 51	-24 53
10104	B - Supply (VDC)	-24.44	-24.51	-24.29	-24 57	-24.70	-24.72	-24 71	-24 71	-24 71

N - Data not available
F - Unit Off

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)
LANDSAT-1

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)

The Wideband Telemetry Subsystem was not operated in this report period.

WBPA-2 was last used during Orbit 27805 on 7 January 1978 when ACS and command problems prompted an advancement of the scheduled shut-down date (16 January 1978) of Landsat-1 operations in preparation for the launch of Landsat-3.

WBPA-1 was last used during Orbit 2100 on 21 December 1972. Both WBPA1 and 2 can resume normal operations if required.

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

AGC readings at Goldstone continue to show nominal values. (See Figure 13-1.)

Table 13-1. Wideband Modulator Telemetry Values, Landsat-1

WBPA-1

Function		Units	Orbits			
Number	Name		26	1894	1944	2095
12001	Impt TWT Coll	DgC	35 7	39 20	39 90	39 90
12002	Helix Current	Ma	6 08	6 49	6 58	6 78
12003	TWT Cath Curr	Ma	45 89	43 54	43 48	45.01
12004	Forward Pwr	DBM	43 18	42 88	42 61	43 15
12005	Reflected Pwr	DBM	34 95	34 99	34 80	35 21
12227	Loop Str AFC Con Volt (1)	MHz	-0 39	-1 29	-0 86	-0 67
12229	Mod Temp VCO	DgC	21 93	20 31	20 88	20 39
12232	+15 VDC Pwr Sup A (2)	TMV	2 69	2 69	2 65	2 62
12234	-15 VDC Pwr Sup A	TMV	5 98	5 96	5 73	5 78
12235	+5 VDC Pwr Sup A	TMV	3 94	3 94	3 94	3 95
12238	-5 VDC Pwr Sup A	TMV	5 28	5 26	5 18	5 12
12240	-24 VDC Unreg Volt A	TMV	5 56	5 51	5 42	5 49
12242	Inv Temp	DgC	20 60	23 43	24 71	24 04

WBPA-2

Function		Units	Orbits							
Number	Name		33	4096	10602	15233	20358	25452	26943	27443	27723
12101	Temp TWT Coll (Max)	DgC	35 38	34 24	35 96	29 77	34.90	29 61	33 07	31 92	33 65
12102	Helix Current	Ma	7 32	7 70	7 67	7 90	7,82	7 90	7 90	7 85	7 85
12103	TWT Cath Cur	Ma	44 30	43 85	42 72	43 70	42,83	43 84	42 42	42 40	43 64
12104	Forward Pwr	DBM	43 57	43 57	43 47	43 52	43 41	43 38	43 37	43 34	43 34
12105	Reflected Pwr	DBM	31 59	32 79	32 62	33 07	32 60	32 97	32 39	32 35	32 32
12228	Loop Str AFC Con Volt (1)	MHz	1 11	-0.78	-1 12	-1 05	-1 53	-2 13	-2 09	-2 77	-2 32
12229	Mod Temp VCO	DgC	21 70	20 88	21 50	21 78	23 65	18 09	20 56	21 03	19 61
12232	+15 VDC Pwr Sup A (2)	TMV	2 68	2 69	2 69	2 65	2 66	2 69	2 69	2 69	2 69
12234	-15 VDC Pwr Sup A	TMV	5 90	5 98	5 92	5 81	5 85	5.97	5 94	5 96	5 91
12236	+5 VDC Pwr Sup A	TMV	3 97	4 01	4 01	3 97	3 96	4 01	4 01	4 01	4 01
12239	-5 VDC Pwr Sup A	TMV	5 24	D	D	D	D	D	D	D	D
12240	-24 5 VDC Unreg Volt A	TMV	5 43	5.52	5 16	5 44	5 37	5 61	5 51	5 33	5 45
12242	Inv Temp	DgC	23 03	22.96	23 86	23 66	22 73	21 10	23 06	24 25	26 74

(1) Satisfactory if not -11 0 or +11 0 (2) B Power Supply not yet used in orbit

D - Defective Telemetry Point

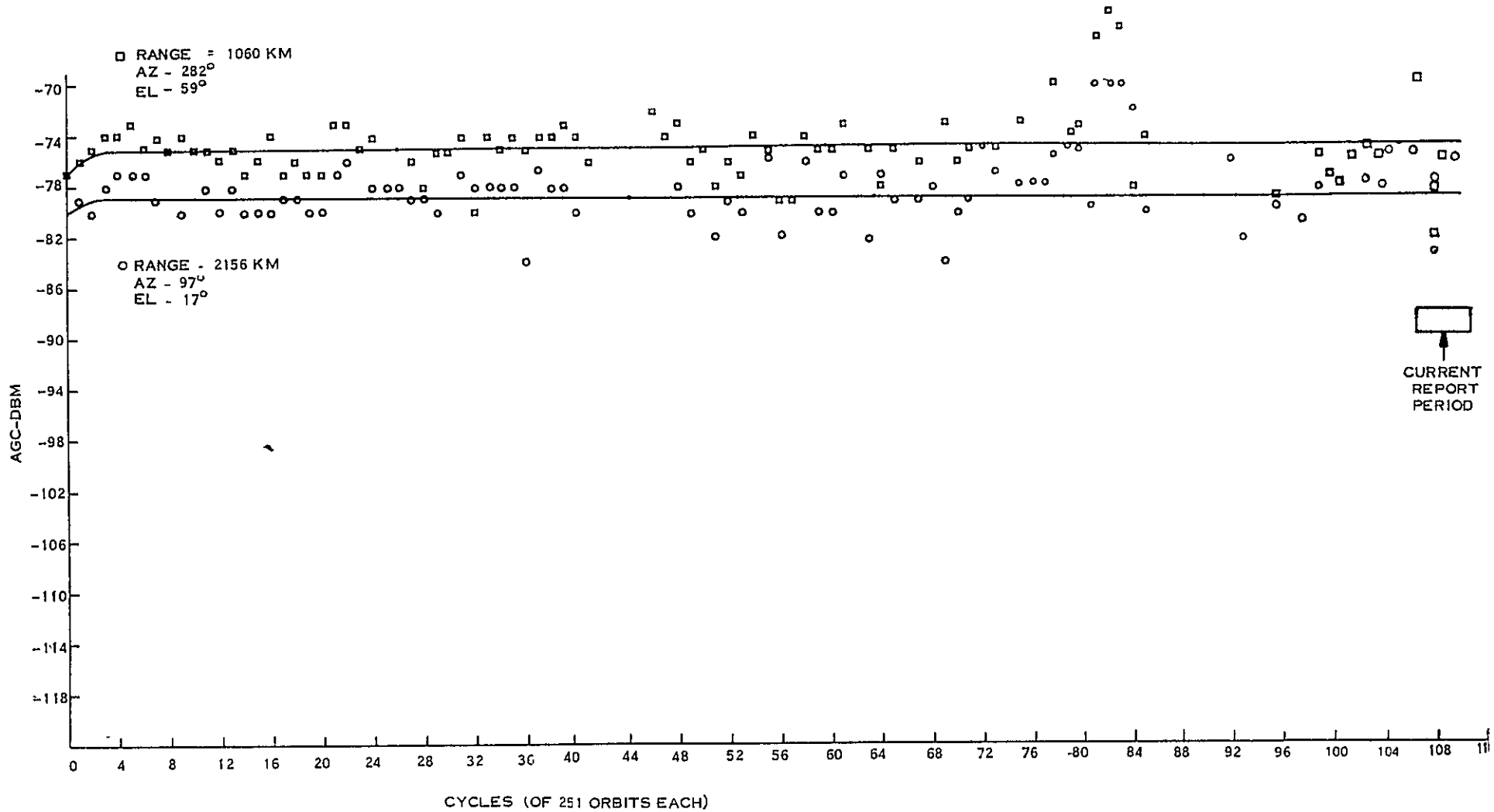

Figure 13-1. WPA-2 (Link 3) AGC Readings at Goldstone with 30' Antenna - Landsat-1

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)
LANDSAT-1

SECTION 14

ATTITUDE MEASUREMENT SYSTEM (AMS)

The AMS subsystem was launched in the OFF mode and energized in Orbit 6. Its performance since Orbit 6 has been without incident. Attitude measurements made with the AMS are in good agreement with ACS fine attitude error measurements.

Table 14-1 gives typical AMS telemetry values. All are nominal.

Table 14-1. Landsat-1 AMS Temperature Telemetry

Function	Description	Units	Orbits								
			35	5099	10182	15254	20364	25523	27950	28424	28821
3004	Case-Temp 1	DGC	18.92	19.42	19.71	18.54	18.23	17.28	21.24	22.10	22.56
3005	Assembly-Temp 2	DGC	19.15	19.76	19.96	18.73	18.51	17.54	21.77	22.64	23.19

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)
LANDSAT-1

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)

WBVTR-2 has not been operated since its failure in Orbit 148, 3 August 1972.

WBVTR-1 was removed from operational service after Orbit 9881, 2 July 1974, because of high minor frame sync error counts. The recorder has remained inactive since suspension of engineering tests after Orbit 10861, 10 September 1974.

SECTION 16

RETURN BEAM VIDICON (RBV)
LANDSAT-1

SECTION 16

RETURN BEAM VIDICON

The Return Beam Vidicon (RBV) Subsystem operated normally from turn-on in Orbit 19 to Orbit 196 (6 August 1972) when it failed to respond to a turn-off command because of a probable failure of a relay in the Power Switching Module. The RBV itself was not the cause of the failure nor was it affected by the failure. The RBV had not been reactivated until Orbit 28835 (22 March 1978) when six triplets were exposed prior to retirement of Landsat-1.

An assessment of the RBV performance was given in Landsat-1 Flight Evaluation Report 23 July to 23 October 1972. For completeness and convenience, the telemetry values are repeated in Table 16-1 together with the values from the RBV exercise in Orbit 28835.

A triplet set of Landsat-1 RBV imagery (Figures 16-1, 16-2, 16-3) is included for illustration of the amount of degradation that has occurred in Cameras 1, 2 and 3 since their last operation in 1972.

Subsystem command execution was normal throughout the exercise.

Table 16-1. RBV Telemetry Values

No.	Function		T/V Value	Orbits				
	Name	Units		26	86	149	196	28835
14001	CCC Board Temp	DGC	N	18.61	20.04	19.30	19.53	27.34
14002	CCC Pwr. Sup. Temp	DGC	N	19.93	21.58	20.70	21.21	29 45
14003	±15 VDC Sup	TMV	3.95	3.69	3.95	3.78	3.95	3.97
14004	+ 6V-5.25 VDC Sup.	TMV	3.05	2.84	2.93	2.98	3.05	3.07
14100	VID OUT CAM 1	TMV	1.06	1.04	1.15	1.13	1.12	1.42
14200	VID OUT CAM 2	TMV	1.09	1.05	1 26	1.23	1.24	1.20
14300	VID OUT CAM 3	TMV	1.05	1.03	1.21	1.19	1.20	0.72
14102	Comb. Align I Com 1	TMV	3.95	3.67	3.94	3.87	3.94	3.90
14202	Comb. Align I Com 2	TMV	3.92	3.90	3.91	3.89	3.91	3.97
14302	Comb Align I Com 3	TMV	4.04	3.75	4.03	3.80	4.03	4.02
14103	Cam 1 Elec Temp.	DGC	N	20.84	23.37	22.64	25.38	T
14203	Cam 2 Elec Temp.	DGC	N	18 64	21.06	20.62	22.87	T
14303	Cam 3 Elec Temp.	DGC	N	21.05	23.61	23.23	25.57	T
14104	Cam 1 LV Pwr Sup T	DGC	N	21.71	23.94	23.49	25.92	T
14204	Cam 2 LV Pwr Sup T	DGC	N	18.38	20.63	19.40	23.30	T
14304	Cam 3 LV Pwr Sup T	DGC	N	20.75	23.02	22.73	25.67	T
14105	Cam 1 Def + 10 VDC	TMV	4.01	3.73	4.00	3.77	4.00	4.02
14205	Cam 2 Def + 10 DVC	TMV	4.00	3.71	3 98	3.77	3.98	3.97
14305	Cam 3 Def + 10 VDC	TMV	3.97	3.95	3.95	4.02	3.95	4.00
14106	Cam 1 + 6V -6.3 VDC	TMV	3.71	3.45	3.70	3.61	3.70	3.75
14206	Cam 2 + 6V -6.3 VDC	TMV	3.69	3.42	3.67	3.49	3.67	3.67
14306	Cam 3 +6V -6.3 VDC	TMV	3.73	3.47	3.72	3.47	3.72	3.77
14107	Cam 1 Telec I	TMV	2.62	2.50	2.54	2 55	2.64	2.22
14207	Cam 2 Telec I	TMV	2.65	2.53	2.56	2.41	2.64	2.55
14307	Cam 3 Telec I	TMV	2.64	2.54	2.51	2.45	2.61	2.55
14108	Cam 1 Vid Fil I	TMV	2.47	2.30	2.36	2.38	2.46	2 47
14208	Cam 2 Vid Fil I	TMV	2.54	2.37	2.52	2.39	2.52	2.55
14308	Cam 3 Vid Fil I	TMV	2.61	2.44	2.60	2.53	2.60	2.67
14110	Cam 1 TARVOLT	TMV	3.43	3.42	3.42	3.45	3.42	3.42
14210	Cam 2 TARVOLT	TMV	3.36	3.13	3.22	3.26	3.32	3.35
14310	Cam 3 TARVOLT	TMV	3.47	3.23	3.46	3 45	3.47	3.47
14113	Cam 1 Vert Def V	TMV	2.96	2.75	2.90	2.85	2.97	2 97
14213	Cam 2 Vert Def V	TMV	3.00	2.86	2.98	2.86	3.01	3.10
14313	Cam 3 Vert Def V	TMV	3.45	3.45	3.47	3.37	3.45	3.97
14114	Cam 1 Vid FPT	DGC	N	18.15	20.77	17.19	20.99	T
14214	Cam 2 Vid FPT	DGC	N	20.62	20.11	20.52	20.62	T
14314	Cam 3 Vid FPT	DGC	N	18.54	20.88	19.08	20.20	T
14115	Cam 1 Foc Coil T	DGC	N	17.71	21.67	18.74	19.70	T
14215	Cam 2 Foc Coil T	DGC	N	17.70	21.60	19.25	19.97	T
14315	Cam 3 Foc Coil T	DGC	N	18.03	22.09	19.88	20.56	T

N - Data Not Available
T - Telemetry Off

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

Function			Orbit	Camera-1	Camera-2	Camera-3
No.	Name	Mode	Typical	28835	28835	28835
14X01	Focus I	Hold	0.65	0.85	0.52	N
		Prep	1.67	1.95	1.52	1.07
		Read	2.80	3.07	2.62	2.15
14X09	Grid V	Prep	0.80	0.90	0.92	0.80
		Read	2.45	2.57	2.27	2.87
		Hold	3.95	4.15	4.17	4.22
14X11	Cath I	Hold	0.37	0.47	0.37	0.42
		Read	0.85	0.75	1.00	0.67
		Prep	3.05	3.05	3.02	3.10
14X12	Hor Def	Hold	0.0	0.0	0.0	0.0
		Prep	1.77	1.85	1.62	1.82
		Read	3.21	3.02	3.07	3.07
14X20	+500 V	Hold	0.92	1.17	0.92	0.97
		Read	4.05	4.27	4.17	4.12

X = 1 Camera 1
2 Camera 2
3 Camera 3
N - Data Not Available

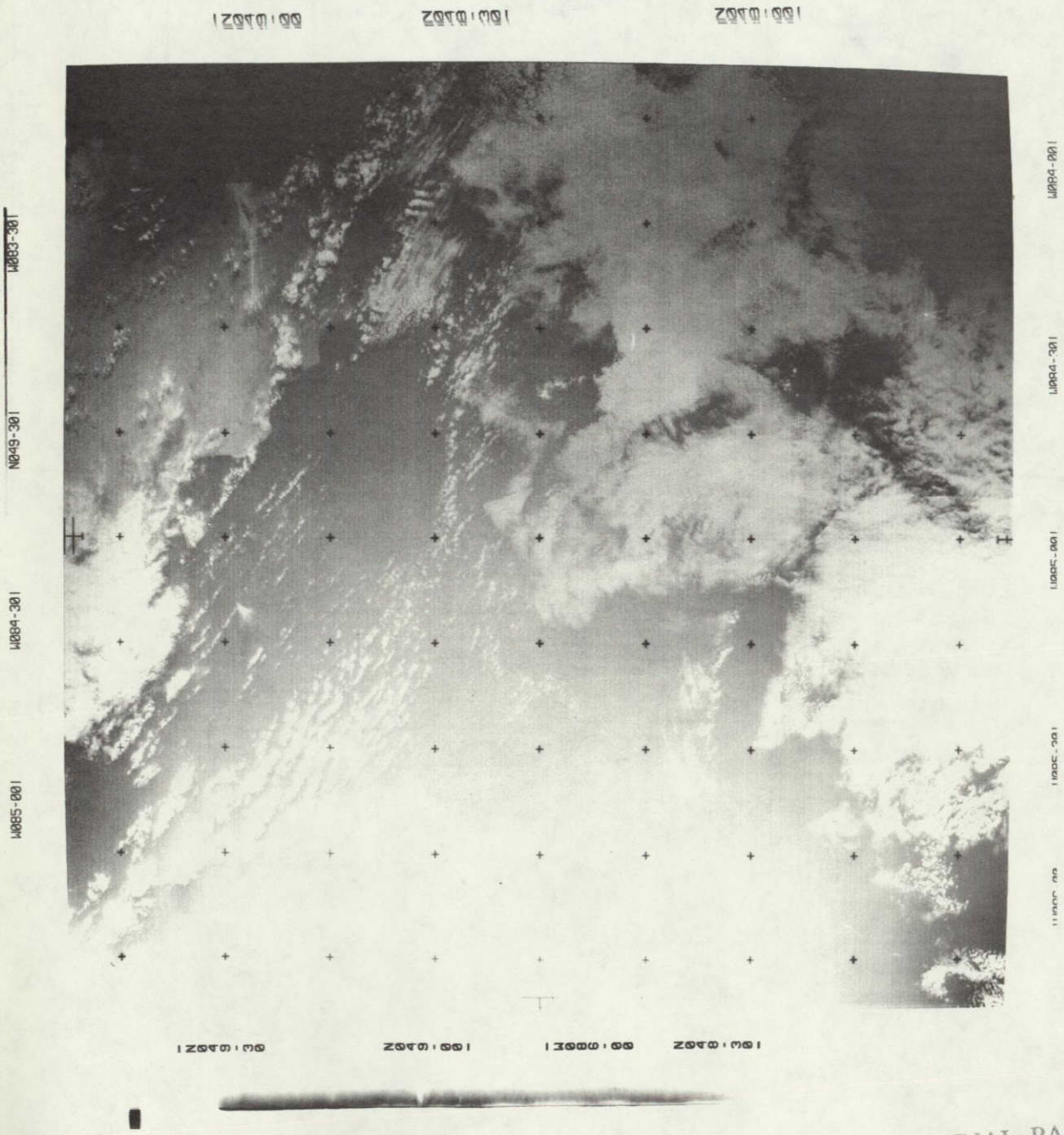

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Figure 16-1. RBV Camera 1, Orbit 28835

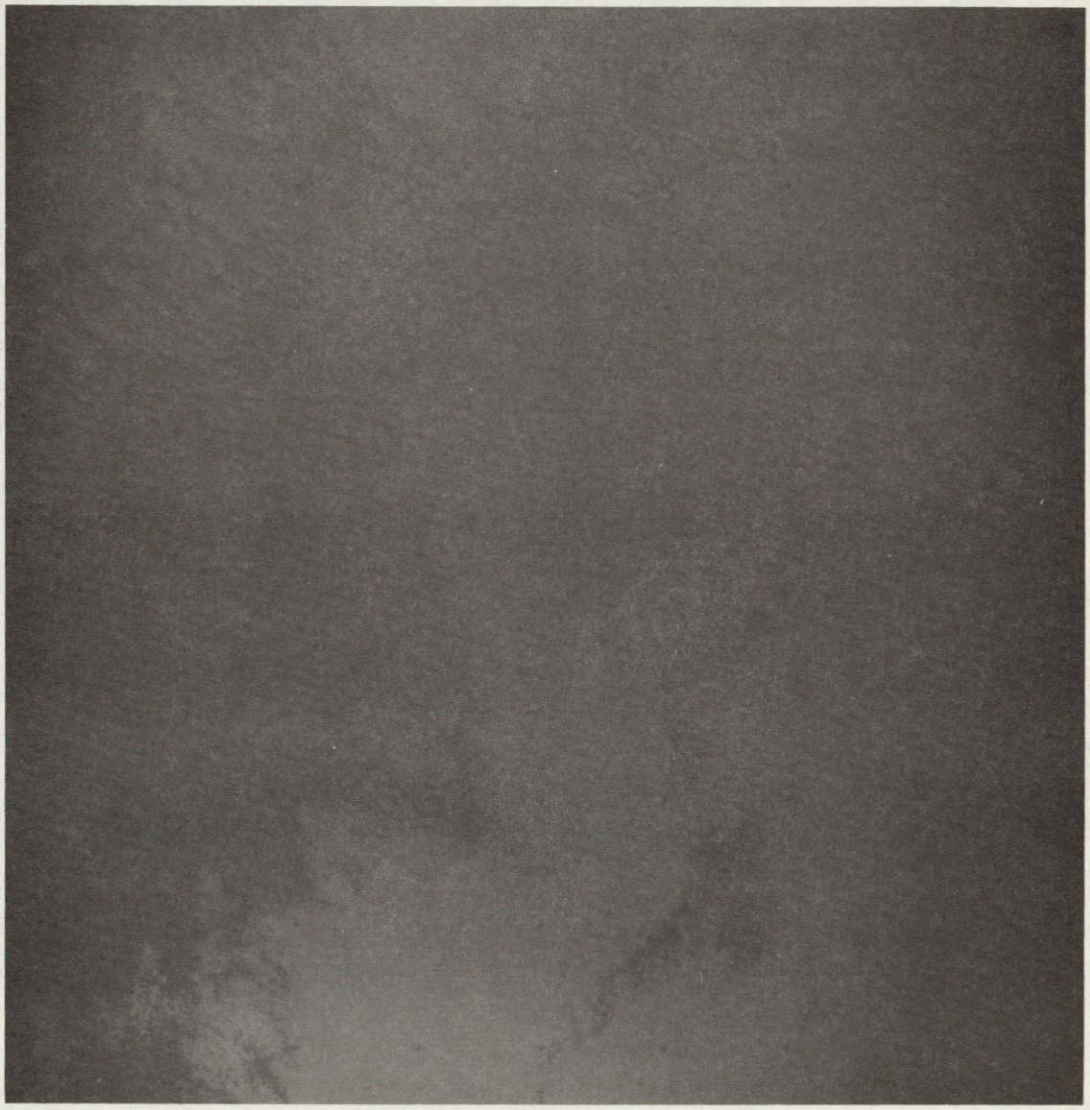

Figure 16-2. RBV Camera 2, Orbit 28835

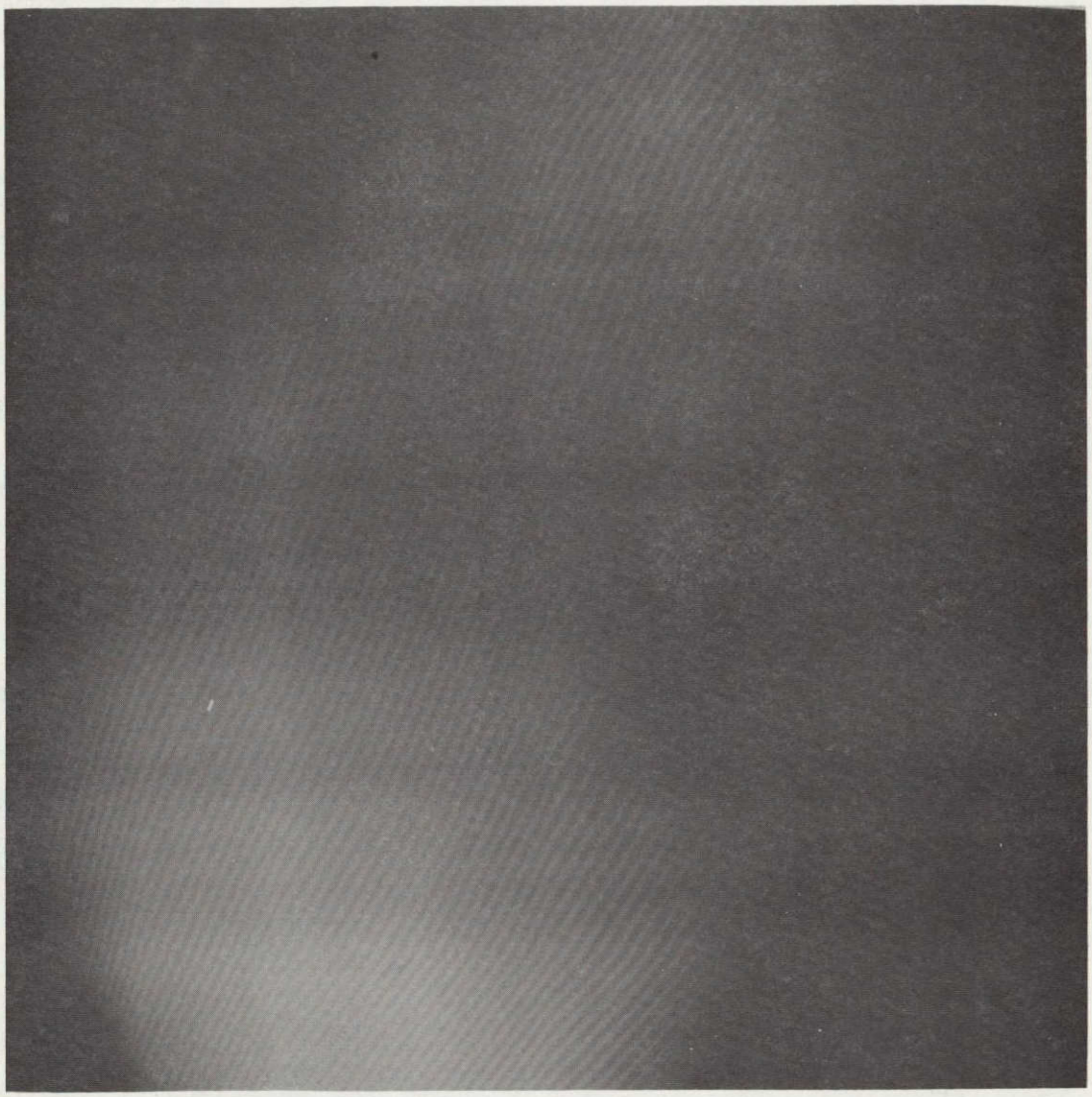

Figure 16-3. RBV Camera 3, Orbit 28835

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS) LANDSAT-1

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

MSS was last used during Orbit 27805 on 7 January, 1978. The MSS subsystem can resume 3-band operations if required.

Band 1 (0.5 to 0.6 micrometers), the green band, had been turned off because of a failure, probably in the ±15 V power supply, on March 3, 1977 during Orbit 23480.

Figure 17-1 shows the number of scenes imaged at each geographical location in the first three years of operation. Figure 17-2 shows the number of scenes imaged since the first three years. In these maps, only those scenes received by U.S. ground stations are shown. Scenes transmitted to Canada, Brazil and Italy (44% of total) are not shown

Table 17-1 shows typical MSS Telemetry Values for this report period. All are nominal. Table 17-2 shows the history of sensor response to a constant input radiance level. Each sensor is sampled at 5 radiance levels, and all show essentially the same trends. Only one of these levels (the second highest) is listed in Table 17-2. Sensor 22 has declined most (22%) since launch. This is twice the average sensor decline. Line length history is also shown in Table 17-2, and is nominal.

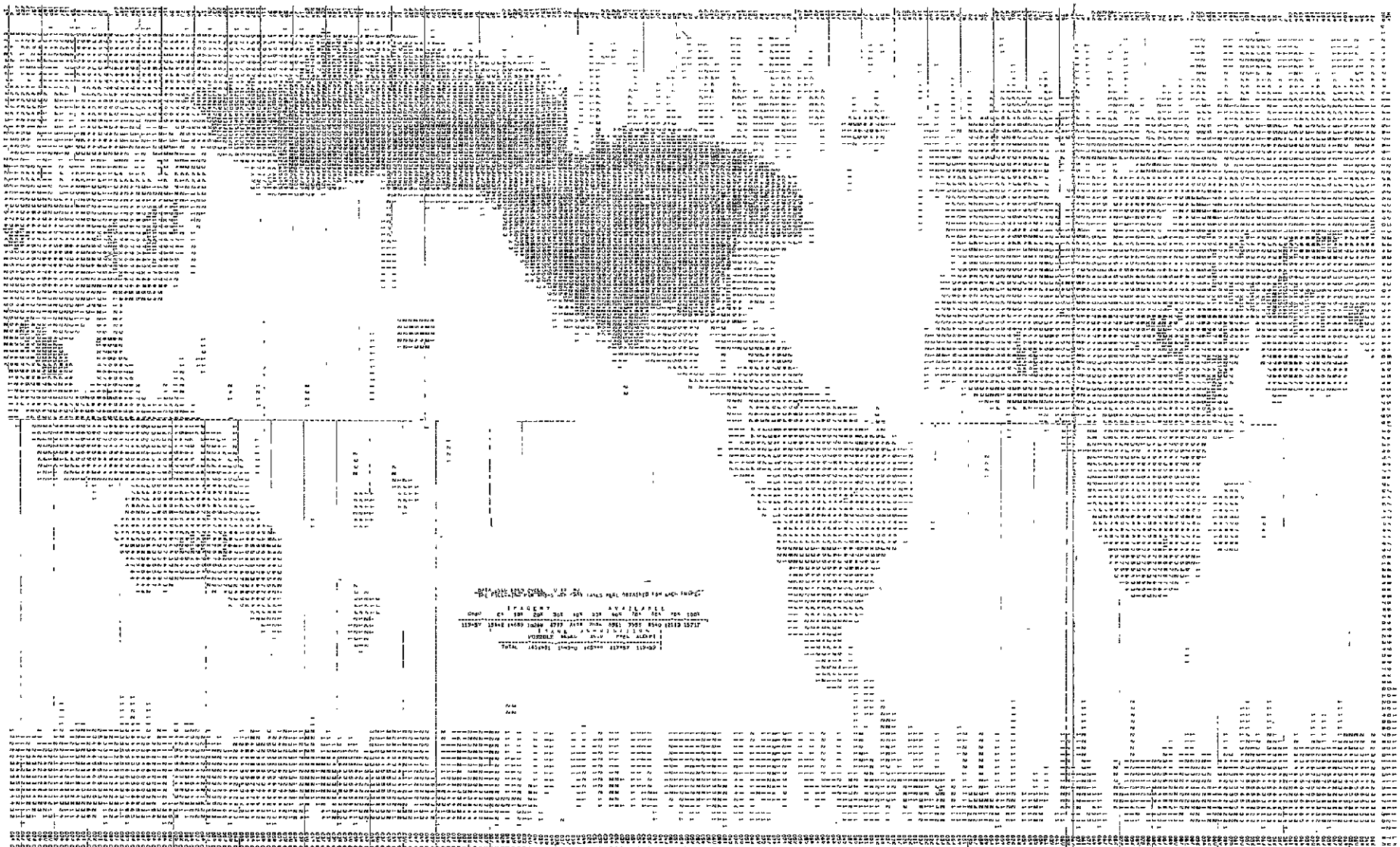

Figure 17-1. Computer Map of MSS Scenes for First Three Years Operation - Landsat-1

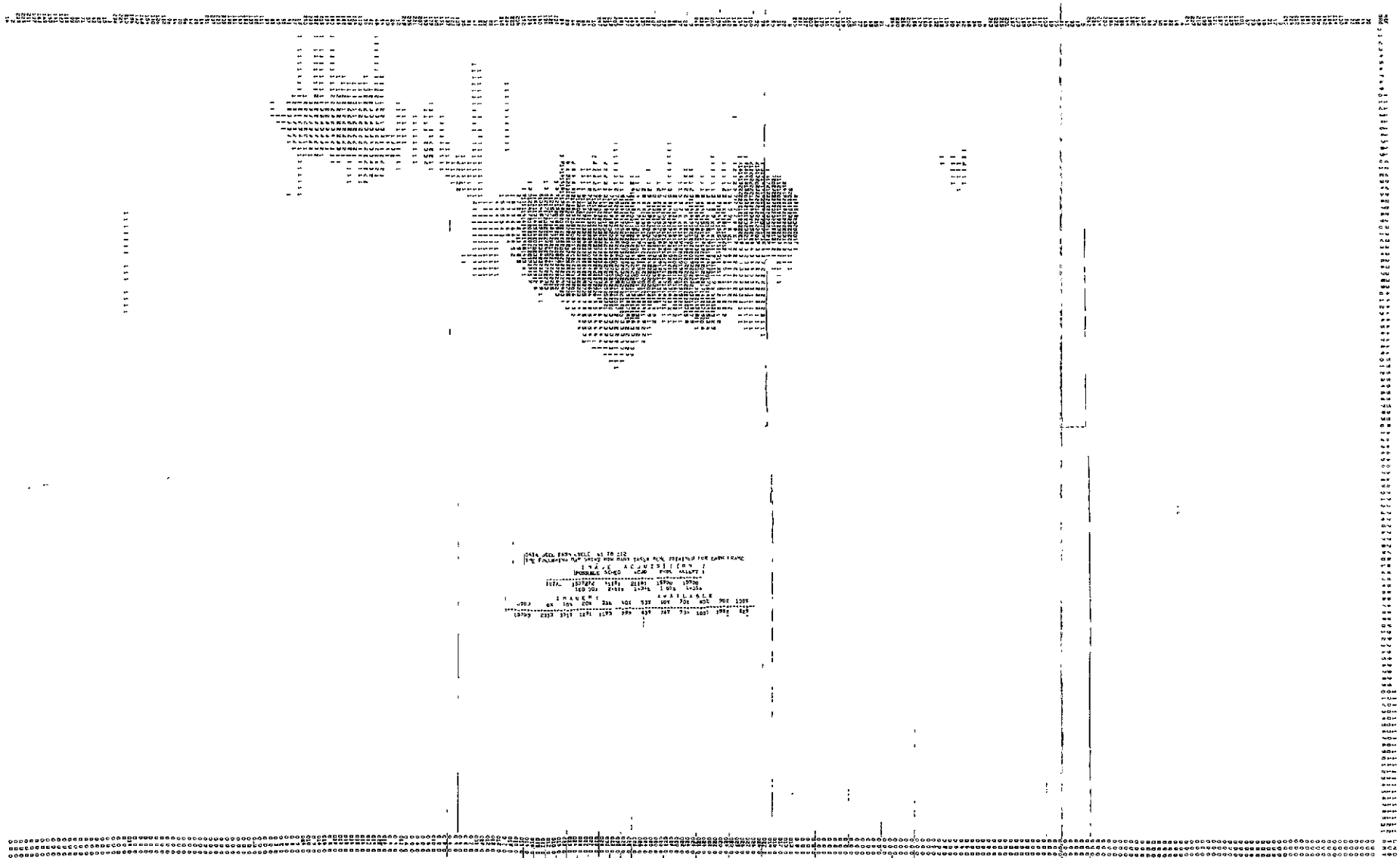

Figure 17-2 Scenes from End of Three-Year Period to Present Quarter - Landsat-1

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Table 17-1. MSS Telemetry Values

Function No.	Name	Units	Telemetry Values in Orbits								
			20	5060	10587	15233	20358	25452	26943	27443	27706
15044	FOPT 2 T	DGC	17 46	19.84	19.75	18.15	18.07	17 50	21 20	22 37	25 44
15046	ELEC CVR T	DGC	19.37	21.83	21.96	20.20	20.11	19 46	22 14	24 02	26 24
15048	SCAN MIR REG T	DGC	16.35	19 77	20.48	20.94	21.90	21.14	24 52	26 75	29 62
15050	SCAN MIR DR. COIL T	DGC	15.94	19.30	19.78	19.21	19.96	19.56	24 13	25 96	28 67
15052	ROT SHUT HSG T	DGC	16.91	20.07	20.23	18.74	18.78	18 17	21 64	23 24	25 51
15043	FOPT 1 T	DGC	17.67	20.01	19.93	18.35	18.28	17 76	21 39	22 83	25 51
15045	MUX T	DGC	21.19	22.03	23.87	26.92	28.63	28 58	32 58	35 68	38 26
15047	PWR SUP T	DGC	17.41	20.00	20.21	19.83	20.28	19 14	22 39	24 50	27 34
15049	SCAN MIR DR. LIC T	DGC	16.12	19.41	20.23	21.16	22.41	21.22	24 32	26 35	28 96
15051	SCAN MIR HSG T	DGC	15 60	19 05	19.49	18.40	19.04	18 92	23 84	25 83	28 57
15040	MUX -6 VDC	TMV	4.03	4 03	3.98	4.02	4 03	4 03	4 03	4 03	4 03
15042	AVE DENS DATA	TMV	1.67	2 13	2.05	2.28	2.28	2 06	2 07	1 82	1 91
14054	CAL LAMP CUR A	TMV	1.12	1.12	1.12	1.12	1.12	1.10	1 10	1 10	1 10
15056	BAND 2 ±15 VDC	TMV	5.10	5.10	5.04	5.10	5.10	5 10	5 08	5 10	5 10
15058	BAND 4 ±15 VDC	TMV	5.10	5.10	5.04	5.10	5.10	5 10	5 10	5 10	5 10
15060	+12 -6 VDC REG	TMV	4.82	5.02	4.97	5.02	5.02	5.02	5 01	5 01	5 02
15062	+19 VDC REC OUT	TMV	4.80	4.90	4.97	5.03	5.03	5.08	5 01	5 01	5 01
15064	BAND 1 HV A	TMV	5.10	5.16	5.12	5.12	5.12	F	F	F	F
15066	BAND 2 HV A	TMV	4.50	4.52	4.52	4.50	4.50	4.50	4 52	4 52	4 52
15068	BAND 3 HV A	TMV	4 60	4.62	4.62	4.62	4.62	4.62	4 62	4 62	4 63
15070	SHUT MOT CON OUT	TMV	2.43	2.44	2.47	2.51	2.50	2.50	2 49	2 48	2 48
15041	A/D SUPPLY	TMV	5.93	5.93	5.87	5 93	5.92	5.93	5 93	5 92	5 93
15053	SCAN MIR REG V	TMV	4.42	4.51	4.51	4.61	4.61	4 61	4 61	4 61	4 61
15055	BAND 1 ±15V	TMV	4.97	4.97	4.92	4.97	4.97	Q	Q	Q	Q
15057	BAND 3 +15V	TMV	5.00	5.00	4.94	5.00	5.00	5.00	5 00	5 00	4 99
15059	-15 VDC TEL.	TMV	5.02	5.02	5.02	5.02	5.02	5 02	5 02	5 02	5 02
15061	+5 VDC LOGIC REG	TMV	4.82	4.81	4.77	4.76	4.78	4 73	4 77	4 78	4 78
15063	-19 VDC REG OUT	TMV	3.43	3.39	3.50	3.58	3.57	3.55	3 57	3 58	3 58
15071	SCAN MIR DR CLK	TMV	1.93	1.97	1.98	2.00	1.96	2.00	2 00	2 00	2 00

F - Unit Off
Q - Power Supply Failure

Table 17-2. MSS Response History Landsat-1

Quantum Level for Selected Word (0=Black: 63=White)

Band	Sensor	Value at Launch	1st Year	2nd Year	3rd Year	4th Year	5th Year	21-22 Quarter	% Chg. Since Launch
			2-4 Quar.	5-8 Quar.	9-12 Quar.	13-16 Quar.	17-20 Quar.		
1	1	43	39	39	38	37	37	POWER SUPPLY FAILED	
	2	44	39	40	40	39	38.5		
	3	43	38	40	40	39	39.5		
	4	43	38	39	39	38	37.5		
	5	41	36	35	34	32	31		
	6	43	39	41	41	40	39		
2	7	47	43	43	42	41	41	41	-13
	8	46	41.5	41	41	40	40	40	-13
	9	47	44	42.5	42	41	39	40	-15
	10	46	42	41.5	41	41	40	40	-13
	11	47	42.5	42	42	41	41	41	-13
	12	45	42	42.5	42	42	42	42	- 7
3	13	46	46	49	51	52	53	54	17
	14	44	42	42	42	42	43	42	- 5
	15	45	42.5	42	41	41	41	41	- 9
	16	40	37.5	37.5	37	37	37	37	- 8
	17	42	39	40	40	40	41	41	- 2
	18	44	40	40.5	41	41	41	41	- 2
4	19	28	28	27	25	23	23	22	-21
	20	25	26	25	23	21	20	20	-20
	21	26	27	26.5	25	23	22	22	-15
	22	23	23	22	21	19	19	18	-22
	23	22	22.5	23	21	21	20	21	- 5
	24	24	23.5	24	23	22	22	22	- 8
Line Length		3221	3219	3217	3216	3217	3215	3211	- 0 3

SECTION 18

DATA COLLECTION SUBSYSTEM (DCS)
LANDSAT-1

SECTION 18

DATA COLLECTION SUBSYSTEM (DCS)

The Data Collection Subsystem was turned OFF after Orbit 12690 on 19 January 1975 and the Data Collection mission was assumed by Landsat-2 at that time. The Landsat-1 Data Collection Subsystem is capable of resuming operational status, if desired.

APPENDIX A

LANDSAT-1 ANOMALY LIST

APPENDIX B

LANDSAT-1 SPACECRAFT ORBIT REFERENCE TABLES

LANDSAT-1

SPACECRAFT ORBIT REFERENCE TABLES

FROM AUGUST 1977 THROUGH JUNE 1978

ORBIT 25578 THROUGH 30235

FLIGHT DAY 1835 THROUGH 2168

LANDSAT-1

AUG. 1977

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	213	1835	25578-25591	154-167	12	102
2	214	1836	25592-25605	168-181	13	102
3	215	1837	25606-25619	182-195	14	102
4	216	1838	25620-25633	196-209	15	102
5	217	1839	25634-25647	210-223	16	102
6	218	1840	25648-25661	224-237	17	102
7	219	1841	25662-25675	238-251	18	102
8	220	1842	25676-25689	1- 14	1	103
9	221	1843	25690-25703	15- 28	2	103
10	222	1844	25704-25717	29- 42	3	103
11	223	1845	25718-25731	43- 56	4	103
12	224	1846	25732-25745	57- 70	5	103
13	225	1847	25746-25759	71- 84	6	103
14	226	1848	25760-25773	85- 98	7	103
15	227	1849	25774-25786	99-111	8	103
16	228	1850	25787-25800	112-125	9	103
17	229	1851	25801-25814	126-139	10	103
18	230	1852	25815-25828	140-153	11	103
19	231	1853	25829-25842	154-167	12	103
20	232	1854	25843-25856	168-181	13	103
21	233	1855	25857-25870	182-195	14	103
22	234	1856	25871-25884	196-209	15	103
23	235	1857	25885-25898	210-223	16	103
24	236	1858	25899-25912	224-237	17	103
25	237	1859	25913-25926	238-251	18	103
26	238	1860	25927-25940	1- 14	1	104
27	239	1861	25941-25954	15- 28	2	104
28	240	1862	25955-25968	29- 42	3	104
29	241	1863	25969-25982	43- 56	4	104
30	242	1864	25983-25996	57- 70	5	104
31	243	1865	25997-26010	71- 84	6	104

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SEP. 1977

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	244	1866	26011-26024	85- 98	7	104
2	245	1867	26025-26037	99-111	8	104
3	246	1868	26038-26051	112-125	9	104
4	247	1869	26052-26065	126-139	10	104
5	248	1870	26066-26079	140-153	11	104
6	249	1871	26080-26093	154-167	12	104
7	250	1872	26094-26107	168-181	13	104
8	251	1873	26108-26121	182-195	14	104
9	252	1874	26122-26135	196-209	15	104
10	253	1875	26136-26149	210-223	16	104
11	254	1876	26150-26163	224-237	17	104
12	255	1877	26164-26177	238-251	18	104
13	256	1878	26178-26191	1- 14	1	105
14	257	1879	26192-26205	15- 28	2	105
15	258	1880	26206-26219	29- 42	3	105
16	259	1881	26220-26233	43- 56	4	105
17	260	1882	26234-26247	57- 70	5	105
18	261	1883	26248-26261	71- 84	6	105
19	262	1884	26262-26275	85- 98	7	105
20	263	1885	26276-26288	99-111	8	105
21	264	1886	26289-26302	112-125	9	105
22	265	1887	26303-26316	126-139	10	105
23	266	1888	26317-26330	140-153	11	105
24	267	1889	26331-26344	154-167	12	105
25	268	1890	26345-26358	168-181	13	105
26	269	1891	26359-26372	182-195	14	105
27	270	1892	26373-26386	196-209	15	105
28	271	1893	26387-26400	210-223	16	105
29	272	1894	26401-26414	224-237	17	105
30	273	1895	26415-26428	238-251	18	105

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OCT. 1977

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	274	1896	26429-26442	1- 14	1	106
2	275	1897	26443-26456	15- 28	2	106
3	276	1898	26457-26470	29- 42	3	106
4	277	1899	26471-26484	43- 56	4	106
5	278	1900	26485-26498	57- 70	5	106
6	279	1901	26499-26512	71- 84	6	106
7	280	1902	26513-26526	85- 98	7	106
8	281	1903	26527-26539	99-111	8	106
9	282	1904	26540-26553	112-125	9	106
10	283	1905	26554-26567	126-139	10	106
11	284	1906	26568-26581	140-153	11	106
12	285	1907	26582-26595	154-167	12	106
13	286	1908	26596-26609	168-181	13	106
14	287	1909	26610-26623	182-195	14	106
15	288	1910	26624-26637	196-209	15	106
16	289	1911	26638-26651	210-223	16	106
17	290	1912	26652-26665	224-237	17	106
18	291	1913	26666-26679	238-251	18	106
19	292	1914	26680-26693	1- 14	1	107
20	293	1915	26694-26707	15- 28	2	107
21	294	1916	26708-26721	29- 42	3	107
22	295	1917	26722-26735	43- 56	4	107
23	296	1918	26736-26749	57- 70	5	107
24	297	1919	26750-26763	71- 84	6	107
25	298	1920	26764-26777	85- 98	7	107
26	299	1921	26778-26790	99-111	8	107
27	300	1922	26791-26804	112-125	9	107
28	301	1923	26805-26818	126-139	10	107
29	302	1924	26819-26832	140-153	11	107
30	303	1925	26833-26846	154-167	12	107
31	304	1926	26847-26860	168-181	13	107

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NOV 1977

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	305	1927	26861-26874	182-195	14	107
2	306	1928	26875-26888	196-209	15	107
3	307	1929	26889-26902	210-223	16	107
4	308	1930	26903-26916	224-237	17	107
5	309	1931	26917-26930	238-251	18	107
6	310	1932	26931-26944	1- 14	1	108
7	311	1933	26945-26958	15- 28	2	108
8	312	1934	26959-26972	29- 42	3	108
9	313	1935	26973-26986	43- 56	4	108
10	314	1936	26987-27000	57- 70	5	108
11	315	1937	27001-27014	71- 84	6	108
12	316	1938	27015-27028	85- 98	7	108
13	317	1939	27029-27041	99-111	8	108
14	318	1940	27042-27055	112-125	9	108
15	319	1941	27056-27069	126-139	10	108
16	320	1942	27070-27083	140-153	11	108
17	321	1943	27084-27097	154-167	12	108
18	322	1944	27098-27111	168-181	13	108
19	323	1945	27112-27125	182-195	14	108
20	324	1946	27126-27139	196-209	15	108
21	325	1947	27140-27153	210-223	16	108
22	326	1948	27154-27167	224-237	17	108
23	327	1949	27168-27181	238-251	18	108
24	328	1950	27182-27195	1- 14	1	109
25	329	1951	27196-27209	15- 28	2	109
26	330	1952	27210-27223	29- 42	3	109
27	331	1953	27224-27237	43- 56	4	109
28	332	1954	27238-27251	57- 70	5	109
29	333	1955	27252-27265	71- 84	6	109
30	334	1956	27266-27279	85- 98	7	109

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LANDSAT-1

DEC. 1972

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	335	1957	27280-27292	99-111	8	109
2	336	1958	27293-27306	112-125	9	109
3	337	1959	27307-27320	126-139	10	109
4	338	1960	27321-27334	140-153	11	109
5	339	1961	27335-27348	154-167	12	109
6	340	1962	27349-27362	168-181	13	109
7	341	1963	27363-27376	182-195	14	109
8	342	1964	27377-27390	196-209	15	109
9	343	1965	27391-27404	210-223	16	109
10	344	1966	27405-27418	224-237	17	109
11	345	1967	27419-27432	238-251	18	109
12	346	1968	27433-27446	1- 14	1	110
13	347	1969	27447-27460	15- 28	2	110
14	348	1970	27461-27474	29- 42	3	110
15	349	1971	27475-27488	43- 56	4	110
16	350	1972	27489-27502	57- 70	5	110
17	351	1973	27503-27516	71- 84	6	110
18	352	1974	27517-27530	85- 98	7	110
19	353	1975	27531-27543	99-111	8	110
20	354	1976	27544-27557	112-125	9	110
21	355	1977	27556-27571	126-139	10	110
22	356	1978	27572-27585	140-153	11	110
23	357	1979	27586-27599	154-167	12	110
24	358	1980	27600-27613	168-181	13	110
25	359	1981	27614-27627	182-195	14	110
26	360	1982	27628-27641	196-209	15	110
27	361	1983	27642-27655	210-223	16	110
28	362	1984	27656-27669	224-237	17	110
29	363	1985	27670-27683	238-251	18	110
30	364	1986	27684-27697	1- 14	1	111
31	365	1987	27698-27711	15- 28	2	111

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LANDSAT-1

JAN-1978

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	1	1988	27712-27725	29- 42	3	111
2	2	1989	27726-27739	43- 56	4	111
3	3	1990	27740-27753	57- 70	5	111
4	4	1991	27754-27767	71- 84	6	111
5	5	1992	27768-27781	85- 98	7	111
6	6	1993	27782-27794	99-111	8	111
7	7	1994	27795-27808	112-125	9	111
8	8	1995	27809-27822	126-139	10	111
9	9	1996	27823-27836	140-153	11	111
10	10	1997	27837-27850	154-167	12	111
11	11	1998	27851-27864	168-181	13	111
12	12	1999	27865-27878	182-195	14	111
13	13	2000	27879-27892	196-209	15	111
14	14	2001	27893-27906	210-223	16	111
15	15	2002	27907-27920	224-237	17	111
16	16	2003	27921-27934	238-251	18	111
17	17	2004	27935-27948	1- 14	1	112
18	18	2005	27949-27962	15- 28	2	112
19	19	2006	27963-27976	29- 42	3	112
20	20	2007	27977-27990	43- 56	4	112
21	21	2008	27991-28004	57- 70	5	112
22	22	2009	28005-28018	71- 84	6	112
23	23	2010	28019-28032	85- 98	7	112
24	24	2011	28033-28045	99-111	8	112
25	25	2012	28046-28059	112-125	9	112
26	26	2013	28060-28073	126-139	10	112
27	27	2014	28074-28087	140-153	11	112
28	28	2015	28088-28101	154-167	12	112
29	29	2016	28102-28115	168-181	13	112
30	30	2017	28116-28129	182-195	14	112
31	31	2018	28130-28143	196-209	15	112

FEB, 1978

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	32	2019	28144-28157	210-223	16	112
2	33	2020	28158-28171	224-237	17	112
3	34	2021	28172-28185	238-251	18	112
4	35	2022	28186-28199	1- 14	1	113
5	36	2023	28200-28213	15- 28	2	113
6	37	2024	28214-28227	29- 42	3	113
7	38	2025	28228-28241	43- 56	4	113
8	39	2026	28242-28255	57- 70	5	113
9	40	2027	28256-28269	71- 84	6	113
10	41	2028	28270-28283	85- 98	7	113
11	42	2029	28284-28296	99-111	8	113
12	43	2030	28297-28310	112-125	9	113
13	44	2031	28311-28324	126-139	10	113
14	45	2032	28325-28338	140-153	11	113
15	46	2033	28339-28352	154-167	12	113
16	47	2034	28353-28366	168-181	13	113
17	48	2035	28367-28380	182-195	14	113
18	49	2036	28381-28394	196-209	15	113
19	50	2037	28395-28408	210-223	16	113
20	51	2038	28409-28422	224-237	17	113
21	52	2039	28423-28436	238-251	18	113
22	53	2040	28437-28450	1- 14	1	114
23	54	2041	28451-28464	15- 28	2	114
24	55	2042	28465-28478	29- 42	3	114
25	56	2043	28479-28492	43- 56	4	114
26	57	2044	28493-28506	57- 70	5	114
27	58	2045	28507-28520	71- 84	6	114
28	59	2046	28521-28534	85- 98	7	114

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MAR 1978

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	60	2047	28535-28547	99-111	8	114
2	61	2048	28548-28561	112-125	9	114
3	62	2049	28562-28575	126-139	10	114
4	63	2050	28576-28589	140-153	11	114
5	64	2051	28590-28603	154-167	12	114
6	65	2052	28604-28617	168-181	13	114
7	66	2053	28618-28631	182-195	14	114
8	67	2054	28632-28645	196-209	15	114
9	68	2055	28646-28659	210-223	16	114
10	69	2056	28660-28673	224-237	17	114
11	70	2057	28674-28687	238-251	18	114
12	71	2058	28688-28701	1- 14	1	115
13	72	2059	28702-28715	15- 28	2	115
14	73	2060	28716-28729	29- 42	3	115
15	74	2061	28730-28743	43- 56	4	115
16	75	2062	28744-28757	57- 70	5	115
17	76	2063	28758-28771	71- 84	6	115
18	77	2064	28772-28785	85- 98	7	115
19	78	2065	28786-28798	99-111	8	115
20	79	2066	28799-28812	112-125	9	115
21	80	2067	28813-28826	126-139	10	115
22	81	2068	28827-28840	140-153	11	115
23	82	2069	28841-28854	154-167	12	115
24	83	2070	28855-28868	168-181	13	115
25	84	2071	28869-28882	182-195	14	115
26	85	2072	28883-28896	196-209	15	115
27	86	2073	28897-28910	210-223	16	115
28	87	2074	28911-28924	224-237	17	115
29	88	2075	28925-28938	238-251	18	115
30	89	2076	28939-28952	1- 14	1	116
31	90	2077	28953-28966	15- 28	2	116

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	91	2078	28967-28980	29- 42	3	116
2	92	2079	28981-28994	43- 56	4	116
3	93	2080	28995-29008	57- 70	5	116
4	94	2081	29009-29022	71- 84	6	116
5	95	2082	29023-29036	85- 98	7	116
6	96	2083	29037-29049	99-111	8	116
7	97	2084	29050-29063	112-125	9	116
8	98	2085	29064-29077	126-139	10	116
9	99	2086	29078-29091	140-153	11	116
10	100	2087	29092-29105	154-167	12	116
11	101	2088	29106-29119	168-181	13	116
12	102	2089	29120-29133	182-195	14	116
13	103	2090	29134-29147	196-209	15	116
14	104	2091	29148-29161	210-223	16	116
15	105	2092	29162-29175	224-237	17	116
16	106	2093	29176-29189	238-251	18	116
17	107	2094	29190-29203	1- 14	1	117
18	108	2095	29204-29217	15- 28	2	117
19	109	2096	29218-29231	29- 42	3	117
20	110	2097	29232-29245	43- 56	4	117
21	111	2098	29246-29259	57- 70	5	117
22	112	2099	29260-29273	71- 84	6	117
23	113	2100	29274-29287	85- 98	7	117
24	114	2101	29288-29300	99-111	8	117
25	115	2102	29301-29314	112-125	9	117
26	116	2103	29315-29328	126-139	10	117
27	117	2104	29329-29342	140-153	11	117
28	118	2105	29343-29356	154-167	12	117
29	119	2106	29357-29370	168-181	13	117
30	120	2107	29371-29384	182-195	14	117

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MAY, 1978

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	121	2108	29385-29398	196-209	15	117
2	122	2109	29399-29412	210-223	16	117
3	123	2110	29413-29426	224-237	17	117
4	124	2111	29427-29440	238-251	18	117
5	125	2112	29441-29454	1- 14	1	118
6	126	2113	29455-29468	15- 28	2	118
7	127	2114	29469-29482	29- 42	3	118
8	128	2115	29483-29496	43- 56	4	118
9	129	2116	29497-29510	57- 70	5	118
10	130	2117	29511-29524	71- 84	6	118
11	131	2118	29525-29538	85- 98	7	118
12	132	2119	29539-29551	99-111	8	118
13	133	2120	29552-29565	112-125	9	118
14	134	2121	29566-29579	126-139	10	118
15	135	2122	29580-29593	140-153	11	118
16	136	2123	29594-29607	154-167	12	118
17	137	2124	29608-29621	168-181	13	118
18	138	2125	29622-29635	182-195	14	118
19	139	2126	29636-29649	196-209	15	118
20	140	2127	29650-29663	210-223	16	118
21	141	2128	29664-29677	224-237	17	118
22	142	2129	29678-29691	238-251	18	118
23	143	2130	29692-29705	1- 14	1	119
24	144	2131	29706-29719	15- 28	2	119
25	145	2132	29720-29733	29- 42	3	119
26	146	2133	29734-29747	43- 56	4	119
27	147	2134	29748-29761	57- 70	5	119
28	148	2135	29762-29775	71- 84	6	119
29	149	2136	29776-29789	85- 98	7	119
30	150	2137	29790-29802	99-111	8	119
31	151	2138	29803-29816	112-125	9	119

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	152	2139	29817-29830	126-139	10	119
2	153	2140	29831-29844	140-153	11	119
3	154	2141	29845-29858	154-167	12	119
4	155	2142	29859-29872	168-181	13	119
5	156	2143	29873-29886	182-195	14	119
6	157	2144	29887-29900	196-209	15	119
7	158	2145	29901-29914	210-223	16	119
8	159	2146	29915-29928	224-237	17	119
9	160	2147	29929-29942	238-251	18	119
10	161	2148	29943-29956	1- 14	1	120
11	162	2149	29957-29970	15- 28	2	120
12	163	2150	29971-29984	29- 42	3	120
13	164	2151	29985-29998	43- 56	4	120
14	165	2152	29999-30012	57- 70	5	120
15	166	2153	30013-30026	71- 84	6	120
16	167	2154	30027-30040	85- 98	7	120
17	168	2155	30041-30053	99-111	8	120
18	169	2156	30054-30067	112-125	9	120
19	170	2157	30068-30081	126-139	10	120
20	171	2158	30082-30095	140-153	11	120
21	172	2159	30096-30109	154-167	12	120
22	173	2160	30110-30123	168-181	13	120
23	174	2161	30124-30137	182-195	14	120
24	175	2162	30138-30151	196-209	15	120
25	176	2163	30152-30165	210-223	16	120
26	177	2164	30166-30179	224-237	17	120
27	178	2165	30180-30193	238-251	18	120
28	179	2166	30194-30207	1- 14	1	121
29	180	2167	30208-30221	15- 28	2	121
30	181	2168	30222-30235	29- 42	3	121

APPENDIX C

LANDSAT-1 DOCUMENTS ISSUED THIS REPORT PERIOD

APPENDIX C

LANDSAT-1 DOCUMENTS ISSUED THIS REPORT PERIOD

No.	Document No.	Title and Data
1	14N5-L/1-210 & REVA	USB Command Anomaly in Landsat-1 dated 1/27/78 and Rev A 1/30/78

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

INTRODUCTION

This is the 14th report in a continuing series of documents issued at launch, and quarterly thereafter, to present flight performance analyses of the Landsat-2 spacecraft. Previously issued documents are:

Document No.	Title	Date
75SDS4214	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

This report contains analysis of performance for Orbits 14015 to 15300 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, and Wideband Video Tape Recorder No. 1 (WBVTR-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 2683 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 has 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. Occasional slippage in the power supply causes motor speed changes and high bit errors, but these are quickly currected by a simple operational procedure.

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 will be resumed with Landsat-3.

The spacecraft continues to perform its mission satisfactorily. Table 1-1 shows cumulative in-orbit payload system performance.

Table 1-1. In-Orbit Payload Systems Performance Launch thru Orbit 16590 (1-26-78) Landsat-2

RBV	Total Scenes Imaged	2568
	Total Area Imaged (million sq. n mi.)	22.4
	ON TIME (hr)	25.2
	ON/OFF Cycles	319
	% Real Time Images	71
	% Recorded Images	29
MSS	Total Scenes Imaged	255,065
	Total Area Imaged (million sq. n mi.)	2,224
	ON TIME (hr)	2,659
	ON/OFF Cycles	16,228
	% Real Time Images	79
	% Recorded Images	21
DCS	Messages at OCC	1,353,058
	Users	48
	ON TIME (hr.)	27,283
WPA-1	ON TIME (hr.)	103.4
	ON/OFF Cycles	677
WPA-2	ON TIME (hr.)	2,349.2
	ON/OFF Cycles	13,393
WBVTR-1	% Record Mode	38
	% 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.)	893.5
	Cycles Head-Tape Contact	11,899
	ON TIME (hr.)	1,131

SECTION 2

ORBITAL PARAMETERS

LANDSAT-2

SECTION 2

ORBITAL PARAMETERS

At the close of this report period, Landsat-2's ground track error was -3.25 nm longitude error at the equator. Error in longitude since launch as a function of time and orbit maintenance burns are shown in Figure 2-1.

During Orbit 14157 (2 November 1977) an orbit adjust program was implemented to change Landsat-2's orbital inclination. This program was successfully completed in Orbit 15440 (2 February 1978) and Landsat-2's orbital inclination was changed from 98.953° to 99.231°. Figure 2-2 shows this orbital inclination change as a function of time and (-Y) OAS burn frequency.

Benefits derived from this exercise are listed below.

- Extended, automatic solar array sun tracking (especially during 1978 and onwards) as a result of more direct stimulation of the SAD sun sensors.
- Maintenance of adequate S/C thermal control.
- Avoidance of conflict between Landsat-2's and Landsat-3's ground station support requirements.
- Maintenance of consistent S/C heading at high latitudes for temporal registration of imagery

Figure 2-3 shows the mean local time for the spacecraft's descending equatorial crossing Note the effect of the orbit adjust program on this parameter.

The mean local crossing times for Landsat-1, 2 and 3 respectively are 07:55 49 MLT, 09:06:15 MLT and 09:30:38 MLT.

Phasing relationships between Landsat-1 and -2 are shown in Figure 2-4 Landsat-1 now leads Landsat-2 by approximately 1.48 minutes. Previously Landsat-2 led Landsat-1.

Phasing relationships between Landsat-2 and -3 are shown in Figure 2-5. Landsat-3 leads Landsat-2 at their descending equatorial crossings by 27.43 minutes.

The Brouwer Mean Orbital Parameters for Landsat-2 are given in Table 2-1. Appendix B gives ground trace report cycle predictions.

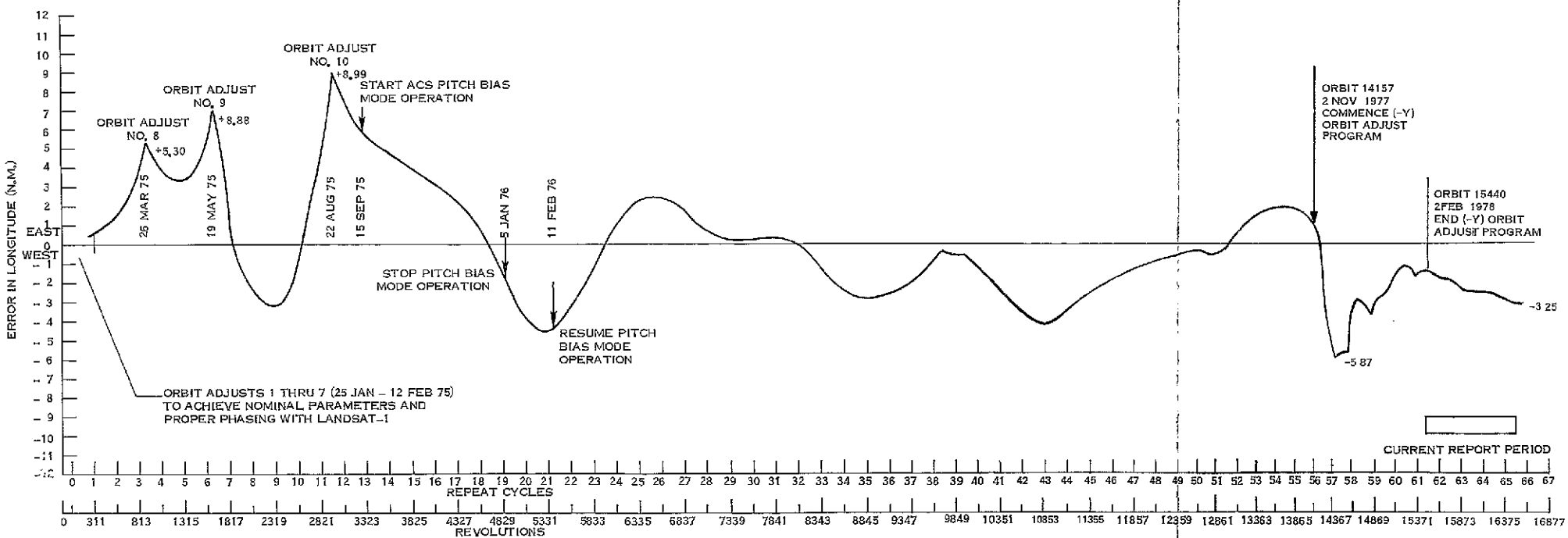

Figure 2-1. Effect of Orbit Adjust and Pitch Position Bias Orbit Maintenance on Landsat-2's Ground Track

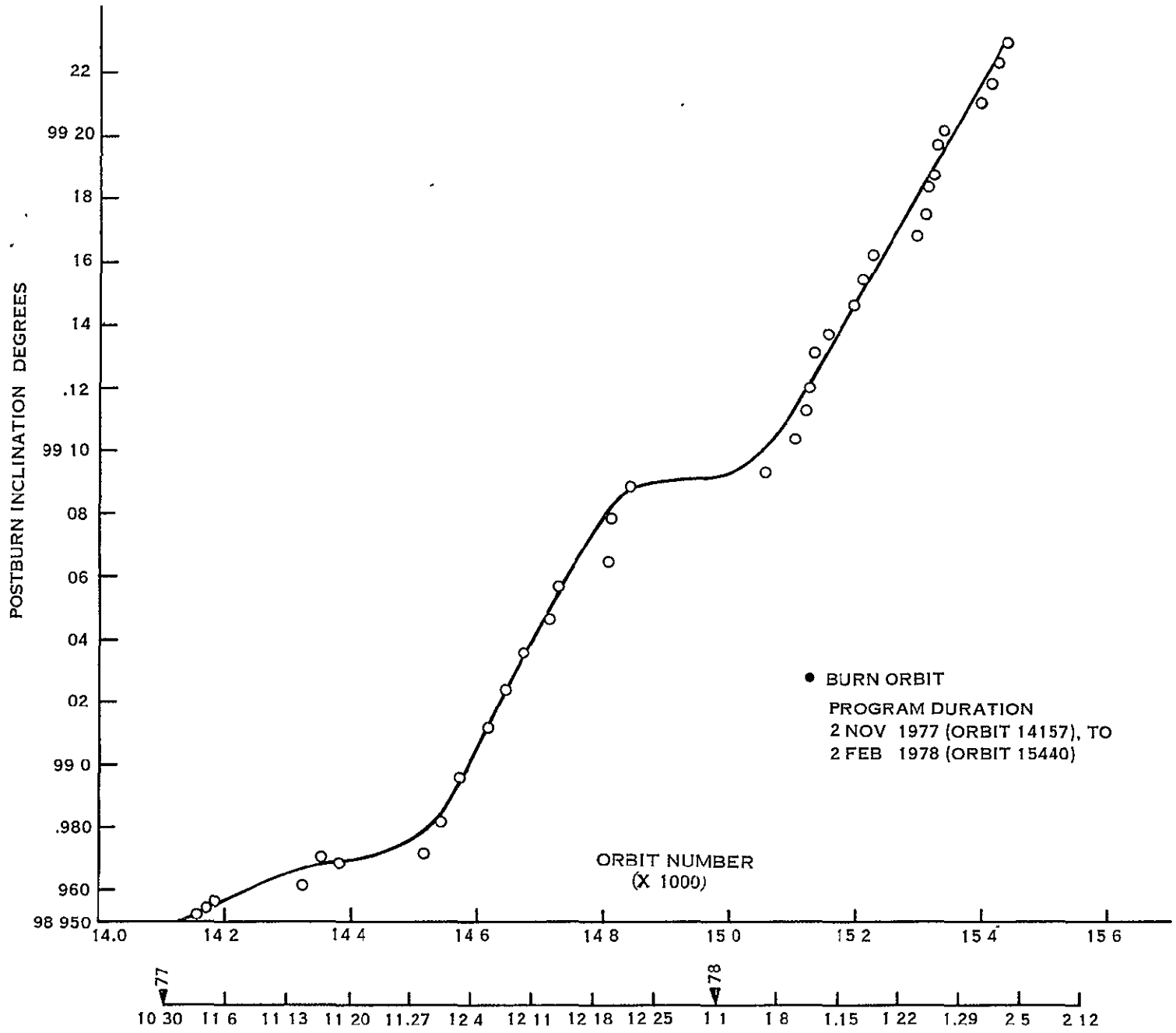

Figure 2-2. Orbit Inclination vs OA Program Progress

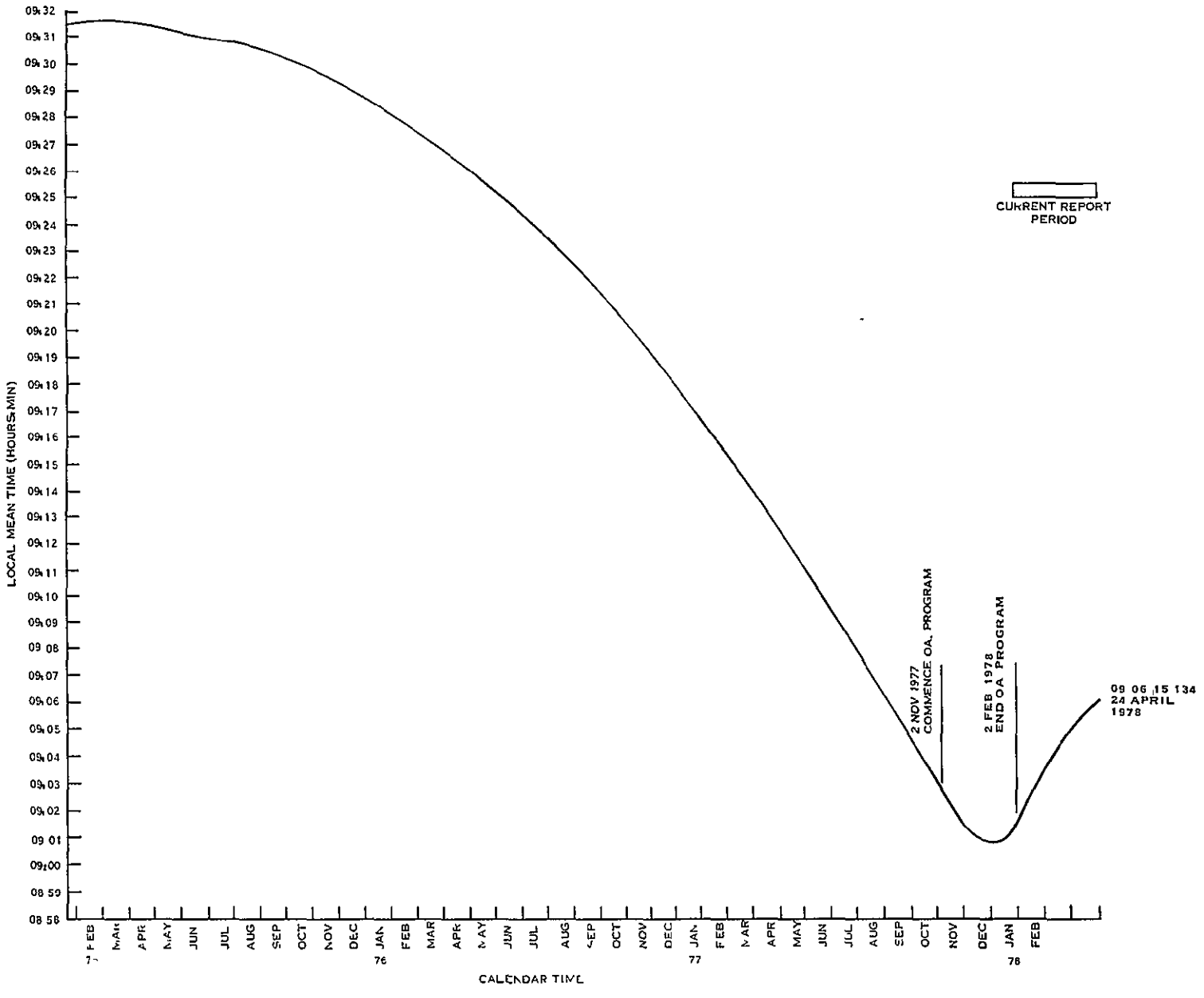

Figure 2-3. Local Mean Time of Descending Node - Landsat-2

Figure 2-4. Drift in the Angular Phasing Between Landsat-1 and Landsat-2

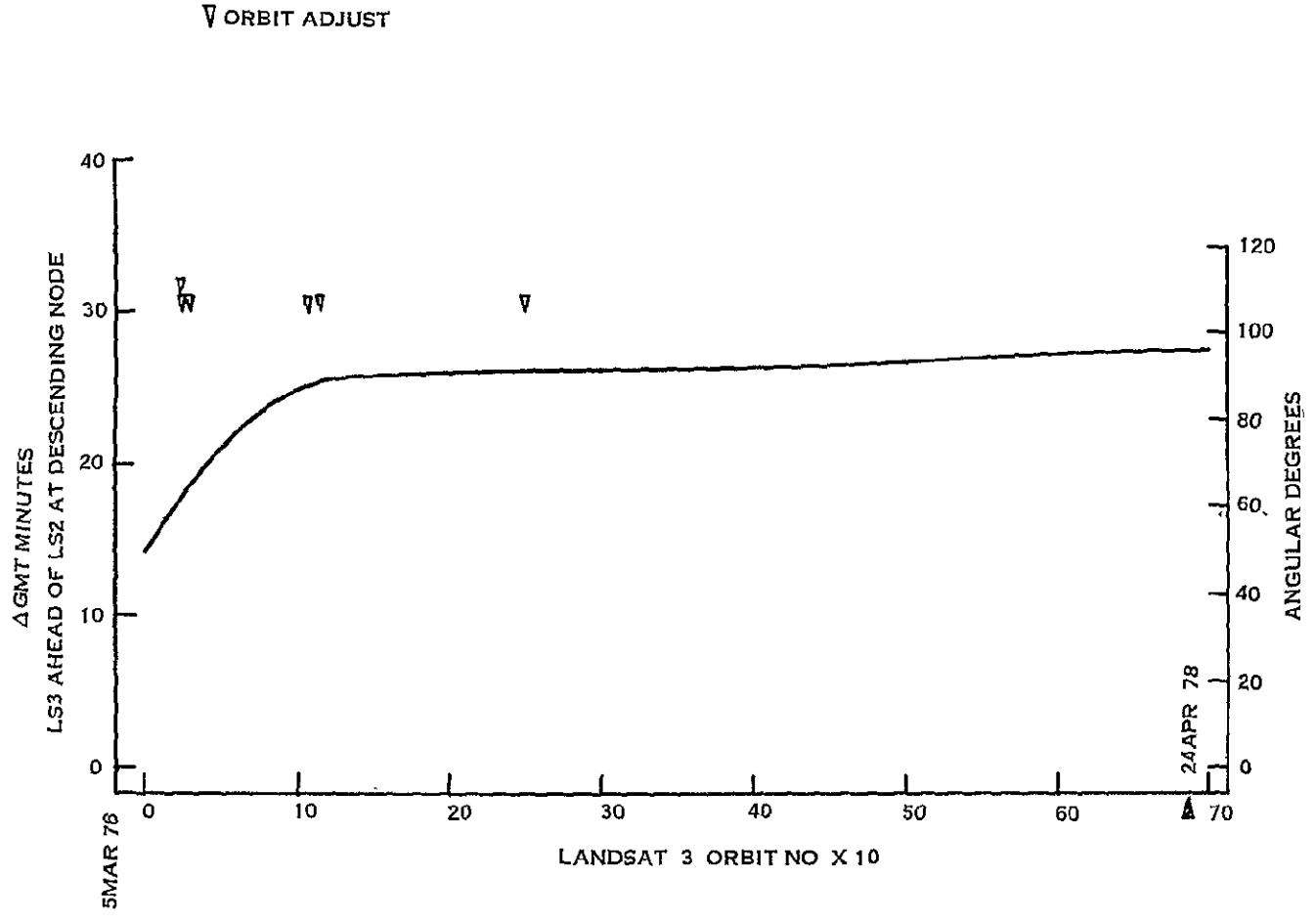

Figure 2-5. Drift in Angular Phasing Between Landsat-2 and Landsat-3

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	0.00=250	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

1. Post Launch.
2. After the sequence of phasing maneuvers completed in Orbit 212.
3. Interim value - orbit adjust program commenced 2 Nov 1977 and still 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

The solar arrays continued to provide excess energy above spacecraft and payload requirements and are expected to support the Landsat-2 mission through 1978. 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 39 months in Orbit was 22.2%, which is higher than predicted The projected values of midday array current 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 averaged 10.31 to 12.18 depth of discharge (DOD) during this report period. When any battery reached high charge-to-discharge current ratios (C/D) it has been turned OFF for a restoration cycle of a few weeks, leaving 7 batteries on-line at all times. The history of these restoration cycles is shown in Table 3-1. Battery 5 was in such a restoration cycle at the end of this report period 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 16.5 to 25.6°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 variation in sun angle to orbit plane and solar panels for Landsat-2. Figure 3-4 is a prediction of the sun angle through 1979 for Landsat 2.

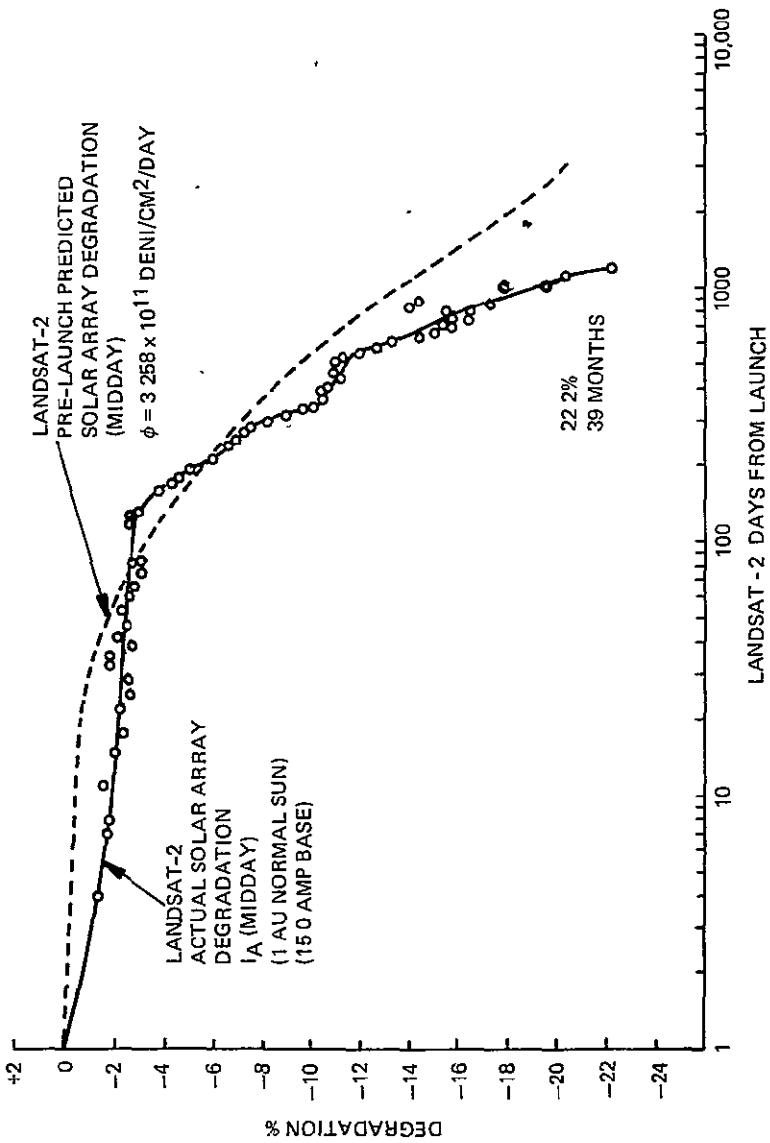

Figure 3-1. Landsat-2 I_A (Midday) Degradation Vs Days

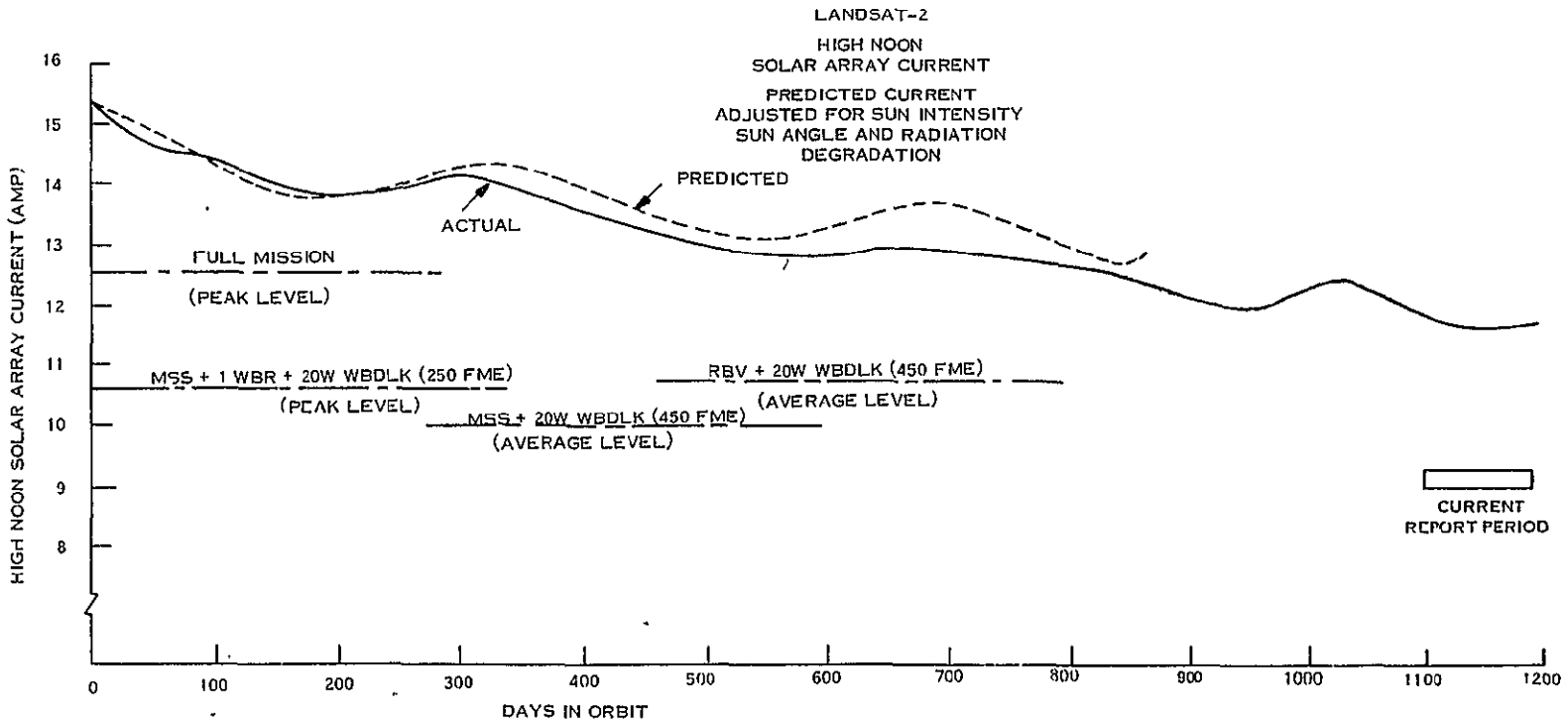

Figure 3-2. Landsat-2 Midday Solar Array Current

Table 3-1. Landsat-2 Battery Restoration Cycles

			1	2	3	4	5	6	7	8	9	10	11	12	13	14
BATT 1	OFF	ORB	8029	11420	12562	13580	14870									
		DATE	8-20-76	4-20-77	7-11-77	9-22-77	12-24-77									
	ON	ORB	8509	11947	12964	13670	15048									
		DATE	9-23-76	5-28-77	8-9-77	9-29-77	1-5-78									
BATT 2	OFF	ORB	12078													
		DATE	6-6-77													
	ON	ORB	12272													
		DATE	6-20-77													
BATT 3	OFF	ORB														
		DATE														
	ON	ORB														
		DATE														
BATT 4	OFF	ORB														
		DATE														
	ON	ORB														
		DATE														
BATT 5	OFF	ORB	10249	15297												
		DATE	1-26-77	1-23-78												
	ON	ORB	10657	15354												
		DATE	2-24-77	2-2-78												
BATT 6	OFF	ORB	7601	8591	9652	10962	11993	12271	12965	13454	13677	14230	14571	14710	15354	15983
		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	2-2-78	3-13-78
	ON	ORB	7992	9164	10028	11311	12077	12532	13159	13486	13836	14325	14615	14755	15550	16125
		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	2-10-78	3-24-78
BATT 7	OFF	ORB	13489	13959												
		DATE	9-16-77	10-19-77												
	ON	ORB	13570	14159												
		DATE	9-21-77	11-3-77												
BATT 8	OFF	ORB	13161													
		DATE	8-23-77													
	ON	ORB	13444													
		DATE	9-12-77													

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

Pwr. Mgmt. Orbit No.	50	5100	10192	13211	15652	16000	16441
Batt 1 Max	33.43	32.66	32.57	32 48	31 63	33 08	32.23
2 Chge	33.40	32 63	32 54	32 46	31 60	33.05	32.20
3 Volts	33.35	32.57	32.57	32 41	31 63	33.00	32.23
4	33.45	32 68	32 59	32.51	31 65	33 02	32 25
5	33.42	32 65	32 56	32.56	31 71	33 08	32.22
6	33 41	32 64	32 56	F	31 70	F	32 22
7	33.45	32 68	32.59	32.51	31 73	33.02	32 25
8	33.45	32 68	32.59	32 50	31.65	33 02	32.25
Average	33.42	32 65	32.57	32.50	31.66	32 31	32 23
Batt 1 End-of-Night	29.32	29.06	28.98	28 55	28.55	29 98	28.63
2 Volts	29 38	29.04	28.95	28.61	28.61	28 95	28 70
3	29.32	29.07	28.89	28.64	28.55	28 98	28 64
4	29 34	29.09	28 91	28.57	28 57	29 00	28.66
5	29.40	29.06	28.97	28.63	28.54	28.97	28 63
6	29.31	28.96	28 88	F	28 54	F	28.62
7	29.34	29 08	29 00	28.65	28 57	29.00	28 65
8	29.34	29.00	28 91	28.57	28 57	29.00	28 65
Average	29.34	29.04	28.94	28 40	28 56	28.76	28 65
Batt 1 Chge	12.76	21.43	13.74	15.00	12 20	14.42	12.80
2 Share	11.68	11.42	11.44	13.67	11.82	13.37	12.24
3 (%)	12.24	12.48	12.41	13.64	11.52	13.49	12.27
4	11.99	11.76	11.81	13.55	11 80	13 44	11.98
5	12.84	13.24	12.95	14.48	13 45	14.09	12.00
6	13 35	14.32	15.14	F	13.30	F	12.92
7	12 90	12 97	11 74	14 88	13.91	16.61	14 33
8	12.24	11.38	10.77	13.78	12.00	13.61	11.47
Batt 1 Load	12.60	11.80	11.16	14.84	12.06	14.98	12.82
2 Share	12.70	13.34	14.14	15 41	13.52	16 33	14.63
3 (%)	12.67	13 74	13.94	13.80	11.76	14 68	13.12
4	12.44	12.48	13 00	13.80	12.27	14.68	12.84
5	12.34	12 36	9.96	13.80	12.66	12.18	12 00
6	12.70	11.56	15 27	F	12.01	F	12 28
7	12.47	12.70	11.33	14 46	12.63	12.42	10 31
8	12 04	12.02	11.21	13.88	13.10	14.71	11 99
Batt 1 Temp	21.46	21 94	22.71	21 78	21.73	21.60	20.08
2 in	20.25	19.94	20.30	19.60	18.87	19.28	19 25
3 (°C)	18.60	17.86	17.52	17.22	16.77	16.94	16 52
4	20.83	20.36	20.36	20.97	20.85	20 41	19.57
5	24.98	27.27	30 49	34 34	35 54	32 68	24.35
6	24.26	27.28	27.69	30.39	32 12	28.98	23 96
7	24.71	26.32	27.01	29 26	30.27	29.83	25.60
8	23.63	24.41	24.55	25 66	29 95	25.33	22 63
Average	22 34	23.17	23.83	25 90	25.26	24.38	21.50
S/C Reg Bus Pwr. (W)	N	149 30	154.49	143.60	137.02	125.71	144 50
Comp Load Pwr. (W)	N	24.80	6.64	0.00	F	F	F
P/L Reg Bus Pwr. (W)	N	9.8	9 59	9.90	19 68	9 10	10.00
C/D Ratio	1 15	1.11	1.24	1.46	1 64	3 34	1.11
Total Charge (A-M)	271 90	223.46	223.51	243.06	201.35	217 29	212.57
Total Discharge (A-M)	237 20	201 45	180.84	166.79	122.63	65 05	190.81
Solar Array (A-M)	1106	1003	939	821.90	803.10	848 30	863.00
S.A. Peak I (Amp)	16.05	14.43	13 25	11.99	11 53	11.00	11.80
Midday Array I (Amp)	N	13.72	12 86	11 92	10.21	9.80	11.60
Sun Angle (Deg)	N	8.35	10 70	14 80	48.50	46.00	40 03
Max R Pad Temp (°C)	N	63.20	58.40	53.27	47.82	54.18	56.00
Min R Pad Temp (°C)	N	-35.00	-34.40	-36 80	-36.80	-32 00	-35 00
Max L Pad Temp (°C)	N	62.15	62.15	56.92	53.84	58 46	58 46
Min L Pad Temp (°C)	N	-42.14	-39.43	-38.86	-37 71	-37.14	-40.71

N - Data Not Available
F - Unit Off

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

Function	Description	Unit	Orbits						
			50	5102	10192	15211	15652	16000	16441
6001	Batt 1 Disc I	Amp	1 01	0 74	0 52	0 66	0 70	0 86	0 59
6002	2		1 01	0 84	0 65	0 71	0 85	0 92	0 66
6003	3		1 00	0 87	0.64	0 62	0 68	0 84	0 60
6004	4		1 00	0 78	0.60	0 63	0 69	0 84	0 58
6005	5		0 99	0.78	0 47	0 63	0 73	0 69	0 55
6006*	6		1 02	0 73	0.70	I	0 70	I	0.56
6007	7		1 00	0 80	0 52	0 66	0 70	0 70	0.17
6008	8		0 97	0 75	0 52	0 52	0 70	0 81	0.55
6011	Batt 1 Chg I	Amp	0 47	0 42	0 46	0 52	0 37	0 41	0.45
6012	2		0 43	0 38	0 37	0 47	0 36	0 38	0 43
6013	3		0 45	0 42	0 40	0 47	0 35	0 39	0 43
6014	4		0 44	0 39	0.39	0 48	0.36	0 38	0 42
6015	5		0 47	0 44	0 45	0 51	0 11	0 40	0 42
6016*	6		0 49	0 47	0 49	F	0 40	*	0 45
6017	7		0 47	0 43	0 40	0 52	0 42	0 48	0 50
6018	8		0 45	0 38	0 36	0 19	0 37	0 39	0 40
6021	Batt 1 Volt	VDC	31 50	31 11	30 79	-30 71	-30 29	-31 22	-30 69
6022	2		31 48	31 09	30 80	-30 68	-30 26	-31 19	-30 67
6023	3		31 49	31 10	30 81	-30 70	-30 27	-31 21	-30 69
6024	4		31 49	31 10	30.81	-30 70	-30 27	-31 21	-30 68
6025	5		31 50	31 11	30 79	-30 73	-30 30	-31 22	-30 70
6026*	6		31 49	31 08	30.80	F	-30 29	-27 13	-30 68
6027	7		31 52	31 14	30.83	-30 74	-30 31	-31 22	-30 69
6028	8		31 49	31 11	30 81	-30 71	-30 29	-31 22	-30.69
6031	Batt 1 Temp	DGC	21 59	21 91	22 67	21 73	21 71	21 53	20 07
6032	2		20 53	19.90	20 36	19 51	18 92	19 32	19 17
6033	3		18 80	17 77	17 54	17 06	16 77	17 01	16 51
6034	4		20 90	20 33	20 43	20 94	20 90	20 54	19 58
6035	5		25 16	27 18	30 52	34 20	35 68	32 90	24 35
6036	6		24 37	27 19	27 67	30 32	32.14	28 90	23 95
6037	7		24 83	26 19	26 95	29 20	30 22	29.85	25 58
6038	8		23 75	24 36	24 49	25 63	25 92	25 28	22 63
6040	Rt Pad Temp	DGC	28 96	30 90	26 11	24 98	19 20	21 42	25.86
6041	Rt Pad VM	VDC	33 72	32.86	31 44	30 53	30 04	32 12	32 13
6042	Rt. Pad VN	VDC	33 46	32.44	31.27	21 60	31 10	31 24	31 23
6044	Lt Pad Temp	DGC	25.56	28 22	26 41	27 99	23 23	22 25	26 24
6045	Lt. Pad VF	VDC	34 40	33.82	33.36	33 24	32 75	34 03	33 20
6046	Lt Pad VG	VDC	34.48	33 91	33 45	33 32	32 84	34 13	33 30
6050	S/C UR Bus V	VDC	31 73	31 33	30.93	-30 99	-30 42	-31 42	-30 86
6051	S/C RG Bus V	VDC	24 57	24 58	24 57	-24 58	-24 57	-24 58	-24 57
6052	Aux Reg AV	VDC	23 36	23 44	23 44	-23.44	-23 44	-23 45	-23 44
6053	Aux Reg BV	VDC	23 37	23.44	23 43	-23 44	-23 44	-23 45	-23 44
6054	Solar I	Amp	14 81	13 40	12 25	10 57	10 21	10 89	11 58
6056	S/C RG Bus I	Amp	7 23	6 28	6 41	5 86	5 52	5 14	5 90
6058	PC Mod T1	DGC	21 67	20 77	20 08	20 37	18 91	18 75	19 24
6059	PC Mod T2	DGC	20 44	19 56	19 16	18 94	18 50	18.50	18 31
6070	P/L RG Bus V	VDC	24 61	24 00	24 59	-24 59	-24 57	-24 61	-24 59
6071	P/L UR Bus V	VDC	31.85	31 40	30 97	-31 03	-30 44	-31.50	-30 89
6073	P Aux AV	VDC	23 47	23 51	23 50	-23 50	-23 51	-23 50	-23 50
6074	P Aux BV	VDC	23 46	23 51	23 50	-23 50	-23 51	-23 50	-23 50
6075	PR Mod T1	DGC	20 84	20 32	20 82	20 23	19 68	19 65	19 80
6076	PR Mod T2	DGC	22 13	21.79	22 14	21 77	21 21	21 35	21 38
6079	Fuse Blow V	VDC	24 48	24 49	24.48	-24.49	-24.45	-24 49	-24 47
6080	Shunt 1 I	Amp	0 0	0 0	0 0	0 0	0 0	0 0	0 0
6081	2		0 0	0 0	0 0	0 0	0 0	0 0	0 0
6082	3		0 0	0 0	0 0	0 0	0 0	0 0	0.0
6083	4		0 0	0 0	0 0	0 0	0 0	0 0	0 0
6084	5		0 0	0 0	0 0	0 0	0 0	0 0	0 0
6085	6		0.0	0 0	0 0	0 0	0 0	0 0	0 0
6086	7		0 0	0 0	0.0	0 0	0 0	0 0	0 0
6087	8		0 0	0 0	0 0	0 0	0 0	0 0	0 0
6100	P/L RG Bus I	Amp	0 38	0 54	0.10	0 41	0 73	0.39	0 41
Total No	Major Frames	Frm	396	785	697	725	386	435	785

I - Unit Off

Figure 3-3. Landsat Actual β and α (Paddle) Sun Angles

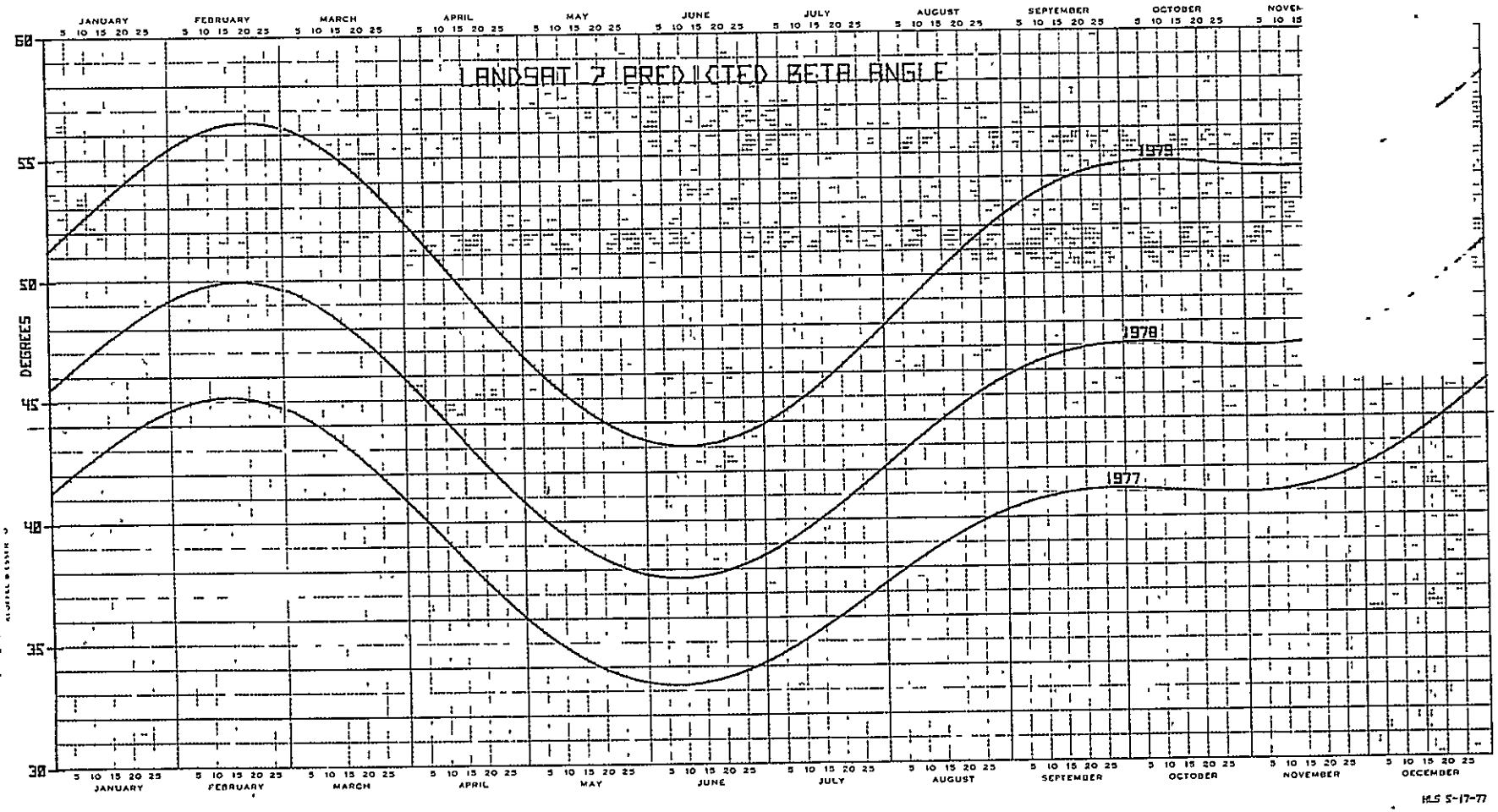

Figure 3-4. Predicted Beta Angle for LS-2 - 1977, 1978, 1979

SECTION 4

ATTITUDE CONTROL SUBSYSTEM (ACS)
LANDSAT-2

SECTION 4

ATTITUDE CONTROL SUBSYSTEM (ACS)

Landsat-2's Attitude Control Subsystem has performed normally since launch and has consistently maintained correct spacecraft attitude.

The orbit adjust program - implemented during Orbit 14157 (2 November 1977) - was completed in Orbit 15440 (2 February 1978). (See Sections 2 and 7.) Nine (-Y) firings and eight (+X) firings were performed during this quarter and in all firings, the ACS system successfully controlled the resulting disturbances.

The final burns had less effect on the spacecraft's attitude than did the earlier burns because the (-Y) thrust vector was better aligned with the spacecraft's center of mass and the (-Y) thrust level had decreased from approximately 1 LBF to 0.4 LBF. Figures 4-1, 4-2, 4-3 and 4-4 show the actual response of the spacecraft to the final 600 second, (-Y) burn. (Orbit 15440, 2 February 1978.)

Freon consumed over the span of the entire orbit adjust program was well within predicted limits.

The program implemented in September 1975 to minimize spacecraft ground track drift by controlling Pitch gating was continued during this quarter. Table 4-1 summarizes the Pitch Position Bias mode sequences implemented this quarter as part of this program, and Figure 2-1 in Section 2 shows the effects of Pitch gating control on the spacecraft's orbital ground track drift. As a result of the ground track drift maintenance program, Freon Usable Impulse consumption rate is relatively low (excluding the orbit adjust effects) as shown in Figures 4-5 and 4-6.

RMP2 was commanded into operation shortly after ACS acquisition as the primary control of the Yaw subsystem and has functioned normally.

During all of the orbit adjust maneuvers, RMP1 performed normally while on for backup to RMP2.

Both solar array drives functioned normally during this report period, however, through mid-March 1978, Beta angle exceeded 45° and the sun sensors were partially ineffective in maintaining the solar array's alignment with the sun. After mid-March, Solar Array tracking was normal.

Typically, flywheel duty cycles have averaged seven percent or less. Pitch and Yaw flywheel speeds have averaged less than -150 RPM while the Roll flywheels have averaged 760 RPM. Sun transient response due to dual scanner mode operation is normal.

Tables 4-2, 4-3 and 4-4 show typical telemetry values. All are nominal.

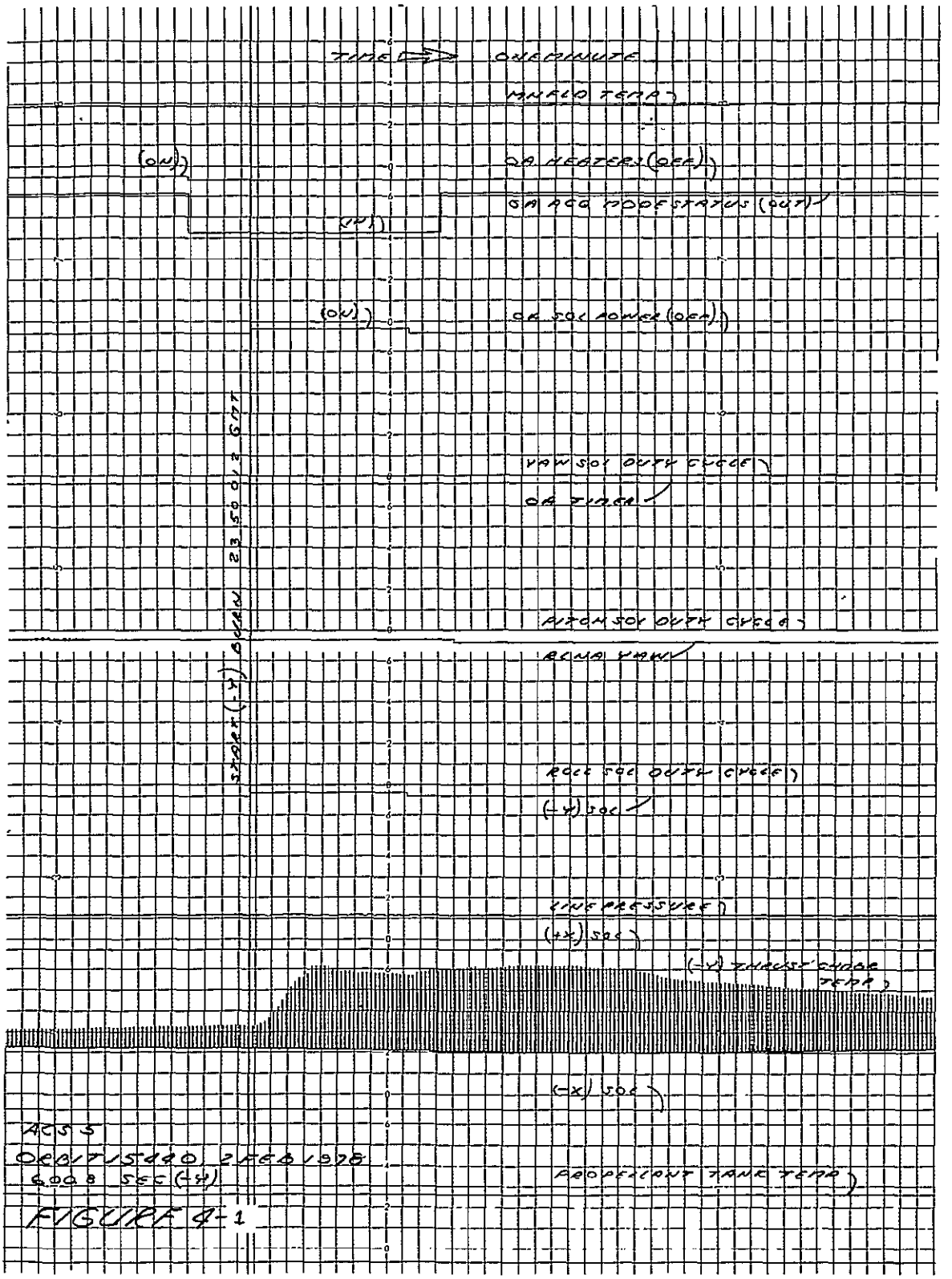

Figure 4-1. Orbit Adjust Chart

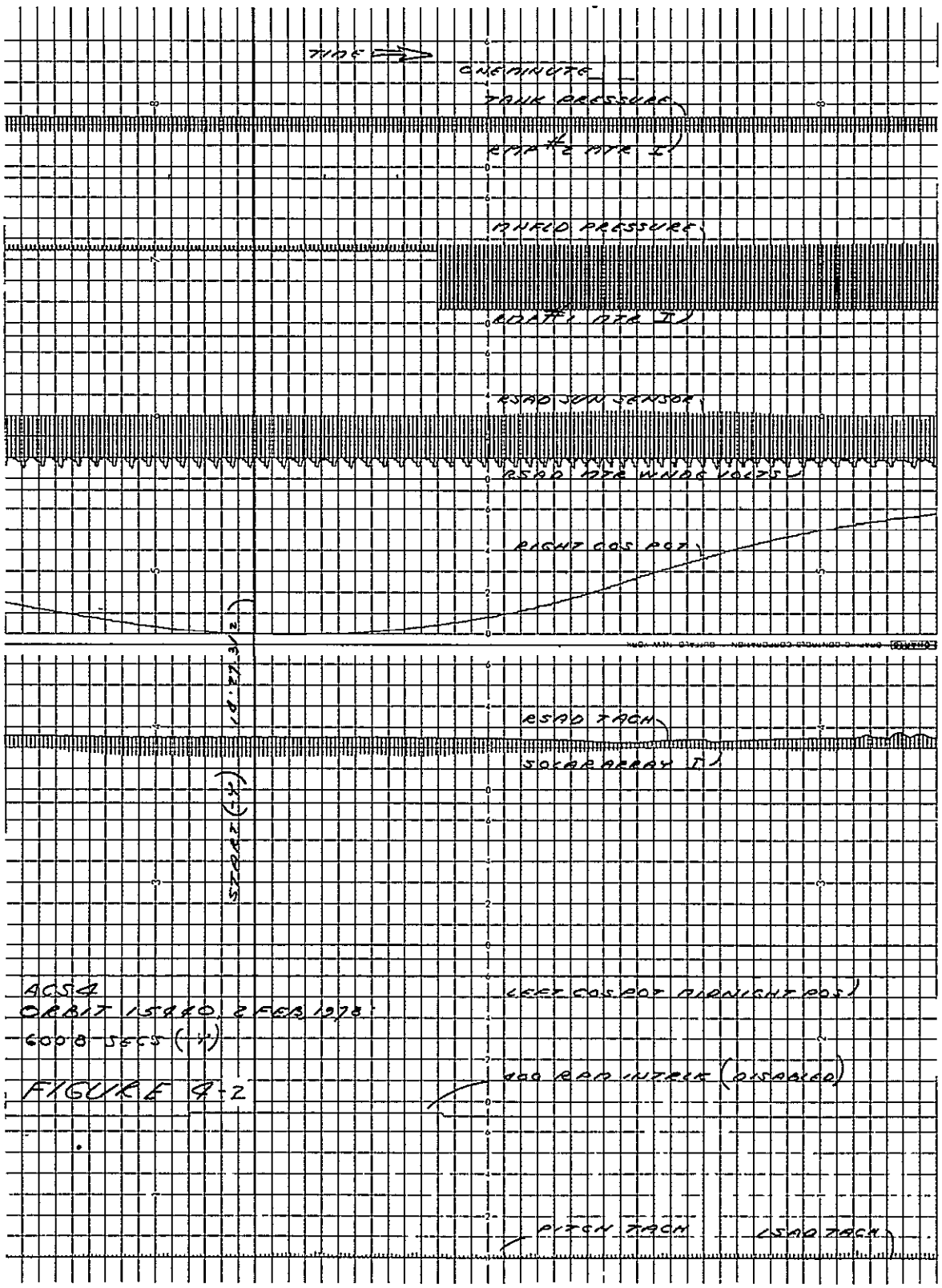

Figure 4-2. Orbit Adjust Chart

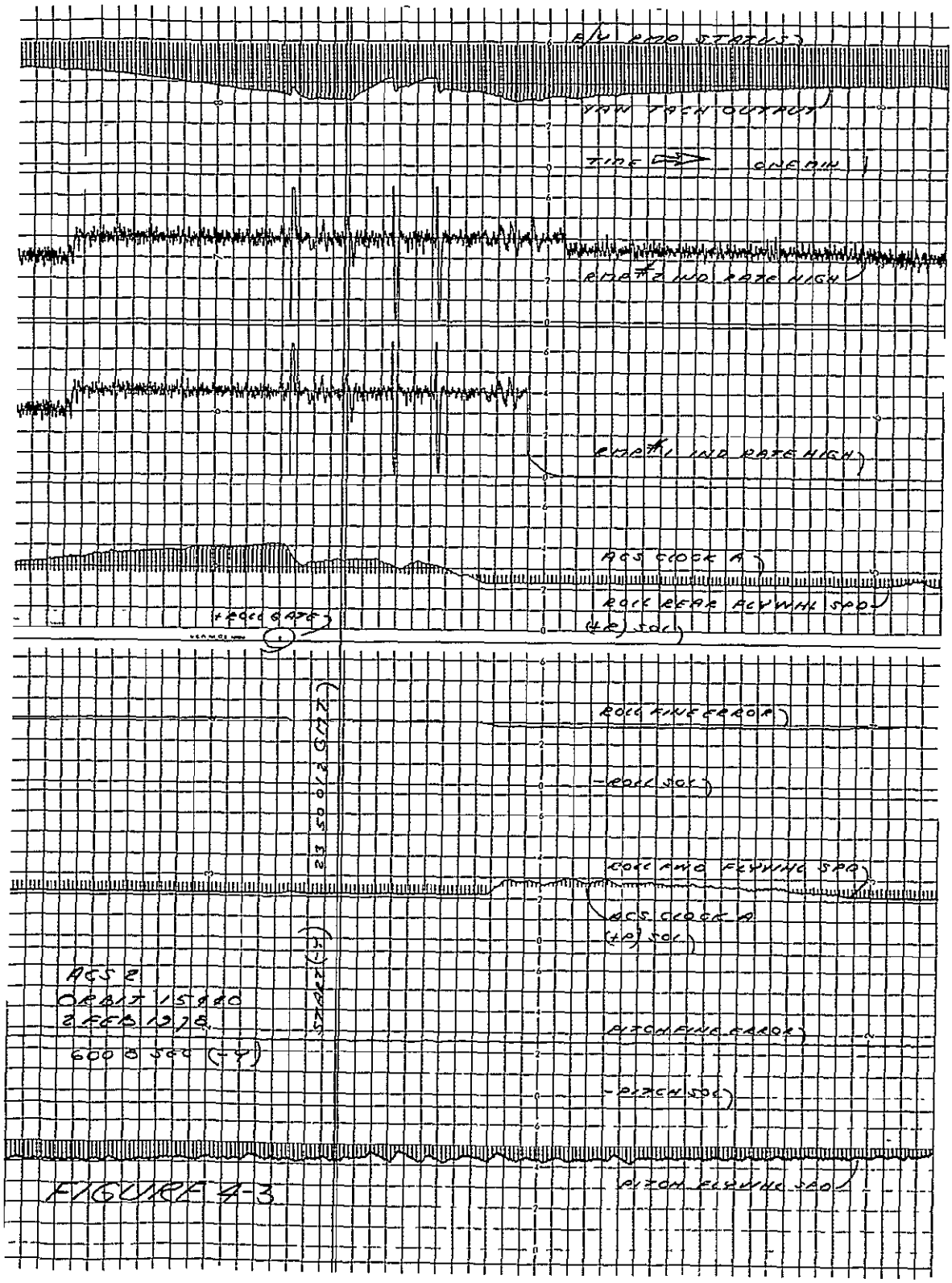

Figure 4-3 Orbit Adjust Chart

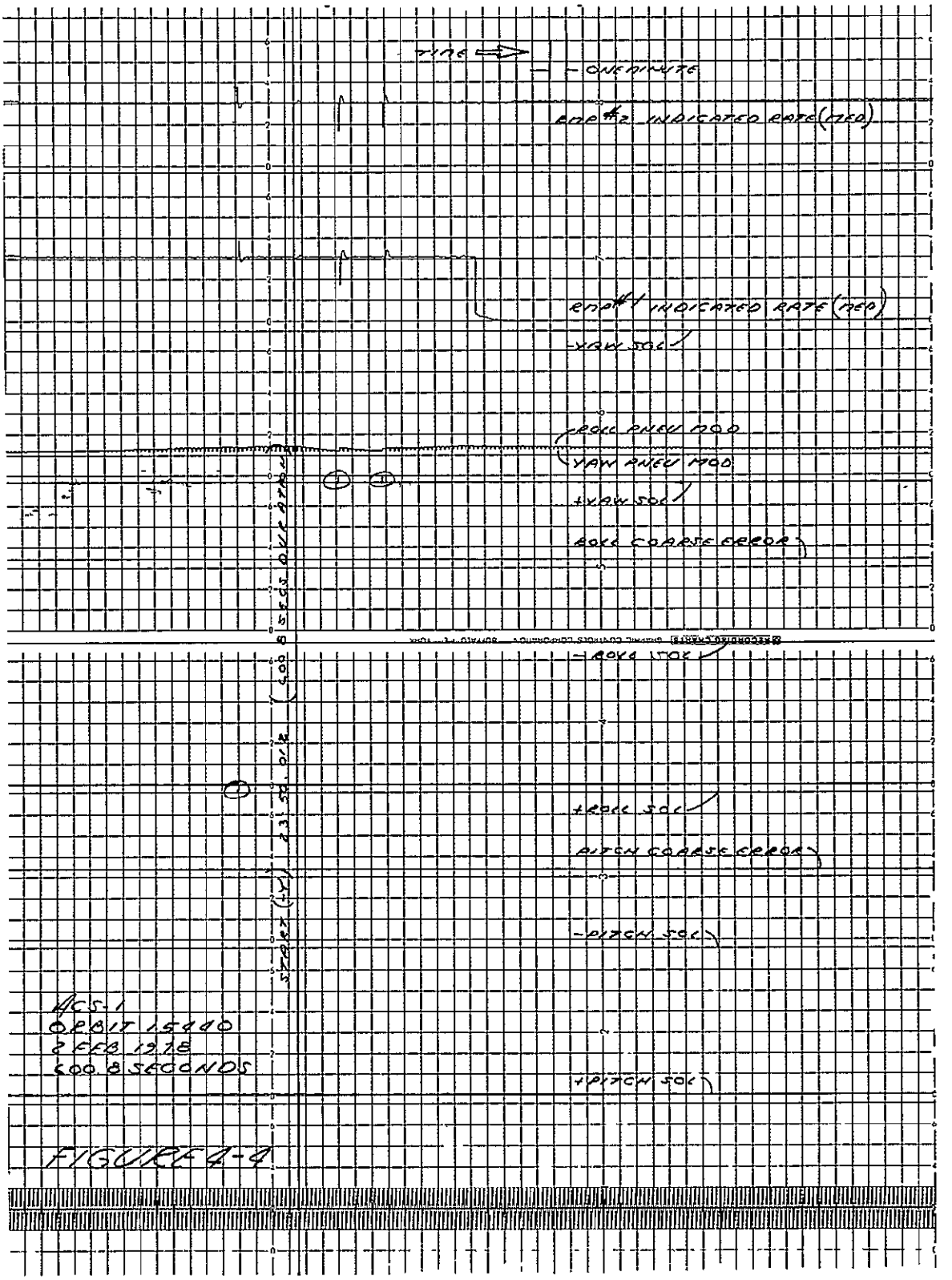

Figure 4-4. Orbit Adjust Chart

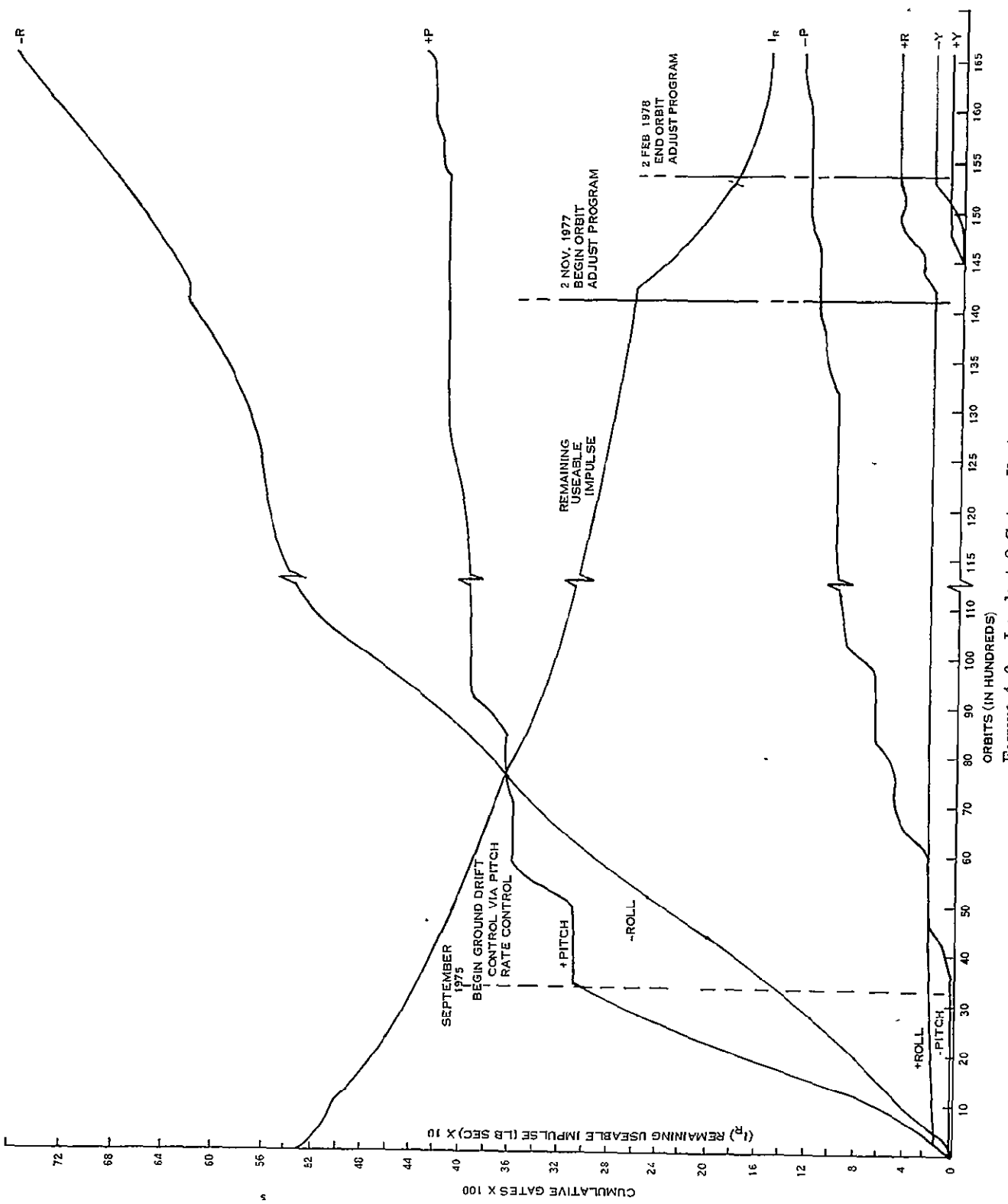

Figure 4-6. Landsat-2 Gating History

Table 4-1. Landsat-2 Pitch Position Bias Quarterly Pneumatic Gating Summary

Period		PPB Implementation Sequence			Centered About Satellite Midnight (Minutes)	Resulting Average Number of Pitch Gates Per Day
From Orbit	To Orbit	N_o	$N_o + 1$	$N_o + 2$		
15301 23 Jan 78	15537 10 Feb 78	+ 2.0	+ 2.0	+ 2.0	35.0	0 to 1 (+ P)
15538 10 Feb 78	15985 14 Mar 78	+ 2.0	-	+ 2.0	50.0	3 to 4 (+ P)
15986 14 Mar 78	16134 24 Mar 78	+ 2.0	+ 2.9	+ 2.0	48.0	5 to 6 (- P)
16135 24 Mar 78	16317 6 Apr 78	+ 2.0	+ 2.0	+ 2.0	48.0	3 to 4 (- P)
16318 6 Apr 78	16570 23 Apr 78	+ 2.0	-	+ 2.0	48.0	1 to 2 (+ P)

Table 4-2. Landsat-2 Subsystem Temperature and Pressure Averages

Function	Units	Orbits						
		29	5102	10191	15211	15652	16000	16441
1084 RMP 1 Gyro Temperature	DGC	19.33(1)	22.69	22 70	20.21(3)	19.08	21.17	23 37
1094 RMP 2 Gyro Temperature	DGC	70 00	74.26	74.50	65 14	64.57	64 64	64 83
1222 SAD RT MTR HSNG Temp	DGC	19 50	22 98	22 73	20.08	18 70	21.41	23 93
1242 SAD LT MTR HSNG Temp	DGC	26.87	29 79	30.26	28.17	27 09	29.28	30.55
1223 SAD RT MTR WNDNG Temp	DGC	21 76	24 36	23 72	20.87	19.47	22 21	25 04
1243 SAD LT MTR WNDNG Temp	DGC	30.23	32 83	33.15	30.47	29 29	31.90	33.23
1228 SAD RT HSG Pressure	PSI	7.26	7 18	7.00	6.77	6 76	6 76	6.76
1248 SAD LT HSG Pressure	PSI	7.28	7 21	6.91	6.46	6 42	6 47	6.48
1007 FWD Scanner MTR Temp	DGC	22 07	23.80	23 97	21.18	19 83	22.45	24.33
1016 Rear Scanner MTR Temp	DGC	24.19	25 04	24.83	22.87	21.88	23.90	25 48
1003 FWD Scanner Pressure	PSI	9 59(2)	D	D	D	D	D	D
1012 Rear Scanner Pressure	PSI	6 21	5.62	5 11	4 47	4 46	4 47	4 49
1212 Gas Tank Pressure	PSI	1948 00	1517.04	1256 98	863.19(4)	786 26	772.52	752.36
1210 Gas Tank Temperature	DGC	20.66	24.25	24 43	22.25	21.25	23.32	24.88
1213 Manifold Pressure	PSI	53.98	54 56	55 26	56.49	56 50	56 55	56 59
1211 Manifold Temperature	DGC	19 18	22.59	22.78	20.51	19.23	21 61	23.23
1059 CLG Power Supply Card Temp	DGC	39.00	41 47	41.81	39.93	38 71	40.67	42.04
1260 TH01 EBP	DGC	24 29	27.21	27 58	25.58	24.71	26.74	28.02
1261 TH02 EBP	DGC	20 29	23.25	23 48	21 32	20.27	22 48	24 15
1262 TH03 EBP	DGC	18 29	21.46	21 29	18 99	17.85	20.17	22.24
1263 TH01 STS	DGC	6 54	0.52	- 1.66	- 3.67	- 4 92	- 2.23	- 0.22
1264 TH02 STS	DGC	D	D	D	D	D	D	D
1265 TH03 STS	DGC	8 46	8 67	11.66	9.78	6.84	9 98	11 46
1266 TH04 STS	DGC	- 2 78	- 3.26	- 0 08	- 3 56	- 6.50	- 3.05	0.66
1267 TH05 STS	DGC	9.62	5.57	4.24	0.97	- 0.60	3.00	5.19
1224 SAD R FSST	DGC	35.00	35.81	34.24	7 91(5)	2.30	34.43	42 12
1214 SAD L FSST	DGC	50 00	49 13	55 24	52 49	51.46	54.04	55 35

(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

Function	Units	Orbit						
		29	5102	10191	15211	15652	16000	16441
1081 RMP 1 MTR Volts	VDC	F	F	F	F	F	F	F
1082 RMP 1 MTR Current	Amps	F	F	F	F	F	F	F
1080 RMP 1 Supply Volts	VDC	F	F	F	F	17 57	-17 57	- 17 54
1091 RMP 2 MTR Volts	VDC	29 99	29.92	29.87	29.90	29.87	29.87	29.87
1092 RMP 2 MTR Current	Amps	0.10	0 10	0 10	0.10	0 10	0 10	0 10
1090 RMP 2 Supply Volts	VDC	- 23.63	-23.59	- 23 58	-23.61	- 23.61	-23 59	- 23 58
1220 SAD RT MTR WNDNG Volts	VDC	- 5 47	- 4.47	- 4 09	- 4 23	- 4 37	- 4 10	- 4.12
1240 SAD LT MTR WNDNG Volts	VDC	- 5.08	- 4.72	- 4.57	- 4.53	- 4 45	- 4.60	- 4 46
1227 SAD RT -15 VDC Conv	VDC	15 14	15 16	15 15	15.18	15 17	15.13	15 12
1247 SAD LT -15 VDC Conv	VDC	15.23	15.21	15 22	15 21	15.21	15 19	15.21
1056 CLB ± 6 VDC	TMV	2 35	2.38	2.40	2.40	2.40	2 40	2.40
1055 CLB ± 10 VDC	TMV	2.88	2 92	2 94	2 94	2 94	2 94	2.94
1057 CLB Power Supply Volts	TMV	2 97	2 96	2 97	2 96	2 96	2 96	2 97

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

Function	Units	Orbit						
		26	5102	10191	15211	15652	16000	16441
1041 Pitch Fine Error	DEG	- 0.15	- 0 13	- 0.82	- 0 78	- 0 72	- 1 73	- 0.75
1043 Pitch Flywheel Speed	RPM	-156 12	-162.97	3 39	51.87	-117.58	245 17	-159.30
1038 Pitch Mtr Drvr CCW	PCT	6 64	6.05	4 33	1 76	4 17	2.55	7.06
1039 Pitch Mtr Drvr CW	PCT	2.03	1.80	3 87	4.59	0 61	7.68	3 33
1030 Roll Fine Error	DEG	- 0.13	- 0.14	- 0.21	- 0 20	- 0.14	- 0.15	- 0 18
1027 Roll Rear Flywheel SPD	RPM	729.30	748 56	792 27	796 70	720 99	749 28	752 68
1026 Roll Fwd Flywheel SPD	RPM	703 02	735 81	737.44	767.93	714.75	727.16	727 53
1022 Roll Rear Mtr Drvr CCW	PCT	0 67	0 63	0 87	0.01	0 00	0.49	0 86
1025 Roll Rear Mtr Drvr CW	PCT	7 54	6.34	6.09	6 07	5 36	5 72	6.77
1023 Roll Fwd Mtr Drvr CCW	PCT	0.70	0.87	0 72	0 03	0.00	0 65	0 94
1024 Roll Fwd Mtr Drvr CW	PCT	5.46	4.01	4 34	3.20	2 93	3.24	3 89
1035 Yaw Tach	RPM	- 95.73	- 38 16	-163.04	- 34 38	-114.30	-124 78	-123.70
1033 Yaw Mtr Drvr CW	PCT	1.98	2.01	1.91	1 81	1 09	1 70	1.96
1034 Yaw Mtr Drvr CCW	PCT	2.10	1.90	2.49	1.50	1 42	2.09	2 26
1221 SAD Right Tach	D/M	3 38	3 38	3 37	3.42	3 42	3 41	3 36
1211 SAD Left Tach	D/M	3.68	3.56	3.48	3 55	3 56	3.54	3.51

* Pitch Pos. Bias Implemented During This Orbit
F = Unit Off

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

LANDSAT-2

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

The Command Clock Subsystem operated nominally in this report period. During Orbit 15874 the S/C clock was set back two seconds. Figure 5-1 shows the history of the S/C clock drift since launch. Figure 5-2 shows the cumulative clock drift, 17.795 seconds faster in 39 months; and Figure 5-3 gives drift rate of S/C clock. The clock of Landsat-2 drifts in opposite direction from the clock of Landsat-1 and in the same direction as Landsat 3.

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

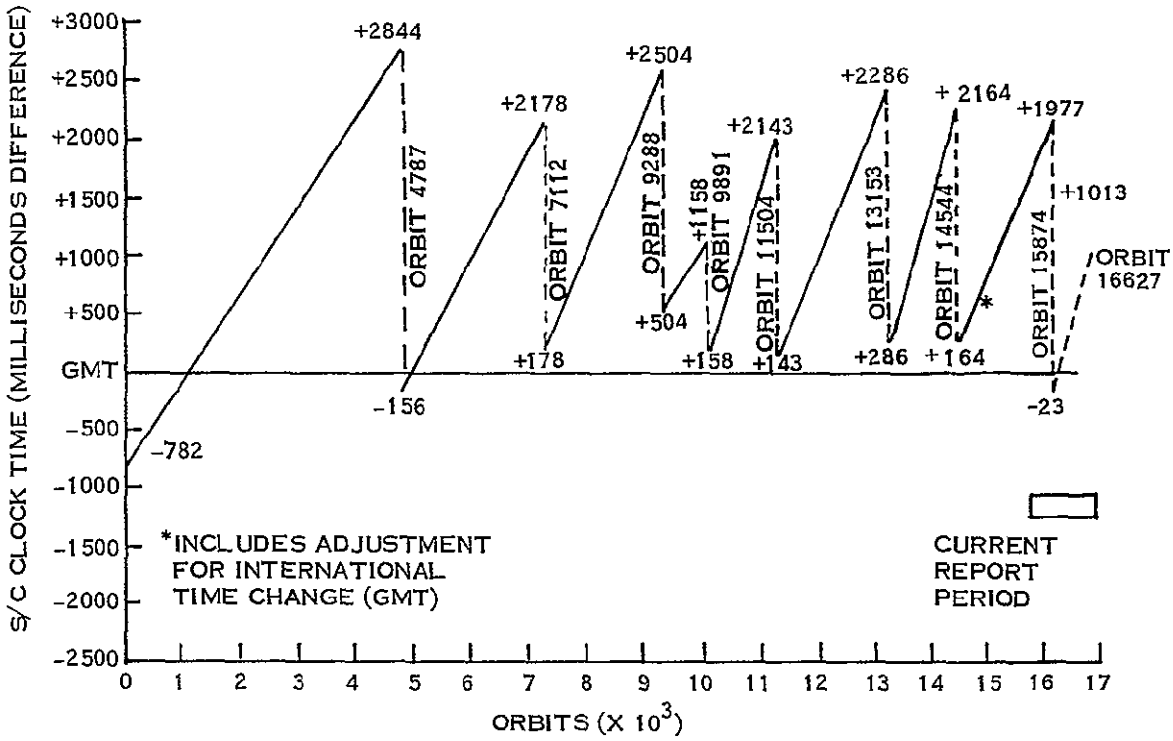

Figure 5-1. Landsat-2 Drift History

Figure 5-2. Cumulative Clock Drift

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

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

Function No.	Name	Mode	Units	Orbit 35	5091	10192	15211	15652	16000	16441
8005	Pri. Power Supply Temp	-	DGC	38 82	39 43	39 08	39 12	38 82	38 80	38 65
8006	Red. Power Supply Temp	-	DGC	36 93	38 00	37 85	37 91	37 61	37 60	37 54
8007	Pri. Osc. Temp	-	DGC	28 70	28 70	28 56	28 69	28 50	28 13	27 65
8008	Red Osc. Temp	-	DGC	27 82	27 26	26 97	27 40	26 96	26 95	26.74
8009	Pri. Osc. Output	-	TMV	1 06	1 05	1 05	1 06	1 05	1.05	1 05
8010	Red. Osc. Output	-	TMV	1 17	1 18	1 18	1 18	1 18	1 18	1.18
8011	100 KHz	Pri. - Red	TMV	3 17	3 15	3 15	3 15	3 15	3 15	3 15
8012	10 KHz	Pri. - Red	TMV	3 08	3 05	3 05	3 05	3 05	3 05	3 05
8013	2.5 KHz	Pri. - Red	TMV	3.01	2 95	2 95	2 95	2 95	2 95	2 95
8014	400 Hz	Pri. - Red	TMV	4 17	4 45	4 45	4 45	4 45	4.45	4 45
8015	Pri. 14V Power Supply	Pri. Clk ON	TMV	N	2 05	2 05	2 05	2 05	2.05	2 05
8016	Red 14V Power Supply	Red Clk ON	TMV	N	2 00	2 00	2 00	2 00	2 00	2 00
8017	Pri. 16V Power Supply	Pri. Clk ON	TMV	N	2 30	2 30	2 30	2 30	2.30	2 30
8018	Red. 16V Power Supply	Red Clk ON	TMV	N	2 30	2.30	2 30	2.30	2 30	2.30
8019	Pri. -6V Power Supply	Pri. Clk ON	TMV	N	5 23	5 23	5 23	5.23	5.22	5 23
8020	Red. -6V Power Supply	Red Clk ON	TMV	N	5 23	5.23	5 23	5 23	5 22	5.23
8021	Pri. -23V Power Supply	Pri Clk ON	TMV	N	5 70	5 70	5 70	5 69	5 69	5 70
8022	Red -23V Power Supply	Red Clk ON	TMV	N	5.65	5 65	5 65	5 65	5.65	5 65
8023	Pri -29V Power Supply	Pri. Clk ON	TMV	N	5 29	5 29	5 30	5 29	5 30	5 30
8024	Red -29V Power Supply	Red Clk ON	TMV	N	5 29	5 28	5 29	5 29	5 29	5 29
8101	CIU A - 12V	CIU A ON	TMV	3.79	3 97	3.97	3 97	3 97	3.97	3 97
8102	CIU B - 12V	CIU B ON	TMV	3 78	3 95	3 95	3 95	3 95	3 95	3 95
8103	CIU A - 5V	CIU A ON	TMV	3.93	4 15	4 15	4 14	4 14	4 14	4 13
8104	CIU B - 5V	CIU B ON	TMV	3.90	4 10	4 10	4 10	4.10	4.10	4 10
8105	CIU A Temp	CIU A ON	DGC	26 01	21.67	21 67	22 29	22.19	21.62	20 83
8106	CIU B Temp	CIU B ON	DGC	23 35	19 70	19 71	20 21	2- 10	19.66	19 02
8201	Receiver RF-A Temp	-	DGC	N	29 14	28 83	28 86	28 63	28 33	28 23
8202	Receiver RF-B Temp	-	DGC	29.09	F	22 66	22 67	22 36	22.53	21 87
8203	D MOD A Temp	-	DGC	38 95	38 56	38 25	38 33	28 13	37 68	37 83
8204	D MOD B Temp	-	DGC	37 73	26 72	26 31	26 34	26 12	26 45	25 59
8205	Receiver A AGC	Receiver A ON	DBM	F	-91 43	-90 78	-89 02	-88 86	-88 55	-89 45
8206	Receiver B AGC	Receiver B ON	DBM	-87.93	F	F	F	F	-88 00	F
8207	Amp. A Output	Receiver A ON	TMV	F	2.54	2 75	2 66	2 60	2.66	2 61
8208	Amp. B Output	Receiver B ON	TMV	2.10	I	F	F	F	2.95	I
8209	Freq. Shift Key A Out	Receiver A ON	TMV	F	1 08	1 09	1.08	1.10	1 09	1 08
8210	Freq Shift Key B Out	Receiver B ON	TMV	1.11	F	F	I	F	1.10	F
8211	Amp. A Output	Receiver A ON	TMV	F	1 13	1 14	1 13	1 14	1.14	1 14
8212	Amp. B Output	Receiver B ON	TMV	1 13	F	F	F	F	1 08	1
8215	D MOD A - 15V	Receiver A ON	TMV	I	4 87	4.87	4 87	4 87	4 86	4 87
8216	D MOD B - 15V	Receiver B ON	TMV	4 77	I	I	I	F	4 55	I
8217	Regulator A - 10V	Receiver A ON	TMV	F	5 40	5 40	5 40	5 40	5 39	5 40
8218	Regulator B - 10V	Receiver B ON	TMV	5 32	F	I	F	F	5 30	F
8311	ECAM Mem. Imp	ECAM ON	DGC	N	18 41	18.41	18 38	18 11	18 13	17 86
8312	ECAM Pwr Spply Temp	ECAM ON	DGC	N	23 13	23.00	22 97	22 53	22 50	22.13

N - Data Not Available
I - Unit 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 No.	Function Name	Unit	Orbit						
			35	5091	10192	15211	15652	16000	16441
9001	Memory Sequencer A Converter	VDC	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
9003	Memory Sequencer Temp	°C	20 00	21.37	21.34	21.87	22.16	21.86	20.46
9004	Formatter A Converter	VDC	4 52	4.52	4 52	4.54	4.55	4.53	4 52
9005	Formater B Converter	VDC	F	F	F	F	F	F	F
9006	Dig Mux A Converter	VDC	4 22	4.22	4.22	4.23	4.22	4 22	4.22
9007	Dig Mux B Converter	VDC	F	F	F	F	F	F	F
9008	Formatter/Dig Mux Temp	°C	25.00	27.80	29.75	32.56	34.80	32.50	26.89
9009	Analog Mux A Converter	VDC	4 02	4.05	4.05	4.05	4.05	4.05	4.05
9010	Analog Mux B Converter	VDC	F	F	F	F	F	F	F
9011	A/D Converter A Voltage	VDC	4 02	4.03	4.04	4.05	4.05	4.00	4.03
9012	A/D Converter B Voltage	VDC	F	F	F	F	F	F	F
9013	Analog Mux, A/D Conv Temp	°C	25.00	27.33	27.44	29 72	30.01	27.50	27 08
9014	Preregulator A Voltage	VDC	4.00	4.00	4.00	4.00	4.00	4.04	4 00
9015	Preregulator B Voltage	VDC	F	F	F	F	F	F	F
9016	Reprogrammer Temp	°C	22.50	24.74	25.47	28.98	29,85	29 99	22.50
9017	Memory A Converter	VDC	4 45	4.45	4.45	4.45	4.45	4.45	4.45
9018	Memory A Temp	°C	17 50	17.17	17.16	16.66	16.62	16.24	14.71
9019	Memory B Converter	VDC	F	F	F	F	F	F	F
9020	Memory B Temp	°C	17 50	17.41	17.50	17.52	17.81	17.50	16 66
9100	Reflected Power	dBm	18 29	14 18	14.53	15.24	15.26	14.69	14.15
9101	Xmtr A-20 VDC	VDC	3 80	3.97	3.98	3.98	3 98	3.97	3 97
9102	Xmtr B-20 VDC	VDC	F	F	F	F	F	F	F
9103	Xmtr A Temp	°C	27 73	26.40	30.37	26.69	38.16	33.51	24.25
9104	Xmtr B Temp	°C	N	27.74	31.74	37.80	39.23	34.84	25.47
9105	Xmtr A Power Output	dBm	27 73	26 69	26 41	26.59	26.62	26.50	26.35
9106	Xmtr B Power Output	dBM	F	F	F	F	F	F	F

N - Data Not Available
F - Unit Off

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

LANDSAT-2

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

Landsat-2's orbit adjust program was conducted from 2 November 1977 (Orbit 14157) to 2 February 1978 (Orbit 15440). The program was successful and the Orbit Adjust system functioned normally during every maneuver.

Statistics for this specific interval are listed below.

• Initial inclination	98.953 degrees
• Final inclination	99.231 degrees
• Number of (-Y) burns	35
• Number of (+X) burns	29
• Cumulative (-Y) burn time	18264.2 secs.
• Cumulative (+X) burn time	1010.6 secs.
• Hydrazine consumed	35.52 lbs.
• Hydrazine remaining	26.22 lbs.
• Initial nitrogen pressure	425.55 PSIA
• Final nitrogen pressure	170.52 PSIA
• Initial freon pressure	1082.74 PSIA
• Final freon pressure	801.57 PSIA

During this report period, the (-Y) thruster was fired 9 times (5443.4 cumulative seconds) and the (+X) thrust was fired 8 times (148.0 cumulative seconds).

All maneuvers involving the (-Y) thruster were conducted with the spacecraft within $\pm$ 25.0° of the descending node, with the LSAD stopped in the midnight position and with payload operations suspended.

Orbital inclination changes require predominant use of the (-Y) thruster; however, intended misalignment of this thruster with the spacecraft's center of mass produces thrust components that affect orbital altitude. Consequently, the (+X) thruster was employed to cancel these effects.

Table 7-1 summarizes all of the OAS system's operation since launch with burn numbers 38 through 45 reflecting this quarter's activities.

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

Figures 4-1, 4-2, 4-3 and 4-4 in the Attitude Control section of this report (Section 4) are actual telemetry records of burns conducted during this quarter.

Table 7-2. Landsat-2 OAS Telemetry Values

Function No.	Name	Units	Orbit 50	5102	10191	15211	15652	16001	16441
2001	Prop. Tank Temp.	°C	23.03	23.89	23.05	24.48	24.72	23.89	21.48
2003	Thrust Chamber No. 1 (-X) Temp.*	°C	24.84	25.12	21.75	20.83	20.08	21.30	25.05
2004	Thrust Chamber No. 2 (+X) Temp.*	°C	37.34	38.55	37.60	35.32	32.54	32.86	36.49
2005	Thrust Chamber No. 3 (-Y) Temp.*	°C	47 22	46.35	49.78	78.50	78.49	55.86	43.92
2006	Line Pressure	psia	545.60	413.25	419.94	205.21	171.63	171.38	170.02

*Widespread of temperature is due to nozzle locations and satellite day/night transitions relative to data averaged. Typical orbital range is from 19 to 59 DGC.

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.

No adjustment to the MMCA dipoles was made during this report period.

Orbital averages of MMCA telemetry functions for selected orbits are given in Table 8-1.

Table 8-1. Landsat-2 MMCA Telemetry Values

Function	Name	Units	Orbit							
			50	5102	10191	12721	15211	15652	16001	16411
4001	A1 Board Temp	°C	20 56	19 47	19.12	18 79	18 82	18 76	18.82	18 84
4002	A2 Board Temp	°C	*	*	*	*	*	*	*	*
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 06	3 07	3.07
4005	Pitch Flux Density	TMV	3 15**	2 90	2.90	2.90	2 90	2 90	2 90	2 90
4006	Roll Flux Density	TMV	2.99	2 97	2.97	2 97	2 97	2.97	2 97	2 97

*Defective Telemetry Function (Pre-launch)
**Post Launch Telemetry Drift

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 about 1.4 watts since launch. Figure 9-1 shows AGC readings of Goldstone for 2 constant positions in space. The scatter of data points reflect variations in the ground station calibration and readout.

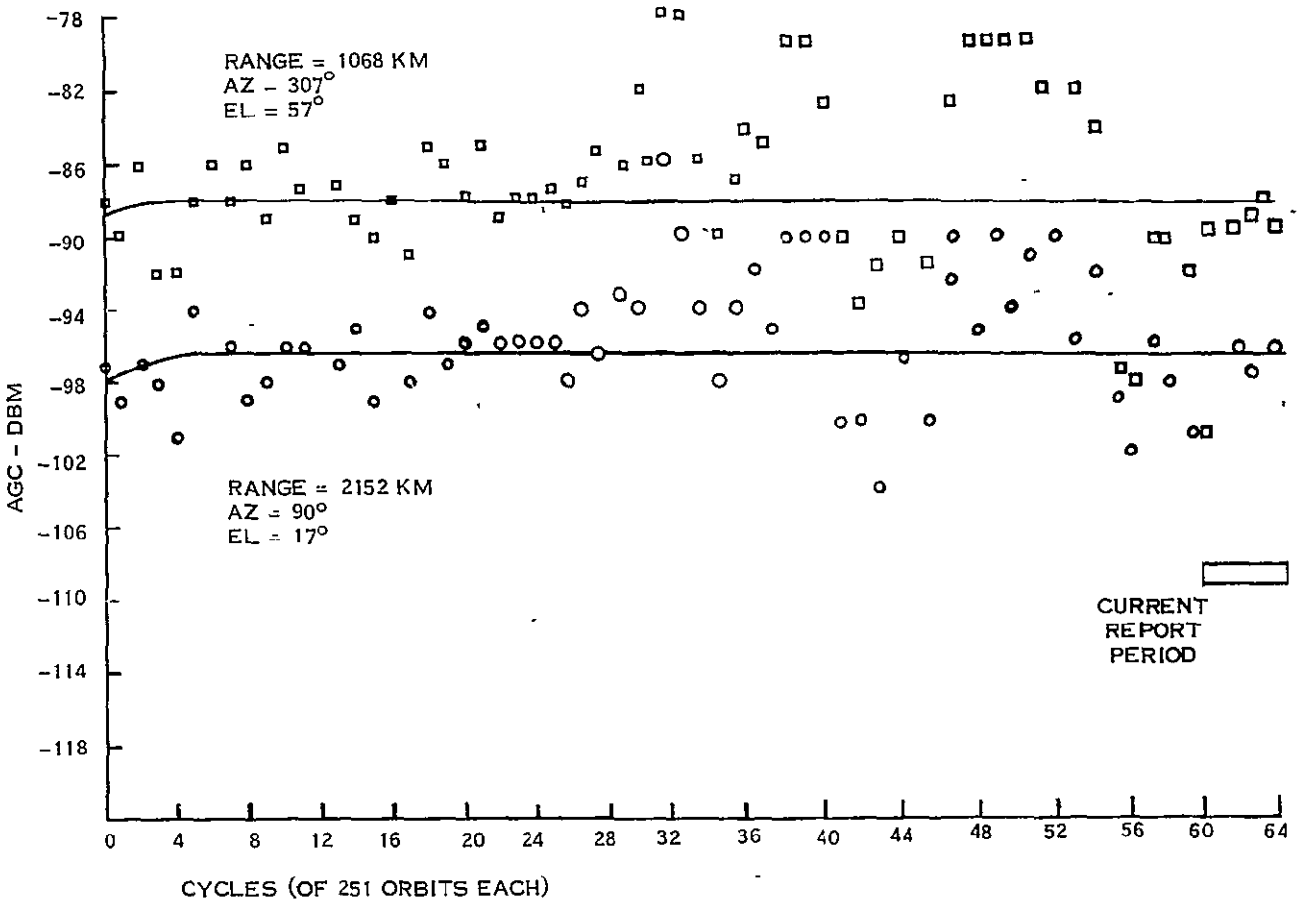

Figure 9-1. USB (Link 4) AGC Readings at Goldstone with 30' Antenna - Landsat-2

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

No.	Function Name	Units	T/V (20°C)	Orbits						
				15	5091	10641	15211	15630	16050	16410
11001	USB Rcvr AGC	DBM	NA	-112.72	-124 29	-124.85	-126 13	-124 21	-122 22	-124.51
11002	USB Xmtr Pwr	WTS	1.40	1.36	1 38	1.39	1 39	1.39	1 37	1.37
11003	USB Rcvr Error	KHz	- 2.15	- 2.15	- 2.97	- 3 43	- 4.98	- 4.62	- 3.49	- 4 48
11004	USB Xpond Temp	DGC	22.93	25.88	27.49	29.06	33.03	34.41	31.66	25 71
11005	USB Xpond Press	PSI	16.99	17.08	16.49	15 96	16.03	16.06	15 87	15 46
11007	USB Xmtr A -15V	VDC	2.35	2.36	F	F	F	F	F	F
11008	USB Xmtr B -15V	VDC	2.39	F	2.42	2.39	2.36	2.40	2.40	2 37
11009	USB Range -15V	VDC	2.07	2.07	2 06	2.06	2 06	2 06	2.06	2 05
11101	PMP Pwr A Volt	VDC	-15.22	- 15.10	Γ	F	F	F	F	F
11102	PMP Pwr B Volt	VDC	-15.07	F	- 14 99	- 14.99	- 14.96	- 14.99	- 14.98	- 15 01
11103	PMP Temp A	DGC	N/A	37.30	34.67	37.49	43 12	44 95	39 83	31.98
11104	PMP Temp B	DGC	N/A	28.34	36.08	38.64	44 11	46 20	40.92	32 92

Γ = Unit OΓΓ

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)

LANDSAT-2

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)
LANDSAT-2

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	10192	15211	15652	16000	16441
13200	APU, -24 5 VDC	TMV	D	D	D	D	D	D
13201	APU, -12 Volts	TMV	2.42	2.45	2 45	2.45	2.45	2.45
13202	APU Temp	DGC	27.44	28.78	30.64	29.38	29.38	26.88

D - Defective Telemetry (Prelaunch)

The Power Switching 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 perod, the MSS, WBPA-2 and WBVTR-2 power circuits, have been operated on a regular basis. 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)

The Thermal Control Subsystem in Landsat-2 has provided satisfactory control of all spacecraft equipments since launch.

Table 11-1 gives average subsystem telemetry values for several representative orbits during the 39 months of operation of Landsat-2. Average temperatures of the sensory ring bays are plotted in Figure 11-1.

During this report period, the sun intensity decreased from 1.032 to 0.989 times the mean value and the satellite night length increased. As a result, the average spacecraft temperature decreased.

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

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

Function No	Function Description	Unit	Orbits 21	5102	10192	15211	15652	16000	16441
7001	THM TH01 STI	DGC	19 40	19 97	19 59	19 68	19 50	19 12	18 06
7002	THM TH02 SBO	DGC	17 18	17 47	17 65	17 36	16 64	16 63	16 84
7003	THM TH03 STI	DGC	18 73	18 50	18 65	18 02	17 47	17 21	17 18
7004	THM TH10 TCB	DGC	19 38	19 34	19 94	21 20	21 45	19 95	18 36
7005	THM TH04 STI	DGC	17 19	16 76	17 37	16 70	16 02	15 80	16 07
7006	THM TH05 SBO	DGC	17 42	16 68	16 65	16 38	15 80	15 93	15 84
7007	OA-X Thruster	DGC	19 66	19 65	19 44	19 70	19 41	19 13	18 98
7008	THM TH06-STO	DGC	14 78	13 94	13 57	13 34	12 91	12 96	12 79
7009	THM TH06 SBI	DGC	19 18	18 41	18 10	17 91	17 49	17 49	17 08
7010	THM TH07 STI	DGC	18 08	17 44	17 11	17 10	16 74	16 61	16 15
7011	THM TH08 STO	DGC	19 34	19 23	19 00	18 92	18 55	18 49	18 60
7012	THM TH09 SBI	DGC	21 44	20 93	20 94	01 48	21 32	20 84	20 01
7013	THM TH10 SBO	DGC	18 58	18 39	18 59	19 12	19 06	18 44	17 65
7014	THM TH11 STI	DGC	21 65	21 93	22 75	24 58	25 00	23 16	20 66
7015	THM TH12 SBO	DGC	23 93	24 68	26 86	29 56	30 28	27 38	23 57
7016	THM TH13 STI	DGC	22 21	23 62	25 73	29 30	30 37	27 25	21 87
7017	RBV Beam Ctr Ln	DGC	20 38	19 92	20 16	21 25	21 31	20 25	18 63
7018	THM TH14 STO	DGC	24 12	26 43	29 64	35 01	36 06	31 95	24 09
7019	NBR Rad Outbd B4	DGC	2 72	2 93	2 44	2 65	2 56	2 29	1 63
7020	THM TH15 SBI	DGC	23 07	25 56	27 07	31 02	32 07	28 92	22 71
7021	THM TH16 STI	DGC	23 26	25 46	25 87	29 22	30 00	27 46	22 77
7022	THM TH17 SBI	DGC	21 77	23 74	23 75	25 97	26 30	24 86	21 58
7023	THM TH18 SBO	DGC	21 67	23 36	23 69	25 27	24 86	23 77	21 82
7030	THM TH03 Bur	DGC	15 50	15 14	15 59	15 08	14 37	14 19	14 85
7033	THM TH12 Bur	DGC	23 05	24 59	27 14	31 18	32 30	28 20	23 54
7035	THM TH18 Bur	DGC	19 53	20 39	20 20	21 03	20 52	19 89	18 95
7040	THM TH01 TCB	DGC	19 42	19 72	19 96	19 66	19 23	18 96	18 49
7041	THM TH02 TCB	DGC	17 55	17 39	17 42	16 94	16 41	16 45	16 45
7042	THM TH03 TCB	DGC	16 85	16 32	18 04	17 08	15 99	15 34	16 88
7043	THM TH04 TCB	DGC	19 90	18 33	18 16	19 16	18 56	18 60	18 73
7044	THM TH05 TCB	DGC	16 42	15 75	15 44	15 17	14 76	14 88	14 68
7045	THM TH07 TCB	DGC	17 76	17 33	17 01	16 92	16 51	16 47	16 31
7046	THM TH09 TCB	DGC	19 30	18 81	18 82	19 31	19 15	18 76	18 04
7048	THM TH11 TCB	DGC	23 27	23 74	24 99	27 06	27 64	25 53	22 78
7049	THM TH12 TCB	DGC	23 04	23 94	26 83	30 59	31 70	28 08	22 68
7050	THM TH13 TCB	DGC	22 89	24 67	27 61	31 99	33 13	29 58	22 82
7051	THM TH14 TCB	DGC	25 07	27 69	31 17	36 18	37 35	33 62	24 68
7052	THM TH16 TCB	DGC	22 22	24 29	25 62	29 18	29 84	27 08	23 19
7053	THM TH17 TCB	DGC	23 52	24 86	25 00	26 83	26 89	25 71	23 01
7054	THM TH18 TCB	DGC	20 01	20 99	21 41	21 17	20 94	20 61	19 42
7060	THM Shutter By 1	DEG	22 54	26 65	27 36	24 93	22 38	20 12	11 61
7061	THM Shutter By 2	DEG	19 34	21 13	17 89	11 72	12 42	13 64	9 54
7062	THM Shutter By 3	DEG	22 75	11 99	28 91	19 01	8 08	3 19	17 32
7063	THM Shutter By 4	DEG	33 89	33 00	32 90	27 37	27 68	30 19	27 17
7064	THM Shutter By 5	DEG	7 50	2 90	2 42	1 79	1 35	0 58	0 58
7065	THM Shutter By 7	DEG	17 06	14 11	8 88	6 89	7 55	6 80	4 09
7067	THM Shutter By 9	DEG	33 75	34 12	33 70	36 71	38 24	34 13	30 74
7068	THM Shutter By 10	DEG	37 46	37 09	40 64	48 39	50 10	41 81	31 94
7069	THM Shutter By 11	DEG	52 25	17 39	22 81	46 32	36 18	28 95	11 19
7070	THM Shutter By 12	DEG	61 38	67 46	80 70	83 62	83 62	83 62	60 69
7071	THM Shutter By 13	DEG	63 60	74 14	8 189	81 89	81 89	81 89	63 58
7072	THM Shutter By 14	DEG	59 44	72 14	72 91	71 60	71 58	71 51	52 69
7073	THM Shutter By 15	DEG	67 79	82 12	83 87	83 96	83 93	83 93	70 71
7074	THM Shutter By 16	DEG	45 20	61 13	68 30	76 93	77 44	74 99	54 57
7075	THM Shutter By 17	DEG	57 88	67 62	68 67	78 13	78 60	74 50	54 00
7076	THM Shutter By 18	DEG	40 49	45 84	47 49	46 15	45 64	44 05	35 82
7080	THM Q1 T Zener V	VDC	4 85	4 85	4 85	4 85	4 85	4 85	4 85
7081	THM Q2 T Zener V	VDC	4 90	4 90	4 90	4 90	4 90	4 90	4 90
7082	THM Q3 T Zener V	VDC	5 05	5 05	5 04	5 04	5 04	5 04	5 03
7083	THM Q1 S Zener V	VDC	4 97	4 96	4 96	4 97	4 97	4 95	4 95
7084	THM Q2 S Zener V	VDC	4 98	4 99	4 98	5 00	5 00	4 99	4 98
7085	THM Q3 S Zener V	VDC	5 15	5 15	5 15	5 15	5 15	5 15	5 15
7090	THM PSM Mount	DGC	21 02	21 71	21 28	22 79	23 15	21 94	19 53
7091	THM Ind Attitude	DGC	17 79	17 24	16 95	16 98	16 58	16 39	15 90
7092	THM RBV Radiator	DGC	18 01	16 24	16 71	18 06	18 06	16 88	15 02
7093	THM RBVC Ctr Bm	DGC	20 74	19 31	19 44	20 64	20 76	19 79	17 81
7094	THM WBVTR Root	DGC	13 77	15 72	13 90	14 91	14 94	14 07	12 17
7095	THM WBVTR Rad Ct	DGC	3 64	5 55	4 45	5 38	4 81	4 91	3 50
7096	THM WBVTR Strap	DGC	15 90	17 63	15 29	15 98	15 91	15 25	13 58
7097	THM WB Mt Bay 1	DGC	22 91	22 49	16 47	16 44	16 64	16 75	15 71
7098	THM WB Mat Bay 1	DGC	22 07	20 14	16 20	16 50	17 13	16 94	15 42
7099	THM WBVTR Sep 3	DGC	18 03	18 12	17 79	17 38	16 94	16 63	16 24
7100	THM WBVTR Sep 17	DGC	21 83	23 51	22 98	24 85	25 23	23 89	20 84
7101	THM WBVTR 1 Cent	DGC	22 45	23 78	20 33	20 91	20 96	20 30	18 49
7102	THM WBVTR 2 Bay	DGC	17 34	17 29	17 04	16 92	16 18	16 28	15 69
7103	THM WBVTR 2 Bay 15	DGC	21 77	23 87	23 50	26 26	27 20	24 93	20 38
7104	THM WBVTR 2 Ctr	DGC	20 74	22 34	19 94	21 14	21 80	20 64	17 72
7105	THM NBTR B Sep 6	DGC	p7 82	17 86	17 29	17 67	17 10	17 17	15 97
7106	THM NBTR B Sep 1	DGC	22 11	23 85	24 92	28 10	29 09	26 54	21 13
7107	THM NBTR Bm Ctr	DGC	20 32	21 21	20 59	21 90	22 17	21 09	18 36
7108	THM MSS Mount 14	DGC	20 59	22 86	23 83	26 90	27 66	25 11	20 01
7109	THM OA - X Thruster	DGC	25 64	27 51	29 91	36 27	37 71	31 97	24 52
7110	THM MSS WBVTR Bm	DGC	16 75	18 21	16 81	17 55	17 53	16 77	15 01
7111	THM OA +X Thruster	DGC	20 31	20 11	17 54	17 84	17 71	17 65	16 80
7130	THM Aux P1 T	DGC	34 18	29 67	12 01	8 87	8 67	11 02	8 74
7131	THM Aux P2 T	DGC	2 90	6 97	28 16	8 19	11 60	27 91	21 11

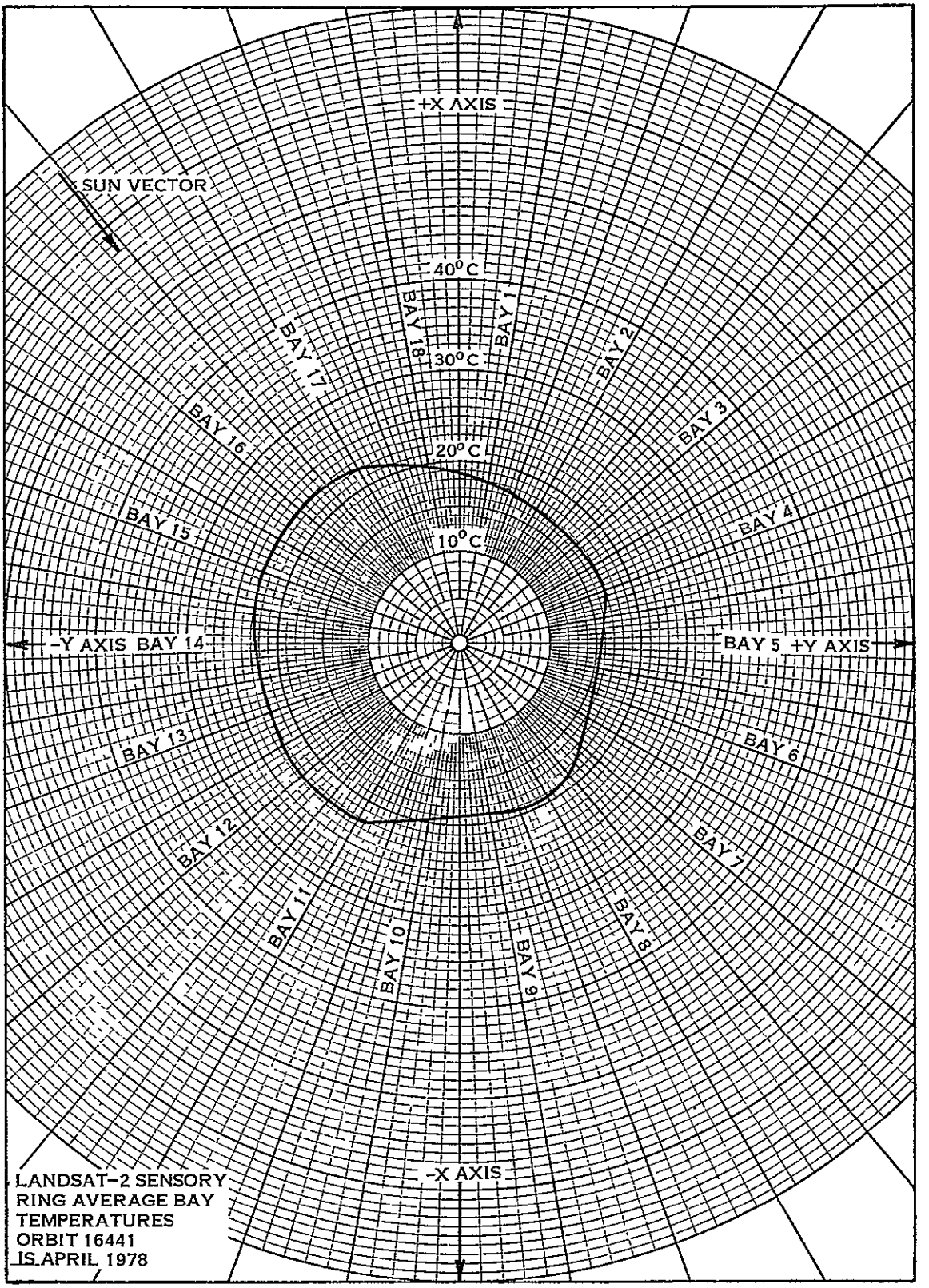

Figure 11-1. Landsat-2 Sensory Ring Thermal Profile

Table 11-2. Landsat-2 Compensation Load History

	Compensation Load Status*							
Orbits	1	2	3	4	5	6	7	8
Launch	0	0	0	0	0	0	0	0
2	X	X	X	X	X	0	X	X
237	X	X	X	X	X	0	0	0
272	X	X	X	X	X	0	X	X
306	X	X	0	X	X	0	0	0
572	X	X	0	X	X	0	0	X
1367	X	X	X	X	X	0	0	X
1645	X	X	0	X	X	0	0	X
1657	X	X	X	X	X	0	0	X
4202	0	0	X	X	0	0	0	0
4372	0	0	X	X	0	0	0	X
6735	0	X	X	0	0	X	0	0
8312	X	X	0	0	X	0	0	0
9753	X	X	0	0	0	0	0	0
14727	0	0	0	0	0	0	0	0

*NOTE X = ON
0 = OFF

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)

Landsat-2

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)

The Narrowband Recorder Subsystem operated satisfactorily throughout the entire 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	14979	13505	599	14380
B	14979	13505	599	14380

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

Function		Typical Telemetry Values - Orbits						
No.	Name	36/37	4980/4981	11460/11461	15211/15212	15611/15612	15999/16000	16438/16440
10001	A - Motor Cur. (ma)							
	Record	132.0	130.2	125.50	114.68	119.05	120.63	119 05
	P/B	108 0	93.7	92.30	99.47	100.26	80.95	108 10
10101	B - Motor Cur (ma)							
	Record	148.5	135.7	129.10	119.27	118 08	116.08	120.25
	P/B	143.6	135.7	127 65	119.09	111.55	114.57	113.06
10002	A - Pwr Sup. Cur. (ma)							
	Record	170.5	162.5	152.13	152.92	152 63	149.34	148.34
	P/B	410.0	399.3	472.26	143.31	472.78	392.76	398 10
10102	B - Pwr Sup. Cur. (ma)							
	Record	260.0	264.5	264.47	270.12	268.84	264.51	261 56
	P/B	481.0	489.2	479.80	270.87	486.08	479.20	482.89
10003	A - Rec. Temp (DGC)	26.1	24.2	21 64	25.40	26.48	25.00	24.57
10103	B - Rec. Temp. (DGC)	27.0	26.2	24.71	23.68	23.30	23.30	21.38
10004	A - Supply (VDC)	-24.87	-25.1	-25.09	-25.08	- 24 95	- 24 80	- 24.95
10104	B - Supply (VDC)	-24.55	-24.6	-24.61	-24.73	- 24 75	- 24 62	- 24.37

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)
LANDSAT-2

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)
LANDSAT-2

The WBTS has operated nominally in this report period.

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

Figure 13-1 is the AGC history recorded at Goldstone with the spacecraft successively at the same two points in space The scatter of data points reflect variations in the ground station calibration and readout WBPA-2 has been used more consistently and is presented in this figure Values from WBPA-1 are nearly identical when that power amplifier is used.

Table 13-1. Typical Wideband Subsystem Telemetry

Function (1)	Name	20W	Orbit						
			47	5091	10641	15211	15630	16050	16441
12001	Temp TWT Coll. (DGC)	33.6	34.38	F	20.00	33.12	30.17	31.09	30 01
12101		31.2	30.00	32.16	34.65	30.00	29.98	30.72	29.67
12002	Cur. Helix (MA)	3.85	4.29	F	F	3.90	F	F	F
12102		4.56	4.41	4.59	4.61	4.70	4.77	4.72	4.74
12003	Cur. Cath (MA)	46.10	46.04	F	F	44.93	F	F	F
12103		46.78	46.42	46.00	44.07	44.62	44.89	44.80	44.74
12004	Fwd. Pwr. (DBM)	42.68	42.83	F	F	42.87	F	F	F
12104		43.71	43.81	43.61	43.51	43.61	43.58	43.58	43.61
12005	Refl. Pwr (DBM)	27.0	26.50	F	F	25.44	F	F	F
12105		36.45	37.50	37.08	36.90	37.17	37.20	37.17	37.18
12227	Mod A Volt Loop Stress (MHz)	1.54	2.14	F	1.60	1.77	1.52	1.53	1.33
12228	Mod B Loop Stress (MHz)	2.53	1.51	-0.22	0.28	-0.66	-.20	-0.25	-0.45
12229	Temp. Mod (DGC)	19.5	18.51	17.97	17.41	16.00	17.90	17.56	17.23
12232	+15 VDC Pwr Sply (TMV)	2.65	2.65	2.65	2.65	2.65	2.61	2.65	2.65
12234	-15 VDC Pwr Sud (TMV)	4.07	4.27	4.04	3.99	4.10	4.11	4.09	4.10
12236	+5 VDC Pwr Suply (TMV)	3.55	3.57	3.51	3.50	3.55	3.51	3.52	3.53
12238	-5 VDC Pwr Sud (TMV)	4.08	4.20	4.07	4.02	4.08	4.06	4.07	4.09
12240	-24 VDC Unreg Pwr (TMV)	5.86	6.20	5.90	5.92	5.92	5.87	5.88	5.90
12242	Temp. Inv. (DGC)	23.7	24.12	22.53	22.18	22.17	22.49	22.11	21.20

F = Unit Off

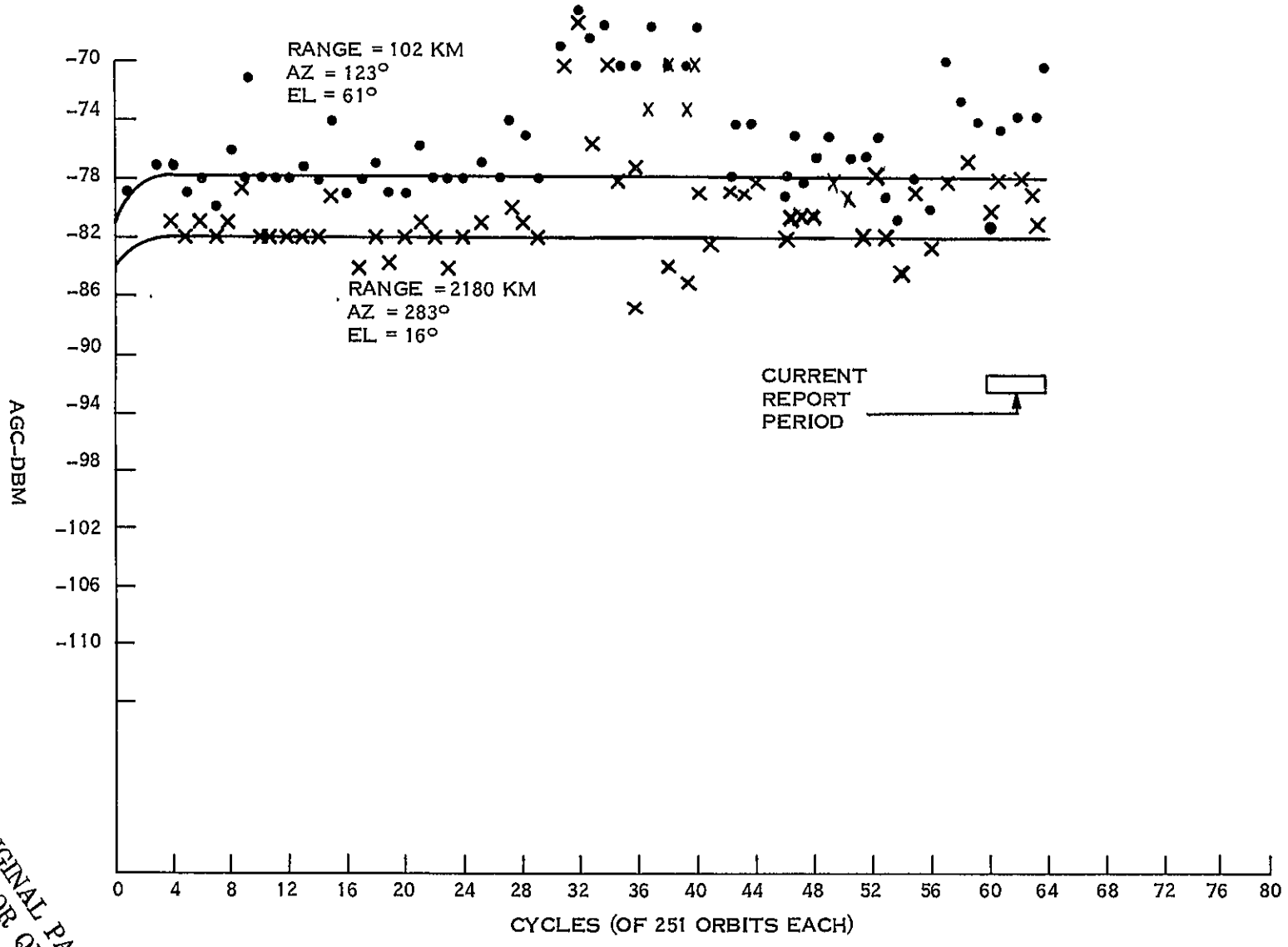

Figure 13-1. WPA-2 (Link 3) AGC Readings at Goldstone with 30' Antenna, Landsat-2

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 was launched in the OFF mode (CMD 774), turned ON during Orbit 6, and has been performing normally since then.

Table 14-1 Landsat-2 AMS Temperature Telemetry

Function	Description	Units	Orbit Number						
			50	5102	10191	15211	15652	16001	16441
3004	Case Temp 1	DGC	19.00	18.68	18.36	18 67	18.40	18 14	17 39
3005	Assembly-Temp-2	DGC	18.70	18.30	17 97	18.28	18 10	17.87	17.02

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR) LANDSAT-2

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)

WBVTR-1 has not been in use during this reporting period 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 undetermined 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.

The power-supply frequency count-down chain of WBVTR-2 occasionally slips phase, increasing motor speed, resulting in high bit error counts and footage over-runs. Simple operational procedures correct this condition when it occurs and normal operation can be resumed.

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.

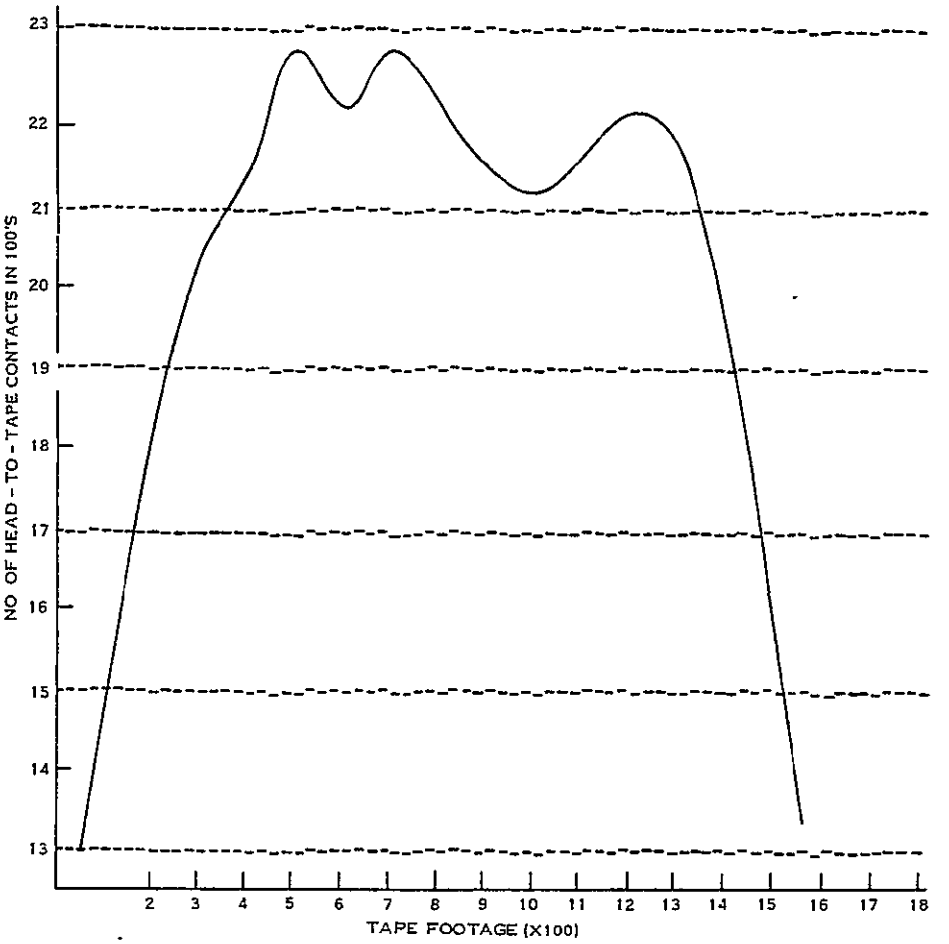

Figure 15-1. Landsat-2 WBR-2 Tape Usage thru Orbit 16544

Table 15-1. WBVTR Telemetry Values

WBVTR-1 Functions		Telemetry Values In Orbits					Orbit	
Number	Name	45/46	4879 (ET)	11871	15286	15612	15999	16432/16438
13022	Pressure Trans	16.52	16.39	16.12	16.12	16.12	16.12	15.99
13023	Temp Trans	20.74	20.12	16.69	19.11	19.50	18.61	16.69
13024	Temp Elec	25.00	21.68	13.85	14.26	14.62	13.85	13.46
13032	Limiter Volt	1.48	1.41	F	F	F	F	F
13034	+5.6 VDC Conv	5.70	5.67	F	F	F	F	F
WBVTR-2 Functions		Telemetry Values in Orbits					Orbit	
Number	Name	45/46	5071	10199	15286	15612	15999	16432/16438
13122	Pressure Trans	16.12	15.33	14.54	13.82	13.74	13.74	13.48
13123	Temp Trans	21.50	23.08	19.92	23.50	25.00	21.50	17.46
13124	Temp Elec	23.50	22.72	16.63	19.41	23.00	17.69	16.54
13132	Limiter Volt	1.30	1.28	1.34	1.31	1.34	1.32	1.34
13134	+5.6 VDC Conv	5.71	5.85	5.66	5.64	5.37	5.80	5.80

F - Unit Off
(ET) - Engineering Test of WBVTR-1

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

WBVTR-1 Function/Description	Orbit					
	31/46	2642	4878(ET)	7628/7643	10050/10081	10249
13029 - Input P/B Voltage						
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 Current						
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 Current						
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 Current						
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						
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 Speed						
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 Motor Speed						
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	98.39	95 62	95 07	93.96	95.07	93 96

(LT) - Engineering Test of WBVTR-1

* Unit not used since Orbit 10249

Table 15-3. Function Values by Mode - Landsat-2 WBVTR-2 Telemetry

WBVTR-2 Function/Description	Orbit						
	31/46	4878	10198/10199	15303/15286	15612	15999	16438
13129 - Input P/B Voltage							
Record	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Playback	0.35	0.34	0.34	0.33	0.34	0.35	0.35
Rewind	0.0	0.0	0.0	0.00	0.0	0.0	0.0
Standby	0.0	0.0	0.0	0.00	0.0	0.0	0.0
13128 - Capstan Motor Current							
Record	0.33	0.38	0.32	0.34	0.34	0.34	0.32
Playback	0.33	0.35	0.35	0.36	0.35	0.37	0.32
Rewind	0.20	0.15	0.18	0.18	0.20	0.15	0.17
Standby	0.0	0.0	0.0	0.0	0.00	0.0	0.0
13130 - Headwheel Motor Current							
Record	0.47	0.48	0.49	0.47	0.46	0.49	0.49
Playback	0.48	0.48	0.49	0.47	0.46	0.47	0.48
Rewind	0.44	0.41	0.43	0.41	0.40	0.40	0.40
Standby	0.43	0.41	0.44	0.40	0.40	0.40	0.40
13131 - Recorder Input Current							
Record	2.90	2.90	2.90	2.93	3.14	2.99	2.93
Playback	3.14	3.11	3.20	3.11	3.08	3.11	3.11
Rewind	1.80	1.80	1.80	1.78	1.80	1.80	1.78
Standby	1.51	1.62	1.49	1.48	1.57	1.60	1.60
13133 - Servo Voltage							
Record	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	49.81	49.62
Rewind	0.0	0.0	0.0	0.00	0.0	0.0	0.0
Standby	0.0	0.0	0.0	0.00	0.0	0.0	0.0
13126 - Capstan Motor Speed							
Record	112.10	105.33	105.30	103.96	102.59	103.27	103.27
Playback	112.10	103.96	105.07	102.59	102.59	101.90	102.59
Rewind	120.43	117.68	117.14	116.31	116.31	115.63	116.31
Standby	0.0	0.0	0.0	0.00	0.0	0.0	0.0
13127 - Headwheel Motor Speed							
Record	98.08	95.48	95.01	93.40	93.40	93.92	93.40
Playback	97.04	94.44	94.80	93.40	93.40	92.88	93.40
Rewind	98.6	96.52	96.81	94.44	94.44	94.44	94.44
Standy	100.79	96.00	95.95	94.96	94.96	94.44	94.44

SECTION 16

RETURN BEAM VIDICON (RBV)

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SECTION 16

RETURN BEAM VIDICON (RBV)

RBV was used only four times during this report period, in the real-time mode only. Telemetry data was normal.

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

Table 16-1. RBV Telemetry Values

Function				Orbits				
No.		Name	Units	54	5662	10157	15228	16483
14001		CCC Borad Temp.	DGC	19.65	20.41	20.15	21.57	18.83
14002		CCC Pwr. Sup. Temp	DGC	20.52	20.80	20.17	22.79	19.39
14003		15 VDC Sup. (TMV)		3.92	4.00	3.84	3.77	3.92
14004		+6V, -5.25 VDC Sup.	(TMV)	2.92	3.13	3.03	2.93	3.07
14100					0.70	1.95	1.18	1.17
14200	*	VID Output V	(TMV)	1.05	1.26	0.88	1.18	1.18
14300				1.03	1.31	1.10	1.17	1.17
14102				3.85	3.82	3.70	3.85	3.80
14202	*	Comb. Align Cur.	(TMV)	3.91	3.88	3.92	3.91	3.87
14302				3.90	3.83	3.75	3.74	3.97
14103				24.24	26.51	23.00	29.43	23.26
14203	*	Elec Temp.	DGC	19.84	22.05	20.18	19.86	18.73
14303				25.05	29.42	23.42	35.07	24.26
14104				23.44	26.28	23.15	28.66	23.36
14204	*	LV Pwr Sup T.	DGC	18.14	20.61	18.90	18.07	18.83
14304				25.36	29.47	24.00	35.25	26.57
14105				4.00	3.96	3.84	3.84	4.00
14205	*	Defl. Pwr. Sup. +10	(TMV)	3.97	3.94	3.82	3.81	3.97
14305		VDC		4.00	3.96	3.96	4.00	4.00
14106				3.67	3.63	3.26	3.54	3.67
14206	*	L.V.P.S. +6V, -6.3	(TMV)	3.65	3.62	3.34	3.50	3.65
14306		VDC		3.70	3.68	3.42	3.72	3.70
14107				2.61	2.61	2.60	2.51	2.75
14207	*	Ther. Elec. Cur.	(TMV)	2.49	2.51	2.44	2.40	2.60
14307				2.57	2.57	2.71	2.44	2.67
14108				2.43	2.50	2.46	2.44	2.55
14208	*	Vid. Fil. Cur.	(TMV)	2.40	2.36	2.39	2.30	2.40
14308				2.58	2.54	2.59	2.47	2.57
14110				2.98	2.96	2.98	2.98	2.97
14210	*	Vid. Tgt. Volt	(TMV)	2.86	2.96	2.60	2.88	3.00
14310				2.63	2.58	2.37	2.52	2.62
14113				2.92	2.81	2.98	2.79	2.86
14213	*	Vert Def V	(TMV)	3.15	3.05	3.16	3.12	3.10
14313				3.59	3.44	3.04	3.47	4.00
14114				19.87	19.21	19.85	19.82	21.99
14214	*	Vid FPT	DGC	20.55	19.80	20.46	20.24	20.54
14314				20.65	20.56	20.38	21.57	22.40
14115				21.04	21.31	21.02	21.41	17.62
14215	*	Foc Coil T	DGC	20.67	21.26	19.17	21.06	18.18
14315				22.25	22.89	20.61	24.14	19.18

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

Function No.	Function Name	Mode	Orbit 054	5663	10157	15228	16483
14101	Focus I	Hold	0.65	0.69	0.65	0.75	0.65
		Prep	1.68	1.74	1.67	1.77	1.70
		Read	2.80	2.85	2.80	2.90	2.82
14109	Grid V	Prep	0.80	0.78	0.80	0.77	0.80
		Read	2.42	2.42	2.45	2.45	2.42
		Hold	3.95	3.98	3.95	3.97	3.95
14111	Cath I	Hold	0.38	0.37	0.37	0.37	0.37
		Read	0.83	0.83	0.85	0.82	0.82
		Prep	3.05	3.02	3.05	3.02	3.02
14112	Hor Def	Hold	0.00	0.00	0.00	0.00	0.00
		Prep	1.75	1.77	1.77	1.77	1.77
		Read	3.25	3.25	3.21	3.25	3.25
14120	+500 V	Hold	0.23	0.90	0.92	0.90	0.90
		Read	4.05	4.05	4.05	4.05	4.05

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

Function No.	Function Name	Mode	Orbit 054	5663	10157	15228	16483
14201	Focus I	Hold	0.54	0.53	0.54	0.50	0.50
		Prep	1.56	1.54	1.50	1.50	1.50
		Read	2.65	2.65	2.65	2.65	2.62
14209	Grid V	Prep	0.75	0.80	0.80	0.75	0.77
		Read	2.25	2.22	2.25	2.20	2.20
		Hold	4.05	4.11	4.11	4.10	4.07
14211	Cath I	Hold	0.37	0.35	0.35	0.35	0.35
		Read	0.95	0.95	0.95	0.95	0.95
		Prep	3.05	3.05	3.05	3.05	3.05
14212	Hor Def	Hold	0.00	0.00	0.00	0.00	0.0
		Prep	1.85	1.87	1.87	1.85	1.85
		Read	3.25	3.31	3.24	3.30	3.30
14220	+500 V	Prep	1.15	1.14	1.15	1.12	1.12
		Read	4.25	4.27	4.27	4.27	4.27

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

Function No.	Function Name	Mode	Orbit 054	5663	10157	15228	16483
14301	Focus I	Hold	0.65	0.72	0.69	0.80	0.67
		Prep	1.79	1.85	1.77	1.95	1.80
		Read	2.85	2.93	2.85	3.02	2.87
14309	Grid V	Prep	0.75	0.75	0.77	0.77	0.77
		Read	2.65	2.66	2.66	2.72	2.70
		Hold	4.08	4.13	4.12	4.12	4.10
14311	Cath I	Hold	0.39	0.40	0.40	0.40	0.40
		Read	0.54	0.55	0.55	0.55	0.55
		Prep	3.25	3.22	3.23	3.22	3.22
14312	Hor Def	Hold	0.00	0.00	0.00	0.00	0.0
		Prep	2.05	2.07	2.07	2.07	2.02
		Read	3.35	3.42	3.42	3.40	3.40
14320	+500 V	Prep	1.15	1.15	1.15	1.15	1.15
		Read	4.25	4.27	4.27	4.27	4.25

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

LANDSAT-2

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

The MSS Subsystem has operated nominally in this period Figure 17-1 shows the number of scenes imaged at each geographic location this quarter, and Figure 17-2 shows images since launch In these maps, only those scenes received by U.S. and Pakistan ground stations are shown. Scenes transmitted to Canada, Brazil and Italy (51% of total) are not shown.

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

Table 17-2 shows the history of sensor response to a constant input radiance level Each sensor is sampled at 5 radiance levels and all show essentially the same trends Only one of these levels (the second highest) is listed in Table 17-2. Line length history is also shown in Table 17-2; it dropped slightly in this quarter, but is still well within satisfactory limits.

Sun calibrations, performed every two weeks, show nominal performance

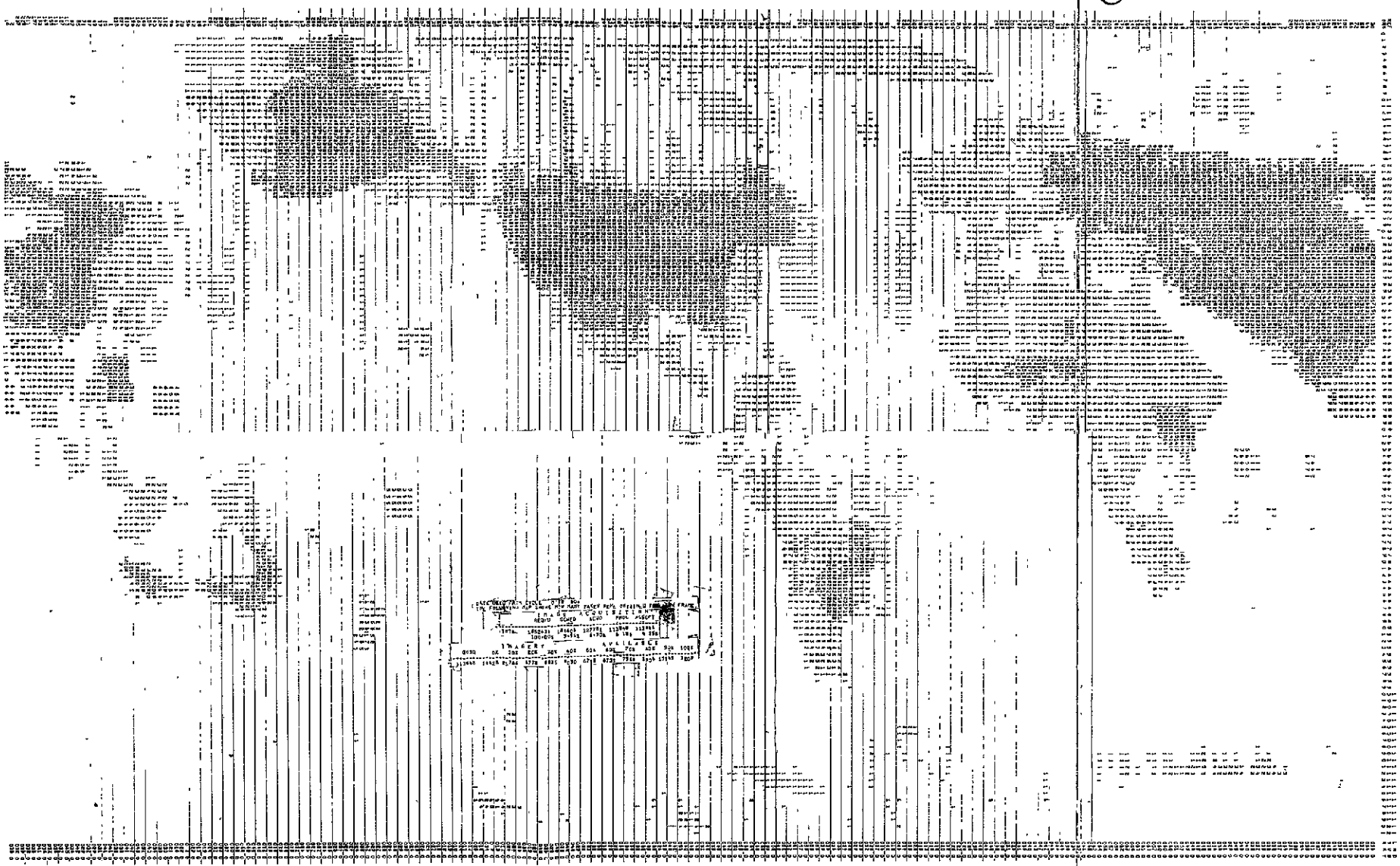

Figure 17-2. Computer Map of MSS Scenes Since Launch - Landsat-2

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Table 17-1. MSS Telemetry - Landsat-2

Function	Name	*T V. Norm	Orbit						
			27	5091	10192	15211	15630	16050	16441
15040	MUX -6 VDC (TMV)	3 92	4.05	4.04	4 05	4 05	4.05	4 05	4 05
15041	A/D SUPPLY (TMV)	5 74	5.95	5.95	5.95	5 95	5.94	5 94	5.94
15042	AVERAGE DENSITY (TMV)	1.72	1 71	1 95	2 62	1 98	2 01	2 22	2.32
15043	FIBER OPTICS PLATE 1 TEMP (DGC)	22 30	18 13	21.75	20.15	21.04	21.59	20 17	18.16
15044	FIBER OPTICS PLATE 2 TEMP (DGC)	22 30	17.87	20.28	18.54	19 50	20 11	18 53	16 38
15045	MUX TEMP (DGC)	25 59	23.38	23.63	24.68	28.27	29 75	27.00	22.63
15046	ELEC COVER TEMP (DGC)	23 09	20.25	22.96	20.01	21.02	21.64	20 25	18.08
15047	PWR. SUP TEMP (DGC)	23.85	19.45	21.62	20.66	21.75	22 58	20.94	18.48
15048	SCAN MIR REG. TEMP (DGC)	23.44	18 30	21.13	20.94	22.37	23.30	21 44	18.23
15049	SCAN MIR DRIVE ELEC. TEMP (DGC)	24.34	18 96	21.42	21 25	22 64	23 68	21 82	18.60
15050	SCAN MIR DRIVE COVER TEMP (DGC)	22.50	17.26	21.21	20 85	22 25	23.25	21 41	18.20
15051	SCAN MIR TEMP (DGC)	21.87	17.26	20.89	20.46	22.06	22.72	20.88	17.83
15052	ROT. SHUT HOUSING TEMP (DGC)	22.58	23.26	20 28	18.58	19.58	20.16	18.55	16.45
15053	SCAN MIR REG VOLT (TMV)	4.56	4 7	4.57	4.63	4 63	4 63	4.63	4.63
15054	CAL LAMP CURRENT (TMV)	1.18	1.17	1.17	1.17	1 17	1.17	1 17	1.17
15055	BAND 1 15 VDC (TMV)	4 97	4.98	4.97	4 97	4 97	4.97	4.97	4 97
15056	BAND 2 15 VDC (TMV)	5.00	5.00	5.00	5.00	5 00	5 00	5 00	5.00
15057	BAND 3 15 VDC (TMV)	4.88	4.95	4.95	4 95	4.95	4.95	4 95	4 95
15058	BAND 4 15 VDC (TMV)	4.83	5.00	5.00	5 00	5.00	4.99	4.99	4 99
15059	TLM 15 VDC (TMV)	5 04	5 06	5 07	5 07	5.07	5 07	5 07	5 07
15060	+12 VDC +6 VDC (TMV)	4.92	5.03	5.02	5 01	5 02	5.01	5.01	5 01
15061	LOGIC +5 VDC (TMV)	4.86	4 81	4 83	4.85	4.83	4.84	4 84	4.84
15062	RECT +19 VDC (TMV)	4.97	5 03	5.05	5.05	5.05	5.05	5 05	5.05
15063	RECT -19 VDC (TMV)	3.54	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	4 95
15065	BAND 1 HVB (TMV)	5 03	F	F	F	F	F	F	F
15066	BAND 2 HVA (TMV)	4 72	4.70	4 75	4 73	4 73	4 74	4 72	4 72
15067	BAND 2 HVB (TMV)	4 70	F	F	F	F	F	F	F
15068	BAND 3 HVA (TMV)	4.75	4 72	4 73	4 75	4 75	4 75	4 75	4 75
15069	BAND 3 HVB (TMV)	4 65	F	F	F	F	F	F	F
15070	SHUT MOT CONTR. INTEG (TMV)	2 49	2.60	2.60	2.60	2.58	2.59	2 59	2 59
15071	SCAN MIRROR DRIVE CLOCK (TMV)	1 93	2 0	2.00	2 01	2.00	1.99	2 00	2.00

*Thermal Vacuum Test Data at 20°C
F = Unit OFF

Table 17-2. MSS Response History - Landsat-2

Quantum Level for Selected Work
(0 = Black; 63 = White)

Band	Sensor	Launch	Average Value				% Change Since Launch
			1st Year	2nd Year	4th Yr. 13th Q 3rd Year	This Quar	
1	1	43	40	39	38	37	-14
	2	41	40	39	37	36	-12
	3	46	43	42	41	42	- 9
	4	46	45	45	44	43	- 6
	5	44	40	39	38	38	-14
	6	46	43	43	42	42	- 9
2	7	47	45	45	45	45	- 4
	8	44	40	41	41	41	- 7
	9	48	46	46	45	44	- 8
	10	50	48	48	46	47	- 6
	11	48	47	47	47	47	- 2
	12	47	44	44	42	42	-11
3	13	42	40	40	39	39	- 7
	14	44	43	42	41	40	- 9
	15	47	46	47	47	47	0
	16	47	45	46	46	46	- 2
	17	48	46	46	46	47	- 2
	18	46	44	45	45	46	0
	19	25	25	25	25	25	0
	20	26	27	27	26	26	0
	21	32	32	32	31	31	- 3
	22	29	30	30	29	29	0
	23	32	33	33	32	32	0
	24	28	28	28	28	28	0
Line Length		3250	3249	3248	3246	3240	-0.3

SECTION 18

DATA COLLECTION SYSTEM (DCS)

LANDSAT-2

SECTION 18

DATA COLLECTION SUBSYSTEM (DCS)

The DCS Subsystem performed nominally until being turned OFF during Orbit 15857 on 4 March 1978 in anticipation of assumption of this function by Landsat-3.

Figure 18-1 shows the number of DCS messages received in each 18-day cycle at OCC. The large number of messages shown for cycle 21 (February 1975) was due to an accidental mode selection for one of the ground transmitters, DCS-6402. The percentage of good messages was about 96%.

There were 48 users in the data base; 256 ground platforms (DCP's) were in the data base, with about 87 active per day.

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

Table 18-1. DCS Telemetry Values

Func. No.	Name	Orbits					
		5	5091	10192	15211	15312	15842
16001	Receiver 1 Sig Strength (DBM)	-123.34	-122.02	-123.06	120.74	-120.79	-124.52
16002	Receiver 1 Temp (DGC)	22.54	24.37	24.82	26.07	26.59	25.93
16003	Rec-1 Pwr Input Volt (VDC)	2.35	2.36	2.37	2.39	2.39	2.38
16004	Receiver 2 Sig Strength (DBM)	F	F	F	F	F	F
16005	Receiver 2 Temp (DGC)	F	F	F	F	F	F
16006	Receiver 2 Input Volt (VDC)	F	F	F	F	F	F

F - Receiver 2 was OFF

FOLDOUT FRAME 1

FOLDOUT FRAME 2

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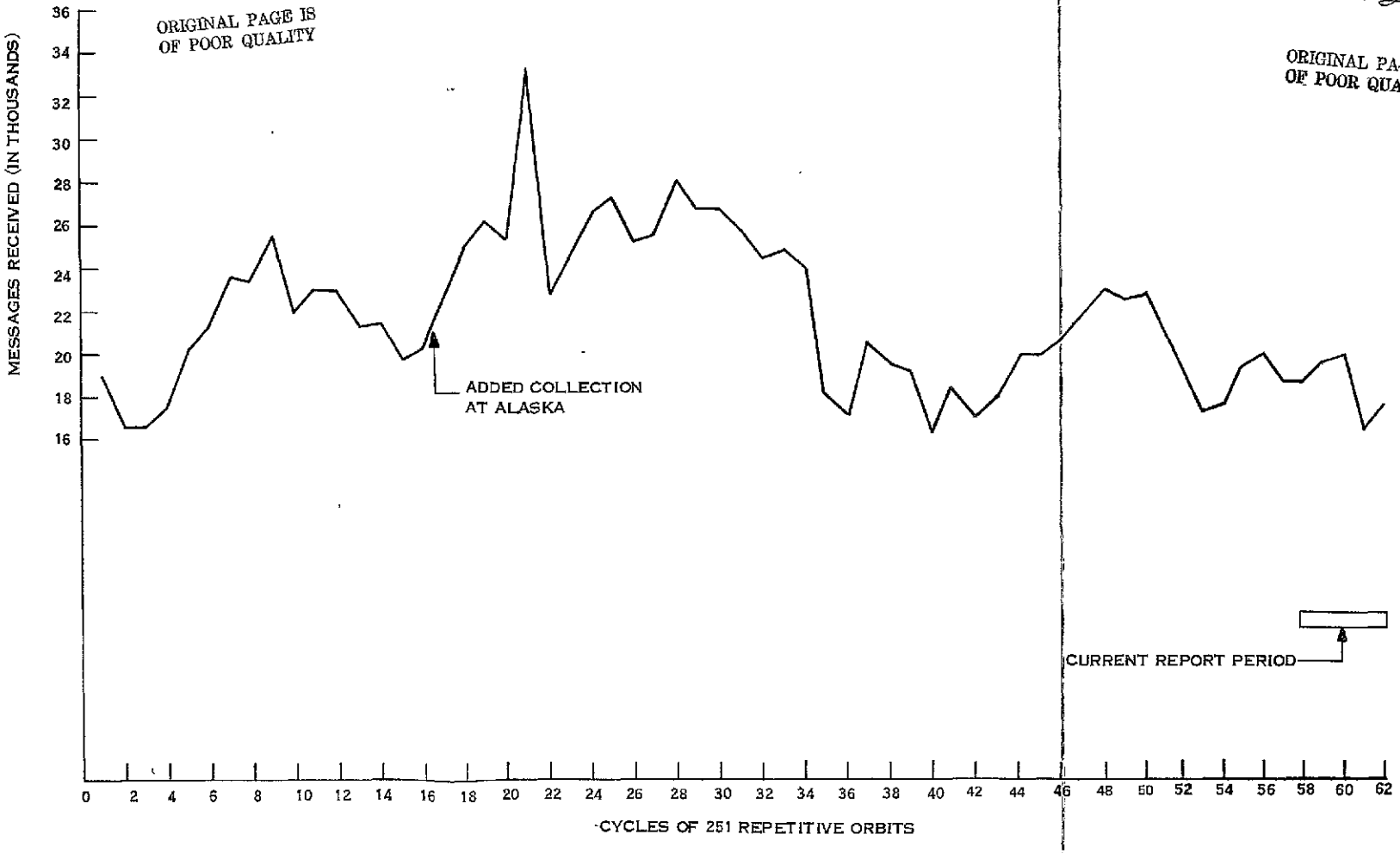

Figure 18-1. DCS Message History

APPENDIX A

LANDSAT-2 ANOMALY LIST

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, 640 741 1575, 1700 2605 3161 4769, 5025 7925 8721, 8804, 9523, 9863, 10268, 10466, 10533 10538, 10603 13309, 14508, 14864, 15553, 16279
3/17/75	MMCA Pitch Flux Density TLM Drift	Off-Line	Telemetry decreased 5 counts and indicates increase 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	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 (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 Recurred and cured by toggling in Orbits 9930, 10199, 10466, 11635, 12191, 12377, 13924, 14630, 15354, 15593, 15621, 15721, 16435 and 16472.
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 Reset returned S/C to normal each time

APPENDIX B

LANDSAT-2 SPACECRAFT ORBIT REFERENCE TABLES

LANDSAT-2

SPACECRAFT ORBIT REFERENCE TABLES

FROM LAUNCH, 5 MARCH 1978 THROUGH DECEMBER 1978

ORBIT 0 TO _____

FLIGHT DAY 0 THROUGH 302

Landsat-2
January 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number														
1	1	1075	14981-14994	113-126	9	59	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
2	2	1076	14995-15008	127-140	10	59	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
3	3	1077	15009-15022	141-154	11	59	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
4	4	1078	15023-15036	155-168	12	59	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
5	5	1079	15037-15050	169-182	13	59	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
6	6	1080	15051-15063	183-195	14	59	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
7	7	1081	15064-15077	196-209	15	59	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
8	8	1082	15078-15091	210-223	16	59	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
9	9	1083	15092-15105	224-237	17	59	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
10	10	1084	15106-15119	238-251	18	59	123	141	159	177	195	213	231	249	016	134	152	070	088	106	
11	11	1085	15120-15133	1- 14	1	60		124	142	160	178	196	214	232	250	017	135	153	071	089	107
12	12	1086	15134-15147	15- 28	2	60		125	143	161	179	197	215	233	251	018	036	054	072	090	108
13	13	1087	15148-15161	29- 42	3	60		126	144	162	180	198	216	234	001	019	037	055	073	091	109
14	14	1088	15162-15175	43- 56	4	60		127	145	163	181	199	217	235	002	020	038	056	074	092	110
15	15	1089	15176-15189	57- 70	5	60		128	146	164	182	200	218	236	003	021	039	057	075	093	111
16	16	1090	15190-15203	71- 84	6	60		129	147	165	183	201	219	237	004	022	040	058	076	094	
17	17	1091	15204-15217	85- 98	7	60	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
18	18	1092	15218-15231	99-112	8	60	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
19	19	1093	15232-15245	113-126	9	60	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
20	20	1094	15246-15259	127-140	10	60	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
21	21	1095	15260-15273	141-154	11	60	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
22	22	1096	15274-15287	155-168	12	60	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
23	23	1097	15288-15301	169-182	13	60	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
24	24	1098	15302-15314	183-195	14	60	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
25	25	1099	15315-15328	196-209	15	60	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
26	26	1100	15329-15342	210-223	16	60	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
27	27	1101	15343-15356	224-237	17	60	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
28	28	1102	15357-15370	238-251	18	60	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
29	29	1103	15371-15384	1- 14	1	61		124	142	160	178	196	214	232	250	017	035	053	071	107	
30	30	1104	15385-15398	15- 28	2	61		125	143	161	179	197	215	233	251	018	036	054	072	089	107
31	31	1105	15399-15412	29- 42	3	61		126	144	162	180	198	216	234	001	019	037	055	073	090	108

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February 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	32	1106	15413-15426	43- 56	4	61		127	145	163	181	199	217	235	002	020	038	056	074	092	110
2	33	1107	15427-15440	57- 70	5	61		128	146	164	182	200	218	236	003	021	039	057	075	093	111
3	34	1108	15441-15454	71- 84	6	61		129	147	165	183	201	219	237	004	022	040	058	076	094	
4	35	1109	15455-15455	85- 98	7	61	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
5	36	1110	15469-15482	99-112	8	61	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
6	37	1111	15483-15496	113-126	9	61	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
7	38	1112	15507-15510	127-140	10	61	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
8	39	1113	15521-15524	141-154	11	61	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
9	40	1114	15535-15548	155-168	12	61	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
10	41	1115	15549-15552	169-182	13	61	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
11	42	1116	15563-15565	183-195	14	61	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
12	43	1117	15576-15579	196-209	15	61	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
13	44	1118	15580-15593	210-223	16	61	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
14	45	1119	15604-15607	224-237	17	61	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
15	46	1120	15618-15621	238-251	18	61	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
16	47	1121	15622-15635	1- 14	1	62		124	142	160	178	196	214	232	250	017	035	053	071	089	107
17	48	1122	15636-15649	15- 28	2	62		125	143	161	179	197	215	233	251	018	036	054	072	090	108
18	49	1123	15650-15663	29- 42	3	62		126	144	162	180	198	216	234	001	019	037	055	073	091	109
19	50	1124	15664-15677	43- 56	4	62		127	145	163	181	199	217	235	002	020	038	056	074	092	110
20	51	1125	15678-15691	57- 70	5	62		128	146	164	182	200	218	236	003	021	039	057	075	093	111
21	52	1126	15692-15705	71- 84	6	62		129	147	165	183	201	219	237	004	022	040	058	076	094	
22	53	1127	15706-15719	85- 98	7	62	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
23	54	1128	15720-15733	99-112	8	62	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
24	55	1129	15734-15747	113-126	9	62	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
25	56	1130	15748-15761	127-140	10	62	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
26	57	1131	15762-15775	141-154	11	62	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
27	58	1132	15776-15789	155-168	12	62	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
28	59	1133	15790-15803	169-182	13	62	118	136	154	172	190	208	226	244	011	029	047	065	083	101	

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March 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	60	1134	15804-15816	183-195	14	62	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
2	61	1135	15817-15830	196-209	15	62	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
3	62	1136	15831-15844	210-223	16	62	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
4	63	1137	15845-15858	224-237	17	62	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
5	64	1138	15859-15872	238-251	18	62	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
6	65	1139	15873-15886	1- 14	1	63		124	142	160	178	196	214	232	250	017	035	053	071	089	107
7	66	1140	15887-15900	15- 28	2	63		125	143	161	179	197	215	233	251	018	036	054	072	090	108
8	67	1141	15901-15914	29- 42	3	63		126	144	162	180	198	216	234	001	019	037	055	073	091	109
9	68	1142	15915-15928	43- 56	4	63		127	145	163	181	199	217	235	002	020	038	056	074	092	110
10	69	1143	15929-15942	57- 70	5	63		128	146	164	182	200	218	236	003	021	039	057	075	093	111
11	70	1144	15943-15956	71- 84	6	63		129	147	165	183	201	219	237	004	022	040	058	076	094	
12	71	1145	15957-15970	85- 98	7	63	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
13	72	1146	15971-15984	99-112	8	63	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
14	73	1147	15985-15998	113-126	9	63	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
15	74	1148	15999-16012	127-140	10	63	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
16	75	1149	16013-16026	141-154	11	63	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
17	76	1150	16027-16040	155-168	12	63	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
18	77	1151	16041-16054	169-182	13	63	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
19	78	1152	16055-16067	183-195	14	63	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
20	79	1153	16068-16081	196-209	15	63	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
21	80	1154	16082-16095	210-223	16	63	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
22	81	1155	16096-16109	224-237	17	63	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
23	82	1156	16110-16123	238-251	18	63	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
24	83	1157	16124-16137	1- 14	1	64		124	142	160	178	196	214	232	250	017	035	053	071	107	
25	84	1158	16138-16151	15- 28	2	64		125	143	161	179	197	215	233	251	018	036	054	072	089	107
26	85	1159	16152-16165	29- 42	3	64		126	144	162	180	198	216	234	001	019	037	055	073	090	108
27	86	1160	16166-16179	43- 56	4	64		127	145	163	181	199	217	235	002	020	038	056	074	091	109
28	87	1161	16180-16193	57- 70	5	64		128	146	164	182	200	218	236	003	021	039	056	075	092	110
29	88	1162	16194-16207	71- 84	6	64		129	147	165	183	201	219	237	004	022	040	058	076	093	111
30	89	1163	16208-16221	85- 98	7	64	112	130	148	166	184	202	220	238	005	023	041	059	077	094	
31	90	1164	16222-16235	99-112	8	64	113	131	149	167	185	203	221	239	006	024	042	060	078	095	

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April 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	91	1165	16236-16249	113-126	9	64	114	132	150	168	186	204	222	240	007	025	043	061	079	097
2	92	1166	16250-16263	127-140	10	64	115	133	151	169	187	205	223	241	008	026	044	062	080	098
3	93	1167	16264-16277	141-154	11	64	116	134	152	170	188	206	224	242	009	027	045	063	081	099
4	94	1168	16278-16291	155-168	12	64	117	135	153	171	189	207	225	243	010	028	046	064	082	100
5	95	1169	16292-16305	169-182	13	64	118	136	154	172	190	208	226	244	011	029	047	065	083	101
6	96	1170	16306-16318	183-195	14	64	119	137	155	173	191	209	227	245	012	030	048	066	084	102
7	97	1171	16319-16332	196-209	15	64	120	138	156	174	192	210	228	246	013	031	049	067	085	103
8	98	1172	16333-16346	210-223	16	64	121	139	157	175	193	211	229	247	014	032	050	068	086	104
9	99	1173	16347-16360	224-237	17	64	122	140	158	176	194	212	230	248	015	033	051	069	087	105
10	100	1174	16361-16374	238-251	18	64	123	141	159	177	195	213	231	249	016	034	052	070	088	106
11	101	1175	16375-16388	1- 14	1	65		124	142	160	178	196	214	232	250	017	035	053	071	089	107
12	102	1176	16389-16402	15- 28	2	65		125	143	161	179	197	215	233	251	018	036	054	072	090	108
13	103	1177	16403-16416	29- 42	3	65		126	144	162	180	198	216	234	001	019	037	055	073	091	109
14	104	1178	16417-16430	43- 56	4	65		127	145	163	181	199	217	235	002	020	038	056	074	092	110
15	105	1179	16431-16444	57- 70	5	65		128	146	164	182	200	218	236	003	021	039	057	075	093	111
16	106	1180	16445-16458	71- 84	6	65		129	147	165	183	201	219	237	004	022	040	058	076	094	
17	107	1181	16459-16472	85- 98	7	65	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
18	108	1182	16473-16486	99-112	8	65	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
19	109	1183	16487-16500	113-126	9	65	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
20	110	1184	16501-16514	127-140	10	65	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
21	111	1185	16515-16528	141-154	11	65	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
22	112	1186	16529-16542	155-168	12	65	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
23	113	1187	16543-16556	169-182	13	65	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
24	114	1188	16557-16569	183-195	14	65	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
25	115	1189	16570-16583	196-209	15	65	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
26	116	1190	16584-16597	210-223	16	65	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
27	117	1191	16598-16611	224-237	17	65	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
28	118	1192	16612-16625	238-251	18	65	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
29	119	1193	16626-16639	1- 14	1	66		124	142	160	178	196	214	232	250	017	035	053	071	089	107
30	120	1194	16640-16653	15- 28	2	66		125	143	161	179	197	215	233	251	018	036	054	072	089	107

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May 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	121	1195	16654-16667	29- 42	3	66		126	144	162	180	198	216	234	001	019	037	055	073	091	109
2	122	1196	16668-16681	43- 56	4	66		127	145	163	181	199	217	235	002	020	038	056	074	092	110
3	123	1197	16682-16695	57- 70	5	66		128	146	164	182	200	218	236	003	021	039	057	075	093	111
4	124	1198	16696-16709	71- 84	6	66		129	147	165	183	201	219	237	004	022	040	058	076	094	
5	125	1199	16710-16723	85- 98	7	66	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
6	126	1200	16724-16737	99-112	8	66	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
7	127	1201	16738-16751	113-126	9	66	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
8	128	1202	16752-16765	127-140	10	66	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
9	129	1203	16766-16779	141-154	11	66	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
10	130	1204	16780-16793	155-168	12	66	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
11	131	1205	16794-16807	169-182	13	66	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
12	132	1206	16808-16820	183-195	14	66	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
13	133	1207	16821-16834	196-209	15	66	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
14	134	1208	16835-16848	210-223	16	66	121	139	157	175	193	211	229	247	014	032	050	068	086	101	
15	135	1209	16849-16862	224-237	17	66	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
16	136	1210	16863-16876	238-251	18	66	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
17	137	1211	16877-16890	1- 14	1	67		124	142	160	178	196	214	232	250	017	035	053	071	089	107
18	138	1212	16891-16904	15- 28	2	67		125	143	161	179	197	215	233	251	018	036	054	072	090	108
19	139	1213	16905-16918	29- 42	3	67		126	144	162	180	198	216	234	001	019	037	055	073	091	109
20	140	1211	16919-16932	43- 56	4	67		127	145	163	181	199	217	235	002	020	038	056	074	092	110
21	141	1215	16933-16946	57- 70	5	67		128	146	164	182	200	218	236	003	021	039	057	075	093	111
22	142	1216	16947-16960	71- 84	6	67		129	147	165	183	201	219	237	004	022	040	058	076	094	
23	143	1217	16961-16974	85- 98	7	67	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
24	144	1218	16975-16988	99-112	8	67	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
25	145	1219	16989-17002	113-126	9	67	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
26	146	1220	17003-17016	127-140	10	67	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
27	147	1221	17017-17030	141-151	11	67	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
28	148	1222	17031-17044	155-168	12	67	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
29	149	1223	17045-17058	169-182	13	67	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
30	150	1224	17059-17071	183-195	14	67	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
31	151	1225	17072-17085	186-209	15	67	120	138	156	174	192	210	228	246	013	031	019	067	085	103	

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June 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	152	1226	17086-17099	210-223	16	67	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
2	153	1227	17100-17113	224-237	17	67	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
3	151	1228	17114-17127	238-351	18	67	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
4	155	1229	17128-17141	1- 14	1	68		124	142	160	178	196	214	232	250	017	035	053	071	089	107
5	156	1230	17142-17155	15- 28	2	68		125	143	161	179	197	215	233	251	018	036	054	072	090	108
6	157	1231	17156-17169	29- 42	3	68		126	144	162	180	198	216	234	001	019	037	055	073	091	109
7	158	1232	17170-17183	43- 56	4	68		127	145	163	181	199	217	235	002	020	038	056	074	092	110
8	159	1233	17184-17197	57- 70	5	68		128	146	164	182	200	218	236	003	021	039	057	075	093	111
9	160	1234	17198-17211	71- 84	6	68		129	147	165	183	201	217	237	004	022	040	058	076	094	
10	161	1235	17212-17225	85- 98	7	68	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
11	162	1236	17226-17239	99-112	8	68	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
12	163	1237	17240-17253	113-126	9	68	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
13	164	1238	17254-17267	127-140	10	68	115	133	151	169	187	205	223	211	008	026	044	062	080	098	
14	165	1239	17268-17281	141-154	11	68	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
15	166	1240	17282-17295	155-168	12	68	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
16	167	1241	17296-17309	169-182	13	68	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
17	168	1242	17310-17322	183-195	14	68	119	137	155	173	191	209	227	245	012	030	048	066	081	102	
18	169	1243	17323-17336	196-209	15	68	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
19	170	1244	17337-17350	210-223	16	68	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
20	171	1245	17351-17364	224-237	17	68	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
21	172	1246	17365-17378	238-251	18	68	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
22	173	1247	17379-17392	1- 14	1	69		124	142	160	178	196	214	232	250	017	035	053	071	107	
23	174	1248	17393-17406	15- 28	2	69		125	143	161	179	197	215	233	251	018	036	054	072	089	107
24	175	1249	17107-17420	29- 42	3	69		126	144	162	180	198	216	234	001	019	037	055	073	090	108
25	176	1250	17121-17434	43- 56	4	69		127	145	163	181	199	217	235	002	020	038	056	074	091	109
26	177	1251	17435-17448	57- 70	5	69		128	146	164	182	200	218	236	003	021	039	057	075	092	110
27	178	1252	17449-17462	71- 84	6	69		129	147	165	183	201	219	237	004	022	040	058	076	093	111
28	179	1253	17463-17476	85- 98	7	69	112	130	148	166	184	202	220	238	005	023	041	059	077	094	
29	180	1254	17177-17490	99-112	8	69	113	131	149	167	185	203	221	239	006	024	042	060	078	095	
30	181	1255	17191-17504	113-126	9	69	114	132	150	168	186	204	222	240	007	025	043	061	079	096	

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July 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	182	1256	17505-17518	127-140	10	69	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
2	183	1257	17519-17532	141-154	11	69	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
3	184	1258	17533-17546	155-168	12	69	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
4	185	1259	17547-17560	169-182	13	69	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
5	186	1260	17561-17563	183-195	14	69	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
6	187	1261	17564-17587	196-209	15	69	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
7	188	1262	17588-17601	210-223	16	69	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
8	189	1263	17602-17615	224-237	17	69	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
9	190	1264	17616-17629	238-251	18	69	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
10	191	1265	17630-17643	1- 14	1	70		124	142	160	178	196	214	232	250	017	035	053	071	089	107
11	192	1266	17644-17657	15- 28	2	70		125	143	161	179	197	215	233	251	018	036	054	072	090	108
12	193	1267	17658-17671	29- 42	3	70		126	144	162	180	198	216	234	001	019	037	055	073	091	109
13	194	1268	17672-17685	43- 56	4	70		127	145	163	181	199	217	235	002	020	038	056	074	092	110
14	195	1269	17686-17699	57- 70	5	70		128	146	164	182	200	218	236	003	021	039	057	075	093	111
15	196	1270	17700-17713	71- 84	6	70		129	147	165	183	201	219	237	004	022	040	058	076	094	
16	197	1271	17714-17727	85- 98	7	70	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
17	198	1272	17728-17741	99-112	8	70	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
18	199	1273	17742-17755	113-126	9	70	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
19	200	1274	17756-17769	127-140	10	70	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
20	201	1275	17770-17783	141-154	11	70	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
21	202	1276	17784-17797	155-168	12	70	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
22	203	1277	17798-17811	169-182	13	70	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
23	204	1278	17812-17824	183-195	14	70	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
24	205	1279	17825-17838	196-209	15	70	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
25	206	1280	17839-17852	210-223	16	70	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
26	207	1281	17853-17866	224-237	17	70	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
27	208	1282	17867-17880	238-251	18	70	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
28	209	1283	17881-17894	1- 14	1	71		124	142	160	178	196	214	232	250	017	035	053	071	107	
29	210	1284	17895-17908	15- 28	2	71		125	143	161	179	197	215	233	251	018	036	054	072	089	107
30	211	1285	17909-17922	29- 42	3	71		126	144	162	180	198	216	234	001	019	037	055	073	090	108
31	212	1286	17923-17936	43- 56	4	71		127	145	163	181	199	217	235	002	020	038	056	074	091	109

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August 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	213	1287	17937-17950	57- 70	5	71		128	146	164	182	200	218	236	003	021	039	057	075	093	111
2	214	1288	17951-17964	71- 84	6	71		129	147	165	183	201	219	237	004	022	040	058	076	094	
3	215	1289	17965-17978	85- 98	7	71	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
4	216	1290	17979-17992	99-112	8	71	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
5	217	1291	17993-18006	113-126	9	71	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
6	218	1292	18007-18020	127-140	10	71	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
7	219	1293	18021-18034	141-154	11	71	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
8	220	1294	18035-18048	155-168	12	71	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
9	221	1295	18049-18062	169-182	13	71	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
10	222	1296	18063-18075	183-195	14	71	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
11	223	1297	18076-18089	196-209	15	71	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
12	224	1298	18090-18103	210-223	16	71	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
13	225	1299	18104-18117	224-237	17	71	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
14	226	1300	18118-18131	238-251	18	71	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
15	227	1301	18132-18145	1- 14	1	72		124	142	160	178	196	214	232	250	017	035	053	071	107	
16	228	1302	18146-18159	15- 28	2	72		125	143	161	179	197	215	233	251	018	036	054	072	089	107
17	229	1303	18160-18173	29- 42	3	72		126	144	162	180	198	216	234	001	019	037	055	073	090	108
18	230	1304	18174-18187	43- 56	4	72		127	145	163	181	199	217	235	002	020	038	056	074	091	109
19	231	1305	18188-18201	57- 70	5	72		128	146	164	182	200	218	236	003	021	039	057	075	092	110
20	232	1306	18202-18215	71- 84	6	72		129	147	165	183	201	219	237	004	022	040	058	076	093	111
21	233	1307	18216-18229	85- 98	7	72	112	130	148	166	184	202	220	238	005	023	041	059	077	094	
22	234	1308	18230-18243	99-112	8	72	113	131	149	167	185	203	221	239	006	024	042	060	078	095	
23	235	1309	18244-18257	113-126	9	72	114	132	150	168	186	204	222	240	007	025	043	061	079	096	
24	236	1310	18258-18271	127-140	10	72	115	133	151	169	187	205	223	241	008	026	044	062	080	097	
25	237	1311	18272-18286	141-154	11	72	116	134	152	170	188	206	224	242	009	027	045	063	081	098	
26	238	1312	18286-18299	155-168	12	72	117	135	153	171	189	207	225	243	010	028	046	064	082	099	
27	239	1313	18300-18313	169-182	13	72	118	136	154	172	190	208	226	244	011	029	047	065	083	100	
28	240	1314	18314-18326	183-195	14	72	119	137	155	173	191	209	227	245	012	030	048	066	084	101	
29	241	1315	18327-18340	196-209	15	72	120	138	156	174	192	210	228	246	013	031	049	067	085	102	
30	242	1316	18341-18354	210-223	16	72	121	139	157	175	193	211	229	247	014	032	050	068	086	103	
31	243	1317	18355-18368	224-237	17	72	122	140	158	176	194	212	230	248	015	033	051	069	087	104	

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September 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	244	1318	18369-18382	238-251	18	72	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
2	245	1319	18383-18396	1- 14	1	73		124	142	160	178	196	214	232	250	017	035	053	071	089	107
3	246	1320	18397-18410	15- 28	2	73		125	143	161	179	197	215	233	251	018	036	054	072	090	108
4	247	1321	18411-18424	29- 42	3	73		126	144	162	180	198	216	234	001	019	037	055	073	091	109
5	248	1322	18425-18438	43- 56	4	73		127	145	163	181	199	217	235	002	020	038	056	074	092	110
6	249	1323	18438-18452	57- 70	5	73		128	146	164	182	200	218	236	003	021	039	057	075	093	111
7	250	1324	18453-18466	71- 84	6	73		129	147	165	183	201	219	237	004	022	040	058	076	094	
8	251	1325	18467-18480	85- 98	7	73	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
9	252	1326	18481-18494	99-112	8	73	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
10	253	1327	18495-18508	113-126	9	73	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
11	254	1328	18509-18522	127-140	10	73	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
12	255	1329	18523-18536	141-154	11	73	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
13	256	1330	18537-18550	155-168	12	73	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
14	257	1331	18551-18564	169-182	13	73	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
15	258	1332	18565-18577	183-195	14	73	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
16	259	1333	18578-18591	196-209	15	73	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
17	260	1334	18592-18605	210-223	16	73	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
18	261	1335	18506-18619	224-237	17	73	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
19	262	1336	18620-18633	238-251	18	73	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
20	263	1337	18634-18647	1- 14	1	74		124	142	160	178	196	214	232	250	017	035	053	071	107	
21	264	1338	18648-18661	15- 28	2	74		125	143	161	179	197	215	233	251	018	036	054	072	089	107
22	265	1339	18662-18675	29- 42	3	74		126	144	162	180	198	216	234	001	019	037	055	073	090	108
23	266	1340	18676-18689	43- 56	4	74		127	145	163	181	199	217	235	002	020	038	056	074	091	109
24	267	1341	18690-18703	57- 70	5	74		128	146	164	182	200	218	236	003	021	039	057	075	092	110
25	268	1342	18704-18717	71- 84	6	74		129	147	165	183	201	219	237	004	022	040	058	076	093	111
26	269	1343	18718-18731	85- 98	7	74	112	130	148	166	184	202	220	238	005	023	041	059	077	094	
27	270	1344	18732-18745	99-112	8	74	113	131	149	167	185	203	221	239	006	024	042	060	078	095	
28	271	1345	18746-18759	113-126	9	74	114	132	150	168	186	204	222	240	007	025	043	061	079	096	
29	272	1346	18750-18773	127-140	10	74	115	133	151	169	187	205	223	241	008	026	044	062	080	097	
30	273	1347	18774-18787	141-154	11	74	116	134	152	170	188	206	224	242	009	027	045	063	081	098	

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October 1978

Date	GMT Day	Flight Day	Spacecraft Orbit	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	274	1348	18788-18801	155-168	12	74	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
2	275	1349	18802-18815	169-182	13	74	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
3	276	1350	18816-18828	183-195	14	74	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
4	277	1351	18829-18842	196-209	15	74	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
5	278	1352	18843-18856	210-223	16	74	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
6	279	1353	18857-18870	224-237	17	74	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
7	280	1354	18871-18884	238-251	18	74	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
8	281	1355	18885-18898	1- 14	1	75		124	142	160	178	196	214	232	250	017	035	053	071	089	107
9	282	1356	18899-18912	15- 28	2	75		125	143	161	179	197	215	233	251	018	036	054	072	090	108
10	283	1357	18913-18926	29- 42	3	75		126	144	162	180	198	216	234	001	019	037	055	073	091	109
11	284	1358	18927-18940	43- 56	4	75		127	145	163	181	199	217	235	002	020	038	056	074	092	110
12	285	1359	18941-18954	57- 70	5	75		128	146	164	182	200	218	236	003	021	039	057	075	093	111
13	286	1360	18955-18968	71- 84	6	75		129	147	165	183	201	219	237	004	022	040	058	076	094	
14	287	1361	18969-18982	85- 98	7	75	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
15	288	1362	18983-18996	99-112	8	75	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
16	289	1363	18997-19010	113-126	9	75	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
17	290	1364	19011-19024	127-140	10	75	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
18	291	1365	19025-19038	141-154	11	75	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
19	292	1366	19039-19052	155-168	12	75	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
20	293	1367	19053-19066	169-182	13	75	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
21	294	1368	19067-19079	183-195	14	75	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
22	295	1369	19080-19093	196-209	15	75	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
23	296	1370	19094-19107	210-223	16	75	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
24	297	1371	19108-19121	224-237	17	75	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
25	298	1372	19122-19135	238-251	18	75	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
26	299	1373	19136-19149	1- 14	1	76		124	142	160	178	196	214	232	250	017	035	053	071	107	
27	300	1374	19150-19163	15- 28	2	76		125	143	161	179	197	215	233	251	018	036	054	072	089	107
28	301	1375	19164-19177	29- 42	3	76		126	144	162	180	198	216	234	001	019	037	055	073	090	108
29	302	1376	19178-19191	43- 56	4	76		127	145	163	181	199	217	235	002	020	038	056	074	091	109
30	303	1377	19192-19205	57- 70	5	76		128	146	164	182	200	218	236	003	021	039	057	075	092	110
31	304	1378	19206-19219	71- 84	6	76		129	147	165	183	201	219	237	004	022	040	058	076	093	111

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November 1978

Date	GMT Day	Flight Day	Spacecraft Orbit	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	305	1379	19220-19233	85- 98	7	76	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
2	306	1380	19234-19247	99-112	8	76	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
3	307	1381	19248-19261	113-126	9	76	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
4	308	1382	19262-19275	127-140	10	76	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
5	309	1383	19276-19289	141-154	11	76	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
6	310	1384	19290-19303	155-168	12	76	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
7	311	1385	19304-19317	169-182	13	76	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
8	312	1386	19318-19330	183-195	14	76	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
9	313	1387	19331-19344	196-209	15	76	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
10	314	1388	19345-19358	210-223	16	76	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
11	315	1389	19359-19372	224-237	17	76	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
12	316	1390	19373-19386	238-251	18	76	123	141	159	177	195	213	231	249	016	034	052	070	088	106	
13	317	1391	19387-19400	1- 14	1	77		124	142	160	178	196	214	232	250	017	035	053	071	089	107
14	318	1392	19401-19414	15- 28	2	77		125	143	161	179	197	215	233	251	018	036	054	072	090	108
15	319	1393	19415-19428	29- 42	3	77		126	144	162	180	198	216	234	001	019	037	055	073	091	109
16	320	1394	19429-19442	43- 56	4	77		127	145	163	181	199	217	235	002	020	038	056	074	092	110
17	321	1395	19443-19456	57- 70	5	77		128	146	164	182	200	218	236	003	021	039	057	075	093	111
18	322	1396	19457-19470	71- 84	6	77		129	147	165	183	201	219	237	004	022	040	058	076	094	
19	323	1397	19471-19484	85- 98	7	77	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
20	321	1398	19485-19498	99- 112	8	77	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
21	325	1399	19499-19512	113-126	9	77	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
22	326	1400	19513-19526	127-140	10	77	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
23	327	1401	19527-19540	141-154	11	77	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
24	328	1402	19541-19554	155-168	12	77	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
25	329	1403	19555-19568	169-182	13	77	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
26	330	1404	19569-19581	183-195	14	77	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
27	331	1405	19582-19595	196-209	15	77	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
28	332	1406	19596-19609	210-223	16	77	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
29	333	1407	19610-19623	224-237	17	77	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
30	334	1408	19624-19637	238-251	18	77	123	141	159	177	195	213	231	249	016	034	052	070	088	106	

Landsat-2
December 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	335	1409	19638-19651	1- 14	1	78		124	142	160	178	196	214	232	250	017	035	053	071	089	107
2	336	1410	19652-19665	15- 28	2	78		125	143	161	179	197	215	233	251	018	036	054	072	090	108
3	337	1411	19666-19679	29- 42	3	78		126	144	162	180	198	216	234	001	019	037	055	073	091	109
4	338	1412	19680-19693	43- 56	4	78		127	145	163	181	199	217	235	002	020	038	056	074	092	110
5	339	1413	19694-19707	57- 70	5	78		128	146	164	182	200	218	236	003	021	039	057	075	093	111
6	340	1414	19708-19721	71- 84	6	78		129	147	165	183	201	219	237	004	022	040	058	076	094	
7	341	1415	19722-19735	85- 98	7	78	112	130	148	166	184	202	220	238	005	023	041	059	077	095	
8	342	1416	19736-19749	99-112	8	78	113	131	149	167	185	203	221	239	006	024	042	060	078	096	
9	343	1417	19750-19763	113-126	9	78	114	132	150	168	186	204	222	240	007	025	043	061	079	097	
10	344	1418	19764-19777	127-140	10	78	115	133	151	169	187	205	223	241	008	026	044	062	080	098	
11	345	1419	19778-19791	141-154	11	78	116	134	152	170	188	206	224	242	009	027	045	063	081	099	
12	346	1420	19792-19805	155-168	12	78	117	135	153	171	189	207	225	243	010	028	046	064	082	100	
13	347	1421	19806-19819	169-182	13	78	118	136	154	172	190	208	226	244	011	029	047	065	083	101	
14	348	1422	19820-19832	183-195	14	78	119	137	155	173	191	209	227	245	012	030	048	066	084	102	
15	349	1423	19833-19846	196-209	15	78	120	138	156	174	192	210	228	246	013	031	049	067	085	103	
16	350	1424	19847-19860	210-223	16	78	121	139	157	175	193	211	229	247	014	032	050	068	086	104	
17	351	1425	19861-19874	224-237	17	78	122	140	158	176	194	212	230	248	015	033	051	069	087	105	
18	352	1426	19875-19888	238-251	18	78	123	141	159	177	195	213	231	249	016	031	052	070	088	106	
19	353	1427	19889-19902	1- 14	1	79		124	142	160	178	196	214	232	250	017	035	053	071	107	
20	354	1428	19903-19916	15- 28	2	79		125	143	161	179	197	215	233	251	018	036	054	072	089	107
21	355	1429	19917-19930	29- 42	3	79		126	144	162	180	198	216	234	001	019	037	055	073	090	108
22	356	1430	19931-19944	43- 56	4	79		127	145	163	181	199	217	235	002	020	038	056	074	091	109
23	357	1431	19945-19958	57- 70	5	79		128	146	164	182	200	218	236	003	021	039	057	175	092	110
24	358	1432	19959-19972	71- 84	6	79		129	147	165	183	201	219	237	004	022	040	058	176	093	111
25	359	1433	19973-19986	85- 98	7	79	112	130	148	166	184	202	220	238	005	023	041	059	077	094	
26	360	1434	19987-20000	99-112	8	79	113	131	149	167	185	203	221	239	006	024	042	060	078	095	
27	361	1435	20001-20014	113-126	9	79	114	132	150	168	186	204	222	240	007	025	043	061	079	096	
28	362	1436	20015-20028	127-140	10	79	115	133	151	169	187	205	223	241	008	026	044	062	080	097	
29	363	1437	20029-20042	141-154	11	79	116	134	152	170	188	206	224	242	009	027	045	063	081	098	
30	364	1438	20043-20056	155-168	12	79	117	135	153	171	189	207	225	243	010	028	046	064	082	099	
31	365	1439	20057-20070	169-182	13	79	118	136	154	172	190	208	226	244	011	029	047	065	083	100	

APPENDIX C

LANDSAT-2 DOCUMENTS ISSUED THIS REPORT PERIOD

APPENDIX C

LANDSAT-2 DOCUMENTS ISSUED THIS REPORT PERIOD

No	Document No.	Title and Data

None issued this report period

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

INTRODUCTION

This is the 2nd report in a continuing series of documents issued at launch, and quarterly thereafter, to present flight performance analyses of the Landsat-3 spacecraft. The previously issued document is:

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

This report contains analysis of performance for Orbits 0 to 565 for Landsat-3.

SECTION I

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 "1's". The "B" COMSTOR was then taken out of operational use.

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

The spacecraft continues to perform its mission satisfactory with all five bands of the MSS, the RBV, both Wideband Video Recorders, and both Wideband Telemetry Systems in use. Table 1-1 shows cumulative in-orbit payload system performance.

Table 1-1. In-Orbit Payload Systems Performance Launch thru Orbit 722 (4/26/78), Landsat-3

RBV	Total Scenes Imaged	1639
	Total Area Imaged (million sq. n mi.	14.3
	ON TIME (hr.)	19.3
	ON/OFF Cycles	225
	% Real Time Images	85
	% Recorded Images	15
MSS	Total Scenes Imaged	6223
	Total Area Imaged (million sq. n mi.	54.3
	ON TIME (hr.)	83.7
	ON/OFF Cycles	687
	% Real Time Images	78
	% Recorded Images	22
DCS	Messages at OCC	59251
	Users	48
	ON TIME (hr.)	1067.1
WPA-1	ON TIME (hr.)	16.6
	ON/OFF Cycles	156
WPA-2	ON TIME (hr.)	67.4
	ON/OFF Cycles	448
WBVTR-1	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	Time Head-Tape Contact (hr.)	5.6
	Cycles Head-Tape Contact	114
	ON TIME (hr.)	7.1
WBVTR-2	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	MFSE Count in P/B	<5
	Time Head-Tape Contact (hr.)	29.2
	Cycles Head-Tape Contact	518
	ON TIME (hr.)	36.9

SECTION 2

ORBITAL PARAMETERS

LANDSAT-3

SECTION 2

ORBITAL PARAMETERS

Landsat-3's orbit was optimized after launch with a total of 6 orbit adjust operations. By Orbit 115 (13 March 1978) Landsat-3's ground track drift was within -1 nm longitude error and only a 4.2 second (+X) trim burn during Orbit 253 (22 March 1978) was required to complete the normal post launch orbit adjust maneuvers.

Errors in longitude as a function of time from launch and number of orbit maintenance burns are shown in Figure 2-1.

Currently, a Pitch Position Bias program is not being employed with Landsat-3, however, it is anticipated a program will be developed in the future to offset the need for periodic orbit maintenance.

Figure 2-2 shows a plot of Landsat-3's local mean times for descending equatorial crossings and for 24 April 1978 the local mean time was 09:30:58 LMT.

Phasing relationships between Landsat-2 and Landsat-3 are shown in Figure 2-3; per Figure 2-3, Landsat-3 is leading Landsat-2 by 27.43 minutes referenced to the descending equatorial crossing.

Table 2-1 tabulates the Brouwer mean orbital elements from launch through 20 April 1978.

Figure 2-1. Landsat-3 Ground Track

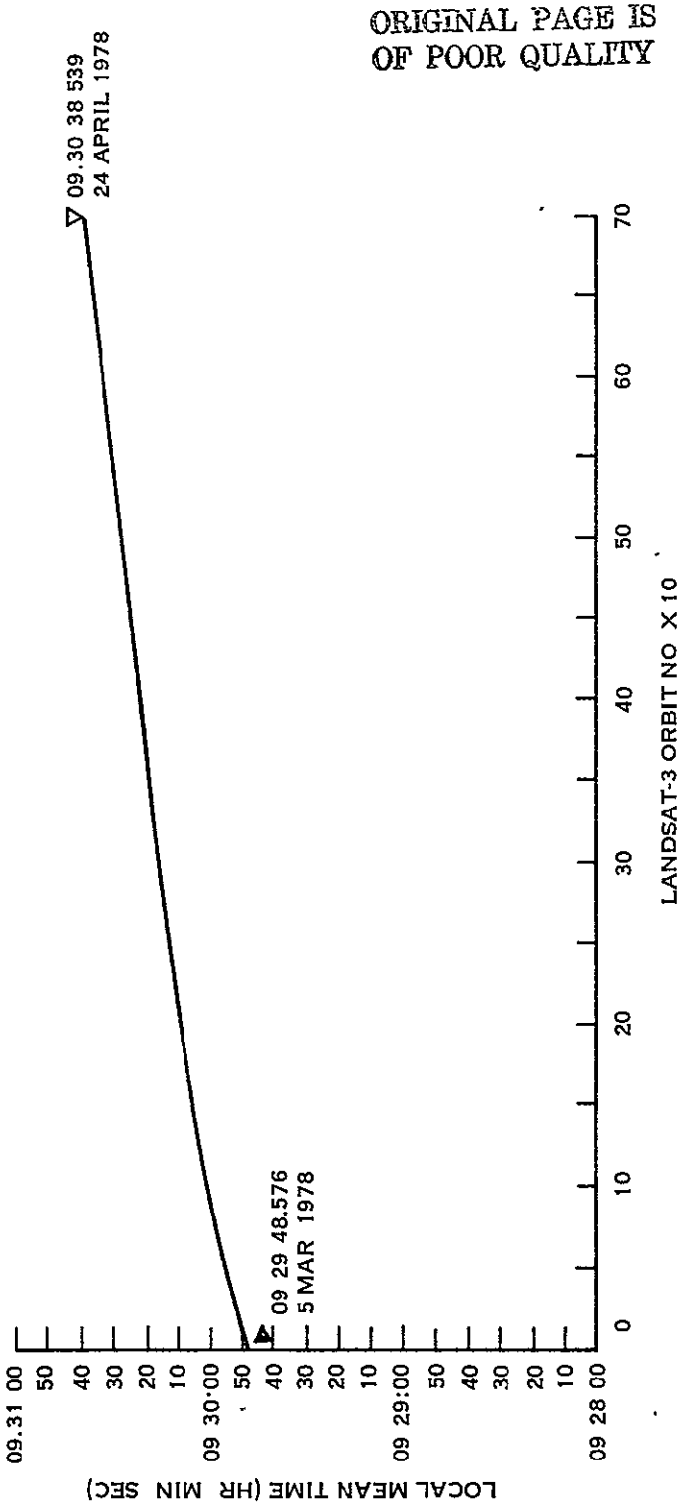

Figure 2-2. Local Mean Time at Descending Node, Landsat-3

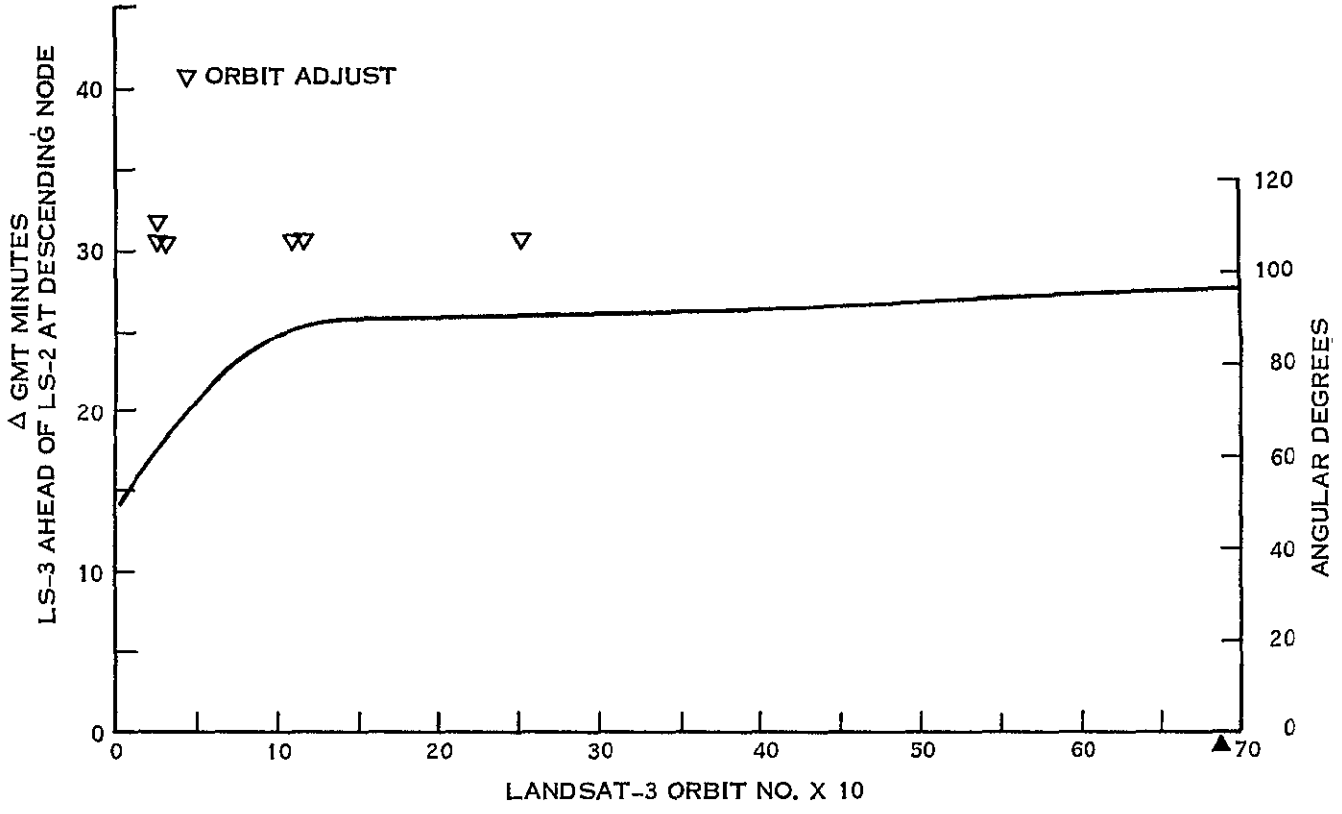

Figure 2-3. Drift in Angular Phasing Between Landsat-2 and Landsat-3

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

1. Post Launch.
2. After the sequence of phasing maneuvers completed in Orbit 115.

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 are expected to support the Landsat-3 mission through 1978. 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 2 months in orbit was 1 93 percent. The projected values of midday array current 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. Because of the degradation of the solar array, the actual array current plot was lower than the predicted array current plot.

The battery packs on-line averaged 11 to 13% 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 14 5^{o} to 19.8^{o}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 variation in sun angle to orbit plane and solar panels for Landsat-3.

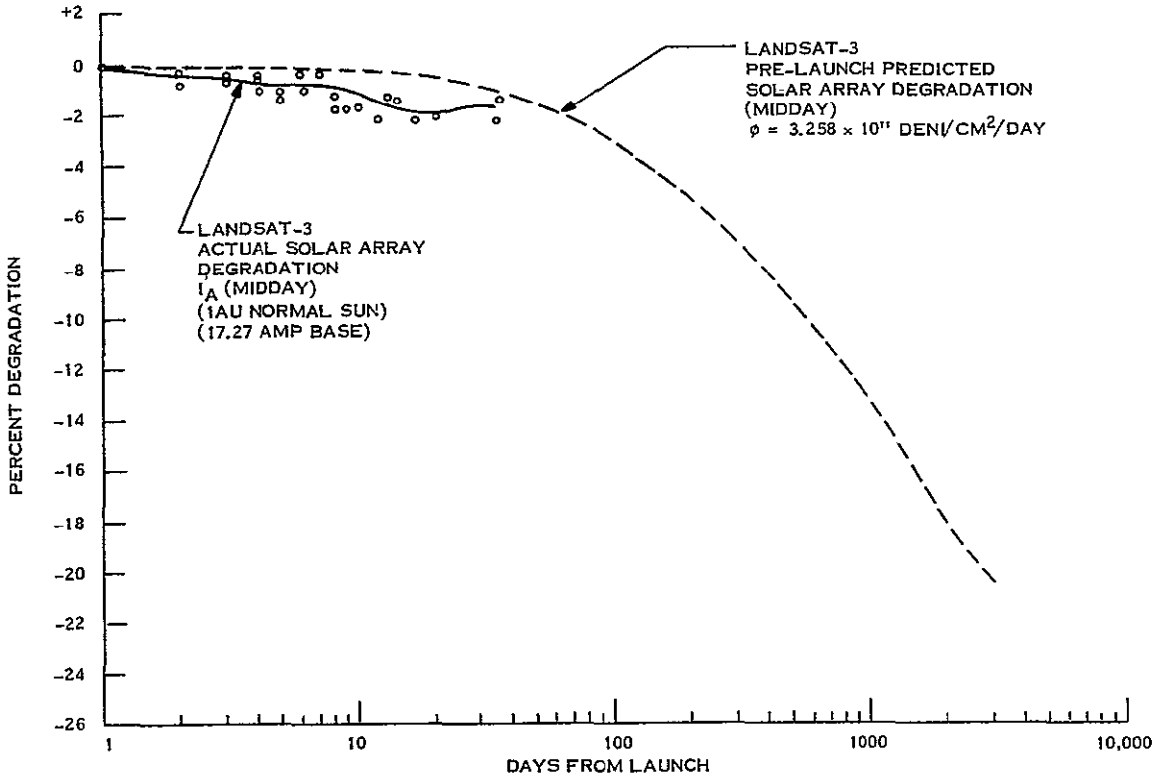

Figure 3-1. Landsat-3 I_A (Midday) Degradation vs Days

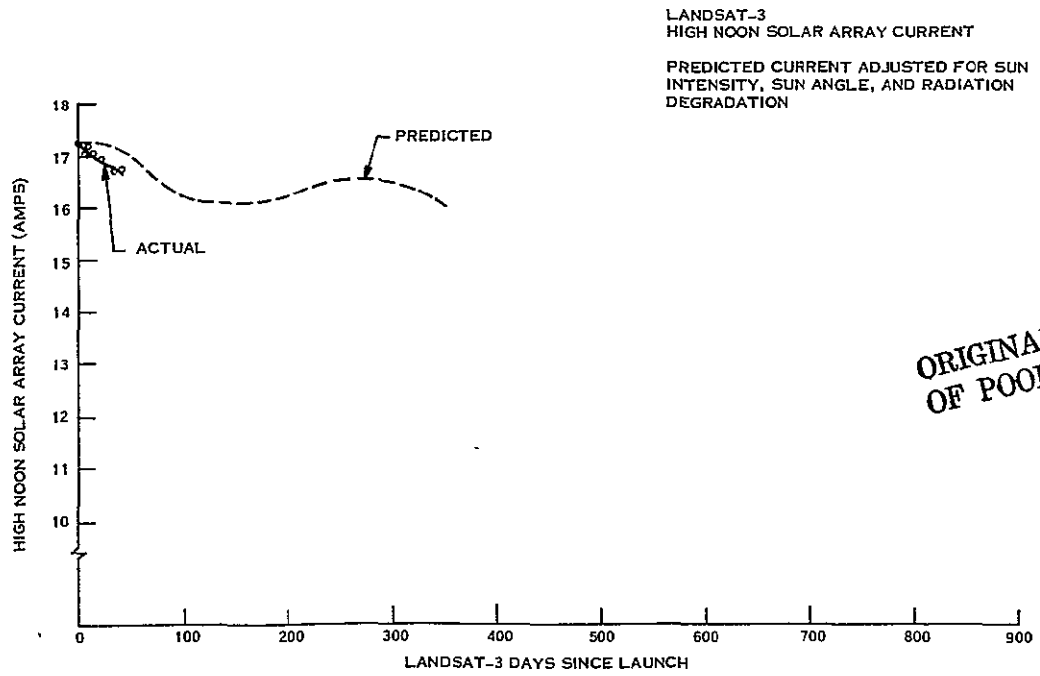

Figure 3-2 Landsat-3 Midday Solar Array Current

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

Pwr Mgmt Orbit No	Orbit					
	5	28	56	140	340	540
Batt 1 Max	-31 64	-30 70	-32 41	-32 58	-33 09	-31 39
2 Chge	-31 64	-30 70	-32 41	-32, 58	-33 09	-31 30
3 Volt	-31 75	-30 84	-32 50	-32 67	-33 17	-31 50
4	-31 64	-30 70	-32 32	-32 49	-33 00	-31 30
5	-31 64	-30 79	-32 41	-32 75	-33 09	-31 39
6	-31 73	-30 79	-32 41	-32 75	-33 17	-31 39
7	-31 86	-30 94	-32 54	-32 71	-33 21	-31 53
8	-31 64	-30 70	-32 32	-32 49	-33 00	-31 30
Average	-31 69	-30 77	-32 41	-32 63	-33 10	-31 39
Batt 1 End-of-Night	-28 83	-27 73	-29 60	-29 43	-29 85	-28, 66
2 Volt	-28 83	-27 73	-29 51	-29 34	-29 85	-28 66
3	-29 00	-27 92	-29 75	-29, 59	-30 00	-28, 84
4	-28 83	-27 73	-29, 51	-29 34	-29 85	-28 58
5	-28 92	-27 81	-29, 60	-29 51	-29 94	-28 66
6	-28 92	-27 81	-29, 60	-29 51	-29 94	-28, 75
7	-29 00	-27 91	-29 76	-29 59	-30, 10	-28 92
8	-28 75	-27 64	-29 51	-29 34	-29 85	-28 58
Average	-28 88	-27 78	-29 60	-29 46	-29 92	-28 70
Batt 1 Chge	12 47	12 64	12 51	12 39	12 50	12 67
2 Share	12 05	12 24	11 78	11 57	12 09	12, 39
3 (%)	11 95	11 50	11 64	11 73	11 87	11 97
4	12 19	12 38	12 31	12 63	12 04	11 58
5	13 95	13 40	14 25	14 09	13 64	13 38
6	12 65	12 62	12 54	12 50	12 93	13, 16
7	12 49	12 56	12 84	12, 99	12 59	12 20
8	12, 24	12 66	12 11	12 11	12 34	12 65
Batt 1 Load	12 97	12 72	12 85	12 43	12 68	12 87
2 Share	12 54	12 17	11 94	11 57	12 05	12 17
3 (%)	12 35	11 94	11 99	11 98	12 47	12 48
4	11 91	12 26	12 06	12 72	12 44	11 91
5	12 90	13 27	13 88	13, 95	13 49	13 35
6	12 03	12 13	11 97	11 87	12 07	12 46
7	12 51	12 71	12 80	13 21	12 62	12, 72
8	12 79	12 80	12 51	12 26	12 17	12 04
Batt 1 Temp	17 37	16 73	15 70	13 82	14 92	15 34
2 in	15 80	15 18	14 31	12 45	13 65	14 44
3 (°C)	17 12	16 17	15 26	14 09	15 79	15 82
4	19 61	20 66	19 46	19 00	19 79	19 65
5	22 59	20 49	19, 57	18 41	18 66	18 01
6	17 25	16 21	15 49	14, 35	15 89	16, 01
7	21 98	21 77	20 71	19, 88	20, 19	19 74
8	20 15	18 80	17 55	15, 85	16 64	16 88
Average	18 98	18 25	17 26	15 98	16 94	16 99
S/C Reg Bus Pwr (W)	150 2	175 4	148 9	145 36	135 0	137. 1
Comp Load Pwr (W) (P/O S/C Reg Bus Pwr)	42 39	49 25	0 0	44 46	22 24	46 05
P/L Reg Bus Pwr (W)	9 3	10 2	14 3	15 8	10 4	21, 2
C/D Ratio	2 59	1 12	1 26	1 24	4 48	1 17
Total Charge (A-M)	422 88	255 6	253 0	226 37	277 25	218 76
Total Discharge (A-M)	163 12	229 2	200 7	215 14	61 92	187 54
Solar Array (A-M)	1263	1260	1252	1236. 6	1200	1206 4
S A Peak I (Amp)	18 26	18 26	18 08	17. 11	16 76	16 76
Sun Angle (Deg)	40 7	40 6	40 4	39 6	37 24	34 74
Max R Pad Temp (°C)	57 20	58 40	58 40	58 4	58 4	60 8
Min R Pad Temp (°C)	-39 34	-39 34	-38 67	-39 34	-40 0	-40 67
Max L Pad Temp (°C)	53 07	53 84	53 84	58 84	53, 84	54 61
Min L Pad Temp (°C)	-40 71	-40 71	-40 71	-41 43	-43 57	-44 29

Table 3-2. Landsat-3 Power Subsystem Analog Telemetry

(Average Value for Data Received in NBTR Playback)

Function	Description	Unit	Orbits					
			5	28	56	140	340	540
6001	Batt 1 Disc I	Amp	0.86	0.95	0 74	.73	.79	66
6002	2		0.82	0.89	0.69	.67	.74	.66
6003	3		0.81	0.86	0.60	1.05	.71	.65
6004	4		0.82	0 93	0.73	.75	.77	.64
6005	5		0 94	0.99	0.80	.79	.83	.72
6006	6		0.83	0.88	0.64	.65	.76	.65
6007	7		0 86	0.95	0.74	.73	.79	.68
6008	8		0.82	0.93	0.72	.73	.75	.65
6011	Batt 1 Chg I	Amp	0 53	0.48	0.62	.62	.63	.56
6012	2		0.56	0.42	0.59	.57	.62	.56
6013	3		0.57	0.44	0.62	.62	.61	.53
6014	4		0.58	0.45	0.63	.66	.60	.53
6015	5		0.64	0.48	0.72	.75	.68	.56
6016	6		0.62	0 45	0.62	.67	.65	.54
6017	7		0.63	0.47	0.66	.70	.63	.45
6018	8		0.56	0.45	0.62	.64	.63	.54
6021	Batt 1 Volt	VDC	-30.75	-29.45	-31 06	-31 11	-31 85	-30.14
6022	2		-30.74	-29.42	-31 04	-31 09	-31.82	-30.11
6023	3		-30 88	-29.61	-31.18	-31.23	-31.96	-30 28
6024	4		-30.69	-29.39	-31.00	-31.05	-31 78	-30.08
6025	5		-30.76	-29 49	-31.09	-31.14	-31.87	-30.16
6026	6		-30.79	-29.50	-31.10	-31.16	-31 89	-30 18
6027	7		-30.93	-29 65	-31.24	-31 29	-32 01	-30.33
6028	8		-30.71	-29.40	-31 00	-31 06	-31.78	-30 08
6031	Batt 1 Temp	DGC	17.17	16.77	15.79	13.80	14.98	15 34
6032	2		15.69	15.28	14.55	12.39	13.68	14.47
6033	3		17.14	16.26	15.33	14 01	15.85	15 79
6034	4		19.72	20.74	19.47	18.98	19.91	19.70
6035	5		22.11	20.57	19.58	18 41	18 77	18.60
6036	6		17.21	16.29	15.56	14 32	15.94	16.00
6037	7		21 84	21 96	20 71	18 80	20 43	19 83
6038	8		19 90	18.80	17.63	15 80	16.67	16.90
6040	Rt Pad Temp	DGC	27.70	22.79	28.58	28.52	28.29	26.51
6041	Rt Pad VM	VDC	34.50	32.73	34.03	34.16	35.08	33.19
6042	Rt Pad VN	VDC	34.31	32.54	33.83	34.01	35.05	33.24
6044	Lt Pad Temp	DGC	22.21	17 71	23.63	23.41	22 68	20 69
6045	Lt Pad VF	VDC	34.51	32 76	34.05	34.17	35.08	33 21
6046	Lt Pad VG	VDC	34.13	32.38	33.65	33 78	34 69	32.82
6050	S/C UR Bus V	VDC	-31.47	-29.66	-31.26	-31.34	-32.17	-30 33
6051	S/C RG Bus V	VDC	-24.57	-24.55	-24.58	-24.58	-24 60	-24 58
6052	Aux Reg AV	VDC	-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
6054	Solar I	Amp	16.81	16.65	16.73	16 63	16 48	16.59
6055	S/C RG Bus I	Amp	6.13	7.15	T	T	T	T
6056	S/C RG Bus I	Amp	6.13	7.16	6.08	5 90	5 51	5 60
6058	PC Mod T1	DGC	21.03	21.85	20.30	19 03	19 70	20.07
6059	PC Mod T2	DGC	19.58	19.55	18 44	17.16	18 34	18 59
6070	P/L RG Bus V	VDC	-24.64	-24.59	-24.64	-24 65	-24.66	-24.62
6071	P/L UR Bus V	VDC	-31.48	-29.70	-31.27	-31 35	-32.16	-30 35
6072	P/L RG Bus I	Amp	0.38	0.42	T	T	T	T
6073	P Aux AV	VDC	-23.63	-23.63	-23.63	-23.63	-23.63	-23.66
6074	P Aux BV	VDC	-23.68	-23.66	-23.68	-23 69	-23 69	-23 70
6075	PR Mod T1	DGC	18.04	17.30	17.36	15 44	16 56	17 30
6076	PR Mod T2	DGC	17.65	16.96	16.77	14 85	16 15	16 81
6079	Fuse Blow V	VDC	-24.65	-24.60	-24.66	-24 66	-24 69	-24 64
6080	Shunt 1 I	Amp	0 08	0.00	0.00	0 00	0.00	0 00
6081	2		0.08	0.08	0.00	0 00	0 00	0 00
6082	3		0.08	0.00	0.00	0 00	0.00	0.00
6083	4		0.08	0.08	0.00	0.00	0.00	0.00
6084	5		0.08	0.00	0.00	0 00	0.00	0 00
6085	6		0.08	0.08	0.00	0.00	0.00	0 00
6086	7		0.08	0.00	0.00	0 00	0 00	0.00
6087	8		0.08	0.08	0.00	0.00	0 00	0.00
6100	P/L RG Bus I	Amp	0 38	0.42	0.58	0 65	0 43	0 86
Total No.	Major Frames	Frm	380	622	372			

* Data from TV not applicable

T - Telemetry OFF

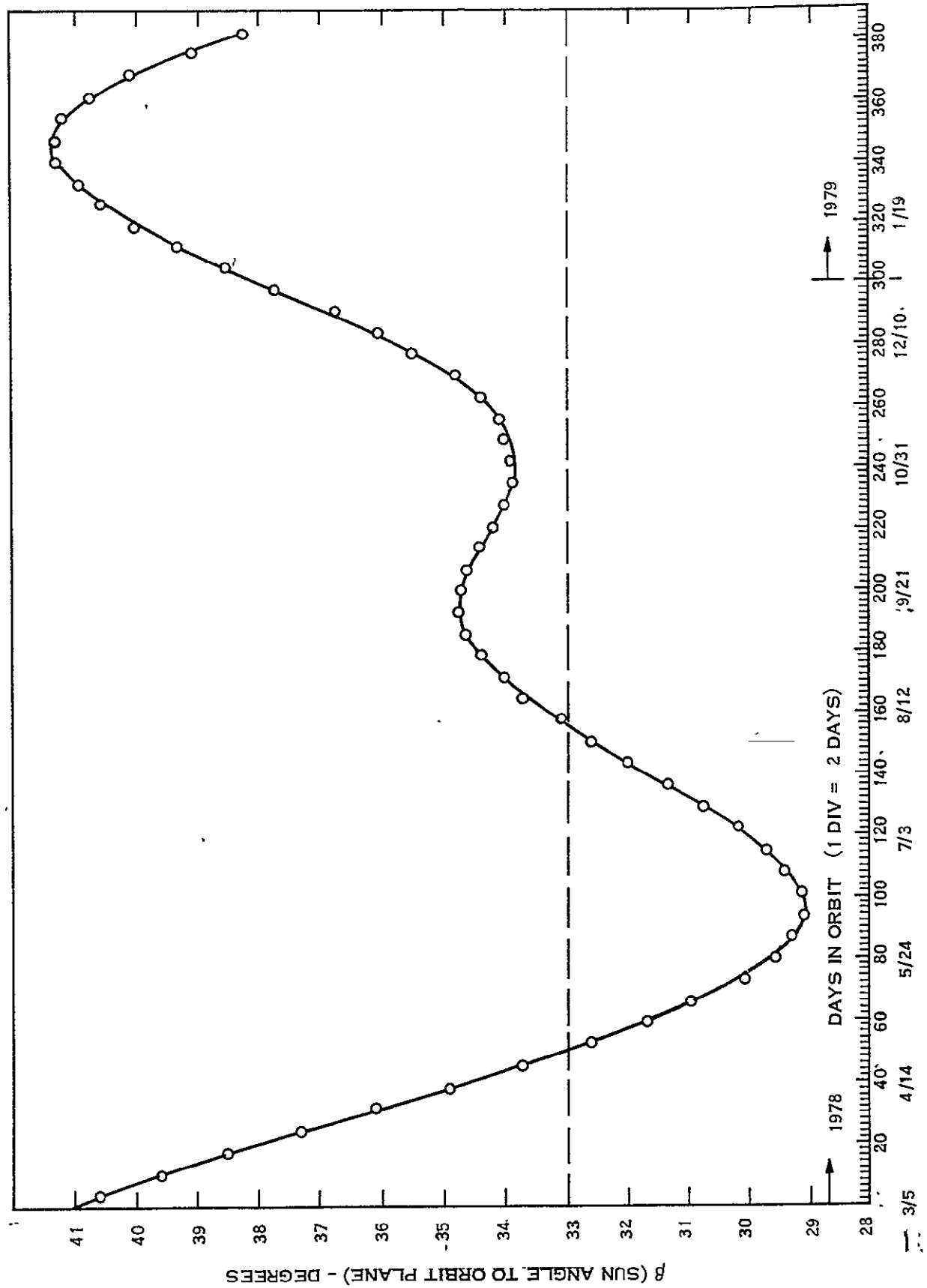

Figure 3-3. Landsat-3 Predicted Sun Angle

SECTION 4

ATTITUDE CONTROL SUBSYSTEM (ACS)
LANDSAT-3

SECTION 4

ATTITUDE CONTROL SYSTEM (ACS)

Since launch, Landsat-3's ACS system has performed normally in all of its operations.

Flywheel duty cycles are low (3 to 5 percent); scanner response to sun transients is normal.

Bath SADS are tracking the sun and their motor voltage and tach output signatures are normal.

Pneumatics are disabled, however, momentary enables are scheduled every orbit about spacecraft midnight (T_o) at the following intervals:

T_o -12 minutes
T_o - 8 minutes
T_o - 4 minutes
T_o minutes
T_o + 4 minutes
T_o + 8 minutes
T_o +12 minutes

Currently, about 2 (+P) and 5 to 7 (-R) gates occur in a 24 hour period

The MMCA has not been utilized. A Pitch Position Bias program is in the planning stage.

During the usual post launch orbit adjust operations, the ACS system's performance was normal. Figures 4-1, 4-2, 4-3 and 4-4 show the ACS's response to the last OA maneuver (Orbit 253, 23 March 1978) RMP1 was commanded on as a RMP2 backup during all of these orbit adjust procedures and it performed normally.

Figures 4-5 and 4-6 are summaries of the pneumatics gating pattern since launch.

Systems temperatures, pressures, voltages and currents have all been normal as shown in the Telemetry Summary, Tables 4-1, 4-2 and 4-3.

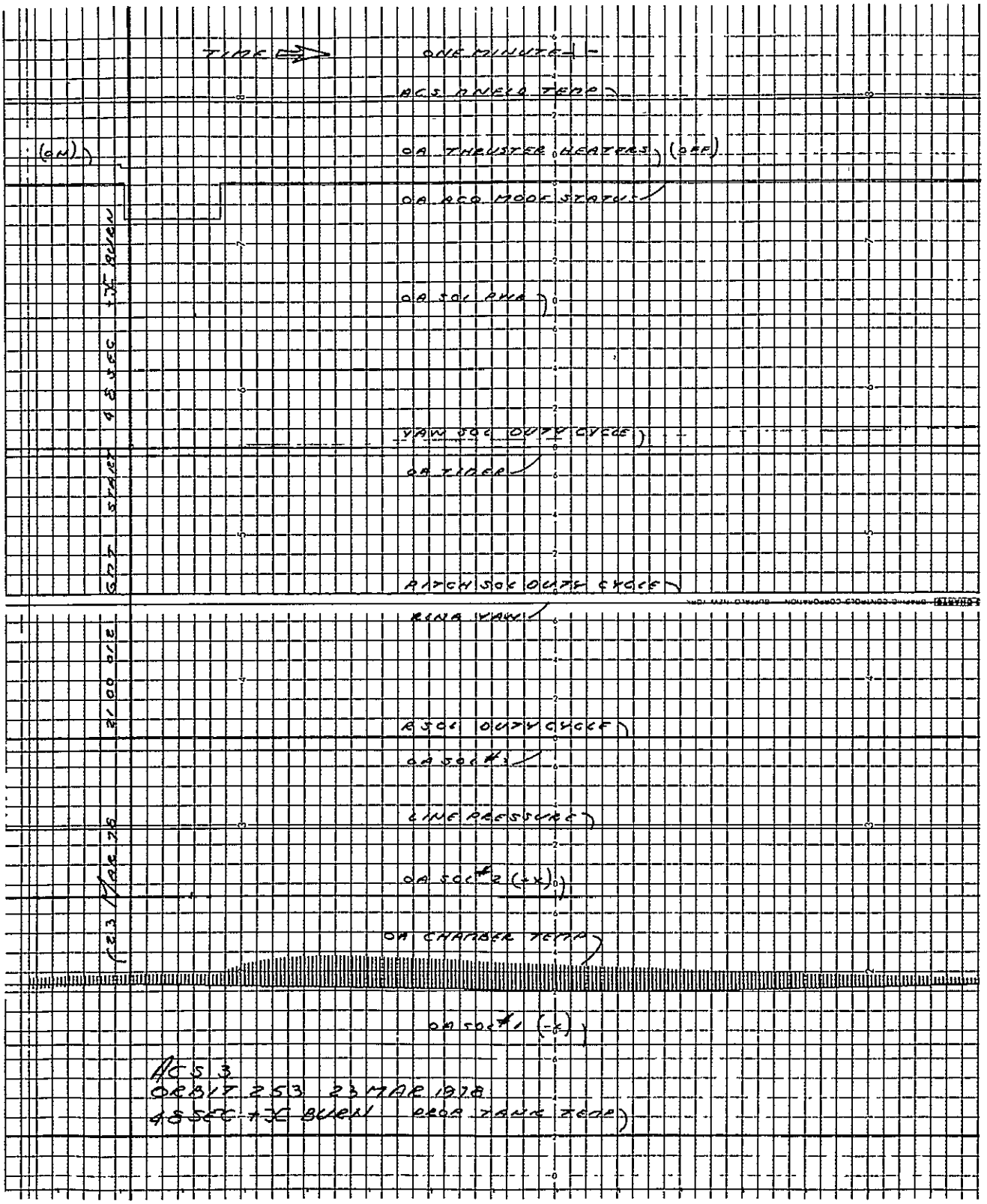

Figure 4-1. Orbit Adjust Chart

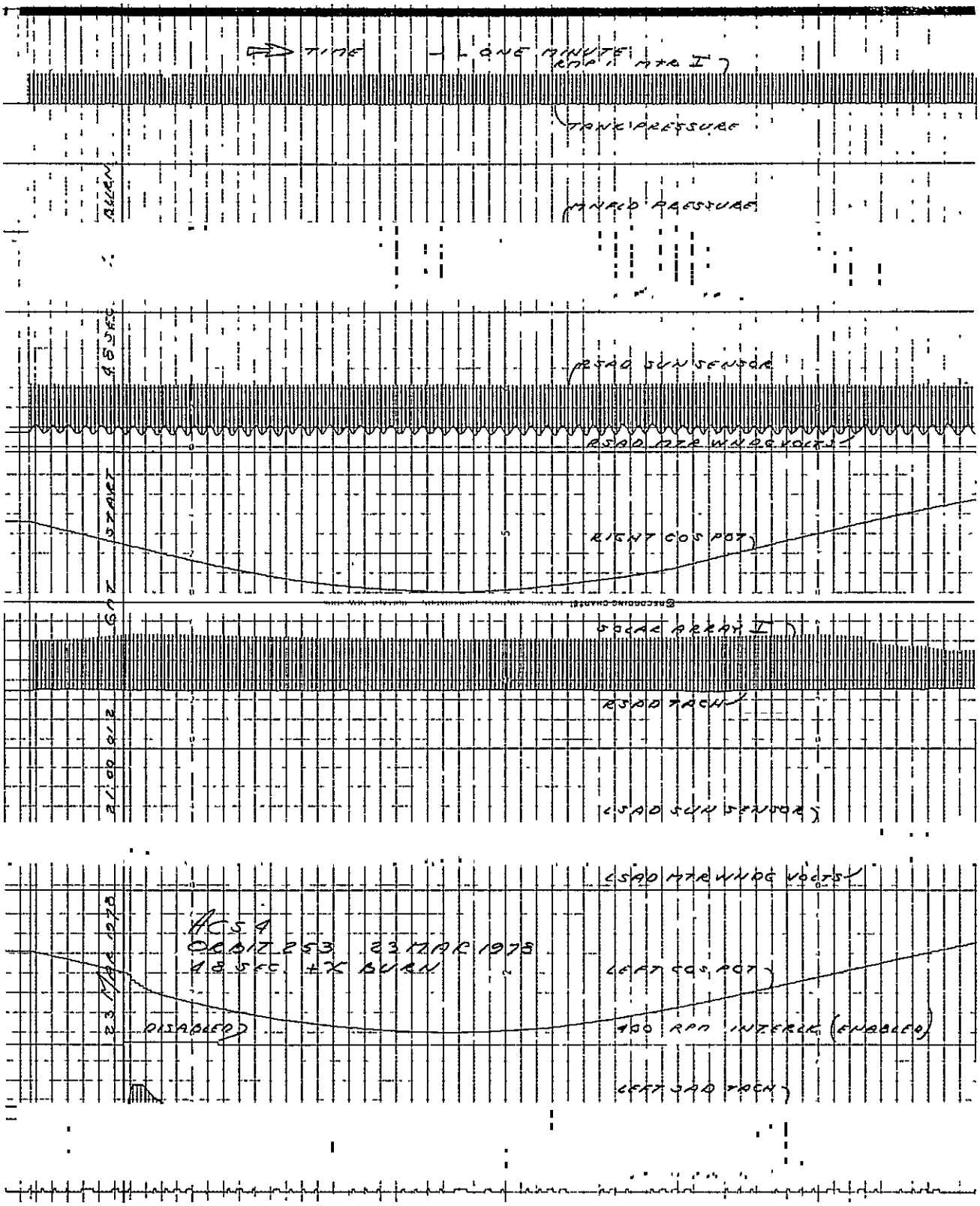

Figure 4-2. Orbit Adjust Chart

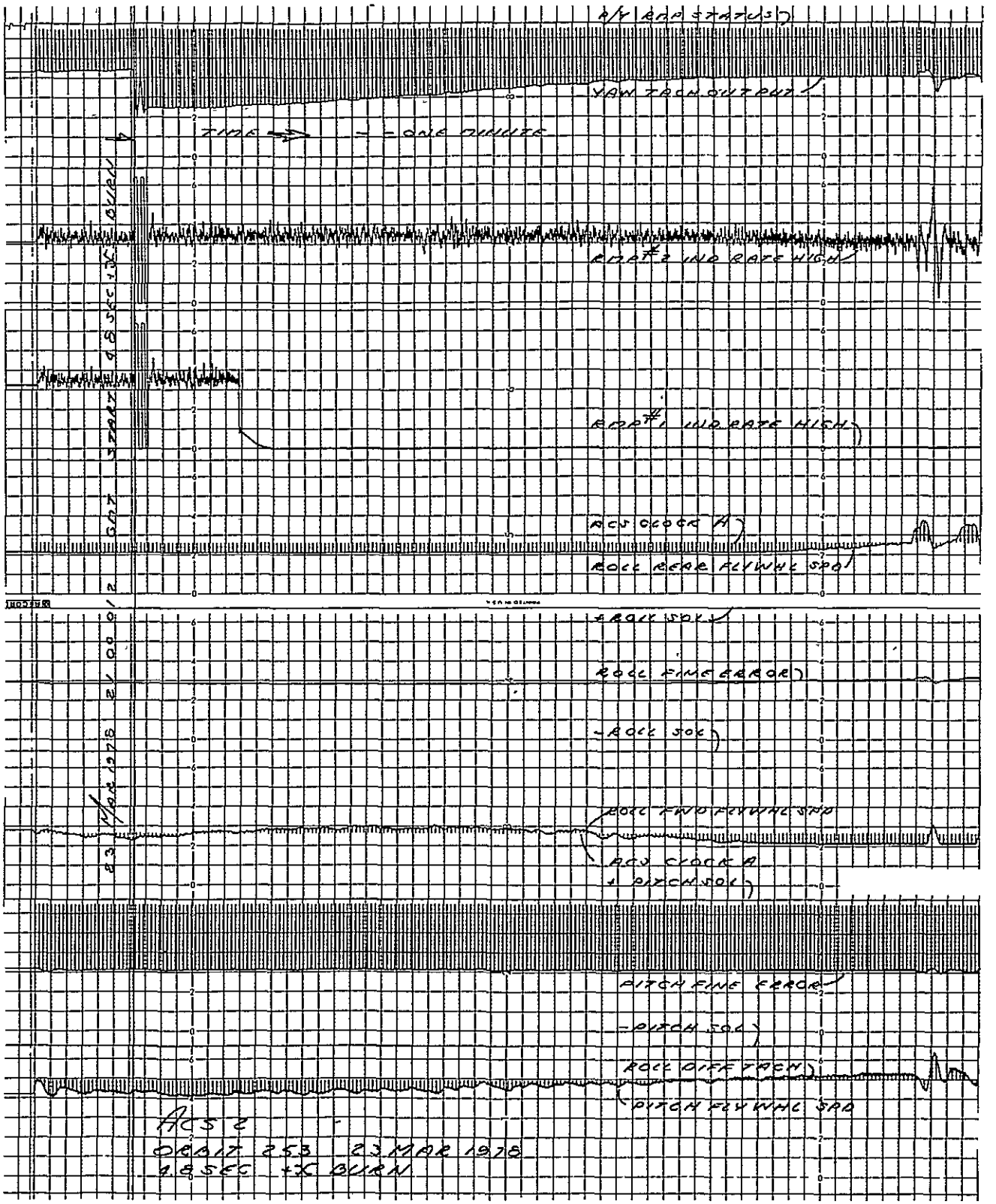

Figure 4-3. Orbit Adjust Chart

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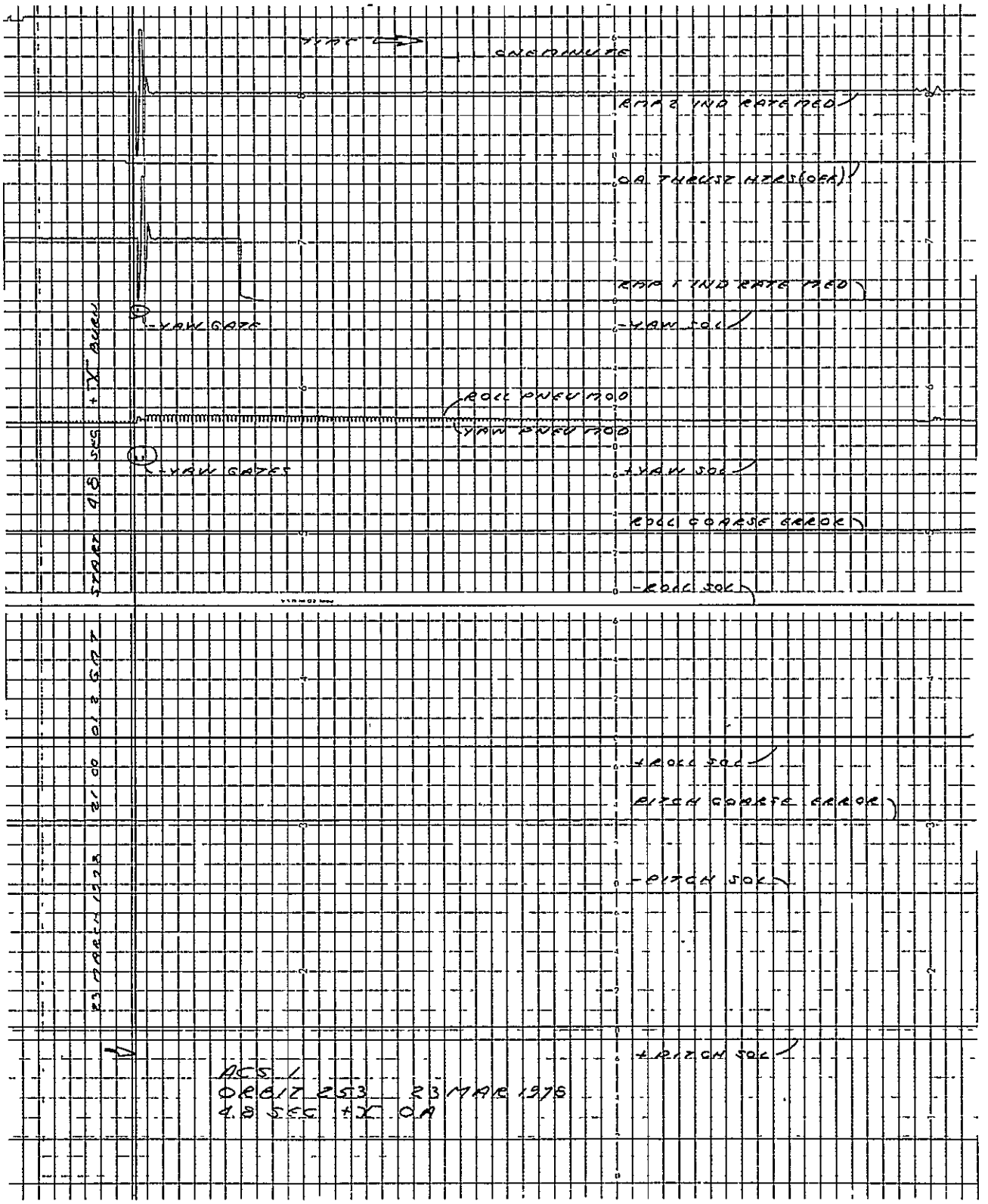

Figure 4-4. Orbit Adjust Chart

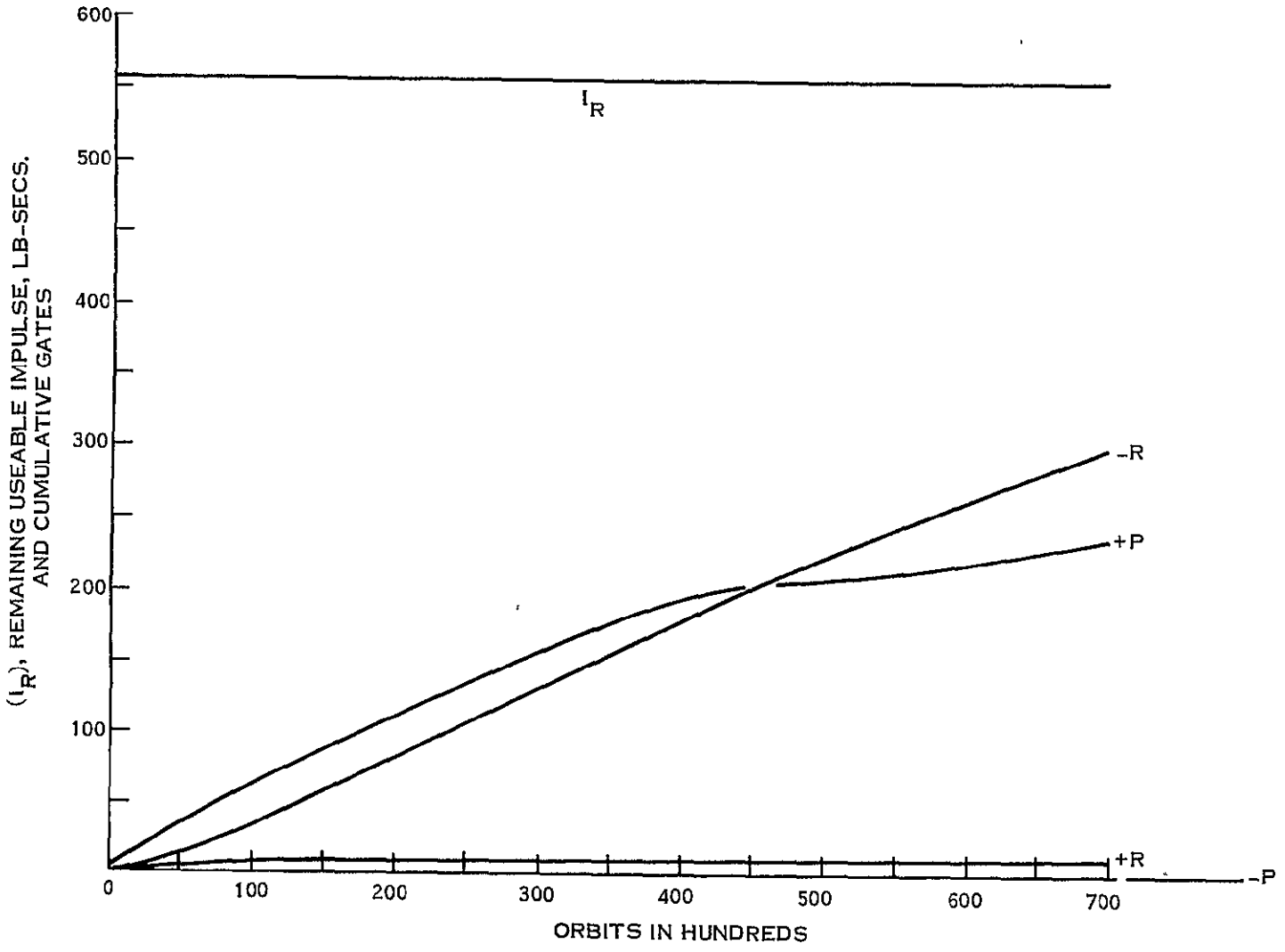

Figure 4-5. Landsat-3 Gating History

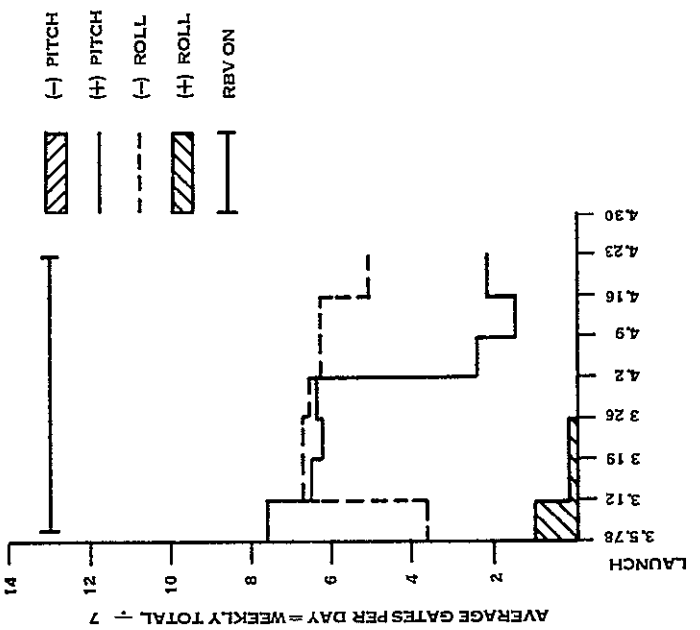

Figure 4-6. Landsat-3 Gating Frequency vs Time

Table 4-1. Subsystem Temperature and Pressure Averages

Function	Units	Orbit					
		1	24	50	140	340	540
1084 RMP 1 Gyro Temperature	DGC	79.45	18.80	18.78	20 29	20.97	21 36
1094 RMP 2 Gryo Temperature	DGC	77.10	77.49	77.52	77 55	77 60	77 55
1222 SAD RT MTR HSNG Temp.	DGC	26.20	21.38	21.32	23 15	24 26	25 08
1242 SAD LT MTR HSNG Temp	DGC	23.46	26 48	26.72	28 40	29 11	29 52
1223 SAD RT MTR WNDNG Temp	DGC	21.23	19.98	19.94	21.45	22 50	23 53
1243 SAD LT MTR WNDNG Temp.	DGC	21.30	27.16	27.03	28.23	28 77	29 13
1228 SAD RT HSG Pressure	PSI	7.00	6.93	6.93	6 93	6 99	6 99
1248 SAD LT HSG Pressure	PSI	7.17	7.19	7.31	7 31	6.37	7.36
1007 FWD Scanner MTR Temp.	DGC	20.93	21.55	21.59	23.30	23 77	24.03
1016 Real Scanner MTR Temp.	DGC	23.96	22.72	22.64	23 93	24 34	24 61
1003 FWD Scanner Pressure	PSI	7.25	7.27	7.27	7 28	6 17	6 20
1012 Rear Scanner Pressure	PSI	6.91	6.93	6.93	6 99	7 04	7.06
1212 Gas Tank Pressure	PSI	1944.14	1999.94	1999.29	2012 44	2012 44	2000 00
1210 Gas Tank Temperature	DGC	18.53	19.76	19.70	21.42	22 05	22 47
1213 Manifold Pressure	PSI	69.83	58.52	59.21	58 21	58 31	59.04
1211 Manifold Temperature	DGC	18 61	19.85	19.80	21.51	22 14	22.59
1039 CLG Power Supply Card Temp.	DGC	24.44	32.42	32.36	33 92	34 16	34 48
1260 THO1 EBP	DGC	22.17	23.19	23 15	24 66	25 19	25 44
1261 THO2 EBP	DGC	20.09	18.67	18 71	20 25	20 94	21 22
1262 THO3 EBP	DGC	23.44	16.70	16.64	18 32	19 17	- 19 78
1263 THO1 STS	DGC	- 4.31	- 2.69	- 1.25	- 0 68	0 07	- 0 31
1264 THO2 STS	DGC	-21.51	-24.34	-22.92	Data Not Available		
1265 THO3 STS	DGC	6.02	3 68	5.33	6 04	6 84	5 21
1266 THO4 STS	DGC	- 1.00	-12.55	- 11.52	-10 59	- 9 04	- 9 39
1267 THO5 STS	DGC	6.99	4.62	6.37	6 84	7 74	6 62
1224 SAD R FSST	DGC	6.17	29 10	31.58	33 35	35 69	37 44
1244 SAD L FSST	DGC	15.43	39.94	40.97	41 56	41 53	41 53

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

Function	Units	Orbit					
		1	24	50	140	340	540
1081 RMP 1 MTR Volts	VDC	36.58	F	F	F	F	F
1082 RMP 1 MTR Current	Amps	0.24	F	F	F	F	F
1080 RMP 1 Supply Volts	VDC	23.37	F	F	F	F	F
1091 RMP 2 MTR Volts	VDC	30.46	30.49	30.50	30.54	30.60	30.50
1092 RMP 2 MTR Current	Amps	0.11	0.11	0.11	0 11	0.11	0.11
1090 RMP 2 Supply Volts	VDC	23.59	23.65	23.66	23.65	23 66	23.64
1220 SAD RT MTR WNDNG Volts	VDC	F	4.73	4.64	4.41	4.25	4.21
1240 SAD LT MTR WNDNG Volts	VDC	6.66	6.37	6.30	6 32	6.52	6.62
1227 SAD RT -15 VDC Conv.	VDC	F	15.48	15.48	15.48	15 48	15.48
1247 SAD LT -15 VDC Conv.	VDC	14.94	14.94	14.93	14 93	14.94	14.94
1056 CLB ± 6 VDC	TMV	2.35	2.35	2.35	2 35	2.35	2.35
1055 CLB ± 10 VDC	TMV	2.88	2.89	2.88	2 89	2.89	2.88
1057 CLB Power Supply Volts	TMV	2.95	2.95	2.94	2.93	2 92	2.91

F = Unit OFF

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

Function	Units	Orbit					
		001	024	051	140	340	540
1041 Pitch Fine Error	DEG	0.58	- 0.13	- 0.13	- 0.12	- 0.11	- 0.11
1043 Pitch Flywheel Speed	RPM	62.11	-133.54	-119.25	-122.83	-125.40	-127.93
1038 Pitch Mtr Drvr CCW	PCT	1.45	4.80	5 04	4.76	5.88	5.21
1039 Pitch Mtr Drvr CW	PCT	2.67	3.08	2 92	2.81	3.74	3.17
1030 Roll Fine Error	DEG	- 2.17	- 0.15	- 0 13	- 0.16	- 0.19	- 0.18
1027 Roll Rear Flywheel SPD	RPM	642.78	766.01	765.38	776.96	803.73	823.74
1026 Roll Fwd Flywheel SPD	RPM	656.85	751.39	761 61	730.50	731.01	764.20
1022 Roll Rear Mtr Drvr CCW	PCT	0.14	0.95	1 05	0 69	0.76	0.67
1025 Roll Rear Mtr Drvr CW	PCT	5.49	6.38	6.94	6.09	6.83	7 36
1023 Roll Fwd Mtr Drvr CCW	PCT	0.03	1.10	1.03	0.77	0.81	0.51
1024 Roll Fwd Mtr Drvr CW	PCT	6.10	6.67	7.49	6 23	6 13	6.91
1035 Yaw Tach	RPM	54.71	- 46 54	24.29	- 98 63	- 24.08	14.77
1033 Yaw Mtr Drvr CW	PCT	0.63	2.76	2 90	2.18	2.62	2.53
1034 Yaw Mtr Drvr CCW	PCT	0.25	3.13	2.72	2.59	2.56	2.20
1221 SAD Right Tach	D/M	16.50	3.20	3.22	3.15	4.03	4.02
1241 SAD Left Tach	D/M	0.89	3 86	3.75	3.78	3.79	3.77

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

LANDSAT-3

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

The Command Clock Subsystem operated nominally in this report period except for an anomaly in Cell 4 of COMSTOR B. During Orbit 40 (8 March 1978) Cell 4 of COMSTOR B failed to verify. In Orbit 44, verification was normal but the PMP "ON" Command in Cell 4 did not execute. During Orbit 48 (9 March 1978) Cell 4, COMSTOR B once again failed to verify. Since then, COMSTOR B has not been used.

The ECAM portion of the CMD Subsystem was checked out and operated during this report period and performed satisfactorily. ECAM was turned on during Orbit 29/(7 March 1978), checked out and both sides "A" and "B" loaded with tick-tock's. ECAM was loaded with operational commands in Orbit 59 (9 March 1978) and command executions were verified in Orbit 62. Normal ECAM operations have occurred since then.

Figure 5-1 shows the history of S/C clock drift since launch.

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

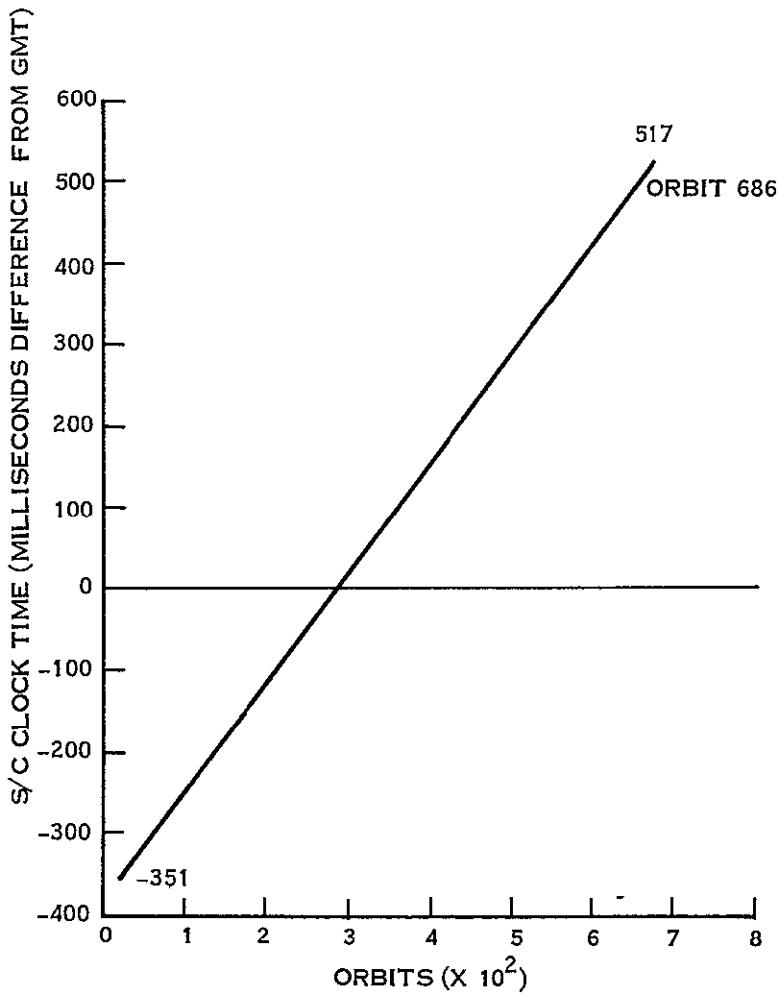

Figure 5-1. Landsat-3 Clock Drift History

Table 5-1. Command/Clock Telemetry Summary

Function No	Name	Mode	Units	20° T/V	0/1	34	50	140	340	540
8005	Pri Power Supply Temp.	-	DGC	38 92	34.82	41.25	41.53	40 26	41 27	41 73
8006	Red Power Supply Temp	-	DGC	38 05	34.24	41.59	41 92	40 74	41 67	42 13
8007	Pri Osc. Temp	-	DGC	34.42	27 67	30 28	30 34	28 63	29 46	29 95
8008	Red Osc Temp	-	DGC	35.50	38.36	31.21	31.09	29 42	30 48	30 70
8009	Pri. Osc. Output	-	TMV	1.08	1.05	1.05	1.05	1 05	1 05	1 05
8010	Red Osc Output	-	TMV	1 25	1.21	1 24	1.24	1 23	1 24	1 24
8011	100 KHz	Pri - Red	TMV	3 13	3 10	3.13	3 13	3 13	3 13	3 12
8012	10 KHz	Pri - Red	TMV	3.05	3.05	3.07	3.06	3 07	3 06	3 06
8013	2.5 KHz	Pri - Red	TMV	2 93	2 94	2.95	2.95	2 95	2 95	2 95
8014	400 Hz	Pri - Red.	TMV	4 45	4.42	4.45	4.45	4 45	4 45	4 45
8015	Pri + 4V Power Supply	Pri Clk ON	VDC	2 05	2.03	2.05	2 05	2 05	2 05	2 03
8016	Red. + 4V Power Supply	Red Clk ON	VDC	1 97	1 95	1 97	1.97	1 97	1 97	1 97
8017	Pri + 6V Power Supply	Pri Clk ON	VDC	2.27	2.25	2 28	2.27	2 27	2 27	2 27
8018	Red + 6V Power Supply	Red Clk ON	VDC	2 25	2 25	2.25	2 25	2 25	2 25	2 25
8019	Pri - 6V Power Supply	Pri Clk ON	VDC	5 25	5.23	5.25	5 25	5 25	5 25	5 25
8020	Red - 6V Power Supply	Red. Clk ON	VDC	5 23	5 22	5.23	5 23	5 23	5 23	5 23
8021	Pri - 23V Power Supply	Pri Clk ON	VDC	5 69	5 70	5.70	5.70	5 70	5 70	5 70
8022	Red. - 23V Power Supply	Red Clk ON	VDC	5 80	5 80	5.80	5 80	5 80	5 80	5 80
8023	Pri - 29V Power Supply	Pri Clk ON	VDC	5.42	5 42	5 42	5.43	5 43	5 43	5 43
8024	Red - 29V Power Supply	Red. Clk ON	VDC	5.38	5 38	5.38	5 39	5 38	5 39	5 38
8101	CIU A - 12V	CIU A ON	VDC	3.95	3 95	3.95	3 95	3 95	3 95	3 95
8102	CIU B - 12V	CIU B ON	VDC	3 98	3 98	3.98	3 98	3 98	3 98	3 98
8103	CIU A - 5V	CIU A ON	VDC	4 12	4 11	4.12	4 12	4 12	4 12	4 12
8104	CIU B - 5V	CIU B ON	VDC	4.15	4 15	4.15	4 15	4 15	4.15	4.15
8105	CIU A Temp	CIU A ON	DGC	26 06	20 98	22.53	22 36	21 09	21 55	21 63
8106	CIU B Temp	CIU B ON	DGC	22 88	19.06	20.36	20 27	19 21	19 61	19 66
8201	Receiver RF-A Temp.	-	DGC	29 90	26 73	28.70	28 51	26 96	27 71	27 96
8202	Receiver RF-B Temp	-	DGC	26 01	22.99	21.74	21.52	19 51	20 38	20 74
8203	D MOD A Temp	-	DGC	38 10	35.15	36.00	36.09	34 57	35 37	35 66
8204	D MOD B Temp	-	DGC	32 32	25 46	25.27	25 34	22 74	23 96	24 37
8205	Receiver A AGC	Receiver A ON	DBM	-79	-81.34	-84 89	-89.71	-85 62	-88 48	-84 97
8206	Receiver B AGC	Receiver B ON	DBM	-76	F	F	F	F	F	F
8207	Amp A Output	Receiver A ON	TMV	1.47	1 98	2.41	2.35	2 36	2 45	2 45
8208	Amp. B Output	Receiver B ON	TMV	1 46	F	F	F	F	F	F
8209	Freq. Shift Key A Out	Receiver A ON	TMV	1 08	1.08	1.09	1 08	1 08	1 08	1 08
8210	Freq. Shift Key B Out	Receiver B ON	TMV	1 12	F	F	F	F	F	F
8211	Amp. A Output	Receiver A ON	TMV	1.11	1.10	1 12	1.10	1 11	1 11	1 10
8212	Amp B Output	Receiver B ON	TMV	1.10	F	F	F	F	F	F
8215	D MOD A - 15V	Receiver A ON	TMV	5.02	5.00	5.01	5.00	5 00	5 00	5 01
8216	D MOD B - 15V	Receiver B ON	TMV	5.05	F	F	F	F	F	F
8217	Regulator A - 10V	Receiver A ON	TMV	5.55	5.52	5.52	5 51	5 50	5 50	5 50
8218	Regulator B - 10V	Receiver B ON	TMV	5.58	F	F	F	F	F	F
8311	ECAM Memory Temp	ECAM-ON	DGC	20.90	15.76	16.18	17 92	13 18	13 90	14 50
8312	ECAM Pwr Sup Temp	ECAM-ON	DGC	25 64	17.72	19.59	19 95	14 13	14 99	15 60

F = Unit OFF

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 fast verify is in use.

Table 6-1. TMP Telemetry Values

Function	Function Name	Unit	Orbit						
			20° T/V	0/1	33	50	340	540	702
09001	Power Supply A +5V	TMV	4.70	4.70	4.70	4.70	4.70	4.70	4.70
09002	Power Supply B +5V	TMV	4.64	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
09004	Power Supply B +15V	TMV	4.85	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
09006	Power Supply B -6V	TMV	5.62	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
09008	Power Supply B -15V	TMV	4.95	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
09010	Power Supply B -22V	TMV	5.30	F	F	F	F	F	F
09011	Power Supply A +6V	TMV	4.82	4.82	4.82	4.82	4.82	4.82	4.82
09012	Power Supply B +6V	TMV	4.80	F	F	F	F	F	F
09013	Power Supply A Temp	DGC	N	28.60	26.66	27.10	26.75	26 83	26.79
09014	Power Supply B Temp	DGC	N	25.75	25.10	25.34	22.30	23.44	23.42
09015	Temperature C	DGC	N	21.20	19.19	20.18	19.30	19.42	19.41
09100	Reflected Power "A"	dBm	6.70	5.11	7.61	7.95	7.65	7 80	7.87
09100	Reflected Power "B"	dBm	6.33	F	F	F	F	F	F
09101	XMTR A -20 VDC	TMV	3.82	3.87	3.87	3.87	3.89	3.90	3.90
09102	XMTR B -20 VDC	TMV	3.84	F	F	F	F	F	F
09103	XMTR A - Temp	DGC	19.50	19.80	21.01	20.90	18.85	18.40	18.00
09104	XMTR B - Temp	DGC	20.00	20.63	21.89	21.79	18.66	19.24	18 55
09105	XMTR A Power Output	dBm	28.12	28.47	28.72	28.74	28.83	28.81	28.80
09106	XMTR B Power Output	dBm	26.58	F	F	F	F	F	F

N - Data Not Available
F - Unit OFF

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SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

LANDSAT-3

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

Landsat-3's Orbit Adjust Subsystem has been exercised six times since launch and it performed normally in every event.

In Orbit 26 two 5.2 second test burns were performed to test the performance and alignment of the +X thruster and -X thrusters. In both cases, the firings were normal. In Orbit 30, an orbit adjust sequence for Landsat-3 was initiated to phase the satellite with Landsat-2 to a 9 day/ 9 day pattern in the 18 day ground track repeat cycle. A burn on the +X thruster in this orbit lasted for 420 seconds, and was normal in all respects. The semi-major axis was reduced from an initial 7283.7 kilometers to 7280.1 kilometers. In Orbits 109 and 115, a 660 second and a 112 second burn, respectively, were executed using the -X thruster. This raised the semi-major axis to 7285.9 kilometers. The last burn in the series occurred on 22 March 1978 and was a 4.2 second, (+X) trim burn, conducted to optimize the spacecraft's altitude.

A summary of the orbit adjust maneuvers is given in Table 7-1. Table 7-2 gives an average telemetry values for the OFF quiescent state and Figures 4-1 through 4-4 (in Section 4) are actual telemetry records of the last OAS maneuver and demonstrate the spacecraft's reaction to the burn.

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	-	-	0.0
2	26	7 Mar 78 14:40:01.2	-X	5.2	2006.12	0.02	532.44	-	-	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

N = Not Available

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Table 7-2. Landsat-3 OAS Telemetry Values

No.	Function Name	Units	Orbit 140	Orbit 340	Orbit 540
2001	Prop. Tank Temp.	°C	15.55	16.39	17.12
2003	Thrust Chamber No. 1 (-x) Temp	°C	28.15	30 15	32.03
2004	Thrust Chamber No. 2 (+x) Temp	°C	32.88	33.97	34.61
2005	Thrust Chamber No. 3 (-y) Temp	°C	50.31	47.16	43 74
2006	Line Pressure	psia	416.59	419 94	423.33

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 urgency exists to implement MMCA compensation. Payload operations have not generated unusual magnetic torques and controlled pneumatic gating - via scheduled momentary enable commands - has successfully unloaded spacecraft momentum.

Plans are developing to utilize the MMCA in the future as an aide in controlling normal, spacecraft ground track drift.

MMCA telemetry values are shown in Table 8-1.

Table 8-1. MMCA Telemetry Values

Number	Name	Units	ORBIT					
			0/1	24	50	140	340	540
4001	A1 Board Temp	DGC	19.64	17.49	17.98	15.60	16.70	16.91
4002	A2 Board Temp	DGC	22.3	20.19	20.78	20.69	19.23	19.48
4003	Hall Current	TMV	3.65	3.65	3.64	3.63	3.63	3.62
4004	Yaw Flux Density	TMV	3.25	.01	3.22	.03	.03	.06
4005	Pitch Flux Density	TMV	3.20	1.87	3.20	1.87	1.87	1.92
4006	Roll Flux Density	TMV	3.15	.32	3.13	.38	.36	.41

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. Figure 9-1 shows AGC readings of Goldstone for 2 constant positions in space The scatter of data points reflect variations in the ground station calibration and readout.

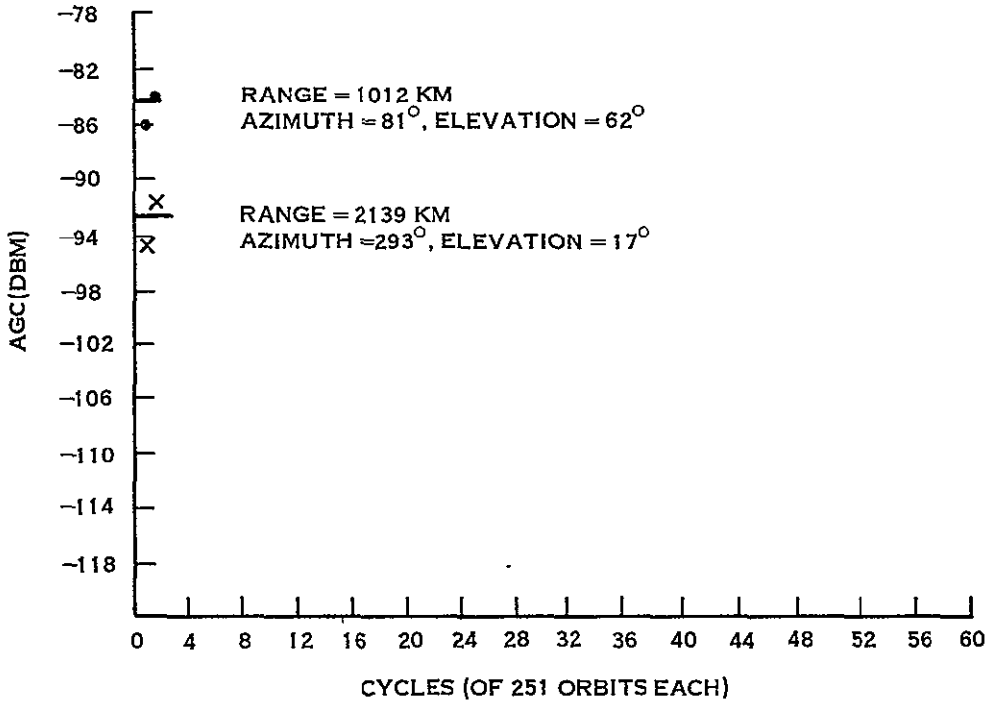

Figure 9-1. USB (Link 4) AGC Readings at Goldstone with 30-Foot Antenna, Landsat-3

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

No.	Function Name	Units	Orbit					
			1	24	50	132	350	540
11001	USB Rcvr AGC	DBM	-101.89	-124.50	-101.62	-75 19	-82.29	-97.17
11002	USB Xmtr Pwr	WTS	1.65	1.62	1.65	1.65	1.65	1.62
11003	USB Rcvr Error	KHz	1.89	3.82	1.81	4.45	3.92	3.31
11004	USB Xpond Temp	DGC	22.12	23.53	24.63	23.35	23.36	22.26
11005	USB Xpond Press	PSI	16.77	17.00	17.00	16 92	16.96	16.90
11007	USB Xmtr A -15V	VDC	F	F	F	F	F	F
11008	USB Xmtr B -15V	VDC	2.35	2.35	2.35	2 35	2.35	2.35
11009	USB Range -15V	VDC	2.05	2.05	2.05	2.05	2.05	2.05
11101	PMP Pwr A volt	VDC	F	F	F	F	F	F
11102	PMP Pwr B Volt	VDC	-15.12	-15.16	-15.11	-15.09	-15.11	-15.13
11103	PMP Temp A	DGC	16.80	20.50	21 48	18.84	18.95	17.71
11104	PMP Temp B	DGC	19.01	24.09	25 96	23.56	23.57	22.16

F = Unit OFF
* Not Applicable

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)

LANDSAT-3

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS)
LANDSAT-3

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

Table 10-1 Landsat-3 APU Telemetry Functions

Function	Description	Unit	Orbit					
			6	31	43	140	340	540
13200	APU, -24 5 Vdc	TMV	2 62	2.62	2.62	2.62	2.62	2.62
13201	APU, -12 Volts	TMV	2.42	2.42	2 42	2.43	2.43	2 42
13202	APU Temp	DGC	23.41	24.32	24.43	22.71	23.02	23.10

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 as well as WBVTR No 2 power circuits, have been operated on a regular basis RBV and WBVTR No 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-3

SECTION 11

THERMAL SUBSYSTEM (THM)

The Thermal Control Subsystem in Landsat-3 has provided satisfactory control of all spacecraft equipments since launch

Table 11-1 gives average subsystem telemetry values for several representative orbits during the 2 months of operation of Landsat-3. Average temperatures of the sensory ring bays are plotted in Figure 11-1.

During this report period, the sun intensity decreased from 1.017 to 0.989 of the mean value and the satellite night length increased As a result, the average spacecraft temperature decreased in this report period.

A history of compensation load switching since launch is shown in Table 11-2. Compensation load 8 was turned on in Orbit 65 to increase the temperature of the ECAM.

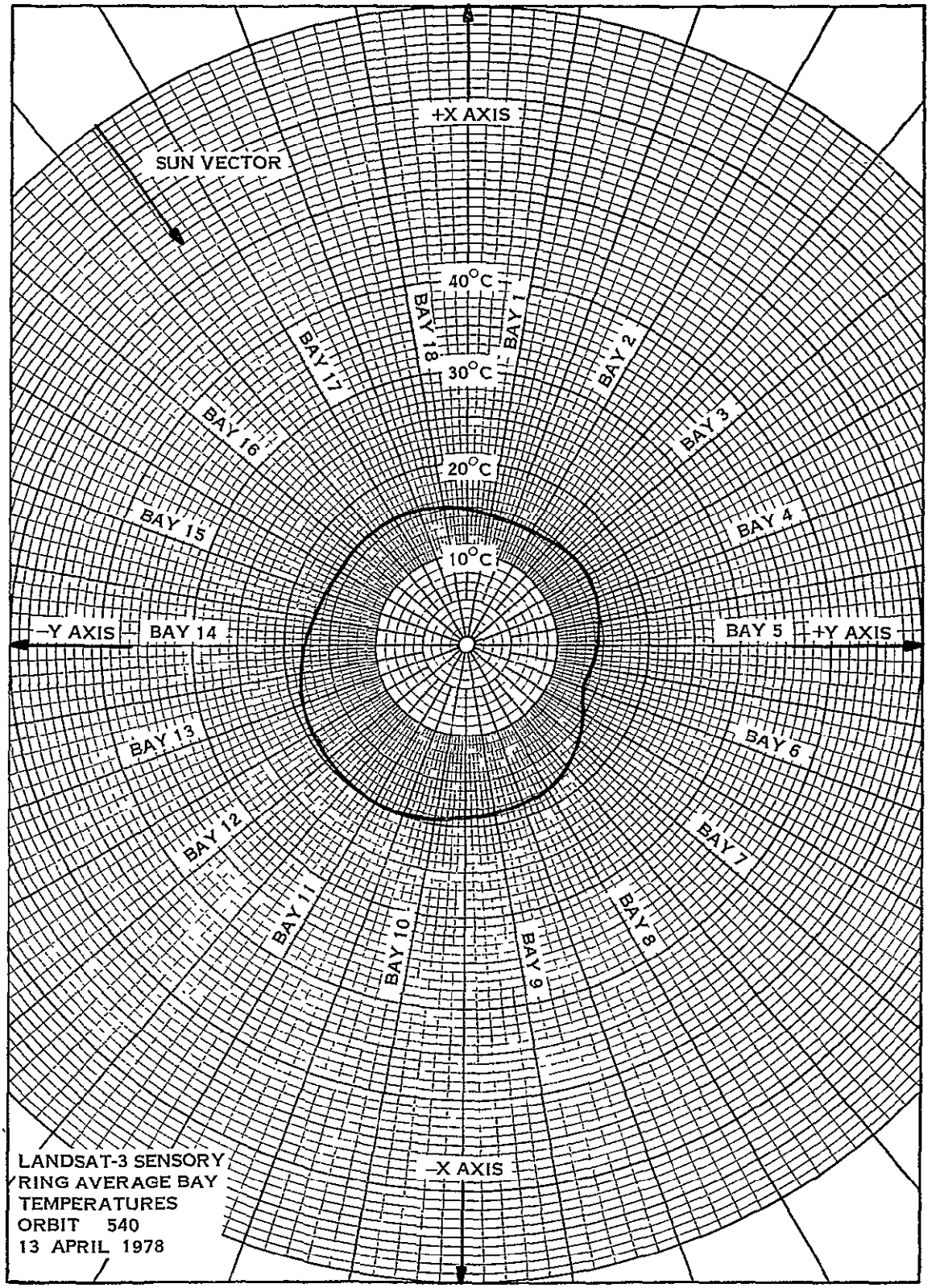

Figure 11-1 Landsat-3 Sensory Ring Thermal Profile

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

Function No	Function Description	Unit	Orbit					
			2 (0/1)	24	50	140	340	540
7001	THM TH02SBM	DGC	16 53	14 29	15 52	11 60	12 40	13 31
7002	THM TH01SBO	DGC	17 31	15 83	16 71	14 03	13 90	14 58
7003	THM TH03SBI	DGC	17 96	15 21	16 40	12 47	13 40	14 44
7004	THM TH10TCB	DGC	17 71	20 20	19 92	18 73	18 94	18 94
7005	THM TH11SBM	DGC	18 89	21 40	21 11	19 54	19 88	19 75
7006	THM TH05SBA	DGC	16 14	15 01	15 74	13 07	14 47	14 83
7007	OA-N THRUSTER	DGC	18 71	20 27	20 20	18 89	19 61	20 06
7008	THM TH02TCB	DGC	18 31	15 49	16 55	12 31	13 34	14 29
7009	THM TH07SBM	DGC	16 81	16 06	16 08	14 02	14 92	15 31
7010	THM TH06SBI	DGC	17 83	18 13	17 93	15 92	16 73	17 12
7011	THM TH08SBM	DGC	18 49	20 36	20 02	18 40	19 08	19 15
7012	THM TH10SBO	DGC	17 15	18 96	18 84	17 78	18 19	18 25
7013	THM TH04SBM	DGC	17 10	15 18	16 47	13 15	14 27	15 19
7014	THM TH11STO	DGC	18 71	20 40	20 46	19 19	19 42	19 31
7015	THM TH12SBI	DGC	19 56	21 65	21 64	19 71	20 00	19 61
7016	THM TH12STO	DGC	19 42	20 89	21 45	19 61	19 96	19 33
7017	RBV BEAM CTR LN	DGC	19 09	21 66	20 89	19 01	19 57	19 70
7018	THM TH13SBM	DGC	20 19	21 56	21 88	19 96	19 84	19 34
7019	NBR RAD OUTBDBI	DGC	10 37	2 46	2 73	53	1 37	1 07
7020	THM TH13STM	DGC	20 32	22 04	22 42	20 34	20 53	19 99
7021	THM TH14SBI	DGC	19 59	20 61	20 86	18 34	18 41	17 95
7022	THM TH14STO	DGC	19 54	20 23	20 48	18 20	18 24	17 54
7023	THM TH15SBM	DGC	19 80	19 46	19 95	17 30	17 24	16 67
7030	THM TH15STO	DGC	19 35	19 09	19 43	16 80	16 93	16 37
7033	THM TH05TCB	DGC	19 04	15 58	16 17	13 39	15 13	15 23
7035	THM TH18STM	DGC	18 90	17 64	18 04	13 77	14 56	15 37
7040	THM TH01TCB	DGC	17 65	15 48	16 45	12 67	13 35	14 19
7041	THM TH06STO	DGC	15 94	12 87	13 27	10 92	12 17	12 38
7042	THM TH03TCB	DGC	17 71	14 57	16 49	13 00	13 39	14 63
7043	THM TH04TCB	DGC	19 42	16 95	17 98	14 98	16 14	16 99
7044	THM TH17STO	DGC	18 30	17 22	17 99	14 78	15 00	15 31
7045	THM TH07TCB	DGC	17 77	16 19	16 16	14 20	15 03	15 43
7046	THM TH09TCB	DGC	18 19	19 13	18 83	17 69	18 30	18 28
7048	THM TH11TCB	DGC	19 29	21 67	21 59	20 01	20 31	20 08
7049	THM TH12TCB	DGC	19 47	21 03	21 45	19 57	19 65	19 07
7050	THM TH13TCB	DGC	20 44	22 02	22 25	20 50	20 31	19 80
7051	THM TH14TCB	DGC	19 70	20 24	20 75	18 14	18 12	17 47
7052	THM TH16TCB	DGC	19 22	19 04	19 57	16 68	16 91	16 95
7053	THM TH17TCB	DGC	19 24	18 13	18 98	15 34	16 02	16 39
7054	THM TH18TCB	DGC	18 54	16 64	17 23	13 41	14 27	14 86
7060	THM SHUTTER BAY 1	DEG	23 14	7 50	9 90	1 48	1 52	1 14
7061	THM SHUTTER BAY 2	DEG	8 73	0 00	0 00	0 00	0 00	0 00
7062	THM SHUTTER BAY 3	DEG	10 86	0 00	1 07	0 00	0 00	0 00
7063	THM SHUTTER BAY 4	DEG	20 66	0.33	6 60	89 99	0 00	0 12
7064	THM SHUTTER BAY 5	DEG	25 06	6 00	6 00	1 04	91	1.18
7065	THM SHUTTER BAY 7	DEG	13 17	0 00	0 00	0 00	0 00	0 00
7067	THM SHUTTER BAY 9	DEG	19 85	28 55	28 82	18 49	23 25	24 14
7068	THM SHUTTER BAY 10	DEG	9 02	32 35	30 27	19 98	22 46	22 56
7069	THM SHUTTER BAY 11	DEG	20 19	41 25	40 32	29 07	31 70	30 11
7070	THM SHUTTER BAY 12	DEG	21 02	38 03	40 17	27 68	27 06	24 57
7071	THM SHUTTER BAY 13	DEG	18 99	34 90	36 13	22 07	21 63	19 09
7072	THM SHUTTER BAY 14	DEG	9 38	10 50	13 76	0 00	0 00	0 00
7074	THM SHUTTER BAY 16	DEG	16 17	13 02	17 35	0 00	0 00	0 00
7075	THM SHUTTER BAY 17	DEG	9 42	8 50	18 29	0 00	0 00	0 00
7076	THM SHUTTER BAY 18	DEG	24 86	4 13	11 42	0 00	0 00	0 00
7080	THM Q1 T ZENER V	TMV	4 91	4 92	4 93	4 92	4 92	4 92
7081	THM Q2 T ZENER V	TMV	5 06	5 08	5 08	5 08	5 08	5 08
7082	THM Q3 T ZENER V	TMV	5 05	5 05	5 05	5 05	5 05	5 05
7083	THM Q1 S ZENER V	TMV	5 00	5 01	5 01	5 00	5 00	5 00
7084	THM Q2 S ZENER V	TMV	4 90	4 90	4 90	4 90	4 90	4 90
7085	THM Q3 S ZENER V	TMV	5 02	5 05	5 03	5 03	5 03	5 03
7090	THM THE CAMM	DGC	17 21	14 31	19 34	13 53	14 73	15 62
7091	THM IND ATTITUDE	DGC	18 69	20 99	21 11	18 82	18 81	18 51
7092	THM RBV RADIATOR	DGC	15 91	14 91	13 10	10 92	11 49	11 81
7093	THM RBVC CTR BM	DGC	17 75	20 24	17 80	15 43	16 02	16 30
7094	THM WEVTR BOOT	DGC	16 28	11 04	10 21	7 17	8 10	8 88
7095	THM WEVTR RAD CT	DGC	14 35	0 92	-1 22	-2 74	-2 11	-1 5_
7096	THM WEVTR STRAP	DGC	17 57	14 11	12 84	9 22	10 16	10 98
7097	THM WEMT BAY 1	DGC	17 71	19 30	17 05	10 04	11 14	12 85
7098	THM WEMT BAY 18	DGC	16 88	18 54	16 50	9 69	10 71	12 80
7099	THM WEVTR SEP 1	DGC	17 24	14 91	15 40	11 14	12 _7	14 23
7100	THM WEVTR SEP 17	DGC	18 71	18 13	18 42	14 12	15 05	15 64
7101	THM WEVTR 1 CENT	DGC	18 07	18 58	16 46	12 07	13 03	13 83
7102	THM VTR2 BAY 4	DGC	17 96	15 07	15 75	12 19	13 54	14 24
7103	THM VTR2 BAY 15	DGC	18 70	18 17	18 42	14 90	15 46	15 92
7104	THM WBV TR2 CTR	DGC	18 07	17 31	16 52	12 41	13 51	14 53
7105	THM NBTRB SEP 6	DGC	18 13	15 79	17 95	12 93	14 09	14 10
7106	THM NBTRB SEP 1	DGC	18 07	20 21	20 40	17 66	17 37	17 04
7107	THM NBTR BM CTR	DGC	18 31	17 76	17 71	14 36	15 _9	15 98
7108	THM MSS MOUNT 14	DGC	17 _3	16 05	16 14	13 68	14 13	14 56
7109	OA-N THRUSTER	DGC	21 51	22 11	_1 15	20 39	20 17	19 47
7110	THM MSS WBVTR BM	DGC	17 15	11 08	11 17	10 80	12 09	12 80
7111	OA +N THRUSTER	DGC	17 _3	17 01	16 80	10 96	11 91	11 14
7130	THM AVN P1 T	DGC	1 78	11 19	10 17	_4 09	25 52	11 91
7131	THM AVN P2 T	DGC	9 16	_7 50	14 24	15 14	15 75	_7 50

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

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)

LANDSAT-3

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	621	560	25	596
B	621	560	25	596

Table 12-2. Narrow Band Tape Recorder Telemetry Values

Func. No.	Name	T/V 20°	Orbit				
			2/3	30/31	174/215	368/369	564/565
10001	A-Motor Current (ma)						
	Record	179 70	179 38	182.47	180.93	182 47	184.02
	P/B	181.07	184 02	179 38	185.57	179.38	177.83
10101	B-Motor Current (ma)						
	Record	165 73	151.53	150.00	143.88	146.94	148.47
	P/B	164 64	143 87	142.34	151.53	145.41	143.88
10002	A-Pwr Supply Cur (ma)						
	Record	172.33	170.95	167.57	164.19	167.57	167.57
	P/B	N	397.25	387.12	383.75	387.13	377.01
10102	B-Pwr Supply Cur. (ma)						
	Record	186.83	190.00	186.67	190.00	186 66	186.66
	P/B	N	419.94	406 62	423.32	426 64	416.64
10003	A-Recorder Temp (DGC)	23.1	23.26	20.43	18 70	17 39	20.65
10103	B-Recorder Temp (DGC)	24.0	20.87	19.35	16 30	20.65	21.30
10004	A-Supply Volt	-24.51	-24.37	-24.37	-24.50	-24.50	-24.38
10104	B-Supply	-24 53	-24.50	-24.38	-24.50	-24.50	-24.50

N - Data Not Available

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. All are nominal.

Figure 13-1 is the AGC history recorded at Goldstone with the spacecraft successively at the same two points in space. The scatter of data points reflect variations in the ground station calibration and readout WBPS-2 has been used more consistently and is presented in this figure Values from WBPA-1 are nearly identical when that power amplifier is used

Table 13-1 Typical Wideband Subsystem Telemetry

Function (1)	Name	T/V 20W	Orbit 16/17	34/50	140	355	564/565
12001 12101	Temp TWT Coll. (DGC)	34.10 32.95	31.42 28.76	39.38 29 07	33.75 27 53	36 88 29.07	34.81 28.06
12002 12102	Cur. Helix (MA)	4.83 5.59	4.76 6 48	4 73 6.50	4.80 6.40	4.81 6.48	4.86 6 34
12003 12103	Cur. Cath (MA)	44.87 40.10	44.51 40.30	44.50 40.32	44 68 39.72	44 40 40.11	44.35 39.91
12004 12104	Fwd Pwr, (DBM)	42.27 42.83	42.06 42.87	42.04 42.46	41.47 42.42	42.28 42.83	42.43 42.82
12005 12105	Refl. Pwr (DBM)	30.00 30.90	30 00 31.32	30.00 31.80	30.00 31.48	30.00 31.32	30.00 31.20
12227	Mod A Volt Loop Stress (MHz)	0.32	- 4.00	+ 1.45	+ 0.85	0.04	- 0.25
12228	Mod B Loop Stress (MHz)	0.65	1.77	1.26	0.92	0.76	0 38
12229	Temp Mod (DGC)	21.33	14 62	1 26	13 31	17.00	17 00
12232	+15 VDC Pwr Sply (TMV)	2 70	2 68	2 68	2 69	2.67	2.68
12234	-15 VDC Pwr Sud (TMV)	4 29	4.38	4.38	4.36	4 32	4 35
12236	+5 VDC Pwr Suply (TMV)	4.05	4 05	4.05	4.05	4.05	4.05
12238	-5 VDC Pwr Sud (TMV)	5.18	5.18	5.18	5.14	5.18	5.18
12240	-24 VDC Unreg Pwr (TMV)	6 01	6.16	6.15	6.25	6.22	6.25
12242	Temp. Inv (DGC)	27.0	18 37	18.45	14 42	12 86	18.21

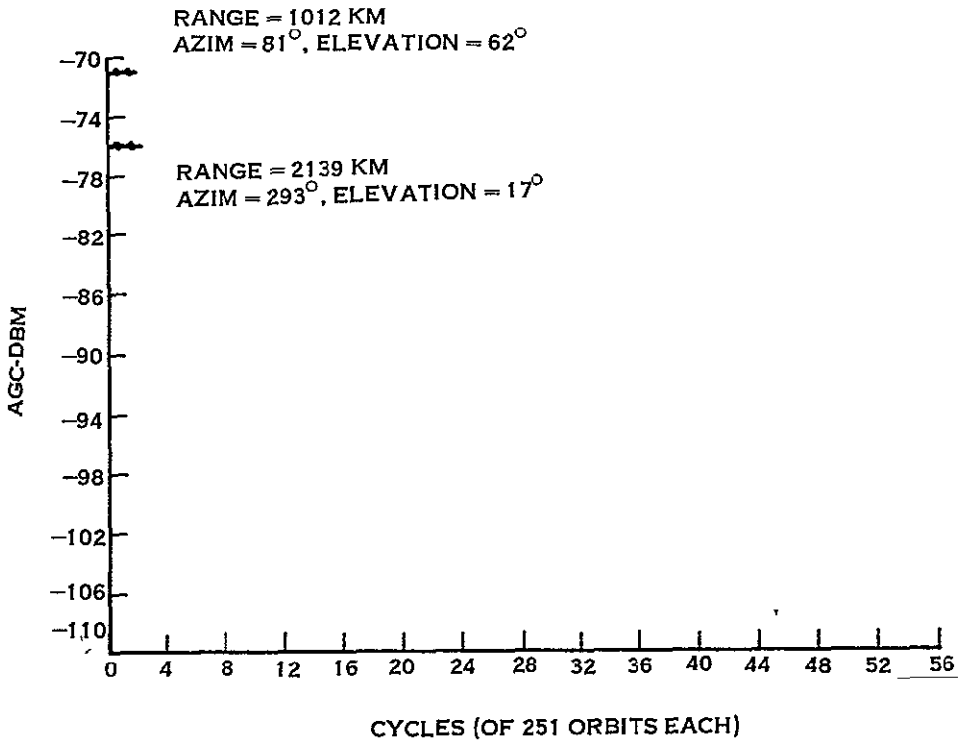

Figure 13-1. WPA-2 (Link 3) AGC Readings at Goldstone With 30 Foot Antenna, Landsat-3

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), turned ON during Orbit 5 and has been performing normally since then.

Table 14-1. AMS Telemetry Values

Function No.		Units	Orbit					
			6	34	50	140	340	540
3004	Case - Temp 1	DGC	19.23	20.61	20.57	18 58	18.61	18.37
3005	Assembly - Temp 2	DGC	19 62	21.15	21.13	19.15	19.15	18.93

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)
LANDSAT-3

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)

The WBVTR subsystem (Recorders 1 and 2) operated satisfactorily during this report period Minor frame sync error counts for WBVTR-2 (used with MSS data) have averaged below 5/10 seconds.

Table 15-1, 15-2 and 15-3 shows typical telemetry values for various recorder functions and modes Figure 15-1 shows tape usage for Recorder 1 and 2

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

Number	Name	Orbit					
		20° T/V	6, 16, 34	42/45	174/215	368/369	564/565
13022	Pressure Trans	16 21	16.25	16 25	16.12	16 12	16.12
13023	Temp Trans	18 82	15 26	16.08	11 69	12.46	14.00
13024	Temp Elec	18.76	16 35	18.42	9.17	10 00	12 69
13032	Limiter Volt	1 36	1.38	1 38	1 38	1.38	1 39
13034	+5.6 VDC Conv	5.48	5 74	5.67	5.47	5.47	5.47
13122	Pressure Trans	17 58	17.15	17 15	17 15	17.15	17.15
13123	Temp Trans	19 02	16.15	16.75	14 77	13.23	16.69
13124	Temp Elec	19.08	16.48	19.62	13.08	11.54	16 92
13132	Limiter Volt	1.29	1 30	1.31	1.30	1.30	1.30
13134	+5.6 VDC Conv	5 47	5.74	5.42	5.45	5.47	5 65

Table 15-2. Telemetry Values for WBVTR-1

Function	Orbit					
	20° T/V	6/16/34	42/45	174/215	368/369	564/565
13029 - Input P/B Voltage						
Record	0.0	0.0	0.0	0.0	0.0	0.0
Playback	0.72	0.83	0.89	0.89	0.85	0.81
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 Current						
Record	0.32	0.36	0.35	0.28	0.30	0.28
Playback	0.34	0.39	0.40	0.30	0.35	0.29
Rewind	0.20	0.22	0.23	0.22	0.24	0.22
Standby	0.0	0.0	0.0	0.0	0.0	0.0
13030 - Headwheel Motor Current						
Record	0.45	0.51	0.50	0.45	0.46	0.50
Playback	0.45	0.50	0.48	0.46	0.46	0.47
Rewind	0.40	0.44	0.41	0.37	0.40	0.39
Standby	0.39	0.45	0.43	0.37	0.39	0.39
13031 - Recorder Input Current						
Record	3.12	3.20	3.17	2.82	2.85	3.06
Playback	2.95	2.96	3.03	2.68	2.68	2.68
Rewind	1.62	1.64	1.60	1.47	1.47	1.50
Standby	1.36	1.27	1.28	1.27	1.30	1.27
13033 - Servo Voltage						
Record	0.0	0.0	0.0	0.0	0.0	0.0
Playback	49.03	49.16	49.10	49.38	49.38	49.32
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 Speed						
Record	101.65	101.64	101.64	103.41	103.41	102.82
Playback	100.94	101.05	101.05	102.82	102.82	102.82
Rewind	108.31	107.56	108.15	106.38	106.38	106.97
Standby	0.0	0.0	0.0	0.0	0.0	0.0
13027 - Headwheel Motor Speed						
Record	101.41	101.13	101.13	100.60	100.60	101.13
Playback	100.98	101.65	101.65	101.13	101.13	101.13
Rewind	103.01	102.18	102.71	101.65	101.65	102.18
Standby	102.95	102.71	102.71	102.18	102.18	102.18

Table 15-3. Telemetry Values for WBVTR-2

Function/Description	Orbit					
	20° T/V	6/16/34	42/45	174/215	368/369	564/565
13129 - Input P/B Voltage						
Record	0 0	0 0	0.0	0.0	0.0	0.0
Playback	0.59	0 57	0.58	0 62	0.62	0.58
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
13128 - Capstan Motor Current						
Record	0 37	0 33	0.45	0.39	0 29	0.46
Playback	0.34	0 30	0.28	0.35	0 33	0.29
Rewind	0.18	0.18	0 18	0.19	0.18	0.19
Standby	0.0	0 0	0 0	0 0	0.0	0.0
13130 - Headwheel Motor Current						
Record	0.44	0 48	0.43	0 45	0.45	0 40
Playback	0.44	0.46	0 47	0.45	0.43	0. 44
Rewind	0.40	0 39	0.40	0.39	0 39	0. 39
Standby	0.40	0 45	0.42	0.39	0.38	0 39
13131 - Recorder Input Current						
Record	2.46	2 39	2.39	2.24	2.06	2.48
Playback	2.77	2.73	2.79	2 18	2.27	2. 39
Rewind	1.31	1.18	1.20	1 05	1 08	1 15
Standby	1.07	0.95	1.03	0.89	0 89	0.95
13133 - Servo Voltage						
Record	0.0	0.0	0.0	0.0	0.0	0.0
Playback	50 16	50.49	50.29	50.29	50 49	50 29
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
13126 - Capstan Motor Speed						
Record	104 62	98.35	98.35	99.65	100.29	98. 35
Playback	103.92	96.42	96.41	99.35	98.35	97 70
Rewind	104.15	99.00	98.35	97.70	97.70	98 35
Standby	0 0	0 0	0 0	0.0	0.0	0 0
13127 - Headwheel Motor Speed						
Record	104.00	104.70	104.09	102 87	102.87	104.09
Playback	103.71	102.87	102.87	102.26	102.26	102.87
Rewind	105.71	104 70	103.97	104 09	104 09	104.70
Standby	106.11	104 70	104.10	104.09	104 70	104 70

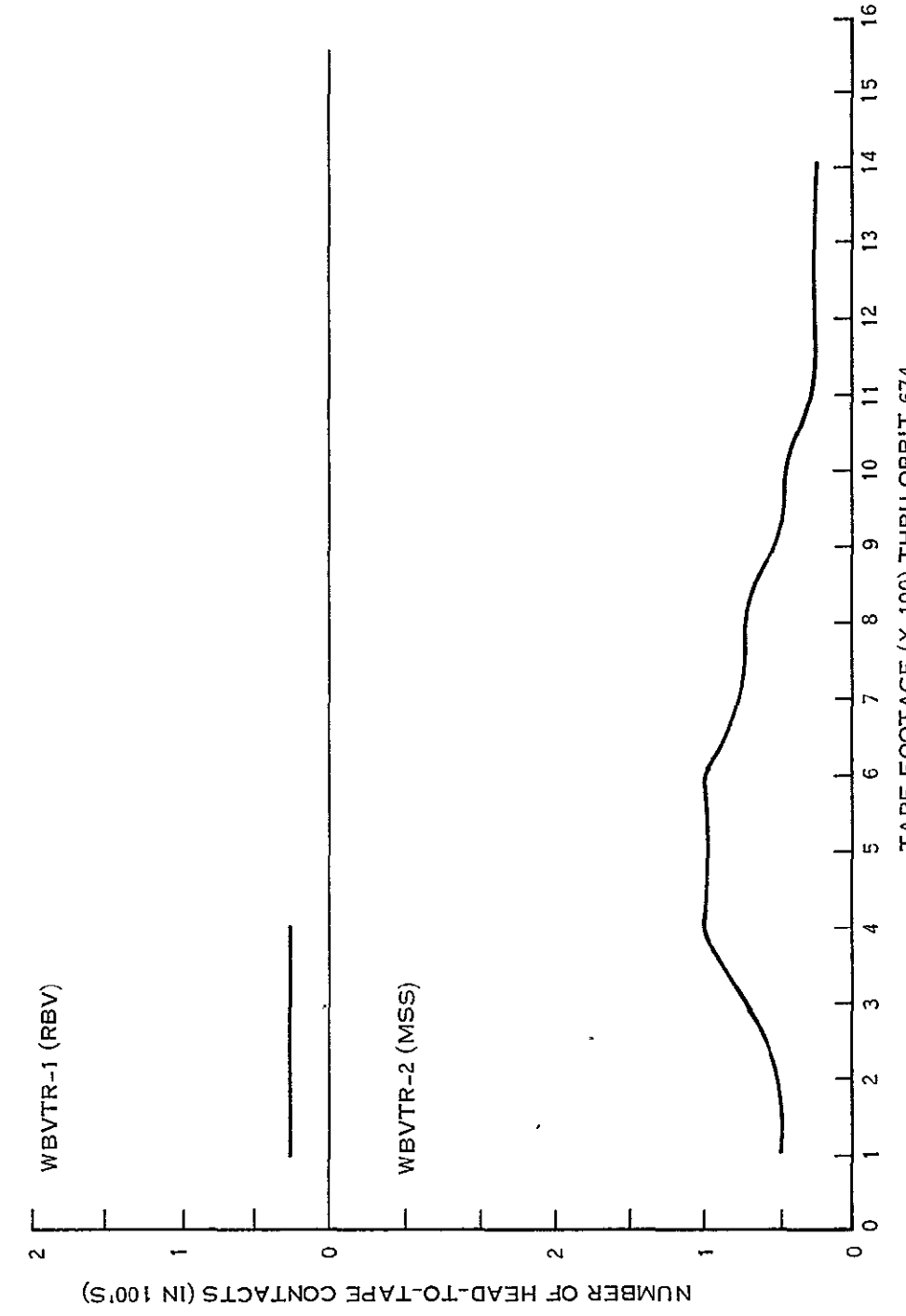

Figure 15-1. Landsat-3 WBR Tape Usage

SECTION 16

RETURN BEAM VIDICON (RBV)

LANDSAT-3

RETURN BEAM VIDICON (RBV)

The RBV operated satisfactorily during this report period. One problem associated with the RBV video is being investigated. Spacecraft equipment has not been conclusively determined to be the cause. It is a condition in which the video information suddenly rises to a white clip level and remains for a line or a portion of a line and returns to normal. It is a rare condition which occurs in a small percentage of frames. Figure 16-1 shows a typical image and the affect of this anomaly.

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

Figure 16-1. RBV Image Showing White Clip Level

Table 16-1. RBV Telemetry Values

Function			Orbit				
No.	Name	Units	34	42	174	368	565
14001	CCC Board Temp.	DGC	21.84	21.58	19.94	20.49	20.49
14002	CCC Pwr. Sup. Temp	DGC	23.39	23.01	21.60	21.60	21.60
14003	15 Vdc Sup.	TMV	4.00	3.97	4.00	4.02	3.97
14004	+6 V, -5, VDC Sup.	TMV	3.07	3.05	3.07	3.07	3.07
14100	VID Output V	TMV	0.83	2.23	1.27	2.17	2.25
14200 *			0.76	2.14	1.82	1.47	0.95
14102	Comb. Align Cur.	TMV	4.15	4.15	4.17	4.15	4.15
14202 *			4.13	4.13	4.15	4.15	4.15
14103	Elec Temp.	DGC	19.23	19.10	16.62	17.73	18.28
14203 *			23.45	22.95	22.60	22.05	22.05
14104	LV Pwr Sup T.	DGC	19.05	19.21	16.73	16.73	18.39
14204 *			23.10	22.95	22.15	21.60	21.60
14105	Defl. Pwr. Sup. +10 VDC	TMV	4.02	4.02	4.02	4.02	4.02
14205 *			4.05	4.08	4.07	4.07	4.07
14106	L.V.P.S. +6V, -6.3VDC	TMV	3.77	3.77	3.77	3.77	3.77
14206 *			3.75	3.75	3.77	3.75	3.75
14107	Ther. Elec. Cur.	TMV	3.02	2.77	2.77	2.25	2.60
14207 *			2.57	2.60	2.77	2.25	2.60
14108	Vid. Fil. Cur.	TMV	2.62	2.57	2.60	2.57	2.57
14208 *			2.38	2.44	2.60	2.60	2.60
14110	Vid. Tgt. Volt	TMV	3.55	3.55	3.37	3.55	3.37
14210 *			3.06	3.15	3.37	3.32	3.35
14113	Vert Def V	TMV	3.20	2.95	3.02	3.02	3.02
14213 *			2.78	2.75	2.97	2.95	2.95
14114	Vid FTP	DGC	24.10	23.90	23.10	23.65	23.65
14214 *			23.90	22.85	22.09	22.60	22.60
14115	Foc Coil T	DGC	19.80	20.33	17.07	18.18	18.18
14215 *			20.00	20.87	17.07	18.18	18.18

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

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

Function		Mode	Orbit				
No.	Name		34	42	174	368	565
14101	Focus I	Hold	0.55	0.52	0.52	0.55	0.52
		Prep	1.65	1.62	1.60	1.62	1.62
		Read	2.77	2.77	2.75	2.77	2.75
14109	Grid V	Hold	0.70	0.70	0.72	0.72	0.72
		Prep	2.20	2.20	2.22	2.22	2.20
		Read	4.15	4.15	4.15	4.15	4.15
14111	Cath I	Hold	0.40	0.40	0.40	0.40	0.40
		Prep	0.77	0.77	0.77	0.77	0.77
		Read	3.10	3.10	3.12	3.12	3.12
14112	Hor Def	Hold	0.0	0.0	0.0	0.0	0.0
		Prep	2.00	2.02	1.97	2.02	2.02
		Read	3.42	3.45	3.45	3.40	3.45
14120	+500 V	Hold	1.07	1.07	1.07	1.05	1.07
		Read	4.17	4.17	4.17	4.17	4.17

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

Function		Mode	Orbit				
No.	Name		34	42	174	368	565
14201	Focus I	Hold	0.50	0.50	0.50	0.50	0.50
		Prep	1.57	1.57	1.57	1.57	1.57
		Read	2.70	2.70	2.70	2.70	2.70
14209	Grid V	Prep	0.55	0.55	0.55	0.55	0.55
		Read	1.90	1.90	1.92	1.90	1.92
		Hold	4.15	4.15	4.15	4.15	4.15
14211	Cath I	Hold	0.40	0.40	0.40	0.40	0.40
		Read	0.90	0.90	0.92	0.92	0.92
		Prep	3.30	3.30	3.32	3.37	3.32
14212	Hor Def	Hold	0.0	0.0	0.00	0.00	0.00
		Prep	1.67	1.67	1.67	1.65	1.62
		Read	3.00	3.02	3.00	3.02	3.02
14220	+500 V	Prep	1.10	1.10	1.22	1.10	1.12
		Read	4.25	4.25	4.25	4.25	4.25

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

LANDSAT-3

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

The MSS Subsystem has operated nominally in this period without incident. Figure 17-1A and 1B show the number of scenes imaged at each geographic location since launch. Figure 17-1A shows the scenes taken during the north-to-south passage (as in all prior quarterly reports) from all 5 bands. Figure 17-1B shows the scenes taken during the south-to-north passages (i.e., the "night" side of the earth) from the infrared sensors in Band 5. The Antarctica, therefore, is at the top of this map, and the northern-most earth latitudes are at the bottom. In these maps, only those scenes received by U.S. ground stations are shown. Scenes transmitted to Canada, Brazil and Italy (44% of total) are not shown.

Table 17-1 shows typical telemetry values since launch. All are nominal. Table 17-2 shows the history of sensor response to a constant input radiance level. Each sensor is sampled at 5 radiance levels and all show essentially the same trends. Only one of these levels (the second highest) is listed in Table 17-2. Line length history is also shown in Table 17-2.

Sun calibrations, performed every two weeks, show nominal performance.

IPF has observed that in a small percentage of processed pictures, real-time and playback, there are random patches of "salt" and "pepper". No consistency in the pattern is yet apparent. Observations are continuing.

Table 17-1. MSS Analog Telemetry

Function No.	Function Name	Units	Vac 20°C	ORBIT					
				20	50	140	340	461	602
15021	Band 5 -15 V	TMv	4.91	F	F	F	F	4.83	4.83
15022	Band 5 Pa Case Temp	°C	13.18	10.42	11.15	10.95	14.32	13.99	13.38
15025	Ch 25 Bias	TMv	3.91	F	F	F	F	3.91	3.91
15026	Ch 26 Bias	TMv	3.86	F	F	F	F	3.59	3.66
15040	Mux -6 Vdc PS	Vdc	- 6.19	6.19	6.19	6.19	6.19	6.19	6.18
15041	A/D Conv Rep Sup	Vdc	3.60	3.60	3.60	3.60	3.42	3.59	3.60
15042	Avg Den Data Trans	TMv	1.75	1.70	1.92	2.28	2.24	2.39	0.09
15043	Fiber Opt Plate T	°C	17.76	13.89	13.92	12.93	14.64	15.39	14.66
15044	Fiber Opt Plate T	°C	16.64	12.78	12.66	11.55	13.34	13.88	13.29
15045	Multiplexer Temp	°C	20.53	19.02	18.37	15.43	14.87	19.17	16.27
15046	Elect. Cover Temp	°C	21.46	16.02	14.23	15.04	16.41	18.86	17.19
15047	Power Supply Temp	°C	20.59	15.23	14.31	13.27	14.15	16.83	14.95
15048	Scan Mirror Reg Temp	°C	19.62	12.59	12.61	11.21	11.98	15.07	13.07
15049	Scan Mirror Drive Elect. T	°C	20.52	15.18	12.94	11.81	12.46	15.96	13.59
15050	Scan Mirror Drive Coil T	°C	19.72	12.52	12.69	11.38	12.33	15.07	13.21
15051	Scan Mirror Temp	°C	18.96	11.55	12.25	10.69	11.77	14.27	12.64
15052	Rot Sht Hsg Temp	°C	18.03	14.07	13.93	13.04	14.86	15.51	14.65
15053	Scn Mirror Reg Volt	Vdc	23.26	24.03	24.02	24.02	24.02	24.02	23.36
15054	Cal Lamp Current	MA	112.51	112.50	112.50	112.50	112.50	112.50	112.50
15055	BD 1 15 V Reg	TMv	5.07	5.07	5.07	5.07	5.07	5.07	5.07
15056	BD 2 15 V Reg	TMv	5.05	5.05	5.05	5.05	5.05	5.05	5.05
15057	BD 3 15 V Reg	TMv	5.10	5.10	5.10	5.10	5.10	5.10	5.10
15058	BD 4 15 V Reg	TMv	5.02	5.02	5.02	5.02	5.02	5.02	5.02
15059	TLM Reg -15 V	Vdc	-15.15	-15.17	-15.17	-15.17	-15.17	-15.17	-15.17
15060	SM Reg +12/-6 Vdc	TMv	5.00	5.00	5.00	5.00	5.00	5.00	5.00
15061	+5 Vdc Logic Reg.	TMv	4.87	4.85	4.90	4.91	4.96	4.89	4.90
15062	+19 V Rect Out	TMv	5.89	6.00	6.02	5.89	5.90	5.88	5.88
15063	-19 V Rect Out	TMv	4.23	4.30	4.30	4.23	4.23	4.33	4.22
15064	BD 1 HVA Mon	TMv	5.00	5.00	5.00	5.00	5.00	5.00	5.00
15065	BD 1 HVB Mon	TMv	4.95	F	F	F	F	F	F
15066	BD 2 HVA Mon	TMv	5.00	5.03	5.04	5.02	5.05	5.05	5.05
15067	BD 2 HVB Mon	TMv	4.88	F	F	F	F	F	F
15068	BD 3 HVA Mon	TMv	5.00	5.00	5.00	5.00	5.07	5.02	5.02
15069	BD 3 HVB Mon	TMv	4.97	F	F	F	F	F	F
15070	Shtr Mtr Con. Int.	TMv	2.52	2.55	2.55	2.55	2.53	2.53	2.54
15071	Scan Mirror Drive	Vdc	- 8.00	- 7.95	- 7.95	- 8.00	- 7.95	- 8.00	- 8.00

Table 17-2. MSS Response History - Landsat-3

Quantum Level for Selected Work
(0 = Black, 63 = White)

Band	Sensor	at Launch	Average Value 1st Quar	% Chg Since Launch
1	1	54	52	-4
	2	49	46	-6
	3	48	47	-1
	4	50	48	-4
	5	51	49	-6
	6	48	48	0
2	7	55	55	0
	8	56	54	-4
	9	52	49	-6
	10	53	51	-4
	11	56	53	-5
	12	53	53	0
3	13	56	54	-4
	14	55	53	-4
	15	58	59	+2
	16	51	51	0
	17	57	54	-5
	18	53	51	-4
4	19	32	32	0
	20	34	34	0
	21	38	38	0
	22	34	34	0
	23	35	35	0
	24	30	30	0
5	25	Outgasing		
	26	Outgasing		
Line Length		3187	3187	0

SECTION 18

DATA COLLECTION SYSTEM (DCS)

LANDSAT-3

SECTION 18

DATA COLLECTION SUBSYSTEM (DCS)

The DCS Subsystem performed nominally during this report period, continuing message collection at the normal rate as previous spacecraft.

Figure 18-1 shows the number of DCS messages received in each 18-day cycle at OCC. Active DCP's in the field average about 86. The percentage of good messages is about 96%.

There are 48 users in the data base; 256 DCP's are in the data base.

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

Table 18-1. DCS Telemetry Values

Func. No.		Orbits					
		6	30	43	152	340	590
16001	Receiver 1 Sig Strength (DBM)	-125	-131	-125	-128.17	-129.21	-130.43
16002	Receiver 1 Temp (DGC)	19.21	19.58	19.05	19.36	19.41	18.94
16003	Rec-1 Pwr Input Volt (VDC)	2.35	2.35	2.35	2.35	2.34	2.34
16004	Receiver 2 Sig Strength (DBM)	F	F	F	F	F	F
16005	Receiver 2 Temp (DGC)	F	F	F	F	F	F
16006	Receiver 2 Input Volt (VDC)	F	F	F	F	F	F

F = Receiver 2 was OFF

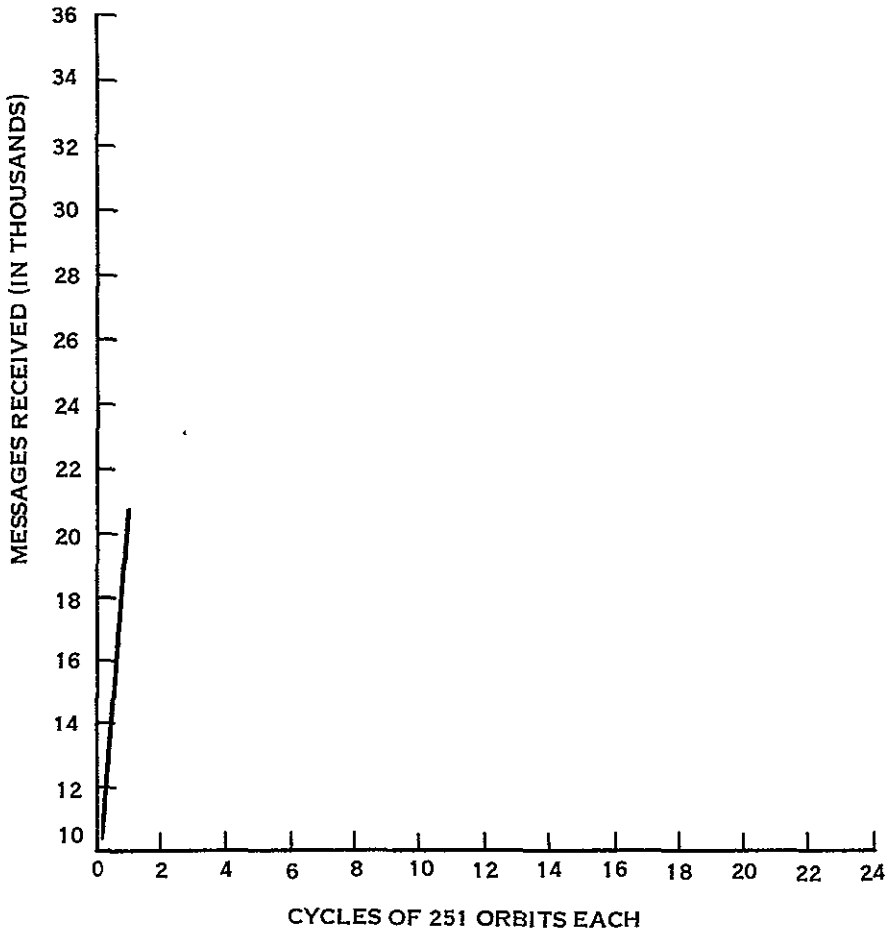

Figure 18-1. Landsat-3 Number of DCS Messages for an 18-Day Cycle

APPENDIX A

LANDSAT-3 ANOMALY AND OBSERVATIONS

APPENDIX A

LANDSAT-3 ANOMALIES AND OESERVATIONS

Date	Anomaly/Observation	How Observed	Comments
3/8/78	Cell 4 of B Comstor would not verify.	On-Line	Cell 4 of B Comstor would not load properly in Orbits 41, 45 and 48. Operational use discontinued on 3/18/78 when all "1s" appeared in cell 4.
3/9/78	RBV had intermittent white level saturation in first 5% of image. MDR D04939	Off-Line	White level saturation occurred in first 5% of images at intermittent occurance

APPENDIX B

LANDSAT-3 SPACECRAFT ORBIT REFERENCE TABLES

LANDSAT-3

SPACECRAFT ORBIT REFERENCE TABLES

FROM LAUNCH, 5 MARCH 1978 THROUGH OCTOBER 1978

ORBITS 0 TO 3350

FLIGHT DAY 0 THROUGH 241

Landsat-3
March 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1																				
2																				
3																				
4																				
5	64	1	0-3			0														
6	65	2	4-17			0														
7	66	3	18-31			0														
8	67	4	32-45			0														
9	68	5	46-59			0														
10	69	6	60-73			0														
11	70	7	74-87			0														
12	71	8	88-101			0														
13	72	9	102-115			0														
14	73	10	116-129			0														
15	74	11	130-143	1-14	1	1		124	142	160	178	196	214	232	250	017	035	053	071	089
16	75	12	144-157	15-28	2	1	107	125	143	161	179	197	215	233	251	018	036	054	072	090
17	76	13	158-171	29-42	3	1	108	126	144	162	180	198	216	234	001	019	037	055	073	091
18	77	14	172-185	43-56	4	1	109	127	145	163	181	199	217	235	002	020	038	056	074	092
19	78	15	186-199	57-70	5	1	110	128	146	164	182	200	218	236	003	021	039	057	075	093
20	79	16	200-213	71-84	6	1	111	129	147	165	183	201	219	237	004	022	040	058	076	094
21	80	17	214-227	85-98	7	1	112	130	148	166	184	202	220	238	005	023	041	059	077	095
22	81	18	228-241	99-112	8	1	113	131	149	167	185	203	221	239	006	024	042	060	078	096
23	82	19	242-255	113-126	9	1	114	132	150	168	186	204	222	240	007	025	043	061	079	097
24	83	20	256-268	127-139	10	1	115	133	151	169	187	205	223	241	008	026	044	062	080	098
25	84	21	269-282	140-153	11	1	116	134	152	170	188	206	224	242	009	027	045	063	081	099
26	85	22	283-296	154-167	12	1	117	135	153	171	189	207	225	243	010	028	046	064	082	100
27	86	23	297-310	168-181	13	1	118	136	154	172	190	208	226	244	011	029	047	065	083	101
28	87	24	311-324	182-195	14	1	119	137	155	173	191	209	227	245	012	030	048	066	084	102
29	88	25	325-338	196-209	15	1	120	138	156	174	192	210	228	246	013	031	049	067	085	103
30	89	26	339-352	210-223	16	1	121	139	157	175	193	211	229	247	014	032	050	068	086	104
31	90	27	353-366	224-237	17	1	122	140	158	176	194	212	230	248	015	033	051	069	087	105

Landsat-3
April 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	91	28	367-380	238-251	18	1	123	141	159	177	195	213	231	249	016	034	052	070	088	106
2	92	29	381-394	1-14	1	2		124	142	160	178	196	214	232	250	017	035	053	071	089
3	93	30	395-408	15-28	2	2	107	125	143	161	179	197	215	233	251	018	036	054	072	090
4	94	31	409-422	29-42	3	2	108	126	144	162	180	198	216	234	252	019	037	055	073	091
5	95	32	123-436	43-56	4	2	109	127	145	163	181	199	217	235	253	020	038	056	074	092
6	96	33	437-450	57-70	5	2	110	128	146	164	182	200	218	236	254	021	039	057	075	093
7	97	34	451-464	71-84	6	2	111	129	147	165	183	201	219	237	255	022	040	060	076	094
8	98	35	465-478	85-98	7	2	112	130	148	166	184	202	220	238	256	023	041	061	077	095
9	99	36	479-492	99-112	8	2	113	131	149	167	185	203	221	239	257	024	042	062	078	096
10	100	37	493-506	113-126	9	2	114	132	150	168	186	204	222	240	258	025	043	063	079	097
11	101	38	507-519	127-139	10	2	115	133	151	169	187	205	223	241	259	026	044	064	080	098
12	102	39	520-533	140-153	11	2	116	134	152	170	188	206	224	242	260	027	045	065	081	099
13	103	40	534-547	154-167	12	2	117	135	153	171	189	207	225	243	261	028	046	066	082	100
14	104	41	548-561	168-181	13	2	118	136	154	172	190	208	226	244	262	029	047	067	083	101
15	105	42	562-575	182-195	14	2	119	137	155	173	191	209	227	245	263	030	048	068	084	102
16	106	43	576-589	196-209	15	2	120	138	156	174	192	210	228	246	013	031	049	067	085	103
17	107	44	590-603	210-223	16	2	121	139	157	175	193	211	229	247	014	032	050	068	086	104
18	108	45	604-617	224-237	17	2	122	140	158	176	194	212	230	248	015	033	051	069	087	105
19	109	46	618-631	238-251	18	2	123	141	159	177	195	213	231	249	016	034	052	070	088	106
20	110	47	632-645	1- 14	1	2		124	142	160	178	196	214	232	250	017	035	053	071	089
21	111	48	646-659	15- 28	2	2	107	125	143	161	179	197	215	233	251	018	036	054	072	090
22	112	49	660-673	29- 42	3	2	108	126	144	162	180	198	216	234	001	019	037	055	073	091
23	113	50	674-687	43- 56	4	2	109	127	145	163	181	199	217	235	002	020	038	056	074	092
24	114	51	688-701	57- 70	5	2	110	128	146	164	182	200	218	236	003	021	039	057	075	093
25	115	52	702-715	71- 84	6	2	111	129	147	165	183	201	219	237	004	022	040	058	076	094
26	116	53	716-729	85- 98	7	2	112	130	148	166	184	202	220	238	005	023	041	059	077	095
27	117	54	730-743	99-112	8	2	113	131	149	167	185	203	221	239	006	024	042	060	078	096
28	118	55	744-757	113-126	9	2	114	132	150	168	186	204	222	240	007	025	043	061	079	097
29	119	56	758-770	127-139	10	2	115	133	151	169	187	205	223	241	008	026	044	062	080	098
30	120	57	771-784	140-153	11	2	116	134	152	170	188	206	224	242	009	027	045	063	081	099

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May 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	121	58	785-798	154-167	12	3	117	135	153	171	189	207	225	243	010	028	046	064	082	100
2	122	59	799-812	168-181	13	3	118	136	154	172	190	208	226	244	011	029	047	065	083	101
3	123	60	813-826	182-195	14	3	119	137	155	173	191	209	227	245	012	030	048	066	084	102
4	124	61	827-840	196-209	15	3	120	138	156	174	192	210	228	246	013	031	049	067	085	103
5	125	62	841-854	210-223	16	3	121	139	157	175	193	211	229	247	014	032	050	068	086	104
6	126	63	855-869	224-237	17	3	122	140	158	176	194	212	230	248	015	033	051	069	087	105
7	127	64	869-882	238-251	18	3	123	141	159	177	195	213	231	249	016	034	052	070	088	106
8	128	65	883-896	1-14	1	4		124	142	160	178	196	214	232	250	017	035	053	071	089
9	129	66	897-910	15-28	2	4	107	125	143	161	179	197	215	233	251	018	036	054	072	090
10	130	67	911-924	29-42	3	4	108	126	144	162	180	198	216	234	001	019	037	055	073	091
11	131	68	925-938	43-56	4	4	109	127	145	163	181	199	217	235	002	020	038	056	074	092
12	132	69	939-952	57-70	5	4	110	128	146	164	182	200	218	236	003	021	039	057	075	093
13	133	70	953-966	71-84	6	4	111	129	147	165	183	201	219	237	004	022	040	058	076	094
14	134	71	967-980	85-98	7	4	112	130	148	166	184	202	220	238	005	023	041	059	077	095
15	135	72	981-994	99-112	8	4	113	131	149	167	185	203	221	239	006	024	042	060	078	096
16	136	73	995-1008	113-126	9	4	114	132	150	168	186	204	222	240	007	025	043	061	079	097
17	137	74	1009-1021	127-139	10	4	115	133	151	169	187	205	223	241	008	026	044	062	080	098
18	138	75	1022-1035	140-153	11	4	116	134	152	170	188	206	224	242	009	027	045	063	081	099
19	139	76	1036-1049	154-167	12	4	117	135	153	171	189	207	225	243	010	028	046	064	082	100
20	140	77	1050-1063	168-181	13	4	118	136	154	172	190	208	226	244	011	029	047	065	083	101
21	141	78	1064-1077	182-195	14	4	119	137	155	173	191	209	227	245	012	030	048	066	084	102
22	142	79	1078-1091	196-209	15	4	120	138	156	174	192	210	228	246	013	031	049	067	085	103
23	143	80	1092-1105	210-223	16	4	121	139	157	175	193	211	229	247	014	032	050	068	086	104
24	144	81	1106-1119	224-237	17	4	122	140	158	176	194	212	230	248	015	033	051	069	087	105
25	145	82	1120-1133	238-251	18	4	123	141	159	177	195	213	231	249	016	034	052	070	088	106
26	146	83	1134-1147	1-14	1	5		124	142	160	178	196	214	232	250	017	035	053	071	089
27	147	84	1148-1161	15-28	2	5	107	125	143	161	179	197	215	233	251	018	036	054	072	090
28	148	85	1162-1175	29-42	3	5	108	126	144	162	180	198	216	234	001	019	037	055	073	091
29	149	86	1176-1189	43-56	4	5	109	127	145	163	181	199	217	235	002	020	038	056	074	092
30	150	87	1190-1203	57-70	5	5	110	128	146	164	182	200	218	236	003	021	039	057	075	093
31	151	88	1204-1217	71-84	6	5	111	129	147	165	183	201	219	237	004	022	040	058	076	094

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June 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	152	89	1218-1231	85-98	7	5	112	130	148	166	184	202	220	238	005	023	041	059	077	095
2	153	90	1232-1245	99-112	8	5	113	131	149	167	185	203	221	239	006	024	042	060	078	096
3	154	91	1246-1259	113-126	9	5	114	132	150	168	186	204	222	240	007	025	043	061	079	097
4	155	92	1260-1272	127-139	10	5	115	133	151	169	187	205	223	241	008	026	044	062	080	098
5	156	93	1273-1286	140-153	11	5	116	134	152	170	188	206	224	242	009	027	045	063	081	099
6	157	94	1287-1300	154-167	12	5	117	135	153	171	189	207	225	243	010	028	046	064	082	100
7	158	95	1301-1314	168-181	13	5	118	136	154	172	190	208	226	244	011	029	047	065	083	101
8	159	96	1315-1328	182-195	14	5	119	137	155	173	191	209	227	245	012	030	048	066	084	102
9	160	97	1329-1342	196-209	15	5	120	138	156	174	192	210	228	246	013	031	049	067	085	103
10	161	98	1343-1356	210-223	16	5	121	139	157	175	193	211	229	247	014	032	050	068	086	104
11	162	99	1357-1370	224-237	17	5	122	140	158	176	194	212	230	248	015	033	051	069	087	105
12	163	100	1371-1384	238-251	18	5	123	141	159	177	195	213	231	249	016	034	052	070	088	106
13	164	101	1385-1398	1-14	1	6		124	142	160	178	196	214	232	250	017	035	053	071	089
14	165	102	1399-1412	15-28	2	6	107	125	143	161	179	197	215	233	251	018	036	054	072	090
15	166	103	1413-1426	29-42	3	6	108	126	144	162	180	198	216	234	001	019	037	055	073	091
16	167	104	1427-1440	43-56	4	6	109	127	145	163	181	199	217	235	002	020	038	056	074	092
17	168	105	1441-1454	57-70	5	6	110	128	146	164	182	200	218	236	003	021	039	057	075	093
18	169	106	1455-1468	71-84	6	6	111	129	147	165	183	201	219	237	004	022	040	058	076	094
19	170	107	1469-1482	85-98	7	6	112	130	148	166	184	202	220	238	005	023	041	059	077	095
20	171	108	1483-1496	99-112	8	6	113	131	149	167	185	203	221	239	006	024	042	060	078	096
21	172	109	1497-1510	113-126	9	6	114	132	150	168	186	204	222	240	007	025	043	061	079	097
22	173	110	1511-1523	127-139	10	6	115	133	151	169	187	205	223	241	008	026	044	062	080	098
23	174	111	1524-1537	140-153	11	6	116	134	152	170	188	206	224	242	009	027	045	063	081	099
24	175	112	1538-1551	154-167	12	6	117	135	153	171	189	207	225	243	010	028	046	064	082	100
25	176	113	1552-1565	168-181	13	6	118	136	154	172	190	208	226	244	011	029	047	065	083	101
26	177	114	1566-1579	182-195	14	6	119	137	155	173	191	209	227	245	012	030	048	066	084	102
27	178	115	1580-1593	196-209	15	6	120	138	156	174	192	210	228	246	013	031	049	067	085	103
28	179	116	1594-1607	210-223	16	6	121	139	157	175	193	211	229	247	014	032	050	068	086	104
29	180	117	1608-1621	224-237	17	6	122	140	158	176	194	212	230	248	015	033	051	069	087	105
30	181	118	1622-1635	238-251	18	6	123	141	159	177	195	213	231	249	016	034	052	070	088	106

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July 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	182	119	1636-1649	1- 14	1	7		124	142	160	178	196	214	232	250	017	035	053	071	089
2	183	120	1650-1663	15- 28	2	7	107	125	143	161	179	197	215	233	251	018	036	054	072	090
3	184	121	1664-1677	29- 42	3	7	108	126	144	162	180	198	216	234	001	019	037	055	073	091
4	185	122	1678-1691	43- 56	4	7	109	127	145	163	181	199	217	235	002	020	038	056	074	092
5	186	123	1692-1705	57- 70	5	7	110	128	146	164	182	200	218	236	003	021	039	057	075	093
6	187	124	1706-1719	71- 84	5	7	111	129	147	165	183	201	219	237	004	022	040	058	076	094
7	188	125	1720-1733	85- 98	7	7	112	130	148	166	184	202	220	238	005	023	041	059	077	095
8	189	126	1734-1747	99-112	8	7	113	131	149	167	185	203	221	239	006	024	042	060	078	096
9	190	127	1748-1761	113-126	9	7	114	132	150	168	186	204	222	240	007	025	043	061	079	097
10	191	128	1762-1774	127-139	10	7	115	133	151	169	187	205	223	241	008	026	044	062	080	098
11	192	129	1775-1788	140-153	11	7	116	134	152	170	188	206	223	242	009	027	045	063	081	099
12	193	130	1789-1802	154-167	12	7	117	135	153	171	189	207	225	243	010	028	046	064	082	100
13	194	131	1803-1816	168-181	13	7	118	136	154	172	190	208	226	244	011	029	047	065	083	101
14	195	132	1817-1830	182-195	14	7	119	137	155	173	191	209	227	245	012	030	048	066	084	102
15	196	133	1831-1844	196-209	15	7	120	138	156	174	192	210	228	246	013	031	049	067	085	103
16	197	134	1845-1858	210-223	16	7	121	139	157	175	193	211	229	247	014	032	050	068	086	104
17	198	135	1859-1872	224-237	17	7	122	140	158	176	194	212	230	248	015	033	051	069	087	105
18	199	136	1873-1886	238-251	18	7	123	141	159	177	195	213	231	249	016	034	052	070	088	106
19	200	137	1887-1900	1- 14	1	8		124	142	160	178	196	214	232	250	017	035	053	071	089
20	201	138	1901-1914	15- 28	2	8	107	125	143	161	179	197	215	233	251	018	036	054	072	090
21	202	139	1915-1928	29- 42	3	8	108	126	144	162	180	198	216	234	001	019	037	055	073	091
22	203	140	1929-1942	43- 56	4	8	109	127	145	163	181	199	217	235	002	020	038	056	074	092
23	204	141	1943-1956	57- 70	5	8	110	128	146	164	182	200	218	236	003	021	039	057	075	093
24	205	142	1957-1970	71- 84	6	8	111	129	147	165	183	201	219	237	004	022	040	058	076	094
25	206	143	1971-1984	85- 98	7	8	112	130	148	166	184	202	220	238	005	023	041	059	077	095
26	207	144	1985-1998	99-112	8	8	113	131	149	167	185	203	221	239	006	024	042	060	078	096
27	208	145	1999-2012	113-126	9	8	114	132	150	168	186	204	222	240	007	025	043	061	079	097
28	209	146	2013-2025	127-139	10	8	115	133	151	169	187	205	223	241	008	026	044	062	080	098
29	210	147	2026-2039	140-153	11	8	116	134	152	170	188	206	224	242	009	027	045	063	081	099
30	211	148	2040-2053	154-167	12	8	117	135	153	171	189	207	225	243	010	028	046	064	082	100
31	212	149	2054-2067	168-181	13	8	118	136	154	172	190	208	226	244	011	029	047	065	083	101

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August 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	213	150	2068-2081	182-195	14	8	119	137	155	173	191	209	227	245	012	030	048	066	084	102
2	214	151	2082-2095	196-209	15	8	120	138	156	174	192	210	228	246	013	031	049	067	085	103
3	215	152	2096-2109	210-223	16	8	121	139	157	175	193	211	229	247	014	032	050	68	086	104
4	216	153	2110-2123	224-237	17	8	122	140	158	176	194	212	230	248	015	033	051	069	087	106
5	217	154	2124-2137	238-251	18	8	123	141	159	177	195	213	231	249	016	034	052	070	088	106
6	218	155	2138-2151	1- 14	1	9		124	142	160	178	196	214	232	250	017	035	053	071	089
7	219	156	2152-2165	15- 28	2	9	107	124	143	161	179	197	215	233	251	018	036	054	072	090
8	220	157	2166-2179	29- 42	3	9	108	126	144	162	180	198	216	234	001	019	037	055	073	091
9	221	158	2180-2193	43- 56	4	9	109	127	145	163	181	199	217	235	002	020	038	056	074	092
10	222	159	2194-2207	57- 70	5	9	110	128	146	164	182	200	218	236	003	021	039	057	075	093
11	223	160	2208-2225	71- 84	6	9	111	129	147	165	183	201	219	237	004	022	040	058	076	094
12	224	161	2222-2235	85- 98	7	9	112	130	148	166	184	202	220	238	005	023	041	059	077	095
13	225	162	2236-2249	99-112	8	9	113	131	149	167	185	203	221	239	006	024	042	060	078	096
14	226	163	2250-2263	113-126	9	9	114	132	150	168	186	204	222	240	007	025	043	061	079	097
15	227	164	2264-2276	127-139	10	9	115	133	151	169	187	205	223	241	008	076	044	062	080	098
16	228	165	2277-2290	140-153	11	9	116	134	152	170	188	206	224	242	009	027	045	063	081	099
17	229	166	2291-2304	154-167	12	9	117	135	153	171	189	207	225	243	010	028	046	064	082	100
18	230	167	2305-2318	168-181	13	9	118	136	154	172	190	208	226	244	011	029	047	065	083	101
19	231	168	2319-2332	182-195	14	9	119	137	155	173	191	209	227	245	012	030	048	066	084	102
20	232	169	2333-2346	196-209	15	9	120	138	156	174	192	210	228	246	013	031	049	067	085	103
21	233	170	2347-2360	210-223	16	9	121	139	157	175	193	211	229	247	014	032	050	068	086	104
22	234	171	2361-2374	224-237	17	9	122	140	158	176	194	212	230	248	015	033	051	069	087	105
23	235	172	2375-2388	238-251	18	9	123	141	159	177	195	213	231	249	016	034	052	070	088	106
24	236	173	2389-2402	1- 14	1	10		124	142	160	178	196	214	232	250	017	035	053	071	089
25	237	174	2403-2416	15- 28	2	10	107	125	143	161	179	197	215	233	251	018	036	054	072	090
26	238	175	2417-2430	29- 42	3	10	108	126	144	162	180	198	216	234	252	019	037	055	073	091
27	239	176	2431-2333	43- 56	4	10	109	127	145	163	181	199	217	235	002	020	039	056	074	092
28	240	177	2445-2458	57- 70	5	10	110	128	146	164	182	200	218	236	003	021	039	057	075	093
29	241	178	2459-2472	71- 84	6	10	111	129	147	165	183	201	219	237	004	022	040	058	076	094
30	242	179	2473-2486	85- 98	7	10	112	130	148	166	184	202	220	238	005	023	041	059	077	095
31	243	180	2487-2500	99-112	8	10	113	131	149	167	185	203	221	239	006	024	042	060	078	096

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September 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	244	181	2501-2514	113-126	9	10	114	132	150	168	186	204	222	240	007	025	043	061	079	097
2	245	182	2515-2527	127-139	10	10	115	133	151	169	187	205	223	241	008	026	044	062	080	098
3	246	183	2528-2541	140-153	11	10	116	134	152	170	188	206	224	242	009	027	045	063	081	099
4	247	184	2542-2555	154-167	12	10	117	135	153	171	189	207	225	243	010	028	046	064	082	100
5	248	185	2556-2569	168-181	13	10	118	136	154	172	190	208	226	244	011	029	047	065	083	101
6	249	186	2570-2583	182-195	14	10	119	137	155	173	191	209	227	245	012	030	048	066	084	102
7	250	187	2584-2597	196-209	15	10	120	138	156	174	192	210	228	246	013	031	049	067	085	103
8	251	188	2598-2611	210-223	16	10	121	139	157	175	193	211	229	247	014	032	050	068	086	104
9	252	189	2612-2625	224-237	17	10	122	140	158	176	194	212	230	248	015	033	051	069	087	105
10	253	190	2626-2639	238-251	18	10	123	141	159	177	195	213	231	239	016	034	052	070	088	106
11	254	191	2640-2653	1- 14	1	11		124	142	160	178	196	214	232	250	017	035	053	071	089
12	255	192	2654-2667	15- 28	2	11	107	125	143	161	179	197	215	233	251	018	036	054	072	090
13	256	193	2668-2681	29- 42	3	11	108	126	144	162	180	198	216	234	001	019	037	055	073	091
14	257	194	2682-2695	43- 56	4	11	109	127	145	163	181	199	217	235	002	020	038	056	074	092
15	258	195	2696-2709	57- 70	5	11	110	128	146	164	182	200	218	236	003	021	039	057	075	093
16	259	196	2710-2723	71- 84	6	11	111	129	147	165	183	201	219	237	004	022	040	058	076	094
17	260	197	2724-2737	85- 98	7	11	112	130	148	166	184	202	220	238	005	023	041	059	077	095
18	261	198	2738-2751	99-112	8	11	113	131	149	167	185	203	221	239	006	024	042	060	078	096
19	262	199	2752-2765	113-126	9	11	114	132	150	168	186	204	222	240	007	025	043	061	079	097
20	263	200	2766-2778	127-139	10	11	115	133	151	169	187	205	223	241	008	026	044	062	080	098
21	264	201	2779-2792	140-153	11	11	116	134	152	170	188	206	224	242	009	027	045	063	081	099
22	265	202	2793-2806	154-167	12	11	117	135	153	171	189	207	225	243	010	028	046	064	082	100
23	266	203	2807-2820	168-181	13	11	118	136	154	172	190	208	226	244	011	029	047	065	083	101
24	267	204	2821-2834	182-195	14	11	119	137	155	173	191	209	227	245	012	030	048	066	084	102
25	268	205	2835-2848	196-209	15	11	120	138	156	174	192	210	228	246	013	031	049	067	085	103
26	269	206	2849-2862	210-223	16	11	121	139	157	175	193	211	229	247	014	032	050	068	086	104
27	270	207	2863-2876	224-237	17	11	122	140	158	176	194	212	230	248	015	033	051	069	087	105
28	271	208	2877-2890	238-251	18	11	123	141	159	177	195	213	231	249	016	034	052	070	088	106
29	272	209	2891-2904	1- 14	1	12		124	142	160	178	196	214	232	250	017	035	053	071	089
30	273	210	2905-2918	15- 28	2	12	107	125	143	161	179	197	215	233	251	018	036	054	072	090

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October 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle	World Reference Path Number													
1	274	211	2919-2932	29- 42	2	12	108	126	144	162	180	198	216	234	001	019	037	055	073	091
2	275	212	2933-2946	43- 56	4	12	109	127	145	163	181	199	217	235	002	020	039	056	074	092
3	276	213	2947-2960	57- 70	5	12	110	128	146	164	182	200	218	236	003	021	039	057	075	093
4	277	214	2961-2974	71- 84	6	12	111	129	147	165	183	201	219	237	004	022	040	058	076	094
5	278	215	2975-2988	85- 98	7	12	112	130	148	166	184	202	220	238	005	023	041	059	077	095
6	279	216	2989-3002	99-112	8	12	113	131	149	167	185	203	221	239	006	024	042	060	078	096
7	280	217	3003-3016	113-126	9	12	114	132	150	168	186	204	222	240	007	025	043	061	079	097
8	281	218	3017-3029	127-139	10	12	115	133	151	169	187	205	223	241	008	026	044	062	080	098
9	282	219	3030-3043	140-153	11	12	116	134	152	170	188	206	224	242	009	027	045	063	081	099
10	283	220	3044-3057	154-167	12	12	117	135	153	171	189	207	225	243	010	028	046	064	082	100
11	284	221	3058-3071	168-181	13	12	118	136	154	172	190	208	226	244	011	029	047	065	083	101
12	285	222	3072-3085	182-195	14	12	119	137	155	173	191	209	227	245	012	030	048	066	084	102
13	286	223	3086-3099	196-209	15	12	120	138	156	174	192	210	228	246	013	031	049	067	085	103
14	287	224	3100-3113	210-223	16	12	121	139	157	175	193	211	229	247	014	032	050	068	086	104
15	288	225	3114-3127	224-237	17	12	122	140	158	176	194	212	230	248	015	033	051	069	087	105
16	289	226	3128-3141	238-251	18	12	123	141	159	177	195	213	231	249	016	034	052	070	088	106
17	290	227	3142-3155	1- 14	1	13		124	142	160	178	196	214	232	250	017	035	053	071	089
18	291	228	3156-3169	15- 28	2	13	107	125	143	161	179	197	215	233	251	018	036	054	072	090
19	292	229	3170-3183	29- 42	3	13	108	126	144	162	180	198	216	234	001	019	037	055	073	091
20	293	230	3184-3197	43- 56	4	13	109	127	145	163	181	199	217	235	002	020	038	056	074	092
21	294	231	3198-3211	57- 70	5	13	110	128	146	164	182	200	218	236	003	021	039	057	075	093
22	295	232	3212-3225	71- 84	6	13	111	129	147	165	183	201	219	237	004	022	040	058	076	094
23	296	233	3226-3239	85- 98	7	13	112	130	148	166	184	202	220	238	005	023	041	059	077	095
24	297	234	3240-3253	99-112	8	13	113	131	149	167	185	203	221	239	006	024	042	060	078	096
25	298	235	3254-3267	113-126	9	13	114	132	150	168	186	204	222	240	007	025	043	061	079	097
26	299	236	3268-3280	127-139	10	13	115	133	151	169	187	205	223	241	008	026	044	062	080	098
27	300	237	3281-3294	140-153	11	13	116	134	152	170	188	206	224	242	009	027	045	063	081	099
28	301	238	3295-3308	154-167	12	13	117	135	153	171	189	207	225	243	010	028	046	064	082	100
29	302	239	3309-3322	168-181	13	13	118	136	154	172	190	208	226	244	011	029	047	065	083	101
30	303	240	3323-3336	182-195	14	13	119	137	155	173	191	209	227	245	012	030	048	066	084	102
31	304	241	3337-3350	196-209	15	13	120	138	156	174	192	210	228	246	013	031	049	067	085	103

APPENDIX C

LANDSAT-3 DOCUMENTS ISSUED THIS REPORT PERIOD

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LANDSAT-3 DOCUMENTS ISSUED THIS REPORT PERIOD

No.	Document No.	Title and Date
1	14N5-L/3-212	Band 5 First Outgas Cycle-Landsat-3, and Subsequent Performance dated 4/17/78
2	14N5-L/3-213	Landsat-3, RBV Camera 1, Occasional White Level Saturation in Video Stream dated 4/3/78.
3	14N5-L/3-214	Band 5 Second Outgas Cycle-Landsat-3 and Subsequent Operation dated 4/21/78

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