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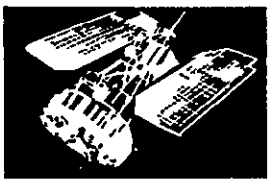
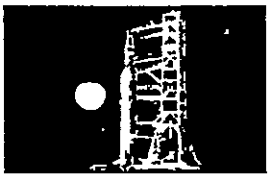
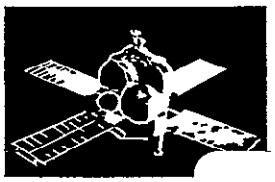
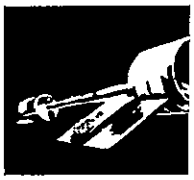
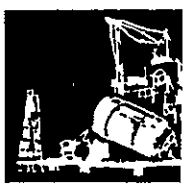






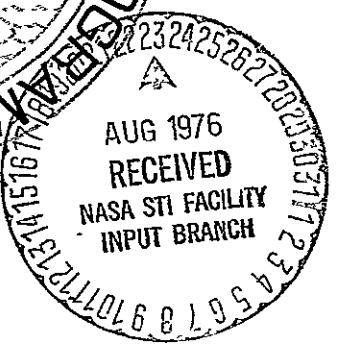
NASA CR- 144771

LANDSAT-1 AND LANDSAT-2 FLIGHT EVALUATION REPORT 23 JULY 1975 TO 23 OCTOBER 1975

Prepared By
GE LANDSAT OPERATIONS CONTROL CENTER

For

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



Contract NAS5-21808

GENERAL ELECTRIC

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Contract NAS5-21808

APPROVED: Thomas W. Winchester
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GENERAL ELECTRIC

SPACE DIVISION

SPACE SYSTEMS ORGANIZATION

NC/MD 0863

GENERAL ELECTRIC COMPANY . . .
(MAIL 5030 HERZEL PLACE, BELTSVILLE, MARYLAND 20705), Phone (301) 345-6000

24 February 1976

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. J. Adamik, Code 209.3

Sybject: Contract NAS 5-21808 Deliverable Item Number 8 of Article VI, Landsat-1 and Landsat-2

Gentlemen:

By copy of this letter, thirty-two (32) copies of deliverable item number 8 of Article VI Landsat-1 and Landsat-2 Document 75SDS4266 entitled, Landsat-1 and Landsat-2 Evaluation Report, 23 July 1975 to 23 October 1975, were distributed as follows:

1 Systems Reliability Directorate, Code 300
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1 Project Scientist, Dr. S. C. Freden, Code 902

Very truly yours,

GENERAL ELECTRIC COMPANY

Daniel J. Wise
for

R. E. Forster
Landsat Contract Manager

LANDSAT–1

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LIST OF ILLUSTRATIONS

LIST OF TABLES

INTRODUCTION

This is the fourteenth report in a continuing series of documents issued at launch, and thereafter quarterly, to present flight performance analysis of the Landsat-1 Spacecraft. Previously issued documents are:

72SD4255	ERTS-1 Launch and Flight Activation Evaluation Report 23 to 26 July 1972	18 October 1972
72SD4262	ERTS-1 Flight Evaluation Report 23 July 1972 to 23 October 1972	28 November 1972
72SD4224	ERTS-1 Flight Evaluation Report 23 October 1972 to 23 January 1973	27 February 1973
73SD4249	ERTS-1 Flight Evaluation Report 23 January 1973 to 23 April 1973	29 May 1973
73SD4260	ERTS-1 Flight Evaluation Report 23 April 1973 to 23 July 1973	10 August 1973
73SD4274	ERTS-1 Flight Evaluation Report 23 July 1973 to October 1973	28 November 1973
74SD4205	ERTS-1 Flight Evaluation Report 23 October 1973 to 23 January 1974	26 February 1974
74SD4217	ERTS-1 Flight Evaluation Report 23 January 1974 to 23 April 1974	18 May 1974
74SD4236	ERTS-1 Flight Evaluation Report 23 April 1974 to 23 July 1974	15 August 1974
74SD4255	ERTS-1 Flight Evaluation Report 23 July 1974 to 23 October 1974	31 December 1974
75SDS4222	Landsat-1 Flight Evaluation Report 23 October 1974 to 23 January 1975	30 April 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

This report contains analysis of performance for Orbits 15271 to 16550 for Landsat-1.

SECTION 1

SUMMARY - LANDSAT-1 OPERATIONS

NASA
FORMAL
REPORT

FFNo 665 Aug 65

SECTION 1

SUMMARY - LANDSAT-1 OPERATIONS

Landsat-1 has completed 3 years of operation and continues to perform its mission nominally.

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 through Orbit 147, after which an internal short circuit disabled one of the Wideband Video Tape Recorders (WBVTR-2). Operations resumed until Orbit 196, when the Return Beam Vidicon failed to respond when commanded off The RBV was commanded off via alternate commands and since that time, Landsat-1 has performed its mission with the Multispectral Scanner and the remaining Wideband Video Tape Recorder providing image data The remaining Wideband Tape Recorder 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, an integrated circuit chip in the TMP failed, disabling four TLM functions. COMSTOR "B" has an intermittent problem with cell 12, which 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 because of excessive decline of transmitter power. The pitch flywheel stopped for 2 minutes in Orbit 8040; and for 8 hours, 2 minutes in Orbits 11125 to 11130. 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 as a precautionary measure after RMP B began showing operating current variations. The DCS subsystem was turned off after Orbit 12690 and the function assumed by Landsat-2. Narrow Band Recorder 2 became noisy and was turned off in Orbit 13015. Operation of NBR 2 resumed in 14116 until failure in Orbit 15253, when operation was terminated. Battery 6 was turned off in Orbit 13346 due to electrical characteristics causing high temperatures. Battery 6 was returned to operation in Orbit 14100 In Orbit 14780, Battery 6 was again turned off because of high temperature and was returned to operation in Orbit 15467 A high current transient occurred at Battery 6 turn on in Orbit 15467 and the battery turn on command is suspended from use. Battery 8 was turned off in Orbit 15588 due to electrical characteristics causing high temperature and will not be returned to service because of the battery command problem. Pitch flywheel motor driver duty cycle rose to a high level again from Orbit 15191 to Orbit 15393 when it returned to normal. The pitch flywheel stopped intermittently with durations to 202 minutes between Orbit 15303 to Orbit 15324. MSS operation was discontinued in Orbit 15304 and resumed in Orbit 15351. See Table 1-1 for a summary of in-orbit operation.

Table 1-1. In-Orbit Payload System Performance Launch thru Orbit 16535 (10/22/75)
Landsat-1

RBV	Total Scenes Imaged	1690
	AVG. Scenes/Day	139
	Total Area Imaged (millions of sq. mi.)	14.7
	ON TIME (hr.)	14.0
	ON/OFF Cycles	91
	% Real Time Images	57
	% Recorded Images	43
MSS	Total Scenes Imaged	192,921
	AVG. Scenes/Day	176
	Total Area Imaged (millions of sq. n. mi.)	1682 2
	ON TIME (hr.)	2045
	ON/OFF Cycles	15,445
	% Real Time Images	76
	% Recorded Images	24
DCS	Messages at OCC	1,152,045
	Non-Perfect MSGS	90,691
	Max. DCP's ACTIVE/DAY	114
	Users	44
	Avg. MSG/Orbit	181
	ON TIME (hr.)	21,820.2
WPA-1	% Real Time Mode	55
	% Playback Mode	45
	ON TIME (hr.)	31.9
	ON/OFF Cycles	312
WPA-2	% Real Time Mode	76
	% P/B Mode	24
	ON TIME (hr.)	1983
	ON/OFF Cycles	13,078
WBVTR-1	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	Minor Frame Sync Error Count in P/B	150
	Time Head-Tape Contact (hr.)	732.8
	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 Orb. 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

Landsat-1 launch and injection was satisfactory. After several 18-day repeat cycles, orbit maintenance burns were made in Orbits 938, 2416, 6390, 7826, 11367, 11464, 13611 and 14365. An unplanned orbit change occurred due to freon gas expended during the pitch flywheel emergency (Orbits 11125 to 11130)

No orbit maintenance burn was required during this report period.

The 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 error has been maintained within $\pm$ 10 nm in the east-west direction at the equator as planned. Figure 2-2 shows the change of sun time at the descending node. Appendix B gives 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	Two Body 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	922.013	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

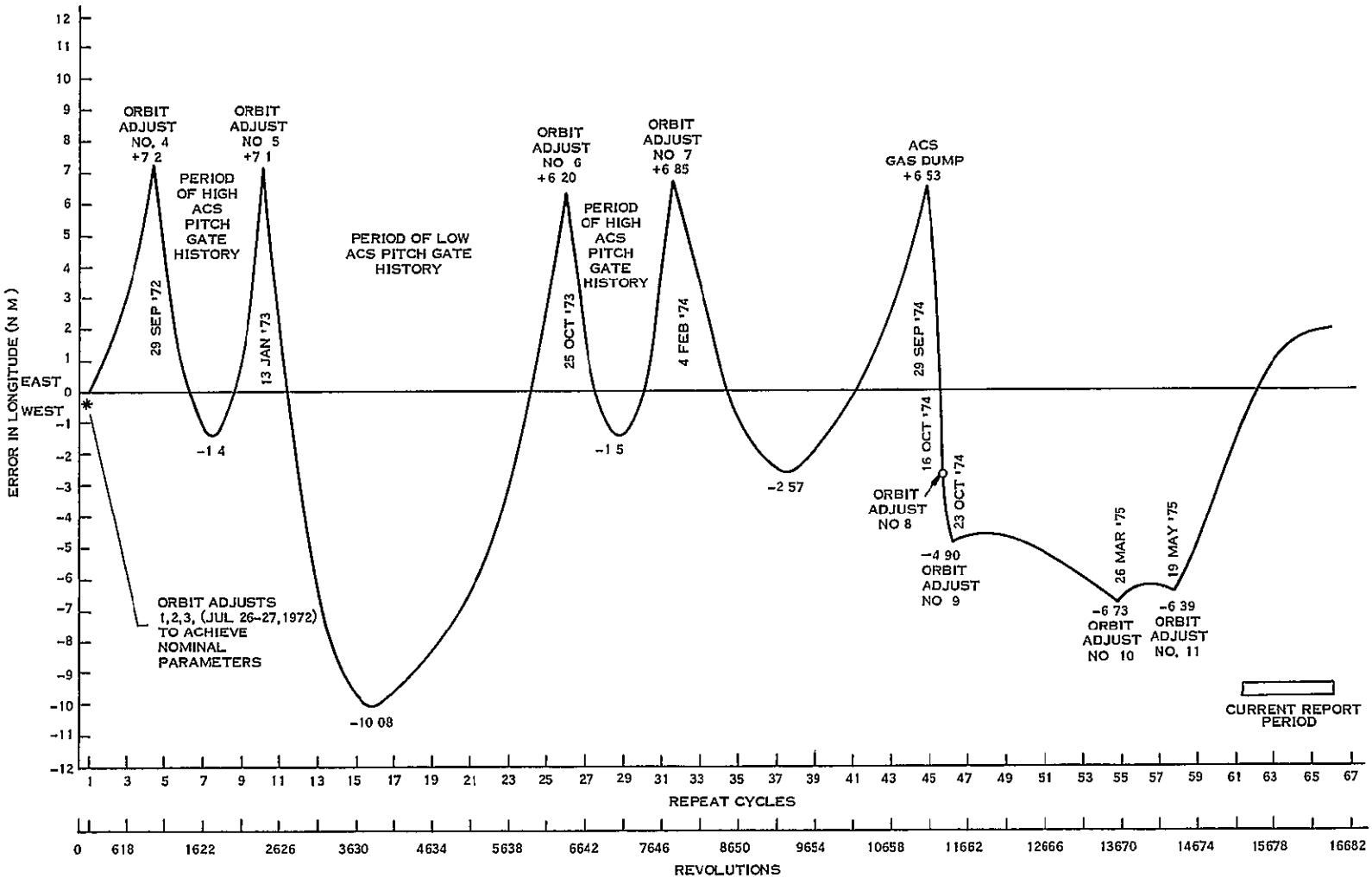

Figure 2-1. Effect of Orbit Adjusts on Landsat-1 Ground Track

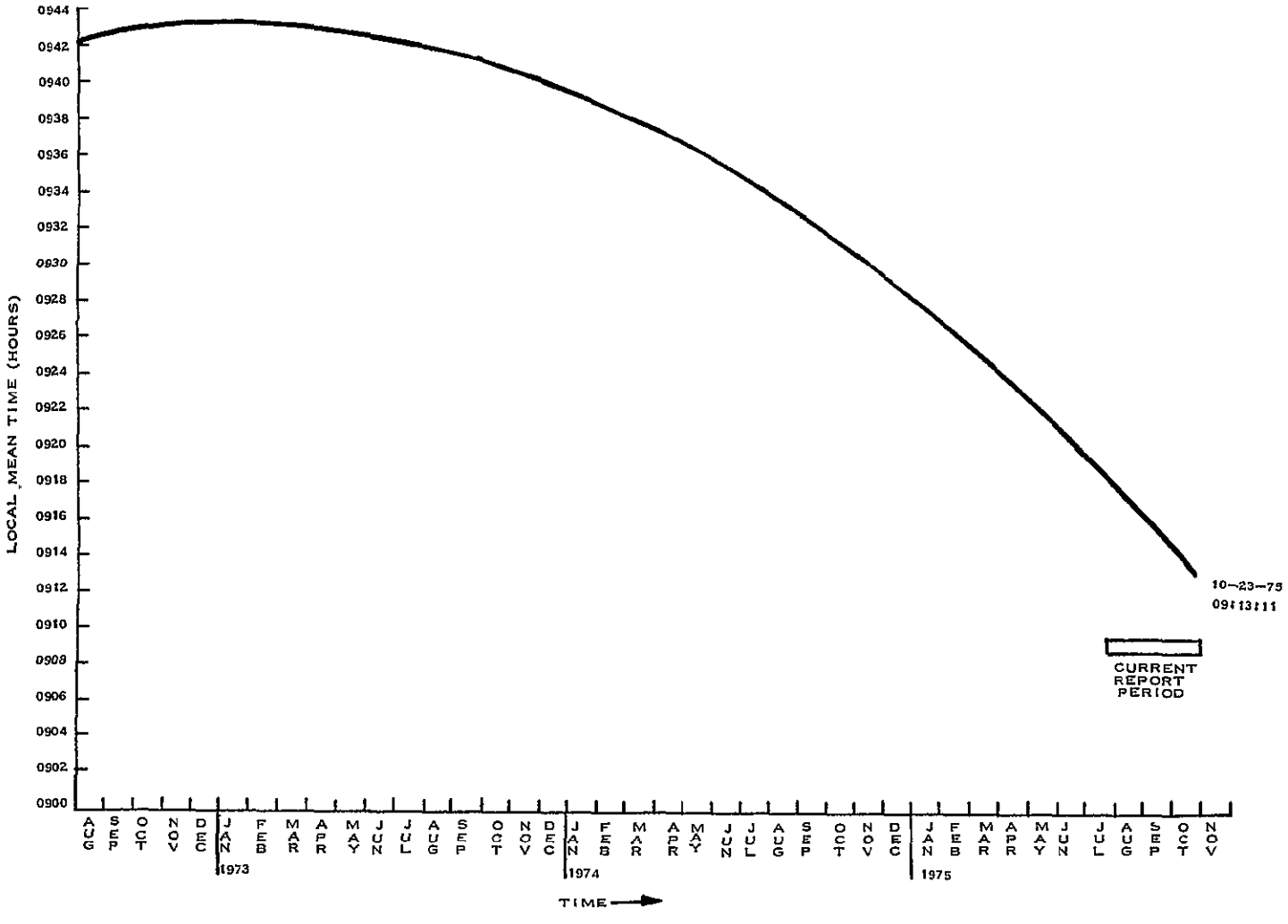

Figure 2-2. Local Mean Time of Descending Node

SECTION 3

POWER SUBSYSTEM (PWR)

LANDSAT-1

SECTION 3

POWER SUBSYSTEM (PWR)

The solar array continued to provide excess energy for the payload and spacecraft load throughout this report period. Compensation loads and auxiliary loads dissipated the excess power above the battery and load requirements using Landsat-1 power management procedures. Midday measured solar array current tracked slightly below the values predicted earlier due to higher than predicted beta angle variations. Solar array degradation was -27.0% at the end of 39 months in orbit. The power subsystem is predicted to have adequate power through 1976 for the present Landsat-1 payload configuration, and may extend to 1977 and 1978 depending on the electrochemical degradation of the battery packs for that period.

A plot of measured and predicted midday solar array current is shown in Figure 3-1. Figure 3-2 shows actual and predicted solar array degradation. Figure 3-3 shows actual sun angles to the spacecraft and solar panels.

It is noted on Figure 3-1 that the high noon solar array current is slightly lower than predicted. This is due to slightly different solar panel sun angles and operating point high noon solar array degradation than initially predicted.

Battery 6, turned off in Orbit 14780 (18 June 1975) for a second restoration cycle, was returned to service in Orbit 15467 (6 August 1975). The battery turn-on was followed by an anomolous time-out of the USB/WPA back-up timer and tripping of the ACS low voltage pneumatics interlock, due to a high transient current occurring simultaneously with the execution of command 353 (All batteries on). (Reference Item 1 of Appendix C). The battery, however, has performed satisfactorily throughout the rest of this report period.

In Orbit 15588 (15 August 1975) Battery 8 was taken off line for a restoration cycle similar to that of Battery 6, when the load sharing of the battery started declining with the result of increased temperatures. The battery reached a voltage of about 26.5 volts around Orbit 16300. However, to avoid the possible risks involved in the execution of Command 353 (all batteries on), the battery turn-on has been deferred. By the end of this report period, the battery has discharged to a voltage of 25.6 volts.

Beginning in Orbit 15794, (30 August 1975) an adjustment to the power management program has kept the batteries slightly undercharged to keep them within acceptable temperature limits.

Temperature spread between the batteries has ranged from 5.5 to 7.5°C during the current report period. Battery packs averaged a typical 8.6 to 9.3% Depth of Discharge (DOD) when all batteries were on line. With Battery 8 off line, the DOD has ranged from 8.9 to 9.6%. (Compensation load 4 was switched off prior to Battery 8 turn-off).

The power system electronics performed well in this report period with all voltages stable. Table 3-1 shows major power subsystem parameters and Table 3-2 shows power subsystem telemetry for selected orbits. Some parameters in Table 3-2 may be slightly different 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 from the NBR. The Shunt Limiter has not operated since Orbit 3 because the unregulated voltage has been held below cut-in voltage by power management.

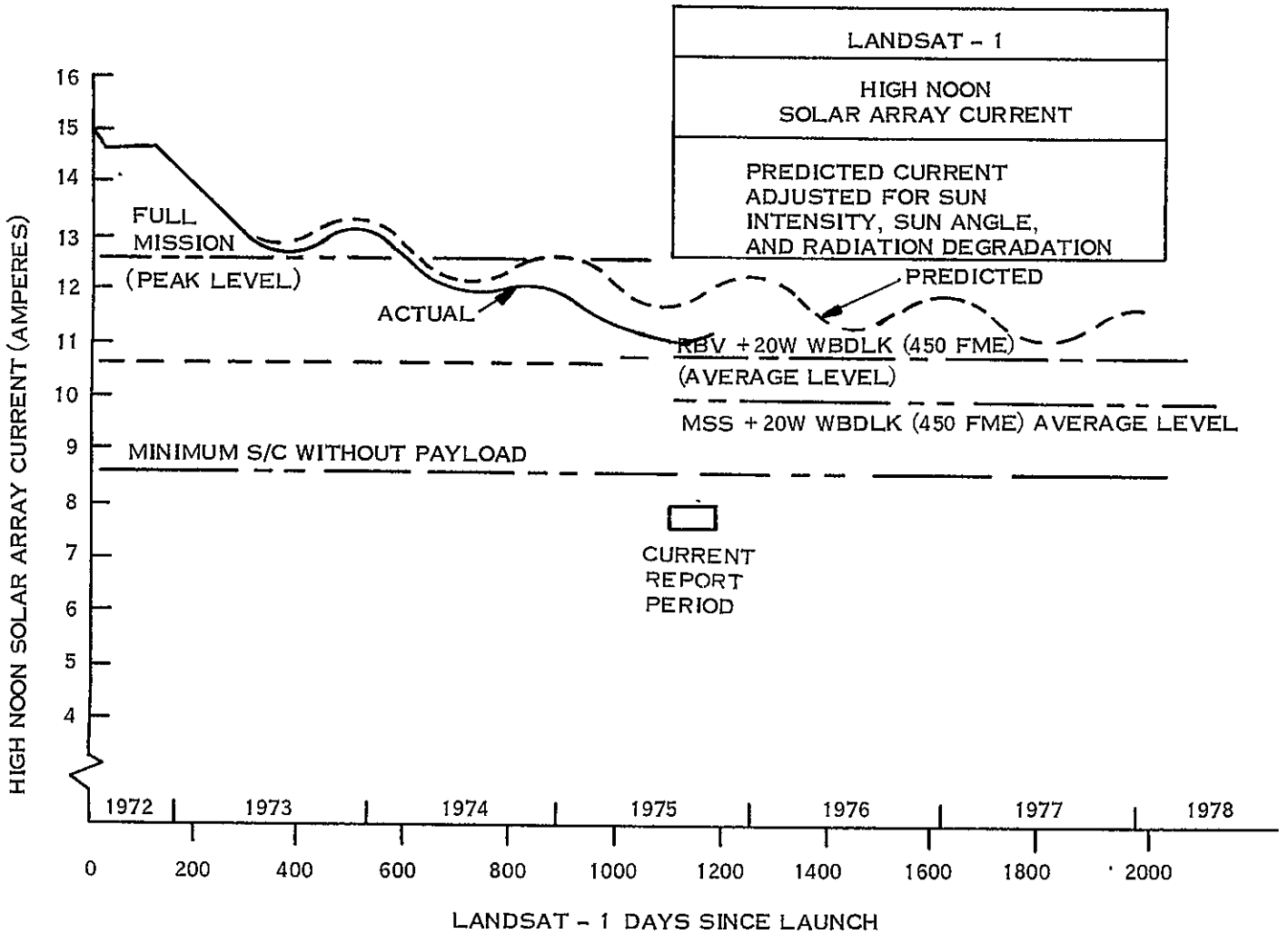

Figure 3-1. Midday Solar Current

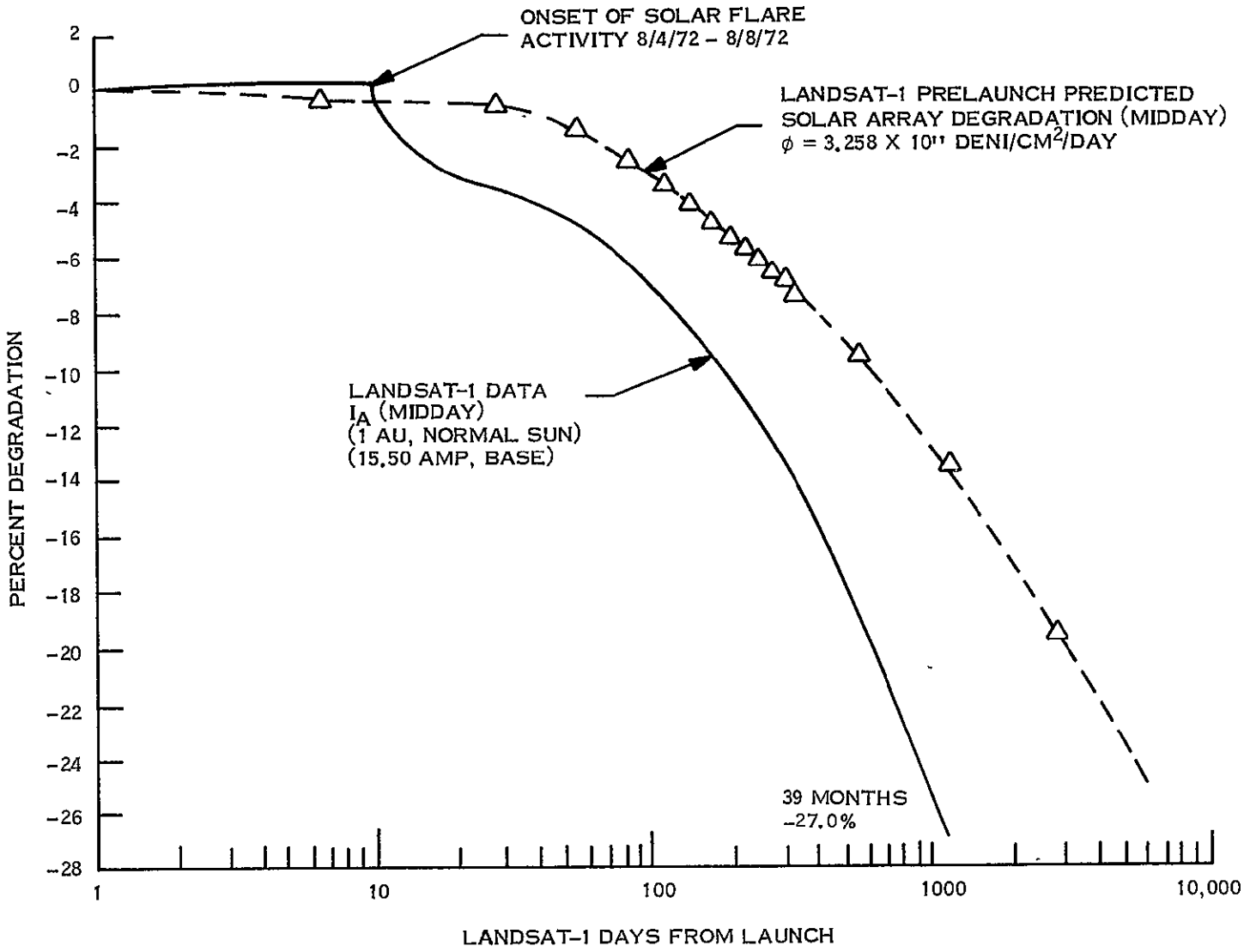

Figure 3-2. IA (Midday) Degradation vs. Days

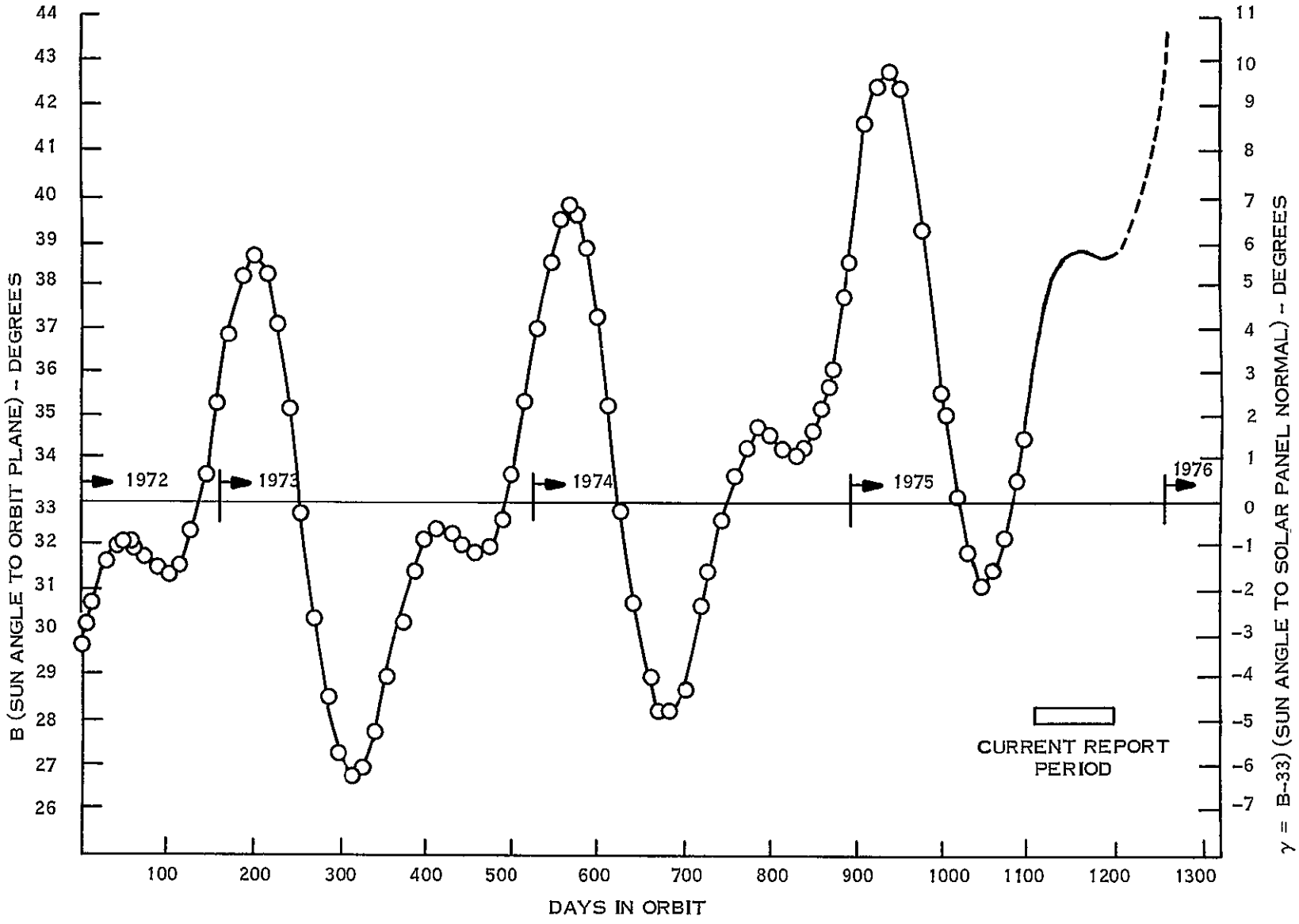

Figure 3-3. Actual β and γ (Paddle) Sun Angles, Landsat-1

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

ORBIT NO.	26	5098	10178	15254	15692	16132	16530
BATT 1 MAX	32.48	32.91	33.25	33.16	32.57	32.73	32.48
2 CHGE	32.48	32.91	33.16	33.16	32.57	32.73	32.48
3 VOLTS	32.48	32.99	33.25	33.16	32.57	32.82	32.48
4	32.48	32.99	33.25	33.16	32.57	32.82	32.48
5	32.48	32.99	33.33	33.25	32.65	32.82	32.57
6 **	32.31	32.91	33.25	28.21	32.48	32.73	32.48
7	32.22	32.91	33.25	33.16	32.57	32.82	32.57
8 ***	32.14	32.91	33.25	33.16	28.72	26.76	25.73
AVERAGE +	32.38	32.92	33.25	33.17	32.56	32.78	32.50
BATT 1 END-	28.81	28.30	28.98	29.15	28.72	28.98	28.55
2 OF-	28.81	28.30	28.98	29.15	28.81	29.06	28.64
3 NIGHT	28.81	28.30	28.98	29.15	28.72	28.98	28.55
4 VOLTS	28.89	28.98	28.98	29.15	28.81	29.06	28.64
5	28.89	28.98	29.06	29.23	28.81	29.06	28.64
6 **	28.81	28.30	28.98	28.12	28.72	28.98	28.55
7	28.81	28.30	28.98	29.15	28.81	28.98	28.55
8 ***	28.81	28.30	28.98	29.15	28.64	26.76	25.73
AVERAGE +	28.84	28.32	28.99	29.16	28.77	29.01	28.59
BATT 1 (%) CHGE	13.11	13.58	13.96	15.27	14.61	14.65	14.57
2 SHARE	12.98	13.58	13.96	15.27	14.61	14.65	14.57
3 (%)	11.38	11.38	11.95	13.59	13.25	12.83	13.27
4	12.39	11.95	12.28	14.06	13.94	14.07	14.22
5	12.32	11.65	11.93	13.63	13.44	13.69	13.67
6 **	12.80	12.35	11.79	**	16.65	17.00	16.21
7	12.62	12.42	12.13	13.59	13.46	13.09	13.36
8 ***	12.45	12.10	11.98	14.54	***	***	***
BATT 1 LOAD	12.71	12.44	12.58	14.67	14.33	14.12	14.28
2 SHARE	12.90	13.62	13.70	15.88	14.90	15.01	14.89
3 (%)	11.43	11.91	12.23	13.85	13.14	13.48	13.30
4	12.77	13.01	13.12	14.91	14.35	14.75	14.57
5	12.54	12.42	12.60	14.02	13.72	13.47	13.73
6 **	12.53	12.21	11.30	**	15.77	15.62	15.62
7	12.80	12.41	12.50	13.77	13.77	13.52	13.59
8 ***	12.32	11.98	11.97	12.88	***	***	***
BATT 1 TEMP	21.11	24.65	24.76	23.12	20.99	21.24	21.15
2 IN	18.74	21.42	20.89	19.32	17.76	17.48	17.77
3 (°C)	18.77	20.29	20.16	18.77	16.99	16.90	16.94
4	21.57	23.17	23.32	22.71	21.27	21.78	21.69
5	21.82	23.85	24.09	23.69	23.17	24.11	24.08
6 **	21.31	24.37	24.78	22.10	22.61	23.59	23.39
7	21.41	25.01	24.96	23.75	22.21	22.71	23.02
8 ***	21.82	25.14	25.24	24.59	31.64	21.66	22.35
AVERAGE	20.81	23.49	23.53	22.26	20.83	21.18	21.33
S/C REG BUS PWR (W)	176.8	153.4	165.0	137.9	124.3	125.8	123.6
COMP LOAD PWR (W) (P/O S/C REG BUS PWR)	49.0	34.8	41.9	29.4	17.4	17.4	17.4
P/L REG BUS PWR (W)	16.2	13.7	8.9	8.9	9.1	8.9	9.1
C/D RATIO	1.06	1.13	1.21	1.18	1.28	1.22	1.20
TOTAL CHARGE (A-M)	309.2	290.21	*258.3	229.29	224.65	208.53	217.46
TOTAL DISCHARGE (A-M)	290.9	256.28	214.2	194.13	174.99	170.30	181.15
SOLAR ARRAY (A-M)	1044.0	908.0	832.0	786	803	812	823
S. A. PEAK I (AMP)	15.8	13.68	12.44	11.60	11.68	11.68	11.84
MIDDAY ARRAY I (AMP)	15.01	12.80	N/A	11.04	11.12	11.20	11.36
SUN ANGLE (DEG)	-3.33	-3.54	-1.82	1.49	4.55	5.83	5.66
MAX R PAD TEMP (°C)	+62.00	+68.00	68.20	62.0	59.60	62.00	64.40
MIN R PAD TEMP (°C)	-62.00	-59.00	-42.79	-42.18	-38.54	-38.54	-37.93
MAX L PAD TEMP (°C)	+67.90	+60.50	56.00	56.00	55.12	58.40	60.80
MIN L PAD TEMP (°C)	-67.00	-64.00	47.00	-46.25	-42.79	-42.18	-42.18

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

** Battery 6 turned off in Orbit 14780 was returned to service in Orbit 15467.

*** Battery 8 was turned off in Orbit 15588 and remained off through the end of this report period.

\+ Average of batteries on-line.

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	15700	16132	16530
6001	BATT 1 DISC	AMP	0.94	0.81	0.81	0.91	0.71	0.84	0.83
6002	2		0.95	*	*	*	*	*	*
6003	3		0.84	0.78	0.80	0.86	0.68	0.79	0.78
6004	4		0.93	0.86	0.86	0.92	0.74	0.87	0.85
6005	5		0.92	0.82	0.82	0.87	0.76	0.79	0.81
6006	6 ++		0.91	0.78	0.72	0.00	0.76	0.91	0.92
6007	7		0.94	0.82	0.80	0.85	0.72	0.79	0.80
6008	8**		0.91	0.77	0.78	0.80	0.00	0.00	0.00
6011	BATT 1 CHG	AMP	0.58	0.58	0.69	0.52	0.49	0.40	0.40
6012	2		0.57	*	*	*	*	*	*
6013	3		0.50	0.48	0.60	0.46	0.43	0.35	0.37
6014	4		0.54	0.51	0.60	0.48	0.47	0.38	0.39
6015	5		0.54	0.50	0.58	0.46	0.45	0.37	0.38
6016	6 ++		0.57	0.52	0.56	0.00	0.59	0.47	0.45
6017	7		0.55	0.53	0.60	0.46	0.44	0.36	0 37
6018	8**		0.55	0.52	0.58	0.49	0.00	0.00	0.00
6021	BATT 1 VOLT	VDC	30.87	31.24	31.64	31.62	31.73	31.35	30.92
6022	2		30.87	31.25	31.66	31.62	31.74	31.84	30.91
6023	3		30.87	31.25	31.66	31.62	31.73	31.34	30.91
6024	4		30.90	31.28	31.70	31.65	31.77	31.37	30.94
6025	5		30.95	31.33	31.75	31.71	31.82	31.43	31.00
6026	6 ++		30.38	31.34	31.65	28.18	31.70	31.32	30.89
6027	7		30.89	31.27	31.68	31.64	31.76	31.37	30.94
6028	8**		30.89	31.27	31.68	31.63	28.66	26.75	25.73
6031	BATT 1 TEMP	DGC	21.17	24.48	26.09	23.02	21.58	21.26	21.47
6032	2		18.80	21.29	22.81	19.28	18.03	17.49	17.84
6033	3		18.76	20.17	21.26	18.76	17.41	16.94	16.96
6034	4		21.57	23.04	23.83	22.69	22.26	21.80	21.71
6035	5		21.84	23.77	24.78	23.64	24.10	24.12	24.09
6036	6 ++		21.24	24.27	25.78	22.08	24.12	23.61	23.43
6037	7		21.43	24.88	26.09	23.07	22.97	22.71	23.08
6038	8**		21.36	25.02	26.21	24.51	21.43	21.65	22.38
6040	RT PAD TEMP	DGC	25.82	27.22	27.16	27.29	28.30	30.05	30.00
6041	R PAD V N	VDC	33.40	33.85	34.36	34.18	33.89	33.49	33.05
6042	R PAD V M	VDC	33.20	33.50	33.60	32.92	32.68	32.22	31.88
6044	LT PAD TEMP	DGC	14.14	16.61	19.11	19.84	21.68	23.79	23.74
6045	L PAD V F	VDC	33.69	34.16	34.67	34.63	34.63	34.18	33.75
6046	L PAD V G	VDC	33.68	34.19	34.72	34.68	34.68	34.22	33.78
6050	S/C UR BUS V	VDC	31.24	31.68	32.60	32.07	32.16	31.78	31.34
6051	S/C RG BUS V	VDC	24.54	24.55	24.55	24.54	24.54	24.54	24.54
6052	AUX REG A V	VDC	23.41	23.48	23.47	23.49	23.48	23.49	23.50
6053	AUX REG B V	VDC	23.50	23.50	23.50	23.50	23.50	23.50	23.50
6054	SOLAR I	AMP	14.87	12.69	11.60	10.33	10.77	10.98	11.18
6055 +	S/C RG BUS I	AMP	7.11	6.27	6.80	5.63	5.40	5.13	5.04
6056 +	S/C RG BUS I	AMP	7.11	6.27	6.79	5.62	5.38	5.12	5.03
6058	PC MOD T 1	DGC	21.82	22.23	23.22	20.63	19.64	19.20	19.41
6059	PC MOD T 2	DGC	21.68	22.53	23.00	21.17	20.17	19.90	20.09
6070	P/L RG BUS V	VDC	24.66	24.68	24.68	24.68	24.69	24.66	24.67
6071	P/L UR BUS V	VDC	31.08	31.53	31.92	31.92	32.01	31.63	31.18
6072 +	P/L RG BUS I	AMP	0.57	0.56	0.36	0.36	0.36	0.36	0.37
6073	P AUX A V	VDC	23.51	23.51	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
6075	PR MOD T 1	DGC	21.50	23.13	23.62	21.44	20.78	20.46	20.70
6076	PR MOD T 2	DGC	20.34	21.45	21.84	19.88	19.36	19.15	19.36
6078	FUSE BLOW V	VDC	24.56	24.57	-24.60	24.59	24.60	24.58	24.67
6080	SHUNT 1 I	AMP	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6081	2		0.00	0.00	0 00	0.00	0.00	0.00	0.00
6082	3		0.00	0.00	0.00	0.00	0.00	0.00	0.00
6083	4		0.00	0.00	0.00	0.00	0.00	0.00	0.00
6084	5		0.00	0.00	0.00	0.00	0.00	0.00	0.00
6085	6		0.00	0.00	0.00	0.00	0.00	0.00	0.00
6086	7		0.00	0.00	0.00	0.00	0.00	0.00	0.00
6087	8		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	0.36	0.36	0.37
Total No.	MAJOR FRAMES	FRM	764.0	389.0	364.0	785	785	784	785

* Function 6002, 6012; missing data resulted from disabled telemetry resulting from IC chip failure which affected charge current directly and discharge current indirectly.

\+ FUNC 6055, 6056, 6072 data is derived from Pseudo FUNC 6155, 6156, 6172 used after change to Mode 11.

++ Battery 6 turned off in Orbit 14780 was returned to service in Orbit 15467.

** Battery 8 was turned off in Orbit 15588 and remained off through the end of this report period.

SECTION 4

ATTITUDE CONTROL SYSTEM (ACS)

LANDSAT-1

SECTION 4

ATTITUDE CONTROL SYSTEM (ACS)

Landsat-1's ACS system accurately maintained the spacecraft's attitude except when the Pitch Flywheel was malfunctioning during the first days of this report period.

The pitch motor driver duty cycle began increasing in Orbit 15191 (18 July 1975), and in subsequent orbits many prolonged Pitch Flywheel stoppage occurred, lasting to 202 minutes in duration. During this time the S/C was oscillating, i.e., NBR P/B Orbit 15316 with a 202 minute PFW stop, oscillated $\pm$ 8 degrees in pitch with a 78 minute period.

MSS operations were suspended from Orbit 15304 (26 July 1975) to Orbit 15350 (29 July 1975) due to the severity of the Pitch Flywheel problem, but were resumed in Orbit 15351 (29 July 1975) when the condition appeared to improve.

The ACS Normal mode was only employed during periods of MSS activity. In order to conserve the remaining ACS gas supply during periods of non-MSS activity, the spacecraft's attitude was commanded into the Roll Diff Tach High Gain with Roll Wheel Unload disabled. In addition, Pitch Position Bias was employed to maintain the Pitch Wheel's speed between -10 RPM and -100 RPM in order to prevent it from seizing with an excess of stored momentum and to utilize gravity gradient to unload accumulated momentum in both Pitch and Roll.

The Pitch Wheel began clearing itself in Orbit 15365 (30 July 1975). By Orbit 15393 (1 August 1975) the Pitch Motor Driver Duty Cycle returned to its pre-emergency average level of 7 to 10 percent and remained there for the duration of this report period.

Use of pneumatics to stabilize the spacecraft during the Pitch Flywheel emergency was not required.

The spacecraft's pre-anomaly routine was resumed in Orbit 15393 (1 August 1975) with the ACS system commanded into the Normal mode only during the six daily orbits of MSS activity. For the remaining eight daily orbits of non-MSS activity, the spacecraft is flown in the Roll Diff Tach High Gain mode and with 0 to 0.6° Pitch Position Bias employed to maintain the Pitch Flywheel Speed between -20 and -100 RPM.

An accurate account of pneumatic gating can no longer be practically provided. Continuous 24 KB telemetry required to maintain a complete gating history has been curtailed due to the failure of NBTR B in Orbit 15256 (22 July 1975).

Currently, pneumatic gating is being limited by providing single Momentary Pneumatics Enable command only at satellite midnight in each of the six to seven orbits where the ACS system is in the Roll Normal Diff Tach Gain Mode. (Periods of MSS activity.)

Based on 24 KB Strip Chart segments covering portions of these intervals, it is estimated that approximately 2, -Roll Gates occur in twenty-four hours.

The decline of Remaining Usable Impulse from 30.59 lb/secs in Orbit 15254 (22 July 1975) to 27.668 lb/secs in Orbit 16530 (21 October 1975) is due to a normal, single step in the telemetry PCM count (Orbit 16346; 8 October, 1975) and not due to an excessive use or loss of freon.

Both SADS are tracking the sun at orbit rate without phase switching. RMP 1 is functioning normally.

Pressure/temperature ratios have all been satisfactory.

The forward scanner pressure decreased from 3.00 psia in Orbit 15254 (22 July 1975) to 2.81 psia in Orbit 16530 (21 October 1975) and is following the predicted leak pattern described in previous reports.

Tables 4-1, 4-2 and 4-3 are a summary of Landsat-1's Attitude Control Subsystem telemetry.

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

Function	Units	Orbit						
		31	5099	10182	15254	15700	16132	16530
1084 RMP 1 Gyro Temperature	DGC	44.5	23.06	21 22	42.40	42.08	42 72	43.11
1094 RMP 2 Gyro Temperature	DGC	74.3	75.10	43 45	24.05	24.07	24.76	25.15
1222 SAD RT MTR HSING Temp	DGC	21 1	22 00	20.55	22.89	22.40	23 16	23.69
1242 SAD LT MTR HSING Temp	DGC	27.0	30.38	28.18	29.53	29 49	30.26	30 79
1223 SAD RT MTR WNDNG Temp	DGC	25.3	26.54	24.63	27 06	26.47	27.11	27.45
1243 SAD LT MTR WNDNG Temp	DGC	28.7	32.92	30.32	31.98	32.00	32.81	33 44
1228 SAD RT HSG Pressure	PSI	7.6	7 35	7.12	6 88	6.88	6.88	6 88
1248 SAD LT HSG Pressure	PSI	7.0	6.86	6.47	6.18	6 18	6.18	6.18
1007 FWD Scanner MTR Temp	DGC	19.8	19.88	18 46	20.36	19.77	20.28	20.63
1016 Rear Scanner MTR Temp	DGC	20.5	19.83	17.86	19.24	19.15	19 70	20.02
1003 FWD Scanner Pressure	PSI	4.6	4 02	3.50	3.00	3.00	3.00	2.81
1012 Rear Scanner Pressure	PSI	7 8	7.87	7 44	6.97	6.98	6 99	6 96
1212 Gas Tank Pressure	PSI	1988 0	1702 34	1454.19	235.44	235.44	235.44	223.05*
1210 Gas Tank Temperature	DGC	22 6	24 30	22.56	24.36	24 05	24.65	25.20
1213 Manifold Pressure	PSI	56 7	57.44	58.73	61.67	61 67	61.66	61 30
1211 Manifold Temperature	DGC	21.9	23.62	21 77	23.82	23 48	24.19	24.78
1059 CLB Power Supply Card Temp	DGC	37.1	40.54	38.83	40 58	40.40	41.07	41.46
1260 ACS Baseplate 1	DGC	25 4	27.93	25 36	26.54	26.53	27.34	27.84
1261 ACS Baseplate 2	DGC	22.9	24.73	23.00	25.09	24.83	25.67	26 14
1262 ACS Baseplate 3	DGC	23.4	23.69	21.97	24 95	24.62	25 41	25 85
1263 THO1 STS	DGC	- 6 8	- 0.97	- 3.41	1 22	1.93	4 60	5.29
1264 THO2 STS	DGC	-14.6	- 9.42	- 8 27	- 4.50	- 3.78	- 2.12	- 1 96
1265 THO3 STS	DGC	- 3.1	9.31	7.58	12.92	14.20	15 84	15.91
1266 THO4 STS	DGC	-13.9	2.85	- 1 85	2.40	2.93	4.71	5 29
1267 THO5 STS	DGC	- 8.9	- 1 16	- 5.17	2.92	3 80	8 41	9.37
1224 SAD R FSST	DGC	39.5	60 21	63.25	64.74	63.80	65 44	66.72
1244 SAD L FSST	DGC	27.1	51.11	53 21	54.69	55.20	56.49	57.40

* Pressure drop due to PCM count step, not to loss of freon.

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

Function	Units	Orbit						
		31	5099	10182	15254	15700	16132	16530
1057 CLB Power Supply Volts	TMV	2.8	2.78	2.78	2.78	2.77	2.78	2.78
1081 RMP 1 MTR Volts	VDC	OFF	OFF	OFF	-30.14	-30.14	-30.14	-30.14
1082 RMP 1 MTR Current	Amps	OFF	OFF	OFF	0.11	0.11	0.11	0.11
1080 RMP 1 Supply Volts	VDC	OFF	OFF	OFF	-23.78	-23.78	-23.78	-23.78
1091 RMP 2 MTR Volts	VDC	-29.7	-29.63	-29.63	OFF	OFF	OFF	OFF
1092 RMP 2 MTR Current	Amps	0.10	0.10	0.11	OFF	OFF	OFF	OFF
1090 RMP 2 Supply Volts	VDC	-23.4	-23.41	-23.50	OFF	OFF	OFF	OFF
1320 SAD RT MTR WNDNG Volts	VDC	- 4.8	- 4.25	- 3.89	- 3.85	- 3.84	- 3.81	- 3.67
1240 SAD LT MTR WNDNG Volts	VDC	- 4.8	- 4.09	- 3.36	- 3.43	- 3.47	- 3.44	- 3.50
1227 SAD RT -15 VDC Conv.	VDC	14.9	14.88	14.89	14.87	14.88	14.87	14.87
1247 SAD LT -15 VDC Conv.	VDC	15.2	15.13	15.14	15.06	15.11	15.10	15.10
1056 CLB $\pm$6 VDC	TMV	2.4	2.35	2.35	2.35	2.35	2.35	2.35
1055 CLB $\pm$10 VDC TMV	TMV	2.75	2.75	2.74	2.74	2.74	2.74	2.74

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

Function	Units	Orbit						
		13198	13569	14001	15254	15700	16132	16530
1141 Pitch Fine-Error	DEG	- 0.40	- 0.08	- 0.02	- 2.13	- 0.51	- 0.24	- 0.82
1143 Pitch Flywheel Speed	RPM	- 10.49	- 26.86	- 1.21	12.92	- 46.27	- 57.10	- 43.34
1038 Pitch MTR DRVR CCW	PCT	4.96	5.81	4.55	3.28	7.71	6.83	5.19
1039 Pitch MTR DRVR CW	PCT	2.29	2.17	5.10	19.65	2.53	2.04	1.65
1030 Roll Fine Error	DEG	- 2.25	- 0.20	- 0.20	- 2.52	- 1.40	- 2.14	- 2.53
1127 Roll Rear Flywheel Speed	RPM	715.78	756.92	782.08	714.05	735.41	730.09	716.75
1126 Roll Fwd Flywheel Speed	PRM	641.82	674.47	693.31	641.32	659.50	645.44	642.77
1022 Roll Rear MTR DRVR CCW	PCT	0.01	0.68	0.90	0.13	0.47	0.31	0.03
1025 Roll Rear MTR DRVR CW	PCT	4.26	5.22	5.52	4.17	4.65	4.56	4.15
1023 Roll Fwd MTR DRVR CCW	PCT	0.01	0.66	0.72	0.08	0.38	0.15	0.03
1024 Roll Fwd MTR DRVR CW	PCT	4.15	4.94	5.35	4.24	4.76	4.30	4.13
1035 Yaw Tach	RPM	-206.08	-116.50	- 93.72	-169.52	-144.65	-182.02	-202.90
1033 Yaw MTR DRVR CW	PCT	0.04	1.53	1.84	0.09	0.96	0.45	0.04
1034 Yaw MTR DRVR CCW	PCT	0.07	1.60	1.76	0.68	1.24	0.91	0.68
1221 SAD Right Tach	DEG/MIN	3.37	3.37	2.81	3.37	3.38	3.38	3.38
1241 SAD Left Tach	DEG/MIN	2.80	2.81	2.81	2.79	2.79	2.77	2.77

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

SECTION 5

COMMAND CLOCK SUBSYSTEM (CMD)

LANDSAT-1

SECTION 5

COMMAND CLOCK SUBSYSTEM (CMD)

The Command Clock Subsystem operated nominally in this report period. In Orbit 16166 on 26 September 1975, the spacecraft clock was reset by approximately 2 seconds as shown in Figure 5-1

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

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

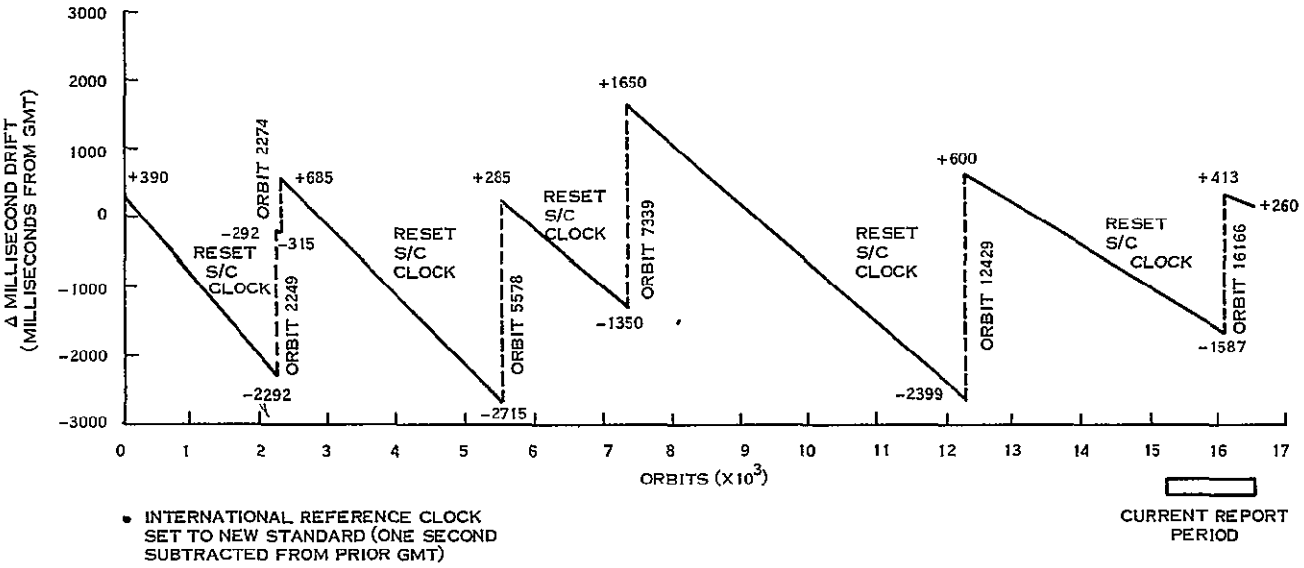

Figure 5-1 Landsat-1 Spacecraft Clock Drift History

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

Function No.	Name	Mode	Units	Orbit						
				35	5099	10182	15233	15700	16132	16530
8005	Pri Power Supply Temp	-	°C	37.31	39 37	39 50	38 26	38 18	38 14	38 36
8006	Red. Power Supply Temp	-	°C	35 73	38.08	38 38	37 06	37 34	37 28	37 55
8007	Pri. Osc. Temp	-	°C	31 14	31.98	32 11	31 14	30 82	30 73	31 09
8008	Red Osc. Temp	-	°C	30.47	31 39	31 42	30 48	30 01	29 89	30 40
8009	Pri. Osc. Output	-	TMV	0.95	0.96	0 97	0 97	0 95	0 95	0 95
8010	Red. Osc. Output	-	TMV	**	**	**	**	**	**	**
8011	100 kHz	Pri - Red	TMV	3.11	3.10	3.11	3 12	3 10	3 10	3 10
8012	10 kHz	Pri. - Red.	TMV	3.10	3 07	3.08	3 08	3 08	3 08	3 07
8013	2.5 kHz	Pri. - Red.	TMV	2.95	2 95	2 95	2.96	2 95	2 95	2 95
8014	400 Hz	Pri. - Red.	TMV	4.40	4 40	4 40	4 40	4 40	4 40	4 40
8015	Pri +4 V Power Supply	Pri. Clk ON	VDC	4.10	4 10	4.10	4 10	4 10	4 09	4 10
8016	Red. +4 V Power Supply	Red. Clk ON	VDC	3.95	3 95	3 95	3 95	3 92	3 93	3 93
8017	Pri. +6 V Power Supply	Pri. Clk ON	VDC	6.06	6.07	6.07	6 11	6 07	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
8019	Pri. -6 V Power Supply	Pri. Clk ON	VDC	- 6 02	- 6.02	- 6.03	- 6 04	-6 02	-6 02	-6 02
8020	Red -6 V Power Supply	Red. Clk ON	VDC	- 5 99	- 6.00	- 6 00	- 6 01	-5 99	-5 99	-5 99
8021	Pri. -23 V Power Supply	Pri. Clk ON	VDC	-22.88	-22.89	-22 89	-22.95	-22 89	-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 99	-22 99
8023	Pri -29 V Power Supply	Pri. Clk ON	VDC	-29 13	-29.16	-29.15	-29 15	-29 15	-29 14	-29 15
8024	Red -29 V Power Supply	Red Clk ON	VDC	-29.07	-29 21	-29.21	-29.21	-29 21	-29 21	-29 21
8101	CIU A -12 V	CIA A ON	VDC	-12.33	-12.33	-12.34	-12.35	-12 34	-12 34	-12 35
8102	CIU B -12 V	CIU B ON	VDC	-12 26	-12 26	-12 23	-12 20	-12 22	-12 22	-12 23
8103	CIU A -5 V	CIU A ON	VDC	- 5 32	- 5.34	- 5 34	- 5 34	-5 34	-5 34	-5 34
8104	CIU B -5 V	CIU B ON	VDC	- 5 31	- 5.31	- 5 31	- 5.31	-5 31	-5 31	-5 31
8105	CIU A Temp	CIU A ON	°C	24 47	24.77	25 04	24.09	24 22	24 16	24 29
8106	CIU B Temp	CIU B ON	°C	24 96	25.31	25 45	24.48	24 59	24 53	24 65
8201	Receiver RF-A Temp	-	°C	**	**	28 67	27.53	26 80	26 73	27 01
8202	Receiver RF-B Temp	-	°C	27 98	28.22	**	**	**	**	**
8203	D MOD A Temp	-	°C	25 41	25.73	37.98	37.31	36 38	36 32	36 44
8204	D MOD B Temp	-	°C	35.03	35.61	26 12	25 27	23 98	23 91	24 21
8205	Receiver A AGC	Receiver A ON	DBM	**	**	-96 77	-85 62	-91 40	-92 68	-93 71
8206	Receiver B AGC	Receiver B ON	DBM	-94 74	-84.67	**	**	OFF	OFF	OFF
8207	Amp. A Output	Receiver A ON	TMV	**	**	2 31	2.94	2 66	2 68	2 60
8208	Amp. B Output	Receiver B ON	TMV	2 81	3 22	**	**	**	**	**
8209	Freq Shift Key A OUT	Receiver A ON	TMV	**	**	1.10	1 11	1 10	1 10	1 14
8210	Freq. Shift Key B OUT	Receiver B ON	TMV	1.10	1.11	**	**	**	**	**
8211	Amp A Output	Receiver A ON	TMV	**	**	1 10	1 16	1 10	1 11	1 12
8212	Amp. B Output	Receiver B ON	TMV	1 13	1 13	**	**	**	**	**
8215	D MOD A -15 V	Receiver A ON	TMV	**	**	5.00	5.00	4 98	4 98	4 99
8216	D MOD B -15 V	Receiver B ON	TMV	5.00	5 00	**	**	**	**	**
8217	Regulator A -10 V	Receiver A ON	TMV	**	**	5.40	5 39	5 38	5 38	5 38
8218	Regulator B -10 V	Receiver B ON	TMV	5 50	5.50	**	**	**	**	**

** Units not in use

SECTION 6

TELEMETRY SUBSYSTEM

LANDSAT-1

SECTION 6

TELEMETRY SUBSYSTEM (TLM)

The Telemetry Subsystem has performed nominally in this report period. Table 6-1 shows typical telemetry values since launch. All are nominal. Functions 1011, 6012, 7010 and 12238 remain inoperative.

Memory Section 11 continues to be used in the Telemetry matrix.

Table 6-1. TLM Telemetry Summary

Function No.	Function Name	Unit	Orbit						
			35	5099	10592	15233	15700	16132	16530
9001	Memory Sequencer A Converter	VDC	6.35	6 33	6 33	6 33	6 33	6 33	6 33
9002	Memory Sequencer B Converter	VDC	**	**	**	**	**	**	**
9003	Memory Sequencer Temp	°C	19.59	21.06	21.30	21 94	20 07	22 50	20 97
9004	Formatter A Converter	VDC	5.99	5 99	5 99	5 99	5 99	5 99	5 99
9005	Formatter B Converter	VDC	**	**	**	**	**	**	**
9006	Dig. Mux A Converter	VDC	10 01	10.04	10 07	10 07	10 07	10 07	10 07
9007	Dig. Mux B Converter	VDC	**	**	**	**	**	**	**
9008	Formatter/Dig. Mux Temp	°C	22.50	24.89	25 00	23 55	24 98	25 00	25 00
9009	Analog Mux A Converter	VDC	26.01	21 18	26.20	26 32	26 35	26 35	26 35
9010	Analog Mux B Converter	VDC	**	**	**	**	**	**	**
9011	A/D Converter A Voltage	VDC	10.00	10 07	10.07	10 07	10 04	10 07	10 07
9012	A/D Converter B Voltage	VDC	**	**	**	**	**	**	**
9013	Analog Mux A/D Converter	°C	25 00	26.83	27.49	25 63	25 00	25 00	27 30
9014	Preregulator A Voltage	VDC	19.93	19 95	19.94	19 98	19 90	19 90	19 89
9015	Preregulator B Voltage	VDC	**	**	**	**	**	**	**
9016	Reprogrammer Temp	°C	22.00	22.50	22 53	22 50	21 92	22 42	22 50
9017	Memory A Converter	VDC	6 00	5 99	6.00	5 97	5 97	6 00	5 97
9018	Memory A Temp	°C	17.51	17 50	17 50	17 50	16 54	16 66	17 50
9019	Memory B Converter	VDC	**	**	**	**	**	**	**
9020	Memory B Temp	°C	17 68	17.63	17.51	17 50	16 06	16 33	17 34
9100	Reflected Power (Xmtr A)	dBm	11.95	12 32	12.38	11 37	12 17	12 12	12 14
9101	Xmtr A -20 VDC	VDC	-19.75	-19 76	-19.75	-19 84	-19 76	-19 75	-19 75
9102	Xmtr B -20 VDC	VDC	**	**	**	**	**	**	**
9103	Xmtr A Temp	°C	20 95	21.14	22.01	21 98	22 41	22 65	22 91
9104	Xmtr B Temp	°C	21 69	21.95	22 76	22 91	23 21	25 00	23 77
9105	Xmtr A Power Output	dBm	25 12	25.35	25 24	25 00	24 98	24 89	24 89
9106	Xmtr B Power Output	dBm	**	**	**	**	**	**	**

** Units not used since prelaunch

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)
LANDSAT-1

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

The Orbit Adjust Subsystem has been fired eleven times, seven times using the -X thruster and four times using the +X thruster. Three -X firings were for initial orbit correction and four -X for orbit maintenance. The four +X firings were for orbit maintenance.

No orbit adjustment was made during this report period.

The subsystem pressure/temperature parameters continue to be normal There is 64.85 pounds of hydrazine fuel remaining from an initial prelaunch load of 67.00 pounds. Figure 2-2 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)	$+\Delta a$ (Meters)	Engine Performance Efficiency	Fuel[1] Used (Lbs)	Tank Pressure (PSIA)	Tank Temperature (^{o}F)	Axis Thruster
38	1	26 Jul 72 11 25 0 0	4.8	12	60 %		540	75	-X
44	2	26 Jul 72 21 44 46	250 0	1975	103 4%	2 15	U[2]	U[2]	-X
59	3	27 Jul 72 23 34 45	318 0	2391	101 5%		516	73 9	-X
938	4	29 Sep 72 00 30 00	12 8	98	110 0 %	0 039	U[2]	U[2]	-X
2316	5	13 Jan 73 00 21 30	20 4	154	106 0 %	0 071	489 4	75 4	-X
6390	6	25 Oct 73 00 04 10 8	14 8	110	100 0 %	0 048	486 8	73 9	-X
7826	7	4 Feb 74 23 27 10 4	14 7	112	101 8 %	0 048	490 59	75 4	-X
11367	8	16 Oct 74 22 42 10 8	8 0	-65	106 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	-22,6	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 6	+X

1 Initial Fuel Capacity - 67 lbs
2 Unavailable

Table 7-2. Landsat-1 OAS Telemetry Values

Function No	Name	Units	Orbit						
			35	5099	10182	15254	15700	16132	16530
2001	Prop Tank Temp	^{o}C	22 03	22 86	23 28	21 62	20 78	20 79	21 61
2003	Thrust Chamber No 1 (-x) Temp **	^{o}C	29 57	29 93	30 55	30 52	28 44	28 62	29 63
2004	Thrust Chamber No 2 (+-x) Temp **	^{o}C	38 76	40 28	38 91	36 25	34 95	35 84	37 11
2005	Thrust Chamber No 3 (-y) Temp **	^{o}C	34 55	34 41	36 09	38 45	42 02	43 84	44 57
2006	Line Pressure	psia	539 29	486 87	490 61	486 87	485 16	486 77	486 97

** Wide spread 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-1

SECTION 8

MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)

The spacecraft was corrected for unbalanced magnetic moments in Orbits 73, 85, 110, 220, 11181, 11185, and 11186, as reported in early reports. Adjustments were made in the yaw negative dipole in Orbit 11186 and the pitch positive dipole in Orbit 220. A short roll dipole test was performed in Orbit 11185, with roll dipole returned to near zero. No adjustments were made in 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	15700	16132	16530
4001	A1 Board Temp	°C	19.77	19.03	19.11	17.59	16.34	16.35	16.83
4002	A2 Board Temp	°C	23.58	23.05	23.13	21.83	20.78	20.79	21.23
4003	Hall Current	TMV	3.48	3.48	3.48	3.47	3.47	3.47	3.47
4004	Yaw Flux Density	TMV	3.11	3.11	3.15	4.02	4.03	4.03	4.03
4005	Pitch Flux Density	TMV	3.13	2.51	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	3.27	3.28

SECTION 9

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

LANDSAT-1

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.

Figure 9-1 shows the USB power output history since launch. In Orbit 10068, the B Section of the transmitter was substituted, restoring full power output to the System. Figure 9-2 shows AGC readings at Goldstone for a constant reference orbit in each cycle since launch.

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

Function			Orbit						
No.	Name	Units	35	5099	10592	15233	15700	16132	16530
11001	USB Rcvr AGC	DBM	-122.78	-131.99	-129.81	-105.41	-126 88	-125.17	-122.92
11002	USB Xmtr Pwr	WTS	1.60	0.29	1.54	1.53	1.58	1 53	1.49
11003	USB Rcvr Error	KHZ	21.79	-21.32	-23.25	-18.01	-20.82	-21.39	-21.32
11004	USB Xpond Temp	DGC	22.92	22.64	25.64	25.11	25.27	25.04	25.39
11005	USB Xpond Press	PSI	15.91	15.91	15.92	15.94	15.92	15.90	15.89
11007	USB Xmtr A -15V	VDC	-15.20	-15.20	**	**	**	**	**
11008	USB Xmtr B -15V	VDC	**	**	-15.20	-14.96	-15.09	-15.20	-15.20
11009	USB Range -15V	VDC	-14.76	-14.76	-14.58	-14.58	-14.58	-14.58	-14.58
11101	PMP Pwr A Volt	VDC	-15.12	-15.18	**	**	**	**	**
11102	PMP Pwr B Volt	VDC	**	**	-15.12	-14.82	-15.09	-15.10	-15.12
11103	PMP Temp A	DGC	30.44	30.23	26.60	26.09	25.67	25.80	26.43
11104	PMP Temp B	DGC	**	**	31.64	31.67	30.50	30.31	30.94

**Units Not in Use

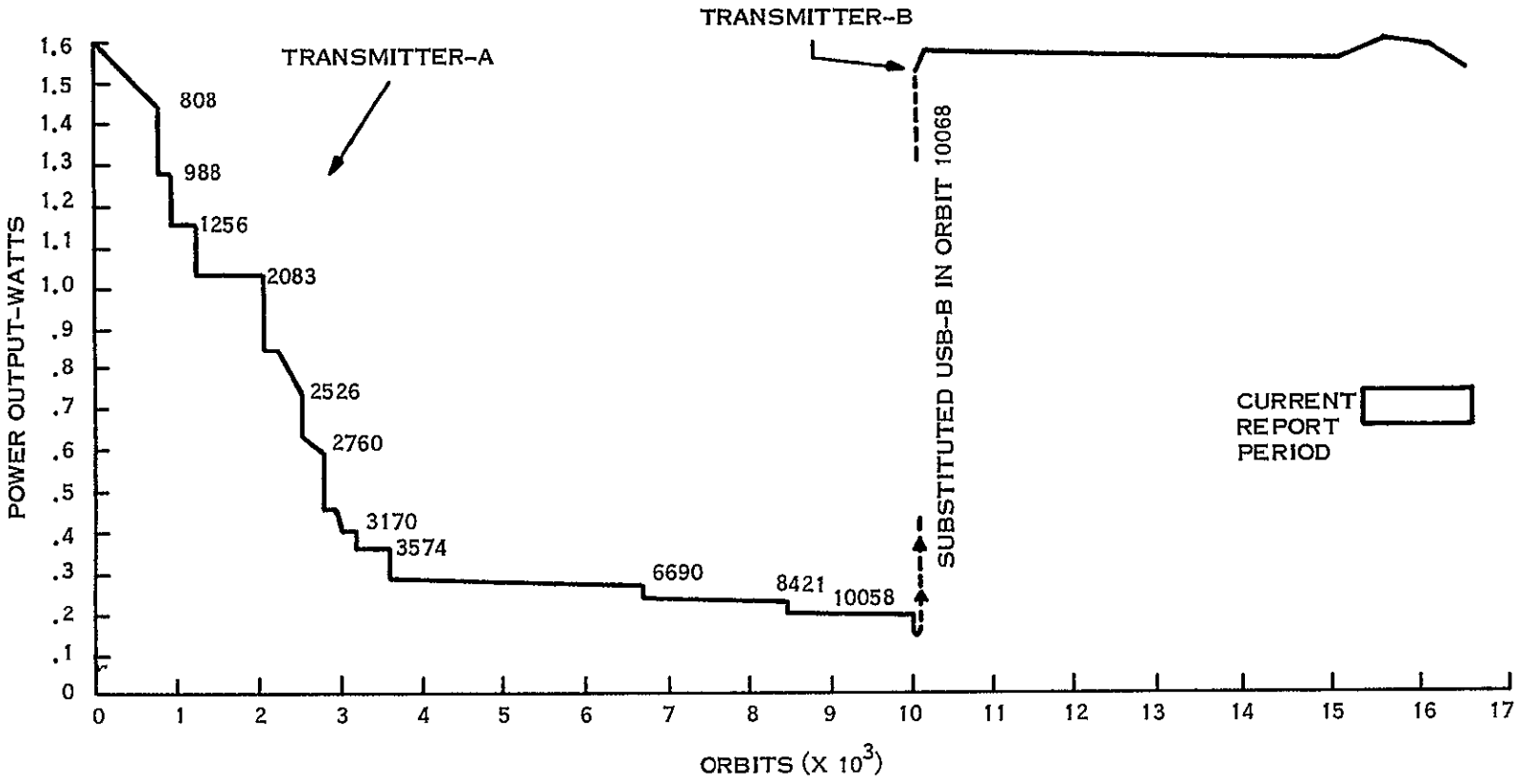

Figure 9-1. USB Power Output History (Landsat-1)

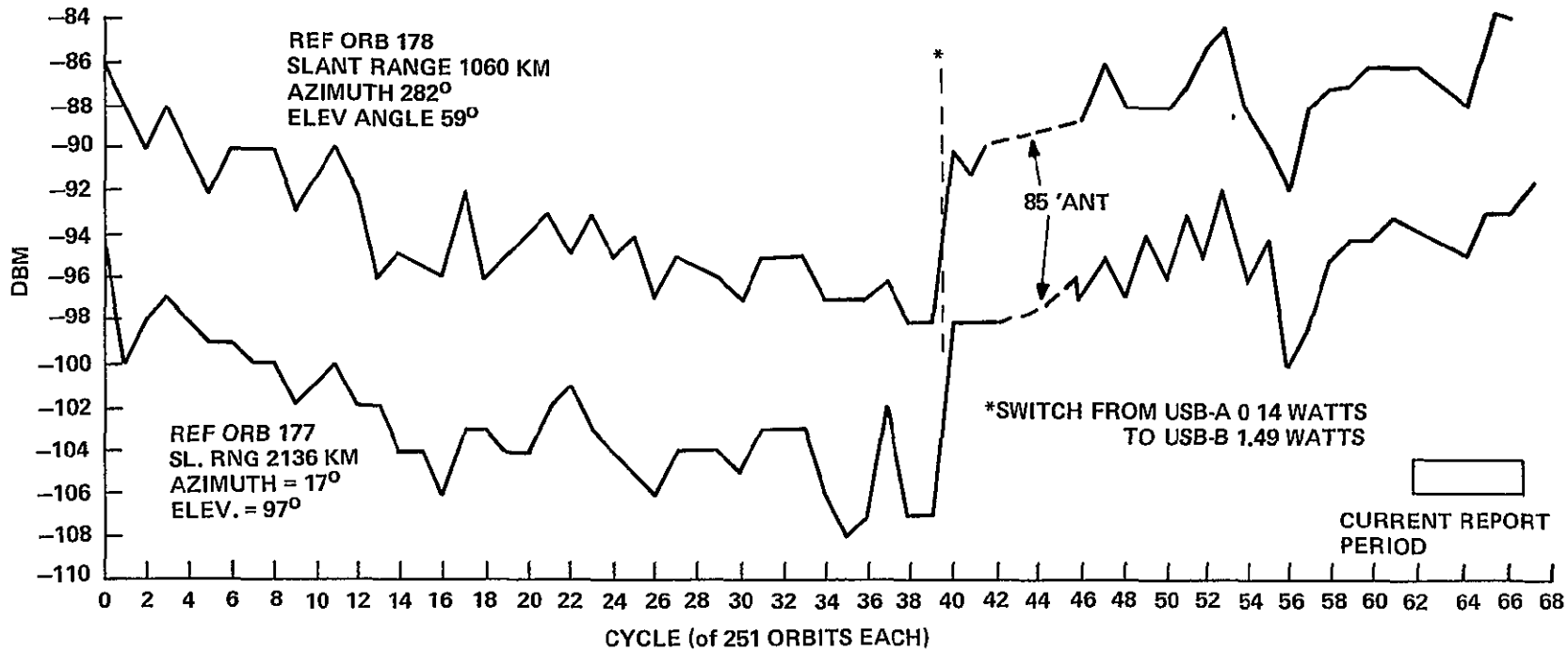

Figure 9-2. USB (Link 4) AGC Reading at Goldstone with 30-Foot Antenna, Landsat-1

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM

LANDSAT-1

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM

Auxiliary Processing Unit (APU) consisting of Search Track Data, Time Code Data, and Backup Timers, operated satisfactorily throughout this report period. The USB/WPA backup timer prematurely operated during Orbit 15467 (6 August 1975) at the time of Battery 6 turn-on. The premature timer trip resulted from the low voltage caused by a high transient current which occurred with the execution of "All Batteries On" command (see Section 3 also). Telemetry for the APU is shown in Table 10-1. The APU is in Normal mode.

Table 10-1. Landsat-1 APU Telemetry Functions

Functions	Description	Unit	Orbit						
			7	5098	10182	15254	15700	16132	16530
13200	APU, -24.5 VDC	VDC	-24.90	-24.90	-24.91	-24.90	-24.90	-24.90	-24.90
13201	APU, -12 Volts	VDC	-12.08	-12.08	-12.07	-12.06	-12.05	-12.05	-12.06
13202	APU Temp.	DGC	25.49	26.95	27.15	26.82	26.91	27.09	27.54

The Power Switching Module (PSM), containing the switching relays for power to Orbit Adjust, MSS, WBVTR No. 1 and No. 2, RBV and PRM, functioned normally. The MSS power circuits have been operating on a regular basis throughout this report period. The power relay for the RBV remained in a failed closed condition since Orbit 196.

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

SECTION 11

THERMAL SUBSYSTEM

LANDSAT-1

SECTION 11

THERMAL SUBSYSTEM (THM)

The Thermal Subsystem of Landsat-1 has maintained spacecraft temperature control over a satisfactory range since launch. Table 11-1 shows average analog telemetry values from data recorded on the NBTR. During this report period, the sun angle varied as shown in Figure 3-3, and the intensity increased from approximately 0.970 to 1.012 of the mean value. Figure 11-1 shows a typical thermal profile for average bay temperatures of the sensory ring in this report period. The values are consistent with the limits established over three years of orbital operation.

The compensation load switching history since launch is given in Table 11-2. Compensation load 4 was turned off in Orbit 15584 (15 August 1975) since it contributed to the rise of Battery 8 temperature. The changes in Orbit 15982 (12 September 1975) were for testing relay operation.

During the initial part of this report period, as seen from Table 11-1, temperatures have dropped due to compensation load 4 and battery 8 turn-off, but have gradually increased thereafter due to increasing sun intensity. Temperatures are expected to increase further during the on-coming period of higher sun intensity.

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

Function			Orbits						
Function No	Description	Unit	26	5098	10182	15254	15700	16132	16530
7001	THM TH01 ST1	DGC	19 52	20 85	21 65	19 48	18 32	18 40	18 95
7002	TIIM TH02 SBO	DGC	18 60	19 95	20 60	18 62	17 80	17 65	18 05
7003	THM TH03 STI	DGC	18,48	20 16	20 87	18 11	17 00	16 84	17 34
7004	THM TH10 TCB	DGC	19 47	20 25	20 36	19 76	19 64	19 73	20 06
7005	THM TH04 STI	DGC	18 39	19 71	20 35	17 86	17 08	16 78	17 20
7006	THM TH05 SBO	DGC	17 57	18 39	18 81	17 20	16 49	16 26	16 42
7007	OA -X THRUSTER	DGC	21 95	22 95	22 90	22 25	21 43	21 46	21 79
7008	THM TH06 STO	DGC	15 95	16 61	16 90	15 34	14 49	14 32	14 51
7009	THM TH06 SBI	DGC	19 38	20 35	20 93	18 98	17 89	17 60	17 79
7010	THM TH07 STI	DGC	18 61	*	*	*	*	*	*
7011	THM TH08 STO	DGC	21 78	22 77	22 88	22 03	21 19	21 19	21 51
7012	THM TH09 SBI	DGC	21 81	22 87	23 08	22 20	21 63	21 60	21 92
7013	THM TH10 SBO	DGC	18 73	19 53	19 64	19 00	18 67	18 67	18 89
7014	THM TH11 STI	DGC	22 37	23 35	23 57	22 80	22 60	22 71	23 16
7015	THM TH12 SBO	DGC	22 37	23 17	23 03	22 86	23 30	23 45	23 91
7016	THM TH13 STI	DGC	20 95	22 02	22 47	22 00	22 31	22 49	22 95
7017	RBV BEAM CTR LN	DGC	21 53	22 62	22 84	21 88	21 43	21 50	21 90
7018	THM TH14 STO	DGC	20 38	21 40	21 93	21 83	22 59	22 85	23 10
7019	NBR RAD OUTBD B4	DGC	5 09	5 86	6 00	4 37	3 00	2 98	3 45
7020	THM TH15 SBI	DGC	21 14	23 24	23 99	22 18	22 80	22 60	23 02
7021	THM TH16 STI	DGC	20 73	22 90	23 68	21 64	21 13	21 24	21 82
7022	THM TH17 SBI	DGC	20 22	22 76	23 56	21 47	20 27	20 38	20 97
7023	THM TH18 SBO	DGC	21 90	24 29	25 19	23 47	22 05	22 23	22 81
7030	THM TH03 BUR	DGC	16 05	17 07	17 42	15 35	14 78	14 54	14 83
7031	THM TH06 BUR	DGC	13 59	14 17	14 28	12 87	12 08	11 88	12 10
7032	THM TH09 BUR	DGC	19 92	20 75	20 74	20 17	19 70	19 75	19 99
7033	THM TH12 BUR	DGC	21 51	22 16	22 76	22 65	23 32	23 40	23 85
7034	THM TH15 BUR	DGC	19 70	21 67	22 38	21 33	21 84	21 97	22 35
7035	THM TH18 BUR	DGC	20 11	21 36	22 02	20 54	19 69	19 86	20 39
7040	THM TH01 TCB	DGC	19 27	20 46	21 26	19 19	18 33	18 34	18 78
7041	THM TH02 TCB	DGC	17 99	19 23	19 89	17 80	16 95	16 84	17 24
7042	THM TH03 TCB	DGC	18 34	19 94	20 92	17 79	17 48	16 90	17 25
7043	THM TH04 TCB	DGC	18 95	19 94	20 26	18 60	18 05	17 86	18 04
7044	THM TH05 TCB	DGC	16 27	16 98	17 32	15 90	15 14	15 00	15 16
7045	THM TH07 TCB	DGC	18 41	19 21	19 45	18 25	17 42	17 29	17 58
7046	THM TH09 TCB	DGC	19 38	20 37	20 64	19 85	19 47	19 29	19 35
7048	THM TH11 TCB	DGC	21 98	22 94	23 18	22 80	22 89	23 04	23 44
7049	THM TH12 TCB	DGC	21 92	22 46	22 35	22 30	22 91	22 97	23 40
7050	THM TH13 TCB	DGC	21 21	21 99	22 29	22 26	22 95	23 20	23 58
7051	THM TH14 TCB	DGC	21 38	22 88	23 62	22 74	23 33	23 51	23 64
7052	THM TH16 TCB	DGC	21 30	23 95	25 13	22 68	22 77	22 65	23 12
7053	THM TH17 TCB	DGC	21 73	24 03	25 02	23 33	21 26	21 50	22 14
7054	THM TH18 TCB	DGC	20 02	22 20	23 35	21 04	19 96	19 93	20 24
7060	THM SHUTTER BY 1	DEG	25 85	33 12	38 62	24 41	18 06	17 23	20 63
7061	THM SHUTTER BY 2	DEG	6 62	8 65	13 28	1 73	0 00	0 00	0 00
7062	THM SHUTTER BY 3	DEG	10 96	23 58	30 24	17 30	15 64	12 63	12 92
7063	THM SHUTTER BY 4	DEG	30 60	35 71	37 92	29 50	24 14	23 50	24 88
7064	THM SHUTTER BY 5	DEG	15 03	16 25	15 00	8 08	4 62	2 89	2 88
7065	THM SHUTTER BY 7	DEG	17 14	24 64	21 96	14 50	11 00	8 00	8 00
7067	THM SHUTTER BY 9	DEG	33 26	38 44	39,50	38 24	37 95	37 96	37 97
7068	THM SHUTTER BY 10	DEG	24 68	28 68	27,31	26 03	24 70	22 50	24 26
7069	THM SHUTTER BY 11	DEG	39 66	46 89	48 96	46 97	47 36	47 97	50 22
7070	THM SHUTTER BY 12	DEG	43 81	46 63	45 68	45 95	49 40	49 86	53 33
7071	THM SHUTTER BY 13	DEG	40 39	46 38	44 79	42 84	43 91	44 43	46 32
7072	THM SHUTTER BY 14	DEG	34 20	39 70	41 91	34 28	36 08	38 23	40 84
7073	THM SHUTTER BY 15	DEG	45 40	58 74	64 79	55 15	60 47	61 05	63 81
7074	THM SHUTTER BY 16	DEG	24 50	48 46	53 54	38 76	37 54	38 05	41 14
7075	THM SHUTTER BY 17	DEG	39 05	54 96	61 88	51 06	35 36	36 78	41 75
7076	THM SHUTTER BY 18	DEG	29 70	43 15	51 20	35 12	28 02	25 67	28 79
7080	THM Q1 T ZENER V	VDC	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
7082	THM Q3 T ZENER V	VDC	8 31	8 31	8 32	8 31	8 31	8 31	8 31
7083	THM Q1 S ZENER V	VDC	8 31	8 32	8 35	8 31	8 32	8 31	8 31
7084	THM Q2 S ZENER V	VDC	8 19	8 19	8 20	8 19	8 19	8 19	8 19
7085	THM Q3 S ZENER V	VDC	8 15	8 15	8 16	8 15	8 15	8 15	8 15
7090	THM PSM MOUNT	DGC	21 60	22 54	22,98	21 43	20 44	20 54	21 27
7091	THM IND ATTITUDE	DGC	19,40	20 42	20 88	19 13	18 09	17 90	18 24
7092	THM RBV RADIATOR	DGC	15 65	17 22	17 47	16 55	16 14	16 21	16 72
7093	THM RBVC CTR BM	DGC	20 30	21 61	21 87	20 73	20 24	20 31	20 89
7094	THM WBVTR ROOT	DGC	12 96	15 71	16 07	13 77	11 28	11 35	12 17
7095	THM WBVTR RAD CT	DGC	4 81	8,17	8 68	6 99	5 41	5 39	6 13
7096	THM WBVTR STRAP	DGC	16 62	19 32	19 66	17 29	14 04	14 11	14 91
7097	THM WB MT BAY 1	DGC	20 56	19 52	21 37	16 97	15 79	15 99	16 80
7098	THM WB MAT BAY 1	DGC	20 22	18.90	20 39	17 12	16 01	16 23	17 07
7099	THM WBVTR SEP 3	DGC	18 60	20 55	21 05	18 45	16 77	16 64	17 22
7100	THM WBVTR SEP 17	DGC	21 31	23 66	24 23	22 02	20 32	20 46	21 14
7101	THM WBVTR 1 CENT	DGC	21 49	23 72	24 01	21 63	17 57	17 68	18 43
7102	THM WBVTR 2 BAY	DGC	17 46	18 92	19 32	17 23	15 99	15 86	16 42
7103	THM WBVTR 2 BY 15	DGC	21 00	23 16	23 82	21 73	20 69	20 81	21 45
7104	THM WBVTR 2 CTR	DGC	19 35	21 51	21 81	19 54	16 72	16 86	17 72
7105	THM NBTR B SEP 6	DGC	18 06	19 30	19 79	17 82	16 14	16 15	16 78
7106	THM NBTR B SEP 1	DGC	20 82	22 35	22 89	21 61	21 35	21 54	22 10
7107	THM NBTR BM CTR	DGC	19 37	21.04	21 34	19 51	18 12	18 24	19 05
7108	THM MSS MOUNT 14	DGC	19 18	21 15	21 70	20 06	19 96	20 10	20 73
7109	THM OA -Y THRUSTER	DGC	22 21	23 80	24 69	24 40	25 27	25 82	26 29
7110	THM MSS WBVTR BM	DGC	18 14	20 06	20 53	18 18	16 56	16 58	17 45
7111	THM OA +X THRUSTER	DGC	20 30	19,92	21 22	18 07	17 03	17 25	18 05
7130	THM AUX P1 T	DGC	15 69	8 49	-18 90	9 68	11 34	18 29	17 64
7131	THM AUX P2 T	DGC	10,63	1 59	41	5 64	16 29	21 28	18 99

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

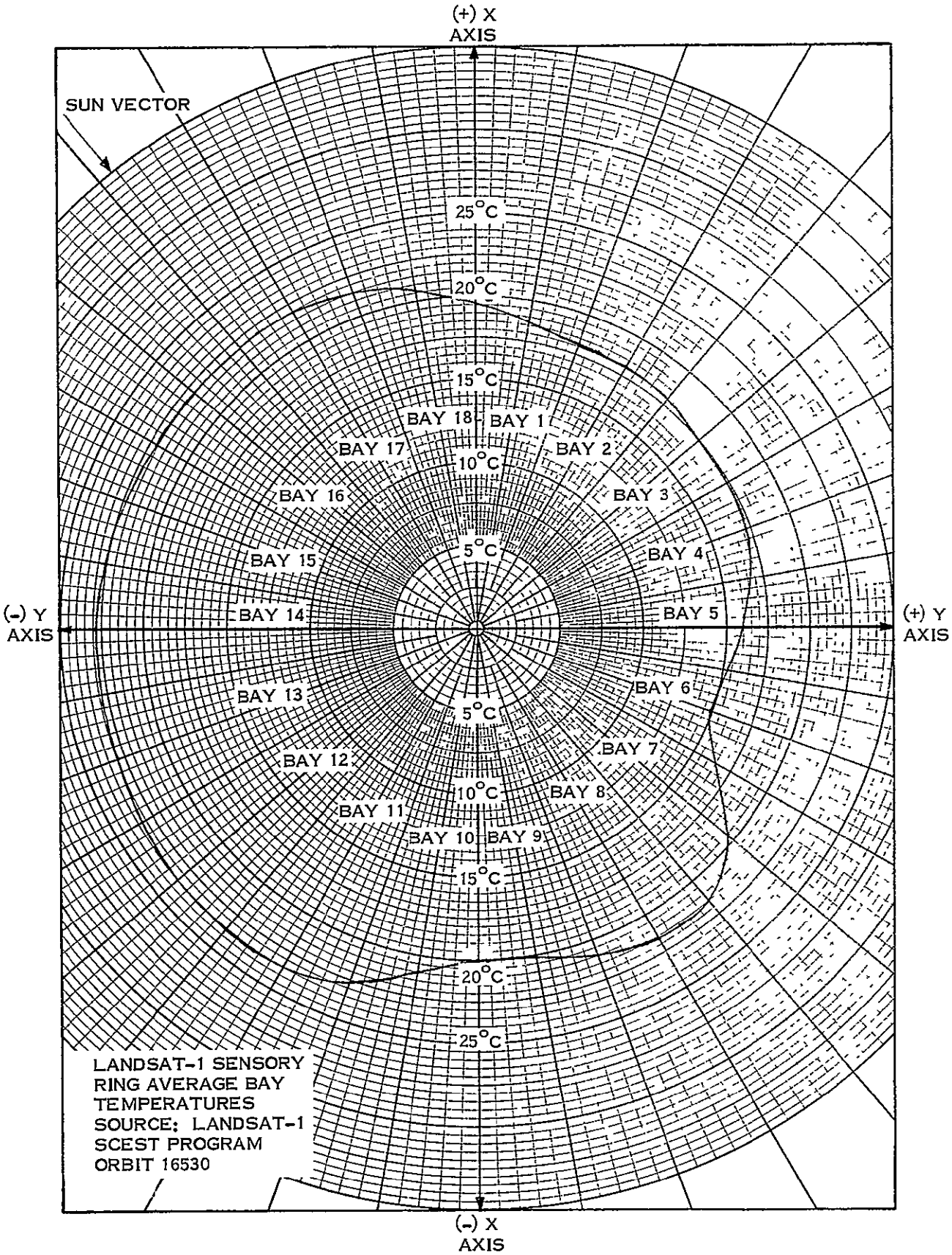

Figure 11-1. Landsat-1 Sensory Ring Thermal Profile

Table 11-2. Landsat-1 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	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

* Note: x = ON
0 = OFF

SECTION 12

NARROWBAND TAPE RECORDERS

LANDSAT-1

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)

Narrowband Recorder NBR-B, which was turned off in Orbit 15256, has remained inactive during the entire reporting period.

Narrowband Recorder NBR-A operated satisfactorily during this period, and has provided coverage for MSS real-time operations as well as approximately seven hours daily of normal orbital telemetry.

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	13479	15005	540	12939
B	11909	12666	476	11433

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

Function		Typical Telemetry Values - Orbits						
No.	Name	6	3750-3751	7480-7481	10862	12343-12344	15256	15888
10001	A - Motor Cur. (ma)							
	Record	190.10	189.20	186.31	186.31	186.31	192.63	192.63
	P/B	180.00	178.69	172.10	180.00	170.52	N.A.	*
10101	B - Motor Cur. (ma)							
	Record	193.26	193.04	194.79	198.95	198.95	198.95	*
	P/B	188.18	185.44	186.31	187.89	189.47	202.1	*
10002	A - Pwr Sup. Cur. (ma)							
	Record	320.56	338.20	339.81	339.81	343.19	343.24	339.81
	P/B	535.78	568.38	569.56	567.75	569.56	N.A.	*
10102	B - Pwr Sup. Cur. (ma)							
	Record	317.62	336.05	343.50	350.00	346.75	346.75	*
	P/B	570.78	555.63	574.00	567.50	567.50	580.51	*
10003	A - Rec. Temp. (DGC)	25.47	24.40	24.20	23.60	26.25	22.00	23.00
10103	B - Rec. Temp. (DGC)	24.58	23.41	24.54	23.41	25.38	23.18	18.18
10004	A - Supply (VDC)	-24.47	-24.44	-24.62	-24.62	-24.57	-24.62	-24.62
10104	B - Supply (VDC)	-24.44	-24.51	-24.57	-24.29	-24.70	-24.57	-24.71

N.A. - Data not available
* - No data. NBR-B out of service

SECTION 13
WIDEBAND TELEMETRY SUBSYSTEM
LANDSAT-1

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM (WBTS)

The Wideband Telemetry Subsystem has operated nominally in this report period.

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

Figure 13-1 is the AGC history at Goldstone.

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

WBPA-1

Function			Orbits			
Number	Name		26	1894	1944	2095
12001	Tmpt 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			Orbits						
Number	Name		33	4096	10602	15233	15700	16118	16565
12101	Temp TWT Coll. (Max)	(DgC)	35.38	34.24	35 96	29.77	33.07	31 92	27 30
12102	Helix Current	(Ma)	7.32	7.70	7 67	7.90	7.70	7.85	7 85
12103	TWT Cath. Cur	(Ma)	44.30	43.85	42 72	43 70	42.61	43 82	43 74
12104	Forward Pwr	(DBM)	43 57	43.57	43 57	43 52	43.38	43 52	43.53
12105	Reflected Pwr	(DBM)	31.59	32.79	32 62	33.07	32.45	32.92	33.12
12228	Loop Str. AFC Con Volt (1)	(MHz)	1 11	-0.78	-1 12	-1 05	-1 24	-1.03	-0 97
12229	Mod Temp VDC	(DgC)	21 70	20 88	21.50	21 78	21 05	18 57	19.00
12232	+15 VDC Pwr Sup A (2)	(TMV)	2 68	2.69	2.69	2.65	2 69	2.68	2.69
12234	-15 VDC Pwr Sup A	(TMV)	5.90	5.98	5.92	5.81	5 98	6.01	6.00
12236	+5 VDC Pwr Sup A	(TMV)	3.97	4.01	4.01	3.97	3 95	4.02	4.01
12239	-5 VDC Pwr Sup A	(TMV)	5 24	telemetry point defective →					
12240	-24 5 VDC Unreg Volt A	(TMV)	5 43	5 52	5.46	5 44	5 57	5.60	5 63
12242	Inv Temp	(DgC)	23 03	22.96	23.86	23 66	19 67	19.44	21 12

(1) Satisfactory if not zero or -7.5 (2) B Power Supply not yet used in orbit

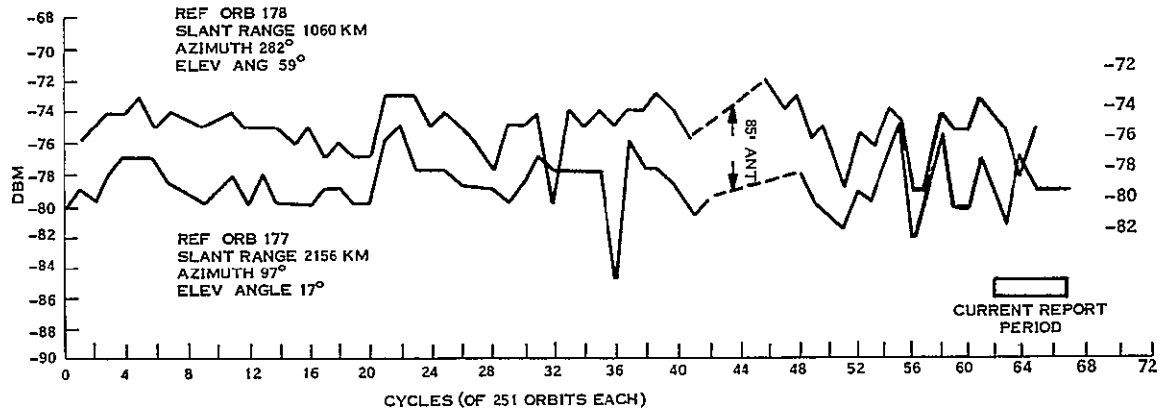

Figure 13-1. Landsat-1 Wide Band Power Amp-2 (Link 3) AGC Readings at Goldstone with 30-Foot Antenna

SECTION 14

ATTITUDE MEASUREMENT SENSOR

LANDSAT-1

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)

Telemetry output of the AMS continues to be normal and in good agreement with the ACS subsystem.

Table 14-1 gives typical AMS telemetry values.

Table 14-1. Landsat-1 AMS Temperature Telemetry

Function	Description	Units	Orbits						
			35	5099	10182	15254	15700	16132	16530
3004	Case-Temp 1	DGC	18.92	19.42	19.71	18.54	17.86	17.77	18.37
3005	Assembly-Temp 2	DGC	19.15	19.76	19.96	18.73	18.08	18.08	18.70

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS

LANDSAT-1

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS

WBVTR-2 has not been operated since its failure in Orbit 148.

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

Pressure and temperature telemetry values for WBVTR-1 transport and electronics units are shown in Table 15-1.

Table 15-1. WBVTR-1 Telemetry Values

WBVTR-1 Functions		Telemetry Values in Orbits			
Number	Name	15260	15700	16132	16530
13022	Press. Trans. (PSI)	15.73	15.59	15.59	15.66
13023	Temp. Trans. (DgC)	18.55	16.36	16.53	17.36
13024	Temp. Elec. (DgC)	15.00	13.84	13.99	14.75

SECTION 16

RETURN BEAM VIDICON

LANDSAT-1

SECTION 16

RETURN BEAM VIDICON (RBV)

The RBV has not been reactivated since Orbit 196, but it is capable of operation through individual component power switching. An assessment of the RBV performance was given in ERTS-1 Flight Evaluation Report 23 July to 23 October, 1972.

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM

LANDSAT-1

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

The Multispectral Scanner Subsystem operated nominally in this period without incident. Figure 17-1 shows the number of scenes imaged at each geographical location in this quarter. Figure 17-2 shows the number of scenes imaged in the first 3 years of operation. The sum of the two show the number of scenes imaged since launch. In these maps, only those scenes are shown which are received by U.S. Ground stations. Scenes transmitted to Canada, Brazil and Italy (about 30% of total) are not shown.

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

Table 17-2 shows the history of sensor response to a constant input radiance level. Sensor outputs have declined this quarter, but all are still satisfactory. Sensor 13, unlike the other sensors, rose steadily since launch but since September, 1974, seems to have stabilized.

Line length history is also shown in Table 17-2.

Sun Calibration, performed every two weeks, continue to show nominal performance.

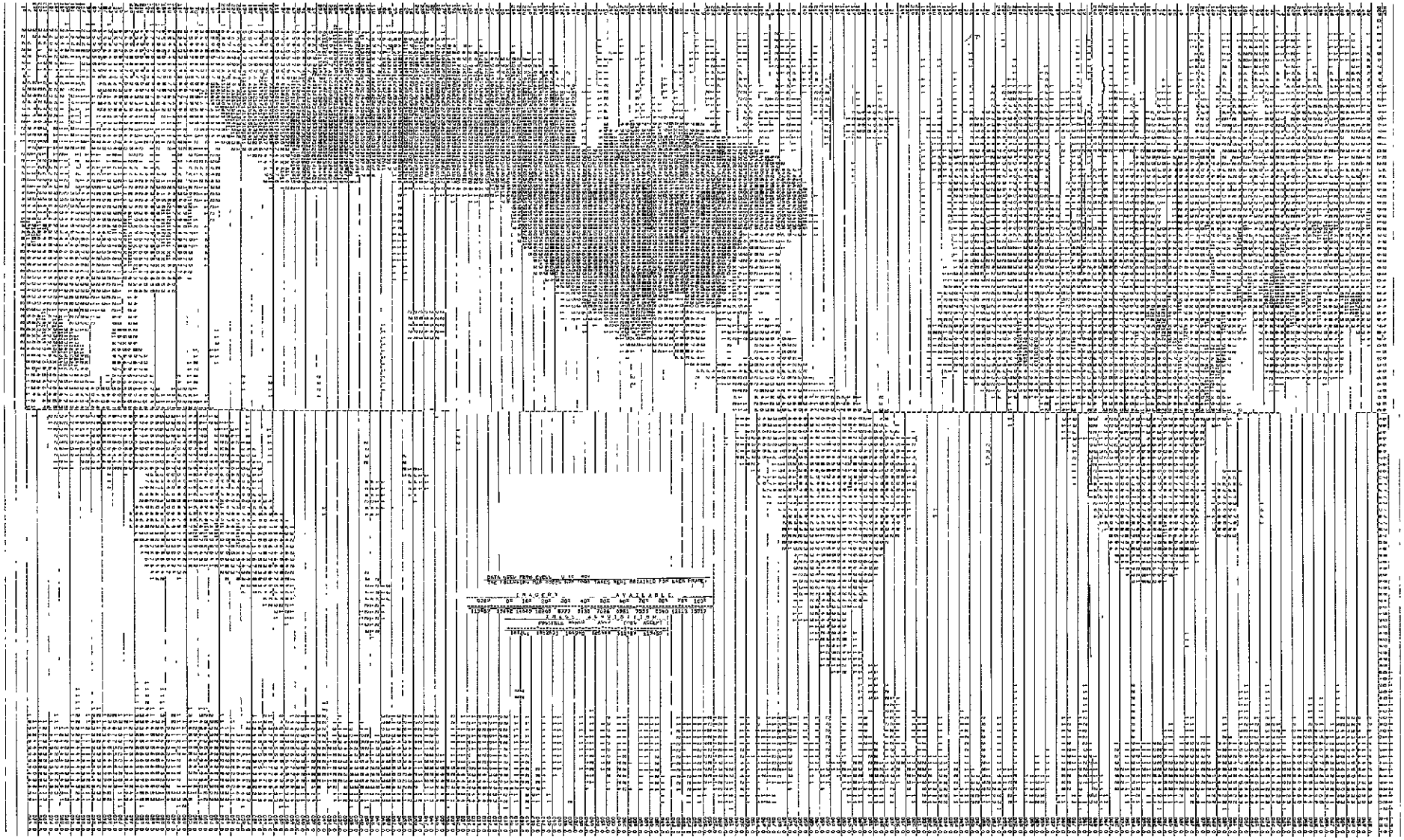

Figure 17-2. Computer Map of MSS Scenes For First 3 Years Operation - Landsat-1

Table 17-1. MSS Telemetry Values

Function No.	Name		Telemetry Values in Orbits						
			20	5060	10587	15233	15700	16118	16565
15044	FOPT 2 T	(DGC)	17.46	19.84	19.75	18.15	16.38	16.38	18.19
15046	ELEC CVR T	(DGC)	19.37	21.83	21.96	20.20	17.37	17.30	19.11
15048	SCAN MIR REG T	(DGC)	16.35	19.77	20.48	20.94	17.19	16.86	19.54
15050	SCAN MIR DR. COIL T	(DGC)	15.94	19.30	19.78	19.21	16.57	16.35	19.11
15052	ROT SHUT HSG T	(DGC)	16.91	20.07	20.23	18.74	17.04	17.01	18.75
15043	FOPT 1 T	(DGC)	17.67	20.01	19.93	18.35	16.65	16.64	18.39
15045	MUX PWR CASE T	(DGC)	21.19	22.03	23.87	26.92	21.21	20.68	22.89
15047	PWR SUP T	(DGC)	17.41	20.00	20.21	19.83	17.02	16.83	18.98
15049	SCAN MIR DR. ELC T	(DGC)	16.12	19.41	20.23	21.16	16.76	16.42	19.34
15051	SCAN MIR HSG T	(DGC)	15.60	19.05	19.49	18.40	16.20	16.14	18.79
15040	MUX -6 VDC	(TMV)	4.03	4.03	3.98	4.03	4.03	4.03	4.03
15042	AVE DENS DATA	(TMV)	1.67	2.13	2.05	2.28	2.02	2.04	1.88
15054	CAL LAMP CUR A	(TMV)	1.12	1.12	1.12	1.12	1.12	1.12	1.12
15056	BAND 2 $\pm$ 15 VDC	(TMV)	5.10	5.10	5 04	5.10	5.10	5.10	5.10
15058	BAND 4 $\pm$ 15 VDC	(TMV)	5.10	5.10	5.04	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	5.02
15062	+ 19 VDC REC OUT	(TMV)	4.80	4.90	4.97	5.03	5.03	5.03	5.03
15064	BAND 1 HV A	(TMV)	5.10	5.16	5.12	5.12	5.12	5.12	5.12
15066	BAND 2 HV A	(TMV)	4.50	4.52	4.52	4.50	4.50	4.50	4.50
15068	BAND 3 HV A	(TMV)	4.60	4.62	4.62	4.62	4.60	4.60	4.62
15070	SHUT MOT CON OUT	(TMV)	2.43	2.44	2.47	2.51	2.51	2.52	2.51
15041	S/D CONV REF V	(TMV)	5.93	5.93	5.87	5.93	5.92	5.92	5.92
15053	SCAN MIR REG V	(TMV)	4.42	4.51	4.51	4.61	4.61	4.61	4.60
15055	BAND 1 $\pm$ 15 V	(TMV)	4.97	4.97	4.92	4.97	4.97	4.97	4.97
15057	BAND 3 $\pm$ 15 V	(TMV)	5.00	5.00	4.94	5.00	5.00	5.00	5.00
15059	-15 VDC TEL.	(TMV)	5.02	5.02	5.02	5.02	5.02	5.02	5.02
15061	$\pm$ 5 VDC LOGIC REG	(TMV)	4.82	4.81	4.77	4.76	4.80	4.76	4.75
15063	-19 VDC REG OUT	(TMV)	3.43	3.39	3.50	3.58	3.58	3.58	3.57
15071	SCAN MIR DR. CLK	(TMV)	1.93	1.97	1.98	2.00	2.00	2.00	2.00

Table 17-2. MSS Response History
Landsat-1
Quantum Level for Selected Work
(0=Black: 63=White)

Sensor	Quantum Level					Band
	← 1st Year →		← 2nd Yr. →	← 3rd Yr. →		
	Launch	2-4 Quar.	5-8 Quar.	9-12 Quar.	This Quar.	
1	43	39	39	38	37	
2	44	39	40	40	39	
3	43	38	40	40	39	
4	43	38	39	39	38	1
5	41	36	35	34	32	
6	43	39	41	41	40	
7	47	43	43	42	41	
8	46	41	41	41	40	
9	47	44	42	42	42	2
10	46	42	41	41	41	
11	47	42	42	42	41	
12	45	42	42	42	42	
13	46	46	49	51	52	
14	44	42	42	42	42	
15	45	42	42	41	41	3
16	40	37	37	37	37	
17	42	39	40	40	40	
18	44	40	40	41	41	
19	28	28	27	25	23	
20	25	26	25	23	21	
21	26	27	26	25	23	
22	23	23	22	21	19	4
23	22	22	23	21	21	
24	24	23	24	23	22	
Line Length	3221	3219	3217	3216	3216	

SECTION 18

DATA COLLECTION SUBSYSTEM

LANDSAT-1

SECTION 18

DATA COLLECTION SUBSYSTEM (DCS)

The Data Collection Subsystem was turned OFF after Orbit 12690 on 19 January 1975, and has not been used since.

The DCS operated without anomaly throughout its operational period. Only Receiver #1 was used.

APPENDIX A

LANDSAT-1 ANOMALY LIST

APPENDIX B

LANDSAT-1 SPACECRAFT ORBIT REFERENCE TABLES

LANDSAT-1

SPACECRAFT ORBIT REFERENCE TABLES

FROM JULY 1975 THRU DECEMBER 1976

ORBIT 14953 THRU 22621

FLIGHT DAY 1073 THRU 1622

LANDSAT-1

JUL, 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	182	1073	14953-14966	29- 42	3	60
2	183	1074	14967-14980	43- 56	4	60
3	184	1075	14981-14994	57- 70	5	60
4	185	1076	14995-15008	71- 84	6	60
5	186	1077	15009-15022	85- 98	7	60
6	187	1078	15023-15035	99-111	8	60
7	188	1079	15036-15049	112-125	9	60
8	189	1080	15050-15063	126-139	10	60
9	190	1081	15064-15077	140-153	11	60
10	191	1082	15078-15091	154-167	12	60
11	192	1083	15092-15105	168-181	13	60
12	193	1084	15106-15119	182-195	14	60
13	194	1085	15120-15133	196-209	15	60
14	195	1086	15134-15147	210-223	16	60
15	196	1087	15148-15161	224-237	17	60
16	197	1088	15162-15175	238-251	18	60
17	198	1089	15176-15189	1- 14	1	61
18	199	1090	15190-15203	15- 28	2	61
19	200	1091	15204-15217	29- 42	3	61
20	201	1092	15218-15231	43- 56	4	61
21	202	1093	15232-15245	57- 70	5	61
22	203	1094	15246-15259	71- 84	6	61
23	204	1095	15260-15273	85- 98	7	61
24	205	1096	15274-15286	99-111	8	61
25	206	1097	15287-15300	112-125	9	61
26	207	1098	15301-15314	126-139	10	61
27	208	1099	15315-15328	140-153	11	61
28	209	1100	15329-15342	154-167	12	61
29	210	1101	15343-15356	168-181	13	61
30	211	1102	15357-15370	182-195	14	61
31	212	1103	15371-15384	196-209	15	61

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AUG. 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	213	1104	15385-15398	210-223	16	61
2	214	1105	15399-15412	224-237	17	61
3	215	1106	15413-15426	238-251	18	61
4	216	1107	15427-15440	1- 14	1	62
5	217	1108	15441-15454	15- 28	2	62
6	218	1109	15455-15468	29- 42	3	62
7	219	1110	15469-15482	43- 56	4	62
8	220	1111	15483-15496	57- 70	5	62
9	221	1112	15497-15510	71- 84	6	62
10	222	1113	15511-15524	85- 98	7	62
11	223	1114	15525-15537	99-111	8	62
12	224	1115	15538-15551	112-125	9	62
13	225	1116	15552-15565	126-139	10	62
14	226	1117	15566-15579	140-153	11	62
15	227	1118	15580-15593	154-167	12	62
16	228	1119	15594-15607	168-181	13	62
17	229	1120	15608-15621	182-195	14	62
18	230	1121	15622-15635	196-209	15	62
19	231	1122	15636-15649	210-223	16	62
20	232	1123	15650-15663	224-237	17	62
21	233	1124	15664-15677	238-251	18	62
22	234	1125	15678-15691	1- 14	1	63
23	235	1126	15692-15705	15- 28	2	63
24	236	1127	15706-15719	29- 42	3	63
25	237	1128	15720-15733	43- 56	4	63
26	238	1129	15734-15747	57- 70	5	63
27	239	1130	15748-15761	71- 84	6	63
28	240	1131	15762-15775	85- 98	7	63
29	241	1132	15776-15788	99-111	8	63
30	242	1133	15789-15802	112-125	9	63
31	243	1134	15803-15816	126-139	10	63

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SEP-1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	244	1135	15817-15830	140-153	11	63
2	245	1136	15831-15844	154-167	12	63
3	246	1137	15845-15858	168-181	13	63
4	247	1138	15859-15872	182-195	14	63
5	248	1139	15873-15886	196-209	15	63
6	249	1140	15887-15900	210-223	16	63
7	250	1141	15901-15914	224-237	17	63
8	251	1142	15915-15928	238-251	18	63
9	252	1143	15929-15942	1- 14	1	64
10	253	1144	15943-15956	15- 28	2	64
11	254	1145	15957-15970	29- 42	3	64
12	255	1146	15971-15984	43- 56	4	64
13	256	1147	15985-15998	57- 70	5	64
14	257	1148	15999-16012	71- 84	6	64
15	258	1149	16013-16026	85- 98	7	64
16	259	1150	16027-16039	99-111	8	64
17	260	1151	16040-16053	112-125	9	64
18	261	1152	16054-16067	126-139	10	64
19	262	1153	16068-16081	140-153	11	64
20	263	1154	16082-16095	154-167	12	64
21	264	1155	16096-16109	168-181	13	64
22	265	1156	16110-16123	182-195	14	64
23	266	1157	16124-16137	196-209	15	64
24	267	1158	16138-16151	210-223	16	64
25	268	1159	16152-16165	224-237	17	64
26	269	1160	16166-16179	238-251	18	64
27	270	1161	16180-16193	1- 14	1	65
28	271	1162	16194-16207	15- 28	2	65
29	272	1163	16208-16221	29- 42	3	65
30	273	1164	16222-16235	43- 56	4	65

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OCT. 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	274	1165	16236-16249	57- 70	5	45
2	275	1166	16250-16263	71- 84	6	45
3	276	1167	16264-16277	85- 98	7	45
4	277	1168	16278-16290	99-111	8	45
5	278	1169	16291-16304	112-125	9	45
6	279	1170	16305-16318	126-139	10	45
7	280	1171	16319-16332	140-153	11	45
8	281	1172	16333-16346	154-167	12	45
9	282	1173	16347-16360	168-181	13	45
10	283	1174	16361-16374	182-195	14	45
11	284	1175	16375-16388	196-209	15	45
12	285	1176	16389-16402	210-223	16	45
13	286	1177	16403-16416	224-237	17	45
14	287	1178	16417-16430	238-251	18	45
15	288	1179	16431-16444	1- 14	1	46
16	289	1180	16445-16458	15- 28	2	46
17	290	1181	16459-16472	29- 42	3	46
18	291	1182	16473-16486	43- 56	4	46
19	292	1183	16487-16500	57- 70	5	46
20	293	1184	16501-16514	71- 84	6	46
21	294	1185	16515-16528	85- 98	7	46
22	295	1186	16529-16541	99-111	8	46
23	296	1187	16542-16555	112-125	9	46
24	297	1188	16556-16569	126-139	10	46
25	298	1189	16570-16583	140-153	11	46
26	299	1190	16584-16597	154-167	12	46
27	300	1191	16598-16611	168-181	13	46
28	301	1192	16612-16625	182-195	14	46
29	302	1193	16626-16639	196-209	15	46
30	303	1194	16640-16653	210-223	16	46
31	304	1195	16654-16667	224-237	17	46

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NOV.1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	305	1196	16668-16681	238-251	18	46
2	306	1197	16682-16695	1- 14	1	47
3	307	1198	16696-16709	15- 28	2	47
4	308	1199	16710-16723	29- 42	3	47
5	309	1200	16724-16737	43- 56	4	47
6	310	1201	16738-16751	57- 70	5	47
7	311	1202	16752-16765	71- 84	6	47
8	312	1203	16766-16779	85- 98	7	47
9	313	1204	16780-16792	99-111	8	47
10	314	1205	16793-16806	112-125	9	47
11	315	1206	16807-16820	126-139	10	47
12	316	1207	16821-16834	140-153	11	47
13	317	1208	16835-16848	154-167	12	47
14	318	1209	16849-16862	168-181	13	47
15	319	1210	16863-16876	182-195	14	47
16	320	1211	16877-16890	196-209	15	47
17	321	1212	16891-16904	210-223	16	47
18	322	1213	16905-16918	224-237	17	47
19	323	1214	16919-16932	238-251	18	47
20	324	1215	16933-16946	1- 14	1	48
21	325	1216	16947-16960	15- 28	2	48
22	326	1217	16961-16974	29- 42	3	48
23	327	1218	16975-16988	43- 56	4	48
24	328	1219	16989-17002	57- 70	5	48
25	329	1220	17003-17016	71- 84	6	48
26	330	1221	17017-17030	85- 98	7	48
27	331	1222	17031-17043	99-111	8	48
28	332	1223	17044-17057	112-125	9	48
29	333	1224	17058-17071	126-139	10	48
30	334	1225	17072-17085	140-153	11	48

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DEC. 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	335	1226	17086-17099	154-167	12	68
2	336	1227	17100-17113	168-181	13	68
3	337	1228	17114-17127	182-195	14	68
4	338	1229	17128-17141	196-209	15	68
5	339	1230	17142-17155	210-223	16	68
6	340	1231	17156-17169	224-237	17	68
7	341	1232	17170-17183	238-251	18	68
8	342	1233	17184-17197	1- 14	1	69
9	343	1234	17198-17211	15- 28	2	69
10	344	1235	17212-17225	29- 42	3	69
11	345	1236	17226-17239	43- 56	4	69
12	346	1237	17240-17253	57- 70	5	69
13	347	1238	17254-17267	71- 84	6	69
14	348	1239	17268-17281	85- 98	7	69
15	349	1240	17282-17294	99-111	8	69
16	350	1241	17295-17308	112-125	9	69
17	351	1242	17309-17322	126-139	10	69
18	352	1243	17323-17336	140-153	11	69
19	353	1244	17337-17350	154-167	12	69
20	354	1245	17351-17364	168-181	13	69
21	355	1246	17365-17378	182-195	14	69
22	356	1247	17379-17392	196-209	15	69
23	357	1248	17393-17406	210-223	16	69
24	358	1249	17407-17420	224-237	17	69
25	359	1250	17421-17434	238-251	18	69
26	360	1251	17435-17448	1- 14	1	70
27	361	1252	17449-17462	15- 28	2	70
28	362	1253	17463-17476	29- 42	3	70
29	363	1254	17477-17490	43- 56	4	70
30	364	1255	17491-17504	57- 70	5	70
31	365	1256	17505-17518	71- 84	6	70

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JAN. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	1	1257	17519-17532	85- 98	7	70
2	2	1258	17533-17545	99-111	8	70
3	3	1259	17546-17559	112-125	9	70
4	4	1260	17560-17573	126-139	10	70
5	5	1261	17574-17587	140-153	11	70
6	6	1262	17588-17601	154-167	12	70
7	7	1263	17602-17615	168-181	13	70
8	8	1264	17616-17629	182-195	14	70
9	9	1265	17630-17643	196-209	15	70
10	10	1266	17644-17657	210-223	16	70
11	11	1267	17658-17671	224-237	17	70
12	12	1268	17672-17685	238-251	18	70
13	13	1269	17686-17699	1- 14	1	71
14	14	1270	17700-17713	15- 28	2	71
15	15	1271	17714-17727	29- 42	3	71
16	16	1272	17728-17741	43- 56	4	71
17	17	1273	17742-17755	57- 70	5	71
18	18	1274	17756-17769	71- 84	6	71
19	19	1275	17770-17783	85- 98	7	71
20	20	1276	17784-17796	99-111	8	71
21	21	1277	17797-17810	112-125	9	71
22	22	1278	17811-17824	126-139	10	71
23	23	1279	17825-17838	140-153	11	71
24	24	1280	17839-17852	154-167	12	71
25	25	1281	17853-17866	168-181	13	71
26	26	1282	17867-17880	182-195	14	71
27	27	1283	17881-17894	196-209	15	71
28	28	1284	17895-17908	210-223	16	71
29	29	1285	17909-17922	224-237	17	71
30	30	1286	17923-17936	238-251	18	71
31	31	1287	17937-17950	1- 14	1	72

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FEB, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	32	1288	17951-17964	15- 28	2	72
2	33	1289	17965-17978	29- 42	3	72
3	34	1290	17979-17992	43- 56	4	72
4	35	1291	17993-18006	57- 70	5	72
5	36	1292	18007-18020	71- 84	6	72
6	37	1293	18021-18034	85- 98	7	72
7	38	1294	18035-18047	99-111	8	72
8	39	1295	18048-18061	112-125	9	72
9	40	1296	18062-18075	126-139	10	72
10	41	1297	18076-18089	140-153	11	72
11	42	1298	18090-18103	154-167	12	72
12	43	1299	18104-18117	168-181	13	72
13	44	1300	18118-18131	182-195	14	72
14	45	1301	18132-18145	196-209	15	72
15	46	1302	18146-18159	210-223	16	72
16	47	1303	18160-18173	224-237	17	72
17	48	1304	18174-18187	238-251	18	72
18	49	1305	18188-18201	1- 14	1	73
19	50	1306	18202-18215	15- 28	2	73
20	51	1307	18216-18229	29- 42	3	73
21	52	1308	18230-18243	43- 56	4	73
22	53	1309	18244-18257	57- 70	5	73
23	54	1310	18258-18271	71- 84	6	73
24	55	1311	18272-18285	85- 98	7	73
25	56	1312	18286-18298	99-111	8	73
26	57	1313	18299-18312	112-125	9	73
27	58	1314	18313-18326	126-139	10	73
28	59	1315	18327-18340	140-153	11	73
29	60	1316	18341-18354	154-167	12	73

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MAR. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	61	1317	18355-18368	168-181	13	73
2	62	1318	18369-18382	182-195	14	73
3	63	1319	18383-18396	196-209	15	73
4	64	1320	18397-18410	210-223	16	73
5	65	1321	18411-18424	224-237	17	73
6	66	1322	18425-18438	238-251	18	73
7	67	1323	18439-18452	1-14	1	74
8	68	1324	18453-18466	15-28	2	74
9	69	1325	18467-18480	29-42	3	74
10	70	1326	18481-18494	43-56	4	74
11	71	1327	18495-18508	57-70	5	74
12	72	1328	18509-18522	71-84	6	74
13	73	1329	18523-18536	85-98	7	74
14	74	1330	18537-18549	99-111	8	74
15	75	1331	18550-18563	112-125	9	74
16	76	1332	18564-18577	126-139	10	74
17	77	1333	18578-18591	140-153	11	74
18	78	1334	18592-18605	154-167	12	74
19	79	1335	18606-18619	168-181	13	74
20	80	1336	18620-18633	182-195	14	74
21	81	1337	18634-18647	196-209	15	74
22	82	1338	18648-18661	210-223	16	74
23	83	1339	18662-18675	224-237	17	74
24	84	1340	18676-18689	238-251	18	74
25	85	1341	18690-18703	1-14	1	75
26	86	1342	18704-18717	15-28	2	75
27	87	1343	18718-18731	29-42	3	75
28	88	1344	18732-18745	43-56	4	75
29	89	1345	18746-18759	57-70	5	75
30	90	1346	18760-18773	71-84	6	75
31	91	1347	18774-18787	85-98	7	75

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APR. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	92	1348	18788-18800	99-111	8	75
2	93	1349	18801-18814	112-125	9	75
3	94	1350	18815-18828	126-139	10	75
4	95	1351	18829-18842	140-153	11	75
5	96	1352	18843-18856	154-167	12	75
6	97	1353	18857-18870	168-181	13	75
7	98	1354	18871-18884	182-195	14	75
8	99	1355	18885-18898	196-209	15	75
9	100	1356	18899-18912	210-223	16	75
10	101	1357	18913-18926	224-237	17	75
11	102	1358	18927-18940	238-251	18	75
12	103	1359	18941-18954	1- 14	1	76
13	104	1360	18955-18968	15- 28	2	76
14	105	1361	18969-18982	29- 42	3	76
15	106	1362	18983-18996	43- 56	4	76
16	107	1363	18997-19010	57- 70	5	76
17	108	1364	19011-19024	71- 84	6	76
18	109	1365	19025-19038	85- 98	7	76
19	110	1366	19039-19051	99-111	8	76
20	111	1367	19052-19065	112-125	9	76
21	112	1368	19066-19079	126-139	10	76
22	113	1369	19080-19093	140-153	11	76
23	114	1370	19094-19107	154-167	12	76
24	115	1371	19108-19121	168-181	13	76
25	116	1372	19122-19135	182-195	14	76
26	117	1373	19136-19149	196-209	15	76
27	118	1374	19150-19163	210-223	16	76
28	119	1375	19164-19177	224-237	17	76
29	120	1376	19178-19191	238-251	18	76
30	121	1377	19192-19205	1- 14	1	77

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MAY, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	122	1378	19206-19219	15- 28	2	77
2	123	1379	19220-19233	29- 42	3	77
3	124	1380	19234-19247	43- 56	4	77
4	125	1381	19248-19261	57- 70	5	77
5	126	1382	19262-19275	71- 84	6	77
6	127	1383	19276-19289	85- 98	7	77
7	128	1384	19290-19302	99-111	8	77
8	129	1385	19303-19316	112-125	9	77
9	130	1386	19317-19330	126-139	10	77
10	131	1387	19331-19344	140-153	11	77
11	132	1388	19345-19358	154-167	12	77
12	133	1389	19359-19372	168-181	13	77
13	134	1390	19373-19386	182-195	14	77
14	135	1391	19387-19400	196-209	15	77
15	136	1392	19401-19414	210-223	16	77
16	137	1393	19415-19428	224-237	17	77
17	138	1394	19429-19442	238-251	18	77
18	139	1395	19443-19456	1- 14	1	78
19	140	1396	19457-19470	15- 28	2	78
20	141	1397	19471-19484	29- 42	3	78
21	142	1398	19485-19498	43- 56	4	78
22	143	1399	19499-19512	57- 70	5	78
23	144	1400	19513-19526	71- 84	6	78
24	145	1401	19527-19540	85- 98	7	78
25	146	1402	19541-19553	99-111	8	78
26	147	1403	19554-19567	112-125	9	78
27	148	1404	19568-19581	126-139	10	78
28	149	1405	19582-19595	140-153	11	78
29	150	1406	19596-19609	154-167	12	78
30	151	1407	19610-19623	168-181	13	78
31	152	1408	19624-19637	182-195	14	78

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JUN, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	153	1409	19638-19651	196-209	15	78
2	154	1410	19652-19665	210-223	16	78
3	155	1411	19666-19679	224-237	17	78
4	156	1412	19680-19693	238-251	18	78
5	157	1413	19694-19707	1- 14	1	79
6	158	1414	19708-19721	15- 28	2	79
7	159	1415	19722-19735	29- 42	3	79
8	160	1416	19736-19749	43- 56	4	79
9	161	1417	19750-19763	57- 70	5	79
10	162	1418	19764-19777	71- 84	6	79
11	163	1419	19778-19791	85- 98	7	79
12	164	1420	19792-19804	99-111	8	79
13	165	1421	19805-19818	112-125	9	79
14	166	1422	19819-19832	126-139	10	79
15	167	1423	19833-19846	140-153	11	79
16	168	1424	19847-19860	154-167	12	79
17	169	1425	19861-19874	168-181	13	79
18	170	1426	19875-19888	182-195	14	79
19	171	1427	19889-19902	196-209	15	79
20	172	1428	19903-19916	210-223	16	79
21	173	1429	19917-19930	224-237	17	79
22	174	1430	19931-19944	238-251	18	79
23	175	1431	19945-19958	1- 14	1	80
24	176	1432	19959-19972	15- 28	2	80
25	177	1433	19973-19986	29- 42	3	80
26	178	1434	19987-20000	43- 56	4	80
27	179	1435	20001-20014	57- 70	5	80
28	180	1436	20015-20028	71- 84	6	80
29	181	1437	20029-20042	85- 98	7	80
30	182	1438	20043-20055	99-111	8	80

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JUL 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	183	1439	20056-20069	112-125	9	80
2	184	1440	20070-20083	126-139	10	80
3	185	1441	20084-20097	140-153	11	80
4	186	1442	20098-20111	154-167	12	80
5	187	1443	20112-20125	168-181	13	80
6	188	1444	20126-20139	182-195	14	80
7	189	1445	20140-20153	196-209	15	80
8	190	1446	20154-20167	210-223	16	80
9	191	1447	20168-20181	224-237	17	80
10	192	1448	20182-20195	238-251	18	80
11	193	1449	20196-20209	1- 14	1	81
12	194	1450	20210-20223	15- 28	2	81
13	195	1451	20224-20237	29- 42	3	81
14	196	1452	20238-20251	43- 56	4	81
15	197	1453	20252-20265	57- 70	5	81
16	198	1454	20266-20279	71- 84	6	81
17	199	1455	20280-20293	85- 98	7	81
18	200	1456	20294-20306	99-111	8	81
19	201	1457	20307-20320	112-125	9	81
20	202	1458	20321-20334	126-139	10	81
21	203	1459	20335-20348	140-153	11	81
22	204	1460	20349-20362	154-167	12	81
23	205	1461	20363-20376	168-181	13	81
24	206	1462	20377-20390	182-195	14	81
25	207	1463	20391-20404	196-209	15	81
26	208	1464	20405-20418	210-223	16	81
27	209	1465	20419-20432	224-237	17	81
28	210	1466	20433-20446	238-251	18	81
29	211	1467	20447-20460	1- 14	1	82
30	212	1468	20461-20474	15- 28	2	82
31	213	1469	20475-20488	29- 42	3	82

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AUG. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	214	1470	20489-20502	43- 56	4	#2
2	215	1471	20503-20516	57- 70	5	#2
3	216	1472	20517-20530	71- 84	6	#2
4	217	1473	20531-20544	85- 98	7	#2
5	218	1474	20545-20557	99-111	8	#2
6	219	1475	20558-20571	112-125	9	#2
7	220	1476	20572-20585	126-139	10	#2
8	221	1477	20586-20599	140-153	11	#2
9	222	1478	20600-20613	154-167	12	#2
10	223	1479	20614-20627	168-181	13	#2
11	224	1480	20628-20641	182-195	14	#2
12	225	1481	20642-20655	196-209	15	#2
13	226	1482	20656-20669	210-223	16	#2
14	227	1483	20670-20683	224-237	17	#2
15	228	1484	20684-20697	238-251	18	#2
16	229	1485	20698-20711	1- 14	1	#3
17	230	1486	20712-20725	15- 28	2	#3
18	231	1487	20726-20739	29- 42	3	#3
19	232	1488	20740-20753	43- 56	4	#3
20	233	1489	20754-20767	57- 70	5	#3
21	234	1490	20768-20781	71- 84	6	#3
22	235	1491	20782-20795	85- 98	7	#3
23	236	1492	20796-20808	99-111	8	#3
24	237	1493	20809-20822	112-125	9	#3
25	238	1494	20823-20836	126-139	10	#3
26	239	1495	20837-20850	140-153	11	#3
27	240	1496	20851-20864	154-167	12	#3
28	241	1497	20865-20878	168-181	13	#3
29	242	1498	20879-20892	182-195	14	#3
30	243	1499	20893-20906	196-209	15	#3
31	244	1500	20907-20920	210-223	16	#3

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SEP, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	245	1501	20921-20934	224-237	17	#3
2	246	1502	20935-20948	238-251	18	#3
3	247	1503	20949-20962	1- 14	1	#4
4	248	1504	20963-20976	15- 28	2	#4
5	249	1505	20977-20990	29- 42	3	#4
6	250	1506	20991-21004	43- 56	4	#4
7	251	1507	21005-21018	57- 70	5	#4
8	252	1508	21019-21032	71- 84	6	#4
9	253	1509	21033-21046	85- 98	7	#4
10	254	1510	21047-21059	99-111	8	#4
11	255	1511	21060-21073	112-125	9	#4
12	256	1512	21074-21087	126-139	10	#4
13	257	1513	21088-21101	140-153	11	#4
14	258	1514	21102-21115	154-167	12	#4
15	259	1515	21116-21129	168-181	13	#4
16	260	1516	21130-21143	182-195	14	#4
17	261	1517	21144-21157	196-209	15	#4
18	262	1518	21158-21171	210-223	16	#4
19	263	1519	21172-21185	224-237	17	#4
20	264	1520	21186-21199	238-251	18	#4
21	265	1521	21200-21213	1- 14	1	#5
22	266	1522	21214-21227	15- 28	2	#5
23	267	1523	21228-21241	29- 42	3	#5
24	268	1524	21242-21255	43- 56	4	#5
25	269	1525	21256-21269	57- 70	5	#5
26	270	1526	21270-21283	71- 84	6	#5
27	271	1527	21284-21297	85- 98	7	#5
28	272	1528	21298-21310	99-111	8	#5
29	273	1529	21311-21324	112-125	9	#5
30	274	1530	21325-21338	126-139	10	#5

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OCT, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	275	1531	21339-21352	140-153	11	#5
2	276	1532	21353-21366	154-167	12	#5
3	277	1533	21367-21380	168-181	13	#5
4	278	1534	21381-21394	182-195	14	#5
5	279	1535	21395-21408	196-209	15	#5
6	280	1536	21409-21422	210-223	16	#5
7	281	1537	21423-21436	224-237	17	#5
8	282	1538	21437-21450	238-251	18	#5
9	283	1539	21451-21464	1- 14	1	#6
10	284	1540	21465-21478	15- 28	2	#6
11	285	1541	21479-21492	29- 42	3	#6
12	286	1542	21493-21506	43- 56	4	#6
13	287	1543	21507-21520	57- 70	5	#6
14	288	1544	21521-21534	71- 84	6	#6
15	289	1545	21535-21548	85- 98	7	#6
16	290	1546	21549-21561	99-111	8	#6
17	291	1547	21562-21575	112-125	9	#6
18	292	1548	21576-21589	126-139	10	#6
19	293	1549	21590-21603	140-153	11	#6
20	294	1550	21604-21617	154-167	12	#6
21	295	1551	21618-21631	168-181	13	#6
22	296	1552	21632-21645	182-195	14	#6
23	297	1553	21646-21659	196-209	15	#6
24	298	1554	21660-21673	210-223	16	#6
25	299	1555	21674-21687	224-237	17	#6
26	300	1556	21688-21701	238-251	18	#6
27	301	1557	21702-21715	1- 14	1	#7
28	302	1558	21716-21729	15- 28	2	#7
29	303	1559	21730-21743	29- 42	3	#7
30	304	1560	21744-21757	43- 56	4	#7
31	305	1561	21758-21771	57- 70	5	#7

LANDSAT-1

NOV 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	306	1562	21772-21785	71- 84	6	87
2	307	1563	21786-21799	85- 98	7	87
3	308	1564	21800-21812	99-111	8	87
4	309	1565	21813-21826	112-125	9	87
5	310	1566	21827-21840	126-139	10	87
6	311	1567	21841-21854	140-153	11	87
7	312	1568	21855-21868	154-167	12	87
8	313	1569	21869-21882	168-181	13	87
9	314	1570	21883-21896	182-195	14	87
10	315	1571	21897-21910	196-209	15	87
11	316	1572	21911-21924	210-223	16	87
12	317	1573	21925-21938	224-237	17	87
13	318	1574	21939-21952	238-251	18	87
14	319	1575	21953-21966	1- 14	1	88
15	320	1576	21967-21980	15- 28	2	88
16	321	1577	21981-21994	29- 42	3	88
17	322	1578	21995-22008	43- 56	4	88
18	323	1579	22009-22022	57- 70	5	88
19	324	1580	22023-22036	71- 84	6	88
20	325	1581	22037-22050	85- 98	7	88
21	326	1582	22051-22063	99-111	8	88
22	327	1583	22064-22077	112-125	9	88
23	328	1584	22078-22091	126-139	10	88
24	329	1585	22092-22105	140-153	11	88
25	330	1586	22106-22119	154-167	12	88
26	331	1587	22120-22133	168-181	13	88
27	332	1588	22134-22147	182-195	14	88
28	333	1589	22148-22161	196-209	15	88
29	334	1590	22162-22175	210-223	16	88
30	335	1591	22176-22189	224-237	17	88

LANDSAT-1

DEC, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE No.
1	336	1592	22190-22203	238-251	18	78
2	337	1593	22204-22217	1- 14	1	79
3	338	1594	22218-22231	15- 28	2	79
4	339	1595	22232-22245	29- 42	3	79
5	340	1596	22246-22259	43- 56	4	79
6	341	1597	22260-22273	57- 70	5	79
7	342	1598	22274-22287	71- 84	6	79
8	343	1599	22288-22301	85- 98	7	79
9	344	1600	22302-22314	99-111	8	79
10	345	1601	22315-22328	112-125	9	79
11	346	1602	22329-22342	126-139	10	79
12	347	1603	22343-22356	140-153	11	79
13	348	1604	22357-22370	154-167	12	79
14	349	1605	22371-22384	168-181	13	79
15	350	1606	22385-22398	182-195	14	79
16	351	1607	22399-22412	196-209	15	79
17	352	1608	22413-22426	210-223	16	79
18	353	1609	22427-22440	224-237	17	79
19	354	1610	22441-22454	238-251	18	79
20	355	1611	22455-22468	1- 14	1	80
21	356	1612	22469-22482	15- 28	2	80
22	357	1613	22483-22496	29- 42	3	80
23	358	1614	22497-22510	43- 56	4	80
24	359	1615	22511-22524	57- 70	5	80
25	360	1616	22525-22538	71- 84	6	80
26	361	1617	22539-22552	85- 98	7	80
27	362	1618	22553-22565	99-111	8	80
28	363	1619	22566-22579	112-125	9	80
29	364	1620	22580-22593	126-139	10	80
30	365	1621	22594-22607	140-153	11	80
31	366	1622	22608-22621	154-167	12	80

APPENDIX C

LANDSAT-1 DOCUMENTS ISSUED THIS REPORT PERIOD

APPENDIX C

LANDSAT-1 DOCUMENTS ISSUED THIS REPORT PERIOD

No.	Document No.	Title and Date
1	PIR-1N23-ERTS-159	Landsat-1 "All Batteries On" Command Anomaly-(MR D04931), dated 9/10/75
2	PRI-1N23-ERTS-164	USB Power At Ground Stations, dated 10/15/75

LANDSAT–2

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

INTRODUCTION

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

75SDS4215	Landsat-2 Launch and Flight Activation Evaluation Report, 22 to 26 January 1975, Launch through Orbit 50 and Orbit Adjust Operation	21 March 1975
75SDS4228	Landsat-1 and Landsat-2 Flight Evaluation Report 23 January 1975 to 23 April 1975	15 August 1975
75SDS4255	Landsat-1 and Landsat-2 Flight Evaluation Report 23 April 1975 to 23 July 1975	10 October 1975

This report contains analysis of performance for Orbits 2526 to 3815 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 orbital injection phase of the space flight were nominal and deployment of the spacecraft followed predictions. All systems continue normal 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 is not expected to effect scanner performance. The Forward Scanner Pressure (function 1003) telemetry became erratic in Orbit 2244. WBVTR-1 failed to rewind in Orbit 1021 and had intermittent operation to Orbit 1659 when normal operation was resumed. WBVTR-1 had a second anomaly in Orbit 2863 when ground stations were unable to obtain video sync lockup because of failure of one head to produce video. WBVTR-1 operations were discontinued.

Mission performance has not been degraded by these anomalies.

Table 1-1 shows accumulative in-orbit payload system performance.

Table 1-1. In-Orbit Payload Systems Performance Launch Thru Orbit 3815
Landsat-2

RBV	Total Scenes Imaged	716
	Avg. Scenes/Day	66
	Total Area Imaged (millions of sq. mi.)	6.2
	ON TIME (hr.)	6.8
	ON/OFF Cycles	48
	% Real Time Images	98
	% Recorded Images	2
MSS	Total Scenes Imaged	52,504
	Avg. Scenes/Day	178
	Total Area Imaged (millions of sq. n. mi.)	461.6
	ON TIME (hr.)	545.2
	ON/OFF Cycles	4,076
	% Real Time Images	65
	% Recorded Images	35
DCS	Messages at OCC	284,326
	Non-Perfect MSGS	20,758
	Max. DCP's ACTIVE/DAY	109
	Users	46
	Avg. MSG/Orbit	164
	ON TIME (hr.)	6,540.2
WPA-1	% Real Time Mode	1
	% Playback Mode	99
	ON TIME (hr.)	84.0
	ON/OFF Cycles	540
WPA-2	% Real Time Mode	65
	% P/B Mode	35
	ON TIME (hr.)	433.3
	ON/OFF Cycles	2,733
WBVTR-1	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	Minor Frame Sync Error Count in P/B	< 10
	Time Head-Tape Contact (hr.)	105.1
	Cycles Head-Tape Contact	1,681
	ON TIME (hr.)	133.0
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.)	255.4
	Cycles Head-Tape Contact	3,122
	ON TIME (hr.)	323.3

SECTION 2

ORBITAL PARAMETERS

LANDSAT-2

SECTION 2

ORBITAL PARAMETERS

Landsat-2, together with Landsat-1, has continued to provide the ground track repeat pattern required for the nine-day image coverage of the earth. During this report period, the ground track of Landsat-2 has been maintained, as required, within 10 NM longitude error at the equator. The only orbit adjustment required for this was made in Orbit 2958 (22 August 1975) with a short firing of the -X thruster of the Orbit Adjust Subsystem. Starting in Orbit 3288 (15 September 1975) the positive pitch gates of the ACS subsystem have been almost eliminated through the use of pitch position bias. (See Section 4 also). This has considerably reduced the need to correct on Landsat-2 orbit thru orbit adjust. The error in longitude since launch as a function of time and orbit maintenance burns, is shown in Figure 2-1. Figure 2-2 shows the change in sun time at the descending equatorial crossings

As of 23 October 1975, Landsat-2 has descending equatorial crossings at approximately 9:30 AM local time as opposed to 9:13 AM for Landsat-1. A projection of the variation of local mean time at the descending nodes for both spacecrafts is given in Figure 2-3.

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

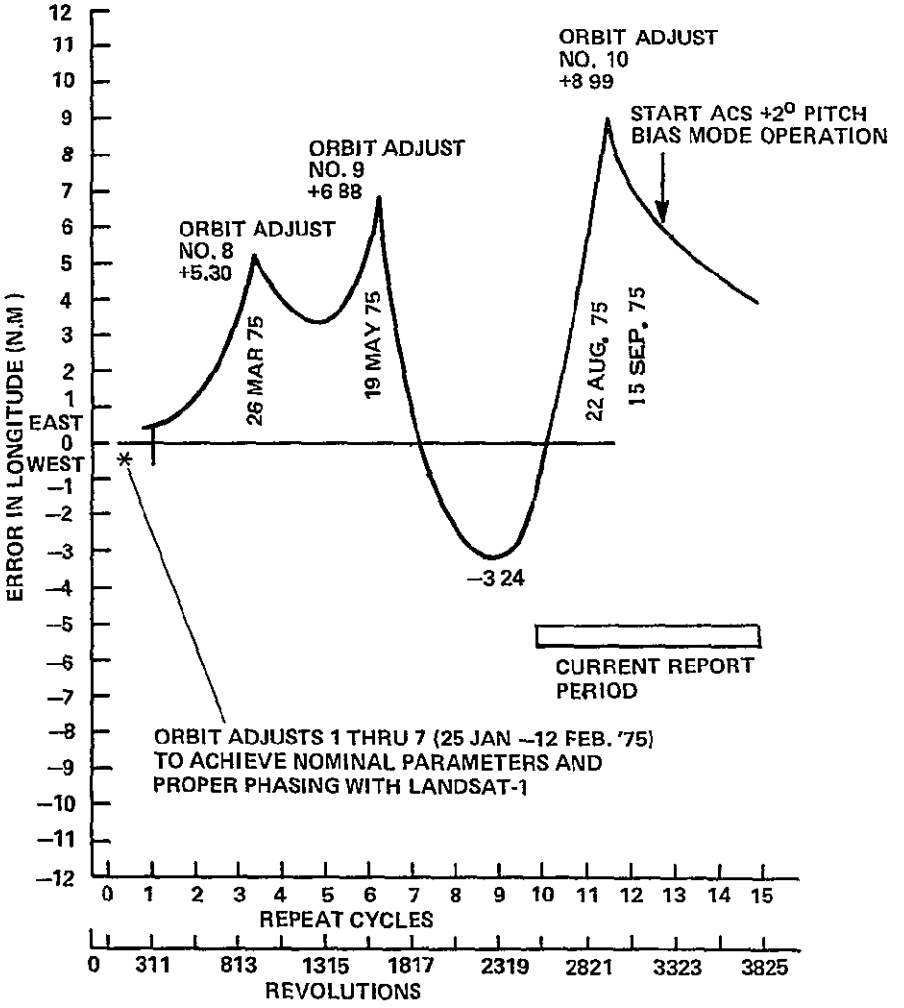

Figure 2-1 Effect of Orbit Adjusts on Landsat-2 Ground Track

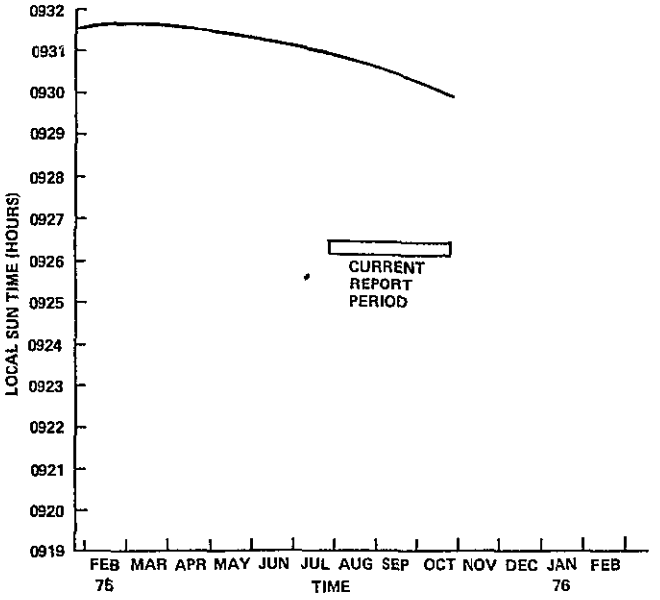

Figure 2-2. Local Mean Time of Descending Node

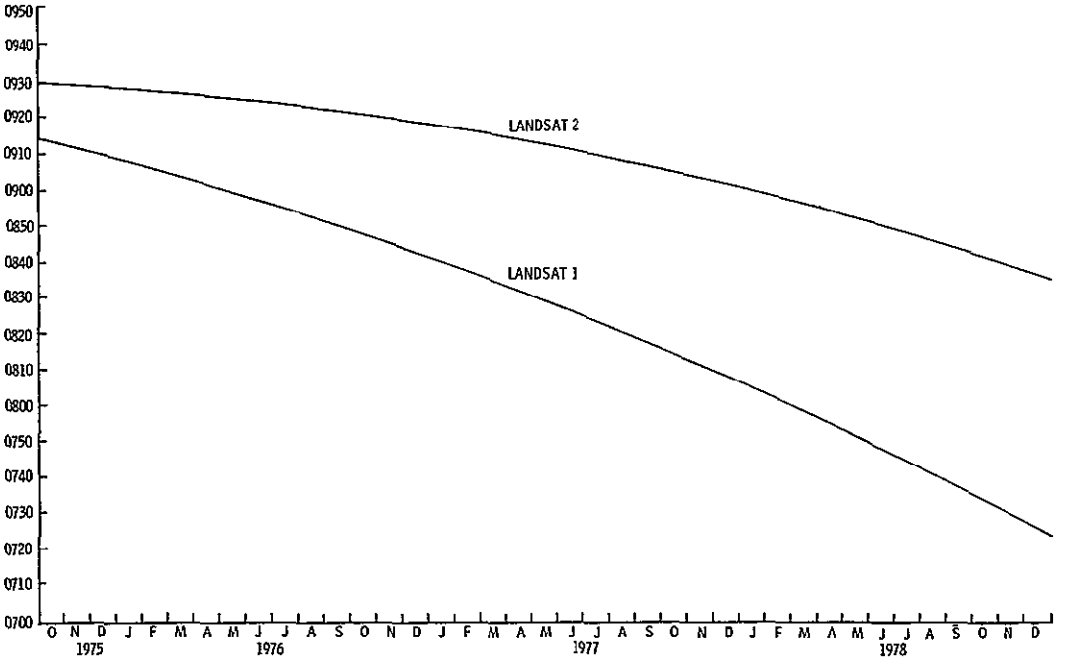

Figure 2-3. Predicted Limit of Descending Node

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

Element / Date	Apogee (KM)	Perigee (KM)	Inclination (Deg)	Semi-Major Axis (KM)	Eccentricity	Two Body Period (Min)	Nodal Period (Min)	Argument of Perigee (Deg)	Right Ascension (Deg)	Mean Anomaly (Deg)
25 Jan 1975[1]	915 03	901 56	99 095	7286 462	0 000925	103 165	-	272 852	86 637	139 578
6 Feb 1975[2]	916 84	898 47	99 096	7285 820	0 001260	103 151	-	256 040	99 347	134 523
24 Apr 1975	917 85	897 40	99 079	7285 788	0 001403	103 151	103 266	62 55	174 339	117 183
25 July 1975	917 45	897 68	99 071	7285 733	0 001356	103 150	103 265	166 118	264 891	13 726
23 Oct 1975	916 70	898 49	99 059	7285 762	0 001250	103 150	103 266	282 749	353 366	257 271

1 Post launch

2 After the sequence of phasing maneuvers completed in Orbit 212

SECTION 3

POWER SUBSYSTEM (PWR)

LANDSAT-2

SECTION 3

POWER SUBSYSTEM (PWR)

The Power Subsystem on Landsat-2 has performed well throughout this report period. The solar arrays have continued to provide excess energy above spacecraft requirements and are expected to fully support the Landsat-2 mission beyond 1976. The batteries and the subsystem electronics have also shown very good performance during this report period.

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 during this report period has swung from slightly lower at the beginning to higher than predicted at the end. 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 during the current report period. The departures from the predicted array degradation is reflected here also.

The battery packs averaged a typical 10.5 - 11% depth of discharge (DOD) during this report period but has peaked as high as about 16% during nights, with long WBR playbacks. Battery temperature spread ranged from 4.0 to 5.7°C and is expected to be in the upper range during the on-coming period of higher sun intensity. Charge and load sharing of individual batteries have been satisfactory. Battery voltages have been maintained within suitable limits with Landsat-2 power management procedures, excess array energy being dissipated through auxiliary loads.

The power subsystem electronics have performed extremely 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.

The shunt limiter on Landsat-2 has operated several times since launch and has held the solar array bus voltage at specified levels. The compensation loads have not been switched during this report period. A history of compensation load switchings since launch is given in Table 11-2.

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

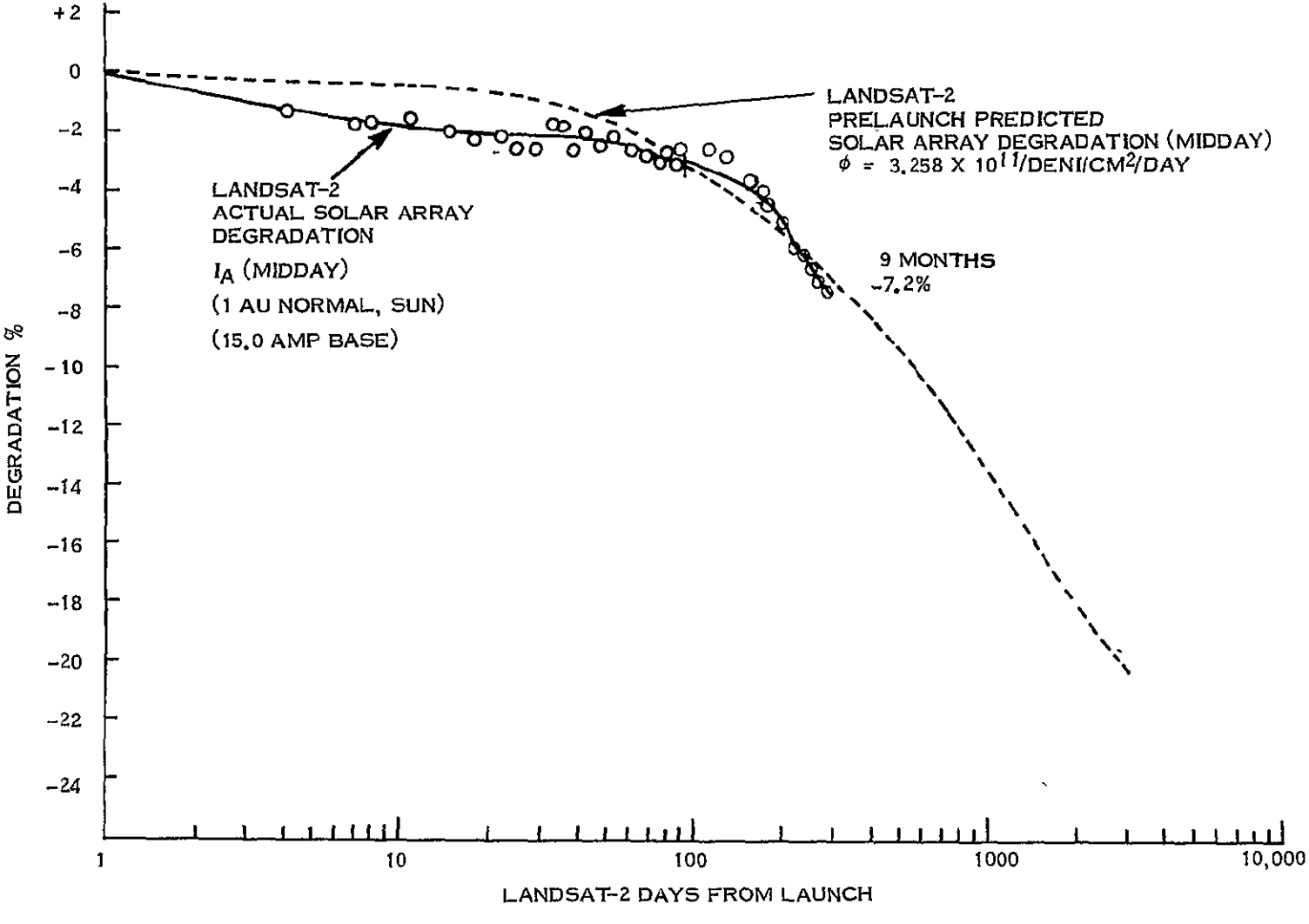

Figure 3-1 Landsat-2 IA (Midday) Degradation vs Days

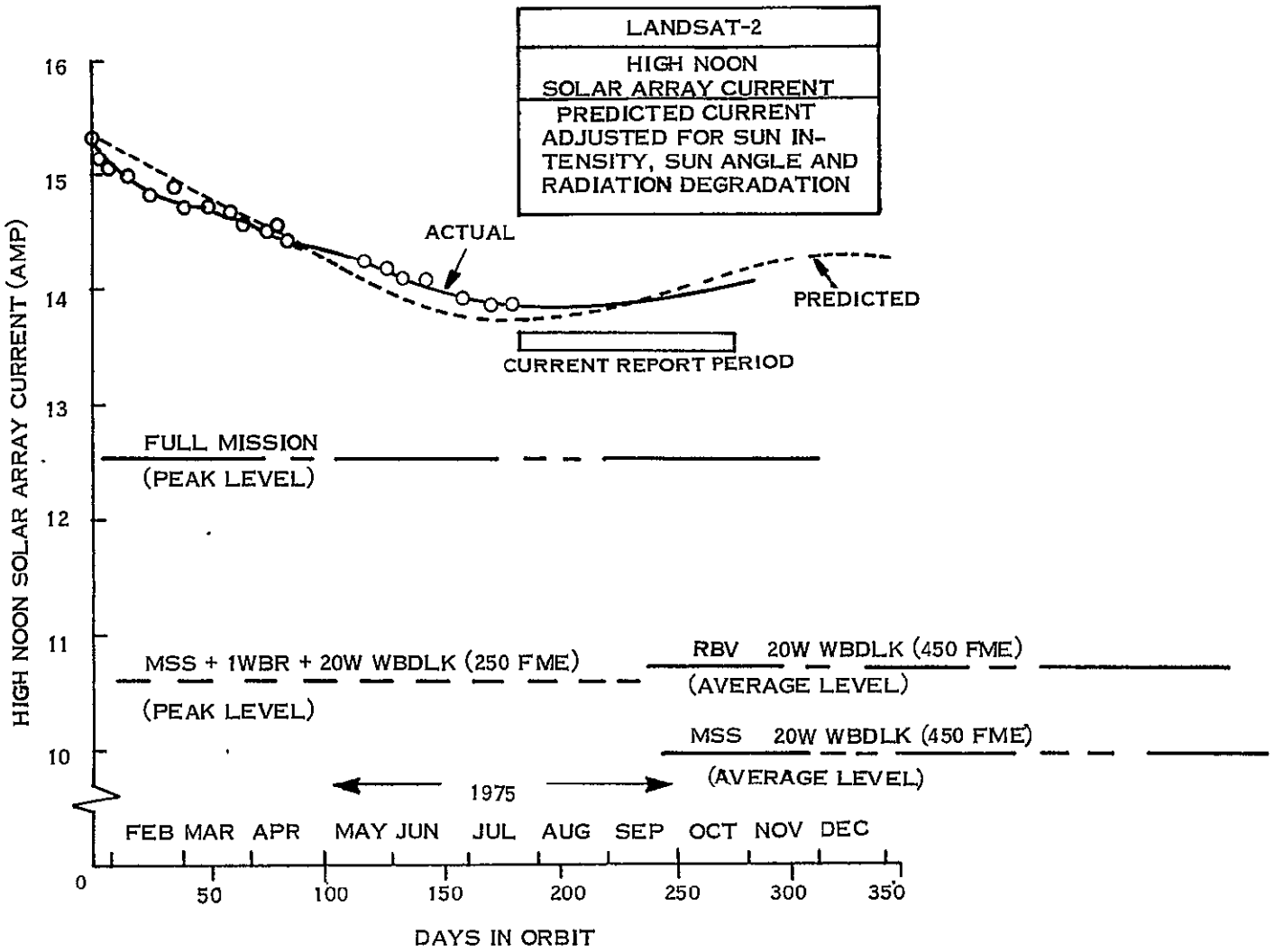

Figure 3-2 Landsat-2 Predicted Midday Solar Array Current

Table 3-1. Landsat-2 Major Power Subsystem Parameters

Pwr. Mgmt. Orbit No.	50	1251	2540	2970	3398	3820
Batt 1 Max	33.43	33.08	33.25	33.60	33.43	33.60
2 Chge	33.40	33.05	33.14	33.48	33.31	33 48
3 Volt	33.35	33.00	33.09	33.43	33.26	33.43
4	33.45	33.02	33.20	33.54	33.36	33.54
5	33.42	33.08	33.25	33.59	33 42	33.59
6	33.41	33.07	33.24	33.59	33.33	33.50
7	33.45	33.11	33.28	33.62	33.36	33.54
8	33.45	33.10	33.27	33.62	33 36	33.53
Average	33.42	33.07	33.21	33 56	33.35	33.53
Batt 1 End-of-Night	29.32	28.98	29.06	28.89	29.06	28 89
2 Volt	29.38	28.95	29.12	28.95	29.04	28.87
3	29.32	28.98	29.07	28.98	29 07	28.89
4	29.34	29.00	29.09	28 91	29.09	28.91
5	29.40	28.97	29.06	28 97	29.06	28.89
6	29.31	28.96	28.96	28.88	29.05	28 79
7	29.34	29.00	29.08	28.91	29.08	28 91
8	29.34	29.00	29.00	28 91	29.00	28.82
Average	29.34	28.98	29.05	28 93	29.05	28.87
Batt 1 Chge	12.76	12.36	12.13	12.02	12.27	12.57
2 Share	11.68	12.24	12.45	12.43	12.13	12.12
3 (%)	12.24	13.21	13.67	14.09	13.46	13.62
4	11.99	12.62	12.50	12.61	12.30	12.34
5	12.84	12.01	11.52	11.79	11.82	11.83
6	13.35	12.71	13.20	12 41	13.36	13.02
7	12.90	12.86	12.81	12.92	13.11	12.83
8	12.24	11.99	11.72	11.73	11.54	11.65
Batt 1 Load	12.60	11.97	11.35	11.34	11.14	11.40
2 Share	12.70	14.12	13.99	13.56	13.64	13.51
3 (%)	12.67	13.14	14.38	14 26	14 40	13.81
4	12.44	12.57	12.99	13.02	12 88	12.87
5	12.34	11.59	11.58	11.52	11.72	11.87
6	12.70	12.10	11.30	11.77	11.66	11.91
7	12.47	12.42	12.35	12.50	12.47	12.56
8	12.04	12.08	12.06	12.03	12.08	12.08
Batt 1 Temp	21.46	20.20	21.34	20.85	22 14	22.02
2 in	20.25	19.98	21.44	20.96	21.72	21.02
3 (°C)	18.60	18.22	19.18	18 72	19 19	18.72
4	20.83	20.73	20.91	20.70	21 01	20.98
5	24.98	22.11	22.31	22 45	23.64	23 14
6	24.26	21.78	23.01	22.19	24.13	23 70
7	24.71	22.59	23.62	23.26	24.89	24.34
8	23.63	22.04	22.71	22.40	23.55	23.29
Average	22.34	20.95	21.81	21.44	22 53	22.15
S/C Reg Bus Pwr. (W)	*	161.38	185.0	192.1	191 9	190.2
Comp Load Pwr. (W)	*	34.06	41.2	41 2	41.2	41.2
P/L Reg Bus Pwr. (W)	*	9.59	9.6	9.6	10 6	9.6
C/D Ratio	1.15	1.08	1.10	1.19	1.23	1.28
Total Charge (A-M)	271.9	250.98	267.55	280.41	285.64	298 55
Total Discharge (A-M)	237.2	229.67	244.33	235.08	232 87	233 14
Solar Array (A-M)	1106	1032	981	988	996	999
S.A. Peak I (Amp)	16.05	15.37	14.67	14 59	14.67	14.82
Midday Array I (Amp)	*	14.51	13.88	13.88	13.96	14.04
Sun Angle (Deg)	*	0.08	-1.22	1.29	2.02	1.55
Max R Pad Temp (°C)	*	60.80	59.60	58.40	63.20	64.40
Min R Pad Temp (°C)	*	-38.67	-38.00	-37.40	-36.80	-37.40
Max L Pad Temp (°C)	*	57.69	56.92	56.92	59.23	60.0
Min L Pad Temp (°C)	*	-45.71	-45.00	-44.29	-43.57	-44.29

*Data not processed and unavailable

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

Function	Description	Unit	Orbits					
			50	1253	2532	2964	3400	3810
6001	Batt 1 Disc I	Amp	1.01	0.89	0.85	0 89	0.77	0 68
6002	2		1.01	0.97	0.97	0.98	0 93	0.82
6003	3		1.00	0.97	0.99	0.98	0.97	0.85
6004	4		1.00	0 93	0.93	0 93	0 88	0.79
6005	5		0.99	0 86	0 85	0.88	0.80	0.73
6006	6		1.02	0 90	0.86	0.91	0.79	0.72
6007	7		1.00	0.91	0.91	0.91	0 84	0 77
6008	8		0.97	0.89	0.87	0.88	0.82	0.74
6011	Batt 1 Chg I	Amp	0 47	0.43	0 57	0 70	0.57	0 51
6012	2		0.43	0.46	0.57	0.69	0.57	0 49
6013	3		0.45	0.45	0.61	0.73	0 63	0.54
6014	4		0.44	0.43	0 57	0.71	0.57	0 50
6015	5		0.47	0 41	0.54	0 69	0 55	0.48
6016	6		0.49	0.44	0.60	0 72	0 62	0.53
6017	7		0.47	0 44	0 60	0.73	0.62	0.52
6018	8		0.45	0.41	0.55	0.68	0 55	0 48
6021	Batt 1 Volt	VDC	31.50	31.18	30.92	30.39	31.10	31.17
6022	2		31.48	31 15	30.90	30.37	31.08	31.16
6023	3		31.49	31.16	30.91	30.38	31.09	31.16
6024	4		31.49	31.16	30 91	30.38	31.09	31 17
6025	5		31.50	31.18	30 92	30 39	31 10	31.18
6026	6		31.49	31.16	30.90	30.37	31 08	31.15
6027	7		31.52	31.20	30.94	30.41	31.12	31.20
6028	8		31.49	31 17	30.92	30.38	31.10	31.17
6031	Batt 1 Temp	DGC	21.59	20.23	20.93	20.55	22.07	22.02
6032	2		20.53	20 05	20.75	20.56	21 55	20.93
6033	3		18.80	18.30	18 66	18.36	19.11	18.84
6034	4		20.90	20 75	20.88	20.74	21.01	21.05
6035	5		25.16	22.15	22.22	22.55	23.55	23.26
6036	6		24.37	21.79	22.55	21.95	24.05	23.86
6037	7		24.83	22.62	23.26	22 89	24.81	24 36
6038	8		23 75	22.05	22.52	22.22	23 47	23.37
6040	Rt. Pad Temp	DGC	28.96	26.72	26.16	26.44	28.36	29.31
6041	Rt Pad VM	VDC	33.72	33.74	33.56	32.82	33.45	33.51
6042	Rt. Pad VN	VDC	33.46	33.00	33 18	32.41	33.06	33 25
6044	Lt. Pad Temp	DGC	25.56	21.86	21.16	22 03	24.00	24.71
6045	Lt. Pad VF	VDC	34.40	33.99	33 80	33.19	33.93	33.95
6046	Lt. Pad VG	VDC	34.48	34.09	33.91	33 29	34 00	34 04
6050	S/C UR Bus V	VDC	31.73	31.41	31.14	30.61	31.29	31 35
6051	S/C RG Bus V	VDC	24.57	24.58	24.57	24.56	24.57	24.57
6052	Aux Reg AV	VDC	23.36	23.39	23.40	23.39	23.40	23 42
6053	Aux Reg BV	VDC	23.37	23 40	23.39	23.40	23.38	23.39
6054	Solar I	Amp	14.81	14.24	13 76	13 69	13.70	13 85
6056	S/C RG Bus I	Amp	7.23	6.62	7 17	7.42	8 12	7.37
6058	PC Mod T1	DGC	21.67	21.42	21 98	22.69	23.20	22.16
6059	PC Mod T2	DGC	20.44	20.06	20.53	20.40	21 06	20.68
6070	P/L RG Bus V	VDC	24.61	24.60	24.60	24.59	24.60	24.60
6071	P/L UR Bus V	VDC	31.85	31 49	31.21	30.66	31 38	31.44
6073	P Aux AV	VDC	23.47	23.50	23 51	23.51	23.50	23.49
6074	P Aux BV	VDC	23.46	23.50	23.51	23 51	23.51	23 50
6075	PR Mod T1	DGC	20.84	20.69	21.39	21.44	22 30	21.44
6076	PR Mod T2	DGC	22.13	22 01	22.38	22.28	23.09	22 54
6079	Fuse Blow V	VDC	24.48	24.47	24 48	24.47	24.50	24.50
6080	Shunt 1 I	Amp	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
6082	3		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
6084	5		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
6086	7		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
6100	P/L RG Bus I	Amp	0.38	0.42	0 80	1.00	0.69	0.0
Total No.	Major Frames	Frm	396	785	387	390	774	384

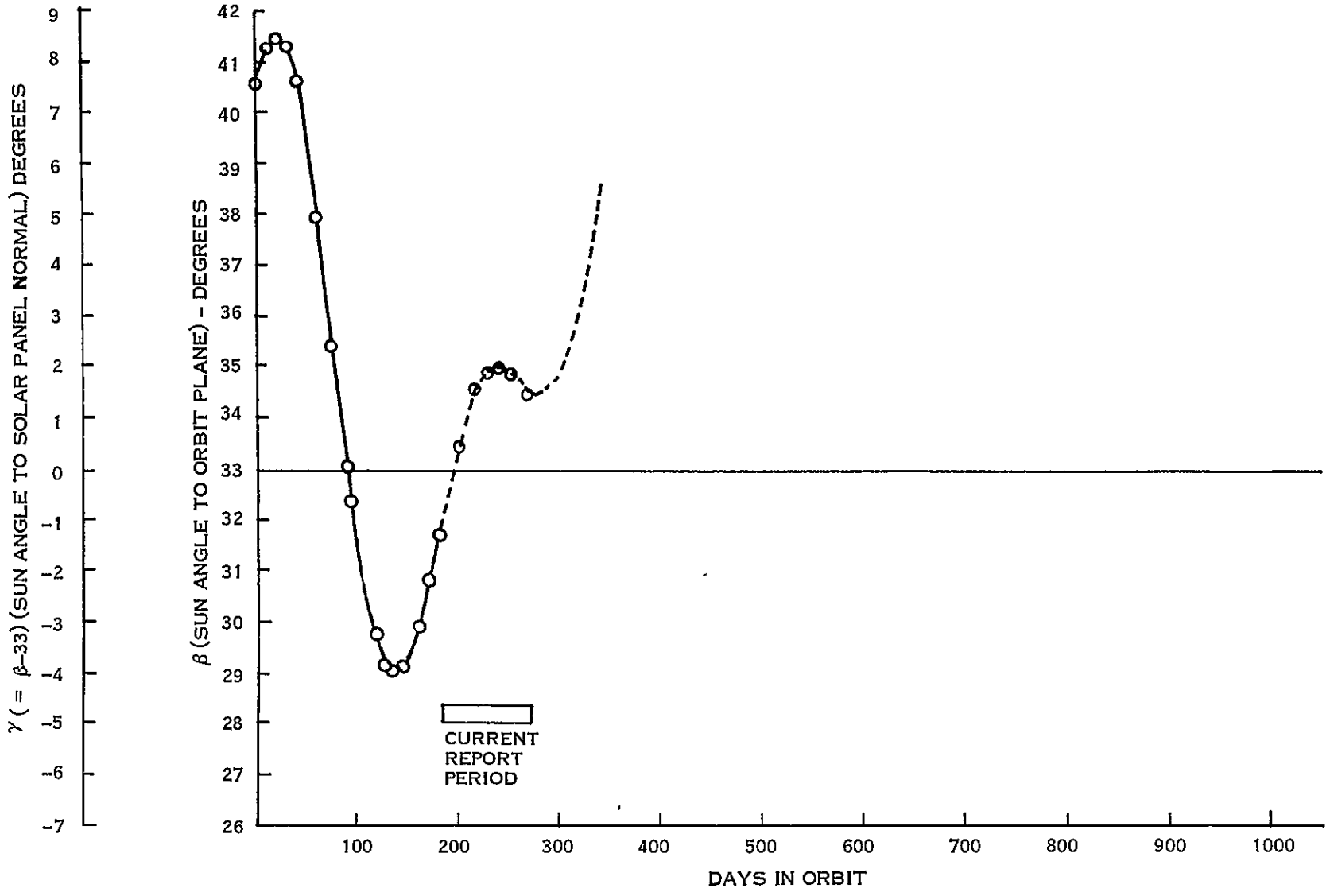

Figure 3-3. Landsat-2 Actual β and γ (Paddle) Sun Angles

SECTION 4

ATTITUDE CONTROL SYSTEM (ACS)

LANDSAT-2

SECTION 4

ATTITUDE CONTROL SYSTEM (ACS)

Landsat-2's Attitude Control System has been operating properly since launch and has consistently maintained correct spacecraft attitude.

The pressure leak in the Forward Scanner has had no effect on the ACS system's performance.

Both Solar Array Drives (SAD) performed normally and maintained proper solar panel alignment with the sun line during satellite day. Motor voltages and temperatures were within specifications. The LSAD's night bias rate has slowly increased and since Orbit 1636 (20 May, 1975) rotates faster than orbit rate when the sun sensor does not see the sun. The LSAD quickly recovers when the sun sensor sees the sun. This is considered within the normal operating design of the solar array drive subsystem.

The LSAD's actual rate is 3.61 deg/min which is 3.5% faster than orbit rate (3.48 deg/min). Correspondingly, the LSAD motor winding voltage has decreased 7.6% from -5.09 volts in Orbit 26 (24 January 1975) to -4.70 volts in Orbit 3810 (23 October 1975).

The RSAD's motor winding voltage has decreased 11.98% from -5.51 volts in Orbit 26 (24 January 1974) to -4.85 volts in Orbit 3810 (22 October 1975). The RSAD's rate is close to orbit rate and no phase switching has been required to maintain RSAD sun alignment.

After 33.8 weeks in orbit, a seasonal pneumatics gating pattern has not developed for Landsat-2 as it has for Landsat-1.

Pitch (+) gating frequency continued to be high and it was anticipated that left unaltered, the + pitch gating pattern would lower Landsat-2's orbit, making frequent orbit adjustments a necessary procedure.

To offset this undesirable condition, a program was devised whereby the ACS system was commanded into the +2° Pitch Position Bias (PPB) mode shortly before satellite night (10 minutes approximately) and restored to the Normal mode shortly after satellite sunrise. Initially, the program was implemented during alternate orbits commencing with Orbit 3288 (15 September 1975) and the + pitch gates were reduced from an average of 14 per day to an average of 5 per day.

Approximately 2.5 days later during Orbit 3323 (18 September 1975), the +2° PPB plan was extended from alternate orbits to consecutive orbits and + pitch gating was eliminated completely. However, - Pitch gates began to appear at an average rate of less than 2 per day commencing with Orbit 3498 (30 September 1975). During this period unrelated -Roll gating increased from an average of 6 per day to 8 per day. This condition is seasonal and will be observed in the future.

Figures 4-1 and 4-2 reflect Landsat-2's pneumatic history on an average daily basis and on a cumulative basis.

Freon Usable Impulse declined predictably during this report period and with the implementation of the +2° PPB program, the remaining freon is anticipated to last until October 1980.

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

RMP1 was submitted to a run down test in Orbit 2945 (21 August 1975) while it was in a back mode up to RMP2 during a scheduled orbit adjust exercise. The 214 second coast-down time was within specifications. Figure 4-3 shows the R/T telemetry record of this test.

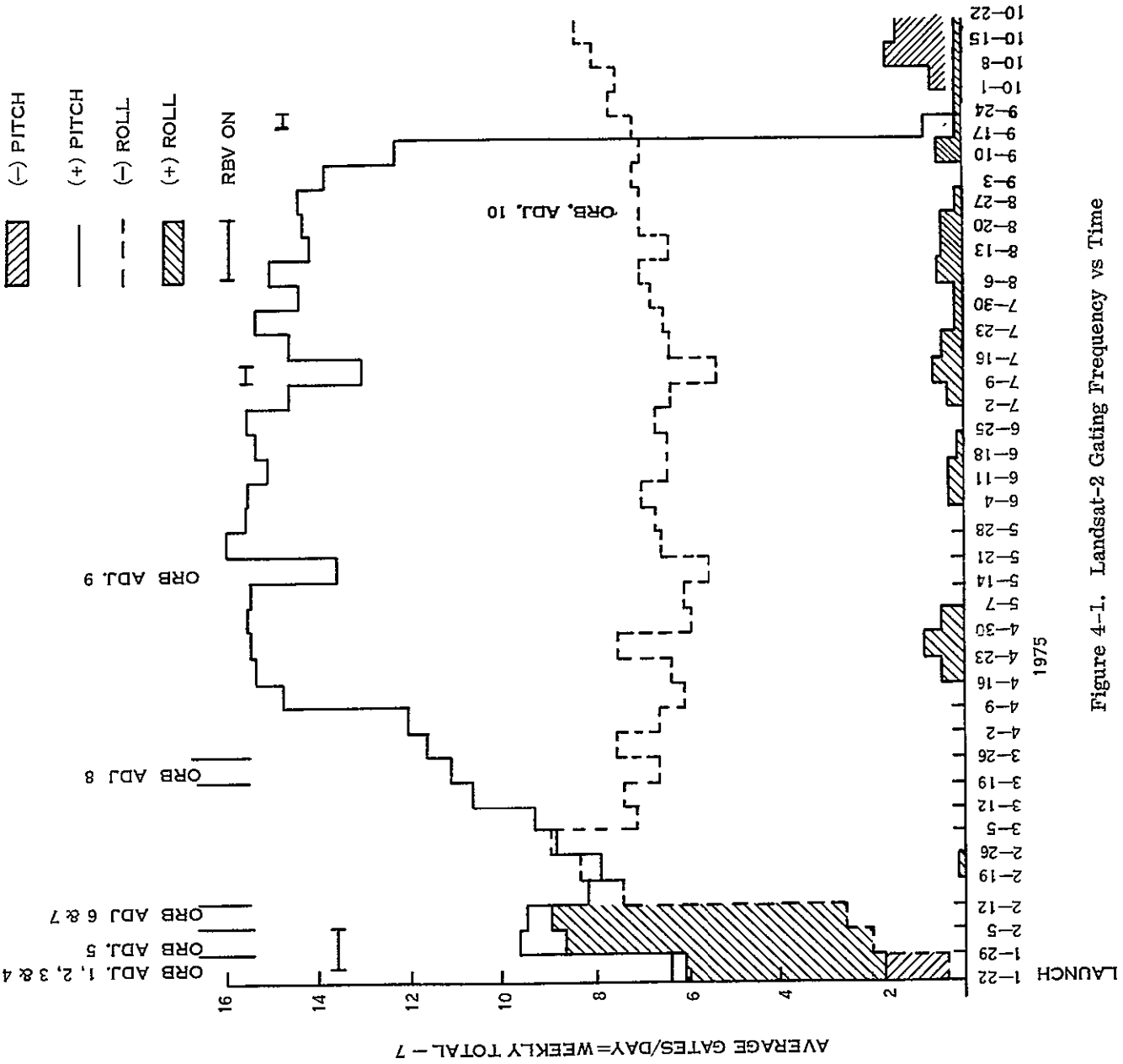

Figure 4-1. Landsat-2 Gating Frequency vs Time

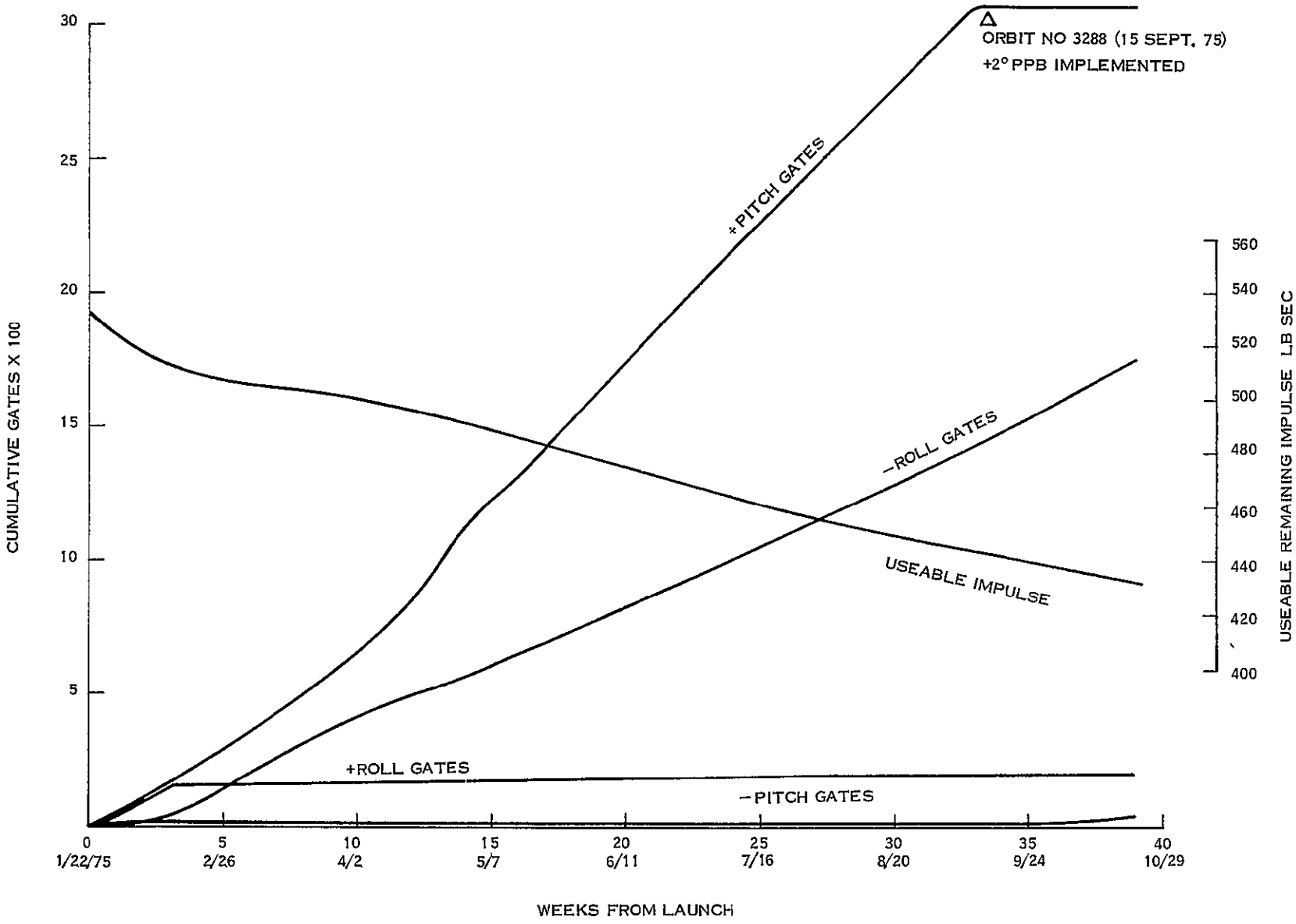

Figure 4-2. Landsat-2 Gating History

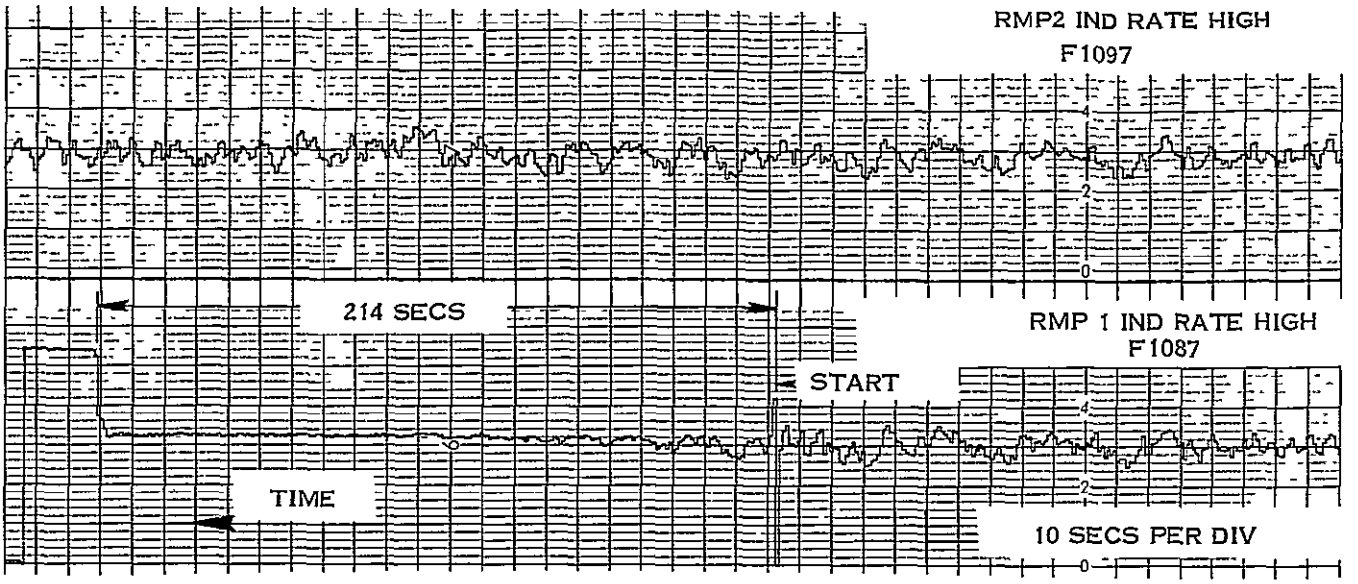

Figure 4-3. Landsat-2 R/T Telemetry, RMP 1 Run Down Test - Orbit No. 2945
(21 August 1975, 22 40 31 GMT)

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 has been similar to Landsat-1 and is normal.

Tables 4-1, 4-2 and 4-3 show typical telemetry for temperatures and pressures; voltages and currents; and attitude errors and driver duty cycles as obtained from SCEST program averages.

Table 4-1. Landsat-2 Subsystem Temperature and Pressure Averages

Function	Units	Orbits					
		29	1253	2532	2964	3400	3810
1084 RMP 1 Gyro Temperature	DGC	19.33(1)	21.15	21.02	21.78	21.55	22.70
1094 RMP 2 Gyro Temperature	DGC	74.00	74.00	74.00	74.00	74.00	74.02
1222 SAD RT MTR HSNG Temp.	DGC	19.50	22.24	22.23	22.70	22.71	23.81
1242 SAD LT MTR HSNG Temp.	DGC	26.87	27.94	27.54	28.30	28.46	29.36
1223 SAD RT MTR WNDNG Temp.	DGC	21.76	24.31	24.23	24.69	24.57	25.75
1243 SAD LT MTR WNDNG Temp.	DGC	30.23	30.85	30.32	31.18	31.28	32.28
1228 SAD RT HSG Pressure	PSI	7.26	7.25	7.25	7.25	7.25	7.25
1248 SAD LT HSG Pressure	PSI	7.28	7.28	7.27	7.27	7.27	7.27
1007 FWD Scanner MTR Temp.	DGC	22.07	22.72	22.25	23.21	22.93	23.82
1016 Rear Scanner MTR Temp.	DGC	24.19	24.18	23.62	24.42	24.07	24.96
1003 FWD Scanner Pressure	PSI	9.59(2)	2.58	D	D	D	D
1012 Rear Scanner Pressure	PSI	6.21	6.19	6.00	5.92	5.89	5.91
1212 Gas Tank Pressure	PSI	1948.0	1800.29	1672.12	1651.52	1612.71	1599.60
1210 Gas Tank Temperature	DGC	20.66	22.66	22.33	23.02	23.09	24.13
1213 Manifold Pressure	PSI	53.98	54.55	54.83	54.99	54.72	54.70
1211 Manifold Temperature	DGC	19.18	20.78	20.50	21.26	21.34	22.45
1059 CLG Power Supply Card Temp.	DGC	39.00	40.00	39.52	40.46	40.31	41.11
1260 THO1 EBP	DGC	24.29	25.31	25.01	25.71	25.80	26.78
1261 THO2 EBP	DGC	20.29	21.63	21.36	22.04	22.04	23.04
1262 THO3 EBP	DGC	18.29	20.31	20.05	20.68	20.55	21.57
1263 THO1 STS	DGC	6.54	- 3.03	- 6.22	- 5.70	- 5.69	- 2.61
1264 THO2 STS	DGC	D	D	D	D	D	D
1265 THO3 STS	DGC	8.46	0.79	- 0.48	0.67	1.44	4.96
1266 THO4 STS	DGC	- 2.78	- 9.13	- 9.65	- 8.97	- 8.09	- 4.95
1267 THO5 STS	DGC	9.62	1.28	- 2.64	- 2.23	- 2.05	2.19
1224 SAD R FSST	DGC	35.00	34.56	36.57	36.02	37.04	38.78
1244 SAD L FSST	DGC	50.00	46.17	46.29	47.02	47.95	48.55

(1) RMP-1 Left off after initial test in Orbit 1

(2) Prelaunch leak - refer to text

D = Defective telemetry point

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

Function	Units	Orbits					
		29	1253	2532	2964	3400	3810
1081 RMP 1 MTR Volts	VDC	OFF	OFF	OFF	OFF	OFF	OFF
1082 RMP 1 MTR Current	Amps	OFF	OFF	OFF	OFF	OFF	OFF
1080 RMP 1 Supply Volts	VDC	OFF	OFF	OFF	OFF	OFF	OFF
1091 RMP 2 MTR Volts	VDC	29.99	29.97	29.94	29.93	29.95	29.94
1092 RMP 2 MTR Current	Amps	0.10	0.10	0.10	0.10	0.10	0.10
1090 RMP 2 Supply Volts	VDC	-23.63	-23.62	-23.61	-23.60	-23.60	-23.59
1220 SAD RT MTR WNDNG Volts	VDC	- 5.47	- 4.71	- 4.51	- 4.65	- 4.65	- 4.85
1240 SAD LT MTR WNDNG Volts	VDC	- 5.08	- 4.91	- 4.70	- 4.83	- 4.70	- 4.70
1227 SAD RT -15 VDC Conv.	VDC	15.14	15.14	15.15	15.16	15.15	15.14
1247 SAD LT -15 VDC Conv.	VDC	15.23	15.21	15.22	15.23	15.24	15.23
1056 CLB $\pm$ 6 VDC	TMV	2.35	2.35	2.35	2.35	2.37	2.38
1055 CLB $\pm$ 10 VDC	TMV	2.88	2.90	2.90	2.90	2.91	2.92
1057 CLB Power Supply Volts	TMV	2.97	2.94	2.94	2.95	2.96	2.96

Table 4-3. Landsat-2 ACS Average Attitude Errors and Driver Duty Cycles

Function	Units	Orbits					
		26	1202	2532	2964	3400	3810
1041 Pitch Fine Error	DEG	- 0.15	- 0.14	- 0.14	- 0.12	- 1.27	- 1.23
1043 Pitch Flywheel Speed	RPM	-156.12	-221.22	-198.41	-173.56	23.06	66.38
1038 Pitch Mtr Drvr CCW	PCT	6.64	8.61	7.35	7.77	4.50	4.33
1039 Pitch Mtr Drvr CW	PCT	2.03	3.64	2.60	3.91	5.55	6.82
1030 Roll Fine Error	DEG	- 0.13	- 0.11	- 0.09	- 0.11	- 0.13	- 0.13
1027 Roll Rear Flywheel Spd	RPM	729.30	731.98	739.75	754.41	753.22	754.14
1026 Roll Fwd Flywheel Spd	RPM	703.02	710.22	725.23	740.86	731.91	735.32
1022 Roll Rear Mtr Drvr CCW	PCT	0.67	0.86	0.39	1.00	0.33	0.31
1025 Roll Rear Mtr Drvr CW	PCT	7.54	7.11	5.47	6.43	5.81	6.21
1023 Roll Fwd Mtr Drvr CCW	PCT	0.70	0.79	0.37	1.11	0.47	0.53
1024 Roll Fwd Mtr Drvr CW	PCT	5.46	4.47	4.74	5.81	5.02	4.06
1035 Yaw Tach	RPM	- 95.73	- 77.38	- 41.57	- 49.26	- 55.97	- 98.81
1033 Yaw Mtr Drvr CW	PCT	1.98	2.10	1.77	2.27	1.78	1.59
1034 Yaw Mtr Drvr CCW	PCT	2.10	2.15	1.72	2.36	1.83	1.80
1221 SAD Right Tach	D/M	0.00	3.39	3.38	3.37	3.37	3.37
1241 SAD Left Tach	D/M	3.68	3.64	3.63	3.61	3.62	3.60

SECTION 5

COMMAND/CLOCK SUBSYSTEM

LANDSAT-2

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

The CMD Subsystem operated nommally in this report period.

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

The clock of Landsat-2 drifts in an opposite direction to the clock of *Landsat-1*. To show this more clearly, the drift histories of both are shown in Figure 5-1.

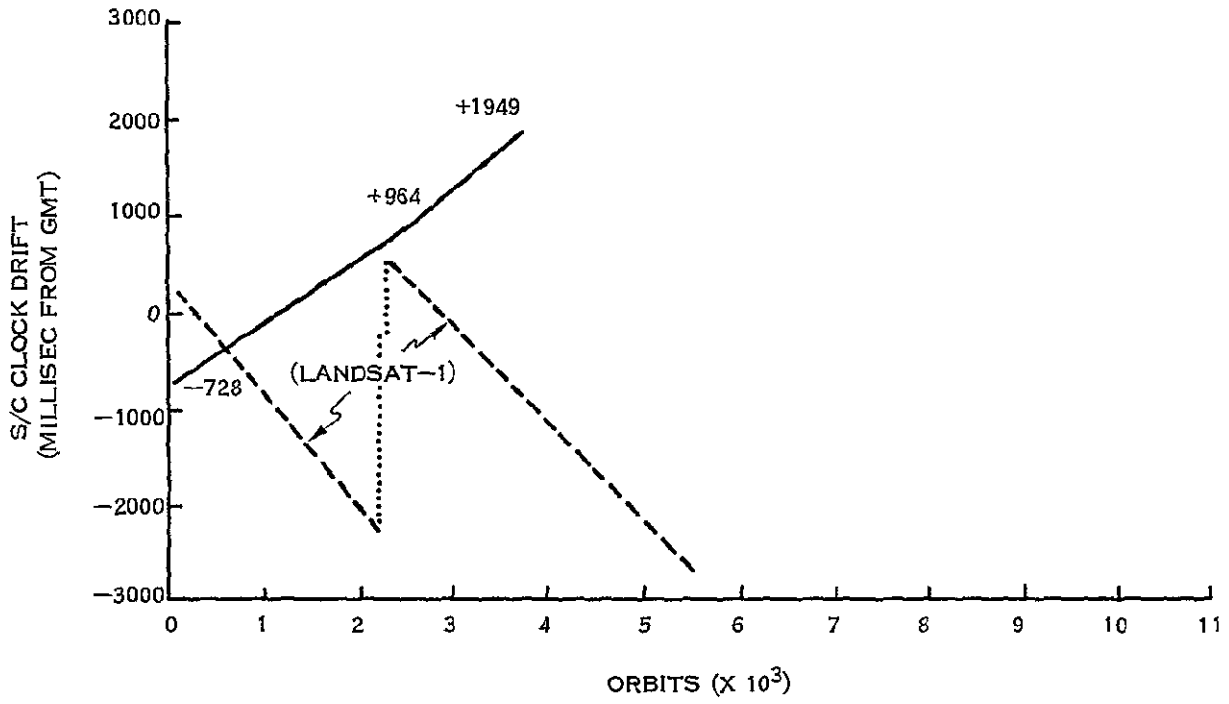

Figure 5-1. Landsat-2 Drift History

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

Function No	Name	Mode	Units	Orbit					
				35	1253	2462	2964	3400	3810
8005	Pri Power Supply Temp	-	°C	38 82	39 86	40 43	39.91	40 18	40 30
8006	Red Power Supply Temp	-	°C	36 93	38 03	38.70	38.20	38 51	38 69
8007	Pri Osc Temp	-	°C	28.70	28 70	29 35	28 70	28 70	28 99
8008	Red Osc Temp	-	°C	27 82	27 93	28 68	27 85	28 37	28 43
8009	Pri Osc. Output	-	TMV	1 06	1 05	1 06	1 06	1 06	1 06
8010	Red Osc Output	-	TMV	1 17	1 19	1 20	1 19	1 19	1 19
8011	100 KHz	Pri - Red.	TMV	3 17	3 16	3 16	3.16	3 16	3 15
8012	10 KHz	Pri - Red	TMV	3.08	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 96	2.95
8014	400 Hz	Pri - Red.	TMV	4 17	4 45	4 45	4 45	4 45	4 45
8015	Pri + 4V Power Supply	Pri. Clk ON	VDC	NA	2 05	2.05	2.05	2.05	2.05
8016	Red + 4V Power Supply	Red Clk ON	VDC	NA	2 01	2 01	2 01	2 01	2 01
8017	Pri + 6V Power Supply	Pri. Clk ON	VDC	NA	2 30	2 30	2 31	2 31	2 30
8018	Red + 6V Power Supply	Red Clk ON	VDC	NA	2 31	2 31	2 31	2 31	2 31
8019	Pri - 6V Power Supply	Pri Clk ON	VDC	NA	5 22	5 23	5 23	5 23	5 23
8020	Red - 6V Power Supply	Red Clk ON	VDC	NA	5 23	5.23	5 23	5 23	5 23
8021	Pri. - 23V Power Supply	Pri. Clk ON	VDC	NA	5 70	5 70	5 70	5 70	5 70
8022	Red - 23V Power Supply	Red Clk ON	VDC	NA	5 65	5 65	5 65	5 66	5 65
8023	Pri. - 29V Power Supply	Pri Clk ON	VDC	NA	5 29	5.30	5.29	5 29	5 29
8024	Red. - 29V Power Supply	Red Clk ON	VDC	NA	5 29	5 29	5 28	5 28	5 28
8101	CIU A - 12V	CIU A ON	VDC	3 79	3 97	3 97	3 97	3 97	3 97
3102	CIU B - 12V	CIU B ON	VDC	3 78	3 95	3 95	3 95	3 95	3 95
8103	CIU A - 5V	CIU A ON	VDC	3.93	4 15	4 15	4 14	4 14	4 14
8104	CIU B - 5V	CIU B ON	VDC	3 90	4 10	4 10	4 10	4 10	4 10
8105	CIU A Temp	CIU A ON	°C	26.01	22.09	22 50	21.94	22 17	22 23
8106	CIU B Temp.	CIU B ON	°C	23 35	19 96	20 38	19.90	20 09	20 18
8201	Receiver RF-A Temp	-	°C	NA	29 58	30.02	29 50	29 81	29 75
8202	Receiver RF-B Temp.	-	°C	29 09	OFF	OFF	OFF	OFF	OFF
8203	D MOD A Temp	-	°C	28 95	38 80	39 20	38 72	39 07	39 00
8204	D MOD B Temp	-	°C	37 73	27 10	27 56	27 03	27 40	27 38
8205	Receiver A AGC	Receiver A ON	DBM	OFF	-91 00	-92.18	-91 74	-89 47	-93 62
8206	Receiver B AGC	Receiver B ON	DBM	-87 83	OFF	OFF	OFF	OFF	OFF
8207	Amp A Output	Receiver A ON	TMV	OFF	2 70	2 51	2 52	2 66	2 42
8208	Amp B Output	Receiver B ON	TMV	2 10	OFF	OFF	OFF	OFF	OFF
8209	Freq Shift Key A Out	Receiver A ON	TMV	OFF	1.09	1.08	1 08	1 08	1.08
8210	Freq Shift Key B Out	Receiver B ON	TMV	1 11	OFF	OFF	OFF	OFF	OFF
8211	Amp A Output	Receiver A ON	TMV	OFF	1 13	1 12	1 12	1 14	1 13
8212	Amp B Output	Receiver B ON	TMV	1 13	OFF	OFF	OFF	OFF	OFF
8215	D MOD A - 15V	Receiver A ON	TMV	OFF	4 87	4 87	4 87	4.87	4 87
8216	D MOD B - 15V	Receiver B ON	TMV	4 77	OFF	OFF	OFF	OFF	OFF
8217	Regulator A - 10V	Receiver A ON	TMV	OFF	5 40	5 40	5 40	5.40	5 40
8218	Regulator B - 10V	Receiver B ON	TMV	5 32	OFF	OFF	OFF	OFF	OFF
8311	ECAM Mem Tmp	ECAM ON	DGC	NA	17 95	18 03	17 89	18 42	18 68
8312	ECAM Pwr Spply Temp	ECAM ON	DGC	NA	22 43	23 13	22 34	23 20	23 39

NA - Not available due to processing problem - MT 710

SECTION 6

TELEMETRY SUBSYSTEM

LANDSAT-2

SECTION 6

TELEMETRY SUBSYSTEM

The TLM has operated nominally in this report period.

Table 6-1 shows typical telemetry values since launch. All are nominal except for functions 1264 (Thermal Shield 5 Temperature), 4002 (MMCA Board 2 Temperature), and 13200 (APU 24 Volt Input), which were defective before launch. 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

Funct. No.	Function Name	Unit	Orbit					
			35	1253	2467	2971	3405	3810
9001	Memory Sequencer A Converter	VDC	4.45	4.45	4.45	4.45	4.45	4.45
9002	Memory Sequencer B Converter	VDC	**	**	**	**	**	**
9003	Memory Sequencer Temp	°C	20.00	19.19	20.77	19.44	20.56	20.65
9004	Formatter A Converter	VDC	4.52	4.51	4.51	4.51	4 52	4.52
9005	Formater B Converter	VDC	**	**	**	**	**	**
9006	Dig. Mux A Converter	VDC	4.22	4.22	4.22	4.22	4.22	4.22
9007	Dig. Mux B Converter	VDC	**	**	**	**	**	**
9008	Formatter/Dig Mux Temp	°C	25.00	23.23	23.98	23.56	24.47	24.75
9009	Analog Mux A Converter	VDC	4.02	4.05	4.05	4.05	4.05	4.05
9010	Analog Mux B Converter	VDC	**	**	**	**	**	**
9011	A/D Converter A Voltage	VDC	4.02	4.02	4.02	4.03	4.03	4.03
9012	A/D Converter B Voltage	VDC	**	**	**	**	**	**
9013	Analog Mux, A/D Conv. Temp	°C	25.00	25.00	24.91	24.60	25.99	25.41
9014	Preregulator A Voltage	VDC	4.00	4.00	4.00	4.00	4.00	4.00
9015	Preregulator B Voltage	VDC	**	**	**	**	**	**
9016	Reprogrammer Temp	°C	22.50	22.24	22.27	22.06	22.29	22.34
9017	Memory A Converter	VDC	4.45	4.45	4.45	4.45	4.45	4.45
9018	Memory A Temp	°C	17.50	16.46	17.33	16.97	16.99	17.26
9019	Memory B Converter	VDC	**	**	**	**	**	**
9020	Memory B Temp	°C	17.50	16.78	17.28	16.84	17.12	17.27
9100	Reflected Power (Xmtr A)	dBm	18.29	13.84	13.68	13.78	13.76	13.85
9101	Xmtr A-20 VDC	VDC	3.80	3.97	3.98	3.97	3.97	3.97
9103	Xmtr A Temp	°C	27.73	21.02	20.97	**	22.03	21.79
9104	Xmtr B Temp	°C	*	23.27	22.07	22.45	23.12	22.87
9105	Xmtr A Power Output	dBm	27.73	26.14	26.19	26.19	26.19	26.19
9106	Xmtr B Power Output	dBm	**	**	**	**	**	**

* Not available due software
** Not turned on since Prelaunch

SECTION 7

ORBIT ADJUST SUBSYSTEM

LANDSAT-2

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)
LANDSAT-2

The Orbit Adjust Subsystem on Landsat-2 has been fired ten times since launch, 6 times using the -X thruster and 4 times using the +X thruster. One firing of the -X and +X thruster each was for alignment tests. Three +X firings and two -X firings were made to phase the satellite with Landsat-1 to obtain a combined nine day ground track repeat pattern. Three -X firings were for orbit maintenance.

The only orbit maintenance burn required during this report period was made in Orbit 2958 (22 August 1975). During this maneuver, the -X thruster was fired for a duration of 22 seconds expending 0.07 lbs of hydrazine. Performance was normal as seen from characteristics of the burn shown in Figure 7-1.

The Subsystem activity through the end of this report period is summarized in Table 7-1. A total of 6.87 lbs of hydrazine has been expended so far from the pre-launch load of 67 lbs.

The OAS telemetry has consistently shown normal pressure temperature parameters. A sampling of the same is given in Table 7-2.

FOLDOUT FRAME 1

FOLDOUT FRAME 2

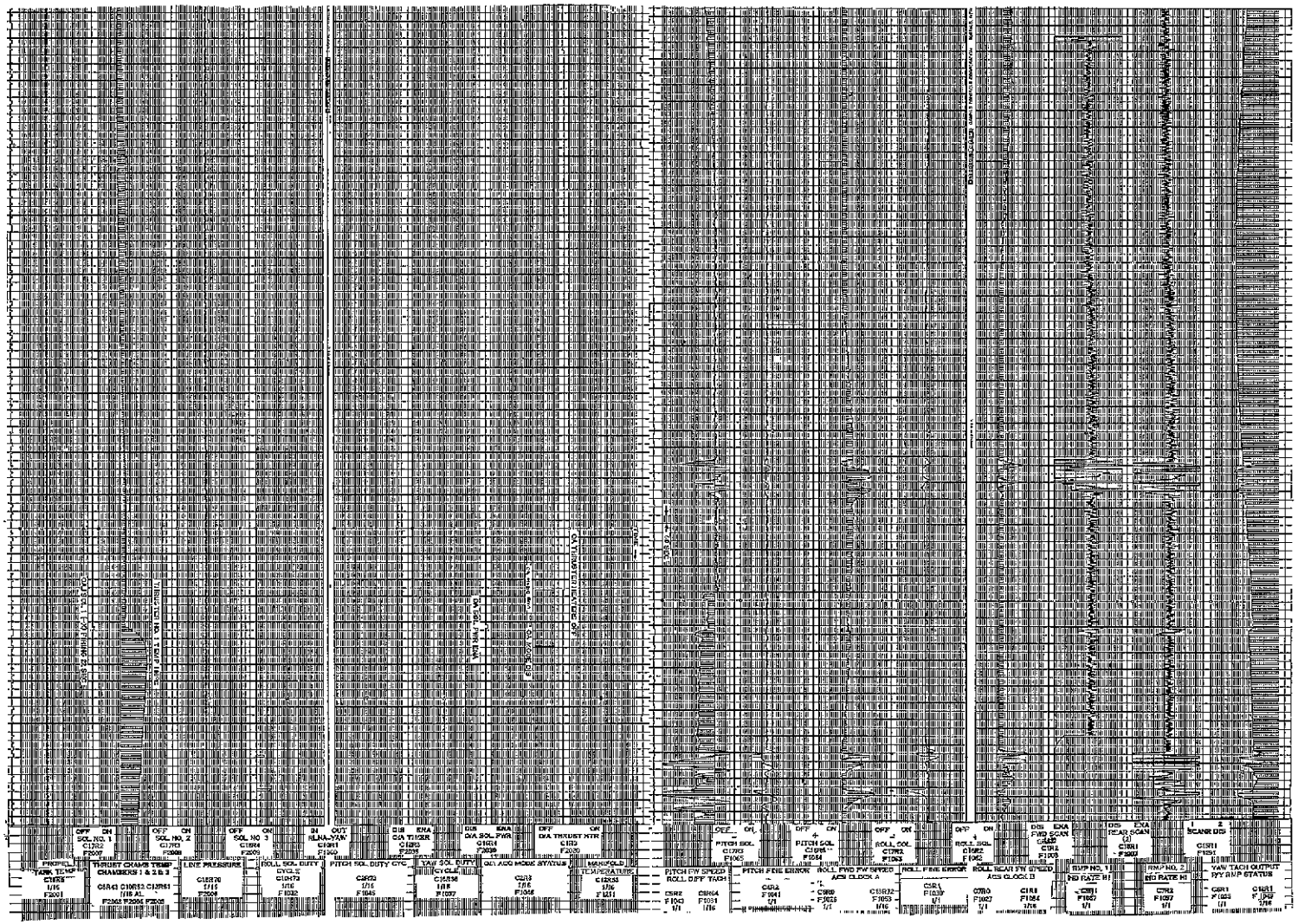

Figure 7-1. Performance Characteristics, Landsat-2 -X Thruster, Orbit Adjust, Orbit 2958 (22 August 1975)

Table 7-1. Landsat-2 Orbit Adjust Summary

Orbit	Orbit Adjust No.	Ignition Epoch	Burn Duration (Seconds)	+Δa (Meters)	Engine Performance Efficiency %	Fuel[1] Used (Lbs)	Tank Pressure (PSIA)	Tank Temperature (° F)	Thruster Axis
32	1	25 Jan 75 00 34 00.8	4.8	39	104.3	0.02	539.96	72.0	-X
71	2	27 Jan 75 19 57 00.8	4.8	-36	90.1	0.02	547.46	73.5	+X
79	3	28 Jan 75 09 49 00.8	420.0	3455	107.0	1.62	547.46	73.5	-X
86	4	28 Jan 75 21 13 00.8	420.0	3233	107.0	1.51	502.46	73.5	-X
163	5	3 Feb 75 10 36 00.8	420.0	-2974	97.0	1.42	468 75	75.0	+X
191	6	5 Feb 75 10 51 00.8	360.0	-2421	97.5	1.15	438.71	75.0	+X
212	7	6 Feb 75 22 31 00.8	308.8	-2009	98.6	0.95	416.21	75.0	+X
880	8	26 Mar 75 21 44 00.8	12.8	82	107.6	0.04	397.47	70.5	-X
1632	9	19 May 75 18 54 00.8	24.0	+154	107.6	0.07	401.21	73.5	-X
2958	10	22 Aug 75 22 11 58.8	22.0	146	110.3	0.07	404.96	73.5	-X

[1] *Initial Fuel Capacity - 67 lbs.*

Table 7-2. Landsat-2 OAS Telemetry Values

Function No.	Name	Units	Orbit					
			50	1253	2532	2964	3400	3810
2001	Prop. Tank Temp.	°C	23.03	21.97	23.05	23.05	23.39	23.47
2003	Thrust Chamber No. 1 (-X) Temp.*	°C	24.84	30.28	30.14	28.89	28.83	29.24
2004	Thrust Chamber No. 2 (+X) Temp.*	°C	37.34	37.63	38.41	37.43	39.42	39.83
2005	Thrust Chamber No. 3 (-Y) Temp.*	°C	47.22	36.23	34.20	36.40	38.07	37.92
2006	Line Pressure	psia	545.60	399.69	404.97	404.94	407.85	410.26

*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

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	1253	2532	2964	3400	3810
4001	A1 Board Temp	°C	20.56	19.84	19.82	19.60	19.86	19.97
4002	A2 Board Temp	°C	*	*	*	*	*	*
4003	Hall Current	TMV	3.40	3.40	3.40	3.40	3.40	3.40
4004	Yaw Flux Density	TMV	3.05	3.06	3.07	3.07	3.07	3.07
4005	Pitch Flux Density	TMV	3.15**	2.92**	2.90	2.90	2.90	2.90
4006	Roll Flux Density	TMV	2.99	2.98	2.98	2.98	2.98	2.98

*Defective Telemetry Function (Pre-launch)
**Post launch telemetry drift.

SECTION 9

UNIFIED S-BAND/PREMODULATION PROCESSOR

LANDSAT-2

SECTION 9

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

The USB Subsystem has operated nominally in this report period.

Table 9-1 shows telemetry values since launch. All are nominal. Unlike the experience of Landsat-1, the transmitter has maintained a steady power output of about 1.4 watts since launch. Figure 9-1 shows AGC readings of Goldstone for a constant position in space.

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

				ORBITS						
No.	Function Name	Units	T/V (20°C)	15	50	1253	2462	2964	3400	3810
11001	USB Rcvr AGC	DBM	NA	-112.72	-120 24	-121.7	-128 8	-125.3	-122 9	-131 5
11002	USB Xmtr Pwr	WTS	1.40	1.36	1.36	1.38	1 43	1.40	1 41	1.42
11003	USB Rcvr Error	KHz	NA	-2 15	-4.87	-4.14	-4.64	-6.88	-3 37	-4.23
11004	USB Xpond Temp	DGC	22.93	25.88	29 12	24.38	24.37	25.20	26.15	24.96
11005	USB Xpond Press	PSI	16.99	17.08	17.09	16 94	16.74	16.71	16.69	16.61
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	2.40	2.40	2.40	2.40	2.43	2.42
11009	USB Range -15V	VDC	2 07	2.07	2 05	2 05	2.07	2.06	2.06	2.06
11101	PMP Pwr A Volt	VDC	-15.22	-15.10	F	F	F	F	F	F
11102	PMP Pwr B Volt	VDC	-15.07	F	-14 96	-14.98	-15.02	-15.00	-14.90	-15.01
11103	PMP Temp A	DGC	NA	37 30	32.37	28.64	29.12	29.46	30 36	29.74
11104	PMP Temp B	DGC	NA	28 34	35.16	30.03	30.57	31.31	32.64	31.26

F Unit OFF in this period.

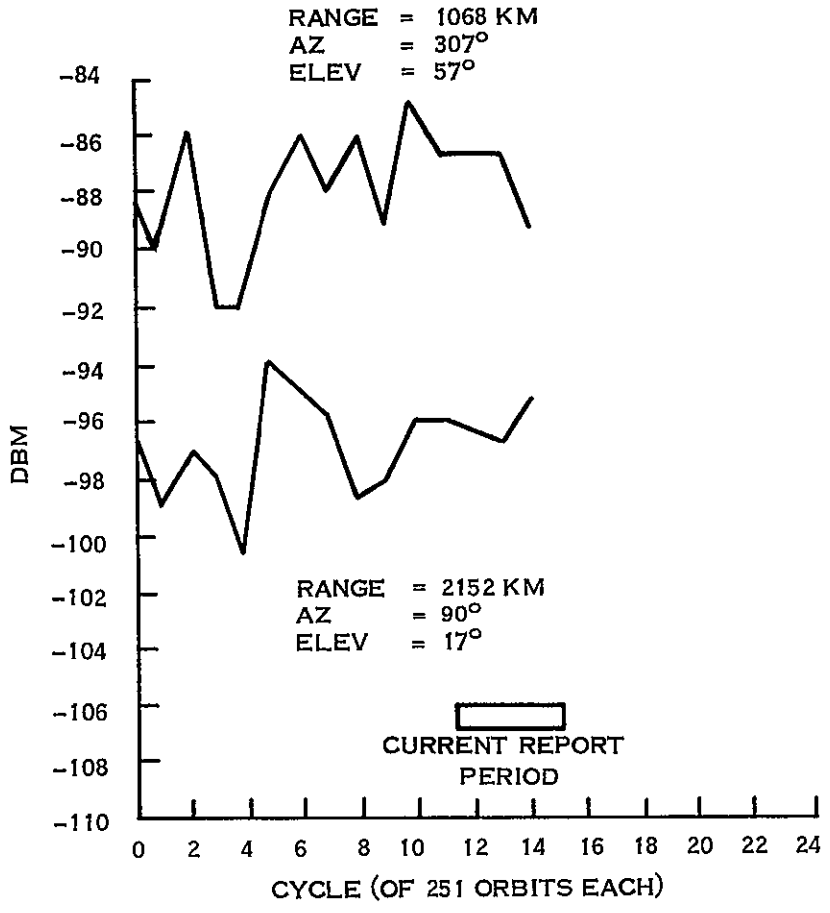

Figure 9-1. USB Link 4 AGC Readings at Goldstone with 30-Foot Antenna, Landsat-2

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM

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.

Table 10-1. LANDSAT-2 APU Telemetry Functions

Function	Description	Unit	Orbit					
			21	1253	2532	2964	3400	3810
13200	APU, -24.5 VDC	TMV	*	*	*	*	*	*
13201	APU, -12 Volts	TMV	2.42	2.44	2.45	2.44	2.45	2 45
13202	APU Temp	DGC	27.44	26.65	26 60	26.85	27.07	27.01

*Defective Telemetry (Prelaunch)

The Power Switching Module (PSM) containing the switching relays for power to the OAS, MSS, WBVTR #1 and #2, RBV and PRM, functioned normally. During this report period, the Orbit Adjust power circuit was powered for the duration of the orbit adjust maneuver in Orbit 2958 (22 August 1975). The MSS, as well as WBVTR #2 power circuits, have been operated on a regular basis. RBV power circuits have been operated during Orbits 3052 (29 August 1975) and 3386 (22 September 1975) when the subsystem was activated in support of WBVTR #1 tests.

The Interface Switching Module performed switchings of the Orbit Adjust Heater normally during this report period.

SECTION 11

THERMAL SUBSYSTEM

LANDSAT-2

SECTION 11

THERMAL SUBSYSTEM (THM)

The Thermal Control Subsystem on Landsat-2 has provided excellent temperature control of all spacecraft equipments since launch.

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

The average temperature of the right forward sun sensor on Landsat-2 has ranged between 35-39^{o}C during this report period, as opposed to 62-67^{o}C for Landsat-1. Other temperatures on Landsat-2 have typically ranged within limits established by Landsat-1 during more than three years of its operation.

No switching of the compensation loads was made during this report period. A history of all compensation load switchings since launch is given in Table 11-2.

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

Function No	Function / Description	Unit	Orbits					
			21	1253	2532	2964	3400	3810
7001	THM TH01 STI	DGC	19 40	18 71	19 59	19 28	20 37	19 90
7002	THM TH02 SBO	DGC	17.18	17 48	18 05	17 86	18 71	18 22
7003	THM TH03 STI	DGC	18 73	18 38	19 49	19 28	20 46	19 54
7004	THM TH10 TCB	DGC	19 38	19 08	19 01	19 13	19 35	19 34
7005	THM TH04 STI	DGC	17 19	17 06	17 92	18 00	19 09	18 03
7006	THM TH05 SBO	DGC	17 42	17 13	17 46	17 32	18 06	17 55
7007	OA -X Thruster	DGC	19 66	20 52	20 58	20 32	20 54	20 61
7008	THM TH06-STO	DGC	14 78	14 50	14 77	14 61	15 14	14 85
7009	THM TH06 SBI	DGC	19 18	18 82	19 18	18 98	19 75	19 52
7010	THM TH07 STI	DGC	18 08	18 00	18 26	18 06	18 58	18 42
7011	THM TH08 STO	DGC	19 34	20 07	20 22	19 94	20 27	20 27
7012	THM TH09 SBI	DGC	21 44	21 75	21 80	21 69	21 98	21 99
7013	THM TH10 SBO	DGC	18 58	18 58	18 56	18 49	18 80	18 80
7014	THM TH11 STI	DGC	21 65	21 11	21 13	21.33	21 63	21 58
7015	THM TH12 SBO	DGC	23 93	22 28	22 13	22 61	23 13	22 87
7016	THM TH13 STI	DGC	22 21	20 49	20 51	20 97	21 56	21 20
7017	RBV Beam Ctr Ln	DGC	20 38	20 32	20 33	20 35	20 62	20 65
7018	THM TH14 STO	DGC	24 12	21 34	21 29	21 75	22 60	22 32
7019	NBR Rad Outbd B4	DGC	2 72	3 05	3 26	2 95	3 34	3 37
7020	THM TH15 SBI	DGC	23 07	20 96	21 13	21 30	22 52	22 15
7021	THM TH16 STI	DGC	23 26	21 92	22 29	22 35	23 68	23 11
7022	THM TH17 SBI	DGC	21 77	20 72	21 22	21 03	22 47	22 11
7023	THM TH18 SBO	DGC	21 67	21 06	21 49	21 31	22 59	22 42
7030	THM TH03 Bur	DGC	15 50	15 48	16 28	16 28	17.14	16 29
7033	THM TH12 Bur	DGC	23 05	21 71	21 70	22 23	22 88	22 41
7035	THM TH18 Bur	DGC	19 53	18 73	19 32	19 19	20 17	19 77
7040	THM TH01 TCB	DGC	19 42	19 08	19 78	19 56	20 54	20 11
7041	THM TH02 TCB	DGC	17 55	17 33	18 02	17 78	18 59	18 14
7042	THM TH03 TCB	DGC	16 85	16 83	18 23	18 70	20 20	18 29
7043	THM TH04 TCB	DGC	19 90	19 69	20 05	19 97	20 77	20 20
7044	THM TH05 TCB	DGC	16 42	16 03	16 21	16 09	16 67	16 45
7045	THM TH07 TCB	DGC	17 76	17 96	18 12	17 94	18 42	18 23
7046	THM TH09 TCB	DGC	19 30	19 24	19 31	19 20	19 46	19 51
7048	THM TH11 TCB	DGC	23 27	22 50	22 45	22 75	23 04	22 98
7049	THM TH12 TCB	DGC	23 04	20 62	20 62	21 15	21 79	21 24
7050	THM TH13 TCB	DGC	22 89	20 43	20 34	20 84	21 55	21 17
7051	THM TH14 TCB	DGC	25 07	22 09	22 11	22 46	23 44	23 19
7052	THM TH16 TCB	DGC	22 22	20 83	21 59	21 45	23 21	22 56
7053	THM TH17 TCB	DGC	23 52	22 32	22 79	22 57	23 91	23 71
7054	THM TH18 TCB	DGC	20 01	19 46	20 05	19 78	20 99	20 89
7060	THM Shutter By 1	DEG	22 51	18 26	24 43	22 59	30 99	27 61
7061	THM Shutter By 2	DEG	19 34	19 00	24 75	21 28	28 95	26 64
7062	THM Shutter By 3	DEG	22 75	19 48	31 67	34 27	42 73	31 71
7063	THM Shutter By 4	DEG	33 89	35 12	36 32	35 00	38 44	36 34
7064	THM Shutter By 5	DEG	7 50	6 35	8 67	7 50	7 50	6 40
7065	THM Shutter By 7	DEG	17 06	19 77	22 52	20 45	21 44	21 57
7067	THM Shutter By 9	DEG	33 75	35 25	38 22	37 10	37 05	37 09
7068	THM Shutter by 10	DEG	37 46	35 65	34 96	35 59	36 37	36 62
7069	THM Shutter by 11	DEG	52 25	17 10	10 16	12 11	31 60	27 12
7070	THM Shutter by 12	DEG	61 38	46 16	46 30	49 19	53 50	50 05
7071	THM Shutter by 13	DEG	63 60	47 54	45 76	49 59	55 65	53 45
7072	THM Shutter by 14	DEG	59 44	40 54	40 40	42 75	48 99	47 92
7073	THM Shutter by 15	DEG	67 79	52 64	53 78	54 62	63 20	62 33
7074	THM Shutter by 16	DEG	45 20	37 85	43 68	42 51	54 74	51 34
7075	THM Shutter by 17	DEG	57 88	49 22	52 10	50 53	59 26	58 35
7076	THM Shutter by 18	DEG	40 49	36 36	39 32	37 68	44 87	44 47
7080	THM Q1 T Zener V	VDC	4 85	4 85	4 85	4 85	4 86	4 86
7081	THM Q2 T Zener V	VDC	4 90	4 90	4 90	4 90	4 90	4 90
7082	THM Q3 T Zener V	VDC	5 05	5 03	5 04	5 04	5 05	5 05
7083	THM Q1 S Zener V	VDC	4 97	4 96	4 96	4 97	4.97	4 97
7084	THM Q2 S Zener V	VDC	4 98	4 98	4 98	4 98	4 99	4 99
7085	THM Q3 S Zener V	VDC	5 15	5 15	5 15	5 15	5 16	5 16
7090	THM PSM Mount	DGC	21 02	20 76	21 05	21 05	21 46	21 36
7091	THM Ind Attitude	DGC	17 79	17 73	17 86	17 76	18 29	18 21
7092	THM RBV Radiator	DGC	18 01	18 07	18 06	18.20	18 59	18 54
7093	THM RBVC Ctr Bm	DGC	20 74	20 82	20 82	20 90	21 17	21 82
7094	THM WBVTR Root	DGC	13 77	14 24	14 71	14 51	15.56	15 00
7095	THM WBVTR Rad Ct	DGC	3 64	4 52	4 99	4 69	5 65	5 19
7096	THM WBVTR Strap	DGC	15 90	16 24	16 95	16 51	17 66	17 12
7097	THM WB Mt Bay 1	DGC	22 91	16 90	22 60	21 35	22 74	21 19
7098	THM WB Mat Bay 1	DGC	22 07	16 61	19 25	19 27	20 57	18 34
7099	THM WBVTR Sep 3	DGC	18 03	17 81	18 76	18 47	19 59	18 82
7100	THM WBVTR Sep 17	DGC	21 83	20 87	21 55	21 20	22 59	22 14
7101	THM WBVTR 1 Cent	DGC	22 45	22 20	23 13	22 58	23 74	23.23
7102	THM WBVTR 2 Bay	DGC	17 34	17 27	17 69	17 62	18 46	17 89
7103	THM WBVTR 2 BY 15	DGC	21 77	20 72	20 99	21 24	22 33	21 57
7104	THM WBVTR 2 Ctr	DGC	20 74	20 65	21 08	21 20	22 08	21 17
7105	THM NBTR B Sep 6	DGC	17 82	17 73	17 96	17 81	18 57	18 36
7106	THM NBTR B Sep 1	DGC	22 11	20 64	20 70	21 06	21 83	21 33
7107	THM NBTR Bm Ctr	DGC	20 32	20 30	20 44	20 69	21 22	20 74
7108	THM MSS Mount 14	DGC	20 59	19 33	19 40	19 63	20 68	20 28
7109	THM OA -Y Thruster	DGC	25 64	22 25	21 99	22 54	23 60	23 39
7110	THM MSS WBVTR Bm	DGC	16 75	17 16	17 54	17 41	18 40	17 64
7111	THM OA +X Thruster	DGC	20 33	17 55	19 72	19 16	20 56	19 39
7130	THM Aux P1 T	DGC	34 18	31 52	6 21	-9 29	-4 15	9 49
7131	THM Aux P2 T	DGC	2 90	0 84	2 22	0 91	1 02	23 50

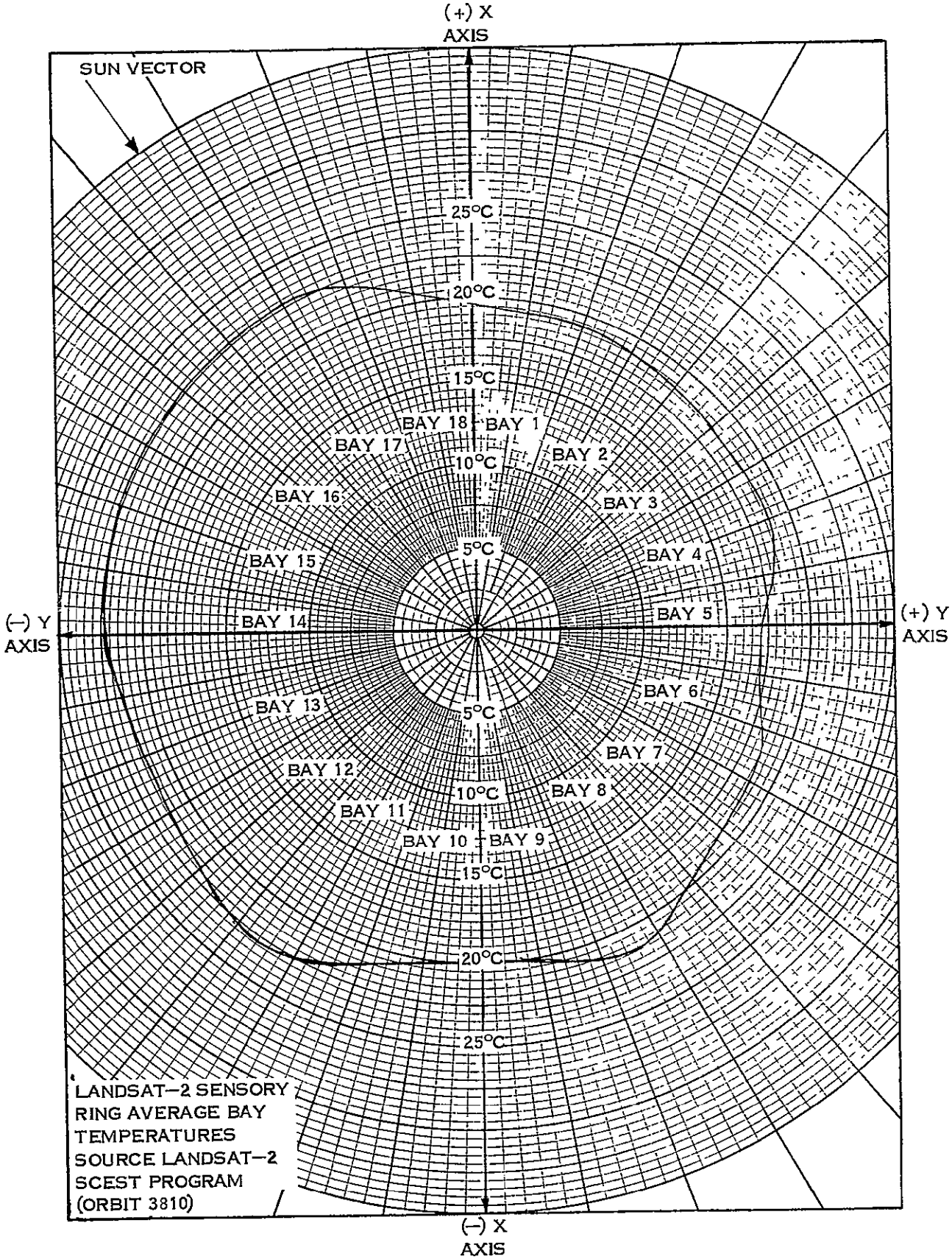

Figure 11-1. Landsat-2 Sensory Ring Thermal Profile

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

*Note
X = ON
0 = OFF

SECTION 12

NARROWBAND TAPE RECORDERS
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.

Since launch, each Recorder has operated for a period of 3430 hours.

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

Table 12-1. NBR Operating Hours by Modes

NBR	On	Off	Playback	Record
A	3430	3122	137	3293
B	3430	3122	137	3293

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

Function		Typical Telemetry Values - Orbits			
No.	Name	36/37	437/719	2111/2112	3801/3802
10001	A - Motor Cur. (ma)				
	Record	132.0	140.5	133.3	130.2
	P/B	108.0	107.8	95.2	95.2
10101	B - Motor Cur. (ma)				
	Record	148.5	146.33	141.7	140.2
	P/B	143.6	141.71	138.7	135.7
10002	A - Pwr Sup. Cur. (ma)				
	Record	170.5	172.4	167.5	165.8
	P/B	410.0	409.2	399.3	405.9
10102	B - Pwr Sup. Cur. (ma)				
	Record	260.0	259.8	261.3	261.4
	P/B	481.0	479.7	479.7	499.7
10003	A - Rec. Temp (DGC)	26.1	25.0	26.1	24.8
10103	B - Rec. Temp. (DGC)	27.0	25.4	27.0	26.6
10004	A - Supply (VDC)	-24.87	-25.10	-25.1	-25.1
10104	B - Supply (VDC)	-24.55	-24.68	-24.6	-24.6

SECTION 13

WIDEBAND TELEMETRY SUBSYSTEM

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 points in space. WBPA-2 has been used more consistantly and is presented in this Figure. Values from WBPA-1 are nearly identical when this power amplifier is used.

Table 13-1. Wideband Telemetry Subsystem

(1)	Name	T/V (2) 10W	T/V (2) 20W	Orbits 424	1479	2462	2964	3400	3810
12001	Temp, TWT Coll. (DGC)	30.1	33.6	OFF	35.63	35.00	20.37	21.11	20.74
12101		27.9	31.2	31.43	35.71	37.14	32.86	37.14	30.00
12002	Cur, Helix (MA)	3.30	3.85	OFF	4.30	4.51	OFF	OFF	OFF
12102		4.03	4.56	4.53	4.43	4.48	4.64	4.53	4.52
12003	Cur, TWT Cath. (MA)	33.20	46.10	OFF	43.60	45.12	OFF	OFF	OFF
12103		34.09	46.78	45.37	45.26	45.24	45.90	45.24	44.39
12004	Fwd Power (DBM) (3)	40.61	42.68	OFF	42.60	42.77	OFF	OFF	OFF
12104		40.93	43.71	43.65	43.66	43.69	43 73	43.67	43.56
12005	Refl Power (DBM) (3)	22.34	27.0	OFF	25.61	26 10	OFF	OFF	OFF
12105		34.55	36.45	36.36	37.15	37.14	37.11	39.96	36.91
12227	Con. Volt, Loop Stress (MHz)(4)	1.54		OFF	1.42	1.12	1.69	1.62	1.32
12228		2.53		0.32	0.24	-0.01	0 28	0.05	-0.30
12229	Temp. Mod (DGC)	19.5		17.16	19.93	20.88	19.25	20.24	19.22
12232	+15 VDC Pwr	2.65		2.65	2.65	2.65	2.65	2.63	2.65
12234	-15 VDC Pwr Sup (TMV) (5)	4.07		4.08	4.01	3.94	3.91	4.02	4.10
12236	+5 VDC Pwr Sup (TMV) (5)	3.55		3.50	3.53	3.54	3.45	3.53	3.47
12238	-5 VDC Pwr Sup (TMV) (5)	4.08		4.07	4.03	4.01	3.91	4.05	4.09
12240	-24 VDC Unreg. Pwr (TMV) (5)	5.86		5.90	5.80	5.66	5.74	5.79	5 91
12242	Temp, Inv. (DGC)	23.7		21.68	23.21	23.79	22.56	23.64	22.93

NOTES:

(1) Function numbers for WPA-1=120XX; for WPA-2=121XX

(2) Thermo-Vacuum Test data for comparison

(3) Pwr outputs of 10 or 20 watts can be selected

(4) Any reading other than zero or -7.5 is acceptable

(5) Only power supply A operated during these orbits

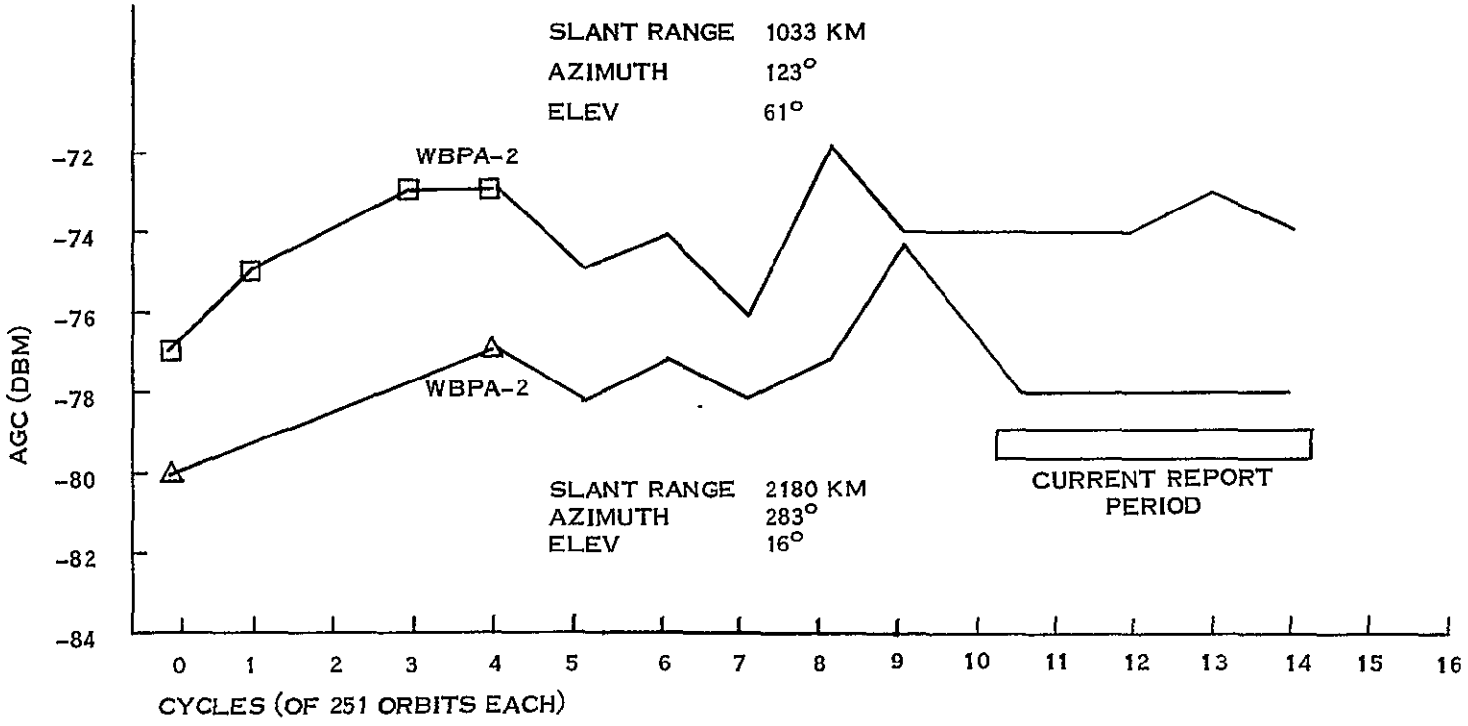

Figure 13-1. Landsat-2 AGC Readings Goldstone 30-Foot Antenna WBPA 2 - Link 3

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		Units	50	1253	2532	2964	3400	3810
3004	Case - Temp 1	DGC	19.00	19.05	19.02	18.93	19.19	19.39
3005	Assembly-Temp 2	DGC	18.70	18.69	18.71	18.51	18.67	18.93

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS

LANDSAT-2

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)

During Orbit 2683 (3 August) the ENT ground station was unable to obtain video sync lock-up on a WBVTR-1 playback on link 3.

To identify the problem, a series of engineering tests using MSS data, four ground stations, both wideband links, and all recorder modes were performed during Orbits 2703, 2719, 2720, 2721, 2723, 2802, 2926, and 2927. In all cases playback video sync lock-up could not be obtained. Subsystem telemetry appeared nominal.

A further test was made in Orbit 3052 (29 August) using RBV as the input data source, since the synchronous characteristic of the RBV data could materially aid in clarifying the problem. Both real-time and playback data were recorded at the ground station on two TR-70 recorders, and Quick-Look photographs were made. All the observed data gave position indication of a malfunctioning WBVTR-1 head or associated circuits. Confirming tests were made in Orbits 3386 and 3387 (22 September) using only the RBV-CCC sync voltages and 1.6 MHz signals.

Operation of WBVTR-1 was suspended after Orbit 3387, and it has remained inactive.

A summary of WBVTR-1 operational history is presented in Table 15-1.

WBVTR-2 has operated normally throughout the reporting period.

Table 15-2 gives typical telemetry values for WBVTR-1 and WBVTR-2. Tables 15-3 and 15-4 show the telemetry values for Record, Playback, Rewind, and Standby operational modes.

Figures 15-1 and 15-2 show tape usage for both Recorders.

Table 15-1. WBVTR-1 Operational History

1975 Date	Orbit	Events	Action Taken	Results	Footage
Jan 22 to Apr 5	0-1020	Normal			0-1830
					1331
5 April	1021	Fail to R/W	4 R/W Trys	All Failed	1534
30 April	1367	R/W Try	4 Succ. CMDS	Normal	1602.5 to 1022
1 May	1379	R/W Try	5° Higher Temp.	Normal	1022 to 445
8 May	1476	Pre-Opn Test	FF & P/B	Normal	445 to 977
	1477	Pre-Opn. Test	R/W & P/B	Normal	977 to 961 to 1347
	1478	Pre-Opn. Test	R/W Rec & R/W	Normal	1347 to 407 to 527 to 307
8-12 May	1478-1531	Operational with restrictions	6 Successful R/W CMDS	-	300 to 1530
12 May	1532	Fail to R/W	Opns Suspnd	-	1492.5
	1535	R/W Try	Operational	Normal	300 - 1530
15 May	1568	Fail to R/W	Opns Suspnd	2 Atmpts Fail	1466
	1574	Fail to R/W	-	6 Atmpts Fail	1490.5
15-21 May	1575 to 1656	60 R/W Atmpts	-	All Fail	1490.5
21 May	1657	6 R/W Atmpts	-	All Fail	1598.5
	1659	R/W Atmpts	-	Fail	1598.5
		Special R/W Test	-	Normal	1598.5 to 650
		R/W Atmpt	-	Normal	650 to 575
	1660	R/W Atmpt	Operational	Normal	575 to 312
21 May to 2 July	1660 to 2236	Operational	-	Normal	300 to 1700
2 July	2237	Abort R/W	-	-	165.5
2 July to 20 July	2238 to 2488	Operational	-	Normal	300 to 1700
20 July	2489	Abort R/W	-	-	93.5
20 July to 3 August	2490 to 2682	Operational	-	Normal	300 to 1700
3 August	2683	No Video Data in one Head	Out of Service	-	300 to 900
4 August to 11 August	2703 to 2802	Test	All Modes	No Data in One Head	314 to 1619.5
20 August	2926	Test	REC, R/W, P/B, R/W	No Data in One Head	203 to 424.5
	2927	Test	P/B	No Data in One Head	203 to 418.5
29 August	3052	Test with RBV	REC, R/W, P/B	No Data in One Head	297.5 to 426.5
22 September	3386 and 3387	Test with RBV	REC, R/W, P/B, Suspended from Service	Data Recorded for Analysis	290 to 729

Table 15-2. WBVTR Telemetry Values

WBVTR-1 Functions		Telemetry Values In Orbits					
Number	Name	45/46	996	2473	2642	3442	3812
13022	Pressure Trans	16.52	16.51	16.50	16.51	16.41	16.39
13023	Temp Trans	20.74	20.05	19.65	20.62	19.28	19.00
13024	Temp Elec	25.00	18.59	21.47	24.57	20.12	19.67
13032	Limiter Voltage	1.48	1.49	1.49	1.51	*	*
13034	+5.6 VDC Conv.	5.70	5.48	5.58	5.54	*	*
13201	-12 VDC APU	2.44	2.45	2.45	2.45	2.45	2.45
13202	Temp APU	29.06	26.76	26.52	26.76	27.10	27.03
WBVTR-2 Functions		Telemetry Values In Orbits					
Number	Name	45/46	966	2473	2642	3442	3812
13122	Pressure Trans	16.12	16.12	15.82	15.81	15.59	15.49
13123	Temp Trans	21.50	18.48	19.73	20.00	20.81	20.99
13124	Temp Elec	23.50	14.49	18.10	18.31	20.03	19.48
13132	Limiter Voltage	1.30	NA	1.27	1.32	1.30	1.33
13134	+5.6 VDC Conv.	5.71	6.32	5.74	5.69	5.73	5.74
13201	-12 VDC APU	2.44	2.45	2.45	2.45	2.45	2.45
13202	Temp APU	29.06	26.76	26.52	26.76	27.10	27.03

NA - Data Not Available
* - No Data WBVTR-1 Out of Service

Table 15-3. Landsat-2 WBVTR-1 Telemetry Function Values by Mode

WBVTR-1 Function/Description	Orbit			
	T/V	718	1734	2642
13029 - Input P/B Voltage				
Record	0.0	0.0	0.0	0.0
Playback	0.33	0.30	0.32	0.32
Rewind	0.0	0.0	0.0	0.0
Standby	0.0	0.0	0.0	0.0
13028 - Capstan Motor Current				
Record	0.32	0.27	0.36	0.33
Playback	0.29	0.30	0.30	0.31
Rewind	0.23	0.21	0.27	0.23
Standby	0.0	0.0	0.0	0.0
13030 - Headwheel Motor Current				
Record	0.50	0.51	0.50	0.50
Playback	0.495	0.49	0.49	0.49
Rewind	0.41	0.44	0.44	0.44
Standby	0.41	0.44	0.43	0.45
13031 - Recorder Input Current				
Record	3.58	3.61	3.62	3.69
Playback	3.92	3.86	3.93	3.86
Rewind	2.18	2.16	2.30	2.19
Standby	1.79	1.90	1.80	1.95
13033 - Servo Voltage				
Record	0.0	0.0	0.0	0.0
Playback	49.99	50.04	50.37	50.08
Rewind	0.0	0.0	0.0	0.0
Standby	0.0	0.0	0.0	0.0
13026 - Capstan Motor Speed				
Record	89.77	88.03	88.03	88.03
Playback	89.37	87.45	86.29	86.87
Rewind	100.12	99.06	97.32	98.48
Standby	0.0	0.0	0.0	0.0
13027 - Headwheel Motor Speed				
Record	97.5	96.18	95.07	95.07
Playback	96.86	95.07	94.52	94.52
Rewind	98.96	97.28	95.62	96.73
Standby	99.12	97.28	93.96	95.62

Table 15-4. Landsat-2 WBVTR-2 Telemetry Function Values by Mode

WBVTR-2 Function/Description	Orbit			
	T/V	437	1734	2642
13129 - Input P/B Voltage				
Record	0.0	0.0	0.0	0.0
Playback	0.37	0.36	0.34	0.33
Rewind	0.0	0.0	0.0	0.0
Standby	0.0	0.0	0.0	0.0
13128 - Capstan Motor Current				
Record	0.33	0.33	0.32	0.37
Playback	0.34	0.35	0.35	0.34
Rewind	0.16	0.20	0.19	0.18
Standby	0.0	0.0	0.0	0.0
13130 - Headwheel Motor Current				
Record	0.47	0.47	0.47	0.47
Playback	0.46	0.46	0.47	0.47
Rewind	0.43	0.42	0.43	0.42
Standby	0.45	0.42	0.43	0.43
13131 - Recorder Input Current				
Record	2.88	2.90	2.90	2.90
Playback	3.11	3.02	3.08	3.08
Rewind	1.79	1.79	1.80	1.80
Standby	1.18	1.58	1.60	1.48
13133 - Servo Voltage				
Record	0.0	0.0	0.0	0.0
Playback	48.92	49.04	49.33	49.52
Rewind	0.0	0.0	0.0	0.0
Standby	0.0	0.0	0.0	0.0
13126 - Capstan Motor Speed				
Record	108.66	106.70	106.02	105.33
Playback	108.38	106.70	106.02	105.33
Rewind	130.09	117.68	117.0	116.31
Standby	0.0	0.0	0.0	0.0
13127 - Headwheel Motor Speed				
Record	98.41	96.52	96.00	96.52
Playback	98.11	96.00	95.48	94.44
Rewind	99.95	97.04	96.00	95.48
Standby	101.72	97.04	96.52	94.96

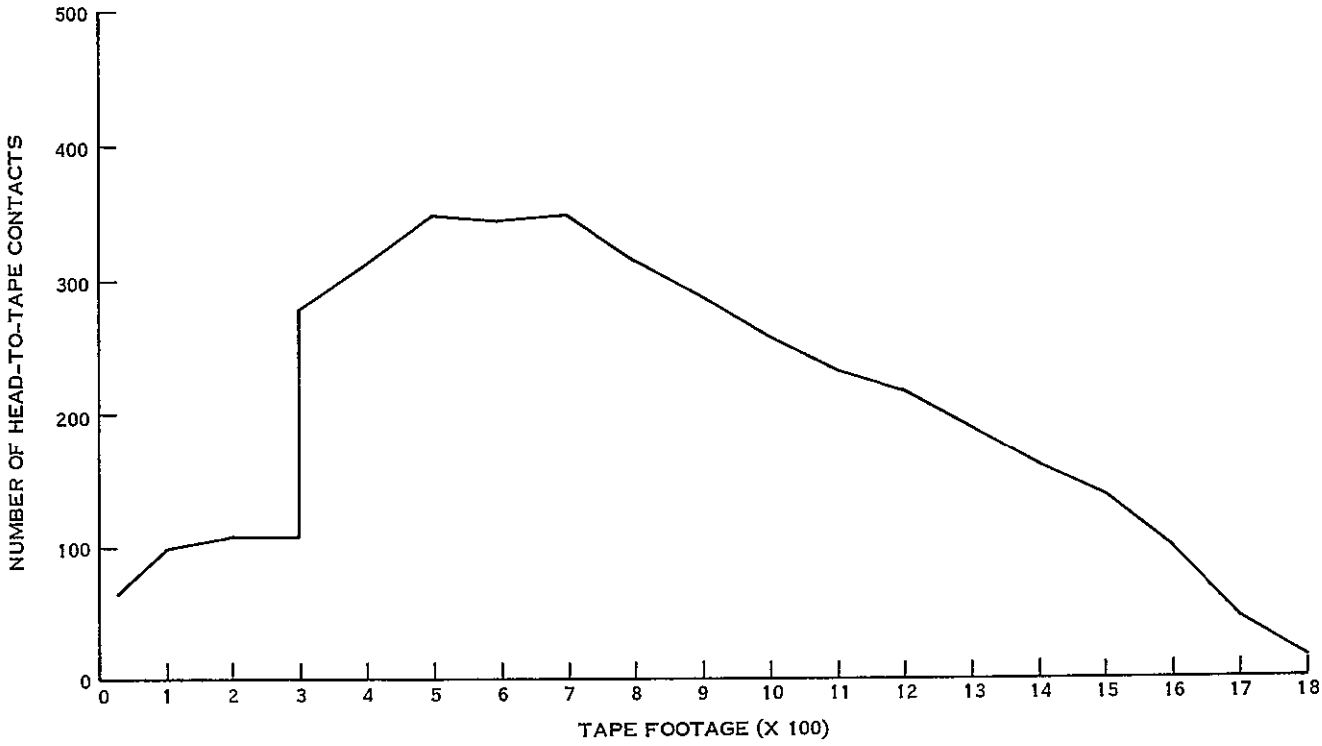

Figure 15-1. Landsat-2 WBR-1 Tape Usage Thru Orbit 2683

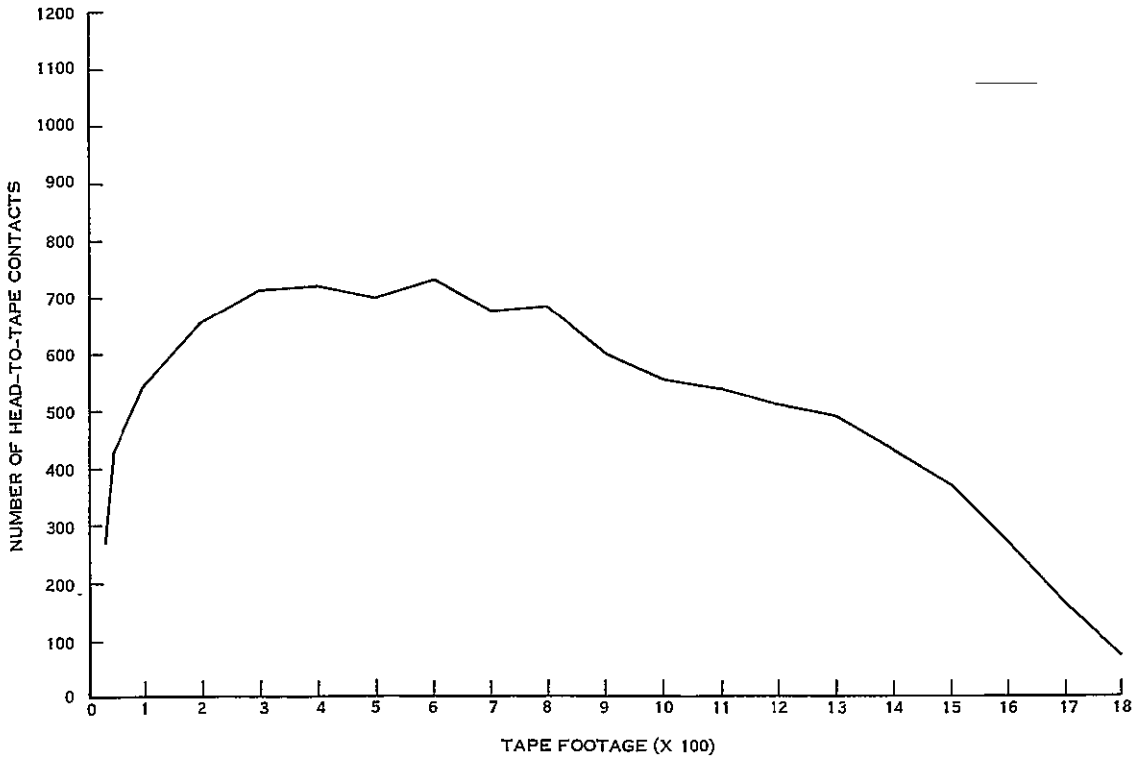

Figure 15-2. WBR-2 Tape Usage Thru Orbit 3702 - Landsat-2

SECTION 16

RETURN BEAM VIDICON

LANDSAT-2

SECTION 16

RETURN BEAM VIDICON (RBV)

The RBV periodic test planned for October was postponed until November, due to other system priorities. The RBV subsystem, however, was operated twice during this period in support of WBVTR-1 tests.

In Orbit 3052 (29 August) RBV was turned on with only Camera #1 operating to assist in diagnosis of WBVTR-1 faulty component(s). The RBV subsystem was operated for 2 minutes and 51 seconds, taking a preliminary scene after warm-up and 3 additional good scenes. These were transmitted in real-time and recorded on WBVTR-1.

Telemetry data for Orbit 3052 is given in Table 16-1; telemetry values for Camera #1 Prepare, Hold, and Read modes are given in Table 16-2. Tables 16-3 and 16-4, which show Prepare, Hold, and Read telemetry values for Cameras #2 and #3, have no new data but are repeated for comparison purposes.

In Orbit 3386 (22 September), RBV was turned on again for 4 minutes to aid in further analysis of WBVTR-1 problems. However, no video was required for this test, so only the CCC was activated to supply sync voltages and 1.6 MHz signals to the tape recorder. None of the cameras were turned on. The RBV waveforms were transmitted in real-time and recorded by scope camera and TR-70 tape recorder for later comparison with WBVTR-1 playback.

Since only a small part of RBV was activated, no telemetry data is shown for this operation.

Table 16-1. RBV Telemetry Value

Function			Orbits					
No.	Name	T/V Value	41	54	151	209	2371	3052
14001	CCC Board Temp. (DgC)	N/A	19.939	19.65	19.72	20.58	20.27	19.41
14002	CCC Pwr. Sup. Temp (DgC)	N/A	21.047	20.52	20.65	21.90	21.46	20.61
14003	15 VDC Sup. (TMV)	N/A	3.950	3.92	3.75	3.89	3.92	3 92
14004	+6V, -5.25 VDC Sup. (TMV)	N/A	3.075	2.92	2.92	3.00	3.07	3 05
14100		0.98	NA	NA	NA	NA	0.70	0.70
14200 *	VID Output V (TMV)	0.93	NA	1.05	1.16	1.30	1 23	F
14300		1.06	NA	1.03	1.10	1.24	1.27	F
14102		3.75-4.02	3.950	3.85	3.85	3.86	3 81	3 83
14202 *	Comb. Align Cur. (TMV)	3.87-4.10	3.875	3.91	3.91	3.92	3.92	F
14302		3.80-4.05	3.850	3.90	3.72	3.85	3.80	F
14103		N/A	24.363	24.24	24.10	26.08	24.49	22.87
14203 *	Elec Temp. (DgC)	N/A	20.387	19.84	19.97	22.16	22 40	20 01
14303		N/A	25.363	25.05	25.35	28.20	24.15	22 22
14104		N/A	23.363	23.44	23.55	25.68	24 13	22.16
14204 *	LV Pwr Sup T. (DgC)	N/A	18.834	18.14	18.29	20.61	20.87	18.20
14304		N/A	26.023	25.36	25.66	28.28	24.12	22 30
14105		3.92-4.07	3.950	4.00	3.82	3.95	3.94	3.98
14205 *	Defl. Pwr. Sup. +10 VDC (TMV)	3.95-4.10	3.950	3.97	3.80	3.93	3.92	F
14305		3.95-4.07	4.000	4.00	4.00	4.00	3.95	F
14106		3.65-3.80	3.700	3.67	3.52	3.64	3.59	3.67
14206 *	L.V.P.S. +6V, -6.3 VDC (TMV)	3.67-3.80	3.650	3.65	3.49	3.61	3.61	F
14306		3.65-3.77	3.725	3.70	3.70	3.71	3 66	F
14107		2.53	2.650	2.61	2.49	2.54	2.54	2.59
14207 *	Ther. Elec. Cur. (TMV)	2.43	2.500	2.49	2.37	2.42	2 44	F
14307		2.52	2.575	2.57	2.46	2.49	2.52	F
14108		1.80-3.50	2.550	2.43	2.44	2.49	2.48	2.55
14208 *	Vid. Fil. Cur. (TMV)	2.55-2.75	2.400	2.40	2.30	2.37	2 34	F
14308		2.50-2.80	2.575	2.58	2.46	2.54	2 54	F
14110		2.95-3.20	3.025	2.98	2.98	2.98	2.95	2.95
14210 *	Vid. Tgt. Volt (TMV)	3.15-3.45	3.050	2.86	2.86	2.93	2 93	F
14310		2.55-2.80	3.225	2.63	2.51	2.60	2.56	F
14113		2.86	4.050	2.92	2.87	2.84	2 79	2 98
14213 *	Vert Def V (TMV)	3.09	4.275	3.15	3.12	3.08	2.99	F
14313		3.91	4.275	3.59	3.45	3.51	3.48	F
14114		21.99	21.997	19.87	20.18	21.18	20.67	19.92
14214 *	Vid FPT (DgC)	21.00	21.059	20.55	20.64	21.56	21.14	20 60
14314		22.66	22.398	20.65	20.85	21.89	21 12	20 37
14115		24.17	20.940	21.04	21.47	23.23	22 41	20.98
14215 *	Foc Coil T (DgC)	23.82	20.387	20.67	21.00	22.83	22 22	20.63
14315		24.47	21.940	22.25	22.66	24.53	23 08	21.72

* 141XX refers to Camera 1
142XX refers to Camera 2
143XX refers to Camera 3
NA - Data not Available
F - Cameras 2 and 3 off. Camera 1 only was operated

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

Function No.	Function Name	Mode	Orbit					
			T/V Value	Orbit 054	Orbit 151	Orbit 209	Orbit 2371	Orbit 3052
14101	Focus I	Hold	0.66	0.65	0.65	0.67	0.70	0.63
		Prep	1.71	1.68	1.68	1.74	1.75	1.67
		Read	2.83	2.80	2.85	2.85	2.90	*
14109	Grid V	Prep	0.79	0.80	0.75	0.75	0.80	0.77
		Read	2.43	2.42	2.43	2.42	2.44	2.42
		Hold	4.00	3.95	3.95	3.95	4.00	3.96
14111	Cath I	Hold	0.38	0.38	0.38	0.38	0.40	0.35
		Read	0.84	0.83	0.83	0.83	0.85	0.82
		Prep	3.03	3.05	3.00	3.04	3.10	3.01
14112	Hor Def	Hold	0.01	0.00	0.00	0.00	0.00	0.00
		Prep	1.79	1.75	1.75	1.75	1.80	1.76
		Read	3.23	3.25	3.25	3.25	3.30	3.20
14120	+500 V	Prep	0.92	0.85	0.85	0.88	0.90	0.90
		Read	4.05	4.05	4.05	4.05	4.10	4.03

*No Data due to slow TLM sample rate

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

Function No.	Function Name	Mode	Orbit				
			T/V Value	Orbit 054	Orbit 151	Orbit 209	Orbit 2371
14201	Focus I	Hold	0.58	0.54	0.49	0.54	0.60
		Prep	1.60	1.56	1.57	1.54	1.60
		Read	2.71	2.65	2.65	2.65	2.70
14209	Grid V	Prep	0.83	0.75	0.82	0.81	0.85
		Read	2.25	2.25	2.25	2 25	2 30
		Hold	4.13	4.05	4.05	4.09	4.10
14211	Cath I	Hold	0.37	0.37	0.33	0.34	0.35
		Read	0.95	0.95	0.95	0.95	1.00
		Prep	3.05	3 05	3.05	3 05	3 10
14212	Hor Def	Hold	0.01	0.00	0.00	0.00	0.00
		Prep	1.87	1.85	1.88	1.85	1.90
		Read	3.32	3.25	3.25	3.25	3.30
14220	+500 V	Prep	1.14	1.15	1.15	1.15	1.20
		Read	4.29	4.25	4.25	4.25	4 30

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

Function No.	Function Name	Mode	Telemetry Values				
			T/V Value	Orbit 054	Orbit 151	Orbit 209	Orbit 2371
		Hold	0.68	0.65	0.65	0.71	0.70
14301	Focus I	Prep	1.80	1.79	1.85	1.84	1.83
		Read	2.89	2.85	2.85	2.92	2.90
		Prep	0.77	0.75	0.75	0.75	0.80
14309	Grid V	Read	2.64	2.65	2.65	2.65	2 70
		Hold	4.13	4.08	4.10	4.13	4.18
		Hold	0.40	0.39	0.39	0.39	0.40
14311	Cath I	Read	0.56	0.54	0.54	0.54	0.55
		Prep	3.23	3.25	3.25	3.25	3.30
		Hold	0.01	0.00	0.00	0.00	0.00
14312	Hor Def	Pref	2.09	2.05	2.05	2.05	2.10
		Read	3.41	3.35	3.35	3.41	3.45
14320	+500 V	Prep	1.16	1.15	1.15	1.15	1.20
		Read	4.28	4.25	4.25	4.25	4.30

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM

LANDSAT-2

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

The MSS Subsystem has operated nominally in this period without incident. 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 are shown which are received by U.S. ground stations. Scenes transmitted to Canada, Brazil and Italy (about 30% 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. Bands 1, 2, and 3 show the same initial decline in response shortly after launch as was seen in Landsat-1. All readings are nominal.

Line length history is also shown in Table 17-2.

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

FOLDOUT FRAME 1

FOLDOUT FRAME 2

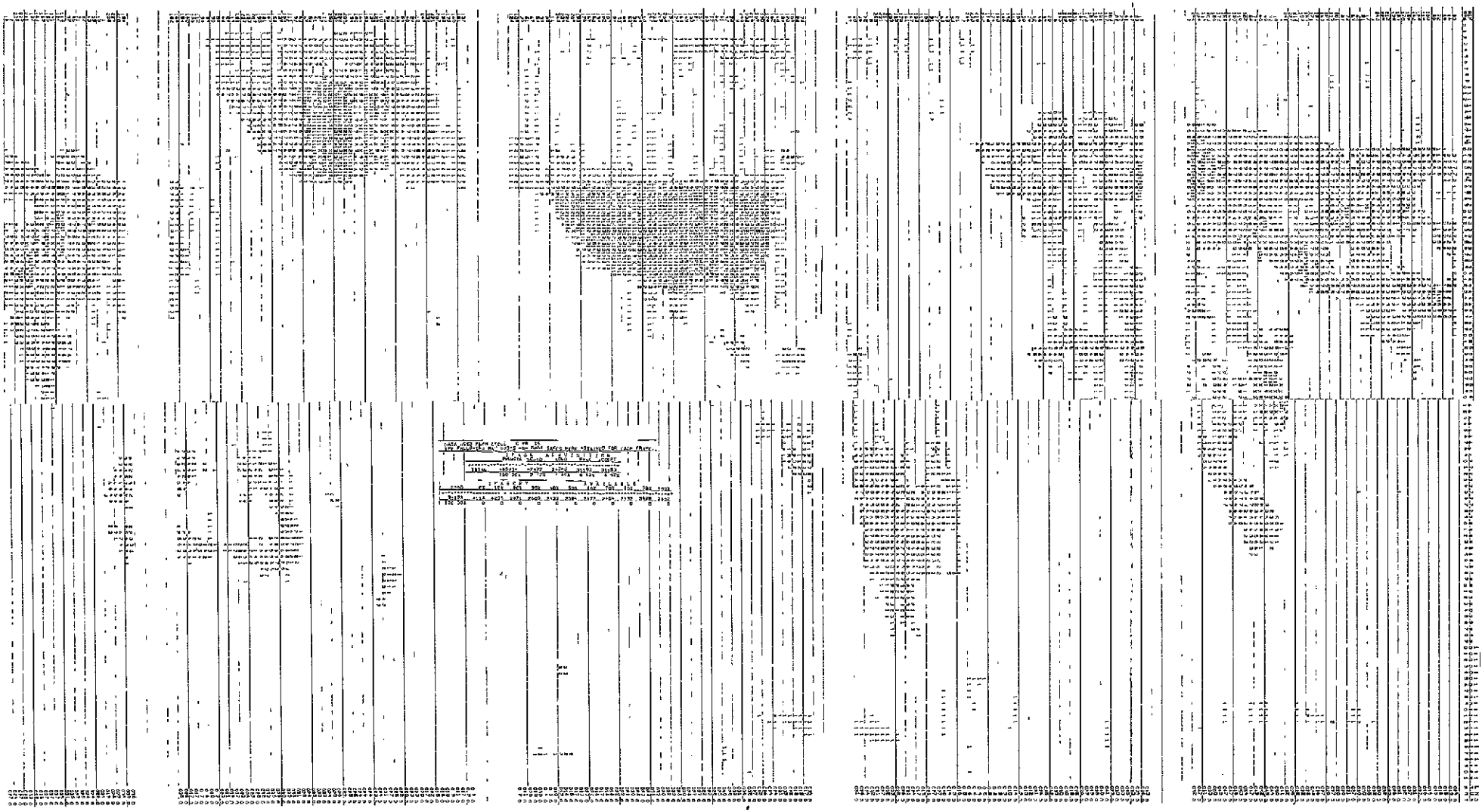

Figure 17-2. Computer Map of MSS Scenes Since Launch Landsat-2

Table 17-1. MSS Telemetry - Landsat-2

Function	Name	*T.V. Norm	Orbit					
			27	1254	2500	2964	2971	3400
15040	MUX -6 VDC (TMV)	3.92	4.05	4.07	4.04	4.07	4.07	4.07
15041	A/D SUPPLY (TMV)	5.74	5.95	5.95	5.95	5.95	5.95	5.95
42	AVERAGE DENSITY (TMV)	1.72	1.71	2.30	2.39	2.17	2.16	2.17
43	FIBER OPTICS PLATE 1 TEMP (DGC)	22.30	18.13	18.4	20.41	20.16	20.62	21.23
44	FIBER OPTICS PLATE 2 TEMP (DGC)	22.30	17.87	18.1	18.86	18.66	19.08	19.75
45	MUX TEMP (DGC)	25.59	23.38	25.6	20.57	20.73	21.56	22.76
46	ELEC COVER TEMP (DGC)	23.09	20.25	21.3	21.40	21.19	21.77	22.44
47	PWR. SUP. TEMP. (DGC)	23.85	19.45	21.0	19.83	19.75	20.56	21.19
48	SCAN MIR REG. TEMP (DG)	23.44	18.30	18.0	18.29	18.32	19.33	20.18
49	SCAN MIR DRIVE ELEC. TEMP. (DGC)	24.34	18.96	19.6	18.49	18.63	19.72	20.53
15050	SCAN MIR DRIVE COVER TEMP. (DGC)	22.50	17.26	19.4	18.28	18.40	19.24	20.20
51	SCAN MIR TEMP (DGC)	21.87	17.26	17.9	18.09	17.99	18.91	19.71
52	ROT. SHUT HOUSING TEMP (DGC)	22.58	23.26	18.4	18.91	18.63	19.14	19.80
53	SCAN MIR REG VOLT (TMV)	4.56	4.7	4.57	4.57	4.57	4.57	4.59
54	CAL LAMP CURRENT (TMV)	1.18	1.17	1.17	1.20	1.17	1.17	1.17
55	BAND 1 15 VDC (TMV)	4.97	4.98	4.97	4.97	4.97	4.97	4.97
56	BAND 2 15 VDC (TMV)	5.00	5.00	5.00	5.00	5.00	5.00	5.00
57	BAND 3 15 VDC (TMV)	4.88	4.95	4.95	4.95	4.95	4.95	4.95
58	BAND 4 15 VDC (TMV)	4.83	5.00	5.00	5.00	5.00	5.00	5.00
59	TLM 15 VDC (TMV)	5.04	5.06	5.07	5.07	5.07	5.07	5.07
15060	+12 VDC +6 VDC (TMV)	4.92	5.03	5.02	5.02	5.02	5.02	5.02
61	LOGIC +5 VDC (TMV)	4.86	4.81	4.80	4.80	4.89	4.83	4.82
62	RECT. +19 VDC (TMV)	4.97	5.03	5.05	5.05	5.05	5.05	5.05
63	RECT. -19 VDC (TMV)	3.54	3.60	3.60	3.60	3.60	3.60	3.60
64	BAND 1 HVA (TMV)	4.95	4.95	4.95	4.95	4.95	4.95	4.95
65	BAND 1 HVB (TMV)	5.03	OFF	OFF	OFF	OFF	OFF	OFF
66	BAND 2 HVA (TMV)	4.72	4.70	4.72	4.72	4.72	4.73	4.72
67	BAND 2 HVB (TMV)	4.70	OFF	OFF	OFF	OFF	OFF	OFF
68	BAND 3 HV A (TMV)	4.75	4.72	4.75	4.76	4.77	4.75	4.75
69	BAND 3 HVB (TMV)	4.65	OFF	OFF	OFF	OFF	OFF	OFF
15070	SHUT MOT. CONTR. INTEG (TMV)	2.49	2.60	2.57	2.60	2.60	2.60	2.60
15071	SCAN MIRROR DRIVE CLOCK (TMV)	1.93	2.0	2.00	2.00	2.00	2.00	2.00

* Thermal Vacuum Test Data at 20°C

Table 17-2. MSS Response History
Landsat-2
Quantum Level For Selected Word
(0 = Black; 63 = White)

Sensor	Launch	1st Half Year	This Quarter	Band
1	43	42	39	
2	41	40	39	
3	46	43	42	1
4	46	45	44	
5	44	41	39	
6	46	43	42	
7	47	46	45	
8	44	41	40	
9	48	47	46	2
10	50	48	48	
11	48	48	47	
12	47	45	43	
13	42	41	40	
14	44	43	42	
15	47	46	46	3
16	47	45	45	
17	48	46	46	
18	46	44	44	
19	25	25	25	
20	26	27	27	
21	32	32	32	4
22	29	29.5	30	
23	32	32.5	33	
24	28	28	28	
Line Length	3250	3249	3248	

SECTION 18

DATA COLLECTION SUBSYSTEM

LANDSAT-2

SECTION 18

DATA COLLECTION SYSTEM (DCS)

The DCS Subsystem performed nominally during this report period, continuing message collection at substantially the same rate.

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

Table 18-1. DCS Telemetry Values

Func. No.	Name	Orbits					
		5	1253	2462	2964	3400	3410
16001	Receiver 1 Sig Strength (DBM)*	-123.34	-122.79	-124.81	-124.67	-122.08	-124.00
16002	Receiver 1 Temp (DGC)	22.54	24.13	24.20	24.16	24.31	24.39
16003	Rec-1 Pwr Input Volt (VDC)	2.35	2.37	2.36	2.36	2.37	2.37
16004	Receiver 2 Sig Volt (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

* This value is for a CW carrier only; it is not valid during DCS message reception

F = Receiver 2 was OFF

Figure 18-1 shows the number of DCS messages per 18-day cycle at OCC, and the average number of DCP's active per cycle. Also shown is percentage of good messages for each cycle. Cycle 9 has the lowest value for percent good messages, and simultaneously the highest number of messages received. It is evident then, that probably a thousand or so of the "messages" received were in reality only noise. This substantial noise occurred between 26 June and 4 July 1975, and has returned to normal since.

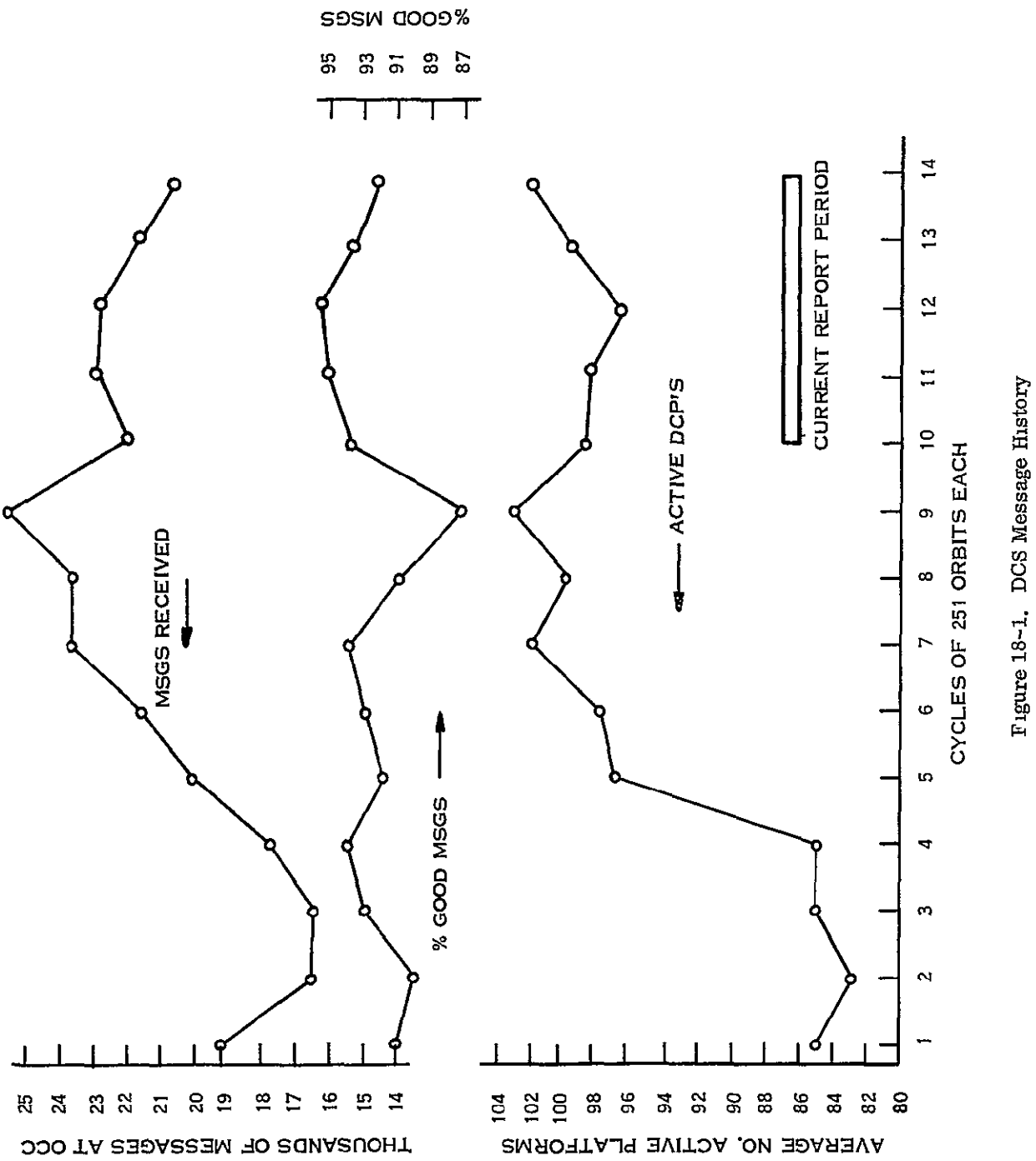

Figure 18-1. DCS Message History

APPENDIX A

LANDSAT-2 ANOMALY LIST

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 are temperatures which are non-critical. Sensors failed prior to launch Mission unaffected.
3/8/75	Non-Landsat OCC authorized Un-encoded command 781, CIU Channel B Off, received by spacecraft from RF interference. Commands 782 or 786, switch comdecs, received at other times.	On-Line	Non-Landsat OCC Authorized Unencoded commands received in Orbit 619, 640, 743, 1575, 1700, 2605, 3164.
3/17/75	MMCA Pitch Flux Density TLM Drift	Off-Line	Telemetry decreased 5 counts and indicates increase flux density on charged magnet. Investigation underway. Probable sensor drift. No apparent effect on S/C performance.
4/5/75	WBVTR-1 Rewind Failure	On-Line	ECAM Rewind command to WBVTR-1 failed to execute in Orbit 1021. R/T commands failed to execute. Operation resumed Orbit 1476. Investigation continuing.
5/12/75	WBVTR-1 Failed to R/W	On-Line	See entry 4/5/75
5/15/75	WBVTR-1 Failed to R/W	On-Line	See entry 4/5/75
6/9/75	WBVTR-2 had short R/W	On-Line	WBVTR-2 started R/W but stopped pre-maturely. WBVTR (1 & 2) investigation still continuing while operation resumed.
7/2/75	WBVTR-1 had short R/W	On-Line	See entry 4/5/75 and 6/9/75.
8/3/75	WBVTR-1 had high BER	On-Line	One WBVTR-1 recorder head circuit failed to operate. 25% of data lost in data stream. Operation discontinued. Investigation committee formed.

APPENDIX B

LANDSAT-2 SPACECRAFT ORBIT REFERENCE TABLES

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SPACECRAFT ORBIT REFERENCE TABLES

FROM JULY, 1975 THROUGH DECEMBER, 1976

ORBITS 2221 THROUGH 9890

FLIGHT DAY 160 THROUGH 709

LANDSAT-2

JUL, 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	182	160	2221- 2234	154-167	12	8
2	183	161	2235- 2248	168-181	13	8
3	184	162	2249- 2262	182-195	14	8
4	185	163	2263- 2276	196-209	15	8
5	186	164	2277- 2290	210-223	16	8
6	187	165	2291- 2304	224-237	17	8
7	188	166	2305- 2318	238-251	18	8
8	189	167	2319- 2332	1- 14	1	9
9	190	168	2333- 2346	15- 28	2	9
10	191	169	2347- 2360	29- 42	3	9
11	192	170	2361- 2374	43- 56	4	9
12	193	171	2375- 2388	57- 70	5	9
13	194	172	2389- 2402	71- 84	6	9
14	195	173	2403- 2416	85- 98	7	9
15	196	174	2417- 2430	99-112	8	9
16	197	175	2431- 2444	113-126	9	9
17	198	176	2445- 2457	127-139	10	9
18	199	177	2458- 2471	140-153	11	9
19	200	178	2472- 2485	154-167	12	9
20	201	179	2486- 2499	168-181	13	9
21	202	180	2500- 2513	182-195	14	9
22	203	181	2514- 2527	196-209	15	9
23	204	182	2528- 2541	210-223	16	9
24	205	183	2542- 2555	224-237	17	9
25	206	184	2556- 2569	238-251	18	9
26	207	185	2570- 2583	1- 14	1	10
27	208	186	2584- 2597	15- 28	2	10
28	209	187	2598- 2611	29- 42	3	10
29	210	188	2612- 2625	43- 56	4	10
30	211	189	2626- 2639	57- 70	5	10
31	212	190	2640- 2653	71- 84	6	10

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AUG. 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	213	191	2654- 2667	85- 98	7	10
2	214	192	2668- 2681	99-112	8	10
3	215	193	2682- 2695	113-126	9	10
4	216	194	2696- 2708	127-139	10	10
5	217	195	2709- 2722	140-153	11	10
6	218	196	2723- 2736	154-167	12	10
7	219	197	2737- 2750	168-181	13	10
8	220	198	2751- 2764	182-195	14	10
9	221	199	2765- 2778	196-209	15	10
0	222	200	2779- 2792	210-223	16	10
11	223	201	2793- 2806	224-237	17	10
12	224	202	2807- 2820	238-251	18	10
13	225	203	2821- 2834	1- 14	1	11
14	226	204	2835- 2848	15- 28	2	11
15	227	205	2849- 2862	29- 42	3	11
16	228	206	2863- 2876	43- 56	4	11
17	229	207	2877- 2890	57- 70	5	11
18	230	208	2891- 2904	71- 84	6	11
19	231	209	2905- 2918	85- 98	7	11
20	232	210	2919- 2932	99-112	8	11
21	233	211	2933- 2946	113-126	9	11
22	234	212	2947- 2959	127-139	10	11
23	235	213	2960- 2973	140-153	11	11
24	236	214	2974- 2987	154-167	12	11
25	237	215	2988- 3001	168-181	13	11
26	238	216	3002- 3015	182-195	14	11
27	239	217	3016- 3029	196-209	15	11
28	240	218	3030- 3043	210-223	16	11
29	241	219	3044- 3057	224-237	17	11
30	242	220	3058- 3071	238-251	18	11
31	243	221	3072- 3085	1- 14	1	12

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SEP, 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	244	222	3086- 3099	15- 28	2	12
2	245	223	3100- 3113	29- 42	3	12
3	246	224	3114- 3127	43- 56	4	12
4	247	225	3128- 3141	57- 70	5	12
5	248	226	3142- 3155	71- 84	6	12
6	249	227	3156- 3169	85- 98	7	12
7	250	228	3170- 3183	99-112	8	12
8	251	229	3184- 3197	113-126	9	12
9	252	230	3198- 3210	127-139	10	12
10	253	231	3211- 3224	140-153	11	12
11	254	232	3225- 3238	154-167	12	12
12	255	233	3239- 3252	168-181	13	12
13	256	234	3253- 3266	182-195	14	12
14	257	235	3267- 3280	196-209	15	12
15	258	236	3281- 3294	210-223	16	12
16	259	237	3295- 3308	224-237	17	12
17	260	238	3309- 3322	238-251	18	12
18	261	239	3323- 3336	1- 14	1	13
19	262	240	3337- 3350	15- 28	2	13
20	263	241	3351- 3364	29- 42	3	13
21	264	242	3365- 3378	43- 56	4	13
22	265	243	3379- 3392	57- 70	5	13
23	266	244	3393- 3406	71- 84	6	13
24	267	245	3407- 3420	85- 98	7	13
25	268	246	3421- 3434	99-112	8	13
26	269	247	3435- 3448	113-126	9	13
27	270	248	3449- 3461	127-139	10	13
28	271	249	3462- 3475	140-153	11	13
29	272	250	3476- 3489	154-167	12	13
30	273	251	3490- 3503	168-181	13	13

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BCY,1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	274	252	3504- 3517	182-195	14	13
2	275	253	3518- 3531	196-209	15	13
3	276	254	3532- 3545	210-223	16	13
4	277	255	3546- 3559	224-237	17	13
5	278	256	3560- 3573	238-251	18	13
6	279	257	3574- 3587	1- 14	1	14
7	280	258	3588- 3601	15- 28	2	14
8	281	259	3602- 3615	29- 42	3	14
9	282	260	3616- 3629	43- 56	4	14
10	283	261	3630- 3643	57- 70	5	14
11	284	262	3644- 3657	71- 84	6	14
12	285	263	3658- 3671	85- 98	7	14
13	286	264	3672- 3685	99-112	8	14
14	287	265	3686- 3699	113-126	9	14
15	288	266	3700- 3712	127-139	10	14
16	289	267	3713- 3726	140-153	11	14
17	290	268	3727- 3740	154-167	12	14
18	291	269	3741- 3754	168-181	13	14
19	292	270	3755- 3768	182-195	14	14
20	293	271	3769- 3782	196-209	15	14
21	294	272	3783- 3796	210-223	16	14
22	295	273	3797- 3810	224-237	17	14
23	296	274	3811- 3824	238-251	18	14
24	297	275	3825- 3838	1- 14	1	15
25	298	276	3839- 3852	15- 28	2	15
26	299	277	3853- 3866	29- 42	3	15
27	300	278	3867- 3880	43- 56	4	15
28	301	279	3881- 3894	57- 70	5	15
29	302	280	3895- 3908	71- 84	6	15
30	303	281	3909- 3922	85- 98	7	15
31	304	282	3923- 3936	99-112	8	15

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NOV, 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	305	283	3937- 3950	113-126	9	15
2	306	284	3951- 3963	127-139	10	15
3	307	285	3964- 3977	140-153	11	15
4	308	286	3978- 3991	154-167	12	15
5	309	287	3992- 4005	168-181	13	15
6	310	288	4006- 4019	182-195	14	15
7	311	289	4020- 4033	196-209	15	15
8	312	290	4034- 4047	210-223	16	15
9	313	291	4048- 4061	224-237	17	15
10	314	292	4062- 4075	238-251	18	15
11	315	293	4076- 4089	1- 14	1	16
12	316	294	4090- 4103	15- 28	2	16
13	317	295	4104- 4117	29- 42	3	16
14	318	296	4118- 4131	43- 56	4	16
15	319	297	4132- 4145	57- 70	5	16
16	320	298	4146- 4159	71- 84	6	16
17	321	299	4160- 4173	85- 98	7	16
18	322	300	4174- 4187	99-112	8	16
19	323	301	4188- 4201	113-126	9	16
20	324	302	4202- 4214	127-139	10	16
21	325	303	4215- 4228	140-153	11	16
22	326	304	4229- 4242	154-167	12	16
23	327	305	4243- 4256	168-181	13	16
24	328	306	4257- 4270	182-195	14	16
25	329	307	4271- 4284	196-209	15	16
26	330	308	4285- 4298	210-223	16	16
27	331	309	4299- 4312	224-237	17	16
28	332	310	4313- 4326	238-251	18	16
29	333	311	4327- 4340	1- 14	1	17
30	334	312	4341- 4354	15- 28	2	17

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DEC. 1975

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	335	313	4355- 4368	29- 42	3	17
2	336	314	4369- 4382	43- 56	4	17
3	337	315	4383- 4396	57- 70	5	17
4	338	316	4397- 4410	71- 84	6	17
5	339	317	4411- 4424	85- 98	7	17
6	340	318	4425- 4438	99-112	8	17
7	341	319	4439- 4452	113-126	9	17
8	342	320	4453- 4465	127-139	10	17
9	343	321	4466- 4479	140-153	11	17
10	344	322	4480- 4493	154-167	12	17
11	345	323	4494- 4507	168-181	13	17
12	346	324	4508- 4521	182-195	14	17
13	347	325	4522- 4535	196-209	15	17
14	348	326	4536- 4549	210-223	16	17
15	349	327	4550- 4563	224-237	17	17
16	350	328	4564- 4577	238-251	18	17
17	351	329	4578- 4591	1- 14	1	18
18	352	330	4592- 4605	15- 28	2	18
19	353	331	4606- 4619	29- 42	3	18
20	354	332	4620- 4633	43- 56	4	18
21	355	333	4634- 4647	57- 70	5	18
22	356	334	4648- 4661	71- 84	6	18
23	357	335	4662- 4675	85- 98	7	18
24	358	336	4676- 4689	99-112	8	18
25	359	337	4690- 4703	113-126	9	18
26	360	338	4704- 4716	127-139	10	18
27	361	339	4717- 4730	140-153	11	18
28	362	340	4731- 4744	154-167	12	18
29	363	341	4745- 4758	168-181	13	18
30	364	342	4759- 4772	182-195	14	18
31	365	343	4773- 4786	196-209	15	18

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JAN. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	1	344	4787- 4800	210-223	16	18
2	2	345	4801- 4814	224-237	17	18
3	3	346	4815- 4828	238-251	18	18
4	4	347	4829- 4842	1- 14	1	19
5	5	348	4843- 4856	15- 28	2	19
6	6	349	4857- 4870	29- 42	3	19
7	7	350	4871- 4884	43- 56	4	19
8	8	351	4885- 4898	57- 70	5	19
9	9	352	4899- 4912	71- 84	6	19
10	10	353	4913- 4926	85- 98	7	19
11	11	354	4927- 4940	99-112	8	19
12	12	355	4941- 4954	113-126	9	19
13	13	356	4955- 4967	127-139	10	19
14	14	357	4968- 4981	140-153	11	19
15	15	358	4982- 4995	154-167	12	19
16	16	359	4996- 5009	168-181	13	19
17	17	360	5010- 5023	182-195	14	19
18	18	361	5024- 5037	196-209	15	19
19	19	362	5038- 5051	210-223	16	19
20	20	363	5052- 5065	224-237	17	19
21	21	364	5066- 5079	238-251	18	19
22	22	365	5080- 5093	1- 14	1	20
23	23	366	5094- 5107	15- 28	2	20
24	24	367	5108- 5121	29- 42	3	20
25	25	368	5122- 5135	43- 56	4	20
26	26	369	5136- 5149	57- 70	5	20
27	27	370	5150- 5163	71- 84	6	20
28	28	371	5164- 5177	85- 98	7	20
29	29	372	5178- 5191	99-112	8	20
30	30	373	5192- 5205	113-126	9	20
31	31	374	5206- 5218	127-139	10	20

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FEB. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	32	375	5219- 5232	140-153	11	20
2	33	376	5233- 5246	154-167	12	20
3	34	377	5247- 5260	168-181	13	20
4	35	378	5261- 5274	182-195	14	20
5	36	379	5275- 5288	196-209	15	20
6	37	380	5289- 5302	210-223	16	20
7	38	381	5303- 5316	224-237	17	20
8	39	382	5317- 5330	238-251	18	20
9	40	383	5331- 5344	1- 14	1	21
10	41	384	5345- 5358	15- 28	2	21
11	42	385	5359- 5372	29- 42	3	21
12	43	386	5373- 5386	43- 56	4	21
13	44	387	5387- 5400	57- 70	5	21
14	45	388	5401- 5414	71- 84	6	21
15	46	389	5415- 5428	85- 98	7	21
16	47	390	5429- 5442	99-112	8	21
17	48	391	5443- 5456	113-126	9	21
18	49	392	5457- 5469	127-139	10	21
19	50	393	5470- 5483	140-153	11	21
20	51	394	5484- 5497	154-167	12	21
21	52	395	5498- 5511	168-181	13	21
22	53	396	5512- 5525	182-195	14	21
23	54	397	5526- 5539	196-209	15	21
24	55	398	5540- 5553	210-223	16	21
25	56	399	5554- 5567	224-237	17	21
26	57	400	5568- 5581	238-251	18	21
27	58	401	5582- 5595	1- 14	1	22
28	59	402	5596- 5609	15- 28	2	22
29	60	403	5610- 5623	29- 42	3	22

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MAR. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	61	404	5624- 5637	43- 56	4	22
2	62	405	5638- 5651	57- 70	5	22
3	63	406	5652- 5665	71- 84	6	22
4	64	407	5666- 5679	85- 98	7	22
5	65	408	5680- 5693	99-112	8	22
6	66	409	5694- 5707	113-126	9	22
7	67	410	5708- 5720	127-139	10	22
8	68	411	5721- 5734	140-153	11	22
9	69	412	5735- 5748	154-167	12	22
10	70	413	5749- 5762	168-181	13	22
11	71	414	5763- 5776	182-195	14	22
12	72	415	5777- 5790	196-209	15	22
13	73	416	5791- 5804	210-223	16	22
14	74	417	5805- 5818	224-237	17	22
15	75	418	5819- 5832	238-251	18	22
16	76	419	5833- 5846	1- 14	1	23
17	77	420	5847- 5860	15- 28	2	23
18	78	421	5861- 5874	29- 42	3	23
19	79	422	5875- 5888	43- 56	4	23
20	80	423	5889- 5902	57- 70	5	23
21	81	424	5903- 5916	71- 84	6	23
22	82	425	5917- 5930	85- 98	7	23
23	83	426	5931- 5944	99-112	8	23
24	84	427	5945- 5958	113-126	9	23
25	85	428	5959- 5971	127-139	10	23
26	86	429	5972- 5985	140-153	11	23
27	87	430	5986- 5999	154-167	12	23
28	88	431	6000- 6013	168-181	13	23
29	89	432	6014- 6027	182-195	14	23
30	90	433	6028- 6041	196-209	15	23
31	91	434	6042- 6055	210-223	16	23

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APR, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	92	435	6056- 6069	224-237	17	23
2	93	436	6070- 6083	238-251	18	23
3	94	437	6084- 6097	1- 14	1	24
4	95	438	6098- 6111	15- 28	2	24
5	96	439	6112- 6125	29- 42	3	24
6	97	440	6126- 6139	43- 56	4	24
7	98	441	6140- 6153	57- 70	5	24
8	99	442	6154- 6167	71- 84	6	24
9	100	443	6168- 6181	85- 98	7	24
10	101	444	6182- 6195	99-112	8	24
11	102	445	6196- 6209	113-126	9	24
12	103	446	6210- 6222	127-139	10	24
13	104	447	6223- 6236	140-153	11	24
14	105	448	6237- 6250	154-167	12	24
15	106	449	6251- 6264	168-181	13	24
16	107	450	6265- 6278	182-195	14	24
17	108	451	6279- 6292	196-209	15	24
18	109	452	6293- 6306	210-223	16	24
19	110	453	6307- 6320	224-237	17	24
20	111	454	6321- 6334	238-251	18	24
21	112	455	6335- 6348	1- 14	1	25
22	113	456	6349- 6362	15- 28	2	25
23	114	457	6363- 6376	29- 42	3	25
24	115	458	6377- 6390	43- 56	4	25
25	116	459	6391- 6404	57- 70	5	25
26	117	460	6405- 6418	71- 84	6	25
27	118	461	6419- 6432	85- 98	7	25
28	119	462	6433- 6446	99-112	8	25
29	120	463	6447- 6460	113-126	9	25
30	121	464	6461- 6473	127-139	10	25

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MAY, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	122	465	6474- 6487	140-153	11	25
2	123	466	6488- 6501	154-167	12	25
3	124	467	6502- 6515	168-181	13	25
4	125	468	6516- 6529	182-195	14	25
5	126	469	6530- 6543	196-209	15	25
6	127	470	6544- 6557	210-223	16	25
7	128	471	6558- 6571	224-237	17	25
8	129	472	6572- 6585	238-251	18	25
9	130	473	6586- 6599	1- 14	1	26
10	131	474	6600- 6613	15- 28	2	26
11	132	475	6614- 6627	29- 42	3	26
12	133	476	6628- 6641	43- 56	4	26
13	134	477	6642- 6655	57- 70	5	26
14	135	478	6656- 6669	71- 84	6	26
15	136	479	6670- 6683	85- 98	7	26
16	137	480	6684- 6697	99-112	8	26
17	138	481	6698- 6711	113-126	9	26
18	139	482	6712- 6724	127-139	10	26
19	140	483	6725- 6738	140-153	11	26
20	141	484	6739- 6752	154-167	12	26
21	142	485	6753- 6766	168-181	13	26
22	143	486	6767- 6780	182-195	14	26
23	144	487	6781- 6794	196-209	15	26
24	145	488	6795- 6808	210-223	16	26
25	146	489	6809- 6822	224-237	17	26
26	147	490	6823- 6836	238-251	18	26
27	148	491	6837- 6850	1- 14	1	27
28	149	492	6851- 6864	15- 28	2	27
29	150	493	6865- 6878	29- 42	3	27
30	151	494	6879- 6892	43- 56	4	27
31	152	495	6893- 6906	57- 70	5	27

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JUN. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	153	496	6907- 6920	71- 84	6	27
2	154	497	6921- 6934	85- 98	7	27
3	155	498	6935- 6948	99-112	8	27
4	156	499	6949- 6962	113-126	9	27
5	157	500	6963- 6975	127-139	10	27
6	158	501	6976- 6989	140-153	11	27
7	159	502	6990- 7003	154-167	12	27
8	160	503	7004- 7017	168-181	13	27
9	161	504	7018- 7031	182-195	14	27
10	162	505	7032- 7045	196-209	15	27
11	163	506	7046- 7059	210-223	16	27
12	164	507	7060- 7073	224-237	17	27
13	165	508	7074- 7087	238-251	18	27
14	166	509	7088- 7101	1- 14	1	28
15	167	510	7102- 7115	15- 28	2	28
16	168	511	7116- 7129	29- 42	3	28
17	169	512	7130- 7143	43- 56	4	28
18	170	513	7144- 7157	57- 70	5	28
19	171	514	7158- 7171	71- 84	6	28
20	172	515	7172- 7185	85- 98	7	28
21	173	516	7186- 7199	99-112	8	28
22	174	517	7200- 7213	113-126	9	28
23	175	518	7214- 7226	127-139	10	28
24	176	519	7227- 7240	140-153	11	28
25	177	520	7241- 7254	154-167	12	28
26	178	521	7255- 7268	168-181	13	28
27	179	522	7269- 7282	182-195	14	28
28	180	523	7283- 7296	196-209	15	28
29	181	524	7297- 7310	210-223	16	28
30	182	525	7311- 7324	224-237	17	28
1						

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JUL, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	183	526	7325- 7338	238-251	18	28
2	184	527	7339- 7352	1- 14	1	29
3	185	528	7353- 7366	15- 28	2	29
4	186	529	7367- 7380	29- 42	3	29
5	187	530	7381- 7394	43- 56	4	29
6	188	531	7395- 7408	57- 70	5	29
7	189	532	7409- 7422	71- 84	6	29
8	190	533	7423- 7436	85- 98	7	29
9	191	534	7437- 7450	99-112	8	29
10	192	535	7451- 7464	113-126	9	29
11	193	536	7465- 7477	127-139	10	29
12	194	537	7478- 7491	140-153	11	29
13	195	538	7492- 7505	154-167	12	29
14	196	539	7506- 7519	168-181	13	29
15	197	540	7520- 7533	182-195	14	29
16	198	541	7534- 7547	196-209	15	29
17	199	542	7548- 7561	210-223	16	29
18	200	543	7562- 7575	224-237	17	29
19	201	544	7576- 7589	238-251	18	29
20	202	545	7590- 7603	1- 14	1	30
21	203	546	7604- 7617	15- 28	2	30
22	204	547	7618- 7631	29- 42	3	30
23	205	548	7632- 7645	43- 56	4	30
24	206	549	7646- 7659	57- 70	5	30
25	207	550	7660- 7673	71- 84	6	30
26	208	551	7674- 7687	85- 98	7	30
27	209	552	7688- 7701	99-112	8	30
28	210	553	7702- 7715	113-126	9	30
29	211	554	7716- 7728	127-139	10	30
30	212	555	7729- 7742	140-153	11	30
31	213	556	7743- 7756	154-167	12	30

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AUG. 1974

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	214	557	7757- 7770	168-181	13	30
2	215	558	7771- 7784	182-195	14	30
3	216	559	7785- 7798	196-209	15	30
4	217	560	7799- 7812	210-223	16	30
5	218	561	7813- 7826	224-237	17	30
6	219	562	7827- 7840	238-251	18	30
7	220	563	7841- 7854	1- 14	1	31
8	221	564	7855- 7868	15- 28	2	31
9	222	565	7869- 7882	29- 42	3	31
10	223	566	7883- 7896	43- 56	4	31
11	224	567	7897- 7910	57- 70	5	31
12	225	568	7911- 7924	71- 84	6	31
13	226	569	7925- 7938	85- 98	7	31
14	227	570	7939- 7952	99-112	8	31
15	228	571	7953- 7966	113-126	9	31
16	229	572	7967- 7979	127-139	10	31
17	230	573	7980- 7993	140-153	11	31
18	231	574	7994- 8007	154-167	12	31
19	232	575	8008- 8021	168-181	13	31
20	233	576	8022- 8035	182-195	14	31
21	234	577	8036- 8049	196-209	15	31
22	235	578	8050- 8063	210-223	16	31
23	236	579	8064- 8077	224-237	17	31
24	237	580	8078- 8091	238-251	18	31
25	238	581	8092- 8105	1- 14	1	32
26	239	582	8106- 8119	15- 28	2	32
27	240	583	8120- 8133	29- 42	3	32
28	241	584	8134- 8147	43- 56	4	32
29	242	585	8148- 8161	57- 70	5	32
30	243	586	8162- 8175	71- 84	6	32
31	244	587	8176- 8189	85- 98	7	32

LANDSAT-2

SEP, 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	245	588	8190- 8203	99-112	8	32
2	246	589	8204- 8217	113-126	9	32
3	247	590	8218- 8230	127-139	10	32
4	248	591	8231- 8244	140-153	11	32
5	249	592	8245- 8258	154-167	12	32
6	250	593	8259- 8272	168-181	13	32
7	251	594	8273- 8286	182-195	14	32
8	252	595	8287- 8300	196-209	15	32
9	253	596	8301- 8314	210-223	16	32
10	254	597	8315- 8328	224-237	17	32
11	255	598	8329- 8342	238-251	18	32
12	256	599	8343- 8356	1- 14	1	33
13	257	600	8357- 8370	15- 28	2	33
14	258	601	8371- 8384	29- 42	3	33
15	259	602	8385- 8398	43- 56	4	33
16	260	603	8399- 8412	57- 70	5	33
17	261	604	8413- 8426	71- 84	6	33
18	262	605	8427- 8440	85- 98	7	33
19	263	606	8441- 8454	99-112	8	33
20	264	607	8455- 8468	113-126	9	33
21	265	608	8469- 8481	127-139	10	33
22	266	609	8482- 8495	140-153	11	33
23	267	610	8496- 8509	154-167	12	33
24	268	611	8510- 8523	168-181	13	33
25	269	612	8524- 8537	182-195	14	33
26	270	613	8538- 8551	196-209	15	33
27	271	614	8552- 8565	210-223	16	33
28	272	615	8566- 8579	224-237	17	33
29	273	616	8580- 8593	238-251	18	33
30	274	617	8594- 8607	1- 14	1	34

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8CY,1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	275	618	8608- 8621	15- 28	2	34
2	276	619	8622- 8635	29- 42	3	34
3	277	620	8636- 8649	43- 56	4	34
4	278	621	8650- 8663	57- 70	5	34
5	279	622	8664- 8677	71- 84	6	34
6	280	623	8678- 8691	85- 98	7	34
7	281	624	8692- 8705	99-112	8	34
8	282	625	8706- 8719	113-126	9	34
9	283	626	8720- 8732	127-139	10	34
10	284	627	8733- 8746	140-153	11	34
11	285	628	8747- 8760	154-167	12	34
12	286	629	8761- 8774	168-181	13	34
13	287	630	8775- 8788	182-195	14	34
14	288	631	8789- 8802	196-209	15	34
15	289	632	8803- 8816	210-223	16	34
16	290	633	8817- 8830	224-237	17	34
17	291	634	8831- 8844	238-251	18	34
18	292	635	8845- 8858	1- 14	1	35
19	293	636	8859- 8872	15- 28	2	35
20	294	637	8873- 8886	29- 42	3	35
21	295	638	8887- 8900	43- 56	4	35
22	296	639	8901- 8914	57- 70	5	35
23	297	640	8915- 8928	71- 84	6	35
24	298	641	8929- 8942	85- 98	7	35
25	299	642	8943- 8956	99-112	8	35
26	300	643	8957- 8970	113-126	9	35
27	301	644	8971- 8983	127-139	10	35
28	302	645	8984- 8997	140-153	11	35
29	303	646	8998- 9011	154-167	12	35
30	304	647	9012- 9025	168-181	13	35
31	305	648	9026- 9039	182-195	14	35

LANDSAT-2

NOV. 1976

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	306	649	9040- 9053	196-209	15	35
2	307	650	9054- 9067	210-223	16	35
3	308	651	9068- 9081	224-237	17	35
4	309	652	9082- 9095	238-251	18	35
5	310	653	9096- 9109	1- 14	1	36
6	311	654	9110- 9123	15- 28	2	36
7	312	655	9124- 9137	29- 42	3	36
8	313	656	9138- 9151	43- 56	4	36
9	314	657	9152- 9165	57- 70	5	36
10	315	658	9166- 9179	71- 84	6	36
11	316	659	9180- 9193	85- 98	7	36
12	317	660	9194- 9207	99-112	8	36
13	318	661	9208- 9221	113-126	9	36
14	319	662	9222- 9234	127-139	10	36
15	320	663	9235- 9248	140-153	11	36
16	321	664	9249- 9262	154-167	12	36
17	322	665	9263- 9276	168-181	13	36
18	323	666	9277- 9290	182-195	14	36
19	324	667	9291- 9304	196-209	15	36
20	325	668	9305- 9318	210-223	16	36
21	326	669	9319- 9332	224-237	17	36
22	327	670	9333- 9346	238-251	18	36
23	328	671	9347- 9360	1- 14	1	37
24	329	672	9361- 9374	15- 28	2	37
25	330	673	9375- 9388	29- 42	3	37
26	331	674	9389- 9402	43- 56	4	37
27	332	675	9403- 9416	57- 70	5	37
28	333	676	9417- 9430	71- 84	6	37
29	334	677	9431- 9444	85- 98	7	37
30	335	678	9445- 9458	99-112	8	37

LANDSAT-2

DEC. 1974

DATE	GMT DAY	FLIGHT DAY	SPACECRAFT ORBITS	REFERENCE ORBITS	REF DAY	CYCLE NO.
1	326	679	9459- 9472	113-126	9	37
2	327	680	9473- 9485	127-139	10	37
3	328	681	9486- 9499	140-153	11	37
4	329	682	9500- 9513	154-167	12	37
5	340	683	9514- 9527	168-181	13	37
6	341	684	9528- 9541	182-195	14	37
7	342	685	9542- 9555	196-209	15	37
8	343	686	9556- 9569	210-223	16	37
9	344	687	9570- 9583	224-237	17	37
10	345	688	9584- 9597	238-251	18	37
11	346	689	9598- 9611	1- 14	1	38
12	347	690	9612- 9625	15- 28	2	38
13	348	691	9626- 9639	29- 42	3	38
14	349	692	9640- 9653	43- 56	4	38
15	350	693	9654- 9667	57- 70	5	38
16	351	694	9668- 9681	71- 84	6	38
17	352	695	9682- 9695	85- 98	7	38
18	353	696	9696- 9709	99-112	8	38
19	354	697	9710- 9723	113-126	9	38
20	355	698	9724- 9736	127-139	10	38
21	356	699	9737- 9750	140-153	11	38
22	357	700	9751- 9764	154-167	12	38
23	358	701	9765- 9778	168-181	13	38
24	359	702	9779- 9792	182-195	14	38
25	360	703	9793- 9806	196-209	15	38
26	361	704	9807- 9820	210-223	16	38
27	362	705	9821- 9834	224-237	17	38
28	363	706	9835- 9848	238-251	18	38
29	364	707	9849- 9862	1- 14	1	39
30	365	708	9863- 9876	15- 28	2	39
31	366	709	9877- 9890	29- 42	3	39

APPENDIX C

LANDSAT-2 DOCUMENTS ISSUED THIS REPORT PERIOD

APPENDIX C

LANDSAT-2 DOCUMENTS ISSUED THIS REPORT PERIOD

NO	DOCUMENT NO.	TITLE AND DATE
1	PIR-1N23-ERTS-154	Landsat-2: WBVTR-1 Playback Anomaly, dated 8/15/75
2	PIR-1N23-ERTS-155	Test of WBVTR-1 of Landsat-2, dated 8/20/75
3	PIR-1N23-ERTS-156	Consolidated History of WBVTR-1 of Landsat-2, dated 8/21/75
4	PIR-1N23-ERTS-157	WBVTR-1 Test With RBV Date Input on Landsat-2, dated 8/29/75
5	PIR-1N34-ERTS-158	WBVTR-1 in Landsat-2: 3-Second Normalcy in Anomalous Operation, dated 9/4/75
6	PIR-1N23-ERTS-160	Landsat-2: Comstor Command Omitted When Delayed by R/T Command, dated 9/16/75
7	PIR-1N23-ERTS-161	WBVTR-1 on Landsat-2: Test With No Video Input, dated 9/23/75
8	PIR-1N23-ERTS-164	USB Power At Ground Station, dated 10/15/75

GENERAL ELECTRIC

Space Division

Headquarters Valley Forge, Pennsylvania ☐ Daytona Beach, Fla. ☐ Cape Kennedy, Fla
☐ Evendale, Ohio ☐ Huntsville, Ala ☐ Bay St Louis, Miss ☐ Houston, Texas
☐ Sunnyvale, Calif ☐ Roslyn, Va ☐ Beltsville, Md